PARKIN ENGINEERING INC.
CONSULTING AND STRUCTURAL ENGINEERING
14014 NE SALMON CREEK AVE., VANCOUVER, WA 98686
PHONE (360) 694-8378 • FAX (360) 694-3376
email: info@johnwparkin.com

CALCULATIONS

16986-1

PARKIN ENGINEERING INC.
CONSULTING AND STRUCTURAL ENGINEERING

14014 NE SALMON CREEK AVE.
VANCOUVER, WA 98686

(360) 694-8378
FAX (360) 694-3376

DESIGN CRITERIA.

ADDRESS: 105 SE 137TH PLACE
PORTLAND OR 97233

REF. CODES: OSSC 2010
ASCE7-05
NDS 2005

ROOF: DEAD LOAD = 12 PSF (OVER RAFTERS)
SNOW LOAD = 25 PSF.

* THE FOLLOWING CALCULATIONS ARE FOR THE NEW RAFTERS THAT CREATE A NEW PEAK OVER AN EXISTING DEAD ROOF VALLEY.

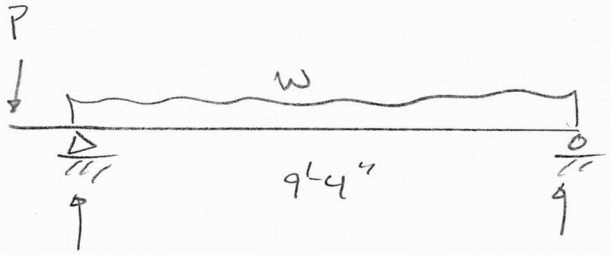
16986-2

PARKIN ENGINEERING INC.
CONSULTING AND STRUCTURAL ENGINEERING

14014 NE SALMON CREEK AVE.
VANCOUVER, WA 98686

(360) 694-8378
FAX (360) 694-3376

R1 RAFTERS,
@ 24" O.C.



$P = \left(\frac{12}{25}\right) \times \frac{8.25}{2} =$

$W = \left(\frac{15}{25}\right) psf.$

USE 2x6 NO.2 DF-L
@ 24" O.C.

16986-3

WoodWorks® SOFTWARE FOR WOOD DESIGN	COMPANY	PROJECT
	Apr. 26, 2013 10:56	R1

Design Check Calculation Sheet

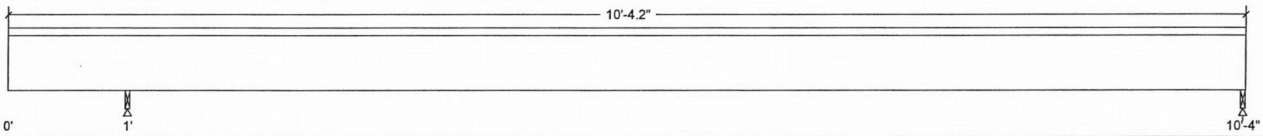
WoodWorks Sizer 9.14

Loads:

Load	Type	Distribution	Pat-tern	Location [ft] Start	End	Magnitude Start	End	Unit
Load1	Dead	Full Area	No			12.00 (24.0)*		psf
Load2	Snow	Full Area	Yes			25.00 (24.0)*		psf
Load3	Dead	Point	No	0.00		50		lbs
Load4	Snow	Point	Yes	0.00		103		lbs
Self-weight	Dead	Full UDL	No			2.0		plf

*Tributary Width (in)

Maximum Reactions (lbs), Bearing Capacities (lbs) and Bearing Lengths (in) :



Unfactored:					
Dead			204		115
Snow			400		228
Factored:					
Total			604		342
Bearing:					
Capacity					
Joist			835		469
Supports			604		586
Anal/Des					
Joist			0.72		0.73
Support			1.00		0.58
Load comb			#2		#4
Length			0.52		0.50*
Min req'd			0.52**		0.50*
Cb			1.73		1.00
Cb min			1.73		1.00
Cb support			1.25		1.25
Fcp sup			625		625

*Minimum bearing length setting used: 1/2" for end supports
**Minimum bearing length governed by the required width of the supporting member.

