Eagle Nest
Saugeen First Nation
Sustainable Housing

Multi Unit Residential

8 ☛ 3-Bedroom Apartments

Funding provided by INAC and The Saugeen First Nation

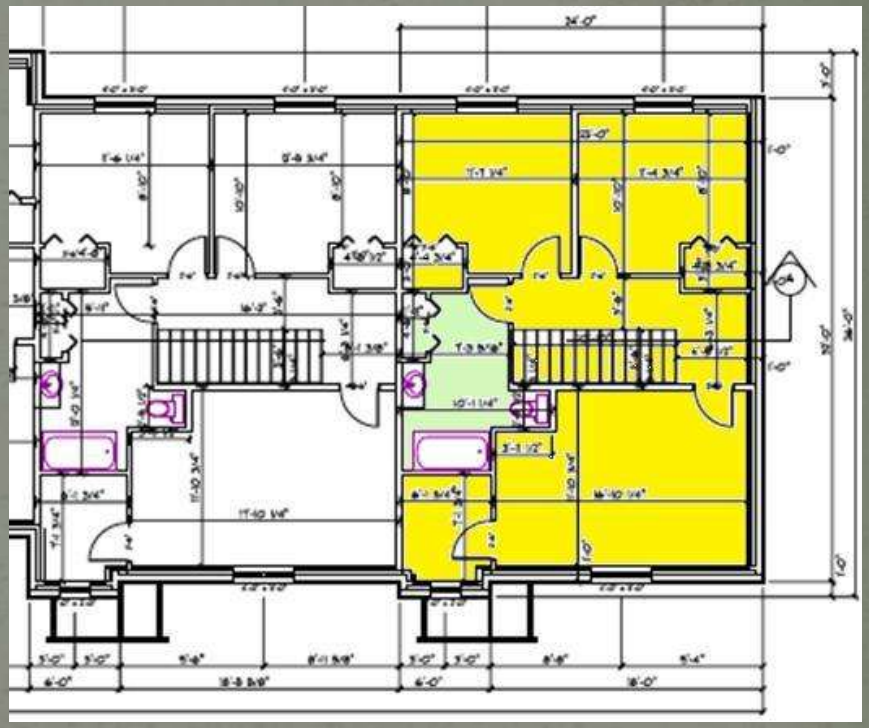
Project Cost : 1.5 Million Average cost per unit 187,500.00

Average unit cost includes site servicing and landscaping

Proposed Multi Unit Site Selection

Site was selected because of Service: Hydro, Water, Street, Fire protection , Communication Service and Maximum sunlight exposure (Date was Nov 5 2009)

Design Concept and Plan Review



Architect commissioned and design and review phase commenced

INAC Visit the proposed site

- Siva Appiah

  Senior Funding Officer
- Dallas Anderson

  Funding Services Officer
- Tanya Girke
- Manager
- Thomas Laronde

  Four winds Consultant

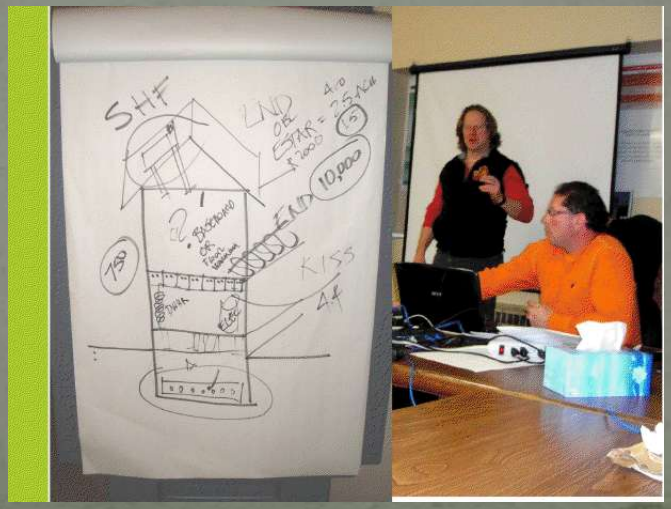
INAC visited the site to confirm the location and it was really there for shovel ready (Nov 9 2009)

