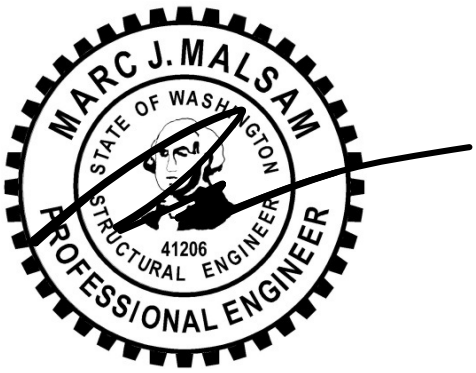
REVISED STRUCTURAL CALCULATIONS FOR:

LABAN REMODEL

10 BROOK BAY RD
MERCER ISLAND, WA

ARCHITECT: FLOISAND STUDIO

OCTOBER 10, 2023



MALSAM TSANG
STRUCTURAL ENGINEERING

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DESIGN CRITERIA IBC 2018

DEAD LOADS

FLAT ROOF		FLOOR		DECK FRAMING		MISC. LOADS
Mbrne+Rig. Insul	2 psf	1/2" Flr Tile Fin.	7.0 psf	3/4" Porcel. Slab	10 psf	
3/4" Plywood	2.4 psf	1 1/4" Gypcrete	13 psf	3/4" Plywood	2.4 psf	
Truss @ 24" o.c.	3.0 psf	w/ hydro. tubing	- -	2x @ 16" o.c	2.9 psf	
Gyp Board (5/8")	2.8 psf	3/4" Plywood	2.4 psf	Gyp Board (5/8")	2.8 psf	
MEP	1.5 psf	TJI @ 16" o.c.	2.3 psf	MEP	1.5 psf	
2x Slat Clg or	7.5 psf	Gyp Board (5/8")	2.8 psf			
Solar pan. (5psf)	- -	MEP	1.5 psf			
(where occurs)						
Total	19.2 psf	Total	29.0 psf	Total	19.6 psf	
Use	20.0 psf (Typ. roof)	Use	30.0 psf	Use	20.0 psf	
Use	25.0 psf(w/ solar pan.)	Use	15.0 psf (for floor w/ no gypcrete topping)			

LIVE LOADS/OCCUPANCY

		ROOF SNOW		FLOOR LIVE		DECK LIVE	
Risk Category	II	Snow+Rain surc=	30 psf	Occupancy =	40 psf	Occupancy =	60 psf
Roof Deck	No	**Note:** 5 psf rain on snow		Stair/Corridor =	40 psf		
Common Access	No	surc. added for 5deg or less					

SEISMIC CRITERIA ASCE 7-16 Ch. 11 & Ch. 12

Imp. Factor =	1.00	Seismic Ht, hn=	22 ft	
Site Class =	F	T, Building=	0.2	
R Value =	6.5	Ts=		

T= 0.2 < 0.5, Site resp. analysis not required

Geo. Ground Hazard? **Yes.**

S_s =	1.461		F_a =	1.000	Table 11.4-1
S_1 =	0.507		F_v =	NULL	Table 11.4-2
S_{ms} =	1.461	x 2/3 =	S_{ds} =	**0.974**	Eqn. 11.4-3
S_{m1} =	NULL	x 2/3 =	S_{d1} =	NULL	Eqn. 11.4-4

C_{SULT} =	**0.150**
C_{SALL} =	**0.105**

T/Ts= #####

SEISMIC WEIGHT ASCE 7-16 12.7.2

Partitions = 15 psf

***Roof weight = 1/2 Partition + Roof DL**

***Floor weight = Full Partition + Floor DL**

FLAT ROOF 27.0 psf

FLOOR 44.0 psf

SEISMIC DESIGN CATEGORY IBC 1613.2.5

Seismic DC = D See IBC 1613.2.2

WIND CRITERIA ASCE 7-16 Ch. 27 Directional Procedure

V =	97 mph	K_d =	0.85
Exposure =	C	G =	0.85
h =	28 ft	K_{zt} =	1.00

Roof Slope = FLAT : 12 = 0 °

PRESSURE COEFFICIENTS (Cp)

Windward Wall =	0.8	Windward Roof =	N/A
Leeward Wall =	-0.5	Leeward Roof =	N/A

PRESSURE (PSF) $q = 0.00256 K_z K_{zt} K_d V^2$

Ht	K_z	q_z	$0.6xq_z$ [1]	q_h	P_{WW}	P_{LW}	P_{WALL}	P_{ROOF}
0-15	0.85	17.4	10.4		7.1	5.1	**12.2**	
15-20	0.90	18.4	11.1		7.5	5.1	**12.6**	
20-25	0.94	19.2	11.5		7.9	5.1	**13.0**	
25-30	0.98	20.1	12.0	12.0	8.2	5.1	**13.3**	N/A
30-35	1.02	20.9	12.5		8.5	5.1	**13.6**	
35-40	1.04	21.3	12.8		8.7	5.1	**13.8**	
40-45	1.07	21.9	13.1		8.9	5.1	**14.1**	
45-50	1.09	22.3	13.4		9.1	5.1	**14.2**	

[1] Per IBC 2018 1605.3.1 Basic Load Combinations

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LABAN REMODEL
Project

10 BROOK BAY RD

MERCER ISLAND, WA

4/12/2023
Date

0189-2022-03-01
Proj. No.

JCM
Design

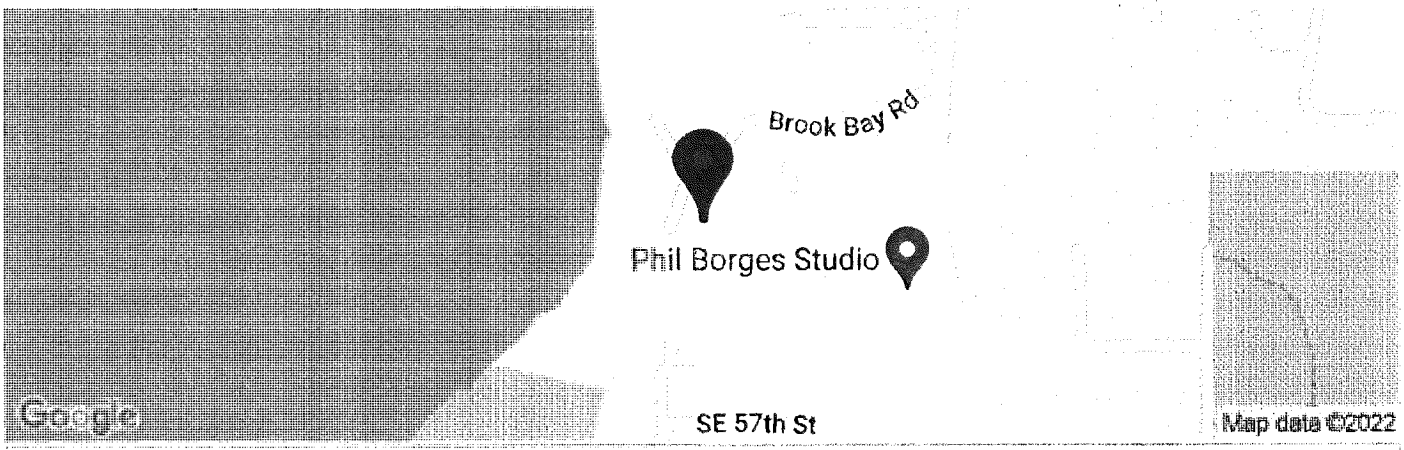
DC1
Sheet

OSHPD

Laban Remodel

10 Brook Bay Rd, Mercer Island, WA 98040, USA

Latitude, Longitude: 47.5525473, -122.2319333



Date	4/6/2022, 3:41:10 PM
Design Code Reference Document	ASCE7-16
Risk Category	II
Site Class	D - Default (See Section 11.4.3)

Type	Value	Description
S_S	1.461	MCE_R ground motion. (for 0.2 second period)
S_1	0.507	MCE_R ground motion. (for 1.0s period)
S_{MS}	1.753	Site-modified spectral acceleration value
S_{M1}	null -See Section 11.4.8	Site-modified spectral acceleration value
S_{DS}	1.169	Numeric seismic design value at 0.2 second SA
S_{D1}	null -See Section 11.4.8	Numeric seismic design value at 1.0 second SA

Type	Value	Description
SDC	null -See Section 11.4.8	Seismic design category
F_a	1.2	Site amplification factor at 0.2 second
F_v	null -See Section 11.4.8	Site amplification factor at 1.0 second
PGA	0.626	MCE_G peak ground acceleration
F_{PGA}	1.2	Site amplification factor at PGA
PGA_M	0.751	Site modified peak ground acceleration
T_L	6	Long-period transition period in seconds
SsRT	1.461	Probabilistic risk-targeted ground motion. (0.2 second)
SsUH	1.62	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration
SsD	4.172	Factored deterministic acceleration value. (0.2 second)
S1RT	0.507	Probabilistic risk-targeted ground motion. (1.0 second)
S1UH	0.564	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration.
S1D	1.621	Factored deterministic acceleration value. (1.0 second)
PGAd	1.398	Factored deterministic acceleration value. (Peak Ground Acceleration)
C_{RS}	0.902	Mapped value of the risk coefficient at short periods
C_{R1}	0.898	Mapped value of the risk coefficient at a period of 1 s

DC 2

ATC Hazards by Location

Search Information

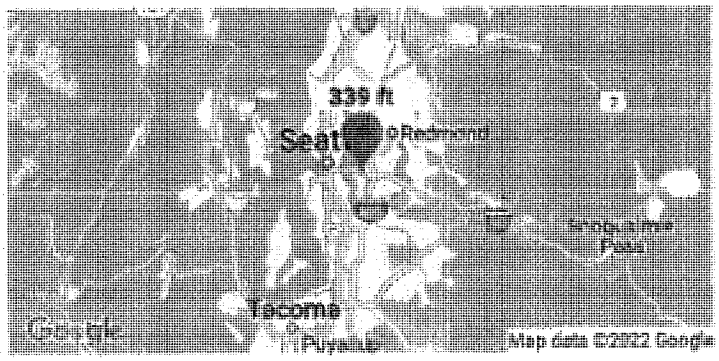
Address: Mercer Island, WA 98040, USA

Coordinates: 47.5706548, -122.2220673

Elevation: 339 ft

Timestamp: 2022-04-06T22:52:03.332Z

Hazard Type: Wind



ASCE 7-16

MRI 10-Year	67 mph
MRI 25-Year	73 mph
MRI 50-Year	78 mph
MRI 100-Year	83 mph
Risk Category I	92 mph
Risk Category II	97 mph
Risk Category III	104 mph
Risk Category IV	108 mph

ASCE 7-10

MRI 10-Year	72 mph
MRI 25-Year	79 mph
MRI 50-Year	85 mph
MRI 100-Year	91 mph
Risk Category I	100 mph
Risk Category II	110 mph
Risk Category III-IV	115 mph

ASCE 7-05

ASCE 7-05 Wind Speed	85 mph

The results indicated here DO NOT reflect any state or local amendments to the values or any delineation lines made during the building code adoption process. Users should confirm any output obtained from this tool with the local Authority Having Jurisdiction before proceeding with design.

Disclaimer

Hazard loads are interpolated from data provided in ASCE 7 and rounded up to the nearest whole integer. Per ASCE 7, islands and coastal areas outside the last contour should use the last wind speed contour of the coastal area – in some cases, this website will extrapolate past the last wind speed contour and therefore, provide a wind speed that is slightly higher. NOTE: For queries near wind-borne debris region boundaries, the resulting determination is sensitive to rounding which may affect whether or not it is considered to be within a wind-borne debris region.

Mountainous terrain, gorges, ocean promontories, and special wind regions shall be examined for unusual wind conditions.

