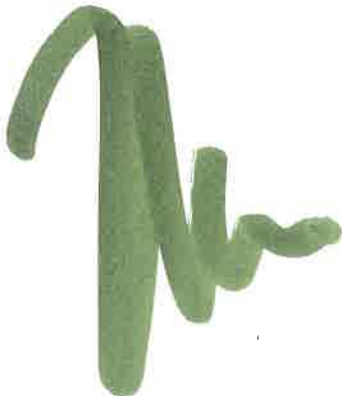


STRUCTURAL CALCULATIONS FOR

A NEW EXTERIOR DECK FOR THE FREESTONE HOTEL

306 BOHEMIAN HIGHWAY
FREESTONE, CA.



LEVEL STRUCTURAL ENGINEERING

P.O. Box 1302, Sebastopol, Ca. 95473

Ph: (707) 829-8439

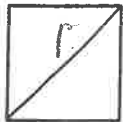
Email: LEVELSE@SONIC.NET

DATE: JUNE 18, 2024

NEW EXTENSION DECK FOR FREESTONE HOTEL
300 BOHEMIAN HIGHWAY
FREESTONE, CA.

LEVEL STRUCTURAL
ENGINEERING

DATE: 6/18/24



JOB DESCRIPTION A NEW WOOD DECK ATDP AN EXISTING PORCH ROOF
ON 2 SIDES (NORTH & WEST) OF THE FREESTONE HOTEL

MATERIALS CONCRETE MASONRY REINFORCING STEEL STRUCTURAL STEEL

F_c=2500 p.s.i.

F_m=1500 p.s.i.

#3 BARS - GR. 40

ASTMA-36

CODES 2022 CBC, ASCE7-16, 2012 NDS, 2018 IBC

#4 BARS AND LARGER - GR.60

HSS - ASTM A-50
GRADE B

LUMBER

LUMBER & WOOD GRADES AS FOLLOWS:
DOUGLAS FIR SDRY NO. 2 OR BETTER

Fb - SINGLE
USE (p.s.i.)
DRY/WET

Fb - MULTIPLE
USE (p.s.i.)
DRY/WET

Fv
(p.s.i.)
DRY/WET

E MODULUS
(p.s.i.)
DRY/WET

2x4, 3x4, and 4x4	1350/1148	1552/	180/175	1.6E6/1.44E6
2x6, 3x6, 4x6, and 4x8	1170/995	1346/	180/175	1.6E6/1.44E6
2x8, 3x8, and 4x10	1080/1080	1242/	180/175	1.6E6/1.44E6
2x10, 3x10, and 4x12	990/990	1139/	180/175	1.6E6/1.44E6
2x12 and 3x12	900/900	1035/	180/175	1.6E6/1.44E6
6x BEAMS and STRINGERS (6X12-6X16 D.F. No. 1)	1310/1111	N/A	170/165	1.6E6/1.44E6
6x POSTS and TIMBERS (D.F. No. 1)	1200/1020	N/A	170/165	1.6E6/1.44E6
LVL and PS	2900/N/A	N/A	290/N/A	2.0E6/N/A
GLU-LAMS DF/DF 24F-V8	2400/N/A	N/A	240/N/A	1.8E6/N/A
GLU-LAMS AC/AC 20F-V13	2000/N/A	N/A	265/257	1.5E6/1.35E6
2X and 4x SEL STR. WESTERN CEDAR GROUP	1000/1000	N/A	155/155	1.1E6/1.1E6
6x SEL. STR. (P&T) WESTERN CEDAR GROUP	1100/858	N/A	140/138	1.4E6/1.15E6

DESIGN LOADING

GRAVITY LOADS ROOF U. FLOOR L. FLOOR WALLS DECKS N/A
MATERIAL (ALC) (WOOD) (N/A) (WOOD) (WOOD) (Ø)
(3 1/2 SLOPE)

LIVE LOADS (p.s.f.) 20 40 Ø N/A 40 Ø
DEAD LOADS (p.s.f.) 14 14 Ø 14 12 Ø

LATERAL LOADS

SEISMIC

LATITUDE = 38.372 LONGITUDE = -122.9158

SEISMIC DESIGN CATEGORY = D

SEISMIC SITE CLASS = D

S_s = 1.5, F_a = 1.2, S_{ms} = 1.8, C_s = $\frac{S_{ds}}{(R/I)}$

S_{ds} = 2/3 x S_{ms} = 1.2, R = 6.5, I = 1.0

F_s = C_s x W, C_s = 1.85, F_s = 1.85 x W

WIND 90 MPH, EXPOSURE "C" MWFRS PROCEDURE

q = (0.00256(K_z)(K_{st})(K_d)(K_e)(V²), RISK CATEGORY II, V=90 MPH

K_z = 0.85 TO 1.04, K_{st}=1.0, K_d=0.85, K_e=1.00, G = 0.85, C_p = 0.8

F_w = q(G)(C_p) - q_i(G_{C_{pi}}), G_{C_{pi}} = ± 0.18 ROOF F_{wu} = 25 psf

F_w = q(0.85)(0.8) + q(0.18), F_w = (0.86)(q), EAVES F_{wu} = 25 psf

H= 0'-15'	K _z = 0.85	q = 15.0 psf	F _w = 12.9 psf
H= 15'-20'	K _z = 0.90	q = 15.9 psf	F _w = 13.7 psf
H= 20'-25'	K _z = 0.94	q = 16.6 psf	F _w = 14.3 psf
H= 25'-30'	K _z = 0.98	q = 17.3 psf	F _w = 14.9 psf
H= 30'-35'	K _z = 1.04	q = 18.4 psf	F _w = 15.9 psf