The Team Brain Storm Session

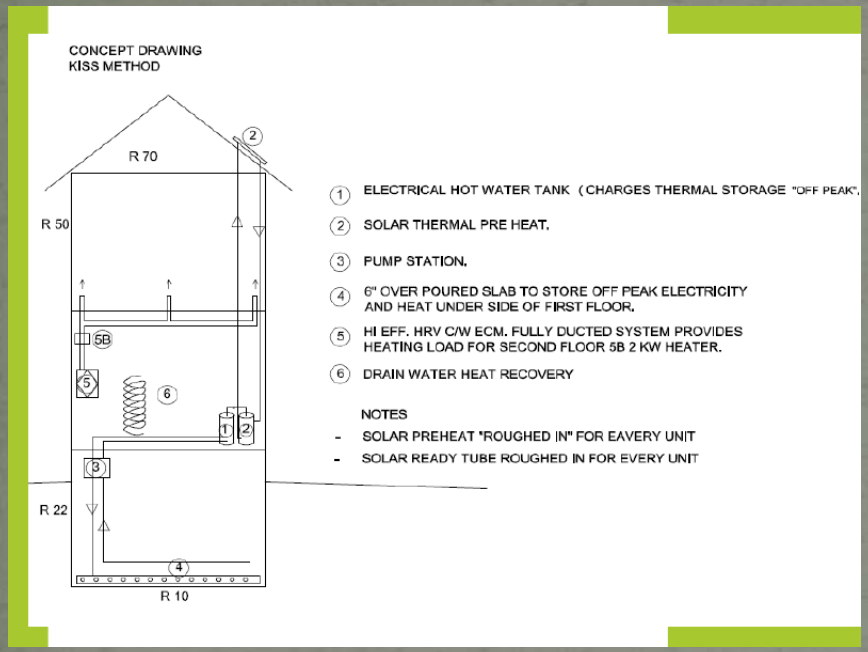
KISS PRINCIPLE = KEEP IT SIMPLE SAUGEEN !!

- Review the plans and modeling info as to the potential
- Identify and review potential energy improvements to the plans
- Identify areas that need more research
- Review first cost implications
- Discuss potential sponsors/partners and identify roles

