

WASH #6846

ORE #4406

CAL #12345

GENE T. STRADER ENGINEERING
STRUCTURAL - SOILS - CIVIL
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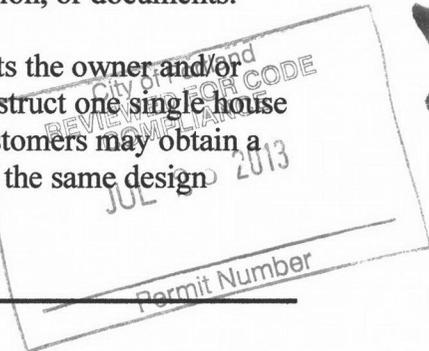
July 19, 2013

JIMMY & ROBIN MAY
N.W. SKYLINE BLVD. NORTHPLAINS, OR
DIAPHRAGM RETAINING WALL

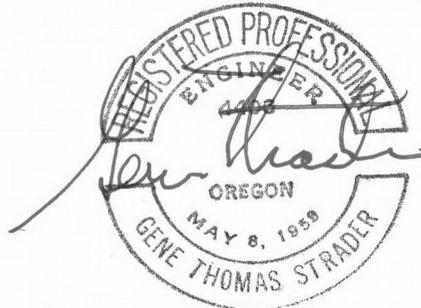
Limiting Conditions and Warning

Professional engineering provided herein is based upon plans and information provided by client and is limited to attached documents only, unless otherwise noted in signed and sealed documents and/or plans provided by professional engineer. If changes are made to the attached elevations or floorplans, contact our office before construction begins. No liability is assigned to any unsigned or unstamped plan, specification, or documents.

For payment of a one-time fee, Gene T. Strader Engineering grants the owner and/or contractor, a limited license to use this analysis and design to construct one single house or structure. After the initial analysis and design is purchased, customers may obtain a wet stamped renewal sheet for a subsequent house or structure (if the same design conditions exist) by paying a reduced additional order fee.



6-30-13



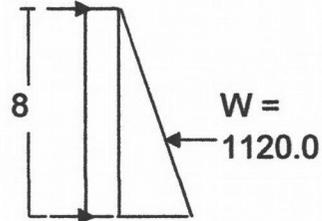
SIGNATURE MUST APPEAR IN RED INK TO BE A VALID SIGNATURE

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B-133412 REV 01 RS

Gene T. Strader Engineering Structural-Soils-Civil P.O.Box 957 Kelso, WA 98626 (360) 423 - 0130	Project: 4' TO 8' DIAPHRAGM WALL Location: NORTH PLAINS, OR For: JIMMY MAY	By: JTL Date: 7/19/2013 Page:
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DIAPHRAGM RETAINING WALL

$W = w * L^2 / 2$ $w = 35 \text{ \#-psf}$
 $M =$ moment of force
 $A_s =$ area of steel
 $f_y =$ specified yield strength of nonprestressed reinforcement, ksi
 $f'_c =$ specified compressive strength of concrete, ksi
 $M_o =$ overturning moment = $.1283 * W * L$ $M_u = M_o * 1.7 / 1000$
 $b_w =$ web width, in
 $d =$ distance from extreme compression fiber to neutral axis, in.
 $a = A_s * f_y / (0.85 * f'_c * b)$
 $\phi =$ STRENGTH REDUCTION FACTOR = 0.9
 $\phi M_n = 0.9 * A_s * f_y * (d - (a/2)) / 12 \text{ KIP-FT.}$



L	w	W	M	A _s	f _y	b _w	f' _c	a	d	ϕM_n	M _u
8.0	35	1120.0	1149.6	0.13	60	12	3	0.255	5.75	3.29	1.95

$\phi M_n > M_u$ OK

USE #4 BAR @ 18" O.C. VERTICAL, GRADE 60

MINIMUM STEEL REINFORCEMENT FOR FLEXURAL AS PER ACI 318-95, SECTION 10.5.1 for $f'_c < 4500 \text{ psi}$

$A_{s_{min}} = 200bd / (f_y * 1000)$ OR $(1.33 * M_u * 12) / ((d - a/2) * F_y)$
 $A_{s_{min}} = 0.23$ $A_{s_{min}} = 0.09$

