

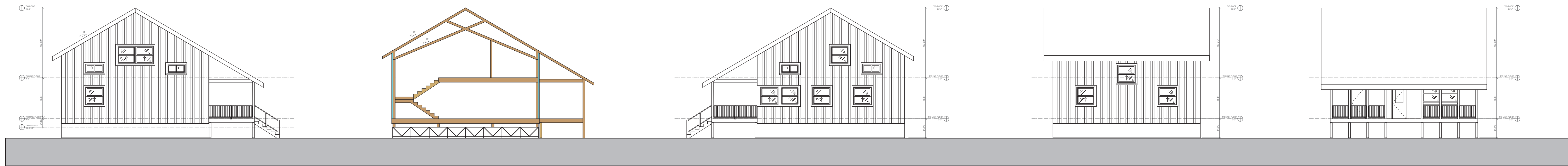
COMMUNITY PLANNING



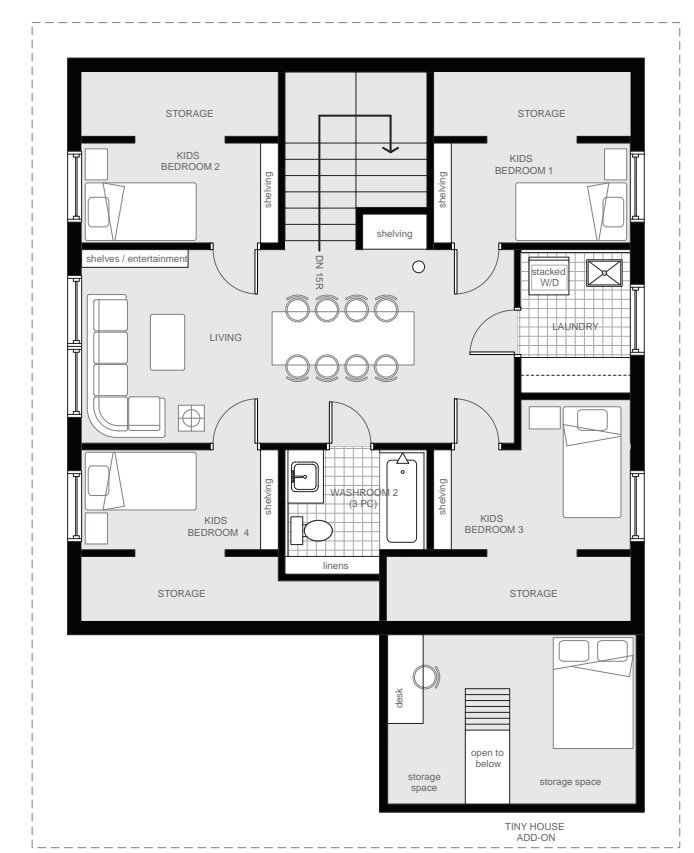
250 Homes on 60x120' lots
four five-plex apartments shown
two corner stores w/ parking lot

Not yet shown, but recommended for further refinement:
shared parks / greenspaces with play equipment near drainage reservoirs
second similar development of approximately 300 homes on southeast side
shared sewage lagoon(s)
shared renewable energy sources

