

a House to be Home

by
Reuben William Grin

A thesis
presented to the University of Waterloo
in fulfillment of the
thesis requirement for the degree of
Master of Architecture

Waterloo, Ontario, Canada, 2014

© Reuben William Grin 2014

Author's Declaration

I hereby declare that I am the sole author of this thesis. This is a true copy of my thesis, including any required final revisions, as accepted by my examiners.

I understand that my thesis may be made electronically available to the public.

Abstract

Architecture exists in context. Buildings are designed for, and exist in, a place and time. The vast majority must adhere to a relative strict set of construction, regulatory, and cultural considerations; all of them are designed according to some notion of occupation or utilization by people.

Our architecture educations make it easy to envision building as a function of the vision of an architect and that architecture follows a linear and orderly process from design intent to building. The reality is that the construction of a building, regardless of its scale, is an immensely complex undertaking, and while an architect designs the material reality of a building architecture happens in concert with, and in relationship to, the will and expertise of a great array of personalities including bureaucrats, contractors, tradespeople, and, always, a client. Interestingly, the education of an architect invests significantly in developing a “vision”, and is remarkably quiet on the relationships intrinsic to the realization of an architectural project.

This is a thesis about the addition and renovation of a house into a home for myself and my family. It begins with the selection of an appropriate existing building and continues through the design, construction and occupation of what, by the end, is a new home for my wife Sarah, my two children, Eli (4) and Petra (2), and myself. I endeavored to learn by doing. The thesis takes the form of a narrative about a project that was executed as much as it was designed, subject to all the requirements of any project: schedule, budget, regulation and the limitations and talents of everyone involved in its selection, design, construction, and occupation. Implicit in this narrative are the relationships that helped shape the final building, expounded through emails, text messages, and my own reflections in the moment.

This thesis is located outside of the confines of the institution and is instead located in the place where buildings are built.

ACKNOWLEDGMENTS

My home, the building and the place, is a product of relationships. Of builders and regulators and tradespeople and family, of design and construction and neighborhood.

My thesis is likewise.

To my brother Jesse, for patience and expertise and unflagging assurance.

To my father Albert, for ideas and optimism and selfless investment.

To my mother, Wilma, for giving and for being there.

To Brock, who is far away, yet still inspires me.

I want to thank Val Rynnimmeri for good advice when I needed it and the space to make my own mistakes and to find a thesis in my architecture.

I want to thank John McMinn and Andrew Levitt who believed in me.

There are others, throughout this thesis who guided and directed and helped me find my way. Thank-you for your advice and for your willingness to give it.

To my children, Eli and Petra, who get bigger every day.

Finally to Sarah, my wife and my best friend.

Because it wouldn't really matter without you.

DEDICATION

The book of love is long and boring
No one can lift the damn thing
It's full of charts and facts, some figures and instructions for dancing

But I,
I love it when you read to me.
And you,
You can read me anything.

The book of love has music in it,
In fact that's where music comes from.
Some of it is just transcendental,
Some of it is just really dumb.

But I,
I love it when you sing to me.
And you,
You can sing me anything.

The book of love is long and boring,
And written very long ago. It's full of flowers and heart-shaped boxes,
And things we're all too young to know.

the book of love, Stephin Merritt.

For Sarah

Contents

list of Figures

1. Introduction

- 1.1. the Basics
- 1.2. the Project
- 1.3. the People

2. Selection

- 2.1. Overview
- 2.2. Ethos
- 2.3. Significance
- 2.4. the Beginning
- 2.5. Selection Criteria
- 2.6. Selection Timeline
- 2.7. Neighborhood Holons

3. Design

- 3.1. Overview
- 3.2. Ethos
- 3.3. Significance
- 3.4. Design Relationships
- 3.5. Plan Evolution

4. Construction

- 4.1. Overview
- 4.2. Ethos
- 4.3. Significance
- 4.4. the Model
- 4.5. Construction Drawings
- 4.6. Construction

5. Occupation

- 5.1. Overview: we live here
- 5.2. Ethos
- 5.3. Significance
- 5.4. Moving In
- 5.5. Living
- 5.6. Lessons

6. Reflection

- 6.1. a Translation
- 6.2. a Difference
- 6.3. my Conclusion

7. Afterward

- 7.1. a refuge for memories
- 7.2. just do it

Bibliography

Appendices

- A. Appendix A: Construction
- B. Appendix B: Regulations
- C. Appendix C: Economics
- D. Appendix D: Environmental

list of Figures

0

0.a Home author

1

1.1.a You're Not Wrong internet
1.2.a Front Steps September 2013 author
1.2.b Front Steps June 2014 author
1.2.c Back September 2013 author
1.2.d Back April 2014 author
1.2.e First Floor Existing author
1.2.f First Floor New author
1.2.g Second Floor Existing author
1.2.h Second Floor New author
1.3.2.a People Involved author
1.3.3.a People Map author

2

2.a Searching author
2.5.1.a Initial Zone author
2.5.1.b Divided Search Area author
2.5.2.a Concentrated Search Area author
2.5.2.b Three Attractions author
2.5.2.c Morphed Area of Interest author
2.5.3.a Canvassed Neighbourhoods author
2.5.4.a Spadina and Queen author
2.5.5.a Process of Elimination author
2.5.6.a Homewood Ave author
2.5.7.a 17 Brock author
2.5.8.a Begin Again author
2.5.9.a 87 Patricia author
2.5.10.a 63 Mill author
2.5.11.a 35 Garden author
2.5.12.a 8 Dill author
2.5.12.a 63 Heins author
2.5.14.a Offer on 4 Spadina author
2.5.15.a A Wrench in the Works author
2.5.16.a Houses Map author
2.6.1.a Suitable Area author
2.6.1.b Final Limits author
2.6.1.c Areas author
2.6.1.d Neighbourhoods author
2.6.1.e Sub-neighbourhoods author

3

3.a A Window author

3.2.1.a	Quinta Monroy as Built	Christobel Palma
3.2.1.b	Quinta Monroy as Occupied	Christobel Palma
3.4.1.1.a	From our Shower	author
3.4.1.1.b	Ensuite Section	author
3.4.1.1.c	West Elevation	author
3.4.1.1.d	Entry South Elevation	author
3.4.1.1.e	Entry East Elevation	author
3.4.1.2.1.a	Focus	Joel @ Creative Sobriety as shown on http://www.creativesobriety.co.uk/
3.4.1.2.1.b	Metal Trim Sketches	author
3.4.1.2.1.c	Metal Trim Invoice	Turkstra Lumber
3.4.1.2.1.d	Nothing New Under the Sun	author
3.4.1.2.2.a	Trim @ Vinyl Windows	author
3.4.1.2.2.b	Windows in the Wall	author
3.4.1.2.2.c	Windows Cost	Graham Climie @ Dashwood Windows and Doors
3.4.1.3.a	Office Windows	author
3.4.1.3.b	Powder Room Exterior	author
3.4.1.3.c	Powder Room Plan	author
3.4.1.3.d	Existing Kitchen	author
3.4.1.3.e	New Kitchen	author
3.4.1.3.f	Mechanical Grilles	author
3.4.1.4.1.a	Maibec Wood Siding	author
3.4.1.4.2.a	Original Front Plan	author
3.4.1.4.2.b	Sub-neighbourhoods	author
3.4.1.4.2.c	Original Front Entry	author
3.4.1.4.2.d	New Front Entry	author
3.4.2.3.1.a	Philip Johnson's Glass House	Thomas Loof
3.4.2.3.2.a	Office Window	author
3.4.2.3.2.b	Backstairs Plan	author
3.4.2.3.2.c	Back Stairs	author
3.4.2.3.3.a	Daylight Penetration	Alex Lukakcho
3.4.3.1.a	Trim 5 as for Permit	author
3.4.3.1.b	Trim 5 as Bent	author
3.4.3.2.a	January 10 Costs page 1	author
3.4.3.2.b	January 10 Costs page 2	author
3.4.3.2.c	January 10 Costs page 3	author
3.4.4.1.a	Laundry Room 1	author
3.4.4.1.b	Laundry Room 2	author
3.4.4.2.a	Initial Solution Example	JW
3.4.4.2.b	Stand Alone Tub Design	author
3.4.4.2.c	Skirted Tub Integration	author
3.4.6.a	At the Top of the Stairs	author
3.4.6.b	Original Plan	author
3.4.6.c	Initial Permit Plan	author
3.4.6.d	Revised Foyer Plan	author

3.4.6.1.a	South Glazing	author
3.4.6.1.b	East Glazing	author
3.4.6.1.c	North Glazing	author
3.4.6.1.d	West Glazing	author
3.4.6.2.a	Whole Wall Performance	author
3.4.6.2.b	Revised Whole Wall Performance	Aaron Grin
3.5.1.a	Proposed Front Porch Revision	author
3.5.2.1.a	2013.08.11 First Floor	author
3.5.2.1.b	2013.08.11 Second Floor	author
3.5.2.2.a	2013.08.14 First Floor	author
3.5.2.2.b	2013.08.14 Second Floor	author
3.5.2.3.a	2013.08.16 First Floor	author
3.5.2.3.b	2013.08.16 Second Floor	author
3.5.2.4.a	2013.08.25 First Floor	author
3.5.2.4.b	2013.08.25 Second Floor	author
3.5.2.5.a	2013.08.30 First Floor	author
3.5.2.6.a	2013.09.01 First Floor	author
4		
4.a	My Big Boots	author
4.3.a	Offset Post	author
4.3.b	Corner Post	author
4.3.c	Front Porch Post	author
5		
5.a	Living Here	author
5.1.a	Relaxing on the Couch	author
5.4.a	Kids Helping	author
5.4.b	Picture Wall	author
5.5.1.a	Yakisugi House	Edmund Sumner
5.5.1.b	South Wall of Ensuite	author
5.5.1.c	West Wall of Ensuite	author
6		
6.1.a	Original Street View	author
6.1.b	Original Porch View	author
6.1.c	Various Front Porch Sketches	author
6.1.d	Entry Permit Design	author
6.1.e	Entry Built Design	author
6.1.f	Four Front Porch Schemes	author
6.1.g	The Window Issue	author
6.1.h	Final Scheme Render	author
6.1.i	Front Construction	author
6.1.j	Queen Street Approach	author
6.1.k	Front Walkway	author

6.1.1 Front Door author

7

7.1.a A Place Above author

7.2.a Our Home author

9

A.1.a Site Plan author

A.1.b Basement Plan author

A.1.c First Floor Plan author

A.1.d Second Floor Plan author

A.1.e Attic Plan author

A.1.f Roof Plan author

A.1.g South Elevation author

A.1.h North Elevation author

A.1.i West Elevation author

A.1.j East Elevation author

A.1.k Powder Room Section author

A.1.l Rear Addition Section author

A.1.m Building Section author

A.2.1.a Rear Decks author

A.2.1.b Rear Deck Footing author

A.2.1.c Quick Cut Saw author

A.2.1.d The Hole author

A.2.1.e The Hole with Formwork author

A.2.2.a Plastic Capped Nails author

A.2.2.b Dumb Labour author

A.2.3.a Front Porch Brick author

A.2.3.b Connection Engineering author

A.2.3.c Front Porch Permit Plan author

A.2.3.d Original Connection author

A.2.3.e Structural Sketch author

A.2.3.f Front Column Change author

A.2.3.g Final Permit Revision author

A.2.4.a Plumbing Challenge author

A.2.4.b HVAC Challenge author

A.2.4.c Tub Insulation author

A.2.4.d Half Measures author

A.2.4.e Insulation Baffle author



Fig. O.a.
Home

1. Introduction

1.1. the Basics

I renovated a house. Guttled a century home, added a powder room on the main floor, a master suite on the second and “opened up” the kitchen, living, and dining rooms. Essentially a trivial thing, a project that pushes few boundaries, and mostly conventional. Thousands of these projects happen across Canada every year, and while I will claim some measure of quality, of considered and effective use of materials and architecture to create pleasant and satisfying spaces, it is on the whole merely another one of a type.

I did however, construct something real. I organized and designed a home, with my time, skills, energy and strength, with my hands and mind I realized a real building. My home exists. It isn't a model or a drawing or a concept. This is an actual building, a real architecture, something more than an experiment or conceptualization, pursuant to all the risks, limitations and regulations of reality. People live in this building. My kids, my wife, and myself, we live in these adapted spaces.

This thing survived construction. Survived the practical considerations. Survived my limited means. It had to work. It did, and does. In Architecture school we are immersed in an institution that primarily strives to push “Architecture” into new and exciting realms, but which usually settles for a drawing, or a render, or a model of an architectural idea. Reality is, however, a building constructed, and lived in. Reality demands compromise, it demands attention and competence. This thing will be for 25 or 50 or 100 years more. My home is not without experiment, not without expression and investigation, but it has to work, it had to be built for a specific amount of money, had to be finished by a certain date, has to stay dry, has to be warm in the winter, has to have a room for each of my children, has to have a 2nd floor laundry room, has to “meet code”. It is easy to construe these things as hindrances, or inconsequential to architectural theories and analysis, but they comprise the bones of most architectural projects, are essential to the instantiation of the buildings that do change the world.

We want to change the world. I believe everyone does, I certainly believe that architects intend to change the world. As architects we change the world by making buildings. As long as we are practicing architecture our means of impact - our modus operandi - is buildings. Okay, yes, we like and produce pretty pictures, and models, and fantastic imaginings but as actors in an architecture school, these are means by which we modulate and inform the practice of architects who make buildings. These are ultimately means towards changes in buildings, even if we are

not always entirely sure how they might.

Are not buildings what, as bright-eyed applicants, we envisioned ourselves creating when starting our architecture education. We aimed to design buildings - buildings which would be built and that people would inhabit, and in-so-doing, change the world, or at least our part of it. I came to learn how to design buildings, to learn how to produce good design, so that I could make good buildings, so that people would pay me to design buildings that would be built. I learned that Architects design spaces, and that buildings are perhaps ancillary to this, but they are no less important to the trajectory of an Architect and to Architecture itself.

A building, and perhaps more so, a renovation, is beholden to set of realities and factors not normally addressed in our architecture education, and even a project which is just one more of a type, a renovation which is perhaps mundane, can serve to illuminate realms of architecture not often explored academically.

The following thesis is an account and an exploration of a realm in architecture that often functions largely independently of architects and a lesson in the contingencies of architecture as buildings are built and occupied.

It is also an endeavor in application rather than a conceptualization. As discussed, reality imposes the full set of considerations and contingencies on a designed thing, any element is ignored only at one's own peril and the conceptually possible withers in the face of a practical application. Doing does, however, liberate the designer from the strictures of perfection, any project should be good, should be well executed but very few, if any, will be perfect. In fact, sometimes, aiming for perfection causes us to fail or come up far short of what we might have achieved if we just executed a more modest goal.

Constructing a real thing also makes mistakes explicit, mistakes which constitute learning. It is all well and good to be warned of an eventuality, or a consequence of a poor decision, but to experience a mistake is to know why and how that thing fell short, and to develop strategies for avoiding them in the future. In this way architecture, like any profession, progresses incrementally. If we limit our experiments - the risks for mistakes - to specific aspects of a particular design or building and thereby have the time and energy to devote the requisite attention to our deviations from the norm, our chances of successes are increased and our failures will be on a scale proportional to the extent of the experiment. This relinquishes the remainder of the building to a set of conventional strategies, or to previously learned lessons. Previously learned lessons are important. As architects

we assemble our own competencies based on our previously learned lessons. These lessons become our strengths. A building, any building, cannot be separated from its context. And that context includes the techniques and conventions of those who will construct the building.

When we get beyond the lines on paper, our design, material, and site experiments inevitably come up against the construction of the thing and the people who will build it. It is easy to think that because of our years of education and, as we practice, years of construction oversight, that the tradesperson with a high school education has little to offer our “enlightened design(s)”. We could, perhaps, run roughshod over the complaints and suggestions of people who have done their trade for decades, and we might be able to force them into servitude to our vision and our particular method, but this dismisses the wealth of knowledge that their years of experience offers and also, often, poisons the relationship necessary for quality work. If we insist on a particular method, without consultation, we set ourselves up for a vindictive and legalistic reading of our drawings and specs which are themselves never perfect.

Construction requires relationships, even on my small project 60 different trades-groups, suppliers, regulators and consultants had a hand in its realization. This does not even count the trades in which 3 or 4 or 5 different people may have worked, or the sub-trades of sub-trades. Counting every person that was involved would put the number well over 100. Each of these people had a significant impact on the final product and more-so on the construction process. The management and motivation of these people and the maintenance of relationships, because there will be another project another day, becomes an important consideration.

This thesis tracks the selection, design, construction and occupation of my home highlighting important elements, decisions and products of the process, design and of the house itself. Additionally, each section delineates an ethos and situates a significance for that particular facet of the process.

The architecture of a place or community might be described as a collection of buildings, but architecture is also a practice, a process: and these actions are motivated and modulated by the overarching ethos. While each project might be a discrete and unique thing or space, the motivation and intentions of an architect in a project are crucial to the implementation of their project. To recognize and delineate one’s own goals and intentions for the design and implementation of a project creates a set of parameters by which to judge its success, and to justify

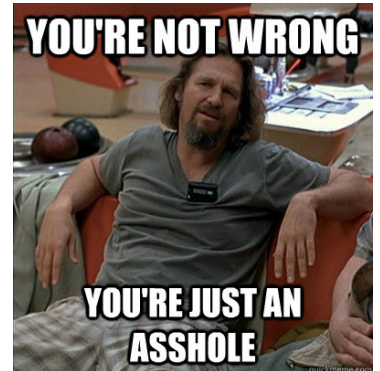


Fig. 1.1.a.
You're Not Wrong

A popular internet meme, lifted from the movie “The Big Lebowski”. Sometimes it isn’t enough just to be right.

one's decisions. For example, one of my intentions, part of my ethos, for the project as a whole was to learn, to spend a little more time and money in order to explore more options than I might have otherwise. When something took a little longer or cost a little more than it might have if I had just done the conventional thing, I could recognize the value and justify the expense by embracing this element of my ethos. Sometimes I settled on the conventional solution in the end, but I knew why I was making this decision, and I had explicitly placed a value on that learning when I set out to do the project.

Ethos:

noun:

The distinguishing character, sentiment, moral nature, or guiding beliefs of a person, group, or institution

A large majority of single family home additions and renovations proceed without any involvement from architects. Many proceed without input from any design professional at all. I argue that these are significant projects and a significant realm in architecture that is unduly overlooked by architects and those that study architecture. There are many reasons for this, and many hurdles that preclude architects from working at this scale. I don't have solutions. But I do have this particular project, and I can at least begin a discussion of how these architectural interventions do not deserve obscurity. I can begin to envision how and why an (almost) architect can influence even a relatively modest addition and renovation.

The thesis that follows is divided up into the major elements of any building project: site, design, construction, and occupation.

Woven through these this thesis are selected correspondence and reflection which shaped and modified the project through various means. Also inherent throughout is my own personal meditations on architectural practice, my musings about what defines architecture and architectural practice, and how construction, and budgets, and schedule are important architectural considerations, just as is design.

Matthew B. Crawford

Allow me to say a word about what this book [thesis] is not. I want to avoid the kind of mysticism that gets attached to "craftsmanship" while doing justice to the very real satisfaction it offers. I won't be talking about Japanese sword makers or any such thing, and generally prefer to use the term "trade" [construction] over "craft" [making] to emphasize the prosaic nature of my subject. . . Compared to any real craftsman, my own skills are execrable, so I have no basis for talking about the higher spirituality that is alleged to arise from a perfectly fit mortise or whatever. As a rough working formula, we might say that craftsmanship, as an ideal, provides the standards, but that in a mass-market economy such as ours, it is the tradesman who exemplifies an economically viable way of life, one that is

broadly available and provides many of the same satisfactions we associate with craftsmanship. . . So I wan to avoid the precious images of manual work that intellectuals sometimes traffic in.¹

Shop Class as Soul-Craft
[parenthesis mine]

When someone else has already said it, and as succinctly and articulately as I would wish, I'll not say again. Suffice to say, while I will not shy away from some of the philosophical implications of home, or the phenomenological or psychological impact of architecture, my thesis is intensely practical, and implemented as an exhibition of, what I believe to be, good practical architecture.

1. Matthew B. Crawford, *Shop Class as Soul-Craft* (New York: Penguin Group, 2006), 8.

1.2. the Project

We gutted the existing house and revised the front entry experience and added about 350 square feet over an existing attached garage.

Fig. 1.2.a.
Front Steps September 2013
4 Spadina Road West.
Kitchener Ontario.
September 2013.





Fig. 1.2.b
Front Steps June 2014
4 Spadina Road West.
Kitchener Ontario.
June 2014

Fig. 1.2.c.
Back September 2013
(opposite, top)
September 2013

Fig. 1.2.d.
Back April 2014
(opposite, bottom)
April 2014
The elements of the addition
and renovation are completed.
The doors have yet to be
painted, and the two decks
yet to be built, but the back of
the house is now an entirely
different architecture.



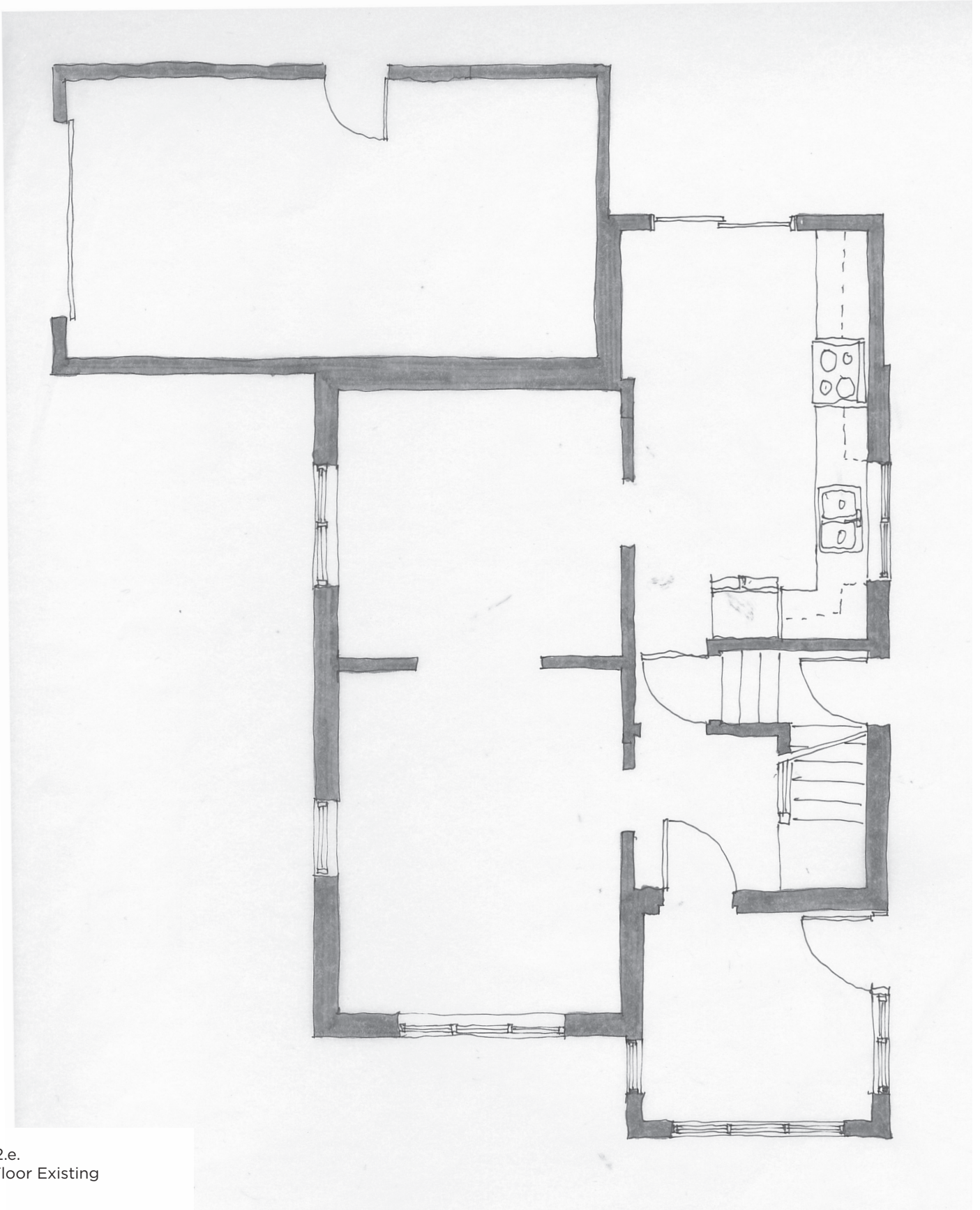


Fig. 1.2.e.
First Floor Existing

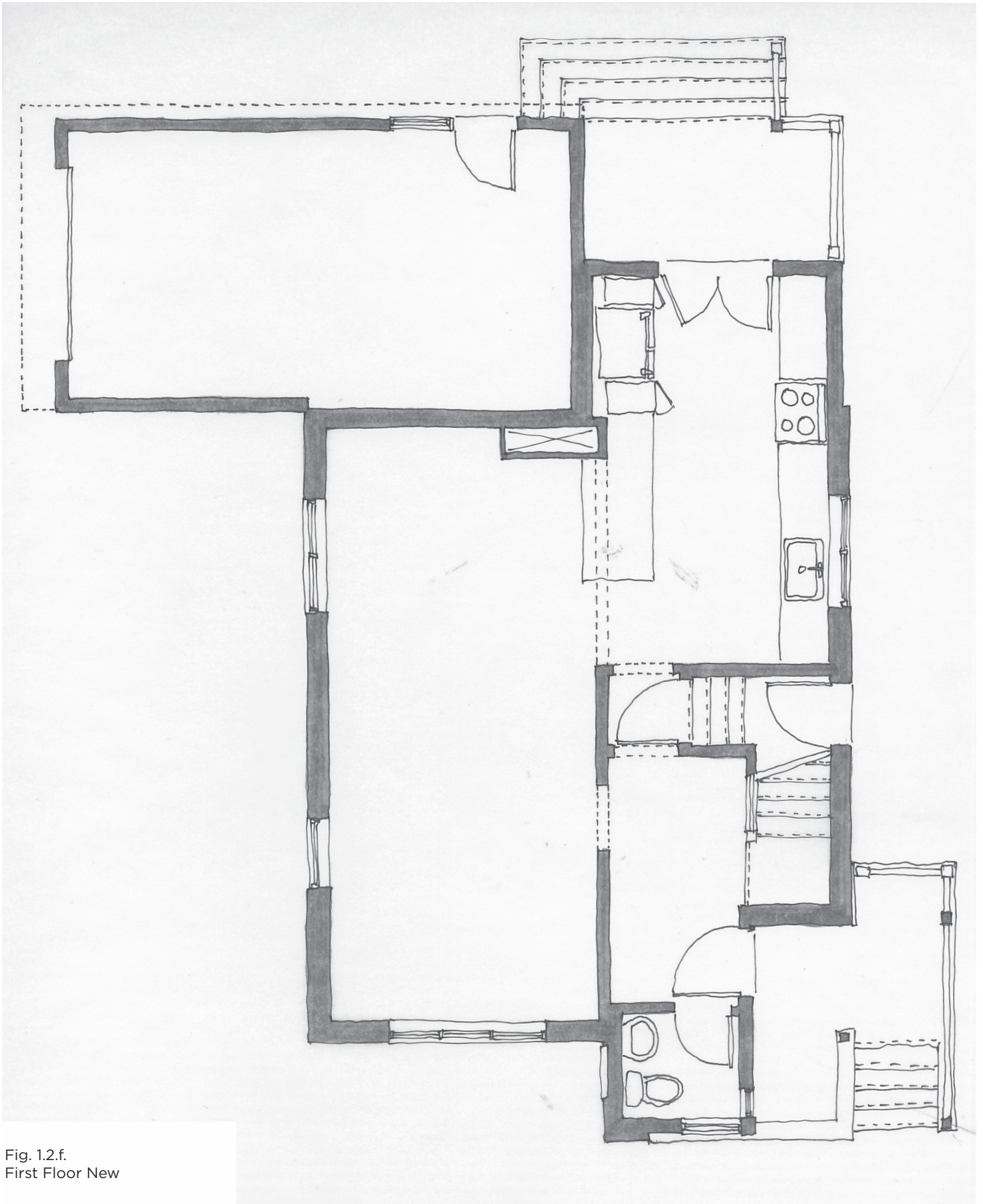


Fig. 1.2.f.
First Floor New

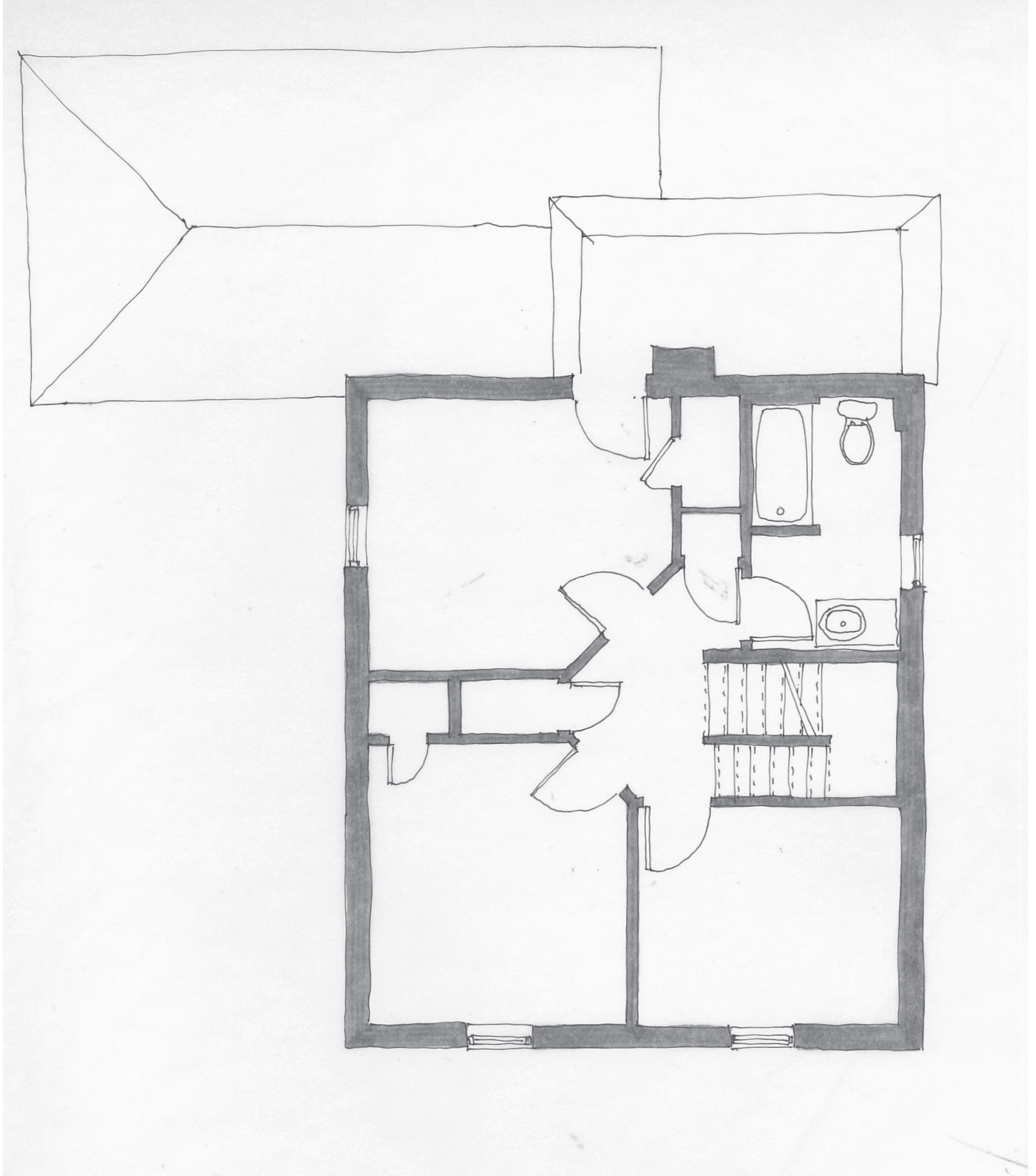


Fig. 1.2.g.
Second Floor Existing

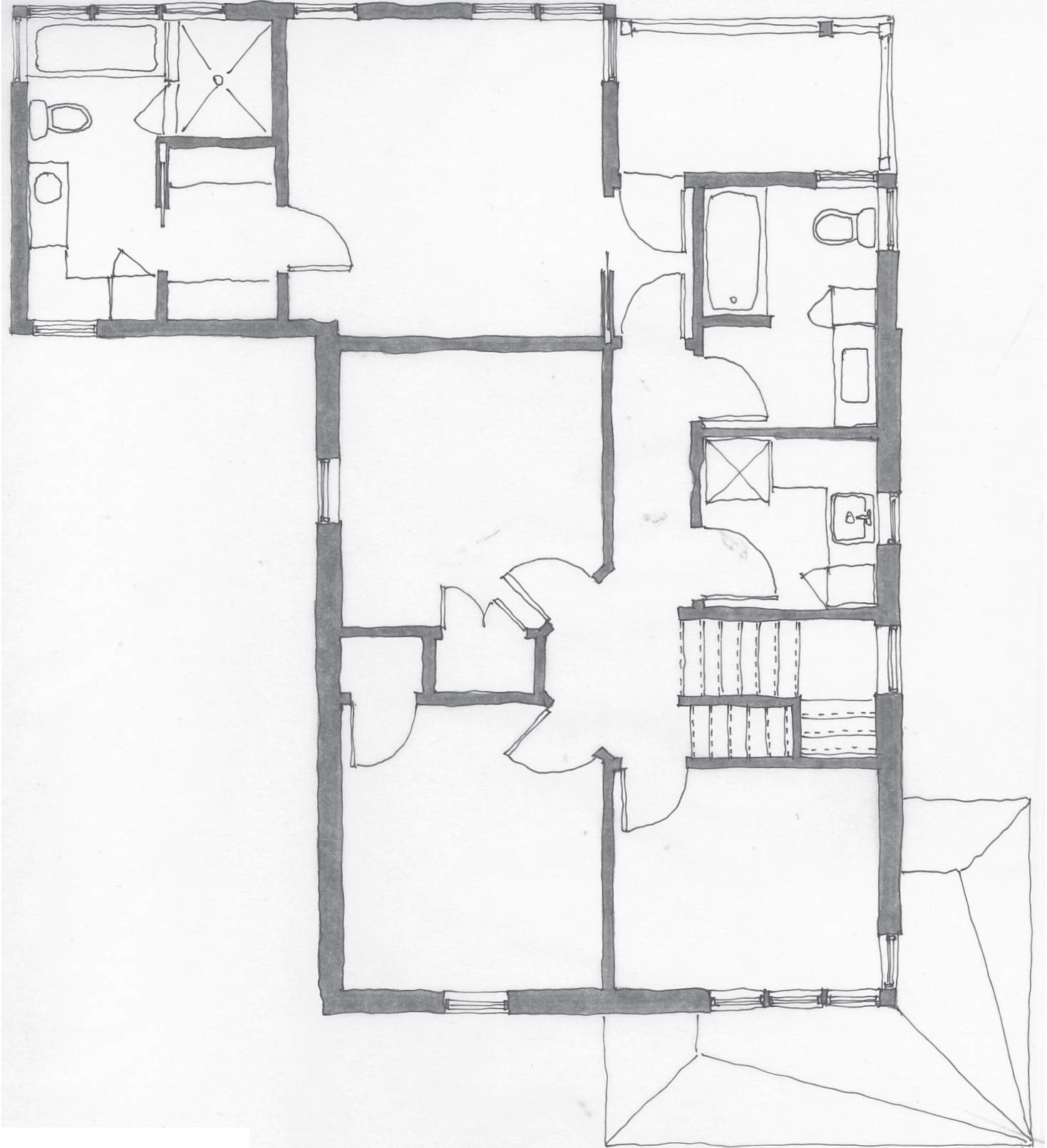


Fig. 1.2.h.
Second Floor New

1.3. the People

1.3.1. Key People

Throughout this narrative conversations with several key people demonstrate some of the scope and the influence of other people, most non-architects, in the selection, design, and construction of our home.

Sarah Grin: My wife.

Eli and Petra Grin: My son and daughter, respectively.

Jesse and Albert Grin: The contractors, also my brother and father.

Reuben Grin: Me, (almost) an architect.

Val Rynimmeri: My Thesis Supervisor at the University of Waterloo

Aaron Grin: Building Scientist, Engineer.

Jessica March: Our real estate agent.

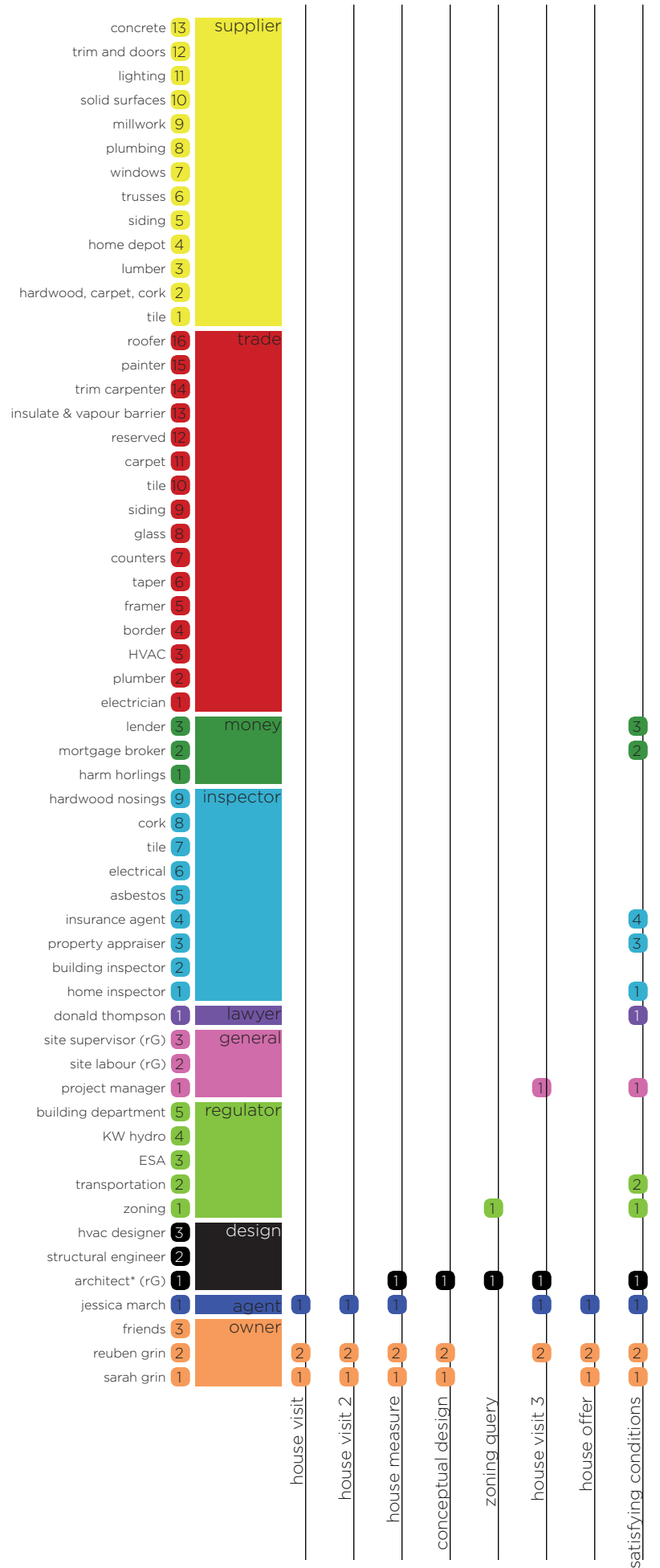
Tim Scott: An Architect, adjunct professor.

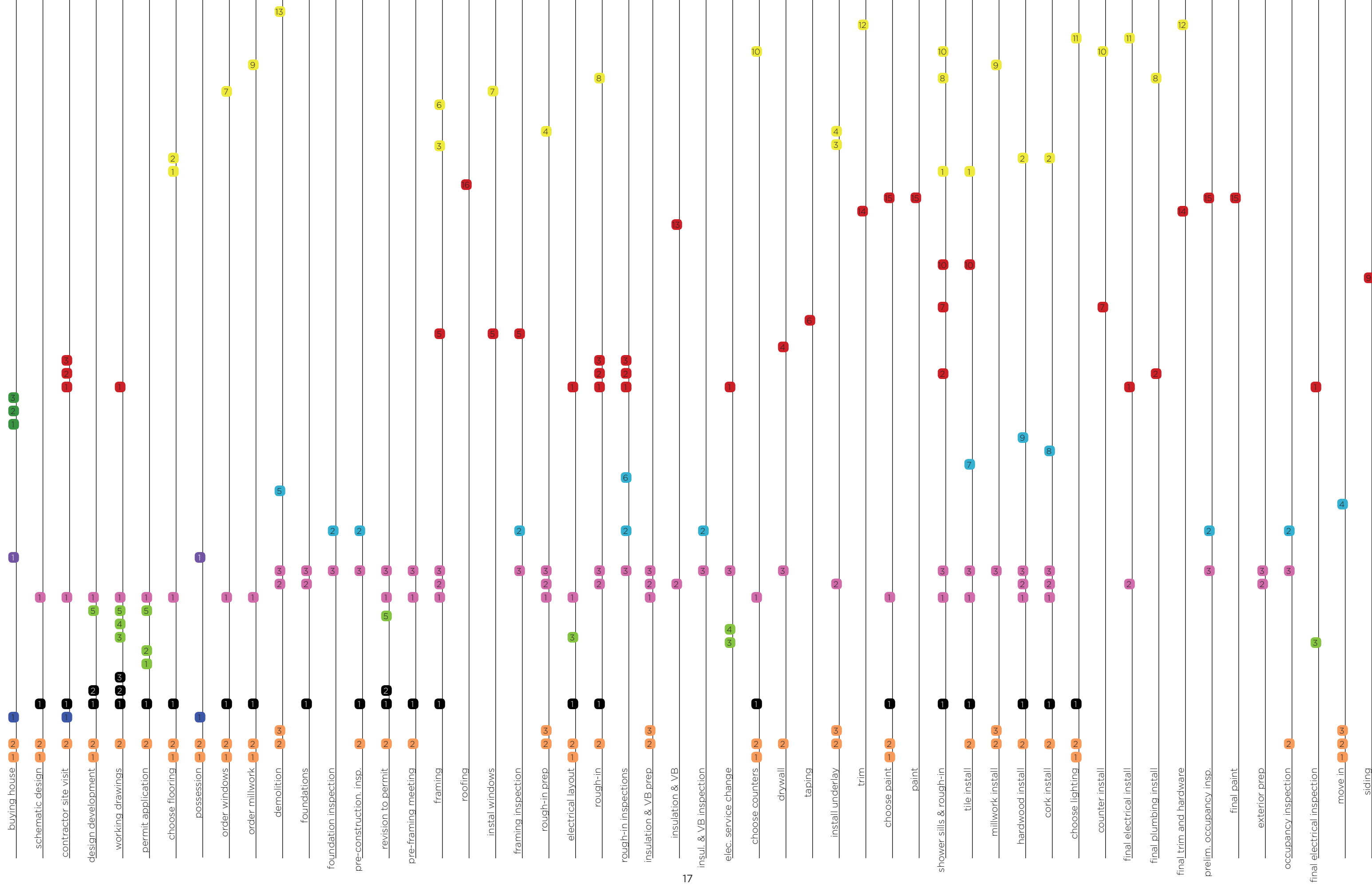
Jeff Medeiros: Planning official at the City of Kitchener.

1.3.2. Involvement

Any construction project involves a wide array of people. Any particular decision or process demands the attention of various inspectors, trades, suppliers, contractors, installers, lenders and so forth. The following table delineates a significant subset of the “landmarks” of the process, and demonstrates which people influenced that particular element or decision. For a very few landmarks only one or two people are involved, for the majority however, a number of different actors weigh in, and for some there are many, for example: to satisfy the conditions on the purchase of the home required 13 different significant parties,

Fig. 1.3.2.a.
 People Involved
 Who was involved, and how.





1.3.3. Locations

The actors came from dispersed geographical locations in southern Ontario, most of them congregating around Georgetown Ontario, where our General Contractor is located and Kitchener where the house is. Kitchener is slightly outside of the usual realm of business for our contractor and this presented some problems with getting trades on site; longer travel times created situations where tradespeople endeavored to make as few trips as possible, and, because I was paying my contractor on an hourly basis, any trip to site for him involved almost 2 hours of travel time. My intention was to need his advice as little as possible, and to operate by telephone and email when convenient, but this reality artificially complicated some conversations.

Fig. 1.3.3.a.
People Map
The significant actors plotted
on a map of a portion of
Southern Ontario



concrete	13	supplier
trim and doors	12	
lighting	11	
solid surfaces	10	
millwork	9	
plumbing	8	
windows	7	
trusses	6	
siding	5	
home depot	4	
lumber	3	
hardwood, carpet, cork	2	
tile	1	
roofer	16	trade
painter	15	
trim carpenter	14	
insulate & vapour barrier	13	
reserved	12	
carpet	11	
tile	10	
siding	9	
glass	8	
counters	7	
taper	6	
framer	5	
border	4	
HVAC	3	
plumber	2	
electrician	1	
lender	5	money
mortgage broker	2	
harm borlings	1	
hardwood nosings	9	inspector
cork	8	
tile	7	
electrical	6	
asbestos	5	
insurance agent	4	
property appraiser	3	
building inspector	2	
home inspector	1	
donald thompson	1	lawyer
site supervisor (rG)	3	general
site labour (rG)	2	
project manager	1	
building department	5	regulator
KW hydro	4	
ESA	3	
transportation	2	
zoning	1	
hvac designer	3	design
structural engineer	2	
architect* (rG)	1	
jessica march	1	agent
friends	3	owner
reuben grin	2	
sarah grin	1	

1.4. the Thesis

2014.04.29

Hi Val,

I'm getting very frustrated with the whole process of this thesis. I've talked to Sarah about just quitting, but we think that is a waste. I need to finish this before I become completely disinterested in this whole thing. As you may have noticed, I have a lot of ideas and not a lot of follow through - at least not with reports and writing and research. I like designing and building, this is why I came to architecture school, and why I want to be an architect. I want to design and make good buildings, I want to be on site and to see designs built. I found myself the other morning very jealous of the driver beside me on the road. He was in a company pick-up truck and headed to or from some job-site. All I had to look forward to was another day behind a computer, writing stuff I only half believe and ultimately don't care too much about. I have one philosophy degree, that's enough, I hope.

I don't want to build a case for the significance of the renovation/addition to the single family home in the greater architectural landscape - or craft a compelling argument for design intervention and involvement in this realm, though I do none-the-less believe that this is both a significant and important architectural realm.

I can't create a unified theory for architecture at this scale. Or theoretically underpin architectural interventions at the scale of the home renovation/addition. I believe that it is far more important that architects or designers at least are involved rather than how they're involved, or to impose a methodology on these designs. I don't have a set of principles or imperatives that doesn't sound trite, self-evident, and universal rather than specific to this scale.

I think I can show, in the project I designed and built, how things like schedule, budget, economics, regulators, tradespeople, and contractors influenced and participated in the construction of this particular renovation and addition, I think at the end of the day architects are ultimately concerned with buildings - and that design theories and conceptualizations, while important, comprise only part of architecture.

I would like to document and analyze the process itself. I like the email chain as an armature around which to pin the drawings and diagrams and justifications. I think there is also a latent proposition about the involvement of an architect in the construction of a building, about the opportunities for both the architect and for the building itself. I think this is unexplored or at least underexposed

territory. I think I can force myself to compile the email, get permissions, and key the details, drawings, photographs, diagrams, and stories into this narrative. I can start it with a few pages of introduction, and end it with a few pages of conclusions.

I would like to put all this together and have some sort of committee meeting. I talked with John McMinn a couple weeks ago, and he is willing to be on my committee.

Yeah I'm stuck. I don't like what I've been working on, and I don't feel like I've done very much at all. I have no other responsibilities for the foreseeable future though - other than the mounting pressure to get a job at alleviate some of the financial stress building up at home.

Maybe let me know what you think.

r

2014.04.30

So, I'm re-reading this, I sound like a child. We should talk again soon though.

r

I did sound like a child, and I talked with Val later that day: Architecture is a second order profession, separated from the execution of building by an intellect concerned with what is being built as much or more so than how it is built. I hope this thesis demonstrates that intellect even as we delve into the practical concerns and realities of building itself.

Fig. 2.a.
Searching



2. Selection

2.1. Overview

Take a look at the zoning map of many mid-sized Ontario cities and you'll find a preponderance of residential zoning. Look closer and you'll find that a large percentage of the total area is single family houses. This is not to say that most people are living in single family homes - only that of the total land, much is devoted to single family houses. Seen from the sky these houses appear the same - and the neighborhoods of the mid-sized city appear to stretch across the city - punctuated by parks, schools, retail plazas and various commercial/business zones. On the ground however, one recognizes distinct and varying neighborhoods and districts, defined by proximity to amenities, or the qualities of their streets, or proximity to undesirable infrastructure, or increasingly variable factors which serve to distinguish ever smaller classifications of neighborhoods and sub-neighborhoods. At the most basic level, each house is a place of its own, affected by and affecting the houses around it, defining a place in its own right by virtue of its architecture inside and out.

Choosing a house to be home for yourself and your family becomes a intuitive navigation of neighborhoods and sub-neighborhoods, something that happens hundreds of times a day as houses are bought and sold in Southern Ontario, and the world over. Different parameters govern the requirements for a house for each individual, and these parameters define a site, and create a set of what are essentially filters, against which individual houses might be ranked and assessed. Now, it must also be said that this process is also intensely personal - that new and specific parameters evolve over the period of looking at houses, and that any ranking or value placed in these areas was essentially intuitive and amorphous, and that many of these parameters could not really be ranked against each other explicitly - they do however create a interesting map of neighborhoods that doesn't necessarily exist in the "pure data". The following analysis is partially post-rationalization and essentially an interpretation of an emotional and relational process that played out and eventually resulted in choosing a house.

We must acknowledge here the effect of the automobile and by extension suburbia. Within the historical city, proximity and quality of building defined increasingly minute neighborhoods influenced by the pedestrian model and a sense of connection to the city itself. The great illusion of suburbia - an idyllic life in the country side - made possible by the mass adoption of transportation by automobile, overturned this model, rendering featureless and undifferentiated great swaths of land surrounding large urban centres. Land where it was now possible to live and raise a family, and

where, now, the virtually only choice is the house itself. Any individual housing lot became essentially the same and it is one of the great failures of architecture that at the very moment when the building itself became the most salient feature of the identity of an individual home, “Cookie cutter homes” and “McMansions” flourish. The upgrades one chooses; more expensive plumbing fixtures or hardwood instead of carpet, choices that line the wallets of developers and contractors, become the only “customizations” available. With the demonization of the city centre, mass production construction methods and techniques, and the ubiquitous use of the automobile, massive numbers of essentially interchangeable houses were created and “neighborhoods” would now be measured in square kilometers and by the hundreds or thousands of houses.

Within the city, where we find our site, neighborhoods might be differentiated by a collection of 10 houses - and the characteristics of site and proximity might further divide homes into three or four that share a common set of pertinent parameters. Because the city was built over a longer period of time than the suburbs, and because the dwellings have been integrated into the urban fabric of the city, neighborhoods and collections of homes developed and had a distinct character and set of relationships to the proximal buildings and the city at large. These are the relationships that came to the forefront when looking for a house in the heart of Kitchener Ontario.

As any individual person searches for a house, the relationships of these neighborhoods become more or less important depending on the criteria of that person. The neighborhoods and sub neighborhoods maintain an objective location and have a distinct quality and environment. The way they are appreciated by each individual is different and the suitability of any one house in any one sub neighborhood depends on the requirements of the individual looking.

In searching for a house in Kitchener, one within walking distance of work and the amenities of town, my wife and I intuitively and explicitly began to classify different places by how they fit into our ideal for a home in the city. Beginning with the simple requirement of “Close to work” and then whittling down the available homes in our price-range and of a size suitable for our lives, we discovered just how nuanced the differences between two proximal locations could be, nuances that begin to hint at how neighborhoods develop and why houses just a street apart, or merely meters down the same street might feel like entirely different places.

2.2. Ethos

When we were first married, Sarah and I moved into an apartment within easy walking distance of the University of Waterloo where I was finishing a philosophy degree. When I finished my degree we moved to an apartment on the same street as the hospital where Sarah worked. When I started my Bachelor of Architecture we bought a house on Grant Street in Cambridge, from which I could walk to school. We think of ourselves as pedestrians.

We were and are concerned with the environmental impact of our lifestyle. We are also both quite frugal, and concerned with how much of our lives get devoted directly or indirectly to our jobs. The synergy between these things is interesting; the same considerations that limit our environmental impact also save us money and time. Much of these savings are embodied in where we choose to live.

We wanted to find a place to live which would limit our expenditures and maximize the time we had to spend with each other and with our children. An existing house in the city satisfied these requirements, placing us in close proximity to employment and offered a lifestyle and amenities familiar to us both: a house to ourselves, a small property, and a wide array of parks and amenities within walking distance.

The single family detached home is now oft considered a relic and the architectural manifestation of the nearly unanimously despised suburbia. It is, however, an element of a massive existing housing infrastructure, one already built and paid for. Much of it is, perhaps, outdated and out of place, but at least some of it can be updated to serve into the 21st century. We we looking for something to be ours, and something reasonably close to everything. Here is how we found it.

2.3. Significance

Residential additions and renovations are architecturally significant for many reasons, and the selection of appropriate site is an integral part of that architecture. A decision to work in and on the site of an existing house is important environmentally, politically, and demographically.

Ben Rabidoux

In 1975, the average size of a house in Canada was 1,050 square feet. Fast forward to 2010 and new homes being built almost doubled to an average of 1,950 square feet. This increase in house size is accompanied by a decrease in the average number of people living in a household. In 1971, it was 3.5; by 2006, that number fell by a full person to 2.5.¹

<http://www.theeconomicanalyst.com/>

The ideal house evolves: fewer people are occupying more space, and demanding more amenities from the space they occupy. So, regardless of population growth or decline, existing housing infrastructure, which may satisfy the sheer number of houses wanted, as population growth slows, will still require adaptation to satisfy the evolving requirements of the population; to say nothing of the adaptation of housing to meet the needs of an aging population. We can:

- i) Tear down existing housing infrastructure to build new in its place.
- ii) Continually build new housing on new land
- iii) Abandon the old as it becomes “obsolete”
- iv) Adapt current housing infrastructure to our evolving sensibilities.

i) Tear Down Existing Housing Infrastructure to Build New in its Place

This is perhaps the most widely appropriated and envisioned long term option within the architecture community. As land values escalate we tear down existing developments to accommodate more people, as the existing stock ages and degrades, “urban infill” projects are often projects that entirely or substantially demolish the existing. Often enough, the existing architecture is considered irreconcilable to present requirements and design sensibilities, and when “architectural” renovation is considered, it demands a total “makeover”, transforming mid-century bungalows into neo-modern palaces.

1. Ben Rabidoux as cited by Preet Banerjee, “Our love affair with home ownership might be doomed.” *The Globe and Mail*, January 2012.

ii) Continually Build New Housing on New Land

This is perhaps the current status quo. Current demand supports the projected creation of 73,000 new single-detached houses this year in Canada², and, at least in the near future, will continue to do so. This model is predicated on and supported by the automobile, and cheap gas prices. This is not expected to be sustainable, and even if so, even if the electric car or some unforeseen technology “saves” us, this model also has the unfortunate side effect of filling vast swaths of land surrounding our cities with asphalt and McMansions.

iii) Abandon the Old as it Becomes “Obsolete”

Nobody wants this. Great swaths of abandoned buildings is self-evidently untenable.

iv) Adapt Current Housing Infrastructure to our Evolving Sensibilities

The previous models are predicated on a prevalent mentality of buildings as something disposable. Especially in North America, but also across much of the western world, and increasingly in the developing world, “newer is better” and our inclination is to wipe the slate clean and start fresh.

Canadians are demanding houses that fit their evolving sensibilities but these houses need not be built on the ruins of the current infrastructure.

Certainly the reasons for the inadequacy of the existing housing infrastructure go beyond merely the deficiencies of the architecture itself. A neighborhood is a fickle thing and the safety, quality, desirability of a place at a time are dependent on factors that exceed the building itself. But, the fact remains, there are enough, just not the right kind, and the opportunity exists to adapt - rather than demolish.

A decision to emphasize renovation and addition is significant environmentally, important politically, and demographically probable.

Environmentally, exploiting the sunk costs and carbon footprint of existing housing only makes sense. While it might have been irresponsible for a generation to have built the infrastructure to support the single family home, and to have consumed countless square kilometers of forest and farmland to do so, it will be no less responsible to abandon that investment. These homes exist, and, even as city growth is expected to out-pace suburban growth, these homes nonetheless embody a type of life which is still compelling and desirable for large portions of society.

². Canadian Housing and Mortgage Corporation (2014). *Housing market outlook: Canadian Edition. Second quarter.*

Adapting these homes to our evolving sensibilities and to our evolving codes has to be preferable to abandoning them to their own devices.

Politically, regulations and popular opinion are galvanizing our park and green infrastructure to limit further growth of the type that spawned the existing suburbia. Ontario's Greenbelt exists in our own backyard. The remaining land available to clear-cut for new homes will be used up, and as a society we will be forced to adapt and utilize existing sites and buildings as the basis for "new" homes in the 21st century.

