Calcs (6)
501 N. Casino Center

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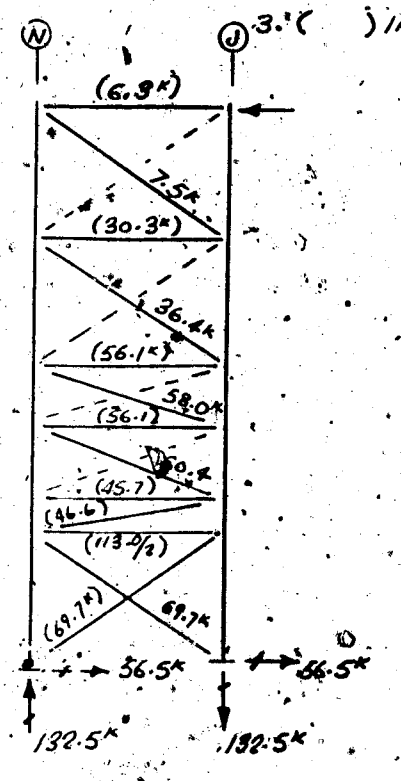
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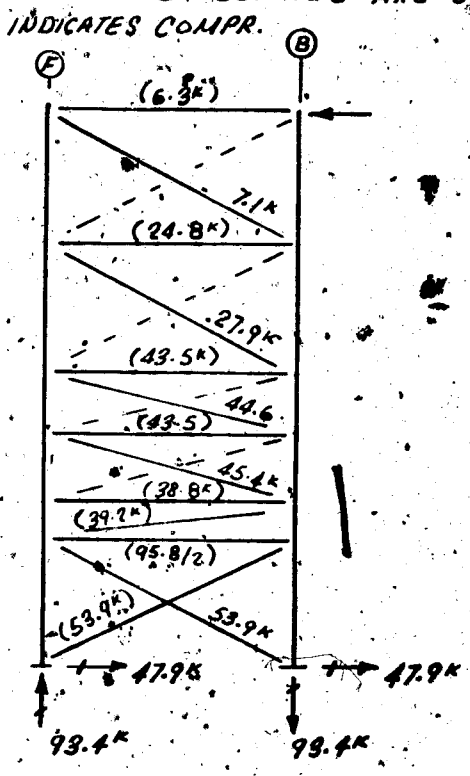
SHEET/ 299 OF 317
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BRACED FRMS

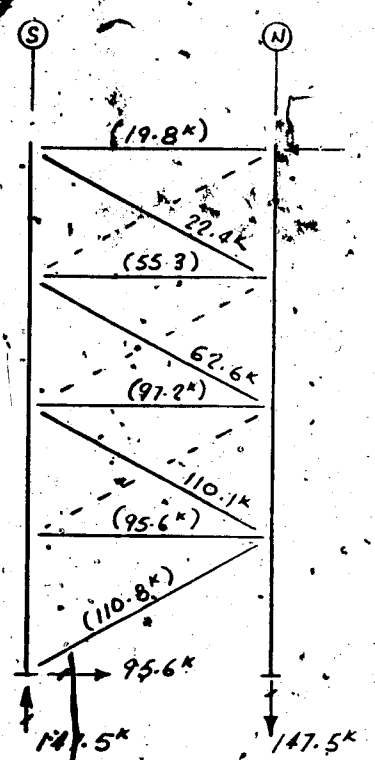
NOTE: 1. SEE SHT N°288 & N°289 FOR SHEAR LOAD C & GEOMETRY.
2. REDUNDANT DIAGONALS ARE SHOWN DASHED
3. ( ) INDICATES COMPR.



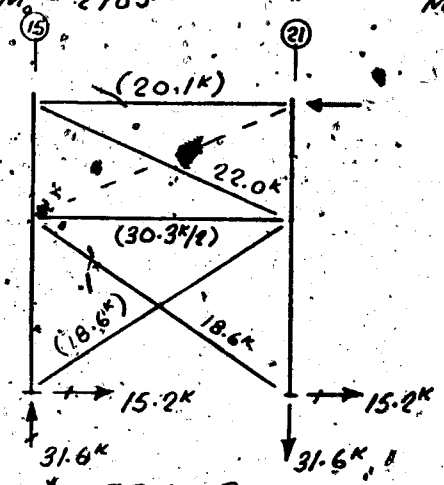
FRM-12-J
V = 113.0K
M_o = 2783KFT



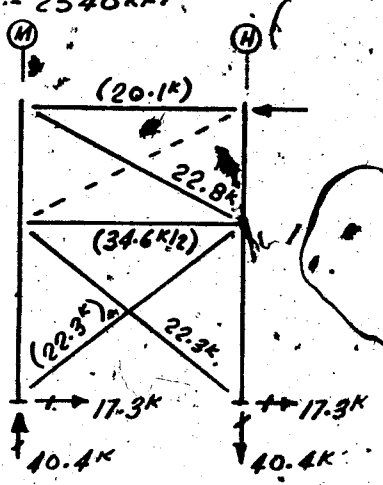
FRM-12-B
V = 95.8K
M_o = 2540KFT



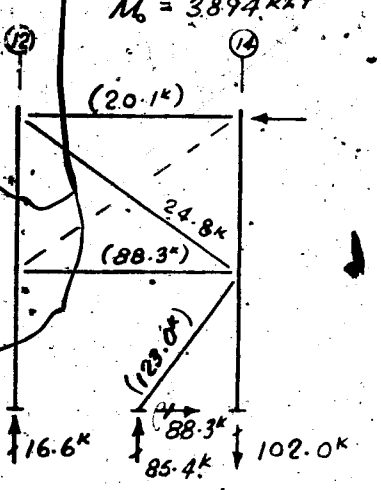
FRM-12-S
V = 95.6K
M_o = 3894KFT



FRM - P
V = 30.3K
M_o = 888KFT



FRM-34
V = 34.6K
M_o = 945KFT



FRM-A
V = 88.3K
M_o = 1682KFT

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9.2

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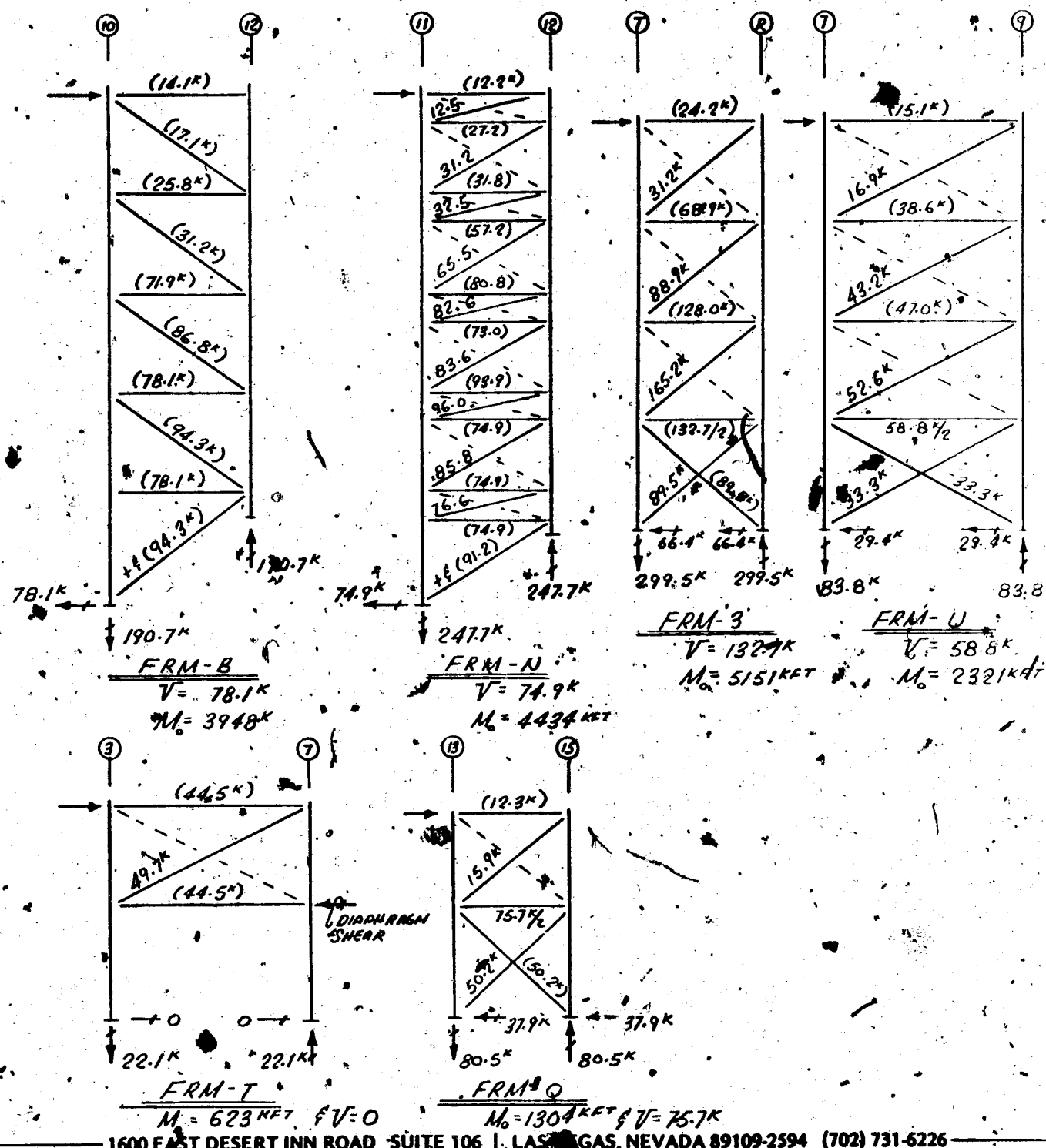
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BRACED FRMS

SEE NOTES PRECEDING SHT.



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BRC'D FRM'S

BRC'G LIMITED TO 9" DIMEN ⊥ TO PLANE OF FRM.

FRM	DIAGONALS LENGTH	FORCE	1.25×F	MEMBER	F ALLOWABLE
B	25.0"	± 94.3ᴷ	± 118ᴷ	W8×48	(4/3)(102) = 136ᴷ @ L_u = 25.0
	26.2'	± 94.3ᴷ	± 118ᴷ	W8×58	(4/3)(114) = 152ᴷ @ L_u = 26.2'
N	18.3'	96.0ᴷ	120ᴷ	TT 6×4×3/8 LLBB	(4/3)(7.22-1.22)(22) = 176ᴷ
	20.5'	85.8ᴷ	108ᴷ	do	do
	21.6'	± 91.2ᴷ	± 114ᴷ	W8×40	(4/3)(108) = 144ᴷ @ L_u = 21.6'
3	22.2"	165.2ᴷ	207ᴷ	TT 6×4×1/2 LLBB	(4/3)(9.50-1.63)(22) = 231ᴷ
	22.5'	± 89.5ᴷ	± 112ᴷ	TT 8×4×1 LLBB	(4/3)(1.7) = 156ᴷ @ L_u = 22.5'
U	31.0'	52.6ᴷ	66ᴷ	TT 5×3 1/2×5/16	(4/3)(5.12-1.024)(22) = 120ᴷ
	31.2'	± 33.3ᴷ	± 42ᴷ	W8×35	(4/3)(45ᴷ) = 60ᴷ @ L_u = 31.2'
T	31.5'	49.7ᴷ	62ᴷ	TT 5×3 1/2×5/16 LLBB	120ᴷ SEE ABOVE
Q	20.9'	15.9ᴷ	20ᴷ	TT 5×3 1/2×5/16 LLBB	120ᴷ SEE ABOVE
	21.5'	± 50.2ᴷ	± 63ᴷ	TT 6×4×1/2 LLBB	(4/3)(58) = 77ᴷ @ L_u = 21.5'
12-J	21.7'	58.0ᴷ	73ᴷ	TT 5×3 1/2×5/16 LLBB	120ᴷ SEE ABOVE
	22.6"	60.4ᴷ	76ᴷ	do	do
	21.4'	± 46.6ᴷ	± 58ᴷ	TT 6×4×1/2 LLBB	77ᴷ @ L_u = 21.5' SEE ABOVE
	25.4'	± 69.7ᴷ	± 87ᴷ	TT 8×4×1 LLBB	(4/3)(91) = 121ᴷ @ L_u = 25.4'
12-B	27.9'	44.6ᴷ	56ᴷ	TT 5×3 1/2×5/16 LLBB	120ᴷ SEE ABOVE
	28.4'	45.4ᴷ	57ᴷ	do	do
	27.5'	± 39.2ᴷ	± 49ᴷ	W8×35	(4/3)(58) = 77ᴷ @ L_u = 27.5'
	30.0'	± 53.9ᴷ	± 68ᴷ	W8×48	(4/3)(70) = 93ᴷ @ L_u = 30.0'
12-S	29.9'	100.1ᴷ	125ᴷ	TT 6×4×3/8 LLBB	176ᴷ SEE ABOVE
	30.0'	± 110.8ᴷ	139ᴷ	W10×54	(4/3)(119) = 158ᴷ @ L_u = 30'
R	30.7'	22.0ᴷ	28ᴷ	TT 5×3 1/2×5/16 LLBB	120ᴷ SEE ABOVE
	34.5'	± 18.6ᴷ	24ᴷ	W8×58	(4/3)(66) = 88ᴷ @ L = 34.5'
34	26.5'	22.8ᴷ	29ᴷ	TT 5×3 1/2×5/16 LLBB	120ᴷ SEE ABOVE
	30.2'	± 22.3ᴷ	± 28ᴷ	W8×31	(4/3)(42) = 56ᴷ @ L_u = 30.2'
A	29.8'	24.8ᴷ	31ᴷ	TT 5×3 1/2×5/16 LLBB	120ᴷ SEE ABOVE
	20.9'	± 123.0ᴷ	± 154ᴷ	W8×48	(4/3)(142) = 189ᴷ @ L_u = 20.9'

N° OF 3/4" Ø A325 BOLTS = { 1.25F/9.9ᴷ S.S. ; 1.25F/18.6ᴷ D.S.

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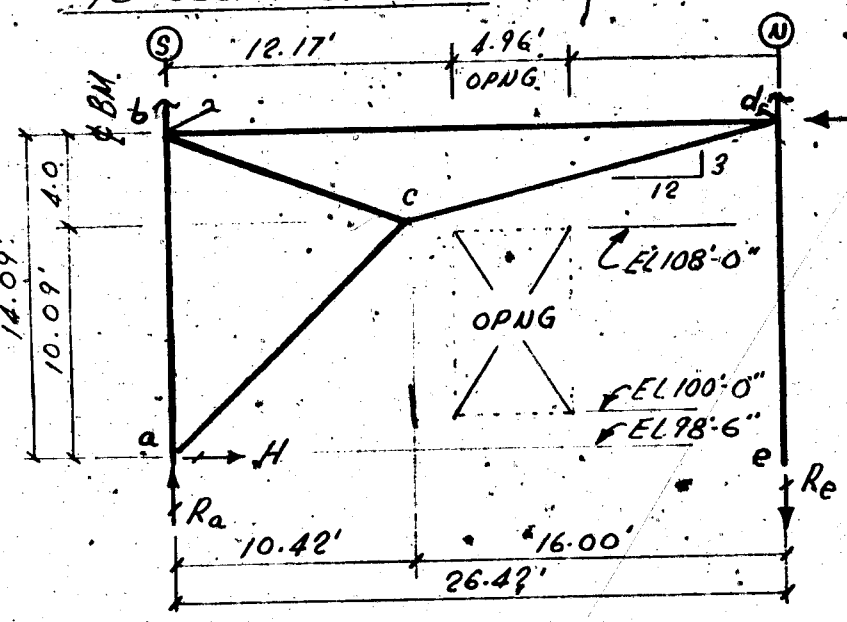
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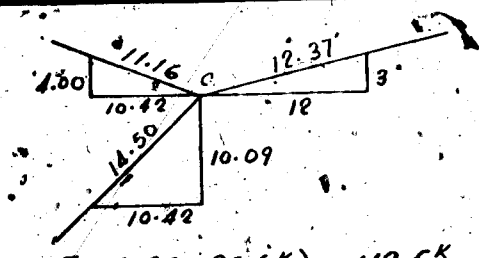
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FRAME 12-S

REVISED AT 1ST STORY TO CLEAR OPNG



FRM-12-S 1ST STORY PORTION



$F = (1.25 \times 95.6^K) = 119.5^K$

$R_e = R_a = F(14.09)/26.42 = 63.73^K$

$H = F = 119.5^K$

from F.B.D. & $\Sigma M_c = 0$:

$(bd) = \dfrac{H(10.09) - R_a(10.42)}{4.00}$

$(bd) = 135.42^K$ TENS.

$(cd) = [-H \div (bd)](12.37/12.0)$

$(cd) = -262.78^K$ COMPR.

$(bc) = [+(bd)](11.16/10.42)$

$(bc) = -145.04^K$ COMPR.

$(ac) = [-H](14.50/10.42)$

$(ac) = -166.29^K$ COMPR.

WITH FORCE F REVERSED:

$(bd) = -135.42^K$ COMPR.

$(cd) = 262.78^K$ TENS.

$(bc) = 145.04^K$ TENS

$(ac) = 166.29^K$ TENS

w/ DIAGONALS FLAT:

$l_x = 31.0'$
$l_y = 16.5'$

TRY W10x60 { $l_x/(r_x/r_y) = 31.0/1.71 = 18.2' > l_y$ ∴ x-x AXIS GOVERNS }

$P_{ALW} = 260^K$ AT $l_{ux} = 31.0'$

USE W10x60 DIAGONALS (FLAT) ac, bc, & cd

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DRAG-STRUTS

TO FRM-A → 15.1K x 1.25 = 19K ℄ L_u = 24.7'

TO FRM-B → 12.3K x 1.25 = 16K ℄ L_u = 21.1'

TT 4x4x1/4 → P_{allw} = (4/3)(21K) = 28K @ L_u = 24.7'

USE TT 4x4x1/4 DRAG-STRUTS AT FRMS A & B

DIAPHRAGM TO DIAPHRAGM CONN AT GRID 8 & GRID N

3RD LEVEL	50.8K
2ND LEVEL	42.9K

DESIGN · 50.8K x 1.25 = 64K ℄ L_u = 7.0' MAX

USE TT 6x4x 3/8 LLBB DRAG-STRUTS ⊥ TO FLR BMS.

DIAPHRAGM SHEAR

LOCATION		DIAPHRAGM		
FRM	LEVEL	DEPTH (FT)	SHEAR (KIP)	UNIT SHEAR (#/FT)
B	3RD	42.0'	(19.0+6.3)=25.3	603
	2ND	42.0'	(4.0+6.0)=10.0	238
N	3RD 3RD	42.0' 70.5'	(22.5+6.3)=28.8 (9.8+6.7)=16.5	686 234
	2ND 2ND	79.0' 70.5'	(8.5+6.0)=14.5 (11.8+3.9)=15.7	184 223
T	3RD	79.2'	43.0K	543
	2ND	—— NOT USED AT 2ND ——		
V	3RD	79.2'	43.9K	555
	2ND	79.2'	(10.8+13.0)=23.8	301
3	3RD	47.8'	46.5K	973
	2ND	47.8'	14.6K	306
12-S	3RD	38.8'	40.9K	1054
	2ND	38.8'	68.0K	1753

MARGINAL WELDS
(1150/1753)(12) = 7.9" 2ND
(1150/1054)(12) = 13.1" 3RD

SEE DIAPHRAGM SHEAR DIAGRAMS SHT N° 282 & N° 283

Continued

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DIAPHRAGM SHEAR continued

LOCATION		DIAPHRAGM		
FRM	LEVEL	DEPTH (FT)	SHEAR (KIP)	UNIT SHEAR (#/FT)
12-J & 12-B SOUTH OF GRID 12	3RD	69.2	99.6	1440
	2ND	69.2	84.5	1221
12-J & 12-B NORTH OF GRID 12	3RD	53.7	42.1	784
	2ND	91-8	43.9	478
A	3RD	*		
	2ND	24.2 FRM 105.7 DRAG	(18.2+9.6)=27.8 35.2	1149 330
P	3RD	*		
	2ND	94.0	30.3	322
Q	3RD	35.9	12.3	343
	2ND	35.9	(44.7+8.1)=52.8	1471
34	3RD	*		
	2ND	34.0'	34.6	581

(SEE SHT N°282 & N°283 FOR DIAPHRAGM SHEAR DIAGRAMS)

MARGINAL WELDS

$(1150/1471)(12) = 9.4"$ 2ND

$(1150/1440)(12) = 9.6"$ 3RD

* INDICATES FLEXIBLE ROOF DIAPHRAGM PORTION. SEE SHT N° 292

RIGID DIAPHRAGM PORTIONS

USE 1½" B-DECK 20 GA
COMPOSITE W/ 3½" REG WT CONC COVER (5" TOT. THK)
36" WIDTH
7 - PUDDLE WELD PATTERN
BUTTON PUNCH SEAMS @ 24" O.C.
MARGINAL WELDS 6" O.C., 9" O.C., & 12" O.C.

$V_{allow} = 2260$ #/' W/ BMS 7'-0" MAX O.C.
$F = 0.33$

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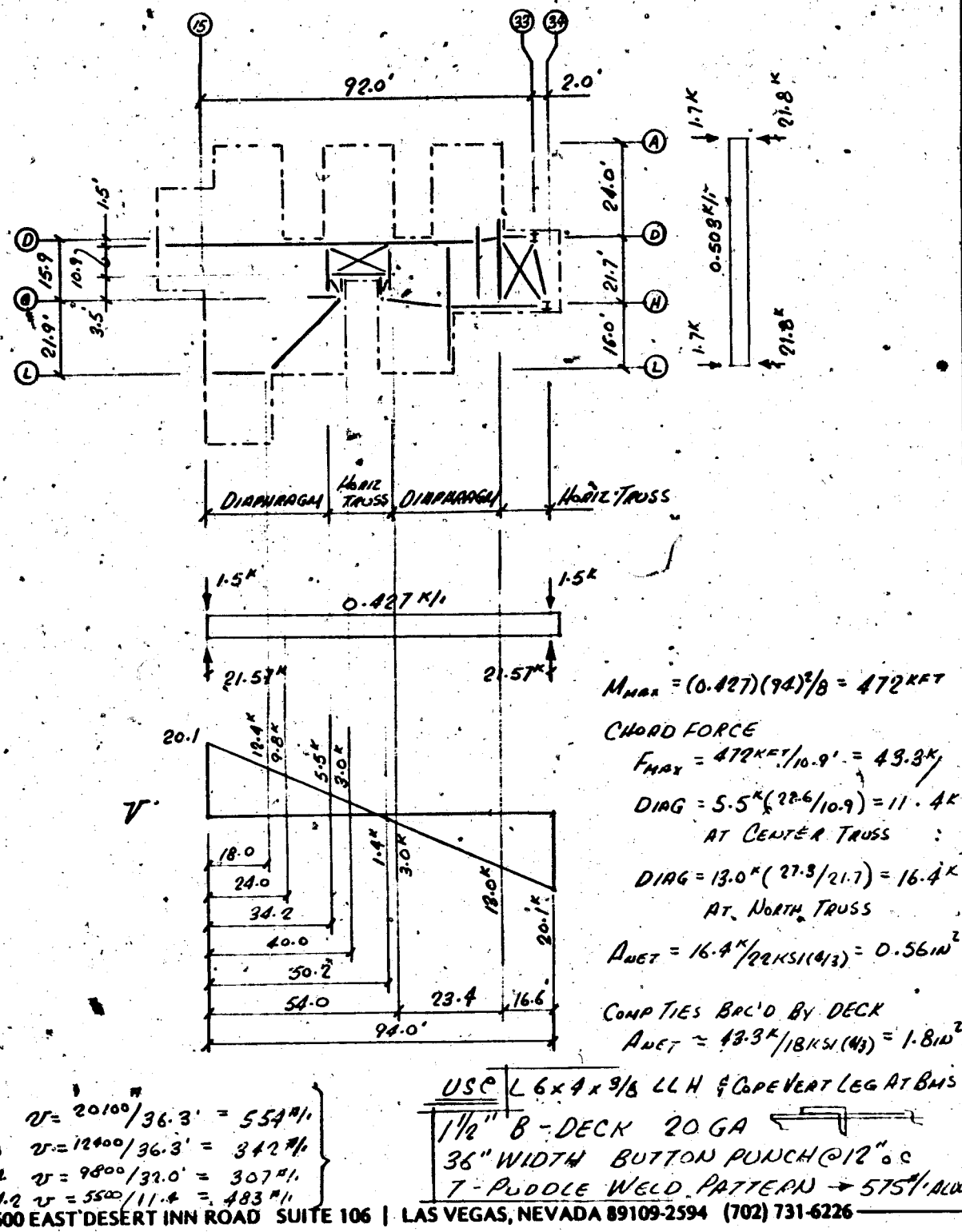
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FLEXIBLE ROOF DIAPHRAGM & HORIZ TRUSS IN PLANE OF ROOF



$M_{MAX} = (0.427)(94)^2/8 = 472^{K-FT}$

CHORD FORCE

$F_{MAX} = 472^{K-FT}/10.9' = 43.3^K$

$DIAG = 5.5^K(22.6/10.9) = 11.4^K$
AT CENTER TRUSS

$DIAG = 13.0^K(27.3/21.7) = 16.4^K$
AT NORTH TRUSS

$A_{NET} = 16.4^K/22KSI(4/3) = 0.56in^2$

COMP TIES BAC'D BY DECK

$A_{NET} = 43.3^K/18KSI(4/3) = 1.81in^2$

USE L 6x4x3/8 LLH & COPE VERT LEG AT BMS

1½" B-DECK 20 GA
36" WIDTH BUTTON PUNCH @12" o.c
7-PUDDLE WELD PATTEAN → 575#/' ALW

v_{DIA}

@ x = 0	$v = 20100^{\#}/36.3' =$	554 #/'
= 18	$v = 12400/36.3' =$	342 #/'
= 24	$v = 9800/32.0' =$	307 #/'
= 34.2	$v = 5500/11.4 =$	483 #/'

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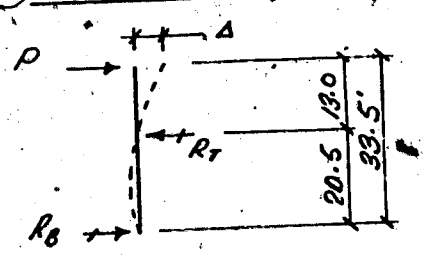
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FLEXIBLE ROOF DIAPHRAGM continued.

SWAY COLS AT HORIZ TRUSS COLS D-33 & H-34



$P = (21.6^K / 2\ Cols) = 10.8^K/Col$ SEISMIC LOAD'G

$R_T = (10.8 \times 33.5)/20.5 = 17.65^K$
$R_B = (10.8 \times 13.0)/20.5 = 6.85^K$
$M = 10.8 \times 13.0 = 140.4^{KFT}$

$$\Delta = \frac{(10.8)(13.0)^2(33.5)(1728)}{3(29\times10^3)(I)} = \frac{1214.5}{I} \leq \frac{13\times12}{200} = 0.78$$

$I > 1214.5/0.78 = 1557\ in^4$ SEISMIC

$P = (0.243^{Kli.})(94/2)/2 = 5.71^K/Col$ WIND LOAD'G

$$\Delta = (5.71/10.8)\left(\frac{1214.5}{I}\right) = \frac{642.1}{I} \leq \frac{13\times12}{400} = 0.39"$$

$I > 642.1/0.39 = 1646\ in^4$ WIND GOVERNS

TRY W12x170 { $I_x = 1650\ in^4$, $A = 50.0\ in^2$, $S_x = 235\ in^3$, $r_y = 3.22"$, $r_x = 5.74"$ }

CHECK COMBINED BEND'G & AXIAL

$13.0' < (76\ b_f/\sqrt{F_y})/12 = 13.26' \rightarrow F_b = 24KSI(4/3) = 32KSI$

$f_b = 140.4\times12/235 = 7.17KSI$

D-33 → P = 29.4K
H-34 → P = 21.2K

$f_a = 29.4^K\ MAX/50.0 = 0.59KSI$

$KL_x/r_x = 2(13.0\times12)/5.74 = 54.4 \rightarrow F'_e = (4/3)(50.47) = 67.30KSI$
$KL_y/r_y = 2(13.0\times12)/3.22 = 96.9 \rightarrow F_a = (4/3)(13.36) = 17.81KSI$

$f_a/F_a = 0.04 < 0.15$

UNITY EQUA → $0.04 + \frac{7.17}{32} = .0.27 < 1.0$

USE Col W12x170 AT D-33 & H-34

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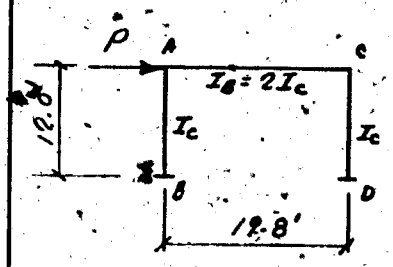
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FLEXIBLE ROOF DIAPHRAGM continued

SWAY FRMS ON GRIDS A & L 2ND STORY

SIDESWAY CORRECTION

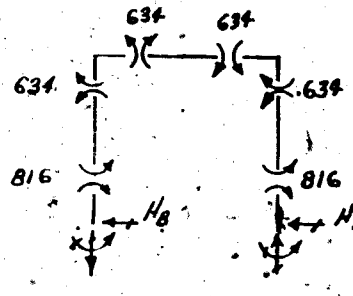


$K_{AB} = 1/12 = .083$ $DF_{AB} = 0.45$
$K_{AC} = 2/19.8 = .101$ $DF_{AC} = 0.55$
0.184

ARBITRARY SWAY OF 1000 KFT = $M_{FCal} = \frac{6EI\Delta}{L^2}$

	A		C	
	0.45	0.55	0.55	0.45
M_F	+1000	0	0	+1000
DIST	-450	-550	-550	-450
CO	0	-275	-275	0
DIST	+124	+151	+151	+124
CO	0	+76	+76	0
DIST	-34	-42	-42	-34
CO	0	+21	+21	0
DIST	-9	-12	-12	-9
CO	0	-6	-6	0
DIST	+3	+3	+3	-3
Σ	+634	-634	-634	+634

	B	D
	0	0
M_F	+1000	+1000
CO	-225	-225
CO	+62	+62
CO	-17	-17
CO	-4	-4
Σ	+816	+816



$H_B = H_D = \frac{(634+816)}{12.0} = 120.83^K$

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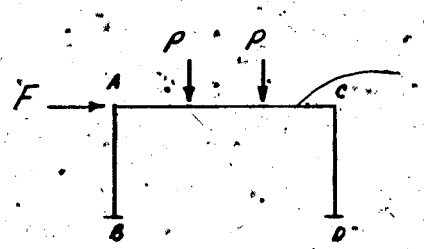
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FLEXIBLE ROOF DIAHRAGM continued

SWAY FRMS ON GRIDS A & C 2ND STORY



$P = 4.8^K$ REF BEAM B-37 NORTH ROOF FRMG

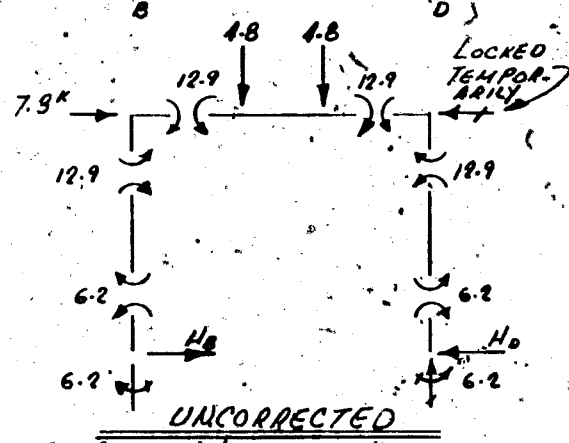
$$M_{F_{AC}} = \frac{4.8[(6.6)(13.2)^2 + (6.6)^2(13.2)]}{19.8^2} = 21.2^{KFT}$$

$F = 21.8^K/(3\text{-FRMS}) = 7.3^K/\text{FRM}$

	A		C	
	.45	.55	.55	.45
M_F	0	+21.2	-21.2	0
D	-9.5	-11.7	+11.7	+9.5
CO	0	+5.9	-5.9	0
D	-2.7	-3.2	+3.2	+2.7
CO	0	+1.6	-1.6	0
D	-0.7	-0.9	+0.9	+0.7
Σ	-12.9	+12.9	-12.9	+12.9

	B	D
M_F	0	0
CO	-4.8	+4.8
CO	-1.4	+1.4
Σ	-6.2	+6.2

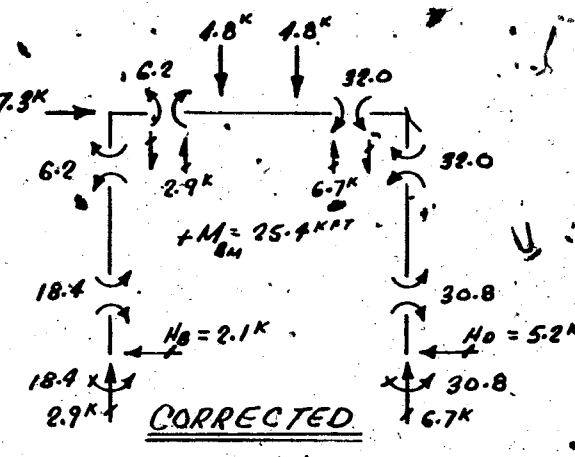
	A		C		B	D
	.45	.55	.55	.45	0	0
Muncol.	-12.9	+12.9	-12.9	+12.9	-6.2	+6.2
Corr.	+19.1	-19.1	-19.1	+19.1	+24.6	+24.6
M_{corr}	+6.2	-6.2	-32.0	+32.0	+18.4	+30.8



UNCORRECTED

$H_B = (12.9+6.2)/12.0 = 1.59^K$

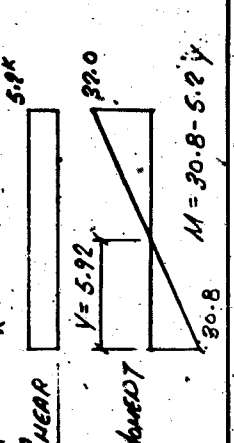
$H_D = (\ \ )/d_0 = 1.59^K$



CORRECTED

$H_B = (6.2+18.4)/12.0 = 2.1^K$

$H_D = (32.0+30.8)/12.0 = 5.2^K$



$\Sigma H = 7.3 + 1.59 - 1.59 = 7.3^K \neq 0$

$\therefore$ SIDESWAY CORR. FACTOR $= (7.3^K) + X(-120.83 - 120.83) = 0$

$X = 7.3/241.66 = +0.0302$ CORR. FACTOR

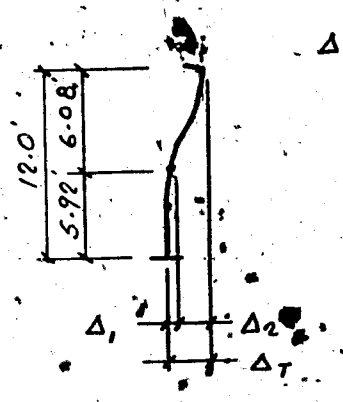
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FLEXIBLE ROOF DIAPHRAGM continued

SWAY FRMS ON GRIDS A & L 2ND STORY



$\Delta_T = (\Delta_1 + \Delta_2) = \frac{(5.2^K)(1728 IN^3/FT^3)}{3(29\times10^3 KSI)(I)}(5.92^3 + 6.08^3) = \frac{44.64}{I}$

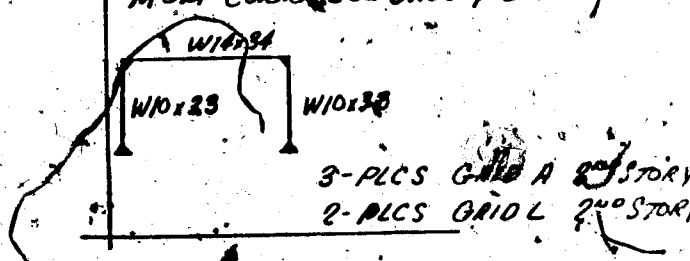
for $\Delta_T \leq 144/400 = 0.36" \rightarrow I \geq \frac{44.64}{0.36} = 124.0 IN^4$

COL W10x33 $I = 170 IN^4 > 124 IN^4$
for $L_u = 12' \rightarrow M_R = 64^{K FT.} > 32^{K FT.}$

BM W14x34 $I = 340 IN^4$
$M_R = 97^{K FT} > 32.0^{K FT}$

$I_{W14\,BM} = 2\,I_{W10\,COL}$ AS ASSUMED
& REL STIFF & DISTR. OK

USE MOM. RESIST. FRMS
W/ W10x33 COLS & W14x34 BM
MOM CONN COL BASE & BM TO COL



3-PLCS GRID A 2ND STORY
2-PLCS GRID L 2ND STORY

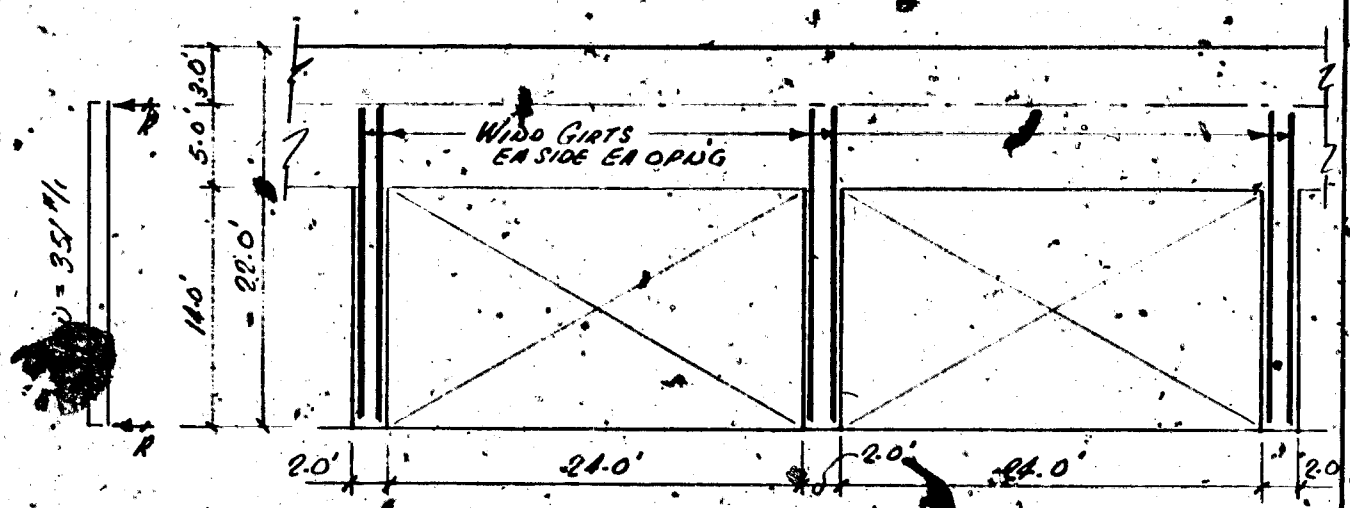
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WIND GIRTS AT ROLL-UP-DOOR OPNGS.