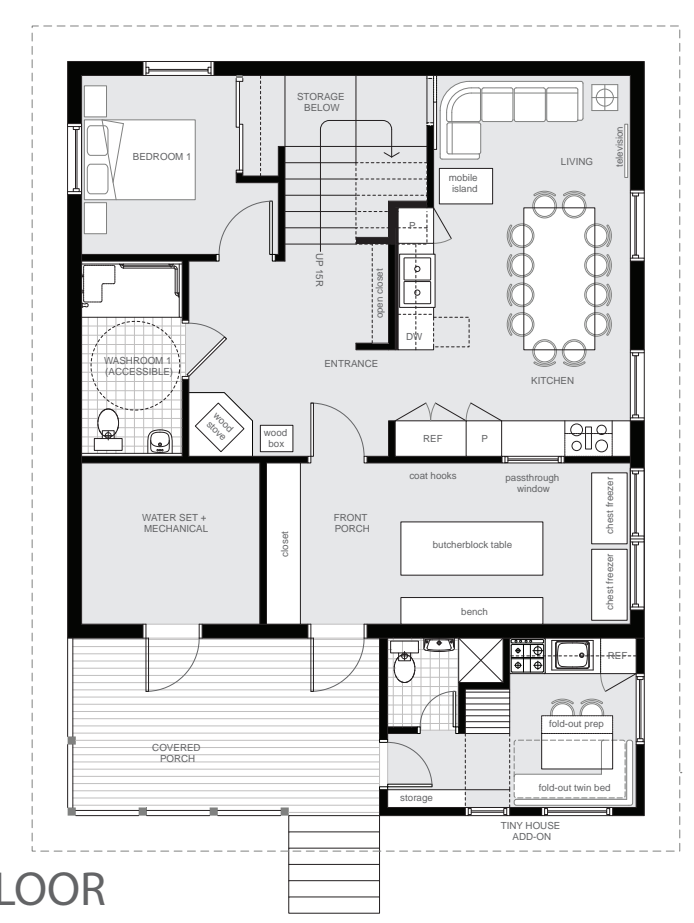




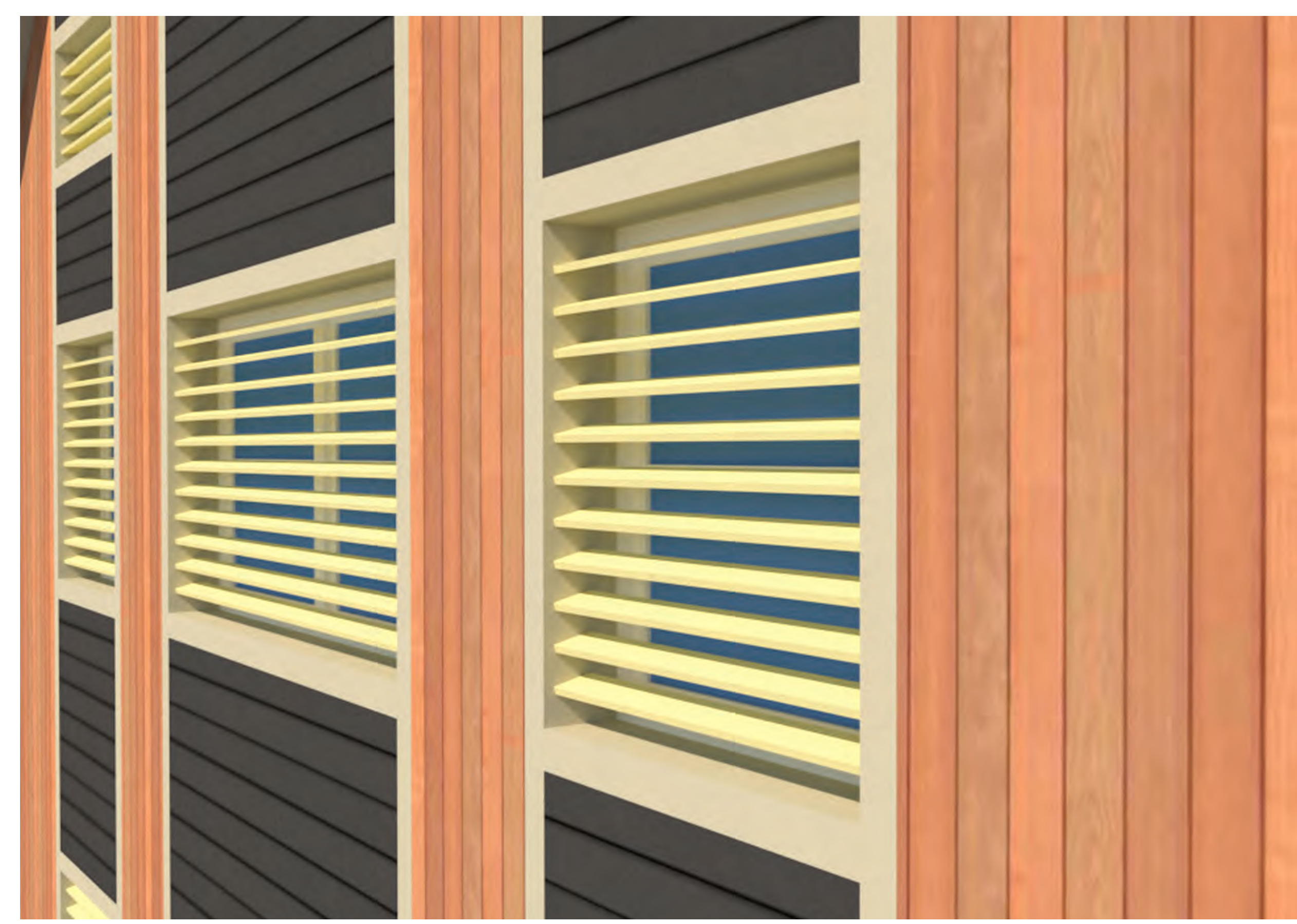
1.5 STOREY HOUSE OPTION



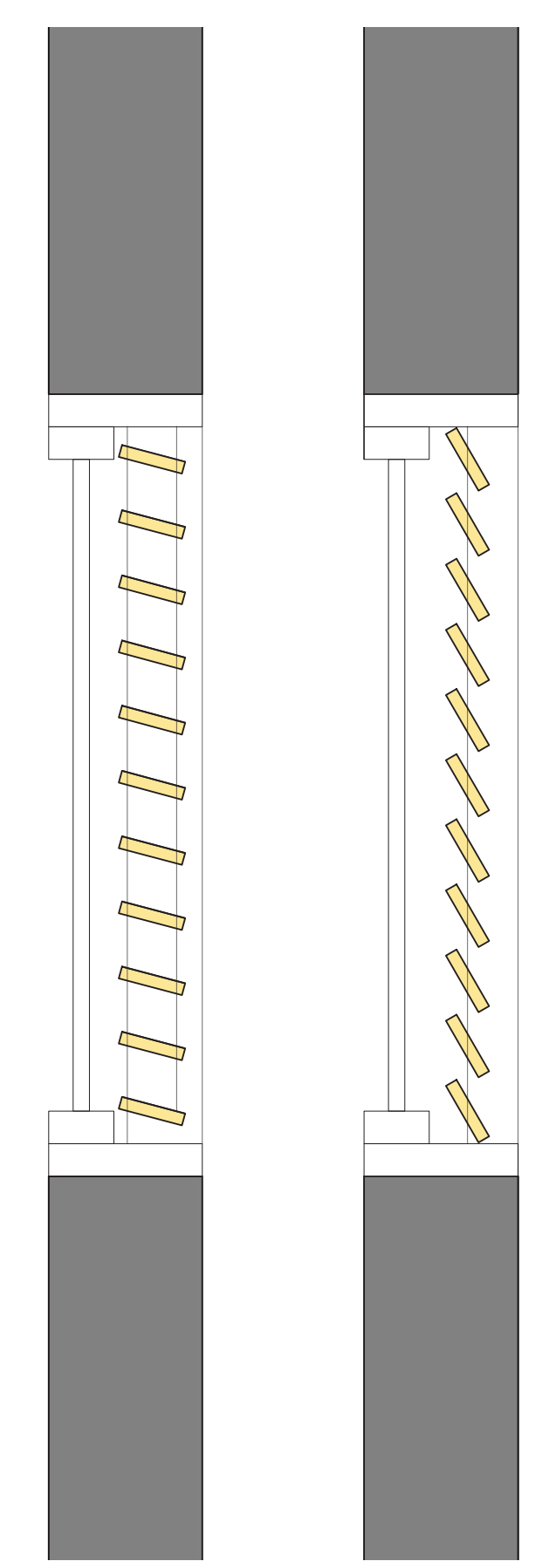
UPPER FLOOR



MAIN FLOOR



WINDOW PROTECTION OPTION - WOOD SLAT SCREENS



WOOD SLAT SCREENS OPEN + CLOSED POSITIONS



HARDIE PANELS



ENGINEERED WOOD SIDING



LOCAL WOOD RAILING



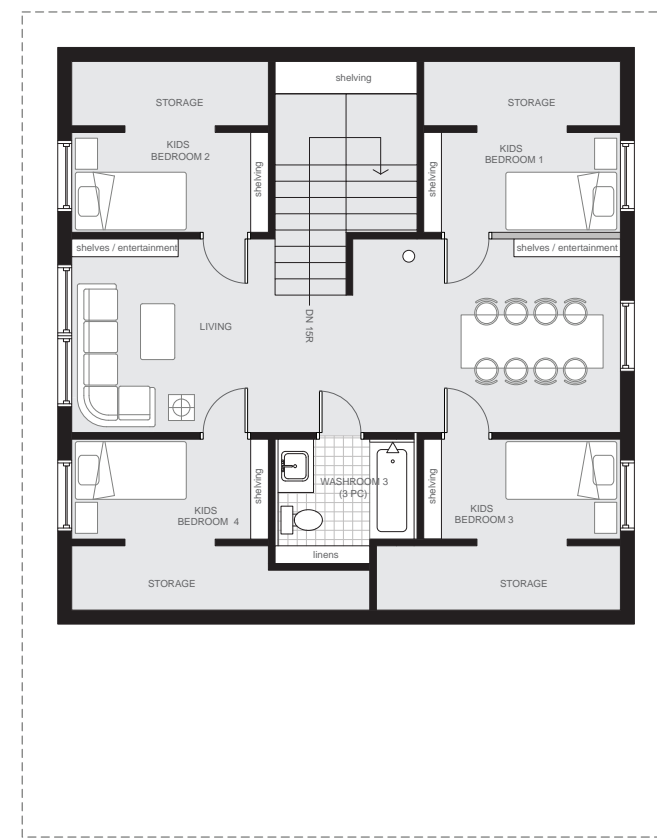
LOCAL WOOD CHARRED



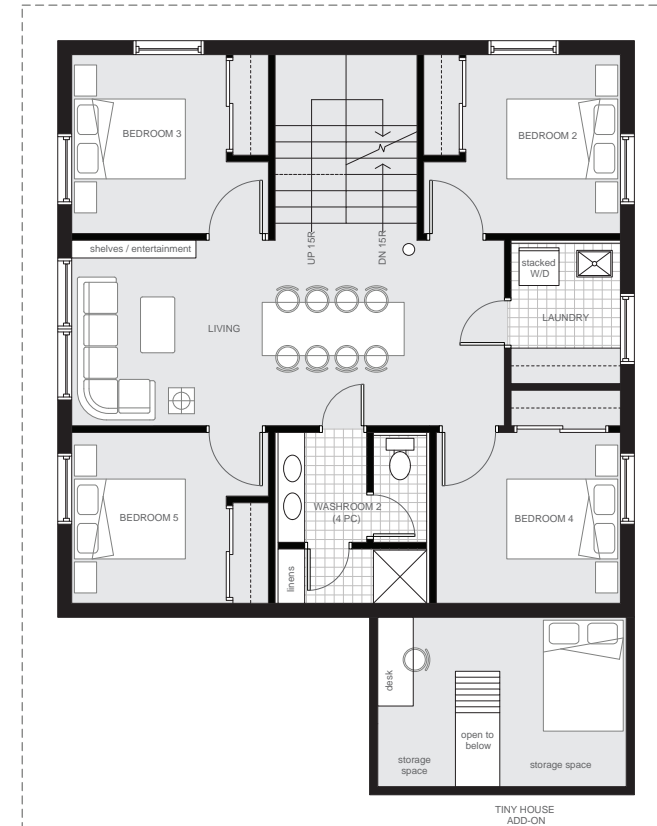
LOCAL WOOD RAILING



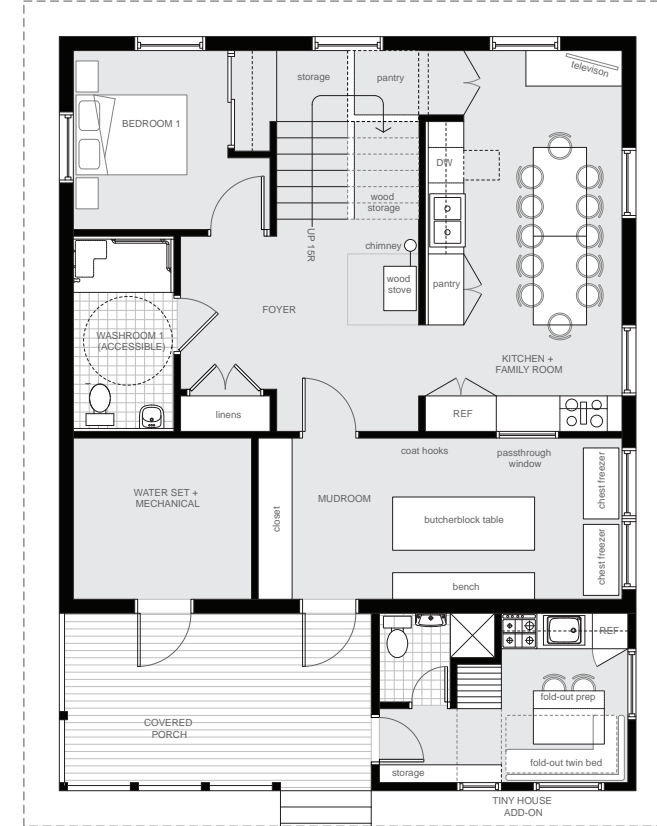
2.5 STOREY HOUSE OPTION



UPPER FLOOR



SECOND FLOOR



MAIN FLOOR



2.5 STOREY HOUSE RENDER - CRAWLSPACE ON GRANULAR FILL



**APPENDIX D
ENGAGEMENT SESSION 2 PRESENTATION**



BUNIBONIBEE CREE NATION HOUSING WORK SHOP
CAPITAL ENHANCEMENT & STRATEGIC PLANNING PROCESS

Housing: Best Practices in Design

2019 OCTOBER 16



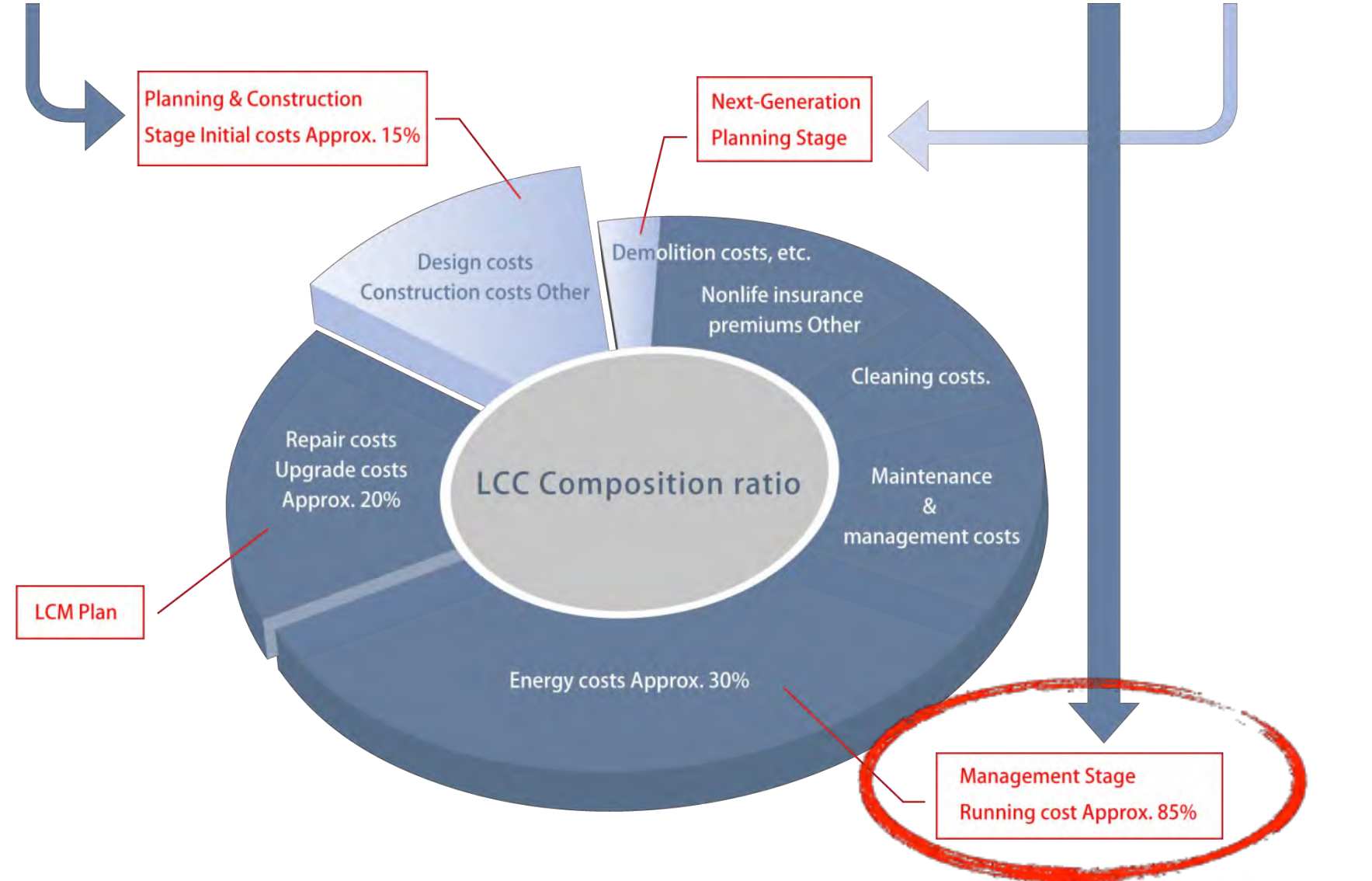


Acknowledgements & Introduction



the impact of housing





* The aforementioned distribution will vary by building type, scale and function.



Giiwednong (North)
 Wiingushk (Sweet Grass)
 Mkwa (Bear)
 Bboon (Winter)
 Naakshik (Evening)
 Gaatesid (Elder)
 Waabshkaa (White)
 Jichaag (Spirit)



Waabnong (East)
 Semaas (Tobacco)
 Mgizi (Eagle)
 Mnookmi (Spring)
 Gizheb (Morning)
 Binoojiinhs (Baby)
 (O)zaawaa (Yellow)
 Nendmowin (Mind)

Epingishmok (West)
 Mshkwoodewashk (Sage)
 Bwaji Bizhiki (Buffalo)
 Dagwaagi (Autumn)
 Naakshik (Evening)
 Ntaawgid (Adult)
 Mkadeewaa (Black)
 Enmanjiwang (Emotion)



Zhaawnong (South)
 Zhgob (Cedar)
 Waawaashkeshi (Deer)
 Niibin (Summer)
 Naawkwe (Noon)
 Shkiniigewin (Adolescent)
 Mskwaa (Red)
 Wiiyow (Body)





building scale
community scale
regional scale



building scale

Key problem areas

- Foundations
- Openings
- Roof Ventilation
- Eaves and downspouts
- Material Selection



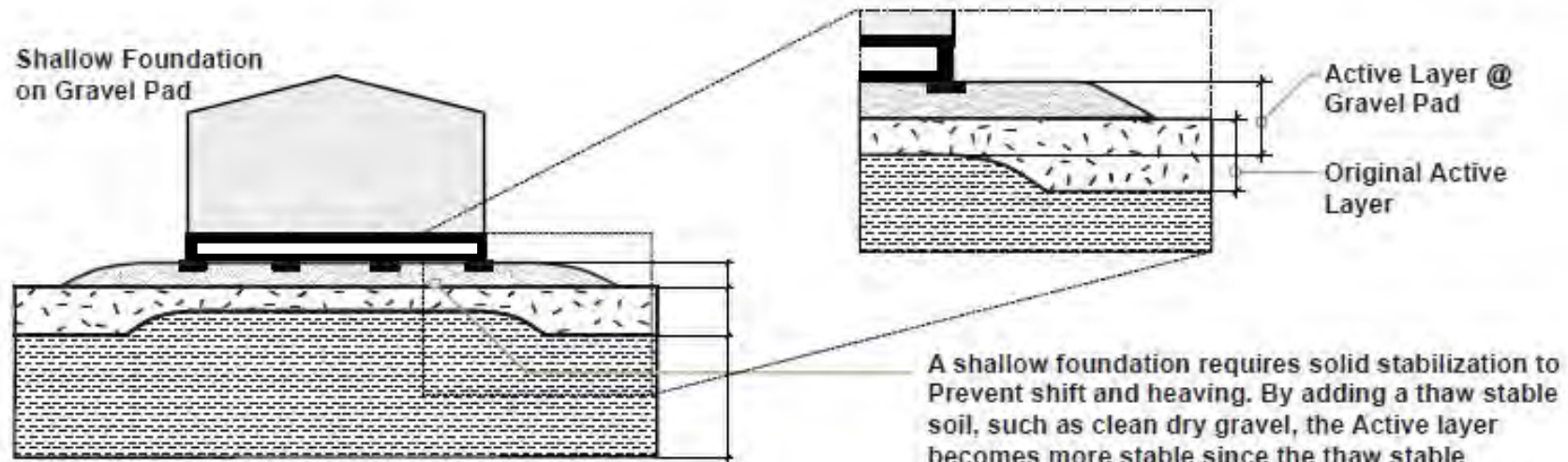
Foundations

1. Site Prep
2. Multi-point
3. Ground hogs
4. Insulated Concrete Forms
5. Crawlspace
 - Floor assembly
 - Sump pits
 - HRV units and ventilation
 - Weeping Tile
 - Built-up substrate
 - Dampproofing



Built-up Substrate

- Great for areas with a high water mark



A shallow foundation requires solid stabilization to prevent shift and heaving. By adding a thaw stable soil, such as clean dry gravel, the Active layer becomes more stable since the thaw stable granular does not move as much as ice rich soil allowing for a shallower foundation.

Legend

	Active Layer		Bedrock
	Permafrost		Gravel Fill (clean)

Image by Formline Architecture

Naskapi of Kawawachikamach Women's Shelter

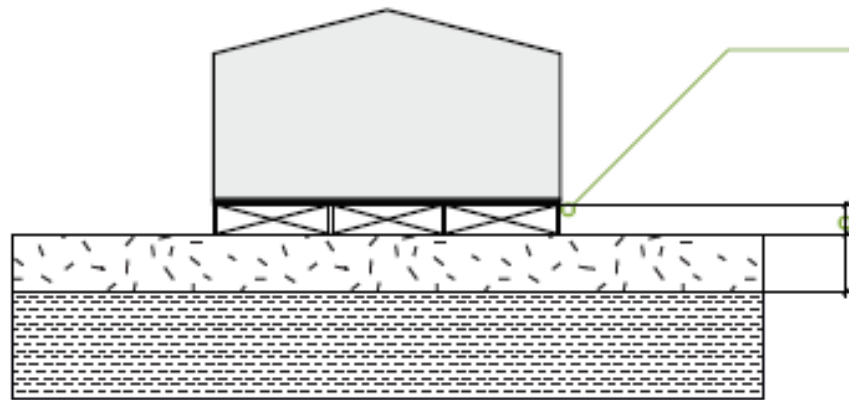


Multi-point Foundations

Great for areas with discontinuous permafrost

Note: Foundations should be anchored against uplift due to wind and frost heaving.

Triodetic Foundation



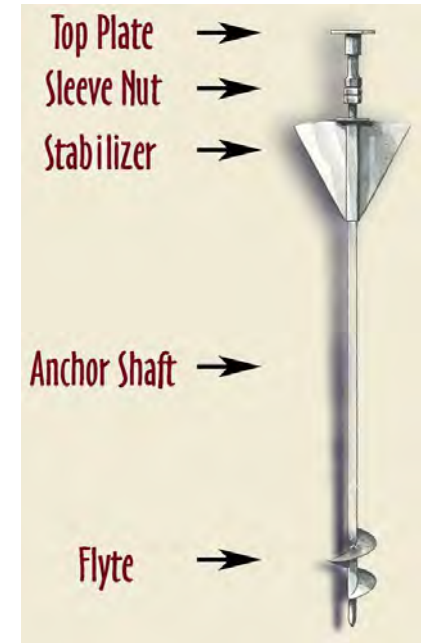
Triodetic Frames are custom designed for each home and due to their triangulation will likely be capable of resisting torsional wind-loads.

Foundation should be a minimum of 1m off the ground to ensure space for heat radiation from the floor to be dispersed by outside air adequately so that there is no heat transferred into the earth.