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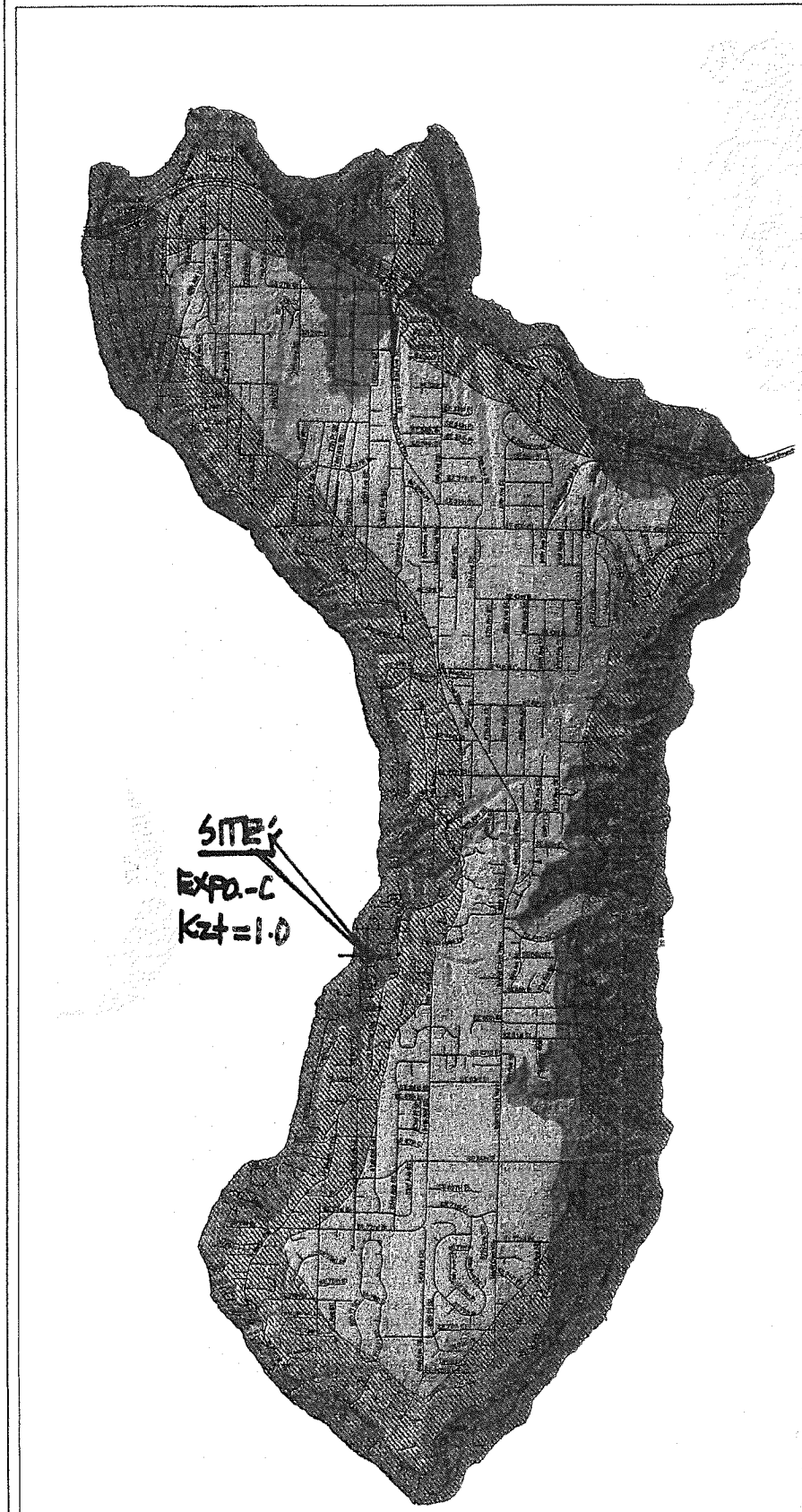
DC3A

Mercer Island Wind Exposure and Wind Speed-Up (Topographic Effect)

by Development Services Group (DSG), City of Mercer Island
April 2008



0 0.5 1 Kilometers 1:12,000
0 0.5 1 Miles
N

WIND EXPOSURE CATEGORIES & WIND SPEED-UP FACTORS
(ICC Section 1609 & ASCE 7-05 Chapter 6)

It is the responsibility of the Owner (or their Design Professional) to review site conditions and determine the Kzt factor to be utilized for each specific project. The Kzt factors and wind exposure categories indicated on this map are the minimum values accepted by the City of Mercer Island without requiring the design professional to submit additional calculations and supporting topographic documentation (to verify the values utilized in their wind load determination).

Please note – The Kzt values indicated on this map are approximations based upon periodic calculations of representative samplings around Mercer Island. These values are intended for City of Mercer Island's plan review purposes only.

WIND EXPOSURE CATEGORIES:

Wind Exposure Category	
	Exposure 'C' (1500 feet from Lake)
	Exposure 'B' (all other areas)

WIND SPEED-UP (TOPOGRAPHIC EFFECT) - K_zt Factor :

K_zt Factor	
	$K_zt = 1.0$
	$K_zt = 1.3$
	$K_zt = 1.6$
	$K_zt = 1.9$

GENERAL NOTES FOR WIND EXPOSURE AND WIND SPEED-UP MAP

This map is the Wind Exposure Category and Wind Speed-up (Topographic Effects) Map for the City of Mercer Island. This map shows the minimum wind exposure category and the minimum wind speed-up, "K_zt" factor, which will be accepted without site specific documentation and calculation.

Other wind speed phenomena may occur on Mercer Island that is not specifically indentified on this map. It is the responsibility of the Owner (or their Design Professional) to review site conditions and determine the appropriate design wind speed and exposure category for their specific project and location.

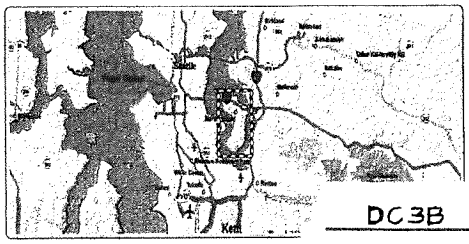
This map is for the sole use of the staff of the City of Mercer Island's Development Services Group (DSG) for the purposes of permit application evaluation. This map provides DSG staff a general assessment of Wind Exposure Category and Wind Speed-up (Topographic Effects). All areas have not been specifically evaluated and there may be locations that are not correctly represented on this map. It is the responsibility of individual property owners and map users to evaluate risk associated with their proposed development. No site-specific assessment of risk is implied or otherwise indicated by the City of Mercer Island with this map.

Information about data used for the map, references, and data limitation are all described the associated "Read Me" document. The digital version of this map is accompanied by a meta data file containing pertinent information about map construction. This data map is available on the City of Mercer Island website.

The City of Mercer Island is using guidance provided within ICC Section 1609 & ASCE 7-05 Chapter 6 regarding definitions used when creating this map.

DEFINITIONS:

K_zt factor	The topographic effect of wind speed-up at isolated hills, ridges, and escarpments constituting abrupt changes in the general topography, located in any exposure category, that meet all of the conditions noted in ASCE 7-05 Minimum Design Loads for Buildings and Other Structures, Section 6.5.7.
Exposure B	The wind exposure category that applies where the site in question is located a minimum of 1500 feet from the shoreline and the mean roof height is less than or equal to 30 feet per IBC 2006 section 1609.4.3.
Exposure C	The wind exposure category that applies where the site in question is located within 1500 feet from the shoreline per IBC 2006 section 1609.4.3.
Wind Speed	Minimum 85 mph 3-second gust per IRC Figure R301.2(4)

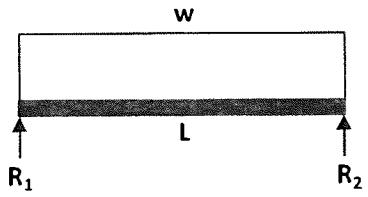


DC3B

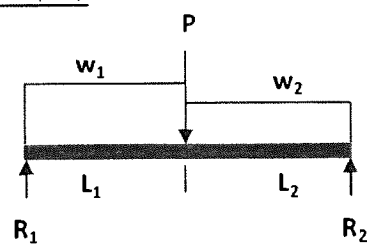
TYPICAL BEAM CASES

***ASSUME CASE 1 FOR ALL BEAMS U.N.O.**

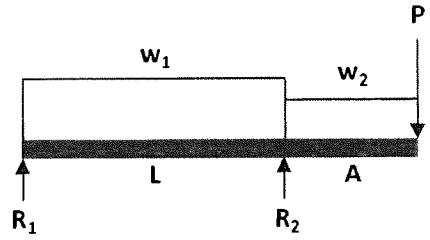
CASE #1: (C1)



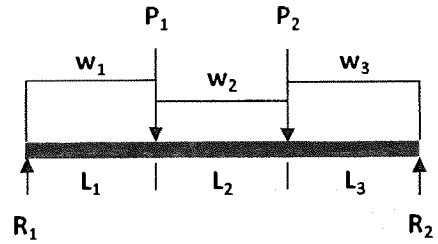
CASE #2: (C2)



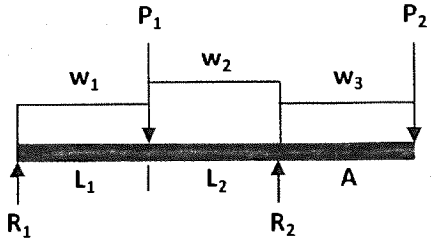
CASE #3: (C3)



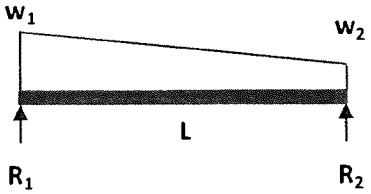
CASE #4: (C4)



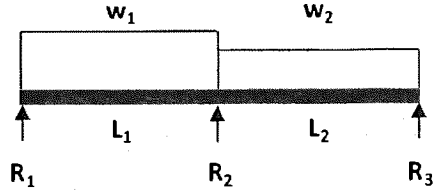
CASE #5: (C5)



CASE #6: (C6)



CASE #7: (C7)



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Date	4/7/2022
Proj. No.	0189-2022-03-01
Design	JCM
Sheet	DC4

LATERAL ANALYSIS AND DESIGN:

WIND ANALYSIS: - BOTH DIRECTIONS:

LEVEL	TRIB. HT. (FT.)	V WIND LOAD - FULL (ALLOW.)	V WIND WARD LOAD (ALLOW.)
ROOF DIAP.	~4 + 11/2 = 9.5'	= 13.0 * 5' + 12.6 * 4.5' = 122 #/'	= 7.9 * 5' + 7.5 * 4.5' = 73.50 #/'
UPPER FLOOR DIAP.	11/2 + 1 + 9/2 = 11.0'	= 12.6 * 0.5' + 12.2 * 10.5' = 134.8 #/'	

FULL WIND ABV. MAIN FL. WIND WARD @ BSMT WALL
= 12.6 * 0.5' + 12.2 * 5' + 7.1 * 5.5' = 106.4 #/'

SEISMIC ANALYSIS:

LEVEL	AREA (ft²)	WT. (K)	HT. (FT.)	Wi Hi (K-FT)	DISTRIB.	PER 12.8.3 BI-LIFD V DIAP. FORCE ALLOW.	INERTIAL DIAP. FORCE PER 12.10; EQ. 12.10-2 $F_{px} = 0.25 S_{DS} I_e \times W_{px}$ = 0.139 W_{px}
ROOF DIAP.	2420	64.0	19	1215	0.59	9.70	8.90
MAIN FLOOR DIAP.	1885 x 43.5 + 545 x 20.0	82 + 10.9 = 92.9	9	835	0.41	6.80	11.4 + 1.5 = 12.9
		Σ WT = 156.9		Σ = 2050			

$V_{Sx\ ULTIM.} = 0.150\ (156.9) = 23.50$ KIPS

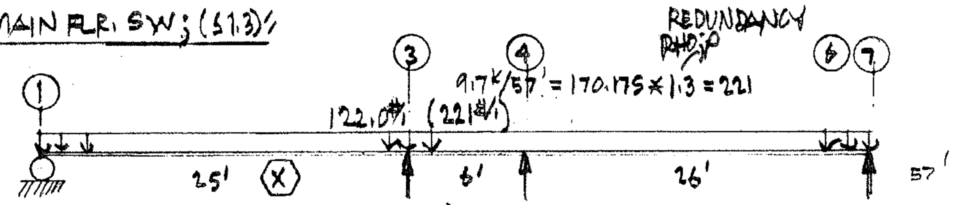
$V_{Sx\ ALLOW.} = 0.105\ (156.9) = 16.50$ KIPS

② LATERAL DESIGN:

Ⓐ NORTH-SOUTH (FRONT-BACK) DIREC.; SEISMIC LOAD IN PARENTHESIS:

ROOF DIAP. / MAIN FLR. SW; (S1.3):

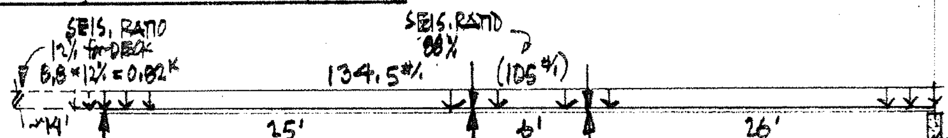
Ht = 11'



R (k):		3.445 (6.2)	1.98 (3.5)	1.60 (2.9)
l (ft):	14.25	~~28' = 8.75 + 11.25~~	9.5	16.5+8.5 = 25
v (plf):	240(435)	~~171 (310)~~	205(364)	64(116)
SW:	SW2	~~SW4~~ SW2 — TO CONTROL DEFLECTION DUE TO ROTATION	SW3	SW6 USE SW4
OT (k):	2.64(4.79)	~~1.8 (3.4)~~	2.2 (4.0)	.7(1.28)
HD:	(3)CS16 OR HDU8	~~(2)CS16 OR HDU4~~	(3)CS16 OR HDU8	~~HDU2~~ HDU4
H/L:		N/A	N/A	N/A

MAIN FLR. DIAP. / LOWER FLR SW; (S1.2):

Ht = 9'



R:	1.7(2.130)	5.5 (7.8)	4.1 (5.2)	3.3 (4.26)
l:	7.25+2.75+2.75 = 12.75	7 + 30' of FDN. WALL	9 + 8 = 17	FDN.
v:	133(167)	USING CONC./2x MUDSILL AS DRAG STRUT SUPPORT ← ASSUMING W/ 1/2"Ø AB @ 60L (CONS. ASSUMPTION; ~(5) TOT.) (TOT. # OF BOLTS) VDRAG = 590 × (5) × 1.6 ÷ Co = 4720# ∴ vnet; 115 (440)	241 (306)	
SW:	SW4	SW2	SW4	
OT:	1.2 (1.5)	1.0 (3.8) — UNSTACK (NET) — 2.1 (2.8); 2.8 (6.9) STACK		
HD:	HDU2	HDU4; (2) HDU4 ON 4× STUD	~~HDU2~~ HDU4	
H/L:	2x2.75/9x350 = 214 > 133(167)	N/A	N/A	

Ⓧ CHORD FORCE CHK. DUE TO ROTATION (OPEN FRONT):

$C/T = 221.0 \, \#/' \times 25^2/2 \div 50' \times 1.25$ ← 25% INCR.