Sustainable Housing Foundation

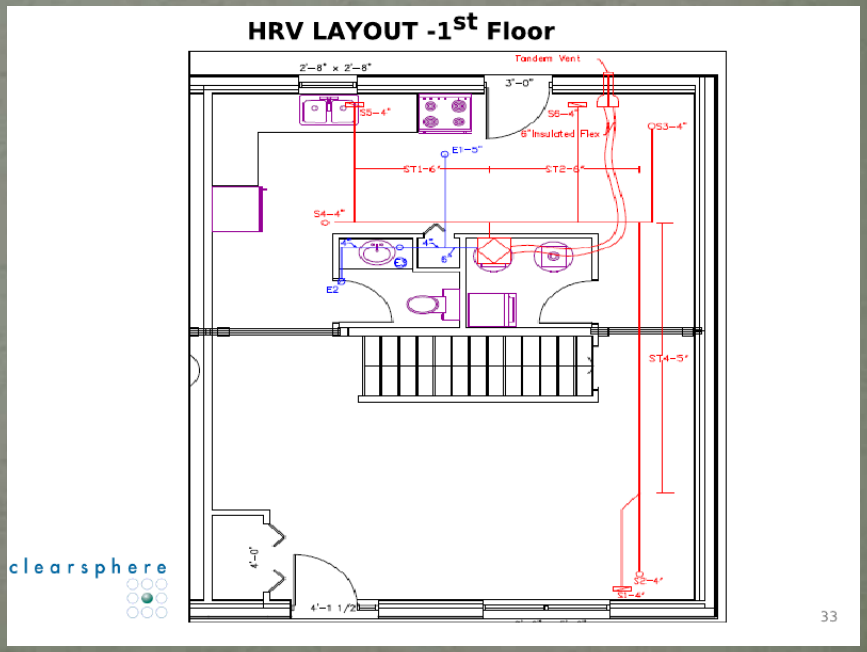


Energy And Design Concepts Review

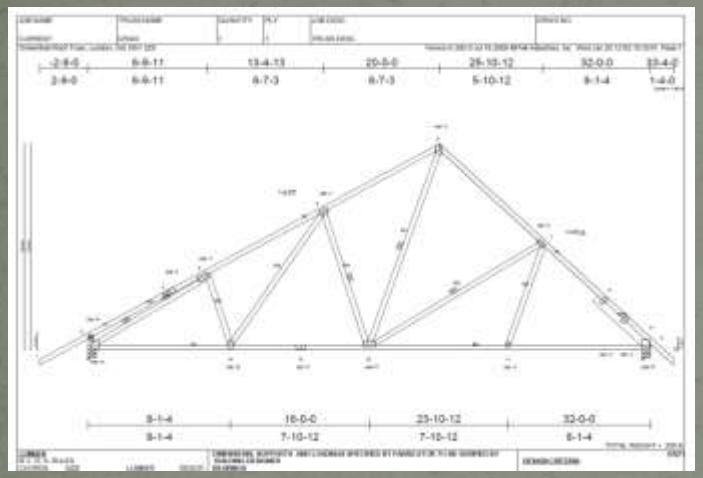


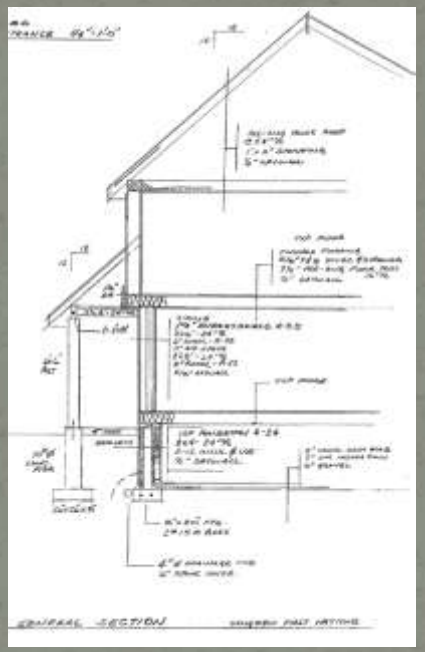
Implementing Potential Energy Conservation Features

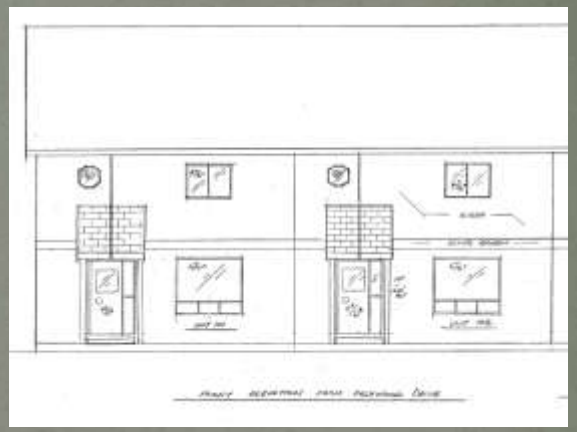
Heat Recovery Ventilation design



Design Build or Build Design







Geotechnical Review
Clearing and Grubbing

Test hole was excavated and geotechnical review was conducted on Dec 9 2009 and lot clearing commenced

Location and Excavating December 17, 2009

The excavation starts Dec17 2009

Sub grade Prep and Footings

Footings: Start Dec 19 2009
Footing Pour : Dec 21 2009

ICF Foundation & Pour

Insulated Concrete Forms

First Floor Framing

Wood I Floor System

Flooring Starts : Jan.12 2010

Foundation Protection Layer and Exterior Drainage

- Water proofing membrane extending over footings
- 4” socked weeping tile and clear stone

Super Stud Factory

Super Stud Factory: Starts working on studs at the training centre, Jan.15 2010

Utilizing First Nation Resources: Training Centre and Community Employment

Exterior walls & Party walls

Party Walls designed for Ease of second floor transition

Expanded Wall Cavity R-45 +Wall

Provides thermal break, increased levels of insulation, allows installation of services without creating air voids in insulation

Thermal Break and in Piped for in floor heating

2” rigid foam under slab

Pex in floor heating

6” poured concrete slab provides thermal mass for heat retention

Uponor

Fire Separation

Dens Armour (Tm) Paperless Drywall Moisture and Mold Resistant – allows for exposure to elements during construction

Framing

Multi Unit Construction allowed for varying stages for construction

Insulation and Vapor barrier

Air Tightening

Foam guns, Acoustical Caulking and sheathing tape

Exterior Insulation

Additional layer of exterior insulation Provides an additional R value - 6 (RSI) 1.05