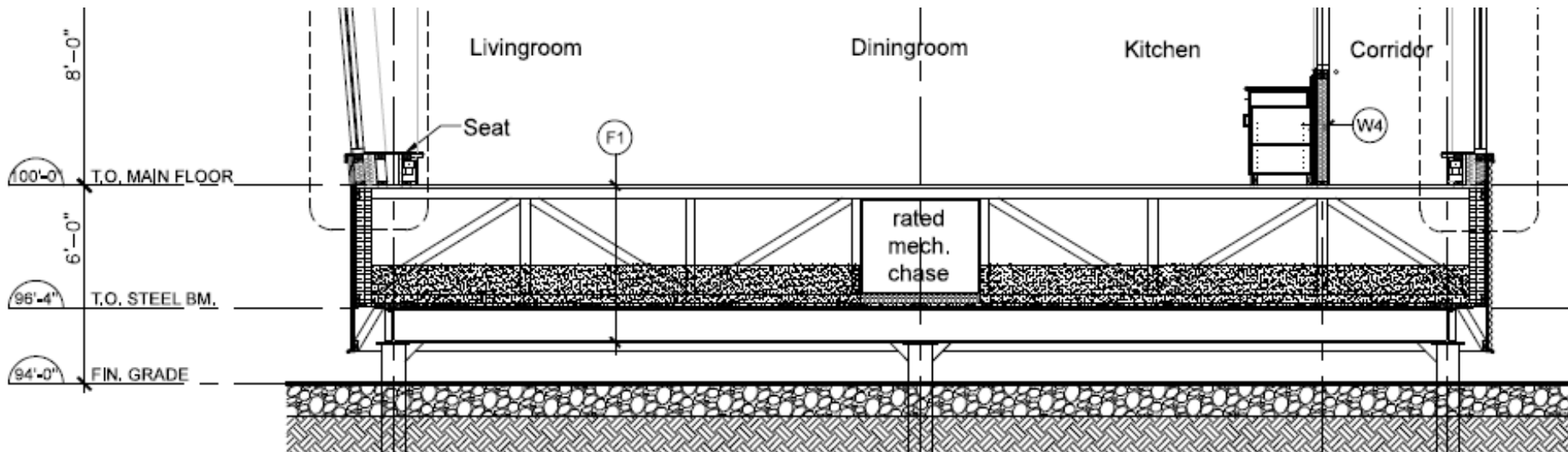
“Groundhog” Anchors / Screw Piles / Helical Piles

Can be installed by hand
Lightweight and portable
Cost effective



Insulating Plumbing in Above Ground Foundations

- Run plumbing through “Utilidor” under the floor (install louvres to allow heat to pass from the home into the utilidor)
- Deep floor trusses w/ plumbing chase



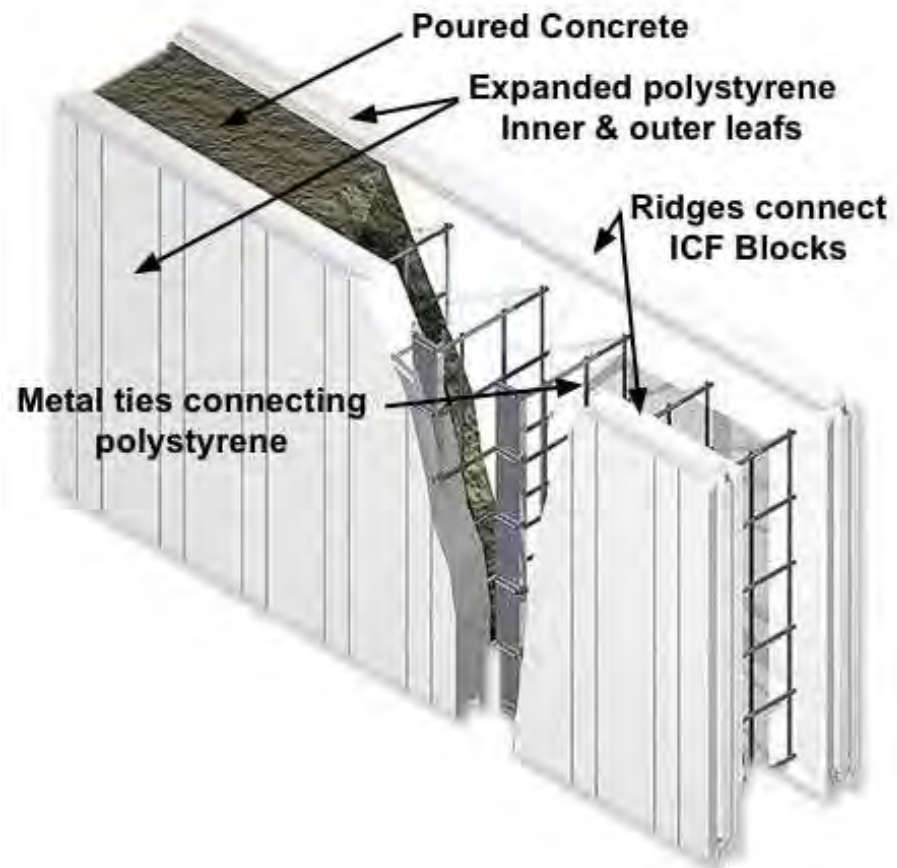
Crawlspaces

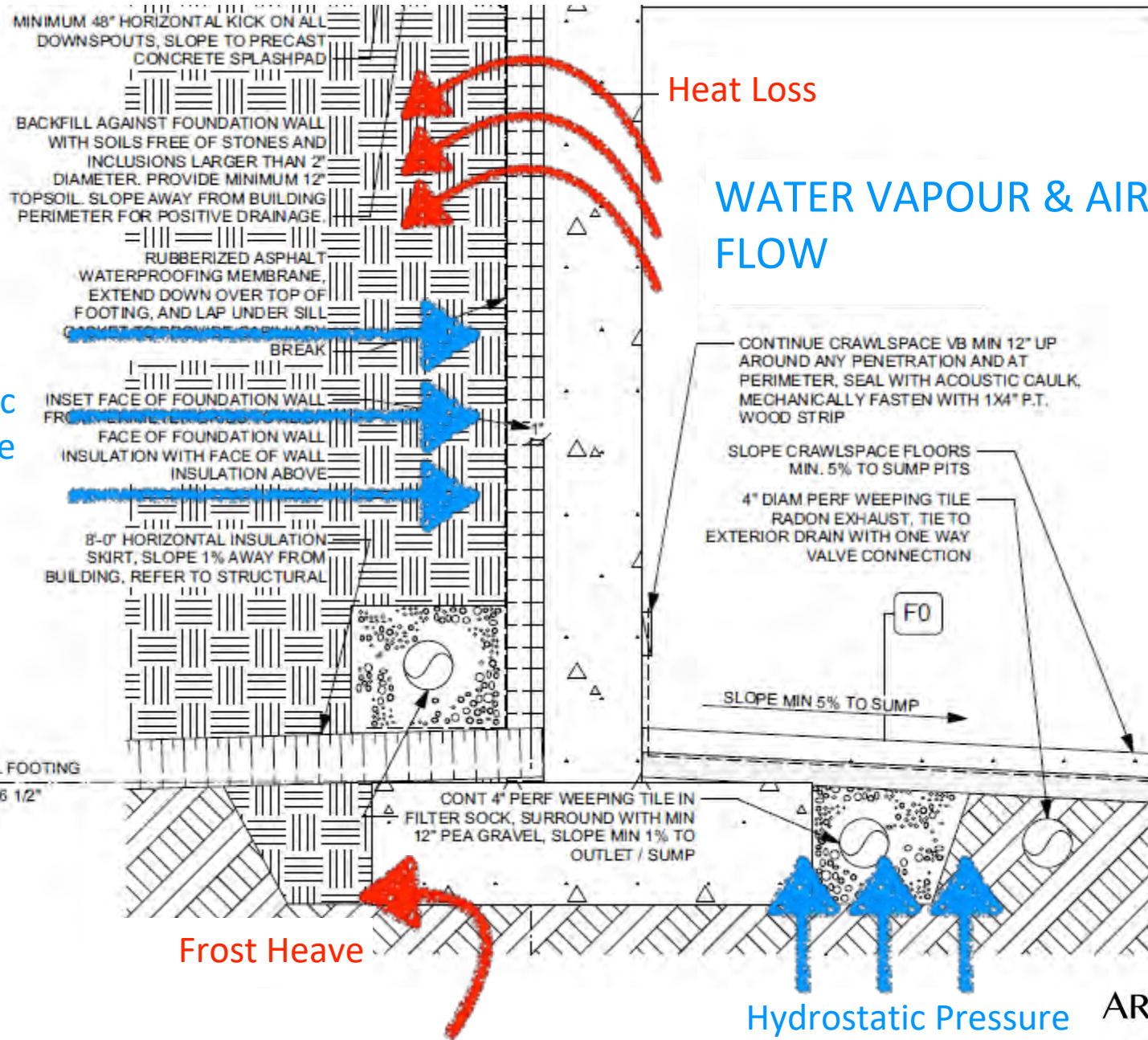
- Floor assembly
 - should never be bare soil
 - sand — (15 mil fibre reinforced) polyolefin — sloped concrete slurry
 - “Stego”



Crawlspaces

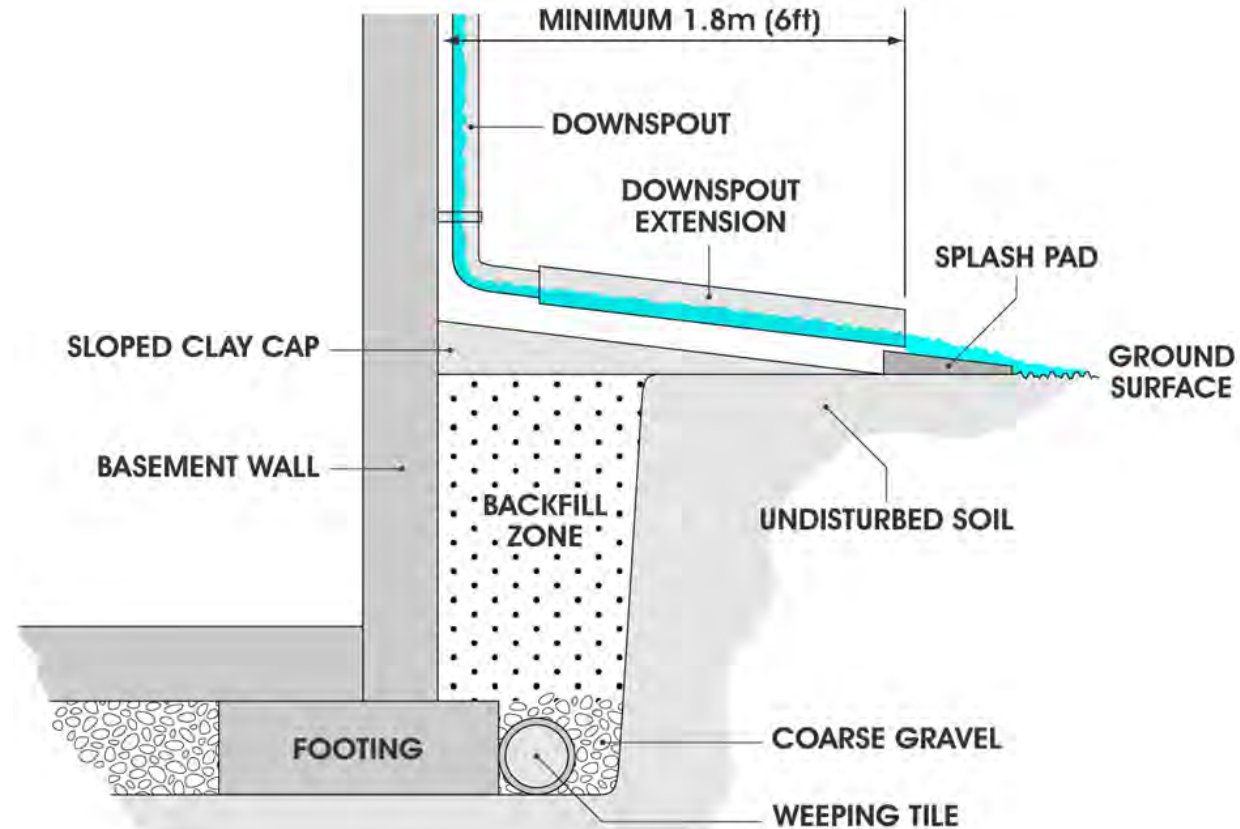
- ICFs (Insulated concrete forms)
 - minimize costly concrete & shipping weight
 - continuous high levels of insulation
 - fast & easy install



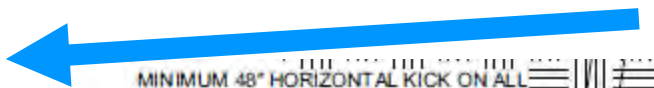


Foundation Challenges

- Weeping Tile
 - Filtered sock surrounded by pea gravel at the base of the foundation
 - Vent to daylight



Water & Vapour
- outside

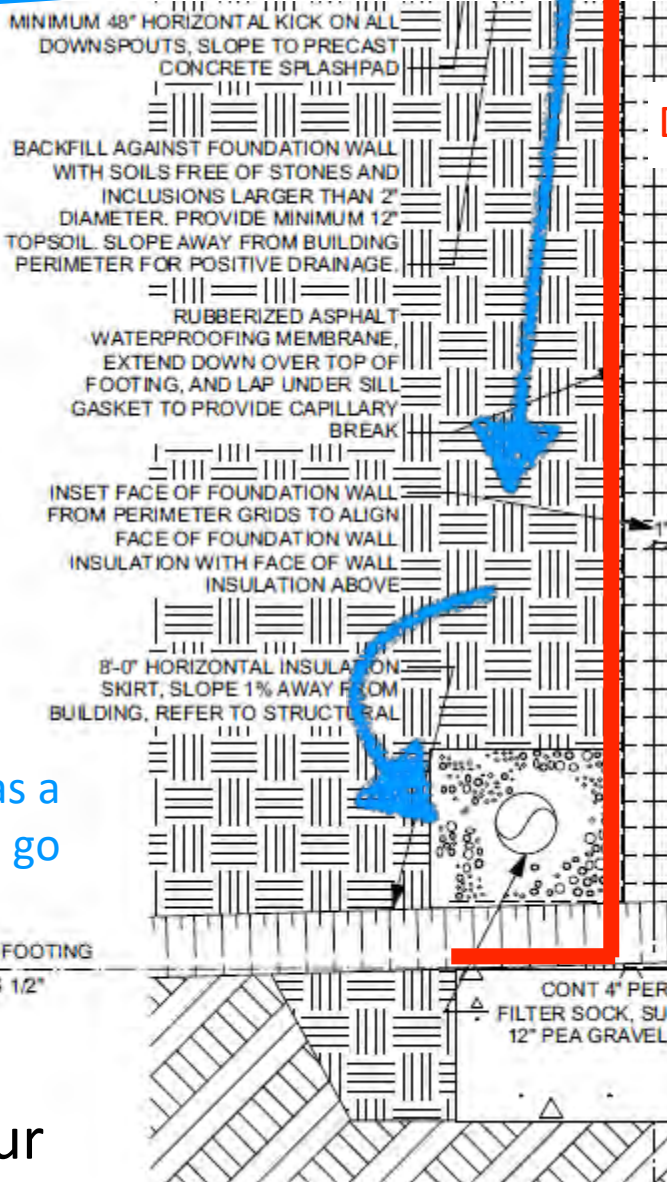


Include kicks & splash pads

Slope away from walls

Water has a place to go

Water & Vapour - outside



Dampproofing

TYPICAL NOTE:
FOR FOUNDATION DETAILS, GRANULAR FILL, LOCATION OF UNDISTURBED SOILS: REFER TO STRUCT

CONTINUE CRAWLSPACE VB MIN 12" UP AROUND ANY PENETRATION AND AT PERIMETER, SEAL WITH ACOUSTIC CAULK, MECHANICALLY FASTEN WITH 1X4" P.T. WOOD STRIP

