

**Structural Calculations for:**

# **Day Residence Remodel**

**7825 SE 76<sup>th</sup> Street  
Mercer Island Washington**

**Client: Sturman Architects**

**21 June 2023**

**Index:**

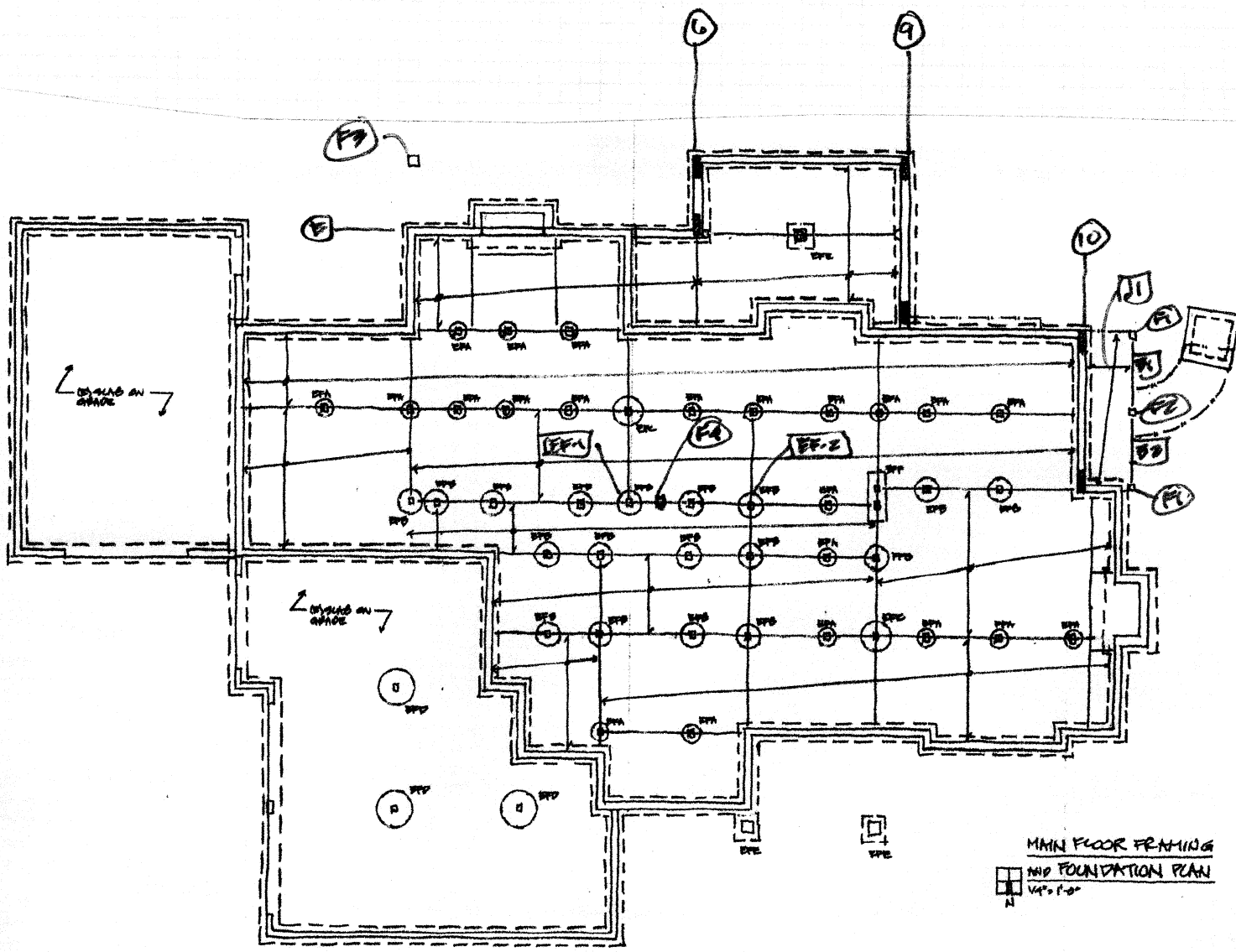
<b>KP-</b>	<b>Key Plans</b>
<b>UF-</b>	<b>Upper Floor and Low Roof Framing</b>
<b>MF-</b>	<b>Main Floor Framing and Foundations</b>

