WBC Restaurant

Automated Cost, Embodied Carbon Exergy & Thermal Data

prepared for

Cost, GWP, R-Value Impact Study

prepared by

enzyme apd

806 Arion Commercial Center 2-12 Queen's Road West - Sheung Wan Hong Kong ph: +852 5424 7533
hello@weareenzyme.com

thomson architecture inc

104 Shirley Avenue. Barrie, ON L4N 1N4
cell: 647.607.7920 office: 705.417.2751
email: a@andythomson.ca

A8.01

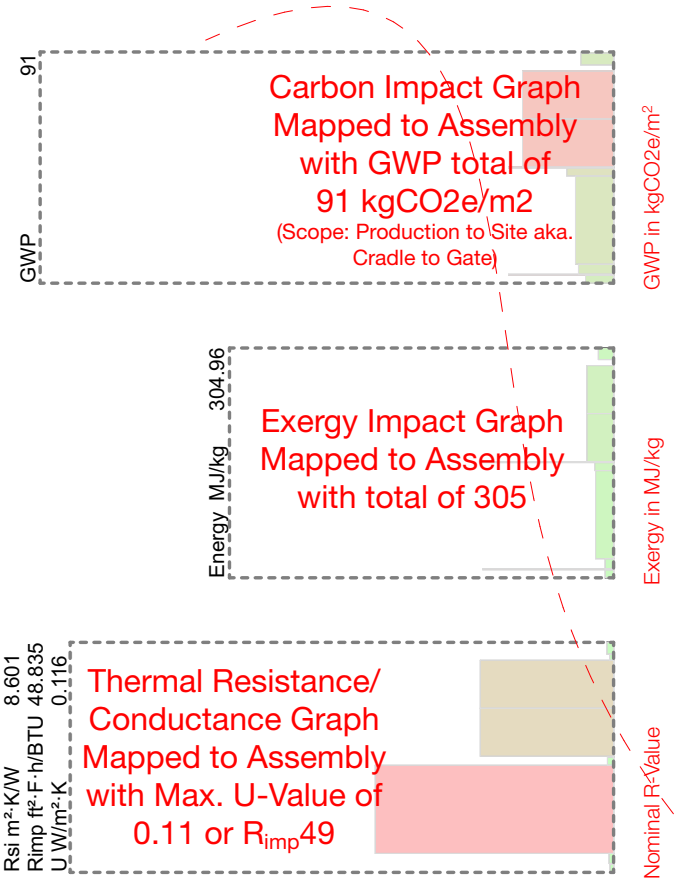
Wall ID: **Wx49**
Wall Type: **Wx | R49 2x6 Wood Rainscreen**
Occupancy: Typical Major Occupancy where the Assembly has been used ie. A2
Location: Location of Assembly in the Building ie. Exterior Wall with

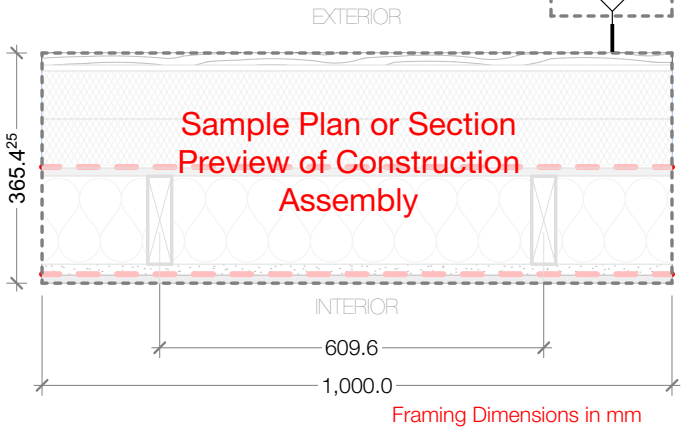
How to Read this Document

OUR FAVOURITE DETAIL!

Wx49

ID Tag as found on Plans/Sections





(Production Scope: A1–A3, according to EN-15804 2019)
Total Embodied Carbon

EXTERIOR
19.1 mm 06 | Prefinished Wood Siding (Maibec/Cape Cod OAA) Black
9.5 mm 00 | Air Space + Wood Strapping
76.2 mm 07 | Rockwool Comfortboard 110
76.2 mm 07 | Rockwool Comfortboard 110
1.6 mm 07 | SIGA Majvest SA WRB+AB (Joints Taped w. Wigluv)
12.7 mm 06 | ZIP OSB Sheathing c/w Integral AVB (liquid flashed seams)
140 mm 06 | Wood Framing + Mineral Fibre Batts
15.9 mm 09 | Gypsum Board (Type X)
1.6 mm 07 | SIGA Majrex Smart Vapour Resistive Layer, Lapped Joints Sealed w. Rissan Tape
12.7 mm 09 | Gypsum Board (Regular)
INTERIOR

Material Thickness & Types

Assembly Typ

GWP 091

Wf = Wall Foundation
Wx = Wall Exterior
Wi = Wall Interior
Sx = Slab
Si = Interior Floor
Rx = Roof
R0 = Roof Overhang

QUESTIONS:

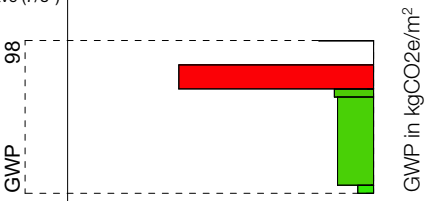
1. **Brand Preference:** Are there specific manufacturers of the wall elements/ materials you like to use? if so why?
2. **History:** How long have you been using this wall type?
3. **Novelty:** Do you think this wall is a common/popular choice for this occupancy?
4. **Applicability:** Have you used it on other occupancies? if so what?
5. **Regionality**: Ave you used it in other provinces? if so where?
6. **Trends:** Have you noticed any emerging trends with the use/application of this wall type?
7. **Benefits:** Tell us more about why you used this wall type for this project: durability, appearance, combustibility, energy efficiency, environmental factors. acoustics, specific compliance requirements, etc.
8. **Issues:** Does this wall assembly have any specific design/ construction issues that you have discovered during its construction/ use?