SLOPE CRAWLSPACE FLOORS MIN. 5% TO SUMP PITS

4" DIAM PERF WEeping TILE RADON EXHAUST, TIE TO EXTERIOR DRAIN WITH ONE WAY VALVE CONNECTION

F0

SLOPE MIN 5% TO SUMP

CONT 4" PERF WEeping TILE IN FILTER SOCK, SURROUND WITH MIN 12" PEA GRAVEL, SLOPE MIN 1% TO OUTLET / SUMP



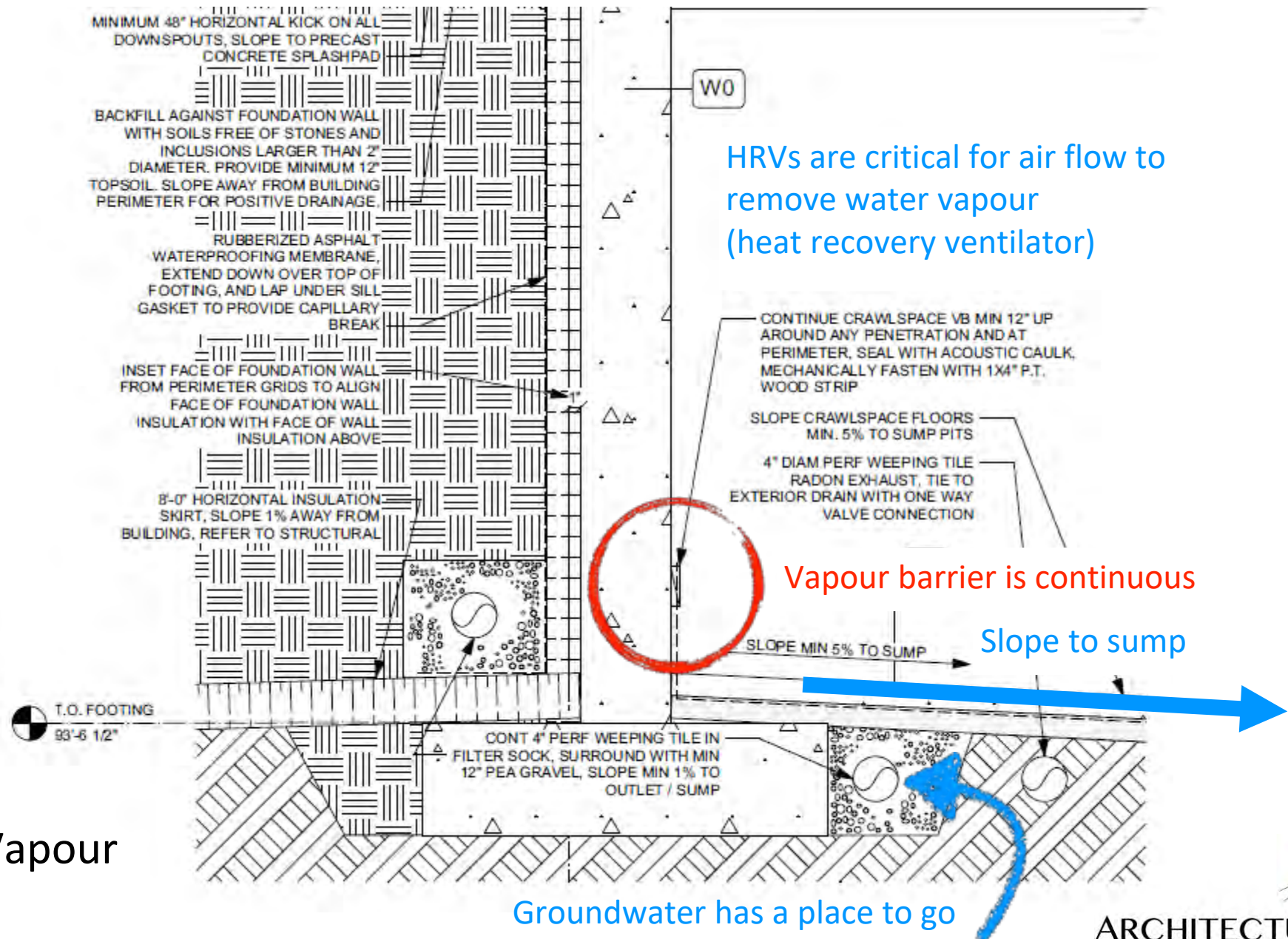
**WEeping TILE
WITH SOCK**

Water & Vapour
- outside

- Dampproofing

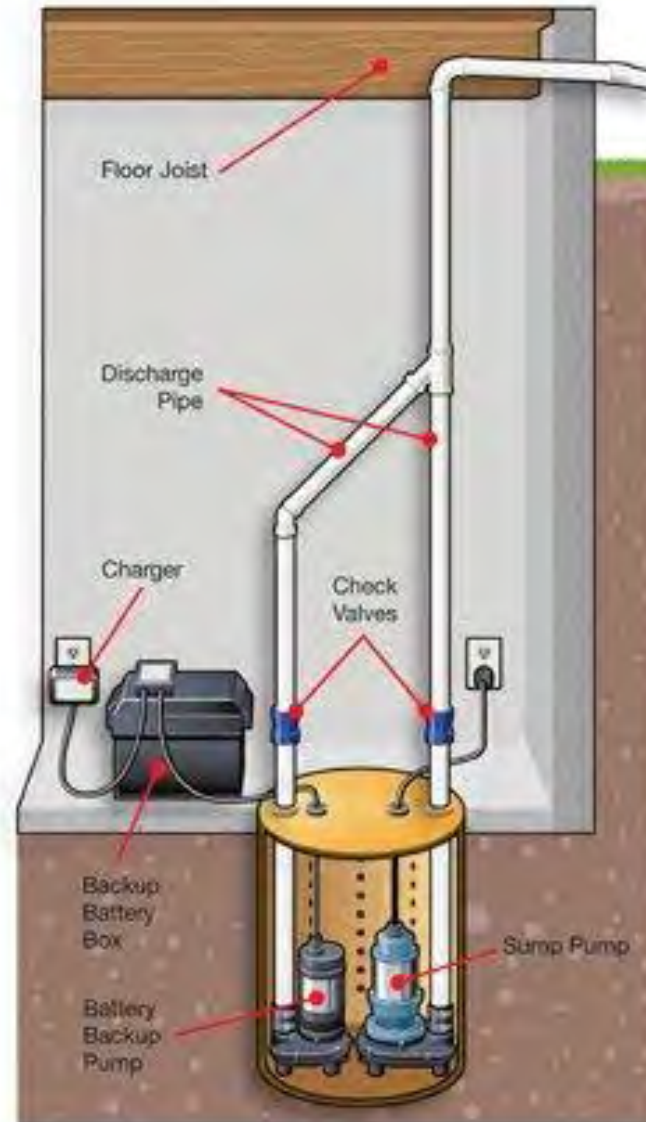
- Peel and stick rubberized membranes are best and do not rely on good weather
- Roll-on mastic is okay but not as reliable
- ONLY use materials that are rated as “below-grade”



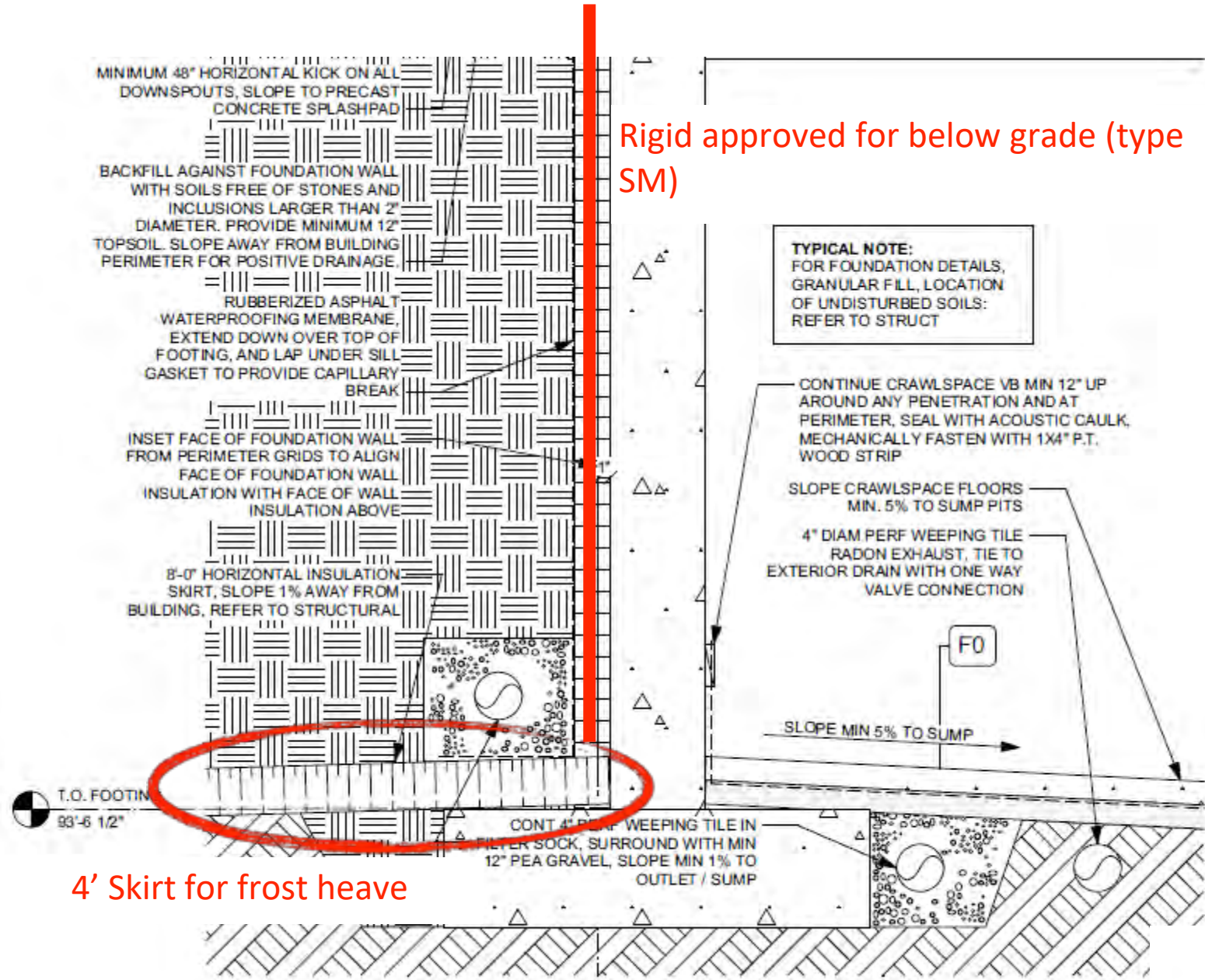


Water & Vapour
- inside

- Sump pits
 - 2 pumps requires
 - Vent to daylight
- HRV units and mechanical ventilation
 - Exhaust and intake need to be located at opposite ends of the crawlspace