**Note: See Sheet UF-2 for a description of the shear wall changes**



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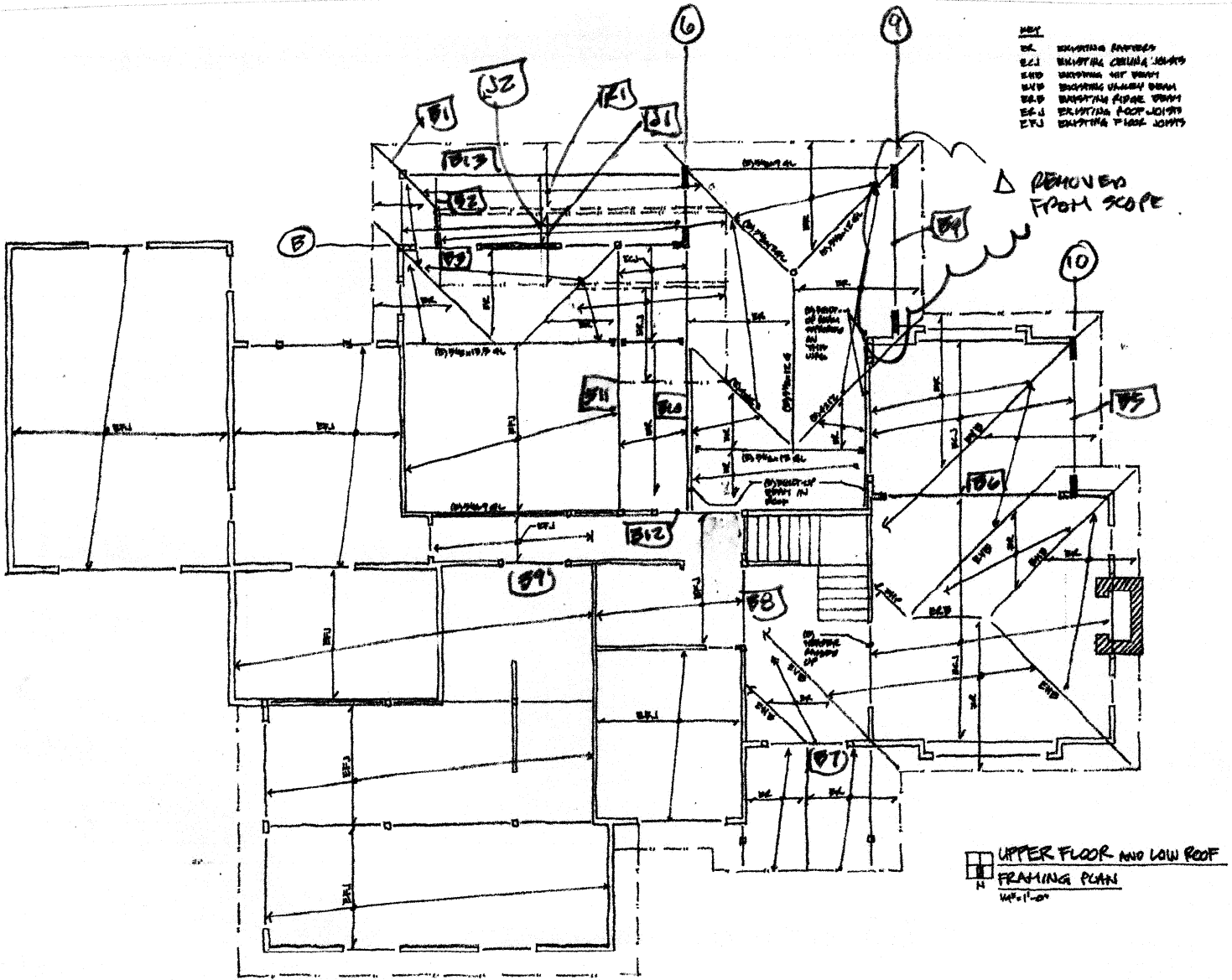
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project: DAY REMODEL  
 client: STURMAN ARCHITECTS

date: 5-24-23  
 proj #: 2022-0516  
 sheet: KP-2



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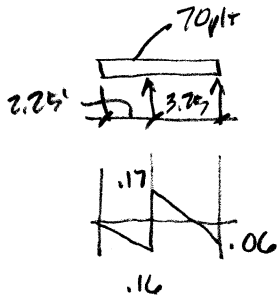
06-21-03  
 date: 5-24-03  
 proj #: 2002-056  
 sheet: KP-1

**UPPER FLOOR & LOW ROOF FRAMING**

(SEE KP-1)

**RAPTERS 24" o.c.**

**[R1]**



$M = .18 \text{ ft-k}$   
2x8 (4F#2)

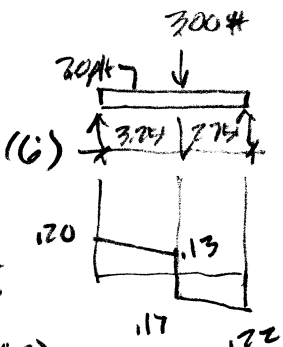
**ROOF JOISTS 24" o.c.**

**[J1]**  $l = 6'$   $W = 70 \text{ plf}$   $V = .21 \text{ k}$   
 $M = 1.32 \text{ ft-k}$

2x8 (4F#2)