Lumber-soft, D.Fir-L, No.2, 2x6 (1-1/2"x5-1/2")
Supports: All - Timber-soft Beam, D.Fir-L No.2
Roof joist spaced at 24.0" c/c; Total length: 10'-4.2";
Lateral support: top= full, bottom= at supports; Repetitive factor: applied where permitted (refer to online help);

Analysis vs. Allowable Stress (psi) and Deflection (in) using NDS 2005 :

Criterion	Analysis Value	Design Value	Analysis/Design
Shear	fv = 62	Fv' = 207	fv/Fv' = 0.30
Bending(+)	fb = 1214	Fb' = 1547	fb/Fb' = 0.78
Bending(-)	fb = 303	Fb' = 1537	fb/Fb' = 0.20
Deflection:			
Interior Dead	0.12 = L/970		
Live	0.24 = L/469	0.47 = L/240	0.51
Total	0.41 = L/272	0.62 = L/180	0.66
Cantil. Dead	-0.03 = L/348		
Live	-0.08 = L/156	0.10 = L/120	0.77
Total	-0.13 = L/93	0.13 = L/90	0.96

Additional Data:

FACTORS:	F/E(psi)	CD	CM	Ct	CL	CF	Cfu	Cr	Cfrt	Ci	Cn	LC#
Fv'	180	1.15	1.00	1.00	-	-	-	-	1.00	1.00	1.00	2
Fb'+	900	1.15	1.00	1.00	1.000	1.300	1.00	1.15	1.00	1.00	-	4
Fb'-	900	1.15	1.00	1.00	0.993	1.300	1.00	1.15	1.00	1.00	-	2
Fcp'	625	-	1.00	1.00	-	-	-	-	1.00	1.00	-	-
E'	1.6 million		1.00	1.00	-	-	-	-	1.00	1.00	-	4
Emin'	0.58 million		1.00	1.00	-	-	-	-	1.00	1.00	-	4

CRITICAL LOAD COMBINATIONS:

```
Shear     : LC #2  = D+S, V =    375, V design =    338 lbs
Bending(+): LC #4  = D+S (pattern: sS), M =    765 lbs-ft
Bending(-): LC #2  = D+S, M =    191 lbs-ft
Deflection: LC #4  =   (live)
            LC #4  =   (total)
D=dead L=live S=snow W=wind I=impact Lr=roof live Lc=concentrated E=earthquake
All LC's are listed in the Analysis output
Load Patterns: s=S/2,  X=L+S or L+Lr,  _=no pattern load in this span
Load combinations: ASCE 7-05 / IBC 2009
```

CALCULATIONS:

```
Deflection:  EI =     33e06 lb-in2
"Live" deflection = Deflection from all non-dead loads (live, wind, snow…)
Total Deflection = 1.50(Dead Load Deflection) + Live Load Deflection.
```

Design Notes:

1. WoodWorks analysis and design are in accordance with the ICC International Building Code (IBC 2009), the National Design Specification (NDS 2005), and NDS Design Supplement.
2. Please verify that the default deflection limits are appropriate for your application.
3. Continuous or Cantilevered Beams: NDS Clause 4.2.5.5 requires that normal grading provisions be extended to the middle 2/3 of 2 span beams and to the full length of cantilevers and other spans.
4. Sawn lumber bending members shall be laterally supported according to the provisions of NDS Clause 4.4.1.

Date: March 1, 2013

Proposal Submitted to: Marylou Zimmerman
Attn: Marylou Zimmerman
Phone: 503-544-6261
Email:

Job Name:
Job Location: 105 SE 137th Place, Portland, OR. 97233

We hereby submit specifications and estimates for:

SCOPE OF WORK

- **Use safety precautions per OSHA standards.**
- **Tear off dead valley and slopes into dead valley.**
- **Extend roof rafters off garage and living room to form a peak**
- **Side gables using pre-primed T1-11 with 4" reveal.**
- **Install new pre-primed barge board to match existing dutch hips.**
- **Sheet structure using ½" CDX plywood.**
- **Install 15 lb underlayment**
- **Install OC Oakridge Shingle. (used to be 30 yr, now lifetime prorated after 10 years) color to be closest match to existing.**
- **Extend existing pipe through new structure.**
- **Properly flash sidewalls, pipes and vents to manufacture specifications.**
- **Install 8 metal RVO 38 roof vents.**
- **Paint exposed barge board and siding to match existing house (color to be closes match to existing).**
- **Clean up and haul away work related debris.**

- **Note: Price does include the cost for permits or engineering.**

INVESTMENT $14,859.00

Assumptions:
Positively connecting ducts to vents and/or fans is not included in the scope of work and is not the responsibility of Interstate. This type of work should be completed by a licensed HVAC contractor after the roofing project is completed.

Prepared Roof-covering Materials (TFWZ)–*Continued*

installation as Class A prepared roof coverings. Suitable for installation on minimum 3/8 in. thick plywood decks.Also Classified in accordance with ASTM D3161, Class F. Also Classified in accordance with ASTM D3462.

Asphalt glass mat shingles designated "Prestique Xtra", "Timberline ArmorShield II", "Starter Strip", "ProStart Starter", for installation as Class A prepared roof coverings. Suitable for installation on minimum 3/8 in. thick plywood decks. Also Classified in accordance with ASTM D3462.

Hip and ridge shingles designated "Seal-A-Ridge XTRA", "Seal-A-Ridge ArmorShield", "Z-Ridge", for installation as Class A prepared roof coverings.

Asphalt glass mat shingles designated Prestique Plus, for installation as Class A prepared roof covering when used over existing wood shingle roof.

Asphalt glass mat shingles designated Prestique I and Prestique II, for installation as Class A prepared roof covering when used with minimum Type 15 underlayment over existing wood shingle roof.

GAF MATERIALS CORP — R21

1361 ALPS RD, WAYNE NJ 07470

Asphalt glass fiber mat shingles - "Royal Sovereign," "Sentinel," "Timberline Prestique 30," "Timberline Natural Shadow," "Timberline Prestique 40," "Timberline Cool Series," "Marquis WeatherMax," "Grand Canyon," "Grand Sequoia," and "Camelot" for installation as Class A roof covering. Suitable for installation on minimum 3/8-in. thick plywood in combination with minimum one ply "Shingle-Mate" or Type 15 or Type 30 underlayment. Also Classified in accordance with ASTM D3161, Class F. Also Classified in accordance with ASTM D3462.

Asphalt glass fiber mat shingles - "WeatherBlocker Starter Strip Shingles" for installation as Class A roof covering. Suitable for installation on minimum 3/8-in. thick plywood in combination with minimum one ply "Shingle-Mate" or Type 15 or Type 30 underlayment. Also Classified in accordance with ASTM D3161, Class A. Also Classified in accordance with ASTM D3462.

Asphalt glass fiber mat shingles - "Slateline" for installation as Class A roof covering. Suitable for installation on 15/32-in. thick plywood in combination with minimum one ply "Shingle-Mate" or Type 15 or Type 30 underlayment. Also Classified in accordance with ASTM D3161, Class F. Also Classified in accordance with ASTM D3462.

Asphalt glass fiber mat shingles - "Royal Sovereign," "Sentinel," "Timberline Prestique 30," "Timberline Natural Shadow," "Timberline Prestique 40," "Timberline Cool Series," "Marquis WeatherMax," "Grand Canyon," "Grand Sequoia," and "Camelot" for installation as Class A prepared roof covering when used with minimum Type 30 underlayment over existing wood shingle roof.

Asphalt glass mat and hip and ridge shingles - "Timbertex Hip and Ridge" for installation as Class A prepared roof covering. Also been evaluated in accordance with ASTM D3161, Class F when Henkel "PL Roofing and Flashing Sealant" or Sonneborn "NP1 Gun-Grade Polyurethane Sealant" or TopCoat Inc. "FlexSeal Adhesive" is applied as specified in manufacturer's application instructions." Also Classified in accordance with ASTM D3462.