Foil-Faced
Polyisocyanurate Foam Sheathing

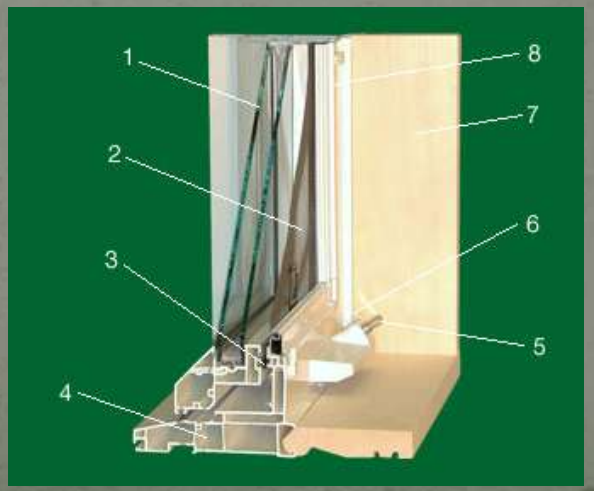
Triple Glazed Low E Argon Windows

Energy Star Rated Windows

Awning and Casement windows provide higher sealing qualities

TECHNICAL FEATURES

1 - THERMAL SEALED GLASS - Available in various Thermal Edges, Low E and Argon Gas for Maximum R-Value Performance
2 - SCREEN - Aluminum Frame with Fiberglass Mesh
3 - WHEATHERSTRIP - Compression weather strip for Superior Energy Efficiency
4 - DESIGN - Multi-Chambered Design Add Insulation and Strength
5 - HARDWARE - Durable Hardware to Ensure a Consistent Smooth Operation
6 - FUSION WELDED - Fusion-Welded for Superior Strength and Seal
7 - WOOD OR VINYL JAMB EXTENSIONS - For New Construction Application
8 - VINYL - High Impact Resistant P.V.C.



Attic Insulation R – 70 Batt and Blown-in

ROXUL®
The Better Insulation™

Alternating layers of R-14
Roxul insulation
Total R – 42 Batt Insulation

Therm-O-Light Cellulose Fibre Insulation

Blown in to provide seal around framing members
R – 32 Blown in depth 9.6”

First Nation Community Employment

Created employment for Saugeen First Nation Members, Sub trades and students

Created 25 jobs under Saugeen's Work force. Plus various Sub trades hired community members.

Septic Design – Tertiary System

DESIGN CRITERIA FOR SEWAGE SYSTEM AT SAUGEEN CEAP 8-PLEX
By Mac Taylor, BCIN #10557

January 22, 2010

Building to be serviced is an 8-plex consisting of eight single family dwellings each, approximately 112 square metres, 3 bedrooms, 1 ½ bathrooms, kitchen sink, clothes washer, laundry tub and dishwasher.

Total daily design flow is 1600 litres per day each x 12800 litres per day = Q

Soil conditions a beach sand and I have assumed a percolation rate of 6 – 10 minutes per centimetre = T

SEPTIC TANK SIZE = Q x 2=12,800 x 2 = 25,600 litres (5638 gallons)

Note (1) Purpose to use either 1-6500 gallon or 2-3000 gallon septic tanks with risers to grade and effluent filters.
Tanks to be over 1.5 metres from the buildings and over 3 metres from the property line

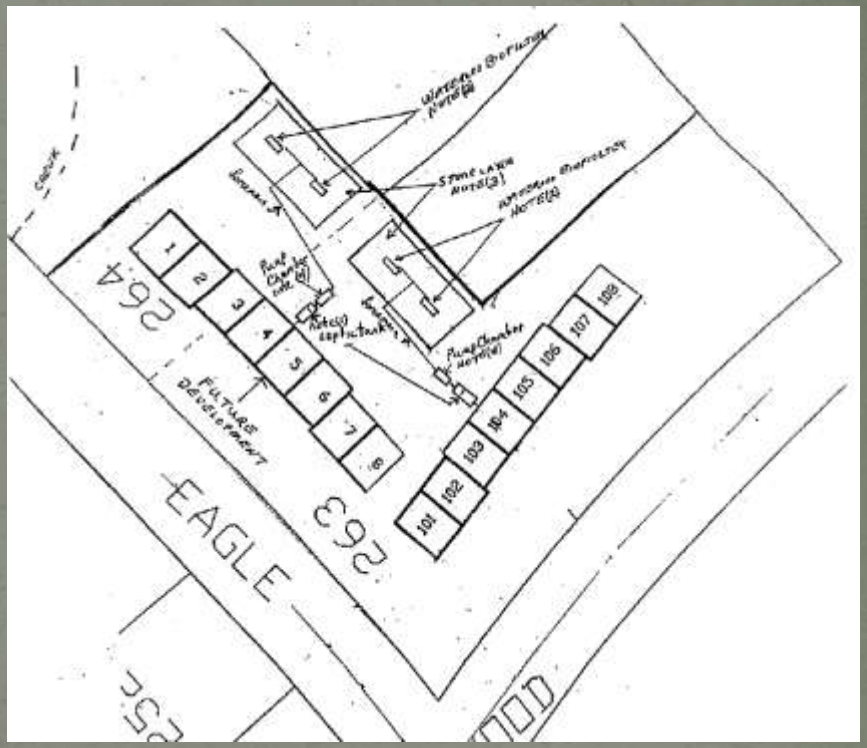
LEACHING BED to be Tertiary Treatment using a Waterloo Biofilter System