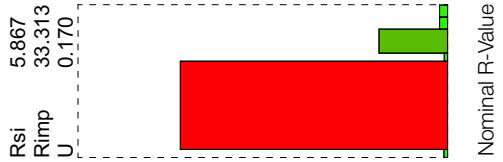
Wx49

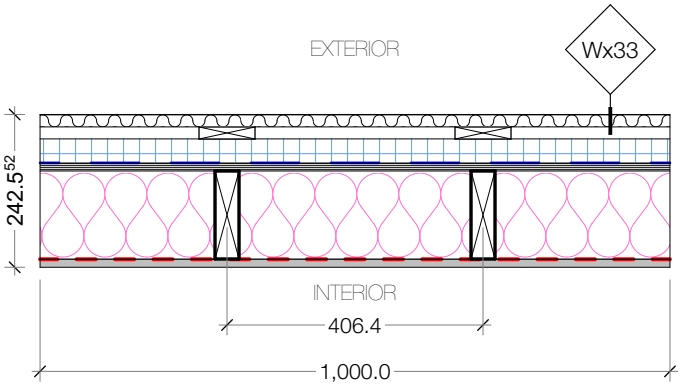
A8.02

Wall ID: Wx33
Wall Type: Wx | R33 OBC 'Builder Special' Wall GV
Occupancy: C (SFR)
Location: Exterior Wall ($R_{imp}33$)

System:	B
Trade:	00 00 00
Composite:	Wx | R33 OBC 'Builder Special' Wall GV
Takeoff:	1.00 M2
Method:	Composite UC
	OUTSIDE
Cladding:	$32.30 Prefinished Galvalume Sinwave (7/8")
Strapping:	$3.50 1x4 SPF
WRB:	$1.64 Tyvek
Rigid:	$27.65 XPS 1.5"
Sheathing:	$14.79 1/2" Plywood
Cavity Batt:	$14.26 6" FG Batt
Framing:	$12.60 2x6 @ 16" OC
AVB:	$0.78 6mil SuperSix PE
Int. Sheath:	$8.30 1/2" GWB
Int. Finish:	$3.00 P3 1 Primer + 2 Latex
	INSIDE
Total Cost:	**$118.82**







EXTERIOR

0.6 mm 07 | Galvalume Cladding
19.1 mm 00 | Metal Cladding Void Space
19.1 mm 00 | Air Space
38.1 mm 07 | Insulation XPS (R5/inch) *KPMB
0.2 mm 07 | c/w Tyvek WRB+AB (Integral or Self Adhered, All Joints Taped)
12.7 mm 06 | Plywood
140 mm 06 | Wood Frame + FG Insulation
0.2 mm 07 | 3mil PE VB
12.7 mm 09 | Gypsum Board (Regular)

INTERIOR

GWP
098
$118.82/m^2

Wx33

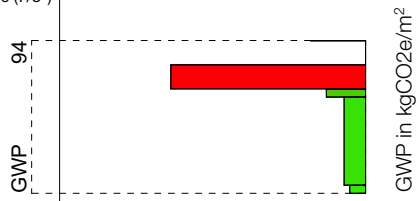
QUESTIONS:

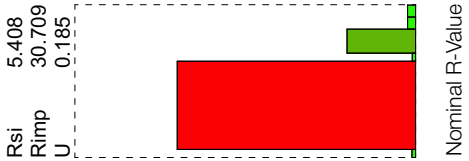
1. **Brand Preference:** Standard tract builder assembly using 2x6 framing, FG Insulation, Exterior 'Code Board' XPS insulation as thermal break. Standard SuperSix 6mil PE AVB with Tyvek. All prices current to Feb 2023 per HomeDepot.ca
2. **History:** Standard Assembly compliant with most OBC SB12 prescriptive tables from 2016 onwards.
3. **Novelty:** Typical assembly, but generally PVC cladding is used. We have shown upgraded prefinished wood siding here only to compare with our advanced wall Wx36.
4. **Applicability:** Formerly used on all R2000 SFR homes for exterior above-grade walls.
5. **Regionality**: Ontario.
6. **Trends:** Phasing-out, do to higher cost, high GWP and high potential to trap condensation in the framing cavity unless proper air detailing per CHBA Builder Guide is observed. 2x6 was introduced in the 1980's to allow for deeper insulation, NOT for structural reasons.
7. **Benefits:** Allows for taller walls due to 2x6 framing and/or use of brick veneer.
8. **Issues:** High cost, high GWP, sensitive dependence on skilled trades wrt air sealing and cavity penetrations for services, plumbing, electrical, HVAC. Higher cost of labour to detail penetrations of the stud cavity and complete interior AVB caulking, header wraps, etc.

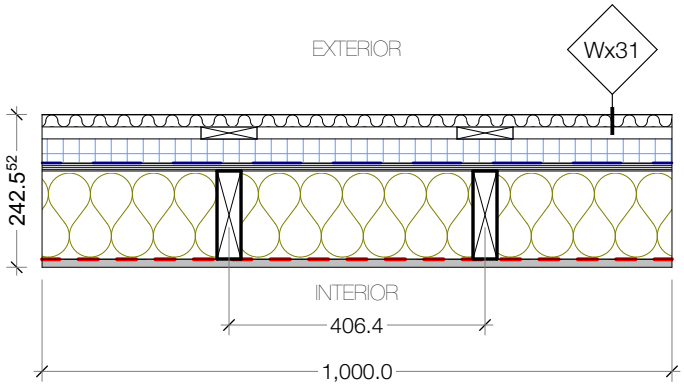
Note: XPS is considered vapour impermeable and so has a high risk of vapour trapping potential when used in this configuration without careful attention to air-sealing the interior AVB. All foams must be detailed to limit ingress of insects and vermin per OBC 9.3.2.9

Wall ID: Wx31
Wall Type: Wx | R31 OBC 'Builder Special' Wall GV MW
Occupancy: C (SFR)
Location: Exterior Wall (R_{imp}33)

System:	B
Trade:	00 00 00
Composite:	Wx | R31 OBC 'Builder Special' Wall GV MW
Takeoff:	1.00 M2
Method:	Composite UC
	OUTSIDE
Cladding:	$32.30 Prefinished Galvalume Sinwave (7/8")
Strapping:	$3.50 1x4 SPF
WRB:	$1.64 Tyvek
Rigid:	$27.65 XPS 1.5"
Sheathing:	$14.79 1/2" Plywood
Cavity Batt:	$24.87 6" FG Batt
Framing:	$12.60 2x6 @ 16" OC
AVB:	$0.78 6mil SuperSix PE
Int. Sheath:	$8.30 1/2" GWB
Int. Finish:	$3.00 P3 1 Primer + 2 Latex
	INSIDE
Total Cost:	**$129.43**







EXTERIOR

0.6 mm 07 | Galvalume Cladding
19.1 mm 00 | Metal Cladding Void Space
19.1 mm 00 | Air Space
38.1 mm 07 | Insulation XPS (R5/inch) *KPMB
0.2 mm 07 | c/w Tyvek WRB+AB (Integral or Self Adhered, All Joints Taped)
12.7 mm 06 | Plywood
140 mm 06 | Wood Framing + Mineral Fibre Batts
0.2 mm 07 | 3mil PE VB
12.7 mm 09 | Gypsum Board (Regular)