$p = C_e C_q q_s I$

$p = (1.2)(1.3)(15 PSF)(1.15) = 27 PSF$

$\therefore w = (26'/2)(27 PSF) = 351 \#/'$

$R = 3.34^k$

$M = 15.9^{KFT}$

$\Delta = \frac{5(.351)(19.0)^4(1728)}{384(29\times10^3)(I)} = \frac{35.5}{I} < \frac{19\times12}{180} = 0.57''$

$I \geq 35.5/0.57 = 62.3 in^4$

C12 x 20.7 $I = 129 in^4$

$F_b = \frac{12\times10^3 \#'}{14\times12\times8.18} = 8.78 KSI$

$M_R = (1/3 \times 8.78 KSI)(24.5 in^3)/12 = 21.0^{KFT}$ ✓

USE C12 x 20.7 VERT WIND GIRTS AT ROLL-UP DOOR OPNGS

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COMBINED BEND'G & AXIAL LOAD from LATERAL ANALYSIS

FRM-B

BEAM B-8 2ND & 3RD LEVELS
BEAM B-33 PLAZA LEVEL

— $P = (78.1^K \times 1.25)$ & $M = 46.1^{KFT}$ ← DESIGN MAXIMUMS

W14 x 43 { $A = 12.6 in^2$, $r_y = 1.89$; $S_x = 62.7 in^3$, $r_x = 5.82''$ }

$Kl_x/r_x = 20.67 \times 12 / 5.82 = 42.6 \rightarrow F'_e = (4/3)(82.32) = 109.76 KSI$

$Kl_y/r_y = 20.67 \times 12 / 1.89 = 131.2 \rightarrow F_a = (4/3)(8.67) = 11.56 KSI$

$f_a = (1.25 \times 78.1)/12.6 = 7.75 KSI \rightarrow f_a/F_a = .67$

$f_b = 46.1 \times 12 / 62.7 = 8.82 KSI \qquad F_b = (4/3)(24) = 32 KSI$

UNITY EQUA. $0.67 + \frac{8.82}{(1 - \frac{7.75}{109.76})\,32} = 0.97 < 1.0$ OK

USE W14 x 43 for B-8 2ND & 3RD FLR & B-33 PLAZA

FRM-N

BEAMS B-12 & B-25 2ND & 3RD LEVELS
BEAMS B-29 & B-30 PLAZA LEVEL

— $P = (93.9^K \times 1.25)$ & $M = 39.8^{KFT}$ ← DESIGN MAXIMUMS

W14 x 43 { $A = 12.6 in^2$, $r_y = 1.89$; $S_x = 62.7 in^3$, $r_x = 5.82$ }

$Kl_x/r_x = 17.92 \times 12 / 5.82 = 37.0 \rightarrow F'_e = (4/3)(109.08) = 145.44 KSI$

$Kl_y/r_y = 17.92 \times 12 / 1.89 = 113.8 \rightarrow F_a = (4/3)(11.15) = 14.87 KSI$

$f_a = (1.25 \times 93.9)/12.6 = 9.32 KSI \rightarrow f_a/F_a = 0.63$

$f_b = 39.8 \times 12 / 62.7 = 7.62 KSI$

UNITY EQUA. $0.63 + \frac{7.62}{(1 - \frac{9.32}{145.44})(29.33)} = 0.91 < 1.0$ OK

USE W14 x 43 for B-12 & B-25 2ND & 3RD FLRS & B-29 & B-30 PLAZA LEVEL

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COMBINED BEND'G & AXIAL LOAD continued

FRM-3

BEAM B-36 2ND & 3RD LEVELS
— P = (128.0K x 1.25) & M = 54.9 KFT ← DESIGN MAXIMUMS
W14x43 { A = 12.6 ry = 1.89 ; S = 62.7 rx = 5.82 }

Kl_x/r_x = 17.13x12/5.82 = 35.3 → F'_e = (4/3)(119.90) = 159.86 KSI
Kl_y/r_y = 13.13x12/1.89 = 83.4 → F_a = (4/3)(14.97) = 19.96 KSI

f_a = (1.25x128.0)/12.6 = 12.70 KSI → f_a/F_a = 0.64

f_b = 54.9x12/62.7 = 10.51 KSI

UNITY EQUA. $0.64 + \frac{10.51}{(1-\frac{12.70}{159.86})(32)} = 0.997 \leq 1.0$ OK

USE W14x43 for B-36 2ND & 3RD LEVELS

FRM-U

BEAM B-19 2ND LEVEL & FUTURE 3RD LEVEL EXTENDED
— P = (47.0K x 1.25) & M = 39.3 KFT ← DESIGN MAXIMUMS
W18x40 { A = 11.8 in² ry = 1.27" ; S = 68.4 in³ rx = 7.21" }

Kl_x/r_x = 27.67x12/7.21 = 46.1 → F'_e = (4/3)(70.27) = 93.69 KSI
Kl_y/r_y = 18.63x12/1.27 = 176.0 → F_a = (4/3)(1.82) = 6.43 KSI

f_a = 47x1.25/11.8 = 4.98 KSI → f_a/F_a = 0.78

f_b = 39.3x12/68.4 = 6.89

UNITY EQUA $0.78 + \frac{6.89}{(1-\frac{4.98}{93.69})(32)} = 1.007 \simeq 1.0$ SAY OK

USE W18x40 for B-19 2ND LEVEL

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COMBINED BEND'G & AXIAL LOAD continued

FRM - T BEAM B-47 2ND LEVEL

— P = (44.5K x 1.25) & M = 467.3 KFT ← DESIGN MAX
W 27 x 94 { A = 27.7 in² ry = 2.12" ; S = 243 in³ rx = 10.9" }

Kl_x/r_x = 28.16 x 12/10.9 = 31.0 → F'_e = (4/3)(155.39) = 207.19 KSI
Kl_y/r_y = 7.04 x 12/2.12 = 39.9 → F_a = (4/3)(19.20) = 25.60 KSI

f_a = (1.25 x 44.5)/27.7 = 2.01 KSI → f_a/F_a = 0.08 < 0.15

f_b = 467.8 x 12/243 = 23.08

UNITY EQUA 0.08 + 23.08/32 = 0.81 < 1.0 OK

USE W27x94 for B-47 2ND LEVEL

BEAM B-31 3RD LEVEL

— P = (44.5K x 1.25) & M = 79.4 KFT ← DESIGN MAX
W14 x 53 { A = 15.6 in² ry = 1.92" ; S = 77.8 in³ rx = 5.89" }

Kl_x/r_x = 28.17 x 12/5.89 = 57.4 → F'_e = (4/3)(45.33) = 60.44 KSI
Kl_y/r_y = 28.17 x 12/1.92 = 176.1 → F_a = (4/3)(4.81) = 6.41 KSI

f_a = (1.25 x 44.5)/15.6 = 3.57 KSI → f_a/F_a = 0.56

f_b = 79.4 x 12/77.8 = 12.25 KSI

UNITY EQUA $0.56 + \frac{12.25}{(1 - \frac{3.57}{60.44})(32)}$ = 0.97 < 1.0 OK

USE W14x53 for B-31 3RD LEVEL

FRM - Q BEAMS B-28 & B-55 N.ROOF & 2ND LEVEL RESPECTIVELY

— P = (37.9K x 1.25) & M = 24.0 KFT ← DESIGN MAXIMUMS
W12 x 26 { A = 7.65 in² ry = 1.51" ; S = 33.4 in³ rx = 5.17" }

Kl_x/r_x = 16.2 x 12/5.17 = 37.6 → F'_e = (4/3)(105.68) = 140.91 KSI
Kl_y/r_y = 16.2 x 12/1.51 = 128.8 → F_a = (4/3)(9.0) = 12.0 KSI

f_a = (1.25 x 37.9)/7.65 = 6.20 KSI → f_a/F_a = 0.52

f_b = 24 x 12/33.4 = 8.62 KSI

UNITY EQUA $0.52 + \frac{8.62}{(1 - \frac{6.2}{120.91})(32)}$ = 0.80 < 1.0 OK

USE W12x26 for B-28 N. ROOF & B-55 N. 2ND

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COMBINED BEND'G & AXIAL LOAD ~~continued~~

FRM-12-B BEAM B-16 2ND & 3RD LEVELS

— $P = (47.9^K \times 1.25)$ & $M = 251.3^{KFT}$ ← DESIGN MAX

W 24 × 68 $\begin{cases} A = 20.1 in^2 & r_y = 1.87" \\ S = 154.0 in^3 & r_x = 9.55" \end{cases}$

$Kl_x/r_x = 27.21 \times 12/9.55 = 34.2 \rightarrow F'_e = (1/3)(127.72) = 170.29 KSI$

$Kl_y/r_y = 7.0 \times 12/1.87 = 44.9 \rightarrow F_a = (1/3)(18.78) = 25.04 KSI$

$f_a = (1.25 \times 47.9)/20.1 = 2.98 KSI \rightarrow f_a/F_a = 0.12 < 0.15$

$f_b = 251.3 \times 12/154.0 = 19.58 KSI$

UNITY EQUA $0.12 + \frac{19.58}{32} = 0.73 < 1.0$ OK

USE W 24 × 68 for B-16 2ND & 3RD LEVELS

BEAM B-62 N. ROOF

— $P = (43.5^K \times 1.25)$ & $M = 149.4^{KFT}$ ← DESIGN MAX

W 21 × 44 $\begin{cases} A = 13.0 in^2 & r_y = 1.26" \\ S = 81.6 in^3 & r_x = 8.06" \end{cases}$

$Kl_x/r_x = 27.3 \times 12/8.06 = 40.7 \rightarrow F'_e = (4/3)(90.18) = 120.24 KSI$

$Kl_y/r_y = 7.0 \times 12/1.26 = 66.7 \rightarrow F_a = (4/3)(16.77) = 22.36 KSI$

$f_a = (1.25 \times 43.5)/13.0 = 4.18 \rightarrow f_a/F_a = 0.19$

$f_b = 149.4 \times 12/81.6 = 21.97 KSI$

UNITY EQUA. $0.19 + \frac{21.97}{(1 - \frac{4.18}{120.24})(32)} = 0.90 < 1.0$ OK

USE W 21 × 44 for B-62 N. ROOF

BEAM B-80 N. 2ND LEVEL.

— $P = (47.9^K \times 1.25)$ & $M = 195.4^{KFT}$ ← DESIGN MAX

W 24 × 55 $\begin{cases} A = 16.2 in^2 & r_y = 1.34" \\ S = 114 in^3 & r_x = 9.11" \end{cases}$

$Kl_x/r_x = 27.3 \times 12/9.11 = 36.0 \rightarrow F'_e = (4/3)(115.22) = 153.62 KSI$

$Kl_y/r_y = 7.0 \times 12/1.34 = 62.7 \rightarrow F_a = (4/3)(17.17) = 22.89 KSI$

$f_a = (1.25 \times 47.9)/16.2 = 3.70 KSI \rightarrow f_a/F_a = 0.16$

$f_b = 195.4 \times 12/114 = 20.57 KSI$

UNITY EQUA. $0.16 + \frac{20.57}{(1 - \frac{3.70}{153.62})32} = 0.82 < 1.0$ OK

USE W 24 × 55 for B-80 N. 2ND LEVEL

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COMBINED BEND'G & AXIAL LOAD continued

FRM - 12-J BEAM B-14 2ND & 3RD LEVELS

P = (56.1K x 1.25) ℄M = 129.9 KFT ← DESIGN MAX

W24 x 55 { A = 16.2 IN² ry = 1.34" ; S = 114 IN³ rx = 9.11" }

Kl_x/r_x = 21.0 x 12 / 9.11 = 27.7 → F'_e = (4/3)(194.18) = 259.70 KSI

Kl_y/r_y = 7.0 x 12 / 1.34 = 62.7 → F_a = (4/3)(17.17) = 22.89 KSI

f_a = (1.25 x 56.1) / 16.2 = 4.33 KSI → f_a/F_a = 0.19

f_b = 129.9 x 12 / 114 = 13.67 KSI

UNITY EQUA $0.19 + \frac{13.67}{(1 - \frac{4.33}{259.70})(32)} = 0.63 < 1.0$

USE W24 x 55 for B 14 2ND & 3RD FLRS

BEAM B-74 N. ROOF

P = (56.1K x 1.25) ℄M = 48.8 KFT ← DESIGN MAX

W14 x 38 { A = 11.2 IN² ry = 1.55" ; S = 54.6 IN³ rx = 5.87" }

Kl_x/r_x = 21.0 x 12 / 5.87 = 43.0 → F'_e = (4/3)(80.76) = 107.68 KSI

Kl_y/r_y = 12.2 x 12 / 1.55 = 94.5 → F_a = (4/3)(13.66) = 18.21 KSI

f_a = (1.25 x 56.4) / 11.2 = 6.26 KSI → f_a/F_a = 0.35

f_b = 48.8 x 12 / 54.6 = 10.73 KSI $F_b = (4/3)(\frac{90 KFI \times 12}{54.6 IN^3})$

UNITY EQUA. $0.35 + \frac{10.73}{(1 - \frac{6.26}{107.68})(26.3)} = 0.79 < 1.0$

USE W14 x 38 for B-74 N. ROOF

BEAM B-78 N. 2ND LEVEL

P = (56.5K x 1.25) ℄M = 78.4 KFT ← DESIGN MAX

W16 x 36 { A = 10.6 IN² ry = 1.52" ; S = 56.5 IN³ rx = 6.51" }

Kl_x/r_x = 21.0 x 12 / 6.51 = 38.7 → F'_e = (4/3)(99.75) = 133.0 KSI

Kl_y/r_y = 7.0 x 12 / 1.52 = 55.3 → F_a = (4/3)(17.87) = 23.82 KSI

f_a = (1.25 x 56.5) / 10.6 = 6.67 KSI → f_a/F_a = 0.28

f_b = 78.4 x 12 / 56.5 = 16.65 KSI

UNITY EQUA $0.28 + \frac{16.65}{(1 - \frac{6.67}{133.0})(32)} = 0.83 < 1.0$

USE W16 x 36 for B-78 N. 2ND LEVEL

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COMBINED BEND'G & AXIAL LOAD continued

FRM-12-S BEAM B-43 2ND & 3RD LEVELS

— $P = (97.2^{K} \times 1.25)$ & $M = 212.4^{KFT}$ ← DESIGN MAX

W 24x62 $\begin{cases} A = 18.2 in^2 & r_y = 1.38'' \\ S = 131.0 in^3 & r_x = 9.23'' \end{cases}$

$Kl_x/r_x = 26.4 \times 12 / 9.23 = 34.4 \rightarrow F'_e = (4/3)(126.26) = 168.34\ KSI$

$Kl_y/r_y = 7.0 \times 12 / 1.38 = 60.9 \rightarrow F_a = (4/3)(17.34) = 23.12\ KSI$

$f_a = (1.25 \times 97.2)/18.2 = 6.68\ KSI \rightarrow f_a/F_a = 0.29$

$f_b = 212.4 \times 12 / 131 = 19.46\ KSI$

UNITY EQUA $0.29 + \dfrac{19.46}{(1 - \frac{6.68}{168.34})(32)} = 0.93 < 1.0$

USE W24x62 for B-43 2ND & 3RD FLRS

FRM-P BEAM B-73 N. 2ND LEVEL

— $P = (15.2^{K} \times 1.25)$ & $M = 320.1^{KFT}$ ← DESIGN MAX

W 24x76 $\begin{cases} A = 22.4 in^2 & r_y = 1.92'' \\ S = 176 in^3 & r_x = 9.69'' \end{cases}$

$Kl_x/r_x = 28.2 \times 12 / 9.69 = 35.0 \rightarrow F'_e = (4/3)(121.90) = 162.50\ KSI$

$Kl_y/r_y = 7.0 \times 12 / 1.92 = 43.8 \rightarrow F_a = (4/3)(18.88) = 25.17\ KSI$

$f_a = (1.25 \times 15.2)/22.4 = 0.85\ KSI \rightarrow f_a/F_a = 0.04 < 0.15$

$f_b = 320.1 \times 12 / 176 = 21.83$

UNITY EQUA $0.04 + \dfrac{21.83}{32} = 0.73 < 1.0$

USE W24x76 for B-73 N. 2ND LEVEL

FRM-34 BEAM B-29 N. 2ND LEVEL

— $P = (20.1 \times 1.25)$ & $M = 77.1^{KFT}$ ← DESIGN MAX

W16x36 $\begin{cases} A = 10.6 in^2 & r_y = 1.52'' \\ S = 56.5 in^3 & r_x = 6.51'' \end{cases}$

$Kl_x/r_x = 23.4 \times 12 / 6.51 = 43.2 \rightarrow F'_e = (4/3)(80.03) = 106.70\ KSI$

$Kl_y/r_y = 23.4 \times 12 / 1.52 = 184.8 \rightarrow F_a = (4/3)(4.37) = 5.83\ KSI$

$f_a = (1.25 \times 20.1)/10.6 = 2.37\ KSI \rightarrow f_a/F_a = 0.41$

$f_b = 77.1 \times 12 / 56.5 = 16.38\ KSI$

UNITY EQUA $0.41 + \dfrac{16.38}{(1 - \frac{2.37}{106.70})(32)} = 0.94 < 1.0$

USE W16x36 for B-29 N. 2ND LEVEL

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COMBINED BEND'G & AXIAL LOAD continued

FRM-A

BEAM B-37 N. 2ND LEVEL

P = (88.3^K x 1.25) & M = 38.9^{KFT} ← DESIGN MAX

W 14 x 34 { A = 10.0 in^2, r_y = 1.53 ; S = 48.6 in^3, r_x = 5.83 }

Kl_x/r_x = 24.2 x 12 / 5.83 = 49.8 → F'_a = (4/3)(60.22) = 80.30 KSI

Kl_y/r_y = 12.1 x 12 / 1.53 = 94.9 → F_a = (4/3)(13.61) = 18.14 KSI

f_a = (1.25 x 88.3) / 10.0 = 11.04 KSI → f_a/F_a = 0.61

f_b = 38.9 x 12 / 48.6 = 9.61 KSI

UNITY EQUA $0.61 + \frac{9.61}{(1 - \frac{11.04}{80.80})(32)} \doteq 0.96 < 1.0$

USE | W14 x 34 w/ BOTT FLNG BRACED @ MID Pt for B-37 N. 2ND LEVEL

BRACE TT 3x3x1/4 w/ 2 - 3/4" Ø EA END COUNTER 3/8"

1600 EAST DESERT INN ROAD SUITE 106 | LAS VEGAS, NEVADA 89109-2594 (702) 731-6226

JACKIE B. 2-12-86

ELEC. ONLY PLBG. ONLY, A.C. ONLY

OWNER		DATE
ADDRESS		
CONTRACTOR	PERMIT NO.	FINAL INSPECTION
LOT / BLOCK / SUBDIVISION		
LOG NO. Card Reading Sys	AREA	

ELECTRIC ONLY		PLUMBING ONLY	
Contractor	Gifford Elec	Contractor	
Permit No.	961	Permit No.	
Rough Elec	RP5-29-84	Rough Soil	
Final Rough		Rough Water	
Final Elec.	RP6-18-84	Top Out	
Temp. Service		Rough Gas	
HEAT & VENT. A/C ONLY		Final Plbg.	
Contractor		Final Gas	
Permit No.		Sewer Final	
A/C Rough Duct			
Rough Gas			
Final A/C			
Final Gas			

79-3-15 (R11-81) DEPT. OF BLDG. & SAFETY
CITY OF LAS VEGAS

501 N CASINO CT 6
Fire Station

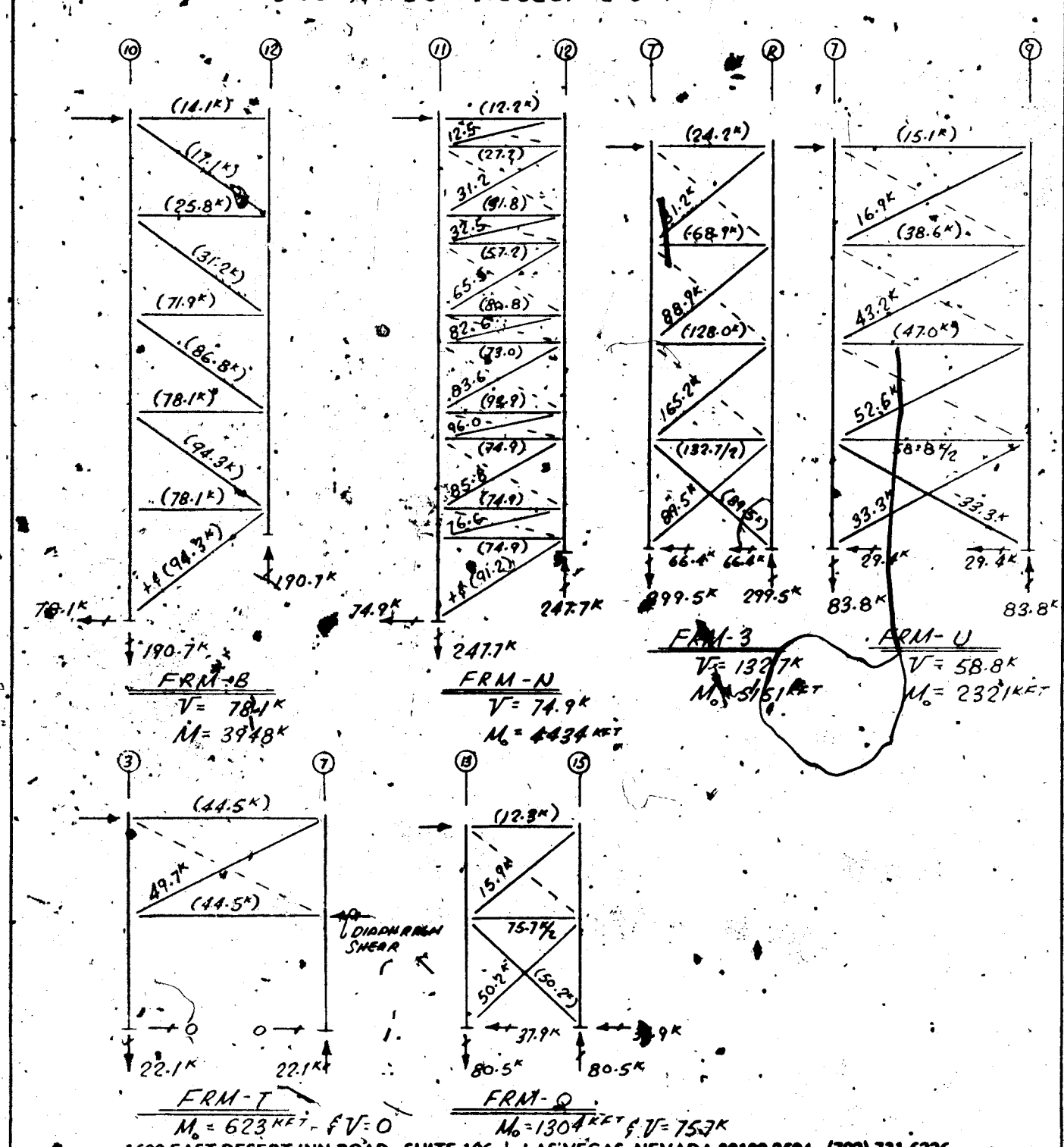
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STRAUSS & LOFTFIELD
STRUCTURAL ENGINEERS

CLIENT/ SHEET/ 300 OF 317
PROJECT/ PROJECT # 82017
DATE/ OCT. '82
ENGINEER/ HS

BRACED FRMS

SEE NOTES PRECEDING SHT.



Dora Hasel 12/31/87

STRAUSS & LOFTFIELD
STRUCTURAL ENGINEERS

CLIENT/ SHEET/ 301 OF 317
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DATE/ OCT '82
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BRC'D FRM'S

BRC'G LIMITED TO 9" DIMEN ⊥ TO PLANE OF FRM.

	DIAGONALS				
FRM	LENGTH	FORCE	1.25×F	MEMBER	F ALLOWABLE.
B	25.0'	± 94.3ᴷ	± 118ᴷ	W8x48	(4/3)(102) = 136ᴷ @ L_u = 25.0'
	26.2'	± 94.3ᴷ	± 118ᴷ	W8x58	(4/3)(114) = 152ᴷ @ L_u = 26.2'
N	18.3'	96.0ᴷ	120ᴷ	2L 6x4x3/8 LLBB	(4/3)(7.22-1.22)(22) = 176ᴷ
	20.5'	85.8ᴷ	108ᴷ	do	do
	21.6'	± 91.2ᴷ	± 114ᴷ	W8x40	(4/3)(108) = 144ᴷ @ L_u = 21.6'
3	22.2'	165.2ᴷ	207ᴷ	2L 6x4x1/2 LLBB	(4/3)(9.50-7.63)(22) = 231ᴷ
	22.5'	± 89.5ᴷ	± 112ᴷ	2L 8x4x1 LLBB	(4/3)(117) = 156ᴷ @ L_u = 22.5'
U	31.0'	52.6ᴷ	66ᴷ	2L 5x3 1/2 x 5/16	(4/3)(5.12-1.02)(22) = 120ᴷ
	31.2'	± 33.3ᴷ	± 42ᴷ	W8x35	(4/3)(45) = ᴷ @ L_u = 31.2'
T	31.5'	49.7ᴷ	62ᴷ	2L 5x3 1/2 x 5/16 LLBB	120ᴷ SEE ABOVE
Q	20.9'	15.9ᴷ	20ᴷ	2L 5x3 1/2x 5/16 LLBB	120ᴷ SEE ABOVE
	21.5'	± 50.2ᴷ	± 63ᴷ	2L 6x4x1/2 LLBB	(4/3)(58) = 77ᴷ @ L_u = 21.5'
12-J	21.7'	58.0ᴷ	73ᴷ	2L 5x3 1/2 x 5/16 LLBB	120ᴷ SEE ABOVE
	22.6'	60.4ᴷ	76ᴷ	do	do
	21.4'	± 46.6ᴷ	± 58ᴷ	2L 6x4x1/2 LLBB	77ᴷ @ L_u = 21.5' SEE ABOVE
	25.4'	± 69.7ᴷ	± 87ᴷ	2L 8x4x1 LLBB	(4/3)(91) = 121ᴷ @ L_u = 25.4'
12-B	27.9'	44.6ᴷ	56ᴷ	2L 5x3 1/2x 5/16 LLBB	120ᴷ SEE ABOVE
	28.4'	45.4ᴷ	57ᴷ	do	do
	27.5'	± 39.2ᴷ	± 49ᴷ	W8x35	(4/3)(58) = 77ᴷ @ L_u = 27.5'
	30.0'	± 53.9ᴷ	± 68ᴷ	W8x48	(4/3)(70) = 93ᴷ @ L_u = 30.0'
12-S	29.9'	100.1ᴷ	125ᴷ	2L 6x4x3/8 LLBB	176ᴷ SEE ABOVE
	30.0'	± 110.8ᴷ	139ᴷ	W10x54	(4/3)(119) = 158ᴷ @ L_u = 30'
P	30.7'	22.0ᴷ	28ᴷ	2L 5x3 1/2 x 5/16 LLBB	120ᴷ SEE ABOVE
	34.5'	± 18.6ᴷ	24ᴷ	W8x58	(4/3)(66) = 88ᴷ @ L_u = 34.5'
34	26.5'	22.8ᴷ	29ᴷ	2L 5x3 1/2 x 5/16 LLBB	120ᴷ SEE ABOVE
	30.2'	± 22.3ᴷ	± 28ᴷ	W8x31	(4/3)(42) = 56ᴷ @ L_u = 30.2'
A	29.8'	24.8ᴷ	31ᴷ	2L 5x3 1/2 x 5/16 LLBB	120ᴷ SEE ABOVE
	20.9'	± 123.0ᴷ	± 154ᴷ	W8x48	(4/3)(142) = 189ᴷ @ L_u = 20.9'

N° OF 3/4"ϕ A325 BOLTS = { 1.25 F / 9.3ᴷ S.S. ; 1.25 F / 18.6ᴷ D.S. }

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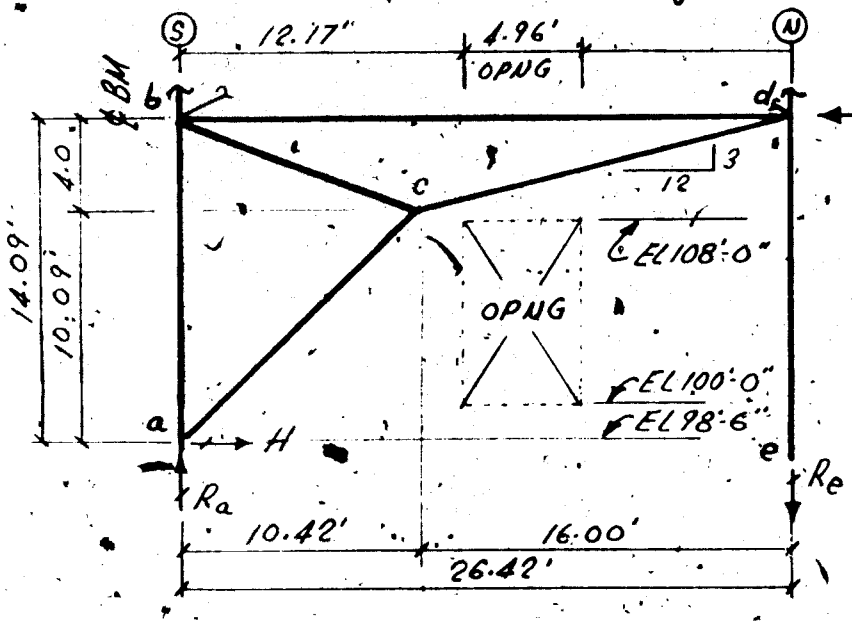
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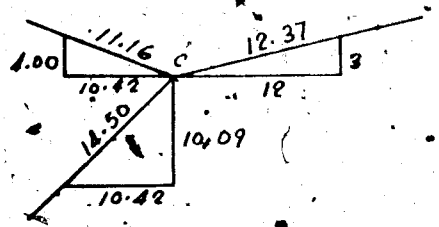
CLIENT/
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PROJECT No 8207
DATE/ OCT'87
ENGINEER/ HS

FRAME 12-S

REVISED AT 1ST STORY TO CLEAR OPNG



FRM-12-S 1ST STORY PORTION



$F = (1.25 \times 95.6^K) = 119.5^K$

$R_e = R_a = F(14.09)/26.42 = 63.73^K$

$H = F = 119.5^K$

from F.B.D. & $\Sigma M_c = 0$:

$(bd) = \dfrac{H(10.09) - R_a(10.42)}{4.00}$

$(bd) = 135.42^K$ TENS.

$(cd) = [-H-(bd)](12.37/12.0)$

$(cd) = -262.78^K$ COMPR.

$(bc) = [-(bd)](11.16/10.42)$

$(bc) = -145.04^K$ COMPR.

$(ac) = [-H](14.50/10.42)$

$(ac) = -166.29^K$ COMPR.

WITH FORCE F REVERSED:

$(bd) = -135.42^K$ COMPR.

$(cd) = 262.78^K$ TENS.