Note (2) Two cedar shed configuration, capable of treating 6400 litres each per day. Treatment Units to be over 5 metres from buildings and over 3 metres from the property line

Note (3) The stone layer under the sheds is Q>3000 litres per day = Q/50
12800/50 = 256 square metres, the stone layer is to be covered with filter cloth prior to backfilling

Note (4) Pump chamber/balance tank equal to 1/3 to ½ of the daily flow
Use 9100 litres (2000 gallon tank) and duplex alternating pump system with current sensors.
The forcemain will be 2" PVC and will free drain back to the pump chamber.
All electrical supply and connections is to be done by the owner.

Water supply is Municipal



Implemented Renewable Technology

SOLARSHEAT
SOLARSHEAT 1500G

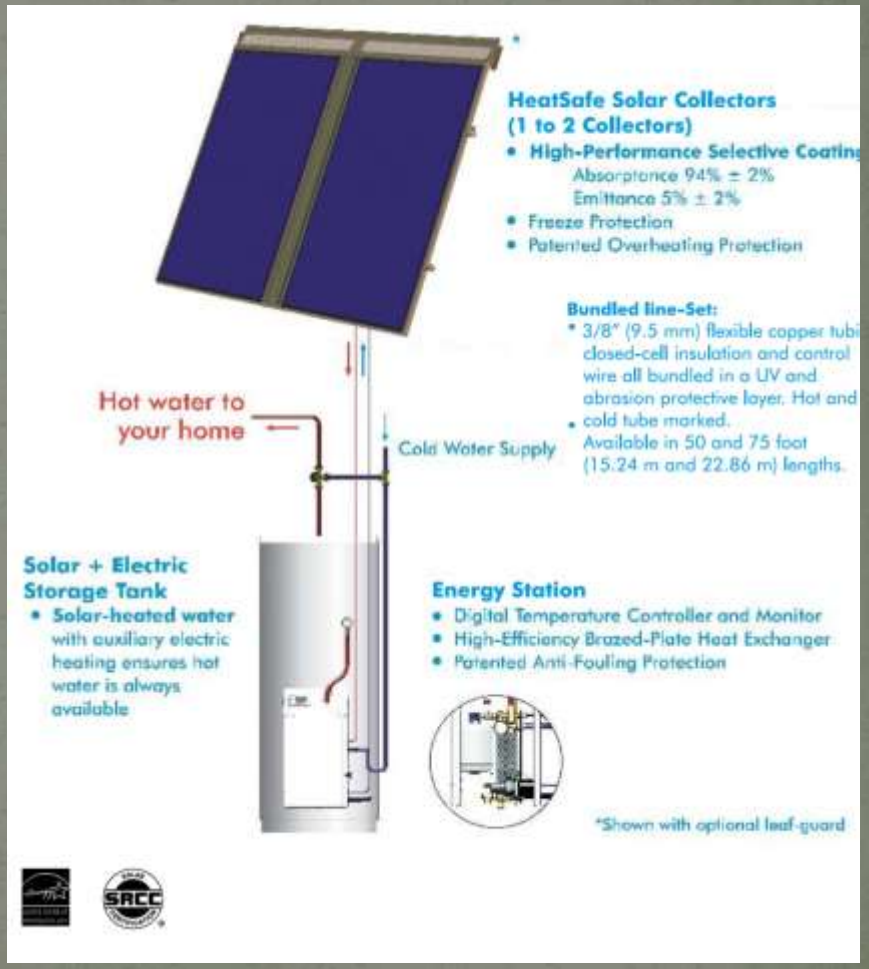
Solar Air Curtain

The SolarSheat 1500G is a glazed recirculation solar air collector designed for space heating applications. The 1500G is a supplemental room heating system. A 1500GS (secondary) collector can be attached for larger room heating needs (see the 1500G 2 Pak). The addition of the 1500GS will allow for higher temperatures and better performance in colder climates and hazy conditions.

The SolarSheat 1500G can heat an area of the home or room up to 750 ft^2 or 70m^2 when the sun is shining. Air is drawn from inside the room through the bottom of the collector and blown out through a duct in the top. The desired temperature is set at the external digital thermostat.