$= 1725^{\#}$ ← TO GRIDLINE-A/E — SHALL BE COMPARED TO EAST/WEST DIRECTION LOADING

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MALSAM-TSANG.COM

PROJECT: LABAN REMODEL

DATE: 4/18/22

PROJECT NO: 0189-2022-03

DESIGN: JCM

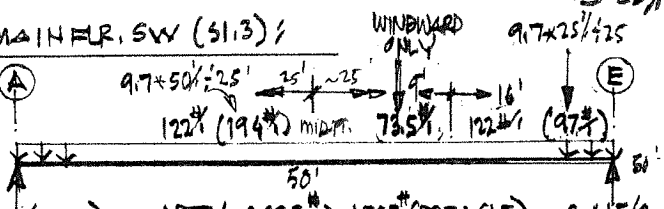
SHEET: L-2

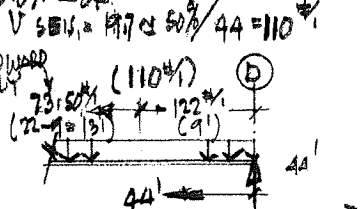
☒ EAST-WEST (SIDE-SIDE) DIRECTION;

NOTE; $\rho = 1.0$ THIS ORTHO. DIRECTION
$\approx 25\% < 33.0\%$ - OK!

ROOF DIAP. / MAIN FLR. SW (S1.3);

$h_t = 11'$

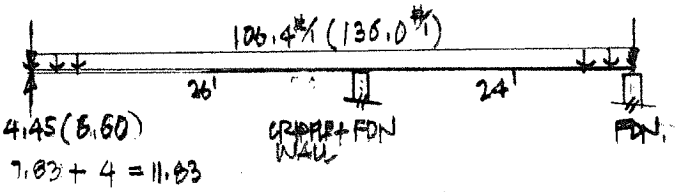




R;	3.05 (4.85)	NOTE! 2425# > 1725# (FROM SHT.) NOT CRIT.! from LOAD DUE TO ROTATION		2.615 (2.425)	2.05 / 2.425
ℓ;	7.5 + 4.75 + 9.25 = 21.5'			17	7.25
V;	142 (226)			143 (154)	283 (335)
SW;	SW3	SW4 OK USE SW3		~~SW6~~ SW4	SW3
DT;	1.56 (2.48)			1.57 (1.7)	3.1 (3.68)
HD;	(2) G516 OR MSTC48B3			HDU2 ~~HDU4~~	HDU5
H/L;	2x4.75/11 x 350 = 302 > 142 (226)			N/A	N/A

MAIN FLR. DIAP. / LOWER FLR. SW (S1.2);

$h_t = 9'$



R; 4.45 (5.60)

ℓ; 7.83 + 4 = 11.83

V; 376 (559)

SW; SW3-2

DT; UNSTACK; 3.3 (5.0) — 5.4 (8.3); STACK

HDU5 @ GAR. FRONT SW CORNER - GRID-A/4

NET UPLIFT - GAR. FRONT SW AT DOOR EDGE:
3.3 - 1.9 (5 - 2.85)
1.4 (2.15) - STACK

NET UPLIFT - DEN NORTH SW AT WINDOW EDGE (STACK):
3.3 + 1.05 (5 + 1.3)
4.35 (6.3) - STACK

HD; HDU4 & HDU5 to match CORNER

(2) HDU5 AT CORNER GRID-A/2

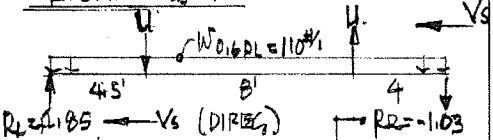
HDU8

H/L; (450x2) 2x4/9 = 800#/' > 559#/' - OK!

@ ANG. of SW SEG. ALONG GAR. FRONT;

$W_{0.6DL} = 15\,psf \times 12 \times 0.6 = 110\#/'$

SEISMIC; $U_s = 4.0$



WIND; $U_s = 2.1$

GRID / HDU2 AT GAR. DOOR EDGE NEAR GRID-B

RL = 3.925 ← Vw (DIREC.) RR = -0.11

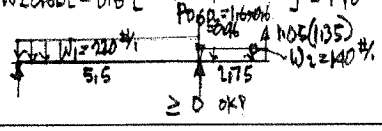
RL = -0.11 → Vw (DIREC.) RR = +4.925

@ ANG. of SW SEG. ALONG DEN NO. WALL;

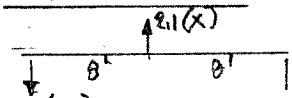
CANT. BM @ GRID-1 for COUNTER WT;

$W_{T\,0.6DL} = 0.6[10psf \times 11' + 29\,psf \times (6/2 + 5psf \times 9/2)] = 220\#/'$

$W_{2\,0.6DL} = 0.6[$ " + " $] = 140\#/'$



RHM/BM @ GRID-A;



NET UPLIFT SEIS. = 1.35 x 16'/8 = 2.7
= 4.0 - 2.7 ← NET UPLIFT SEIS @ EDGE OF DEN NORTH WI
= 1.30k

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PROJECT: LABAN REMODEL

DATE: 4/18/22

PROJECT NO: 0189.2022-03

DESIGN: JCM

SHEET: L-3

VERTICAL ANALYSIS

ROOF FRAMING (S1.3)

DL - 25 PSF LL = 30PSF

#301 - CHECK "B3 - PSL 5 1/4 x 11 7/8

L = 3.5'

w = 18/2 x .055 = .495 k/'

R = 0.87k

M = 0.76k · ft

f_b = .07ksi

f_v = 9psi

Δ = L/1000+

#302 - CHECK CANT. "B3" BM (C3)

L = 12' A = 2.5'

$w_1 = w_2$ = .055 k/'

P = 2.23k

R_1 = ~~0~~

R_2 = 3.18k

M = -5.75k · ft

f_b = -.53ksi

f_v = 53psi

Δ = .074"

= L/807

#303 - CHECK BM AT SKYLIGHT "B3"

L = 14.75

w = 15/2 x .055 = .413 k/'

R = 3.0

M = 11.23k · ft

f_b = 1.04ksi

f_v = 60psi

Δ = .318"

= L/556

#304 - CHECK CANTILEVER GLB 5 1/2 x 19 1/2 (C3)

L = 8' A = 3.5'

w_1 = 22 1/2 x .055 = .605 k/'

w_2 = 16 1/2 x .055 = .44 k/'

P = 1.0k

R_1 = 1.6k

R_2 = 5.7k

M = -6.2k · ft

f_b = .21ksi

f_v = 81psi

Δ = L/1000+

#305 - CHECK "B2" RIM/BM

L = 3.75'

w = 30.5/2 x .055 = .839 k/'

R = 1.57k

M = 1.47k · ft

f_b = .2ksi

f_v = 27psi

Δ = L/1000+

#306 - CHECK "B3" BM/RIM (C2)

L_1 = 6.25 L_2 = 7.25

$w_1 = w_2$ = (10/2 + 1) x .055 = .33 k/'

P = 3.35k

R_1 = 4.03k

R_2 = 3.78k

M = 18.72k · ft

f_b = 1.82ksi

f_v = 89psi

Δ = .37"

= L/439

#307 - CHECK 5 1/2 x 15 BM

L = 16.75'

w = 31.25/2 x .055 = .86 k/'

R = 6.77k

M = 26.67k · ft

f_b = 1.55

f_v = 103

Δ = .428"

= L/442

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LABAN REMODEL
PROJECT
10 BROOK BAY

DATE
0189.2022.03
PROJECT NO
JRF
DESIGN
V1
SHEET

VERTICAL ANALYSIS

#308 - TRELLIS BEAM C9x20

L = 14.75'
W = (10½ + 2.75) x .055 = .426
R = 3.14ᵏ
M = 11.59ᵏ·ft

f_b = 10.3ksi
f_v = 0.78ksi
Δ = .257
= L/689

#309 - GL 5½x18 @ GRID 1

L = 16'
W = 24.5½ x .055 = .674ᵏ/'
R = 5.39ᵏ
M = 21.57ᵏ·ft

f_b = 0.87
f_v = 66
Δ = 0.21"
= L/930

#310 - WEST TRELLIS BM C15x33.9

L = 15.5'
W = 15½ x .055 = .413ᵏ/'
R = 3.2ᵏ
M = 12.4ᵏ·ft

f_b = 3.54ksi
f_v = .53ksi
Δ = .06"
= L/3170

CHECK TRELLIS FRAMING

(WEST)

L = 14'
W = 0.11ᵏ/'
R = 0.77ᵏ
M = 2.7ᵏ·ft

f_b = 0.91ksi
f_v = 44psi
Δ = 0.36"
= L/466

3x10 DF #1

(SOUTH)

L = 10'
W = 0.11ᵏ/'
R = 0.55ᵏ
M = 1.38ᵏ·ft

f_b = 0.75ksi
f_v = 40psi
Δ = 0.19"
= L/615

3x8 DF #1

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LABAN REMODEL
PROJECT
10 BROOK BAY

DATE
0189.2022.03
PROJECT NO
JRF
DESIGN
V2
SHEET

(sheet V3 not used)

① MAIN FLOOR FRMG; (S1.2) — #2005!

#201 & #202 – 14" TJI FJ. @16" o/c

↳ DL = 30 PSF ; LL = 40 PSF

SEE FORTE WEB OUTPUT

#203 — RIM/BEAM o/ GAR. DOOR ; (C-4)

$l_1 = 4.5$; $l_2 = 7.5$; $l_3 = 4.5$

$W's = 15\,PSF \times 15' = 0.225$

$P_1 = P_2 = UW$ OR USEK; $UW = 2.1$ (ASCE 7.14.5 EQN-9)

$= 7.65$ $\quad USEK = 4.0 \times \Omega_0$

$= 4.0(0.525 \times 2.5 \times 1.4)$

$= 7.35$ – governs

$R_1 = 5.2$

$R_2 = -1.48$

$M = 21.1$

$fv = 101$

$fb = 1.477$ — OK? B3-PSL 5 1/4 x 14

#204A – B2 FB UNDER STAIR LANDING ;

$l = 9'$; $W = (30+40)15/2 = 0.525\,k/l$

$R = 2.36$ < MBHU CAP. = 4.11 k – OK?

$M = 5.32$

$fv = 54$

$fb = 0.156$

$\Delta TL = 0.06'' \sim l/1728$ — OK!

#205 – CANT. B3 BM. O/ ENTRY GRID-3 ;

$l_1 = 7$; $l_2 = 4$; $A = 3'$ (C-5)

$P_1 = \sim 0$

$P_2 = 15 \times 15 \times 9/2 = 1.10$

$W_1 = W_2 = (30+40)9/2 + 15 \times 11 + (70)25/2 + (40)5/2$

$= 1.475\,\#/l$

$W_3 = (70) \times 9/2 + 15 \times 11 + (25 \times 25)25/2 = 1105\,\#$

$R_1 = 7.36$; $R_2 = 13.3$

$M+ = 18.4$; $M- = -8.3$

$fv = 146$ $\quad \Delta TL_{LDS} = 0.143'' \sim l/924$

$fb- = -0.57$

$fb+ = 1.285$ OK!

#206 – LAUNDRY RM. HDR ;

$l = 4.25$; $W = (30+40)25/2 = 875\,\#/l$

NOT USED

$R = 1.97$

$M = 2.12$

$fv = 85$

$fb = 0.187$

~~DL 3 1/2 x 7.5~~

$\Delta TL = 0.045'' \sim l/1190$ — ~~OK!~~ 4x8

#207 – B3 BEAM o/OPENING BTWN ROOMS ;

L = 12'
W = 25/2 x .07 = .875
R = 5.25
M = 15.75
Fb = 1.46
Fv = 101
DEFL = .3" = L/487

#208 – B3 FB O/ BATH RM. 106 ;

L = 8.75' W = 25/2 x .07 = .875
R = 3.83 M = 8.37
Fb = 1.22
Fv = 107
DEFL = .15" = L/689

#209 – CHK W8x21 @ ENTRY ;

(C-2) $I_x = 75.3$; $d = 8\,1/4''$

$S_x = 18.2$; $bf = 5\,1/4$

$l_1 = 9$; $l_2 = 6$; $P = 0$

$W_1 = (40)3/2 = 60 \simeq 100$ NOT USED

$W_2 = (40)8/2 = 160$

$R_1 = 0.82$; $R_2 = 1.04$

$M = 3.4 \times 12 = 40.8$

$S_{x\,REQD} = 1.14$ – N/CRIT

$\Delta TL = 0.062'' \sim l/2861$ — OK?

#204B – B3 FB TO REPLACE BM/POST/STHP FTG ;

$l = 9'$; $W = (30+40)25/2 = 875\,\#/l$

$R = 3.94$

$M = 8.85$

$fv = 60$

$fb = 0.62$

$\Delta TL = 0.05'' \sim l/2007$ — OK?