Demographically, population growth is expected to slow, in fact it is already beginning in some developed nations. Birth-rates are slowing. While growth rates are slowing, Canada will continue to grow from a population of about 34 million to somewhere between 43 million and 63 million³; somewhere between 26% and 85% growth. What the projections agree on however, is that the proportion of people over the age of 65 in Canada will almost double, from 14% currently to between 23% and 28% by 2061⁴. A paper in the *Journal of the American Planning Association* concluded that after the age of 65 people become net sellers of real estate⁵ - often their homes. It is expected that the proportionally smaller portion of the population buying homes will now incur reduced demand for this increased supply. If existing homes can be adapted economically, this reduced demand compared to supply, should create an opportunity where housing starts can decrease.

The problem of suburbia is much larger than one Master's Thesis. I can, however, explore the architectural implications of the adaptation of an exiting house, and imagine architectural practice adapted to the realities of scale and the necessary flexibility of architecture in the renovation or addition to the single family home.

3. Statistics Canada (2010). *Population projections for Canada, provinces and territories 2009 to 2036* (catalogue no. 91-520-X), 41.

4. Ibid.

5. Dowell Meyers & Sung Ho Ryu. "Aging baby boomers and the generational housing bubble: foresight and mitigation of an epic transitions," *Journal of the American Planning Association* 74, no. 1.

2.4. the Very Beginning

Initially we intended to buy our next house ready-made. We sent the following email detailing what we wanted to our real estate agent Jessica March. We sent this right near the beginning of our house search, prompted by her request for an idea about what we were looking for. Our search would last almost 8 months.

2013-02-09

Hi Jessica,

Ideally we'd like the kitchen/living/dining and hopefully a bathroom, maybe an office on a single main level. We'd rather not have steps between living space like we have now.

We'd also like either the kitchen or the living room to look out into the back yard, we want to be able to watch the kids play outside without necessarily being outside ourselves.

We'd also want at least 3 bedrooms that are not in a basement. That could be two bedrooms upstairs and a master on the main floor, or three bedrooms upstairs, or two bedrooms on the second floor and a master in the attic. Some combination like that.

A fourth bedroom/office could be in the basement.

Two full bathrooms. Conceptually we'd like there to be a bathroom for guests to use that isn't the bathroom that the family uses. A guest suite would be great, but that would necessitate a powder room for random people who don't achieve the rank of "stay-over" guest. And a bathroom connected to the master bedroom would also be nice. But then we're at like 4 bathrooms and we feel a little silly. If our basement wasn't freezing, and the bathroom was actually finished downstairs, what we'd have now is nice.

I think we want a detached house.

As far as walk-ability is concerned we're mostly interested in a house close to St. Mary's hospital, which has a relatively short walk (max 10 or so minutes) that is a safe walk, even at night. (no cutting through dark parks or sketchy neighborhoods etc.) Ideally we'd also be able to walk to a coffee shop, some restaurants, a library, and in general fun things to do, (closer to King is preferable, as long as the walk still feels safe), but we could be persuaded to live in a nice spot that may be further from King street.

As evidenced by the fact that I've still not completed all the random finishing touches on our place after 5 years, I'm not really a fan of subtle renovations. I can do the total demolition and build from new, or major renovations but I really

don't like small projects. So we're looking for something in relatively good shape. Some cognizance of school districts might be informative, this might be a moot point considering our relatively small area around St. Mary's General Hospital, but, it would be good to know, we might be persuaded one way or another.

Big trees are nice, but not coniferous trees primarily (ideally), we're not picky at all, really.

Sidewalks.

Air-Conditioning.

We'd like it to be on a residential street, one with slower moving cars, or if the cars move faster, wider sidewalks and boulevards and larger trees. Queen street just east of the hospital is actually nice, and feels safer because it has some life, perhaps even more appealing than some of the dead end "quiet" streets which are conventionally a "nice safe street" this isn't to say we don't like the conventional residential street, just that it isn't necessarily a no-brainer. Highland road is totally unappealing - the houses are too close to the road for how fast the cars move, and the life of the street is only in the cars.

Garage would be nice, and/or space for tools and bikes and equipment and the various paraphernalia of life in a consumer society.

We'd want to be on site for the passing of a train if railroad tracks are in the general vicinity, just to judge for ourselves how loud or not loud it is.

As far as era goes - It's not a huge deal to us really, we can appreciate newer houses as well as old. We do like there to be some character in the house, so a builder's spec house is usually pretty repulsive to us. We also like quality materials: laminate flooring, vinyl siding, chromed plastic plumbing fixtures, cheap windows, etc. are the types of things we'll inevitably replace, so anything we look at would be under the consideration of the costs of updating these things.

Kind of on the Era thing again - we'd both like the house to be efficient from an energy perspective. We've had enough of drafts and cold spots and loud furnaces with creaking ducts. So this might be a renovated old house, or a well constructed new house. Although I may or may not trust the skills of the constructor of either.

As far as style goes, we're pretty minimalistic. Essentially form follows function, things are designed the way they are because of the function they perform, things should be simple and clean (Sarah says she likes "clean lines"). Historical finishes can still be nice, if their historical and not a contemporary imagination of something that never really was. The sort of Japanese karaoke bar atmosphere

that is passed off as “modern” style typically is also not really appealing. We like the place to be consistent, a room from the 70s and one from the 90s and one from the 80s isn’t appealing, although considered differences from room to room can be interesting and compelling if they fit with the feel of the house.

All of this is a bit idealized, we do understand that we’re not going to find everything, but we thought it would be good to give you an idea of what is going through our heads.

thanks again,

Sarah and Reuben

2013-02-10

Wow, this is incredible! Ha! Most people say ‘well, at least three bedrooms... whatever, really.’

I’m similar in that I know what I like so I appreciate this thorough list.

I’ll have a look and send through some options. You’ll know right away based on photos what works so I won’t be offended if you don’t like something...we’ll work together and with your feedback something great will come up!

Have a great night and we’ll talk soon!

Jessica

2.5. Selection Timeline

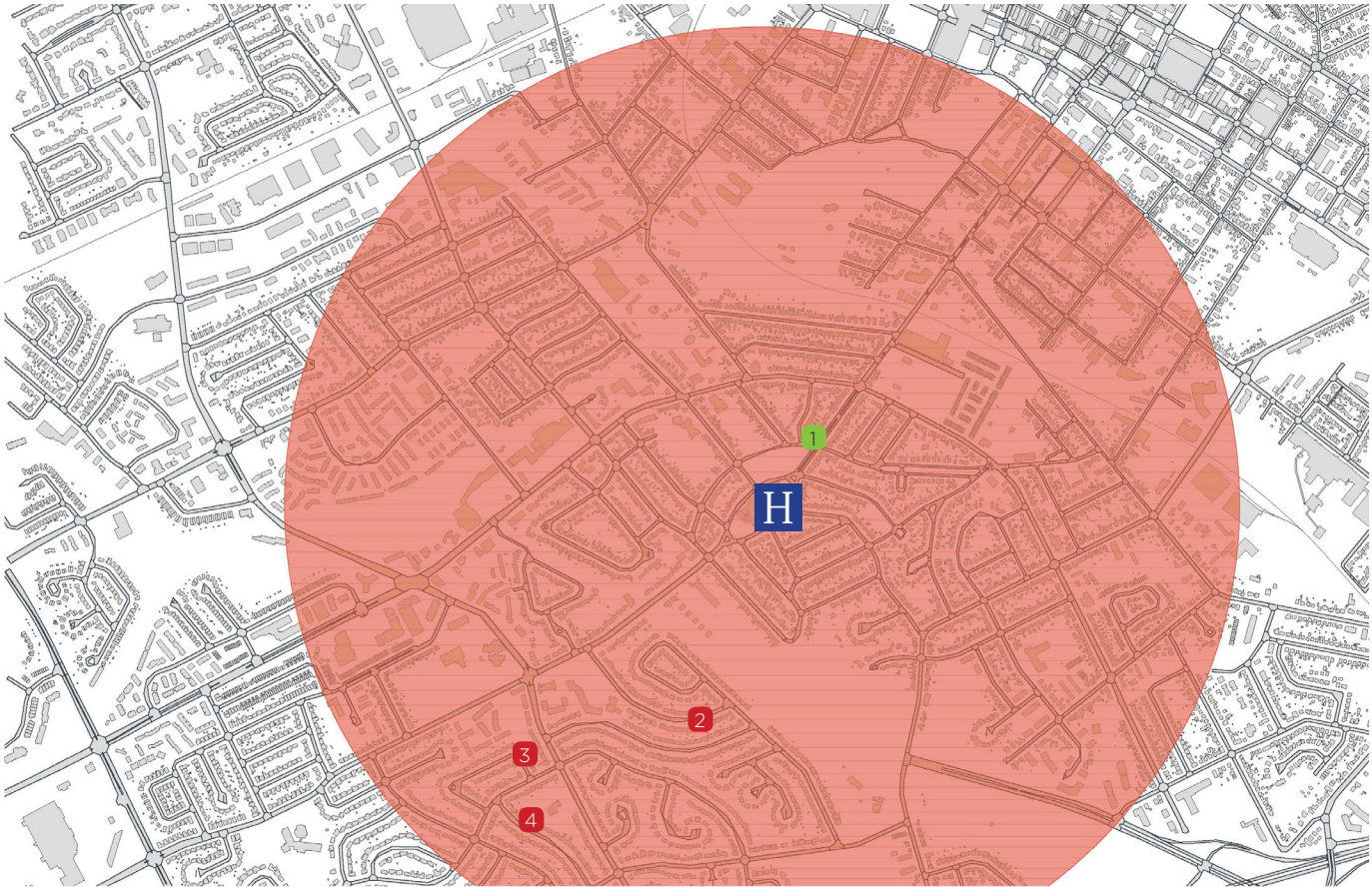
Following is a graphic representation of the rationale and the evolving criteria for the selection of a suitable area for our home in Kitchener: House hunting. Thousands of people across Canada are engaged in a similar endeavor, and this particular timeline is the product of only one intensely personal search. Over almost 200 days, a figure of the city and of our connection to the city emerges. It exposes a set of neighborhoods and highlights the varied and relative nature of how neighborhoods are evaluated by the personal criteria of the individuals buying or looking to buy a house.

2.5.1 Day 1

At the beginning we had only a rudimentary knowledge of Kitchener and started with a one kilometer radius of Sarah's workplace: St. Mary's General Hospital, indicated by: **H**

Fig. 2.5.1.a.
Initial Zone

An approximately 1km radius
around St. Mary's Hospital



Right at the beginning, we looked at **1** 4 Spadina Road West, the house we would end up buying. Then in quick succession we visited: **1** 100 Blueridge, **3** 39 Springbank, and **4** 20 Greystone. These three houses were in older suburbs, as suggested by the convoluted dead-end streets. They were situated as part of a development designed for quiet streets and what we regarded as a very “monotone” environment: characterized by a lot of the same type and style of house and almost exclusively residential buildings.

We also knew fairly early on that we did not like Highland Road creating two halves to our search area.

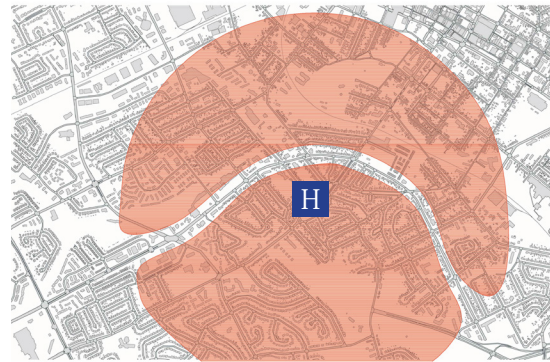


Fig. 2.5.1.b.
Divided Search Area

2.5.2. Day 3

We visited 5 21 Schneider Ave, which we really liked. We found out that it was right beside a halfway house for teenagers and we put in an offer tempered by this. We were out-bid. This ‘find’ shrunk our area of interest to the small residential neighborhood south of Victoria Park. We assumed that something else would come up again quickly

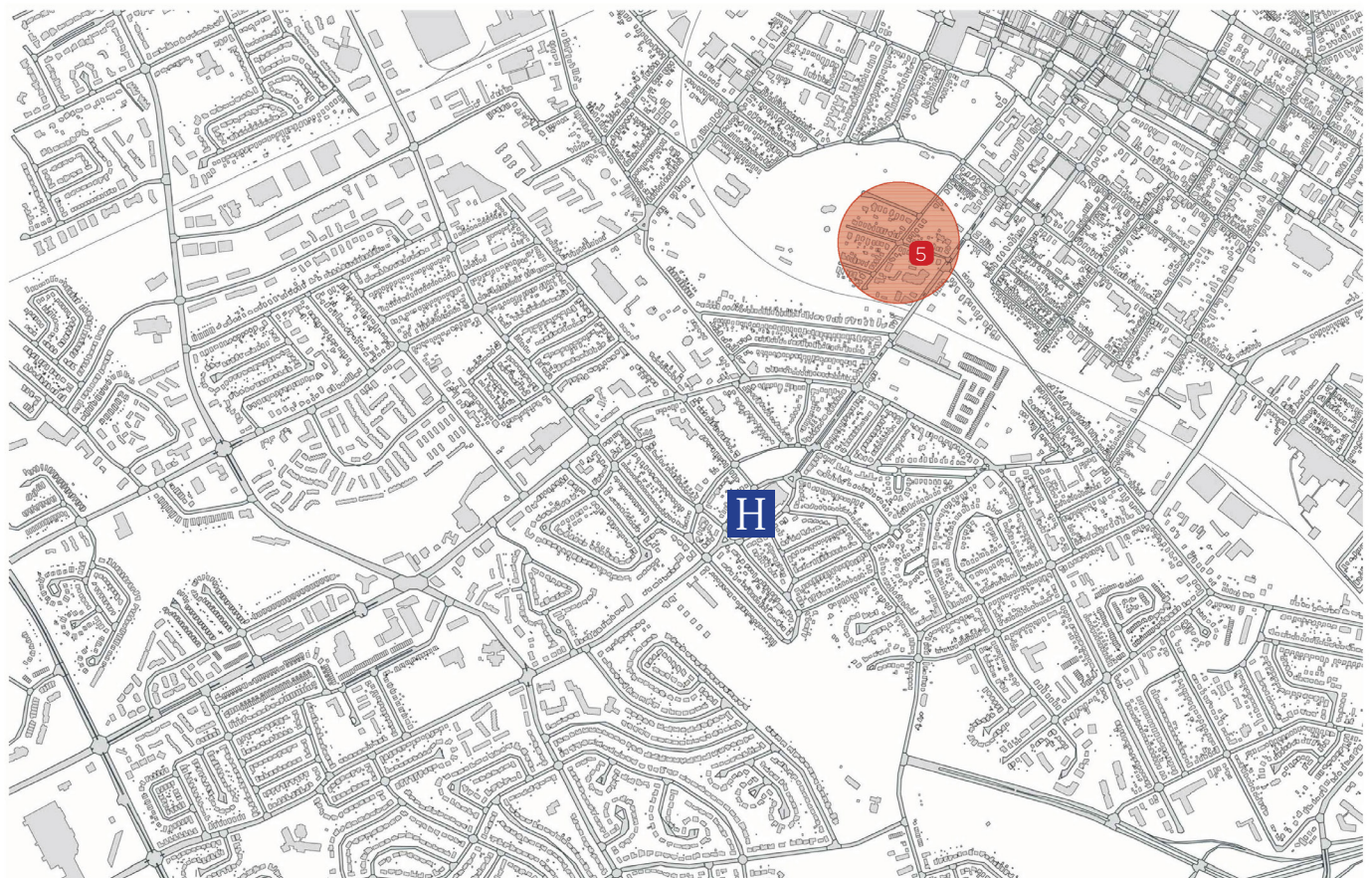
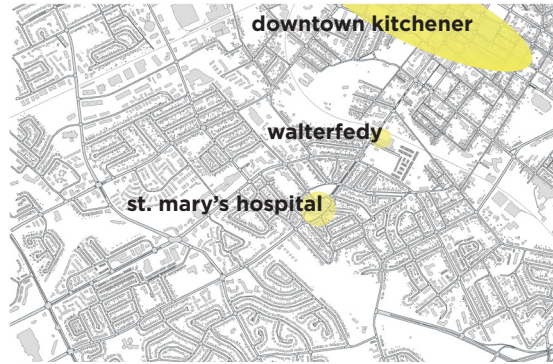


Fig. 2.5.2.a.
Concentrated Search Area

During this time we also assessed more of what was driving our decision. Three major elements were attractive to us in Kitchener: St. Mary's General Hospital where Sarah worked, WalterFedy - where I would work, and the amenities and energy of downtown Kitchener with the associated Victoria Park.

Fig. 2.5.2.b.
Three Attractions



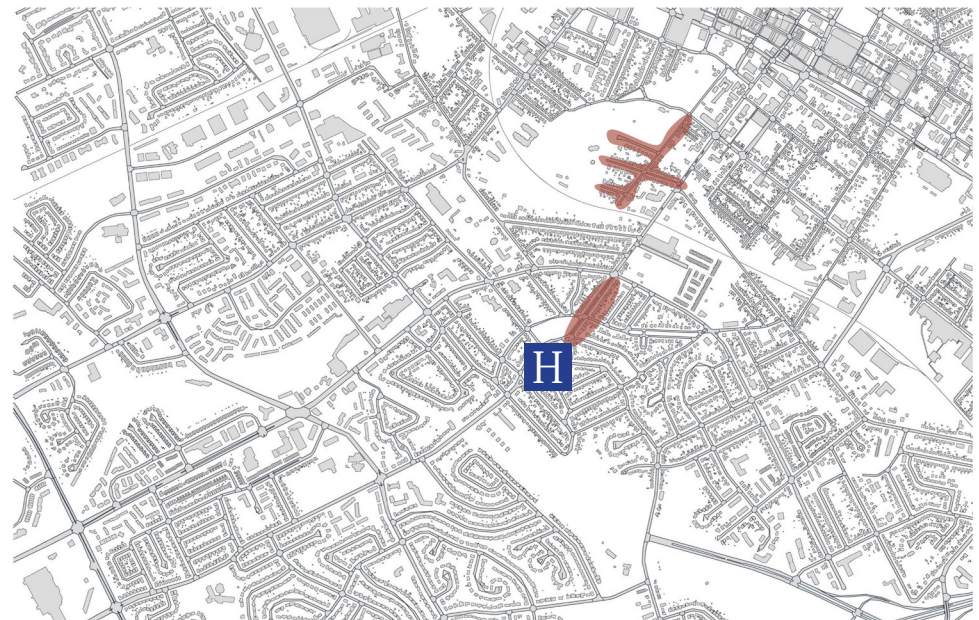
Practically I didn't like the idea of Sarah walking home through a deserted, poorly lit park at night. This essentially cut off the area due north of Victoria Park and due south of Lakeside Park; lopping off the top and bottom of our one kilometer radius. Combined with the nodes of Walterfedy, Downtown, and St. Mary's our area of interest morphed into figure 2.5.2.c.

Fig. 2.5.2.c.
Morphed Area of Interest



2.5.3 Day 35

Fig.2.5.3.a.
Canvased Neighborhoods



Nothing new came up for 32 days. We decided to be proactive and asked our real-estate agent to canvas two neighborhoods. We expanded our search area to include queen's boulevard. Time began to influence what and where we would buy, a theme that would recur through-out the process. As our search lengthened, our criteria relaxed. We would go back to 4 Spadina 4 times as it's price fell and our standards expanded

2.5.4 Day 47

Something else finally came up in our area: **6** 839 Queen's Boulevard. We saw it the day it came up, and we were outbid by \$400. We also looked at **1** 4 Spadina for the 2nd time - as a comparison and because it's price had come down from \$359,000 to \$349,000.

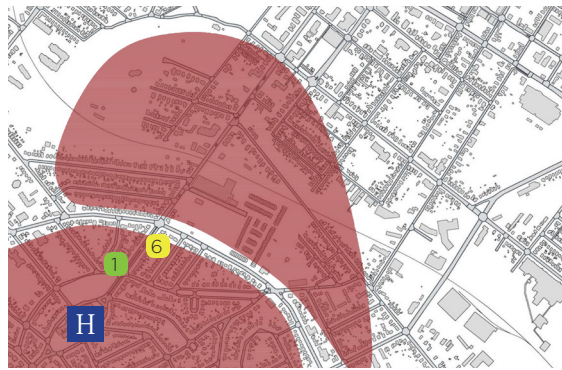


Fig. 2.5.4.a.
Spadina and Queen

2.5.5 Day 50

We looked at **7** 28 Pleasant. We had opportunity to really consider houses in this neighborhood and found them to be typically too small. The roads were tight and the space didn't have the feel we were looking for. This tightened up our desired area.

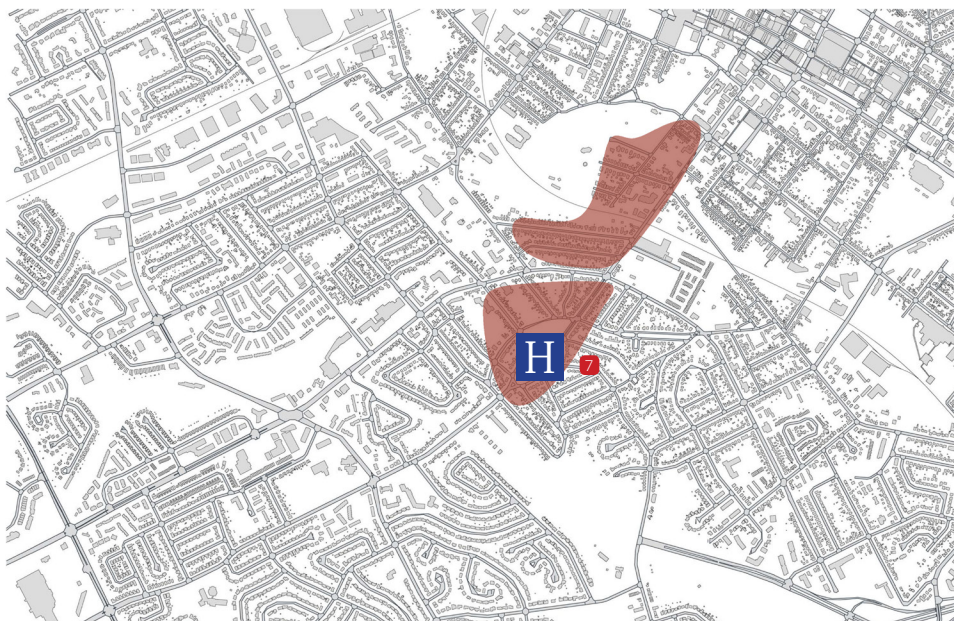
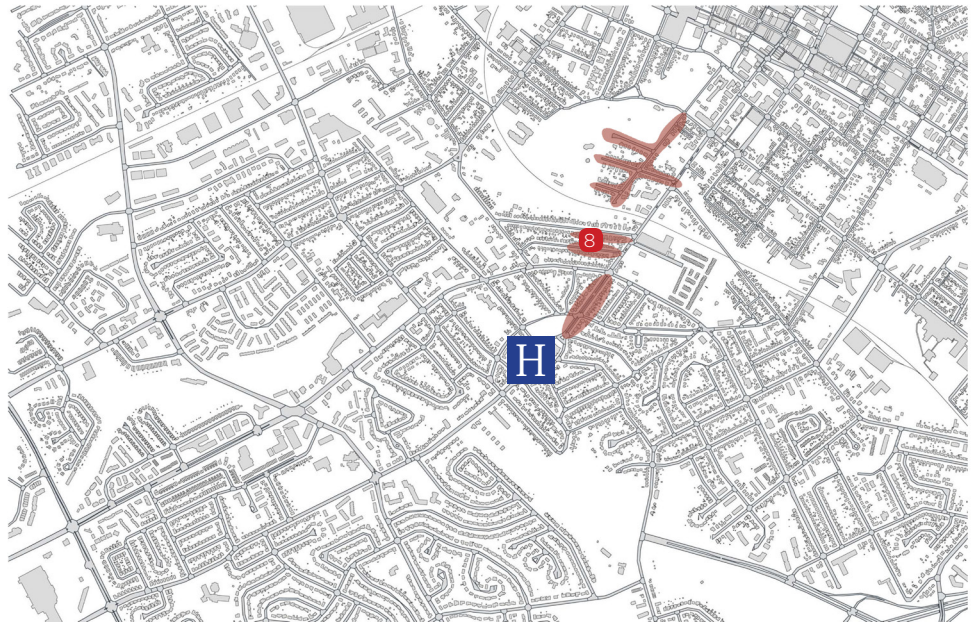


Fig. 2.5.5.a.
Process of Elimination

2.5.6 Day 55

We looked at a house **8** on Homewood Ave. and while we didn't like this particular house, we thought this area looked appealing - we asked our agent to re-canvas the neighborhoods and to include the south ends of Brock and Homewood in our search.

Fig. 2.5.6.a.
Homewood Ave.



2.5.7 Day 59

Fig. 2.5.7.a.
17 Brock



We looked at **9** 17 Brock. This house was under-priced and had 5 offers the day it went on the market. We declined making an offer because it was too small.

2.5.8 Day 72

We looked at 14 Spadina for the third time, this time taking a comprehensive set of measurements and doing a preliminary design investigation into the possibility of an addition or renovation that would suit us: the space was too small and an addition would cost too much.



Fig. 2.5.8.a.
Begin Again

2.5.9. Day 90

1087 Patricia came on the market and was sold before we could even look at it.

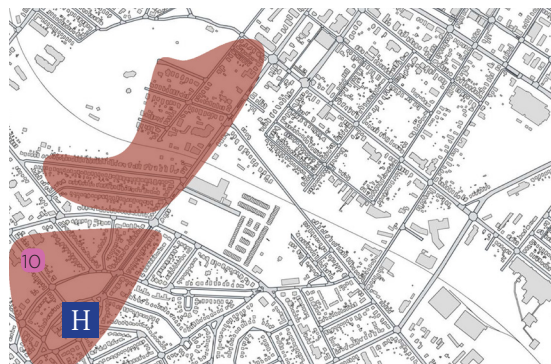


Fig. 2.5.9.a.
87 Patricia

2.5.10. Day 108

63 Mill Street came on the market, and we relaxed our standards to entertain living on Mill Street. We tried to place an offer on it, but were beaten by someone else and the house was conditionally sold by the time we were comfortable putting in our offer.

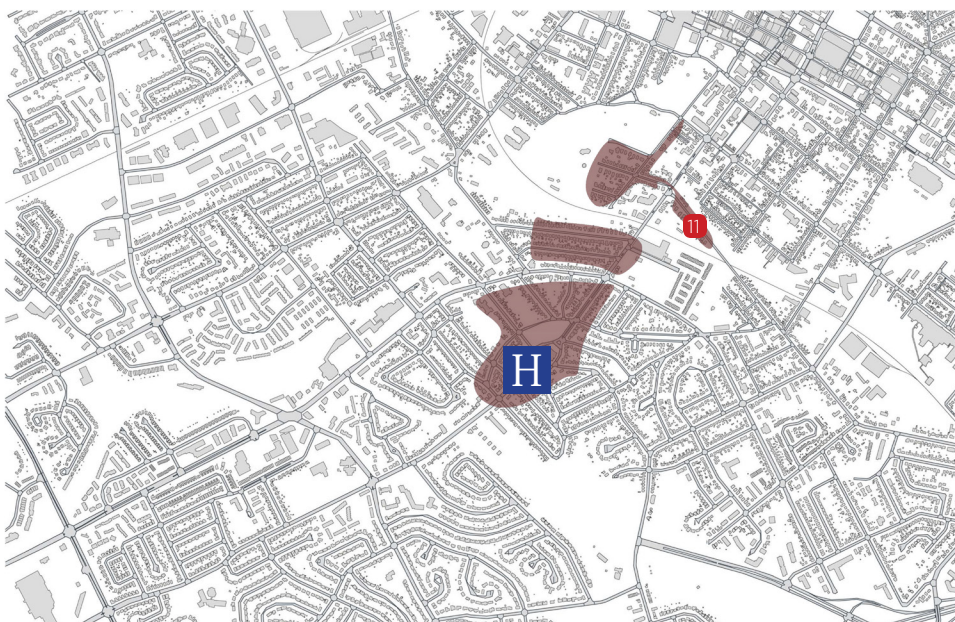
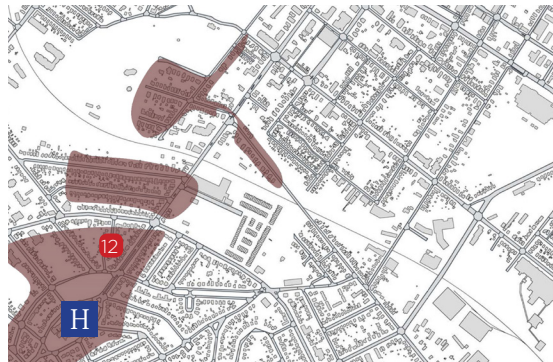


Fig. 2.5.10.a.
63 Mill

2.5.11 Day 119

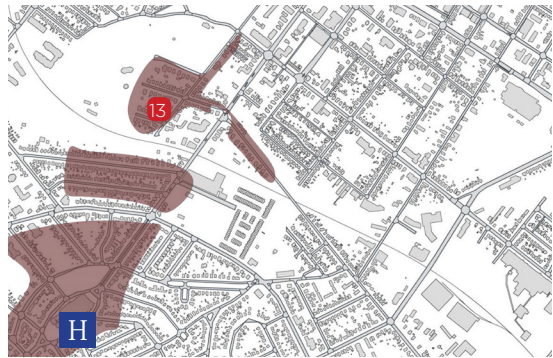
Fig. 2.5.11.a.
35 Garden



We looked at **12** 35 Garden, which was, to us, a fixer-upper, but which had a much more complex layout and convoluted floor plan than Spadina. We thought Spadina was better value, and we were not interested in Spadina at this time.

2.5.12 Day 122

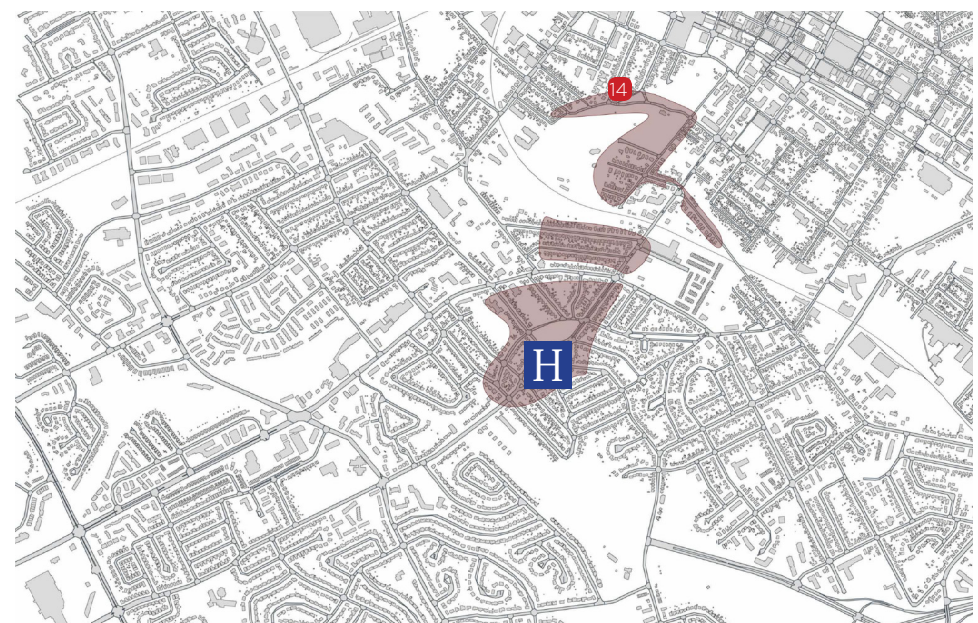
Fig. 2.5.12.a.
8 Dill



13 8 Dill Street came on the market and we looked at it. It was a house that a real estate agent had “flipped” and the list of sub-standard materials and low-quality workmanship would have required us to “re-gut” it and redo everything that had just been done.

2.5.13 Day 127

Fig. 2.5.13.a.
63 Heins



14 69 Heins momentarily prompted us to expand our acceptable area to just north of the park. We decided not to buy this house. We thought it was a bit overpriced and was still technically in an area we were not entirely comfortable with.

2.5.14 Day 179

After a meeting in the home with a contractor, and generating a preliminary budget for our renovation and addition, we put an offer of \$310,000 in on 1 4 Spadina Road West in Kitchener Ontario



Fig. 2.5.14.a.
Offer on 4 Spadina

2.5.15 Day 181

Just to throw us for a loop 15 a house on David street, overlooking the park, appeared on the market for \$500,000. It sold in a couple days, and because this house on David Street had only 12" of backyard (none at all really) we decided not to break our current offer on 1 Spadina.



Fig. 2.5.15.a.
A Wrench in the Works

2.5.16. The Houses

Even considering the qualities of a more or less desirable neighborhood or sub-neighborhood, an individual house had to suit our tastes and needs. After stating emphatically that “anything on David Street looking at the park would be perfect” we rejected a home there that had been built up to within inches of the lot lines and included no back-yard at all. We put official offers in on three homes, two of which we were out-bid on, and finally settled on a fixer-upper that had come down from over \$380,000 to our final offer of \$311,000 over a 16 month period on the market.

Fig. 2.5.16.a.
Houses Map



839 Queen's Boulevard	6	offer
21 Schnider mill	5	
David	11	viewed
69 Heinz	14	
8 Dill	13	
35 Garden	12	
17 Brock	9	
Homewood	8	
28 Pleasant	7	
20 Greystone	4	
39 Springbank	3	
100 Blueridge	2	
patricia	10	too late
4 spadina	1	purchase

2.6. Neighborhood Holons

2.6.1 The Differentiation of Neighborhoods

We eventually settled on an area delineated by the map below in which to settle our home. But through-out this process we had opportunity to consider intensely the area shown in the maps that follow.

Over the 181 days of house search our criteria quickly morphed from statements like “We’ll buy anything on the streets just south of Victoria park” or “Highland Road is a nice street” to “Which side of Schneider Road?” and “Where exactly on Highland” The quality of a place changes dramatically even over only a few hundred meters, and we found ourselves grouping homes into increasingly smaller sub categories - each encompassing perhaps only a half dozen homes.

Each of these areas can be and are, effectively, holons - a territory defined by a criteria that unites the pertinent elements inside of this area, and differentiates it from other territories.

These graphics are a post-rationalization of an intuitive yet no less structured rational for the delineation of spaces and places in and around the St. Mary’s Neighborhood in Kitchener.

Fig. 2.6.1.a.
Suitable Area
(opposite page)

Analysis was not required for areas outside of easy walking distances from work.

Fig. 2.6.1.b.
Final Limits

By the end of our search we were pretty committed to find an appropriate house in these neighborhoods





suitable area
yes
no

Fig. 2.6.1.c.
Areas

Experientially the neighborhoods surrounding St. Mary's Hospital differentiate themselves according to the most obvious salient landmark or sense of space. Highland road defined a type and energy of home based on the quality of the street, Victoria Park defined the homes in its vicinity just by its proximity



- areas
- park
- between
- queen
- highland
- hospital
- east

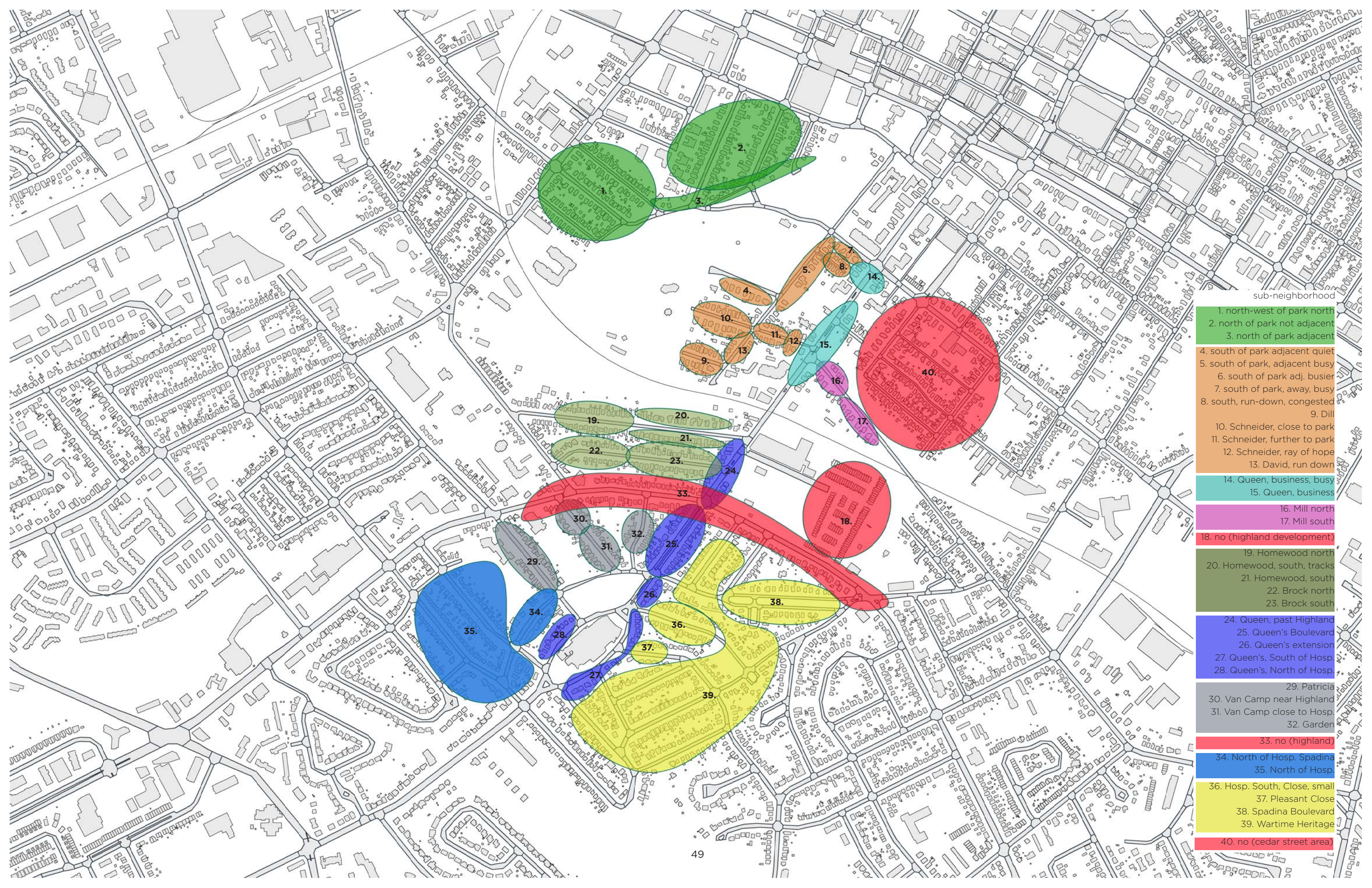
Fig. 2.6.1.d.
Neighborhoods

Within larger areas defined by the salient landmark, neighborhoods defined themselves by a shared quality of home and immediate surroundings. A townhouse development east of highland road and south of queen street differentiated itself by virtue of a its homogenous type and construction date, Queen's Boulevard differentiated itself based on the street type and house quality rather than style.



Fig. 2.6.1.e.
Sub-Neighborhoods

Within a neighborhood, sub-neighborhoods emerged which defined themselves by virtue of the micro-spaces created by proximity of certain specific attractors. Sub neighborhood 12. defined itself based on it's proximity to a "Ray of Hope" halfway house, 5. based on it's view right into the park. Whereas 18. was no further divided based on the almost interchangeability of any particular house within the homogeneous environment which permeated this development.



sub-neighborhood

- 1. north-west of park north
- 2. north of park not adjacent
- 3. north of park adjacent
- 4. south of park adjacent quiet
- 5. south of park, adjacent busy
- 6. south of park adj. busier
- 7. south of park, away, busy
- 8. south, run-down, congested
- 9. Dill
- 10. Schneider, close to park
- 11. Schneider, further to park
- 12. Schneider, ray of hope
- 13. David, run down
- 14. Queen, business, busy
- 15. Queen, business
- 16. Mill north
- 17. Mill south
- 18. no (highland development)
- 19. Homewood north
- 20. Homewood, south, tracks
- 21. Homewood, south
- 22. Brock north
- 23. Brock south
- 24. Queen, past Highland
- 25. Queen's Boulevard
- 26. Queen's extension
- 27. Queen's, South of Hosp.
- 28. Queen's, North of Hosp.
- 29. Patricia
- 30. Van Camp near Highland
- 31. Van Camp close to Hosp.
- 32. Garden
- 33. no (highland)
- 34. North of Hosp. Spadina
- 35. North of Hosp.
- 36. Hosp. South, Close, small
- 37. Pleasant Close
- 38. Spadina Boulevard
- 39. Wartime Heritage
- 40. no (cedar street area)

Fig. 3.a.
A Window
(at Stanley Park Community
Centre)



3. Design

3.1. Overview

The design process never really stops. Our schedule for the project being what it was, the design bled into the working drawings stage, bled into construction. Our offer for the property was accepted on August 22, 2013 and we applied for permit on October 11, and receiving possession on October 25th. Demolition commenced the day we gained possession. Framing started on November 25th, and we moved in on February 22, 2014. I'm still trying to decide on the design for a closet for the front entry, how exactly to finish a counter in the master bathroom, and a fence to keep my kids in the backyard.

I'm going to describe my design and its relationships to a number factors, relationships which evolved over the course of the design, construction and occupation of the building. Some of them were intentionally designed this way, sometimes they were accidents, and sometimes they fell somewhere in between. I have to acknowledge that I didn't always fully appreciate the implications of all of my design decisions, and some of them turned out better than others. Maybe some of us always understand the implications, or most of the implications of our designs. I had to trust that my intentions, and my education would motivate my decisions by principles that would create good designs, and push me towards decisions that would create pleasing spaces and buildings. I was concerned that my design would be modern, and practical. I think my building is.

3.2. Ethos

3.2.1 Modern

Modern philosophy arose almost 300 years prior to modern architecture. Rene Descartes is widely regarded as the forerunner of modern philosophy: a philosophy predicated on investigation and “first principles”. Modern philosophy encapsulates Empiricism, Rationalism, Idealism, Existentialism, Phenomenology, Pragmatism, and Analytic Philosophy, to name a few¹. While these are varied and discordant means of understanding and interpreting the world, what they have in common is an understanding that the world, and our response to it, must be predicated on universal principles accessible to all people, which are true across actors and cultures, and that our behaviour and constructs should be motivated by function rather than tradition. Further, Modern philosophy strives to reduce knowledge to only what is necessary. It is a philosophy concerned with grasping the motivations or reason behind the rules. For example: modern ethical philosophy would aim to ascertain principles or concepts by which behavior can be judged right or wrong, rather than listing a set of conventionally or traditionally or culturally determined. ‘Because God said so’, or ‘because our fathers said so’ was not good enough. A behavior was right or wrong because of a universal principle that could be applied to anybody (not merely to white people or nobility or the clergy).

While the definition and scope of modern philosophy are contested, it is safe to say that most modern philosophy aims to create truth and to underpin knowledge on principles rather than traditions. Modern philosophy, and by extension a modern ethos, is primarily concerned with the reduction of a thing to only what is required, to the truth of a thing or its essence. Stylistically, architectural minimalism would be a manifestation of this Modern Ethos, as a function of this reduction to basic principles in modern architecture which manifests in the early 20th century, nearly 300 years later. Perhaps the greatest truism of modern architecture is ‘form follows function’, an assertion consistent with a mentality which predicates action and knowledge (form) on a principle (function) rather than a tradition.

When asked for a quintessential example of an architecture that takes modernity as an ethos as much as a style I would have to answer with the Quinta Monroy project by Elemental.

Overwhelmingly, I would classify these buildings as true. That is to say that they are what they were designed and intended to be, without flair, or a style. They achieve their density goals. They achieve their economic goals. They give the

1. “Modern Philosophy.” *Wikipedia*. http://en.wikipedia.org/wiki/Modern_philosophy.

inhabitants space to expand. With some paint and some ingenuity. An inhabitant can take control of his or her own home. Even the flat roof, so often merely a stylistic component of modern residential architecture, functions as space to be occupied. These are architecture stripped down to only the truth of what is intended in their design. If ever a building was an efficient machine to do what was intended are not these it? Take a look at most “modern” architecture in the glossy pages of popular architecture magazines and you’ll find nothing like this. You’ll find a style, rather than an ethos, and a look rather than a philosophy. I’m not going to say that the style is not useful. It is. It inculcates a mentality in the occupant and good modern style architecture creates spaces which can be incredibly powerful. But this architecture demonstrates that the style is something different than the philosophy, and that an architecture can be modern without the trappings of the particular modern style we’ve created.

All this being said - my “modern” ethos bespeaks a emphasis on efficiency, and an inclination towards minimalism within the bounds of that efficiency. I certainly utilized the tropes of the modern style when practical: I like this style, and believe that the modern style continues to reflect the core principles of the modern ethos, but my design intention was to the philosophy behind the style, and not to the style itself. I think my house is modern without undue reliance on the classic modern tropes.

Fig. 3.2.1.a.
Quinta Monroy
(left)
As built

Fig. 3.2.1.b.
Quinta Monroy
(right)
As occupied



3.2.2. Practical

Under my understanding of Modernity as an Ethos rather than a style, practicality almost falls out of this approach without the need for an explanation of the emphasis I placed on practical solutions and construction techniques which conform to industry standards as much as possible. But, I would, however, like to single out practicality as a motivation and ethos for the design, because it is possible to design a true, efficient, “Modern”, building or house which nonetheless escapes the practical considerations of construction and design. I hope someday I might be given the opportunity to manifest my particular modern ethos on projects which will be less constrained by economics and schedule and the practical considerations these entail. But, as a function of my limited means, I was forced to embrace practical design solutions. Under these conditions it was imperative that this was not a reluctant acceptance, or a necessary compromise, but a ready and enthusiastic embrace of the practical. It would have been easy to do a preliminary design divorced from reality, and then to claw back each element until it conforms to the practical realities of the project, but to do so would risk a building I might apologize for, riddled with “if only”. As it was, I was forced to compromise when my “practical” solutions were actually more expensive, or when the quality of a chosen material forced its replacement with a surface motivated more by schedule than by design intent. On the whole however, the elements that might normally be attributed to compromise, vinyl windows, or pressure treated wood, or steel siding, were designed intentionally and consciously to fit into the design ethos such that I could and can confidently explain their significance.

3.3. Significance

The residential addition and renovation market, and new home construction for that matter, is chronically under serviced by design professionals. Additions, renovations, and new construction typically involve an architect or designer only to the minimum extent allowable by law, with contractors or homeowners controlling a large majority of design and construction. This disconnect exists for a variety of reasons: regulations allow for minimal design involvement, popular culture is virtually devoid of architects - homeowners are ignorant of their value, architects have a hard time making money at this scale and, contractors have evolved to work without architects at this scale.

There are other reasons, some of them quite reasonable: it certainly seems prudent to allow certain renovations to proceed without professional design input, a remodel of a kitchen, or a bathroom upgrade probably doesn't need to involve an architect. I do believe, however, that as a general rule, there should be a place for architects and/or designers in a greater percentage of the projects than is currently the case. The Design of these renovations and additions is significant and important to architects and to society. I believe the significance of architects in general is self evident - or at least the topic of a separate discussion - I do not intend to justify architects in general. Most of us will be in agreement that architects add value to a project, that a well designed building is more valuable for being well designed.

I do intend, however, to argue that this realm, the residential addition and renovation, is economically significant for society, and by extension for architects. As is proportional to their prevalence, significant economic resources are expended on single family home additions and renovations. The single family home is after all a habitat in which we find a large portion of our middle and upper classes. For better or for worse, the adaptation of these homes will be a significant economic expense for the foreseeable future. This presents a problem insofar as these projects are incremental and often progress as a set of discordant micro projects which could benefit tremendously from the oversight and vision of an architect or designer, but are priced too low to be financially viable for an Architect.

Irregardless of the drawbacks and roadblocks to the involvement of Architects in these projects they also present an opportunity, and as evidenced by the prevalence of Home Depots and their ilk, significant money is being spent here.

This realm is also significant to architects and society for the design it inspires. A home is intrinsically tied to the identity of the occupant and if we identify the single family residential renovation or addition as significant to a significant portion of

the population, the design of these should be no less important. “Architecture”, the elements of a building designed for purposes in addition to construction and economic consideration; a home designed for effect, and to affect behaviour, consciousness and unconsciousness, physical wellbeing - architecture designed and intended to affect persons - should not be just for “rich people”, or for people who can afford it. There is more to architecture than arranging a program and satisfying the building code, we are committed to believing this: architects endure scholastic trials comparable to doctors. Somebody somewhere determined that our architecture was too important to entrust to just anybody, and that the training for these individuals was necessarily long and comprehensive. As such, it seems counterintuitive to relinquish a majority of peoples’ homes to a haphazard or formulaic architecture.

A lot of money is spent on residential renovations and additions in Canada. According to projections by TD bank in 2015 the reported spending - not including spending in “the underground economy” will be \$45 billion¹.

TD Economics

At 7% per year since 2003, spending gains in this area have outshone other components of household spending. During the 1990s, outlays for home renovations accounted for just over 25% of total residential investment. Currently, that share is almost 40%. Accordingly, the sector’s economic importance has grown significantly over the past decade².

Observation: 2013-09-30

Renovation spending constitutes a significant portion of construction spending by Canadian households and is also a spending stream that is less effected by economic turmoil or recessions:

TD Economics

Counter to historical experience, the renovation sector made it through the recent economic downturn in 2008-09 relatively unscathed. In fact, it was the only major component of GDP that managed to grow in 2009³.

Observation: 2013-09-30

1. Diana Petramala. “Outlook for Canadian Renovation Spending: Built on Sturdy Foundation.” *TD Economics: Observation*, 2013.

2. Ibid, 1.

3. Ibid, 1.

As a profession who's fortunes closely follow the general economic performance of a given region, a architectural type which weather's economic down-turns is certainly an attractive sector in which to practice.

This is, in and of itself, significant architecture. These are peoples homes, where they spend the majority of their lives, nowhere else is the possibility of individual expression in architecture, or for the effect of design, more richly manifest.

Ayn Rand

“Most people build as they live – as a matter of routine and senseless accident. But a few understand that building is a great symbol. We live in our minds, and existence is the attempt to bring that life into physical reality, to state it in gesture and form. For the man who understands this, a house he owns is a statement of his life.”⁴

Howard Roark in “The Fountainhead”

I think the inverse is also true, or at least that causality works both ways, a life is lived as one's architecture is built. To occupy architecture built as a matter of routine and senseless accident is to concede at least a portion of one's self to that same unexamined routine, and the senseless accident of a building erected merely as a commodity to be sold for a profit.

The adaptations of existing houses erected without consciousness is an important architectural venture, one that is perhaps as much about education as it is about building. In my discussions with architects and designers a problem that continuously arose about these projects is a public that is unaware of the benefits of an architect or designer, and that popular culture that is almost entirely bereft of architects except as near-mythical pillars of the bourgeoisie whose designs and ambitions are opaque and inaccessible to “everyday people”. When Peter Eisenman can credibly postulate that architecture exists as a discourse between architects. I think this is a problem.

As architects our lexicon is and should be comprised of buildings. The design of homes for “everyday people” is no less significant than a library or a museum, except perhaps, insofar as the “dream commission” captures and reflects our own ego.

4. Ayn Rand. *The Fountainhead*. (New York: Penguin Group, 1943), 541.

3.4. Design Relationships

Resonance:
(Mirriam Webster)

1. The quality of a sound that stays loud, clear, and deep for a long time.
2. A quality that makes something personally meaningful or important to someone.
3. A sound or vibration produced in one object that is caused by the sound or vibration produced in another.

Proposed Alternate Definition:

A harmony or sympathy between elements, within which, the the first element produces an effect in the second element.

eg: (between a building and person) "That house made me think of childhood summers at our cottage, it really resonated with me."

I believe building exists in relationship to people, and that design and construction exist in relationship with the science, technology, and construction practices which modulate and manifest its existence. Every building and design manifests these relationships differently and modulates its response according to their specific intentions. Good buildings do so in a manner that resonates, poor buildings fall flat. A building is a bit like a joke, they are designed to elicit a response, or to create an effect, the worst ones are often those which do nothing.

Limbic Resonance

Limbic resonance is the theory that the capacity for sharing deep emotional states arises from the limbic system of the brain. These states include the dopamine circuit promoted feelings of empathic harmony, and the norepinephrine circuit originated emotional states of fear, anxiety and anger . . . In other words, it refers to the capacity for empathy and non-verbal connection that is present in animals, and that forms the basis of our social connections as well as the foundation for various modes of therapy and healing. According to the authors (Thomas Lewis, M.D, Fari Amini, M.D. and Richard Lannon, M.D.), our nervous systems are not self-contained, but rather demonstrably attuned to those around us with whom we share a close connection. "Within the effulgence of their new brain, mammals developed a capacity we call 'limbic resonance' — a symphony of mutual exchange and internal adaptation whereby two mammals become attuned to each other's inner states."¹

wikipedia.com

Limbic Resonance is a theory, psychologically, which posits a non-verbal communication by which humans become attuned to those close to them. I contend, that insofar as this particular psychological process is explained by the limbic system in the brain, a similar relationship of unspoken and "inarticulate" communications between our environments, built and natural, can be attributed to the same system.

The design itself attempted to create a resonance between the finished architecture and:

3.4.1. the Passerby and the Neighborhood

3.4.2. the Occupant

1. "Limbic Resonance." *Wikipedia*. http://en.wikipedia.org/wiki/Limbic_resonance.

Further, any building also exists in relationship to the inanimate considerations and realities of it's context:

- 3.4.3. Current Accepted Construction Techniques
- 3.4.4. our Limited Means
- 3.4.5. "Safe" Building Science
- 3.4.6. the Existing House
- 3.4.7. "Green" Building practices.

What follows are a few examples of how my home relates to these elements. This is not a comprehensive list of all the ways, or of all the elements that were considered for, the design to respond to it's intentions.

3.4.1. to the Passerby and the Neighborhood

The exterior of the renovation and addition was meant to appeal to the mass aesthetic currently informing home design while violating as many of "principles" of typical house design as possible. The primary means of achieving this were and are:

- 3.4.1.1. Maintaining balance while eschewing symmetry.
- 3.4.1.2. Using conventions in subtly different ways
- 3.4.1.3. Juxtaposing old with new, rather than blending.
- 3.4.1.4. Creating a building similar in scale and quality

3.4.1.1. Maintaining balance while eschewing symmetry

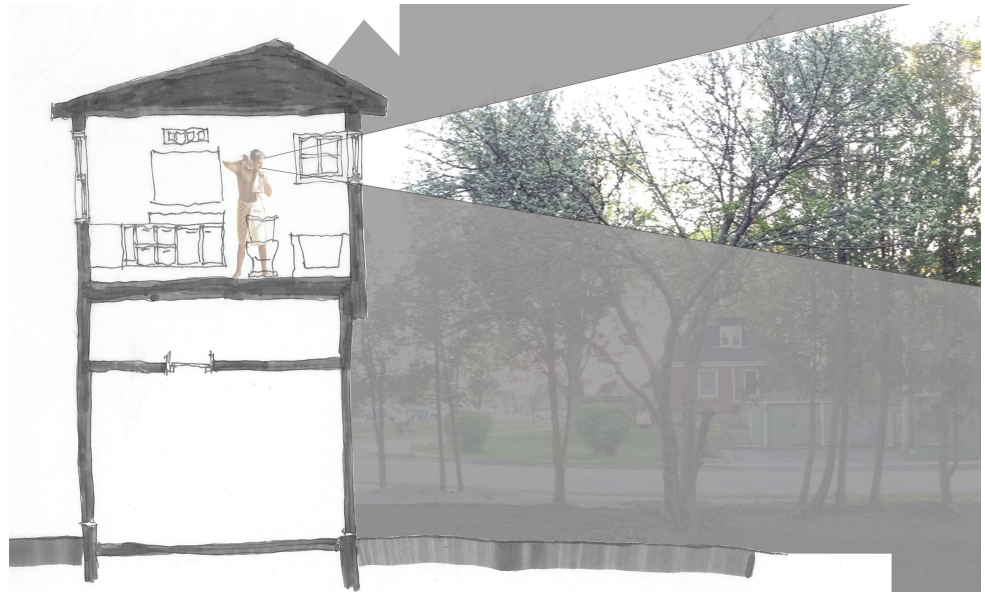
The reality of the chosen addition massing necessitated asymmetrical relationships between old and new building elements which demanded a design motif consistent with the inherent discontinuity between these elements. Further, much of the design was accomplished from the inside out: rooms were placed and glazed according to an efficient and pleasant arrangement of spaces. Windows were chosen to maximize natural light and views while maintaining privacy as required by the program.

A good example of this is the window in our shower. It is part of a bank of 4 windows that wrap the northwest corner of the bathroom. These windows are short, and high up on the wall, to best allow daylighting without excess glazing. Three of the windows are mostly inapproachable, blocked from getting right up to by our bathtub. This effectively creates a view out which is limited to the tops of the trees. The height of these windows also prevents people looking in from seeing below the neck of the bathroom occupant.

Fig. 3.4.11.a.
From our Shower
The view of the apple tree foliage
from our shower



Fig. 3.4.11.b.
Ensuite Section
The view blocked by the tub
distance and the high short
window



The window in our shower is far enough from the street and dominated by the canopy of the apple tree that approaching it merely expands the view of apple blossoms in spring and the budding apples and foliage in the fall. In winter, the dense, under pruned apple branches form a privacy lattice, maintaining a separation from the street traffic while juxtaposing a sense of privacy with the view of the street.