**CEILING JOISTS 24" o.c.**

**[J2]**



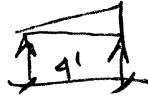
$M = .54 \text{ ft-k}$   
 $V = .22 \text{ k}$

2x8 (4F#2)

**BEAMS**

**[B1]**

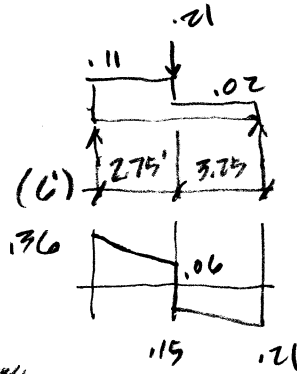
$W = .32 \text{ k}$



$M = .116 \text{ ft-k}$   
 $V = .21 \text{ k}$

(2) 2x10

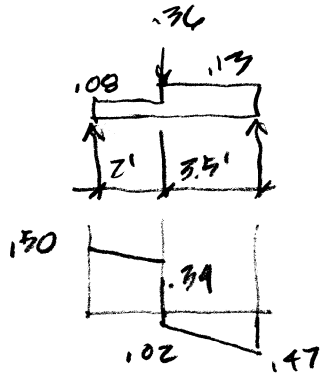
**[B2]**



$M = .158 \text{ ft-k}$   
 $V = .176 \text{ k}$

(2) 2x8

**[B3]**



$M = .184$   
 $V = .50 \text{ k}$

(2) 2x8

**[B4]**  $l = 10.25'$   $M = 3.41 \text{ ft-k}$   
 $W = .26 \text{ k}$   $V = 1.33 \text{ k}$   
3/4x9 GL  $DTL < 4/600$   
 REMOVED FROM SCOPE

**[B5]**  $l = 10'$   
 $W = .26$

3/4x9 GL

**[B6]**  $l = 14.5'$   $M = 19.20 \text{ ft-k}$   
 $W = .73 \text{ k}$   $V = 5.31 \text{ k}$

TRM 3/4x11 1/2 PSL  
 $DTL < 4/257$

USE 3/4x14 PSL

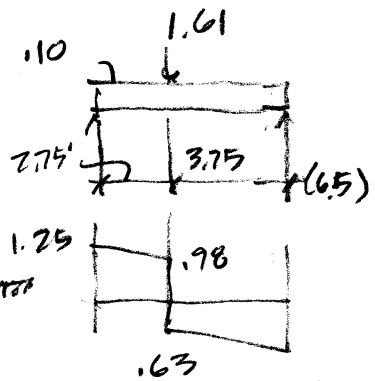
$DTL < 4/422$

**[B7]**  $l = 7'$   $M = 2.16 \text{ ft-k}$   
 $P = 1.5 \text{ k}$   $V = .75 \text{ k}$

4x8 (DF/L #15)

$DTL < 4/800$

**[B8]**



$M = 3.06 \text{ ft-k}$   
 $V =$

(2) 2x10

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project: DAY RENOVEL

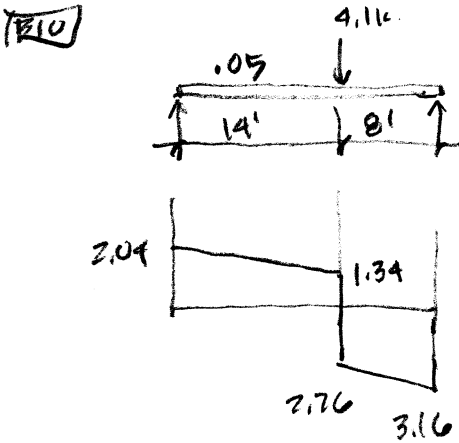
date: 5.24.23

proj #: 2022.056

client: STURMAN ARCHITECTS

sheet: UF-1

**B9**  $l = 5.5'$   $M = 2.91 \text{ FM}$   
 $W = .77 \text{ k}$   $V = 2.112$   
4x8



$M = 23.7 \text{ FM}$   
 $V = 3.16 \text{ k}$

3 1/2 x 18 PSL  $\Delta TL = 4/702$

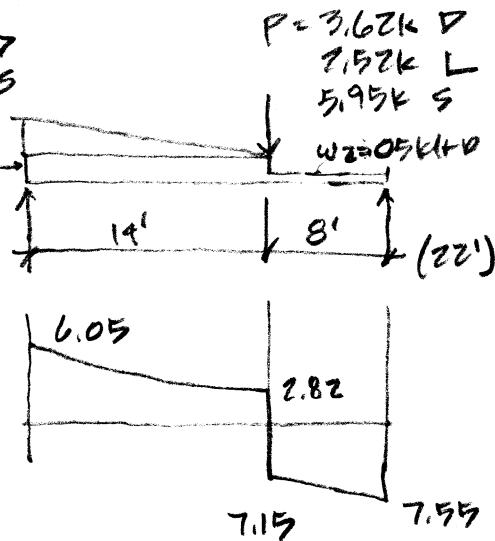
**B11**  $W = .49 \text{ k}$   $V = 1.23 \text{ k}$   
 $W1 = .131 \text{ k}$   $D = 3.62 \text{ k}$