$(bc) = 145.04^K$ TENS

$(ac) = 166.29^K$ TENS

W/ DIAGONALS FLAT:

$l_x = 31.0'$, $l_y = 16.5'$ → TRY W10x60 → $l_x/(r+l_y) = 31.0/1.71 = 18.2' > l_y$ ∴ x-x AXIS GOVERNS

$P_{ALW} = 260^K$ AT $l_{ux} = 31.0'$,

USE W10x60 DIAGONALS (FLAT) ac, bc, & cd

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CLIENT/ — SHEET/ 363 OF 317
PROJECT/ — PROJECT # 82017
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ENGINEER/ HS

DRAG-STRUTS

TO FRM-A → 15.1K x 1.25 = 19K. ℄ L_U = 24.7'

TO FRM-B → 12.3K x 1.25 = 16K ℄ L_U = 21.1'

TT 4x4x1/4 → P_{ALLW} = (4/3)(21K) = 28K @ L_U = 24.7'

USE | TT 4x4x1/4 DRAG-STRUTS AT FRMS A & B

DIAPHRAGM TO DIAPHRAGM CONN AT GRID 8 & GRID N

3RD LEVEL 50.8K
2ND LEVEL 42.9K

DESIGN 50.8K x 1.25 = 64K ℄ L_U = 7.0' MAX

USE | TT 6x4x 3/8 LLBB DRAG-STRUTS ⊥ TO FLR BMS

DIAPHRAGM SHEAR

LOCATION		DIAPHRAGM		
FRM	LEVEL	DEPTH (FT)	SHEAR (KIP)	UNIT SHEAR (#/FT)
B	3RD	42.0'	(19.0+6.3)=25.3	603
	2ND	42.0'	(4.0+6.0)=10.0	238
N	3RD 3RD	42.0' 70.5'	(22.5+6.3)=28.8 (9.8+6.7)=16.5	686 234
	2ND 2ND	79.0' 70.5'	(8.5+6.0)=14.5 (11.8+3.9)=15.7	184 223
T	3RD	79.2'	43.0K	543
	2ND	—— NOT USED AT 2ND ——		
U	3RD	79.2'	43.9K	555
	2ND	79.2'	(10.8+13.0)=23.8	301
3	3RD	47.8'	46.5K	973
	2ND	47.8'	14.6K	306
12-S	3RD	38.8'	40.9K	1054
	2ND	38.8'	68.0K	1753

MARGINAL WELDS
(1150/1753)(12) = 7.9" 2ND
(1150/1054)(12) = 13.1" 3RD

SEE DIAPHRAGM SHEAR DIAGRAMS SHT N° 282 & N° 283

Continued

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DIAPHRAGM SHEAR continued

LOCATION		DIAPHRAGM		
FRM	LEVEL	DEPTH (FT)	SHEAR (KIP)	UNIT SHEAR (#/FT)
12-J & 12-B South of Grid 12	3RD.	69.2	99.6	1440
	2ND	69.2.	84.5	1221
12-J & 12-B North of Grid 12	3RD	53.7	42.1	784
	2ND	91.8	43.9	478
A	3RD	*		
	2ND	24.2 FRM 105.7 DRAG	(18.2+9.6)=27.8 35.2	1149 330
P	3RD	*		
	2ND	94.0	30.3	322
Q	3RD	35.9	12.3	343
	2ND	35.9	(44.7+8.1)=52.8	1471
34	3RD	*		
	2ND	34.0'	34.6	581

[SEE SHT N°282 & N°283 FOR DIAPHRAGM SHEAR DIAGRAMS

MARGINAL WELDS

$(1150/1471)(12) = 9.4''$ 2ND

$(1150/1440)(12) = 9.6''$ 3RD

* INDICATES FLEXIBLE ROOF DIAPHRAGM PORTION. SEE SHT N° 292

RIGID DIAPHRAGM PORTIONS

USE: 1 1/2" B-DECK 20 GA
COMPOSITE W/3 1/2" REG WT CONC COVER (5" TOT. THK)
36" WIDTH
7 - PUDDLE WELD PATTERN
BUTTON PUNCH SEAMS @ 24" o.c.
MARGINAL WELDS 6" o.c., 9" o.c., & 12" o.c.

$V_{allow} = 2260$ #/' w/ BMS 7'-0" MAX O.C.
$F = 0.33$

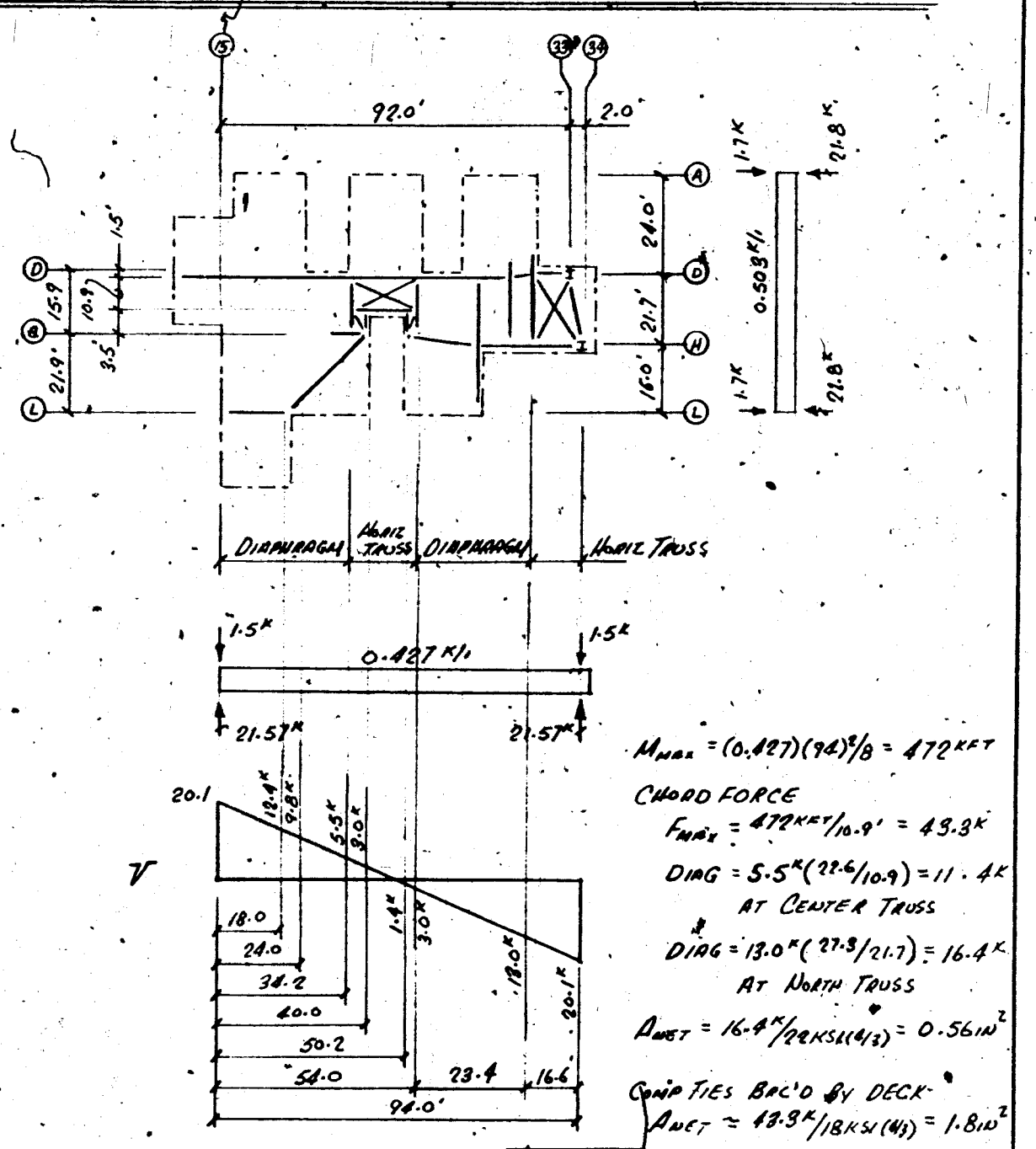
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FLEXIBLE ROOF DIAPHRAGM & HORIZ. TRUSS IN PLANE OF ROOF



$M_{MAX} = (0.427)(94)^2/8 = 472^{K-FT}$

CHORD FORCE

$F_{MAX} = 472^{K-FT}/10.9' = 43.3^K$

$DIAG = 5.5^K(22.6/10.9) = 11.4^K$
AT CENTER TRUSS

$DIAG = 13.0^K(27.3/21.7) = 16.4^K$
AT NORTH TRUSS

$A_{NET} = 16.4^K/22KSI(4/3) = 0.56IN^2$

CHORD TIES BAC'D BY DECK

$A_{NET} \simeq 43.3^K/18KSI(4/3) = 1.8IN^2$

USE L 6x4x⅜ LLH & COPE VERT LEG AT BMS

1½" B-DECK 20 GA
36" WIDTH BUTTON PUNCH @12" o.c.
T-PUDDLE WELD PATTERN → 575#/ALW

V_{DIA}

@ X = 0 $v = 20100^{\#}/36.3' = 554^{\#}/'$
= 18 $v = 12400/36.3' = 342^{\#}/'$
= 24 $v = 9800/32.0' = 307^{\#}/'$
= 34.2 $v = 5500/11.4 = 483^{\#}/'$

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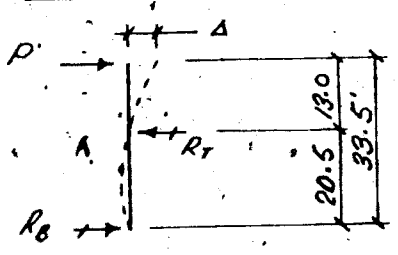
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FLEXIBLE ROOF DIAPHRAGM continued

SWAY COLS AT HORIZ TRUSS. COLS D-33 & H-34.



$P = (21.6^K / 2\ Col's) = 10.8^K/Col$ SEISMIC LOAD'G

$R_T = (10.8 \times 33.5)/20.5 = 17.65^K$
$R_B = (10.8 \times 13.0)/20.5 = 6.85^K$
$M = 10.8 \times 13.0 = 140.4^{K}FT$

$$\Delta = \frac{(10.8)(13.0)^2(33.5)(1728)}{3(29\times10^3)(I)} = \frac{1214.5}{I} \leq \frac{13\times12}{200} = 0.78$$

$I > 1214.5/0.78 = 1557\ in^4$ SEISMIC

$P = (0.243^{K/L})(94\ 1/2)/2 = 5.71^K/Col$ WIND LOAD'G

$$\Delta = (5.71/10.8)\left(\frac{1214.5}{I}\right) = \frac{642.1}{I} \leq \frac{13\times12}{400} = 0.39"$$

$I > 642.1/0.39 = 1646\ in^4$ WIND GOVERNS

TRY W12x170 $\{I_x = 1650\ in^4,\ A = 50.0\ in^2,\ S_x = 235\ in^3,\ r_y = 3.22",\ r_x = 5.74"\}$

CHECK COMBINED BEND'G & AXIAL

$13.0' < (76\,b_f/\sqrt{F_y})/12 = 13.26' \rightarrow F_b = 24KSI(4/3) = 32KSI$

$f_b = 140.4 \times 12/235 = 7.17\ KSI$

D-33 → P = 29.4K
H-34 → P = 21.2K

$f_a = 29.4^K\ MAX/50.0 = 0.59KSI$

$Kl_x/r_x = 2(13.0\times12)/5.74 = 54.4 \rightarrow F_a = (4/3)(50.47) = 67.30\ KSI$
$Kl_y/r_y = 2(13.0\times12)/3.22 = 96.9 \rightarrow F_a = (4/3)(13.36) = 17.81\ KSI$

$f_a/F_a = 0.04 < 0.15$

UNITY EQUA → $0.04 + \frac{7.17}{32} = .0.27 < 1.0$

USE Col W12x170 AT D-33 & H-34

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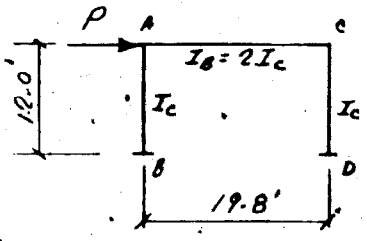
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FLEXIBLE ROOF DIAPHRAGM continued
SWAY FRMS ON GRIDS A & 5 2ND STORY

SIDESWAY CORRECTION

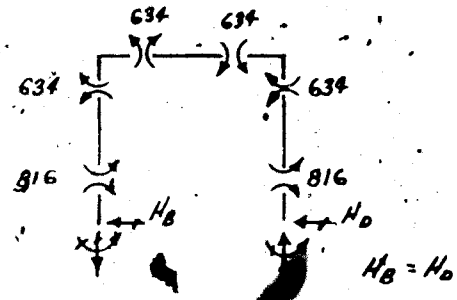


$K_{AB} = 1/12 = .083$ $DF_{AB} = 0.45$
$K_{AC} = 2/19.8 = .101$ $DF_{AC} = 0.55$
0.184

ARBITRARY SWAY OF 1000 K-FT = $M_{FOA} = \frac{6EI\Delta}{L^2}$

	A		C	
	0.45	0.55	0.55	0.45
M_F	+1000	0	0	+1000
DIST	- 450	- 550	- 550	- 450
CO	0	- 275	- 275	0
DIST	+124	+151	+151	+124
CO	0	+ 76	+ 76	0
DIST	- 34	- 42	- 42	- 34
CO	0	+ 21	+ 21	0
DIST	- 9	- 12	- 12	- 9
CO	0	- 6	- 6	0
DIST	+ 3	+ 3	+ 3	- 3
Σ	+634	-634	-634	+634

	B	D
M_F	+1000	+1000
CO	- 225	- 225
CO	+ 62	+ 62
CO	- 17	- 17
CO	- 4	- 4
Σ	+816	+816



$H_B = H_D = \frac{(634+816)}{12.0} = 120.83^K$

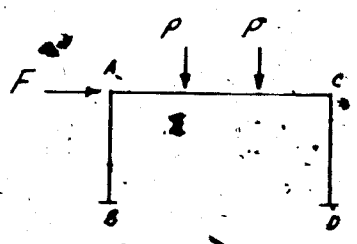
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FLEXIBLE ROOF DIAHRAGM, continued

SWAY FRMS ON GRIDS ~~A-L~~ 2ND STORY



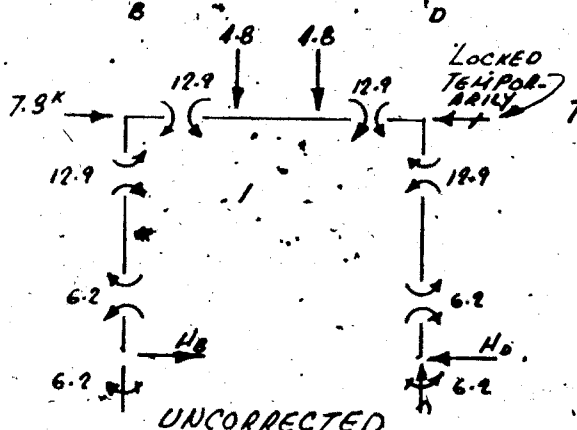
$P = 4.8^K$ REF BEAM B-37 NORTH ROOF FRMG

$M_{FAC} = \frac{4.8[(6.6)(13.2)^2 + (6.6)^2(13.2)]}{19.8^2} = 21.2^{K\text{-}FT}$

$F = 21.8^K/(3\text{-FRMS}) = 7.3^K/FRM$

	A	C	C	A	B	D
	.45	.55	.55	.45		
M_F	0	+21.2	-21.2	0		
D	-9.5	-11.7	+11.7	+9.5		
CO	0	+5.9	-5.9	0		
D	-2.7	-3.2	+3.2	+2.7		
CO	0	+1.6	-1.6	0		
D	-0.7	-0.9	+0.9	+0.7		
Σ	+12.9	+12.9	-12.9	+12.9		
M_F	0		0			
CO	-4.8		+4.8			
CO	-1.4		+1.4			
Σ	-6.2		+6.2			

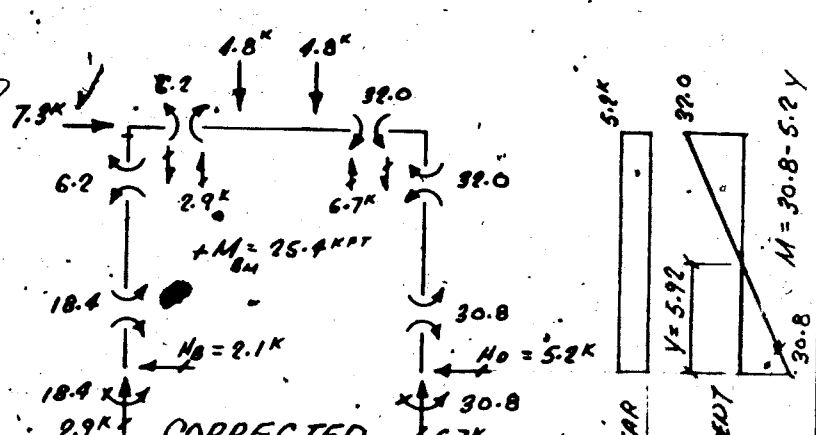
	A		C		B	D
	.45	.55	.55	.45	0	0
M_{UNCORR}	-12.9	+12.9	-12.9	+12.9	-6.2	+6.2
CORR.	+19.1	-19.1	-19.1	+19.1	+21.6	+21.6
M_{CORR}	+6.2	-6.2	-32.0	+32.0	+18.4	+30.8



UNCORRECTED

$H_B = (12.9+6.2)/12.0 = 1.59^K$

$H_D = (\ do\ )/d_o = 1.59^K$



CORRECTED

$H_B = (6.2+18.4)/12.0 = 2.1^K$

$H_D = (32.0+30.8)/12.0 = 5.2^K$

$\Sigma H = 7.3 + 1.59 - 1.59 = 7.3^K \neq 0$

∴ SIDESWAY. CORR. FACTOR $= (7.3^K) + X(-120.83 - 120.83) = 0$

$X = 7.3/241.66 = +0.0302$ CORR. FACTOR

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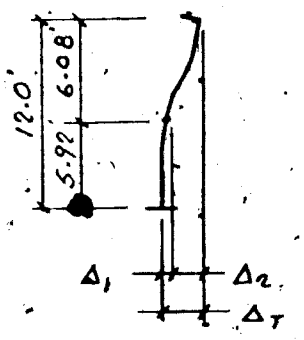
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FLEXIBLE ROOF DIAPHRAGM continued

SWAY FRMS ON GRIDS A & L 2ND STORY

$\Delta_T = (\Delta_1 + \Delta_2) = \frac{(5.2^K)(1728^{IN^3/FT^3})}{3(29\times10^3 KSI)(I)}(5.92^3 + 6.08^3) = \frac{44.64}{I}$

for $\Delta_T \leq 144/400 = 0.36" \rightarrow I \geq \frac{44.64}{0.36} = 124.0\ IN^4$

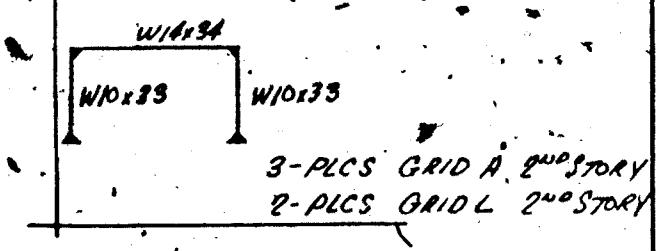


COL W10x33 $I_x = 170\ IN^4 > 124\ IN^4$
for $l_u = 12' \rightarrow M_R = 64^{KFT} > 32^{KFT}$

BM W14x34 $I = 340\ IN^4$
$M_R = 97^{KFT} > 32.0^{KFT}$

$I_{W14\ BM} = 2\ I_{W10\ COL}$ AS ASSUMED
∴ REL STIFF & DISTR. OK.

USE MOM. RESIST'G FRMS
W/ W10x33 COLS & W14x34 BM.
MOM CONN COL BASE & BM TO COL



3-PLCS GRID A 2ND STORY
2-PLCS GRID L 2ND STORY

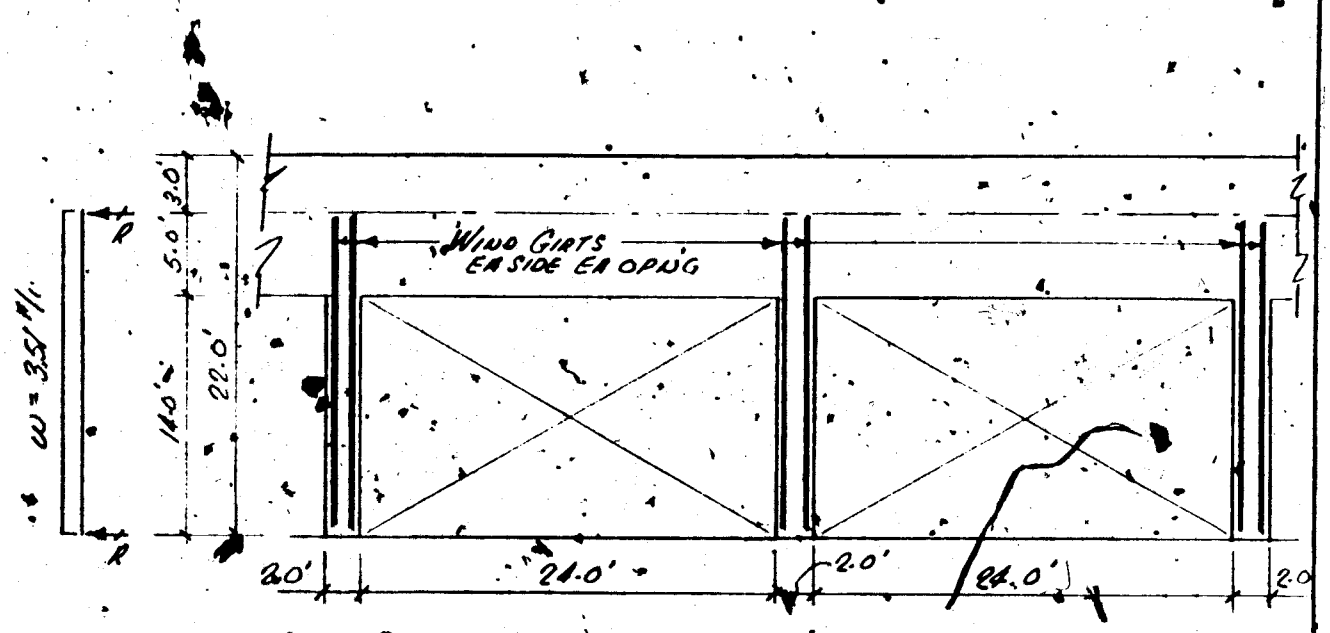
1600 EAST DESERT INN ROAD SUITE 106 | LAS VEGAS, NEVADA 89109-2594 (702) 731-6226

Doris Hotel, 12/31/87

STRAUSS & LOFTFIELD
STRUCTURAL ENGINEERS

CLIENT/
PROJECT/
SHEET/ 310 OF 317
PROJECT # 82017
DATE/ OCT'82
ENGINEER/ H.S.

WIND GIRTS AT ROLL-UP-DOOR OPNGS.



$p = C_e C_q q_s I$

$p = (1.2)(1.3)(15\text{PSF})(1.15) = 27\text{ PSF}$

$\therefore w = (26'/2)(27\text{PSF}) = 351\text{ #/ft}$

$R = 3.24^K$

$M = 15.9^{KFT}$

$\Delta = \frac{5(.351)(19.0)^4(1728)}{384(29\times10^3)(I)} = \frac{35.5}{I} < \frac{19\times12}{400} = 0.57"$

$I \geq 35.5/0.57 = 62.3\text{ in}^4$

C12 x 20.7 $I = 129\text{ in}^4$

$F_b = \frac{12\times10^3\times1}{14\times12\times8.13} = 8.78\text{ KSI}$

$M_R = (4/3 \times 8.78\text{KSI})(21.5\text{in}^3)/12 = 21.0^{KFT}$ ✓

USE C12 x 20.7 VERT WIND GIRTS AT ROLL-UP DOOR OPNGS

1600 EAST DESERT INN ROAD SUITE 106 | LAS VEGAS, NEVADA 89109-2594 (702) 731-6226

Dora Hasel 12/31/81

STRAUSS & LOFTFIELD
STRUCTURAL ENGINEERS

CLIENT/
PROJECT/
SHEET/ 311 OF 317
PROJECT # 82041
DATE/ OCT 82
ENGINEER/ HS

COMBINED BEND'G & AXIAL LOAD from LATERAL ANALYSIS

FRM-B

BEAM B-8 2ND & 3RD LEVELS
BEAM B-33 PLAZA LEVEL

P = (78.1^K x 1.25) & M = 46.1^KFT ← DESIGN MAXIMUMS

W14 x 43 { A = 12.6 in² r_y = 1.89 ; S_x = 62.7 in³ r_x = 5.82" }

kl_x/r_x = 20.67 x 12 / 5.82 = 42.6 → F'_e = (4/3)(82.32) = 109.76 KSI
kl_y/r_y = 20.67 x 12 / 1.89 = 131.2 → F_a = (4/3)(8.67) = 11.56 KSI

f_a = (1.25 x 78.1) / 12.6 = 7.75 KSI → f_a/F_a = 0.67

f_b = 46.1 x 12 / 62.7 = 8.82 KSI F_b = (4/3)(24) = 32 KSI

UNITY EQUA. $0.67 + \frac{8.82}{(1 - \frac{7.75}{109.76})32} = 0.97 < 1.0$ OK

USE W14 x 43 for B-8 2ND & 3RD FLR & B-33 PLAZA

FRM-N

BEAMS B-12 & B-25 2ND & 3RD LEVELS
BEAMS B-29 & B-30 PLAZA LEVEL

P = (93.9^K x 1.26) & M = 39.8^KFT ← DESIGN MAXIMUMS

W14 x 43 { A = 12.6 in² r_y = 1.89 ; S_x = 62.7 in³ r_x = 5.82 }

kl_x/r_x = 17.98 x 12 / 5.82 = 37.0 → F'_e = (4/3)(109.08) = 145.44 KSI
kl_y/r_y = 17.98 x 12 / 1.89 = 119.8 → F_a = (4/3)(11.15) = 14.87 KSI

f_a = (1.25 x 93.9) / 12.6 = 9.32 KSI → f_a/F_a = 0.63

f_b = 39.8 x 12 / 62.7 = 7.62 KSI

UNITY EQUA. $0.63 + \frac{7.62}{(1 - \frac{9.32}{145.44})(29.33)} = 0.91 < 1.0$ OK

USE W14 x 43 for B-12 & B-25 2ND & 3RD FLRS & B-29 & B-30 PLAZA LEVEL

1600 EAST DESERT INN ROAD SUITE 106 | LAS VEGAS, NEVADA 89109-2594 (702) 731-6226

Nona Yousl 12/31/87

STRAUSS & LOFTFIELD
STRUCTURAL ENGINEERS

CLIENT/ SHEET/ 312 OF 317
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DATE/ OCT '82
ENGINEER/ HS

COMBINED BEND'G & AXIAL LOAD continued

FRM-3

BEAM B-36 2ND & 3RD LEVELS
— $R = (128.0^K \times 1.25)$ & $M = 54.9^{K\text{-}FT}$ ← DESIGN MAXIMUMS
W14x43 $\begin{cases} A = 12.6 & r_y = 1.89 \\ S = 62.7 & r_x = 5.82 \end{cases}$

$Kl_x/r_x = 17.13 \times 12/5.82 = 35.3 \rightarrow F'_e = (4/3)(119.90) = 159.86$ KSI
$Kl_y/r_y = 13.13 \times 12/1.89 = 83.4 \rightarrow F_a = (4/3)(14.97) = 19.96$ KSI
$f_a = (1.25 \times 128.0)/12.6 = 12.70$ KSI $\rightarrow f_a/F_a = 0.64$
$f_b = 54.9 \times 12/62.7 = 10.51$

UNITY EQUA. $0.64 + \frac{10.}{(1-\quad)(32)} = 0.997 \leq 1.0$ OK

USE W14x43 for B-36 2ND & 3RD LEVELS

FRM-U

BEAM B-19 2ND LEVEL & FUTURE 3RD LEVEL EXTENDED
— $P = (47.0^K \times 1.25)$ & $M = 39.3^{K\text{-}FT}$ ← DESIGN MAXIMUMS
W18x40 $\begin{cases} A = 11.8 in^2 & r_y = 1.27'' \\ S = 68.4 in^3 & r_x = 7.21'' \end{cases}$

$Kl_x/r_x = 27.63 \times 12/7.21 = 46.1 \rightarrow F'_e = (4/3)(70.27) = 93.69$ KSI
$Kl_y/r_y = 18.63 \times 12/1.27 = 176.0 \rightarrow F_a = (4/3)(4.82) = 6.43$ KSI
$f_a = 47 \times 1.25/11.8 = 4.98$ KSI $\rightarrow f_a/F_a = 0.78$
$f_b = 39.3 \times 12/68.4 = 6.89$

UNITY EQUA. $0.78 + \frac{6.89}{(1-\frac{4.98}{93.69})(32)} = 1.007 \doteq 1.0$ SAY OK

USE W18x40 for B-19 2ND LEVEL

Don Hosel 12/31/87.

STRAUSS & LOFTFIELD
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CLIENT/
PROJECT/
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PROJECT # 82017
DATE/ OCT 82
ENGINEER/ HS

COMBINED BEND'G & AXIAL LOAD continued

FRM - T BEAM B-47 2ND LEVEL

P = (44.5K x 1.25) & M = 467.3 KFT ← DESIGN MAX

W 27 x 94 { A = 27.7 in² ry = 2.12" ; S = 243 in³ rx = 10.9" }

Kl_x/r_x = 28.16 x 12/10.9 = 31.0 → F'_e = (4/3)(155.39) = 207.19 KSI

Kl_y/r_y = 7.04 x 12/2.12 = 39.9 → F_a = (4/3)(19.20) = 25.60 KSI

f_a = (1.25 x 44.5)/27.7 = 2.01 KSI → f_a/F_a = 0.08 < 0.15

f_b = 467.8 x 12/243 = 23.08

UNITY EQUA. 0.08 + 23.08/32 = 0.81 < 1.0 OK

USE W27x94 for B-47 2ND LEVEL

BEAM B-31 3RD LEVEL

P = (44.5K x 1.25) & M = 79.4 KFT ← DESIGN MAX

W14 x 53 { A = 15.6 in² ry = 1.92" ; S = 77.8 in³ rx = 5.89" }

Kl_x/r_x = 28.17 x 12/5.89 = 57.4 → F'_e = (4/3)(45.33) = 60.44 KSI

Kl_y/r_y = 28.17 x 12/1.92 = 176.1 → F_a = (4/3)(4.81) = 6.41 KSI

f_a = (1.25 x 44.5)/15.6 = 3.57 KSI → f_a/F_a = 0.56

f_b = 79.4 x 12/77.8 = 12.25 KSI

UNITY EQUA 0.56 + 12.25 / (1 − 3.57/60.44)(32) = 0.97 < 1.0 OK

USE W14x53 for B-31 3RD LEVEL

FRM - Q BEAMS B-28 & B-55 M.ROOF & 2ND LEVEL RESPECTIVELY

P = (37.9K x 1.25) & M = 24.0 KFT ← DESIGN MAXIMUMS

W12 x 26 { A = 7.65 in² ry = 1.51" ; S = 33.4 in³ rx = 5.17" }

Kl_x/r_x = 16.2 x 12/5.17 = 37.6 → F'_e = (4/3)(105.68) = 140.91 KSI

Kl_y/r_y = 16.2 x 12/1.51 = 128.8 → F_a = (4/3)(9.0) = 12.0 KSI

f_a = (1.25 x 37.9)/7.65 = 6.20 KSI → f_a/F_a = 0.52

f_b = 24 x 12/33.4 = 8.62 KSI

UNITY EQUA 0.52 + 8.62 / (1 − 6.2/140.91)(3.2) = 0.80 < 1.0 OK

USE W12x26 for B-28 M. ROOF & B-55 M. 2ND

Don Hasel 12/31/87

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COMBINED BEND'G & AXIAL LOAD - continued.

FRM-12-B BEAM B-16 2ND & 3RD LEVELS

P = (47.9 x 1.25) & M = 251.3 KFT ← DESIGN MAX

W24x68 { A = 20.1 in² ry = 1.87" ; S = 154.0 in³ rx = 9.55" }

Kl_x/r_x = 27.21x12/9.55 = 34.2 → F'_e = (1/3)(127.72) = 170.29 KSI

Kl_y/r_y = 7.0x12/1.87 = 44.9 → F_a = (1/3)(18.78) = 25.04 KSI

f_a = (1.25x47.9)/20.1 = 2.98 KSI → f_a/F_a = 0.12 < 0.15

f_b = 251.3x12/154.0 = 19.58 KSI

UNITY EQUA 0.12 + 19.58/32 = 0.73 < 1.0 OK

USE W24x68 for B-16 2ND & 3RD LEVELS

BEAM B-62 N. ROOF

P = (43.5 x 1.25) & M = 149.4 KFT ← DESIGN MAX

W21x44 { A = 13.0 in² ry = 1.26" ; S = 81.6 in³ rx = 8.06" }

Kl_x/r_x = 27.3x12/8.06 = 40.7 → F'_e = (1/3)(90.18) = 120.24 KSI

Kl_y/r_y = 7.0x12/1.26 = 66.7 → F_a = (1/3)(16.77) = 22.36 KSI

f_a = (1.25x43.5)/13.0 = 4.18 → f_a/F_a = 0.19

f_b = 149.4x12/81.6 = 21.97 KSI

UNITY EQUA. 0.19 + 21.97 / (1 - 4.18/120.24)(32) = 0.90 < 1.0 OK

USE W21x44 for B-62 N. ROOF

BEAM B-80 N. 2ND LEVEL

P = (47.9 x 1.25) & M = 195.4 KFT ← DESIGN MAX

W24x55 { A = 16.2 in² ry = 1.34" ; S = 114 in³ rx = 9.11" }

Kl_x/r_x = 27.3x12/9.11 = 36.0 → F'_e = (1/3)(115.22) = 153.62 KSI

Kl_y/r_y = 7.0x12/1.34 = 62.7 → F_a = (1/3)(17.17) = 22.89 KSI

f_a = (1.25x47.9)/16.2 = 3.70 KSI → f_a/F_a = 0.16

f_b = 195.4x12/114 = 20.57 KSI

UNITY EQUA. 0.16 + 20.57 / (1 - 3.70/153.62)(32) = 0.82 < 1.0 OK.

USE W24x55 for B-80 N. 2ND LEVEL

Don Hasel 12/31/87

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COMBINED BEND'G & AXIAL LOAD continued

FRM - 12-J BEAM B-14 2ND & 3RD LEVELS

P = (56.1K x 1.25) & M = 129.9 KFT ← DESIGN MAX

W 24 x 55 { A = 16.2 in² r_y = 1.34" ; S = 114 in³ r_x = 9.11" }

Kl_x/r_x = 21.0 x 12 / 9.11 = 27.7 → F'_e = (4/3)(194.78) = 259.70 KSI

Kl_y/r_y = 7.0 x 12 / 1.34 = 62.7 → F_a = (4/3)(17.77) = 22.89 KSI

f_a = (1.25 x 56.1) / 16.2 = 4.33 KSI → f_a/F_a = 0.19

f_b = 129.9 x 12 / 114 = 13.67 KSI

UNITY EQUA $0.19 + \frac{13.67}{(1 - \frac{4.33}{259.70})(32)} = 0.63 < 1.0$

USE W 24 x 55 for B-14 2ND & 3RD FLRS

BEAM B-74 N. ROOF

P = (56.1K x 1.25) & M = 48.8 KFT ← DESIGN MAX

W 14 x 38 { A = 11.2 in² r_y = 1.55" ; S = 54.6 in³ r_x = 5.87" }

Kl_x/r_x = 21.0 x 12 / 5.87 = 43.0 → F'_e = (4/3)(80.76) = 107.68 KSI

Kl_y/r_y = 12.2 x 12 / 1.55 = 94.5 → F_a = (4/3)(13.66) = 18.21 KSI

f_a = (1.25 x 56.1) / 11.2 = 6.26 KSI → f_a/F_a = 0.35

f_b = 48.8 x 12 / 54.6 = 10.73 KSI. $F_b = (4/3)(\frac{90 KFI \times 12}{54.6 in^3})$

UNITY EQUA. $0.35 + \frac{10.73}{(1 - \frac{6.26}{107.68})(26.3)} = 0.79 < 1.0$

USE W 14 x 38 for B-74 N. ROOF.