This primary emphasis on the quality of interior created by the glazing and the

plan developed an exterior with a character disconnected from the symmetrical paradigms of the typical house construction seen across our suburbs. Windows emerged at certain locations which defied readily available maxims such as peaked gables centred on the window. Further, in light of my emphasis on “safe building science” I was extremely reticent to use flat roofs, the typical pedagogy of modern architecture. Sloped roofs are cheaper, less leaky, more reliable, lend themselves to large overhangs, and are cheaply and easily insulated.

Aside from the existing garage there is very little symmetry on this elevation. I would however argue that there is balance between the roof and the window and horizontal wood siding that speaks of a design rather than a haphazard result of interior focused window locations. Even with a sloped roof, the master suite hangs as a discrete element over the utilitarian garage. The sloped cottage roof helps give this lone window an intentionality it would not have otherwise.



The front entry mirrors this condition, with the combination of 3/12 and 9/12 roofs combining to place the balance over the powder room inserted into the existing brick porch without conceding to the typical convention of centred peaked gables or absolute symmetry. Experientially, approach from the rear, beside the house reveals the same cantilevering deck, railing and roof as the rear decks, and further integrates the design motif across both the front and rear of the house. This combination of a very shallow slope with a steep slope further emphasizes the very flatness of the soffit, and as one approaches from the front gives the incurs an aura perhaps akin to the prairie style of architecture, without succumbing to the trope of the flat roof.

Fig. 3.4.11.c.
West Elevation
Exterior elevation of west wall of
master bathroom

3.4.1.2. Using conventions in subtly different ways

For various reasons I limited myself to conventional materials. Primarily for cost purposes, but as much because I intended to make an approachable and comfortable presence on the street. I had no intention or inclination towards a contentious or controversial “lightning rod” to galvanize opinion or to shock or awe people into new ways of thinking about architecture or their lives. I did however, intend a thoroughly modern building, but one that most people would nonetheless enjoy and appreciate.

Fig. 3.4.1.1.d.
Entry South Elevation
(Left)

designed to balance the front, and accentuate the flat expanse of soffit, as well as provide enough room to insulate the powder-roof roof with blown-in insulation. the front roof succeeds across the elements of its design intents.



Fig. 3.4.1.1.e.
Entry East Elevation
(Right)

Designed in sympathy with the structure and cantilevering decks of the rear of the house, this elevation assists in uniting the new front and rear aspects of the building.

2013-05-23

I was filling in some of the grading outside earlier this evening. It had been a beautiful spring day, and many people from the neighborhood were out walking their dogs or just out enjoying the evening. I've become familiar with a few of them, "Ken with the dog", the two women who live together over on VanCamp, Judith who does a short loop up and down the street with her walker, who has lived in her house on Garden Ave. for 60 years, a disheveled "laid off power crane operator" who currently lives at a group home and has been trying to convince me to rent out my attic for \$600 a month. Most of them stopped to chat for a minute. Each of them genuinely likes what we've done with the place. While I'm talking with one of the walkers a man in a van mentions from his window while he's stopped at the intersection that he's lived just down the street on Highland for 50 years and he thinks all the work we've done looks great. A woman with her young son stopped to tell me that the apple tree in my yard is a macintosh, and that they would pick the apples from the low branches which hang over the fence in the late summer. Most of them have seen the house come together, seen me cleaning up the construction debris, seen my kids running around the dirt pile that is currently our back-yard, and they like it. Apparently it's "the talk of the neighborhood". The architecture appeals to them. This was the idea, to make something different but accessible and familiar.

Judging from the near unanimous positive reactions of passers-by and my neighbors, I have at least succeeded on that front: To be accessible and likable, but I wanted the building to be modern.

To achieve this I opted to use these conventional materials in slightly unconventional or unusual ways. The four primary elements I want to discuss are my use of:

- 3.4.1.2.1. Wood Siding with Metal Trims.
- 3.4.1.2.2. Vinyl Windows.
- 3.4.1.2.3. Corrugated Metal Siding.
- 3.4.1.2.4. Sloped Roof

3.4.1.2.1. Wood Siding with Metal Trims

2013-09-24

Hi Tim,

How are things? I'm plugging away at my thesis - which has morphed to accommodate a major renovation and addition to a house that my wife and I just purchased. I was intrigued by the two cottages you presented to the class in your presentation for the 4B studio last summer, most notably the untreated wood siding you allowed to "silver" over time. I'm wondering how that might work for my home and was interested in your experience with it. I know you indicated that the detail(s) on the second building were "better" to keep the siding straight and true and dry. I'm also wondering if you had/have issues with certain areas not weathering the same as others, perhaps under overhangs or on the leeward side of the building. Was this an issue for the continuity of the finish and the appearance of the building? How long did it take for the siding to achieve a consistent weathered look?

Could I give you a call sometime, or would you have a few minutes to sit down and talk about this?

Any advice you have would be very much appreciated,

r

2013-09-24

Hi Reuben;

I'm happy to talk any time. Try me at work 416.466.5717.

The wood I showed was western Hemlock. Eastern Hemlock has way more knots. In Quebec, where those cottages were located, Hemlock gets used for all farm buildings and goes charcoal pretty fast. Seems to react to the chemistry in the local atmosphere. It aged quickly on western exposures and where exposed elsewhere to sun and rain. It was definitely the case that it did not age under overhangs. Although I noticed that over the five years I kept in touch with the project these conditions softened noticeably. Cedar, on the other hand, I have found to have a much less likable response to exposure to conditions such as going black where snow leans up against it, etc..

I discovered that Cape Cod, a purveyor of pre-finished wood siding (infinite colour choice, 35 year warranty) in the same profile! Do we know what we are doing or what? Just finished using it on our cabin . . . as in why wait for it to go dark. That said I keep running into the flamed Japanese cedar preservation technique. . .

Tim

Tim Scott is an adjunct professor at the University of Waterloo who presented a cottage project to a class I was helping teach. I was interested in a particular siding that he had milled and had allowed to weather naturally. What I got however was a piece of advice which I ended up taking to heart. He said that I need to decide what element of the building I am going to do my experiment on, that I should choose only a few things to interrogate, because there was just too much to try to be novel and unique with everything.

This advice was perhaps one of the saving graces of my entire project, and in my opinion one of the best useful and practical pieces of architectural advice I've received thus far in my architectural education. It gave me permission to lean on the construction conventions and techniques that have developed out of the Canadian construction industry and to concentrate my efforts on an element that I could consider deeply and thoroughly, rather than a large number of things only peripherally. I chose to use a pre-finished wood siding that my contractor recommended and was familiar with, and chose to develop a set of bent metal trims to frame this siding as my "experiment".



Fig. 3.4.1.2.1.a.

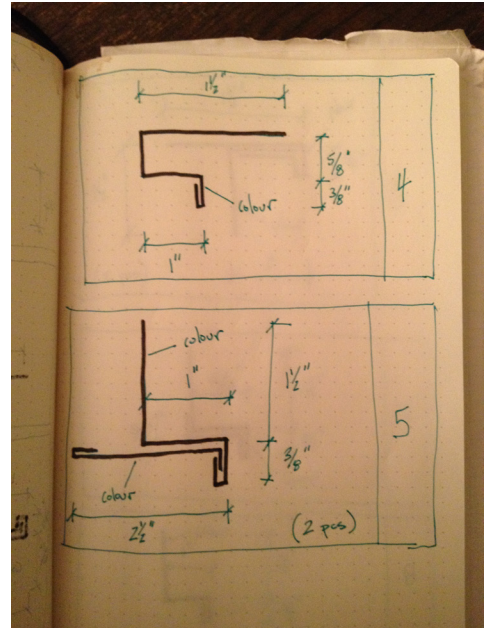
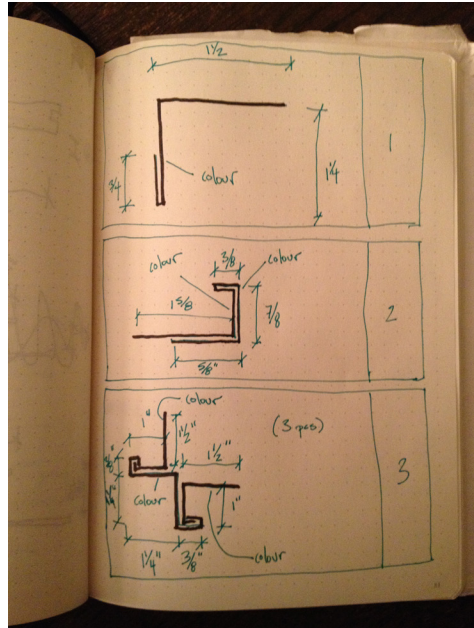
Focus

"Never half as two things, whole ass one thing."

Ron Swanson: as played by Nick Offerman in the TV sitcom "Parks and Recreation"

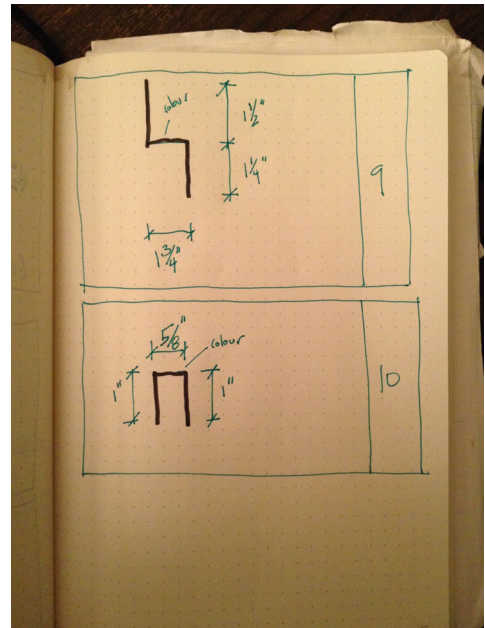
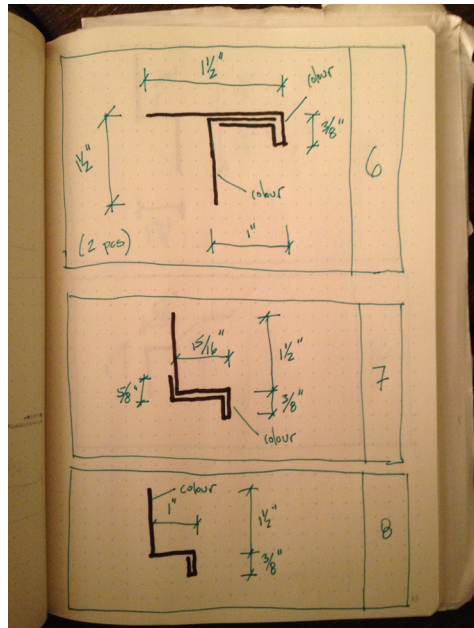
Fig. 3.4.1.2.1.b.
Metal Trim Sketches

A selection of the final sketches used to bend the trims for the exterior of my house.



Aside:

This exercise also points to the "built-up" nature of architectural practice. By developing a quality solution, and investing the time and energy required to properly examine this set of details I can use these in the next project at a fraction of the design cost that was required for this project. This will leave me free to experiment with another element of the design or construction. Ideally this is how my design practice will evolve, and ultimately allow me to confidently design and detail increasingly unique and satisfying buildings.



So I chose to use an utterly conventional wooden siding, in an almost archetypal ship-lap style. I would however, in collaboration with Billy and Paul from Westman Steel in Cambridge, develop a set of pre-bent, pre-finished metal trims to be installed around windows, doors, at the soffits, and at the bottom of walls. I ended up with 11 different profiles. The development of these profiles required an inordinate amount of time. I met with Westman steel at their plant 4 times, had countless phone conversations with Billy or Paul, with my general contractor, and with the installer, who suggested a few revisions and who after the trims were delivered to site had to modify a few of them to address a few issues I hadn't considered.

TURKSTRA LUMBER
"ALWAYS ON THE LEVEL"



www.turkstralumber.com

HEAD OFFICE
 1050 UPPER WELLINGTON STREET
 HAMILTON, ONTARIO L9A3S6
 Administration: (905) 388-8222 Fax: (905) 388-9891
 Store: (905) 388-8220 Fax: (905) 388-6261

SOLD TO

ROCKHAVEN HOMES LIMITED
 C/O ALBERT GRIN
 13106 22ND SIDEROA R.R.#1
 GEORGETOWN, ON L7G4S4

SHIP TO

Reuben Grin
 Rockhaven Homes
 costum trims
 ,

ACCOUNT #	QUOTE / PO#	TERMS	ORDER #	ORDER DATE	SLSMN	INVOICE #	EXPIRY DATE	
020549	6015196	2% 15 MONTH FOLLO		02/03/14	718		03/05/14	
ORDERED	BACKORDERED	SHIPPED	U/M	DESCRIPTION		UNIT PRICE	EXTENDED TOTAL	
				**** QUOTE ****				
8			EA	TRIM #1		9.320	74.56*	
13			EA	TRIM #2		11.720	152.36*	
12			EA	TRIM #3		32.760	393.12*	
17			EA	TRIM #4		12.600	214.20*	
4			EA	TRIM #5		17.640	70.56*	
8			EA	TRIM #6		12.600	100.80*	
8			EA	TRIM #7		13.000	104.00*	
9			EA	TRIM #8		10.580	95.22*	
1			EA	TRIM #9		8.190	8.19*	
1			EA	TRIM #10		8.190	8.19*	
2			EA	TRIM #11		17.700	35.40*	
1			EA	TRIM #12		17.700	17.70*	
February 3, 2014 16:44:43 Adriano Ferreira						MERCHANDISE	1274.30	
***** * QUOTE * *****				SHIP VIA	FILLED BY	CHK'D BY	DRIVER	
				06				
				PAGE 1 OF 1			OTHER	0.00
							TAX	0.00
							HST 13.000%	165.66
							FREIGHT	0.00
							TOTAL	1439.96

Fig. 3.4.1.2.1.c.
 Metal Trim Invoice

Everything costs money. But, because these were pre-bent at the plant, these trims actually worked out to be about the same cost as the typical wood trims, all my design time however, would have put the actual cost to a client significantly higher. Cost becomes another reason to avoid too many experiments on any given project



Fig. 3.4.1.2.1.d.

Nothing New Under the Sun
 While in Montreal with Sarah I had some time to explore the city. I noticed this building, more notably the detail around the window: wood siding butting right up to the edge of a beige window with minimal trim around the window. My trim details were well under way by this point, and eventually evolved to include a lip over the edge of the siding, which cleaned up the edge a little bit. It was interesting, and a bit reassuring to see how my details might turn out.

Fig. 3.4.1.2.2.a.
Trims @ Vinyl Windows

Each location has a unique trim profile to make a consistent look around the window.



3.4.1.2.2. Vinyl Windows

Conventionally, and for easy math, wood windows (the “architecturally acceptable” windows) cost twice as much as vinyl windows (the typical windows used by contractors). We spent about \$7000 on windows, another \$7000 for wooden windows was not in our budget. I grew up in a home with vinyl windows, and was quite used to them, in fact it wasn’t until I started architecture school that I realized vinyl windows were repulsive, as illuminated by an incredulous “vinyl?!?!?” from professor Geoff Thun when I suggested them as an alternative material for windows in a project critique.

With this perception in mind, I endeavored to design and place the vinyl windows in the wall in a way that would identify them in a manner which exploited their strengths, rather than as the by-product of a compromise. It would have been easy, and conventional, to match the windows of the existing house (white), or to match the colour of the siding (grey), I instead chose to colour the exterior of the frames a tan-beige, sandstone according to the product colour guide. I also opted to divide the glazing with internal muntins to match this colour. My intention was to evoke a the feel of a natural wood window, which was further accentuated by the size of the windows (relatively small) and the fact that almost every window was ganged with others of a type. This created a perception of the windows as a collection with a purpose, rather than a hole in the wall. Historically glass windows were comprised of small panes of glass assembled in frames comprised of numerous muntins and

mullions, and my arrangement was designed to evoke this arrangement, even as it was comprised of different materials.

Further, the window banks often wrap a corner of the building, which in addition to providing more daylight to the building at more times of day, has the effect of dematerializing the corners of the volumes and encouraging the perception of the hierarchical structure of the windows: pane, muntin, frame, middle post, corner-post. Each element is consistently maintained in each collection of windows.

Fig. 3.4.1.2.2.b.
Windows in the Wall

Typically the windows are arranged in ganged “banks” of windows, which emphasize the arrangement of the windows rather than the individual window itself. Even the solitary window in the middle of the upper wall exists in relationship to the bank of tall windows to it’s left, and the bank of short windows to it’s right.



Please Review Quote To Confirm Accuracy

- 1) Pricing is Guaranteed For 30 Days
- 2) Quoted Total Price Includes Only Products Itemized Above
- 3) Customer Changes In Specifications Will Result In Revised Costs
- 4) Due To Products Being Built To Order No Returns Will Be Accepted

SUB-TOTAL:	\$5,125.35
SALES TAX:	\$666.30
TOTAL:	\$5,791.65
DEPOSIT:	(\$0.00)
BALANCE:	\$5,791.65

Fig. 3.4.1.2.2.c.
Windows Cost

We would add 5 more windows to this cost, the final window bill totaling about \$7000.

CUSTOMER SIGNATURE _____ DATE _____

Thank You For The Opportunity To Provide You With This Quote!

3.4.1.2.1. Corrugated Metal Siding

Most simply, corrugated metal siding is an “industrial” siding. Two weeks ago I was asked by a visitor of my neighbor, who had installed my siding. I said the same guys who had put up the wood siding, and that I thought they did a good job. He said he thought so too, and that he often installed siding like this himself, on warehouses and industrial buildings. He’d never done it on a house, but he liked it.

3.4.1.2.4. Sloped Roof

Approaching modernity as an ethos, rather than a style creates an opportunity to escape the tropes of the modern style and begin to embrace the efficiencies and strengths of the vernacular.

The most enduring stylistic infatuation of modern architecture is probably the flat roof.

Matt Winter

“Sloped roofs look like ass”

remarked during a design review in 1B

It is, however, primarily thus - a stylistic infatuation - based on a maxim of minimalism disguised as efficiency, or as a stylistic carry-over from institutional or industrial architecture into residential architecture, designed in part to reinforce a perception of the building as analogous to a machine - another system of the industrial revolution in which modern architecture germinated. The flat roof stylistically reinforces the idea of the building as a collection of rectilinear platonic elements, pointing towards the purity of design and building, but as such, the flat roof operates stylistically, rather than as a manifestation of the most efficient or practical roof. (It is certainly the most practical roof on buildings over a certain size, but the vast majority of residential homes do not approach this practicality). This platonic shape evokes the most extreme minimalism of both essence and geometry.

Alain de Botton

So strong was the aesthetic interest of the Modernists that it routinely took precedence over considerations of efficiency. The Villa Savoye might have looked like a practically minded machine, but it was in reality an artistically motivated folly. The bare walls were handmade by artisans using costly imported Swiss mortar, they were as delicate as pieces of lace and as devoted to generating feelings as the jewel-encrusted naves of a Counter-Reformation Church.

By Modernism's own standards, the roof of the villa was equally, and yet more ruinously, dishonest. . . Le Corbusier insisted that a flat roof would be preferable to a pitched one. . . But only a week after the family moved in, the roof sprang a leak.¹

The Architecture of Happiness

1. Alain de Botton, *The Architecture of Happiness*. (New York: Random House Inc., 2008), 65.

The sloped roof, insofar as it is manifest as the unintentional application of the typical vernacular ideals of symmetry and “houseness” often degenerates into a collection of un-designed triangles and parallelograms.

Before coming to the University of Waterloo School of Architecture to begin my formal architecture education I did some house design for clients of the contracting company I worked for. I worked primarily in a software program called “softplan”, which had a roof button. The user laid out a floor plan and when finished could push the roof button, specify the roof slope, and whether they preferred cottage or gable roofs, and the program would draw them a roof in 3D. A roof plan and perspective renders could then be generated from this “automatic building”. The mentality that this fostered was that a roof is basically the manifestation of a set of rules. Computer software could encode and then generate a roof based on those rules for any plan geometry. After almost 6 years of architecture education this idea is a little repulsive to me, and essentially anathema to an architect who believes that design matters. But if I truly think that design matters, and that a designer or an architect brings more to the table than a systematic implementation of a set of rules or principles, then is a flat roof any less formulaic than that roof button in my design software?

I needed a roof that worked, that was reliable, and was inexpensive. I needed a practical roof that would be:

- 1) familiar
- 2) easily insulated
- 3) dependable at keeping rain out
- 4) allow for large overhangs to protect my windows
- 5) be sympathetic to the existing building

These requirements committed me to a sloped roof, but I could modulate and design that sloped roof to suit a modernistic ethos, and to accentuate the elements which were important to me.

3.4.1.3. Juxtapose Old and New

I intended the addition to be transparent, I wanted the intervention to be obvious. The design was predicated partially on the inhabitation of the old by the new.

This was most manifest on the exterior at the front of the house. The powder room and front entry were designed to fit into and behind the existing structure, and though the new powder room is smaller than what was the existing mud room, it manifests as a piece “peaking out” from behind the existing brick wall of the house. The corner windows of the office manifest similarly; a new element descending from the new grey metal eaves and soffit, into the existing brick.

These juxtapositions further served, beyond merely the design parti, economic means. I could re-use elements of the old in the renovated building without sacrificing my design “scruples”.

Fig. 3.4.1.3.a.
Office Windows

The office windows maintain the new style - sandstone vinyl with brownstone aluminum between to form a band, with windswept smoke aluminum to match the charcoal pre-bent metal profiles around them.





Fig. 3.4.1.3.b.
Powder Room Insertion

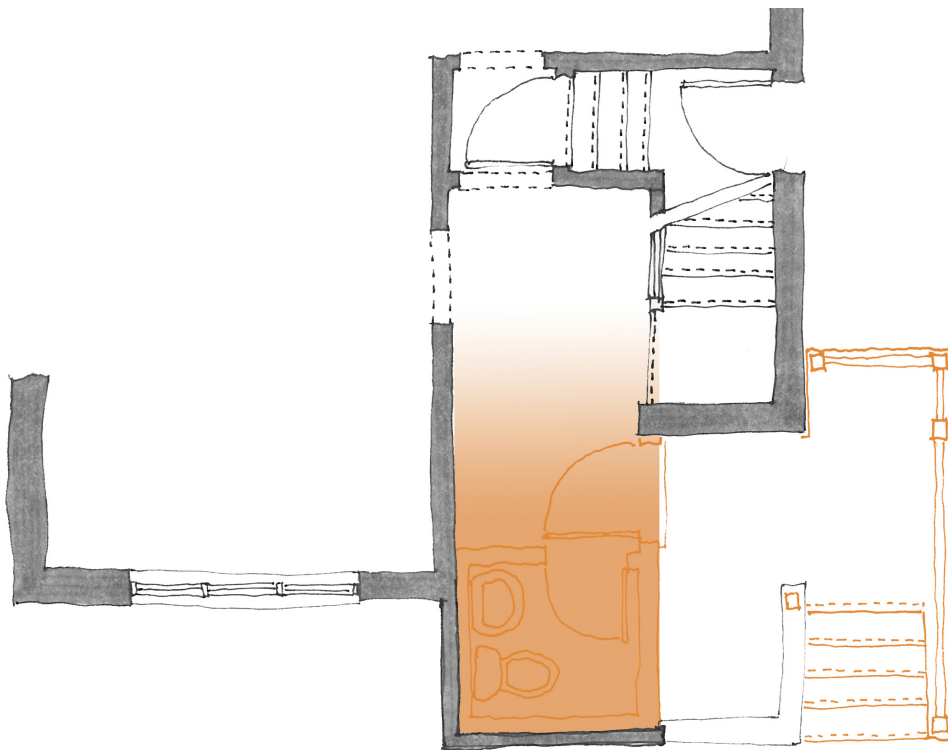


Fig. 3.4.1.3.c.
Powder Room Plan
The new powder room volume
inserts itself into the existing
brick-work of what was a front
entry mud-room.

This juxtaposition is perhaps best represented in the kitchen. We reused the existing shaker-style cabinets along one wall, painting them white, and installed new counters, and then juxtaposing them with new grey “modern” cabinets which pick up the grey of the centre wall of the house. The grey of the wall and the grey of the cabinets in relief to the lighter walls and white trim of the rest of the walls further reinforces the idea of the new occupying, or being inserted into, the old.

We chose to re-purpose and re-use the existing mechanical grilles in the existing rooms, and rather than try to limit their “obtrusiveness” or try to disguise them we

Fig. 3.4.1.3.d.
Existing Kitchen

These Cabinets were removed, re-installed, and repainted.



Fig. 3.4.1.3.e.
New Kitchen

The new cabinets fit into the revised space, relative to the repainted existing cabinets.



opted to accentuate them, and embrace these nearly 100-year-old elements from the existing building.

3.4.1.4. Create a building similar in scale and quality

This is perhaps the most conventional element of my design intentions. It is, nonetheless, an important and integral element of my intentions for my design. Importantly the similarity of my project was qualified as “similar in scale and quality”, rather than an unqualified “similar” or the ubiquitous and meaningless “fit into the neighborhood”. It was important that the building felt at home with the rest of the houses on the street, but in-so-doing I had to be cognizant of how I would design it to fit, and how the passerby would judge its “fit”. The most cliché tactic would be to use similar materials, similar conventions, and similar shapes; to build something in the style of the surrounding buildings. There are no other buildings on the street with corrugated metal siding or grey wood lap siding. Almost all the houses include gable roofs, rather than exclusively cottage. Stylistically my addition maintains few elements from the surrounding homes. This was intentional, but I was nonetheless concerned and cognizant of how the finished house would be perceived in its neighborhood context. My design strategy in this regard is similar to my balanced instead of symmetrical design strategy; I want the house to feel similar, without necessarily being similar. I choose to maintain a similar scale, and quality of materials to achieve this. I want to talk about two ways I tried to achieve this:

- 3.4.1.4.1. Material Quality
- 3.4.1.4.2.. a Significant Front Porch

3.4.1.4.1 Material Quality

The homes on Queen’s boulevard were primarily build 80 - 100 years ago. Mine was constructed in 1927 according to one of the permit documents we obtained. They are primarily constructed of durable “natural” materials, wood and brick. Many have detached garages. They present a front porch to the street.

I choose a grey Maibec pre-finished wood siding as the primary exterior finish. A natural product and immediately recognizable. It is also readily identifiable as better quality than vinyl siding - a choice made by a few homeowners for a number of the neighborhood’s backyard additions.

This had the further effect of endearing the addition to passersby. It became



Fig. 3.4.1.3.f.
Mechanical Grilles
Re-used as counterpoint to the new modern elements, a consistent motif across the project.

Fig. 3.4.1.4.1.a.
Maibec Wood Siding



something better than “just a slapped on addition” for the sole benefit of the occupant as cheaply as possible. The overriding sense of the addition is of this wood.

When we purchased the house the existing attached garage had become that “cheap slapped on addition”. It was covered with two types of cheap vinyl siding, the fascia and soffit were rotting but the foundations were good. I chose to differentiate the garage with grey corrugated metal siding from Westman Steel. In the scope of the neighborhood many of the garages were detached and generally conformed to a grade lower exterior finish than their associated houses. While our garage was attached to the house I could indicate a difference between garage and house materially, and save money without sacrificing the sense of the quality of the addition.

3.4.1.4.2. a Significant Front Porch

The existing front entry was comprised of a sequence of steps addressing the street, a screened mudroom door perpendicular to the street, and a hidden wooden front door parallel to the street.

Some manner of front porch would be essential to integrate the building into the neighborhood. We were intent on identifying our house primarily with Queen's Boulevard rather than Spadina Road. Our house exists on the cusp of two different neighborhoods: Queen's Boulevard and Garden street. Garden Street consists of houses which are just a little more run down, and not built to the same standard as those on Queen's Boulevard. Our address is on Spadina, but our front walkway spills out onto Queen's boulevard and our driveway enters off of Garden street. Our house is oriented towards Queen's Boulevard, and we wanted to accentuate this with our revisions.

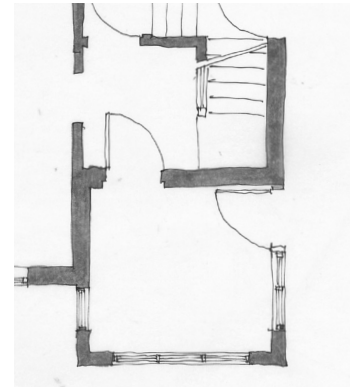


Fig. 3.4.1.4.2.a.
Original Front Plan

The original front plan created an ambiguity regarding the "front door" with a flimsy front screened door first and a more substantial front door hidden behind a ratty mud room.



Fig. 3.4.1.4.2.b.
Sub Neighborhoods
4 Spadina exists just on the edge of Queen's Boulevard.

2014.05.05

I'd formed up the new concrete wall for our front porch. Its a learning process and a combination of design and construction and structural intuition. I'm currently mixing up a few wheel barrows of concrete. My son is helping, My daughter is playing while their mother watches. It's a beautiful Sunday afternoon, and one person in particular decides to stop and chat. I'm not really prepared to stop with half of a wall of concrete poured and a wheelbarrow of half mixed concrete waiting, but my wife is commended on the job we've done and are doing and invited to join the Queen's Boulevard social club. I feel like we fit in.

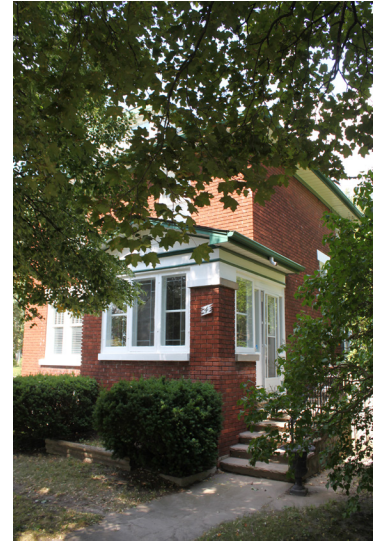


Fig. 3.4.1.4.2.c.
Original Front Entry

Fig. 3.4.1.4.2.d.
New Front Entry
Designed to connect to Queen's
Boulevard.

3.4.2. the Occupant

Like any good North American consumer family we wanted certain things: A bedroom for each child, an office, a guest room, a master suite for my wife and myself, 2nd floor laundry close to the bedrooms, a nice kitchen, and the list goes on. We needed, or at least wanted, a certain list of amenities and would spend the money to get them

But more than this, or perhaps in parallel to this we wanted a home. A place to be ourselves, a place to enjoy each other and a place to call our own. Our shopping list is relatively simple - a cursory schematic layout would determine the capacity of the proposed addition to accommodate these things, but home is something more.

- 3.4.2.1. the Shopping List
- 3.4.2.2. Home
- 3.4.2.3. the Quality and Feeling of the Space

3.4.2.1. the Shopping List

The qualifications of any house we looked at were determined by the potential for certain realities. As we originally asked our real estate agent we wanted a set of things (section 2.4). They weren't hard and fast but in our requirements was a shopping list of "things" and what we got would have to satisfy those things as a minimum, the rest, the "architecture" would build out and over and above this, but a building is a commodity after all, bought and sold.

3.4.2.2. Home

This house had to be home, we intended it to be familiar to us and to our children. I originally intended to design a home, to somehow by design make the place our home. At the same time, people the world over call home anything from a single room hut to a 50 room mansion. Homes exist in refugee camps in Palestine and gated communities in Florida. We could have purchased virtually any house, and made it home, with or without major modifications. Home is as much, perhaps more, concept than architecture. Architecture is important, I'll not deny this, but to design "home" is a task both beyond and beneath the talents of an architect. Beyond in the sense that a home exists in the relationship between inhabitant and building, and that relationship exists in the mind and spirit of the occupant; an architect can design a place to feel like home, can give a person what they want from a home, but the "homeness" of a place is bequeathed by the occupant and while we as architects

might make this easier, we are ultimately outside of this relationship. It is beneath the talents of the architect for much the same reason - the “homeness” of a place occupied is almost inevitable, as evidenced by the vast differences in the homes of people across the world, almost any place can become home. The task of an architect is therefore, to meet a certain set of requirements, and to aspire to a space which will be embraced by the occupant, the task is hence, similar to the task of any architect on any building: to create the desired quality and feeling in the space(s).

3.4.2.3. The Quality and Feeling of the Space

I intended for the spaces to have certain qualities, or at least to create the potential for certain qualities:

- 3.4.2.3.1. the building should Blur
- 3.4.2.3.2. Views should be Controlled
- 3.4.3.3.3. rooms should be lit Naturally

There are others, of course, some of them opaque even to myself. But I want to talk a little about these three, these were and are explicit in the design and in the space, and consciously informed design decisions and motivations, and they also all resolve around the windows in the house, and further exhibit the nature of compromise and design and the utilization of a single element: windows, to perform a myriad of design objectives.

3.4.2.3.1. the building should Blur

I wanted to deemphasize the delineation of space created by walls, and, in-so-doing make the spaces inside feel both larger than they are, and connect them to a view or to the outside. Primarily I used the arrangement of windows, and the structural design of the decks and porch to achieve this. Almost all of the windows in the new and renovated spaces wrap a corner. These windows are intended to create an axis at angle to the rectilinear pattern of wall and floor and ceiling, a pattern which lends itself to occupation and furniture and usability of space, but the occupant is encouraged to escape these patterns experientially and address the room on an axis which diverges from the traditional patten and begins to dematerialize the corner. Traditionally a corner serves as an anchor and a solid point of reference, reinforcing the wall as a line, a boundary between inside and outside. What is a wall really, but a line, and a line (a straight one) is defined by the path between two points. To obscure the corner, to blur the corner is to undermine this definition of a wall and to begin to define the space in relationship to the window, and to the view

Blur:
(google define)
verb
make or become unclear or less distinct

Fig. 3.4.2.3.1.a.
Philip Johnson's Glass House

One of the icons of traditional modernism.



the window engenders.

Traditionally modernism “blew the walls off” of the building entirely, substituting entire walls for floor-to-ceiling-to-corner-to-corner window, a strategy which certainly placed the building inhabitant in his or her surroundings but which achieves this coup by creating what might be likened to a fishbowl. I can become unclear who or what is on display: the world for the inhabitant or the inhabitant for the world. In truth it is both, and the answer is undoubtedly a subtle function of the myriad architectural, cultural, and site specific considerations. These floor-to-ceiling-to-corner-to-corner windows are more accurately classified as glass walls, rather than windows. A window, in a house at least, is a device by which the occupant views out, which brings light and atmosphere to the inhabitant and while it may perform the inverse in particular instances. its intention is usually unambiguous. A wall serves to protect and separate, and more often than not, this is exactly what we want from our houses and buildings. My intention was to maintain this separation, and the sense of being inside, for what is better than standing on the threshold in a rainstorm, “in” the rain but not “in” the rain, or being warm and snug on a silent winter night, while incurring a sense of being “in the edge”. The structural design of the decks best describes this particular occupation, they are designed gradually slip off the interiority of the house. Each of them are covered, and at each cantilevers past their vertical structural elements.

2014.08.08

“It all makes sense from standing back and looking at the house”

I was standing with Sarah on the upper deck, where I had just finished installing the top rail of the railing. She wasn't entirely sure of the design.

“I don't like it as much though looking at it standing here from the door, the post being away from the corner, but when you look at the house from the backyard and you see each of the corner windows, and how they wrap and then see the deck extending past the post, the whole thing comes together as a consistent whole”

I was immediately defensive, but I knew what she meant, the column forced you to look around it, and upset the natural inclination to address the deck at right angles, and there was something vaguely unsettling about that.

“I know what you mean, but come stand over here, on the outside corner of the deck, and lean on the corner, we're standing right here in the tree, and the entire pear tree is right below us.”

3.4.2.3.2. Controlled Views

We added three washrooms, a laundry room, a bedroom, and an office. These each required a different approach to control views. The washrooms would emphasize privacy while maximizing daylight, the office would require daylight and a view that didn't distract, in the bedroom we wanted to create as open a space as possible while maintaining our privacy from the world beyond our own backyard. The bathroom windows are all high on the wall, maximizing daylight penetration into the rooms, and cutting off our private bits from the ground. The office windows are high on the wall, but a little taller, a nod to the brick coursing and the adjacent existing window in my son's bedroom. They offer a view of sky and trees, and a very real sense of time, of the season: stark sky and the snow laden skeletons of our 40' maple trees in winter, the blooms and buds of spring, the dense foliage of summer blocking out all else, and the flashing colours of autumn.

Fig. 3.4.2.3.2.a.
Office Window

The office is about focus, and the view is designed to be concentrated, especially while sitting down, on the foliage of the trees just outside, rather than the hustle of the street. This bank of windows is at head height and faces south with the 24" roof overhang above, they will be mostly shaded in the summer and bright in the winter.

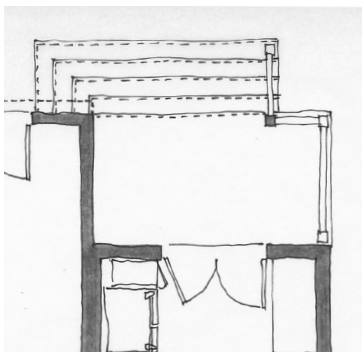


Fig. 3.4.2.3.2.b.
Back Stairs Plan

The view from our kitchen is designed to be as unobstructed as possible to the backyard. This is a function of the placement of the double doors, but also how the deck was designed. The glazing itself matters, but also how the house arranges itself around the view, and the deck was important in this regard. We didn't want a long railing obstructing the view, but the building code will require a railing on any surface more than 24" above grade. A stair however is just a small drop each time, and a railing up at the top defeats the purpose of stairs. It would have been easier to do a straight set of stairs directly out the front, but these would have required a railing along both edges, owing to the large drop of the side of the stairs, thus a cascading corner stair that wraps the corner of the garage.

3.4.2.3.3. rooms should be lit Naturally

These first three objectives all mesh into each other, and windows are an integral



Fig. 3.4.2.3.2.c.
Back Stairs

Purely from the point of view of the deck itself these steps are a bit overkill, a lot of work for a lot of steps that is probably more than we needed. But, we have this idea of our children playing in the yard, of the connection between the house and the yard, and a railing across the front of this deck would obstruct this. Obviously, I haven't quite finished everything in this picture, hopefully, by the time I submit the final thesis I will have had time to screw up the rest of the boards.

part of the strategy for each. So, when strategy two seeks to limit the size of windows to accentuate or limit certain views, it feels in conflict with any daylighting strategy, and perhaps it is, to a certain extent, but the threshold for enough light is surprisingly low, perhaps it shouldn't be - the sun is after all a rather large ball of hot hot light, so even with objectives to control views and use windows judiciously for privacy and thermal considerations daylighting is still very possible, and once you have enough light for the things you're doing more doesn't make an appreciable difference. Too much can create glare, or bring problems with solar heat gain, or thermal performance or reduced privacy. One of the biggest factors in daylight is light penetration into the room, and the limiting reality on light penetration is the height of the window above the floor. As delineated in fig. 3.4.2.3.2.a. light will get in to a depth of approximately twice the height of the top of the window above the floor. It is a little more complex than this, depending on the orientation of the sun relative to the window, but as a general rule smaller higher windows are better than larger lower windows if those smaller windows let in enough light in the first place.

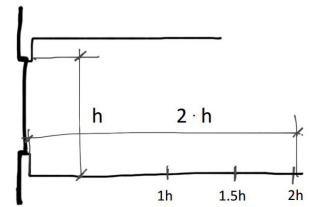


Fig. 3.4.2.3.3.a.
Daylight Penetration

Lifted from a daylighting presentation by Alex Lukakcho for Comprehensive Building Studio at the University of Waterloo.

3.4.3. Current Accepted Construction Techniques

This was a project beholden to all the contingencies and requirements of any real project. It was conceived and designed to be executed for a budget and on a schedule. It was also my hypothesis that a full scale re-imagining of architectural techniques and technology was not necessary or prudent for the purposes of this project. Practice and Technology advance incrementally and current techniques and conventions, while certainly not perfect, define the strictures to which virtually all building projects adhere. These technologies and conventions will advance, change, adapt, and improve, but change will be incremental. Significant advances do occur: for example, balloon framing techniques in the mid 20th century revolutionized the single family home industry because of a confluence of advances across a large number of pertinent technologies and the creation of demand by advances in automobile availability. But the residential construction industry is also an industry which has yet to adopt the metric system.

Trades and suppliers were going to be selected based on both on their price and their expertise. I'd like to illuminate the cost of departing from typical solutions with two examples, one where I opted to depart, and one where I investigated the possibilities and decided against:

- 3.4.3.1. Bent Metal Trims
- 3.4.3.2. Soffits

3.4.3.1. Bent Metal Trims

We've already talked about the metal trims, and the cost of developing and implementing this departure from the norm. While at the end of the day they didn't cost much more to install than typical trims, they took up a significant proportion of my time and energy for weeks in the design and construction phases of our project. Looking back at the details of the design, I'm not sure that we won't have a problem with how the wood siding weathers in a few places. It might be the case that the profile on one of the trims will allow for standing water in which the bottom edge of my wood siding will be submerged after rainfall. We'll have to see how the building looks in 5 to 10 years to know whether this will be the case. These trims cost me a significant amount of design time, and prompted one tradesperson to significantly over-estimate the job to avoid unforeseen installation costs, and sometimes keep me up at night thinking about how they might weather over time, this sort of departure, while worth it, in my opinion, is why sometimes the conventions are worth maintaining.

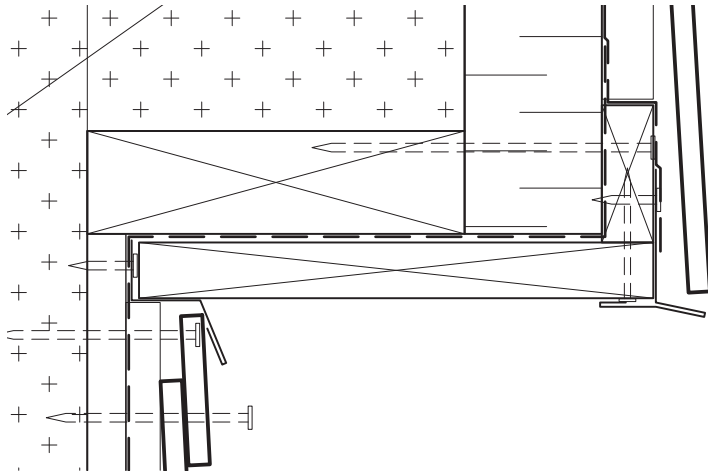


Fig. 3.4.3.1.a.
Trim 5 as for permit

In this iteration there was a significant slope on the flashing to "kick" water out and away from the wood. There was as well, enough breathing space under and around the wood siding keeping it away from any water that might sit on the metal trim.

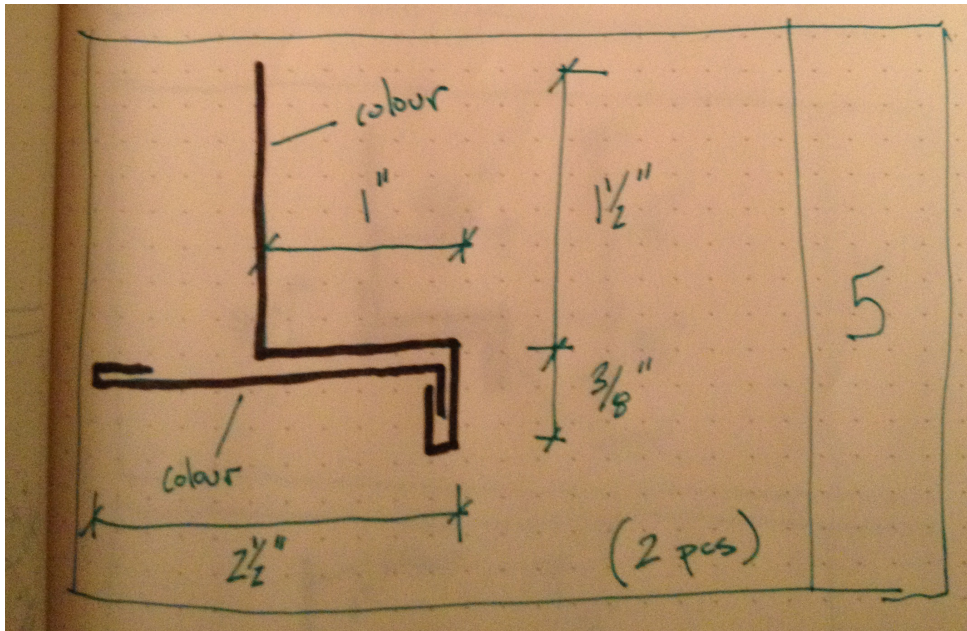


Fig. 3.4.3.1.b.
Trim 5 as bent

This profile has the increased benefit of a drip edge which will keep water from slicking back onto the soffit. but, as a product of the bending process and the installation process the top of the flashing under the wood is now level. Which would be ok, except in the installation of the product the wood was pushed closer to the flashing and will now sit in any water that might sit on top of the flashing.

3.4.3.2. Soffits

Originally I'd intended to depart from the norm on the soffits of the house, I used a brown pressure treated [pt] wood for the exterior posts, decks, and railings. I wanted to continue this feel and look into the soffits which connect perceptually to the pt wood by the pt posts.

2013-10-03

Hi Reuben,

Soffit in brown P.T. is an interesting idea. My thoughts below.

1. Expansion – it will shrink considerably causing beautiful gaps IF you are a bug. You may need to put up screening before installation
2. Cost – approx. \$0.80 per lf and 2.43lf (assuming 5" width) per square foot which equals \$1.95/sf supply. Aluminum soffit is approximately \$5-6.00/sf installed.
3. Installation – it will need to be fasted every 2'-0" which adds more back-framing and material cost.

Jesse

So at this point I thought, if supply of pt amounted to \$1.95 per square foot, and aluminum averaged \$5.50 per square foot, I had \$3.55 per square foot for installation and some extra back framing, which seemed reasonable. I didn't think much of it after that until I received a phone call on January 10th to tell me that my project had increased from \$150,000 +HST to \$181,500 +HST, when I had expected my own work on the project should have lowered some of the costs. Part of this increase was an extra \$5000 for the pressure treated wood soffit, because pt soffit was a departure from the norm any trade that priced the job wasn't comfortable with the unknown, installation costs skyrocketed. It just wasn't worth it to us.

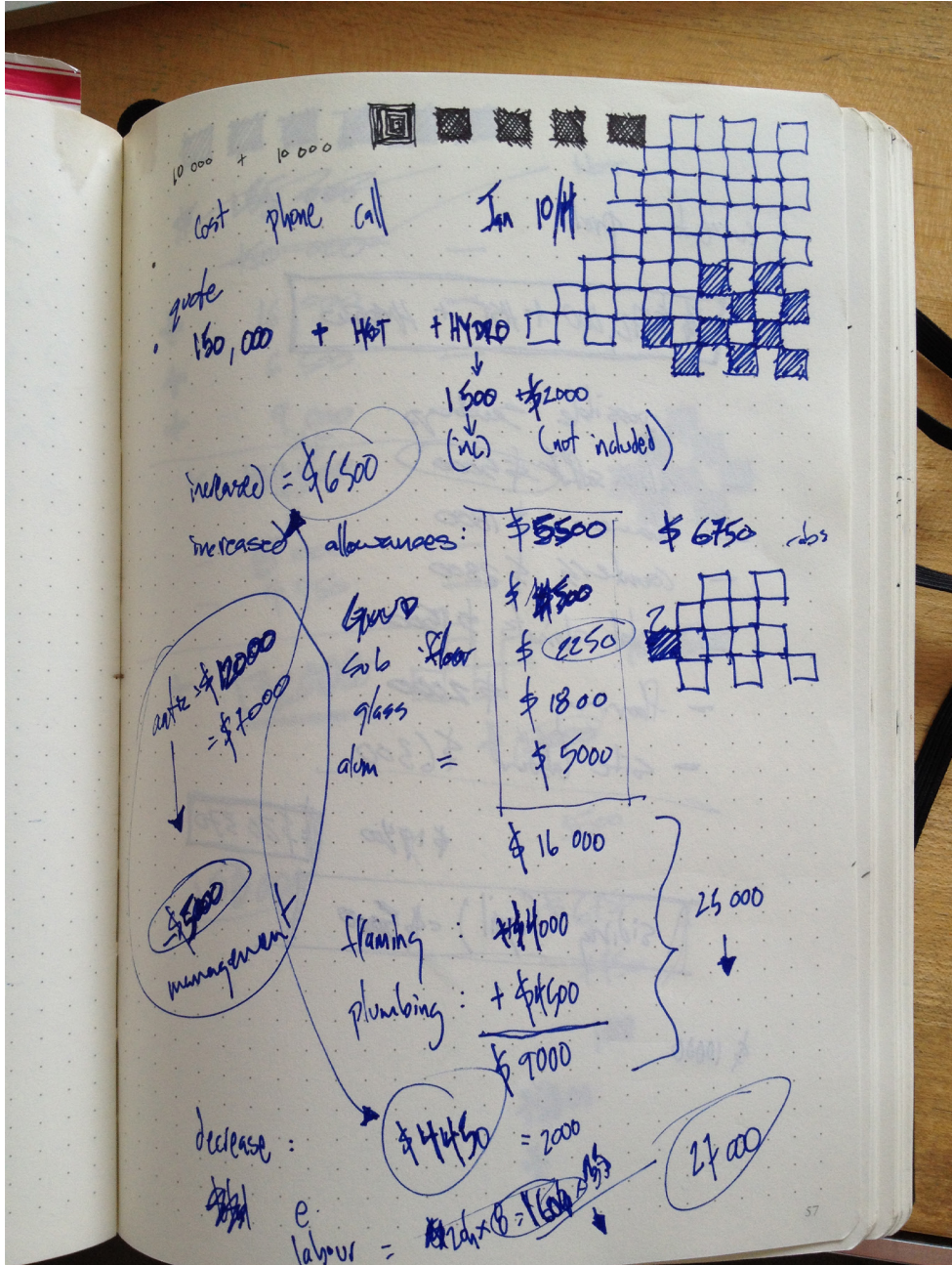
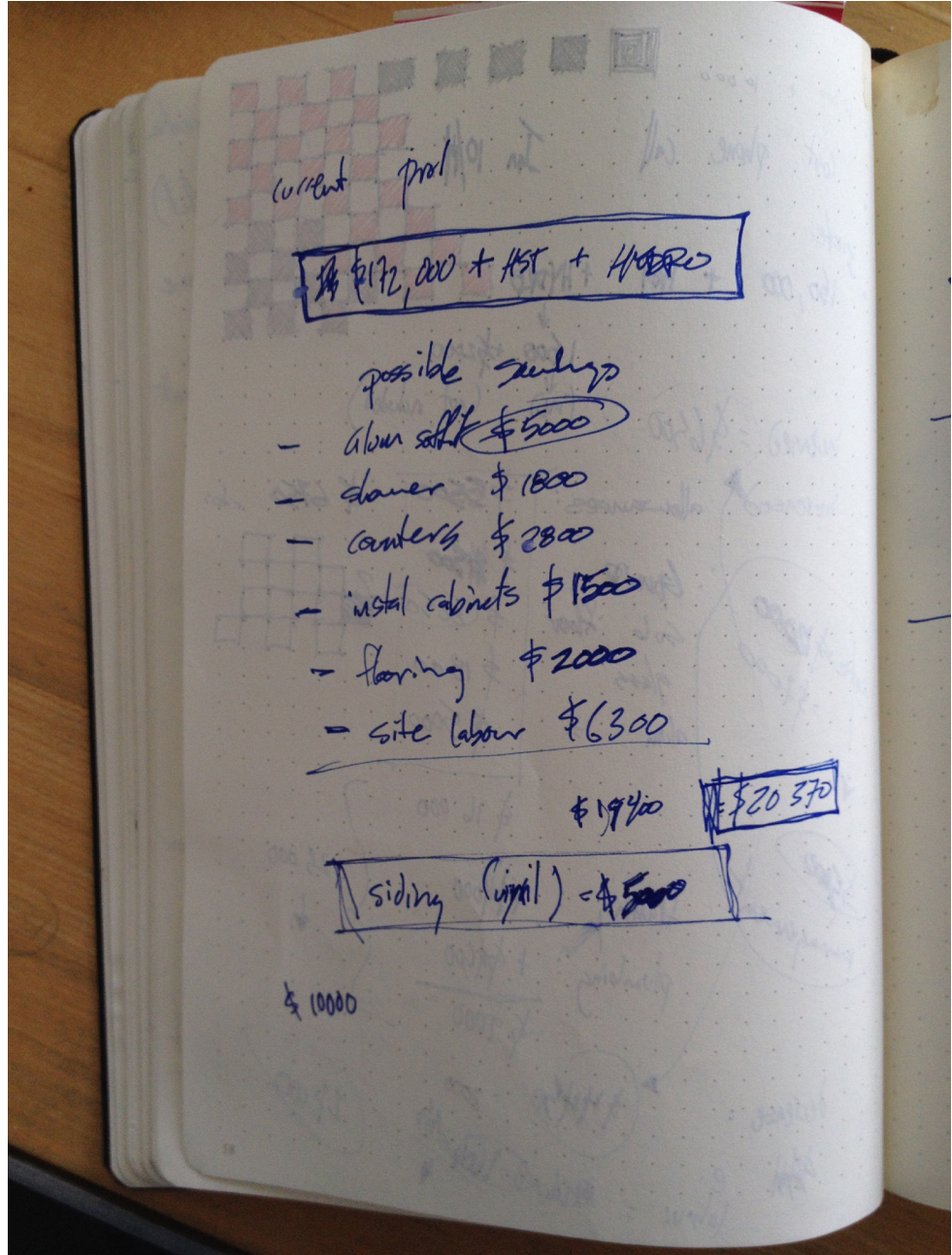


Fig. 3.4.3.2.a.
Jan. 10th Costs. pg1

These are my notes from that phone call. This page lays out the original cost estimate: \$150,000 +HST +Hydro upgrade. A whole bunch of miscellaneous things that we didn't specify added up to the first \$6500. Our allowances (cabinets, plumbing fixtures, flooring etc.) would be \$5500 over budget. We knew about these. Our gypsum board and taping had increased by \$500, we opted to install plywood over the existing subfloor to reduce squeaking the estimated cost of this was \$2250, a glass door and partition in the master shower was going to cost \$1800, and the wood soffit was costing us an extra \$5000. Conceptually we could still back out of these costs. Framing had cost \$4000 more than anticipated (my roofs, mostly), and plumbing \$4500 more. I'd managed to save \$4450 through my site labour, and \$5000 through site management.

Fig. 3.4.3.2.b.
Jan. 10th Costs. pg2

So adding up the increases put me at 181,500, but I had saved \$9,500, so I was sitting at \$172,000 +HST, when I had hoped to see the project come in at \$150,000 even. These were my possible savings: I could possibly save \$19,400 if we went with a shower curtain in the master bedroom, laminate counters in the kitchen, aluminum soffits, I did the remaining \$6300 of site labour myself, and installed both the flooring and the cabinets. I could save another \$5000 if I went with vinyl siding instead of wood.



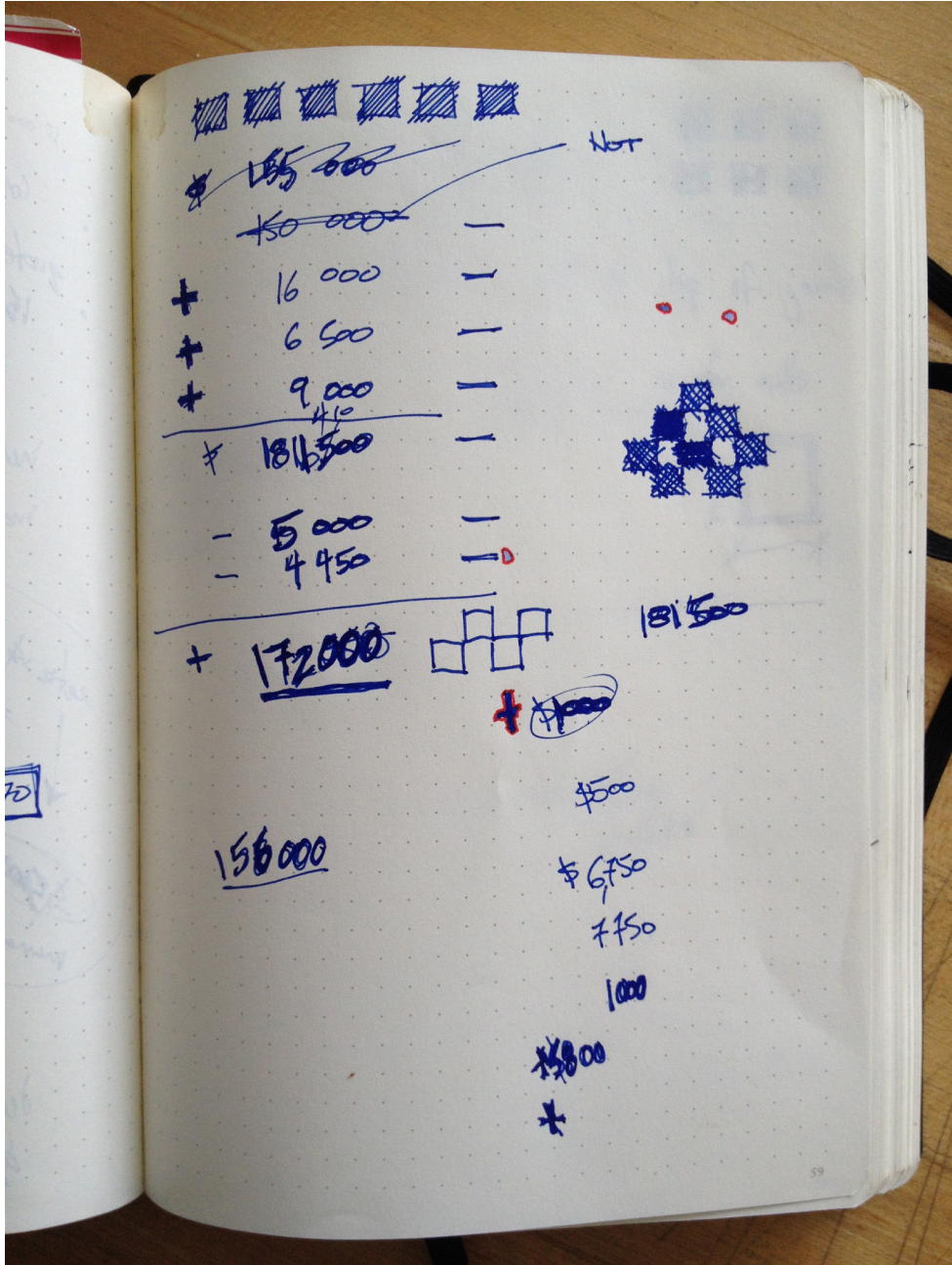


Fig. 3.4.3.2.c.
Jan. 10th Costs. pg3

A recap of the realities. The pressure treated wood soffit died this day. We kept the rest of the things and I decided to work my ass off for another 6 weeks; doing all the installation, and managing the site. Which is part of the reason I'm still working on my thesis as July approaches.