Water & Vapour
- inside



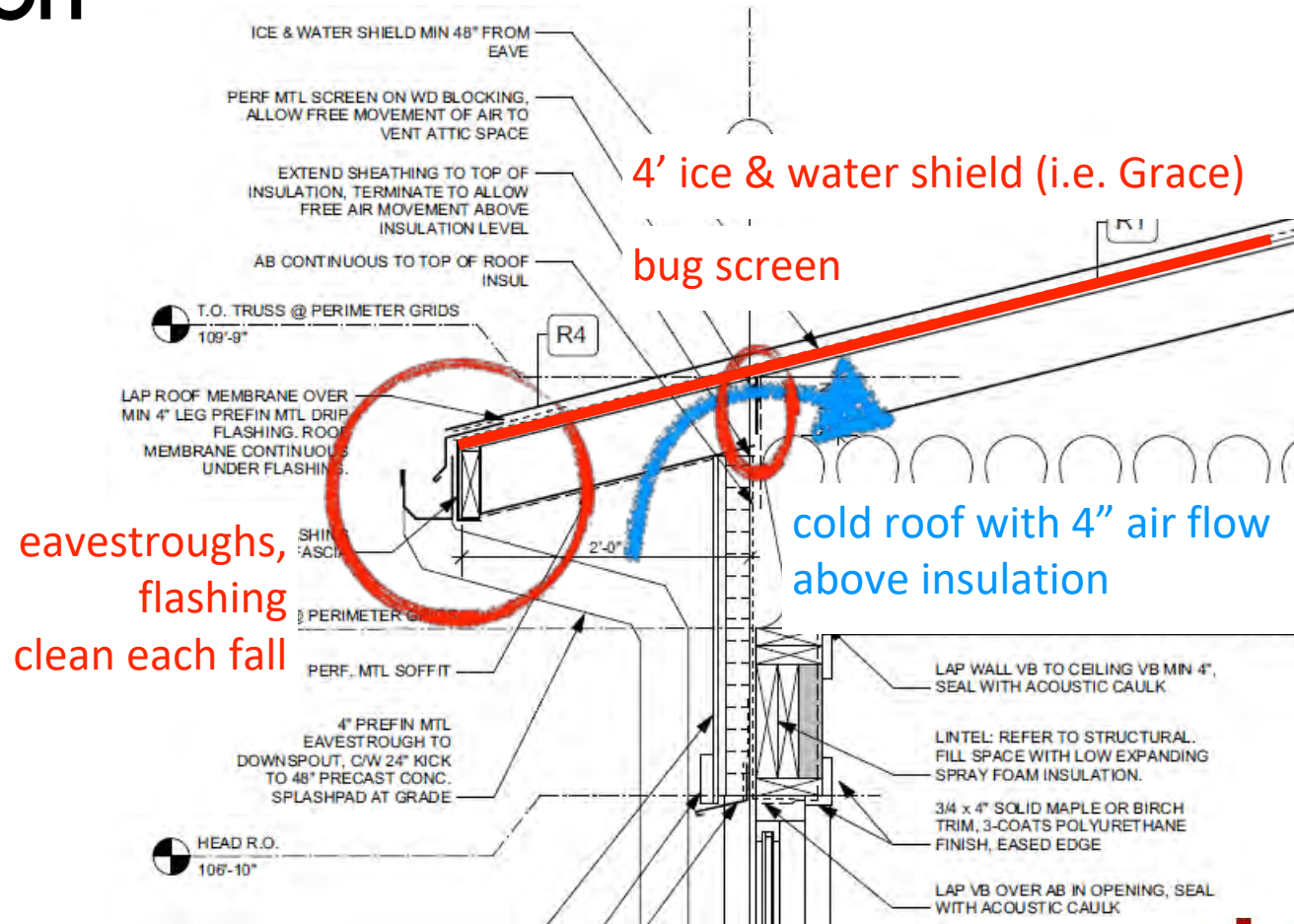
Rigid approved for below grade (type SM)

4' Skirt for frost heave

Insulation

Roof Ventilation

- Vented Soffits
 - 20" heel trusses allow for 16" insulation + 4" airspace
 - Don't forget bug screens!
- Ridge Vent
- Other Roof vents





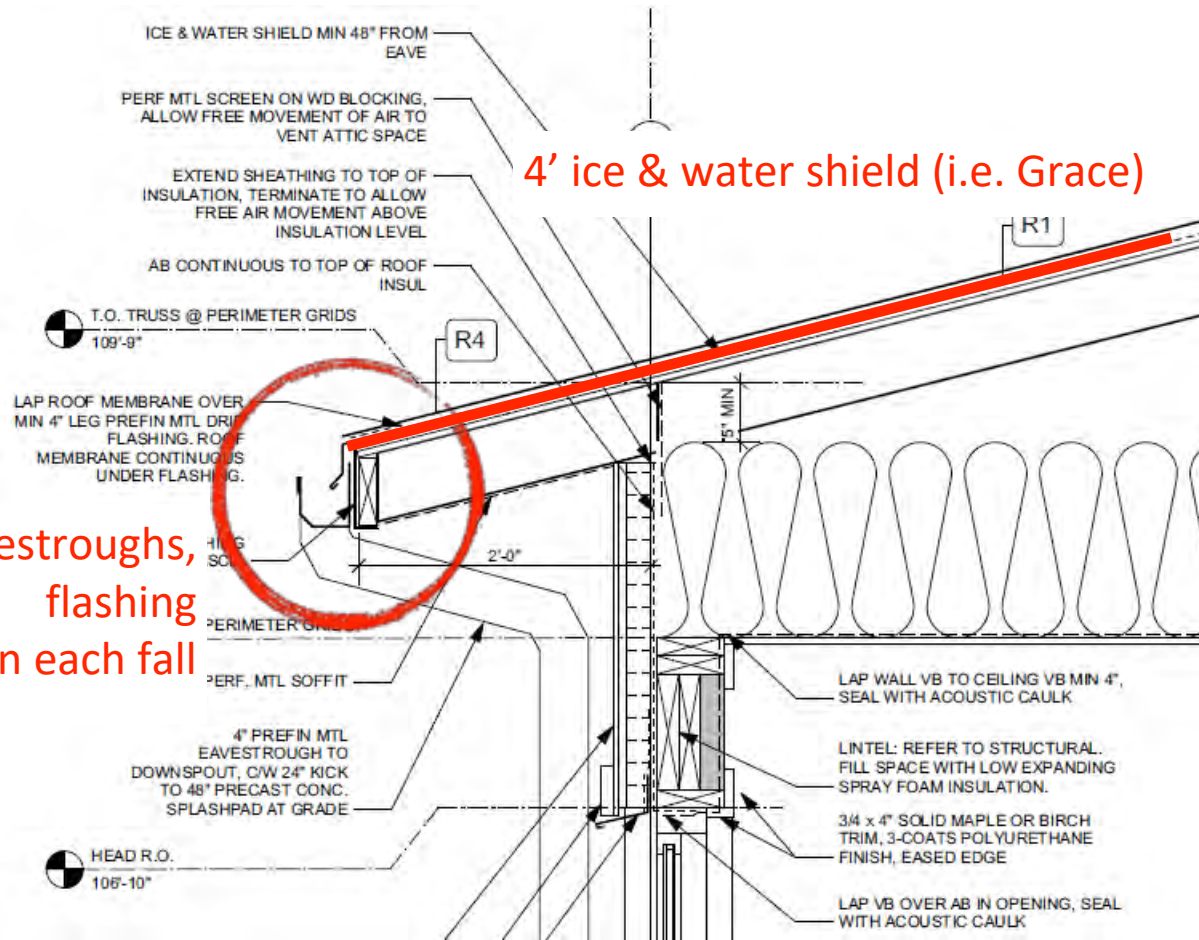
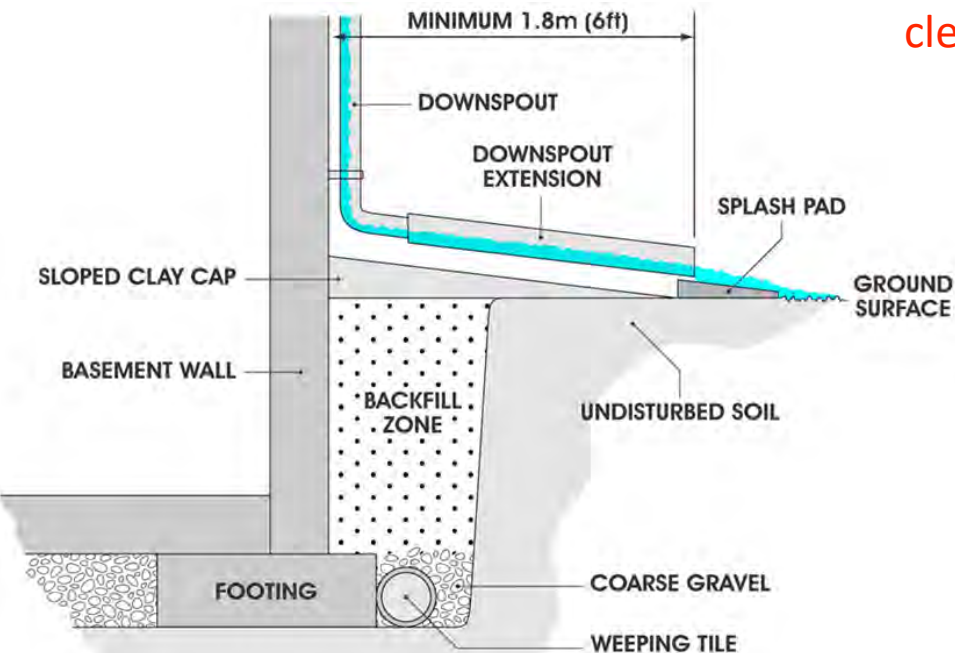


Eaves

- Ice/water shield
- Proper splashpad

eavestroughs,
flashing
clean each fall

4' ice & water shield (i.e. Grace)