BEAM B-78 N. 2ND LEVEL

P = (56.5K x 1.25) & M = 78.4 KFT ← DESIGN MAX

W 16 x 36 { A = 10.6 in² r_y = 1.52" ; S = 56.5 in³ r_x = 6.51" }

Kl_x/r_x = 21.0 x 12 / 6.51 = 38.7 → F'_e = (4/3)(99.73) = 133.0 KSI

Kl_y/r_y = 7.0 x 12 / 1.52 = 55.3 → F_a = (4/3)(17.87) = 23.82 KSI

f_a = (1.25 x 56.5) / 10.6 = 6.67 KSI → f_a/F_a = 0.28

f_b = 78.4 x 12 / 56.5 = 16.65 KSI

UNITY EQUA $0.28 + \frac{16.65}{(1 - \frac{6.67}{133.0})(32)} = 0.83 < 1.0$

USE W 16 x 36 for B-78 N. 2ND LEVEL

Dona Hasel, 12/31/87

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STRUCTURAL ENGINEERS

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ENGINEER/ AS

COMBINED BEND'G & AXIAL LOAD continued

FRM-12-S BEAM B-43 2ND & 3RD LEVELS

P = (97.2K x 1.25) & M = 212.4 KFT ← DESIGN MAX

W 24 x 62 { A = 18.2 IN² ry = 1.38" ; S = 131.0 IN³ rx = 9.23" }

Klx/rx = 26.4x12/9.23 = 34.4 → F'e = (4/3)(126.26) = 168.34 KSI

Kly/ry = 7.0x12/1.38 = 60.9 → Fa = (4/3)(17.34) = 23.12 KSI

fa = (1.25x97.2)/18.2 = 6.68 KSI → fa/Fa = 0.29

fb = 212.4x12/131 = 19.46 KSI

UNITY EQUA = $0.29 + \frac{19.46}{(1-\frac{6.68}{168.34})(32)} = 0.93 < 1.0$ ✓

USE W24x62 for B-43 2ND & 3RD FLRS

FRM-P BEAM B-73 N. 2ND LEVEL

P = (15.2K x 1.25) & M = 320.1 KFT ← DESIGN MAX

W 24x76 { A = 22.4 IN² ry = 1.92" ; S = 176 IN³ rx = 9.69" }

Klx/rx = 28.2x12/9.69 = 35.0 → F'e = (4/3)(121.90) = 162.50 KSI

Kly/ry = 7.0x12/1.92 = 43.8 → Fa = (4/3)(18.88) = 25.17 KSI

fa = (1.25x15.2)/22.4 = 0.85 KSI → fa/Fa = 0.04 < 0.15

fb = 320.1x12/176 = 21.83

UNITY EQUA $0.04 + \frac{21.83}{32} = 0.73 < 1.0$ ✓

USE W24x76 for B-73 N. 2ND LEVEL

FRM-34' BEAM B-29 N. 2ND LEVEL

P = (20.1 x 1.25) & M = 77.1 KFT ← DESIGN MAX

W16x36 { A = 10.6 IN² ry = 1.52" ; S = 56.5 IN³ rx = 6.51" }

Klx/rx = 23.4x12/6.51 = 43.2 → F'e = (4/3)(80.03) = 106.70 KSI

Kly/ry = 23.4x12/1.52 = 184.8 → Fa = (4/3)(4.37) = 5.83 KSI

fa = (1.25x20.1)/10.6 = 2.37 KSI → fa/Fa = 0.41

fb = 77.1x12/56.5 = 16.38 KSI

UNITY EQUA $0.41 + \frac{16.38}{(1-\frac{2.37}{106.70})(32)} = 0.94 < 1.0$ ✓

USE W16x36 for B-29 N. 2ND LEVEL

Done Hand, 12/31/87

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COMBINED BEND'G & AXIAL LOAD. continued

FRM-A

BEAM B-37 N. 2ND LEVEL
P = (88.3^K x 1.25) & M = 38.9^KFT ← DESIGN MAX
W14x34 { A = 10.0 IN² r_y = 1.53 ; S = 48.6 IN³ r_x = 5.83 }

KL_x/r_x = 24.2 x 12 / 5.83 = 49.8 → F'_e = (4/3)(60.22) = 80.30 KSI
KL_y/r_y = 12.1 x 12 / 1.53 = 94.9 → F_a = (4/3)(13.61) = 18.14 KSI

f_a = (1.25 x 88.3) / 10.0 = 11.04 KSI → f_a/F_a = 0.61

f_b = 38.9 x 12 / 48.6 = 9.61 KSI

UNITY EQUA $0.61 + \frac{9.61}{(1 - \frac{11.04}{80.30})(32)} = 0.96 < 1.0$

USE | W14x34 w/ BOTT FLNG BRACED @ MID PT for B-37 N. 2ND LEVEL
BRACE TT 3x3x1/4 w/ 2 - 3/4" Ø EA END CONN @ 3/8"

· 501 N CASINO CTR FF ·

Pina Holiday 3-15-82

BUILDING DEPARTMENT
CITY OF LAS VEGAS

RLS FILE

CORRECTION NOTICE

CADVANCE

Job Located at 501 CASINO CTR. N.

I have this day inspected this structure and these premises and have found the following violations of City and/or State laws governing same:

'79 U.B.C. 2607 (d) AND
PROJ. SPECS 3B-3

REBAR SHALL BE BLOCKED TO SPECIFIED DIMENSIONS & SECURED AGAINST DISPLACEMENT PRIOR TO FUTURE POURS.

You are hereby notified to correct above violation ~~and call for re inspection.~~

Date 3-11-82 R#103 (ANGEL 3)

Inspector

23.03 Do not remove this tag!

Dora Healy 3-15-)

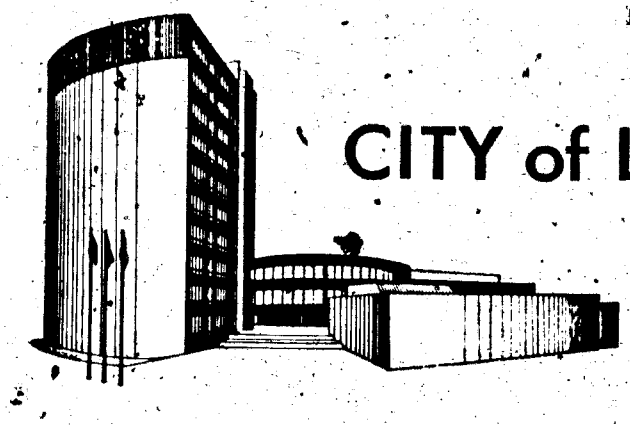
501 N.C.C.

MAYOR BILL BRIARE

COMMISSIONERS
RON LURIE
PAUL J. CHRISTENSEN
ROY WOOFTER
AL LEVY

CITY ATTORNEY
GEORGE F. OGILVIE

CITY MANAGER
RUSSELL DORN



CITY of LAS VEGAS

July 14, 1982

Mr. Patrick Klenk, A.I.A.
Harris Sharp & Associates
2616 State Street
Las Vegas, Nevada 89109

Re: Fire Services Headquarters/Fire Station No. 1

Dear Mr. Klenk:

After receiving your letter dated July 12, 1982, I felt a need to clarify my position by informing you of the following conditions:

1. The design of your stair shafts must conform to the requirements of the Uniform Building Code.

2. The final determination of what we consider to be a floor level must be made following plans check review.

If you have any questions, please feel free to call.

Sincerely,

DEPARTMENT OF BUILDING & SAFETY

Michael Traasdahl

MICHAEL TRAASDAHL
Building Plans Technician

cc: Clay Hymer, Director

CLV-6218

400 E. STEWART AVENUE • LAS VEGAS, NEVADA 89101 • (702) 386-6011

Done Final 4-4-83

CITY OF LAS VEGAS, NEVADA

DEPARTMENT OF BUILDING AND SAFETY—PLUMBING APPLICATION & PERMIT

ADDRESS OF CONSTRUCTION: Las Vegas Central Fire Station 501 N. Casino Center

PHONE NO. _____

OWNER'S NAME: City of Las Vegas

CIRCLE: Addition; Remodel; New Bldg. TYPE OF BLDG.: SFD APT. COMM. PUBLIC

CONTRACTOR'S NAME: Universal Fire Protection Co., Inc.

STATE LICENSE # 6352C

CITY LICENSE # C11-653-2-05216

UNITS	DESCRIPTION	FEE	TOTAL
	PERMIT ISSUANCE		
	For Issuing Each Permit	10.00	10.00
	For Issuing Each Supplemental Permit	4.50	
	FIXTURE CHARGE		
	Bathtub, Shower, Lavatory, Toilet, Urinal EA.	2.00	
	Floor Drain, Floor Sink, Wash Tray, Sink EA.	2.00	
	Garbage Disposal, Clothes Washer, Dishwasher (residential) EA.	2.00	
	Garbage Disposal (commercial) EA.	8.00	
	Clothes Washer, Dishwasher (commercial) EA.	2.00	
	Clothes Dryer (gas) (venting)	2.00	
	Dental Unit	2.00	
	Drinking Fountain	8.00	
	Refrigerator - Ice Maker, Water Dispenser	2.00	
	Any other water using equipment, Attached Coffee Makers, Ice Makers	2.00	
	Hot Water Heater (Gas or Electric) EA.	2.00	
	SEWER SYSTEM		
	New, Replacement, Modification, or Any Drainage Work	10.00	
	Grease or Sand Trap or Interceptor	2.00	
	Trailer Trap (rental parks)	5.00	
	WATER SOFTENERS		
	Non Permanent Type (rental)	2.00	
	Permanent Type (connected to drain)	2.00	
	SWIMMING POOLS		
	Private or Wading Pool (including spa)	20.00	
	Public or Semi-Public	30.00	
	Spas - Preformed (private)	10.00	
	Spas - Preformed (commercial)	20.00	
	WATER DISTRIBUTION SYSTEM		
	Single Family Dwelling	6.00	
	Multi-Family Dwelling	6.00	
	Plus Each Dwelling Unit	3.00	
	Commercial Building per floor	3.00	
	Plus Each Unit (leased space or office)	2.00	
	Hotel or Motel	8.00	
	Plus Each Unit	3.00	
	Trailer Park	30.00	
	Plus Each Space	2.00	
	Irrigation	8.00	
	FUEL PIPING SYSTEM		
	Single Family Dwelling	6.00	
	Multi-Family Dwelling	10.00	

UNITS	DESCRIPTION	FEE	TOTAL
	Plus Each Unit	2.00	
	Commercial Building (per floor)	6.00	
	Plus Each Unit (leased space or office)	6.00	
	Medium Pressure Gas System (plan check)	12.00	
	Each Gas Appliance (any type)	2.00	
	Standby Emergency (generating engines)	5.00	
	Steam Boilers	5.00	
	Service Station Fuel Tank and Piping System	10.00	
		10.00	
	AUTOMATIC FIRE EXTINGUISHING SYSTEM		
	Underground Piping	20.00	
	Distribution Piping (per foot) 3000	.05	150.00
	Sprinkler Head (each) 336	.20	67.20
	In Range Hood and Vent	10.00	
	Dry Sandpipe System		
	Piping	75.00	75.00
	Each Outlet 6	2.00	12.00
	Wet Standpipe System		
	Piping	10.00	
	Fire Hose Cabinet	2.00	
	SOLAR ENERGY SYSTEMS 1 JULI $ .00		
	Collectors (including piping) (per collector) BTL $ .00		
	Storage Tanks (each) TOTL $ .00		
	PIPELINE CONTRACT CASH $ .00		
	For Onsite Sewer, Gas or Water Contract Value. Fee based on Building Code Permit Valuation Chart. PMB927 SR#001.01		
	Inspections for which no fee is specifically indicated (minimum charge - one half hour) CITY OF LAS VEGAS	30.00	per hour
	Additional plan review required by changes, additions or revisions to approved plans (minimum charge - one half hour) BLDG. & SAFETY 04/13/83	30.00	per hour
	Misc.		
	TOTAL PERMIT FEE $: 314.20		

Plumbing permit fees may be computed the same as building permit fees by using the cost of installation for valuation amount when such work is not included in the above schedule

I hereby certify that I have carefully examined and read the above application; that the same is true and correct; and that the work herein described is to be done in accordance with all the provisions of the applicable Ordinances of the City of Las Vegas, Nevada and the State Laws; whether herein specified or not.

Approval for the work under this permit will be given only after refuse and debris have been removed from job site and public right of way.

CITY MASTER CARD NO. _____

SIGNED Lois J. Evans Date 4/13/83
Registered Master Plumber, Spec. Contractor or Owner

BUILDING DIVISION Dave Date 4/13/83

PERMIT NO. 8927. PERMIT FEE $ N/C

RECEIPT

=1721-2403

501 N. Casino Ctr.

CENTRAL FIRE STATION COMPLEX

WEEKLY MEETING AGENDA

DATE: MARCH 30, 1983

TIME: O/A 9:00 AM - O/A/C 10:00 AM

LOCATION: O/A CITY HALL - 2ND FLOOR

O/A/C SITE TRAILER

PRESENT:

CITY OF LAS VEGAS

TOM GRAHAM
DAVE WALLISER
JEFF JACOMB
LARRY POWELL
TED REXING
DAN PILKINGTON
GIL GILPIN

HARRIS SHARP & ASSOCIATES

DAVID DAILEDA
NED COLE
PATRICK KLENK

S.J. AMOROSO CONSTRUCTION

PAT HENDERSON
DON DES JARDIN
JOHN CLATTERBUCK

CONSULTANTS

SUB-CONTRACTORS

ITEMS

ACTION REQ'D/DATE

1. PUBLIC SERVICE ITEMS
2. PURCHASING ITEMS
   - A. MOTOROLA NEGOTIATIONS
   - B. TELEPHONE BID

4020-83

3. FIRE SERVICES ITEMS

   A. COLOR SCHEME
   B. FUEL TANKS

4. OAS ITEMS

   A. COST REDUCTION PROPOSALS
   B. PLAZA EDGE STEP
   C. PARKING LOT ISLAND

5. HSA ITEMS

   A. COMPUTER REQUIREMENTS
   B. PLAN CHECK ITEMS
   C. COMPUTER FLOOR
   D. WATERPROOFING GUARANTEES
   E. CERAMIC VENEER
   F. EMERGENCY GENERATOR LOCATION

6. AMOROSO ITEMS

Lora Hurley 4420-83

CENTRAL FIRE STATION COMPLEX

WEEKLY MEETING MINUTES

DATE: MARCH 24, 1983

TIME: 9:00 - 12:15 PM

LOCATION: 2ND FLOOR - CITY HALL AND SITE

PRESENT:

CITY OF LAS VEGAS
DAVE WALLISER - OAS
TOM GRAHAM - OAS
TED REXING - OAS
DAN PILKINGTON
ED PARK

HARRIS SHARP & ASSOCIATES
PAT KLENK
NED COLE

CONSULTANTS

GENERAL CONTRACTOR
JOHN CLATTERBUCK

SUB-CONTRACTORS

ITEMS DISCUSSED

1. The only obstacle in signing of Motorola/Amoroso contract seems to be an insurance dispute regarding Motorola working at the site unsupervised - this item to be further discussed on site.

DISTRIBUTION

4-20-83 Dora Pinedo

2. Dan P. and Ed P. are concerned that ther questions posed at last week's meeting are still unanswered by Don Lucia. They are not yet convinced that sufficient study of the bids has been done to determine Centel to be the proper choice of bidders. Request was made to set up a meeting with Don Lucia and all concerned to discuss bids and get written interpretations. Don Lucia had made reference to both bids being "non-responsive"; if this is indeed so, then we may need to re-bid.

3. Fire Services is to prepare a letter of acceptance for the Architect's proposed color scheme enumerating any exceptions.

4. Architect is to prepare a letter requesting an alternate for Gerry Strehlow to be present at meetings

5. Architect is to forward letters and information regarding testing of ceramic veneer to Dave W.

6. Discussed the plan check items; a) City will not require exhausting of the sleeping quarters; b) Sleeping quarters will be pressurized by air balancing; c) We already have the required fire sprinkler system; d) Must add a fire alarm system. Architect to investigate probable cost for next meeting.

7. JBA is presently to be researching the reserve capacity of the emergency generator based on information transmitted to them by Larry Powell.

8. Architect's suggestion of planters and portable benches at ramp/entrance area unacceptable. Architect to research possibilities of ceramic veneered concrete bench or similar solution.

9. Parking lot island planter near Bonanza not to be deleted. Dave W. to provide sketch for relocation.

10. Architect to research the following items concerning computer flooring:

    a) Verify quantity of perforated panels required.
    b) Verify quantity of extra panels.
    c) Check seismic considerations for essential facilities.

4-20-83
Ann Presley

11. Letters referring to change orders should say Change Order #1, 2, et. Letters referring to Change Order Proposals should say Proposal #1, 2, etc. The first Change Order should be written after all anticipated site and underground problems have been resolved.

SITE MEETING

12. John C. called his office and was informed that the insurance concern between Motorola and Amoroso had been resolved and that the contracts were in the mail.

Contractor was reminded that HSA has not received breakdown of vinyl wallcovering credits.

14. Waterproofing guarantees:

a) Contractor asked to have 20 year guarantee on Volclay product confirmed and resubmitted.

b) Contractor informed to not proceed with installation of American Hydrotech's 6125 system until proper 15 year warranty is supplied.

Respectfully submitted,

HARRIS SHARP & ASSOCIATES, INC.

NED COLE, A.I.A.

NC/je

4420-83 Motorola Israel

CENTRAL FIRE STATION COMPLEX

WEEKLY MEETING AGENDA & WEEKLY REPORT

DATE: APRIL 14, 1983

TIME: O/A 9:00 AM - O/A/C 10:00 AM

LOCATION: O/A CITY HALL - 2ND FLOOR

O/A/C SITE TRAILER

PRESENT:

CITY OF LAS VEGAS	HARRIS SHARP & ASSOCIATES	S.J. AMOROSO CONSTRUCTION
TOM GRAHAM	DAVID DAILEDA	PAT HENDERSON
DAVE WALLISER	NED COLE	DON DES JARDIN
JEFF JACOMB	PATRICK KLENK	JOHN CLATTERBUCK
LARRY POWELL		
TED REXING		
DAN PILKINGTON		
GIL GILPIN		

CONSULTANTS

SUB-CONTRACTORS

ITEMS	ACTION REQ'D/DATE
1. Public Service Items	
A. N.D.O.T. due in town on the 15th - 4th Street fence will be discussed - 9:00 A.M.	

4-20-83

2. Purchasing Items

   A. Motorola contract signed, Amoroso preparing proposal to add this to its contract.

   B. Centel installation contract is signed, Amoroso is preparing a proposal to add this to its contract. City still negotiating with Centel for lease of equipment. City still investigating the addition of all City Hall phones to C.F.S. system. HSA to ask to recover O H & P when Amoroso submits proposal. The "ring-down" installation cost issue has been settled.

3. Fire Service Items

   A. HSA has "color scheme chart" to present to Larry. Larry now to write HSA accepting this - with changes

   B. Color selected for lockers is not standard - do we pay $575.00, or select new color ?

   C. Amoroso reports that they have been asked to alter sink #10 (raise to 3'-0") while moving it - is this true, if so, other changes are required.

4. OAS Items

   A. Current analysis of cost reduction proposals - attached.

   B. Shall HSA prepare C.O. #1 ?

   C. HSA is to ask Amoroso about a "drainage test for slab".

4-20-83 Steve Fireside

5. HSA Items.

A. HSA recommends that we step the emergency generator down to 400 KVA. This must be decided by 3 P.M. today.

B. JBA is now preparing two options for the smoke detectors the Building Department is requesting.

C. HSA still awaiting final computer floor design information.

D. HSA is to receive a letter from L & L Roofing today guaranteeing the compatibility of their proposed waterproofing system.

E. HSA has requested additional tests on the ceramic veneer per the City's request, and the installation aids promised last week.

6. Amoroso Items

A. HSA has a letter re: The replacement of John Clatterbuck.

Item 3
420-83

CENTRAL FIRE STATION COMPLEX

WEEKLY MEETING MINUTES

DATE: APRIL 7, 1983

TIME: 9:00 - 11:15 PM

LOCATION: 2ND FLOOR - CITY HALL AND SITE

PRESENT:

CITY OF LAS VEGAS
DAVE WALLISER - OAS
DAN PILKINGTON
LARRY POWELL
TOM GRAHAM

HARRIS SHARP & ASSOCIATES
DAVID DAILEDA
NED COLE

CONSULTANTS

GENERAL CONTRACTOR
JOHN CLATTERBUCK
BOB THURNILEY
PAT HENDERSON
DON DES JARDIN

SUB-CONTRACTORS

ITEMS DISCUSSED

DISTRIBUTION

1. Dave W. reported that on April 15th a representative of the State Department of Transportation will be in Las Vegas to inspect the off-ramp area before the work is begun. At this time, the issue of the fence along Casino Center will be brought up and another attempt will be made to get the fence removed. If it is, some provision must be made to landscape the area between the sidewalk and the fence.

2. Dave D. reported that all sides have signed the Motorola agreement and Amoroso is preparing a proposal for adding this contract to the existing agreement.

3. Dave D. reported that the City is still negotiating the lease of the telephone equipment with Centel, but that both Amoroso and Centel had signed the installation agreement. Dan reported that the City is investigating the possibility of using the new phone system to feed all of City Hall and he would keep us informed.

4. No delivery date has been established for the landscape screens.

5. Dave D. reported that HSA's written list of color scheme information was almost ready, and would be presented next week.

6. Dave W. & Larry reported that the fire line tie in, discussed last week, can not be done.

7. Ned reported that [redacted] awaiting a price on the proposals to change the demountable partitions before a decision as to their final details can be made.

8. Ned presented Amoroso's price from the deletion of the vinyl wall coverings. This will now be considered by the City. HSA will prepare an overall report on cost reduction proposals next week.

9. HSA presented a letter recommending the proposals to be included in C.O. #1. HSA will prepare the C.O., but should await word from the City before proceeding.

10. Dave W. asked that a test of the apparatus bay slab to check for proper drainage be arranged as soon as possible. HSA will work on this.

11. Other proposals discussed include:

A. #32 - $0.00 - Approved

B. Time extensions asked - 4 days for weather. HSA says we should acknowledge receipt, and grant them at the end of the job, if necessary.

C. Overhead door insulation & glazing - $4,092 credit accepted.

D. Window mullion system change - being studied.

Conv. Finally 420-83

12. A meeting with JBA and the City has been arranged to finalize the "smoke detector" system requirements requested by the City in plan check.

13. Ned is still awaiting the letter from the computer floor manufacturer on the "seismic design" of this floor.

14. The waterproofing system has not been approved - yet, and any action Amoroso takes is at their own risk.

15. The City presented HSA with a letter detailing what tests they would like to see to settle the ceramic tile issue. HSA will implement this.

16. HSA has asked for more information on the roof than was submitted.

17. Pat Henderson informed us that the emergency generator must be ordered on the 12th of April and a decision must be given to Amoroso by the City.

18. Pat also said that a problem has developed re: the timing of the light pole submittal, and that Bongerg & Whitney has altered their proposal price. HSA will investigate.

19. The additional information requested on the replcement light fixtures has not been received by HSA. A decision will be made upon its receipt.

20. Pat H. has requested that any decision on a proposal be reported directly to him, even if by phone, so we can alleviate any future problems.

21. Pat said that there are some conflicts developing between the electrical installation and the structural steel, this will be reported when it is fully investigated.

22. Amoroso has been asked to perform a test on the slab drainage of the aparatus bay slab. This will be worked out with HSA.

23. Amoroso presented a letter requesting the replacment of John Clatterbuck as job superintendent. This has been taken under advisement.

Respectfully submitted,

DAVID A. DAILEDA, A.I.A

DAD/je

Amo. Hosp. 420-83

501 N.C.C.

CENTRAL FIRE STATION COMPLEX

WEEKLY MEETING AGENDA

DATE: APRIL 21, 1983

TIME: O/A 9:00 AM - O/A/C 10:00 AM

LOCATION: O/A CITY HALL - 2ND FLOOR

O/A/C SITE TRAILER

File

PRESENT:

CITY OF LAS VEGAS

TOM GRAHAM
DAVE WALLISER
JEFF JACOMB
LARRY POWELL
TED REKING
DAN PILKINGTON
GIL GILPIN

HARRIS SHARP & ASSOCIATES

DAVID DAILEDA
NED COLE
PATRICK KLENK

S.J. AMOROSO CONSTRUCTION

PAT HENDERSON
DON DES JARDIN
JOHN CLATTERBUCK

CONSULTANTS

SUB-CONTRACTORS

ITEMS

ACTION REQ'D/DATE

1. Public Service Items

   A. N.D.O.T. in town on the 15th - 4th Street fence was discussed. U.S.D.O.T. is checking on this.

Solar Weekly 4/25-83

2. Purchasing Items

   A. HSA to meet with Amoroso Friday to discuss proposal for adding Motorola contract and Centel contract to general contract. Centel and Amoroso are currently discussing the speaker cans.

3. Fire Services Items

   A. Larry to write HSA accepting color scheme - with changes.

   B. HSA has looked into altering sink #10, it can be changed, but this will require atering both adjacent cabinets - and they are now being fabricated.

4. OAS Items

   A. Current analysis of cost reductin proposals - (attached). The following need to be reviewed: 10, 15, 17, 19, 25, 27, 28, 33, 34, 35, 36, 45.

   B. Shall HSA prepare another letter on C.O. #1 per Russ Dorn's instructions ?

5. HSA Items

   A. JBA is now preparing two options for the smoke detectors the Building Department is requesting.

   B. HSA still awaiting final computer floor design information.

   C. HSA has received letters from L & L Roofing guaranteeing the compatibility of their proposed waterproofing system. HSA recommends acceptance.

6. Amoroso Items

   A. Arrange the slab drainage test with Amoroso.

   B. Bolt testing to be discussed and decided.

Russ Dorn 435-83

CENTRAL FIRE STATION COMPLEX

WEEKLY MEETING MINUTES

DATE: APRIL 14, 1983

TIME: 9:00 - 10:15 AM

LOCATION: 2ND FLOOR - CITY HALL

PRESENT:

CITY OF LAS VEGAS
TOM GRAHAM - OAS
DAVE WALLISER - OAS
TED REXING - OAS
LARRY POWELL
ED PARK

HARRIS SHARP & ASSOCIATES
DAVID DAILEDA
PATRICK KLENK

CONSULTANTS

GENERAL CONTRACTOR

SUB-CONTRACTORS

DISTRIBUTION

ITEMS DISCUSSED

1. The April 15th meeting between N.D.O.T. and the City wherein the Fourth Street fence will be discussed, is still set for approximately 9:00 a.m. tomorrow. Steve Oxby of N.D.O.T. has indicated that the fence can now be taken down. We will await the meeting.

4-35-83
Lois Greally

2. HSA is awaiting Amoroso's Proposal to include both the Motorola and Centel contracts in the overall contract. Both Motorola and Centel have signed contracts with Amoroso. the City is still negotiating the lease with Centel. The meeting at HSA yesterday resolved the questions regarding the "ring-down" equipment and installation.

3. HSA has requested that Amoroso send copies of all contracts and purchase orders over $10,000.00, as well as copies of all certified payrolls to the City.

4. HSA presented Larry with the "color scheme schedule". Larry will now use this as the basis of his letter of acceptance.

5. Dave D. explained that the "chocolate" color selected for the turn-out lockers is not a standard color, and it would cause an additional $575.00 cost. In lieu of this extra cost, the standard color "patriot red" was chosen.

6. Dave D. asked if Amoroso had been asked to alter sink #10 while moving it - if so, why had HSA not been informed ? Larry said this probably happened when Amoroso was at the existing Fire Station. HSA will look at the effect of altering this sink.

7. Dave D. presented the following new proposals:

   #39 Credit for waterproofing protection board - $3,322.00

   #33 Relocate construction joint in concrete wall - cost - $667.00 - rejected by HSA

   #32 Add for locker color change $575.00 - color changed to standard

8. HSA was told not to prepare C.O. #1 yet - not until the second commission meeting in May, and that the dollars should balance out. OAS will inform HSA what to do and when.

9. HSA will set-up a "slab drainage" test and inform all concerned as to its date and time.

10. Ted asked HSA to find out if the bolted connections are "bearing" or "friction" - so he can determine what to look for.

11. HSA recommended that the emergency generator be down sized to 400 KVA. OAS agreed, and this information is to be sent to Amoroso today.

12. HSA reported that they had met with the Building Department and that JBA was now preparing two optional proposals for the smoke detector system required. Prices will be obtained as soon as these are ready.

4-25-93
Dora Steele

13. HSA still has not received any information on the seismic design of the computer floor.

14. HSA is awaiting a letter from L & L Roofing guaranteeing the compatibility of the proposed waterproofing systems. Once this is received, the waterproofing system will be approved.

15. HSA is working out the details of testing on the ceramic veneer system that has been requested by the City.

16. HSA presented a letter on the replacement of John Clatterbuck as job superintendent for the City's review. This was reviewed and accepted and will be forwarded to Amoroso.

17. HSA is to ask for a Proposal to install a speaker at the pool of the adjacent Dula Center.

18. No site meeting was held today.

Respectfully submitted,

HARRIS SHARP & ASSOCIATES, INC.

DAVID A. DAILEDA, A.I.A.

DAD/je

Dora Pinelly 4-05-83

Dona Tisdale 4-25-83

PROJECT: CENTRAL FIRE STATION

CHANGE ORDER PROPOSALS

Proposal Number	Description	Estimated Amount	Contr. Amount	Days	Action: App	App Noted	Resub	Not App	Change Order Number
1	RELOCATE FIRE HYDRANT ON DRAWING C-6		COST 407.00		X				
2	REVISE PRESSURE VACUUM BREAKER ORIGINALLY SHOWN TO BE REMOVED ON DRWG. C-6		CREDIT 500.00		X				
3	REVISE EMERGENCY GENERATOR		CREDIT 7,872.00		X				
4	REVISE 25' LIGHT POLES TO BE TAPERED @ BB; CC, & DD (* ALSO SQUARE STEEL SUBSTITUTE)		CREDIT ~~1,080.00~~ 720.00		X				
5	REVISE PATTERNED "BOMANITE" CONCRETE TO JUST COLORED CONCRETE		CREDIT 1,824.00					?	
6	DELETE TUNNEL 104 & DOOR 104		CREDIT 4,440.00					X	
7	REVISE SECTIONAL OVER HEAD DOORS		CREDIT 4,092.00		X				
8	REPLACE 24" x 24" RED CERAMIC VENEER W/ 8" x 8" RED CERAMIC VENEER BY MARAZZI, USA		CREDIT 2,800.00		X				
9	REPLACE 24" x 24" RED CERAMIC VENEER W/ 12" x 12" RED CERAMIC VENEER BY MARAZZI, USA		COST 8,872.00					X	
10	DELETE ALL VINYL WALL COVERINGS & PAINT		CREDIT 2,283.00		?				
11	REVISE INTERIOR MORTAR BED TO THIN-SET		CREDIT 1,700.00		X				
12	DELETE 8 ROTAR POP-UPS & ADD 18 HEADS		COST 557.00		X				
13	DELETE PARKING ISLAND ON DRWG. C-3		COST 130.00					X	
14	DELETE 110' OF TRENCHING E CONDUIT		CREDIT 0.00		X				
15	REVISE WATERPROOFING O/ COMMUNICATIONS LEVEL		CREDIT 3,322		N/A ?				
16	REVISE TRENCH COVERS IN APPARATUS BAY	CREDIT 2,000.00	CREDIT 2000		X				
17	REVISE 8-150-U FIXTURES TO 8-225-W FIXTURES	COST 1,498.11	COST (1,903.00) REV 2033.00		?				
18	REVISE ALL INTERIOR CARPET	CREDIT 8,000.00	CREDIT 8,413.00		X				

Dona Fiscalez 4-25-83

CENTRAL FIRE STATION

CHANGE ORDER PROPOSALS

Proposal Number	Description	Estimated Amount	Contr. Amount	Days	Action: App	Action: [redacted]	Action: Resub	Action: Not App	Change Order Number
19	REVISE WINDOW TYPES 1,2,4,7,8&9 FROM KAWNEER 1600 TO ARCADIA		CREDIT ~~Pending~~ 4,250		?				
20	TIME EXTENSION		X	8			X		?
21	OVER-EXCAVATE UNSUITABLE BEARING MATERIAL & REPLACE w/ LEAN CONCRETE		COST 14,172.00		X				
22	ADD 31 L.F. OF 18" STORM DRAIN & ADJUST SEWER CONNECTION		COST 1,892.00		X				
23	REMOVE ALL LOOSE & DISTURBED MATERIALS & REPLACE w/ LEAN CONCRETE		COST 2,893.00 ~~2,000.00~~		X				
24	INSTALL TWO DECK DRAINS Q-11 & Q-12		COST 5,841.00		X				
25	DELETE CARPETING 107 & 109	CREDIT 4,000.00	CREDIT 1,249					?	
26	3 ITEMS, CONDUIT, TUBING & DISCONNECT SWITCH		(PARTIAL CREDIT $200)		?				LINY
27	DELETE TOP 8' OF SCREEN WALL	CREDIT 6,000.00	CREDIT 1,008.00		? ONS				
28	DELETE TOILET ROOMS 313 & 314 REF. Q-13	CREDIT 7,000.00	CREDIT 6,378		?				
29	REVISE GLAZING @ ADMIN. OFFICES FROM BUTT TO STANDARD FRAMING	CREDIT 3,000.00	CREDIT 0					X	
30	REVISE LANDSCAPE MAINTENANCE PERIOD FROM 180 TO 60 DAYS	CREDIT 2,000.00							
31	REVISE ELEVATOR TO ELIMINATE FUTURE EXPANSION CAPABILITIES	CREDIT 10,000.00							
32	RELOCATE LIGHT SWITCHES AT DOORS # 106, 108A, 302	CREDIT 0	CREDIT 0		X				
33	REVISE MARLITE PARTITIONS ELEC. OUTLETS		CREDIT 754.00		?				
34	REVISE FIBER CORE OF MARLITE PARTITIONS		COST 6,939.00		? ONS				
35	REVISE FRAMING & SUPPORTS OF DEMOUNTABLE PARTITIONS		COST 2,859.00		? ONS				
36	REVISE CARPETING IN ROOMS #		COST 1073.00		? ONS				

Lora Pivalica 4-25-83

PROJECT :

CHANGE ORDER PROPOSALS

Proposal Number	Description	Estimated Amount	Contr. Amount	Days	Action				Change Order Number
					App	App Noted	Resub	Not App	
37	10 : 20 YR GUARANTEES ON CERAMIC VENEERS								
38	RELOCATE CONT. JT IN CONC. WALL		COST $667.00					X	
39	CHANGE LOCKER COLOR TO CHOCOLATE		COST 575.00					X	
40	STAIR RAIL OCTAIL EXTRA		COST 431.00					?	
41	ADD BEAM NO. A20B		COST 674.00		?				
42	CHANGES IN REBAR PER Q-10		COST 0		X				
43	REVISE : MACH. EQUIP. PENETRATIONS		COST $1,212.00						
44	REVISE CURVE LAY-OUT		COST 230.00						
45	TIME EXTENSION			4					

501 N. Casino Ctr

Title

CENTRAL FIRE STATION COMPLEX

WEEKLY MEETING AGENDA

DATE: APRIL 28, 1983

TIME: O/A 9:00 AM - O/A/C 10:30 AM

LOCATION: O/A CITY HALL - 2ND FLOOR

O/A/C SITE TRAILER

PRESENT:

CITY OF LAS VEGAS

TOM GRAHAM
DAVE WALLISER
JEFF JACOMB
LARRY POWELL
TED REXING
DAN PILKINGTON
GIL GILPIN

HARRIS SHARP & ASSOCIATES

DAVID DAILEDA
NED COLE
PATRICK KLENK

CONSULTANTS

S.J. AMOROSO CONSTRUCTION

PAT HENDERSON
DON DES JARDIN
JOHN CLATTERBUCK

SUB-CONTRACTORS

ITEMS

ACTION REQ'D/DATE

1. Public Service Items

   A. Dave W. was to contact N.D.O.T. to find out the logistics of fence removal, and to discuss landscaping and possible drive relocation.