LOAD CASE A  
 CRITICAL

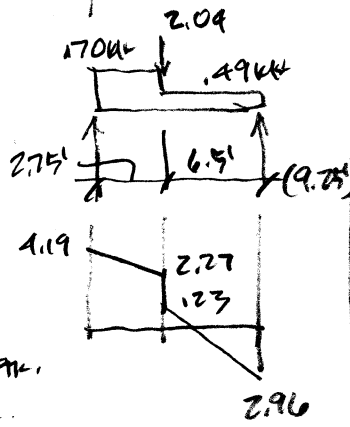
$W1 = .13 \text{ k}$   
 $W2 = .05 \text{ k}$   
 $V = 1.91 \text{ k}$   
 $P = 9.97 \text{ k}$

$M = 58.8 \text{ FM}$   
 $V = 7.55 \text{ k}$

TRY W8x28  $\Delta LL = 4/990$   
W8x40  $\Delta u = 4/982$



**B12**



$M = 8.91 \text{ FM}$   
 $V = 4.19 \text{ k}$

3 1/2 x 9 GL

**B13**  $l = 22.75'$   $M = 17.47 \text{ FM}$   
 $W = .27 \text{ k}$   $V = 3.07 \text{ k}$

TRY 7x9 1/2 PSL

$\Delta TL = 4/185$

7x11 7/8 PSL  $\Delta TL = 4/960$

STEEL THIN = 74.1104

W8x28  $\Delta TL = 4/976$

NOTES REGARDING

GREATER WALLS:

- ① THE EXISTING WALLS ON GRIDS ② & ③ WERE ORIGINALLY DESIGNED TO RESIST THRUST FROM THE ROOF OVER THE KITCHEN (SEE 2015 PERMIT SUBMITTALS) THE WSW WALL MORE THAN COMPENSATE FOR THAT CAPACITY
- ② THE EXISTING WALL ON GRID ① WAS NEVER AN ENGINEERED WALL (THE HOME WAS PERMITTED w/ PRESCRIPTIVE WALLS. THE PROPOSED WSW WALLS FAR EXCEED THE NOMINAL CAPACITY OF THE PRESCRIPTIVE WALLS,
- ③ SIMILARLY ON GRID ② THE PROPOSED WSW WALL FAR EXCEEDS THE CAPACITY OF THE EXISTING PRESCRIPTIVE WALLS AND THE REMOVAL OF THE MASONRY CHIMNEY SIGNIFICANTLY REDUCES SEISMIC LOADS @ THAT WALL LINE.

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D6-21-23  
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 sheet: UF-2

**MAIN FLOOR  
FRAMING & FOUNDATIONS**

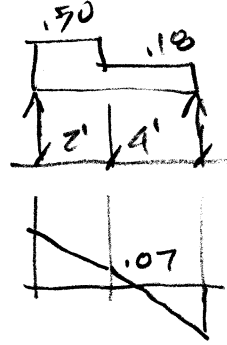
(SEE KP-2)

**JOISTS** 16" o.c.

**J1** L x 4' M = .197K  
W = 93plf V =

**BEAMS**

**B1 & B2**



1.07

M = 1.17K  
V = 1.07K

AXIS (P.T.)

**FOOTINGS**

**F1** P = .65K. 18" x 18" x 10"

**F2** P = 2.14K. 24" x 24" x 10"

**F3** P = 3.6K 24" x 24" x 10"  
qs < 1500 PSF

**F4** SUPPORTING LOAD  
FROM ABOVE +  
(E) BEAM

P = 5.67K.

ADMIN = 3.78K

24" x 24" x 10"

EXISTING FOOTINGS  
W/ INCREASED LOADS

**EF-1** P = 9.37K.

(E) 24"  $\phi$  qs = 2980 PSF NG

ADD TO (E) ADMIN = 6.2K

2'-0" = 4'-0" MIN.

**EF-2** P = 7.82K.

(E) 24"  $\phi$  qs = 2490 PSF NG

ADD TO (E) 2' x 4' MIN

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