INTERIOR

GWP
094
$129.43/m^2

Wx31

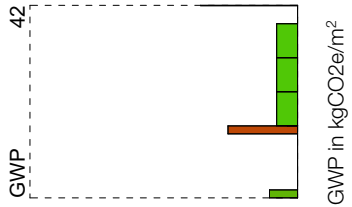
QUESTIONS:

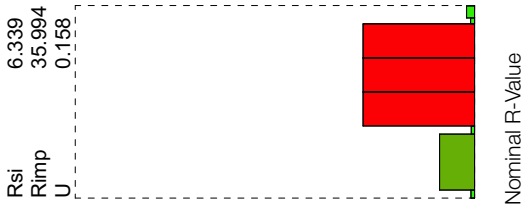
1. **Brand Preference:** Standard tract builder assembly using 2x6 framing, FG Insulation, Exterior 'Code Board' XPS insulation as thermal break. Standard SuperSix 6mil PE AVB with Tyvek. All prices current to Feb 2023 per HomeDepot.ca
2. **History:** Standard Assembly compliant with most OBC SB12 prescriptive tables from 2016 onwards.
3. **Novelty:** Typical assembly, but generally PVC cladding is used. We have shown upgraded prefinished wood siding here only to compare with our advanced wall Wx36.
4. **Applicability:** Formerly used on all R2000 SFR homes for exterior above-grade walls.
5. **Regionality**: Ontario.
6. **Trends:** Phasing-out, do to higher cost, high GWP and high potential to trap condensation in the framing cavity unless proper air detailing per CHBA Builder Guide is observed. 2x6 was introduced in the 1980's to allow for deeper insulation, NOT for structural reasons.
7. **Benefits:** Allows for taller walls due to 2x6 framing and/or use of brick veneer.
8. **Issues:** High cost, high GWP, sensitive dependence on skilled trades wrt air sealing and cavity penetrations for services, plumbing, electrical, HVAC. Higher cost of labour to detail penetrations of the stud cavity and complete interior AVB caulking, header wraps, etc.

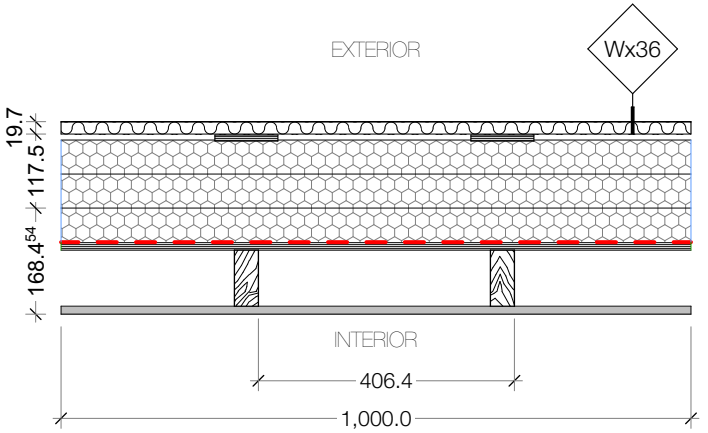
Note: XPS is considered vapour impermeable and so has a high risk of vapour trapping potential when used in this configuration without careful attention to air-sealing the interior AVB. All foams must be detailed to limit ingress of insects and vermin per OBC 9.3.2.9

Wall ID: Wx36
Wall Type: Wx | R36 2x4 3xGPS GV Rainscreen
Occupancy: C (Residential SFR & Low-Rise), D&E Budget low-rise Commercial Occupancies
Location: Exterior Wall (R_{imp}36)

System:	B
Trade:	00 00 00
Composite:	Wx | R36 2x4 3xGPS GV Rainscreen
Takeoff:	1.00 M2
Method:	Composite UC
	OUTSIDE
Cladding:	$32.30 Prefinished Galvalume (7/8")
Strapping:	$2.00 Ripped 3/8 Spruce Plywood
WRB:	$0.00 SIGA Wigluv Taped GPS
Rigid:	$55.38 GPS 6 3/8" (3x 2 1/8")
Sheathing:	$14.79 1/2" SPF Plywood
Cavity Batt:	$0.00 N/A
Framing:	$6.50 2x4 @ 16" OC
AVB:	$3.00 SIGA Majvest 200
Int. Sheath:	$8.30 1/2" GWB
Int. Finish:	$3.00 P3 1 Primer + 2 Latex
	INSIDE
Total Cost:	**$125.27**







EXTERIOR

0.6 mm 07 | Galvalume Cladding
19.1 mm 00 | Metal Cladding Void Space
9.5 mm 00 | Air Space + Wood Strapping
54 mm 07 | Insulation Neopor (mylar-metal-faced) seams/edges taped w. Wigluv
54 mm 07 | Insulation Neopor (mylar-metal-faced) seams/edges taped w. Wigluv
54 mm 07 | Insulation Neopor (mylar-metal-faced) seams/edges taped w. Wigluv
0.2 mm 07 | SIGA Majrex Smart Vapour Resistive Layer, Lapped Joints Sealed w. Rissan Tape
12.7 mm 06 | SPF Plywood
88.9 mm 06 | Wood Framing 2xV Cavity
12.7 mm 09 | Gypsum Board (Regular)

INTERIOR

GWP
042
$125.27/m²

QUESTIONS:

Wx36

1. **Brand Preference:** PlastiFab DuroSpan GPS (Neopor) is specified as a least-cost alternative high-performance wall, where DuroSpan is readily available from the Home Depot at ~$44/4'x8' sheet of R_{imp}10. Coated 8" Rothoblaas screws are used to secure strapping & insulation to studs, at a cost of less ~ $0.75/fastener.
2. **History:** In use in our office since 2022.
3. **Novelty:** Similar to Wx42 but with mylar-metal films integral to the DuroSpan GPS (Graphite EPS aka BASF Neopor) insulation. WUFI analysis and studies by Quick-Therm, Morrison Hershfield, John Straube and others have shown that condensate danger is bypassed by keeping the majority of insulation on the exterior and sheathing always on the 'warm' side. Interior PE AVB can be omitted as it is redundant. This assembly can be specified in R10, R20 and R30 assembly variants by layering insulation or by custom ordering thicker panels. In R20 and R30 walls, interior batt insulation can also be omitted as studies show the dead airspace alone can contribute as much as Rimp4 to the 89mm assembly (not accounted for in our nominal R-Values).
4. **Applicability:** We specify this on ultra-economy projects such as the BeHomes DADU and ADU projects (residential accessory dwellings), which were part of the first round of the CMHC Housing Supply Challenge.
5. **Regionality**: Only used in Ontario to date as that is the jurisdiction of 90% of our work.
6. **Trends:** This is an emergent trend, with ultra-low GWP and ease of construction, combined with low cost, this could be a potential solution for a wide range of economy projects.
7. **Benefits:** AVB and WRB are combined as a single 'smart' control layers in the taped mylar-metal film of the board insulation product and as a Self-Adhered membrane direct to the exterior of the structural sheathing.
8. **Issues:** Some inspectors question omission of an interior 'poly' AVB or 'cavity insulation'. With exterior insulation this is not needed, we provide inspectors with documents by Building Science professionals to explain the rationale, but we can add that 3 coats of latex paint can also be considered an AVB (per Airtight Drywall Approach, (CHBA Builder Manual reference). All foams must be detailed to limit ingress of insects and vermin per OBC 9.3.2.9