5-3-83

Done 4/28/83

2. Purchasing Items

   A. HSA met with Amoroso Friday and discussed the proposals for adding the Motorola contract and the Centel contract to general contract. Amoroso has presented this to HSA for our reiview.

3. Fire Services Items

   A. Larry has written HSA accepting the color scheme - with changes. Should we have the Chief sign the color scheme, just as he signed all other drawings? Additionally, the carpet change listed by Fire Services needs to be adjusted.

   B. HSA has received a color chart from Centel - this will be given to Fire Services for their selection.

4. CAS Items

   A. Current analysis of cost reduction proposals. The following are to be reviewed: 10, 27, 28, 31, 35, 48, 49, 50.

   B. HSA has prepared another letter on C.O. #1 per Russ Dorn's instructions, and will present it at the meeting.

5. HSA Items

   A. HSA has proposed the two options for the smoke detectors per the Building Department's request to Amoroso for pricing.

   B. HSA still awaiting final computer floor design information. We have discussed this problem with Amoroso who has agreed to place additional pressure on the manufacturer.

   C. A decision is required today on the testing of bolts and welds. Dave will present the proposal HSA recommends and Hal will also discuss this.

6. Amoroso Items

501 N. Casino Ctr.

CENTRAL FIRE STATION COMPLEX

WEEKLY MEETING MINUTES

DATE: APRIL 21, 1983

TIME: 9:00 - 11:20 AM

LOCATION: 2ND FLOOR - CITY HALL

PRESENT:

CITY OF LAS VEGAS
TOM GRAHAM - OAS
DAVE WALLISER - OAS
TED REXING - OAS
LARRY POWELL
DAN PILKINGTON

HARRIS SHARP & ASSOCIATES
DAVID DAILEDA
NED COLE

CONSULTANTS

GENERAL CONTRACTOR
JOHN CLATTERBUCK

SUB-CONTRACTORS

ITEMS DISCUSSED

DISTRIBUTION

1. At the April 15th meeting between N.D.O.T. and the City the Fourth Street fence was discussed. N.D.O.T. has indicated that the fence can be taken down. Dave W. will check with Steve Schroyer at N.D.O.T. to find out how we go about getting it removed. Additionally, Dave is to discuss the possibility of landscaping this area or even moving our driveway into this area.

5-2-83
Minutes Weekly

2. Dave D. reported that he will meet with Amoroso on Friday to discuss their Change Order Proposals for both Motorola and Centel. The only issue in question appears to be a clarification of the speaker cans and who supplies them. This is an issue between these two parties.

   Dan reported that the Proposal from Nevada National Leasing of 10.5% ($38,927.00), probably will be accepted.

3. Dan reported that additional information on the "expanded" phone system is due this week.

4. The traffic signal drawings are due to go out to bid next week. The current estimate is $100,000.00. The schedule calls for bid opening on May 17th and construction completion on November 11th.

5. Larry presented HSA with his letter accepting the color scheme, with listed exceptions.

6. Dave D. said that altering Sink #10 would also cause alterations to the adjacent cabinets. Larry said that the problem was that the bottom of the sink is too low and it causes "sore backs" for the dishwashers. Larry will look into getting the sink fixed "in-house".

7. The following cost reduction proposals were reviewed and acted upon:

   5 - Still reviewing, credit too low
   10 - Still reviewing, need a decision date
   15 - Accepted
   17 - Still reviewing; asking for back-up
   19 - Accepted
   25 - Rejected
   27 - OAS still reviewing
   28 - HSA to revise - convert room too office
   33 - Accepted
   34 - Rejected
   35 - OAS still reviewing
   36 - Accepted
   45 - Ted to review his records

5-3-83
Dave Kroeker

8. HSA was instructed to prepare a new letter addressing the items to be covered in C.O. #1. The items should be a net change of $0.00 dollars.

9. JBA's smoke detector system design is due to be ready on Monday. HSA will issue it for pricing.

10. HSA still has not received any information from the computer floor manufacturer on its seismic stability. Ned will call next week.

11. HSA has reviewed all the waterproofing warranties and information, and has approved the system.

12. At the site, the apparatus bay floor was reviewed with Amoroso and the "flaws" were pointed out. It was decided that Amoroso would repair the slab and when they have it in proper order, a drainage test will be performed. Amoroso was reminded that any "connection" to the slab would be made by grinding, not by using any kind of "floor stone" material.

13. Amoroso indicated that the kitchen equipment will be moved about October 1st.

14. Hal Strauss was not available for the meeting so the discussion of the bolt testing was put off until later.

Respectfully submitted,

HARRIS SHARP & ASSOCIATES, INC.

DAVID A. DAILEDA, A.I.A.

DAD/je

Dave Woolley 5-3-83

501 N. Cavens Ctr.

CENTRAL FIRE STATION COMPLEX

WEEKLY MEETING AGENDA

DATE: MAY 12, 1983

TIME: O/A 9:00 AM - O/A/C 10:30 AM

LOCATION: O/A CITY HALL - 2ND FLOOR

O/A/C SITE TRAILER

PRESENT:

CITY OF LAS VEGAS

TOM GRAHAM
DAVE SALLISER
JEFF JACOMB
LARRY POWELL
TED REXING
DAN WILKINGTON
GIL GILPIN

HARRIS SHARP & ASSOCIATES

DAVID DAILEDA
NED COLE
PATRICK KLENK

CONSULTANTS

S. J. AMOROSO CONSTRUCTION

PAT HENDERSON
DON DES JARDIN
JOHN CLATTERBUCK

SUB-CONTRACTORS

ITEMS

ACTION REQ'D/DATE

1. Public Service Items

AGENDA/CENTRAL FIRE SERVICES

2. Purchasing Items

   A. The proposal for bolt testing was signed and given to Purchasing on Friday.

   B. Has a decision been reached on the additions to the telephone system?

   C. Has a Contract for the phone leasing been finalized?

3. Fire Services Items

4. OAS Items

   A. Current analysis of cost reduction proposals. The following are to be reviewed: 10, 17, 31.

   B. HSA has prepared C.O. #1 and presented it to the City. Amoroso to sign this today.

5. HSA Items

   A. HSA still awaiting final computer floor design information. We have discussed this problem with Amoroso who has agreed to place additional pressure on the manufacturer.

   B. HSA has worked out a solution to the deck drain problem and is checking it now.

6. Amoroso Items

   A. Solution to concrete beam at emergency generator.

   B. C.O. #1 to be signed.

CENTRAL FIRE STATION COMPLEX

WEEKLY MEETING MINUTES

DATE: MAY 5, 1983

TIME: 9:00 - 11:20 AM

LOCATION: 2ND FLOOR - CITY HALL

PRESENT:

CITY OF LAS VEGAS
TOM GRAHAM - OAS
DAVE WALLISER - OAS
TED REXING - OAS
LARRY POWELL
DAN PILKINGTON

HARRIS SHARP & ASSOCIATES
DAVID DAILEDA
NED COLE

CONSULTANTS
HAL STRAUSS

GENERAL CONTRACTOR
JOHN CLATTERBUCK

SUB-CONTRACTORS

DISTRIBUTION

ITEMS DISCUSSED

1. Dave W. reported that he has prepared a letter to N.D.O.T. accepting their offer to remove the fence on 4th Street. No discussion of the landscaping was started because the timing of the States' construction will preclude this landscaping installation.

5-23-83 Dave W.

2. HSA noted that progress report from Motorola has been received and is available for review.

3. The Proposal for bolt and weld testing was reviewed, and will be altered by HSA. HSA will then get it signed and give it to Purchasing.

4. No decision has yet been made on the full transfer of City Hall phone service to the Fire Station. It was noted that by next week it will almost be too late.

5. The City and the leasing company are still negotiating the language for the phone lease Contract.

6. In reviewing the specified lamps for use in the parking lot, it was noted that the high pressure sodium lamps were indeed the ones that Public Services likes, and the record should reflect that HSA finally got something right.

7. HSA was asked to get a copy of the Centel and Motorola Contracts to Purchasing along with the Proposals.

8. HSA presented a letter from Pat indicating the carpet selection worked out with Larry for the upper floors. Additionally, the color selections for the phones were included in this letter.

9. No new cost reduction Proposals had been received by HSA. Proposals 31, 37 and 50 were reviewed to note that HSA was awaiting additional information.

10. HSA was instructed to prepare C.O. #1 to reflect an $8,241.00 credit to the Contract.

11. HSA noted that only the metal deck manufacturer for the building has been approved, not the Shop Drawings.

*12. HSA noted that they are still waiting for information on computer floor. John Clatterbuck indicated that he had recently spoken with the manufacturer, and that the requested information in on its way.

*13. Ned started a discussion the "between ~~sub~~ SLAB" drainage problem at the Plaza. This will be reviewed by HSA with both Hal Strauss and Amoroso.

*14. Amoroso was reminded that a resubmittal on the Bomanite was pending.

*15. In a discussion of the metal deck Shop Drawings, it was agreed that HSA would mark them up, and ask for a partial resubmittal - this will save time. The end conditions are the real question.

*16. John Clatterbuck indicated that the required washers for the steel base plates had been purchased. Hal reviewed the washers and accepted them.

*17. HSA asked John to review the "M&M" situation. John indicated that they may fold soon and that Amoroso was currently getting prices from new subs to replace M&M.

*18. The misaligned concrete beam at the emergency generator was rereviewed. It was agreed that Hal will design an acceptable alternative and that Amoroso will make what ever changes are necessary, at their expense.

Respectfully submitted,

HARRIS SHARP & ASSOCIATES, INC.

DAVID A. DAILEDA, A.I.A.

DAD/kah

* At Site

5-22 Done Visual

501 N. Casino Ctr.

Title

CENTRAL FIRE STATION COMPLEX

WEEKLY MEETING AGENDA

DATE: MAY 5, 1983

TIME: O/A 9:00 AM O/A/C 10:30 AM

LOCATION: O/A CITY HALL - 2ND FLOOR

O/A/C SITE TRAILER

PRESENT:

CITY OF LAS VEGAS	HARRIS SHARP & ASSOCIATES	S.J. AMOROSO CONSTRUCTION
TOM GRAHAM	DAVID DAILEDA	PAT HENDERSON
DAVE WALLISER	NED COLE	DON DES JARDIN
JEFF JACOMB	PATRICK KLENK	JOHN CLATTERBUCK
LARRY POWELL		
TED REXING		
DAN PILKINGTON		
GIL GILPIN		

CONSULTANTS

SUB-CONTRACTORS

ITEMS

ACTION REQ'D/DATE

1. Public Service Items

   A. Dave W. was to write N.D.O.T. to find out the logistics of fence removal, and to discuss landscaping and maintenance of the area.

Minutes 5-23-83

2. Purchasing Items

   A. Motorola has submitted a progress report on their work to date. This is available for review.

   B. The proposal for bolt testing is ready. It will be signed today. How should it be transmitted to Purchasing ?

   C. Has a decision been reached on the additions to the telephone system.

3. Fire Services Items

   A. Larry and Pat K. wre to get together to finalize the carpet for the upper floors - any progress.

   B. Has a color for the phones been selected ?

4. OAS Items

   A. Current analysis of cost reduction proposals. The following are to be reviewed: 31, 37, 50.

   B. HSA has prepared another letter on C.O. #1 per Russ Dorn's instructions, and will present it at the meeting.

5. HSA Items

   A. HSA still awaiting final computer floor design information. We have discussed this problem with Amoroso who has agreed to place additional pressure on the manufacturer.

6. Amoroso Items

   A. Concrete beam at emergency generator well needs to be modified.

5-23
Mark Woolley

501 N. Casino Ctr

File

CENTRAL FIRE STATION COMPLEX

WEEKLY MEETING MINUTES

DATE: APRIL 28, 1983

TIME: 9:00 - 11:20 AM

LOCATION: 2ND FLOOR - CITY HALL

PRESENT:

CITY OF LAS VEGAS
TOM GRAHAM - OAS
DAVE WALLISER - OAS
TED REXING - OAS
LARRY POWELL
DAN PILKINGTON

HARRIS SHARP & ASSOCIATES
DAVID DAILEDA
NED COLE

CONSULTANTS
HAL STRAUSS

GENERAL CONTRACTOR
JOHN CLATTERBUCK

SUB-CONTRACTORS

DISTRIBUTION

ITEMS DISCUSSED

1. Dave W. reported that he is preparing a letter to N.D.O.T. accepting their offer to remove the fence, and requesting the state also landscape the area, and that the City will maintain the landscaping. After a long discussion it was decided that we will not try to move our drive on to the State R.O.W.

2. HSA presented the Amoroso Proposals (#49 & 50) which reference the addition of the Centel and Motorola contracts to the general contract. After a discussion about overhead and profit and the Amoroso change for bidding the project, it was decided to accept the Motorola Proposal (#49) as is and to ask for a resubmittal of the Centel Proposal (#50) deleting the bidding cost. HSA will follow-up.

3. Dan reported that the City has not received a full "package" of information from Centel as of this date regarding the expansion of the City Hall phone system.

4. After a discussion with Larry about the color scheme it was decided that the City's cover letter would suffice, and the Chief would not have to sign the color scheme sheets. HSA also explained that the colors and weights of carpet specified for the upper offices need to be consolidated into one because the price for the extra (C.O.#36) is based on a single role price. Larry is to get with HSA to work this out.

5. HSA presented Larry with a color chart and letter from Centel asking Larry to select the colors for the telephone instruments.

6. The following cost reduction proposals were reviewed with the indicated action taken:

5	-	To be resubmitted
10	-	Waiting for final decision date
27	-	Holding for review
28	-	HSA asking for new finishes
31	-	Awaiting back-up
34	-	Awaiting back-up
35	-	Awaiting back-up
48	-	Approved
49	-	Approved
50	-	Approved without the 815 cost

7. HSA presented a letter indicating the recommended items for C.O. #1. After discussion, it was decided that a new letter should be written - with a credit of $6,200.00. This will compensate for the cost of bolt and weld testing.

8. Hal and Dave presented a Proposal for bolt and weld testing. This is to be written into a contract form for the City to sign. This is to be a set figure with a dollar amount for any additional "approved" work. Dave will present this to the City when ready.

9. The two smoke detector options have been issued to Amoroso for pricing (Proposal #42).

10. HSA has asked Amoroso to assist in getting seismic information for the computer floor from the manufactuser. No response has been received in the past three (3) weeks by HSA.

*11. John agreed to resubmit the Bomanite Deletion Proposal (#5) so a final decision can be reached on this issue.

*12. The three columns that "missed" the bolts were reviewed. Two are already fixed by adjusting steel. The third will require an extension of the base plate to repair.

*13. The over punched holes in the base plates will require washers to hold the bolt in place. Hal will review this with John before the welds are ad[illegible].

*14. John said that the steel erection was going so well that it will be completed one to two weeks ahead of schedule.

Respectfully submitted,

HARRIS SHARP & ASSOCIATES, INC.

DAVID A. DAILEDA, A.I.A.

DAD/je

* At the job site

5-23-73

Dona Hoesly 7-10-83

BUILDING DEPARTMENT
CITY OF LAS VEGAS
CORRECTION NOTICE

Job Located at 501 N. Casino Ctr.

I have this day inspected this structure and these premises and have found the following violations of City and/or State laws governing same:

NEITHER THE MATERIALS BEING USED NOR THE SUBSTITUTION OF C.F.S. FOR M+M HAVE BEEN APPROVED. THEREFORE, YOU ARE PROCEEDING W/ THE WORK AT YOUR OWN RISK. IF THESE AREN'T RECEIVED BY 2:30 PM, JULY 6, 1983 THEN A RED TAG WILL BE ISSUED.

You are hereby notified to correct above violation and call for re-inspection.

Date 6-30-83

Inspector

23.03 Do not remove this tag!

7-7-83 MTG.: PILKINGTON APPROVED SUBSTITUTION
7-8-83 MTG.: ARCHITECTS APPROVED SUBSTITUTION

Dora Hoeby 9-6-83

FORWARD O COPY ATE
TO THE FIRE DEPARTMENT

CITY OF LAS VEGAS, NEVADA

LOG NO. & AREA _____ CONST. VAL. $ _____

DEPARTMENT OF BUILDING AND SAFETY

PHONE 386-6251

PLUMBING PERMIT

ADDRESS OF CONSTRUCTION 501 N Casino Center ~~Main St~~ OWNER City of Las Vegas

CONTRACTOR PSmi STATE LICENSE NO. 11218 CITY LICENSE NO. 15790

LOT(s) _____ BLOCK _____ SUBDIVISION _____

PROPOSED CONSTRUCTION Install 3 10,000 Gal Tanks & 1,000 Gal Tank & Disp ZONE _____

PLUMBING PERMIT NO. 2306 USE _____

UNITS	DESCRIPTION	FEE	TOTAL
	PERMIT ISSUANCE		
	For Issuing Each Permit	10.00	
	For Each Supplemental Permit	4.50	
	FIXTURE CHARGE		
	Bathtub, Shower Stall or Head	EA	.50
	Floor Drain, Floor Sink, Wash Fountain	EA	.50
	Laundry Trays: Clothes Washer, Dishwasher (each unit)	EA	.50
	Sinks: Kitchen, Bar, Lavatory	EA	.50
	Water Heater, Dishwasher	EA	.50
		EA	.50
			.50
			.50
		EA	.50
	SEWER SYSTEM		
			.50
	WATER SOFTENERS		.50
	SWIMMING POOLS		
	WATER DISTRIBUTION SYSTEM		
			.50
	GAS PIPING SYSTEM		.50

Approval of the work under this permit will be given only after all debris have been removed from job site and public right of way

UNITS	DESCRIPTION	FEE	TOTAL
	Medium Pressure Gas System (over 5psig)	4.00	
X	Each Gas Appliance (any type)	1.00	
	Standby Emergency (generating engines)	5.00	
	Steam Boilers	5.00	
1	Service Station Fuel Tank and Piping System	5.00	
4		.50	
	AUTOMATIC FIRE EXTINGUISHING SYSTEM		
	Each Riser for Floor		
	Sprinkler Heads		
	Range Hood and Duct		
	Dry Standpipe System		
	Fire		
	Wet Standpipe System		
	Fire		
	SOLAR ENERGY SYSTEMS		
	Collector		
	PIPELINE CONTRACT		
	OTHER INSPECTIONS AND FEES		

Plumbing permit fees may be computed the same as building permit fees by using the cost of installation for valuation amount when such work is not included in the above schedule

SEWER CONNECTION 250-2443

FIXTURES _____

FEE _____

PERMIT FEE N/C

TOTAL FEES _____

STL $ RECEIPT #
TOTL $
CASH $

PMT 306 SP 001
CITY - LAS VEGAS
BLDG & SAFETY
08/19/83

P. Lyons 8-19-83

NOTICE: THIS IS AN ACKNOWLEDGEMENT OF WORK

Joni Hoesly 9-21-83

FILE

BUILDING DEPARTMENT
CITY OF LAS VEGAS

CORRECTION NOTICE

FOLLOWING TWO VERBAL NOTICES.

Job Located at 501 Casino Ctr. Blvd.

I have this day inspected this structure and these premises and have found the following violations of City and/or State laws governing same:

U.B.C. CHP. 47 11(c)
TABLE 43-B #6 & 10
1-HOUR FIRE RATED WALLS:
HAVE SCREWS AT 8" O.C.
AROUND THE PERIMETER
AND 12" O.C. ON THE
INTERMEDIATE STUD.

You are hereby notified to correct above violation and call for re-inspection. BT 9-21-83

Date 9-14-83 Inspector

23.03 Do not remove this tag

Dona Hotels 11-30-83

BUILDING DEPARTMENT
CITY OF LAS VEGAS

CORRECTION NOTICE

Job Located at 501 CRANBROOK

I have this day inspected this structure and these premises and have found the following violations of City and/or State laws governing same:

① PROJECT STEEL TC 3.01
② CONDITIONS OF PERMIT ISSUE

INSULATION HAS AGAIN STARTED W/OUT AN APPROVED FRAMING INSPECTION. THIS IS A NOTICE THAT A "RED TAG" MUST FOLLOW IF PROCEDURES AREN'T RESPECTED.

You are hereby notified to correct above violation and call for re-inspection.

Date 10-3-83 Inspector

23.03 Do not remove this tag!

LAS VEGAS FIRE PREVENTION BUREAU

SPRINKLER TEST RECORD

Address 501 N. Casino Center Blvd.

Name of business Central Fire Station

Sprinkler company or installer Universal

Underground flush witness .....Inspector _____ Date _____

Underground test (2 hr @ 200 lbs).....Inspector _____ Date _____

Overhead piping (2 hr @ 200 lbs) entire bldg. .Inspector Swing Date 1/12/84

Partial tests: #1.....Inspector _____ Date _____

#2.....Inspector _____ Date _____

#3.....Inspector _____ Date _____

#4.....Inspector _____ Date _____

Final Test .....Inspector _____ Date _____

Remarks Riser located N/W corner of bldg. ITV located in Station #1's Kitchen.

79-8-7

1-18-84

Van Hinkle

Done Verbally 1-19-84

BUILDING DEPARTMENT
CITY OF LAS VEGAS

CORRECTION NOTICE

AUTHORIZED BY COLE

Job Located at 501 N. CASINO CIR.

I have this day inspected this structure and these premises and have found the following violations of City and/or State laws governing same:

APPLICATION OF LEVELING COAT PLASTER IS CONTINUING DESPITE ARCHITECTS REJECTION OF SUBSTRATE YESTERDAY AT 9:15 A.M. THIS NOTICE DOCUMENTS THE UNDERSTANDING THAT E.J.A. IS PROCEEDING AT ITS OWN RISK.

~~You are hereby notified to correct above violation and call for re-inspection on~~

Date 1-11-84 [signature]
Inspector

23.03 Do not remove this tag!

Dona Healy 2-8-84

CITY OF LAS VEGAS

INTER-OFFICE MEMORANDUM

Date: 02-02-84

TO:	FROM:
FIRE PREVENTION DIVISION	DEPARTMENT OF BUILDING AND SAFETY
SUBJECT:	**COPIES TO:**
SPRINKLER SYSTEM HYDROSTATIC TEST	FILE

The undersigned inspectors have this date conducted a hydrostatic test of the sprinkler system located at 501 Casino Center (Central Fire Station) and we certify that no discrepancies were found.

Mac McCalister #81
Plumbing Inspector

Stuart Cornelius
Building Inspector

GF:sf

Dona Hively 2-8-84

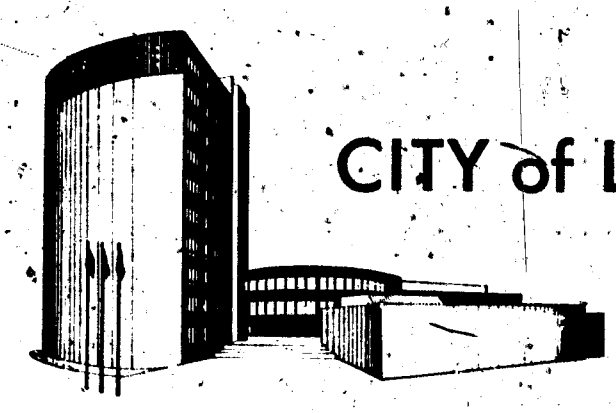
501 N. Casino Ctr.

MAYOR BILL BRIARE

COUNCILMEN
RON LURIE
PAUL J. CHRISTENSEN
AL LEVY
BOB NOLEN

CITY ATTORNEY
GEORGE F. OGILVIE

CITY MANAGER
ASHLEY HALL



CITY of LAS VEGAS

February 3, 1984

Harris Sharp & Associates Incorporated
2915 West Charleston Boulevard
Las Vegas, Nevada 89102

Attn: Mr. Ned Cole

RE: Central Fire Station Complex

Gentlemen:

I have written S. J. Amoroso concerning the Code and adhered veneer after our meeting last week; a copy of the letter is attached. Upon further consideration there is one aspect of this problem which must be addressed to you. Namely, that the Mei-Krete tile setting adhesive, approved by you on January 24, 1983, is a deviation from U.B.C. Section 3005(d)2 which has not been approved by this Department or by I.C.B.O. Therefore, in accordance with Sections 105 and 107, we request that all information concerning that product be submitted to our Plans Check Division for review prior to continuance of any veneer work. Furthermore, we request that a recognized testing laboratory certify that the existing installations meet the requirements of Section 3004.

Sincerely,

Clay Hymer

CLAY HYMER, DIRECTOR
Building and Safety Department

CH:TR:bjl
cc: Thomas B. Graham
David C. Walliser
Ted Rexing
File: Bldg. & Safety
File: OAS. WH1353.

CITY OF LAS VEGAS NEVADA

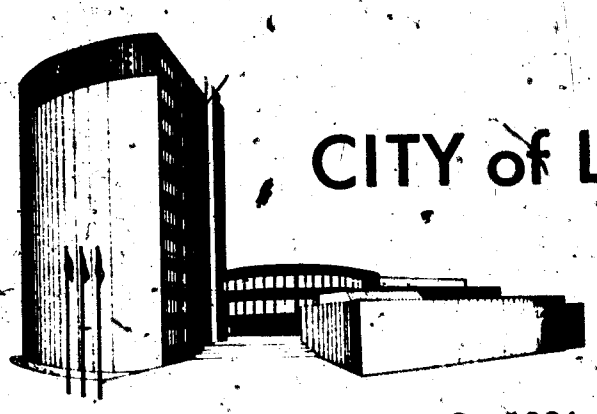
Nina Healy 2-8-84

MAYOR BILL BRIARE

8 COUNCILMEN
RON LURIE
PAUL J. CHRISTENSEN
AL LEVY
BOB NOLEN

CITY ATTORNEY
GEORGE F. OGILVIE

CITY MANAGER
ASHLEY HALL



CITY of LAS VEGAS

February 3, 1984
and

Hand Delivered _____

Rec'd by: _____

S. J. Amoroso Construction Co.
3380 Wynn Road
Las Vegas, Nevada 89102

Attn: Mr. Brian K. Furlong

RE: Central Fire Station Complex

Gentlemen:

The City as owner of this project must channel its communication through Architectural Services and the architect. However, the City as Building Official has a direct relationship with any contractor building within the City limits. Therefore, we are writing you directly about several problems which the architect brought to our attention in their January 31, 1984 letter to you and our meeting with them yesterday.

1. Your January 31, 1984 letter indicates that you will be ... "proceeding with the completion of the previously red tagged areas..." Let me explain the problems you would face should you do so. Violation of any Stop Order is a misdemeanor. If you do so, it will be necessary for us to issue a citation to appear in court. While it passes out of my hands at that point, a restraining order and/or fines are among the possible outcomes. I would not want to see this happen to you, and advise you not to treat a "red tag" lightly.

2. Recent tests, requested and conducted by you and observed by the owner and architect, demonstrate that the veneer has not been installed in conformance with either of the two criteria in Chapter 30 of the U.B.C.

CITY OF LAS VEGAS NEVADA

Dina Healy 2-8-84

A. Section 3004(b) requires a minimum shear strength of 50 psi or 28,800 pounds for the 24" x 24" veneer being installed. Two of the three "dry, pull-off" tests demonstrated that the veneer could be easily removed with a simple hammer by one man. Since the tiles had been cured a minimum of 16 days, and in some cases 28 days, it is clear that this required strength has not developed. Furthermore, particles of the Mer-Krete tile setting adhesive can be easily removed from sample tiles without any effort indicating that the material itself is not developing adequate strength.

B. Section 3005(d) 2. requires that the veneer be pressed and tapped into place to provide complete coverage between the mortar bed and veneer unit. However, all of the observed tests, and all of the "core tests" you have also made for your own purposes, revealed hollow cavities in the adhesive. The furrows left by the notched trowel are remaining separated instead of blending together for "complete coverage". In two of the three tests only 50%+ contact is accomplished; in the third, only 65%+. Clearly, the application is not satisfying the code.

C. The I.C.B.O., which produces the code and is independent of this Department is the final authority and has been consulted on each of the above issues. They agree and are forwarding some additional data.

In conclusion, the defective method of installation must be immediately remedied to the satisfaction of this Department and the architect before proceeding with new areas of veneer work; and all existing areas must be brought into conformance with the Code to the satisfaction of this Department and the Architect before a Certificate of Occupancy can be issued.

If you continue to work in violation of the Code and this Correction Notice, then another Stop Order will be issued, etc. Please keep me advised of your actions to the foregoing order through my authorized representative Ted Rexing.

Sincerely,

CLAY HYMER, DIRECTOR
Building and Safety Department

CH:TR:bjl
cc: Harris Sharp & Associates
File: Building & Safety
Thomas B. Graham
David C. Walliser
Ted Rexing
File: OAS: WH1353

Vons - Healy 2-10-84

501 N. Casino Ctr.

S.J. AMOROSO CONSTRUCTION COMPANY
GENERAL CONTRACTORS SINCE 1938

February 8, 1984

Harris Sharp Associates
2915 W. Charleston Blvd.
Las Vegas, Nevada 89102

Attention: David Daileda

Regarding: Central Fire Station

Gentlemen:

Pursuant to receiving the enclosed letter from the City of Las Vegas, dated February 3, 1984, all work on the exterior tile has been stopped. As you know, this has a major impact on our critical path. It is our contention that the tile is put on per the plans and specifications, and has been directed by the Architect. From this day forward, i.e., until this problem is resolved, no tile will be set. Please be advised however, that for each day that this work is detained, SJA will expect to receive that day as an extension of time to our contract.

Very truly yours,

S. J. AMOROSO CONSTRUCTION COMPANY

Brian K. Furlong

Brian K. Furlong
Project Manager

BKF:eh

copy: Pat
Brian
Jobsite
Mike Springer, Esq.
Building & Safety/ Clay Hymer
Thomas B. Graham, City of Las Vegas
David C. Wallise:, City of Las Vegas
Ted Rexing, City of Las Vegas
File

FEB 9 1984

P.O. BOX 11148 • LAS VEGAS, NEVADA 89111-1148 • 739-5188
OTHER OFFICES: SAN FRANCISCO BAY AREA • RENO

Mrs Healy 2-10-84

MAYOR BILL BRIARE
COUNCILMEN
[illegible] LURIE
PAUL J. CHRISTENSEN
AL LEVY
BOB NOLEN
CITY ATTORNEY
GEORGE F. OGILVIE
CITY MANAGER
ASHLEY HALL



CITY of LAS VEGAS

1984

February 3, 1984

and

Hand Delivered

Rec'd by: Brian K. Furlong
12:24 PM 2/7/84

S. J. Amoroso Construction Co.
3380 Wynn Road
Las Vegas, Nevada 89102

Attn: Mr. Brian K. Furlong

RE: Central Fire Station Complex

Gentlemen:

The City as owner of this project must channel its communication through Architectural Services and the architect. However, the City as Building Official has a direct relationship with any contractor building within the City limits. Therefore, we are writing you directly about several problems which the architect brought to our attention in their January 31, 1984 letter to you and our meeting with them yesterday.

1. Your January 31, 1984 letter indicates that you will be ... "proceeding with the completion of the previously red tagged areas..." Let me explain the problems you would face, should you do so. Violation of any Stop Order is a misdemeanor. If you do so, it will be necessary for us to issue a citation to appear in court. While it passes out of my hands at that point, a restraining order and/or fines are among the possible outcomes. I would not want to see this happen to you, and advise you not to treat a "red tag" lightly.

2. Recent tests, requested and conducted by you and observed by the owner and architect, demonstrate that the veneer has not been installed in conformance with either of the two criteria in Chapter 30 of the U.B.C.

Copy Pat
Br.
J

CITY OF LAS VEGAS NEVADA

Dora Hanley 2-1-84

S. J. Amoroso Construction Co. February 3, 1984
Page 2

A. Section 3004(b) requires a minimum shear strength of 50 psi or 28,800 pounds for the 24" x 24" veneer being installed. Two of the three "dry, pull-off" tests demonstrated that the veneer could be easily removed with a simple hammer by one man. Since the tiles had been cured a minimum of 16 days, and in some cases 28 days, it is clear that this required strength has not developed. Furthermore, particles of the Mer-Krete tile setting adhesive can be easily removed from sample tiles without any effort indicating that the material itself is not developing adequate strength.

B. Section 3005(d)2. requires that the veneer be pressed and tapped into place to provide complete coverage between the mortar bed and veneer unit. However, all of the observed tests, and all of the "core tests" you have also made for your own purposes, revealed hollow cavities in the adhesive. The furrows left by the notched trowel are remaining separated instead of blending together for "complete coverage". In two of the three tests only 50%± contact is accomplished; in the third, only 65%±. Clearly, the application is not satisfying the code.

C. The I.C.B.O., which produces the code and is independent of this Department is the final authority and has been consulted on each of the above issues. They agree and are forwarding some additional data.

In conclusion, the defective method of installation must be immediately remedied to the satisfaction of this Department and the architect before proceeding with new areas of veneer work; and all existing areas must be brought into conformance with the Code to the satisfaction of this Department and the Architect before a Certificate of Occupancy can be issued.

If you continue to work in violation of the Code and this Correction Notice, then another Stop Order will be issued, etc. Please keep me advised of your actions to the foregoing order through my authorized representative Ted Rexing.

Sincerely,

CLAY HYMER, DIRECTOR
Building and Safety Department

CH:TR:bjl
cc: Harris Sharp & Associates
File: Building & Safety
Thomas B. Graham
David C. Walliser
Ted Rexing
File: OAS: WH1353

Gloria Harris 2-24-84

501 N. Casino Ctr.

Harris Sharp Associates Incorporated
Architecture, Planning, Interiors

2915 West Charleston Boulevard Las Vegas Nevada 89102 (702) 877 0125

File

February 20, 1984

TO: S. J. AMOROSO CONSTRUCTION COMPANY

ATTN: BRIAN FURLONG/CHUCK CLATTERBUCK

RE: PROGRESS AT CENTRAL FIRE STATION

Dear Mr. Furlong:

In letters to S. J. Amoroso on both January 14, and January [redacted] 1984, we have indicated our concerns based on our observance of the progress of the work at the Central Fire Station Project. In response to those letters, S. J. Amoroso issued a construction schedule on January 6. That schedule indicated that the communication level of the building would be ready for inspection and acceptance on February 3rd, 1984. Subsequently, S. J. Amoroso did request that the indicated walk through be performed on February 16th. During that walk through it appears that the building was not ready for occupancy. Therefore, the City of Las Vegas, at the recommendation of Harris Sharp Associates, Inc. has scheduled a walk through inspection of the Central Fire Services Complex at 9:00 A.M. on Wednesday, February 22, 1984. Present at this inspection will be representatives of Harris Sharp Associates, City of Las Vegas Department of Architectural Services, General Services, Building and Safety, and the City Attorney.

David A Dalgoda AIA Ned E Cole AIA Patrick J Klenk AIA Thomas M Silva AIA Harris P Sharp AIA (Retired)

Dina Healy 2-27-84

February 20, 1984
Central Fire Station

Additional representatives of the State Contractor's Board and the Surety for S. J. Amoroso have been asked to attend.

At this walk through a list of building deficiencies will be compiled. Please have an authorized representative at the site for this walk through.

Very truly yours,

HARRIS SHARP ASSOCIATES, INC.

DAVID A. DAILEDA, A.I.A.

