SUPPLEMENTAL STRUCTURAL CALCULATIONS

PIN PILE FOUNDATION

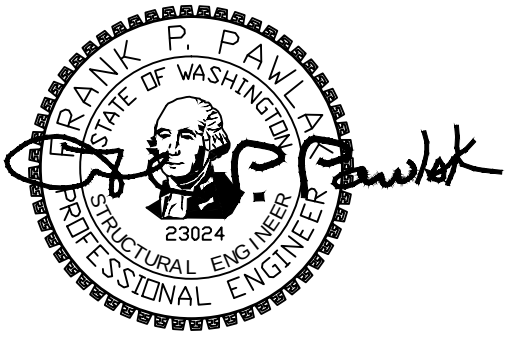
9820 SE 35th Place Remodel

Mercer Island, Washington

PROJECT NO.: 20-129

DATE: FEBRUARY 16, 2022

02/16/2022



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9820 SE 35th Pl

Pin Pile Foundation Revision

The condition of site soils has necessitated the use of pin piles to support the new structure.
The geotechnical engineer has confirmed.
2" dia driven pipe piles will be used with a 3T capacity.
The floor slab will be soil supported.

Reposition Shear Wall at Fireplace

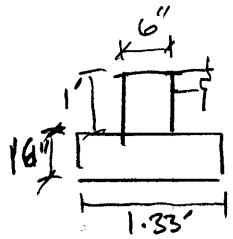
The SW-3 shear wall adjacent to the fireplace has been moved to the end wall over the C15 channel. The attached calc checks the channel and outrigger for max loading and omega seismic forces. The framing is found to be adequate.

EAST WALL ON GRID 'A': LOAD BEARING WALL

$DL = 25\ psf\ (7.75') + 8\ (12\ psf) = 290\ p/f$

$LL = 60\ psf\ (7.75') = 465\ p/f$

$W_G = DL + LL = 755\ p/f$



$W_{FTG} = 150\ pcf \times 1.33' \times \frac{16'}{12} = 266\ p/f$

$W_{STEM} = 150\ pcf \times 1' \times \frac{6}{12}' = 75\ p/f$

$\Sigma W = 1096\ p/f$

NON-LOAD BEARING WALL:

$\Sigma W = 266 + 75 = 341\ p/f$

$\text{PILE SPACING} = \frac{6000}{341} = 17'\ o.c\ max$

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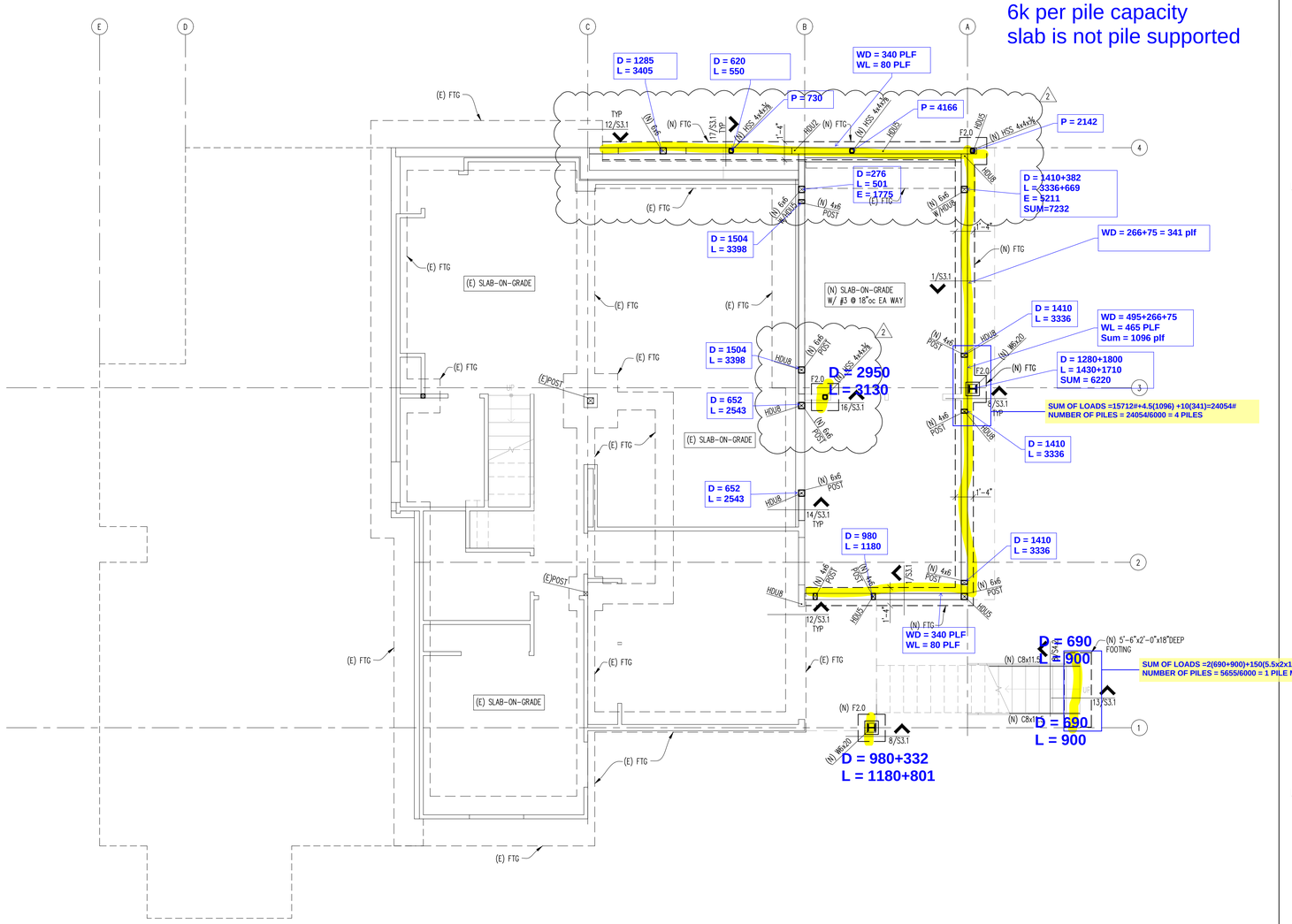
9820 SE 35th Pl