3.4.4. to our Limited Means

We aren't poor, really, but we don't have the money for "Architecture" as it is often interpreted. Things were designed not to be more expensive than they needed to be. This is not to say that they were cheap, but we did however concede that the best value was often something that wasn't the perfect thing. We adopted a mentality that accepts the small imperfections in both materials and execution. Value for money is important - more important in our design philosophy than having the perfect thing. In the laundry room it would be nice to have custom cabinets to match the rest of our millwork, but it is a laundry room, and Ikea cabinets will save us almost \$1000. A stand alone tub would be perfect to increase the sense of space in the master ensuite bathroom and be a really nice element but a insert tub, done in a considered and appealing manner can save us over \$2000. We would eventually like to have everything updated, but we had to cut costs, so we opted to remove things that wouldn't cost a lot more to do later.

3.4.4.1. Design to Maximize Ikea Cabinets (Laundry Room)

3.4.4.2. Design to Integrate an Insert Tub

3.4.4.3. Removal of Elements which could be done later

3.4.4.1. Design to Maximize Ikea Cabinets (Laundry Room)

In producing drawings for the three companies who I investigated to do our millwork, I entertained Ikea Cabinets for a few locations, and figured out how much it would cost to use Ikea for these locations. We eventually opted for custom cabinets everywhere except the laundry room, our cabinet maker was within 40% of the Ikea option in every room except the laundry room where he was out by 150%. Ikea cabinets come in only a few set sizes, and one of their biggest drawback is, if you have a room that doesn't fit these sizes, you end up with wasted space. By changing the dimension of the laundry room from 6'-7 1/4" to 6'-8 3/4" the Ikea cabinets would fit perfectly in the space.

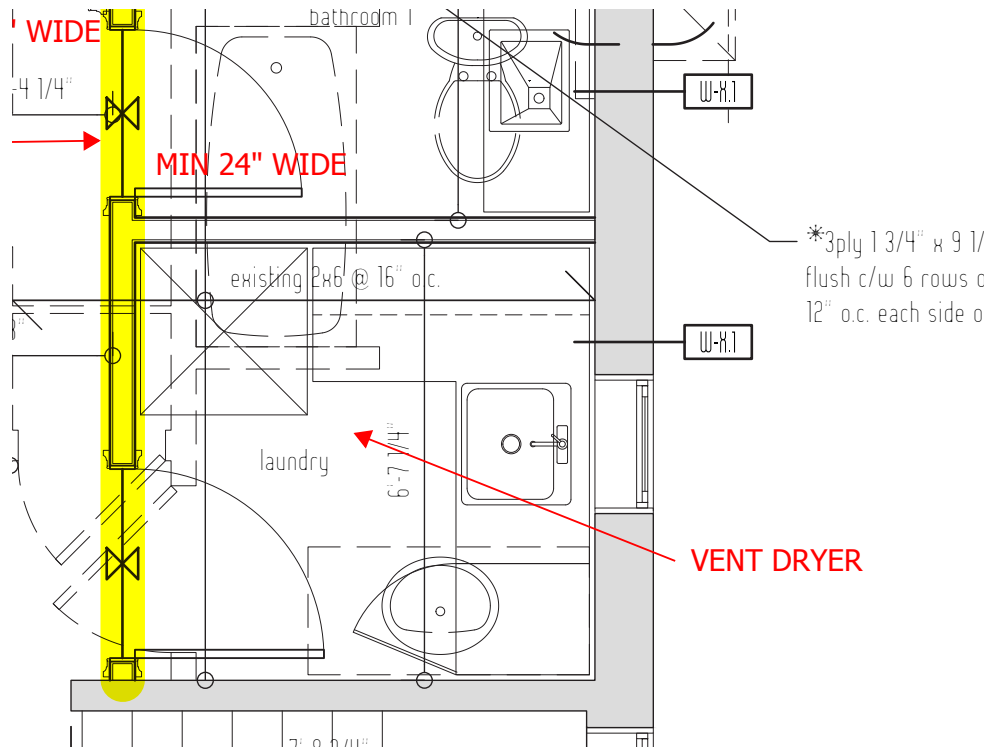


Fig. 3.4.4.1.a.
Laundry Room 1
Dimensions as originally designed.

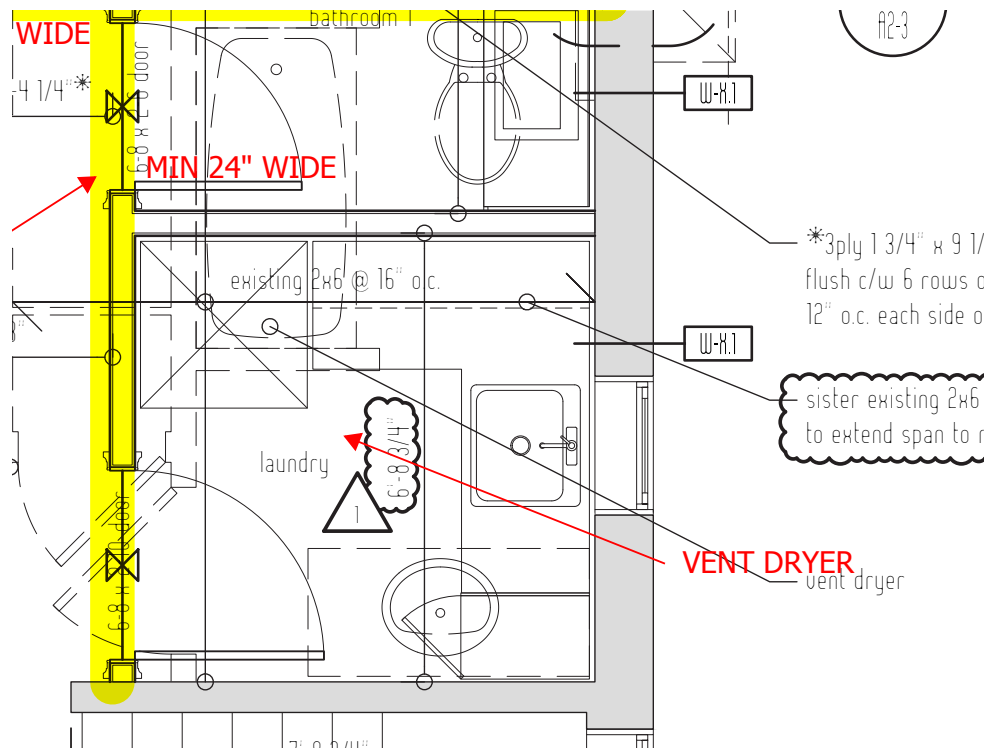


Fig. 3.4.4.1.b.
Laundry Room 2
Subtly changed dimensions to reflect less expensive, "off the shelf" cabinets.

3.4.4.2. Design to Integrate an Insert Tub

Throughout the design we had accounted for a stand-alone tub in our master bathroom. Sarah liked the look and idea, I also liked how it would offer a feeling of more space in the bathroom. At a certain point we ran up against the cost for this: over \$2000, and the faucets for tubs like this also cost significantly more than faucets that could be deck or wall mounted. I initially proposed that we go with the stand-alone tub and inset a counter into the wall with conventional faucets.

2013-11-22

Hi Linda,

Thanks for your help again.

I think we're going to do something like the attached photograph, with an alcove in the wall for the deck mount faucet and the smaller (67x29.5) "skye" stand alone tub. So we can stick with the faucet system we originally picked.

Jesse is going to have to figure out how to insulate behind it (exterior wall), but he's a smart guy.

Unless Jesse kicks up a stink lets proceed this way.

Thanks again,

r

Jesse kicked up a stink: any wall we could inset a counter into would be an exterior wall, on the northeast corner of the building. He was very concerned about pipes freezing, to the point where he would refuse to do it. The tub itself would also still cost significantly more. I had to re-design how all the parts of the shower and tub would fit together. Eventually we settled on a skirted tub, one of the least expensive types of bathtubs. We opted for a nice model of this type of tub, a nice upgrade from the typical contractor's tub but still much less expensive than any stand-alone tub.



Fig. 3.4.4.2.a.
Initial Solution Example

We could inset a counter into the wall and use conventional fixtures to save the cost of the stand-alone fixtures.

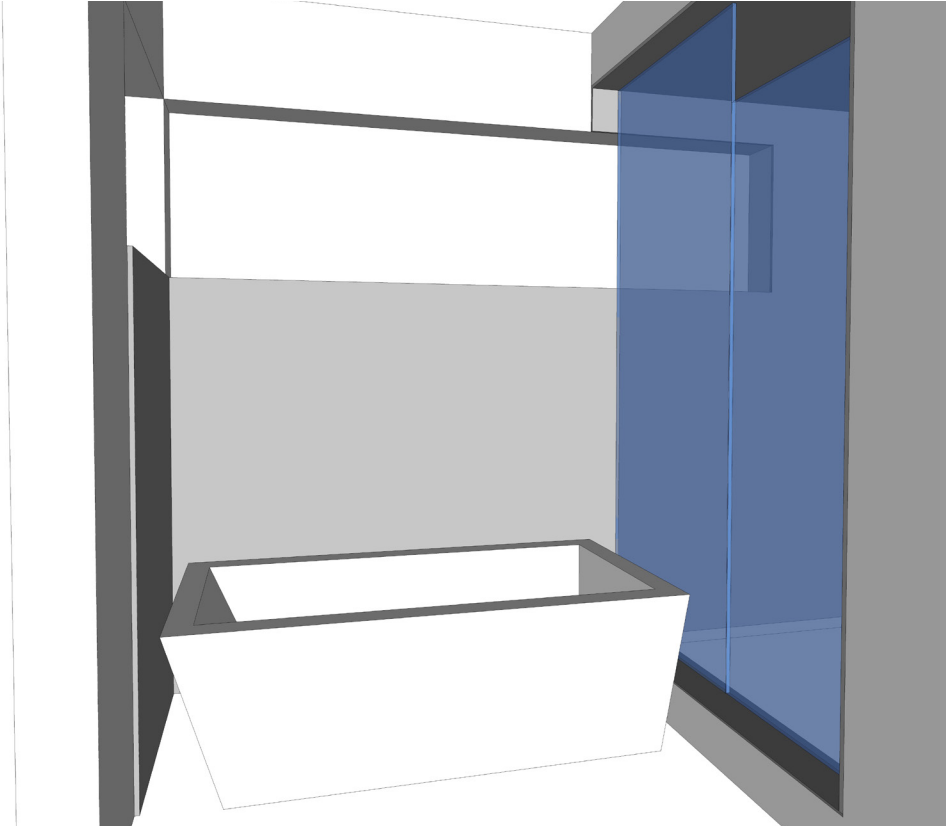


Fig. 3.4.4.2.b.
Stand-Alone Tub Design



Fig. 3.4.4.2.c.
Skirtd Tub Integration

3.4.4.3. Removal of Elements which could be done later

We had to cut things, the project costs were more than we could afford. But we had to cut things intelligently. We decided to cut things that wouldn't cost too much more to do later. There are elements of a projects that, to put off until later will cost significantly more to do then than to do now. Plumbing, for example: to add another plumbing line would require removing drywall, fishing pipes through areas that, during construction are open and accessible, but would then be almost impossible to access without significant expense. Siding, to upgrade to wood later would require a \$7000 investment in vinyl siding which would be discarded if we ever upgraded, it wouldn't be \$7000 now and \$5000 more down the road to upgrade later, it would be \$7000 now and \$13000 later. Most of what we chose to cut were things that we could still put in later a little extra cost.

We cut the gas fireplace in the master bedroom. This would cost a little bit more to install later, we would have to cut out some shingles and find a way to install a gas line to it's location, but at \$5000 it was a significant expense, and to do later might cost \$200 more than to do now.

We cut out replacing the side door of the house. There was no construction there in the project, it was a totally isolated project and I can install, caulk and trim it myself if necessary, there would be no extra cost at all to do it later.

We cut out a window on the bottom landing of our stairs. Again, like the side door there was no other construction going on right there - we wouldn't have to do extra work later, or replace or tear out work we were doing in order to install this window later when we could afford it.

As a general rule, as the project advanced and costs mounted we opted to cut things that could be done later, and pay for things which couldn't. We could have saved more money, we could have reduced the quality of the finishes, the counter tops could have been downgraded to laminate, we could have installed hardwood at \$3.00 a square foot from Home Depot, or installed fewer pot lights. But by judiciously selecting things which didn't compromise the quality of construction or finish we ended up with a home which is still what we envisioned, and can still be everything we wanted without significant extra expense.

3.4.5. to “Safe” Building Science

As building science and technologies advance, the possibilities for design have exploded. It seems possible to design just about anything; with the right mix of money, expertise, technology and quality installation, the limits of design have been pushed ever further towards buildings of any shape or complexion. The mundane functions of “building” - to create a suitable environment for human use - are concentrated in and function as a product of the nature of the building envelope. With enough precision and technological ingenuity the “architectural” design of a building can be expressed in any form desired by the architect or client. This does, however, require a staggering amount of confidence on the part of the architect, and on projects large enough to draw experts from all the requisite fields as well as the money to pay tradespeople for perfect installation this confidence might be warranted. But on a project such as this, with an inexperienced “architect” and normal tradespeople, with conventional technologies the design of the building itself functioned to protect the building from the elements.

What follows is part of an email conversation about the particular wall assembly we chose to use and the risk management approach rather than relying on any one element working perfectly:

2013-09-30

Hi Aaron, [My cousin, an engineer, who works as a building scientist]

Sarah and I recently bought a house and we’re going to do a relatively major renovation/addition and I’m wondering if I could give you a quick call to ask about a few building details?

Thanks,

r

2013-09-30

Hey,

Congrats on the house. Projects are fun. What is your plan?

Cheers,

Aaron

2013-10-01

Thanks Aaron,

We’re quite excited - and a little bit leary of such a big project but it should be

fun.

We're putting an addition over the existing garage and what I'm getting snagged on is the wall assembly itself. Jesse wants to do his standard 2x6 construction + batt insulation, 1" codeboard, with poly inside and tyvek outside. I've been looking at a 2x4 construction + batt insulation with 2" XPS and taped joints as air/water/vapour barrier. From my conversations with John Straube in the past this way might get me a tighter building, with more continuous insulation and save me the tyvek and poly as well as a wall that is 1" thinner.

Jesse's way obviously meets the part 9 requirements¹ and mine would need a stamp (engineer? architect?). What do you think - do you think moving more of the insulation to XPS is worth it? You have a lot more experience with this - especially beyond the sort of school projects I've mostly done. Do you think I'm gaining enough by doing this - or am I missing anything?

Do you guys deal with projects at this scale? How would your normal relationship work with an architect/designer who might want something stamped, do you stamp details at all?

Thanks for responding so quickly.

r

2013-10-01

Hey Reuben,

Funny - I was trying to talk your dad and brother into this wall when I was on-site with them a while ago. 2x4+2" XPS is better thermally than 2x6+1" XPS. XPS is the way to go for this application - stick away from polyiso for now. Under SB12 with the OBC I think any 'R-24' wall will be accepted. If you do R19 + 5 or R14 + 10. The cottage we just rebuilt - we did with R14 and 2" exterior insulation. You can do the wall you want omitting poly, but you would likely need to prove it works to the code official with a stamped letter. We definitely do work on small projects like this when were asked to, I have stamped things for small projects, but were not cheap - minimum contract is \$2500.

Are you doing any structural sheathing? I would tape the plywood and caulk the top and bottom plates as air barrier and tape the XPS as a drainage plane². Is there a specific reason to omit the poly? (This will raise the biggest hairs with the code official.) Are you dropping it to make the wall safer for moisture?

1. Ontario, *Building Code Act, 1992*. Amended 2014.

2. Aaron Grin and Joseph Lstiburek, "Guidance on Taped Insulating Sheathing Drainage Planes: Final Report." Building Science Press.

(inward drying?) If you flash the windows properly this shouldn't be an issue because the wall should never get wet and you could leave the poly in. Having the sealed sheet poly on the interior is nice as a secondary air barrier as well, but it does limit drying. If you need a sheet good there to represent a vapour barrier and you want inward drying capability just install CertainTeed MemBrain. MemBrain is a code approved vapour barrier but if does get wet in the cavity for some reason its pores open and its 10x more open than a vapour barrier and the wall can dry. Home Hardware can get the MemBrain, it is about \$200 a roll, which is probably all you need for the walls assuming this is about a 20'x24' garage. Your other option would be to do omit the poly and paint the drywall with a vapour barrier paint, that should also suffice the code official.

How are things?

Cheers,

Aaron

I forwarded all this on to Jesse, and he replied with a link to a paper³ on insulated sheathing published by building science group, the company Aaron works for. The paper indicates that 2" of XPS is less vapour permeable than 1" (the standard) and Jesse was concerned about vapour-lock in the wall cavity. Following is my rebuttal to his concerns regarding that paper:

2013-11-05

Thanks for this Jesse.

I'm still comfortable with the assembly we settled on for the permit drawings. For a number of reasons:

1. I think exterior water getting in and getting stuck is mostly what we're worried about. I think this because:

a) We have a poly air/vapour barrier on the inside, which won't stop 100% but should allow through an equal amount of vapour both ways. Air that gets through however, might condense and then be stuck insofar as it cannot get out the same way it gets in. This leads to:

b) With 2" of XPS on the outside, a lot of the time the dewpoint will be inside the XPS such that condensation issues are going to be limited to the absolute coldest times of year when the dewpoint moves into the batt insulation. At these times of year our internal RH should be relatively low. Granted there will be times an locations that the "perfect storm" of high internal RH and very

3. Building Science Corporation. *Guide to Insulated Sheathing*, 7.

low temperatures will conspire to induce condensation in the walls, but these would primarily be in bathroom locations and would almost always be short duration high RH (shower/bath) and have a disproportionately long time to dry in relation to the time of high RH. Your point about sustained high RH is taken, and I will avoid the certain-teed membrain for this reason, but for the majority of time when there is high internal RH (summer) there won't be condensation issues, and the poly should function to block a great majority of that water from the inside to outside.

2. So to address water from the outside getting in and getting stuck:

a) All of my exterior windows are protected by overhangs immediately above them, the worst offenders for liquid water infiltration are quite well protected in this regard.

b) We're using tyvek, which creates a mechanical water drainage plane that will operate even if tape breaks down.

c) Inverse vapour transmission, where the hot humid exterior air in the summer might condense on the cool air-conditioned interior layer should be limited by the vapour semi-impermeable layer, which is actually an improvement on this count.

d) We have a few locations, primarily at the bottom of the walls, where there is less insulation between the interior and exterior. For example the joists spaces. These are precisely the locations where condensation will percolate to and have a better chance of drying out.

e) There are still locations where wood spans from inside into the wall cavity (eg. joist spaces) that will allow water to dry to the inside, slowly, but the situations under which water gets into the wall cavity are few and far between - it should be possible for the wall to "stay ahead of the curve" so to speak, in that the wall should always be able to dry out fully before more water gets in, preventing water infiltration occurrences from creating a perpetually wet space for mold to grow.

f) According to the paper, foil faced foams are worse still, and the residential construction industry routinely uses those foams on the exterior, relying on gaps and the joints to allow for drying. This is not to say that they're doing the right thing - perhaps these walls will perform poorly in the long run - but I believe our solution to be superior to those.

Thoughts? I'm actually a bit impressed with myself, but, if anyone can bring me down its you.

Thanks for forcing me to clarify my thinking (even to myself).

r

The number one reason I am comfortable with the wall assembly we choose was that the design included large overhangs over the windows and doors. This assembly that gained us more than 10 square feet extra floor area and increased the thermal efficiency of the wall. Every single window in the design is protected by an overhang. The most unprotected opening, the garage man-door and window, is protected by only a 7" overhang 32" above it. Other openings are protected to the extent that only in the most extreme weather will any water drain to the top of a window - the most susceptible place for water infiltration. Was this necessary? Perhaps not, it is totally possible to design a wall and window flashing system which requires no overhangs immediately above the window, and I would ultimately be comfortable with an unprotected window openings in the building but when this convention also satisfies my other design considerations and is sympathetic to the existing building's roof overhang, the added confidence helps me sleep better at night and offers some solace when considering the standards or lack thereof of the tradespeople or laborers responsible for the implementation and installation of these elements.

Sloped roofs have been specifically raised already in the design considerations, suffice to say a sloped roof is the most cost effective and least likely to fail roof technology for this scale of building currently practiced on earth. A sloped roof further allows for the easy use of cheapest dollar per r-value insulation (blown-in cellulose insulation). It requires less expensive structural members than a flat roof. Asphalt shingles are among the cheapest exterior cladding material and are readily available when they need to be replaced. A sloped, shingled, roof saved money and works better longer than just about any alternative. Conceptually a sloped metal roof might be shown to be more cost effective in the long term but would require a significant initial investment which was outside of the our practical budget.

This is not an exhaustive exploration of the safe building science decisions but exhibits the mentality of integration of prudent or conservative decisions when confronted with the realities of Canadian climate, and the capabilities of building trades.

2013.11.06

There is a history here.

@ 4:38 on a Wednesday afternoon - with the windows open and a light rain falling on a balmy November dusk. Something about that makes this place speak - even with many of its studs raw and exposed, and the plaster dust thick in the air and laying in a thin veil over everything. Perhaps because these bones are exposed. This place speaks of Christmases. Sarah wants to put our tree, next year, right here beside the stairs, and the early morning laughter and the children of almost 100 years of inhabitation, of 100 years of home. This place has any identity and a spirit, one that speaks of craftsmanship and warmth, of lathe and plaster applied in a time when things were done by hand, more so than they are today. Wood here in the foyer. What will I make of it? This place is a different place than my last home project, a different home, of a different time. Can my design respect that? Is there a place for the old and the new? Is there a way to be part of what was - to connect with the boys and girls and men and women who lived here once - to make this place our own, for our children with our own style and our own life but still participate in the traditions of here? Can I make something new here that doesn't break with this heritage and the soul of this place? Can my design participate and enhance and synergize with the spirit that is here. A site speaks, and this home speaks, and now - listening to the cascade of water on asphalt under the wheels of passing cars - an idea of the life that was here and could be here imminent and subdued and vibrant all at the same time. Who designed this place and who lived here? Who built it and why? Can we rescue some of that essence from here and from history? This is a good place, with a good soul, it's just a little below the surface now.

3.4.6. to the Existing Building

I'm not sure what possessed me to write just then as I was sitting in the disassembled foyer of my recently acquired house. It prompted a change. Up until this point I had intended to co-opt some of the space in the existing foyer, and block off a portion of the stairs. Now this was changing. My changes would simplify construction, save me some money, make the foyer larger. There were some practical reasons for the change but at it's heart this was one about the phenomenology and the history and connection to who was here and to the evolution of a behavior in a place, and the nature of that space because of that behavior. I'm not sure necessarily what this means, or what I'm doing beyond an intuitive grasp of an architectural gravity which impelled me to revise my design to maintain this gravity.

Fig. 3.4.6.a.
At the top of the Stairs
I changed the design for this moment. My son at the top of the stairs coming down from bed in the morning and looking down from the middle landing, like perhaps other 4 year olds before.



This particular building was chosen because we could do an addition without any new foundations. The existing single story garage was assessed and deemed capable of supporting an addition above. This did, however, drive the maximum extents of any addition which in turn limited the possible arrangement of new program around the existing program. A building is practical as well, and this one was chosen for that. Practically the master suite needed room, and the garage footings weren't going anywhere. Practically there was more space needed than was there, so I cantilevered the master bedroom and bathroom over the garage. This cantilever is among the defining architectural characteristics of the house. It defines the wood-siding apart from the garage, establishes it as a volume, and offers a protected space below, motivated originally by the considerations of necessary space and economics coupled with the nature of the existing building

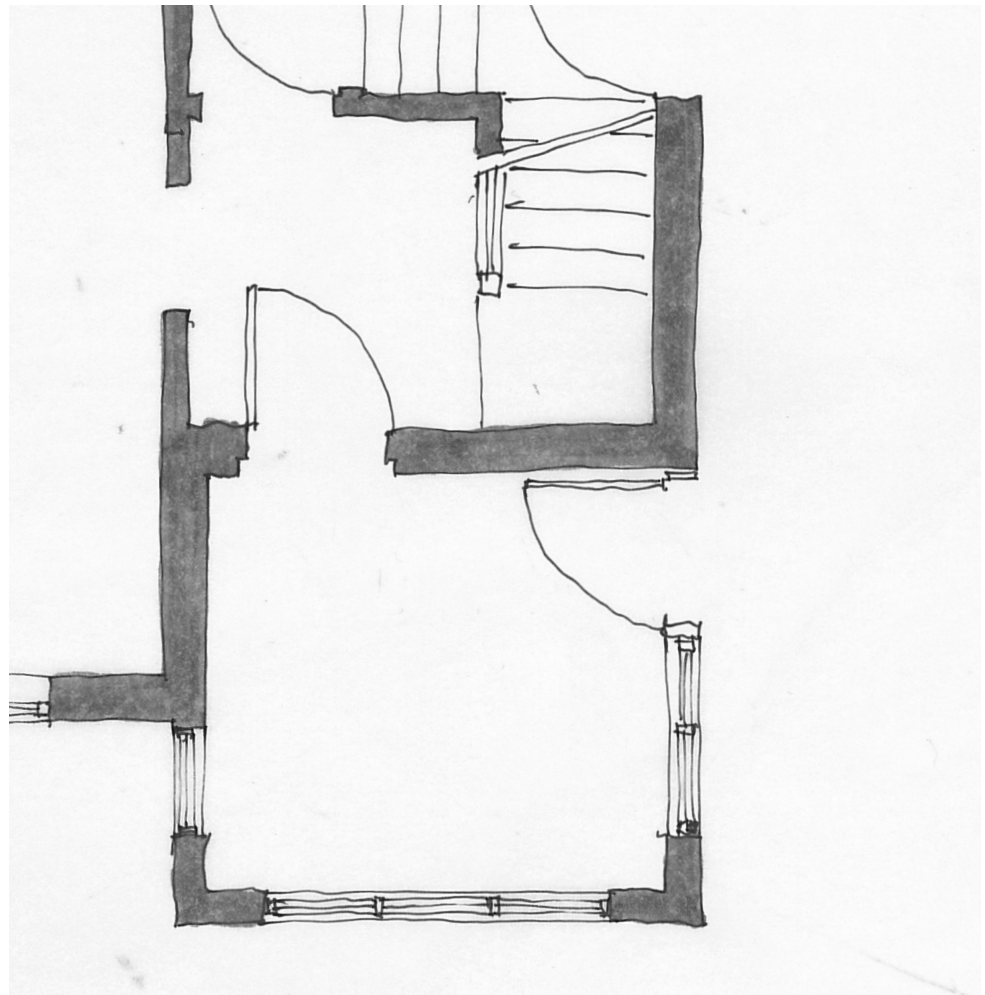


Fig. 3.4.6.b.
Original Plan

Originally the house had a small foyer behind a unconditioned mud room. The lower half of the stairs are exposed and while the headroom is tight, the railing opens the stairs into the foyer and has been this way for almost 90 years.

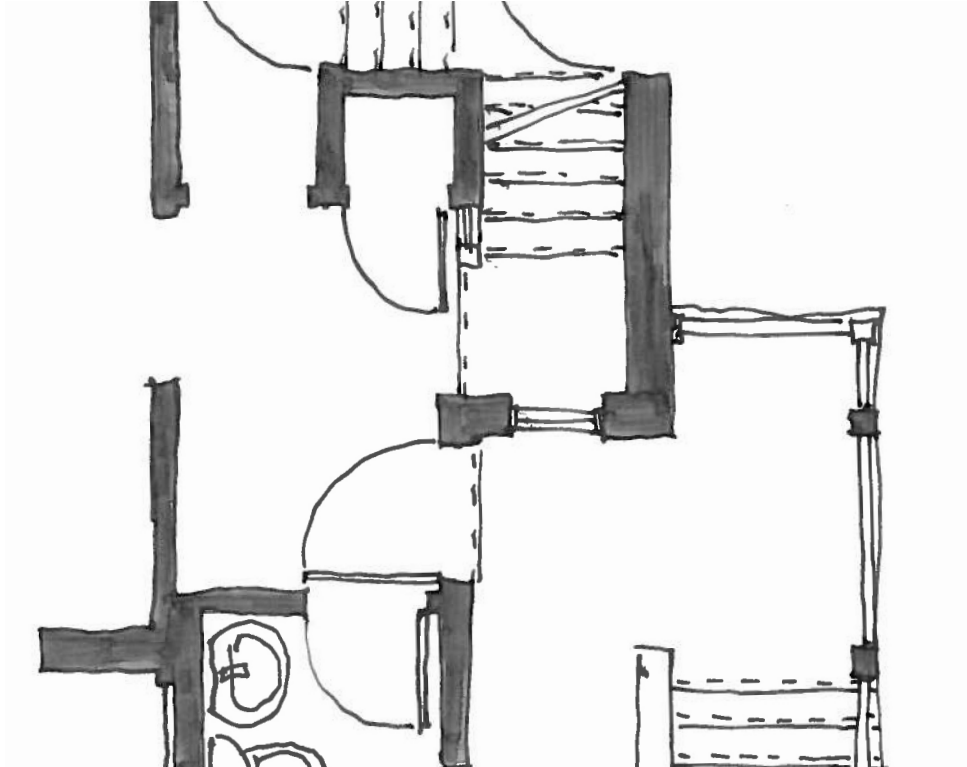


Fig. 3.4.6.c.
Initial Permit Plan

This plan introduced a front hall closet and moved the arc to the family room across from the landing of the stairs. It was a perfectly nice plan, creating a little space between the foyer and kitchen, nicely aligned the bottom of the stairs, and prevented what we are currently doing with our coats: stacked on a bench in the foyer.

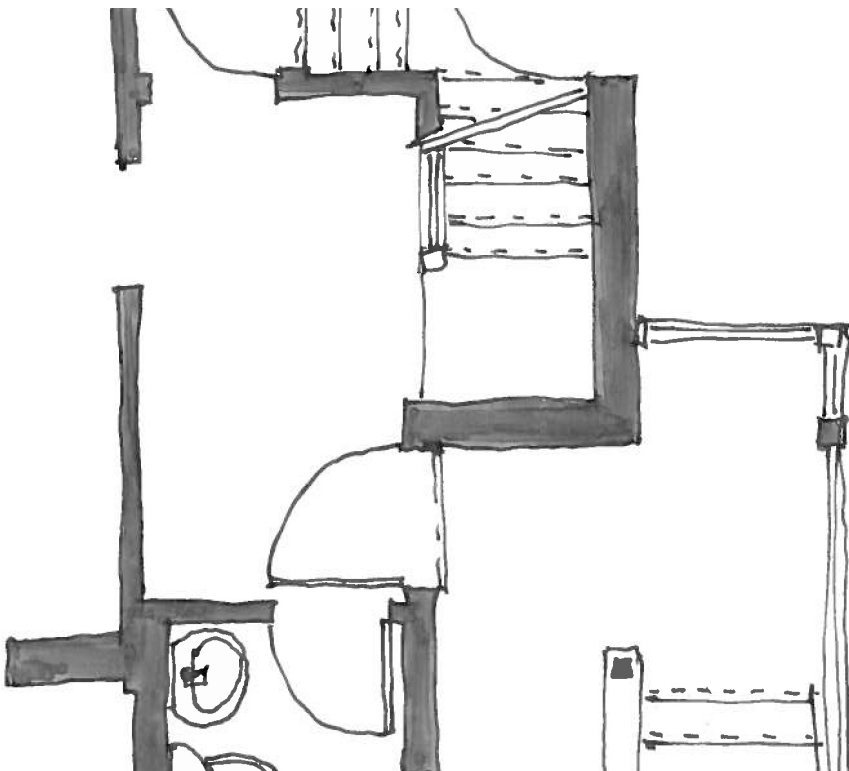


Fig. 3.4.6.d.
Revised Foyer Plan

Essentially I left the space as it was, but added some extra space where the door would open. I trusted that we would figure out something to do with our coats.

3.4.6. to “Green” Building Practices

Generally “green” building practices were not emphasized technologically. Insofar as specifically environmentally conscious technologies were concerned “green” was not a priority. There are no solar panels, or grey water recovery systems, no heat recovery system on my plumbing stack, and no heat recovery ventilator. I did not choose porous pavers for the driveway. One of the reasons for this is the fact that most of these technologies can be added later, or are currently prohibitively expensive for the possible savings. Green design elements were however integrated into the design itself where possible and practical.

3.4.6.1. Low Glazing Area

3.4.6.2. Efficient Wall Assembly

3.4.6.3. Rain Water Collection

3.4.6.4. Natural Ventilation

3.4.6.1. Low Glazing Area

We opted against floor-to-ceiling glazing anywhere, and in fact, installed windows that are, for the most part, quite small. This was intentional purely from a design perspective to limit the views and increase the privacy, but also from a home efficiency perspective: glazing is the least thermally efficient element of the building envelope. The height of the windows above the floor plays a major roll in the amount of daylight a room will receive, so to place short windows high on the wall will accomplish more with less than tall windows lower on the wall. This has the added benefit of keeping the glazing closer to overhangs which will shade them to prevent excessive solar heat gain, but allow enough lumens of light to make artificial lighting unnecessary almost all day, while also protecting the opening from rain water. Total glazing, on the south and north faces of the building was about 12% and about 6% on the west and east faces, amounting to about 250sf of total glazing. To put this in perspective, if we had done floor to ceiling glazing on the exterior wall of the master bedroom we would have been at over 144sf for just this room, which is more area than all of the rest of the new glazing combined. Controlling glazing area has the benefit of controlling views, creating privacy, optimizing daylighting, and limiting both solar heat gain in the summer, and limiting conductive heat loss in the winter.

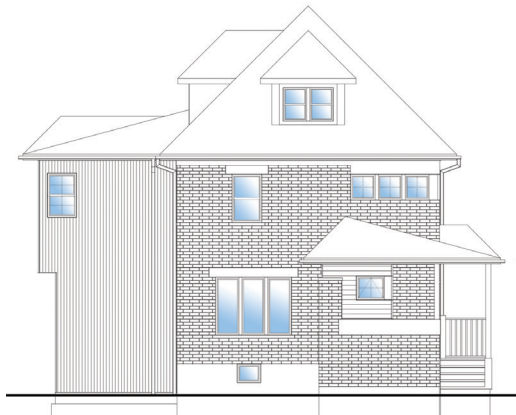


Fig. 3.4.6.1.a.
South Glazing
total glazing: 90.6sf
total wall: 706.93sf
glazing %: 12.74%



Fig. 3.4.6.1.b.
East Glazing
total glazing: 56.18sf
total wall: 855.14sf
glazing %: 6.58%

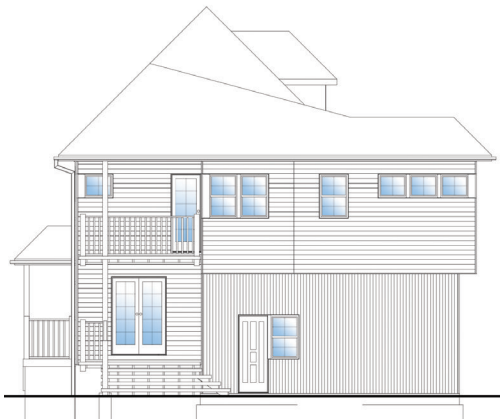


Fig. 3.4.6.1.c.
North Glazing
total glazing: 88.06sf
total wall: 706.41sf
glazing %: 12.46%

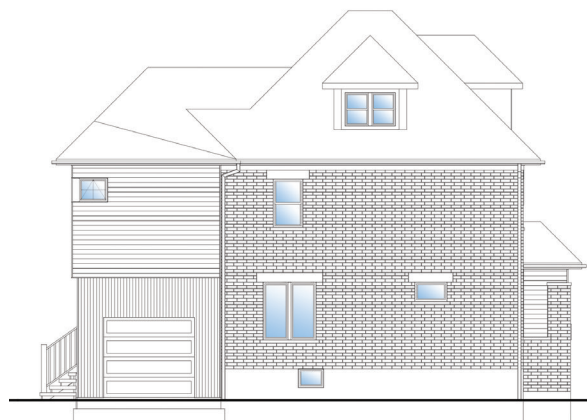


Fig. 3.4.6.1.d.
West Glazing
total glazing: 58.20sf
total wall: 855.17sf
glazing %: 6.80%

3.4.6.2. More Efficient Wall Assembly

2013.10.10

Reuben[R.] to Jesse[J]: How much money do I save by going to 2x6 walls with 1" rigid vs 2x4 with 2". I just realized that I actually loose 2" of the interior of all my rooms which is a bit more severe that the 1" I thought.

[R.] to [J]: Some architect I am.

[R.] to [J]: Sorry, I shouldn't be bugging you. I'll figure it out.

[J] to [R]: I'm not sure of a massive t savings....studs are cheaper, codeboard is more expensive, batt insul is cheaper. sucks for siding because you are using 4-1/4" nails to attach strapping. Smaller amount because of total lf of wall

[R.] to [J]: It's basically taking 10sf out of the house when I change it

[R.] to [J]: Can we compromise and do the 2x4 + 2" and poly and tyvek?

[R.] to [J]: So 4 percent of square footage.

[R.] to [J]: And I'm really sorry to be bugging you at 8:00 at night

I've addressed the advantages of this wall assembly before, I'd just like to re-iterate that it is a better thermal assembly than typical, and also creates more space inside the house, both because it is thinner overall, and because the rigid insulation can start at the extreme edge of the structure, gaining another inch of interior space.

When I sat down to calculate the actual advantage of my chosen wall type I was confronted again by my own limitations, and by a nagging feeling that I needed help clarifying why exactly I had chosen this particular wall:

2014.07.11

10:29

Hi Aaron,

We missed you at Opa's birthday party. How's life with a kid?

Can I ask your advice again? Our house is pretty much done, I have a some railings to finish and I have to make the decks. We went with the 2" XPS and 2x4 framing with batt insulation like you suggested. I've modified my thesis to revolve around the house and I recently did the actual calculations for the whole-wall thermal performance and for whatever reason I thought the performance would be better, I'm only getting R0.64 better for the 2" XPS with 2x4 framing over a 1" XPS and 2x6 framing. Am I wrong? I'm a little underwhelmed, is there another reason I should choose this wall.

CHOSEN WALL

layer	conductivity (W/m K)	thickness	conductance	resistance (RSI)	R (imperial)
exterior air film	N/A	N/A	17.00	0.06	0.33
siding	0.10	0.02	5.26	0.19	1.06
air space	N/A	0.02	N/A	0.17	0.95
2" XPS	0.03	0.05	0.56	1.79	10.00
R14 Batt insulation	0.04	0.09	0.41	2.47	14.00
1/2" GWB	0.16	0.01	12.31	0.08	0.45
interior air film			8.30	0.12	1.45
				4.88	28.25

layer	conductivity (W/m K)	thickness	conductance	resistance (RSI)	R (imperial)
exterior air film	N/A	N/A	17.00	0.06	0.33
siding	0.10	0.02	5.26	0.19	1.06
air space	N/A	0.02	N/A	0.17	0.95
2" XPS	0.03	0.05	0.56	1.79	10.00
2x4 stud	0.14	0.09	1.57	0.64	3.55
1/2" GWB	0.16	0.01	12.31	0.08	0.45
interior air film			8.30	0.12	1.45
				3.05	17.79

framing factor 0.25

whole wall performance 25.63

CONVENTIONAL WALL

layer	conductivity (W/m K)	thickness	conductance	resistance (RSI)	R (imperial)
exterior air film	N/A	N/A	17.00	0.06	0.33
siding	0.10	0.02	5.26	0.19	1.06
air space	N/A	0.02	N/A	0.17	0.95
1" XPS	0.03	0.03	1.12	0.90	5.00
R19 Batt insulation	0.04	0.15	0.30	3.35	19.00
1/2" GWB	0.16	0.01	12.31	0.08	0.45
interior air film			8.30	0.12	1.45
total				4.86	28.25

layer	conductivity (W/m K)	thickness	conductance	resistance (RSI)	R (imperial)
exterior air film	N/A	N/A	17.00	0.06	0.33
siding	0.10	0.02	5.26	0.19	1.06
air space	N/A	0.02	N/A	0.17	0.95
1" XPS	0.03	0.03	1.12	0.90	5.00
2x6 stud	0.14	0.15	0.93	1.07	5.98
1/2" GWB	0.16	0.01	12.31	0.08	0.45
interior air film			8.30	0.12	1.45
total				2.59	15.22

framing factor 0.25

whole wall performance 24.99

Fig. 3.4.6.2.a.

Whole wall performance

an extra R0.64 seems a little underwhelming. I may have done something wrong with the calculation.

Thanks again for your help before,

r

10:39

Hey Ruben,

Life with Eva is pretty great. Ireland was amazing and Eva travelled really well.

Do you have this written up in excel? First comment, yes that is possible.

Second comment, from an air leakage condensation potential point of view the 2x4+2" is far superior in terms of hours of possible concerns. With that wall you could run a really high RH and have no issues. Did you run cost/ft² numbers from your quotes?

Follow up questions:

What framing spacing did you use and what framing fraction are you basing your calculations on? Did you do a stick count to come up with it? Did you use double top and single bottom plates?

What R-values are you assuming for the cavity fill batt types?

Did you install wood sheathing before the exterior insulation or just the exterior insulation?

Did you install housewrap? Or did you tape the face of the XPS as the drainage plane?

What exterior cladding are you using? And did you use strapping?

Are you running something hourly to come up with annual \$ savings?

Cheers,

Aaron

11:39

Thanks for the fast response, Yes I have an excel file, I'll send it along if you don't mind taking a quick look.

Regarding your RH comment, that makes sense, keeping the dew-point in the rigid insulation, its a nice advantage from a peace of mind point of view, especially considering we don't have an HRV and have a tendency to open windows at night rather than turn on the AC.

The cost/sf to build the wall was close to a wash, although I had to spend some time manually taking plastic caps off 2" nails and putting them on 3" ardox nail because our supplier couldn't get 3" plastic capped nails on short notice after they forgot to include them in the original order.

In response to your questions:

What framing spacing did you use and what framing fraction are you basing your calculations on?

16" on centre framing, I based it on a 0.25 framing factor

Did you do a stick count to come up with it?

I just used a number that seemed reasonable from my online research

Did you use double top and single bottom plates?

Used a single bottom plate and triple top plate to line up the new framing with the existing. This could have been thought out better but was a solution to a problem that kept the construction going, and with the 2" XPS I was less worried about extra framing.

What R-values are you assuming for the cavity fill batt types?

R14 for the 2x4 framing and R19 for the 2x6

Did you install wood sheathing before the exterior insulation or just the exterior insulation?

Just the XPS, no wood sheathing

Did you install housewrap?

House-wrap, Jesse was extremely reluctant to go without tyvek, and has very poor experience with certainteed membrain - apparently it doesn't function if the RH in the house gets above 50% and we often have RH significantly above that, we don't turn on our air conditioner much, or have any HRV, and our basement can be pretty damp.

Or did you tape the face of the XPS as the drainage plane?

We used poly as an air/vapour barrier on the interior of the batt insulation, we were worried about vapour-lock if we taped the XPS.

What exterior cladding are you using?

pre-finished shiplapped wood siding, 1x4 strapping.

And did you use strapping?

yep

Are you running something hourly to come up with annual \$ savings?

not as of yet.

Thanks Again Aaron.

r

Hey Reuben,

I made a green edited section to the calculation. I assume you have a copy of John's BS for BE book? The way to calculate that is using parallel path, and parallel path uses the U-values, not the R-values (Eq 5.43 page 212 of the edition I have). It gets you about R1.4 better on the 2" XPS wall vs R0.6. You will note there is little difference on the wall with very little thermal bridging and more difference on the wall with more thermal bridging. Adjust your sheet to get rid of exterior insulation, assume an R24 high density batt to have the same installed total R, and you will see an even bigger difference – R3.4. You could mention that because some people are also building that wall.

0.25 isn't a bad guess on 16" FF.

Triple top plates? Do you have pics of that. I have not run into where that was necessary.

We should have a chat about MemBrain¹ and who told Jesse it doesn't work when the RH gets over 50%. The product is designed around being vapour closed when it needs to be and vapour open when it doesn't. When you are opening your windows and letting it get to 60% RH inside its because its nice outside and the vapour drive (which is little to none in the summer around here except for on a west wall) is inward through the enclosure and the high interior RH would never be able to go into the wall system and do anything. Its an outward drive during cold weather that would be an issue and the MemBrain would drop its vapour transfer as soon as the RH in the house dropped to 30% as it does in the winter (spec sheet attached). Further, taping the XPS has nothing to do with trapping vapour. Interior Poly will trap a lot more vapour than taping the seams on the XPS which is in itself a pretty good vapour retarder. Assuming the sheet is taped and air sealed really well, and you have no plumbing or window leaks in the exterior walls, then the poly should work fine. Taping the seams on the XPS would only improve the system by making it more airtight and provide a backup drainage plane.

Glad you got the strapping behind the wood cladding. That will make a big difference in long term durability.

Cheers,

Aaron

1. National Research Council Canada: Institute for Research in Construction, *MemBrain- Vapour Barrier and Air Barrier System*. CCMC 13278-R, 2010.

CHOSEN WALL

layer	conductivity (W/m K)	thickness	conductance	resistance (RSI)	R (imperial)
exterior film	N/A	N/A	17.00	0.06	0.33
siding	0.10	0.02	5.26	0.19	1.06
air space	N/A	0.02	N/A	0.17	0.95
2" XPS	0.03	0.05	0.56	1.79	10.00
R14 Batt insulation	0.04	0.09	0.41	2.47	14.00
1/2" GWB	0.16	0.01	12.31	0.08	0.45
interior air film			8.30	0.12	1.45
				4.88	28.25

U Value	Area
0.035400857	0.75

layer	conductivity (W/m K)	thickness	conductance	resistance (RSI)	R (imperial)
exterior film	N/A	N/A	17.00	0.06	0.33
siding	0.10	0.02	5.26	0.19	1.06
air space	N/A	0.02	N/A	0.17	0.95
2" XPS	0.03	0.05	0.56	1.79	10.00
2x4 stud	0.14	0.09	1.57	0.64	3.55
1/2" GWB	0.16	0.01	12.31	0.08	0.45
interior air film			8.30	0.12	1.45
				3.05	17.79

U Value	Area
0.0562	0.25

framing factor 0.25

whole wall performance 25.6344

Clear Wall U-Value	0.0406
Clear Wall R-Value	24.6303

CONVENTIONAL WALL

layer	conductivity (W/m K)	thickness	conductance	resistance (RSI)	R (imperial)
exterior film	N/A	N/A	17.00	0.06	0.33
siding	0.10	0.02	5.26	0.19	1.06
air space	N/A	0.02	N/A	0.17	0.95
1" XPS	0.03	0.03	1.12	0.90	5.00
R19 Batt insulation	0.04	0.15	0.30	3.35	19.00
1/2" GWB	0.16	0.01	12.31	0.08	0.45
interior air film			8.30	0.12	1.45
total				4.86	28.25

U Value	Area
0.0354	0.75

layer	conductivity (W/m K)	thickness	conductance	resistance (RSI)	R (imperial)
exterior film	N/A	N/A	17.00	0.06	0.33
siding	0.10	0.02	5.26	0.19	1.06
air space	N/A	0.02	N/A	0.17	0.95
1" XPS	0.03	0.03	1.12	0.90	5.00
2x6 stud	0.14	0.15	0.93	1.07	5.98
1/2" GWB	0.16	0.01	12.31	0.08	0.45
interior air film			8.30	0.12	1.45
total				2.59	15.22

U Value	Area
0.0657	0.25

framing factor 0.25

whole wall performance 24.9910

Difference in Performanc 0.64

Clear Wall U-Value	0.0430
Clear Wall R-Value	23.2701

Difference in Performance 1.36

Fig. 3.4.6.2.b.
Revised Whole wall
Performance

This is awesome Aaron, thank-you.

I have John's "High Performance Enclosures" and I couldn't find that calculation so I did mine from memory, which is obviously bad, I guess.

As far as taping the XPS goes, our thought was that this would further prevent drying to the exterior. We were committed to the interior poly, by Jesse's assertion that the membrain didn't work properly in high RH environments and the fact that I'm not an architect yet - so I have to follow part 9 and use something to appease the building inspector. So we didn't want to further retard drying outward if water did/does get trapped in the wall cavity. The inspector was also concerned about water getting stuck and I had a conversation with the plans examiner who was wary of sealing up the outside of the XPS if there was poly inside. Basically it was a compromise. I could have ripped down the interior poly, post inspection, but then if the inspector saw the taped XPS I have some explaining to do.

Regarding the membrain itself - apparently Jesse knows a contractor who used it a few times in a basement, and/or a bathroom, I'm not totally sure of all the details, but they ended up having a lot of mold growing behind the wall on a couple occasions. The product looks good to me, and it must work somehow, but I had a hard time arguing with his experience.

Thanks for the advice on the R24 Batt, that'll help.

We needed triple top plates because the studs were on site, and to get the trusses to sit properly such that the tops would line up with the adjacent roof plane and the ceiling would work inside, we needed the walls to be 1 1/2" taller to match the 100 year old existing walls. I probably could have solved it more elegantly, but I wanted to keep everyone moving. Mostly it was the product of an earlier mistake. and not as thermally poor because the 2" XPS runs over it.

I hope some of my rationale makes sense. Thank-you very much for your advice, I really appreciate it.

r

It's one thing to learn in school what a good wall assembly is, it's another to be able to justify that assembly to clients and contractors. Even after choosing and implementing this particular wall I needed to lean on the advice of a building scientist to solidify my position. Architects are sometimes described as a jack-of-all trades, or said to know "a little bit about a lot of things" and this is true, I think, which makes it all the more necessary to lean on the expertise of experts, engineers and tradespeople.

3.4.6.3. Rain Water Collection

We had an exterior water use assessment done for our property (Appendix D), and, almost purely by accident, qualify for the maximum government storm-water tax rebate. We ended up burying a large amount of cracked and poorly installed concrete that was around our house when we moved in. Essentially we dug a hole (with an excavator) 6 feet deep, 10 feet wide, and 30 feet long, and put 4' of broken up concrete in the hole, and covered it up with 12" of fill, and 12" of topsoil, which we had saved from digging the hole. We used the extra fill and topsoil around the house to build it up to increase the drainage away from the house. This buried concrete counts as a "drain-away pit". Because of the spaces created in and around the concrete water that drains into this area has space to fill while it percolates down to the ground-water. I can drain my downspouts to this location (underground) and keep that water out of the municipal storm system.

The home assessment also suggested that my paving be permeable, and demonstrated a permeable paver system that was installed at their model home on Mill Street. This system, similar to interlock but which allows water to drain through it, has a cost similar to interlock: about \$15 per square foot. The concrete I poured costs about \$5 per square foot. Asphalt would have cost \$2-\$3 per square foot. But, again by accident, because of the nature of my site, I was required to drain my driveway towards a trench drain in-front of my garage. This trench drain drains into the drain-away pit, providing the same benefit (reduced storm-water draining into the city system) as permeable pavers at one third of the cost.

3.4.6.4. Natural Ventilation

We didn't turn on our air conditioner until July. Every room in the house has operable windows. It would be easy for me to draw a few diagrams of airflow through the house and "demonstrate" a stack effect or a "cool breeze" with nice blue tinged arrows for cool air and red arrows for exhausted warm air, but this particular convention only really works when the outside temperature and humidity is just right, a few degrees on the cool side of what is comfortable. For our southern Ontario climate this occurs mostly in the spring and fall, for a small percentage of days, the real benefit of operable windows happens as a function of selectively opening and closing windows to take advantage of the day-night cycle. Sarah, for whatever reason, is quite enamored of this principle. Yesterday, when she left to visit her parents with the kids she reminded me that she'd text me to remind me to open the windows this evening, and would text me again in the morning to remind

me to close them. She looks at the overnight forecast and, if the temperature drops below 19-20, we open all the windows in the house. When we wake up, we close them. Our house is fairly well insulated, and while not exceptionally airtight, getting the internal temperature down to 18 or 19 at night keeps the internal temperature comfortable all day. As a design intention this only works in concert with the continued participation of the occupant: leaving even a few windows open all day subverts this practice, and forgetting to open them at night in the first place totally invalidates any design for natural ventilation.

3.5. Design Development

These design relationships were not always clear from the start. As the project advanced, certain things became possible and others became impractical. Because of the constraints of the existing building and the constraints of the required program, the evolution of the plan became the driver for the design relative to construction costs and zoning and building regulations. Much of this was done before we even committed to buy the property. It was imperative that we could envision a renovation and addition that would fit our programmatic requirements, be within our budget, and conform to all the applicable regulations.

3.5.1. Zoning

The Zoning by-law (Appendix B.4) had perhaps the most significant impact on the final plan for the building. We included a clause in our offer for the house that we wanted conceptual approval from the zoning department for our proposed addition and renovation. I had reviewed the zoning by-law, and while the existing building encroached on the required setbacks, nothing we were proposing violated the zoning by-law. I considered this requirement to be a formality, and almost dropped it without consulting the building department. I was wrong. In the city of Kitchener any construction that increases the square footage of a building requires that variances be issued for elements of the existing building which do not conform to the by-law.

I primarily dealt with Jeff Medeiros in the zoning department at the city of Kitchener:

2013.08.20

Hi Jeff,

Please find attached a copy of the survey i received from the seller of the property.

I have also attached the rough plans of the addition and alterations to the building that we're proposing.

See you tomorrow at 3:00.

Thank-you

r

When I initially called the zoning department to receive approval in principle to do our addition and renovation they indicated that I would require 3 variances to “grandfather” the existing house. We would need a variance for the front yard setback, the side-yard abutting a street setback and for the driveway location. I set up a meeting to discuss what these would entail and to see if there was any flexibility on this.

2013.08.22

Hi Jeff,

Thanks again for taking the time to meet with me yesterday. It was actually kindof interesting to go through the whole rationale for the variances and requirements, sorry to take up so much of your time going through it all.

I’m just wondering if you have had time or still think you will have time to look at the driveway entry with the transportation department, and if you might still be able to let me know today if I would have to submit a minor variance application for that, or if I would have to, if I’m likely to have the city’s support in that?

Thanks again,

r

We had talked for almost 3 hours, and by the end of our meeting we’d agreed in principle that I would not require new zoning variances for the proposed renovations which would not change the footprint of the house. These variances had been obtained by a previous owner in 1987.

2013.08.22

Good afternoon Reuben,

After discussing with Planning and Transportation staff, we will not be requiring a minor variance application for your proposed addition (on the second floor) to the existing single-detached dwelling at this time.

Minor Variance application A274/87 from 1987 legalized the 1.22 metre (4’.02) setback from Spadina Road and the 5.76 metre (18’.93) from Garden Avenue.

Staff will not require you to address the 9 metre setback from the intersection for the access driveway, as the subject addition should not exacerbate the existing/

2013.08.29

Hi Reuben,

Since the porch will be a new development/construction, it will be subject to zoning regulations. Below are the regulations for a porch from Section 5 of the City's Zoning By-law:

5.6A.4 Terraces, Porches and Decks

Terraces, porches and decks, attached or unattached to the main building, may be located within a required yard, only in accordance with the following regulations:

- a) set back a minimum of 3.0 metres from the front lot line or lot line abutting a street, whether or not covered, provided they are not enclosed and do not exceed 0.6 metres in height above finished grade level;
- b) subject to no minimum setback from a side or rear lot line provided they are not covered or enclosed and do not exceed 0.6 metres in height above finished grade level at that point on the side or rear lot line closest to the terrace, porch or deck;
- c) set back a minimum of 4.0 metres from a rear lot line provided they are not covered or enclosed and exceed 0.6 metres in height above finished grade level; and
- d) in compliance with the setback provisions required for the dwelling for front, side and rear yards in all other cases.
- e) Notwithstanding clauses a) b) and d) above, terraces, porches or decks attached or unattached to the main building of a structure designated under the Ontario Heritage Act, may be located, or reconstructed, within a required front yard, side yard abutting a street or side yard, provided that the setback, gross floor area, dimensions and height do not exceed what existed on or before March 5, 2012 and provided that a Heritage Permit application is approved.