DAD/gh

cc: Ted Rexing
Dave Walliser
General Services
Building & Safety
City Attorney
State Contractor's Board
Dan Evans

Dona Healy 3-9-84

MAYOR BILL BRIARE

COUNCILMEN
RON LURIE
PAUL J. CHRISTENSEN
AL LEVY
BOB NOLEN

CITY ATTORNEY
GEORGE F. OGILVIE

CITY MANAGER
ASHLEY HALL



CITY of LAS VEGAS

March 2, 1984

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

S. J. Amoroso Construction Company
P. O. Box 11146
Las Vegas, Nevada 89111-1146

Attn: Pat Henderson, Project Manager

Gentlemen:

The Central Fire Station Project for which your firm is General Contractor, was inspected on Friday, March 2, 1984, by representatives of Harris Sharp Associates and the City of Las Vegas. This on-site project review found your construction status to date to be incomplete as per the latest project completion schedule established and submitted by you. Therefore, this office, with the concurrence of Harris Sharp Associates, has placed an item on the agenda for the meeting of the City Council, which will be held on Wednesday, March 7, 1984, for discussion and possible action on removal of S. J. Amoroso Construction Company from the Central Fire Station Project as General Contractor. You may wish to have your firm represented at this meeting, which will be held in the Council Chambers, Las Vegas City Hall, 400 East Stewart Avenue, commencing at 10:00 A.M. For your information, attached is an agenda for this public meeting.

In the event that you choose to have a representative present, he should be prepared to answer any questions directed to him by Council members, including when the project will be completed if the Council decides to allow your firm to continue.

CITY OF LAS VEGAS NEVADA

Tipe Furlong 3-9-84

This letter is merely to advise you of the removal recommendation which this office intends to make to the City Council at that meeting. If the City Council, as per the project's contractual terms and conditions, authorizes your removal from this project, you will be subsequently issued an official notice of such removal in accord with the time requirements contained in the project's specifications.

Sincerely,

THOMAS B. GRAHAM, AICP, RLA, DIRECTOR
Office of Architectural Services and
Project Control

TBG:bjl
attachment

cc: Don DesJardin, S. J. Amoroso Construction Co.
Brian Furlong, S. J. Amoroso Construction Co.
Dave Dalleda, Harris Sharp Associates
Ashley Hall, City Manager
Don J. Saylor, Deputy City Manager
George Ogilvie, City Attorney
Dan Pilkington, General Services
Ed Park, Purchasing & Contracts
Clay Hymer, Building & Safety Director
Larry Powell, Fire Services

Done Hooley 3-9-84.

Harris Sharp Associates Incorporated
Architecture, Planning, Interiors

2915 West Charleston Boulevard Las Vegas Nevada 89102 (702) 877 0125

February 22, 1984

TO: CITY OF LAS VEGAS
BUILDING & SAFETY DEPARTMENT

ATTN: CLAY HYMER

RE: CENTRAL FIRE STATION

FEB 28 1984

Dear Clay,

In response to your letter of February 3rd, regarding the approval of the "Mer-Krete" tile setting adhesive, I am enclosing the following information for your review:

1) ICBO research report indicating that CTI is an approved quality control agency,

2) CTI standards for thin-set Portland cement mortar,

3) CTI tested materials report on thin-set mortars.

We hope a review of this information will confirm our understand that the Mer-Krete is indeed in conformance with UBC Section 3005(d)2.

If you need any further information or have any questions, please do not hesitate to call.

Sincerely,

HARRIS SHARP ASSOCIATES, INC.

David A. Daileda, A.I.A.

DAD/lm
Enclosures

cc: Dave Walliser
Ted Rexing
Tom Graham
File WH353

David A Daileda AIA Ned E Cole AIA Patrick J Klenk AIA Thomas M Silva AIA Harris P Sharp AIA (Retired)

Don Healy 3-9-84

SJA S.J. AMOROSO CONSTRUCTION COMPANY
GENERAL CONTRACTORS SINCE 1938

February 29, 1984

Dept. of Building & Safety
City of Las Vegas
400 East Stewart Avenue
Las Vegas, Nev. 89101

Attention: Mr. Clay Hymer, Director

Reference: S.J. Amoroso Construction Company - Central Fire Station

Dear Mr. Hymer:

This letter is written to correct the many inaccuracies contained in your letter of February 23, 1984, received by the undersigned February 24th.

Firstly, as a general statement, it is clear that you are not acting in the capacity of the City's Building and Safety Department Director but rather have undertaken the additional role of the Owner's contract administrator. This status is buttressed throughout your correspondence received by this office.

In response to the numbered statements contained in your February 23rd letter, I respond as follows:

In response to item number 1, be advised it has never been S.J. Amoroso's suggestion to test installed tile samples. If you correctly recall the suggestion came from David Dialeda, the owner's Architect. You heretofore have been advised in writing as to our position as to the inapplicability of UBC Sections 3004 and 3005. Such Sections are wrongfully relied upon by the City and constitute improper grounds for your Department's red tag.

Your item Number 2 is addressed above, however, to make our point perfectly clear, "complete coverage" as defined by your Department is not required by Code and is inapplicable to the subject ceramic tile application on the project.

With respect to your item number 3, be advised that we do not feel your input as regards contract administration and interpretation of legal consequences of such interpretation are valid or have anything to do with the Department of Building and Safety. More importantly, you are absolutely wrong when you state Carmine Catello acknowledged any incorrect installation or any problems with tile application resulting in delays. Your statements are incorrect and not based upon fact. Neither Catello Tile nor S.J. Amoroso Cosntruction Company is responsible for any delays resulting from tile application.

P.O. BOX 11146 • LAS VEGAS, NEVADA 89111-1146 • 738-5188
OTHER OFFICES: SAN FRANCISCO BAY AREA • RENO

Dave Hooley 3-9-84

SJA

With respect to your items addressed in paragraph 4, be advised that once again you are encroaching upon contract interpretation. The legal rights of the parties are controlled by a legal document to which your interpretation lends no benefit.

Your paragraph number 5 has been addressed above. S.J. Amoroso is not proposing to conduct any such testing at its own expense. In the event the City as owner or the City's Architect requests such testing to confirm their specifications as being proper, then in that event the General Contractor will most certainly cooperate in such testing and make the facilities for such fully available.

Your paragraph number 6 is contrary to our understanding. The Architect has in fact heretofore wrongfully condemned certain portions of the mortar bed including scratch coat. S.J. Amoroso at such Architect's direction did replace the same. The red tags, pursuant to your previous correspondence, have in fact been issued and maintained pursuant to your erroneous interpretation of Sections 3004 and 3005 of the Code. However, since it is now your position, pursuant to your paragraph 6 that the Architect must advise you when their specifications are satisfied then I can only interpret your paragraph to mean that the Architect's specification supersedes and prevails over your code construction. I suggest you request of the Architect a statement from him that in fact his specifications have been substantially met so as to satisfy the contract documents.

Lastly, in response to your statement that time is of the essence. Be advised that once again you are trading upon contract issues for which your Department is not concerned. Your reference to a March 2nd "deadline" causes me great concern. Nowhere in the contract is there a March 2nd "deadline". The only time a March 2nd date appears is upon a revised completion schedule prepared by S.J. Amoroso for the benefit of its various Subcontractors in order to aid in work coordination. Such schedule is not a contract document and does not seek to modify or control the contract existing between the Owner and this Contractor. S.J. Amoroso Construction Company is entitled to contract extension days which far exceed March 2nd, 1984. In any event that is not your Department's concern.

Regards,

Brian Furlong

Brian Furlong, Proj. Manager
S.J. AMOROSO CONSTRUCTION COMPANY
BF/hr
cc: C. Catello
Harris Sharp Assoc.
Architectural Services, City of Las Vegas
City of Las Vegas, City Manager's Office
P. Henderson/File
Michael Springer, Esq.

Don Healy - 3-9-84

International Conference of Building Officials

5360 SOUTH WORKMAN MILL ROAD • WHITTIER, CALIFORNIA 90601 • (213) 699-0541

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SUPERINTENDENT, BUILDING
AND SAFETY
LONG BEACH, CALIFORNIA

OFFICES OF
EXECUTIVE DIRECTOR
JAMES E. BIHR, P.E.
TECHNICAL DIRECTOR
DONALD R. WATSON, P.E.

February 16, 1984

Clay Hymer
Director
Department of Building and Safety
City of Las Vegas
400 E. Stewart Avenue
Las Vegas, Nevada 89101

Subject: Application of Adhered Veneer
Section 3005 (d) 2
1982 Uniform Building Code

Dear Mr. Hymer:

The method of application described in your letter of February 9, 1984, would not comply with the intent of the subject section. Twenty to forty percent voids would not be considered complete coverage.

If you have any further questions or need additional data, please feel free to contact us.

Yours very truly,

Frank M. Drake

Frank M. Drake, P.E.
Senior Staff Engineer
Plan Check

FMD:ng

3-9-84

CITY OF LAS VEGAS

INTER-OFFICE MEMORANDUM

Date: FEBRUARY [illegible], 1984

TO: CLAY HYMER, DIRECTOR
BUILDING AND SAFETY

FROM: THOMAS B. GRAHAM, AICP, [illegible], DIRECTOR
OFFICE OF ARCHITECTURAL SERVICES AND
PROJECT CONTROL

SUBJECT: WALK-THRU PROJECT INSPECTION OF CENTRAL FIRE STATION

COPIES TO:

Please be advised that the Project Committee for the new Central Fire Station, in contemplation of significant action with respect to the Construction Contract, hereby requests representation by the Department of Building and Safety during the entire walk-thru inspection of the facility scheduled for Wednesday, February 22nd at 9:00 A.M. This Activity is expected to consume the entire day due to the size of the structure. Representatives of Architectural Services, State Contractor's Board, General Services, Harris Sharp Associates, and SafeCo Insurance Company will attend.

David C. Wallisen

DAVID C. WALLISER, NCARB CERTIFIED
Chief of Architectural Design

DCW:bjl

Vona Hawks 3-9-84

SJA S.J. AMOROSO CONSTRUCTION COMPANY
GENERAL CONTRACTORS SINCE 1936

February 8, 1984

Harris Sharp Associates
2915 W. Charleston Blvd.
Las Vegas, Nevada 89102

Attention: David Daileda

Regarding: Central Fire Station

Gentlemen:

Pursuant to receiving the enclosed letter from the City of Las Vegas, dated February 3, 1984, all work on the exterior tile has been stopped. As you know, this has a major impact on our critical path. It is our contention that the tile is put on per the plans and specifications, and has been directed by the Architect. From this day forward, i.e., until this problem is resolved, no tile will be set. Please be advised however, that for each day that this work is detained, SJA will expect to receive that day as an extension of time to our contract.

Very truly yours,

S. J. AMOROSO CONSTRUCTION COMPANY

Brian K. Furlong

Brian K. Furlong
Project Manager

BKF:eh

copy: Pat
Brian
Jobsite
Mike Springer, Esq.
Building & Safety/ Clay Hymer
Thomas B. Graham, City of Las Vegas
David C. Walliser, City of Las Vegas
Ted Rexing, City of Las Vegas
File

FEB 9 1984

P.O. BOX 11146 • LAS VEGAS, NEVADA 89111-1146 • 739-5188
OTHER OFFICES SAN FRANCISCO BAY AREA • RENO

501 N CASINO CENTER
FF

Dana Peasley 1-3-83

CITY OF LAS VEGAS, NEVADA

LOG NO. & AREA C-197 CONST. VAL. $

DEPARTMENT OF PUBLIC SERVICES
DIVISION OF BUILDING AND SAFETY

APPLICATION & BUILDING PERMIT — for:
Commercial or Public Structures.

ADDRESS OF CONSTRUCTION: 5101 N. Casino Center Blvd OWNER: City of Las Vegas

LOT(S): Por. N½ NW¼ BLOCK SUBDIVISION Sec 34, T20S, R61E ZONE: C-V

Existing structure on lot: Dwelling ☐ Accessory Bldgs. ☐ Vacant Lot ☐ Commercial Bldg. ☐ Other ☒

PROPOSED CONSTRUCTION: Demo + excavation USE: E

MATERIALS OF CONSTRUCTION: Wood Frame ☐ Concrete Block ☐ Reinforced Concrete ☐ *Steel Frame ☐

SQUARE FEET OF FLOOR AREAS: 1st 2nd 3rd Other TOTAL SQ. FT.

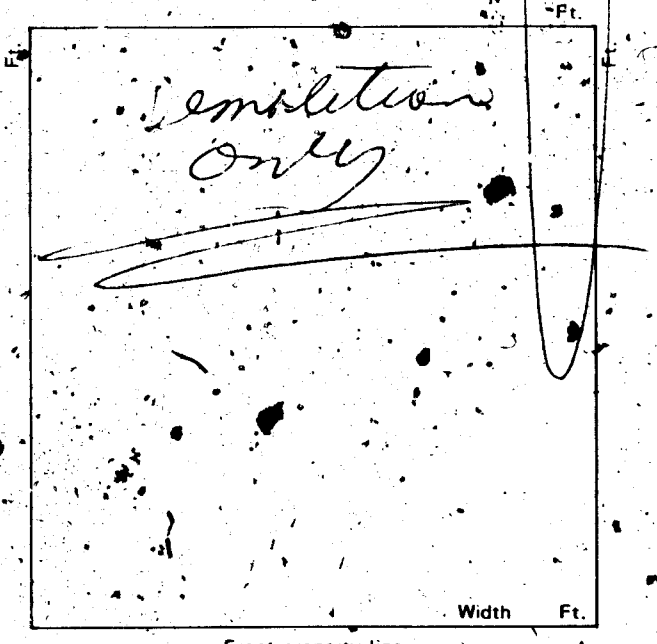
FIRE ZONE: Occupancy Group CONST. TYPE:

ARCHITECT: Harris + Sharp ENGINEER: NO. of UNITS: NO. of STORIES:

Plans Submitted: Yes ☐ No ☐ Calculations Submitted Yes ☐ No ☐ Sewer Fee Req'd. Yes ☐ No ☐

CONTRACTOR: Amoroso Const Co STATE LICENSE # CITY LICENSE #

ADD'L. PERMITS REQ'D.: Air Cond. ☐ Elec. ☐ Plumbing ☐ Signs ☐ Paving ☐ Fence ☐ Public Walks ☐ Curb-gutters ☐ Incinerators ☐ Fire Sprinkling System ☐



Front property line

CONDITIONS OF THE PERMIT:

1. I agree to call the City Building Department for inspections before concrete is poured, before rough wiring, electrical, plumbing, framing is covered. Also for Air conditioning, drywall and sheathing inspection.
2. I agree that when the job is completed that I will call for final inspection before occupancy.
3. I agree to perform all construction in accordance with City Ordinances and Building Codes.
4. The Contractor's signature below denotes authority from the owner to sign in his behalf and that the owner is aware of all requirements of this application and permit. Separate permits must be taken out for work outlined above this agreement.
5. I have read and understand the contents of this application and permit; I hereby state that the information I have supplied on this application is true and correct.

* Approval for the work under this permit will be given only after refuse and debris have been removed from job site and public right of way.

SIGNED: Contractor

BY: Agent or Owner

Clark County Health Department Date

Las Vegas Fire Department Date

PLANNING DEPT. Date 12-23-82

PUBLIC WORKS DEPT. Date 12-23-82

BUILDING DIVISION: Dave Date 12/23/82

76-10-13
154-01-220

PERMIT NO. 5851 PERMIT FEE $ N/C

RECEIPT

MUST BE MACHINE VALIDATED

Some Variety 1-5-83

CITY OF LAS VEGAS, NEVADA

LOG NO. & AREA C-197-2

CONST. VAL. $ 4,000,000.00

DEPARTMENT OF PUBLIC SERVICES
DIVISION OF BUILDING AND SAFETY

APPLICATION & BUILDING PERMIT – for:
Commercial or Public Structures.

ADDRESS OF CONSTRUCTION: 501 N. CASINO CENTER BLVD. OWNER: City of L.V.

LOT(s): R.O.W. BLOCK: SE¼, SEC 27, T20S, R61E SUBDIVISION: ZONE: CV

Existing structure on lot: Dwelling ☐ Accessory Bldgs. ☐ Vacant Lot ☐ Commercial Bldg. ☐ Other ☐

PROPOSED CONSTRUCTION: CENTRAL FIRE STATION & COMMUNICATIONS CENTER USE:

MATERIALS OF CONSTRUCTION: Wood Frame ☐ Concrete Block ☐ Reinforced Concrete ☐ Steel Frame ☐

COMM: LEV. 6750 ft

SQUARE FEET OF FLOOR AREAS: 1st 19,266 2nd 13,543 3rd ____ Other ____ TOTAL SQ. FT. 39,559

FIRE ZONE: ____ Occupancy Group B-2 CONST. TYPE: II-1 Hour

ARCHITECT: HARRIS & SHARP ENGINEER: ____ NO. of UNITS ____ NO. of STORIES 2

Plans Submitted: Yes ☑ No ☐ Calculations Submitted Yes ☑ No ☐ Sewer Fee Req'd. Yes ☐ No ☑

CONTRACTOR: Amoroso Const Co. STATE LICENSE # 015028 CITY LICENSE # C1-23457

ADD'L. PERMITS REQ'D.: Air Cond. ☑ Elec. ☑ Plumbing ☑ Signs ☐ Paving ☐ Fence ☐ Public Walks ☐ Curb-gutters ☐
Incinerators ☐ Fire Sprinkling System ☐

Ft. LV-1-82 Ft.

THIS PERMIT IS BEING ISSUED PRIOR TO PLAN CHECK APPROVAL UPON THE CONDITION THAT THE CONTRACTOR AGREES TO PERFORM ACCORDING TO THE REQUIREMENTS OF THE FORTHCOMING PLANCHECK

Width Ft.

Front property line

CONDITIONS OF THE PERMIT:

1. I agree to call the City Building Department for inspections before concrete is poured, before rough wiring, electrical, plumbing, framing is covered. Also for Air conditioning, drywall and sheathing inspection.
2. I agree that when the job is completed that I will call for final inspection before occupancy.
3. I agree to perform all construction in accordance with City Ordinances and Building Codes.
4. The Contractor's signature below denotes authority from the owner to sign in his behalf and that the owner is aware of all requirements of this application and permit. Separate permits must be taken out for work outlined above this agreement.
5. I have read and understand the contents of this application and permit; I hereby state that the information I have supplied on this application is true and correct.

Approval for the work under this permit will be given only after refuse and debris have been removed from job site and public right of way.

UTIL $ .00
STL $ .00
TDY $ .00
CHEK $ .00
PMS065 SR# 00V01350

SIGNED: ____ Contractor
CITY – LAS VEGAS
BLDG. & SAFETY
BY: ____ Agent or Owner

12/30/82
Clark County Health Department Date ____

Raymond R. Powell
Las Vegas Fire Department Date 12-30-82

PLANNING DEPT.: Per H.P.F. Date: 12/30/82

PUBLIC WORKS DEPT.: TURK Date: 12/30/82

BUILDING DIVISION: M.J. 12/30/82

76-10-13
154-01-220

PERMIT NO. 6065

PERMIT FEE $ No FEE

RECEIPT

MUST BE MACHINE VALIDATED

Dona Vocaly 3-1-83

CITY OF LAS VEGAS

INTER-OFFICE MEMORANDUM

501 N. Casino Center

Date January 18, 1983

TO:	FROM:
ALL CITY DEPARTMENTS	DON J. SAYLOR DEPUTY CITY MANAGER
SUBJECT: CENTRAL FIRE STATION COMPLEX CONSTRUCTION	**COPIES TO:** ALL DEPARTMENT AND DIVISION HEADS: THOMAS B. GRAHAM DAVID WALLISER TED REXING

Please observe the following procedures relative to the new Central Fire Station Complex Project:

1. Direct all questions or concerns regarding this project to the Office of Architectural Services and Project Control. Contact Thomas B. Graham, AICP, RLA, Director, or David C. Walliser, Chief of Architectural Design, at extension 535.

2. All site visitations must be authorized in advance by the Architectural Services Project Representative. Contact Ted Rexing, CLV (2-way radio channel 4) call sign Angel 3; or field office phone 384-3171.

3. All authorized visitors must sign in and out at the Project Representative's field office.

4. Hardhats must be worn at all times on site.

5. City I.D. badges must be worn and be plainly visible.

6. Authorized visitors are not to interfere with construction activities or personnel and should direct all questions and comments to Ted Rexing.

Please inform all appropriate personnel of these procedures when and if involved with this project.

Don J. Saylor

DON J. SAYLOR
Deputy City Manager

DJS:DCW:sd

Casino Center

File in New Fire Sta File

CENTRAL FIRE STATION COMPLEX

WEEKLY MEETING AGENDA

DATE: FEBRUARY 10, 1983

TIME: O/A 9:00 AM - O/A/C 10:00 AM

LOCATION: O/A CITY HALL - 2ND FLOOR

O/A/C SITE TRAILER

PRESENT:

CITY OF LAS VEGAS	HARRIS SHARP & ASSOCIATES	S.J. AMOROSO CONSTRUCTION
TOM GRAHAM	DAVID DAILEDA	PAT HENDERSON
DAVE WALLISER	NED COLE	DON DES JARDIN
JEFF JACOMB	PATRICK KLENK	JOHN CLATTERBUCK
LARRY POWELL		
BILL PURVIS		
TED REXING		

CONSULTANTS

SUB-CONTRACTORS

3-1-83

Donna Hackley

ITEMS		ACTION REQ'D/DATE
1.	MOTOROLA NEGOTIATIONS	
2.	TELEPHONE NEGOTIATIONS	
3.	COST REDUCTION PROPOSALS	
4.	SEPARATE METERING OF COMM. LEVEL	
5.	RE-ROUTE OF SEWER LINE	
6.	SOIL BEARING PROBLEM	
7.	WATERPROOFING PROBLEM	
8.	COLOR SELECTIONS PRESENTATION	
9.	BONANZA ROAD ACCESS TO SENIORS PARKING LOT	

CENTRAL FIRE STATION COMPLEX

WEEKLY MEETING MINUTES

DATE: JANUARY 27, 1983

TIME: 9:00 - 11:45 AM

LOCATION: 2ND FLOOR - CITY HALL & BUILDING SITE

PRESENT:

CITY OF LAS VEGAS
DAVE WALLISER - OAS
TED REXING - OAS
LARRY POWELL
BILL PURVIS
DAN PILKINGTON
ED PARK

HARRIS SHARP & ASSOCIATES
NED COLE
DAVID DAILEDA

CONSULTANTS

GENERAL CONTRACTOR
JOHN CLATTERBUCK

SUB-CONTRACTORS

DISTRIBUTION

ITEMS DISCUSSED

1. Motorola Negotiations - Fire Services has a concern that the required four T.V. monitors are not in the bid - HSA to investigate. Motorola contends sales tax is not in their bid - HSA to look into this matter and try to expidite.

2. Telephone Negotiations - Bid Documents are now being put together. Documents are to be issued on the first of February. Pre-Bid is on the 17th of February and Bid Opening is in HSA's office at 2 PM on March 3, 1983.

3-1-83
Done Wally

3. Notice of Materials Supplied - Sub-contractors who are filing their Notice of Materials supplied should file these in the office of the City Clerk.

4. Bill Purvis - Bill Purvis is retiring from the City on February 18, 1983. He will notify the Committee of his replacement.

5. Cost Reduction Proposals - Proposal on the drive-way island relocation is to be issued by HSA. HSA is to investigate separate metering of the communications area. If Fire Services could come up with any information on their future computer, the A/C units may be resized and the emergency generator may be down sized. Fire Services is to check.

6. Floor Drains, Room 107 - The plumber has been instructed as to the exact location of these drains.

7. Footing Bearings Problem - HSA is reviewing the proposal submitted by Amoroso concerning the additional soil removed, and concrete placed under footings. Will report results.

8. Construction Joints - Structural Engineer has agreed that entire walls can be poured at one time - with prior approval of proposed construction joint location. The hesitation expressed is that to date, concrete pouring has been very slow and this could be a problem, if the concrete sub does not speed up his operation.

9. Gas Line Location - Southwest Gas has forwarded their site service to the Contractor for review.

10. Manhole - Curb Conflict - This problem has been resolved.

11. Roofing & Waterproofing Warranty - HSA is to issue a proposal requesting a 20 year guarantee on the roof and the waterproofing.

12. Architect's Field Reports - City would prefer to have Field Reports on 8-1/2" x 11" format and a bit more concise - HSA will comply.

3-1-83
Dave Hacala

SITE MEETING

13. Storm Sewer Location - HSA to study the problem of storm sewer location, as brought up by Contractor's Civil Engineer - HSA to determine which drawing is in error.

14. Existing Waterline - Amoroso will encase the existing 4" steel water line that crosses the drive near Bonanza Road, for their own protection.

15. Footing Clarification - Footing F-8 was deleted on Drawing Q-2. Is this really the case - HSA has to check.

16. Toilet Room Dimensions - HSA to review toilet room dimensions at Rooms 207, 208 & 230.

17. Gas Line Routing - The proposed site service by Southwest Gas goes thru the area designated on site as a future garage. This proposal has to be reviewed for alternte approaches.

18. The following subs have been added to the sub-contractors list:

Special Floor Coatings - Sierra Waterproofing
Acoustical Treatment - Paul Ogaz Co.
Fireproofing - Solari & Sons

The sign sub-contractor listed has pulled his bid and this is being re-bid by Amoroso.

19. 2 X 2 X 2.5 Concrete Block-Out - This block-out in the footing needs to be reviewed by HSA to see if it can be pumped to the storm sewer.

20. No H.W.C.P. - The H.W. circulating pump referred to in Addendum No. 2, Item E-25, cannot be found. HSA to research.

21. Pay Request #2 - Some items on Pay Request #2 need to be changed - all Pay Requests need to be run by Ted Rexing before being submitted.

Respectfully submitted,

HARRIS SHARP & ASSOCIATES, INC.

DAVID A. DAILEDA, A.I.A.

Dona Hvatt 3-1-93

CENTRAL FIRE STATION COMPLEX

WEEKLY MEETING MINUTES

DATE: FEBRUARY 3, 1983

TIME: 9:00 - 11:05 AM

LOCATION: 2ND FLOOR - CITY HALL

PRESENT:

CITY OF LAS VEGAS
TOM GRAHAM - QAS
TED REXING - QAS
LARRY POWELL
DAN PILKINGTON
JEFF JACOMB

HARRIS SHARP & ASSOCIATES
NED COLE
DAVID DAILEDA

CONSULTANTS

GENERAL CONTRACTOR
JOHN CLATTERBUCK

SUB-CONTRACTORS

DISTRIBUTION

ITEMS DISCUSSED

NOTE: DUE TO WEATHER CONDITIONS, NO SITE MEETING WAS HELD. JOHN CLATTERBUCK WAS INVITED TO THE OWNER/ARCHITECT MEETING.

1. Motorola Negotiations - The four monitors that were in question in the Motorola proposal have been specifically identified and HSA will confirm this in writing. The only remaining question in this area is that of sales tax. We are awaiting a letter from Motorola spelling out their position on this matter.

3-1-83
Done Weekly

2. Telephone Negotiations - HSA has reviewed the document prepared by Ed Park and has returned the comments. Dave Daileda and Ed will meet one final time to wrap-up the document.

3. Cost Reduction Proposals - The following proposals have been received by HSA:

#1	Relocation of fire hydrant per State request (This is approved-add to Change Order #1)	$ + 407.00
#3	Reduce emergency generator from 500 kv to 400 kv (This is based on knowing actual loads for Fire Services computer. This can be additionally increased by downsizing A/C units if computer will allow. (Total could be an additional $3,000.00)) Larry will get any data possible on existing City computer which will probably be purchased by Fire Services).	$ - 7872.00
#4	Change parking lot light poles to tapered steel	$ + 683.00
	Change parking lot light poles to square steel (The change to the square poles is fine, if this includes paint to match).	$ - 1185.00
#5	Change "Bomanite" to simple dusted concrete (HSA feels that this is too low. Amoroso is asked to review this. Also, HSA is concerned with who Amoroso has selected to do the "Bomanite". Only a licensed applicator will be accepted).	$ - 1828.00

4. Separate Metering of Comm Level - JBA's initial conclusion is that this will cost $10-15,000. If it is over $5,000 after more investigation, the idea is to be dropped.

5. Re-Routing of Sewer Line - HSA to have an answer on this today.

6. First Change Order - HSA to hold all accepted site proposals to be submitted at one time as C.O. #1.

Dave Daileda 3-21-83

7. Waterproofing Problem - Amoroso has submitted an alternate to the specified system. HSA is currently reviewing for "equality" to specified system. Under no circumstances will HSA accept the 1/8" protection board in lieu of the 1" protection board specified without a credit from the Contractor.

8. Color Selection Presentation - Larry is given the color boards to present to Fire Services.

9. Dan's Reports - Dave Daileda will talk to Dave Walliser about the specific problems with Dan's Field Reports.

10. Nevada Power Company's Service to Site - Nevada Power Company's Service Drawing and HSA's Electrical Drawings don't agree on length of underground service. If the underground per HSA's drawings is less than $1,000 extra, it is to be accepted. Otherwise, Nevada Power Company Drawing is to be accepted and credit for additional trenching is to be requested.

11. North Side of Retaining Wall - This area will be cleaned by Amoroso before the job is finished.

12. Flooring Priority - Amoroso is reminded that the Apparatus Bay flooring is the 2nd most important part of this project.

13. State R.O.W. Submittal - HSA is reviewing. Will be out today.

14. Phone Information Requested - HSA is to answer the Amoroso letter re: Centel Service information.

15. Emergency Generator Rail Submittal - HSA approves the location as long as it is compatible with the generator which is supplied.

16. Plaster and Tile Mock-Up - Amoroso is preparing a mock-up of both the plaster and tile information for HSA's review.

17. Soil Bearing Problem - Another area of poor soil bearing has been encountered at the Plaza level. Amoroso will submit a proposal for this work.

Dana Healy 3-1-83

18. Bonanza Road Access to Senior Citizen's Parking Lot - Amoroso has indicated that when the parking lot entry at Bonanza Road has been finished, it will have to be fully accepted by the city, or Amoroso cannot allow use of it until the entire project is finished and accepted. Architectural Services will investigate the City's feelings.

Respectfully submitted,

HARRIS SHARP & ASSOCIATES, INC.

DAVID A. DALLEDA, A.I.A.

DAD/je

Dona Healy 3-1-83

Dona Hocaly 3-1-83

Directors:
JAMES M. KLEINFELDER
CYRIL M. McRAE
EARL C. KLEINFELDER
MICHAEL E. MAHONEY
RICHARD M. WARY

J. H. KLEINFELDER & ASSOCIATES
GEOTECHNICAL CONSULTANTS • MATERIALS TESTING
5115 SOUTH INDUSTRIAL ROAD, SUITE 605
LAS VEGAS, NEVADA 89118
(702) 736-2936

WILLIAM E. ELLIS
ROBERT D. HOWELL
RON T. HFINZEN
JAMES E. McNUTT
DAVID C. MATHY
RONALD J. PERISHO

File under

COMPRESSION TEST REPORT

S.J. Amoroso Construction
3380 Wynn Road
Suite A
Las Vegas, Nevada 89102

File No.: L-1278-1
Date: January 19, 1983

Project: Central Fire Station 501 North Casino Center

Attention: Pat Henderson

Specimen Sampled From: N. Site Wall - 90' East of West End 0-3'

Mix Design: 1577
Type Cement: V
Max. Size Aggregate: 3/4"
Design Strength, psi: 3000 @ 28 days
Temperature-Mix °F: 55
Temperature-Air °F: 45
Air Content, %: --

Supplier: W.M.K. Transit Mix
Admixture:
Sampled By: Y.B.
Ticket No.: 1-65469 Truck #18
Slump, inches: 2 3/4"
Nominal Dimension, in.: 6x12
Area, sq. in.: 28.3

Specimen No.	2A	2B	2C			
Client's Identification						
Date Cast	1-19	1-19	1-19			
Date Tested	1-26	2-16	SPARE			
Age, Days	7	28	H			
Date Reported	1-26	2-16				
Ultimate Load, lbs.	89000	134,000				
Compressive Strength, p.s.i.	3140	4730				

Copies: Ted Rexing - City of Las Vegas
Harris Sharp & Associates

Respectfully submitted,

J.H. Kleinfelder & Associates

by: Judy Aldrich

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3189 Mill St., Reno, NV 89502 (702) 323-7182
1975 E St., Fresno, CA 93706 (209) 486-0750
1901 Olympic Blvd., Suite 300, Walnut Creek, CA 94596 (415) 938-5610
9795 Business Park Dr., Suite A, Sacramento, CA 95827 (916) 366-1701
2825 E. Myrtle St., Stockton, CA 95205 (209) 948-1348
1575 W. Main St., Merced, CA 95340 (209) 722-7552

Dona Vocaly 3-1-83

Directors:
JAMES H. KLEINFELDER
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EARL C. KLEINFELDER
MICHAEL E. MAHONEY
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RONALD J. PERISHO

COMPRESSION TEST REPORT

S.J. Amoroso
3380 Wynn Road
Suite A
Las Vegas, Nevada 89102

File No.: L-1278-1
Date: 2-10-83

Project: Central Fire Station

Attention: Mr. John Clatterbuck

Specimen Sampled From Foundations at A-33, D-33, [illegible] of Sheet S-3 Plaza Level

Mix Design: CM 2130-FA
Type Cement: V
Max. Size Aggregate: 1½"
Design Strength, psi: 3000
Temperature-Mix °F: 72
Temperature-Air °F: 56
Air Content, %: --

Supplier: WMK
Admixture: Air Entrained
Sampled By: Crask
Ticket No.: 66608
Slump, inches: 3½
Nominal Dimension, in.: 6x12
Area, sq.in.: 28.3

Specimen No.	14A	14B	14C	14D		
Clients Identification						
Date Cast	2-10	2-10	2-10	2-10		
Date Tested	2-17	3-10	3-10	--		
Age, Days	7	28	28	H		
Date Reported	2-17					
Ultimate Load, lbs.	80,000					
Compressive Strength, psi	2830					

Copies:
Ted Rexing - City of Las Vegas
Harris Sharp & Associates

Respectfully submitted,
J.H. Kleinfelder & Associates

by:

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Dona Hocaby 3-1-83

Directors:
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DAVID C. MATHY
RONALD J. PERISHO

COMPRESSION TEST REPORT

S.J. Amoroso Construction Co.
3380 Wynn Road
Suite A
Las Vegas, Nevada 89102

Attention: Mr. John Clatterbuck

File No.: L-1278-1
Date: 2-10-83

Project: Central Fire Station

Specimen Sampled From Foundations F-8, J-8 per Sheet S-Z

Mix Design: CM2130FA
Type Cement: V
Max. Size Aggregate: 1½"
Design Strength, psi: 3000 @ 28 days
Temperature-Mix °F: 73
Temperature-Air °F: 56
Air Content, %: --

Supplier: WMK
Admixture: Air Entrained
Sampled By: L.C.
Ticket No.: 66624
Slump, inches: 2 3/4"
Nominal Dimension, in.: 6x12
Area, sq.in.: 28.3

Specimen No.	15A	15B	15C	15D		
Clients Identification						
Date Cast	2-10	2-10	2-10	2-10		
Date Tested	2-17	3-10	3-10	SPARE		
Age, Days	7	28	28	H		
Date Reported	2-17					
Ultimate Load, lbs.	105,000					
Compressive Strength, psi	3710					

Copies:
Ted Rexing - City of Las Vegas
Harris Sharp & Associates

Respectfully submitted,

J.H. Kleinfelder & Associates

by:

5115 So. Industrial Rd, Suite 605, Las Vegas, NV 89118 (702) 736-2936
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1575 W Main St, Merced, CA 95340 (209) 722-7552

501 N. Casino Center

CENTRAL FIRE STATION COMPLEX

WEEKLY MEETING MINUTES

DATE: FEBRUARY 24, 1983

TIME: 9:00 - 11:20 PM

LOCATION: 2ND FLOOR - CITY HALL AND SITE TRAILER

PRESENT:

CITY OF LAS VEGAS
DAVE WALLISER - OAS
TOM GRAHAM - OAS
TED REXING - OAS
LARRY POWELL
DAN PILKINGTON

HARRIS SHARP & ASSOCIATES
DAVID DAILEDA
PATRICK KLENK

CONSULTANTS
DON LUCIA - LUCIA ASSOCIATES
*GARY GOSZ - JBA

GENERAL CONTRACTOR
*JOHN CLATTERBUCK

SUB-CONTRACTORS
*HENRY & KELLY - BONGBERG-WHITNEY

DISTRIBUTION

File

ITEMS DISCUSSED

1. Street Light at Bonanza - The light pole for the street light at Bonanza Road will have to be replaced because the existing pole is 25' high and all the poles are being changed to 30'.