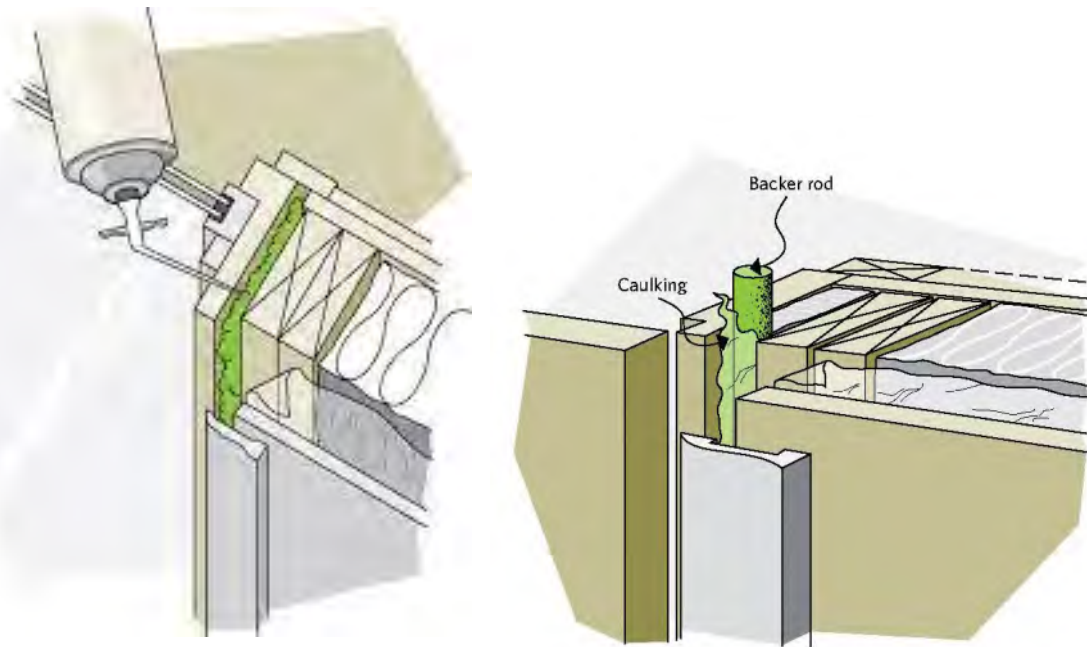
Openings

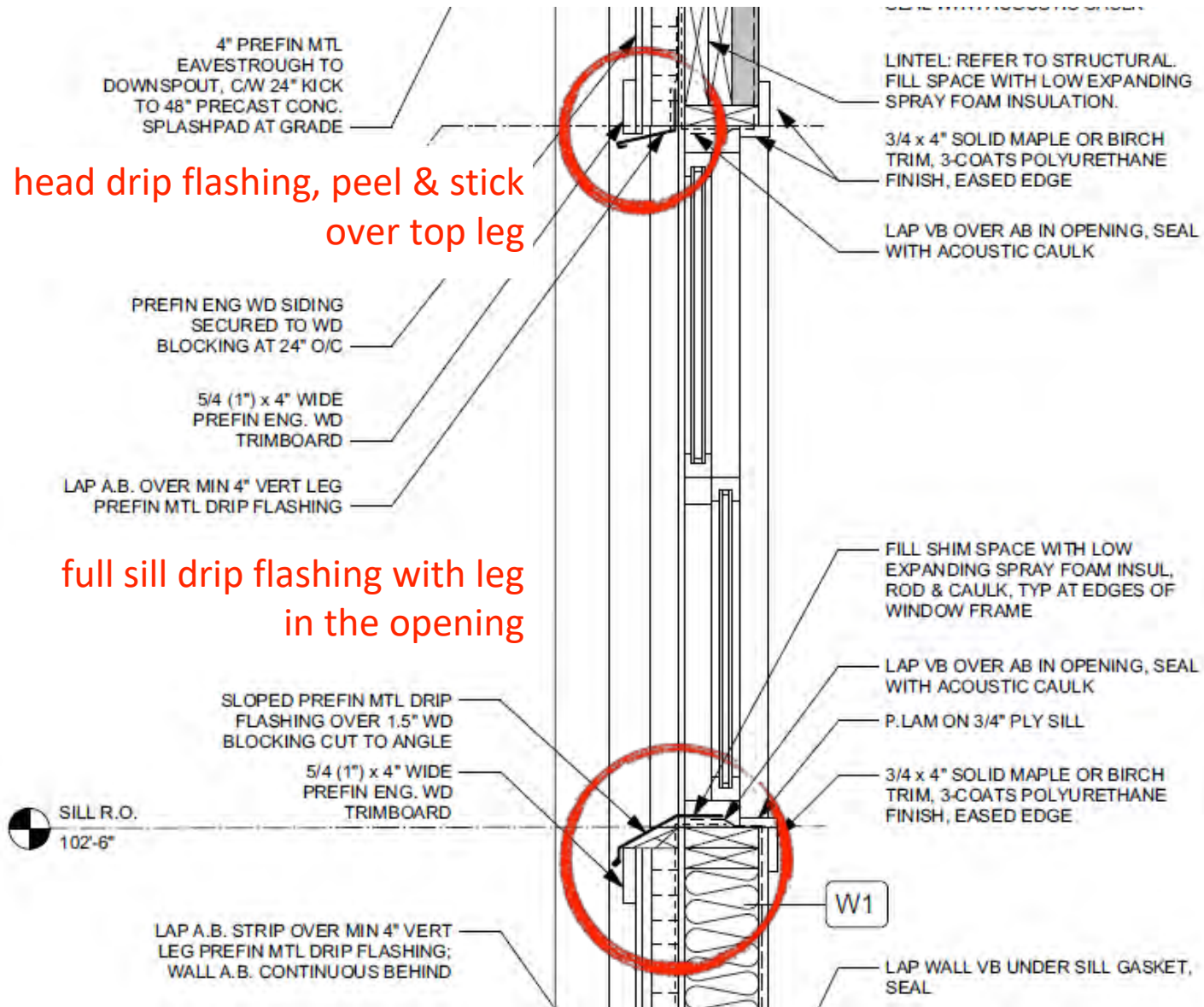
- Lapped membranes
- Proper flashing



Openings

- Fill shim space with low-expanding foam
- Backer rod & caulk at edge



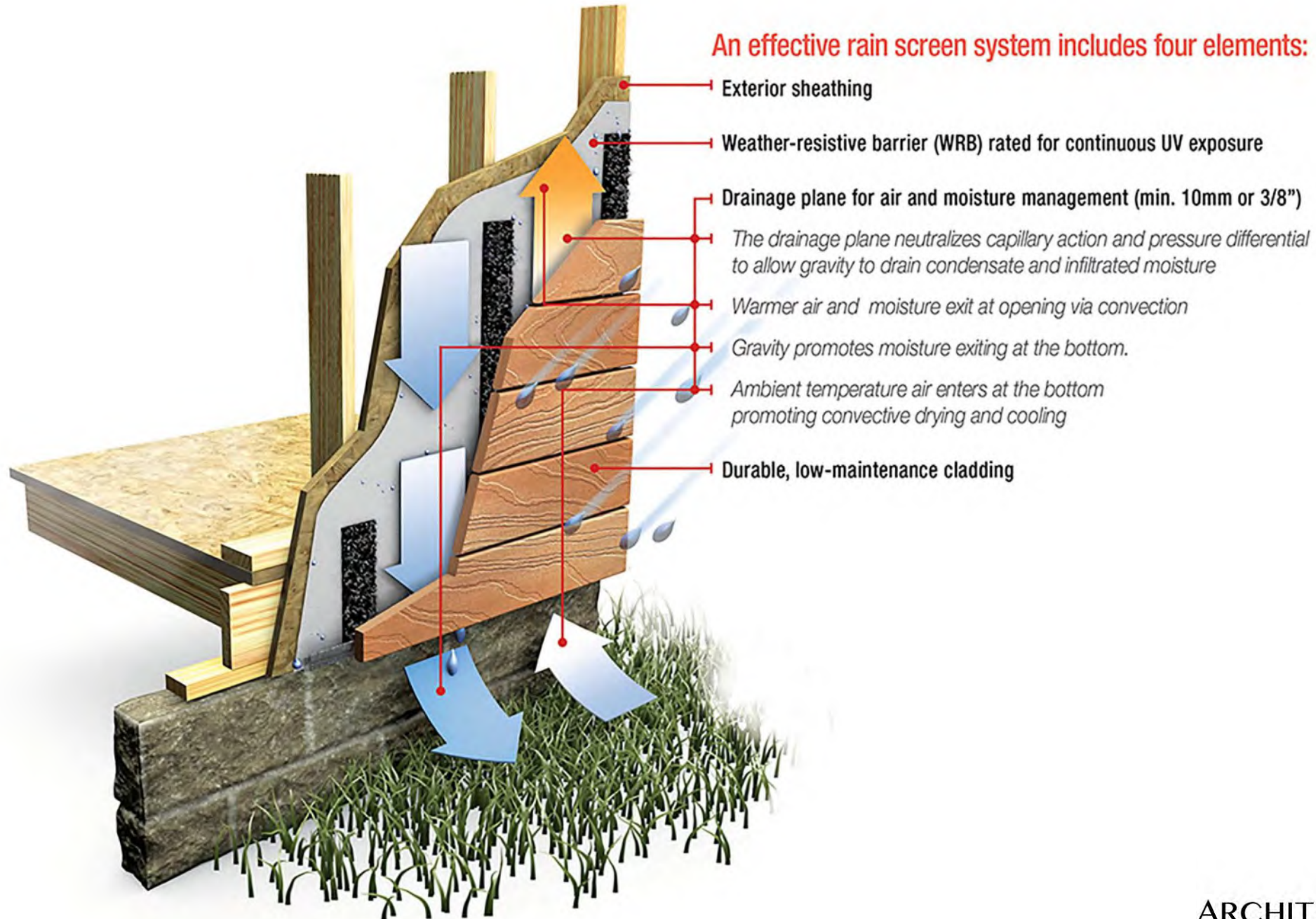


Wall insulation + air space

- 2x6 wall filled with batt insulation and 2” rigid on the exterior (must BREATHE in extreme cold climates).
 - 2” ROCKWOOL COMFORTBOARD
 - 2x8 wall filled with batt insulation
- 3/4” strapping should ALWAYS be installed before the siding. This air space allow for proper drainage and ventilation of the wall system (also called “rainscreen” system)



An effective rain screen system includes four elements:

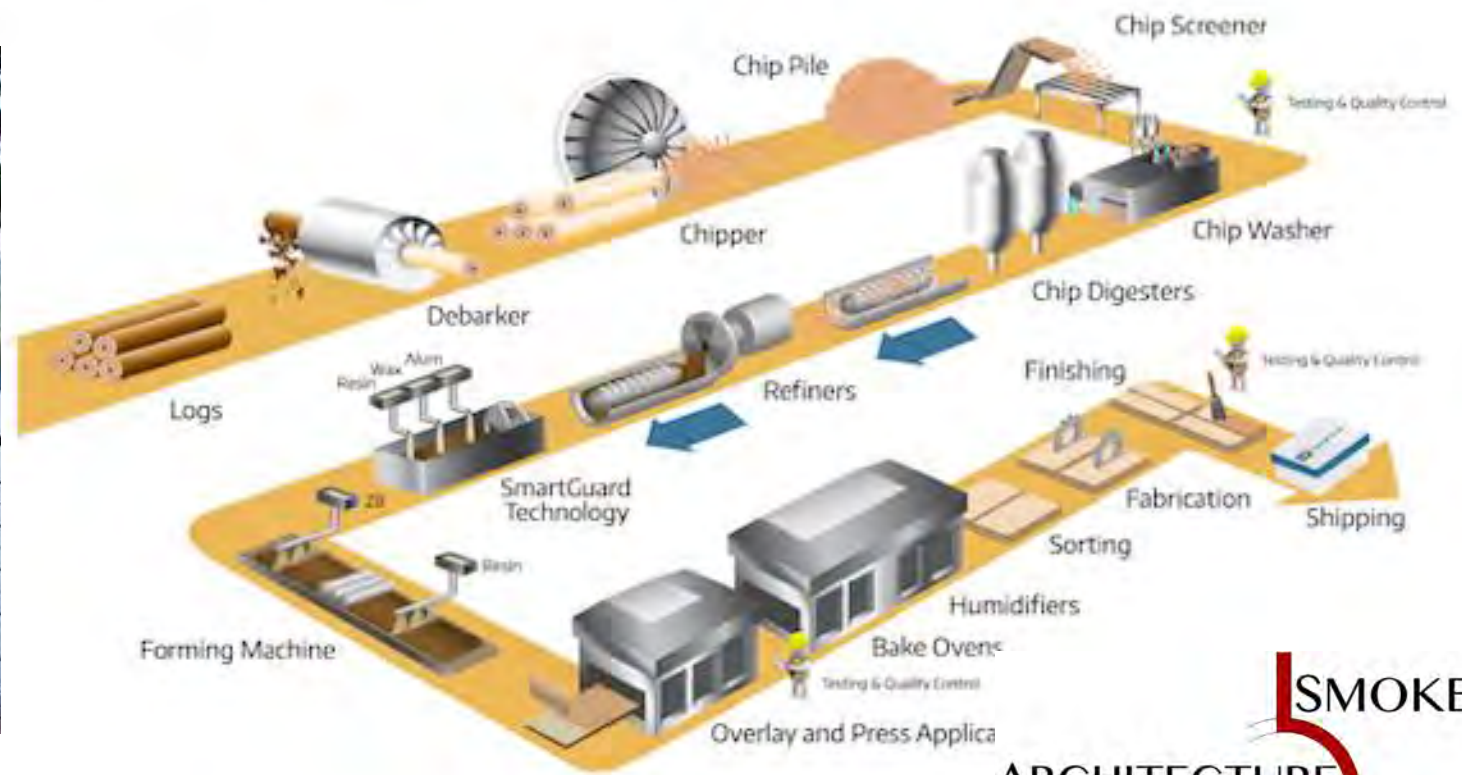


Best Practice Material Choices

- Siding
 - Cement board (i.e. Hardie) or other durable material
 - Engineered wood siding (i.e. Naturetech)
 - wood is very vulnerable
 - vinyl is easy to damage

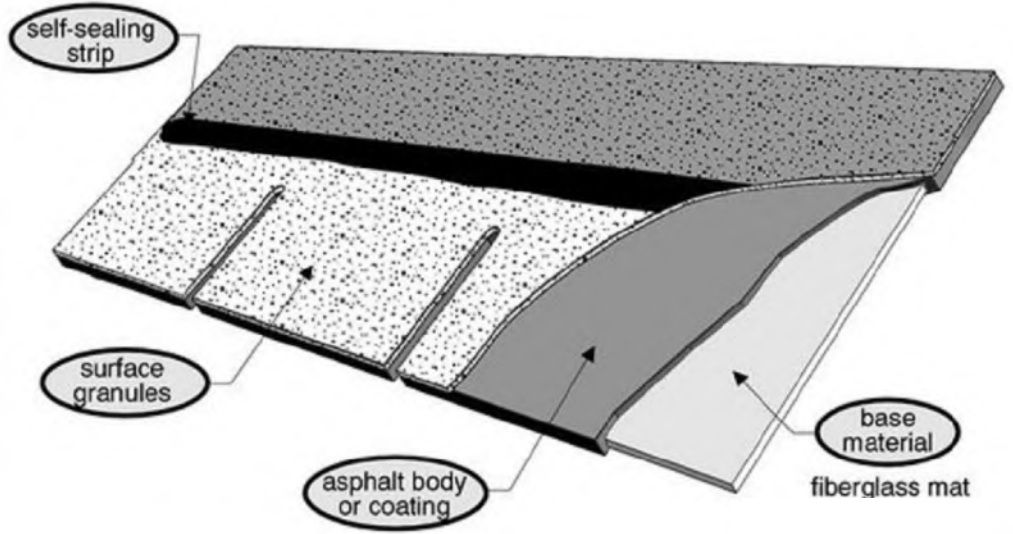


Engineered Wood Fiber Technology



Best Practice Material Choices

- Roofing
 - Asphalt shingles (fibreglass backing)
 - Standing seam w/ concealed fasteners
 - Stone-clad metal (ex. Decra) w/ non-slip underlay
 - NOT corrugated / flat metal: exposed fasteners don't last
 - Lighter colour = longer life



Dark vs. Light Colored Shingles

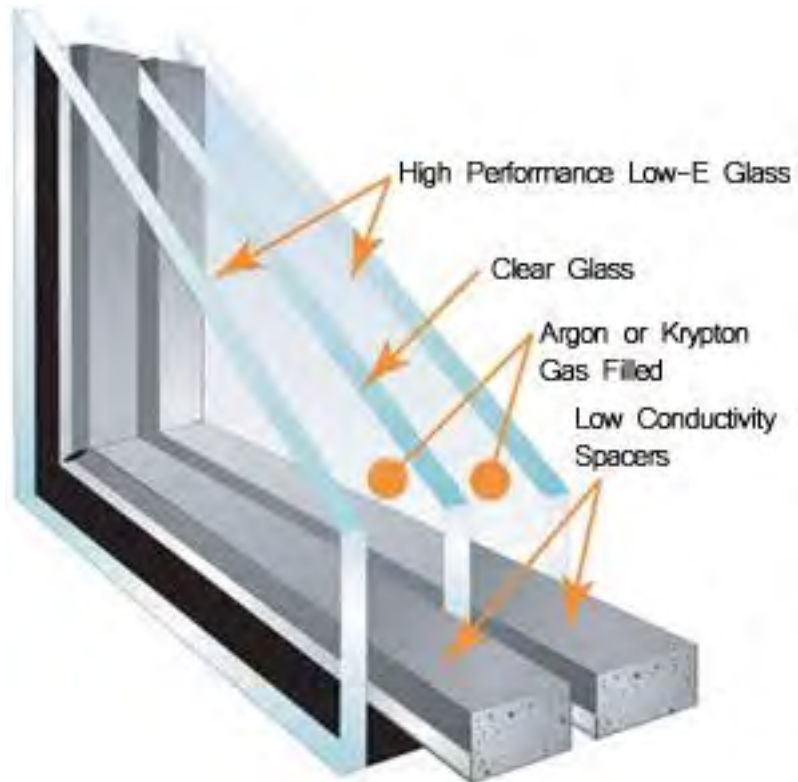
180°	Average Roof Surface Temperature	100°
115°	Average Indoor Temperature	80°
20%	Sunlight Reflection	85%

Installing a light colored roofing material can decrease the energy costs of your home. You can save up to 40% on your electric bills.