Solar Hot Water Pre Heat

EnerWorks
Innovative Solar Energy Solutions



RHEEM - Marathon Hot Water Tank

Marathon™ ...Shaping The Future

Available in 40, 50, 85 and 105 Gallon Electric Models

▶ **Lifetime Limited Tank Warranty*** ▶ **6-Year Limited Parts Warranty***

- Seamless, blow-molded, polybutene tank – impervious to rust and corrosion
- Multiple layers of filament wound fiberglass give the tank unmatched strength
- Polyurethane **Envirofoam™** insulation helps reduce energy consumption
- The highest energy factors (EF) available!
- Pipe wrap energy saving kit included to achieve maximum energy savings
- Recessed drain valve is out of the way of brooms and scrubbers
- Tough molded polyethylene outer shell resists dents and scratches
- Bowl shaped bottom allows complete sediment draining
- High temperature polysulfone dip tube
- Thermally fused upper element provides protection against "dry-firing" – stainless steel incoloy lower element for resistance to lime build-up
- Factory installed conduit between element control boxes
- All plastic tank eliminates the need for an anode rod
- Factory installed temperature and pressure relief valve
- Factory installed vacuum relief valve

*See Residential Warranty Information Brochure for complete warranty information.

DESCRIPTION			FEATURES		ROUGHING IN DIMENSIONS (SHOWN IN INCHES)				ENERGY INFORMATION	
TYPE	SAL. CAP.	MODEL NUMBER	FIRST HOUR RATING (GPH)	RECOVERY IN GPH AT 90° RISE	TANK HEIGHT A	HEIGHT TO WATER CONN. B	DIAMETER C	APPROX. SHIP WT. (LBS.)	ENERGY FACTOR	AVERAGE ANNUAL OPER. COST
TALL	40	MR40245	52	21	61-1/2	55-1/2	21-3/4	91	0.94	$402
	50	MR50245	61	21	62-3/4	56-3/4	23-1/2	103	0.94	$402
	85	MR85245	91	21	66-1/4	70-1/4	28-1/4	139	0.92	$411
	105	MR105245	104	21	66-3/4	70-3/4	30-1/4	152	0.91	$415
SHORT	50	MSR50245	54	21	47-1/4	51-1/4	28-1/4	101	0.93	$402

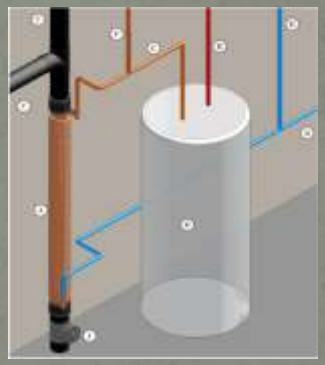
- Water heaters furnished with standard 240 volt AC, single phase non-simultaneous wiring, and 4500 watt upper and lower heating elements.
- For height to top of T&P and heat traps add 3-1/2" to the height to water connection.

Maximum test pressure: 300 PSI
Maximum working pressure: 150 PSI

Recovery = wattage/2.42 x temp. rise °F
Example: $\frac{4500W}{2.42 \times 90°} = 21$ GPH

- 94% efficient
- $ 402 annual cost

Power pipe - Drain Recovery



A 60-inch Power-Pipe System, for example, can raise the cold water temperature from 10°C (50°F) to as much as 24°C (75°F), under equal flow conditions.

Heat Recovery Ventilator (HRV)

VCR 90H-V ECM

Its innovative design incorporates extremely high performance motors that are equivalent in power to a compact fluorescent light bulb (13.5 watts each), which enable the 90H-V ECM to significantly lower energy costs without affecting its performance. Additional energy efficiency is found through its advanced heat recovery core, which can retain up to 80% of a home's heating or cooling.

Modeling of End and Middle Units

Unit Type	Design Heat Loss	Consumption (kWh)	Consumption (LP)	Energuide #	Estimated Cost (Space and DHW)
End Unit	9,748 bth/h 2.857 kw	8218.5		85	$986
Middle Unit	7,179 btu/h 2.104 kw	6555.6		86	$787
End Unit	9,748 bth/h 2.857 kw		1447.8	85	$1,086
Middle Unit	7,179 btu/h 2.104 kw		1183.9	86	$888

The Design Heat Loss of the End unit as modeled = 9,748 BTU/hr.

The Design Heat Loss of the Middle unit as modeled = 7,179 BTU/hr.

