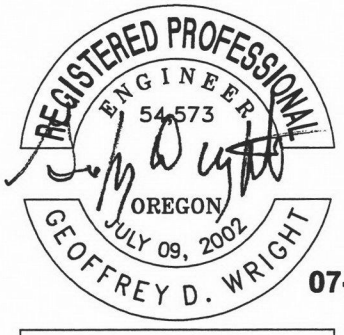
STRUCTURAL CALCULATIONS

NEW GARAGE

SW 52ND AVE
PORTLAND, OR



07-22-2013

EXPIRES: 06/30/2014

13-193360 RS

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PROJECT: SW 52ND AVE, SOUTH LOT	**PROJECT #:** 124-135
JOB ADDRESS: PORTLAND, OR	
CLIENT: EVERETT CUSTOM HOMES	
DATE: 07/22/13	**PAGE:** 1

JOB SUMMARY:

THIS JOB ENTAILS THE VERTICAL AND LATERAL SUPPORTS FOR A NEW GARAGE.

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PROJECT: SINGLE CAR GARAGE PROJECT #:

JOB ADDRESS: PORTLAND, OR

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DATE: PAGE: 2/5

VERTICAL

25psf RSL

15psf RDL

40 psf RTL

MANUF TRUSSES BY OTHERS

HDRS

BY IRUSP

4x12 @ GARAGE DOOR

4x8 @ DOOR / WINDOWS

FTGS

$W = 40\left(\frac{12}{2}\right) = 240 plf$

BRG = 240 psf

12" WIDE x 6" CONT FTG.

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JOB ADDRESS: PORTLAND, OR	
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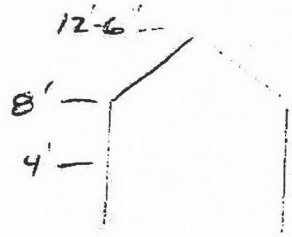
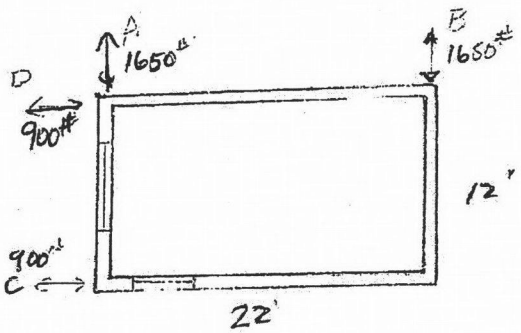
LATERAL





CK. SEISMIC $V = 0.11/1.4 = 0.079W$

$W_1 = [15(22)(12) + 10(4)(64)] = 6520^{\#}(0.079) = 515^{\#}/2 = 258^{\#}$

WIND CONTROLS

Check per 2010 OSSC

$V_{35} = 95$ mph - Exp B

$P_{NET} = q_s\ k_z\ C_{NET}\ [I \cdot k_{zt}]$

$q_s = 23$ psf

$I = 1.0$

(R) $P_{NET} = 19$ psf

(W) $P_{NET} = 16$ psf

(R) $C_{NET} = 1.13$

(W) $C_{NET} = 0.94$

$k_z = 0.57$

$k_{zt} = 1.30$

$W = 19(4'-6") + 16(4) = 150\#/lf$

$A = B = 150(22'/2) = 1650^{\#}$

$C = D = 150(12'/2) = 900^{\#}$

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PROJECT: SINGLE CAR GARAGE PROJECT #: 1

JOB ADDRESS: PORTLAND, OR

CLIENT: EVERETT CUSTOM HOMES

DATE:

SHEARWALLS

D $V = 900^{\#}$ $L = 22'$ $h = 8'$

$v = 900^{\#} / 22' = 41 \text{plf}$

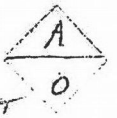
$M_O \quad 900^{\#}(8) = 7200^{\#FT}$

$M_R \quad \left[15\left(\frac{12}{2}\right) + 10(8)\right]\frac{22^2}{2} = 41{,}140^{\#FT}$

$FS = 5.7$ NO HD

C $V = 900^{\#}$ $L = 18'\text{-}0''$ $h = 8'$

$v = 900^{\#} / 18' = 50 \text{plf}$



$M_O = 900(8) = 7200^{\#FT}$

$M_R = \left[15\left(\frac{12}{2}\right) + 10(8)\right]\frac{18^2}{2} = 27540^{\#FT}$