A8.50

Wall ID: Rx40
Wall Type: Rx | R68.4 Layered Cathedral Roof (no PISO)
Occupancy: A2, C (Residential SFR & Low-Rise)
Location: Exterior Roof, Cathedral Ceilings

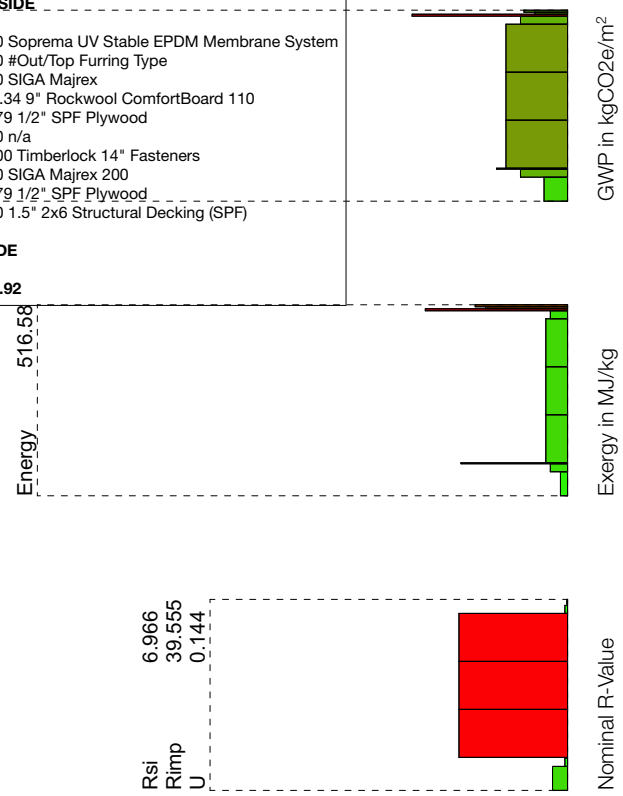
System: B
Trade: 00 00 00
Composite: Rx | R68.4 Layered Cathedral Roof (no PISO)
Takeoff: 1.00 M2
Method: Composite UC

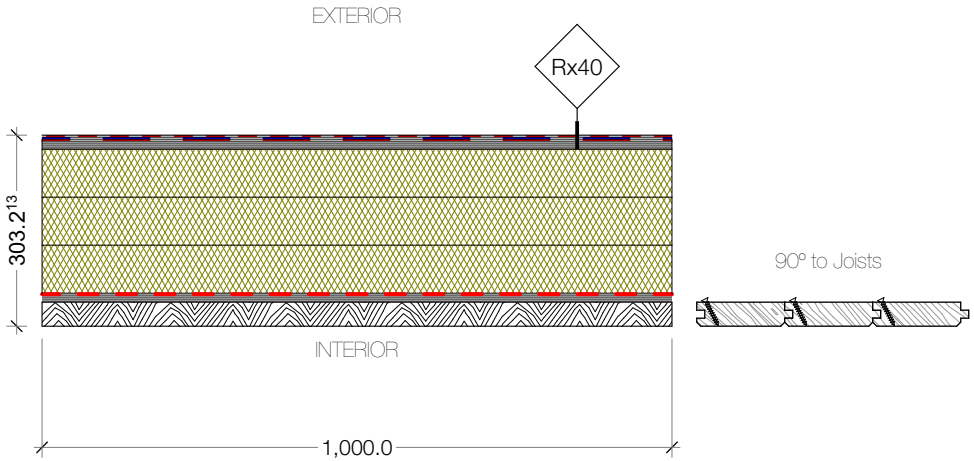
OUTSIDE

Cladding: $5.00 Soprema UV Stable EPDM Membrane System
Strapping: $0.00 #Out/Top Furring Type
WRB: $3.00 SIGA Majrex
Rigid: $203.34 9" Rockwool ComfortBoard 110
Sheathing: $14.79 1/2" SPF Plywood
Cavity Batt: $0.00 n/a
Framing: $18.00 Timberlock 14" Fasteners
AVB: $3.00 SIGA Majrex 200
Int. Sheathing: $14.79 1/2" SPF Plywood
Int. Finish: $4.00 1.5" 2x6 Structural Decking (SPF)

INSIDE

Total Cost: $265.92





EXTERIOR

3.2 mm 07 | EPDM Adhered Waterproof Membrane
3.2 mm 07 | Soprastar Flam HD/GR, torchd Cap + Cap Flash
3.2 mm 07 | Sopralene FlamStick Base Sheet + Flash
12.7 mm 06 | SPF Plywood H
76.2 mm 07 | Rockwool Comfortboard 110
76.2 mm 07 | Rockwool Comfortboard 110
76.2 mm 07 | Rockwool Comfortboard 110
1.6 mm 07 | SIGA Majrex Smart Vapour Resistive Layer, Lapped Joints Sealed w. Rissan Tape
12.7 mm 06 | SPF Plywood H
38.1 mm 06 | Structural T&G Deck 89mm

INTERIOR

GWP
142
$265.92/m²

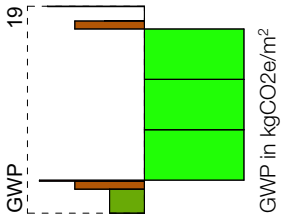
QUESTIONS:

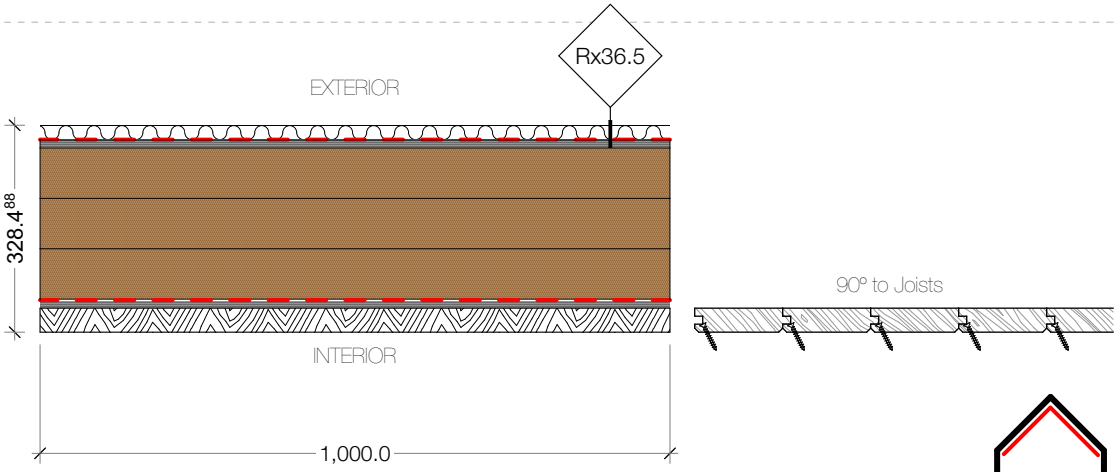
Rx40

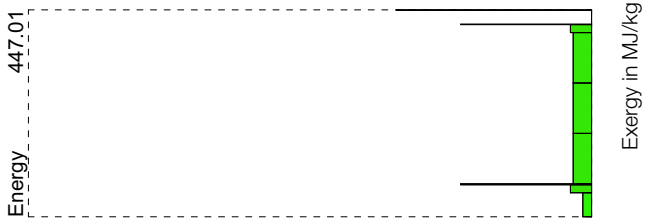
1. **Brand Preference:** Rockwool & SIGA are specified for the tech support they offer (WUFI analysis), Ready availability and local supply (SIGA - Mississauga) and manufacture (Rockwool - Milton)
2. **History:** In use in our office since 2020.
3. **Novelty:** This is a premium performance detail. Layering of roof insulation allows for a range of R-values on cathedral ceilings/roofs.
4. **Applicability:** We have used variations of this in SFR/Residential and Commercial A2 Occupancies, for perforrnance reasons and where a wood ceiling as finish was desired
5. **Regionality**: Only used in Ontario to date as that is the jurisdiction of 90% of our work.
6. **Trends:** We are seeing the emergence of ever more outboard insulation approaches generally, in high performance projects, as a function of improved ease of constructing a consistent and continuous air-barrier.
7. **Benefits:** Allows overhang rafters to ride on-top of Polyiso layer while providing a thermal break from structure. CB110 limits thermal degradation of Polyiso layers and retains higher R value.
8. **Issues:** Expensive, long expensive structural fasteners are required (ie. Rothoblaas), Polyiso (Soprema) shrank laterally within weeks of installation, requiring a warranty claim against Soprema who remedied with canned spray foam at seams. Many GCs are unfamiliar with Structral T&G decking and how to procure it. Top layer can also be Standing Seam roofing when high-temp WRB is used.

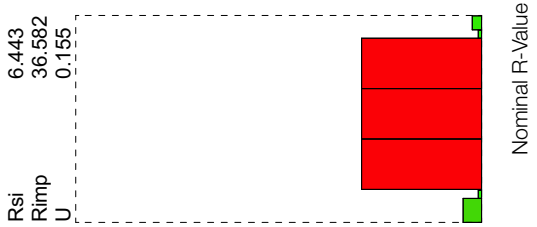
Wall ID: Rx36.5
Wall Type: Rx | R36.5 Layered Cathedral Roof 3xGutex
Occupancy: A2, C (Residential SFR & Low-Rise)
Location: Exterior Roof, Cathedral Ceilings

System:	B
Trade:	00 00 00
Composite:	Rx | R36.5 Layered Cathedral Roof 3xGutex
Takeoff:	1.00 M2
Method:	Composite UC
	OUTSIDE
Cladding:	$7.00 24ga Galvalume Standing Seam
Strapping:	$0.00 n/a
WRB:	$3.00 SIGA Wetguard
Rigid:	$250.00 12" TimberHP TimberBoard
Sheathing:	$14.79 1/2" SPF Plywood
Cavity Batt:	$0.00 n/a
Framing:	$18.00 Timberlock 14" Fasteners
AVB:	$0.00 #In/Bottom Furring Type
Int. Sheath:	$14.79 1/2" SPF Plywood
Int. Finish:	$4.00 1.5" 2x6 T&G Structural Decking (SPF)
	INSIDE
Total Cost:	**$311.58**









EXTERIOR

0.6 mm 07 | Galvalume Roof/Cladding
22.2 mm 00 | Metal Cladding Void Space
0.6 mm 07 | SIGA Majvest SA WRB+AB (Joints Taped w. Wigluv)
12.7 mm 06 | SPF Plywood H
80 mm 07 | Insulation Gutex Multitherm Board
80 mm 07 | Insulation Gutex Multitherm Board
80 mm 07 | Insulation Gutex Multitherm Board
1.6 mm 07 | SIGA Majrex Smart Vapour Resistive Layer, Lapped Joints Sealed w. Rissan Tape
12.7 mm 06 | SPF Plywood H
38.1 mm 06 | Structural T&G Deck 89mm

INTERIOR

GWP
019
$311.58/m²

COST UNCERTAINTY RE. GUTEX OR TIMBERHP, PRICES IN USD, AVAILABILITY MAY POSE ISSUES, CUSTOMS, BROKERAGE, ETC. U-VALUE TO BE REVISED ON REVIEW OF FINAL MARKETED PRODUCT SPECIFICATIONS