Based on the plan you sent, your porch will encroach within 1.669 metres (minimum) from your lot line abutting Spadina Rd W.

As per clause (a) above, minimum setback is 3.0 metres. Looks like you will need to apply for a minor variance to get relief from this Section of the Zoning By-law.

Depending on the height of your porch above finished grade, this may potentially impact the setback requirement. Anything above 0.6 metres will be subject to clause (d), meaning that the porch will need to be in compliance of the setback provisions for the existing dwelling.

If you have any other questions/comments, don't hesitate to contact me.

Regards,

-Jeff

We didn't have time or money or energy to apply for a variance, and decided to work inside of the existing zoning bylaw and create a design that respected the rules.

3.5.2. Plan Development

The plan itself developed in conjunction with considerations of schedule, regulations, cost and our own design style. Most of it occurred before we even placed an offer on the house. I had done a survey of the existing house on an early visit in our search, so when the house came down to the \$300,000 range I began in earnest to configure an addition and renovation that would suit our needs. There are perhaps two major strategies regarding design and budget: one, to design what is wanted and then force that into the budget or to “value engineer” the design back to the level of the budget, or two, to design something that conforms to a budget in the first place, and maximize the possibilities within a budget. Building homes, as a contractor years ago, we ran across a certain number of designers who designed whatever the client wanted and attached unrealistic budget costs to the elements of the design on the rationale that if they designed something “in the budget” the client would never even start the project. It could be a bit heartbreaking and eternally frustrating to price out a design that a homeowner had just paid \$10,000 or \$15,000 for on the assurances of their designer that it could be built for \$80/square foot, and tell them it would be closer to \$150/sf. The designer received his fee, but for a project which would never be built, and the client is sitting there with plans that are totally useless to them. To be honest, considering the limited emphasis placed on economics in our design education, out in the world, my limited experience demonstrates the impossibility of design without economics. I’ve heard of projects where money was no object, but I’ve never actually seen one, and even talking to my own wife about a material or a fitting, any decision is prefaced with the question of cost: “I like that” but not for \$5000. And design costs money, so our plan evolved as a function of our means as much as it did as a function of the existing building, and of our own taste and style.

3.5.2.1 August 11 2013

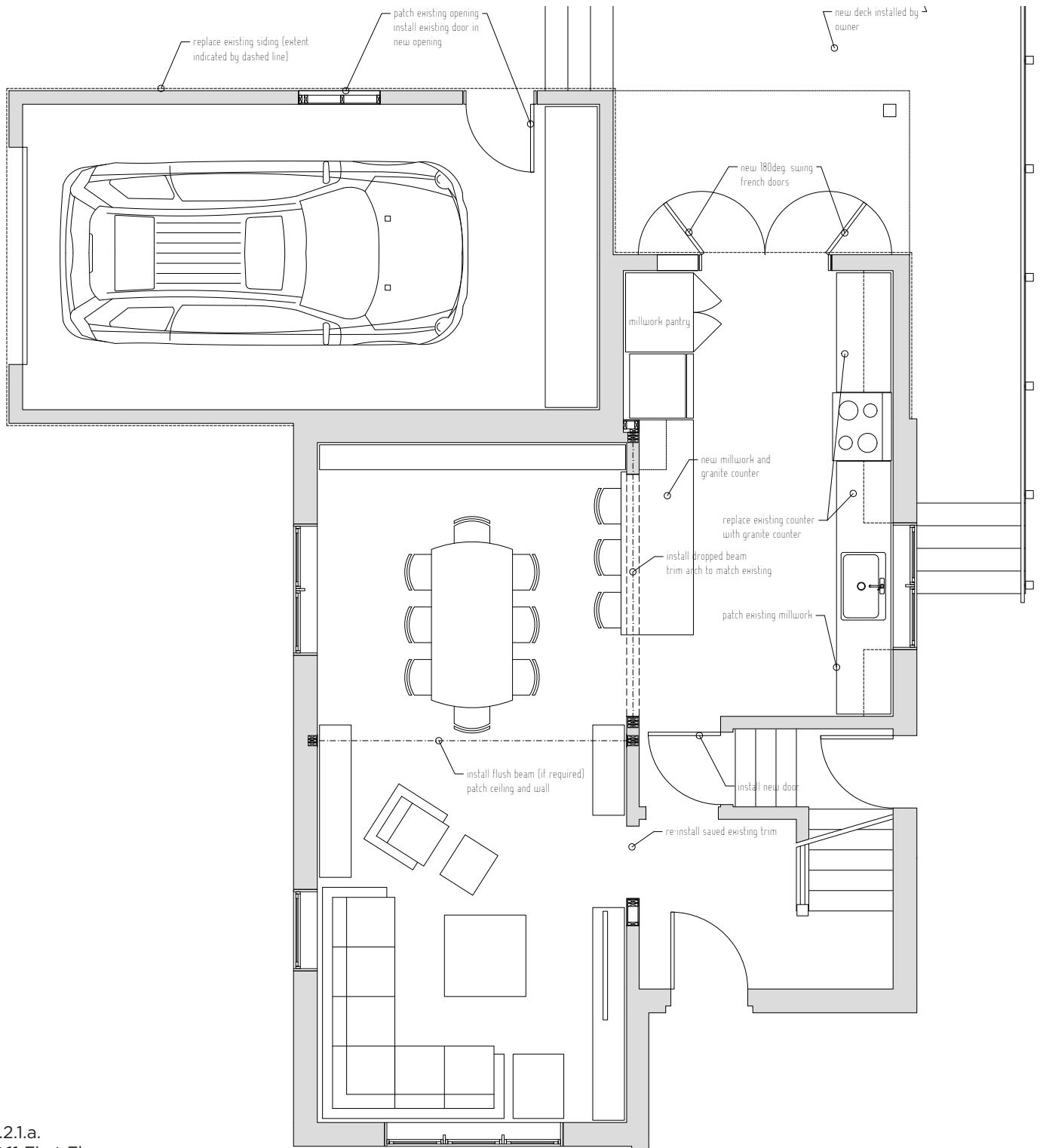


Fig. 3.5.2.1.a.
2013.08.11 First Floor

This was the first basic “real” design. Comprising as simple a renovation and addition as possible, to establish a baseline price to renovate the house

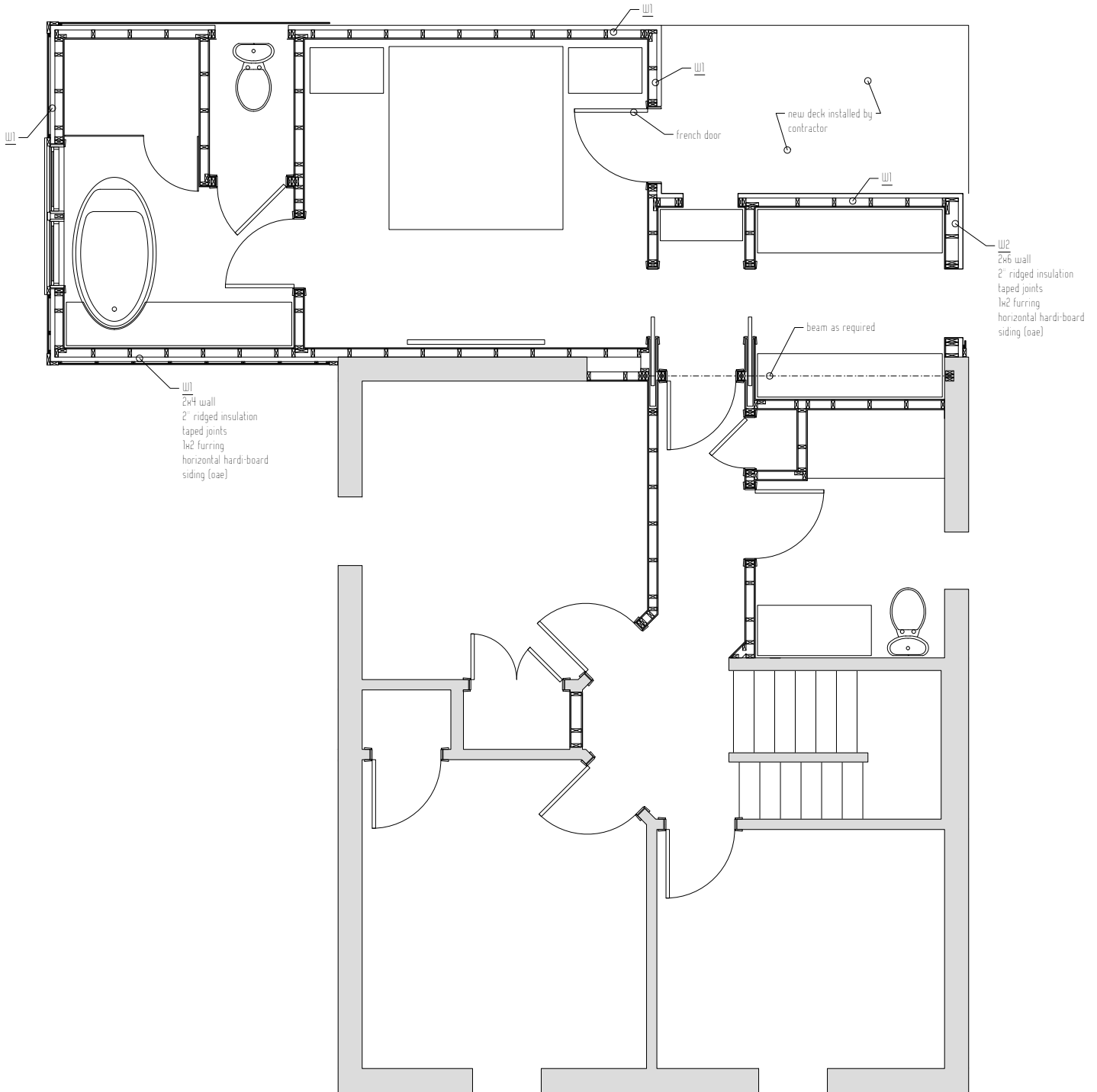
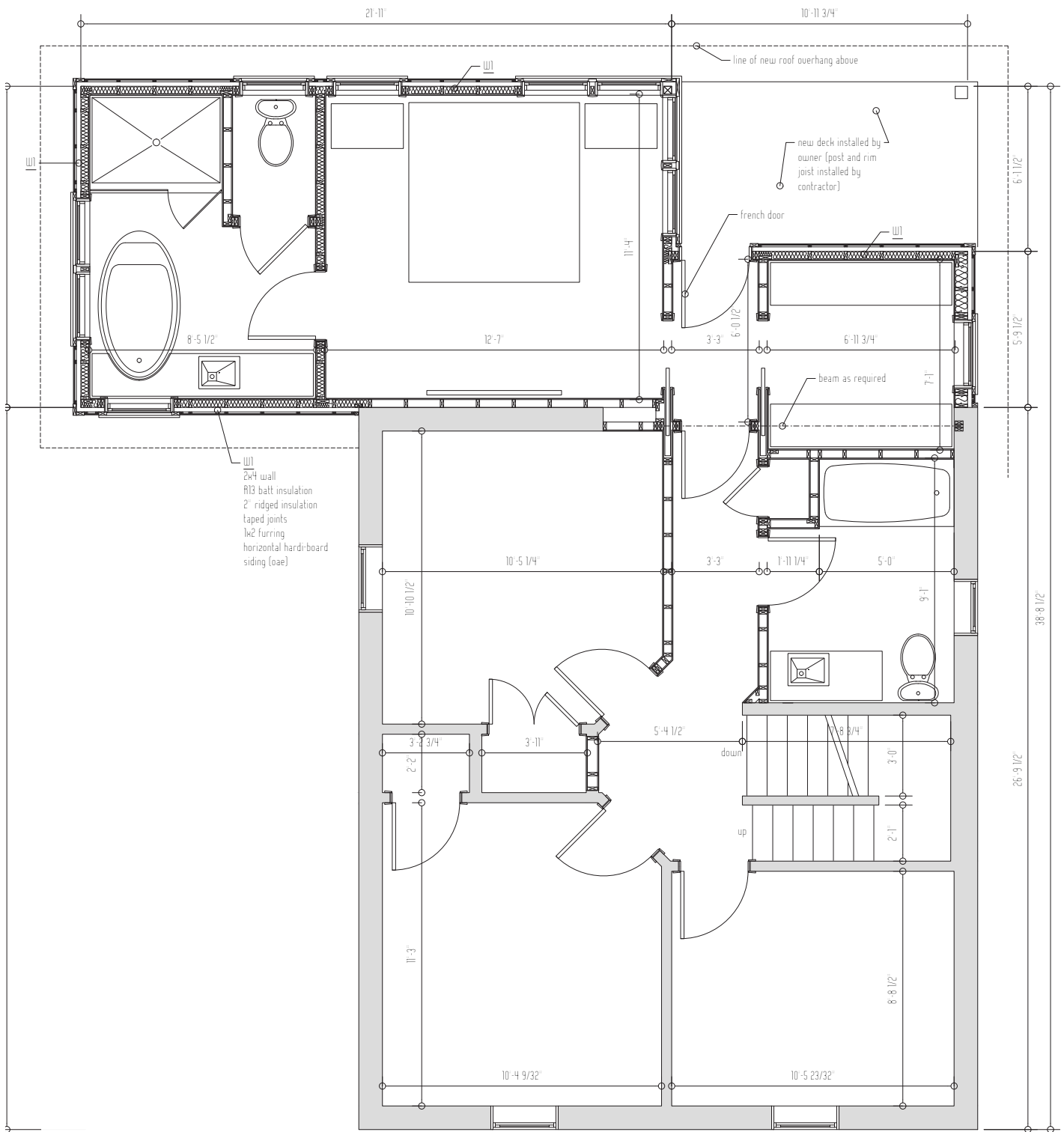


Fig. 3.5.2.1.b.
2013.08.11 Second Floor
the basic requirements are in
this scheme. A master suite and
a renovated 2nd floor bathroom.



general notes:

- all 2nd floor doors to be replaced with new raised panel masonry doors
 - all interior partitions 2x4 construction with 1/2" GWB
 - all 2nd floor interior trim to be replaced with poplar trim
 - "new" measurements are to extent of framing, "old" to extent of surfaces
 - new flooring throughout entire second floor
- 22'-11 1/2"

Fig. 3.5.2.3.b.
2013.08.16 Second Floor
The Second floor remained largely unchanged at this point.

3.5.2.4 August 25, 2013

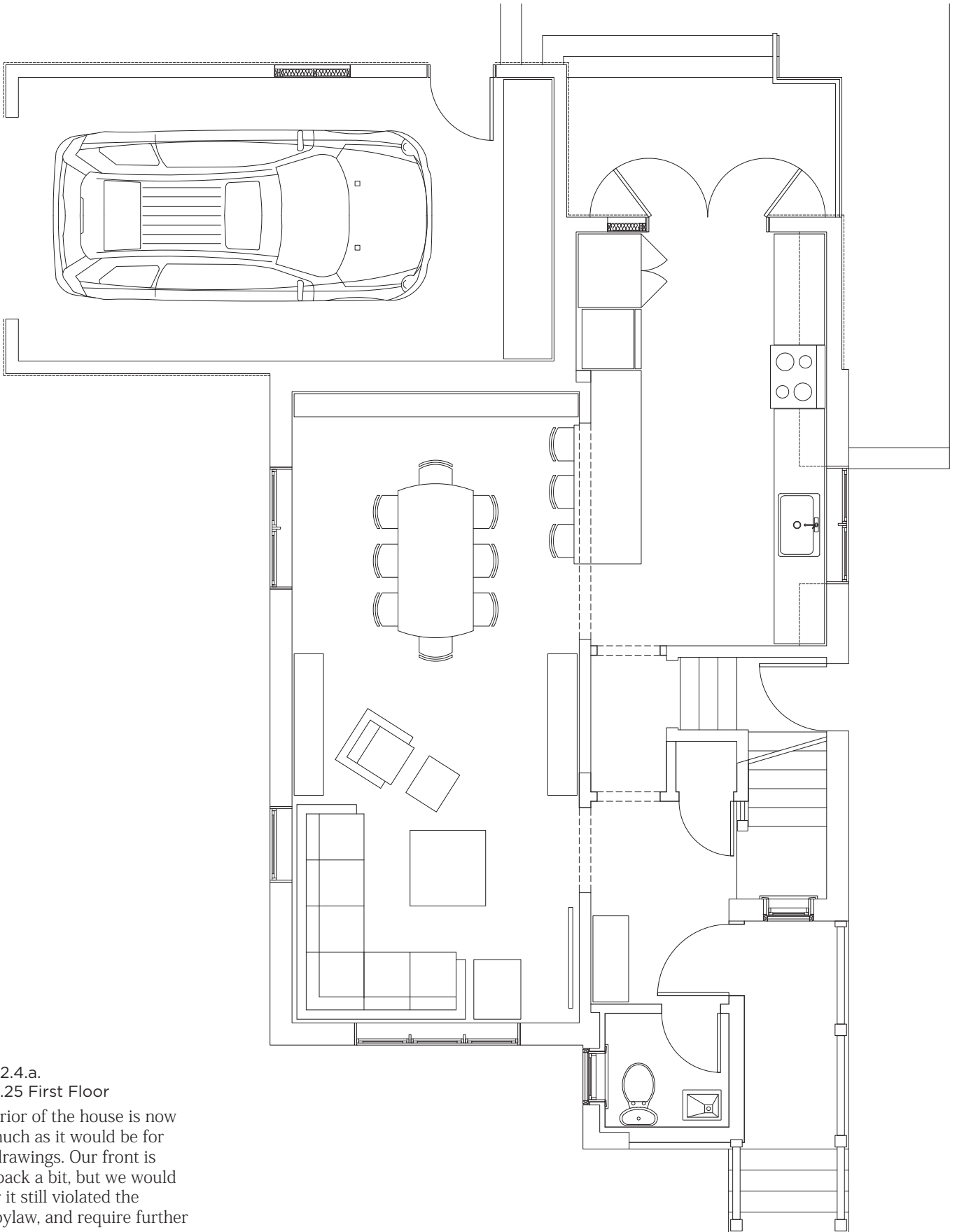


Fig. 3.5.2.4.a.
2013.08.25 First Floor
The interior of the house is now pretty much as it would be for permit drawings. Our front is clawed back a bit, but we would discover it still violated the zoning bylaw, and require further revision.

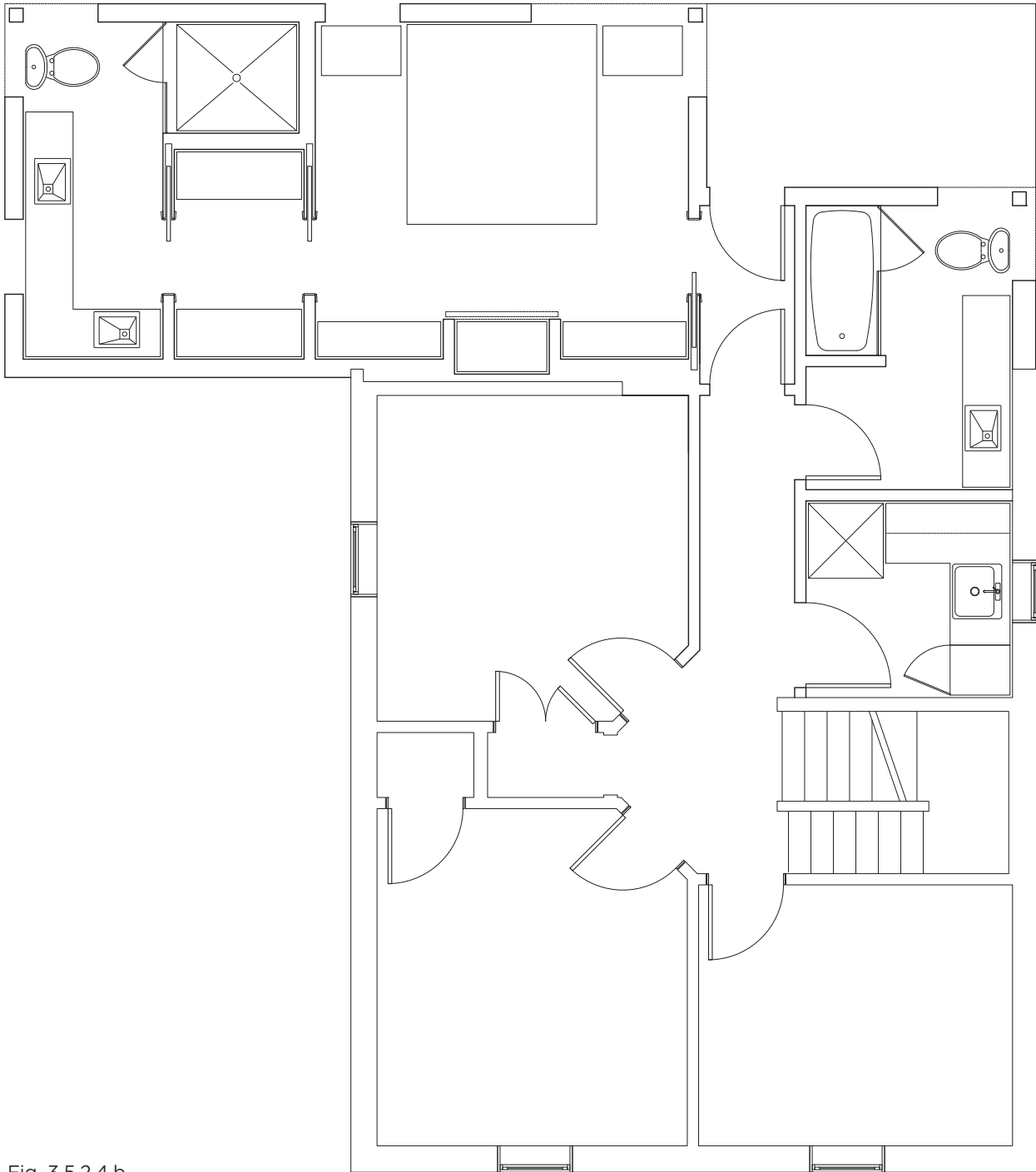


Fig. 3.5.2.4.b.
2013.08.25 Second Floor

The second floor as well is now essentially as it will be built. The fireplace would however be eliminated from the master bedroom for cost considerations

3.5.2.5 August 30, 2013

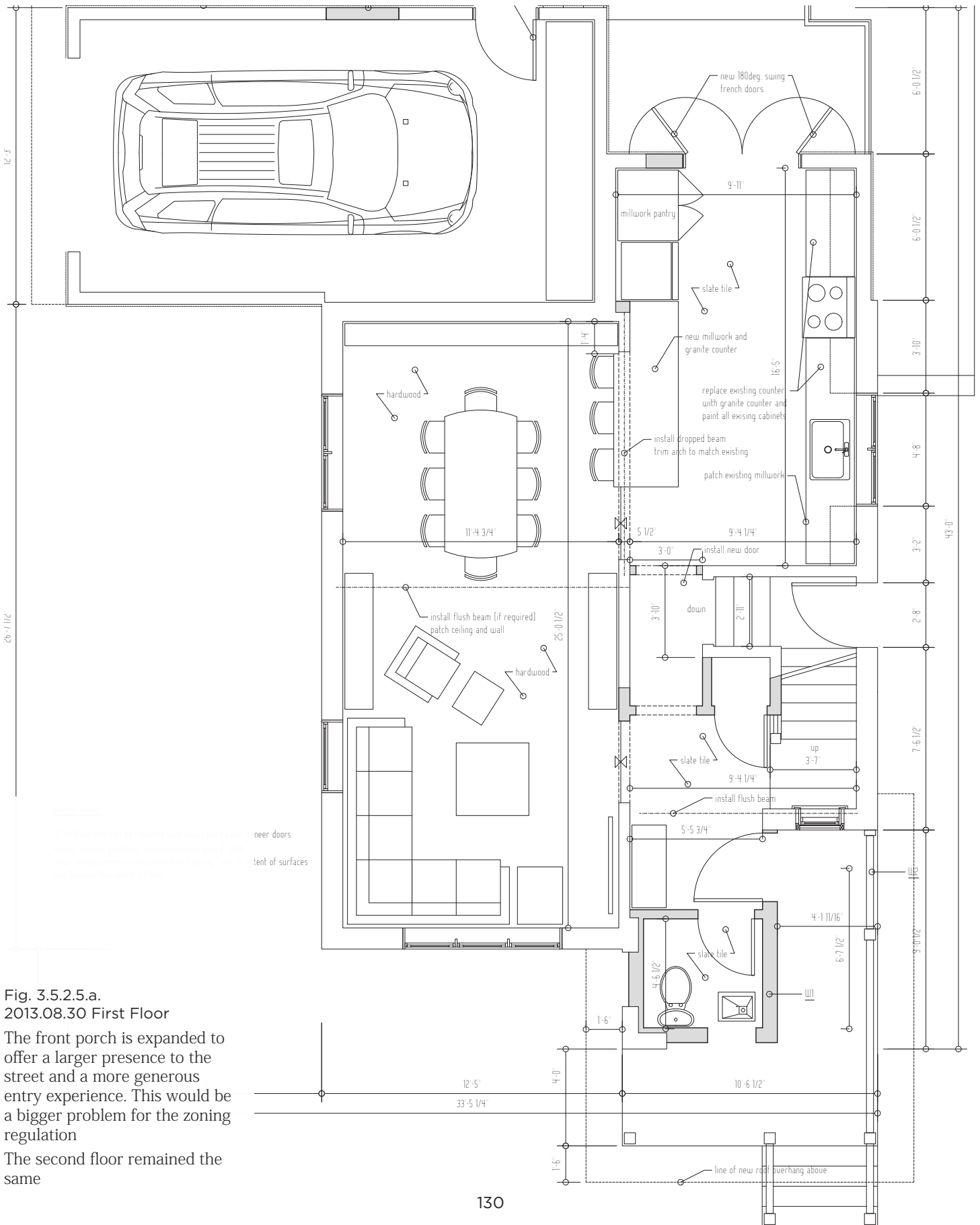


Fig. 3.5.2.5.a.
2013.08.30 First Floor

The front porch is expanded to offer a larger presence to the street and a more generous entry experience. This would be a bigger problem for the zoning regulation

The second floor remained the same

3.5.2.6 September 01, 2013

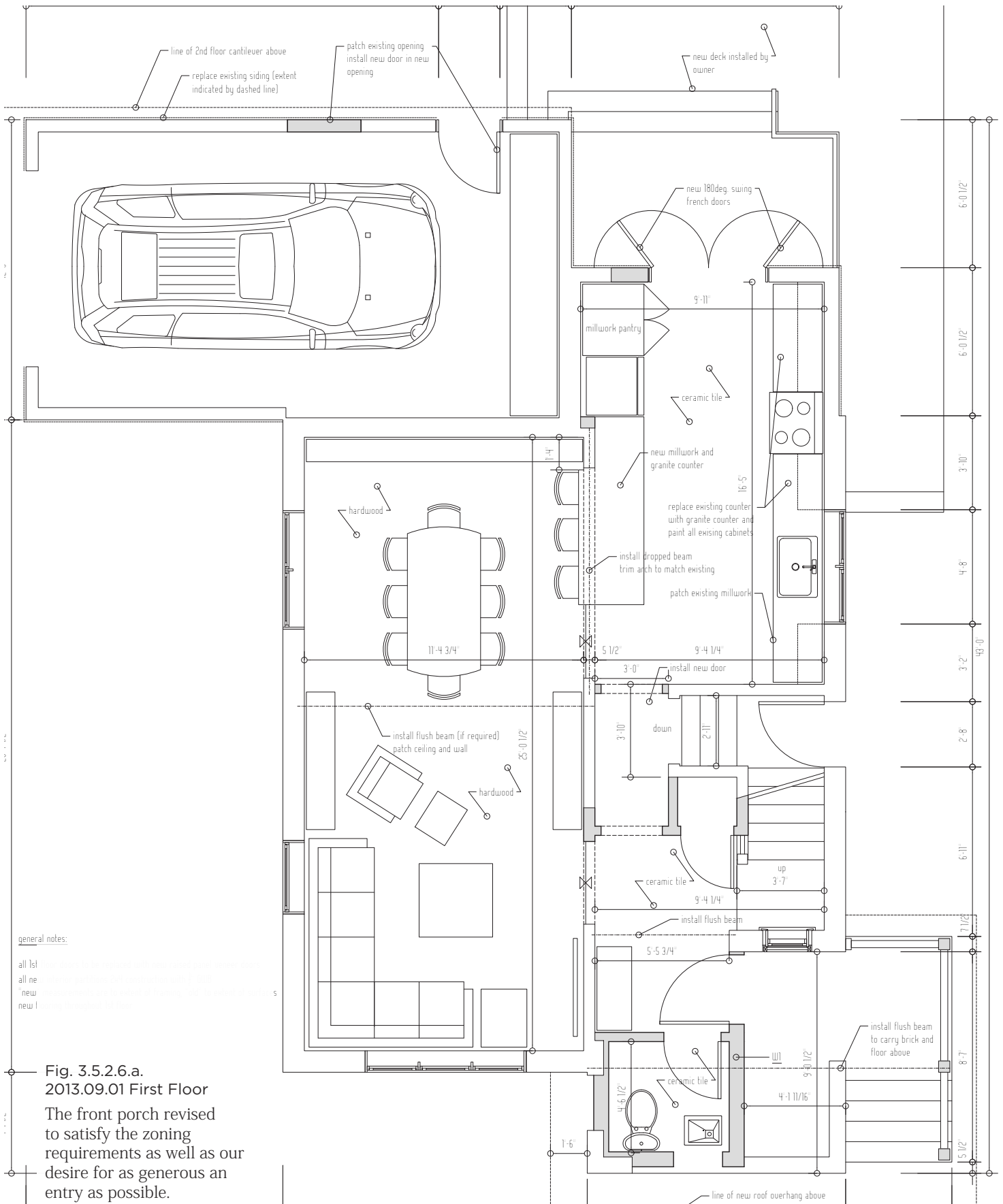


Fig. 3.5.2.6.a.
 2013.09.01 First Floor
 The front porch revised to satisfy the zoning requirements as well as our desire for as generous an entry as possible.

Fig. 4.a.
My Big Boots



4. Construction

4.1. Overview

Sometimes it feels easier to concede construction to builders, to relinquish our designs to people who actually enjoy 30 degree summer days under the relentless sun, and winter cold that will frostbite exposed skin in minutes. To remain comfortable and inured in our offices in front of our computers, or in meetings with important people, placated by mill-board and 3D renderings. It is easy to imagine that I am too well educated, or too smart, or that construction is for people without university educations. But, after 6 years of architecture education, and 4 years of a philosophy degree before that, I felt ready for a break, and, with the romantic notions of carpenters past, and the art of making in my mind I decided to be on site for this project. I had some experience on site, significantly most of them in summer, so I bought some big boots, pulled out my old overalls and, over the course of 3 months managed to loose 15 pounds, and learn how little I actually knew.

The winter of 2013/14 was one of the coldest in recent memory¹, and more snow fell this past year than I can remember in any recent winter. Eventually, after breaking two snow shovels and falling critically behind the mounting ice in our driveway, I gave up, and kept only enough of the sidewalk clear for pedestrians to walk safely past. By the spring melt there was more than six inches of ice coating our driveway and the path to our door. I left home in the dark in the morning, and drove home after dark in the evening. Construction days in the Canadian winter are short. I'm not sure I would do it again, but I am glad I did it this time. I know where each point load carries down, how the ducts are threaded through from old to new, I've had some wins and some failures but they're my wins and my failures.

1. Environment Canada. *Quarterly Climate Impacts and Outlook: Great Lakes Significant Events- for December 2013 to February 2014.*

4.2. Ethos

Truly “Architecture” will succeed or fail as it is built. My experience on the construction of this house was essentially about relationships and motivating tradespeople to do the type of work you want. It’s easy to imagine that somehow a trade will be willing to build or assemble or install whatever you pay them to install. I had the illusion that as an architect, and as the owner, and working as the site supervisor, my ideas about how something would be installed or how an element would fit with another was entirely up to me, and that I could ask (nicely) and they would do things my way. This was not often how things actually worked.

First of all, most of the trades knew more about the thing they were doing than I did. They’ve been doing their chosen profession for 20 or 30 years and have seen far more than I ever have; there are often reasons why their way works better than my way.

Second, most of the time they’ve priced the job at a certain price, to deviate from their accepted normal practice will cost them time - even if my way is easier or objectively less work, it will cost them time to learn a new way of doing things.

Third, even if they are paid time and material, they like doing things a certain way, often they enjoy what they do, and they enjoy it partly because of how they do it. They like their systems and routines and to ask them to step outside of them is difficult and less enjoyable for them. This might sound petty, but it hold true for people across professions, we all like our way of doing things, and have to be motivated to change or to do something differently. Further we are all motivated by different things in different ways.

Fourth, there are certain things that a trade might refuse to do on principle. They are professionals, and if asked to step outside of their comfort zone too far, into practices that they consider lower quality, or prone to failure, some of them will refuse the work outright. Mark, who poured my driveway, refused to pour it as I had originally designed it. Regardless of the fact that I was the homeowner, architect, and was paying him directly, he was convinced that the risk of flooding my garage was too high, and he was not willing to have his name on the driveway as it was originally designed.

Fifth, what I ask might be beyond the skill-set of that particular trade. I cannot expect someone to do something that they are not capable of doing, or that they are not capable of doing to my standards. If the trade believes you will ask them to rip out their work, or refuse to pay them because you have unreasonable standards, they’re not going to do that work in the first place - either by doing it their way

because they know it will work, or by refusing altogether.

There are many other reasons why it isn't as simple as telling a trade to do something, or drawing something a certain way and getting it built. Sometimes you just don't like each other. Sometimes one of you is out to screw the other one, sometimes your particular job is insignificant to that tradesperson - he has other people giving him better or more important work. Sometimes a trade may not speak english well enough to actually understand what you're trying to communicate. Sometimes one or both of you is just too tired or busy to communicate effectively. Sometimes there just isn't time. But these 5 are the reasons that stood out to me as legitimate and pertinent considerations that are easy to overlook, and are often overlooked in architectural practice. They are the ones that I came up against most often and the ones I was trying explicitly to overcome.

These considerations demand an ethos that accommodates reality, and a pragmatic mentality that emphasizes getting the job done. Each trade will be motivated in different ways, and to get good, creative, efficient work out of any given trade is often a political game. Sometimes it's as simple as buying coffee and donuts at break time, or asking a question and actually listening to the answer. Often it's about being there. A line on a drawing, or a sentence in a spec, while technically "legal", often serve only to antagonize and alienate the people with the tools in hand, implying the architect believes him/herself to know it all, which is markedly and obviously untrue.

I was determined to listen, while insisting on a building that looked like I wanted it to. I had ideas about how it should be built, but my intention was to exploit the knowledge and expertise of the tradespeople to the maximum extent. I could not however motivate all the trades all the time, and I could not explain my vision, or the reasons why I wanted things to be different to each and every sub-trade and apprentice who came to the site. The General Contractor, in this particular case my brother Jesse, was crucial to my project. If and when I convinced him of the importance or significance of an element or design decision he could communicate that to the trades who did the work, in a way they would understand, and find trades that were capable and willing to work that satisfied my design standards. Deciding to trust my contractor, and trying to treat him as a collaborator rather than an employee was perhaps the single most important element of my construction ethos for this project. When I could convince him that something was important to me, and communicate what I wanted something to look like, he could and usually would figure out a way to do it in a way that was more efficient and more economical than

the way I myself might have imagined the solution. Obviously, because he is my brother, I generally trusted his judgement, but I also hope that I inspired him to want to help me make a well designed and well built building. That was certainly my intention.

4.3. Significance

There are many reasons for Architects to be involved in the construction phase of any building, and no less for residential additions and renovations.

From the perspective of the Architect, being involved in the construction phase of a project is an unparalleled means of learning and testing. It is in building that the ideas and designs are truly tested. The critique model of design and design development nurtured by traditional architecture education only serves up to a point, and the qualified opinions of professors and colleagues are still only the educated opinion of that person.

From the perspective of the building itself the architect's involvement in the construction serves to maintain the design intent.

From the perspective of the client, an architect's involvement offers a voice to advocate for the interests of the client.

Architectural practice is cumulative, that is, the lessons and techniques developed on earlier projects should and do directly influence design on following projects. To limit an architectural practice to the generation of design drawings creates architects who are ignorant of the elements of their design that are not working, and the opportunity for refinement and the evolution of an Architect's designs is lost.

Years ago, when I was a projects supervisor for a small custom home building contractor, I was tasked with ensuring that the masons on a particular project would flash around the windows in accordance with our details. After meeting them on site and climbing up the scaffolding to look at the windows, and demonstrating how we wanted the windows flashed, the mason expressed reluctance to adhere to our chosen method, and disbelief at my assertion that water would penetrate through the brick masonry. He insisted that he'd been a mason for 15 years and no-one had complained about the detail he usually used. My immediate thought was to tell him he'd been doing it wrong for 15 years,

but what I ended up saying was: “Nobody calls you when it leaks, they call me, and I have to fix it, and you’re never the wiser”. Conceivably he might have been extraordinarily lucky and never had his flashing style leak, but more probably, no one ever told him about the leaks, or no one could tell him about mold hidden behind the drywall that was never found.

Without some method of feedback or involvement in the project beyond the design, an Architect might never get better, and might never even know what mistakes he or she is making.

Construction often demands compromise. Involved in the construction, an Architect can effect compromises which remain consistent with the design intentions. As we discovered elements of the home that had be buried behind walls or hidden in the ceiling we could revise the design to take advantage of these, while maintaining the design intent. Sometimes the considered revisions to one section of the building have implications for other parts that would be missed if the drawings and the design was relinquished to a contractor.

2013-10-20

We were considering simplifying the location of the 25’ tall 6x6 at the rear of the house. In the original design it was 24” offset from the corner of the house (fig. 4.3.a.) but to avoid engineering the cantilevers on beams in the decks and the roof we considered placing where it would be typical: right on the corner (fig. 4.3.b.). Entertaining this revision also had implications for the design in other parts of the building. The front porch was designed in sympathy with these decks (fig. 4.3.c.), the structure of the railing and the cantilevering concrete deck was designed to mimic the condition at the back of the house. A design revision to the back decks would have implications at the front. By the time we investigated the costs associated with the engineering for these cantilevers, we’d already paid for the engineering, and there wasn’t much saving any more, but the lesson was there, My contractor would have just moved the post at the back, and never thought twice about the post at the front.

Involved in the construction I could ensure that “value engineering” was done in a way that maintained the design intent.

The contractor and sub-trades usually know more about construction than the client, and while there might be as many bad architects as there are bad contractors, an architect or designer involved in the construction of a project can be another



Fig. 4.3.a.
Offset Post



Fig. 4.3.b.
Corner Post



Fig. 4.3.c.
Front Porch Post

voice, to raise questions or suggest alternatives that the client might not be aware of, and to fight for the things that matter. While, most of the time, I played both client and architect, my wife was equally responsible for the approval of my design decisions and on a car drive in late November I had to fight for the wood siding. I had been told by Jesse that wood siding cost twice as much as vinyl, and during an earlier conversation had been told that this would raise the price from the initial estimate. I didn't really analyze what this would mean until I got the revised price: an extra \$7000. Sarah would have just gone with vinyl, it is hard to put an actual monetary value on the feel of an exterior surface. Technically siding and wood have the same lifespan, the wood might actually require more maintenance, so I couldn't make the case for the wood from a durability standpoint. A render can't really capture the difference between wood and vinyl, I couldn't show Sarah why wood was required with a pretty render. It was about the look, and the feeling of the house, vinyl screamed cheap to me, wood would age more gracefully, and imperfections would add character, enhancing the warmth of the home, standing beside wood siding relates you to a history and that doesn't exist with vinyl siding designed to merely look like wood. Wood siding is authentic, but a contractor, faced with a client flipping out over a cost increase will most easily propose a solution that decreases the cost, and isn't necessarily equipped to explain why wood is worth it. Being involved in the construction of a project creates headaches, and in residential construction, an intensely personal realm, architects and designers have developed models of design and drawing delivery that limit their exposure to these headaches. I would argue, however, that better architects are trained and better buildings built when the designer is active in the construction phase.

4.4. the Model

This project is a relatively major home addition and renovation in which I attempted - for various reasons including cost, schedule, design, and education - a hybrid approach to construction.

Personally, I have not-insignificant experience in the construction industry, including working as site labour, framer, carpenter and projects manager, but not enough experience or relationships with trades-people I could call on to complete the work, to feel comfortable managing a project of this scale entirely on my own, while still completing it in a reasonable amount of time. I opted to manage the on-site construction myself while hiring a contractor to act as a consultant for the

site construction and to co-ordinate and vet trades-people and suppliers. I also performed the various tasks which typically fall to a site labourer. My intention was to save the cost of both a site supervisor and a site laborer - \$85/hour and \$40/hour respectively - while maintaining the advantages inherent to hiring a contractor: access to quality trades-people who are motivated by repeat business to perform, an expedited schedule, contractor pricing and rates from both suppliers and trades, responsibility for both site safety and the pertinent regulatory paperwork, and the years of experience and knowledge of the contractor himself. We entered into an agreement by which I would pay a predetermined hourly rate for his time and the time of extra site labour as necessary, as well as cost plus a modest percentage on materials and supplies. (It should be noted that the contractor in question here was a company run by my father and my brother, and this is a relationship they would be reticent to enter into with anyone else.).

There were a number of different “typical” models I could have followed:

I could have built the entire project myself with minimal involvement from trades-people. I could have perhaps realistically completed the project in a year. Further I would have forgone contractor pricing and credit from suppliers, and had only the benefit of my own, while not insignificant, still limited knowledge of construction and building.

I could have decided to act as contractor. I would have been responsible to find and vet 2-5 trades/suppliers for each element, judging as well as I can from their prices and a brief meeting or phone call, who was best suited to complete the work, would show up, would listen to me, and who would give the best price. There were over 25 trades and suppliers on my project - that would have required cold calling between 50 and 125 trades or suppliers, obtaining cost estimates, figuring out if they could be trusted and if I could work with them. Typically a contractor has a large number of quality trades which he or she has found over years of building - myself I would be beholden mostly to luck. I might have completed the project in 6-8 months if I had tried to play contractor - I am fairly certain it would have cost significantly more as well.

I could have drawn up the working drawings and tendered them out to a set of contractors and chosen the best price from the proposals submitted. This was tempting, and essentially what my education has trained me for. If ever there was a homeowner capable of getting the most out of this model it was myself:

- 1) I am capable of creating comprehensive working drawings

- 2) I have a relatively good knowledge of home construction and construction techniques
- 3) I have received extensive and quality education in design
- 4) I have co-op experience on site in the capacity of “architect”
- 5) My father and brother are both contractors: I can bounce ideas off them and confirm good or bad prices or trades.

I chose against this model for a few reasons. First of all I was interested in working collaboratively with the contractor, partially for the experience that they bring, but also for the possibility of cost cutting in the design phase, I was hopelessly ignorant of what my design decisions were costing me and I wanted the knowledge and opinions of the contractor in the design development and working drawings phase. Second - if my (limited) construction experience had taught me anything about renovations and additions it's that they are full of surprises, and that extras and unanticipated expenses can very quickly escalate. I wanted control of how these factors would be mitigated - and I was convinced that design had a place in mitigating these costs, it wouldn't merely be downgrading the quality of finish, or eliminating elements to keep costs reasonable but the manipulation of design to reduce costs while maintaining the quality of both the design and materials. Finally - very few contractors would admit me to the site in the capacity I was interested in if they were responsible to deliver the project for a fixed cost on a schedule. I could save significant costs by doing much of what would fall to a site super or a site laborer myself.

I felt my solution would give me the best of all worlds. It also created a few problems of its own:

- 1) As architect, site super, site labour, and owner I “wore many hats” and these sometimes conflicted with each other.
- 2) Because of the many different roles I was playing I could sometimes lose sight of the responsibilities of other roles. (eg. forgetting about design in a rush to complete, or sacrificing quality so that my job as carpenter was easier).
- 3) I couldn't blame anyone else for deficiencies or oversights.
- 4) I often had no one checking my work.

Conceptually I still believe it to be an interesting model, one that I would be interested to try as an architect/builder in a situation where I am not also the owner.

4.5. Construction Drawings

It took perhaps a full week of time to complete permit drawings once the general design was formalized. It is difficult to delineate exactly how long these took depending on how to count the design time that was running concurrently to the production of the drawings and the discussions of details and revisions for the cost of certain elements. But, in terms of raw hours for the production of a full set of permit drawings for a house it is probably about a week.

Except insofar as the drawings served as a tool by which I created my own idea about how the project would be built, they were mostly unnecessary for construction. First of all, under part 9, they included far more detail than the building department requires to issue a permit [see appendix B]. Second, After the framers gleaned what few dimensions and door/window locations they needed, And the plumbing and HVAC trades used the drawings to bid the project. I don't believe a single trade referenced the drawings during the construction of the project. Perhaps few of the suppliers referenced the drawings for preliminary budget prices, but then did their own site measurements for final supply. Other than those, trades proceeded to work according to conversations and agreements generated by those conversations. I walked through the framed building with the electrician and we placed all the switches and plugs and indicated them on the studs with magic marker. The plumber likewise. Our HVAC installer referenced the HVAC drawings we had made up by our mechanical engineer, but we again had a discussion on site, in the rooms, about where and how we would place the grilles and how we would get from the furnace to any given room location. Our inspector needed the drawings for the framing inspection, to ensure that we'd followed the structural engineer's instructions, but for each subsequent inspection they were unnecessary. I was a bit surprised by this, even with my construction background, but the construction moved along and conformed to budget and schedule constraints without constantly leaning on the drawings.

The complete set of permit drawings can be found in appendix A.

4.6. The Construction

4.6.1. Schedule

Construction commenced even before the permit was ready. On October 25, 2013 I began demolition. The permit would be issued on November 6th 2013. I would schedule my first inspection, a footings inspection for November 15th. Our initial completion date was February 8, 2014, but because our chosen framers were not able to start until late November, this was revised to late February 2014. Everything now pointed to this date, and the constraints and demands of the schedule - which had been previously moderated the completion of drawings and the permit application process kicked into full gear.

There is a sense in construction that Architects are responsible for design, clients for money, and contractors for schedule. Together they determine what exactly gets built. In a good project they collaborate to determine construction details and materials, and the client and architect might collaborate to a greater or lesser degree on the design, but the contractor's strength and often their primary day to day concern is the schedule. The Contractor co-ordinates when trades will be on site, predicts weeks or months ahead when exactly the electrician will need to be on site, or when a drywall crew will start boarding. Get that wrong too many times and, similar to the boy who cried wolf, trades might stop showing up. So when you're talking to a contractor and he asks you what the three most important considerations in construction are, the answer is: 1. Schedule, 2. Schedule, and 3. Schedule.

4.6.2. Construction

As described previously I opted to include a general contractor in the construction of my home. He co-ordinated the schedule and was available to answer questions. In addition to meetings and phone calls, by current count there are over 1800 text messages and almost 1000 emails exchanged between myself and the contractor over the duration of construction. I had at one point intended to include the communication chain as a narrative which would illuminate the construction, and the extent to which coordination and collaboration effects and drives the process of construction. I have instead opted to include a few of these communications in the appendix pertaining to specific elements of construction, and, because a set of discrete conversations about particular elements gives an impression that the construction proceeded as a sequence of individual tasks, I also include a set of the correspondence for December 6th to 23rd, two of what were perhaps the busiest and most stressful weeks of my life.

Fig. 5.a.
Living Here



5. Occupation

5.1. Overview: We Live Here



Fig. 5.1.a.
Relaxing on the Couch

The things that punctuate our lives often have little to do with an architectural parti, or the “design intent”. Day-to-day those things fade into the background, a subconscious appreciation rather than a manifest intellectual satisfaction. The mundane realities have to work as well as the feel and personality of the space.

Vulnerability. A vulnerable building is one that must be cared for. That care, that maintenance, creates a relationship between occupant and building. A building protects and nurtures us and when that building engenders a reciprocal act, it establishes a relationship and a means by which a building gains character, and an identity, and a personality. Boats, perhaps, have the longest and most obvious tradition of personality and personification in our cultural context, partially because of the obvious nature of the risks and forces held at bay by the sturdy bow of a boat, but also by the degree to which most boats demand the attention and the constant care from their sailors. This relationship animates and personifies the inanimate object. Few homes are graced with a name, but I know of no boats disgraced by the lack of one.

Vulnerability, and the susceptibility of a place to change further supplies a canvas for the narrative of the lives within, can make a house a home if we let it. These imperfections delineate a history and a place embossed with the lives of its occupants. A scratch from a chair dragged across the floor by our son, a crack in the siding from an errant ball, a faint ring from a too hot pizza placed directly on the counter-top. Insofar as a home acts as a touchstone, or a refuge, for our memories it is this vulnerability which prompts those memories of a history on the surfaces of our home.

5.2. Ethos

I live here. My wife lives here with me. My children play in the hallways and their bedrooms and crawl into our bed at 7:00am, to watch Netflix on my phone. We drag ourselves out of bed, take showers, get ready for the day. Right now, in the early summer, we close the windows we opened last night to cool down the house - its almost July and we haven't yet turned on the air-conditioner. On the week-ends, or in the evenings during off peak electricity hours we do our laundry. Sarah adores that we have a laundry room up on the second floor with the bedrooms. I spend most week-ends outside lately, we re-graded the whole site, and there are always things to build or rake or dig. Last week-end we planted 26 boxwood bushes, we're hoping to make a short hedge in the front yard. In Kitchener you're allowed to have a fire-pit in your backyard. I dug a pit and lined it with leftover fire-brick from the chimney we deconstructed. It's a bit like we're camping back here, there isn't any grass yet, and everything is mashed together, old lawn chairs and a set of Muskoka chairs left by the previous owner.

Occupation very quickly differentiates itself from analysis. Even by calling a place home the perception of that place is coloured into something of an idealization. Gaston Bachelard, in his introduction to "The Poetics of Space" asked: "How is it that, at times, [even] a provisional refuge or an occasional shelter is endowed in our intimate day-dreaming with virtues that have no objective foundations"¹. This sense in which a place can become what you call it, and be appreciated as "home" regardless of its physical nature or the "homeness" of its design is humbling to the heroic architect who's education extols her to change the world by design. But there is also in this some grace, some room for our imperfect designs to succeed beyond the limitations of their architecture. The occupation of a space gives the occupier a perception of the properties intrinsic to their idea of the space.

Plato might agree, in fact, Plato would argue that all things merely point to the perfect version of themselves and that the concept of a thing, or the idea of a thing in our minds, is tied to an appreciation of the true form of that thing, a thing "remembered" from before birth. A home, any home, would then also point to the ideal home "remembered" in our unconscious or subconscious (concepts which were not yet clearly delineated in Plato's time), and so assume some measure of the gravity of the ideal, regardless of the particular architecture.

But whether or not there exists a world of the forms, this sense that even an imperfect thing can function and persist as that thing, that even though a home might not ideally reflect "homeness", it might nevertheless acquire the traits and

1. Gaston Bachelard, *The Poetics of Space*, (Boston Massachusetts: Beacon Press, 1994), xxvi.

virtues we ascribe to home. This is a powerful and significant reality; the occupation of an architecture is something different than a merely intellectual analysis of the building or design can offer, and one that is intrinsically individual and experiential. This is perhaps part of the reason why many individuals so readily design their own houses, and paradoxically why the generic and uninspired cookie cutter houses of suburbia flourish. Home may not be something that an architect can design. Home is something that a person does to a space, an appreciation and an act of will and imagination that imbue a space - almost any space - with a set of virtues and properties that are not necessarily intrinsic to the thing itself.

Further, we are invested in appreciating our houses as homes: "In any case, harmony in reading is inseparable from admiration. We can admire more or less, but a sincere impulse, a little impulse towards admiration, is always necessary if we are to receive the phenomenological benefit of a poetic image. The slightest critical consideration arrests this impulse by putting the mind in second position, destroying the primitivity of imagination."² If and because our perception of home is at least partially predicated on the fruits of our imagination, analysis, at least according to Bachelard, breaks this link to imagination by putting the brain in a different state incompatible with this imagination, thereby stripping the space of the properties maintained by our imagination.

By this time, the architectural analysis is over. It's about living.

2. Gaston Bachelard, *The Poetics of Space*, (Boston Massachusetts: Beacon Press, 1994), xxvi.

5.3. Significance

This, after all is said and done, is the life of a building. Occupation imbues a house with a fullness; there is a house across the street that sat empty for a few weeks while new renters were found. It felt hollow, somehow we could tell no-one was living there. Perceptually there was an emptiness on the street around that house. Occupation manifests the intentions of almost all architecture. Always designed-for but often marginalized, or conceptualized rather than embraced. Occupation or utilization is the intention of almost all architecture. The end-game for architecture is its utilization and occupation. Very few architectures are primarily about proving a point or demonstrating an idea, for many of those that are this meta analysis

exists as a dialogue among architects and scholars, for whom the significance or insignificance of any given architecture waxes and wanes with whatever popular architectural idea currently captures the academic sentiment.

Perhaps it is my philosophy degree, an education that demonstrated the constant evolution and reversion of ideas and knowledge. The history and current state of philosophy is like a archipelago of built-up islands, each island populated by the buildings of the members of that camp, ideas and philosophies are built up into the heavens, only to be toppled by the arguments of the next island over - at which point construction begins anew. Bridges are built between islands and perhaps for a time these islands appear as the same, until cracks form and the building starts again. Islands are abandoned for hundred of years, only to be repopulated and rebuilt by the spark of an idea. Sporadically islands appear out of the depths, new camps, some a new idea, some revealed as the foothills or headwaters of another idea, another island. The basic islands have been there since Aristotle, since Plato, and whoever it was, names lost in time, who proceeded them, and will remain until time or humanity unravels.

There is value in this construction and evolution, we learn and evolve and if we remember the lessons of our predecessors, perhaps we might avoid some of them. The proof of these philosophies however, lies not in the philosophy itself, but in the behavior it inspires. A building is no less so, the proof of architecture is not, and will never be, in its adherence to a parti, or to a design idea, or to the dreams of its designer, but in how that building is occupied and utilized. Theory and style will wax and wane, but buildings exist, and are built for a purpose beyond the ego of an architect. A building that doesn't work, one that is intrinsically uncomfortable, or awkward, or lacks some basic necessity of the intended program, can not, in my mind, be called a good building. We might need a few of these buildings, perhaps in the same way structural engineers needed the Tacoma Narrows bridge, as lessons and as proof of concept, but they are tools, stepping stones towards buildings that work, "architecturally" and practically. I want people to live in my buildings, and I want them to like living there.

5.4. Moving In

We moved twice in 3 months, which was taxing on both our family and the friends and family who we leaned on to help us. I, in fact, didn't even help with the first of our two moves: from our house in Cambridge to Sarah's parents' basement. I was on site with the framers, keeping the construction moving and trying to save money by swinging a hammer. We would live in the basement at my in-laws from November 29th to February 22nd, almost 3 months in the middle of one of the coldest and snowiest winters in recent memory, an experience that further increased our motivation to finish 4 Spadina as quickly as possible. Perhaps it was the weeks living in a sort of limbo, in a space defined by the style and paraphernalia of Harm and Joan Horlings, but among the first things we did, before unpacking some of our clothes, before I finished up installing the closet shelving, while we were still essentially living out of boxes, is to hang up our art and pictures. Something about the bare walls demanded attention, and the space became a little more like home with our stuff on the walls. The architecture was familiar, we had selected and decided on it together, the doors and trim were exactly the same style and colour as we had installed at our home on 38 Grant Street in Cambridge. Our home was and is for living in, not for taking pictures of, not for analysis, or to satisfy some design requirement.



Fig. 5.4.a.
Kids Helping
Eli and Petra helping assemble
our furniture.

Fig. 5.4.b.
Picture Wall

Some might argue that the architecture itself should ever be compelling, but me, I like it as a back-drop for my life, and as a means of displaying the things that matter to me.



5.6. Lessons

Getting to the point of living here, and interacting with my home post construction, I found mistakes I might not otherwise have gleaned. These mistakes become lessons, and while I'd prefer to learn from others' mistakes, my own will certainly stick with me. I made a bunch, but I'll talk about two:

5.6.1. the Master Ensuite Window

5.6.2. the Door from the Ensuite to the Walk-in-Closet

5.6.1 the Master Ensuite Window

This window was perhaps the only window whose placement primarily arose from a sense of the balance of the outside of the building. Based on the plan, it is a little bit redundant, and while it is intentionally south facing to bring as much light into the bathroom as possible, there is already a bank of 4 windows in the bathroom, and it's definitely bigger than it has to be. It's placement sprung from two primary motivations: 1. I was inspired to unbalance this particular corner by Yakisugi House (Charcoal House), designed by Japanese architect Terunobu Fujimori and 2. I wanted to avoid the mistake of a house on Park Avenue in Cambridge Ontario.

Yakisugi House cantilevers a small tea house out and away from the building in a way that defies a logical understanding of how one might actually ascend into the room and any conventional structural intuition. My window placement, along with the confluence of 4 different roof planes at this corner, the change in material from wood siding to corrugated metal, and in combination with the much more dominant roof over the "single" window on the west face was intended to merely tweak this same break from our intuitions.



Fig. 5.5.1.a. (left)
Yakisugi House

My house isn't like this, but I wanted some hint of the out-of-place on this corner of my house.

Fig. 5.5.1.b. (centre)
South Wall of Ensuite

Cantilevering over the driveway, much more conservatively than Yakisugi.

Fig. 5.5.1.c. (right)
West Wall of Ensuite

Seeing this roof, and taking a closer look, prompts a query about how the roof line over the south wall has to meet this roof line. If you notice, you might take a step back, across the road, to get an angle that lets you see the hidden 3/12 by 3/12 valley, that the framers misinterpreted as a hip until they were actually up there to frame it.