$F.S = 3.8$ NO HD

A $V = 1650^{\#}$ $L = 2' + 2' = 4'$

$v = 1650^{\#} / 4' = 413 \text{plf}$

$M_O = 1650^{\#}(8)(2/4) = 6600^{\#FT}$

$M_R = \left[15(8) + 10(8)\right]\frac{2^2}{2} + 200(12)(2) = 5200^{\#FT}$

$\text{UPLIFT} = \frac{6600 - 2/3(5200)}{2} = 1567^{\#}$

B $V = 1650^{\#}$ $L = 12'\text{-}0''$

$v = 1650^{\#} / 12' = 138 \text{plf}$

$M_O = 1650^{\#}(8) = 13200^{\#FT}$

$M_R = \left[15(8) + 10(8)\right]\frac{12^2}{2} + 260(12)(8) = 39360^{\#FT}$

$FS = 3.0$ NO HD

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JOB ADDRESS: PORTLAND, OR	
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STRUCTURAL
~~Life Safety~~ Checksheet Response

Permit #: 13-193354-000-00-RS Date: 8/29/13

Customer name and phone number: MIKE COYLE 503-680-5497

Note: In the spaces below, please provide specific information concerning the changes that you have made in response to the checksheet. Note the checksheet item number, your response or a description of the revision, and the location of the change on the plans (i.e. page number and/or detail number). Use as many lines as needed. If the item is not in response to a checksheet, write "Applicant" in the column labeled "Checksheet item number."

Checksheet item number	Description of changes, corrections, additions, etc.	Location on plans
dk 1.	Roof framing plan revised on 2/D3 to better match Truss-Way drawings for for porch. Note that GIRDER TRUSS = TOG.	2/D3
dk 2.	Revised lateral calc package submitted called "supplemental calcs." Lateral bracing plans revised on L1 sheet to match calc package. Also, new details 7/L1 and 8/L1 provided for lateral continuity.	L1
dk Applicant	PORCH framing has been revised. Drawings now show 8' deep porch design.	1/D3, 2/D3, 3/D3
dk Applicant	Upper floor joists have been revised to better match Quality Truss floor joist layout	2/D3
9/9/2013		

RECEIVED
AUG 30 2013
BDS
DOCUMENT SERVICES

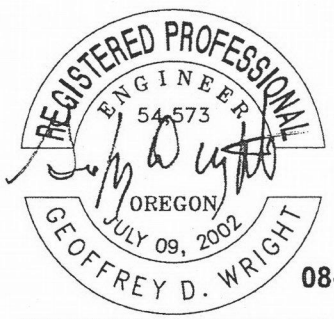
Plan Bin Location: 54RS w/ GARAGE 13-193360-RS

2

STRUCTURAL CALCULATIONS
SUPPLEMENTAL CALCS

NEW RESIDENCE

SW 52ND AVE
PORTLAND, OR



08-29-2013

EXPIRES: 06/30/2014

13-93354-RS

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PROJECT: SW 52ND AVE, NORTH LOT	**PROJECT #:** 124-135
JOB ADDRESS: PORTLAND, OR	
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DATE: 08/29/13	**PAGE:** 1

LATERAL * REVISED LATERAL DESIGN

WIND

V_{35} = 95mph Exp B
Simplified Method

q_s = 23psf K_z = { 0.7 Roof + upper ; 0.57 upper + main }

I = 1.0 K_{zt} = 1.0

	WINDWARD		LEEWARD	
C_{NET} =	0.43	+	0.51	= 0.94 wall
C_{NET} =	0.66	+	0.14	= 0.80 Roof