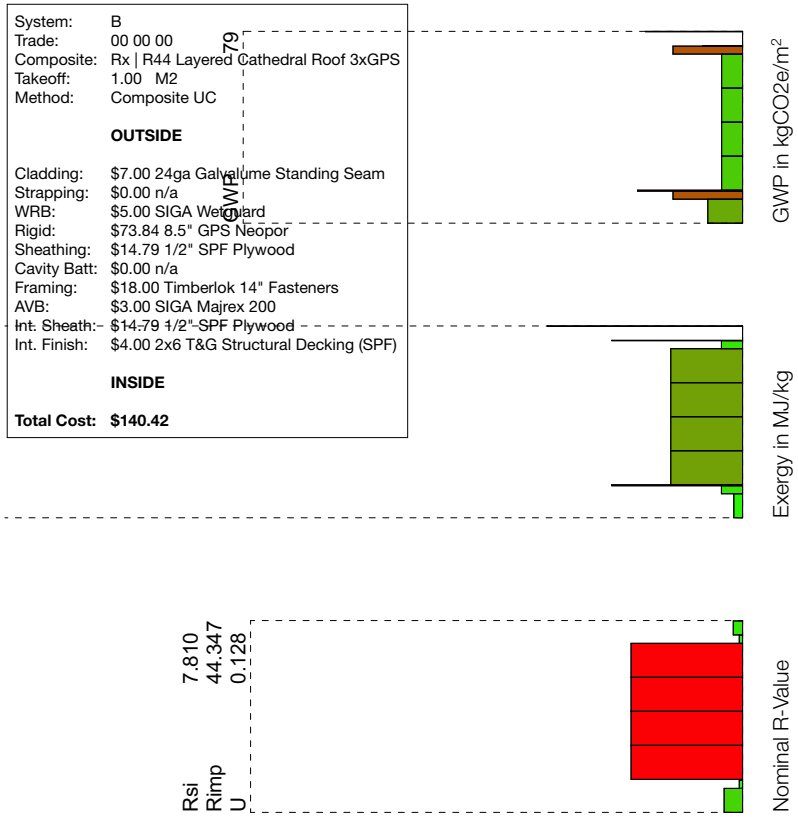
QUESTIONS:

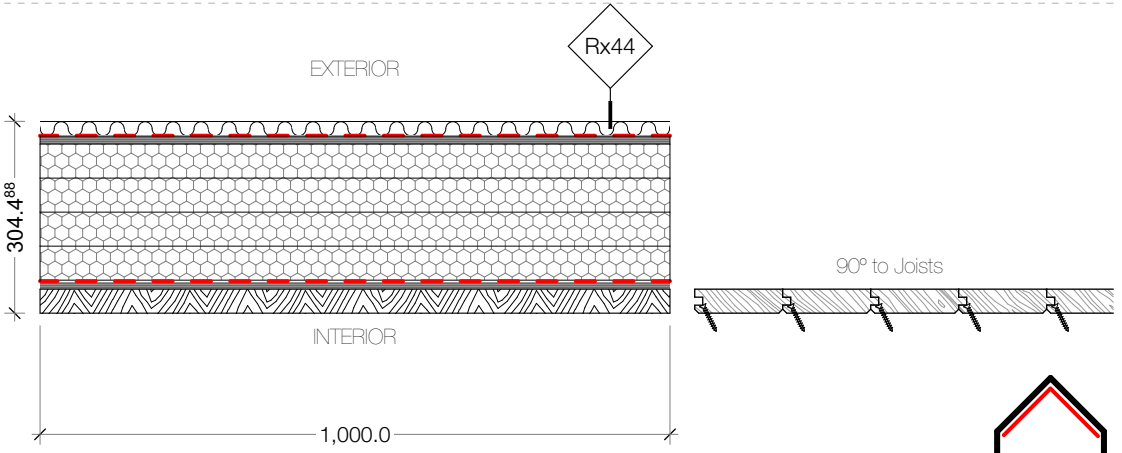
Rx36.5

1. **Brand Preference:** TimberHP (Maine) or Gutex (Germany) Uncertain availability and no local supply (SIGA - Mississauga) or manufacture
2. **History:** In use in our office since 2020.
3. **Novelty:** This is a premium performance detail. Layering of roof insulation allows for a range of R-values on cathedral ceilings/roofs.
4. **Applicability:** We have used variations of this in SFR/Residential and Commercial A2 Occupancies, for perforrnance reasons and where a wood ceiling as finish was desired
5. **Regionality**: Only used in Ontario to date as that is the jurisdiction of 90% of our work.
6. **Trends:** We are seeing the emergence of ever more outboard insulation approaches generally, in high performance projects, as a function of improved ease of constructing a consistent and continuous air-barrier.
7. **Benefits:** Allows overhang rafters to ride on-top of Polyiso layer while providing a thermal break from structure. CB110 limits thermal degradation of Polyiso layers and retains higher R value.
8. **Issues:** Expensive, long expensive structural fasteners are required (ie. Rothoblaas), Polyiso (Soprema) shrank laterally within weeks of installation, requiring a warranty claim against Soprema who remedied with canned spray foam at seams. Many GCs are unfamiliar with Structral T&G decking and how to procure it. Top layer can also be Standing Seam roofing when high-temp WRB is used.

Wall ID: Rx44
Wall Type: Rx | R44 Layered Cathedral Roof 3xGPS
Occupancy: A2, C (Residential SFR & Low-Rise)
Location: Exterior Roof, Cathedral Ceilings

System:	B
Trade:	00 00 00
Composite:	Rx | R44 Layered Cathedral Roof 3xGPS
Takeoff:	1.00 M2
Method:	Composite UC
	OUTSIDE
Cladding:	$7.00 24ga Galvalume Standing Seam
Strapping:	$0.00 n/a
WRB:	$5.00 SIGA Wetguard
Rigid:	$73.84 8.5" GPS Neopor
Sheathing:	$14.79 1/2" SPF Plywood
Cavity Batt:	$0.00 n/a
Framing:	$18.00 Timberlok 14" Fasteners
AVB:	$3.00 SIGA Majrex 200
Int. Sheath:	$14.79 1/2" SPF Plywood
Int. Finish:	$4.00 2x6 T&G Structural Decking (SPF)
	INSIDE
Total Cost:	**$140.42**





EXTERIOR

0.6 mm 07 | Galvalume Roof/Cladding
22.2 mm 00 | Metal Cladding Void Space
0.6 mm 07 | SIGA Majvest SA WRB+AB (Joints Taped w. Wigluv)
12.7 mm 06 | SPF Plywood H
54 mm 07 | Insulation Neopor (mylar-metal-faced) seams/edges taped w. Wigluv
54 mm 07 | Insulation Neopor (mylar-metal-faced) seams/edges taped w. Wigluv
54 mm 07 | Insulation Neopor (mylar-metal-faced) seams/edges taped w. Wigluv
54 mm 07 | Insulation Neopor (mylar-metal-faced) seams/edges taped w. Wigluv
1.6 mm 07 | SIGA Majrex Smart Vapour Resistive Layer, Lapped Joints Sealed w. Rissan Tape
12.7 mm 06 | SPF Plywood H
38.1 mm 06 | Structural T&G Deck 89mm

INTERIOR

GWP
079
$140.42/m^2

QUESTIONS:

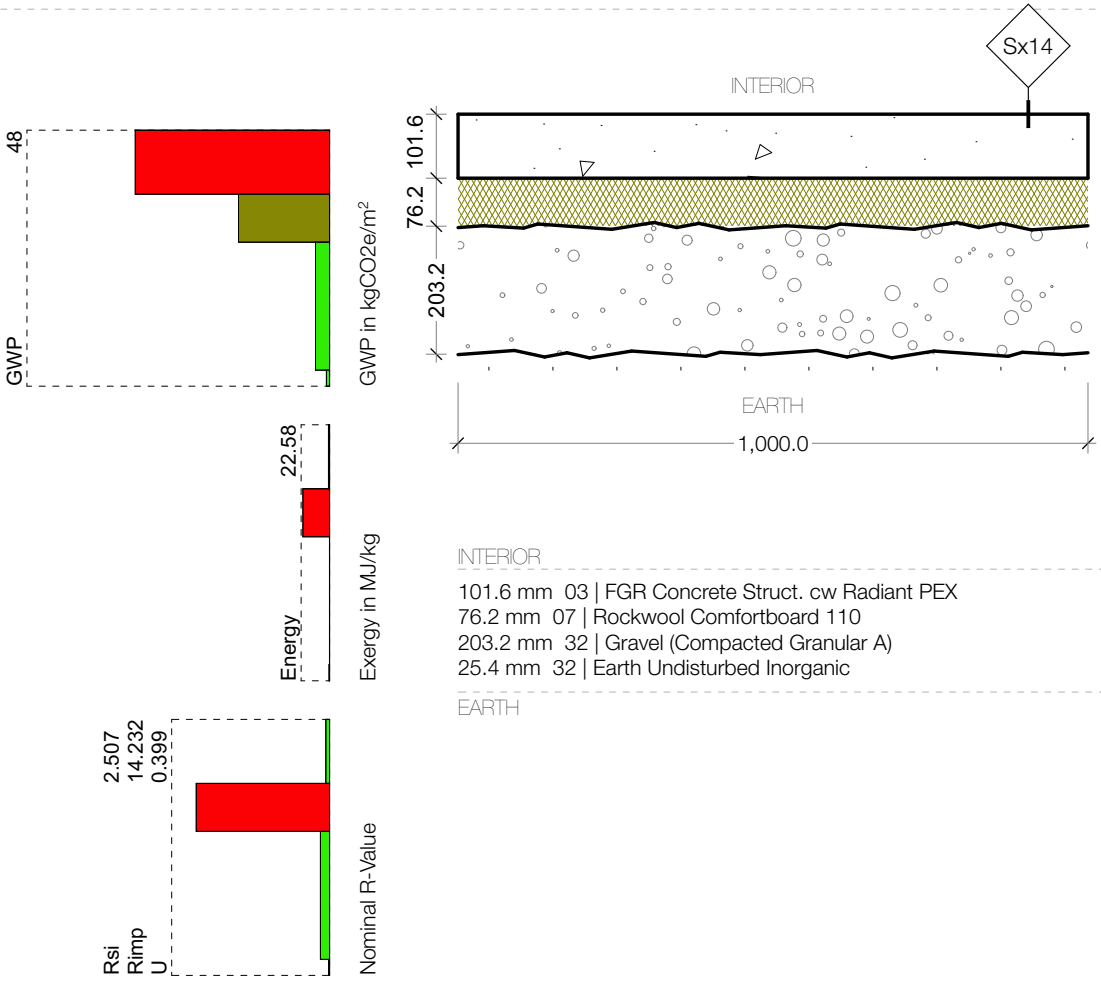
Rx44

1. **Brand Preference:** Rockwool & SIGA are specified for the tech support they offer (WUFI analysis), Ready availability and local supply (SIGA - Mississauga) and manufacture (Rockwool - Milton)
2. **History:** In use in our office since 2020.
3. **Novelty:** This is a premium performance detail. Layering of roof insulation allows for a range of R-values on cathedral ceilings/roofs.
4. **Applicability:** We have used variations of this in SFR/Residential and Commercial A2 Occupancies, for perforrnance reasons and where a wood ceiling as finish was desired
5. **Regionality**: Only used in Ontario to date as that is the jurisdiction of 90% of our work.
6. **Trends:** We are seeing the emergence of ever more outboard insulation approaches generally, in high performance projects, as a function of improved ease of constructing a consistent and continuous air-barrier.
7. **Benefits:** Allows overhang rafters to ride on-top of Polyiso layer while providing a thermal break from structure. CB110 limits thermal degradation of Polyiso layers and retains higher R value.
8. **Issues:** Expensive, long expensive structural fasteners are required (ie. Rothoblaas), Polyiso (Soprema) shrank laterally within weeks of installation, requiring a warranty claim against Soprema who remedied with canned spray foam at seams. Many GCs are unfamiliar with Structral T&G decking and how to procure it. Top layer can also be Standing Seam roofing when high-temp WRB is used.

A8.53

Floor ID: Sx14
Floor Type: Sx | SOG + CB110 + Radiant
Occupancy: A2, C (Residential SFR & Low-Rise)
Location: Slab on Earth

System:	A1032
Trade:	03 33 13
Composite:	Sx | SOG + CB110 + Radiant
Takeoff:	1.00 M2
Method:	Composite UC
	OUTSIDE
Cladding:	$20.00 Power Float
Strapping:	$0.00 #Out/Top Furring Type
WRB:	$0.00 #Weather Barrier Type
Rigid:	$67.78 3" CB110
Sheathing:	$0.00 #Out/Top Sheathing Type
Cavity Batt:	$0.00 #Batt Insulation Type
Framing:	$100.00 Cast In Place
AVB:	$70.00 Radiant Pex
Int. Sheath:	$0.00 #In/Bottom Sheathing Type
Int. Finish:	$20.00 Granular A
	INSIDE
Total Cost:	**$297.78**



INTERIOR

101.6 mm 03 | FGR Concrete Struct. cw Radiant PEX
76.2 mm 07 | Rockwool Comfortboard 110
203.2 mm 32 | Gravel (Compacted Granular A)
25.4 mm 32 | Earth Undisturbed Inorganic

EARTH

GWP
048
$297.78/m²

QUESTIONS:

Sx14

1. **Brand Preference:** Rockwool Comfortboard 110. Power-floated GG-reinforced slab as a finished floor surface.
2. **History:** In use in our office since 2010.
3. **Novelty:** This is a premium performance detail. The benefit is the void-filling properties of the spray in place foam, resulting in fewer air-pockets under slabs, which also helps facilitate radon-control and mitigation measures.
4. **Applicability:** We have used variations of this in SFR/Residential and Commercial A2 Occupancies, often for reduced labour costs, and the foam replaces the need for a PE film barrier.
5. **Regionality**: Only used in Ontario to date as that is the jurisdiction of 90% of our work.
6. **Trends:** We are seeing the emergence of ever more spray-over-gravel sub-slab insulation systems.
7. **Benefits:** High R-value (as much as desired), low labour input, superior slab finishing (moisture control), better radon control, excellent for use with hydronic in-floor heating.
8. **Issues:** Detailing to limit insect ingress is incredibly important and often overlooked. Compaction of sub-slab gravel layer should be to 98% proctor or higher.