USE LESSER VALUE OF TWO ABOVE $A_s \geq A_{s_{min}}$ OK



MINIMUM STEEL REINFORCEMENT FOR TEMPERATURE & SHRINKAGE

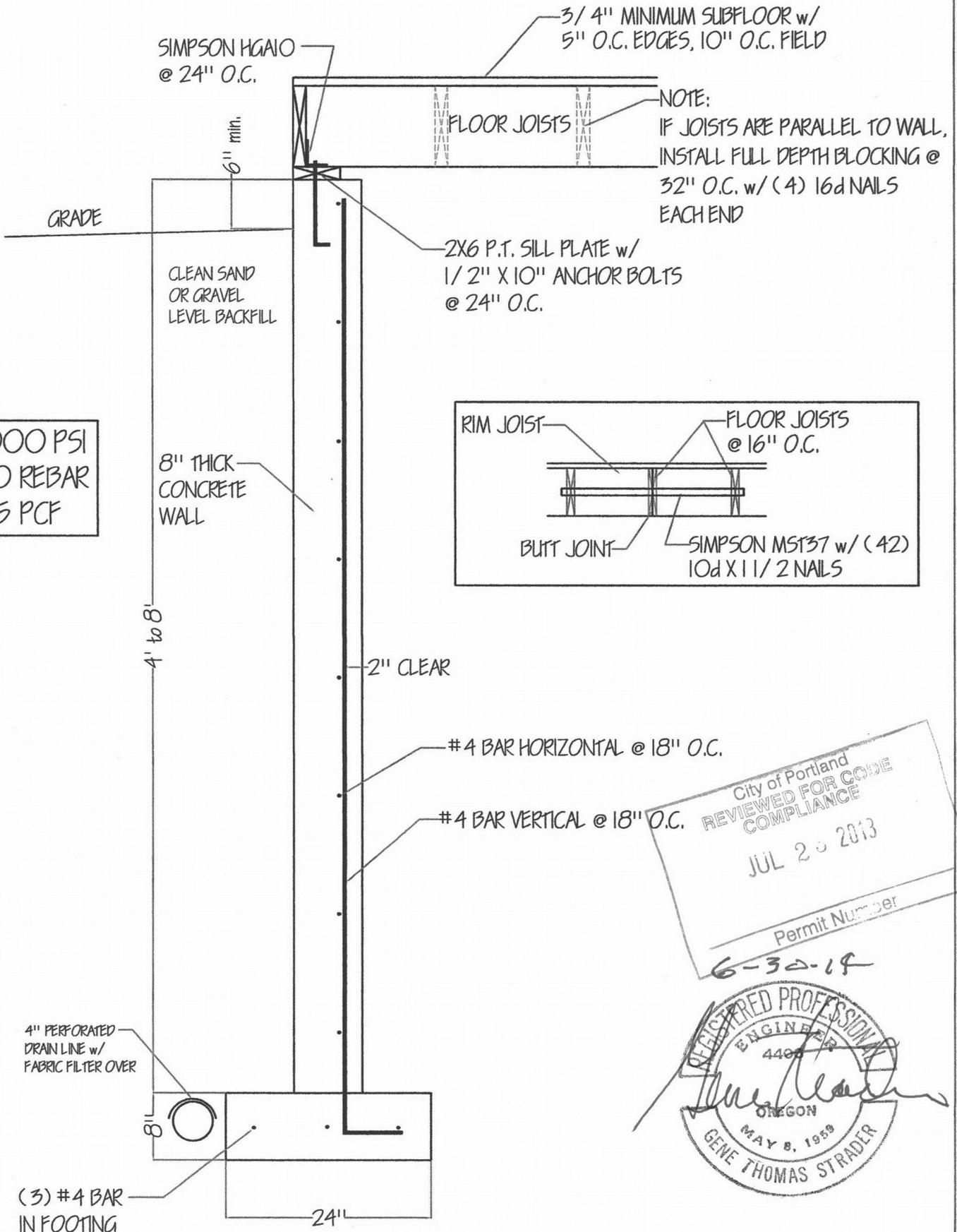
$A_{s_{min}}$ vertical = 0.0012 x gross concrete area for Grade 60 bar (#5 OR LESS) $A_s =$ 0.12 OK