P_{NET} = 12.9psf roof

P_{NET} = 15.1 psf upper

P_{NET} = 12.3psf main

w_{R+U} = 12.9(13) + 15.1(8/2) = 228plf ↔

w_{R+U} = 12.9(6.5) + 15.1(8/2) = 144 plf ↕

w_{U+M} = 12.3(8/2 + 1 + 9/2) = 117 plf

SEISMIC

V = 0.11wt / 1.4 = 0.079wt

wt of roof + upper =
15psf(30×40)
+10psf(270)(8/2)
= 28,800#

wt of upper + main =
15psf(30×40)
+10psf(270)(8/2)
+10psf(200)(9/2)
= 37,800#

V_{R+U} = 0.079(28,800) = 2275

V_{U+M} = 0.079(37,800) = 2986

Σ 5,261#

DIRECTION 1-2 ↔

V_{R+U} = 228(40) = 9120#

V_{U+M} = 117(40) = 4680

Σ 13,800#

DIRECTION A-B ↕

V_{R+U} = 144(30) = 4320#

V_{U+M} = 117(30) = 3510

7830#

WALL LINE LOADS

U1 = U2 = 9120/2 = 4560#

UA = UB = 4320/2 = 2160#

M1 = 117(5/2) = 293#

M2 = 117(40/2) = 2340#

M3 = 117(35)/2 = 2048#

MA = MB = 3510/2 = 1755#

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U1: $L = 3'-0" + 3'-6" + 10'-0 = 16'-6"$; $V = 4560^{\#}$; $v = 4560/16'-6" = 276\ plf$

$M_O = 4560(8)(3'-0/16'-6) = 6633^{\#'}$

$M_R = \left[15(8) + 10(8)\right]\frac{(3'-0)^2}{2} + [200](3)(6) = 4500^{\#'}$

$Uplift = \frac{M_O - 2/3\,M_R}{3'-0"} = 1210^{\#}$

B / 1

U2: $L = 2'-6" + 5'-0" + 5'-0 + 2'-6" = 15'-0"$; $V = 4560^{\#}$; $v = 4560/15 = 304\ plf$

$M_O = 4560(2'-6/15)(8') = 6080^{\#}$

$M_R = \left(15(8) + 10(8)\right]\frac{(2'-6)^2}{2} + [200](2'-6)(6) = 3625^{\#'}$

$Uplift = 1465^{\#}$

B / 1

UA: $L = 18'-6" + 16'-6" = 35'-0"$; $V = 2160^{\#}$; $v = 2160/35 = 62\ plf$

$M_O = 2160(8)(16'-6/35) = 8146^{\#'}$

$M_R = \left[15(15) + 10(8)\right]\frac{(16'-6)^2}{2} = 41,518^{\#'}$

$F.S. = 5.10 > 1.5 \therefore$ No HD's req'd

A / 0

UB: $L = 13'-0" + 10'-0 + 4'-6" + 4'-6" = 32'-0"$; $V = 2160^{\#}$; $v = 2160/32 = 66\ plf$

$M_O = 2160(8)(4'-6/32) = 2430^{\#'}$

$M_R = \left[15(15) + 10(8)\right](4'-6)^2/2 + [305](4'-6)(2) = 5833^{\#'}$

$F.S. = 2.4 \therefore$ No HD's req'd

A / 0

M1: $L = 4'-0 + 4'-0" = 8'-0"$; $V = 4560 + 293 = 4853^{\#}$; $v = 4853/8 = 606\ plf$

$M_O = \left[4560(18) + 293(4)\right](4/8) = 42,358^{\#'}$

$M_R = \left[15(8)\times 2 + 10(17)\right]\frac{(4)^2}{2} + [410](6)(4) = 13,170^{\#'}$

$Uplift = 8403^{\#}$

D / 3

M2: $L = 4'-6" + 2'-6" = 7'-0"$; $V = 2340^{\#}$; $v = 2340/7 = 334\ plf$

$M_O = 2340(9)(2'-6/9'-0) = 7521^{\#'}$

$M_R = \left[15(8)\times 2 + 10(9)\right]\frac{(2'-6)^2}{2} + [330](2'-6)(3) = 3506^{\#'}$

$Uplift = 2073^{\#}$

B / 2

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M3 $L = 2'-6" + 5 + 5 + 2'-6" = 15'-0"$; $V = 4560 + 2048 = 6608$; $v = 6608/15 = 441$ plf

$M_O = \left(4560(18) + 2048(9)\right)\left(\frac{2-6}{15}\right) = 16,752^{\#}$

$M_R = \left[15(8)\times 2 + 10(17)\right]\frac{(2-6)^2}{2} + [410](2-6)(6) = 7431^{\#'}$

Uplift = $4719^{\#}$

C / Z

M4 FRONT PORCH

WIND = $12.3(10\times 3) = 369^{\#}$ (90V)

SEISMIC = $15(8\times 30)\times 0.1079 = 284^{\#}$

STRAP FORCE = $369(8)/30 = 98^{\#} \Rightarrow$ USE SIMPSON ST6224

MA $L = 3'-6" + 6'-6" + 22'-0" = 32'-0"$; $V = 2160 + 1755 = 3915^{\#}$; $v = 3915/32 = 122$ plf