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PROJECT: LABAN REMODEL

DATE: 4/18/22

PROJECT NO: 0189-2022-08

DESIGN: JCM

SHEET: V-4A

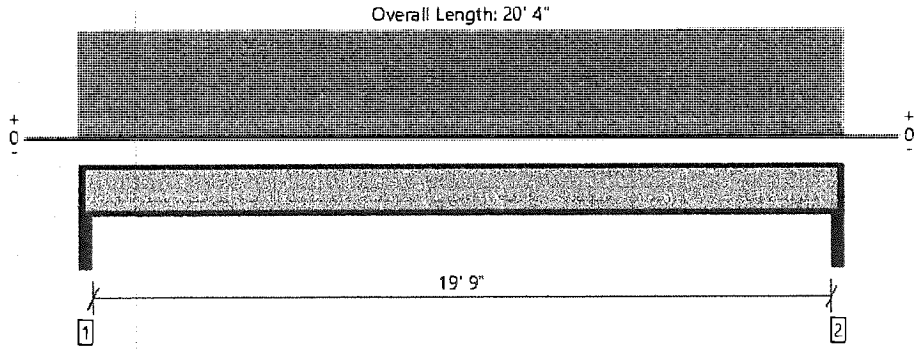
FORTE WEB

MEMBER REPORT

PASSED

Floor, #201 Floor Joist

1 piece(s) 14" TJI® 230 @ 16" OC



All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal.

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	935 @ 2 1/2"	1060 (1.75")	Passed (88%)	1.00	1.0 D + 1.0 L (All Spans)
Shear (lbs)	922 @ 3 1/2"	1945	Passed (47%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	4628 @ 10' 2"	4990	Passed (93%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.349 @ 10' 2"	0.498	Passed (L/685)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.611 @ 10' 2"	0.996	Passed (L/391)	--	1.0 D + 1.0 L (All Spans)
TJ-Pro™ Rating	41	40	Passed	--	--

System : Floor
Member Type : Joist
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- A structural analysis of the deck has not been performed.
- Deflection analysis is based on composite action with a single layer of 23/32" Weyerhaeuser Edge™ Panel (24" Span Rating) that is glued and nailed down.
- Additional considerations for the TJ-Pro™ Rating include: None.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Total	
1 - Stud wall - DF	3.50"	1.75"	1.75"	407	542	949	1 3/4" Rim Board
2 - Stud wall - DF	3.50"	1.75"	1.75"	407	542	949	1 3/4" Rim Board

- Rim Board is assumed to carry all loads applied directly above it, bypassing the member being designed.

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	4' 2" o/c	
Bottom Edge (Lu)	20' 1" o/c	

- TJI joists are only analyzed using Maximum Allowable bracing solutions.
- Maximum allowable bracing intervals based on applied load.

Vertical Load	Location	Spacing	Dead (0.90)	Floor Live (1.00)	Comments
1 - Uniform (PSF)	0 to 20' 4"	16"	30.0	40.0	Default Load

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The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Joseph Marquez Malsam-Tsang Engineering (206) 602-5122 JosephM@malsam-tsang.com	

Weyerhaeuser

4/18/2022 4:34:05 AM UTC
ForteWEB v3.2, Engine: V8.2.0.17, Data: V8.1.0.16
File Name: Joist

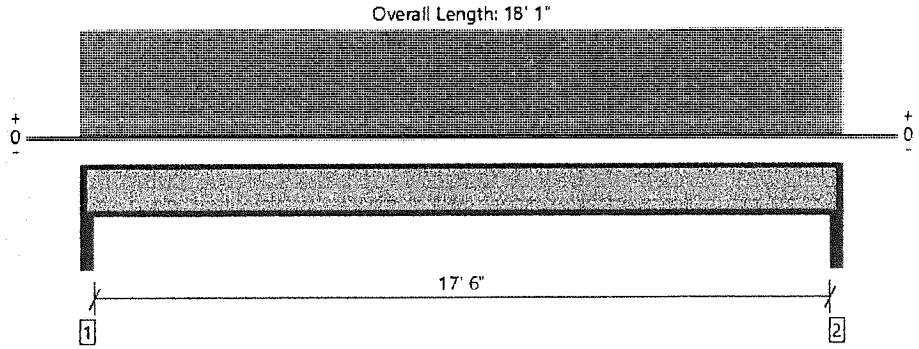
FORTE WEB

MEMBER REPORT

PASSED

Floor, #202 Floor Joist

1 piece(s) 14" TJI® 210 @ 16" OC



All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal.

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	830 @ 2 1/2"	1005 (1.75")	Passed (83%)	1.00	1.0 D + 1.0 L (All Spans)
Shear (lbs)	817 @ 3 1/2"	1945	Passed (42%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	3641 @ 9' 1/2"	4490	Passed (81%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.240 @ 9' 1/2"	0.442	Passed (L/884)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.419 @ 9' 1/2"	0.883	Passed (L/505)	--	1.0 D + 1.0 L (All Spans)
TJ-Pro™ Rating	48	40	Passed	--	--

System : Floor
Member Type : Joist
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- A structural analysis of the deck has not been performed.
- Deflection analysis is based on composite action with a single layer of 23/32" Weyerhaeuser Edge™ Panel (24" Span Rating) that is glued and nailed down.
- Additional considerations for the TJ-Pro™ Rating include: None.

Supports	Bearing Length			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Total	
1 - Stud wall - DF	3.50"	1.75"	1.75"	362	482	844	1 3/4" Rim Board
2 - Stud wall - DF	3.50"	1.75"	1.75"	362	482	844	1 3/4" Rim Board

• Rim Board is assumed to carry all loads applied directly above it, bypassing the member being designed.

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	4' 1" o/c	
Bottom Edge (Lu)	17' 10" o/c	

•TJI joists are only analyzed using Maximum Allowable bracing solutions.
•Maximum allowable bracing intervals based on applied load.

Vertical Load	Location	Spacing	Dead (0.90)	Floor Live (1.00)	Comments
1 - Uniform (PSF)	0 to 18' 1"	16"	30.0	40.0	Default Load

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The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

ForteWEB Software Operator	Job Notes
Joseph Marquez Malsam-Tsang Engineering (206) 602-5122 JosephM@malsam-tsang.com	

Weyerhaeuser

4/18/2022 4:36:21 AM UTC
ForteWEB v3.2, Engine: V8.2.0.17, Data: V8.1.0.16
File Name: Joist

V-4C,

CONT. \ MAIN FLOOR FRMG. (S1.2):

#210 — CANT. B3 @ GRID-1 ; (C-3):

$\ell = 5.5$; $A = 3$; $P = 15\times15\times8/2 = 0.9$

$W_1 = (60+20)\,9.5/2 + 15\times11 + (30+40)\,16/2$
$= 1.105^{K/'}$

$W_2 = 15\times11 + (70)16/2 = 0.725$

$R_1 = 1.95$

$R_2 = 7.20$; $R_{TOT} = 7.2 + 3.184 = 10.0^{K}$

$M+ = 1.73$

$M- = -5.96$

$fv = 58$

$fb = 0.018'' \sim \frac{2A}{3960}$ — OK!

#211 — 2x12 DF#1 AT 12" OC TAPERED TO 1/4" PER 1'-0" TO 8" MIN. DEPTH

$\ell = 13'$; $W = (20+60)12/12 = 0.08$

$d_{eff} \simeq 8.5''$

$R = 0.52$ USE (2)2x12's AT 16"oc

$M = 1.69$

$fv = 58$

$fb = 1.12 < 1.0\,ksi \times 1.15 = 1.15$ — OK!

$\Delta_{TL} = 0.39'' \sim \ell/396$

#212A — C15x33.9 DECK RIM

$\ell_1 =$ 15.5

$W's =$ 14/2 x .08 = 0.56

$=$

$R_1 =$ 4.34

$M =$ 16.82

Fb = 4.81
Fv = 0.72
DEFL = .08 = L/1000+

#212B — W14x22 DECK RIM ~~;~~

$\ell = 10$; $W = 0.56$ NOW C15x33.9

$R = 2.180$

$M = 7.10$ — OK!

#213 - W8x28 BEAM @ CONCEALED GUTTER:

$\ell = 21$; $W = (20+60)14/2 = 0.56$

W8x28 ; $I_x = 98$; $d = 8''$
$S_x = 24.3$; $b_f = 6\frac{1}{2}''$

$R = 5.88$

$M = 30.9 \times 12 = 371$; $S_{x\,REQD} = 12.4$ OK!

$\Delta_{TL} = 0.186'' \sim \ell/292 > \ell/240$ — OK!

#214 - CANT. STEEL BEAM ALONG GRID-C (C-5)

$\ell_1 = 0.75$; $\ell_2 = 8.5$; $A = 5$

$P_1 = R\#213 + 0.56\times10/2 = 5.88 + 2.8 = 8.68$

$P_2 = R\#212A + R\#212B + P_{ABV}$
$= 7.4 + 2.8 + 3.105 = 13.25$

W's ~0

$R_1 = 0.814$

$R_2 = 24.11$

$M+ = 0.61$

$M- = -66.25 \times 12 = 795$; $S_{x\,REQD} = 27$ OK!

W8x48 ; $I_x = 184$; $d = 8\frac{1}{2}''$
$S_x = 43.2$; $b_f = 8\frac{1}{8}''$

$\Delta_{TL\,@\,END} = 0.149'' \sim 2A/243$ — OK!

#215 - CANT. STL. BM. DECK AT GRID-D: (C-5)

$\ell_1 = 0.75$; $\ell_2 = 8.5$; $A = 5$

$P_1 = 2.8$; $P_2 = 2.8 + 1.55 = 4.35$ ($R_{\#212B}$ + P_{ABV})

W = ~0.07

$R_1 = 0.45$

$R_2 = 7.70$

$M- = -22.625 \times 12 =$

NOT USED

$\Delta_{TL\,@\,END} = 0.123'' \sim 2A/971$ - OK!

W14x26 ; $I_x = 245$; $d = 13\frac{7}{8}''$
$S_x = 35.3$; $b_f = 5''$

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PROJECT: LABAN REMODEL

DATE: 4/18/22

PROJECT NO: 0189-2022-03

DESIGN: JCM

SHEET: V-5

CONT. MAIN FLR. FRMG; (S1.2);

216 - DECK BM;

$\ell = 10.5$; $W = (20+60)\frac{4}{2} = 360$

$R = 1.9$

$M = 5.0$ NOT USED

$\Delta_{TL} = 0.017" \sim \ell/7385$ — OK?

W14X22 ; $I_x = 199$; $d = 13\text{-}3/4"$

$S_x = 29$; $b_f = 5"$

217 - CANT STL. BM @ DECK GRID-B.4; (C-5)

$\ell_1 = 0.75$; $\ell_2 = 8.5$; $A = 5$

$P_1 = 5.88$; $P_2 = R_{\#217A} + P_{ABV}$

$= 7.44 + 1.55 = 8.95$

$W_1 = W_2 = 0$; $W_2' = 0.045$ NOT USED

$R_1 = 0.5$

$R_2 = 14.55$

$M+ = 0.38$

$M- = -45.3'$

$= -544"$

W14X26;

$I_x = 245$; $d = 13\text{-}7/8"$

$S_x = 35.3$; $b_f = 5"$

$S_{X\,REQD} = 18.2$

$\Delta_{TL@END} = 0.25" \sim \frac{2A}{474}$ — OK!

218 - B2 BM AT FRONT - GRID-2;

$\ell = 8'$; $W = (30+40)25/2 = 875$

$R = 3.5$

$M = 7.0$

$f_V = 76$

$f_b = 0.735$

$\Delta_{TL} = 0.065" \sim \ell/1477$

@ CRAWLSPACE FRAMING; (S1.1);

NEW CRAWL SPACE BEAM/HDR. SUPPORTING BRG. WALL LINE;

$W = W_{\#206/\#207} + 12\text{psf} \times 4' =$

$= 875 + 105 = 980\ \#/'$

$\ell_{MAX} = 5.5'$

$R = 2.4$

$M = 3.3$

$f_V = 11.9$

$f_b = 1.355$

$\Delta_{TL} = 0.10" \sim \ell/724$ — OK?;

GL 3 1/8 X 7.5

CHK (E) 4X10 CS BEAM AT 8'0" ;

$W = (30+40)8/2 = 280\ \#/'$

CHK. SPANNING, $\ell = 8'$;

$R = 1.12$ $f_V = 4.2$

$M = 2.24$ $f_b = 0.538$

$\Delta_{TL} = 0.07" \sim \ell/1374$ — OK!

CHK. SPANNING, $\ell = 15.75'$;

$R = 2.2$; $f_V = 9.2$ } (E) 4X10

$M = 8.7$; $f_b = 2.08$ — N/G!

- (E) 4X10 SHALL BE SISTERED WITH LVL 1 3/4 X 14 FASTEN W/ 12d@10"oc - PROVIDE 1 1/2" EDGE DIST. TOP AND BOTTOM OF 4X10

LVL 1 3/4 X 14 ;

$f_V = 11.5$

$f_b = 1.82$

$\Delta_{TL} = 0.484" \sim \ell/390$

$\Delta_{LL} = 0.277" \sim \ell/683$ — OK!