Chart Key

Proposed Construction	R70 attic, R44 Roxul + 1" XTPS walls, R22 full crawlspace, R10 Type IV under slab, 80% ASE HRV, 0.92 EF High Efficiency DHWT, 2.0 ACH or better.

Notes

Propane consumption for space and domestic hot water heating only.

Propane cost includes , customer charge & delivery charge averaged at $0.75/L and electricity at $0.12/kWh.

All propane calculations are based on typical usage patterns and are consistent across models, actual usage may vary.

The above heat loss calculation refers to a house with most windows facing north. It is the responsibility of HVAC contractor to oversize to local design conditions and building codes. These numbers are meant for guide line purposes only.

Exterior and Interior Finishes

Hard Board Siding

Laminate and Sheet Flooring

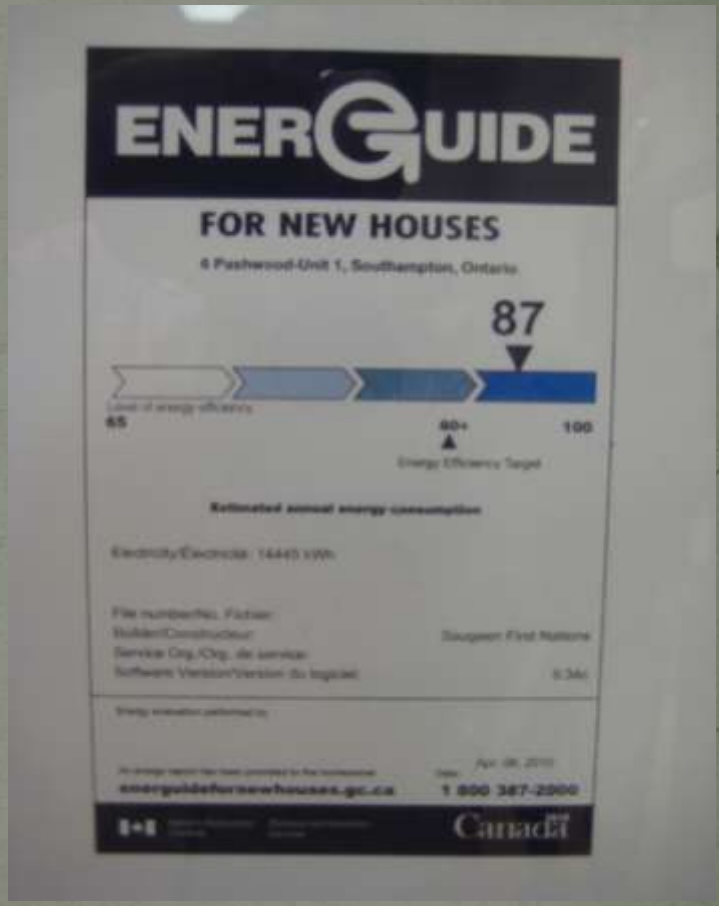
Energy Star or Energuide rated appliances