$M_O = \left(2160(18) + 1755(9)\right)\left(\frac{3-6}{32}\right) = 5,900^{\#'}$

$M_p = \left[15(15) + 15(8) + 10(17)\right]\frac{(3-6)^2}{2} + [515](3-6)(4) = 10,364^{\#'}$

F.S. = 1.73 ∴ NO HD'S

A / O

MB $L = 13-0 + 7'-9" = 20-9"$; $V = 2160 + 1755 = 3915^{\#}$; $v = 3915/209 = 188$ plf

$M_O = \left[2160(18) + 1755(9)\right](7.9/209) = 20,420^{\#'}$

$M_R = \left[15(15) + 15(8) + 10(17)\right]\frac{(7.9)^2}{2} + [515](7.9)(2-6) = 25,414^{\#}$

Uplift = $446^{\#} \Rightarrow$ ½" ø ANCHOR BOLT @ 48" OC Adequate by Inspection

∴ NO HD'S

A / O

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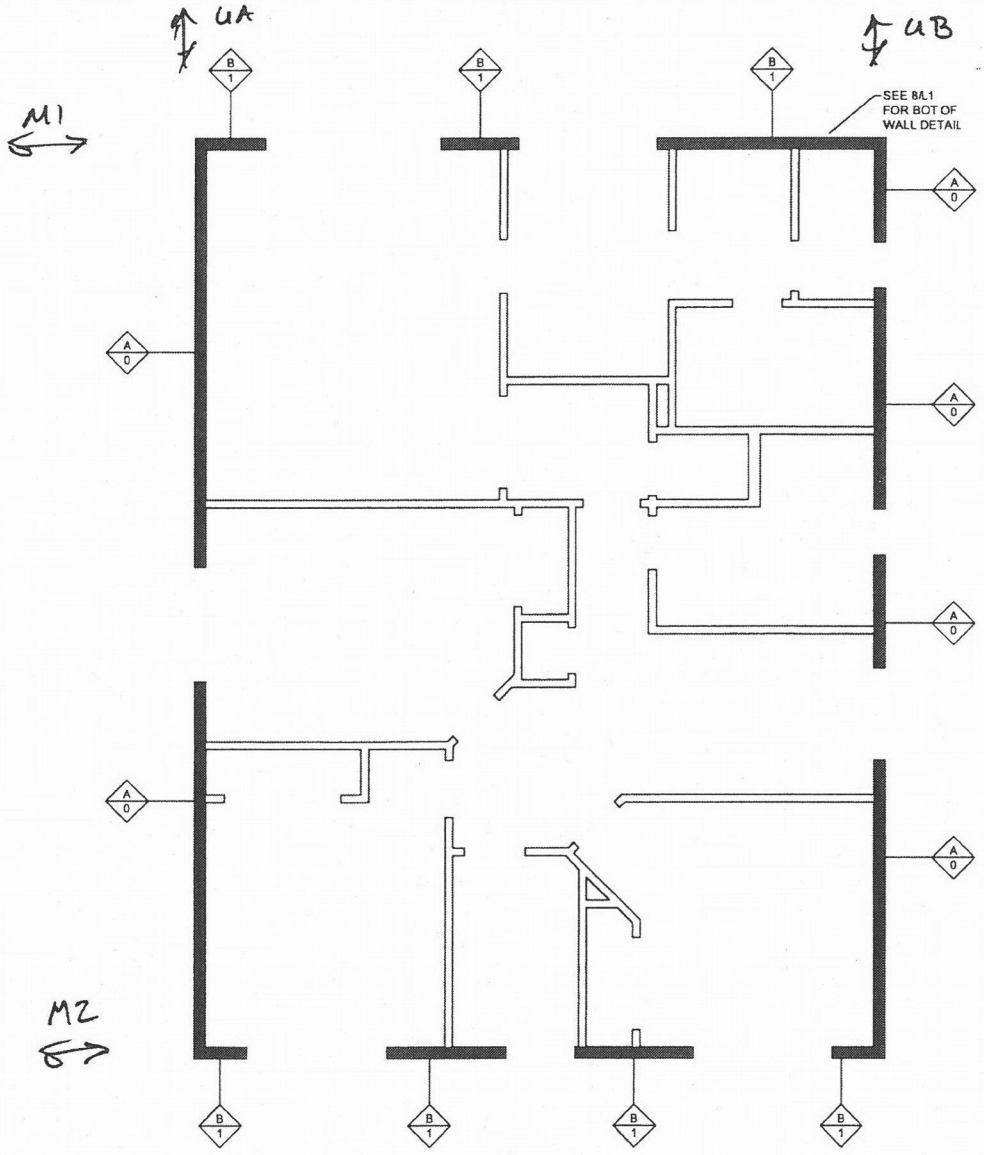
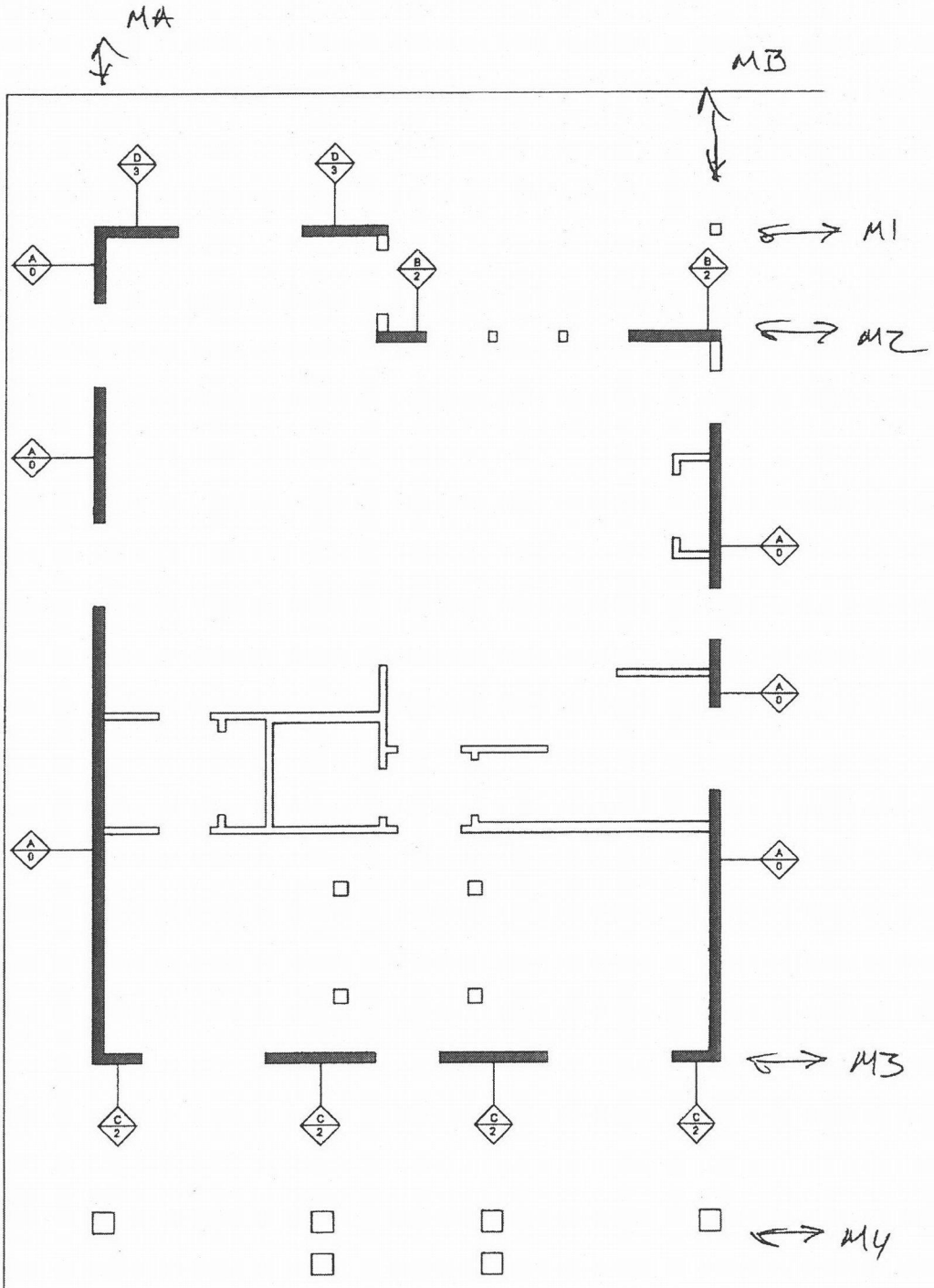
* REVISED UPPER FLOOR LATERAL PLAN



2 / L1 UPPER FLOOR PLAN
1/4" = 1'-0"



1 / L1 MAIN FLOOR PLAN
1/4" = 1'-0"