PROJECT: CONTINOUS FTG LOAD ON PILE	PROJECT NO.
SUBJECT	DATE
DESIGN: MT	SHEET NO.

pin pile foundation
2" dia pipe
6k per pile capacity
slab is not pile supported



NOTES:
1. FX.X DENOTES FOOTING SIZE. FOOTING SCHEDULE:
   F2.0 IS 2'-0"x2'-0"x12" DEEP W/ (3) #5 EA WAY BOT
2. SEE ARCH FOR DIMENSIONS.
3. SEE ARCH FOR INSULATION BELOW SLAB-ON-GRADE, IF APPLICABLE.
4. WALLS SHOWN ARE BASEMENT LEVEL WALLS.
5. SEE SHEETS S3.X FOR CONCRETE DETAILS.
5. ⟜ INDICATES HOLDOWN TYPE, SEE 10/S4.1 FOR HOLDOWN SCHEDULE.
6. SEE SHEET S2.2 FOR BASEMENT SHEARWALL LOCATIONS.

TRUE NORTH PROJECT NORTH

FOUNDATION PLAN ¼"=1'-0" 3

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PROJECT

9820 SE 35TH PLACE
ACHIN & MARY CHEN
9820 SE 35TH PL
MERCER ISLAND, WA 98040

REVISIONS

NO.	DATE	
	11-4-20	PERMIT
1	4/2/21	PERMIT RESPONSE
2	1/26/22	REVISIONS

11/4/20 DATE	20-129 JOB #
AM DESIGN	FPP CHECKED
LMS DRAWN	AS NOTED SCALE

SDCI STAMP

SHEET TITLE

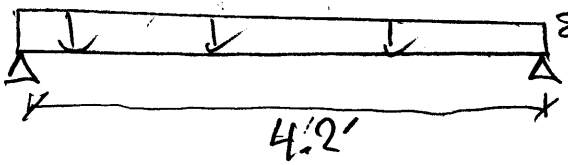
FOUNDATION PLAN

SHEET NO.

S2.1

GRADE BEAM @ GRID A 3

WORST CASE



$\Sigma w_u = 1.2(290+266+75) + 1.6(465) = 1502$ P/F

$$M_u = \frac{wL^2}{8} = \frac{1502}{8}(4.2)^2 = 3.8 \text{ k-ft}$$

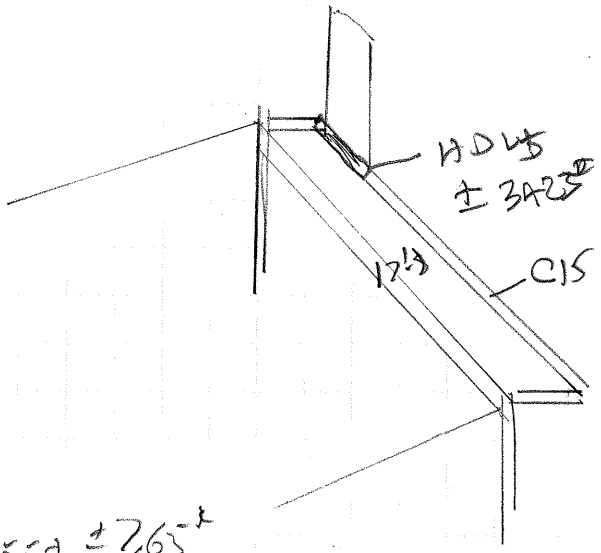
$$V_u = \frac{wL}{2} = \frac{1502}{2}(4.2) = 3.2 \text{ k}$$