The house on Park Avenue is another grey addition to an old brick house, this one primarily stucco. Walking by, one large wall of the addition is entirely without windows or articulation, and stretches two stories of uninterrupted grey stucco. I wanted to avoid this by throwing a window on this wall.

So I know why I put the window there, from an “architectural” point of view I wanted to flummox expectations, from an aesthetics point of view the wall would look empty without it, but from living there, this is the worst window in the house.

The first big hint that I did something wrong was probably the can of spray window frosting I bought, and covered the lower pane with before we even moved in. Without frosting the bottom pane the sight-lines to this window are terrible; from right on the sidewalk you could see someone standing at the sink from the waist up, from the bus that now stops (temporarily) directly in front of our house you could watch me clean up after nature's call. Making that bottom sash translucent mitigates this, but it's a single hung window, another by-product of value engineering. So, opening the window to get a cross breeze going through this room totally defeats the frosting. I didn't think enough about how the “architecture” of this window would effect life in the building. Hopefully next time, I will.

3.5.2 the Door from the Ensuite to the Walk-in-Closet

I've decided to just remove this door entirely, take it off it's hinges and put it in the basement. Originally this was going to be a pocket door. Which would have worked; a pocket door is totally out of the way when it's open, and we rarely close this door. We even framed the opening to accommodate a pocket door. But walking through the house with the electrician, we needed a spot to put the switches for all the lights in the ensuite, and with one fell swoop: hinged door.

This hinged door gets in the way. We have a nice tall cabinet to store all the things that end up getting used in a bathroom, and when the door is open it completely blocks it off. Further, it's a big door and perceptually it blocks off everything behind it, making the bathroom seem much smaller than it is. I should have stuck to my instincts and sacrificed a few inches of closet space to slide a pocket door past the electrical switches.

6. Reflection

Early 2014

Yesterday I was privy to a question, in the guise of a statement: “A well photographed piece of architecture does not often live up to the thing in the photographs”¹

The trite response to this was to diminish the photographed architecture: “If this is too often the case, then you’re looking at the wrong architecture.”²

A broad, limiting, and un-examined assertion, but buried in the follow-up was a more nuanced conjecture: if we are more impressed – more “taken” by the photographs and representations of architectures – perhaps we should also appreciate architecture with an eye less encumbered by our theories and measures, take a perspective less obsessed with analysis and metaphysical checklists. They are, after-all just buildings.

Intentionally appreciating the “Architecture” precludes merely occupying the space.

Architectural analysis is not architecture.

I recently moved into 4 Spadina Road West in Kitchener Ontario. Over the past 4 months I have worked to make a house there to be home for my family and myself.

Can an ordinary building be a thesis? If it is – what goes here?

1. Robert Jan van Pelt, “Exhibiting Architecture Lectures,” 2014.
2. Ila Berman, “Exhibiting Architecture Lectures”, 2014.

6.1. a Translation

Any architecture project essentially involves the transformation of an existing condition (site/existing building) - into a new or different condition (building/intervention). Typically an architect envisions a design or a scheme for a new building, architectural practice. I think this often amounts to the translation of this scheme or vision into a building. Within this translation are a number of smaller translations; from vision to scheme, from scheme to drawings, from drawings to construction, from construct to occupancy. Each of these smaller translations exist as both means towards the larger translation, and translations themselves. With each translation there is nuance and "information" gained and lost; that is to say, that a building is both more and less than the architect's vision. The fidelity and potency of any translation is intrinsically tied to the competence of those executing these translations. Appreciating these stages as translations, complete with their own convention and language, allows for an appreciation of the conventions, the strengths and weaknesses, of any particular "language", and admits that a building might not conform to the letter of an architectural vision, but nonetheless achieve the intended affect. If an architect endeavors and intends to actually create good buildings, he or she must become competent at these translations, and surround themselves with competent people to realize these translations. This thesis exists as a case study and analysis across architectural translations but particularly the translation from drawing to constructed building: a translation often outside of the scope of conventional architectural education but one intrinsic to what architects do.



Fig. 6.1.a.
Original Street View



Fig. 6.1.b.
Original Porch View

Birgitta Englund Dimitrova

In this context [professional translation], a central issue is the translator's professional knowledge and competence. Although very often other professional categories are also involved and influence the final shape of the text [architecture], such as specialists and terminologists, editors, revisers and publishers [engineer's draftspeople, tradespeople, code officials] the person who translates a text [architect] obviously plays an important role in the whole process of producing the translated text. The translator produces a target text (TT) [building] on the basis of a source text (ST) [vision], the the translator's competence in various areas, as well as previous experience in translation, will have a decisive influence on the translation process and it's outcome, the target text [building].¹

Expertise and Explication in the Translation Process

[brackets mine]

1. Birgitta Englund Dimitrova, *Expertise and Explication in the Translation Process*, (Philadelphia, PA: John Benjamins Publishing, 2005), 7.

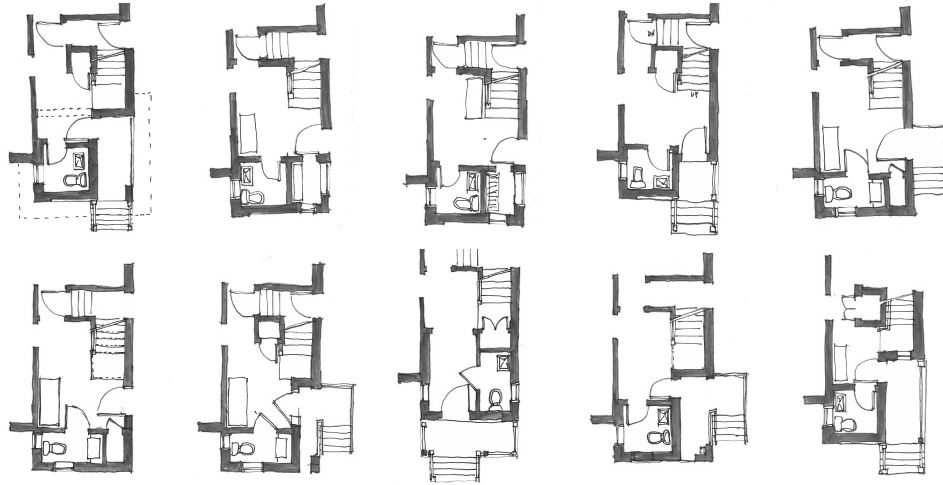


Fig. 6.1.c.
Various Front Porch Sketches

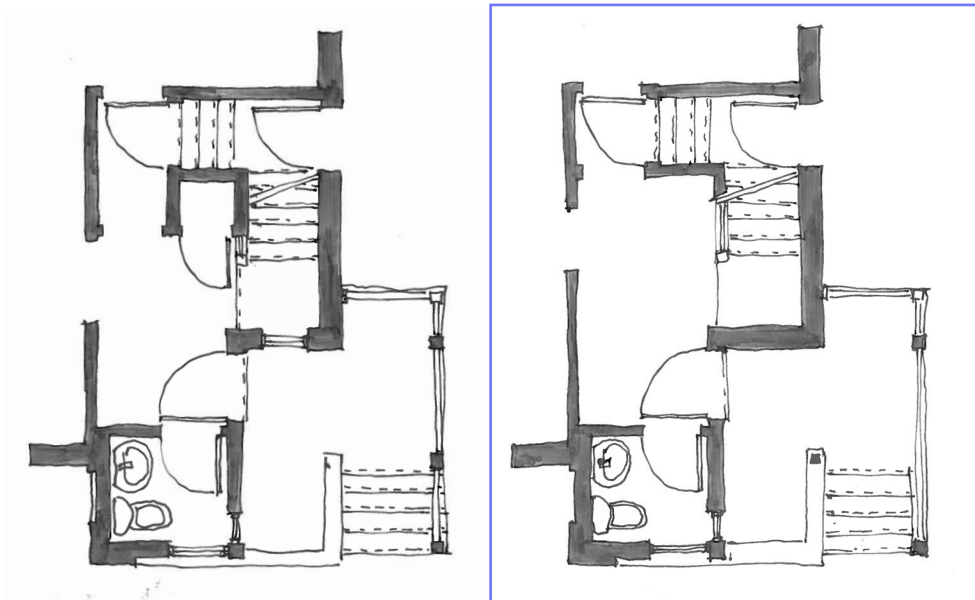


Fig. 6.1.d.
Entry Permit Design
(left)

Fig. 6.1.e.
Entry Built Design
(right)

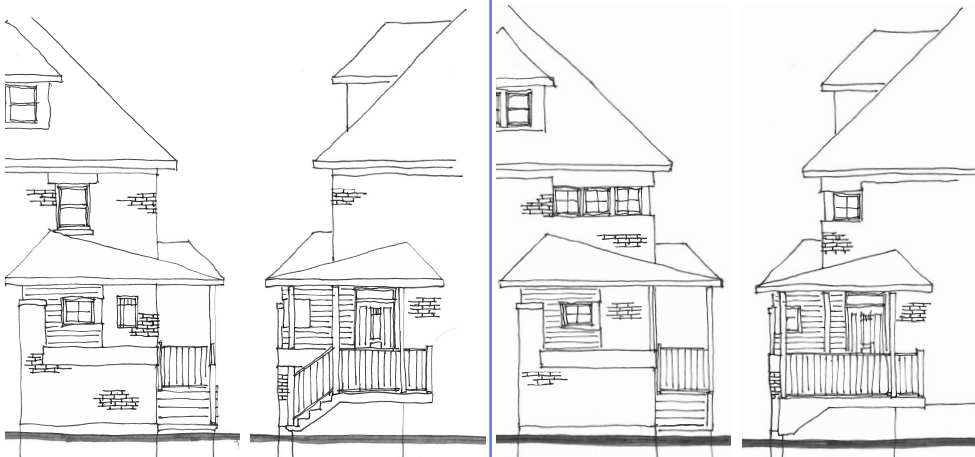


Fig. 6.1.f.
4 Front Porch Schemes



Fig. 6.1.g.
The Window Issue
Three options to resolve the problem with the roof of the porch intruding on the office windows



Fig. 6.1.h.
Final Scheme Render





Fig. 6.1.i.
Front Construction

A set of images demonstrating some of the scope of construction.



trans·late

1. express the sense of (words or text) in another language.
2. move from one place or condition to another.

oxford dictionary

3. to shepherd an architectural vision into a building.

reuben grin



Fig. 6.1.j.
Queen Street Approach

Fig. 6.1.k.
Front Walkway





Fig. 6.1.l.
Front Door
Just the railing yet to be installed.

6.2. a Difference

2013.06.06

I had an opportunity to sit and help critique a set of final year architecture students' projects this week. Last year I helped teach this studio as a TA and the year before that I participated as a student myself. The evolution of my appreciation of the work on the wall was a surprise to me. When I designed a building to execute a relatively similar program, I designed one not dissimilar to some of the projects I saw. My instincts now immediately went to the practical significance of the design decisions and the costs and risks of incurred to achieve architectural goals which seems insignificant compared to these risks or costs. My instinct was to simplify, conventionalize, and to place each building in the context of its identity and the construction industry, while, at the same time, emphasizing architectural elements that defined the parti; to be judicious and intentional about the elements chosen to depart from the norm. I envisioned their designs as an architecture stripped back to the necessary architectural inflections, rather than buildings unique in every way. I restrained myself, but my immediate internal response was to ask why. When the parti was essentially about an arrangement of buildings according to a vernacular paradigm we couldn't concede a rectilinear floor plan instead of one cranked 10.7 degrees from parallel, or why we couldn't add a sloped roof to a building designed to be appreciated as a cottage or a tool shed. I was not imagining boring conventional buildings, my instinct was however to impose an architectural expression that was proportional to the buildings' context and goals. Perhaps it is harder to design a building centred on the imaginary context of a studio assignment, and a general lack of a concrete idea of the occupants and their stories was also endemic of the projects as a whole. I was a bit incredulous that buildings could be designed around a concept, or a parti, or a technology, without an idea about who would live there and the stories of its inhabitants. Looking back at my own work generated out of the conceptual programs assigned in undergraduate and graduate studios, I easily slipped into the notion that the architecture of my projects was as important or more important the identity and the narratives of its inhabitants. An architecture education without real clients probably contributes to a mentality and an ethos to create buildings which primarily bear the stylistic desires of the architect, and imposes the morality and the current context of the architect on the design rather than a building which embraces the life and energy of its occupant. I am increasingly convinced that, especially as students progress in their architecture education that they should be encouraged and compelled to envision robust and compelling clients and occupants, for whom

they can then design a building with a real identity.

My conjecture at the end of this thesis is that architecture is inseparable from its context. Design is contingent on building and construction, and building are only activated by occupation. Style is useful insofar as it engenders an emotion or behavior which is pertinent and significant to the story of the occupant. Everything has a cost, each decision is ultimately in the context of a greater set of considerations and risks which often include monetary expenses, but also include architectural consequences which directly influence the nature of the space designed. To eliminate an overhang to create a platonic shape or a pure geometry risks a wall more susceptible to water infiltration, and an area below which is now a different space. Perhaps the “purity” or stylistic gain is worth the practical impact, and perhaps not. I do however believe that the best and most readily available measure of the success or value of an architectural “maneuver” is its effect on the life or experience is its effect on the life of the occupant, and that the presiding architectural ethos should be one that embraces the occupant as real, rather than imposing the ideals of the architect. The appreciation or experience of the lay-person might be something very different than the intention or the educated analysis of the architect or the architecture community, and while we might objectively assess or rate the judgment of the architect as “better” than said lay-person, this person will actually exist in the space designed by the architect, and manifested by its construction, while said architect might never return.

6.3. my Conclusion

So here I am at the end of my project and at the end of my thesis and at the end of my formal architecture education. I think the question at the end of it all is: what do I bring to the table as an architect, and what separates me as an architect from me seven years ago who was a contractor, carpenter, and philosopher? Further: what makes the house I designed different from a house designed by the happy accidents of joe-homeowner-designer? I guess the answer to that, and what I will design as an architect, is ultimately the measure of my education. Primarily, I think the buildings of an architect- the good ones anyway- are intentional, and intentionally innovative: they speak to larger ideas than rooms and a roof. I think good designs aspire to modulate how and what people think and feel, and I think architects' innovations create buildings that fit into a larger discourse than the immediate site and the practicalities of the particular project.

I set out to design a modern "housey" building. I wanted to build a pleasant space and an appealing building, but at the same time my house was designed as a statement. I wanted to fit it into part of a larger discourse between conventional row houses whose design is predicated on adherence to a particular set of stylistic rules, and contemporary modern design principles that relate to the occupant and the person rather than what the "rules" say about how a roof should be used or where windows should go. I believe that design - good design - participates in the larger discussion about how we should live and how our buildings modify how we live and how we think about the world. An architect is uniquely equipped to be aware of the impact of buildings and built form. As an architect I can't just put up whatever building is laid in front of me, not without at least understanding that this itself makes its own statement. Architects are given a monopoly on design - at least at scales larger than the house - and while ostensibly this is so that the public is protected from poorly constructed buildings, the ensuing design education creates an architect; an individual aware of the place of a building and of its design in the larger picture. An architect justifies and relishes escape from the conventional, and engenders innovation, because of the effects of that innovation, that design, on people.

Often, historically, design has been appreciated as a function of adherence to a style or a set of principles: Vitruvius' 10 books on architecture come immediately to mind as a set of rules, or a framework within which, to practice and by which to judge, design. But with the rise of modernism, good design is increasingly measured by its effect on people, rather than its adherence to said principles or styles.

An architect is consciously aware of these things, and trained to design buildings which can intentionally respond to these realities. I'm not saying that there aren't

designers who design nice houses, or that a rule based adherence to a particular style can't create a pleasing building, but real innovation falls to architects.

Home design is often driven by the instinctual designs of homeowners and designers, or the economical rules of contractors. Many homes, and even more renovations are executed without architects. To adhere to a set of design rules is essentially a referential process - one that can do little to progress towards new ideas or new ways of processing or appreciating the world. And, while following an instinct might arrive at an innovative process or tactic for design, these amount to accidents without intention, and are unlikely to lead towards an architecture which envisions and responds to society at large, or to the evolving sensibilities of cultures or individuals. Architects engender innovation. This is why I couldn't and didn't design a house which fit nicely into part 9 of the building code. Even on our modest means I was compelled to design outside of that box: cantilevering my concrete porch and offsetting a post 28" from the "obvious" corner, even the railing on my deck required \$800 worth of engineering. After 7 years of architecture education this is worth it to me, I have no desire to design "inside the box". As an (almost) architect I design to test ideas; to make compelling spaces, to push my design, and design in general. My buildings should be more than an adherence to a set of rules, my design should make a statement.

My father is a custom home builder, with whom I once attempted to design a "spec" home; a house he would build and then sell. We couldn't do it. I wanted and needed to design something that spoke to a larger idea than simply the consumer idea of a house. I couldn't convince him of the intrinsic merit of this, or of a popular appeal for this idea. I designed for him a house similar to what my own would be, a building that aimed to navigate the gulf between "housiness" and a modern contemporary design. That house was intended to be both something that a "traditional" person could appreciate and one that embraced a more modern ethos. My own house continued that discussion: its design evolved in response to that project, which was scuttled by the constraints of economics and an aversion to risk which mandated a project that fit more neatly into a pre-existing category. The house I built is designed to say that a modern house doesn't have to be cold or austere and can be appreciated by my 90 year old neighbor, and my contractor father, and my architecture classmates.

I think an architect is responsible to be truly intentional about the design of a building and aware of how it fits into the larger cultural picture. Contractors, trades, regulators and clients all contribute to the final product in their own way

but architects, in addition to managing and guiding the process, are also aware of the impact of a building, and are capable and qualified to innovate. Cultures and peoples evolve, and design must as well. As an architect, I am tasked with designing buildings which are the thing that the client wants, and the regulator will allow and the contractor can build, but I am compelled towards intentional designs which can break the rules to serve motivations, the intentions, behind those rules.

Plato said that if people know the right they will do the right. He was talking about morality, and argued that a moral education would create better people. I'm not sure I agree with him on morality, I do know, however, that as an architect I have been educated to innovate and to design buildings that speak to something more than the status quo, and so educated, have a damned hard time designing any other way.

Fig. 7.1.a.
A Place Above
The untreated wood steps up to
our attic.



7. Afterward

7.1. a refuge for memories

Gaston Bachelard

Of course, thanks to the house, a great many of our memories are housed, and if the house is a bit elaborate, if it has a cellar and a garret, nooks and corridors, our memories have refuges that are all the more clearly delineated.¹

“The Poetics of Space”

6 weeks after moving in I was forced to finish off our attic. My cousin Rachael was coming to live for the summer to be nanny to our two children. The existing attic was well and truly horrid, the walls and ceiling all finished with a troweled on red stucco-like finish which abraded skin too roughly rubbed against. The floor was covered in a cheap laminate and the doors and trim, while wood, were tired and stained. The whole space sucked up what natural light came in the windows and hovered forebodingly over our home, above a dark staircase which gaped open into our 2nd floor hallway. I could have finished the space in-step with the rest of the renovation, matched the trim and the doors, and finished the floors with carpet to match the bedrooms. We choose instead to use what paint we had left over, to merely paint the walls and trim and ceiling in colours that would match, and to plane down some 12” barn-board purchased at \$0.95 per foot to lay down as flooring. The walls soaked up the paint - almost 5 gallons of primer was required to paint one room and a staircase, and two more gallons of paint were necessary to put one coat on the walls. a full gallon of ceiling paint was needed for the ceiling, and another gallon for the trim. We updated the light fixtures, and replaced the aging switches and plugs with new one which matched the new house below. So for \$500 worth of cosmetic adjustments we transformed the space. The raw pine barn board floor suggests an attic, a space apart and different and delineates a separation that does not exist in our consistent and continuous first and 2nd floor, and reading this quote from Bachelard, I think I understand why the transformed attic works for our home, and why it might take some time for us to develop a relationship with our new home.

1. Gaston Bachelard, *The Poetics of Space*, (Boston Massachusetts: Beacon Press, 1994), 8.

7.2. just do it

2013-14-10

A drill; screwdriver bit, a hammer, a circular saw, a framing square, an unruly pile of stripped concrete forming, an idea. A few bags of leftover concrete, and 4 bags of topping mix left over from the tile installation. A beautiful Saturday evening, the temperature just right for a little project. No planning, no documentation, no reflection.

2013-15-10

17:12

[R] to [J]: Can I mix topping mix with normal concrete mix. I have bags of both. . .

[J] to [R]: I don't see why not. Go for it.

[R] to [J]: Thanks. And thanks for always letting me bug you.



Fig. 7.2.a.
Our Home

Bibliography

- Aravena, Alejandro. *Codigo*. [http://www.revistacodigo.com/alejandro-aravena-ciudades-elementales/ image 5](http://www.revistacodigo.com/alejandro-aravena-ciudades-elementales/image5)
- Bachelard, Gaston. *The Poetics of Space*. Boston Massachusetts: Beacon Press, 1994.
- Building Science Corporation. *Guide to Insulated Sheathing*, 2007 <http://www.buildingscience.com/documents/guides-and-manuals/gm-guide-insulating-sheathing/>
- Burrows, John. *Canadian Wood-Frame House Construction. 2nd combined imperial/metric ed. Rev. ed.* Ottawa: Canada Mortgage and Housing Corporation, 2006/1967.
- Canada Mortgage and Housing Corporation. *Comprehensive Analysis of Self- Build Housing Experiences*, 2000. Ottawa, Ontario. <http://www.cmhc-schl.gc.ca/odpub/pdf/62456.pdf?lang=en>.
- Canadian Mortgage and Housing Corporation. *Housing market outlook: Canadian Edition. Second quarter*, 2014. http://www.cmhc-schl.gc.ca/odpub/esub/64591/64591_2014_Q02.pdf.
- Canadian Wood Council. *Wood Design Manual 2010. 6th ed.* Ottawa: Canadian Wood Council, 2010.
- Coaldrake, William Howard. *The Way of the Carpenter: Tools and Japanese Architecture*. New York: Weatherhill, 1990.
- Crawford, Matthew. *Shop Class as Soul-Craft*. New York: Penguin Group, 2006.
- Day, Christopher. *Places of the Soul: Architecture and Environmental Design as a Healing Art. 2nd ed.* Oxford, England: Architectural Press, 2004.
- De Botton, Alain. *The Architecture of Happiness*. New York: Random House Inc., 2008.
- Descartes, René, and Donald A. Cress. *Discourse on Method and Meditations on First Philosophy. 4th ed.* Indianapolis: Hackett Pub., 1998.
- Descartes, René and Roger, Ariew. *Philosophical Essays and Correspondence*. Indianapolis: Hackett Pub., 2000.
- Environment Canada. *Quarterly Climate Impacts and Outlook: Great Lakes Significant Events- for December 2013 to February 2014*. <http://www.ec.gc.ca/eau-water/default.asp?lang=En&n=B6344EC5-1>.
- Ethos (n.d.). In Merriam Webster Dictionary online. <http://www.merriam-webster.com/dictionary/ethos>.
- Gladwell, Malcolm. *Blink: The Power of Thinking Without Thinking*. New York: Little, Brown and Co., 2005.

Grin, Aaron and Lstiburek, Joseph. "Guidance on Taped Insulating Sheathing Drainage Planes: Final Report." Building Science Press, 2012. <http://www.buildingscience.com/documents/bareports/ba-1301-guidance-taped-sheathing-drainage-planes>

Plato, Grube, G. M. A., and C. D. C. Reeve. *Republic*. Indianapolis: Hackett Pub. Co., 1992.

James, William. *Pragmatism*. Cambridge, Mass.: Harvard University Press, 1975.

Jodidio, Philip. *Architecture now! Houses = Architektur heute! Häuser = L'architecture d'aujourd'hui! Maisons*. Köln: Taschen, 2009.

"Limbic Resonance." Wikipedia. http://en.wikipedia.org/wiki/Limbic_resonance.

Loof, Thomas. *The Glass House*. <http://www.architecturaldigest.com/architecture/2012-09/architect-philip-johnson-glass-house-modernism-article>.

Meyers, Dowell. & Ryu, Sung Ho. "Aging baby boomers and the generational housing bubble: foresight and mitigation of an epic transitions." *Journal of the American Planning Association* 74, no. 1 (2008): 17-33. DOI: 10.1080/01944360701802006.

"Modern Philosophy." Wikipedia. http://en.wikipedia.org/wiki/Modern_philosophy.

National Research Council Canada: Institute for Research in Construction. *MemBrain-Vapour Barrier and Air Barrier System*. CCMC 13278-R, 2010.

Ontario. Building Code Act, 1992. Amended 2014. http://www.e-laws.gov.on.ca/html/regs/english/elaws_regs_120332_e.htm.

Palma, Christobal. *Elemental's Housing*. Quinta Monroy, Iquique, Chile. http://www.grahamfoundation.org/system/grants/press/269/original/McGuirk_MediaCov_DisegnoDaily_20140715.pdf

Petramala, Diana. "Outlook for Canadian Renovation Spending: Built on Sturdy Foundation." TD Economics: Observation, 2013. <http://www.td.com/document/PDF/economics/special/CanadianRenovationSpending.pdf>

Pollan, Michael. *A Place of My Own: The Architecture of Daydreams*. New York: Penguin Books, 2008.

Postiglione, Gennaro. *The Architect's Home*. China: TASCHEN, 2013.

Rabidoux, B. as cited by Banerjee, P. "Our love affair with home ownership might be doomed." *The Globe and Mail*, January 2012. <http://www.theglobeandmail.com/globe-investor/personal-finance/mortgages/our-love-affair-with-home-ownership-might-be-doomed/article4179012/>

Rand, Ayn. *The Fountainhead*. New York: Penguin Group, 1943.

- Scarpa, Carlo, Guido Beltramini, Italo Zannier, Giannantonio Battistella, Václav Šedý, Kurt Walter Forster, Ilaria Abbondandolo, and Laura Orsini. *Carlo Scarpa: Architecture and Design*. New York: Rizzoli, 2007.
- Shane, David Grahame. *Recombinant Urbanism: Conceptual Modeling in Architecture, Urban Design, and City Theory*. Chichester: Wiley-Academy, 2005.
- Statistics Canada (2010). *Population projections for Canada, provinces and territories 2009 to 2036 (catalogue no. 91-520-X)*. <http://www.statcan.gc.ca/pub/91-520-x/91-520-x2010001-eng.pdf>.
- Watterson, Bill. *The Complete Calvin and Hobbes*. Kansas City, Mo.: Andrews McMeel Pub., 2005.
- Weizman, Eyal. *Hollow Land: Israel's Architecture of Occupation*. London: Verso, 2007.
- Zumthor, Peter. *Atmospheres: Architectural Environments, Surrounding Objects*. Basel: Birkhäuser, 2006.

Appendices

Appendix A: Construction

- A.1. Permit/Construction Drawings
- A.2. Construction Transcripts

Appendix B: Regulations

- B.1. Building Permit Status Letters
- B.2. Kitchener Addition Building Permit Drawing Guidelines
- B.3. Neighborhood Zoning Map
- B.4. Kitchener Zoning By-Law R4

Appendix C: Economics

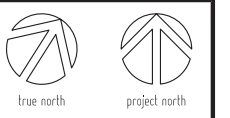
- C.1. Costs by Trade and Division

Appendix D: Environmental

- D.1. REEP RAIN home assessment

Appendix A: Construction

A.1. Permit/Construction Drawings



DATE	REVISION
DATE	ISSUED FOR DISCUSSION
DATE	ISSUED FOR PERMIT

**City of Kitchener
Building Division**
Date Received:
10/17/2013

customer:
reuben and sarah grin
38 grant street
cambridge ontario

project:
4 spadina road west
addition and renovation
kitchener, ontario

title:
site and grading plan

SCALE:	B100
DATE:	2013/12/24
JOB NO.:	2013/01
CDR:	spadina_west
DRAWN BY:	rt
CHECKED BY:	

The contractor shall check and verify all dimensions and report any errors or omissions to the consultant before commencing or proceeding with any work. Do not scale this drawing.

Copyright © 2013 reuben grin

sheet no:
C2-1

Fig. A.1.a.
(opposite)
Site Plan

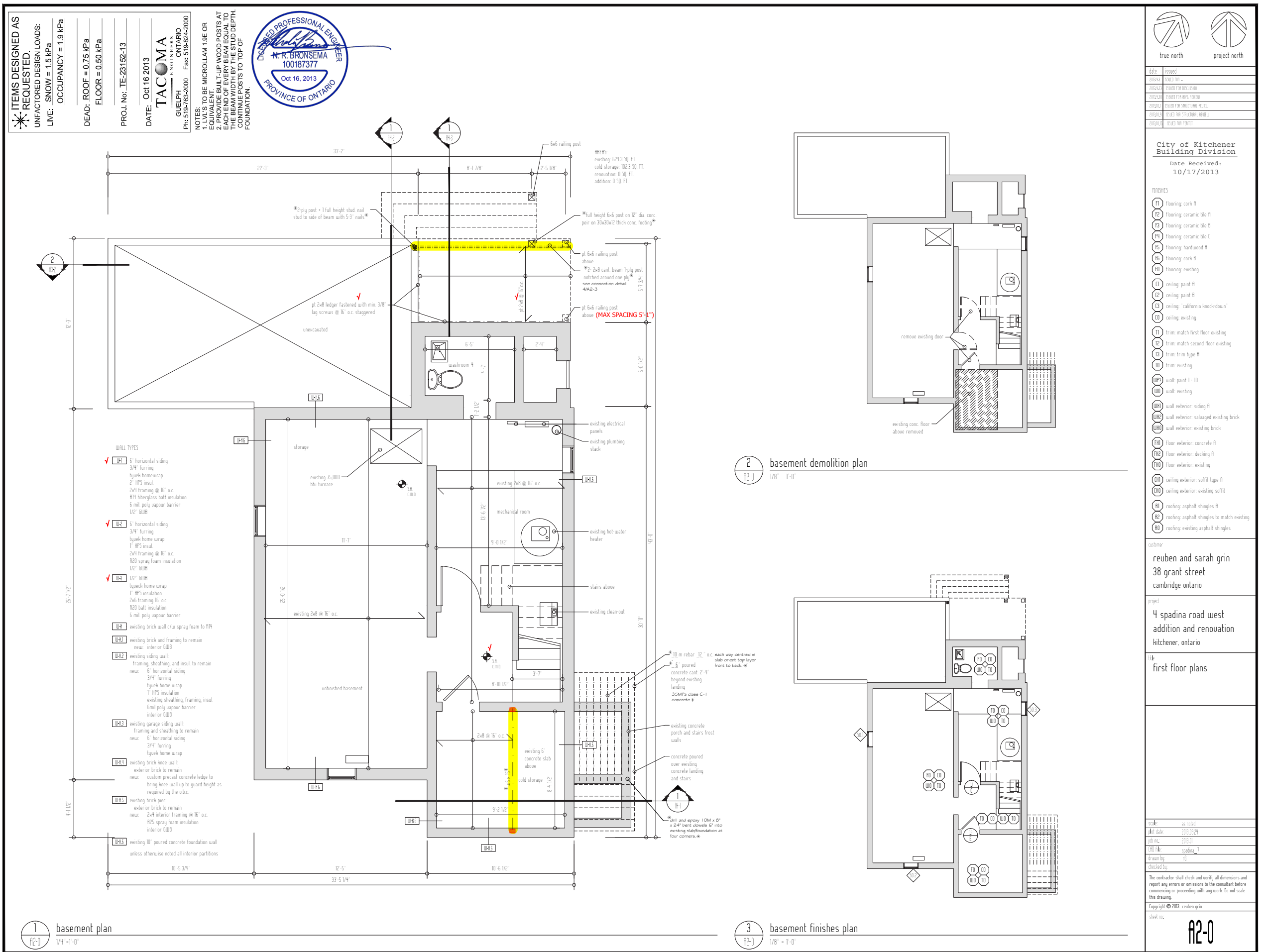


Fig. A1.b.
Basement Plan

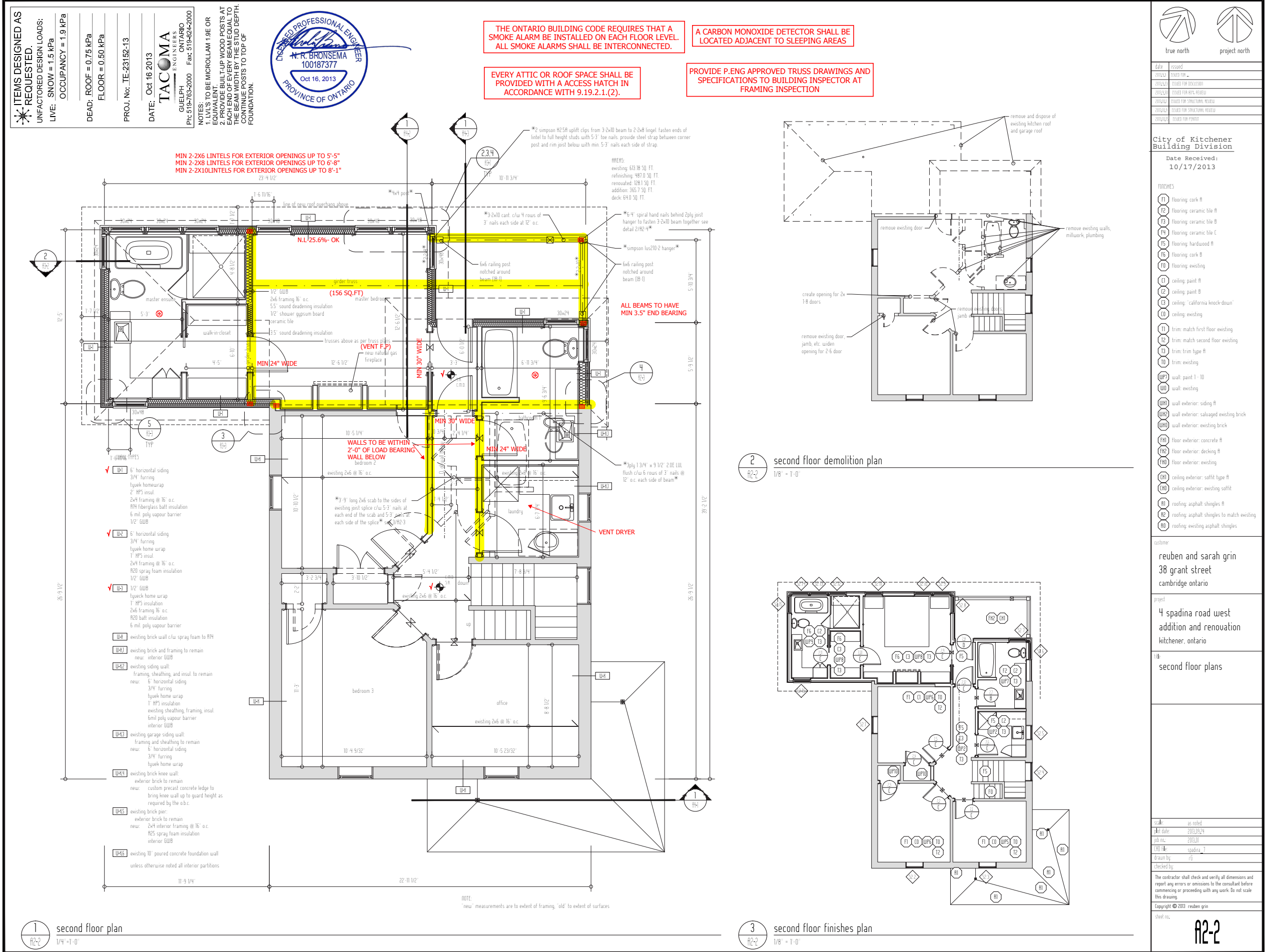
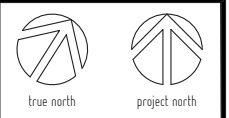


Fig. A.1.d.
Second Floor Plan

1 second floor plan
1/4" = 1'-0"

3 second floor finishes plan
1/8" = 1'-0"



Date:	Issued:
Project:	Reuben and Sarah Grin
Client:	Reuben and Sarah Grin
Contract:	Construction
Drawn by:	RB
Checked by:	RB

City of Kitchener
Building Division
Date Received:
10/17/2013

FINISHES	
F1	Flooring: cork fl
F2	Flooring: ceramic tile fl
F3	Flooring: ceramic tile B
F4	Flooring: ceramic tile C
F5	Flooring: hardwood fl
F6	Flooring: cork B
F7	Flooring: existing
C1	ceiling: paint fl
C2	ceiling: paint B
C3	ceiling: "california knock-down"
C4	ceiling: existing
T1	trim: match first floor existing
T2	trim: match second floor existing
T3	trim: trim type fl
T4	trim: existing
WP1	wall: paint 1 - 10
W2	wall: existing
W3	wall exterior: siding fl
W4	wall exterior: salvaged existing brick
W5	wall exterior: existing brick
F8	floor exterior: concrete fl
F9	floor exterior: decking fl
F10	floor exterior: existing
CE1	ceiling exterior: soffit type fl
CE2	ceiling exterior: existing soffit
R1	roofing: asphalt shingles fl
R2	roofing: asphalt shingles to match existing
R3	roofing: existing asphalt shingles

customer:
reuben and sarah grin
38 grant street
cambridge ontario

project:
4 spadina road west
addition and renovation
kitchener, ontario

title:
second floor plans

Title:	as noted
Date:	2013/09/24
Job No.:	2013.01
Drawn by:	spadina 7
Checked by:	RB

The contractor shall check and verify all dimensions and report any errors or omissions to the consultant before commencing or proceeding with any work. Do not scale this drawing.
Copyright © 2013 reuben grin

sheet no.
A2-2

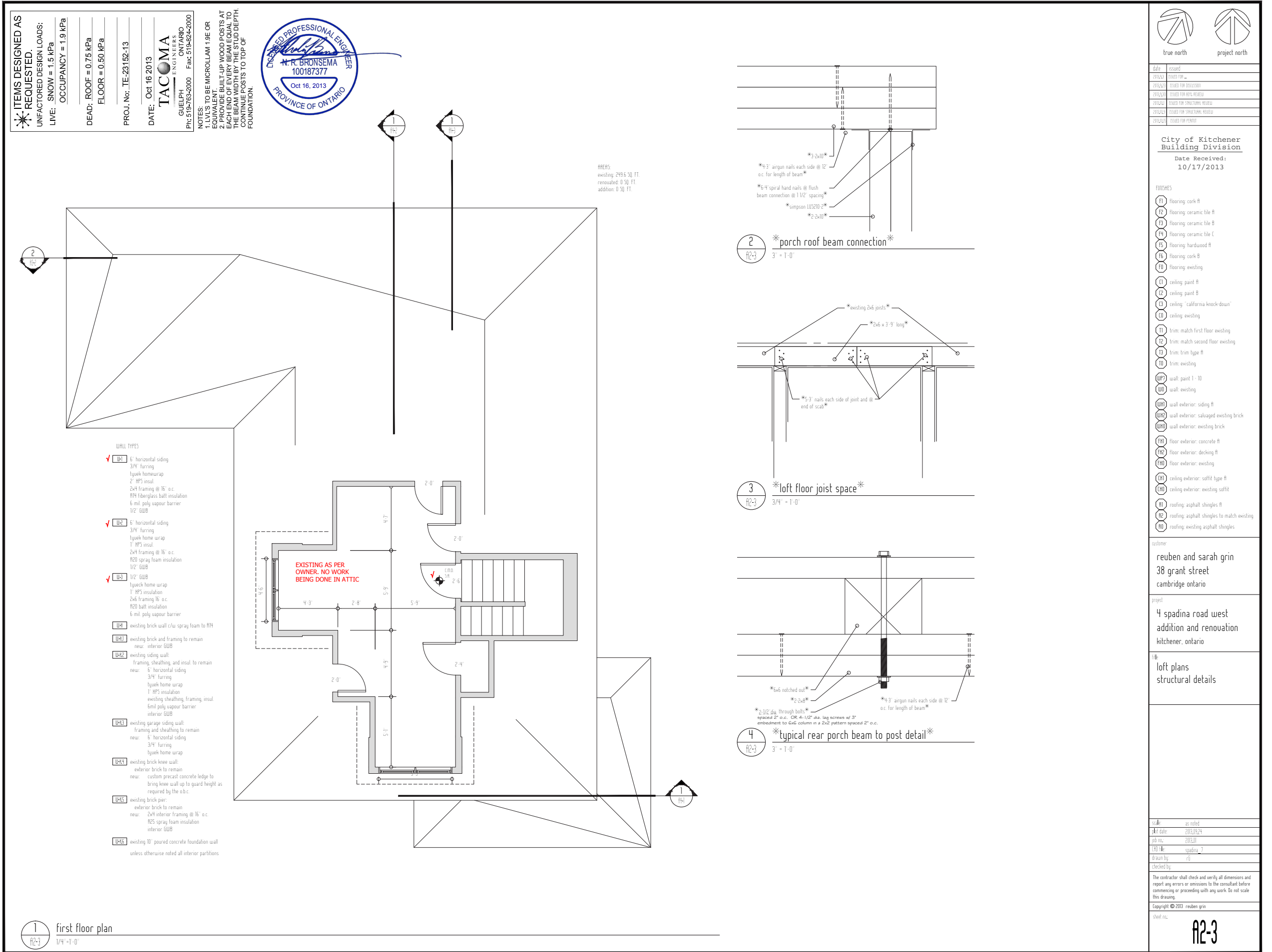
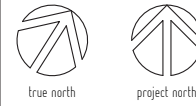
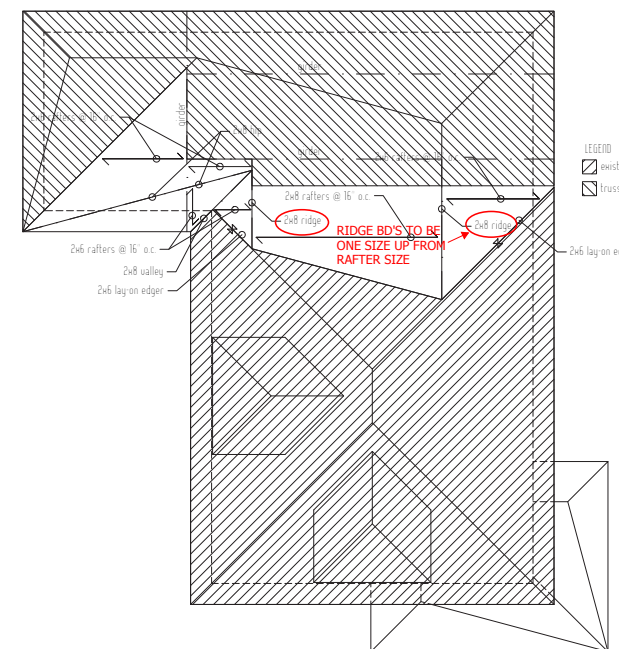
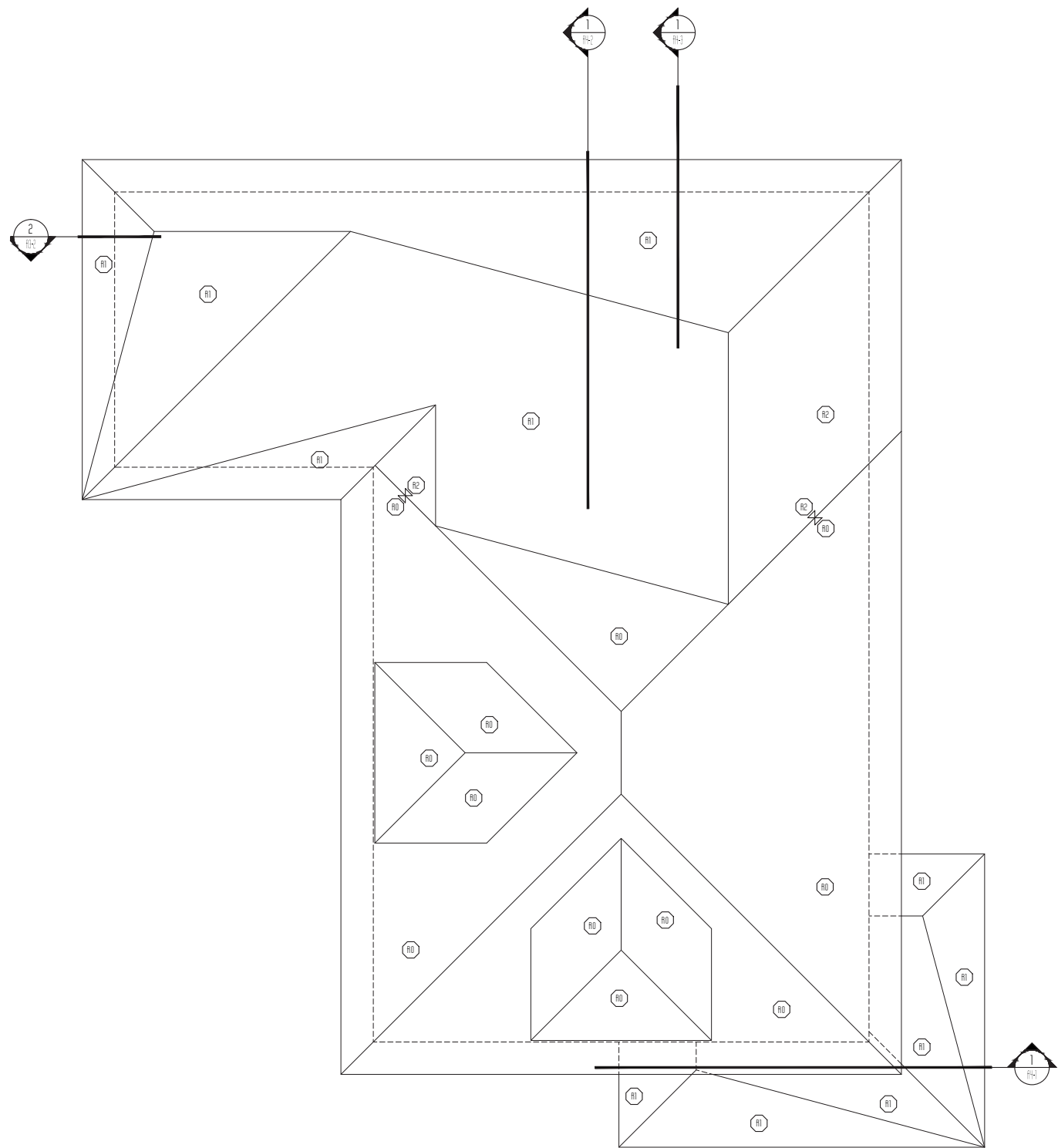


Fig. A.1.e. Attic Plan

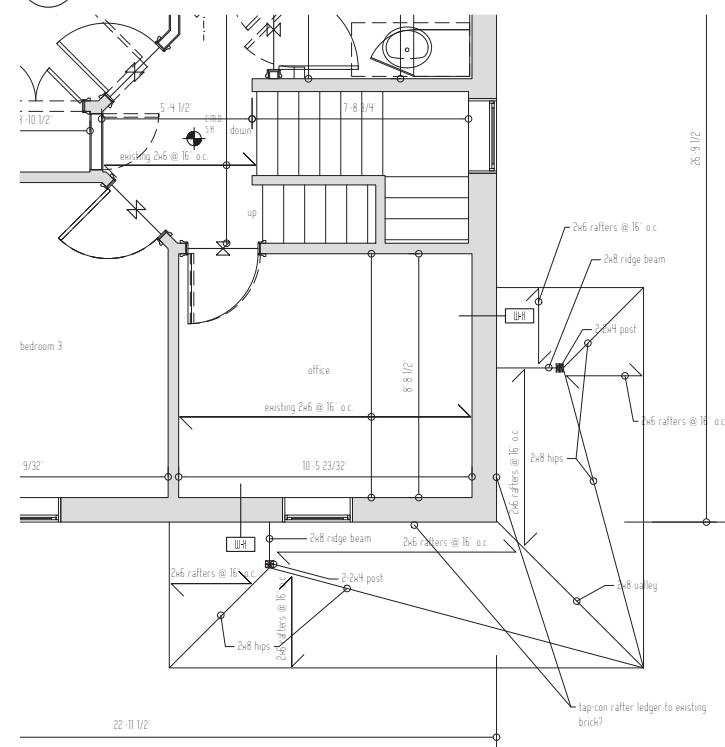


DATE	ISSUED
PROJECT	ROOF PLAN
PREPARED	ROOFING FOR DOCUMENT
CHECKED	ROOFING FOR SITE REVIEW
DESIGNED	ROOFING FOR STRUCTURAL REVIEW
APPROVED	ROOFING FOR PERMIT

City of Kitchener
Building Division
Date Received:
10/17/2013



2 roof framing plan
1/8" = 1'-0"



NOTE:
"new" measurements are to extent of framing, "old" to extent of surfaces

3 porch roof framing plan
1/4" = 1'-0"

1 roof plan
1/4" = 1'-0"

- R1 roofing: asphalt shingles fl
- R2 roofing: asphalt shingles to match existing
- R3 roofing: existing asphalt shingles

location:
reuben and sarah grin
38 grant street
cambridge ontario

project:
4 spadina road west
addition and renovation
kitchener, ontario

title:
roof plans

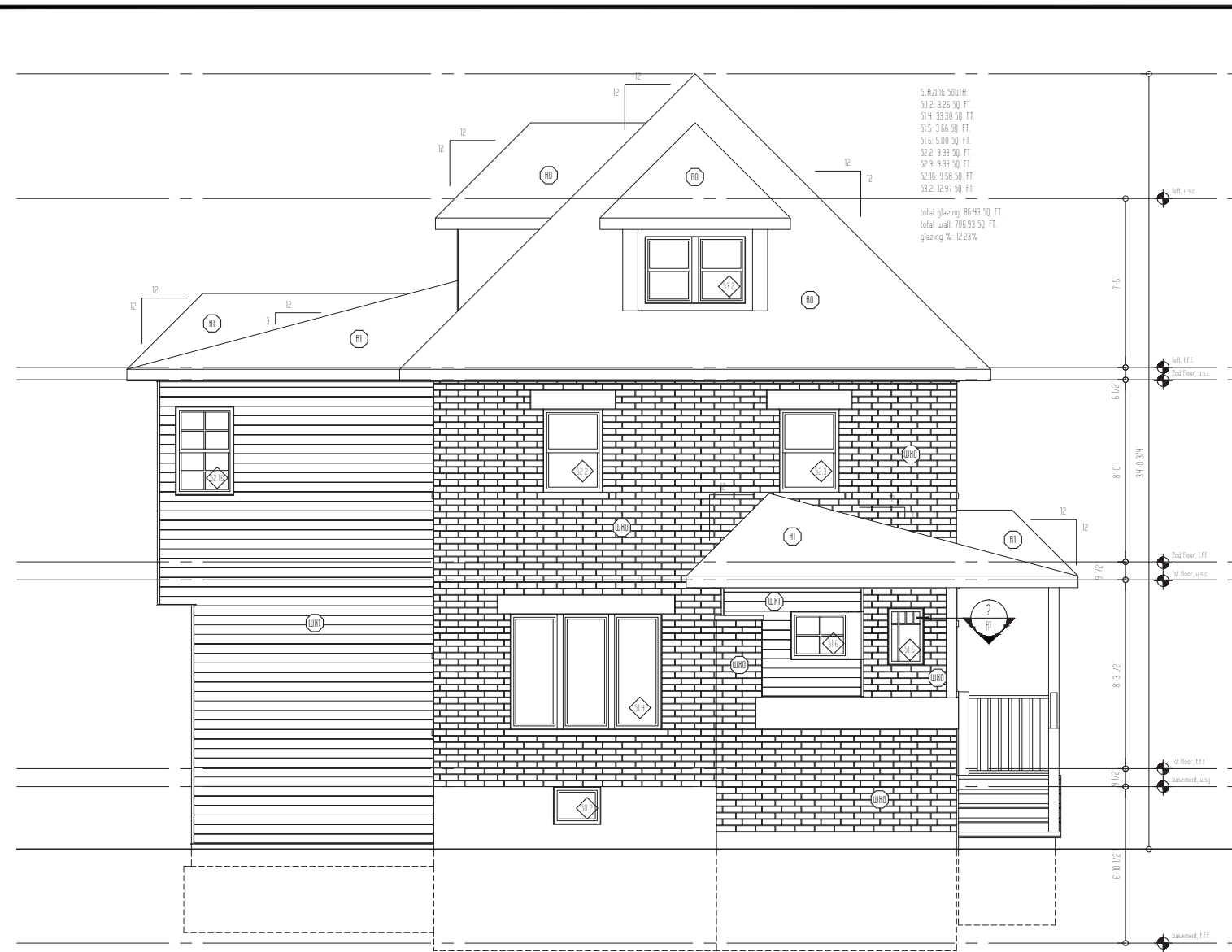
SCALE	as noted
DATE	2013/07/24
JOB NO.	2013.01
TRACER	spadina 7
DRAWN BY	rs
CHECKED BY	

The contractor shall check and verify all dimensions and report any errors or omissions to the consultant before commencing or proceeding with any work. Do not scale this drawing.

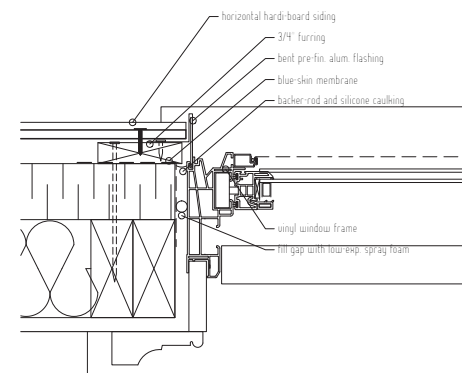
Copyright © 2013 reuben grin

sheet no.
A2-4

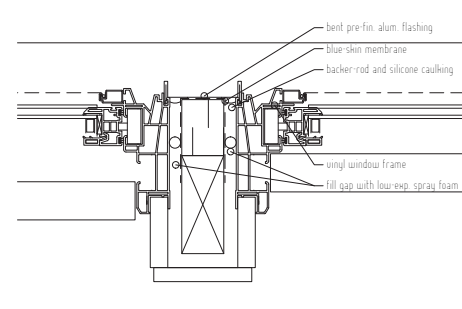
Fig. A.1.f.
Roof Plan



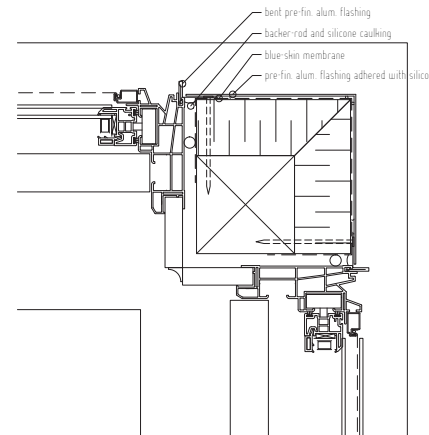
1 south elevation
1/4" = 1'-0"



2 typical window jamb plan detail
3" = 1'-0"

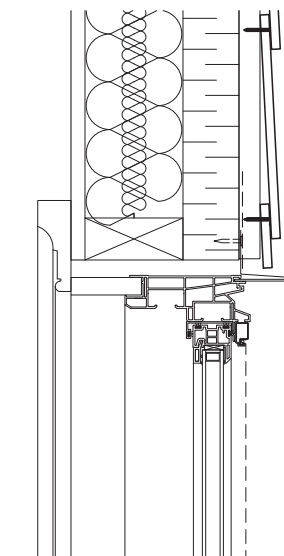


3 typical ganged window jamb plan detail
3" = 1'-0"

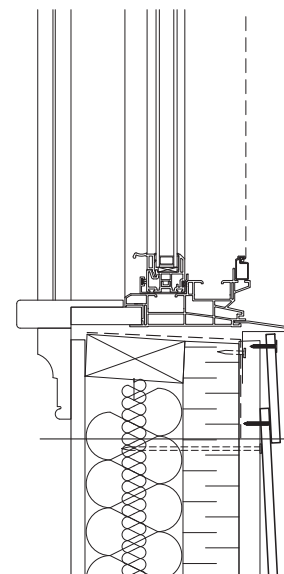


4 typical corner window jamb plan detail
3" = 1'-0"

5 typical window header detail
3" = 1'-0"



6 typical window sill detail
3" = 1'-0"



DATE	ISSUED
PROJECT	SPADINA RD.
PERMIT	PERMIT FOR EXCAVATION
PERMIT	PERMIT FOR PIPE REVISION
PERMIT	PERMIT FOR STRUCTURAL REVISION
PERMIT	PERMIT FOR STRUCTURAL REVISION
PERMIT	PERMIT FOR PERMIT

City of Kitchener
Building Division
Date Received:
10/17/2013

- UR1 wall exterior: siding ft
- UR2 wall exterior: salvaged existing brick
- UR3 wall exterior: existing brick
- R1 roofing: asphalt shingles ft
- R2 roofing: asphalt shingles to match existing
- R3 roofing: existing asphalt shingles

customer
reuben and sarah grin
38 grant street
cambridge ontario

project
4 spadina road west
addition and renovation
kitchener, ontario

title
south elevation
window jamb details

DATE	AS NOTED
DATE	2013/09/24
JOB NO.	2013.00
TITLE	SPADINA 7
DRAWN BY	RS
CHECKED BY	

The contractor shall check and verify all dimensions and report any errors or omissions to the consultant before commencing or proceeding with any work. Do not scale this drawing.

Copyright © 2013 reuben grin

sheet no.