Modified asphalt glass fiber mat shingles - "Timberline Prestique Lifetime" for installation as Class A prepared roof covering. Suitable for installation on minimum 3/8-in. thick plywood in combination with minimum one ply "Shingle-Mate" or Type 15 or Type 30 underlayment. Also Classified in accordance with ASTM D3161, Class F. Also Classified in accordance with ASTM D3462.

IKO INDUSTRIES LTD — R6765

71 ORENDA RD, BRAMPTON, ON L6W 1V8 CANADA

Asphalt organic felt shingles designated as "New Englander", "T Lock", "Imperial Superseal", for installation as Class C roof coverings. Also Classified in accordance with ASTM D3161, Class A.

Asphalt glass fiber mat shingles designated "Super Armour-Seal", for installation as Class A prepared roof coverings. Also Classified in accordance with ASTM D3161, Class A.

IKO MFG INC — R9806

HAY RD EDGEMOOR, WILMINGTON DE 19809

Asphalt organic felt shingles designated "Imperial Seal 15", for installation as Class C prepared roof coverings. Also Classified in accordance with ASTM D3161, Class A.

Asphalt glass fiber mat shingles designated "Imperial Glass 20", "Gentry 25", "Armour Glass 3 Tab", "Armour Class", "Gentry", "Imperial Gentry", for installation as Class A prepared roof coverings. Also Classified in accordance with ASTM D3161, Class A.

INOVATE MFG L L C — R21860

9303 GARFIELD AVE, SOUTH GATE CA 90280

Asphalt glass fiber mat shingles designated "Artistic Slate", for installation as Class A prepared roof coverings. Suitable for installation on minimum 3/8 in. thick plywood decks with underlayment such as asphalt saturated felt or shingle underlayment classified by UL as a prepared roofing accessory and on minimum 15/32 in. thick plywood decks without underlayment. Also Classified in accordance with ASTM D3161, Class A.

Hip and ridge shingles designated "Rapid Ridge", for installation as Class A prepared roof coverings. Suitable for installation on minimum 3/8 in. thick plywood decks and on minimum 15/32 in. thick plywood decks without underlayment. Also Classified in accordance with ASTM D3161, Class A or Class F.

ITALIANA MEMBRANE S P A — R18948

VIA GALOPPAT 134 33087, PASIANO ITALY

Modified Asphalt Glass-Fiber Mat and Glass/Polyster Reinforced Shingles designated "Tegola Italiana Classic 4 F/P" or "Tegola Italiana Classic 4 F/V", for installation as Class A prepared roof covering in accordance with manufacturer's instructions. Suitable for installation over minimum 3/8 in. thick plywood decks when laid over one ply of Italiana Membrane's "Ecoplast V" (1 Kg) base sheet.

MALARKEY ROOFING PRODUCTS — R4299

3131 N COLUMBIA BLVD KENTON STATION PO BOX 17217, PORTLAND OR 97217

Asphalt glass fiber mat shingles designated "Dura-Seal 20", "Dura-Seal 25", "Northwest-XL", "Northwest-XL AB", "Highlander-CS", "Highlander-CS AR", and "Ecoasis", for installation as Class A prepared roof coverings. Also Classified in accordance with ASTM D3161, Class A.

Asphalt glass fiber mat sheet roofing, for installation as Class C prepared roof coverings.

Hip and ridge shingles designated "EZ Ridge" and "EZ Ridge XT", for installation as Class A prepared roof coverings. Suitable for installation on minimum 3/8 in. thick plywood decks and on minimum 15/32 in. thick plywood decks without underlayment. Also Classified in accordance with ASTM D3161, Class A.

OWENS CORNING — R2453

1 OWENS CORNING PKY, TOLEDO OH 43659

Asphalt glass fiber mat sheet roofing designated "Mineral Surfaced Roll Roofing", for installation as Class C prepared roof coverings. These rolls may also bear the statement, "Also Classified in accordance with ASTM D3909.