(2) #5 cont T&B
As = .62 in^2
b = 16"
d = 12.5"
Ø Mn = 33.3 k-ft OK

vu = 3.2/(.75*16*12.5) = .021 ksi USE #4 @ 12 stirrups

Check C15 + OUTRIGGER to SUPPORT SW

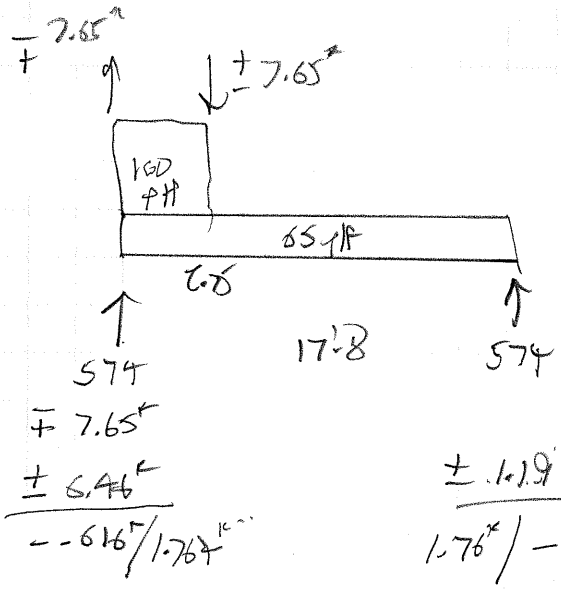
$V_E = 2.365^K$ SERVICE



$P = \pm 3423^{\#}$

$\Omega_0 = 2.5$

$P_S = \frac{2.365(1/2)}{1.3}(9.25)/2.75 \times 2.5 = \pm 7.65^K$



$M = 1.76(14.92) - .065(14.92)^2/2$

$= 19^{K-1}$

C15 OK

SEE OUTPUT

$\mp 7.65^K$

$\pm 6.46^K$

$-.616^K / 1.764^K$

$\pm 1.19^K$

$1.76^K / -.616^K$

CHECK OUTRIGGER

$M = 5K4(20\frac{1}{2}+)(3423 - 2880)(20) = 22,134^{11-\#}$

HSS5X4X1/2 $S = 8.49\ in^3$ ✓

$f_b = 2.6\ ksi$

$\Delta = .005^{11}$ ✓

Gravity Beam Design

RAM SBeam v5.0

02/18/22 13:06:46

STEEL CODE: AISC 360-05 ASD

SPAN INFORMATION (ft): I-End (0.00,0.00) J-End (17.67,0.00)

Beam Size (User Selected) = C15X33.9 Fy = 36.0 ksi
Total Beam Length (ft) = 17.67
Mp (kip-ft) = 152.40
Top flange not braced by decking.

POINT LOADS (kips):

			Flange Bracing	
Dist (ft)	DL	LL	Top	Bottom
2.750	0.00	7.65	No	No

LINE LOADS (k/ft):

Load	Dist (ft)	DL	LL
1	0.000	0.034	0.000
	17.670	0.034	0.000
2	0.000	0.030	0.000
	17.670	0.030	0.000

No Loads

C15 OK!

SHEAR: Max Va (DL+LL) = 7.03 kips Vn/1.67 = 77.60 kips

MOMENTS:

Span	Cond	LoadCombo	Ma kip-ft	@ ft	Lb ft	Cb	Ω	Mn / Ω kip-ft
Center	Max +	DL+LL	19.1	2.8	17.7	1.37	1.67	57.02
Controlling		DL+LL	19.1	2.8	17.7	1.37	1.67	57.02

REACTIONS (kips):

	Left	**Right**
DL reaction	0.57	0.57
Max +LL reaction	6.46	1.19
Max +total reaction	7.03	1.76

DEFLECTIONS:

Dead load (in)	at	8.83 ft	=	-0.015	L/D =	13792
Live load (in)	at	7.77 ft	=	-0.077	L/D =	2761
Net Total load (in)	at	7.77 ft	=	-0.092	L/D =	2307