A3-1

Fig. A.1.g.
South Elevation

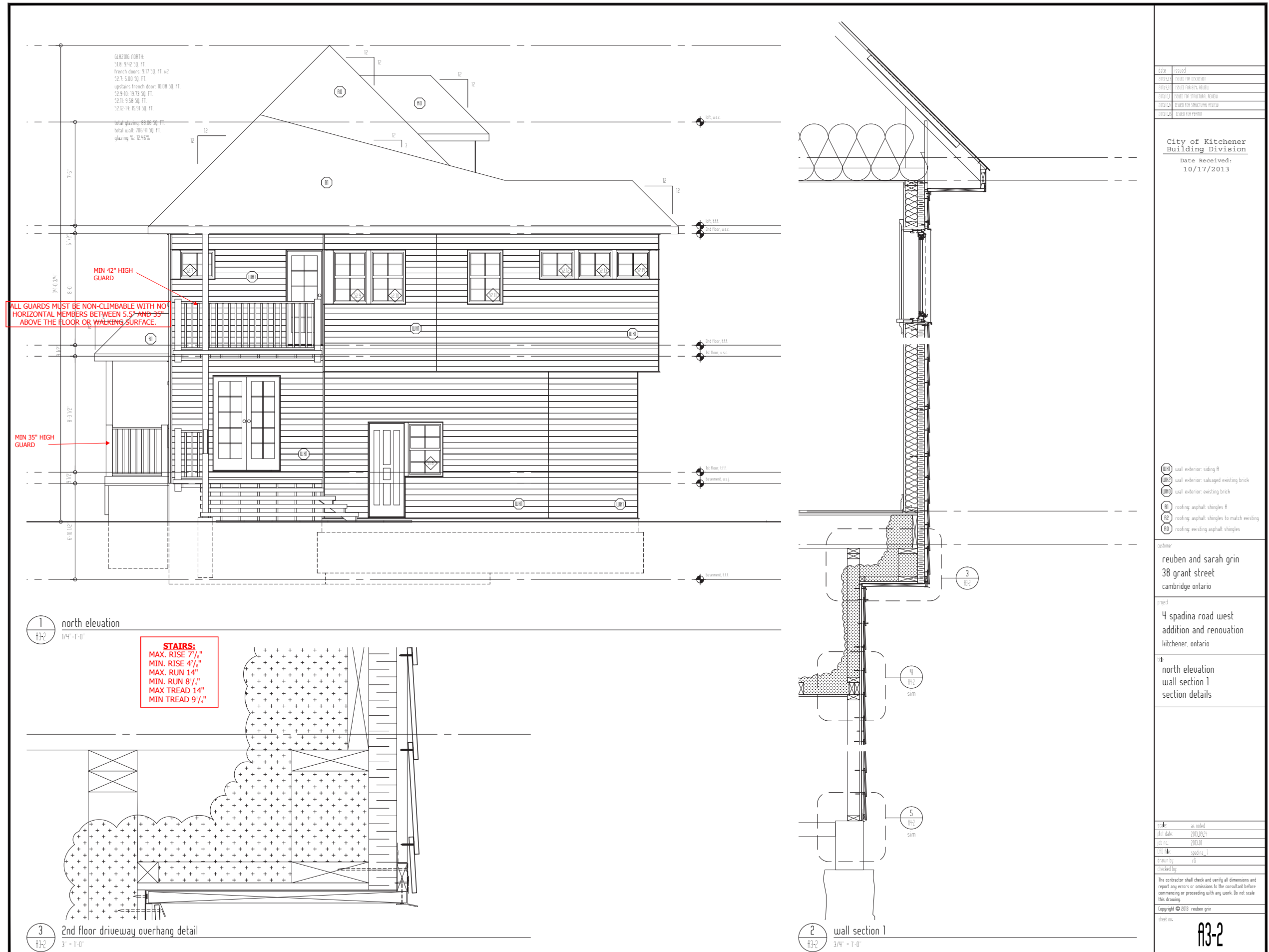


Fig. A.1.h.
North Elevation

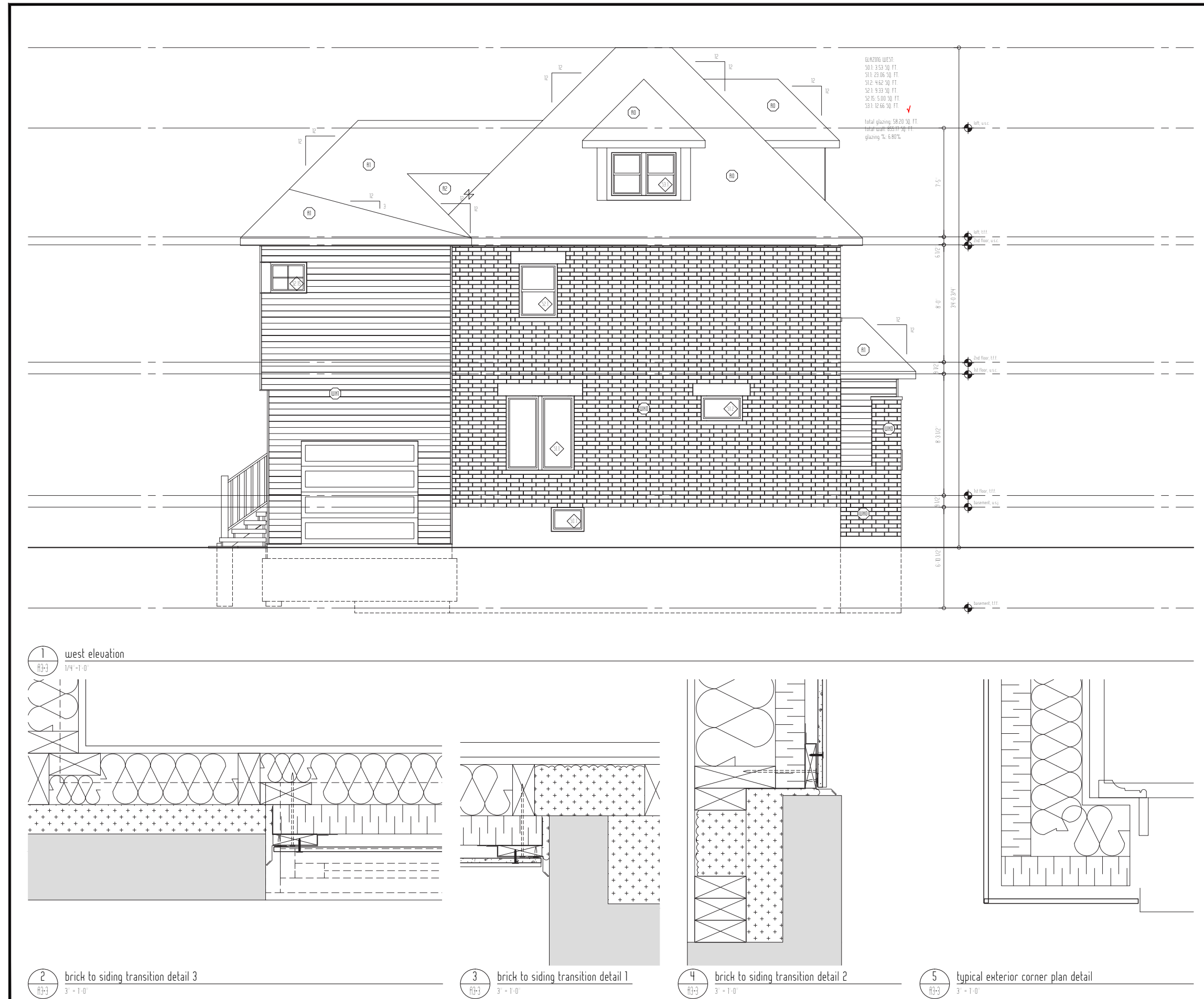
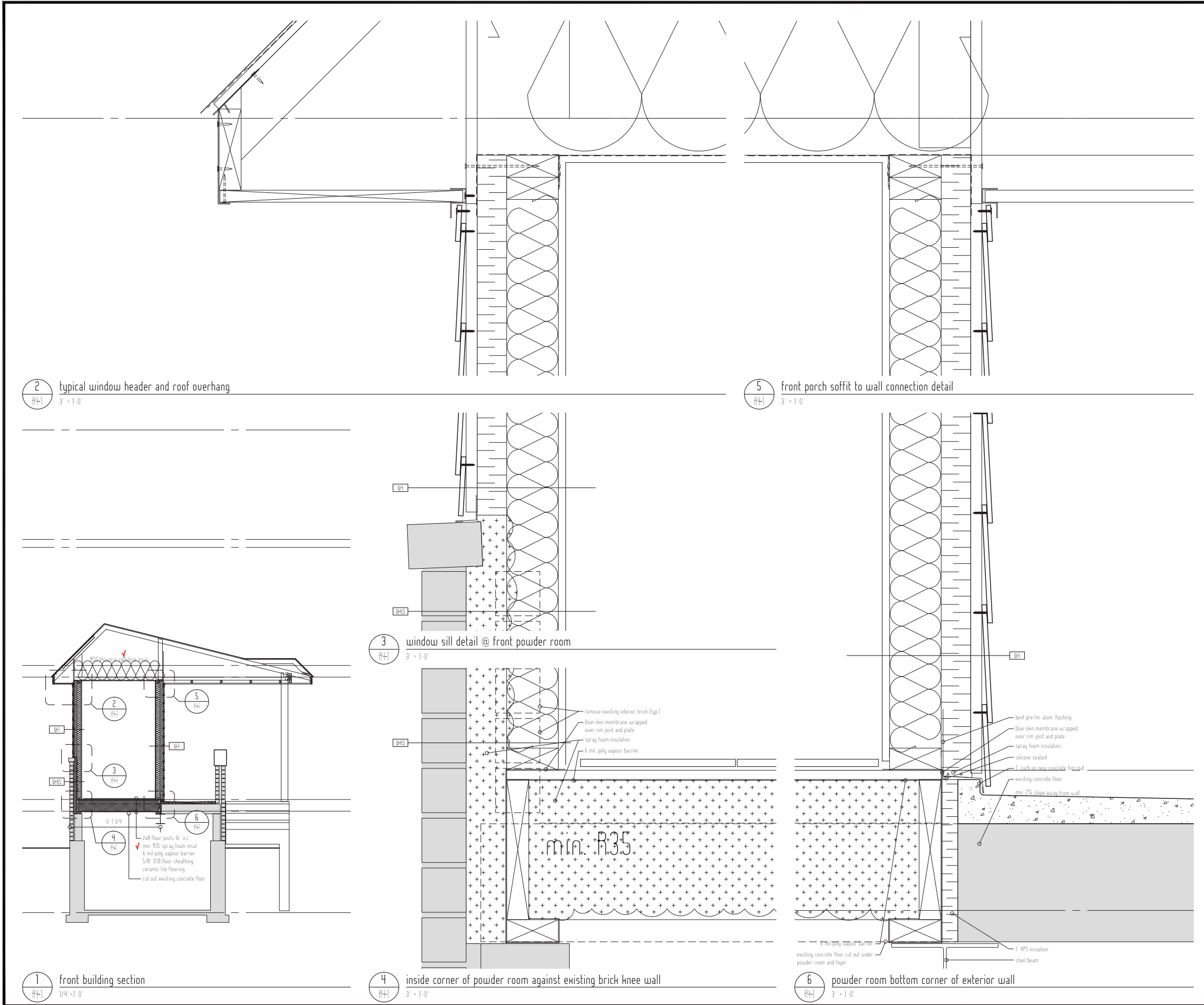


Fig. A.1.i.
West Elevation



2 typical window header and roof overhang
3\"/>

5 front porch soffit to wall connection detail
3\"/>

3 window sill detail @ front powder room
3\"/>

4 inside corner of powder room against existing brick knee wall
3\"/>

6 powder room bottom corner of exterior wall
3\"/>

1 front building section
1/4\"/>

date	issued
project	STUDY FOR RENOVATION
project	STUDY FOR POWDER ROOM ADDITION
project	STUDY FOR PIPE REVISION
project	STUDY FOR STRUCTURAL REVIEW
project	STUDY FOR STRUCTURAL REVIEW
project	STUDY FOR PERMIT

City of Kitchener
Building Division
Date Received:
10/17/2013

customer
reuben and sarah grin
38 grant street
cambridge ontario

project
4 spadina road west
addition and renovation
kitchener, ontario

title
building section 1
section details

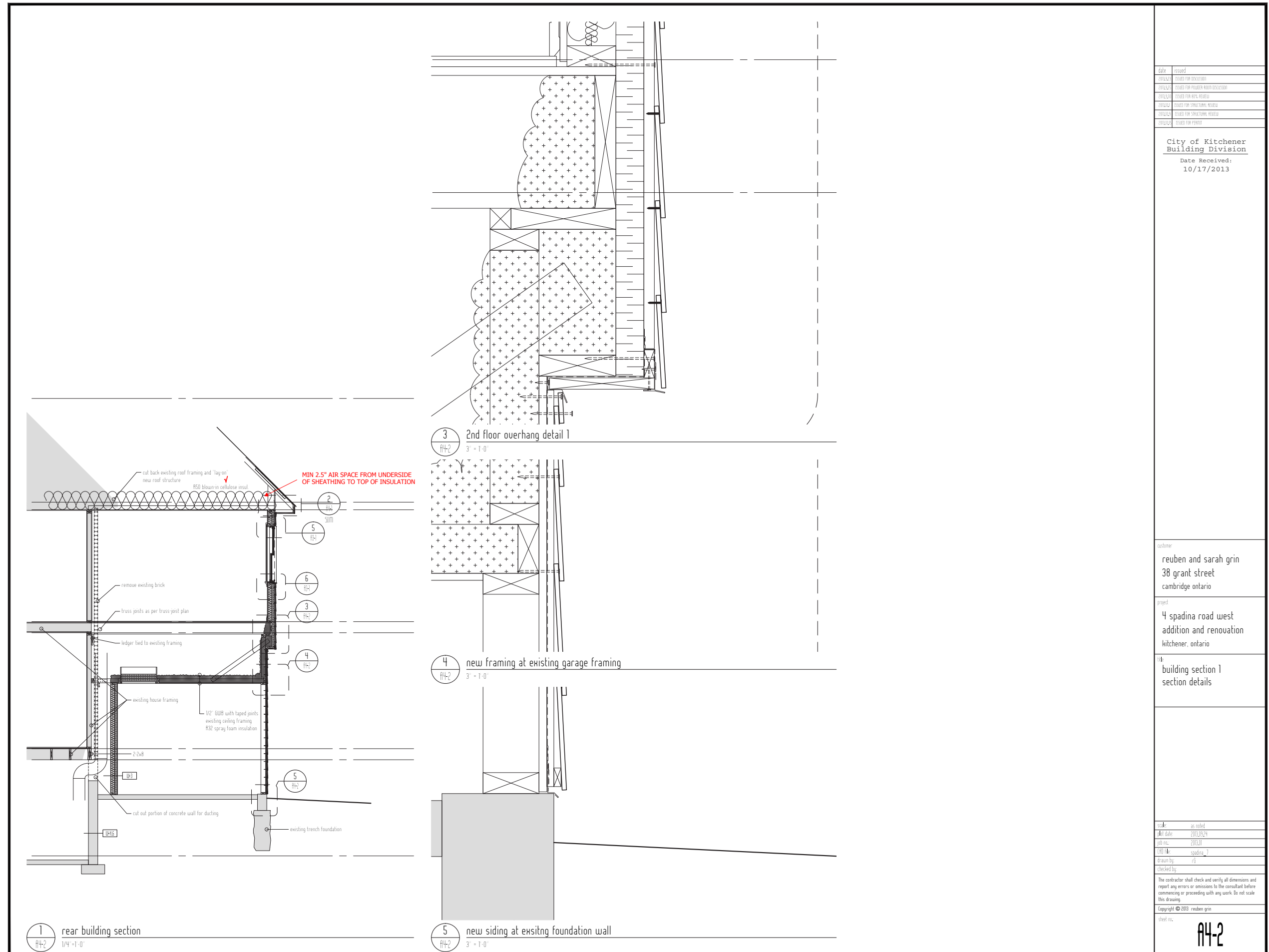
title	as noted
drawn date	2013.05.24
job no.	2013.00
TRD no.	spadina 7
drawn by	rs
checked by	

The contractor shall check and verify all dimensions and report any errors or omissions to the consultant before commencing or proceeding with any work. Do not scale this drawing.
Copyright © 2013 reuben grin

sheet no.
A4-1

Fig. A.1.k.
Powder Room Section

Fig. A.1.1.
Rear Addition Section



date	issued
revised	revised for PROVISION
revised	revised for PROVISION
revised	revised for PROVISION
revised	revised for PROVISION
revised	revised for PROVISION
revised	revised for PROVISION
revised	revised for PROVISION

City of Kitchener
Building Division
Date Received:
10/17/2013

customer
reuben and sarah grin
38 grant street
cambridge ontario

project
4 spadina road west
addition and renovation
kitchener, ontario

title
building section 1
section details

title	as noted
drawn date	2013/09/24
job no.	2013.00
drawn by	spadina 7
checked by	rs

The contractor shall check and verify all dimensions and report any errors or omissions to the consultant before commencing or proceeding with any work. Do not scale this drawing.

Copyright © 2013 reuben grin

sheet no.
A4-2

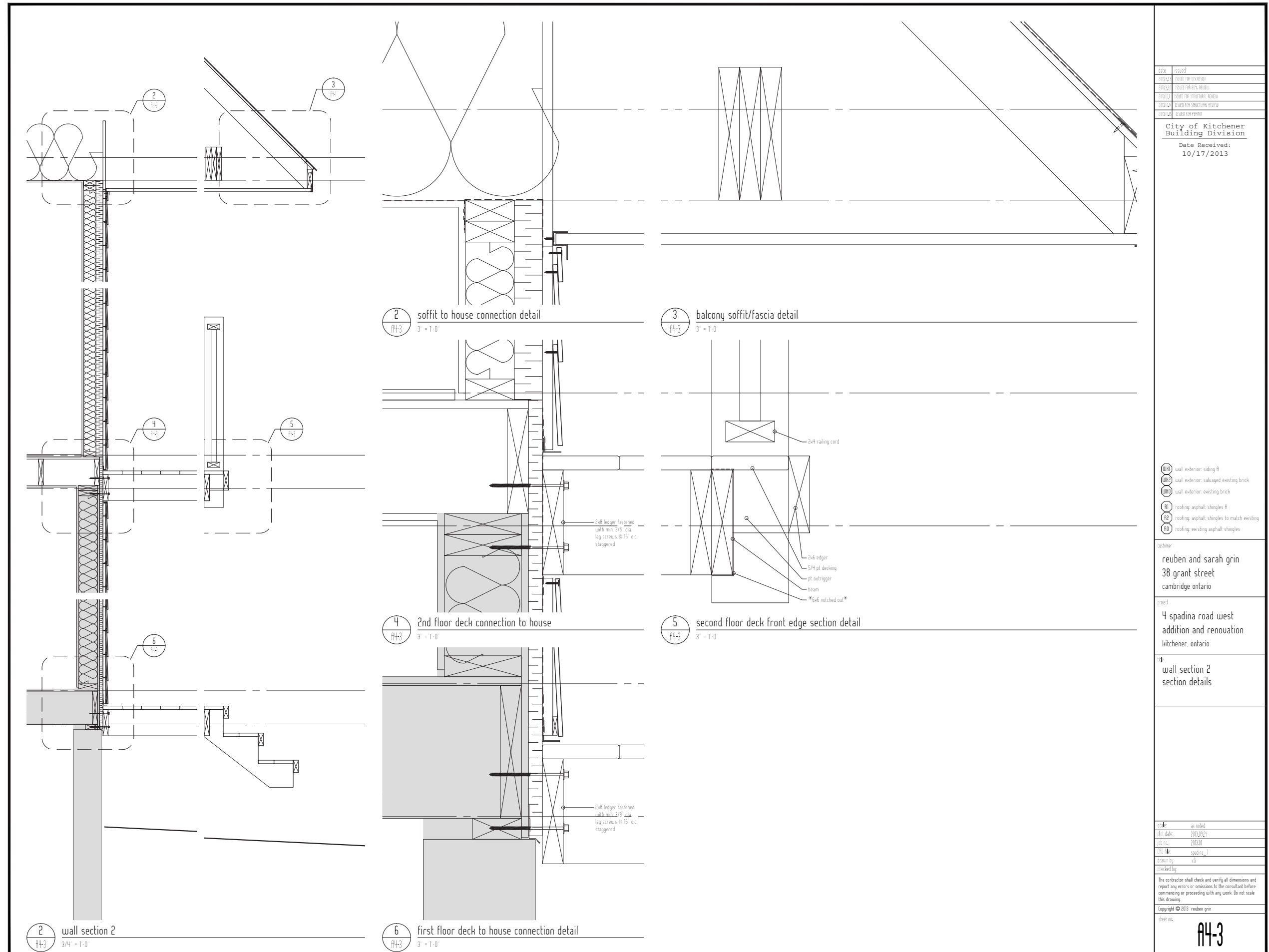


Fig. A.1.m.
Building Section

date	issued
PROJECT	STUDY FOR RENOVATION
PROJECT	STUDY FOR SITE REVIEW
PROJECT	STUDY FOR STRUCTURAL REVIEW
PROJECT	STUDY FOR FINISHING

City of Kitchener
Building Division
Date Received:
10/17/2013

location
reuben and sarah grin
38 grant street
cambridge ontario

project
4 spadina road west
addition and renovation
kitchener, ontario

title
wall section 2
section details

scale	as noted
drawn date	2013/09/24
job no.	2013.00
TRD no.	spadina 7
drawn by	rb
checked by	

The contractor shall check and verify all dimensions and report any errors or omissions to the consultant before commencing or proceeding with any work. Do not scale this drawing.

Copyright © 2013 reuben grin
sheet no.

A4-3

A.2. Construction Transcripts



Fig. A.2.1.a.
Rear Decks

This footing and pair would hold up both decks and the corner of the roof overhanging this alcove

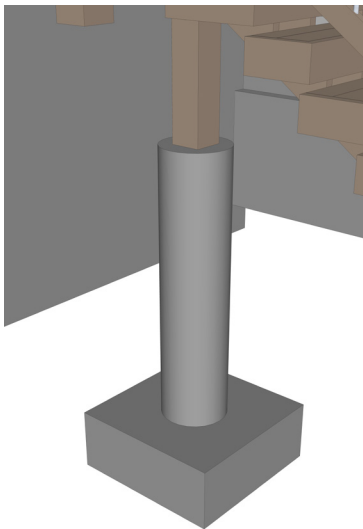


Fig. A.2.1.b.
Rear Deck Footing

Close up image of what the footing would look like underground.

A.2. Construction (Re-iteration from thesis body)

As described previously I opted to include a general contractor in the construction of my home. He co-ordinated the schedule and was available to answer questions. In addition to meetings and phone calls, by current count there are over 1800 text messages and almost 1000 emails exchanged between myself and the contractor over the duration of construction. I had at one point intended to include the communication chain as a narrative which would illuminate the construction, and the extent to which coordination and collaboration effects and drives the process of construction. I have instead opted to select a few of these communications pertaining to specific elements of construction, and, because a set of discrete conversations about particular elements gives an impression that the construction proceeded as a sequence of individual tasks, I will also include a set of the correspondence for December 6th to 23rd, two of what were perhaps the busiest and most stressful weeks of my life.

A.2.1. The Footing

There would be one new footing in the design. to support the back decks and the overhanging roof. Our engineer spec'd a 12" diameter concrete pier on a 30"x30"x12" deep concrete footing.

2013.11.08

10:47

Reuben[R.] to Jesse[J]: When/how are we doing the footing dig?

[Jesse's response was essentially: "do you have a good shovel?"]

12:05

[R.] to [J]: Can I borrow the quik-cut saw for a few days? Either pick it up this evening or you bring it on Monday?

12:25

[J] to [R]: I will need to get back to you on that one as we may need it as well. Let me ponder...

2013.11.13

12:11

[R.] to [J]: Pcwa [please call when available]

16:31

[R] to [J]: the quik cut is behaving weirdly

[R] to [J]: Have you had it bounce around on you a lot in the past?

[a quick-cut saw has a little collet that adapts the shank to the diameter of the centre hole of the blade currently being used, ours was missing - I made do.]

17:19

[R] to [J]: The slab is 11" thick

[This was a problem, I was cutting out the existing concrete slab over the footing location, at 11" thick, the slab would be impossible to cut through with the tools we had, and I'd have to rent a jackhammer, or pay a concrete cutting company to come cut it out with a big saw.]



Fig. A.2.1.c.
Quick Cut Saw

a quick-cut saw, used with a diamond blade for cutting masonry or concrete, or an various abrasive blades for cutting anything from asphalt to steel

18:00

[R] to [J]: Edge thickening :)

[R] to [J]: (I got out the drill and drilled some holes)

[Edge thickening refers to the edge of the concrete, whoever had poured it had made the first 6" of the concrete significantly thicker than the rest of the slab, I would now dig a hole beside the slab and cut from both the top and the side.]

[R] to [J]: So I'll figure out what I'm doing tonight and I think I can get it out.

19:00

[J] to [R]: Good news. Thanks for the updates on the windows.

2013.11.14

11:11

[R] to [J] and Sarah [S]: Footing hole dug. Bring drugs.

12:28

[J] to [R]: Steroids????

12:39

[R] to [J]: Pain killers.

17:51

[R] to [J]: Have you ordered the long pt 6x6?



Fig. A.2.1.d.
The Hole

[R] to [J]: I scheduled the footing inspection for tomorrow morning too.

[The first required inspection was for the footings, the inspector would want to confirm that the footings would be poured on undisturbed native soil, he just had to see the hole and the formwork]

17:56

[J] to [R]: Yes. Scheduled for delivery next Friday. Good news on footing. You may want to talk with him [the inspector] about existing beams as well and cover up your holes inconspicuously at the front of the home.

[our inspection passed the next morning.]

2013.11.15

08:06

[R] to [J]: I'm sitting in the Home Depot parking lot, I'm going to buy 18 bags of concrete mix. Is there a better way?

[J] to [R]: Order concrete through a supplier is you only other option. It is more expensive because you have to pay a short load charge but much faster

[R] to [J]: Yeah, this will be cheaper than that I think

[R] to [J]: What would you do?

[R] to [J]: 18 bags is going to cost me about \$100

[J] to [R]: Yes cheaper. It will be about 300 - 350 from a supplier because of the small load charges. A meter normally coats 120-130

[R] to [J]: K

[At this point Jesse called let me know that he figured a bag would take 10 minutes to mix, at 18 bags that would be 180minutes, 3 hours of hand mixing concrete. I decided to get my concrete on a truck.]

08:54

[J] to [R]: Going to be 360 before tax. What do you want to do?

[J] to [R]: Please call soon. I have concrete ordered for today at 2:30. 386 which includes tax.

[we ordered the concrete, if I had to do it again, I would mix it myself]

13:27

[R] to [J]: I'm scared of this thing falling in.

[J] to [R]:?

[R] to [J]: The plywood cap on my footing. [with all the back-fill on top]

15:50

[J] to [R]: Concrete won't be there till a little after 4. I just got the call.

[R] to [J]: K

17:23

[R] to [J]: None yet

17:39

[R] to [J]: Concrete just drove down the road

[R] to [J]: And away...

[R] to [J]: He's back

[J] to [R]: Great. Have fun!

18:10

[R] to [J]: Done

[R] to [J]: :)

[R] to [J]: Do you know when exactly the framers are starting?

A.2.2. 2" Rigid Insulation

For various reasons, I designed a wall assembly that consisted of 2x4 studs 16" on centre, with 2" XPS [extruded polystyrene] insulation mounted continuously over top. This particular detail, while encouraged by my professors and recommended by a building science engineer, is not often utilized by the residential construction industry, at least not in this particular corner of southern Ontario. Prior to submitting permit drawings, I had numerous conversations regarding this detail, and the building department requested clarification to the drawings to confirm this variation from the norm. To actually assemble the walls as such also required extra effort.

2013.11.26

16:57

[R] to [J]: Do you know if Gilles [the lumber supplier] sends the plastic cap nails?

[R] to [J]: For the XPS

[R] to [J]: I don't see any here, is the other load on its way?



Fig. A.2.2.e.
The Hole with Formwork

The formwork in the hole. We decided to do this as one pour, so we could backfill around the whole works before pouring. It didn't fall in.



Fig. A.2.2.a.
Plastic capped nails

These would be driven through the XPS insulation and into the framing. The large plastic cap distributes the load of the nail over a larger area and prevents the nail from pulling all the way through the insulation.



Fig. A.2.2.b.
Dumb Labour

Manually separating and re-assembling plastic capped nails.

[I was standing in what would be the master bedroom with a wall framed up on the floor in front of me, the framers needed these nails first thing tomorrow morning, this wall need to be erected to make room for the next wall]

[J] to [R]: Jeff Harron 1-519-573-9586. Is the salesman at Gillies. I sent him a text asking but I am going into a meeting. Gillies is located in Cambridge so try following up with him in the next hour. You may need to pick up on your way home if Jeff can't get them out to you. Gillies office is 1-519-653-3219 and you can speak with Jamie at the order desk or Mark in shipping.

17:55

[R] to [J]: Pcwa

[I had called Jeff Harron. He had informed me that Gilles doesn't stock 3" plastic cap nails. Because they rarely have anyone who uses 2" XPS like this they only stock nails up to 2 1/2", which would only offer 1/2" of embedment into the framing. I was not comfortable with this. As an alternative I proposed that Gilles ship the furring with the scheduled load in the morning, and also include 4" nails or screws to mount the furring through the XPS; the furring would now distribute the load of the nail and, because we would need the furring anyway for the siding, this would actually be more efficient. Jeff assured me he would include the furring and 4" screws on the load coming first thing in the morning.]

2013.11.27

7:50

[R] to [J]: Pcwa

[I was pissed, to put it mildly. The lumber load arrived, and there were no nails or furring included. I had 3 framers standing around an nothing for them to do I immediately called Jamie directly and asked if Jeff had mentioned anything - he hadn't, and to make matters worse Gilles didn't stock 4" screws or nails. Jamie said he'd try to get something out to me later in the morning, but I was S.O.L. until then.]

10:50

[R] to [J]: We're not doing the furring

[To make it work, we'd manually separated the caps from the 2" nails we had on hand and slid them on to 3" ardox framing nails. One at a time.]

[R] to [J]: They didn't have 4" nails

[R] to [J]: Or screws

[R] to [J]: So Jeff weren't to he depot an got me all the 3" plastic capped nails they had. (150)

[R] to [J]: The home depot*

[J] to [R]: Ok.

18:54

[J] to [R]: So how did the walls go?

A.2.3. The Front Porch Beams

We submitted for permit 2 weeks before we even had possession of the house. With a copy of the agreement of sale the building department would process the permit and have it ready for us when we received possession on the 25th of October. This expedited the process but also necessitated making educated guesses at some of the elements behind the walls and in the ceilings of the house. The current homeowners would not allow us to cut any holes in their walls. So we made up drawings based on these guesses, and most of them turned out pretty good, but the front porch was quite different than we had initially thought and, after a discussion with the building inspector, we decided to apply for a revision to permit with new details to take advantage of some of the existing structure. This presented a few challenges because we were actually working on two designs in tandem. The initial design was being reviewed for permit, and the plans examiner was asking for a connection detail from the engineer to show how we would connect the beams as they were detailed in those drawings. We were also trying to figure out how we might actually construct this corner considering what we'd found out during demolition.

2013-10-30

10:06

[R] to [J]: Bin is delivered. ETA on steel beam detail?

[Nick, our engineer was preparing a detail that we had no intention of using, to satisfy the plans examiner to issue our permit. We would revise these later.]

[J] to [R]: This afternoon. Nick couldn't finish a job on Monday that was pushed until Tuesday. Good news on the bin.

Plans Examiner

The individual at the building department who reviews the plans submitted for permit, and ensures they conform to the building code. This person is different than the building inspector, and the two might have different opinions on different elements of the building.

Building Inspector

The individual at the building department who reviews the construction at various stages. He or she is responsible for ensuring that the constructed building matches the drawing and meets code.



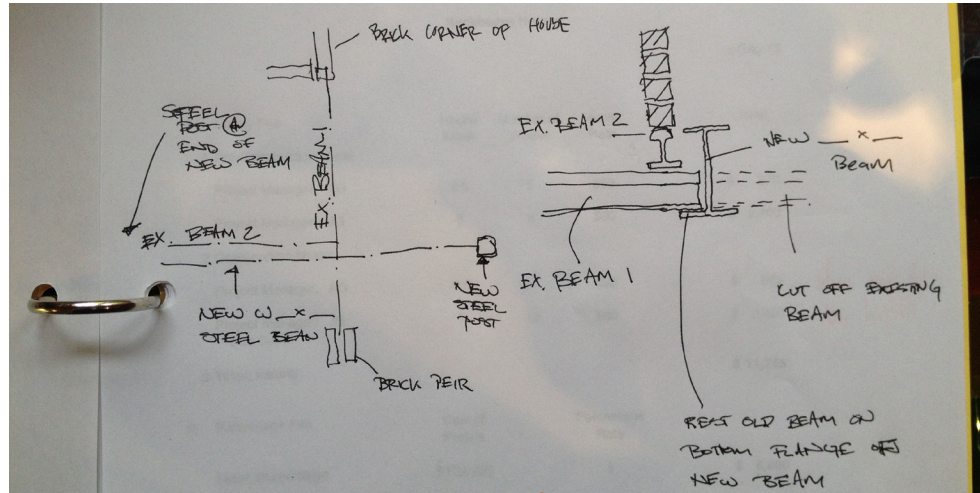
Fig. A.2.3.a.

Front Porch Brick

The office hung over the front porch, part of which we were going to convert into exterior space. Structurally we had to find a way to carry these loads.

Fig. A.2.3.e.
Structural Sketch

My initial thoughts about how to carry the office above now that we knew what was going on behind the walls.



11:20

[R] to [J]: Here [fig. 4.6.2.3.e.] is what I think we should do with the beams at the front. Maybe give me a call? If you have time? This is probably more involved than we should do for permit...

16:08

[R] to [J]: Any idea on the steel beam detail? Tomorrow probably?

[J] to [R]: Yes he's fairly backed up.

[R] to [J]: K

17:19

Nick to [J]: Please find attached the certified steel connection for Reuben's project.

18:44

[R] to Jon [plans examiner]:

Hi Jon,

Please find attached a pdf [appendix B] addressing your questions, including a stamped detail for the steel beam connection at the front porch. Sorry this was delayed, my engineer took longer than anticipated to produce the connection detail. I hope this addresses all of your concerns. Please don't hesitate to email: reuben.grin@gmail.com, or call: 519-240-2780 if you have any further questions.

Thank-you

r

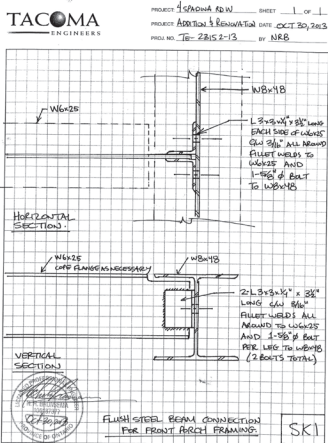
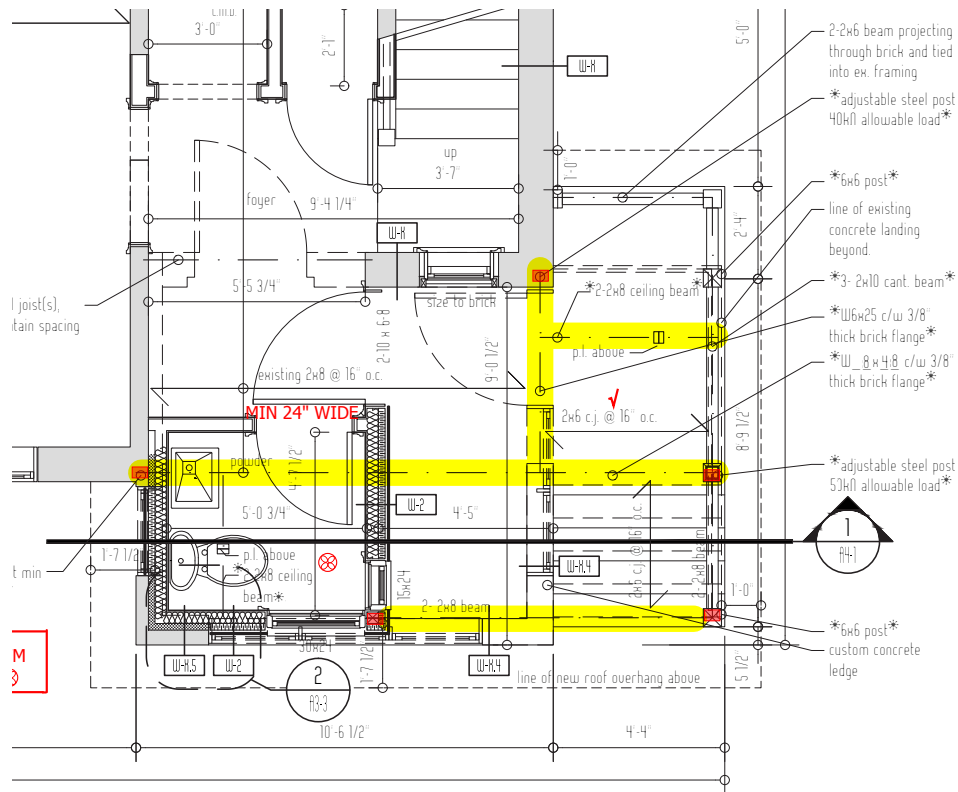


Fig. A.2.3.b.
Connection Engineering
the beam detail to satisfy our plans examiner



NOTE:
 "new" measurements are to extent of framing. "old" to extent of surfaces

Fig. A.2.3.c.
 Front Porch Permit Plan

The original plan for the front porch beams and columns. Engineered and submitted for permit. Marked up by our plans examiner.



Fig. A.2.3.d.
 Original Connection

The original connection detail holding up the office brick and floor

2013.11.05

10:58

Jon to [R]:

Hi reuben,

This permit is now ready for pick up. Fee is \$983.66 which includes a \$250.00 deposit. The drawings are available on our online system for you to download. Ensure when you print them they are colour.

Jon

2013-11-06

11:33

[R] to [J]: I've got a pre-construction inspection scheduled for tomorrow. Would it be worth it to re-schedule when your on site?

[J] to [R]: Pre construction? And yes.

[R] to [J]: Yeah they come out and look and go over the project together

[R] to [J]: Do you think Monday will work?

[J] to [R]: Mid day on monday yes. Let me get back to you.

[R] to [J]: The inspection is optional...

[J] to [R]: No it may be a good idea to meet and discuss what has been demolished and get a feel for our inspector.

[R] to [J]: Yeah that's what I thought

[R] to [J]: I'll cancel tomorrow's anyway - and let him know that it will be early next week

[J] to [R]: Ok.

[At this meeting I wanted to talk with the building inspector to determine what he would accept if we decided to support the front differently than the permit drawings.]

2013.11.17

23:28

Hi Jesse,

I've put together a package of drawings comprising how the project has changed in the past couple weeks. The changes have been bubbled and labeled with a 1 - indicating revision 1. If you want to forward this to the framers, these would be the best ones to do this with.

I also need to submit something to the city for an application for revision to

permit. I'm kind-of scared of this but the inspector requested this and I have a feeling like this is going to delay something somewhere. Do you have experience with this?

My inclination now is to get Nick to review these drawings and approve the post move and keeping the existing beams. Alternatively it might be nice for you to try to talk to the inspector and ask him what he really wants. I got talked into this re-submission and I'm not sure what it means really.

Let me know what you think,

r

23:36

Hi Jesse - please find attached the latest drawings.

I also re-designed the ceiling of the garage to eliminate that crawlspace - I don't want to get dinged again if the inspector sees us changing this.

If you could forward these on to the proper people that would be great. I will submit for revision when we hear back from the engineer.

Thanks,

r

A.2.4. Two Weeks

With two weeks of showing up with the framers at 7:15am and leaving in the dark after cleaning up and securing the site once the framers left, I thought perhaps that there might be a little breathing room. At a family get-together I discussed the coming week with Jesse. The roofers had started on the previous Thursday, December 5th and on Monday the Electrician, Plumber, and HVAC trades would be coming to start rough-in. Jesse also had a list of 53 items to complete before insulation could start. He thought that conservatively there were 40-50 man-hours on the list + whatever came up day to day as trades installed all the services. Once rough-in was done and the insulation was in, and the boarders started, I should be able to take a break. I had the option now to take an extra week after rough-in to finish the list, and push the whole schedule back a week; the taper could start in the new year, and the trim would start in the 2nd week of January. I rashly committed to manage the site, and complete the work in time. We scheduled the plumbing inspection for Thursday, HVAC, electrical and framing for Friday, and insulation and air barrier for Monday afternoon - anticipating that the insulators would take only the morning to insulate and poly. Boarders could start on Tuesday.

2013.12.06: Friday

11:09

[R] to [J]: Pcwa

11:17

[R] to [J]: Call me when you can

11:43

[R] to [J]: Did the plumber drive off with my parking pass?

[J] to [R]: He didn't give it to me...

I will text him. He is back monday.

[R] to [J]: K

[J] to [R]: That is fine

11:48

[J] to [R]: How do you get in the house when you are not there?

[R] to [J]: There is a key in the side burner of the BBQ by the side door.

[J] to [R]: Ok. Good to know for next week. What door?

[R] to [J]:The side door.

13:19

[R] to [J]:I'm going to move the key into the garage and give you the code? And put the key in the garage?

[R] to [J]:That's a little more secure?

[J] to [R]:That's fine especially if someone steals the BBQ.

[R] to [J]:Yes, especially if they do that.

[R] to [J]:The garage combo is 5908

[J] to [R]: Perfect.

[J] to [R]:Are you working tomorrow as well?

[R] to [J]: Maybe in the morning.

[R] to [J]: The key for the side door is hanging on the stud beside the garage man-door.

[R] to [J]: Are you and Sarah able to go through the house to review any particulars regarding the electrical so you know for Pete on Monday? Thanks re: key.

[R] to [J]: We'll try to get to that this evening.

[J] to [R]: Or on the weekend with the plans is fine.

[R] to [J]: Probably both.

14:52

[J] to [R]: Did you order all of your plumbing fixtures?

[R] to [J]: My understanding is that we did.

[R] to [J]: I said that barring any comments from you we approve.

[J] to [R]: Ok great.

14:59

[R] to [J]: I just called them. I can't sign off. You or The plumber needs to...

[R] to [J]: So they never got that

[J] to [R]: Ok. I'll call Tom.

[R] to [J]: If it is tom's account he would have to.

[R] to [J]: Thanks. Good catch.

[J] to [R]: Yes.

[R] to [J]: I don't know these things.

[J] to [R]: I know. That's why I'm checking up.

[R] to [J]: :)

15:18

[J] to [R]: Tom will be emailing Linda today.

[R] to [J]: K

[R] to [J]: Thanks

15:26

[R] to [J]: How far offset can a point-load be?

[J] to [R]: Not really anything. Why?

[R] to [J]: The HVAC is goin to have a hell of a time getting through here.

[J] to [R]: Oh....is that what terry mentioned?

[R] to [J]: Yeah essentially.

[R] to [J]: How many studs do I need to carry that lvl in the roof minimum?

[R] to [J]: Well when I opened up the Wally it is worse than I we thought.

[R] to [J]: Wall*

[J] to [R]: The width of your point load must match the width of beam.

[R] to [J]: What about the depth? Like the number of plys?

[at this point we had a conversation - we needed a three ply 2x6 post and this would be in the way of the chase that the HVAC contractor (Terry) had already measured up for the custom build duct connections]

15:38

[J] to [R]: Terry Hartwig - 1-519-831-1234

[I had to call Terry to tell him]

15:44

[R] to [J]: Terry knows.

[J] to [R]: Perfect!!!

17:33

[J] to [R]: Do you know off hand what size the pocket doors are in your house
x 2

[R] to [J]: Can I fit a 2-6 door in a 71" opening?

[R] to [J]: Correction 61

[R] to [J]: The other one is a 2-10

[J] to [R]: I don't think so but I'm unsure.

[R] to [J]: If you could confirm one way or another I'll figure out what we're doing then. Could I borrow your framing nailer + some hose if possible?

19:30

[R] to [J]: You tried calling?

[J] to [R]: Pocket dial

[R] to [J]: G'nite

[J] to [R]: U 2

2013.12.07: Saturday

09:08

[R] to [J]: How far do I have to drop the ceilings in the showers to avoid the insulated pots?

09:21

[R] to [J]: We're adding [extra] pot lights....

09:59

[R] to [J]: Did you push the trim to after Christmas?

10:03

[R] to [J]: I'm going to stop now. Have a good morning. See you this afternoon.

10:19

[J] to [R]: You need to drop the ceilings 8" I believe. How many more potlights did you add? We can talk about schedule this afternoon maybe and the amount of work required to keep on schedule for drywall.

[R] to [J]: K

[R] to [J]: I'm out of the house right now, and would want to double check with the drawings we sketched to confirm the pot lights. Text you in an hour with final numbers?

[J] to [R]: Ok.

10:42

[J] to [R]: Is our concrete saw back at the shed with our gas can?

[R] to [J]: It's in my truck, I'll bring it this aft?

[R] to [J]: I've been using it to cut brick lately, I think I'm done except for the front windows, but I should be able to get that with the angle grinder.

[J] to [R]: Don't need it I just didn't see it yesterday so I was curious.

11:29

[R] to [J]: Pot lights.

[R] to [J]: 10 interior, non-insulated

[R] to [J]: 4 existing interior non-insulated to be re-installed

[R] to [J]: 5 interior insulated

[R] to [J]: 5 exterior

[R] to [J]: Of the 10 interior non-insulated, 2 are for showers.

[R] to [J]: Do you often drop the ceilings in the showers enough to put uninsulated pots in?

[R] to [J]: Uninsulated*

[R] to [J]: 8" seems like a lot.

[J] to [R]: No we don't unless it is a 9' ceiling. If you drop the ceiling it will cost less on tile as well. We can ask pete on monday what the exact depth is.

[R] to [J]: "I'm measuring out an 8"" drop and standing under it and it's too low, 6" is better. So if we can't fit the pot in a 6" drop it will have to be an insulated instead.

[R] to [J]: Thanks Jesse."

[R] to [J]: I can keep the saw for that cut then?

[J] to [R]: Yes

[R] to [J]: Thanks, I feel bad to be bugging you all the time. It feels like everything has to be sorted out yesterday though.

12:02

[J] to [R]: It's totally fine. The joy of material decisions and building your own place as well as providing labour. See this afternoon. What time will you be at the rents house.

[R] to [J]: We're planning on heading out around 11:40

[J] to [R]: K see u soon

19:56

[R] to [J]: I grabbed a roll of poly and tyvek from the shed.

[R] to [J]: Also 1 spray gun (left one for you) and a box of foam and a can of



Fig. A.2.4.a.
Plumbing Challenge
Our plumber, Lambert, pointing to a point load he wanted to drill a hole through for a plumbing vent. We did it differently.



Fig. A.2.4.b.
HVAC Challenge
Terry, our tinbasher [HVAC installer] needed the ceiling joist notched out further to avoid a bulkhead. We decided on a bulkhead.

cleaner.

2013.12.09: Monday

08:32

[R] to [J]: The place looks great. Thanks Jesse.

My (free) pleasure. Have a good day and call if you need anything.

09:27

[J] to [R]: Did you get snow and freezing rain in kitchener?

[R] to [J]: Snow, no freezing rain.

How much?

10:29

[J] to [R]: Coring holes tomorrow or we'd morning. Roofer will be back tomorrow. Text me when trades are onsite please and thanks.

11:30

[R] to [J]: All trades are here

12:55

[R] to [J]: How deep do isle the shower nib wall

[R] to [J]: 31.5 ok?

[J] to [R]: 3.5" is fine yes.

[R] to [J]: I mean long.

[R] to [J]: I'm saying 2" tile on the end of the wall cornered from the skirt.

[J] to [R]: If that works for your design yes

13:51

[R] to [J]: Resilient channel on all truss ceilings?

[J] to [R]: Yes.

14:19

[R] to [J]: Can he go through this with 1.5" abs? [fig. 4.6.2.4.a.]

[J] to [R]: How big?

[R] to [J]: 1.5"

14:42

[R] to [J]: He's doing it differently

[R] to [J]: Never mind

17:50

[R] to [J]: Can we notch out the ceiling joist that is sitting on this wall? [fig. 4.6.2.3.b.]

[J] to [R]: If the wall is loadbearing then yes. If not, then no.

[R] to [J]: Also the air return in the master, does that have to be low wall, or can it be high wall.

[J] to [R]: Whatever the engineer specified.

18:15

[R] to [J]: The days are short

[J] to [R]: Yes the night comes fast...



18:35

[J] to [R]: Where do Harm and Joan live exactly? I'm trying to get the pocket door frame delivered and they are not in the kitchen area till end of next week...

[R] to [J]: 405 west river road, Brant

20:38

[R] to [J]: I'll get it done for Monday



21:22

[J] to [R]: Ok. What about the concrete breaking in the coldcellar?

[R] to [J]: It's done

[R] to [J]: :)

[J] to [R]: Awesome! Have a good night and call if you have any questions.

[R] to [J]: Will do.

Fig. A.2.4.c.
Tub Insulation

Walls behind bathtubs need to get insulation and poly behind them before they are installed. I'd be doing this by light of a flashlight because the tubs would be installed tomorrow

2013.12.10: Tuesday

10:10

[R] to [J]: What time are the coring guys comming?

[J] to [R]: I don't have an exact time it may be later today or first thing in the am.

[R] to [J]: K

12:17

[R.] to [J]: Can I use this R13.5 stuff behind the tubs?

[R.] to [J]: The insulation that is here from existing.

[J] to [R.]: Yes you can.

[R.] to [J]: Ty

[J] to [R.]: It's roxul correct?

14:41

[R.] to [J]: How wide is the casing?

[J] to [R.]: 2.75"

[J] to [R.]: Also, please think about central vac locations assuming a 30' hose and close to electrical outlets. Please call when available to discuss.

16:16

[R.] to [J]: Thanks

[J] to [R.]: ?

16:44

[R.] to [J]: No coring guys yet.

[J] to [R.]: Ok. I will follow up. Most likely tomorrow then.

2013.12.11: Wednesday

09:43

[R.] to [J]: Do you have any better idea when the coring guys might show up?

[I was getting hassled constantly by the plumber for the holes to be drilled, he needed them to finish rough-in in the new powder room]

09:47

[R.] to [J]: Tubs may or may not be here this week, more likely next week....

[The late signoff might bite me in the ass here]

09:58

[J] to [R.]: Ok and 12. His daughter just had a baby....

10:16

[R.] to [J]: We'll I guess that is ok.

[R] to [J]:Thanks do the update

[J] to [R]: I guess so. What is Lambert saying about installing those tubs after drywall? Please call if this needs to be a discussion.

[I called, we figured out how to install them after the board]

10:43

[R] to [J]:You didn't find my permit package when you cleaned up on Saturday did you?

[R] to [J]:Yes you did, and I just remembered where you put it

[J] to [R]: In you "tool box cabinet"

[R] to [J]: My rah

[R] to [J]:Yeah*

[R] to [J]: Inspections scheduled

[J] to [R]: Ok for when?

[R] to [J]: Plumbing tomorrow aft, framing and HVAC Friday morning.

[J] to [R]: Ok. Thanks.

12:31

[R] to [J]: Pete is asking about bathroom fans, I texted Terry.

[Terry supplied the fans, but Pete (Electrician) would install them]

[J] to [R]: Ok. Terry should have them.

[J] to [R]: Ok. Terry should have them.

[R] to [J]: K

18:21

[R] to [J]:When is terry comming back?

19:05

[R] to [J]:What's your site laborer's name? Can I borrow him for Friday?

[R] to [J]: Mom is going to clean up the house on Friday too.

[R] to [J]::)

21:41

[R] to [J]: I've done enough hand framing to last me a while now.

[R] to [J]:Would it be possible for you to bring the nail gun and gun spikes on

Friday morning? Along with the heaters I think? I'm going to try and have a few people out on Saturday for the final push and that would really help.

[By now I had figured out I was really in trouble, but too proud to admit we should hold off with the insulators. I texted or called just about everyone I knew to see if I could get people to help. I ended up getting my mother to help on Friday, and father-in-law and two friends to come and help on Saturday. I also managed to get one framer to come on Friday.]

2013.12.12: Thursday

11:21

[R] to [J]: Roofers aren't here today?

11:28

[R] to [J]: Is this your ladder?

[R] to [J]: I think the roofers took yours and left theirs. This one is just raw steel at the top.

[J] to [R]: Yes that is ours.

[R] to [J]: K

11:44

[R] to [J]: Are the roofers back tomorrow to do the porch roof?

[It was now too cold to shingle, and the roofers wouldn't be back for a while, we would however start insulation and board without a finished roof over the powder room, if it thawed, things would start to melt, and I wouldn't be able to turn the heat on in the house until the roof was finished for fear of the heat from the house melting the snow on the roof and that water wrecking the gypsum board. I started paying very close attention to the weather.]

14:51

[J] to [R]: Terry is coming Friday at 8:00

[R] to [J]: Great. I just talked with him as well.

16:07

[R] to [J]: Can you add a air hose to your list? Mine is pretty short.

[R] to [J]: Dan is going to try I send Seamus over tomorrow too. Which will help out.

[J] to [R]: I already have in my truck.

[R] to [J]: Thanks

17:34

[R] to [J]: Can you check with Lambert how plumbing inspection went?

18:38

[R] to [J]: And do you have any extra hard hats? For on site? Can I ask Mom to bring some from the shed?

[R] to [J]: Yes you can ask Mom.

18:53

[J] to [R]: Plumbing passed

[We were now 2 for 2 on inspections]

[R] to [J]: Thanks Jesse

2013.12.13: Friday

12:17

[R] to [J]: Framing passed. We missed one point load but he's trusting us.

[3 for 3]

[J] to [R]: AWESOME! What about HVAC?

[R] to [J]: That too

[4 for 4]

[J] to [R]: Even better

12:32

[R] to [J]: You tried calling?

12:52

[R] to [J]: I'm just going to bulkhead the laundry room.

[J] to [R]: Ok.

18:37

[R] to [J]: I think this spray-gun for the foam may be pooched. I'm going to try to see if it isn't blocked tonight. Can I buy one of these at Home Depot or the like?

[R.] to [J]: The place looks good though, mom cleaned to whole upstairs. And vacuumed. So I think we're on track.

[R.] to [J]: Pete is all done and ready for insulation and board. So I just have to finish up your list tomorrow.

[Pete (electrician) is qualified to "self-inspect" one of the reasons we used him. This means he has to call for inspections, but if the ESA inspector decides not to come out we can continue]

[5 for 5]

[R.] to [J]: Thank-you. By the way. I was saying to mom too, you're a huge asset, and I couldn't keep all the things straight that you keep in mind.

2013.12.14: Saturday

16:47

[R.] to [J]: Can the boarders bulkhead the garage?

[It was the end of a hectic day with 3 semi-qualified helpers on site to finish up some of the list I had remaining, I would be back all day Sunday to finish up by myself and I was trying to find ways to get other people to do some of the work too.]

2013.12.15: Sunday

21:15

[R.] to [J]: Air barrier and insulation inspection scheduled for PM on Monday.

[I had finished my list, less a couple things I would get done in the morning while the insulators were there, including repairing a drain-pipe I had managed to drive a nail through in the dark.]

2013-12-16: Monday

[I was supposed to be mostly off the hook now, I'd finished up the list, and the boarders were coming, how much more could I have to do? What I was about to find out is that going nuts to keep the schedule on track just makes the next push come sooner.]

09:15

[R.] to [J]: Insulators are here.

[R.] to [J]: They're asking about when the spray foam will arrive.

[J] to [R]: This afternoon

[R] to [J]: Can I foam the windows from inside after they do the poly?

[J] to [R]: Yes if you cut the poly away.

[R] to [J]: K

[R] to [J]: It's so cold that the foam just dribbles out

[J] to [R]: Yes you must keep the foam warm.

[J] to [R]: Once they get the insulation in the furnace will head up the house enough

[R] to [J]: I am, it starts out flowing, then owns down drastically

[R] to [J]: Slows down rather

10:03

[R] to [J]: They want to caulk from the filing to the wall.

[R] to [J]: Ceiling*

[Jesse has a bunch of details for the poly air/vapour barrier. Ones that have to be repeated to the trades each and every time they install. Insulation/poly/board/tape is an interesting sub-trade because one company bids all those elements and then subs out the jobs to various independent contractors that work for them. This creates communication breakdowns, but gets us a better price. Jesse had asked me to tell them to tape the wall poly to the ceiling poly, they wanted to caulk it, we said this was OK.]

10:51

[R] to [J]: I haven't been able to get a hold of the inspector. I did note in the inspection request online that we would like it nearer the end of the day.

[R] to [J]: Spray foam guys are here

[R] to [J]: We might loose the batt insulators when the spray foam guys start....?

[The push-in [fiberglass batt] insulators didn't want to be in a house full of fumes from the spray foam.]

11:06

[R] to [J]: The spray foam guys only do 3 sides of the ducts...

[We had discussed 4 sides, but ended up agreeing with the spray foam guys]

11:12

[R] to [J]: The kitchen stove plug doesn't work with the heater plugs or the adapter.

[I needed to plug in a heater, so I could spray-foam the windows, but the plugs didn't match. The heater had a male dryer-type 240 plug and the one in the wall was a stove-type 240 outlet.]