Rona Woods 347-83

2. Motorola - Dave D. reported that he had attempted to speak with Mr. Gavin the President of Motorola, but that Mr. Gavin was away on a trip. Don Lucia had tried also, to contact various people within the corporate structure of Motorola but to no avail. Dave D. has agreed to do what he can to get this issue resolved by the next meeting.

3. Telephone Bid - The Pre-Bid Conference is scheduled today at the HSA offices. To date, only one actual inquiry with questions. An Addenda will be issued to cover any items brought up at the conference.

4. Keying Requirements - The City of Las Vegas is a "Best Lock" distributer and will do the keying themselves; all the Contractor need do is supply the cylinders and keys.

5. Color Scheme - The only change left to work out in the original scheme is a change in some of the carpeting. A letter is being prepared by the Fire Department on this item for HSA.

6. Emergency Generator - Per George Ferris, all of the City Hall emergency systems are on a 350 KVA emergency generator. However, he would not recommend a drop in the output of the Fire Services emergency generator from 500 to 400 KVA. HSA, however, has been asked to continue the work on possible cost reductions this can bring on.

7. Computer - Larry is to get all available information on the existing City computer so that JBA can design to these standards.

8. Cost Reduction Proposals - HSA presented a comprehensive review of the current status of all cost reduction proposals. (See attached).

9. Plan Check Items - The items that had been requested by the Building Department, will be reviewed by Larry with the Building Department to get a clarification.

10. Ceramic Tile Veneer - The findings of the HSA research into this system were presented. The bottom line is that due to a possible $40,000.00 cancellation cost, the use of Dry-Vit would only save approximately $25,000.00. HSA assured the City that the system will work, and is collecting samples and data to support this position. It was agreed that the system will be used as designed.

*11. Expansion Joint at Veneer - The Contractor has requested a change in the anchoring of the expansion joint that is used in the ceramic veneer system. This was not approved.

Dona Healy 3-7-83

12. Emergency Generator Pull Eyes - Ted asked if pull eyes were needed on the slide rails for the emergency geneator so it can be pulled back into place. HSA agreed that if this is what the installer recommends, that it should be done.

*13. Submittal Problems - HSA expressed their concern to Amoroso over the lack of sufficient detailed information on the recent submittals and explained that this was a major factor in the time it was taking to review submittals. John agreed that this was a situation Amoroso should "clean-up".

*14. Conduit Run Problems - Bongberg & Whitney expressed concern over some of the clearances that were available for some of the conduit runs. These problems were worked out with Bongberg & Whitney, Harris Sharp & Associates and JBA.

Respectfully submitted,

HARRIS SHARP & ASSOCIATES, INC.

DAVID A. DAILEDA, A.I.A.

DAD/je

Dona Healy 3-7-83

* AT SITE MEETING ONLY

Dona Healy 3-7-83

PROJECT: CRAIGMONT FIRE STATION

CHANGE ORDER PROPOSALS

Proposal Number	Description	Estimated Amount	Contr. Amount	Days	Action: App	App Noted	Resub	Not App	Change Order Number
1	RELOCATE FIRE HYDRANT ON BNG C6		COST 407.00						
2	REVISE PRESSURE VACUUM BREAKER ORIGINALLY SHOWN TO BE REMOVED ON DWG. C6		CREDIT 500.00						
3.	REVISE EMERGENCY GENERATOR		CREDIT 7,851.00						
4	REVISE 25' LIGHT POLES TO BE PAINTED @ PB, CC & D (* also SQUARE STEEL SUBSTITUTE)		CREDIT 1,185.00						
5	REVISE PATENTED "REMANITE" CONCRETE TO JUST COLORED CONCRETE		CREDIT 1,824.00						
6	DELETE TUNNEL 104 & DOOR 104		CREDIT 4,440.00					X	
7	REVISE SECTIONAL OVERHEAD DOORS	CREDIT 2,000.00							
8	REPLACE 24"x24" RED CERAMIC VENEER W/S: 8" RED CERAMIC VENEER BY: MARAZZI USA		CREDIT 2,800.00						
9	REPLACE 24"x24" RED CERAMIC VENEER W/12"x12" RED CERAMIC VENEER BY MARAZZI USA		COST 6,872.00					X	
10	DELETE ALL VINYL WALL COVERINGS & PAINT		CREDIT 2,225.00				X		
11	REVISE INTERIOR MORTAR TO THIN-SET		CREDIT 1,700.00						
12	DELETE & REPAIR POP-UPS & ADD 16 HEADS		COST 557.00						
13	DELETE PARKING EXPAND AT BNG. C3	CREDIT 800.00							
14	DELETE 110' OF TRENCHING & CONDUIT	0	0						
15	REVISE WATERPROOFING @ COMMUNICATIONS LEVEL	CREDIT 5,000.00							
16	REVISE TRENCH COVERS IN APPARATUS BAY	CREDIT 2,000.00							
17	REVISE 8-150-H FIXTURES TO 8-225-H FIXTURES								
18	REVISE ALL INTERIOR CARPET	CREDIT 8,000.00							
19	REVISE WINDOW TYPES 1,2,4,7,8 & 9 FROM KAWNEER 1600 TO ARCADIA	CREDIT 17,000.00							
20	TIME EXTENSION						X		
21	OVER EXCAVATE UNSUITABLE BEARING MATERIAL & REPLACE W/ LEAN CONCRETE		COST 14,172.00		X				
22	ADD 31 L.F. OF 18" STORM DRAIN & ADJUST SEWER CONNECTION		COST 1,892.00						
23	REMOVE ALL LOOSE & DISTURBED MATERIALS & REPLACE W/ LEAN CONCRETE		COST 2,011.00		X				
24	REMOVE ALL LOOSE & DISTURBED MATERIALS & REPLACE W/ LEAN CONCRETE	COST 2,000.00							

Dora Healy 3-7-83

PROJECT: CENTRAL FIRE STATION

CHANGE ORDER PROPOSALS

Proposal Number	Description	Estimated Amount	Contr. Amount	Days	Action				Change Order Number
					App	App Noted	Resub	Not App	
25	ADDITIONAL REVISIONS W/EMERGENCY GENERATOR REDUCTION	COST 2,000.00							
26	REVISE MARLITE - TRIM FINISH & CORE	COST 2,446.00							
27	REVISE MARLITE - ELECTRICAL OUTLET	CREDIT 875.00							
28	REVISE DECK DRAINS	COST 51,000.00							

Dona Healy 3-7-83

POSSIBLE CHANGE ORDER PROPOSALS

Proposal Number	Description	Estimated Amount	Contr. Amount	Days	Action: App	Action: App Noted	Action: Resub	Action: Not App	Change Order Number
100	REVISE ELEVATOR TO ELIMINATE FUTURE EXPANSION CAPABILITIES	CREDIT 10,000.00							
101	REVISE PHONE SYSTEM FROM PURCHASED TO LEASED/OWN	CREDIT 75,000.00							
102	REVISE LANDSCAPE MAINTENANCE PERIOD FROM 180 TO 60 DAYS	CREDIT 2,000.00							
103	REVISE CEILING @ ADMIN. OFFICES FROM PLATT TO SUSPENDED FRAMING	CREDIT 3,000.00							
104	REVISE TOILET RMS. 313 & 314	CREDIT 1,000.00							
105	REVISE TOILET RM. 230	CREDIT 2,000.00							
106	ELIMINATE EXTERIOR SCREEN WALL @ 2ND LEVEL OUTSIDE RM. 306	CREDIT 6,000.00							
107	REMOVE PORCELAIN ENAMEL O/STEEL @ A/C UNIT ENCLOSURES (22 PLACES)	CREDIT 2,000.00							
108	REVISE ACCESS FLOOR @ COMMUNICATIONS LEVEL (REMOVE CARPET / ADD VINYL)	CREDIT 4,000.00							
109	REVISE EXISTING LIGHT STANDARD (@ BONANZA RD.)	CREDIT 500.00							
110	REVISE EXTERIOR TILE TO SYNTHETIC PLASTER	CREDIT 25,000.00						X	
111	REMOVE EXTERIOR RED TILE @ SOUTH SIDE BETWEEN COL. LINES N & T	CREDIT 700.00							
112	REVISE RADIO EQUIPMENT FROM PURCHASED TO LEASED.	CREDIT 118,000.00							

CENTRAL FIRE STATION COMPLEX

WEEKLY MEETING AGENDA

DATE: JANUARY 27, 1983

TIME: O/A 9:00 AM - O/A/C 10:00 AM

LOCATION: O/A CITY HALL - 2ND FLOOR

[redacted] O/A/C SITE TRAILER

File

501 N. C. C.

CITY OF LAS VEGAS

TOM GRAHAM
DAVE WALLISER
JEFF JACOMB
LARRY POWELL
BILL PURVIS
TED REXING

HARRIS SHARP & ASSOCIATES

DAVID DAILEDA
NED COLE
PATRICK KLENK

S.J. AMOROSO CONSTRUCTION

PAT HENDERSON
DON DES JARDIN
JOHN CLATTERBUCK

CONSULTANTS

SUB-CONTRACTORS

Dona Wicks 3-9-83

ITEMS

ACTION REQ'D/DATE

1. MOTOROLA NEGOTIATIONS
2. TELEPHONE NEGOTIATIONS
3. COST REDUCTION PROPOSALS
4. FLOOR DRAINS IN ROOM 107
5. FOOTING BOARING PROBLEM
6. CONSTRUCTION JOINTS
7. GAS LINE LOCATION
8. MANHOLE - CURB CONFLICT
9. ROOFING - WATERPROOFING WARRANTY

CENTRAL FIRE STATION COMPLEX

WEEKLY MEETING MINUTES

DATE: JANUARY 20, 1983

TIME: 9:00 - 11:45 AM

LOCATION: 2ND FLOOR - CITY HALL & BUILDING SITE

PRESENT:

CITY OF LAS VEGAS
TOM GRAHAM - OAS
DAVE WALLIGER - OAS
TED REXING - OAS
LARRY POWELLL

HARRIS SHARP & ASSOCIATES
NED COLE
DAVID DAILEDA

CONSULTANTS

GENERAL CONTRACTOR
JOHN GLATTERBUCK

SUB-CONTRACTORS

DISTRIBUTION

ITEMS DISCUSSED

1. Cost Reduction Proposals - 10 have been prepared to date - When prepared 2 copies should be submitted to the City (1 for Fire Services, 1 for Architectural Services).

2. Parking Lot Changes - The Engineering Department will prepare more information regarding the parking lot changes south of the Senior Center before Amoroso is asked to prepare a proposal on it.

Dona Hicks 3-9-83

3. Tree Relocation - This has been completed.

4. List of Sub-Contractors & Back-Up Info - The Architect has now approved the progress billing format, but has not received the requested information of the sub-contractors. This is well beyond the "7 days" that is defined as a reasonable time and the Architect should push this issue.

5. Motorola Negotiations - The proposal from Motorola has been reviewed and is acceptable except for an apparant discrepancy in the number of T.V. monitors required. The Architect is asked to determine if this is the case and adjust the situation. The other problems with Motorola appear to be solved.

6. Telephone Negotiations - General Services is now preparing a "weighted point system" for evaluating the telephone system bids. This will be ready early next week for review. This is to be approved by the Architect and Amoroso. The Architect will then issue as a part of the telephone bid proposals.

7. Project Sign - Approved and forwarded to Contractor.

8. Transformer Location - Nevada Power Company has expressed concern over the possible relocation of the transformer in that they won't be able to feed it as easily and will require additional easements. After discussion, it was decided that the tranformer should remain in its current location.

9. Floor Drains in Room 107 - Ned Cole is to discuss this with Ed Butera.

10. Testing Costs - Amoroso has asked that the costs of testing be set aside as an allowance. The Architect has denied this request.

11. Caliche Removal Costs - The Architect has reviewed the specification and again determined that any caliche removed for standard building excavation is in the bid.

12. Demountable Partition Color - The City will not allow a change in the color of the demountable partitions - We are to use "Golden Teak".

Dona Hinds 3-9-83

13. Roofing & Waterproofing - The roofing and waterproofing as specified, is not guaranteed for more than the typical period to time. The Architect is to prepare a proposal requesting a 10 or 20 year warranty on these items.

14. Drawing Questions -

A. The conflict of the manhole and curb at the Bonanza Road entry is being studied by the Civil Engineer.

B. The problem of column P-32 is being investigated by the Structural Engineer.

C. Structural Engineer will be asked to clarify Add #2 Item P-1.

D. Plasteel is not allowable.

15. Construction Schedule - Amoroso is behind.

SITE MEETING

16. Footing Problem - Caliche too thin to bear on has been encountered at the base of footings F-24, 40, 39 and 25. The soils engineer has recommended that these be excavated to one foot below the caliche and refilled with lean concrete. We have asked Amoroso for a proposal to do this before they pour the concrete.

17. Gas Line Location - The gas line location is not shown on the drawing and Amoroso would like to know where it is so they can work around it. The Architect will check with the gas company.

18. Construction Joints in Concrete - Amoroso is questioning the construction joint placement in the concrete. The Architect will review this.

Respectfully submitted,

HARRIS SHARP & ASSOCIATES, INC.

DAVID A. DAILEDA, A.I.A.

Dora Hwang 3-9-83

'50/N.C.C

CENTRAL FIRE STATION COMPLEX

WEEKLY MEETING AGENDA

DATE: JANUARY 20 1983

TIME: O/A 9:00 AM - O/A/C 10:00 AM

LOCATION: O/A CITY HALL - 2ND FLOOR

O/A/C SITE TRAILER

PRESENT:

CITY OF LAS VEGAS

TOM GRAHAM
DAVE WALLISER
JEFF JACOMB
LARRY POWELL
BILL PURVIS
TED REXING

HARRIS SHARP & ASSOCIATES

DAVID DAILEDA
NED COLE
PATRICK KLENK

S.J. AMOROSO CONSTRUCTION

PAT HENDERSON
DON DES JARDIN
JOHN CLATTERBUCK

CONSULTANTS

SUB-CONTRACTORS

Don Horaly 3-9-83

ITEMS

ACTION REQ'D/DATE

1. COST REDUCTION CHANGE REQUESTS
2. TREE RELOCATION
3. LISTING OF FINAL SUB-CONTRACTORS
4. BACK-UP INFORMATION ON SUB-CONTRACTORS
5. MOTOROLA NEGOTIATIONS
6. TELEPHONE NEGOTIATIONS
7. PARKING LOT CHANGES
8. PROJECT SIGN
9. TRANSFORMER LOCATION
10. FLOOR DRAINS IN ROOM 107
11. TESTING COSTS
12. CALICHE REMOVAL COSTS
13. DEMOUNTABLE PARTITION COLOR

CENTRAL FIRE STATION COMPLEX

WEEKLY MEETING MINUTES

DATE: JANUARY 13, 1983

TIME: 9:00 - 11:45 AM

LOCATION: 2ND FLOOR - CITY HALL & BUILDING SITE

PRESENT:

CITY OF LAS VEGAS
TOM GRAHAM - OAS
DAVE WALLISER - OAS
TED REXING - OAS
RON RUEGEE

HARRIS SHARP & ASSOCIATES
NED COLE

CONSULTANTS

GENERAL CONTRACTOR
JOHN CLATTERBUCK
BOB DONNLEY

SUB-CONTRACTORS
MIKE CHALLENGER
STEVE (?). L & L ROOFING

DISTRIBUTION

Dave Hawley 1-3-9-83

ITEMS DISCUSSED

1. Revisions to Item #7 of January 6 minutes: It is the Contractor's responsibility to contact the State Transportation Department to obtain the permits for work in the State Right-of-Way and to notify them 48 hours in advance of any work within that right-of-way. Also, they should obtain permits from the City 24 hours in advance of any work.

2. Revision to Item #13 of January 6 minutes: Ted Rexing will sign all building, mechanical and electrical inspection reports along with the appropriate inspector.

3. Cost reduction requests are not yet prepared but several items are being researched.

4. Noted that we still had not received complete list of sub-contractors nor the back-up information on three subs:

   Steve's Glass
   Western Plastics
   M & M Painting Drywall

5. Received new pay estimate summary sheet from City as revised to facilitate City's billing procedure.

6. City would like one copy of our inspector's daily log and we would like a copy of Ted's log. City will provide copies of daily logs to Fire Services.

7. Noted that many precedents had been set already regarding the proper methods of submitting information and shop drawings for approval and obtaining approvals prior to doing work.

8. Discussed the fact that meetings were scheduled for this afternoon with Motorola and to discuss telephone system bidding. Requested Don Lucia to obtain an itemized printed price list from Motorola prior to the meeting. City had received all info necessary to determine whether or not to lease the control unit, however, that decision had not yet been made.

9. Discussed the research into possible transformer relocation. Architect is to get name of person to contact at Nevada Power Company so Tom Graham can discuss transformer size and alternate routes for main feeders with him to avoid easements through future building sites.

10. Discussed the intent to change the type and quantity of sprinkler heads for the irrigation system adjacent to the swimming pool deck. Our landscape Architect indicated there would probably be a small additional charge.

Nina Hwang 3-9-83

11. Reviewed City's request to revise our project sign submittal.

12. City proposes to put a sign on gate to site requiring all City personnel to sign in at the site construction trailer with the trailer having a sign on its door indicating "Architects and City's project representatives".

13. Discussed that drain line collar shown on Q-4 only occurs at the ends of the drain lines.

14. Discussed that an existing 4" pressure vacuum breaker which was relocated on site could be left in lieu of a new one and we would ask for a credit to the contract.

15. City plans revisions to parking lot at Senior Citizens Center and will be getting us more info concerning deletion of the center parking island.

16. City is contemplating expanding the parking lot behind the fire station and will try to estimate cost of expansion. Architect suggested City supply a proposed layout so we can obtain an actual cost quote from the Contractor.

17. A tree in the State Right-of-Way needs to be relocated, although it is in the contract to remove it, no provisions have been made for its relocation. City will see if there is a crew available to replant it if the Contractor removes it.

18. City would like color scheme selections from Architect A.S.A.P.

19. Demountable partitions:

    a. City prefers mineral fiber core to honeycomb core
    b. Color to be Golden Teak
    c. Prefer bronze baked on enamel trim
    d. Electrical outlets can be in base rather than @ +18" as specified
    e. Partitions come with hinges in doors and we have scheduled Stanley hinges in hardware schedule.
    f. Scheduled door closers may not fit, suggest we use standard Marlite closers
    g. Architect to revise wall adjacent to Stair #2 to be studs and drywall n lieu of demountable to accommodate handrail.
    h. Architect to relocate switches from demountable walls to stud walls in 3 locations per Ron Ruegge's direction.

Dave Howard 3-9-83

20. Moved to site meeting. Present were:

    Tom Graham
    Dave Walliser
    Ted Rexing
    Ned Cole
    John Chatterbuck
    Bob Donnley
    Mike Challenger
    Steve (?) - L & L Roofing.

21. Talked about American Hydrotech waterproofing as opposed to specified Carlisle system and L & L said they bid 1/8" protection board in lieu of specified 1" APOC system. We recommended they submit information to Architect for review and consideration for aporoval in light of presence of kerosene in boring logs.

22. Rediscussed with Contractor Items #13, 14 and 17 above.

23. Larry, Bob and Ted will visit existing fire station and mark items designated on Drawings to be located.

24. Advised Contractor it was OK to make plumbing wall of Room 223 an 8" thick wall.

25. Contractor requested that Architect research possible relocation of floor drains in Room 107 to accommodate condensate from humidification units.

26. Contractor requested that Architect review 24" x 24" x 30"D sump at elevator pit with structural engineer.

27. Contractor requested Architect to provide him control joint and champfer strip info and requested to strip forms in 24 rather than 48 hours from vertical concrete walls.

Doris Hively 3-9-83

28. Everyone seemed satisfied that proper procedures for submitting and obtaining approvals had been established and would attempt to adhere to them.

29. Toured site.

Respectfully submitted,

HARRIS SHARP & ASSOCIATES, INC.

NED COLE, A.I.A.

NC/je

Dona Hoeck 3-9-83

501 N.C.C.

CENTRAL FIRE STATION COMPLEX

WEEKLY MEETING MINUTES

DATE: JANUARY 6, 1983

TIME: 9:00 - 10:30 AM

LOCATION: 2ND FLOOR - CITY HALL

PRESENT:

CITY OF LAS VEGAS
TOM GRAHAM - OAS
DAVE WALLISER - OAS
TED REXING - OAS
BILL PURVIS

HARRIS SHARP & ASSOCIATES
DAVID DAILEDA
WED COLE

CONSULTANTS

GENERAL CONTRACTOR
JOHN CLATTERBUCK

SUB-CONTRACTORS

ITEMS DISCUSSED

1. Cost Reduction Change Orders

   Architect will attempt to have some of these prepared by next ragular meeting. Architect will research information regarding relocation of main service transformer.

2. Architect Reviewed Field Orders #1 & 2

   It was noted that the sub-contractor indicated no additional costs would be incurred.

3. The Architect advised Amoroso to be sure that speaker enclosures in the building exterior walls are in his contract as they are not in Motorola's costs.

4. After submittals are approved by the Architect, one copy will be sent to Ted Rexing for review (2 copies if off-site information is included). He will return this copy to the Architect with comments, if any. Architect shall redistribute all copies

DISTRIBUTION

3-9-83 Bond Hearing

5. Contractor was asked for final list of all sub-contractors and back-up information on three sub-contractors:

   1. M & M Painting & Drywall
   2. Western Plastics
   3. Steve's Glass

6. Confirmation of meeting to discuss Motorola and telephone negotiations at 2PM, Thursday, January 13, 1983.

7. Discussion relative to Contractor's procedure for obtaining permits to work on State Right-of-Way.

8. Ted Rexing requested clarification of discrepancy on plumbing drawings regarding size of roof drain.

9. Ted Rexing expressed desire to meet with Ned Cole to dicuss 1 hour corridor requirements.

10. Ted Rexing requested clarification of abbreviation F.B.O. (Furnished by others).

11. Ted Rexing requested Architect to look at problem of sprinklers spraying on to swimming pool deck.

12. Contractor expressed concerns with the following items:

    a. Control joint construction details
    b. Champfered edges on concrete walls
    c. Retaining wall steel detail on C-5 (2" from face or centered in wall ?)
    d. Knock out panel detail at tunnel
    e. Time requirement for stripping vertical concrete forms
    f. Need for control joints at basement walls ?

13. Ted Rexing will sign all building inspection reports along with the building inspector and may be allowed to sign off some inspections in the absence of the regular building inspector in cases where no electrical or mechanical inspection is necessary.

Donna Healy 3-9-83

14. It was discussed that procedures for meetings and submittals were working to everyone's satisfaction.

Respectfully submitted,

HARRIS SHARP & ASSOCIATES, INC.

NED COLE, A.I.A.

NC/je

Doris Hicks 3-9-83

Dona Healy 3-10-83

1

CLAY 50 (N.C.C.

HARRIS SHARP & ASSOCIATES INCORPORATED

2616 STATE STREET LAS VEGAS, NEVADA 89109 (702) 734-1464

ARCHITECTURE AND PLANNING

July 12, 1982

Mr. Michael Traasdahl
City of Las Vegas
Department of Building Safety
City Hall
400 East Stewart
Las Vegas, Nevada 89101

RE: FIRE SERVICES HEADQUARTERS/FIRE STATION [redacted] 1

Dear Mr. Traasdahl:

Per our conversation of July 8, 1982, it is our understanding that the following conditions are applicable on the subject project:

1. This structure is to be considered a two story building, as such

2. Floors may be open between stories, and

3. The main entry stair can be an unprotected stair as long as it only traverses the two stories while open.

If there are any discrepancies in the above items, or any item needs clarification, contact this office as soon as possible or all items shall be regarded as correct and in agreement with the understanding of all interested parties.

Sincerely,

HARRIS SHARP & ASSOCIATES, INC.

PATRICK J. KLENK, A.I.A.

PJK/je

cc: Thomas Graham - CLV Architectural Services
Larry Howell - CLV Fire Services

HARRIS P. SHARP, A.I.A. GERALD P. SIMKOW, A.I.A. EDWARD A. DALEDA, A.I.A.

Dona Healy 3-10-83

CITY OF LAS VEGAS

INTER-OFFICE MEMORANDUM

Date 501 N.C.C.

December 1, 1982

TO:

Tom Graham, Director
Architectural Services

FROM:

Clay Hymer, Director
Building & Safety

SUBJECT:

Fire Station #1 Comments

COPIES TO:

Mike Traasdahl
Building Plans Technician

At your request, we reviewed the list of possible corrections needed on the City fire station to ascertain if we missed or misjudged any of the items listed.

As this Department does not use OSHA or Federal standards, we will not research into that area, and all comments we make must be considered as meeting the City Building Codes which are minimum requirements. Any City requirements which have been required are considered as more stringent or personal preference by the City, which this Department would not object to as long as the special requirements conformed to our Codes.

Attachment

CLV-6217

Dona Hocaly 3-10-83

CITY OF LAS VEGAS

INTER-OFFICE MEMORANDUM

Date: November 30, 1982

TO: Clay Hymer, Director
Building & Safety

FROM: Michael Traasdahl
Building Plans Technician

SUBJECT: REVIEW COMMENTS ON FIRE STATION #1, SUPPLIED BY THE DEPARIMENT OF PUBLIC SERVICES

COPIES TO:

Pursuant to your request for a plan check analysis of a document entitled "Review Comments on Fire Station #1 Contract Drawings", dated November 15, 1982, the Plan Check Division is submitting this list of comments.

Our analysis shall incorporate the same categories and item identification as the Public Services' document.

Structural and Architectural Sheets

Item 1, a, b, c - The building would conform to a Type II one hour building. The ceilings are not required to be rated when the floor system is a rated assembly. A fire damper is not required on the swamp cooler penetrations.

Item 2 - See Item 1.

Item 3 - The Building Official shall establish the type of occupancy as per Uniform Building Code, Section 501. Occupancy separations and considerations haye beem provided for. Where some features of the Building would normally be prohibited, we find that they are traditional with fire stations and they must be given consideration in adapting it to a B-2 occupancy category.

Item 4 - Since the building is fully sprinkled and is not greater than two stories, the one hour corridor protection is waived by City ordinance. If at a future date, the City chooses to add two more stories to the structure, all corridors serving an occupant load greater than 30 must be remodeled to a one hour rated condition.

Continued . . .

Dona Hobaly - 3-10-83

Item 5 - See Item 4.

Item 6 - 60 minute label required.

Item 7 - Requires 60 minute label as per Uniform Building Code, Section 708.

Item 8 - Does not create a problem. Door No. 325 is less than 22'-0" from a stairway exit door and a stairway of 8 risers separates the two.

Item 9, a - See Item 3.

b, c - We do not wish to comment on OSHA requirements.

Item 10 - We do not wish to comment on OSHA requirements.

Item 11 - No comment.

Item 12 - This item is inconsequential. If it is a drafting error, a good eraser works fine. If the beam is placed and more stories are added, the beam is easily removed.

Item 13 - 6" handrail extension on one rail is required by the Uniform Building Code. An investigation into the applicability of the Federal standard should be made. The handrail extension of one foot plus the tread length beyond the bottom tread sounds terribly excessive.

Item 14 - This is not required by the Uniform Building Code.

Item 15 - No comment.

Item 16 - No comment.

Item 17 - This item was resolved by the Building Official earlier in the year.

Item 18 - The barrier is there.

Continued . . .

2

Dona Healy 3-10-83

Item 19 - Two means of exit are not required (see Uniform Building Code, Section 3320).

Item 20 - Standpipes may be combined with the automatic sprinkler system. Since plans for the sprinkler system are nonexistant at this time, no conclusion can be reached.

Item 21 - I fail to see his point. Fireblocking is found only in wood construction.

Item 22 - I fail to see his point.

Item 23 - X bracing seems to miss the windows.

Item 24 - No comment.

Item 25 - No comment.

Item 26 - No comment.

Item 27 - This problem was previously resolved.

Item 28 - Since the walls are nonbearing, lintels are not required beyond coventional framing practice.

Item 29 - Minor - see mechanical drawings.

Item 30 - I fail to see on the plans where foam insulation was mentioned. The semi-rigid insulation must have a flame spread rating of not more than 25 and a smoke-developed rating of not more than 50.

Item 31 - I fail to see his point.

Item 32 - The angle iron is not considered a part of the structural frame and therefore need not be protected.

Plumbing Sheets

Sheet P-1:

Item 1 - No comment.

Item 2 - This item is like many in this report; it is beyond the minimum of the Code and therefore, we have no comment.

Continued . . .

Dona Vocaly 3-10-83

Item 3 - No comment.

Item 4 - As per the drawing, the elevator pit is not in danger of flooding.

Sheet P-3:

Item 1 - Detail C reflects the size of pipe rather than the depth below grade.

Item 2 - No comment.

Item 3 - We fail to see his point.

Item 4 - No comment.

Sheet P-4:

Item 1 - We agree.

Sheet P-5:

Item 1 - No comment.

Air Conditioning Sheets

Sheet AC-1:

Item 1 - We agree.

Item 2 - Using what criteria? The information is not available.

Sheet AC-3:

Item 1 - Grilles are incidental to the operation and are not mandatory by the Uniform Mechanical Code.

Item 2 - See Item 1 above.

Item 3 - No comment.

Sheet AC-4:

Item 1 - No comment

Item 2 - RH2 through RH6 may be used for this condition but are not shown to do so.

Item 3 - See Item 1, Sheet A-3.

Continued . . .

Dona Hovaly 3-10-83

Sheet AC-5:

Item 1 - See Item 1, Sheet A-3.

Sheet AC-6:

Item 1 - Combustion air opening needs to have a slightly larger free area but not nearly as large as Note #2 on Sheet A-6 of the plans.

Sheet AC-7:

Item 1 - No comment.

Item 2 - The detail is shown correctly.

Item 3 - No comment.

Electrical Sheets

Sheet E-1:

Item 1 - No comment - typo error.

Item 2 - Not required by National Electrical Code.

Item 3 - Not required by National Electrical Code.

Item 4 - Not required by National Electrical Code.

Item 5 - Beyond Code requirement.

Item 6 - Not required by National Electrical Code.

Sheet E-2:

Item 1 - No problem.

Item 2 - There was no attached plans.

Item 3 - This is above and beyond the Code.

Item 4 - No comment.

Item 5 - G.F.I.'s are not required by National Electrical Code. If the G.F.I.'s are otherwise desired, it is simply a drafting error.

Continued . . .

Dona Hosely 3-10-83

Sheet E-3:

Item 1 - This is not required by the Code but is perhaps a great idea.

Item 2 - This item is of minor consequence. It poses no problem to normal electrical construction practices.

Item 3 - Minor -- acceptable plans do not always include such information.

Sheet E-4:

Item 1 - Agreed.

Item 2 - See Item 2, E-3.

Item 3 - See Item 3, E-3.

Sheet E-5:

Item 1 - See Item 1, E-3.

Item 2 - Minor, like a misspelling.

Sheet E-6:

Item 1 - No comment.

Item 2 - See Item 3, E-3.

Item 3 - A minor drafting miscue.

Sheet E-7:

Item 1 - See Item 3, E-3.

Item 2 - Not required by National Electrical Code.

Item 3 - Agreed..

Item 4 - A design opinion.

Item 5 - This is not required by National Electrical Code. The seal is located at the island (see detail B, Sheet E-1).

Item 6 - A very small item.

Continued . . .

Dona Hawley 3-10-83

Sheet E-8:

Item 1 - No comment.

Item 2 - No comment.

Item 3 - A design opinion.

Item 4 - See Item 3, E-3.

Item 5 - A design opinion.

Item 6 - A design opinion.

Item 7 - A very small item.

Sheet E-9:

Item 1 - A drafting procedure opinion.

Sheet E-10:

Item 1 - See Item 1, E-9.

Item 2 - See Item 1, E-9.

Sheet E-11:

Item 1 - See Item 1, E-9.

Item 2 - See Item 1, E-9.

Sheet E-13:

Item 1 - Minor.

Item 2 - Minor.

Sheet E-15 through Sheet E-18:

All items are not Code violations but tend to be drafting technique disagreements or small drafting errors. Some items are design considerations beyond the minimum of the Code.

Technical Specifications - Electrical

Item 1 - No comment.

Item 2 - National Electrical Code allows for ground to be bare except under corrosive conditions.

Continued . . .

Dona Hocaly 3-10-83

Item 3 - Design above the minimum of the Code.

Item 4 - Pg. 16C-3 - Design above the minimum of the Code.

Pg. 16C-6 - Agreed.

Pg. 16C-7 - Agreed.

Pg. 16C-8 - Design above minimum of the Code.

Pg. 16C-9 - Agreed.

Items 5 & 6 - Items are either above the minimum of the Code or a design suggestion or of such a minor nature that no comment is necessary.

Dona Healy 3-10-83

501 N. C. C.

November 15, 1982

Thomas B. Graham, RLA, AICP
Director of Architectural Services

BHA 11/15/82
Bert H. Anzai, P.E.
Chief of Engineering Design

Fire Station #1

Please include the following changes to construction notes on Sheet C-3 for added clarification to the contractor.

9. Remove existing streetlight and foundation. See Sheet C-2, Note 1.c.

20. Install new streetlight with 30' pole and base per CLV Standard Drawings and specifications. Utilize existing luminaire for series circuit.

21. If existing is not in conduit, install 1-1/4" conduit into streetlight pole bases east and west of new pole (see note 20). Wire to be 5KV streetlight wire (#8 solid) with 10/64 insulation one conductor only.

22. If existing is in conduit, intercept existing conduit and install new #3-1/2 pullbox with cast iron lid.

23. Install new 250 watt H.P.S. streetlight per CLV Standard Drawings and specifications. Stub and cap 1-1/4" conduit. CLV to connect to power source. The existing overhead wire to be removed. (Last span to streetlight to be removed only. See note 9.)

BHA/jm

Dona Vocaly 3-10-83

Nov: Ber 15, 1982

Thomas B. Graham, RLA, AICP
Director of Architectural Services

Donald E. Donovan, P.E.
Director of Public Services

Review Comments on
Fire Station #1 Contract Drawings

C. E. Gilpin, P.E.
William J. Purvis, P.E.
David Wallister, N.C.A.R.B.

Situation

A review of the Fire Station #1 contract drawings was accomplished by Engineering Design Division staff on November 13 and 14, 1982. Attached is a list of comments for consideration.

Recommendation

Recommend the comments be reviewed and forwarded for consideration by the Architect and his engineering staff for possible inclusion in an addendum package.

Analysis

Many of the comments are questions dealing with project criteria which were not available to staff during the weekend review. They point out areas of concern based on the available information.

Bud Willis/

Donald E. Donovan, P.E.

DED/BHW/ja

w/Attachment

Dona Vocaly 3-0-83

CIVIL SHEETS: Contact Carl Krehnovi

Sheet C-2:

1. Note No. 1a should include all valves, quick couplers, and vacuum breakers that are to be removed.

2. Note No. 1c should state all "pole assemblies" are to be delivered to City Yards, 8 each.

3. Proposed property line should end at the existing corner west of the 8' existing sidewalk.

Sheet C-3:

1. Sanitary sewer invert elevations and grades do not agree.

2. 18-inch storm drain line inverts at new proposed drop inlet do not agree with grade line from manhole within parking area.

3. Planter areas do not have any dimensions, curve data, or offsets; seems a base line should be established so islands can be staked out.