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PROJECT: LABAN REMODEL

DATE: 4/18/22

PROJECT NO: 0189-2022-03

DESIGN: JCM

SHEET: V-6

WELDING CONNECTIONS AND SHEAR PL CAPACITY CHECKS:

① "W" – FILLET WELD; $V_{CAP.}$:

$F_{EXX} = 70$ KSI

$\Omega = 2.0$

$W = 3/16"$; $W = 1/4"$

$$V_{CAP.} = \frac{0.6\, F_{EXX} * 0.707}{\Omega} * W$$

$V_{CAP.\ W=3/16"} = 2.734 \frac{K}{IN}$; $V_{CAP.\ W=1/4"} = 3.712 \frac{K}{IN}$

② "t" PL SHEAR YIELDING; $V_{CAP.}$:

$$V_{CAP.} = \frac{0.60\, F_y}{\Omega} * t \quad ; \quad F_y = 36\ KSI,\ \Omega = 1.5$$

$t_{3/16"} = 2.70 \frac{K}{IN}$; $t_{1/4"} = 3.60 \frac{K}{IN}$

③ "t" PL SHEAR RUPTURE; $V_{CAP.}$:

$$V_{CAP.} = \frac{0.60\, F_u}{\Omega} * t \quad F_u = 58\ KSI,\ \Omega = 1.5$$

$t_{3/16"} = 4.35 \frac{K}{IN}$; $t_{1/4"} = 5.80 \frac{K}{IN}$

CHK W5×19 COL. SUPPORTING DECK;

COL. SUPPORTING BEAMS @ #216 & #217

$P_{TOT} = P_{ADD} + R_{@216} + R_{2\ @217}$

$= 2.32 + 11.90 + 14.55$

$= 18.77^K \simeq 19.0$ KIPS

FOR W5×19 ;

$A = 5.56\ \square$

$I_x = 26.3\ IN^4$; $I_y = 9.13\ IN^4$

$r_x = 2.17$ IN ; $r_y = 1.28$ IN ← WEAK-ST AXIS

$E = 29{,}000$ KSI

$F_y = 50$ KSI

$\Omega_c = 1.67$

$K = 0.80$

$$\frac{P_n}{\Omega_c} = \frac{F_{cr} * A_g}{\Omega_c} \quad ; \quad \frac{Kl}{r_y} = \frac{0.80(9' \times 12")}{1.28} = 67.5$$

WHERE;

IF; $\frac{Kl}{r} \leq 4.71\sqrt{\frac{E}{F_y}}$

$67.5 \leq 113.43$

THEN; $F_{cr} = \left[0.658^{\frac{F_y}{F_e}}\right] F_y$; $^{0.80}$

$= 26.18 \simeq 26.2$

WHERE;

$F_e = \frac{\pi^2 E}{(Kl/r_y)^2} = 62.82$

$\phi P_n = \frac{P_n}{\Omega_c} = \frac{26.2 * 5.56}{1.67}$

$= 87.2^K \gg 19.0^K$ — OK!

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PROJECT: LABAN REMODEL

DATE: 4/19/22

PROJECT NO: 0189-2022-03

DESIGN: JCM

SHEET: V-7

CHK. HORIZ. SPANNING CONC. WALL AT GRID - 5 ; BOTT 1-FT STRIP:

$$W_u = \frac{10.5' + 9.5'}{2} * 35 * 1.6 + 140 \quad \text{14H}$$

$W_u = 700\ \#/'$

$l_n = 8.25'$

$M_u = W_u l_n^2 / 10$

$= 4765\ \#\text{-}'$

WHERE:

$f'_c = 2500$; $f_y = 60$ KSI

$d = 4''$ - CENTERED in WALL

$\phi = 0.90$

$$M_u = \phi \rho f_y b d^2 \left(1 - \frac{\rho f_y}{0.85 f'_c}\right)$$

$$14.12\rho^2 - \rho + \frac{M_u}{\phi f_y b d^2} = 0$$

$$14.12\rho^2 - \rho + \frac{4765\ \#\text{-}' * 0.0055}{0.9(60000)(12'')(4)^2} = 0$$

by Q.F. ; $\rho = 0.006$

$A_{S\,REQ'D} = \rho b d = 0.288\ \square''$ — governs!

$A_{S\,MIN.} = \frac{200}{f_y} b d = 0.16\ \square''$

USE # 5 AT 12" OC HORIZ AND # 4 AT 12" OC VERT CENTERED IN WALL

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PROJECT: LABAN REMOD.

DATE:

PROJECT NO: 0184-2022-03

DESIGN: JCM

SHEET: V-8

SHORING CALCULATIONS

10 BROOK BAY RD
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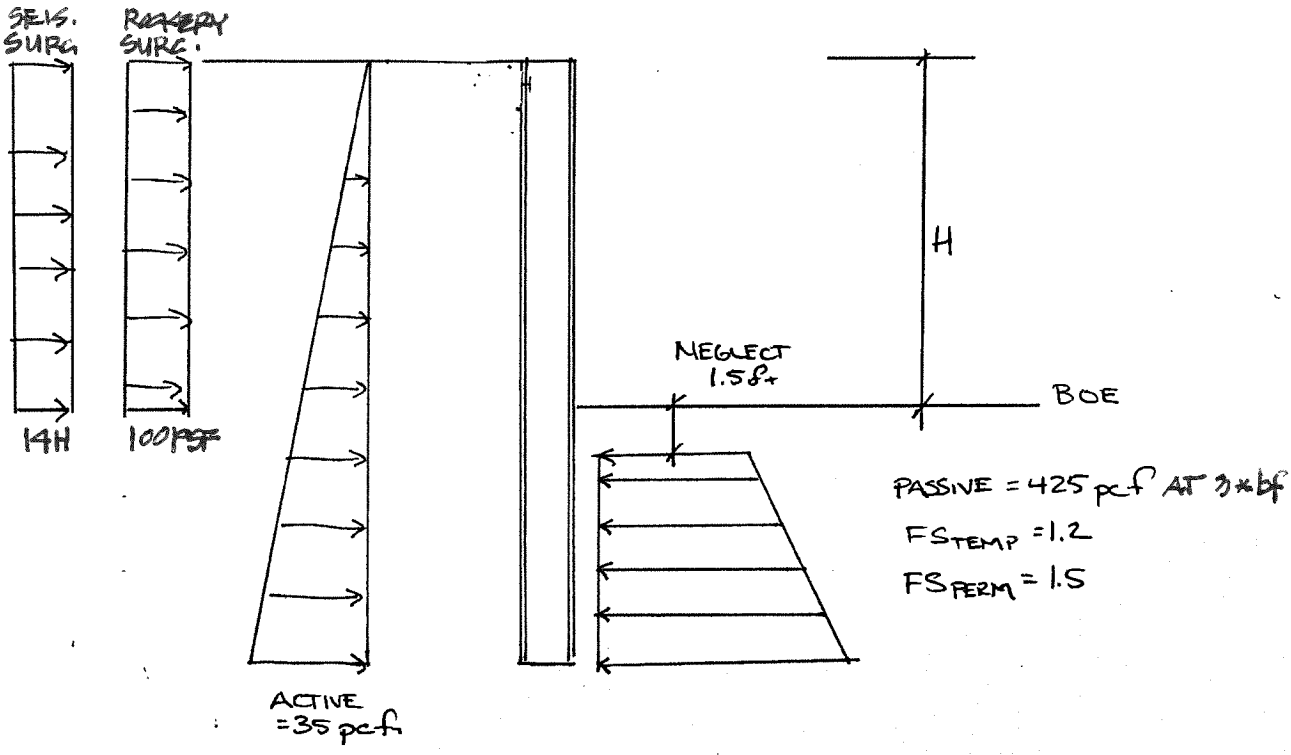
SHORING DESIGN

DRIVEN PILES - PERMANENT



CHECK LAGGING

TEMP

L=4.25'

W=(10 x .035) 50% = .175%

R= .37k

M= .4k·ft

f_b = .28ksi

f_v = 15psi

PT (2) 2x12 [024x12]

PERM

L=4.25

W= (6.5 x .035 + .186) 50% = .207%, (.298) +EQ =14H

R= .44k (.63k)

M= .47k·ft (.67)

f_b = .33ksi (.48)

f_v = 17psi (25)

PT (2) 2x12

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LABAN REMODEL
PROJECT

DATE

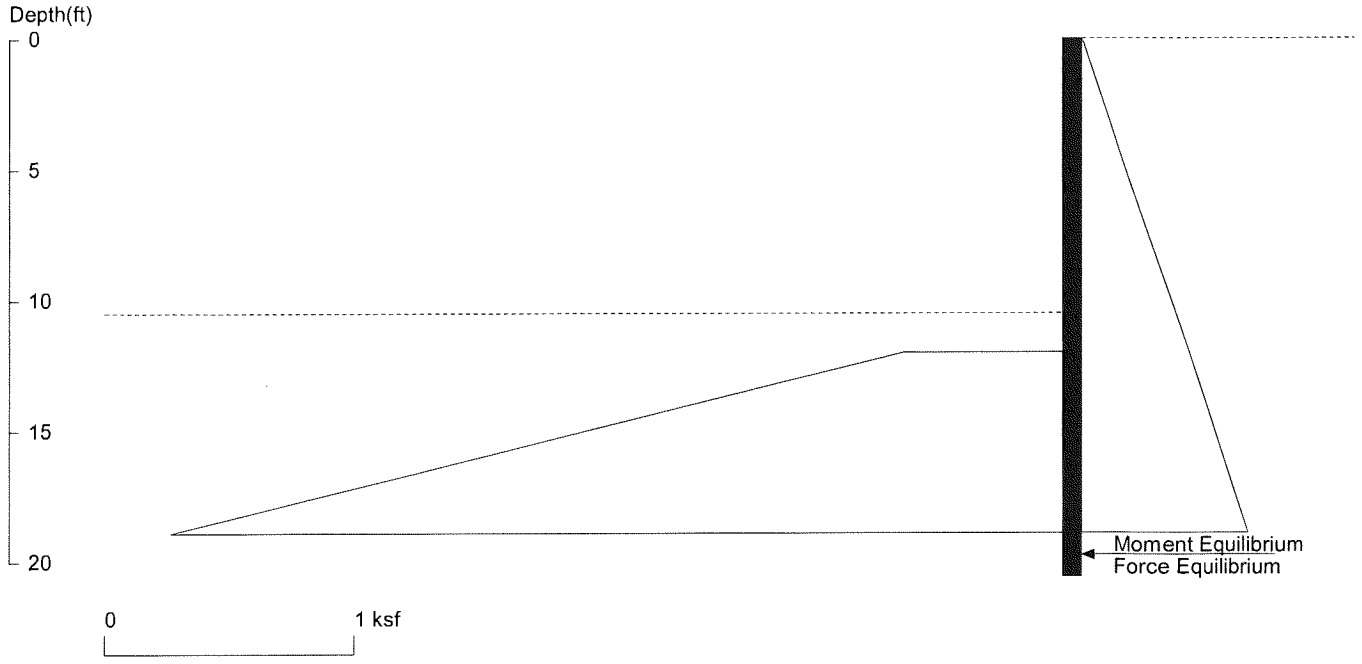
0189.2022.03
PROJECT NO

JRF
DESIGN

SH1
SHEET

10 Brook Bay - Laban

10.5ft South Shoring Wall - Tempo. Condi.



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File: P:\MT Project Folder\0189-2022-03-01 10 Brook Bay (Laban)\Calculations\Shoring Design\10.5ft South Shoring Wal

Wall Height=10.5 ✓ Pile Diameter=2.5 3*bf Pile Spacing=4.5 Wall Type: 3. Soldier Pile, Driving

PILE LENGTH: Min. Embedment=10.09 18' FROM BSE 455' Min. Pile Length=20.59

MOMENT IN PILE: Max. Moment=62.19 per Pile Spacing=4.5 at Depth=14.89

PILE SELECTION:

Request Min. Section Modulus = 24.9 in3/pile=407.62 cm3/pile, Fy= 50 ksi = 345 MPa, Fb/Fy=0.6

W10X54 has Section Modulus = 60.0 in3/pile=983.22 cm3/pile. It is greater than Min. Requirements!