One Piece Acrylic Tubs

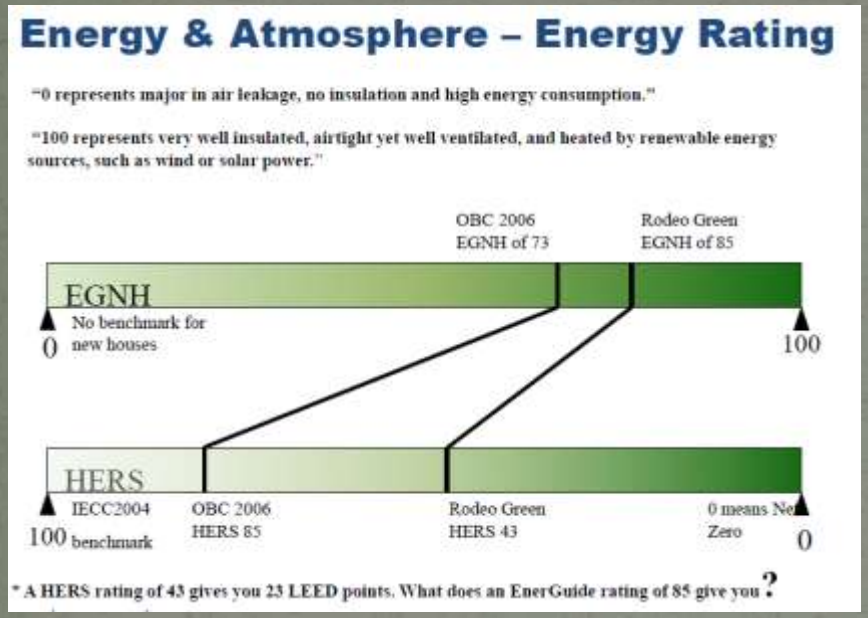
Final Product

Bench Marks


This home meets the Green is 50 Builders' Challenge
Saugeen First Nations
6 Pashwood Dr., Southampton, ON
Rated by: Clearsphere Consulting
Rating Conducted: April 6, 2010
Built by: Saugeen First Nations
Conditioned floor area 2520 square feet
Estimated annual energy usage
Natural Gas Consumption 5085 Kwh
Green House Gas Emissions 7.83 Tonnes
Estimated average monthly energy bill: $56.83
John Godden Apr. 29, 2010
Sustainable Housing Foundation
This rating is available for homes built by leading edge builders who have chosen to advance beyond current energy efficiency programs and have taken the next step on the path to full sustainability.
Your Home is 50
110 100 90 80 70 60 50 40 30 20 10 0
Green is 50
Builders Challenge

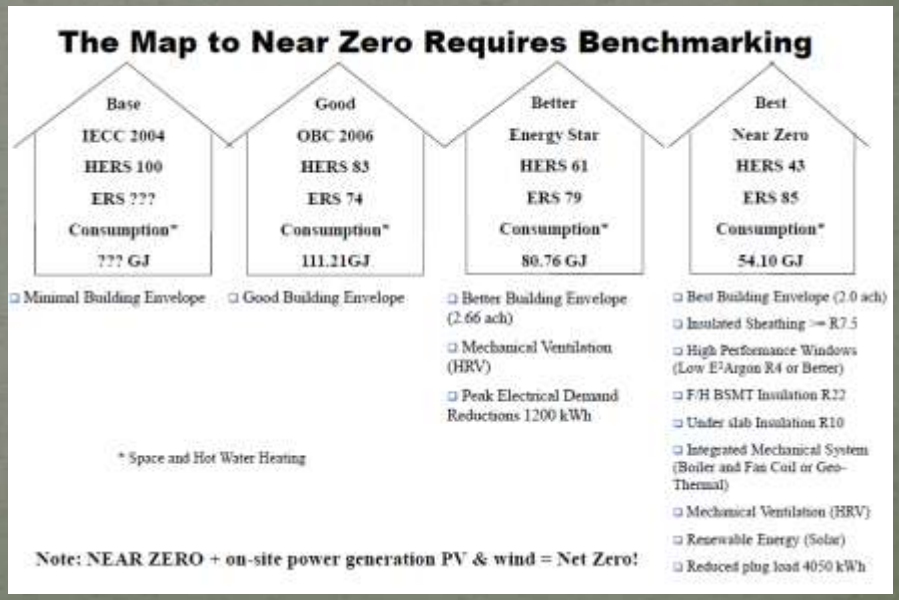

ENERGUIDE
FOR NEW HOUSES
4 Pashwood-Unit 1, Southampton, Ontario
87
65
80+
100
Energy Efficiency Target
Estimated annual energy consumption
Saugeen First Nations
1 800 387-2000
CanadEI

Labelling



Saugeen Multi-Plex Rating

Energuide = 87
Hers = 50



Turn over April 19, 2010
Four Months !!!

Next Step to Net Zero

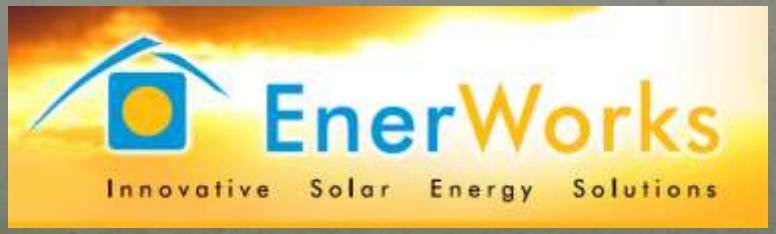
Generate Power…and Money

Installation of Photovoltaic panels on the roof – 10 KW required for net zero

Agreement with Ontario power Authority – Micro Feed In Tariff Program

ONTARIO POWER AUTHORITY

Partnerships



Contact Information

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- derek@abcsc.ca

- Ron Root – Housing Director
- Saugeen First Nation No. 29
- (519) 797 2781
- ronroot@saugeenfirstnation.ca

Thank you

CANADA'S ECONOMIC
ACTION PLAN