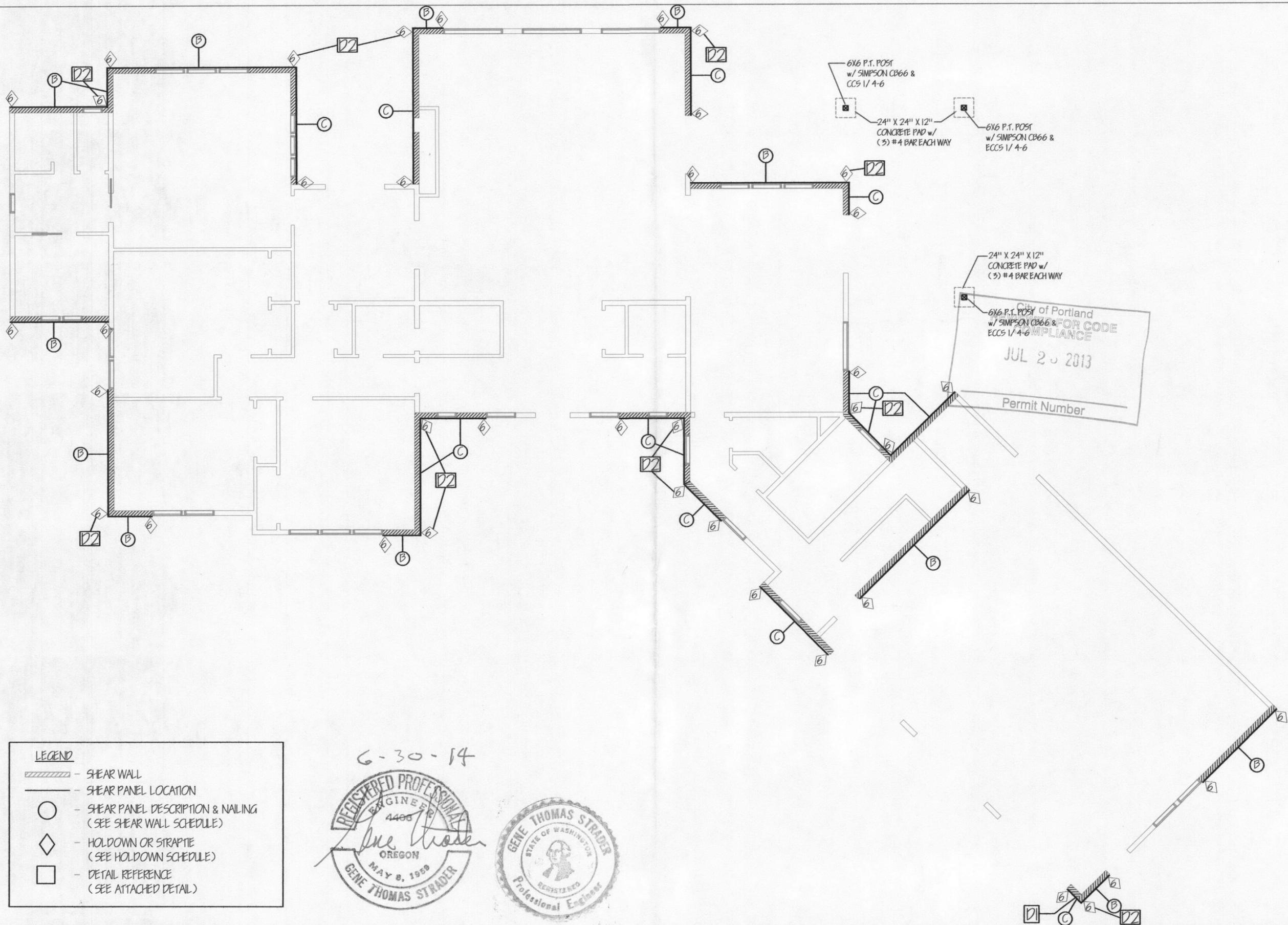
$A_{s_{min}}$ vertical = 0.0015 x gross concrete area for other bars

$A_{s_{min}}$ horizontal = 0.0020 x gross concrete area for Grade 60 bar (#5 OR LESS) $A_s =$ 0.19

$A_{s_{min}}$ horizontal = 0.0025 x gross concrete area for other bars

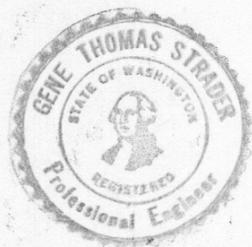
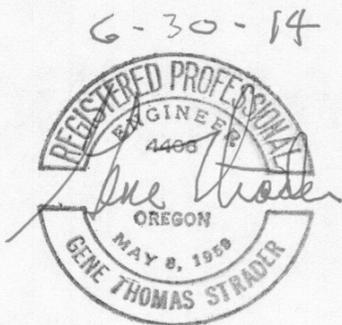
#4 BAR @ 18" HORIZ. GRADE 60





LEGEND

-  - SHEAR WALL
-  - SHEAR PANEL LOCATION
-  - SHEAR PANEL DESCRIPTION & NAILING (SEE SHEAR WALL SCHEDULE)
-  - HOLDOWN OR STRAP (SEE HOLDOWN SCHEDULE)
-  - DETAIL REFERENCE (SEE ATTACHED DETAIL)



6x6 P.T. POST
w/ SIMPSON CB66 &
ECCS 1/4-6

24" X 24" X 12"
CONCRETE PAD w/
(3) #4 BAR EACH WAY

6x6 P.T. POST
w/ SIMPSON CB66 &
ECCS 1/4-6

24" X 24" X 12"
CONCRETE PAD w/
(3) #4 BAR EACH WAY

City of Portland
APPROVED FOR CODE
COMPLIANCE
JUL 20 2013
Permit Number

DATE: 8/29/12
SCALE: 1/8" = 1'
DRAWN BY: JTL
APP. BY:

JIMMY & ROBIN MAY
N.W. SKYLINE BLVD. NORTH PLAINS, OR

REVISIONS

STRADER ENGINEERING
309 OAK STREET KELSO, WA 98626 (360) 425-0190

SHEET NO.
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