Top Deflection = 0.49(in) based on E (ksi)=29000.00 and I (in4)/pile=303.0

DRIVING PRESSURES (ACTIVE, WATER, & SURCHARGE):

Z1	P1	Z2	P2	Slope
0	0	100	3.500	.035

PASSIVE PRESSURES: Pressures below will be divided by a Factor of Safety =1.2

Z1	P1	Z2	P2	Slope
12	.638	109	41.86	.425

ACTIVE SPACING:

No.	Z depth	Spacing
1	0.00	4.50
2	10.50	2.50

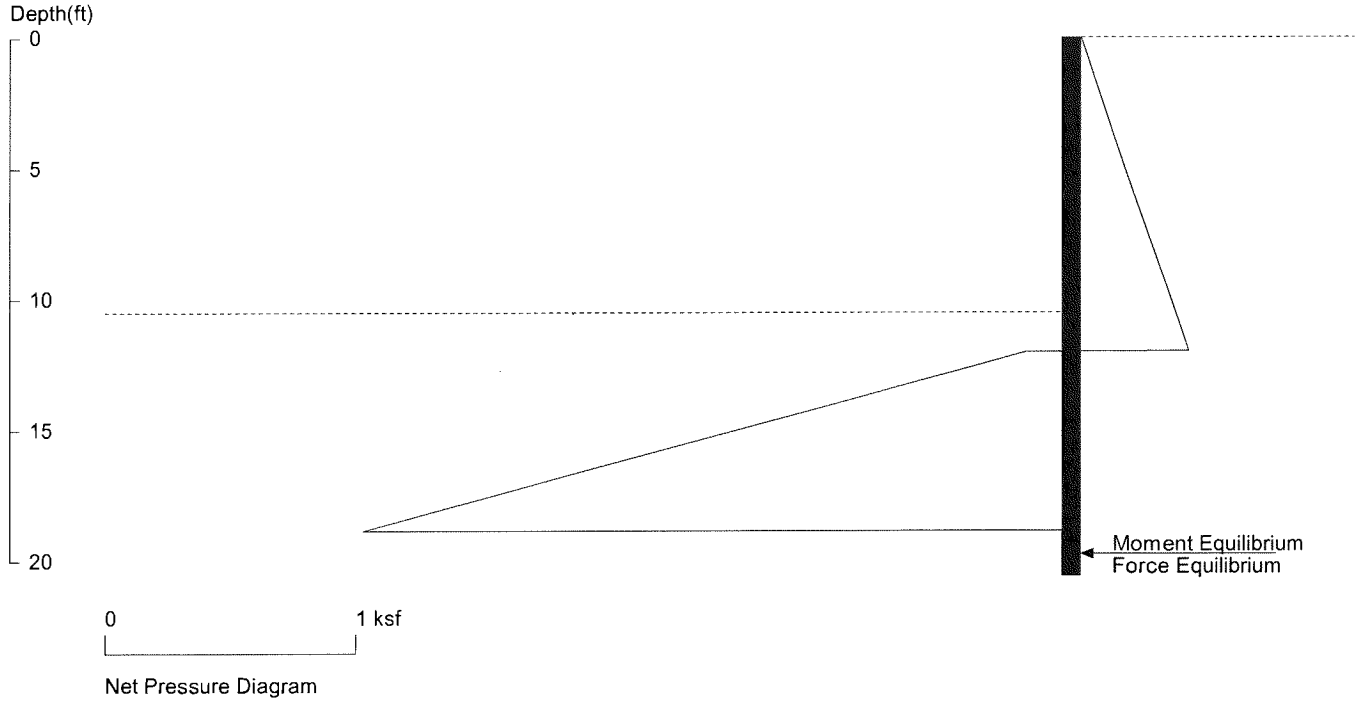
PASSIVE SPACING:

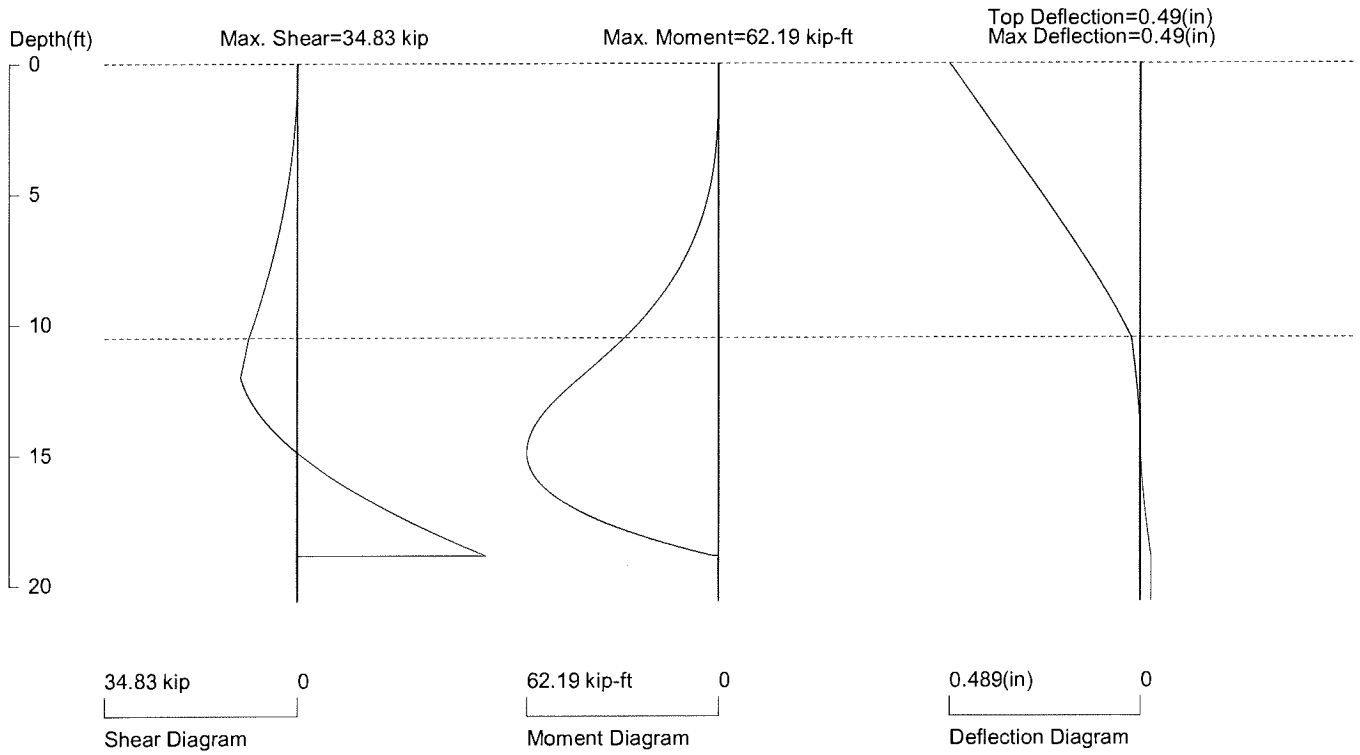
No.	Z depth	Spacing
1	10.50	4.50

UNITS: Width,Spacing,Diameter,Length,and Depth - ft; Force - kip; Moment - kip-ft
Friction,Bearing,and Pressure - ksf; Pres. Slope - kip/ft3; Deflection - in

10 Brook Bay - Laban

10.5ft South Shoring Wall - Tempo. Condi.





PRESSURE, SHEAR, MOMENT, AND DEFLECTION DIAGRAMS

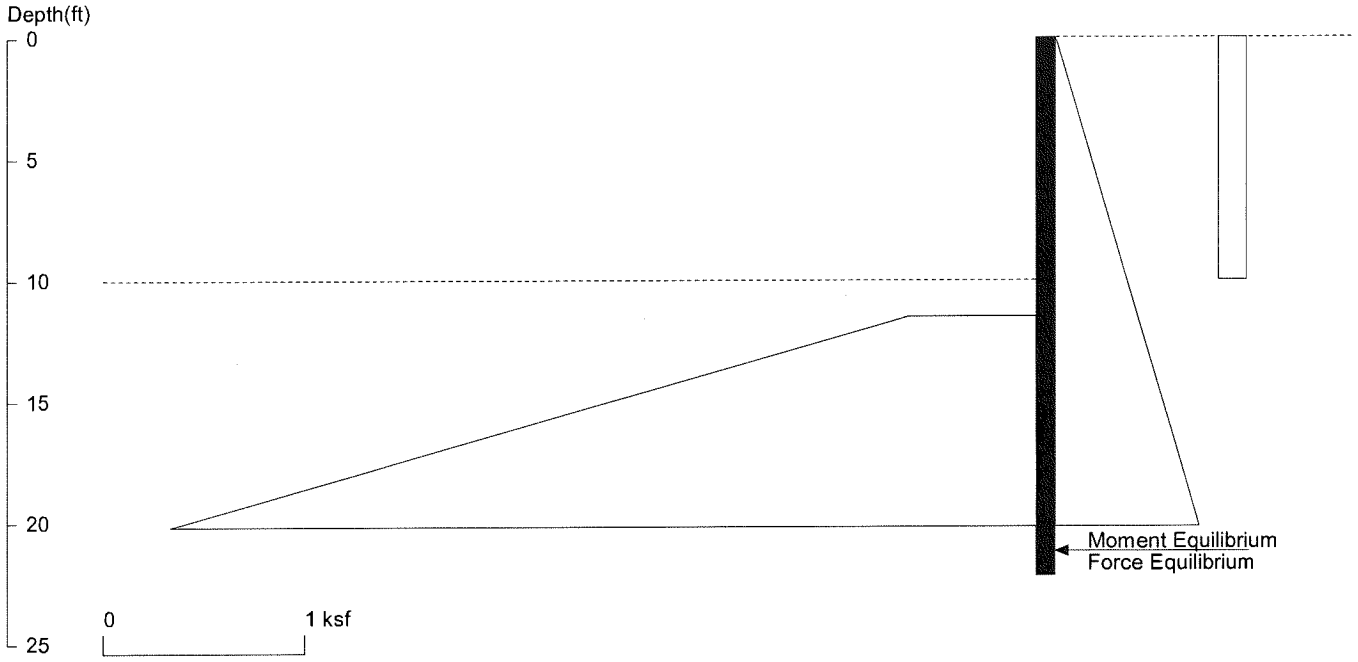
Based on pile spacing: 4.5 foot or meter

User Input Pile, W10x54: E (ksi)=29000.0, I (in4)/pile=303.0

File: P:\MT Project Folder\0189-2022-03-01 10 Brook Bay (Laban)\Calculations\Shoring Design\10.5ft South Shoring Wall - At Tempo. Cond.sh8

10 Brook Bay - Laban

10.0ft So. Shoring Wall - Perma. Condi. with Seis



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File: P:\MT Project Folder\0189-2022-03-01 10 Brook Bay (Laban)\Calculations\Shoring Design\10.0ft South Shoring Wal

Wall Height=10.0 Pile Diameter=2.5 3*bf Pile Spacing=4.4 Wall Type: 3. Soldier Pile, Driving

PILE LENGTH: Min. Embedment=12.21 13.0' from FF47.5' Min. Pile Length=22.21

MOMENT IN PILE: Max. Moment=114.38 per Pile Spacing=4.4 at Depth=15.24

PILE SELECTION:

Request Min. Section Modulus = 45.8 in3/pile=749.76 cm3/pile, Fy= 50 ksi = 345 MPa, Fb/Fy=0.6

W10X54 has Section Modulus = 60.0 in3/pile=983.22 cm3/pile. It is greater than Min. Requirements!

Top Deflection = 1.01(in) based on E (ksi)=29000.00 and I (in4)/pile=303.0

DRIVING PRESSURES (ACTIVE, WATER, & SURCHARGE):

Z1	P1	Z2	P2	Slope
0	0	100	3.500	.035
0	0.14	10	0.140	0

PASSIVE PRESSURES: Pressures below will be divided by a Factor of Safety =1.2

Z1	P1	Z2	P2	Slope
11.5	.638	109	42.07	.425

ACTIVE SPACING:

No.	Z depth	Spacing
1	0.00	4.45
2	10.00	2.50

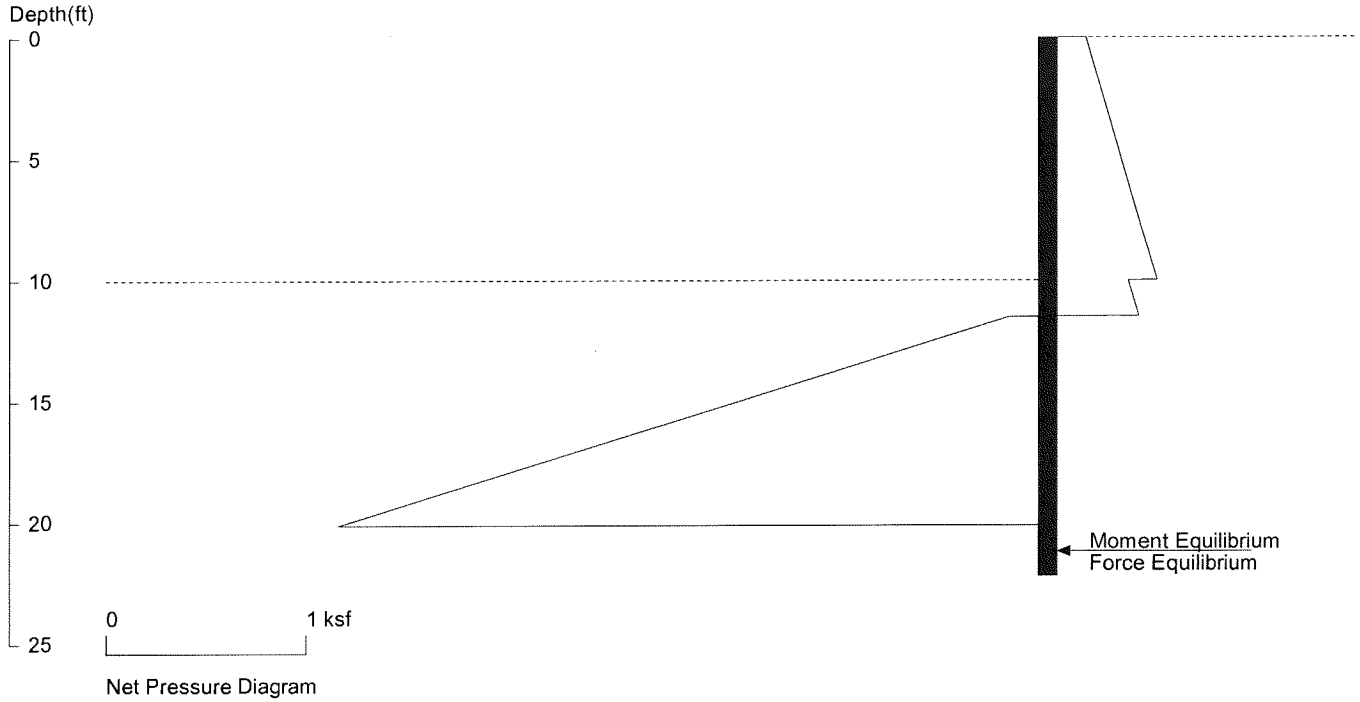
PASSIVE SPACING:

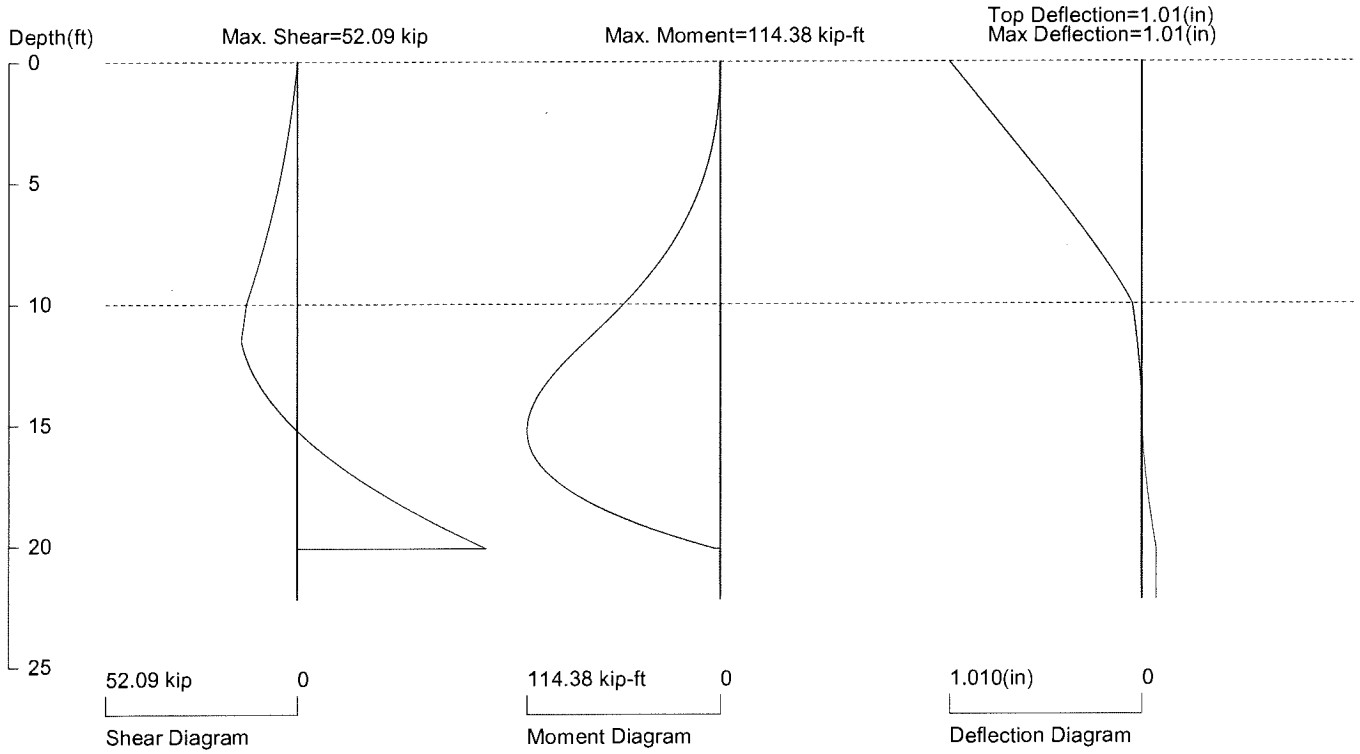
No.	Z depth	Spacing
1	10.00	4.45

UNITS: Width,Spacing,Diameter,Length,and Depth - ft; Force - kip; Moment - kip-ft
Friction,Bearing,and Pressure - ksf; Pres. Slope - kip/ft3; Deflection - in

10 Brook Bay - Laban

10.0ft So. Shoring Wall - Perma. Condi. with Seis





PRESSURE, SHEAR, MOMENT, AND DEFLECTION DIAGRAMS

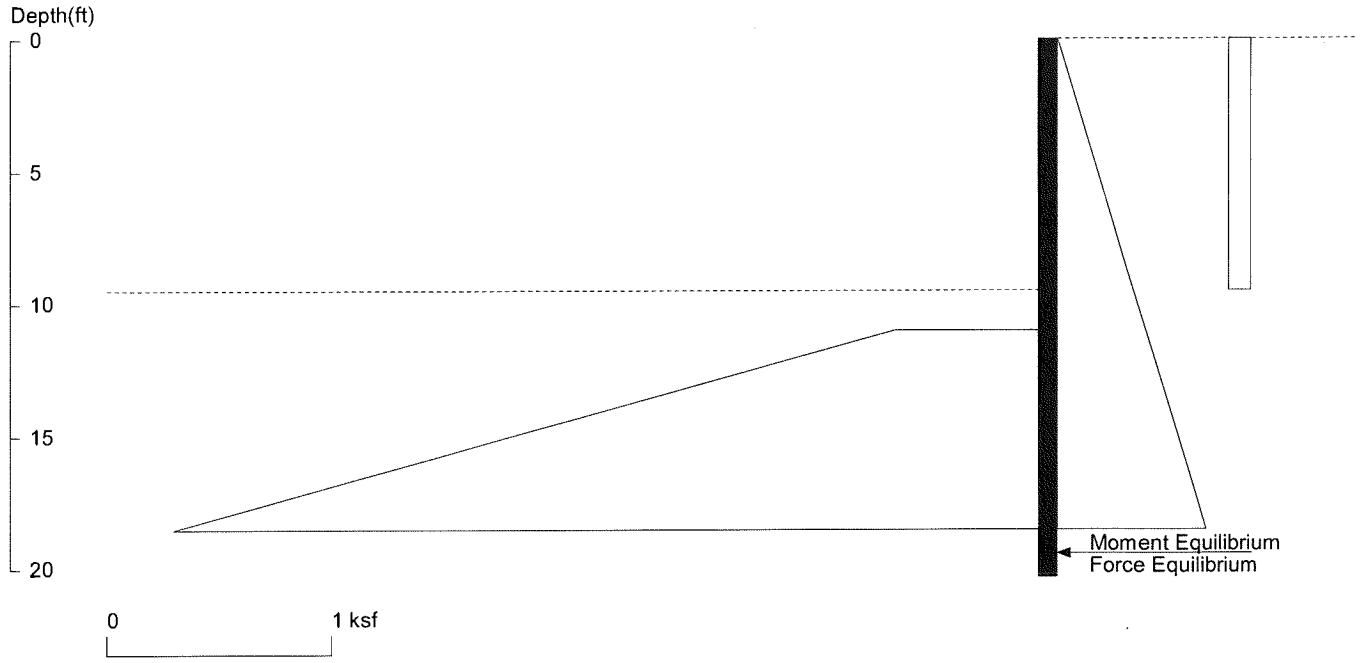
Based on pile spacing: 4.4 foot or meter

User Input Pile, W10x54: E (ksi)=29000.0, I (in4)/pile=303.0

File: P:\MT Project Folder\0189-2022-03-01 10 Brook Bay (Laban)\Calculations\Shoring Design\10.0ft South Shoring Wall - At Perma. Cond. with Seis.sh8

10 Brook Bay - Laban

9.5ft East shoring wall - Tempo. Condi.



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File: P:\MT Project Folder\0189-2022-03-01 10 Brook Bay (Laban)\Calculations\Shoring Design\9.5ft East Shoring Wall -

Wall Height=9.5 Pile Diameter=2.0 3*bf Pile Spacing=4.5 Wall Type: 3. Soldier Pile, Driving

12' from BOE 45.5

PILE LENGTH: Min. Embedment=10.84 Min. Pile Length=20.34

MOMENT IN PILE: Max. Moment=83.93 per Pile Spacing=4.5 at Depth=14.12

PILE SELECTION:

Request Min. Section Modulus = 33.6 in3/pile=550.17 cm3/pile, Fy= 50 ksi = 345 MPa, Fb/Fy=0.6

W8X58 has Section Modulus = 52.0 in3/pile=852.12 cm3/pile. It is greater than Min. Requirements!

Top Deflection = 0.86(in) based on E (ksi)=29000.00 and I (in4)/pile=228.0

DRIVING PRESSURES (ACTIVE, WATER, & SURCHARGE):

Z1	P1	Z2	P2	Slope
0	0	100	3.500	.035
0	0.100	9.5	0.100	0

PASSIVE PRESSURES: Pressures below will be divided by a Factor of Safety =1.2

Z1	P1	Z2	P2	Slope
11	.638	109	42.288	.425

ACTIVE SPACING:

No.	Z depth	Spacing
1	0.00	4.50
2	9.50	2.00

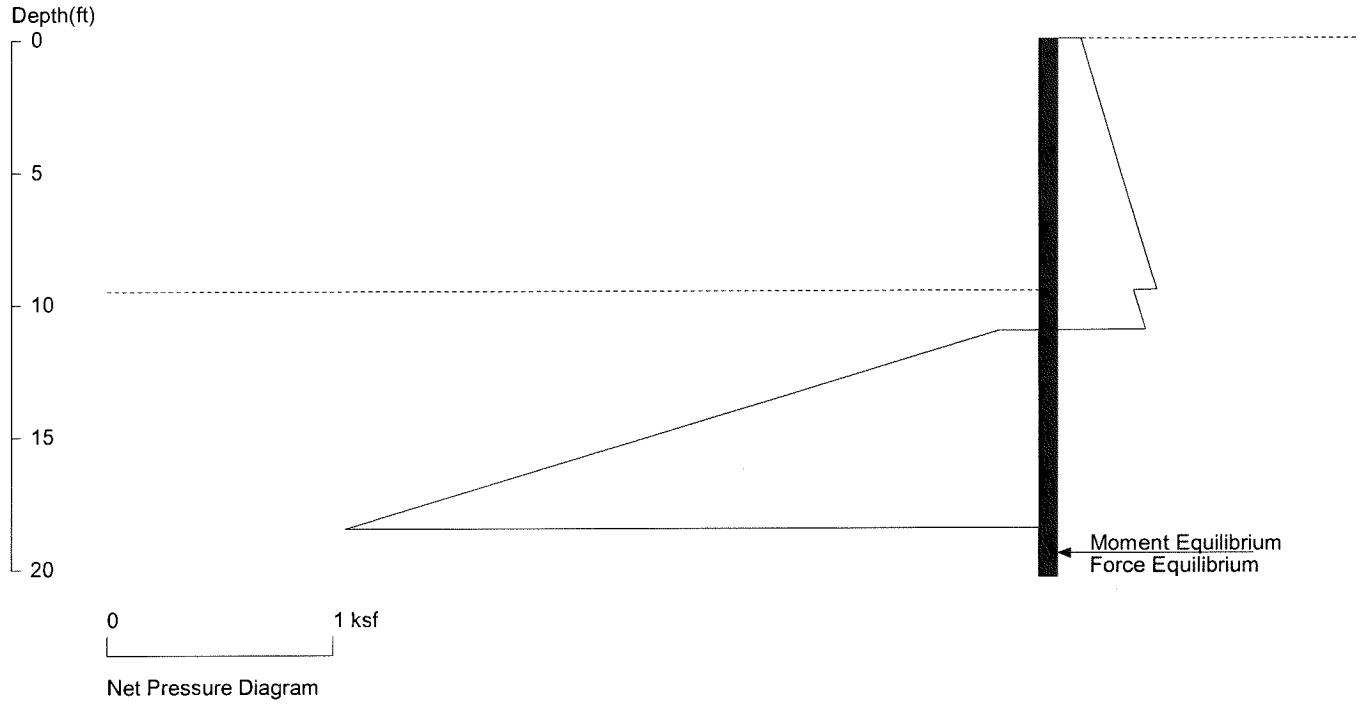
PASSIVE SPACING:

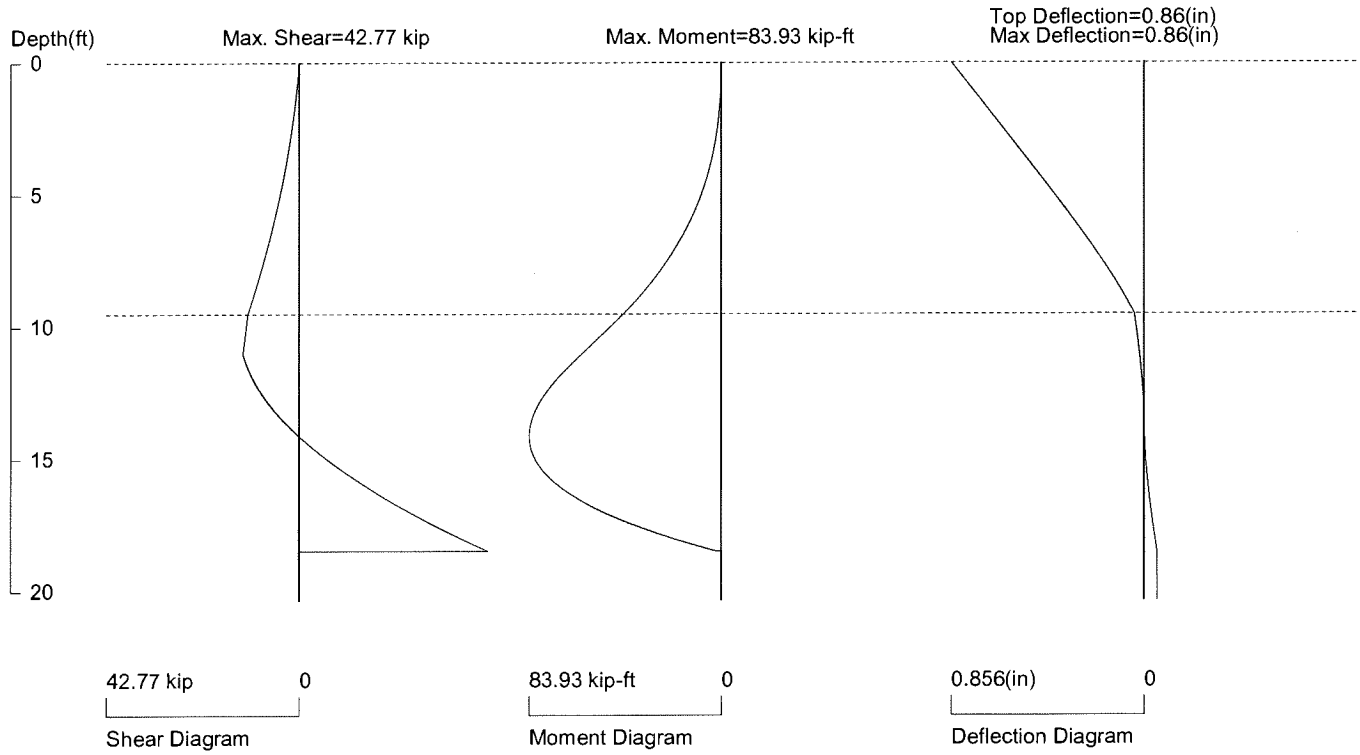
No.	Z depth	Spacing
1	9.50	4.50

UNITS: Width,Spacing,Diameter,Length,and Depth - ft; Force - kip; Moment - kip-ft
Friction,Bearing,and Pressure - ksf; Pres. Slope - kip/ft3; Deflection - in

10 Brook Bay - Laban

9.5ft East shoring wall - Tempo. Condi.