SOILS DESIGN PARAMETERS

GEOTECHNICAL REPORT CBC MIN FOR CLASS 5 SOILS ASSUMED

JOB NO. N/A DATE 6/18/2024

ALLOWABLE BEARING (psf) _____

EQUIVALENT FLUID PRESSURE VALUES (pcf)

LEVEL BACKFILL

LATERAL PASSIVE (psf) N/A

SKIN FRICTION (psf) N/A

N/A

SLOPED BACKFILL

SLIDING COEFFICIENT N/A

RETWALL SEISMIC N/A

UN) UPPER LEVEL EXT. DECK FOR:
FRGESTONE HOTEL

6/2024

LEVEL • STRUCTURAL •

7106 BODEN AVE.
DOR 9302
SEASIDE, CA. 94133
PH: (916) 22-8439

2
2

GRAVITY ANALYSIS

- ① CE) PORCH ROOF BEAMS, $P = 4.5' \downarrow 1.5'$
5'-6" SPAN, 4' O/C
WU = 40 PSF

WDL

1 1/8" ROOF 2X DECK'G ROOFING
PLY A/C TOTAL

WDL 3.5 PSF. 4.5 PSF. 2.5 PSF. 11 DSF.

WU = 160 plf. $P_u = 2.25(4)40(2) = 720$
WDL = 50 plf. $PDL = 2.25(4)(14)(2) = 250$
4' TRIB.

$V_{MAX} = 1375$
 $M_{MAX} = 1834$

2 4X6 DF NO.2 OR 2-2X6 (FULL DM)
DF NO.2

- ② HIP. 8 SPAN

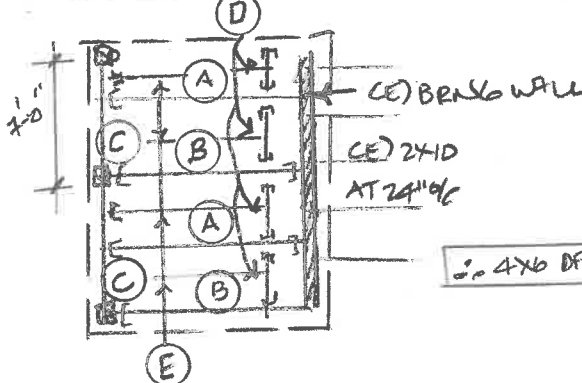
3'-6" EQUW TRIB WU = 140 plf.
WDL = 49 plf.

$V_{MAX} = 756$
 $M_{MAX} = 1512$

EIRER $\Delta TL = (4/240) =$

2-2X8 DF NO.2

- ③



- ④

BEAM

5'-6" SPAN

$V_{MAX} = 1014$
 $M_{MAX} = 1399$

4X6 DF NO.2 OR
2-2X6 (F)

$P_u = 360$
 $PDL = 100$

- ⑤

JOIST

4' SPAN

$V_{MAX} = 419$
 $M_{MAX} = 1135$

2X2X6 DF NO.2

$P_u = 360$
 $PDL = 100$

- ⑥

JOIST

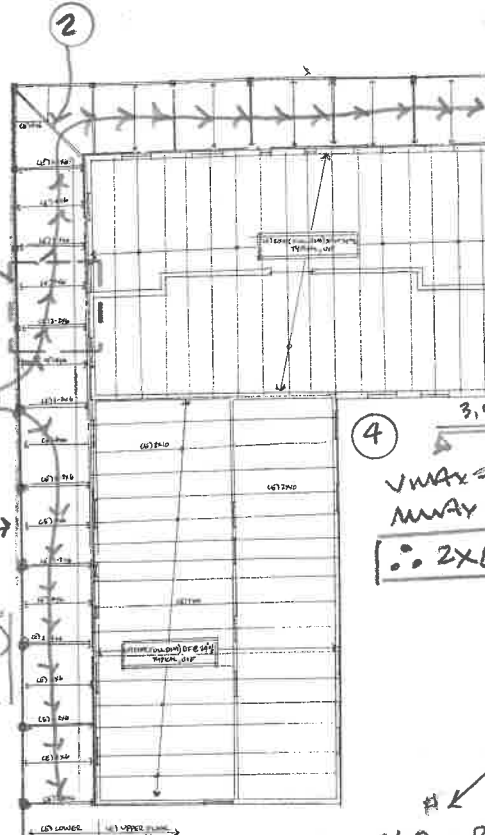
4'-6" SPAN

$V_{MAX} = 468$
 $M_{MAX} = 526$

4X4 PTDF NO.2

$P_u = 360$
 $PDL = 100$

2-2X4 PTDF NO.2



750
= 90
= 54 (104#)
PDL = 14
= 263#
2' TRIB

$V_{MAX} = 884$
 $M_{MAX} = 2434$
2X8 WU

TIP FOR ALL PS

$P_u = 720$
 $360 = P_u = 2.25(4)(14)(2)$
 $100 = PDL = 2.25(4)(14)(2)$

4.5' $\downarrow$ 1.5'

3.5' $\downarrow$ 3.5' 2' TRIB

$P_u = 360$
 $PDL = 100$

$V_{MAX} = 338$
 $M_{MAX} = 568$

2X2X6 DF NO.2

$P_u = 360$
 $PDL = 100$

$V_{MAX} = 468$
 $M_{MAX} = 526$

4X4 PTDF NO.2

$P_u = 360$
 $PDL = 100$

2-2X4 PTDF NO.2