Best Practice Material Choices

- Windows

- Fibreglass windows (double hung instead of casement if possible)
- Triple pane is recommended for the Northern Manitoba climate



Best Practice Material Choices

- Flooring

- Marmoleum, hardwood, ceramic tile or carpet tile
- Low VOC preferred for better indoor air quality
- NOT laminate or vinyl tiles

Marmoleum

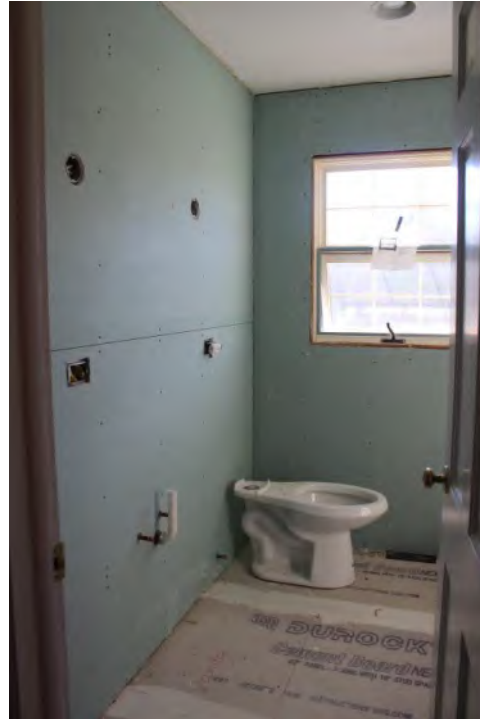
Features:

- ▶ Modern Styles
- ▶ Scratch Resistant
- ▶ Hard Wearing

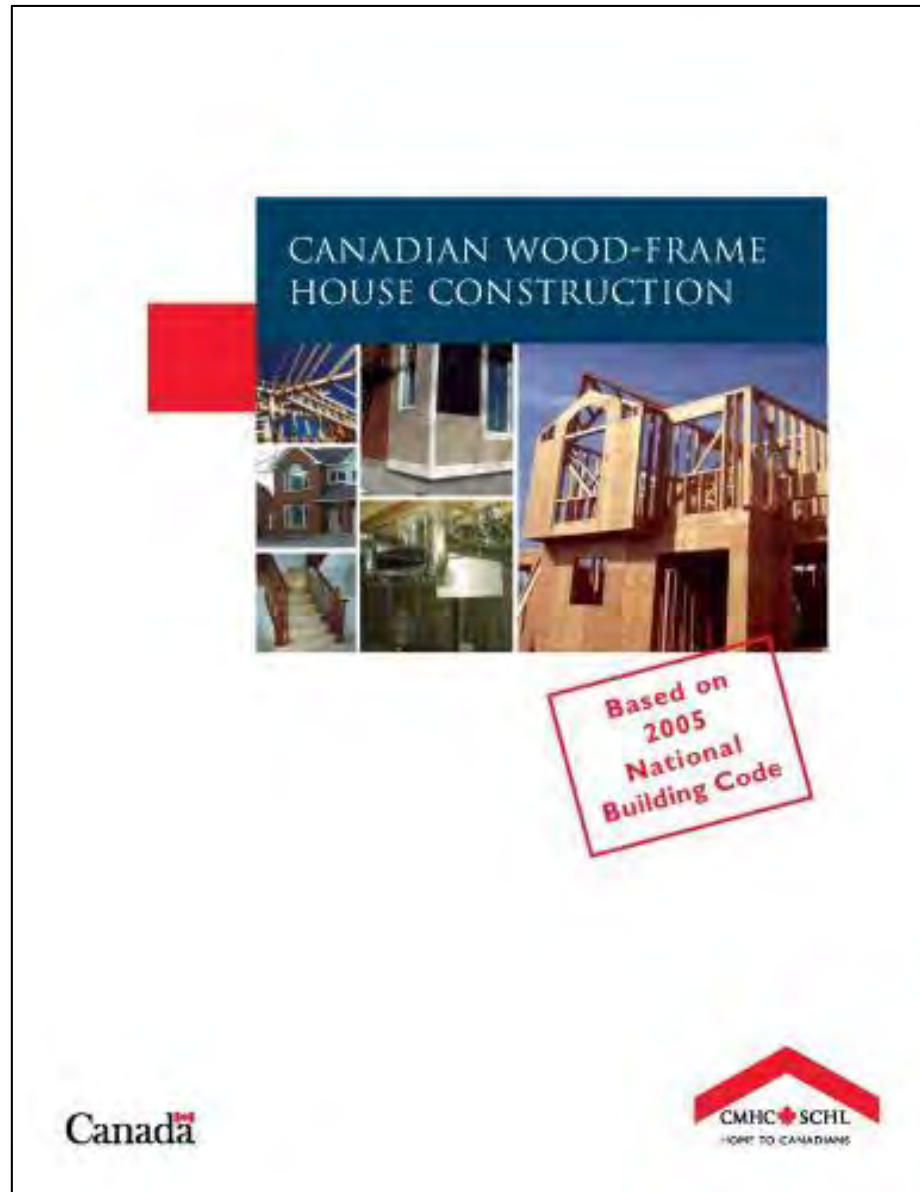


Best Practice Material Choices

- Interior walls
 - Drywall w/ low VOC paint in dry areas of the house
 - ALWAYS use water-resistant options in wet areas such as kitchens and bathrooms to avoid mould (cement board, tile backer board, abuseboard etc)
 - One-piece tub / shower



Resource Materials



community scale

Key focus areas

- Maintenance
- Protecting building materials
- Land use planning
- Neighbourhood planning principles

Asset Condition Reports (ACRs)

- Long-term planning for maintenance
- Funding strategy & making a case
- Inventory and capital planning

Component Code	N/A (Does Not Apply)	No Deficiencies (Component Inspected)	Deficiencies Identified*
Grounds			
A1.1 Landscaping	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
A1.2 Fences/Gates/Railings	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
A1.3 Retaining Walls	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A1.4 Pedestrian Surfaces	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
A1.5 Parking Areas	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
A1.6 Drainage	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
A1.7 Playground Equipment	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A1.8 Paved Play Areas	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A1.9 Play Area Surface	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A1.10 Other	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Building Exterior			
A2.1 Steps/Platforms/Ramps	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
A2.2 Structure	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
A2.3 Foundations/Basement	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
A2.4 Exterior Walls	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
A2.5 Caulking	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
A2.6 Chimney and Stacks	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
A2.7 Painting	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
A2.8 Doors	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
A2.9 Windows	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A2.10 Handicapped Access	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
A2.11 Other	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Roof			
A3.1 Surface	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
A3.2 Flashing	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
A3.3 Drains	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
A3.4 Skylights	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Annual Maintenance:

Site grading



Nobody likes wet feet.

Important things to check, spring and fall:

- Eavestroughs & downspouts
- Kicks & splashpads
- Ground and paving slope AWAY from building
- Weeping tile

Annual Maintenance:

Caulking, Flashings,
Weatherstripping



Nobody likes leaks.

Check Caulking:

- around door & window frames
- wall and roof vents
- outdoor faucets
- gas pipes and electrical lines into the building
- siding joints

Annual Maintenance:

Caulking, Flashings, Weatherstripping



The Flashings

Check:

- Over windows / doors
- Windowsills
- Roof valleys
- Wall / roof connections
- fascia boards at roof edges
- top edges of brick, stone, or other masonry
- bottom of the wall (under siding or masonry)

Annual Maintenance:

Roof



It's your only hat.

Important things to check:

- Penetrations
- Edges
- Ice Damming

Annual Maintenance:

Check for Mold



It only needs two things:

- Food
 - Water
- ...and it eats EVERYTHING

Annual Maintenance:

Mold

Usually, these are the causes:

- Some kind of water from inside
- Some kind of water from outside
- Bad building ventilation

First Steps:

- Check HVAC
- Is water getting in from outside?
- Is there condensation?
- Are there water leaks inside?
- If it's a damp location, is drywall fiberglass backed or moisture-resistant?

Annual Maintenance:

Crawlspaces

Total perimeter check every spring and fall

- Hatch closed and gasketed
- Inside doors between crawlspace areas are closed
- Nothing is stored down there
- Water coming in at the edges
- Water coming up through the floor
- Vapour barrier is protected
- Check sump pit and pump
- Check lighting and exit signs
- Check vents and fans



Annual Maintenance:

Attics

Total perimeter check every spring and fall

- Hatch closed and gasketed
- Inside doors between attic areas are closed
- Nothing is stored up there
- Soffits & insulation stops are clear
- Rafter blocking / insulation isn't stopping eave vents
- Roof & gable vents are clear
- Insulation is continuous
- Roof trusses are sound
- Water damage



Protecting building materials

- Simple storage solutions available such as carport tents
- 2 priorities are:
 - Keep rain and snow off of the materials
 - Keep the materials off the ground – even wood palettes are better than nothing

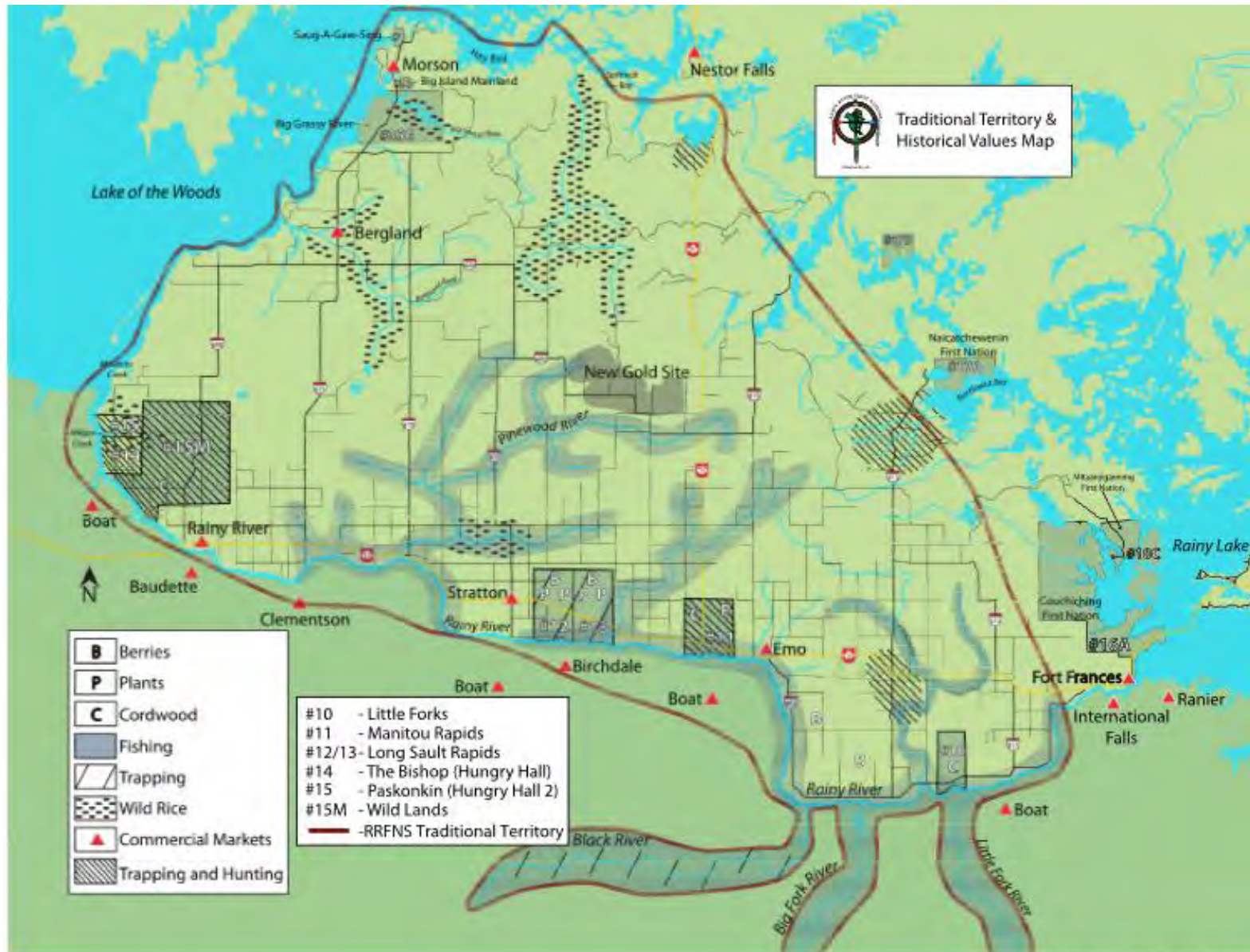


Land use Planning

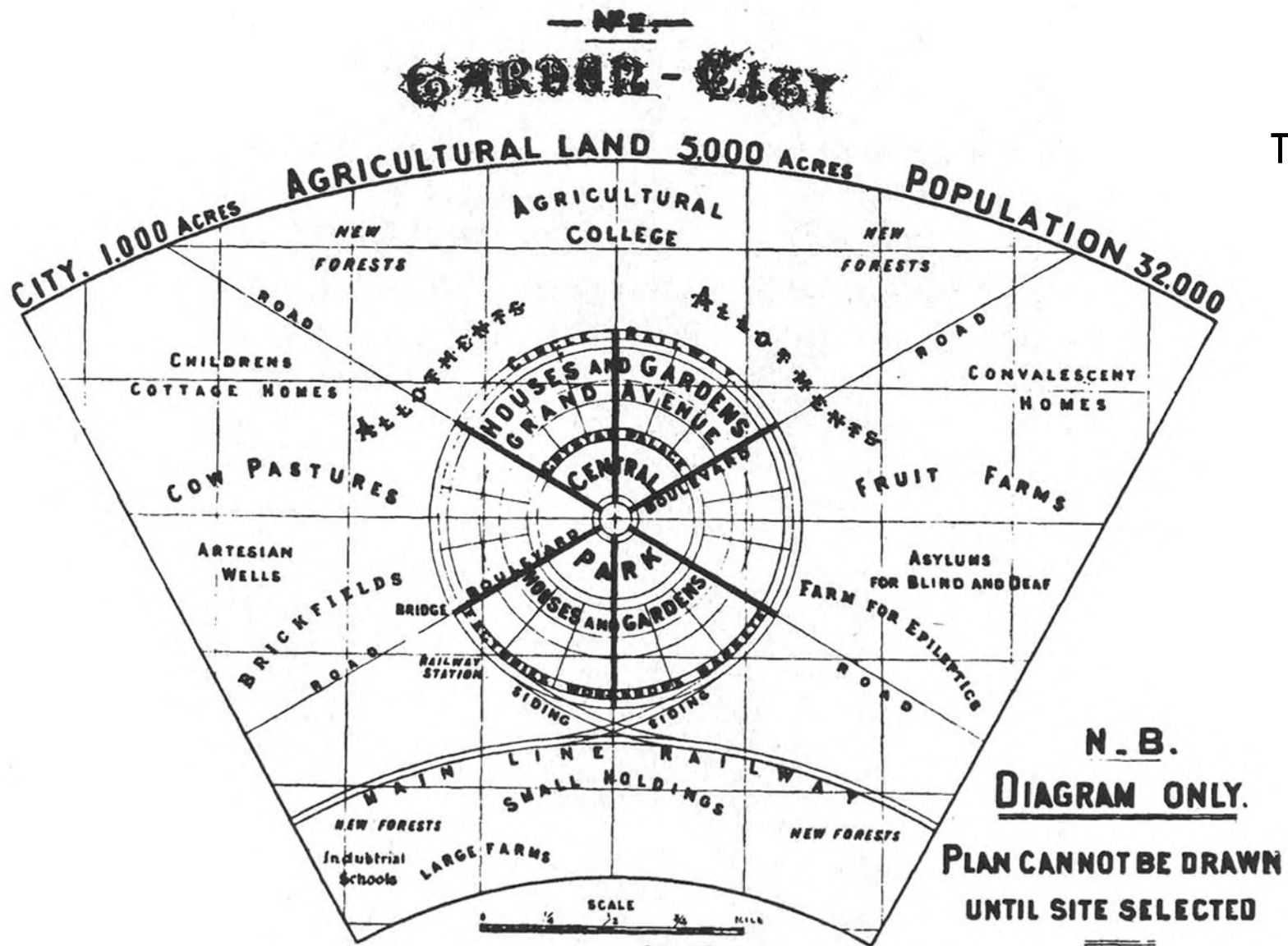
- INAC has a funding opportunity available specifically for First Nations land use planning
- Update plan every 10-15 years
- Good practice to frequently review current infrastructure and housing needs



Rainy River First Nation Traditional Land Use Map



source: Rainy River First Nations



The concept included:

- Central park in the middle, surrounded by public buildings
- Six major boulevards join concentric rings of avenues, and divide the city into 6 neighbourhoods
- First ring from the centre is a commercial & market area.