Asphalt glass fiber mat and shingles designated Berkshire, Classic, Supreme, Oakridge (Oakridge Pro 30), Oakridge Pro 40, Oakridge Pro 50, Woodcrest, Woodmoor, Prominence, WeatherGuard HP, Duration, Duration Premium, Skyview and Starter strip (Supreme), for installation as Class A prepared roof coverings. Suitable for installation on minimum 3/8 in. thick plywood decks with underlayment such as asphalt saturated felt or shingle underlayment classified by UL as a prepared roofing accessory (underlayment not required for hip and ridge shingles) and on minimum 15/32 in. thick plywood decks without underlayment. Asphalt glass fiber mat shingles, for installation as Class C prepared roof coverings on minimum 3/8 in. thick plywood decks without underlayment. Asphalt glass fiber mat and hip and ridge shingles for installation as wind resistant roof coverings. These shingles may also bear the statement "Also Classified in accordance with ASTM D3161, Class F", "Also Classified in accordance with ASTM D3462" and "Also Classified in accordance with CSA-A 123.5". These roofing systems may incorporate starter shingles designated "Strip Shingle" or "TRI-BUILT Shingle Starter".

Hip and ridge shingles designated "High Ridge", "WeatherGuard HP", "Berkshire", "Hip & Ridge shingles with sealant" for installation as Class A prepared roof coverings. These shingles may also bear the statements, "Also Classified in accordance with ASTM D3161, Class F", "Also Classified in accordance with ASTM D3462" and the Hip & Ridge with sealant shingle may bear the statement "Also Classified in accordance with CSA-A 123.5".

Hip and ridge shingles designated "DecoRidge", for installation as Class A prepared roof coverings. Suitable for installation on minimum 3/8 in. thick plywood decks and on minimum 15/32 in. thick plywood decks without underlayment. Also Classified in accordance with ASTM D3161, Class A or Class F.

PABCO BUILDING PRODUCTS L L C, DBA PABCO ROOFING PRODUCTS — R11271

1718 THORNE RD, TACOMA WA 98421

Asphalt organic felt shingles coverings designated"Universal", "Custom Saf-T-Lok", "Double Coverage Saf-T-Lok","Master Slab", "Single Coverage Saf-T-Lok", "Independence", "SS-20", "Hallmark", "Sealdon", "Solid Slab", and "HO-25" for installation as Class C prepared roof coverings.

Asphalt glass mat shingles designated "Premier 25", "Premier 30", "Premier 40", "Premier 50", "SS-30", "Premier Advantage", "GG-20", "Precise", "Paramont", "Paramount Starter Strip with sealant", "Cascade" and "Paramount Advantage" for installation as Class A prepared roof coverings. Suitable for installation on minimum 3/8 in. thick plywood decks. Also

Product Attributes

Tru PROtection® Non-Prorated Limited Warranty* Period

5 Years

UL Fire Rating

Class A

Shingle Core

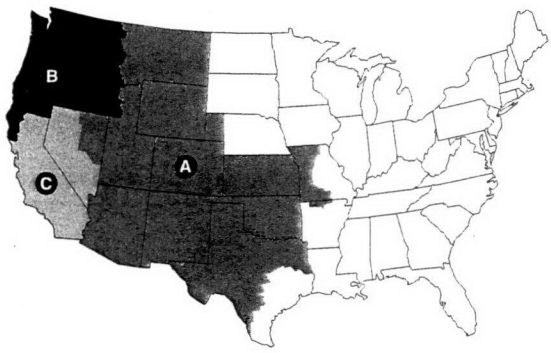
Fiberglas® Mat

Oakridge® Shingles Product Specifications

Nominal Size	13¼" x 38¾"
Exposure	5⅝"
Shingles per Square	66
Bundles per Square	3
Coverage per Square	99.9 sq. ft.

Applicable Standards and Codes

ASTM D 3018, Type 1	ASTM D 228
ASTM D 3462	UL 790, Class A
ASTM E 108, Class A Fire	UL 997, Wind
ASTM D 3161, Class F Wind	



NO. 15 FELT PLAIN 4 SQ. ASTM D226

Description

An asphalt roofing felt made of a specially formulated organic sheet, which has been fully saturated with waterproofing asphalt. This product is strong, flexible and impervious to water penetration, but will allow water vapour to pass through at a restricted rate. Preconditioned to help it lay flat and remain stable after installation on a roof deck. Guidelines are provided at 2", 8 $^1/_2$", 11 $^5/_{16}$" and 17" measured from each edge.