Floor ID: Sx19
Floor Type: Sx | SOG + SIPPU + Radiant
Occupancy: A2, C (Residential SFR & Low-Rise)
Location: Slab on Earth

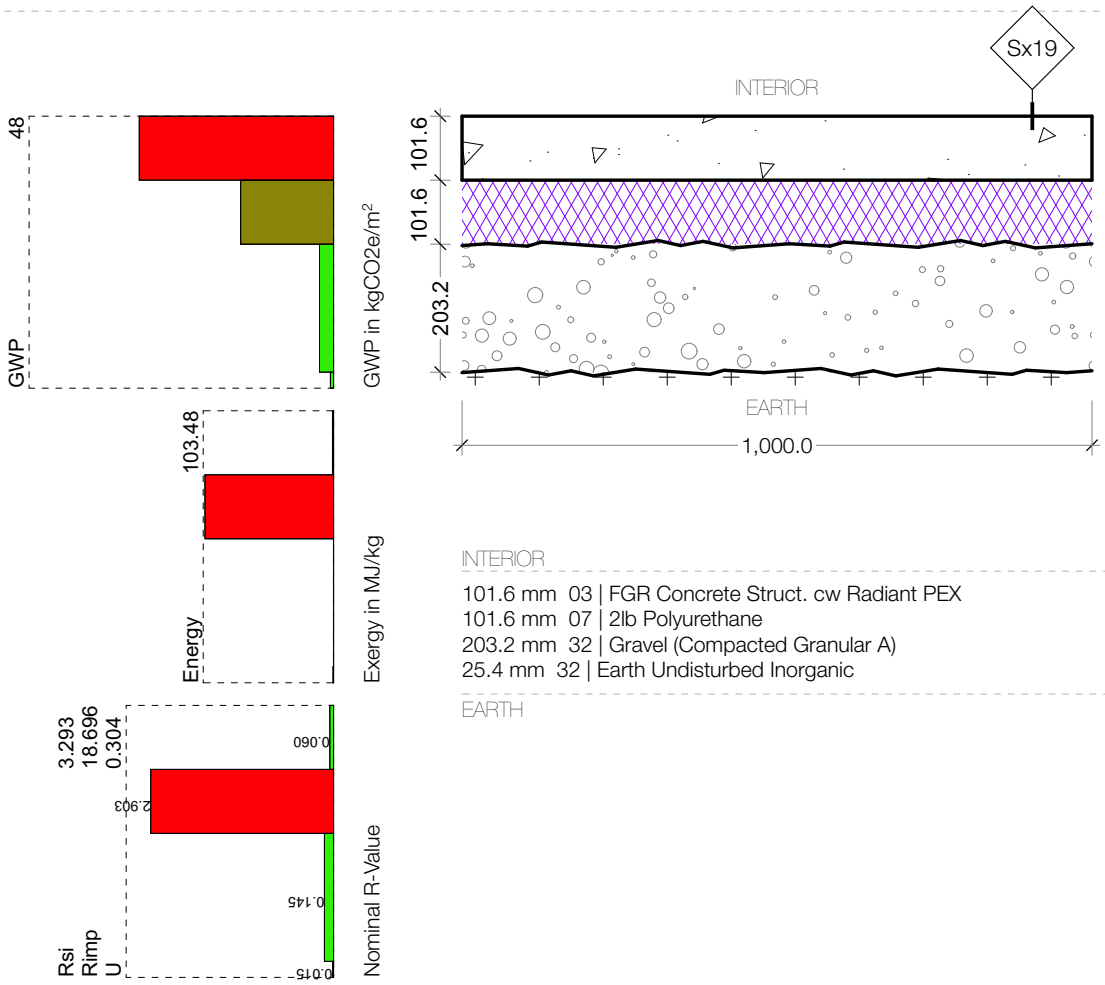
System:	A1032
Trade:	03 33 13
Composite:	Sx | SOG + SIPPU + Ra
Takeoff:	1.00 M2
Method:	Composite UC

OUTSIDE

Cladding:	$20.00 Power Float
Strapping:	$0.00 #Out/Top Furring Type
WRB:	$0.00 #Weather Barrier Type
Rigid:	$38.11 SIPPU
Sheathing:	$0.00 #Out/Top Sheathing Type
Cavity Batt:	$0.00 #Batt Insulation Type
Framing:	$100.00 Cast In Place
AVB:	$70.00 Radiant Pex
Int. Sheath:	$0.00 #In/Bottom Sheathing Type
Int. Finish:	$20.00 Granular A

INSIDE

Total Cost: **$268.11**



INTERIOR

101.6 mm 03 | FGR Concrete Struct. cw Radiant PEX
101.6 mm 07 | 2lb Polyurethane
203.2 mm 32 | Gravel (Compacted Granular A)
25.4 mm 32 | Earth Undisturbed Inorganic

EARTH

GWP
048
$268.11/m²

QUESTIONS:

Sx19

1. **Brand Preference:** BASF Walltite-Eco 2lb spray-in-place polyurethane. Power-floated GG-reinforced slab as a finished floor surface.
2. **History:** In use in our office since 2010.
3. **Novelty:** This is a premium performance detail. The benefit is the void-filling properties of the spray in place foam, resulting in fewer air-pockets under slabs, which also helps facilitate radon-control and mitigation measures.
4. **Applicability:** We have used variations of this in SFR/Residential and Commercial A2 Occupancies, often for reduced labour costs, and the foam replaces the need for a PE film barrier.
5. **Regionality**: Only used in Ontario to date as that is the jurisdiction of 90% of our work.
6. **Trends:** We are seeing the emergence of ever more spray-over-gravel sub-slab insulation systems.
7. **Benefits:** High R-value (as much as desired), low labour input, superior slab finishing (moisture control), better radon control, excellent for use with hydronic in-floor heating.
8. **Issues:** Detailing to limit insect ingress is incredibly important and often overlooked. Compaction of sub-slab gravel layer should be to 98% proctor or higher.

DISCLAIMER:

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Data used for the calculations shown comes from the materials database internal to ArchiCad (originally data from a major University Circular Economy Project), and in some instances has been modified to reflect current EPD (Environmental Product Declarations) from manufacturers. Users should always check the most current EPD and verify that these EPDs have been third-party certified. The data used here pertains mostly to scope ISO EN-15804 2019 Standards for Scope A1-3 emissions although some integration with Design LCA of Denmark has taken place for other scoped materials, these values are not reflected in this publication, but can be found in the matching template of ArchiCad with DesignLCA integration.