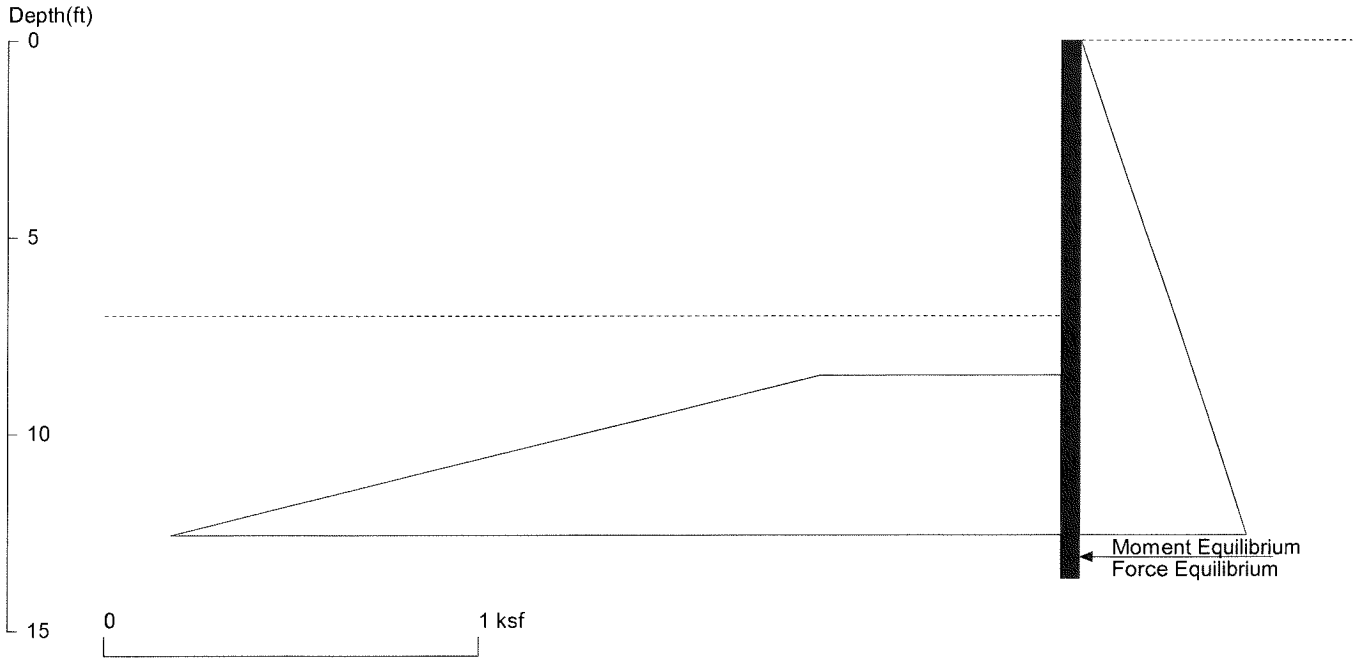
PRESSURE, SHEAR, MOMENT, AND DEFLECTION DIAGRAMS

Based on pile spacing: 4.5 foot or meter

User Input Pile, W8x58: E (ksi)=29000.0, I (in4)/pile=228.0

File: P:\MT Project Folder\0189-2022-03-01 10 Brook Bay (Laban)\Calculations\Shoring Design\9.5ft East Shoring Wall - At Tempo. Condition.sh8

10 Brook Bay - Laban
7ft East shoring wall - Tempo. Condi.



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File: P:\MT Project Folder\0189-2022-03-01 10 Brook Bay (Laban)\Calculations\Shoring Design\9.5ft East Shoring Wall -

Wall Height=7.0 Pile Diameter=2.0 Pile Spacing=6.0 Wall Type: 3. Soldier Pile, Driving

PILE LENGTH: Min. Embedment=6.68 Min. Pile Length=13.68

MOMENT IN PILE: Max. Moment=25.18 per Pile Spacing=6.0 at Depth=9.96

PILE SELECTION:

Request Min. Section Modulus = 10.1 in3/pile=165.06 cm3/pile, Fy= 50 ksi = 345 MPa, Fb/Fy=0.6

W8X48 has Section Modulus = 43.2 in3/pile=707.92 cm3/pile. It is greater than Min. Requirements!

Top Deflection = 0.15(in) based on E (ksi)=29000.00 and I (in4)/pile=184.0

DRIVING PRESSURES (ACTIVE, WATER, & SURCHARGE):

Z1	P1	Z2	P2	Slope
0	0	100	3.500	.035

PASSIVE PRESSURES: Pressures below will be divided by a Factor of Safety =1.2

Z1	P1	Z2	P2	Slope
8.5	.638	109	43.351	.425

ACTIVE SPACING:

No.	Z depth	Spacing
1	0.00	6.00
2	7.00	2.00

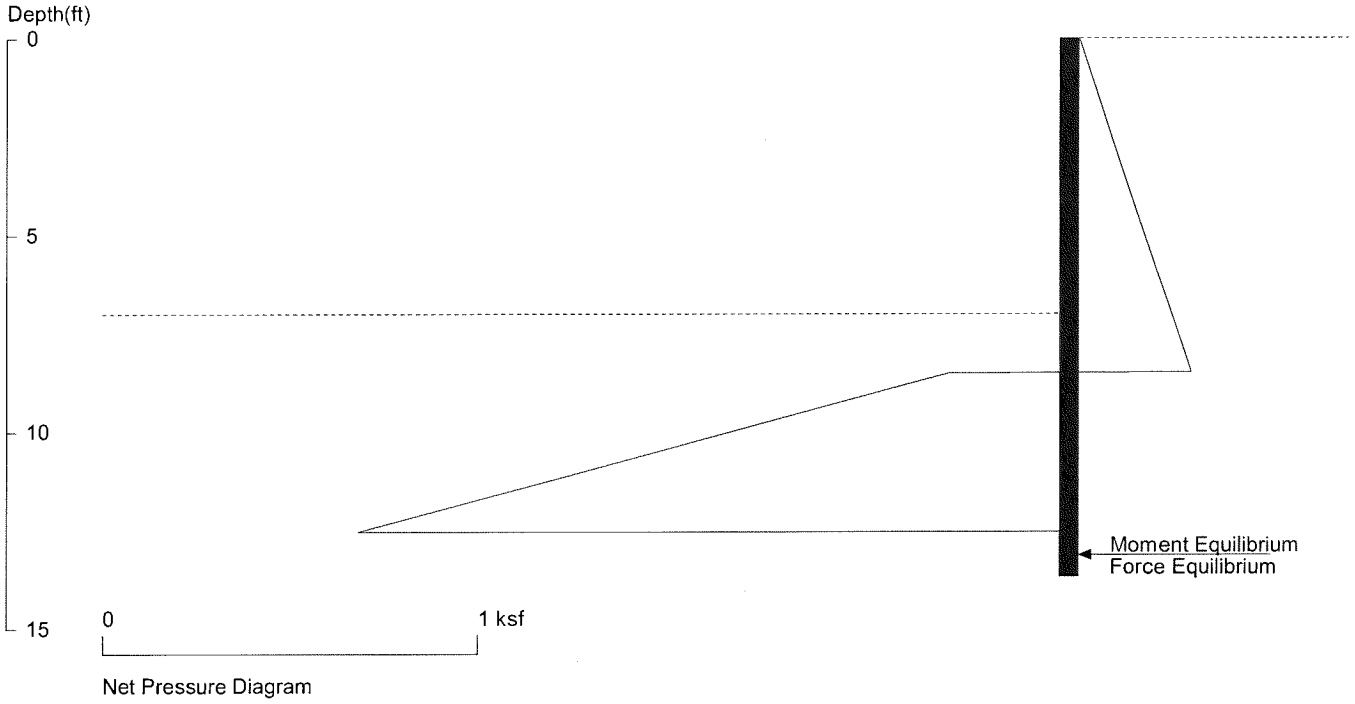
PASSIVE SPACING:

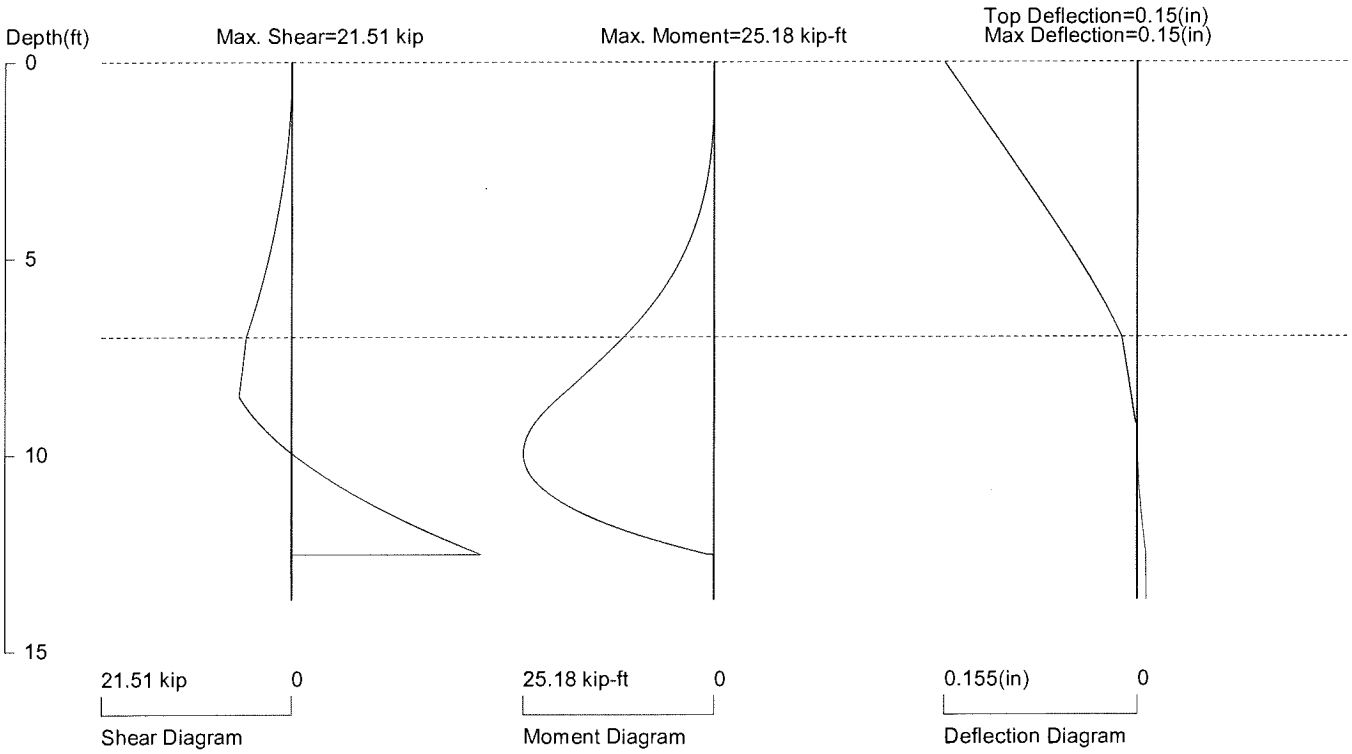
No.	Z depth	Spacing
1	7.00	6.00

UNITS: Width,Spacing,Diameter,Length,and Depth - ft; Force - kip; Moment - kip-ft
Friction,Bearing,and Pressure - ksf; Pres. Slope - kip/ft3; Deflection - in

10 Brook Bay - Laban

7ft East shoring wall - Tempo. Condi.





PRESSURE, SHEAR, MOMENT, AND DEFLECTION DIAGRAMS

Based on pile spacing: 6.0 foot or meter

User Input Pile, W8x48: E (ksi)=29000.0, I (in4)/pile=184.0

File: P:\MT Project Folder\0189-2022-03-01 10 Brook Bay (Laban)\Calculations\Shoring Design\9.5ft East Shoring Wall - At Tempo. Condition.sh8