11:55

[R] to [J]: The tubs are scuffed and have black all over them

[I flipped out. One of the insulators had a ladder set up inside the tub, and one of the others was getting black acoustic seal caulking all over the place. I think I almost made them quit. They just stopped, took a smoke break, and told me: "You have to learn how to talk to people.", when they re-entered the house.]

12:12

[R] to [J]: It's not as bad as I thought at first. I definitely have protection over them now.

[J] to [R]: Perfect. WDs0

[J] to [R]: Perfect. WDs0

[J] to [R]: WD40 or babyoil takes that stuff right off.

[R] to [J]: K

12:49

[R] to [J]: I don't like this at all

[R] to [J]: Being site super

[R] to [J]: Are they putting batt or blown-in in the powder room?

[J] to [R]: Blown in is fine.

[R] to [J]: That's what I said

[R] to [J]: They don't like me much right now cause I flipped out when they had a ladder in the tub and we're standing on the edges.

[J] to [R]: They don't need to like you, just get the job completed. I think you are doing well.

[R] to [J]: True, but it's just not really what I'm good at/enjoy. So it is stressful. Thanks though, it should be done soon anyway.

[R] to [J]: Yes I know, it's not a very glamorous job especially with the variety of people that all need to be motivated and dealt with differently.

[R] to [J]: I'm not saying it isn't glamorous. Just not my hat. I wish I was as good at it as you.

[J] to [R]: Thanks for the compliment. It's really just experience. It's like the duck

anology, on the surface they are gliding along but underneath they are paddling like crazy.

13:28

[R] to [J]: The ceiling of the hallway, can they blow in between the ploy and the crawl space floor slats?

[No they can't. I had them rip down the ceiling poly and push-in insulation]

13:49

[J] to [R]: Please call regarding pocket door.

14:10

[R] to [J]: Is they spay foam in the pex ok?

[J] to [R]: Yes on it is fine.

14:20

[R] to [J]: Push-in guys are done and gone

[J] to [R]: Excellent

[R] to [J]: Spray foam should be done between 2 and 3

[J] to [R]: Awesome!

15:00

[R] to [J]: It's going to rain later this week, are we going to have a roof?

[If the roof wasn't up when the snow melts. . .]

15:18

[J] to [R]: Yes he is coming wednesday.

15:20

[R] to [J]: Insul and air barrier passed for the house

[7 for 7]

[R] to [J]: He' comming back in the AM to look at the garage.

[R] to [J]: I'm planning on ripping out the floor with Trevor on Friday, will that be ok?

[J] to [R]: Should be. We will want to give the taper a heads up so he at least knows that you will be doing this. Also, drywall will be delivered 7-7:30am

tomorrow and blown-in insulation will be tomorrow afternoon. I will get back to you on the time the two drywallers (Dean) will be there.

15:56

[R] to [J]: Garage is done.

[R] to [J]: Can we just board the underside of the existing 2x4 garage ceiling joists?

[R] to [J]: Would that be easier/work?

[R] to [J]: Then I can put an attic access in the existing hole?

17:29

[R] to [J]: Do we need a generator on Friday? Pete is asking.

[We would be upgrading the existing service from a 100amp to a 200 amp, so the overhead wire from the street would be removed by Kitchener-Wilmont hydro, Pete would hook up a new meter and 200 amp electrical panel in the house, and then K-W Hydro would run a new wire to the house. Pete would then start hooking up the existing circuits to the new panel. The power to the house would be off the entire time. (most of the day)]

[J] to [R]: Probably

[R] to [J]: I can see if I can use harm's

[J] to [R]: Ok if not then I may be able to bring ours.

2013.12.17: Tuesday

09:53

[R] to [J]: Drywall delivery is still trying to get it off the truck.

[I had to cut a hole straight through the wall of the house to get the board in, they weren't going to carry all this up the stairs, so I had to slit the Tyvek and remove a piece of the XPS to let them slid the board through the master bathroom wall.]

10:50

[R] to [J]: Are we not using 1/4" board anywhere?

[R] to [J]: For patching in around the windows and down from the line of the old trim....

[J] to [R]: Yes tony will be out this afternoon to measure all of that up and get delivery tomorrow. Will you be out there still? Also, we have priced California knockdown ceilings. We're you thinking smooth? If so it's approximately 2per



Fig. A.2.4.d.
Half Measures

This was perhaps unwise in the long run. To save some money, we patched 1/4" gypsum board over the lathe and taped it into the plaster. The walls have blown-in cellulose already, so our idea was to avoid re-insulating, and paying to re-board all the walls, as well as save the time and disposal charges for all that plaster and lathe. We could have achieved a more energy efficient and air-tight house, as well as ensuring the plaster wouldn't "pop" off in the future, if we had just gone ahead and ripped it down to the studs.

sf more.

[R] to [J]: Cali is fine

[J] to [R]: Ok. Are you out there this afternoon?

[R] to [J]: Yes

[J] to [R]: Ok. You can meet with Tony. Call if you have any questions.

[R] to [J]: Smooth in the bathrooms though?

[J] to [R]: Yes.

[R] to [J]: The ceilings are all 1.5" taller in the new section. They've accounted for that?

[J] to [R]: I would think so yes.

[they didn't really, I would have to screw strips of plywood to the bottom plate to clamp the poly to the studs and re-inforce our air-barrier.]

[R] to [J]: K

[R] to [J]: Is a little 1.5" strip of board at the bottom acceptable?

[J] to [R]: Yes because they can tape and baseboard covers as well.

11:40

[R] to [J]: Are all pocket doors this crappy?

[J] to [R]: Yes.

12:15

[R] to [J]: Do you think I can get Jordan for some time?

[R] to [J]: The inspector ok'd the board on the lower ceiling in the garage.

[J] to [R]: Perfect. I will have to get back to you on Jordan.

12:37

[R] to [J]: Pcwa

[R] to [J]: I'm not sure the pocket door fits

[R] to [J]: How big is the actual door?

[J] to [R]: 1-3/8" wide.

13:48

[R] to [J]: Can you ask the roofers to flash up to my window sill when they shingle the front?

[R] to [J]: So to fill over the space in the brick?

[J] to [R]: I can. Will we have to remove this when brick gets reinstalled then. I

assume that is what you were thinking?

[R] to [J]:Yes

[R] to [J]:I'm just not going to have time to build anything for there

[R] to [J]:This poket door is going to take up 3-4 hours

[R] to [J]:The whole thing falls apart when you adjust it, so I have to re-do all their fasteners

14:22

[R] to [J]:They're going to strap, board and finish the three existing room ceilings for \$100/room

[J] to [R]:Wow, powers of persuasion.

[typically, board is about \$1.25/sf and resilient is about \$0.75/sf, and those three rooms totaled over 300sf, so I was getting this at less than half price. It was a small victory.]

15:23

[R] to [J]: Pocket door finally in. :(

[Carpenters hate pocket doors, they're poorly constructed and framers tend not to leave enough room for them, and they have a tendency to break down after the fact, and they rely on the boarders to install the board over them properly, and they just end up costing way more than they should in labour. Even after 3 hours fighting with this door, there would be more problems later.]

[J] to [R]: Great

16:39

[R] to [J]:Will plywood work between the spray foam and the ignition source?

[I was going to put plywood in the crawlspace between the garage and the master bedroom above. if it would suffice as a fire separation between a car and the spray foam insulation I wouldn't have to board the ceiling in the garage, which would require moving the garage door opener and dealing with the boarders again - who were proving to be a challenge.]

17:08

[R] to [J]: Oh, the shower head in the ensuite shower, I might ask for that to be moved up at some point. It's quite low (for me). I've totally forgot to ask about

it with all the other stuff.

2013.12.17: Wednesday

10:51

[R] to [J]: I moved the shower head a bit. It will be ok now. Higher would be nice but that is probably a little involved with pex and all.

[R] to [J]: The [gypsum board] in-fill, is that a per square-foot price? Because these guys [boarders] are doing next to nothing.

[R] to [J]: Mostly smoking Outside and standing around.

[R] to [J]: One of them just left for a dentist appointment.

16:38

[R] to [J]: Surprise surprise the boarders just left for the day

[R] to [J]: I don't know if there will be much for the taper to do yet. They haven't finished the addition yet

17:28

[J] to [R]: Ok. Thanks for the heads up.

2013.12.17: Thursday

09:38

[R] to [J]: Cement board 3" up and screws 5" up?

[J] to [R]: Yes

[R] to [J]: They did one at two, is that ok?

[R] to [J]: Should they do them all the same or do I ask them to re-cut that one?

[J] to [R]: Yes

[R] to [J]: Re-cut?

[J] to [R]: It will be fine.

[R] to [J]: K then all at 2"?

[J] to [R]: yes.

[R] to [J]: They want me to cut some blocking so they can put the joint off the stud. Is this ok?

[No, it wasn't. They were being lazy. I asked them to put the joints on the studs.]

10:12

[R] to [J]: Oh, I did want to say that Jerry [roofer] came and got the roof all

closed in and took care of the gap in the masonry. Which is awesome. So thank-you.

[Whew.]

[This text was important too, I had to remember that I was dealing with a person, and that the relationship is part of the package, I was in the middle of a crazy busy time where every hour or so I'd have a new problem, and it was nice for both of us to have things go right, and for me to acknowledge when Jesse came through for me and show my appreciation. If I had just been some guy, and had hired a roofer who would never work for me again, would I have managed to convince him to drop his other jobs and come finish up my roof on two days notice because it was going to rain on Friday? Perhaps, but perhaps not, and having Jesse, who is awesome, and who has a relationship with Jerry made this happen.]



Fig. A.2.4.e.
Insulation Baffle

Insulation baffle around the back balcony overhang. We had some insulation blow around and out until the soffit was on this overhang, but it worked overall.

10:56

[R] to [J]: Do you have a trick for the heaters? Two of them I can't get working.

[J] to [R]: That's odd, I know they need to be sitting flat otherwise they will shut off, but other than that no.

11:00

[R] to [J]: Taper came and left.

[J] to [R]: Ok I figured that with the amount of board not done. He will be back tomorrow.

[R] to [J]: The coils heat up but the fan doesn't come on. Is there a delay on the fan coming on?

[J] to [R]: No

[R] to [J]: K.

[J] to [R]: Sorry, I don't know what to say.

[R] to [J]: That's fine.

[R] to [J]: I'll figure it out.

[J] to [R]: They were all tested a couple months ago.

[R] to [J]: One on the main floor keeps it relatively warm. I don't think the insulation is in the ceiling yet.

11:07

[R] to [J]: This is the baffle above the balcony. Is this ok?

[J] to [R]: Should be yes.

[R] to [J]: Should they be using shorter screws to put the ceiling board onto the resilient?

[R] to [J]: A lot of them are poking up through the poly

[This is bad because we get holes in our air/vapour barrier]

[J] to [R]: What size are they using?

[R] to [J]: Looks like 1 1/4"

[R] to [J]: Some are coming right through and grabbing the trusses. Well the first one I checked did

[This is bad, because the resilient channel is intended to allow the board to "float" a little bit and prevent cracking if the trusses move a bit. If the board is screwed right through to the trusses we lose this benefit.]

[J] to [R]: Ok. Leave it with me.

[R] to [J]: Am I being too anal about those screw holes?

[J] to [R]: No.

14:00

[R] to [J]: I'm done on site for the day. I asked the boarders to lock up. Just FYI.

[maybe I would have time to work on this thesis, I was after all supposed to have an easier time now that the boarding had started. . .]

[J] to [R]: Thank you sir.

14:55

[J] to [R]: Have a good night. We are set up with siding guy Monday at noon.

[R] to [J]: Great, thanks

[J] to [R]: You too

2013.12.17: Friday

09:38

[J] to [R]: I hope your day is going well Reuben. I just wanted to say, you are doing a great job on your home. Thank-you for all your help. Keep me informed of how the panel switch out is going.

[The panel switch-out was a little more involved than we had initially anticipated. At one point I had 3 workers from Hydro, 2 from forestry, and 1 back-hoe operator to clear out some snow so the large forestry boom truck and the smaller hydro boom truck could get close enough to the pole to do their work. They also found that a

few of the wires in the main electrical line on the street were broken or breaking which had to be repaired. If you think about the date of this, this was the Friday before the ice storm. A day later and these guys would all be working like crazy to restore power to most of southern Ontario.]

11:51

[R] to [J]: [should the taper]Tape showers?

[Yes]

15:53

[J] to [R]: Is insulation in?

[R] to [J]:Yes

[J] to [R]: Ok.Thx.

16:20

[R] to [J]: Borders are done.

[Finally, after taking twice as long as anticipated]

[R] to [J]: :)

So ends two weeks of crazy. These were just the text messages between myself and Jesse. I was also finalizing millwork designs during this time, and various other minor catastrophes via email and phone calls. But we made it, and the taper would finish up over Christmas break, and the trim carpenter would start in the new year.

B.1. Building Permit Status Letters

BUILDING DIVISION

Visit us on our website at www.kitchener.ca/building



Building Permit Status Letter

October 25, 2013

Applicant:

REUBEN GRIN

4 SPADINA RD W

KITCHENER ON N2M 1E7

Regarding Permit #: 13 127160

Single Detached Dwelling - Addition - Res

PERMIT IS FOR A MASTER BEDROOM ADDITION ABOVE THE EXISTING GARAGE, AND FOR RENOVATIONS TO ADD A POWDER ROOM ON THE MAIN FLOOR AND A LAUNDRY ROOM ON THE SECOND FLOOR.

at:

4 SPADINA RD W

The Building Division has commenced a review of your building permit application based on drawings and documents submitted. As per the Building Code, Division C, Sentence 1.3.1.3.(1), this letter is your written notification listing the outstanding deficiencies. This building permit cannot be issued until the following deficiencies are resolved:

1. Confirm how the addition will be heated.
2. Is the attic existing? Is any work being done up there?
3. New stud walls required R24 insulation. Provide a new detail on how you will be achieving this.
4. Provide P.Eng detail for steel beam to steel beam connection over front porch.
5. Confirm footing location for rear yard deck as I only see a note for one footing in middle of the beam.
6. What is the product name for the railing/guards around the decks.

Note: Partial submissions that fail to address all the outstanding deficiencies will not be accepted. Resubmission must be complete to avoid any further delay. Once all relevant documents listed above are gathered please forward two (2) copies to my attention, including a copy of this letter.

Should you have any questions regarding the above list please contact myself for clarification at your earliest convenience.

Yours truly,

Jonathan Crummer

Municipal Building Official

Bus: 519 741-2200 ext: 7849

Fax: 519-741-2775

jonathan.crummer@kitchener.ca

Re: Building Permit Status Letter Dated October 25th, 2013

Applicant:

Reuben Grin

**4 Spadina Road West
Kitchener Ontario, N2M 1E7**

Regarding Deficiency 1: " Confirm how the addition will be heated"

The addition will be heated with the existing Furnace, A carrier infinity 75,000 btu output 96% efficiency gas furnace.

Regarding Deficiency 2: " Is the attic existing? Is there any work being done up there?"

The attic is existing. There is no work being done up there.

Regarding Deficiency 3: " New stud walls require R24 insulation. Provide a new detail on how you will be achieving this"

All new stud walls will be comprised of (from exterior to interior):

- 6" horizontal siding
- 3/4" furring
- Tyvek Home Wrap
- 2" R10 XPS insulation
- 2x4 framing @ 16" o.c.
- 3.5" R14 batt insulation
- 6 mil. poly. vapour barrier
- 1/2" GWB

Regarding Deficiency 4: " Provide P.Eng detail for steel beam to steel beam connection over front porch"

The short beam running north south will rest on top of the long beam running east west and be fastened with two 1/2" through bolts through the bottom flange of the top beam and the top flange of the bottom beam.

Regarding Deficiency 5: " Confirm footing location for rear year deck as I only see a note for one footing in the middle of the beam."

This footing location is correct. The 2-2x8 beam running east-west on the north side of the deck cantilevers past this post and footing. This beam, post, and footing have been sized and approved and stamped by the Engineer.

Regarding Deficiency 6: " What is the product name for the railing/guards around the decks?"

These will be pt wood as per o.b.c.

B.2. Kitchener Addition Building Permit Drawing Guidelines



Building an Addition Information Guide and Process

Drawing requirements for a building permit application (2 copies)

2 Copies of the following

- a. Site Plan
- b. Construction Drawings
 - Floor Plans
 - Elevations
 - Wall Sections / Details (as required)
 - Schedule 1 – Designer Form

Note: Drawings must be completed by the listed homeowner or a qualified designer. Qualified designers are required to provide their name, BCIN#, designer statement and signature on the plans. They are also required to complete the Schedule 1 designer form.

Site Plan or copy of Property Survey

- Existing building / structures location
- Proposed Addition location
- Property boundaries

Floor Plans (including foundation plan)

- Drawn to scale (3/16" = 1'-0" (1:75) minimum scale)
- Note all structural elements such as joists, rafters, beams, columns, lintels, and footing pad sizes
- Window/door locations and sizes
- Room names including finished basements
- Stair location and direction, cabinet and fixtures
- Show Smoke Alarm and Carbon Monoxide Detector
- Dimensions of interior and exterior including overall dimensions
- Provide floor area totals in square feet for each level including basement
- Deck plan and guard details (if applicable)

Elevations (all sides surrounding addition)

- Drawn to scale (3/16" = 1'-0" (1:75) minimum scale)
- Show size and location of existing window and door openings
- Label wall cladding and roofing material
- Show finished grade
- Show footing and foundations below grade (broken lines) including steps in foundation

Wall Sections / Details (Cross-Section)

- Show materials to be used on section
- Provide construction notes for:
 - exterior wall,
 - all floors,
 - roof / ceiling,
 - footings and foundation,
 - weeping tile and damp proofing
- Locate finished grade, dimension grade to exterior cladding
- Dimensions for all floor heights
- Details
 - Provide details on items that are not typical and /or to clarify construction
 - Examples – plan view for unique stair, guards, deck connection to house, section of cathedral / vaulted ceiling
 - Not necessarily drawn to scale

Where to apply for a building permit

Apply online at www.kitchener.ca/onlinepermits or bring all required drawings to the 5th floor at City Hall. City Hall is located at 200 King St W, Kitchener, Ontario.

Office hours

Monday to Friday 8:30am - 5:00pm

Cost of building permit

The cost of the permit is \$1.23 per ft² of finished or renovated area, minimum charge is \$110.00. There is an additional charge of \$250.00, which is refunded automatically after the final building inspection has been passed. The fees cover the review of drawings for building code compliance, the building permit and building inspections. We accept cash, cheque and debit as methods of payment.

Time

Once a complete permit application is made the permit will be reviewed within a maximum of 10 business days.

Typical Required Building Inspections

Building inspections are booked through our automated phone system or online. Please schedule in advance, same day service is only available when booked before 8:00am the day of the inspection. Required inspections include;

- Excavation/Footing inspection
- Foundation pre-backfill inspection
- Underground rough-in inspection (plumbing)
- Above ground rough-in inspection (plumbing)
- Structural Wood Frame inspection
- HVAC rough-in (supply and return air ducts)
- Insulation (and vapor barrier)
- Air barrier
- HVAC final inspection
- Final plumbing inspection
- Occupancy only inspection
- Final building inspection

Important Numbers to know

- Ontario One Call (natural gas, sewer and water lines, KW Hydro, Rogers Cable and Bell locates) 1-800-400-2255
- Electrical Safety Authority: 1-877-ESA-SAFE (1-877-372-7233)

Don't Forget

- Build Safe
- Use power tools with caution
- Store construction materials safely
- Take your time; there is no prize for finishing early
- Please construct between 7am and 7pm

Any Questions?

Phone: 519-741-2433

Email: building@kitchener.ca

Web: www.kitchener.ca/building



**Building
Division**

250

**ADDITIONS
WITH
BASEMENT**

DATE:

JANUARY 2013

SCALE:

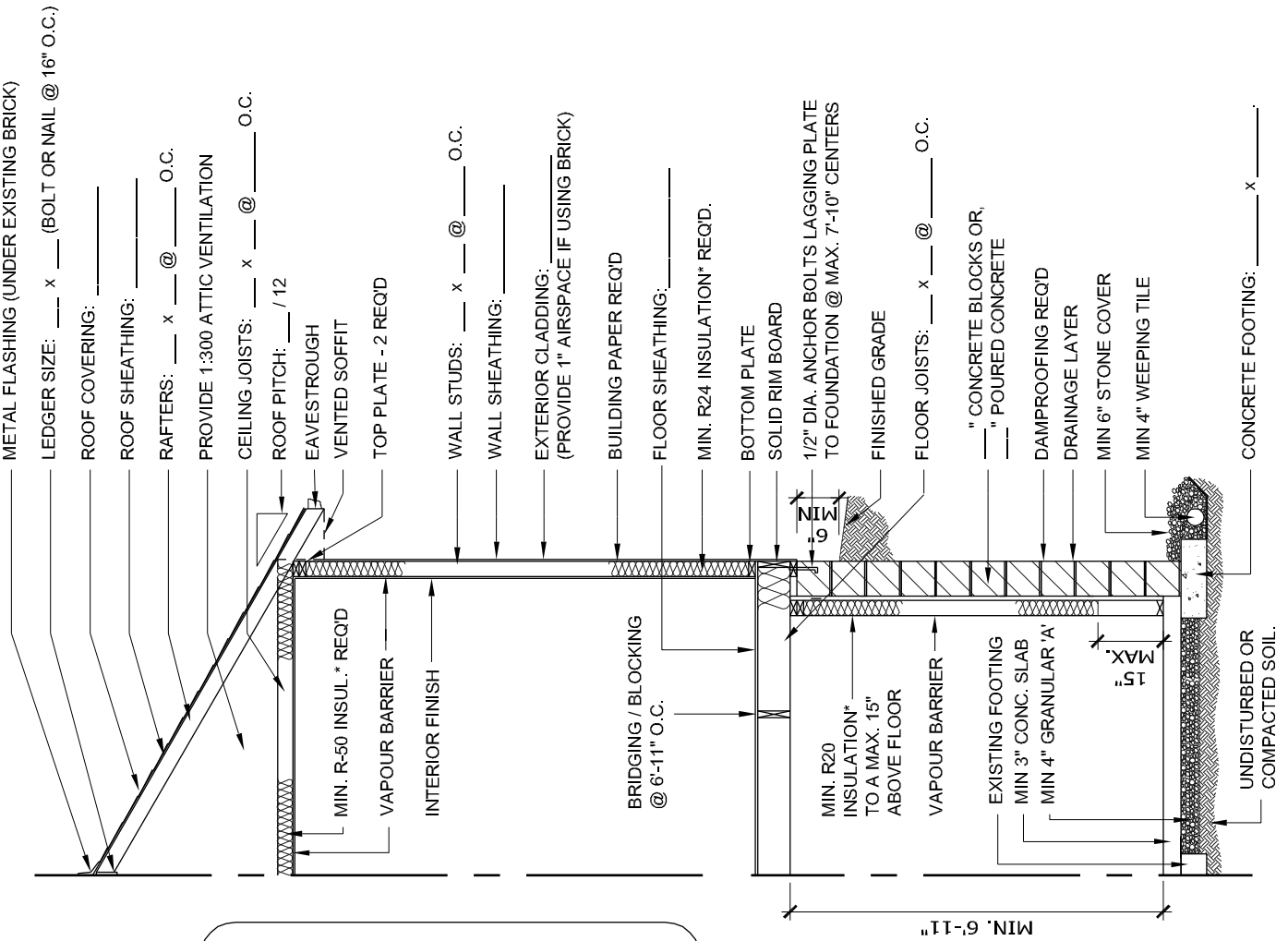
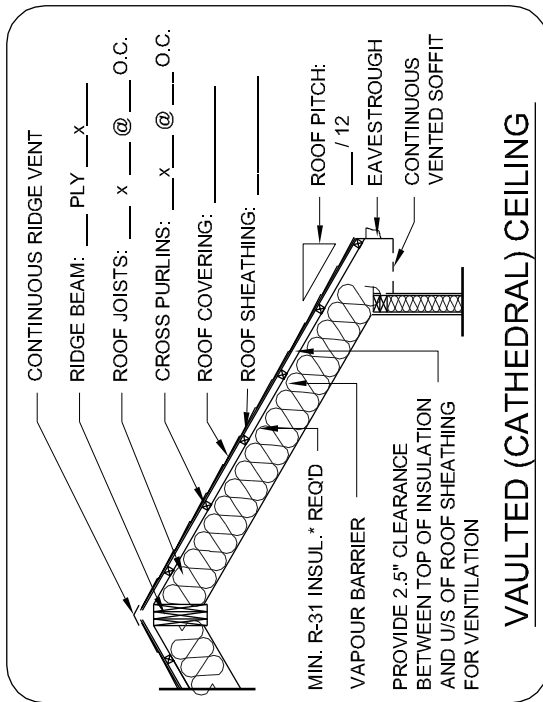
N.T.S.

DRAWING NO.:

9-11

**1 STOREY REAR OR SIDE ADDITION
(FULL BASEMENT)**

SIZE OF ADDITION: _____ x _____
PROPOSED HEATING SYSTEM: _____



* NOTE:
MINIMUM R-VALUES LISTED ARE FOR ADDITIONS HEATED WITH FORCED AIR GAS ONLY. REFER ONTARIO BUILDING CODE FOR ALTERNATE HEATING SYSTEM R-VALUES.

NOTE: JOISTS AND RAFTERS MIN 1 1/2" SOLID BEARING. BEAMS MIN 3 1/2" SOLID BEARING.



**Building
Division**

251

ADDITIONS ON PIERS

DATE:
JANUARY 2013

SCALE:
N.T.S.

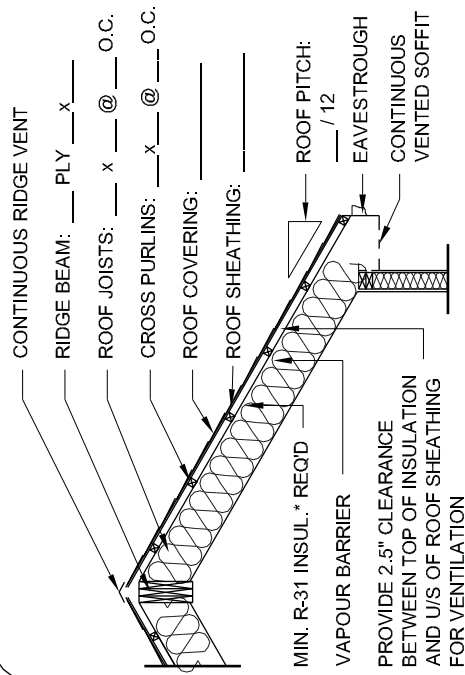
DRAWING NO.:

9-10

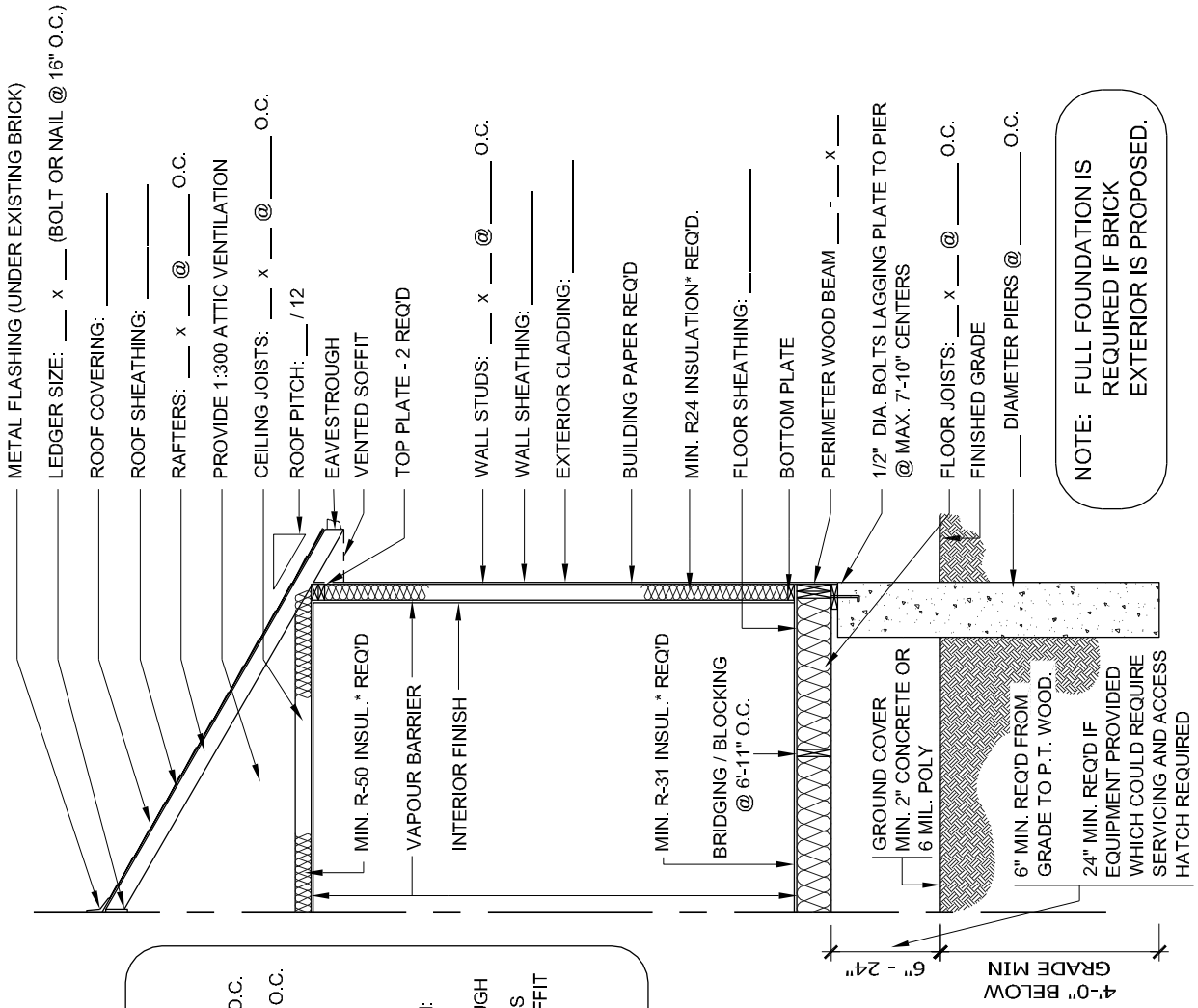
1 STOREY REAR OR SIDE ADDITION (PIER FOUNDATION)

SIZE OF ADDITION: _____ x _____

PROPOSED HEATING SYSTEM: _____



VAULTED (CATHEDRAL) CEILING



NOTE: FULL FOUNDATION IS REQUIRED IF BRICK EXTERIOR IS PROPOSED.

* NOTE:
MINIMUM R-VALUES LISTED ARE FOR ADDITIONS HEATED WITH FORCED AIR GAS ONLY. REFER ONTARIO BUILDING CODE FOR ALTERNATE HEATING SYSTEM R-VALUES.

NOTE: JOISTS AND RAFTERS MIN 1 1/2" SOLID BEARING. BEAMS MIN 3 1/2" SOLID BEARING.

B.3. Neighborhood Zoning Map

B.4. Kitchener Zoning By-Law R4

SECTION 38
(By-law 94-1, S.9)

RESIDENTIAL FOUR ZONE (R-4)

No person shall erect, nor use any building in whole or in part, nor use any land, nor permit to use any land, in whole or in part, within an R-4 Zone for any purpose other than one or more of the following uses, or uses accessory thereto. Such erection or use shall also comply with the prescribed regulations:

(Amended: By-law 2006-174, S.1) (City of Kitchener Housekeeping Amendment)

38.1 PERMITTED USES

Coach House Dwelling Unit

Duplex Dwelling (By-law 94-183, S.20)

Home Business

Private Home Day Care

Residential Care Facility

Semi-Detached Dwelling

Single Detached Dwelling

38.2 REGULATIONS

.1 For Single Detached Dwelling and Duplex Dwelling (By-law 94-183, S.21[b])

Minimum Lot Area	235.0 square metres
Minimum Lot Width (By-law 2000-86, S.10)	9.0 metres
Minimum Corner Lot Width (By-law 2000-86, S.9)	15.0 metres
Minimum Front Yard and Minimum Side Yard Abutting a Street	4.5 metres, except no part of any building used to accommodate off-street parking shall be located closer than 6.0 metres to the street line.
Minimum Side Yard	a) 1.2 metres, <u>or</u> b) 0 metres to a maximum of 0.2 metres on one side, and a minimum of 1.5 metres on the other side for a dwelling with a building height not exceeding 9.0 metres and subject to Section 5.20 of this by-law.

Amended: (By-law 2009-105, S.14)

- c) 0 metres to a maximum of 0.2 metres on one side, and a minimum of 2.5 metres on the other side for a dwelling with a building height exceeding 9.0 metres and subject to Section 5.20 of this by-law.

Amended: (By-law 2009-105, S.14)

- d) 3.0 metres on one side where the driveway leading to a required parking space is situated between the dwelling and the lot line.

Minimum Rear Yard	7.5 metres
Maximum Building Height	10.5 metres
Maximum Lot Coverage (By-law 2003-163, S.38)	A total of 55 percent, of which the habitable portion of the dwelling shall not exceed 45 percent and the accessory buildings or structures, whether attached or detached, shall not exceed 15 percent. (By-law 2003-163, S.38)
Off-Street Parking	In accordance with Section 6.1 of this By-law.

.2 **For Semi-Detached Dwelling**

Minimum Lot Area (By-law 94-183, S.22)	235.0 square metres for each semi-detached house.
Minimum Lot Width (By-law 94-183, S.22)	7.5 metres for each semi-detached house.
Minimum Corner Lot Width (By-law 2000-86, S.11)	a) 20 metres for each dwelling; and b) 12.5 metres for each dwelling unit.
Minimum Front Yard and Minimum Side Yard Abutting a Street	4.5 metres except no part of any building used to accommodate off-street parking shall be located closer than 6.0 metres to the street line.
Minimum Side Yard	1.2 metres, except in the case of a driveway leading to a required parking space situated between the main building and the side lot line, in which case the minimum side yard shall be 3.0 metres.
Minimum Rear Yard	7.5 metres

Maximum Building Height 10.5 metres

Maximum Lot Coverage
(By-law 2003-163, S.38)

A total of 55 percent, of which the habitable portion of the dwelling shall not exceed 45 percent and the accessory buildings or structures, whether attached or detached, shall not exceed 15 percent.
(By-law 2003-163, S.38)

Off-Street Parking

In accordance with Section 6.1 of this By-law.

.3 Coach House Dwelling Unit

Minimum Lot Area

125.0 square metres in addition to the lot area of the other dwelling type located on the same lot.

Other Regulations

In accordance with Section 5.22 of this By-law.

.4 For Residential Care Facility

Maximum Size

8 residents

Other Regulations

In accordance with the regulations of the dwelling type in which such facility is located.

Off-Street Parking

In accordance with Section 6.1 of this By-law.

.5 For Home Business

In accordance with regulations set out in Section 5.13 of this By-law.

Appendix C: Economics

C.1. Costs By Trade and Division

3:27 PM
08/26/14

Rockhaven Homes Limited
Cost of Goods
February 1, 2013 through August 26, 2014

Feb 1, '13 - Aug 26, 14

Cost of Goods

40000 · Cost of Goods

1000 · General Costs	16,150.60
2000 · Site Work and Servicing	1,684.10
3000 · Concrete	8,864.16
4000 · Masonry	1,040.00
5000 · Steel	95.00
6000 · Wood	36,637.63
7000 · Thermal/Moisture	15,963.97
8000 · Windows and Doors - Exterior	6,017.57
9000 · Finishes	22,467.80
10000 · Specialties/Other	1,280.00
14000 · Plumbing	11,899.60
15000 · HVAC	5,020.00
16000 · Electrical	9,775.34
18000 · Other Costs	9.72
Total 40000 · Cost of Goods	<u><u>136,905.49</u></u>

Appendix D: Environmental

D.1. REEP RAIN Home Assessment

SARAH GRIN

May 28, 2014

As you will recall, during our recent visit we discussed these priorities that would benefit from action.

- 1) Direct your downspouts and rain barrel overflows at least 2.4m (8') away from your foundation. The downspout at the front corner of your house is draining very close to your foundation. Bury a drainage pipe under the garden area and run it out past the retaining wall where it can drain onto the lawn, or even better, onto a rain garden or soakaway pit.
- 2) The two downspouts at the side of the house are draining onto a gravel area, graded away from the house, with an impermeable barrier where it meets the house. It would be better to have an impermeable surface right next to the house that slopes away from the foundation, such as clay-based soil with large concrete pavers or flagstones on top, to protect your foundation from water infiltration. You will also want to extend your downspouts so they drain at least 8' away from your foundation. One way to do this would be to connect them to a buried drainage pipe which leads to the large soakaway pit area at the back of the house.
- 3) The ground around your foundation should slope away from the house to keep water from pooling or seeping into your basement. Re-grade the area next to your house to ensure water runs away. The vegetable garden area at the front corner of the house should have a buffer area of a few feet right next to the foundation, with a clay-based soil or other impermeable surface that slopes away from the house.
- 4) Have window wells installed at basement windows that are near or below grade (consider doing this at the same time you are regrading around your foundation).
- 5) Consider installing a rain garden or soakaway pit/infiltration gallery to allow runoff to infiltrate in a more desirable location 3m (10') away and downslope from your foundation. The lawn area at the front corner of the house would be a good location for this. See the links below for more information about rain gardens and soakaway pits.

Fig. 9.06
Figure text

[Basement Flood Reduction \(ICLR\)](#)

[How To Hire A Contractor \(CMHC\)](#)

[RAIN Service Providers List](#)

[BBB List of Foundation Contractors in Waterloo Region](#)

We appreciate your efforts to reduce flooding and pollution entering the Grand River. Our collective efforts will protect homes from infiltration and protect our beaches, wildlife, and drinking water aquifer. The following pages discuss in more detail each item we covered in our checklist, and the corresponding best practices and rationale. Hotlinks to further resources are provided at the bottom right of each page.

We encourage you to talk to your neighbours about this service and share the information provided.

If you have questions or require further resources or advice, please don't hesitate to contact REEP at:

BRENDAN SCHAEFER

519-744-9799

info@reepgreen.ca

This project is generously supported by the Ontario Ministry of the Environment and is a partnership of:



RAIN HOME VISIT - HOMEOWNER DETAILS

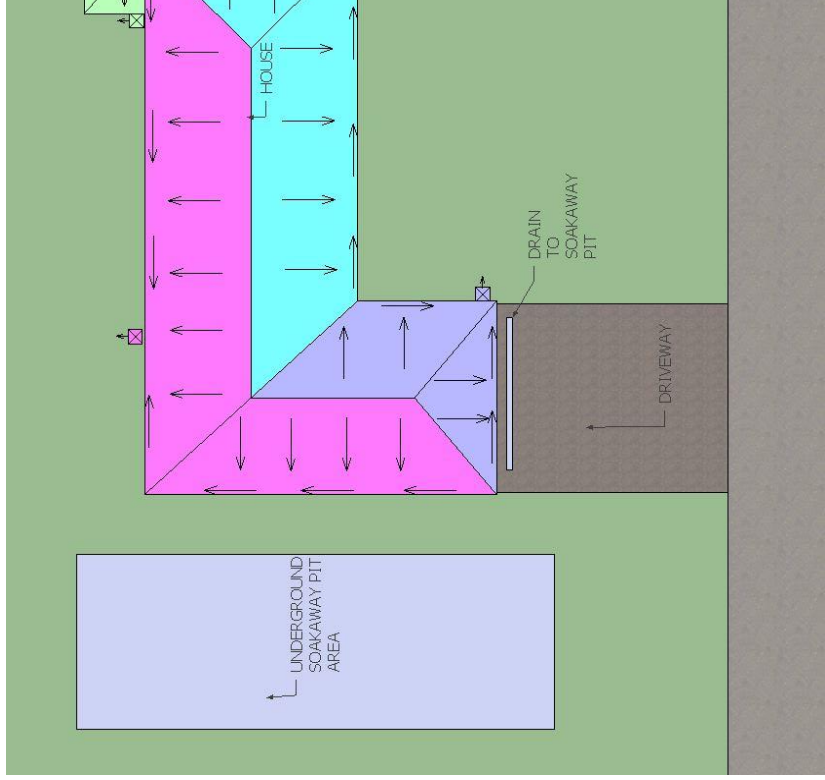
Name of homeowner: SARAH GRIN
 Home Address: 4 SPADINA ROAD WEST
 KITCHENER ON N2M 1E7
 Telephone number: 519-240-2780
 Email address: rsgrin@gmail.com

How Are You Doing?



PERFORMING WELL 10
 NEEDS CONSIDERATION 19
 PRIORITY FOR ACTION 3

SITE SPECIFIC INFORMATION

Age of Home: pre WW2 (1910 - 1940)
 Type of Home: 2-storey
 Type of Foundation: other
 Type of Roof: hip
 Size of Home: 1500 - 2000 sq.ft
 Size of Lot: small (less than quarter acre)



RAIN HOME VISIT - PAVED AREAS

FEATURE	BEST OPTION	NEEDS CONSIDERATION	PRIORITY FOR ACTION	SCORE	RATIONALE
Permeability	Paved areas are fully permeable.	25% > 50% of paved areas are permeable.	0% < 25% of paved areas are permeable.	PRIORITY FOR ACTION	Permeable pavement allows rainfall to percolate into the ground. It can be used instead of standard asphalt and concrete for surfacing sidewalks, driveways, parking areas.
Slope	Paved areas slope away from foundation (and neighbours). Car is washed on permeable surface or taken to commercial carwash.	Some paved areas are level. Car is washed on driveway with pressure hose and no soap or solvents.	Some paved areas slope towards the foundation. Car is washed on driveway with soap and solvents.	PRIORITY FOR ACTION	Adequate grading of paved areas is critical to avoid moisture infiltrating the basement foundation.
Car maintenance	Car is well maintained at a licensed facility.	Car is maintained at home, with spill containment available.	Car is maintained at home with no spill containment available.	NEEDS CONSIDERATION	Metals, fuels and solvents wash off the car when it is cleaned. Carwash effluent is a serious pollutant that runs down the driveway to the nearest storm sewer intake.
Snow	Stored away and downslope from foundation or removed.	Snow is stored away from foundation, but insufficient slope for melt to run away. Used sparingly during periods of freezing rain only.	Snow is packed against foundation or melting snow runs toward foundation. Used often.	BEST OPTION	Maintaining your car at home can lead to spills of fuels and solvents. Unmanaged spills are carried by the next rain to the closest water way via the storm sewer. Snow piled against the foundation will melt and drip down the wall and may overtime erode the foundation structure or sealant.
De-icing salt	Never used. Safe alternatives are used.	Used in the past.	Is often blocked with debris.	NEEDS CONSIDERATION	De-icing salt melts ice and then travels with the melt to the nearest storm sewer intake. It is hazardous to fresh water marine life and can kill your lawn. Blocked sewer grates is one of the leading causes of flooding.
Nearest stormsewer grate (down the street)	Clear of debris and regularly checked.	Collects debris after a heavy storm.		NEEDS CONSIDERATION	
Driveway sealant	Never used.	Used in the past.	Reapplies annually.	NA	Pavement does not need sealing. Coal tar sealants contain known carcinogens and wash off into stormsewers or get tracked into your house on shoes.
RECOMMENDATIONS					
  <p>This driveway slopes toward the garage/house, and there is a drain in front of the garage which carries the rain water to a very large soakaway pit under the yard next to it. The soakaway pit is filled with pieces of concrete salvaged from a slab that was previously covering the yard area. This is not a typical method of building a soakaway pit, so you will need to monitor it closely to make sure it can handle the volume of water you are directing into it. Keep a close eye on the driveway drain to make sure it is draining properly. Be sure to keep leaves and debris away from the drain at all times.</p> <p>Always take your car to a licensed commercial carwash. Look for the WaterSense logo for added water conservation value.</p> <p>When clearing snow, pile it up on a permeable surface (garden or lawn) as far from your foundation as possible.</p> <p>Team up with your neighbours to ensure stormsewer grates are checked and cleared before heavy storms.</p>					
VALUABLE INTERNET LINKS					
Permeable Paving					
De-icing Salt Alternatives					

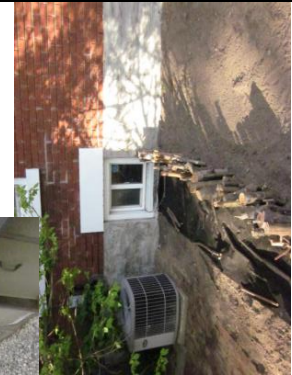
RAIN HOME VISIT - EAVES AND DOWNSPOUTS

FEATURE	BEST OPTION	NEEDS CONSIDERATION	PRIORITY FOR ACTION	SCORE	RATIONALE
Eavestroughs (continuous coverage)	Present on all areas of roof including sheds/porches, etc. Size is adequate for slope and area of roof.	80% > 100% of roof areas covered.	Much roof area not covered.	BEST OPTION	Eavestroughs prevent the rain from pouring off the roof and running down directly to the foundation, allowing you to direct the water (via downspouts) to areas where it is easier to soak into the ground away from the foundation.
Eavestroughs (maintenance)	Free of debris, owner cleans after leaves have fallen, or full leaf guard in place.	Some debris is evident.	Eavestroughs are completely blocked.	BEST OPTION	Debris can block the eavestroughs or downspouts (especially at corners and elbows) allowing rain to spill over and run down directly to the foundation.
Downspouts (direction)	Directed a minimum of 2.4m (8') away from foundation.	Directed 1.2 m (4') > 2.4m (8') away from foundation.	Not directed away or is <1.2m (4') away from foundation.	PRIORITY FOR ACTION	Downspout extensions allow you to direct the water further away from the foundation.
Downspouts (outlet on permeable area)	All are allowed to soak into the ground.	50% > 100% soaking in.	Not soaking in or < 50% soaking in and remainder directed to storm sewer.	BEST OPTION	Downspouts that are directed to a hard surface or connected to the storm sewer contribute to the volume and pollution entering the nearest surface water via the stormsewer.
Rain barrels	One at each downspout with soaker hoses or overflow to permeable area.	Some, but less than one at each downspout, and overflow not directed to permeable area.	No rain barrels.	NEEDS CONSIDERATION	Rain barrels are an excellent way to slow the rain down. Reduced volume running off the property protects the nearest surface water body.
Cistern (if existing)	In good repair and well maintained.	Not repaired, not maintained, not used, dry.	Full of water, but not used or leaking.	NA	Cisterns were once common in homes and can store a lot of rain for non-potable use.
Flat roof areas	Membranes (water proof) are intact and slope is >2% away from building or to drain.	Waterproof membranes appear worn, not enough slope away from house.	Membranes failing (leaking) and slopes toward house or sags, causing ponding.	NA	Flat roofs require a rubberized moisture barrier that breaks down overtime, especially if it is in direct sunlight or weather. When it breaks down the roof will leak.
RECOMMENDATIONS					
<p>Direct your downspouts and rain barrel overflows at least 2.4m (8') away from your foundation. The downspout at the front corner of your house is draining very close to your foundation. Bury a drainage pipe under the garden area and run it out past the retaining wall where it can drain onto the lawn, or even better, onto a rain garden or soakaway pit (see next page for more details).</p> <p>The two downspouts at the side of the house are draining onto a gravel area, graded away from the house, with an impermeable barrier where it meets the house. It would be better to have an impermeable surface right next to the house that slopes away from the foundation, such as clay-based soil with large concrete pavers or flagstones on top, to protect your foundation from water infiltration. You will also want to extend your downspouts so they drain at least 8' away from your foundation. One way to do this would be to connect them to a burried drainage pipe which leads to the large soakaway pit area at the back of the house.</p>					
VALUABLE INTERNET LINKS					
Eavestrough Cleaning & Maintenance REEP Green Solutions Rain Barrels http://rainbarrel.ca/instructions					



RAIN HOME VISIT - DRAINAGE AND INFILTRATION

FEATURE	BEST OPTION	NEEDS CONSIDERATION	PRIORITY FOR ACTION	SCORE	RATIONALE
Slope	All areas slope away from foundation.	Some areas are level.	Some areas slope towards the foundation.	NEEDS CONSIDERATION	A generous slope away from the house is the first line of defence to avoid moisture infiltrating the foundation.
Permeable surfaces	More than half of lot is permeable (gardens, mulch, gravel, permeable paving). Aerated annually (spongy when walked on), provides infiltration.	25% > 50% of lot is permeable (gardens, mulched areas, gravel, permeable paving). Partially compacted, but provides some infiltration.	Less than 25% is permeable (gardens, mulched areas, gravel, permeable paving). Completely compacted and provides no infiltration.	NEEDS CONSIDERATION	Larger areas of hard surfaces mean a greater volume of stormwater and related impacts: more pollutants running off and more erosion. A well aerated lawn can absorb rain. A compacted lawn is a "hard surface" allowing very little, if any, absorption, causing water and pollutants to run-off.
Lawn	50% < 100% garden with some native species planted.	Less than 50% garden with few native species.	No gardens.	NEEDS CONSIDERATION	The soil in gardens absorbs water and plants slow the rain down on their leaves, so it hits the ground more slowly.
Tree canopy	Solid canopy of trees planted over hard surfaces.	Partial coverage.	No trees or canopy provided.	BEST OPTION	Trees slow rain down and hold water on their leaves. Then it shakes off slowly or is evaporated into the air when the sun comes out.
Leaves	Leaves are bagged/removed and/or confined/composted. Owner has witnessed and understands path of run-off.	Leaves are left to decay in place and mulched. Owner has some idea of path of run-off.	Leaves blown to curb/street, can block sewer grates. Owner is not sure where the water runs-off.	BEST OPTION	Blowing leaves often end up blocking sewer grates and often cause or increase the risk of flooding.
Path of run-off	No erosion is evident.	Some evidence of erosion (some areas have bare soil).	Considerable erosion (sloped areas that have bare soil and you can see ruts.)	BEST OPTION	Understanding the path of run-off to the nearest storm sewer grate and where it outlets to the nearest body of water shows the connection between personal activities and water quality.
Erosion	In place and functioning adequately, windows above grade, or no basement.	Window wells have debris or evidence of deterioration.	No window wells in place and window extends below level of surrounding grade.	NEEDS CONSIDERATION	Erosion carries top soil and organic matter into the storm sewer, causing blockages (and subsequent flooding), and cloudy, polluted surface water at the outlet and downstream.
Window wells	Sealants are continuous and in good repair.	Some minor evidence of deterioration.	Sealants missing or need serious repair/replacement.	PRIORITY FOR ACTION	A properly installed window well and cover ensures that moisture does not penetrate window openings that are below grade.
Sealants				NA	Sealant around windows and other openings and joints are applied and reapplied to ensure adequate barrier to moisture.
RECOMMENDATIONS					
<p>The ground around your foundation should slope away from the house to keep water from pooling or seeping into your basement. Re-grade the area next to your house to ensure water runs away. The vegetable garden area at the front corner of the house should have a buffer area of a few feet right next to the foundation, with a clay-based soil or other impermeable surface that slopes away from the house.</p> <p>Have window wells installed at basement windows that are near or below grade (consider doing this at the same time you are regrading around your foundation).</p> <p>Consider installing a rain garden or soakaway pit/infiltration gallery to allow runoff to infiltrate in a more desirable location 3m (10') away and downslope from your foundation. The lawn area at the front corner of the house would be a good location for this. See the links below for more information about rain gardens and soakaway pits.</p>					
VALUABLE INTERNET LINKS					
			Building A Rain Garden	Soak It Up! RAIN Program website	
			Rain Garden Tour	How to make a soakaway pit/infiltration gallery	



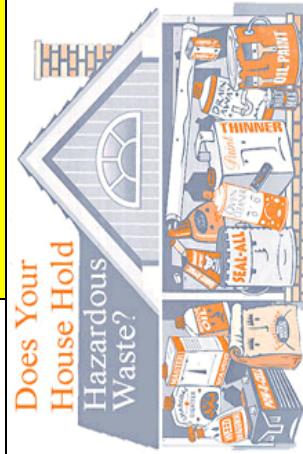
RAIN HOME VISIT - FOUNDATION AND BASEMENT

FEATURE	BEST OPTION	NEEDS CONSIDERATION	PRIORITY FOR ACTION	SCORE	RATIONALE
Foundation walls	In good condition, providing adequate barrier to moisture penetration.	Some cracks. At risk of moisture penetration. Efflorescence.	Moisture is infiltrating the basement.	NEEDS CONSIDERATION	A solid foundation wall with water barrier on the outside that extends to the weeping tile is very efficient at repelling water down below the basement floor level.
Flashing	Flashing is continuous and in good repair.	Some minor evidence of deterioration or missing and potential for leakage.	Flashing is missing and/or in need of serious repair/replacement.	NEEDS CONSIDERATION	Flashing is a folded metal strip where exterior cladding meets the foundation. It re-directs rain as it falls against your house so it will drip a few inches away onto the soil, instead of directly onto the foundation.
Moisture/mold	No evidence of moisture or mold.	Flood/infiltration stains or effervescence.	Mold in evidence.	NEEDS CONSIDERATION	Mold is a serious health hazard for occupants. Moisture can destroy structure and contents.
Floor drains	Fully functional and free of debris.	No visible floor drains.	Floor drains are blocked or smell is evident.	NEEDS CONSIDERATION	Floor drains act to drain any water from leaks or floods.
Sewer backflow protection	Valve in place and functioning.	No backflow valve in place.	Evidence of, or homeowner recalls sewage back-up.	NEEDS CONSIDERATION	Backflow valves ensure that sewage can never back up into your basement or plumbing system.
Sump hole	Functioning hole/pump. Back-up power and pump.	No sump hole or pump or existing needs maintenance. No history of infiltration.	No sump hole or pump. Area is flood prone or basement has history of infiltration.	NEEDS CONSIDERATION	A sump hole provides a place for water to accumulate and be pumped out to a place 3m (10') or greater and downslope from the foundation, which effectively reduces flooding.
Storage	Personal goods are elevated.	Personal goods are stored directly on floor.	Personal goods are on floor and water damage is evident or area is prone to flooding.	BEST OPTION	Goods are protected from damage if they are off the ground when flooding, infiltration or leaking/burst pipes occur.
Furniture	On legs.	Furniture is on floor with no legs.	Furniture is on floor, no legs and water damage is evident or area is prone to flooding.	BEST OPTION	Furniture that is upholstered down to the floor or not on adequate legs is apt to soak up and be damaged by moisture during incidence of flooding, leaking or burst pipe.
Finishes	Basement is unfinished.	Area is finished with moisture resistant materials.	Area is finished with drywall and wall to wall carpets.	BEST OPTION	The best way to reduce losses from flooding is to leave your basement unfinished.
RECOMMENDATIONS					
<p>The foundation wall at the front of the house shows signs of moisture seeping through. To prevent further problems, regrade the area on the outside of this wall, by the vegetable garden. See the recommendation on the previous page for more information about this.</p> <p>Have a sump hole and pump installed to drain water from your foundation weeping tile. Direct water from your sump pump outside onto a permeable surface (lawn or garden) downslope and 2.4m (8') or greater away from your foundation.</p> <p>Have a sewer backflow prevention valve installed by a licensed plumber.</p>					
VALUABLE INTERNET LINKS					
Basement Flood Reduction - Institute for Catastrophic Loss Reduction How to Clean Up Mold CMHC					



RAIN HOME VISIT - COMMON POLLUTANTS

FEATURE	BEST OPTION	NEEDS CONSIDERATION	PRIORITY FOR ACTION	SCORE	RATIONALE
Cleaning and personal products	Only natural/biodegradable products used.	Some chemical products in use.	No natural or biodegradable products used.	NEEDS CONSIDERATION	Whatever goes down the drain in your house can end up in the river because our sewage treatment facilities are only designed to deal effectively with bacteria and other disease pathogens. Chemicals and solvents usually pass unchecked and freely enter lakes and rivers at sanitary sewer outlets.
Cigarette butts	Butts are contained and removed with trash.	Butts are usually confined with some evidence of litter.	Butts are not confined and litter the property.	NA	Cigarette filters capture toxins when the cigarette is smoked, creating toxic bullets. When it rains they are carried to the nearest waterway, polluting the water. They are often mistaken for food and swallowed by fish and turtles.
Fertilizers	Only used on permeable areas (gardens, mulched areas and aerated lawns).	Composted material is spread on compacted lawn.	Chemical fertilizer is spread on compacted lawn.	NEEDS CONSIDERATION	Fertilizer makes plants grow. Heavy rain on a compacted lawn carries fertilizer to the nearest surface water (via the storm sewer) causing weed growth and algal blooms.
Pet waste	Pet waste is bagged and removed or buried/composted.	Pet waste is left on permeable areas.	Pet waste is left on compacted lawn or hard surface.	NA	Pet waste can be four times more hazardous than human waste. Left on compacted lawns and paved surfaces it runs-off to the nearest water way and is a primary cause of closed beaches after heavy rains.
Fuel storage	No fuels are stored on the property.	Fuels are stored in approved containers with spill containment (sand, sawdust, kitty litter) readily available.	Fuels stored in unapproved containers without spill containment (sand, sawdust, kitty litter) available.	NEEDS CONSIDERATION	Storing and refueling on your property can lead to spills. Unmanaged spills on hard surfaces are carried by the next rain to the closest water way via the storm sewer. Spills on permeable surfaces can infiltrate the groundwater aquifer.



RECOMMENDATIONS

Educate yourself on the content of any household cleaners or body products used in your home and limit their use when possible.

Keep all fuel in approved containers and have spill containment materials close at hand.

VALUABLE INTERNET LINKS
[Keep It Clean! RAIN Program website](#)
[Environmental Working Group Skin Deep Cosmetics](#)
[Make the drop - Where to take household hazardous waste](#)
[How to build a Petwaste Digester](#)