Fig. 2. Ebenezer Howard, *Garden-City. No. 2*, 1902, in *Garden Cities of To-morrow*.

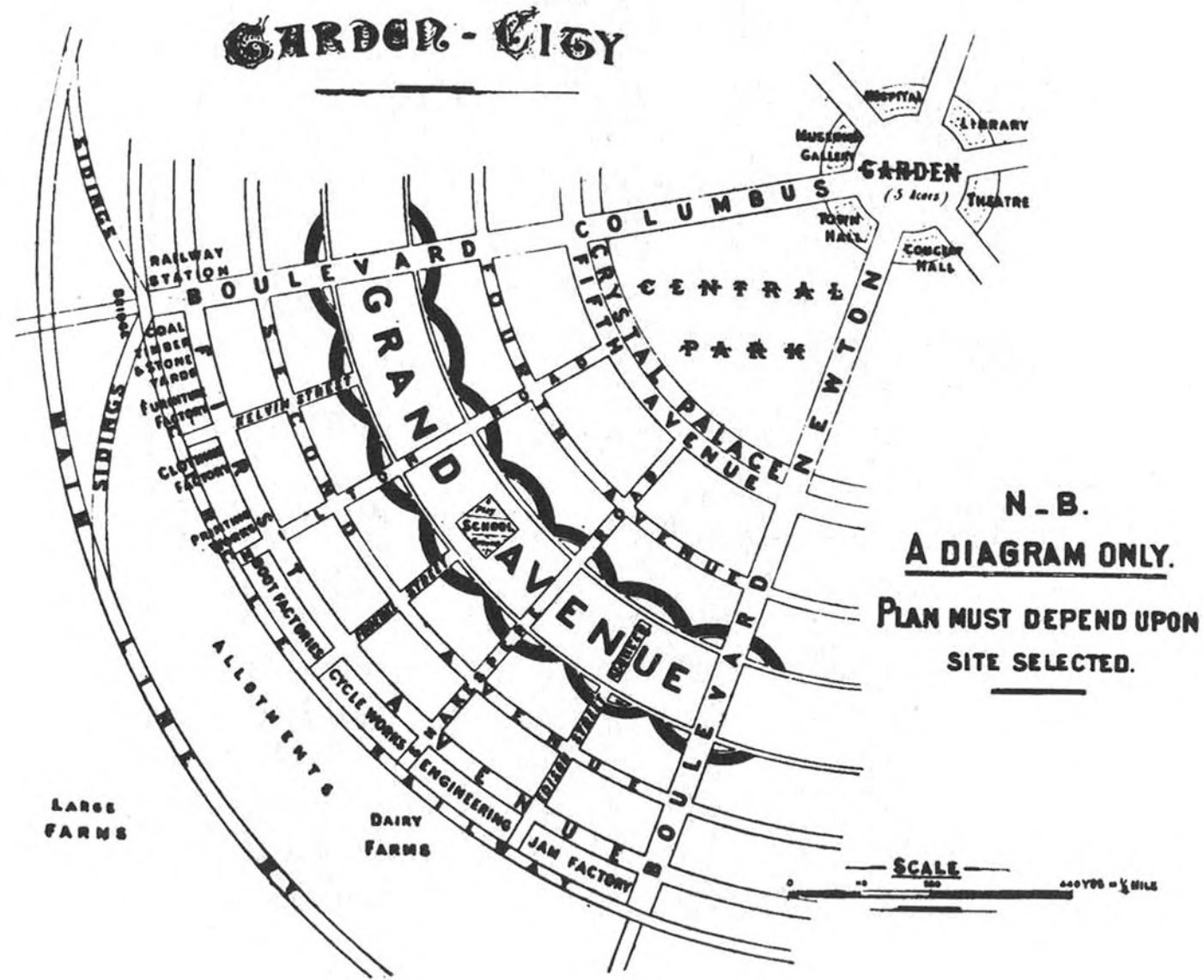


Fig. 3. Ebenezer Howard, *Garden-City. Grand Avenue*, 1902, in *Garden Cities*



Clarence Perry's
"neighborhood unit"
1929



Ouje' Bougoumou Village — Douglas Cardinal Architect

Neighbourhood Planning Principles

- Reduce house spacing:
 - improved security
 - grouped services
 - reduced road lengths



Gwa-yas-dums Village, Gilford Island, BC

Neighbourhood Planning Principles

- Provide housing for a variety of family sizes and age groups
- Provide accessible green space for everyone to enjoy



Gwa-yas-dums Village, Gilford Island, BC

Neighbourhood Planning Principles

- Cluster shared services
- Create connections between individual homes
- Neighbourhoods: identity, relationships



regional scale

First Nation Market Housing Fund



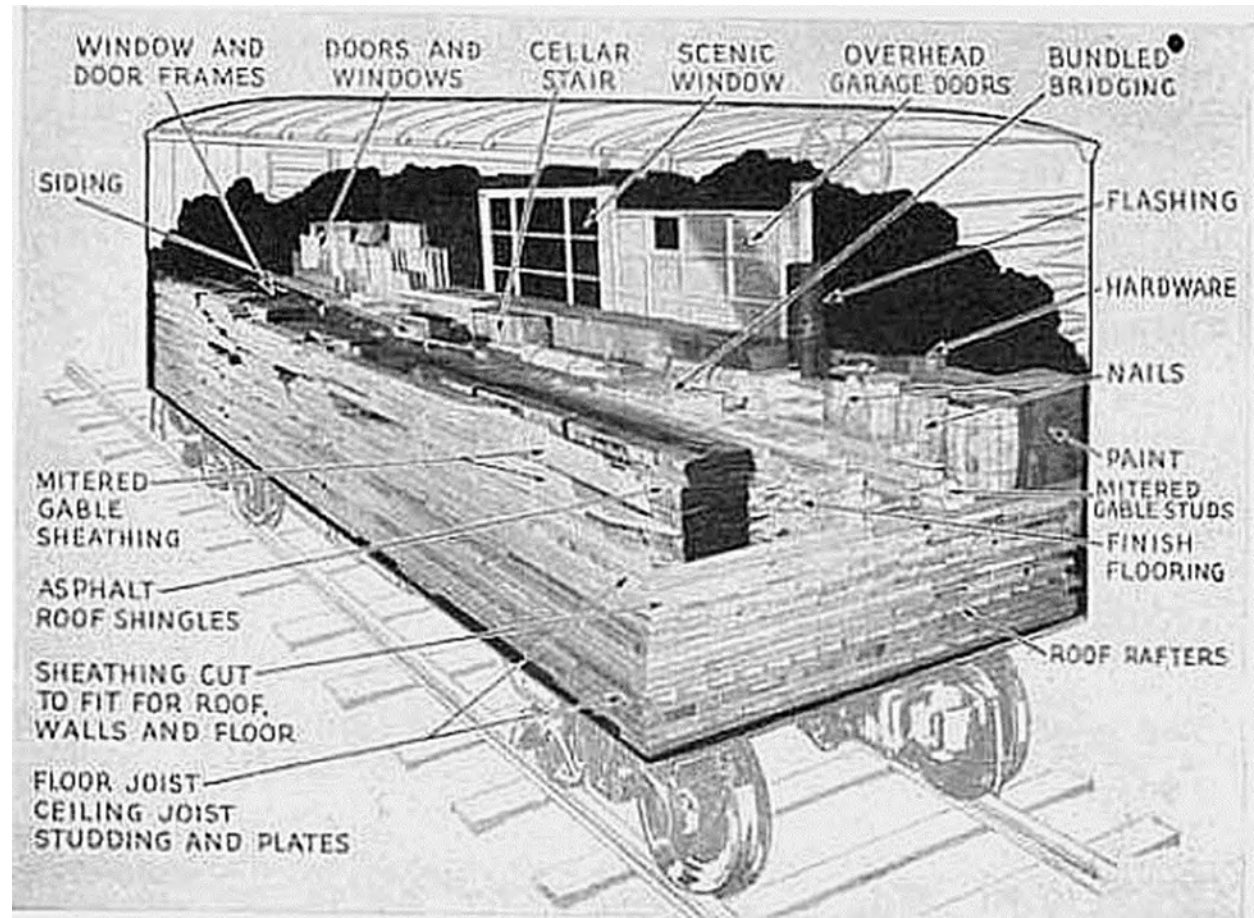
Challenges

- Short building season
- Transportation challenges associated with winter roads and limited fly-in opportunities
- Limited certified tradespeople
- Bulk purchasing power



Bulk Purchasing power

- Can specify flat packed home kits
- Establish a distribution network and hub
- Case study:
 - Shibogama Tribal Council
 - David Gordon – Lac Seul First Nation
 - “Cash Wise” franchise

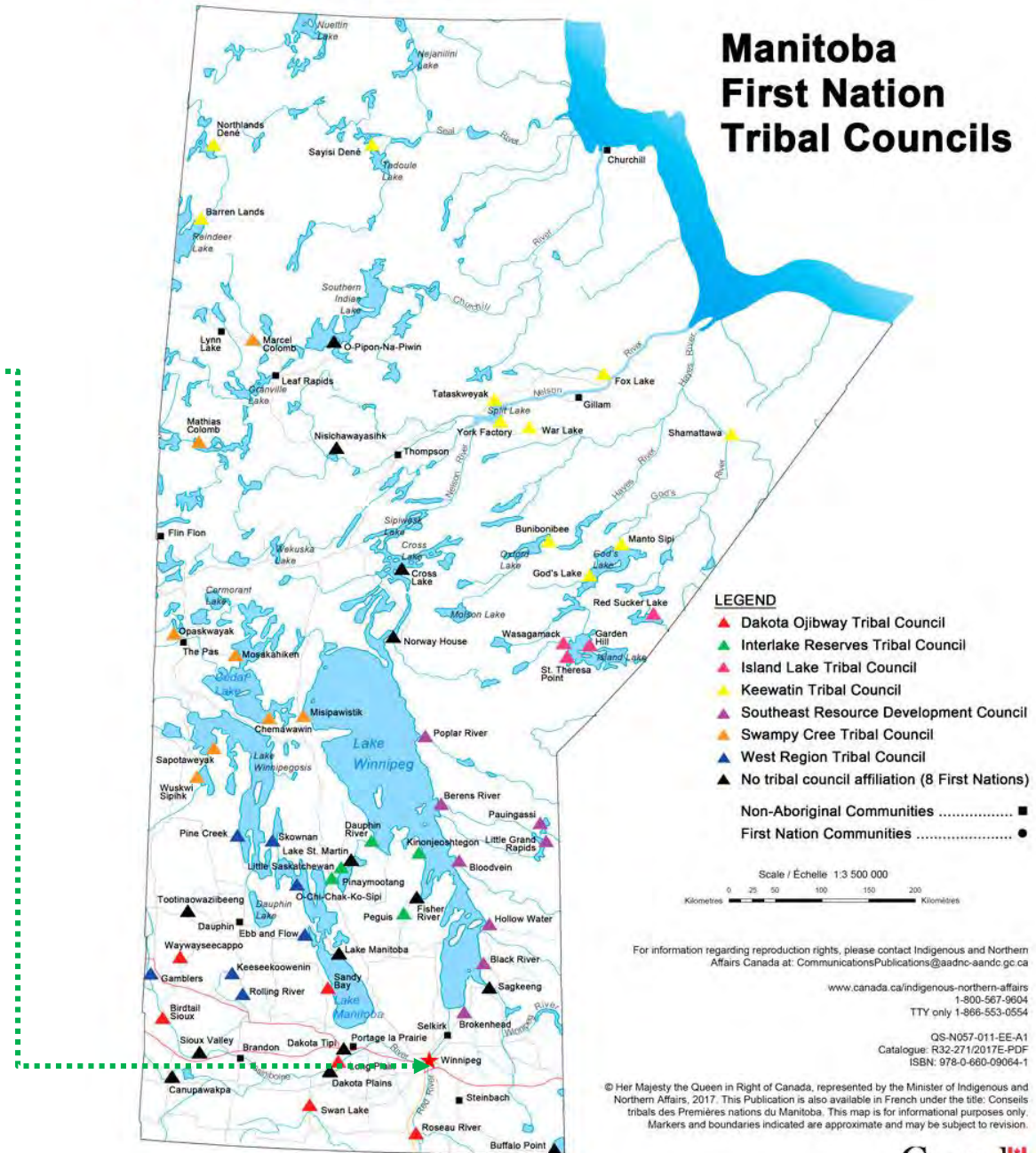


Manitoba First Nation Tribal Councils

Kapyong Barracks

Treaty 1 First Nations

- Brokenhead Ojibway Nation
- Fort Alexander (Sagkeeng First Nation)
- Long Plain First Nation
- Peguis First Nation
- Roseau River Anishinabe First Nation
- Sandy Bay First Nation
- Swan Lake First Nation





Fort William First Nation Sawmill
near Thunder Bay, ON

Q&A



small group discussion:

Building scale — thoughts on building materials & envelope





small group discussion:

Community scale — thoughts on maintenance & land use planning



small group discussion:

Regional scale — thoughts on regional distribution / warehouse



APPENDIX E
TRIODETTIC PROTOTYPE MULTIPOINT FOUNDATION

December 17, 2019

Larissa Roque
Smoke Architecture Inc.

OXFORD HOUSE MANITOBA PROTOTYPE MULTIPOINT FOUNDATION PRICE

Triodetic is pleased to offer our budget price for the design and supply of the galvanized steel Multipoint Foundation frame in accordance with the drawings that you have provided to us.



The preliminary layout and beam dimensions for the multipoint foundation are shown on the sketches.

The foundation frame would incorporate all of the necessary structural steel tube framing, connectors, hardware and adjustable base plates, and would also include saddle brackets at the top chord node points to provide support of the floor joists.

Triodetic will provide engineered shop drawings and material lists for all components being provided with the Multipoint frame, as well as complete installation drawings and instructions.

The following specific items are ***not included*** in our price:

1. Site preparations, gravel pad, geotextile material or timber bearing pads.
2. Installation labor, tools and equipment.
3. Floor beams, flooring, screened material and decking.
4. Taxes.