Uses

No. 15, non-perforated, asphalt felt is designed to be used as an all-purpose protective waterproof sheet in construction projects. Can be installed as a temporary roof cover during house construction and then serve as a permanent shingle underlayment after shingles are installed. As a shingle underlayment, it functions to restrict vapour movement from the wood deck and attic to the underside of the shingles thus preventing condensation and as a barrier to wind-driven moisture which may get past the shingle. Can also act as temporary protection if shingle blow-off occurs. May also be used as a waterproof breather sheet on side-walls beneath outer finish. (Check local building codes.)

Physical Test Parameters

Conforms to:	ASTM D226
Average Breaking Strength:	
Along fibre grain, kN/m (lb/in) of width	10 (57)
Across fibre grain, kN/m (lb/in) of width	3.5 (20)
Perm-rating (water vapour permeance), ASTM E96 procedure (A), ng/Pa.s.m^2(metric perms),	200 (2.3)
Average weight, lb/roll,	53 (approx.)

Packaging

Roll width:	36" (0.09 m)
Roll Contents:	432 sq. ft. (40 sq. m.)
Rolls per pallet	25
Pallets size:	40" x 48"

Installation

1) Temporary Roof Cover - Always run felt horizontally beginning at bottom edge of roof. Use broad headed roofing nails to secure felt to the roof deck. Stretch felt as tightly as possible to keep it flat, then install two rows of nails; one along bottom edge and one at centre. Lap each run 2" over previous sheet. If felt is installed parallel to bottom edge of roof deck, the guidelines will be useful for shingle alignment later.

2) Shingle Underlayment - If the felt has been installed several days in advance of shingle application, it may have some minor buckles and wrinkles due to moisture pick-up. This will not cause problems since nailing of the shingles will force the felt to lay flat.

Continued on next page

www.halind.com
Local: 604-888-0777 Toll Free: 1-800-663-0076 Fax: 604-888-1656
9681 - 187 St., Surrey, BC, V4N 3N3

NO. 15 FELT PLAIN 4 SQ. ASTM D226 *Cont'd*

Deck Preparation

1) Always ensure that the deck lumber is nailed tightly and all rotted or broken boards have been replaced.

2) If new plywood or O.S.B. sheathing is being installed on the roof deck be aware that expansion of these sheets may take place within 3 to 4 months of completion. This expansion is caused by vapour pick-up from the attic, and is more severe in homes with poor ceiling vapour barriers and insufficient attic ventilation. The expansion of new roof sheathing can sometimes cause bulges and ridges to develop in the shingles. O.S.B. manufacturers state that a 1/8" gap must be left between sheet edges for expansion.

To help prevent excessive deck expansion consider the following suggestions:

A) If possible, pre-condition the sheathing by storing separated for several weeks in a humid environment prior to use.
B) When used immediately after purchase, the sheets should be cut in half prior to installation to reduce the amount of expansion per segment.
C) Attic ventilation should be checked and increased if not sufficient. Installing ridge vents is very beneficial.
D) Openings from the living space to the attic must be eliminated and exhaust fans must not discharge into the attic.
E) All sheathing must be nailed very securely to each supporting member with proper fasteners. If nailing over old decking, or strapping, be sure that nails are long enough to penetrate well into joists or rafters, and not simply into old deck boards. Always stagger the sheets so that joints don't coincide.

CAUTION

Great care must be exercised in all phases of steep slope roof application. Follow the safety guidelines of the safety authority having jurisdiction in your area.

The information presented herein, while not guaranteed, is to the best of our knowledge true and accurate. Except when agreed to in writing for specific conditions of use, no warranty or guarantee expressed or implied is made regarding the performance of any product, since the manner of use and handling are beyond our control. The user of such information assumes all risk connected with the use thereof. Nothing contained herein is to be construed as permission or as a recommendation to infringe any patent.