4. The 2 - 6" VCP storm drains do not have a set invert at west end.

5. The 2 - 8" VCP storm drains do not have a set invert at west end.

6. Planter along north property line has two curb openings for drainage; may cause debris across road at outlet. Why not surface drain through parking l

7. Should show overall dimension at north entranceway; also need curve data; should have established base line for staking out entire parking lot.

8. Should have detail of stamped concrete area.

9. 3" drain lines to west not shown as per sheet P-3, notes 46 & 49 indicate.

10. Reference page P-3, grease and sand traps, set locations and elevations.

Sheet C-4:

1. Profile of N.E. property line -

   a. Should show matching elevations on plan sheet so profile can be orientat

   b. Finish floor elevation is approximately 10.85; this is the elevation for the Highway Patrol building.

2. Section B, dimension for sidewalk width is missing.

3. Sections K & L for grate should refer to Detail 2 same sheet.

4. Section G, gravel base note should be 4" of Type II over 6" of Type I.

Dona Hacala 3-10-83

Sheet C-6:

1. Note No. 2 appears to be incomplete.

2. Under estimated quantities, Items No. 3, 13, and 14 do not appear on sheet C-6.

SOILS REPORT:

1. Note should be added to the contract drawings that groundwater was encountered at the depth of 14 feet.

2. Asphalt specifications should reference the Nevada Department of Transportation Specifications rather than the Uniform Pacific Coast Specifications.

Dona Healy 3-10-83

STRUCTURAL & ARCHITECTURAL SHEETS: Contact Bob Hamp

1. Building is a Type II non-rated with fire sprinklers.

   a. With the exception of corridor #130, stairwells #6 & #8, the elevator shaft, and vertical duct shafts, no concern was made to provide a 1 hour building throughout. Very few ceilings are rated assemblies. The suspended ceiling is Class II, the 3/8" gypsum board ceilings are not, and the apparatus bay ceiling is not rated due to holes for swamp cooling ducting without fire damper.

   b. The split level flooring system also creates a non-rated floor. For example, Detail 17, Sheet A-15, shows examples of where one floor level passes through to another floor level without proper 1 hour protection; or Detail 4-A, sheet A-10, shows the conference room on the plaza level leading into the game room without proper 1 hour protection and then back down into the watch office without 1 hour protection.

   c. Stairways Nos. 1, 2, 9, 10, and 11 are not 1 hour rated floor assemblies.

2. A building of this type is acceptable as long as there are no plans to add stories or increase the square footage of the building in the future (Section 507 and 508 UBC).

3. Occupancy separations not adhered to:

   The apparatus bay is group B-1, the warehouse and office space is group B-2, and the dorm areas are Group R-1. All of these areas should be separated by 1 hour fire protection and are not. R-1 & B-1 Should be 3hR

4. The second floor corridor and corridor #118 are not fire rated. Fire dampers are shown where there is no gypsum board.

5. Not all doors in exit corridors or occupancy separation walls requiring 20 min. labels are indicated to have labels, i.e., Door Nos. 126, 211A, 212, 213, 215, 216, 236, 237, 238, 308, 316, 317, 325, 330, 332, 335, 336, 341, 342, 347, 349, 350, 351.

6. Door #203 requires 60 min. label.

7. Door #328 requires 1 hour rating (Sec. 1212 UBC).

8. Door #325 is 25' from an exit creating a dead end corridor.

9. Fire poles and holes create problem:

   a. They break the occupancy separation between the apparatus bay and the response (exit) corridor.

   b. Openings do not have toes to prevent dropping. OSHA 29 CFR Part 1910.23.

   c. Fire poles may not be an acceptable ladder alternate for OSHA standards.

10. Detail 17, sheet A-33, does not show ladder rungs 7 inches from the wall (OSHA). Elevator pit ladder not detailed. Hatch rail not standard rail for OSHA.

Dona Vocaly 3-10-93

STRUCTURAL & ARCHITECTURAL SHEETS
Page 2

11. Locks are specified to be "Best" cylinders but the standard city keying specifications are not used.

12. Roof plan (sheet S-6) shows W8x10 going through elevator shaft. What happens when additional stories are added?

13. Many handrails at top of stairs do not show a 1 foot extension beyond the top tread and the rails at bottom do not show a 1 foot plus the tread length beyond the bottom tread (Federal standards).

14. Handicapped restroom urinals should be mounted at 1'-5", not 1'-7".

15. How deep is planter fill to be?

16. Won't larger access be required to get equipment in and out of Machine, Boiler, and Mechanical Rooms?

17. Sleeping rooms do not have operable window or exterior door (Sec. 1204).

18. Stairwell #6 has no barrier to basement (Sec. 3308(E)).

N.A. 19. Boiler Room requires two means of egress (Sec. 3320 UBC). LESS THAN 500#

20. If two more stories are added, standpipes (Class I or III) will be required and no provisions were made for these.

21. Columns create vertical shafts and there are no provisions required in the plans to fire block (sheet S-5).

22. Detail 1, Sheet A-34 is wrong.

23. X-bracing seems to go through windows 13, 14 and 15 (sheet S-3). AND SOUTH EAST EAST WALL

24. What finish is to go on plaza level kitchen walls? Finish H not identified

25. Why carpet kitchen on communication level?

26. How does 5/8" gypboard suspended ceiling match to the 3/8" gypboard suspend ceiling? Detail missing.

27. Inside of parapet walls do not show weather-resistive barriers and some hav gypboard (sheet A-12).

28. There are no details showing lintels for windows or door openings.

29. Sheets A-6 and A-7 are missing numerous air supply and return diffusers.

30. Rigid foam insulation on communications level is not 15 min. protected. It is Class III and should be Class II.

Dona Hacaly 3-10-93

STRUCTURAL & ARCHITECTURAL SHEETS.
Page 3

31. Ceiling in apparatus bay is not part of a 1 hour envelope causing the north wall to be less than a 1 hour assembly. This wall must be a 1 hour assembly due to its closeness to the property line (see Detail 9, sheet A-13).

32. Angle iron 3" x 3" x 1/4" cont. ledger holding up concrete ceiling in communications level should be 1 hour protected (sheet S-3).

Dora Hovaly 3-10-83

PLUMBING SHEETS: Contact Bert Anzai

P-1:

1. HWCP-1 not shown.
2. Request replacing throttling valves (T.V.) with branch line gate valves and Bell & Gossett circuit setter balancing valve. HWCP-1 to be sized accordingly.
3. Verification of Note 6 should be accomplished by civil consultant rather than contractor.
4. Note 8 connect to 18" RCP drain line to avoid flooding elevator pit. Insure positive slope away from building.

P-3:

1. Detail 6 should reflect 3' below grade rather than 3" below grade.
2. Note 42 should reflect 1/2".
3. Change of throttling valves at coordinates N-9 and in Detail E (item 2 above under P-1).
4. SD & OSD leaving building at coordinates A-13 are not shown on civil plans.

P-4:

1. Increase gas [illegible] size to water heaters to 1" with 3/4" to each heater.

P-5:

1. Detail 6 should reflect planter area surface.

Dona Hocaly 3-10-83

AIR CONDITIONING SHEETS: Contact Bert Anzai

AC-1:

1. RH2 through RH6 - unable to locate.
2. P-1 and P-2 appear to be undersized for maximum GPM.

AC-3:

1. Return air grilles needed in Rooms 115, 120, 126.
2. Return air duct from communications specialist room and secretary office does not connect to return air system.
3. Recommend water softener for computer equipment make-up water.

AC-4:

1. Recommend UH-1 through UH-4 be oriented for circular air pattern.
2. Is evaporative cooler air relieved to the outside through open doors in apparatus bay?
3. Return air grille needed in room 219.

AC-5:

1. Return air grilles needed in rooms 302, 307, 308 and study booths 349, 350, 3

AC-6:

1. Note 4 does not provide adequate combustion air:

Boiler	1250 MBH
Heaters	500 MBH
	1750 MBH

Louver of comparable size of Note 2 required.

AC-7:

1. Detail 1: P-2 with 200 GPM should be P-4.
   P-1 with 125 GPM/200 GPM should be P-5.
2. Detail 6: Spring isolation rail shown as concrete.
3. Request calibrated flow meters in all return lines of unit heaters, fan powered terminal units, VAV terminal units with reheat, HW coils, chilled water coils and circulation pumps be shown on the contract drawings and added to the legend.

Dona Hocaly 3-10-83

ELECTRICAL SHEETS: Contact Michael Goodman

Sheet E-1:

1. Circuit number missing on one light and incorrect on another in planter area west of building. Add 1#10 ground to circuit panelboard 26, 28, 30.
2. Upgrade conduit to lights at drive on N.W. to 1" and conductors to #8 and 1#10 ground.
3. Upgrade conduit and conductors to S. parking lot to 1-1/4" and #8 (voltage drop too large). Include 1#10 ground in all conduits.
4. Indicate which light assembly to go where, i.e., CC, BB, DD. Also indicate which construction detail applies on site plan.
5. Stub and cap conduit to S from S.most pole.
6. Indicate which construction detail applies to pump station pole on detail B-E1.

Sheet E-2:

1. Many symbols listed are not used on plans.
2. Add info. to details 2 and 3 as shown on attached plan.
3. Remove reference to Aluminum on symbol list.
4. Shunt trip or pushbutton station symbol is also used as electric door strike
5. Add symbols for GFI receptacle, alarm lights and change a few to match plans (see plan).

Sheet E-3:

1. Panel 'LB' schedule shows large unbalance. Circuit changes indicated on attached plans will easily help.
2. One fixture in room 109 fed by two pigtails, another no pigtail (see plan).
3. Some circuit designations missing on light fixtures (see plan).

Sheet E-4:

1. Time switches in room 109 should be shown.
2. Light fixture fed by two pigtails (see plan).
3. Room number 209 should be indicated, considering electrical equipment in the room.

Dona Vocaly - 3-10-83

ELECTRICAL SHEETS
Page 2

Sheet E-5:

1. Lights in room 323 should be circuited to EL2-5 to help balance panel 'EL2' (see plan).
2. 'P2' nomenclature in error 3 places--should be 'P2A' (see plan).

Sheet E-6:

1. Feeders from and to 'GDB' should be shown - (19) (20) (21) (see plan).
2. Circuit numbers missing on some outlets (see plan).
3. Symbol for GFI receptacle not shown nor consistent with symbols on E-8 (see plan).

Sheet E-7:

1. Some circuit numbers missing (see plan).
2. GFI receptacle not provided in restrooms.
3. Circuit for 'Relay control cabinets RC1 & 2' should be indicated to and from 'control console'.
4. Conduit and wire to welding receptacle should be upgraded to 1" and #6.
5. Seal-offs should be shown on conduits to gas island at disconnects (see plan)
6. Symbol for 'RC-2' needs diagonal line.

Sheet E-8:

1. Change circuit to boiler to P2B-22 (kitchen outlet is P2B 18, 20).
2. Plan shows RRF-1 from 'SDA', panel schedule shows 'MCCC'; which is correct?
3. Upgrade 1/2" conduits to motor loads to 3/4" min. (see plan).
4. Some circuit numbers missing.
5. Room 327 should have room number because of electrical equipment.
6. Printer conduit should be upgraded to 1" for P2A - 7, 9 (see plan).
7. Symbol for 'RC-1' needs diagonal line.

Sheet E-9:

1. Smoke detector circuitry should be on E-6 (title gives no indication of this circuit).

Dona Hovaly 3-10-82

ELECTRICAL SHEETS
Page 3

Sheet E-10:

1. Same as (1) for Sheet E-9 except E-7 instead of E-6.
2. Volume and speaker control circuitry not clear two places (see plans).

Sheet E-11:

1. Same as (1) Sheet E-9 except E-8 instead of E-6.
2. Same as (2) Sheet E-10.

Sheet E-13:

1. Need arrow to doorbell circuit (see plan).
2. Need 'Note 11' to TV outlet (see plan).

Sheet E-15:

1. Feeder to P2B from MSB should be 26 instead of 9.
2. 'Feeder Schedule' should include the panel designations (see plan).
3. KW information needs to be changed.
4. Some conduit runs need to be increased due to length of pull or future needs.
5. Feeders for ◇25 & ◇26 should be #2, not #12.
6. Bypass switches are not shown on single line diagram.

Sheet E-16:

1. Errors in the number of outlets served, and/or addition in most panel schedules (see plan).
2. Could not find FD-1 on plans - circuit 33, panel P2A.
3. Include room numbers on schedules.

Sheet E-17:

1. Same as (1) for sheet E-16.
2. Spelling error MCCB schedule (see plan).
3. Could not find purpose of 'EPI' 22. Lighting control diagram indicates 'EPI' 20 powers contactors R1 and R2.

Dora Vocaly 3-10-82

ELECTRICAL SHEETS
Page 4

Sheet E-18:

1. No motor and/or pump control diagrams.
2. Same as (1) for Sheet E-16.
3. [illegible] Note 2 for Sheet E-8.
4. [illegible]' should be included for circuit 3 on 'MCCC' schedule.
5. [illegible]iler circuit should be '22' on 'P2B'.

Dona Hocaly 3-10-83

TECHNICAL SPECIFICATIONS - ELECTRICAL:

1. No Section 16 H Fire, Alarm System.

2. 'On Site Electrical'

   Page 25-6

   3.08 - 'System Grounding'

   A. (last line) Change 'bare' to insulated.

3. 'Equipment Under 600 Volts'

   Page 16A-4

   2.02 - 'Distribution Switchboards'.

   B. (last sentence in last paragraph) 'conduit' misspelled.

   C. (first sentence) delete ...'electro tin-plated aluminum or'...

   Page 16A-6

   2.03 - 'Motor Control Center'

   C. (last sentence) delete ...'tin-plated aluminum or'...

4. 'Interior Wiring System 600 Volts or Less'

   Page 16C-3

   1.05 - 'Submittals'

   C. Delete 'aluminum cable terminations'.

   Page 16C-6

   2.03 - 'Raceway Fittings and Boxes'

   B. 'Device Boxes'

   1. Delete ...'non-metallic'... Restructure sentence to read: "Boxes may be constructed of ferrous or non-ferrous materials matching the raceway material employed.

   Page 16C-7

   C. 'Outlet Boxes'

   1. Same as above (B., 1.).

Dora Vocaly 3-10-83

Page 16C-8

2.04 - 'Conductors'

A. Delete second and third sentences. Insert: 'All wiring shall be copper.

1. (last sentence) Change '#8' to #10, change '#6' to #8.

C. 2. Delete second sentence.

Page 16C-9

D. 'Junction and Pullboxes'

1. Same as above (B., 1.).

2. Delete second sentence.

5. 'Lighting Fixtures, Devices and Controls'

Page 16F-1

1.01 - 'Description'

A. Delete items '4., 5. and 7.'.

Page 16F-3

1.05 - 'Submittals'

C. Delete 'photocells, incandescent dimmers' and 'fluorescent dimmers'.

2.02 - 'Lighting Fixtures'

B. Delete ...'universal "energy saving" ballasts'... Delete last sentence.

Page 16F-4

C. Delete

H. Delete

Page 16F-6

2.04 Delete
2.05 Delete
2.06 Delete
2.07 Delete

Dona V. Wakely 3-10-93

Page 16F-9

3.06 Delete
3.07 Delete

6. 'Sound and Inter-Communication Systems'

Page 16G-6

2.03 - 'Performance Requirements'

B. (First sentence) 'outage' misspelled.

Page 16N-7

2.04 - 'Bypass/Isolation Switch'

B. 3. (First sentence) 'circuit' misspelled.

Dona Hocaby 3-10-83

LANDSCAPE SHEETS: Contact Carl Lechnovi

Sheet L-1:

1. Shrubs and trees should show typical spacing for planting.

Sheet L-2:

1. Should have typical head spacing detail.

Calcs (1)
501 N. Casino Center

Lucia Callens 12-19-84

STRAUSS & LOFTFIELD
STRUCTURAL ENGINEERS

CLIENT/ HARRIS SHARP & ASSOCIATES SHEET/ OF
PROJECT/ CITY OF LAS VEGAS PROJECT # 82017
FIRE STATION COMPLEX DATE/
FIRE STATION NO.1 ENGINEER/

STRUCTURAL CALCULATIONS INDEX

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1600 EAST DESERT INN ROAD SUITE 106 | LAS VEGAS, NEVADA 89109-2594 (702) 731-6226

Lucia Collins 12-14-84

STRAUSS & LOETFIELD
STRUCTURAL ENGINEERS

CLIENT: HARRIS SHARP & ASSOC SHEET: 1 OF 317
PROJECT: CITY OF LAS VEGAS PROJECT #: 82017
FIRE SERVICES COMPLEX DATE: OCT '82
FIRE STATION N°1 ENGINEER: HS

TWO STORIED STRUCTURE WITH BASEMENT

INCLUDED CAPACITY FOR ADDITIONAL TWO STORIES

—SEE SKETCH SHT N°13—

DESIGN CRITERIA

UNIFORM BUILDING CODE 1982 EDITION

WIND:

BASIC SPEED — 75 MPH
STAGNATION PRESSURE — 15 PSF
EXPOSURE — C
IMPORTANCE FACTOR — 1.15

SEISMIC ZONE N°2
OCCUPANCY IMPORTANCE FACTOR = 1.5
Z = 3/8

NON-SNOW LOAD AREA

REGISTERED PROFESSIONAL ENGINEER — STATE OF NEVADA — No. 4259 — STRAUSS — 10 Jan '85

DEAD LOADS

ROOF

FOR ALL LOCATIONS EXCERT AS NOTED BELOW	4-PLY B.U. ROOF'G & GRAVEL	6.0 PSF
	1 1/2" B-DECK	2.0
	BATT. INSULATION	1.8
	GYP CEIL'G	2.8
	FIRE SPRINKLERS	1.5
	MISC MECH & ELEC	1.4
		15.5 PSF + FRMG

ROOF

FOR ROOFS OVER THE ATRIUM & APPAR. BAY	4-PLY B.U. ROOF'G & GRAVEL	6.0 PSF
	4 1/2" AVG. THICK VERMICULITE	12.0
	3 1/2" CONC W/ 1 1/2" B-DECK	51.0
	BATT INSULATION	1.8
	GYP CEIL'G	2.8
	FIRE SPRINKLERS	1.5
	MISC MECH & ELEC	0.9
		76.0 PSF + FRMG

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Lucas Collins 12-19-84

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CLIENT/
PROJECT/
SHEET/ 2 OF 317
PROJECT # 82017
DATE/ OCT '82
ENGINEER/ HS

DEADLOADS continued

FLOOR

FOR ALL LOCATIONS EXCEPT AS NOTED BELOW	FINISH FLOOR'G	1.5 PSF
	3½" CONC W/ 1½" B-DECK	51.0
	GYP CEIL'G	2.8
	FIRE SPRINKLERS	1.5
	PARTITIONS	20.0
	MISC MECH & ELEC	1.2
		78.0 PSF + FRMG

FLOOR

SLAB OVER BASEMENT INTERIOR	3½" CONC W/ 1½" B-DECK	1.5 PSF
	GYP CEIL'G	51.0
	FIRE SPRINKLERS	2.8
	MISC MECH & ELEC	1.5
		1.2
		58.0 PSF + FRMG

FLOOR

SLAB OVER BASEMENT EXTERIOR	STAMPED CONC PAVERS 10" MAX	125.0
	3/8" B.U. SEAL'G MEMBRANE	3.0
	3½" CONC W/ 1½" B-DECK	51.0
	GYP CEIL'G	2.8
	FIRE SPRINKLERS	1.5
	MISC MECH & ELEC	1.7
		185.0 PSF + FRM'G

STAIRS

STEEL PAN W/ CONC. FILL	50.0 PSF

WALLS (EXT.)

TILE & GROUT W/ MTL LATH	15.5 PSF
GYP W/ MTL STUDS @ 16" O.C.	3.7
BATT INSULATION	1.8
	21.0 PSF

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Lisa Collins 12-19-84

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CLIENT/
PROJECT/

SHEET/ 3 OF 317
PROJECT # 82017
DATE/ OCT '82
ENGINEER/ HS

LIVE LOADS

ROOF	
ALL - EXCEPT AS NOTED BELOW	20 PSF
FLOOR	
DORMITORY	40 PSF
OFFICE	50 PSF
STORAGE (RECORDS)	250 PSF
GYM & GAME RMS	100 PSF
MECH RMS	
FAN RM. & ROOF @ GAME RM	60 PSF
CHILLER RM	100 PSF
BOILER RM	100 PSF
COOL'G TOWER PLTFM.	100 PSF
PLAZA & LOBBY	100 PSF
STAIRS, LAND'GS & PED. BRIDGES	100 PSF

NOTE: ONLY ROOF, DORMITORY, & OFFICE LIVE LOADS ARE REDUCIBLE BY TRIBUTARY AREA.

SOILS CRITERIA

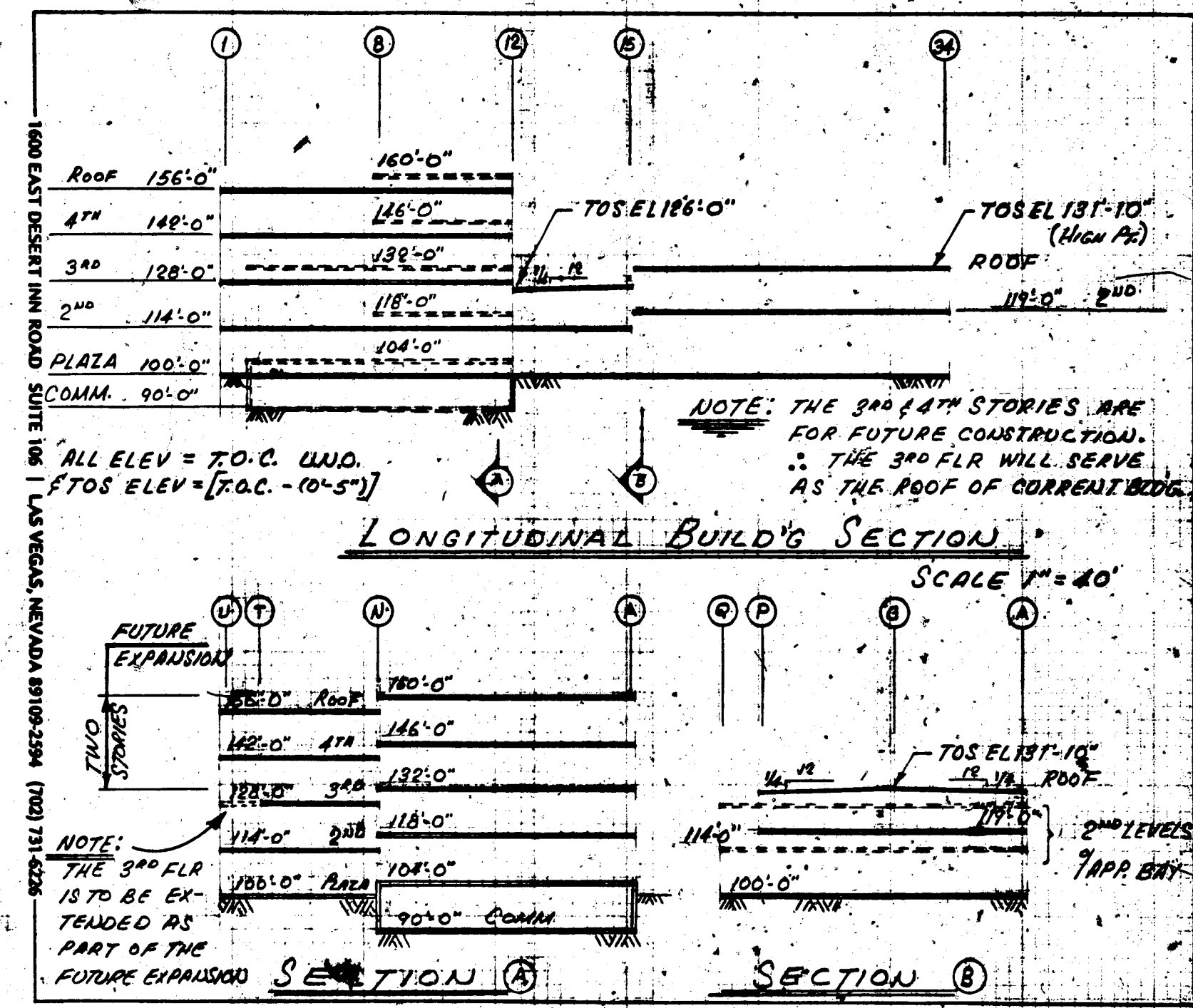
REPORT BY: J.H. KLEINFELDER & ASSOC JUNE 18, '82

DESIGN SOIL PRESSURES:

BEARING	2000 PSF
ACTIVE	35 PSF/FT
PASSIVE	300 PSF/FT
COEF. FRICTION CONC @/SOIL	0.30
SPECIFIC WT	100→118 PCF

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Date Collected 12-19-84



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SCHEMATIC SECTIONS

DATE/ OCT '82

DRAWN/ H/S

CHKD/ PROJECT #

SHEET 4 OF 317

Lucia Cabrera 12-19-84

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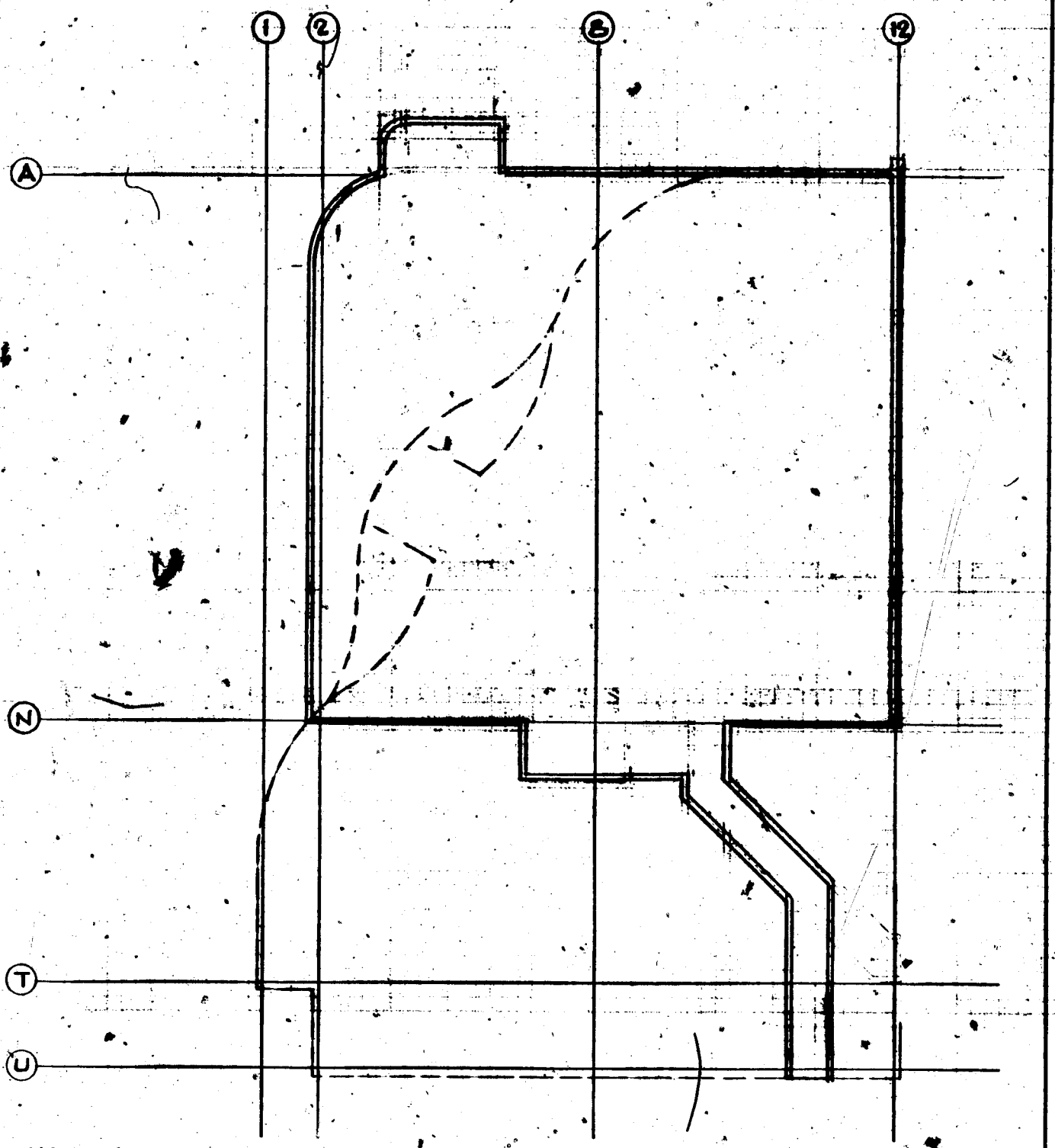
PROJECT/

SHEET 5 OF 317

PROJECT # 82017

DATE/ OCT '82

ENGINEER HS



NORTH

COMMUNICATION LEVEL PLAN, SCALE 1"=20'-0"

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Lula Collins 12-19-84

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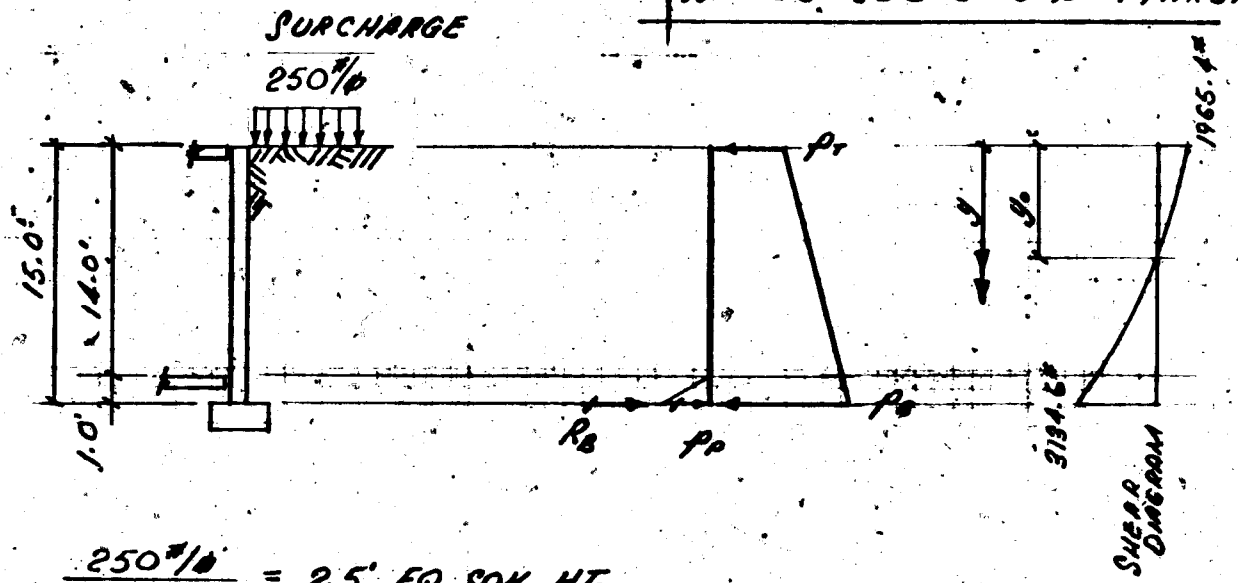
CLIENT/ | SHEET/ 6 OF 317
PROJECT/ | PROJECT # 82017
DATE/ OCT '82
ENGINEER/ HS

BASEMENT WALLS — GRIDS Ⓐ Ⓦ & ②

f'_c = 3000 PSI
F_y = 60 KSI

SOIL PRESSURE
ACTIVE 35#/FT³ EQ. FLUID PRESSURE
PASSIVE 300#/FT³ do
SPECIFIC WT 100#/FT³
COEF FRICTION μ = 0.3 CONC. ON SOIL

NOTE: LATERAL LOAD'G ONLY IS SHOWN. FOR COMBINED LOAD'G ON WALLS SEE SHTS N° 9 THRU N° 15.



$\frac{250\#/ft}{100\#/FT^3}$ = 2.5' EQ. SOIL HT.

p_T = (35#/FT³)(2.5') = 87.5 #/ft² → H_1 = (p_T x 1.0')(15.0) = 1312.5#
p_B = (do)(2.5'+15.0') = 612.5 #/ft² → H_2 = (p_B - p_T)(1.0)(15.0/2) = 3937.5#
p_p = (300#/FT³)(1.0') = 300.0 #/ft² → H_3 = (-p_p x 1.0')(1.0'/2) = -(150.0#)

ΣH = 5100.0#

$\frac{(H_1 \times 15.0/2) + (H_2 \times 15.0/3) + (H_3 \times 1.0/3)}{15.0}$ = 1965.4#

R_B = (5100.0# - R_T) = 3134.6#

Luis Calleros 12-19-84

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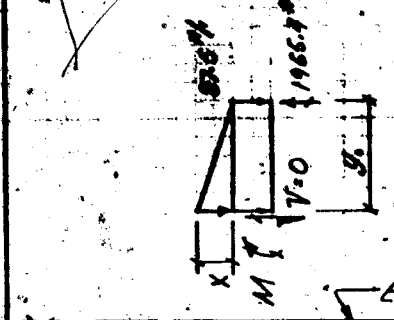
CLIENT/ SHEET/ 7 OF 317
PROJECT/ PROJECT # 82017
DATE/ OCT '82
ENGINEER/ HS

BASEMENT WALLS

GRIDS Ⓐ Ⓦ & ②

$X = 35(y)$

$\Sigma V = 1965.4^{\#} - 87.5(y) - (35/2)(y^2)$



@ $V=0 \rightarrow y = y_o$ & $M = MAX$

$17.5y^2 + 87.5y = 1965.4$

$y^2 + 5y = 112.31$

$(y+2.5)^2 = 112.31 + 2.5^2 = 118.56$

$y + 2.5 = \pm 10.89$

$y = \pm 10.89 - 2.5 = 8.39 = y_o$

$M_{MAX} = (1965.4 \times 8.39) - 87.5(8.39)^2/2 - 17.5(8.39)^3/3$

$M_{MAX} = 9965\ ^{\#}FT$

(1.4D + 1.7L + 1.7H)

$M_U = 1.7(9.97^{KFT}) = 17.0^{KFT}$ AT 8.39' DN. FROM TOP OF WALL

$V_U = 1.7(3.14^{K}) = 5.4^{K}$ AT BOTTOM OF WALL

$h = 8"$:

$d = (8" - 3/4"\,CL - \#6/2) = 6.875$

$F = 12(6.875)^2/12000 = 0.0473$

$K_U = 17.0/.0473 = 360 \rightarrow \rho = .0073$

$A_S = \rho(12 \times 6.875) = 0.61\ in^2/FT$

$V_c = 2\sqrt{3000}\,(12 \times 6.875)/10^3 = 9.04^{K}$ ALW $> V_U = 5.4^{K}$ OK

2x4 SHEAR KEY WALL TO FTG $V_c = 2\sqrt{3000}(12 \times 3.5)/10^3 = 4.6^{K} < V_U = 5.4^{K}$

∴ BAL OF 0.8^{K} SHEAR FRICTION

MIN REINF w/GR60

$A_g = 12 \times 8 = 96\ in^2$

#5 & SMALLER: $A_H \geq .0020 A_g = 0.192\ in^2/FT$
$A_V \geq .0012 A_g = 0.1152\ in^2/FT$

#6 & LARGER: $A_H \geq .0025 A_g = 0.240\ in^2/FT$
$A_V \geq .0015 A_g = 0.144\ in^2/FT$

USE 8" THK CONC BASEMENT WALL
#8 VERT @ 12" o.c. INSIDE FACE & #4 VERT @ 18" oc SOIL FACE
#5 HORIZ @ 18" o.c. $A_S = 0.21\ in^2/FT. > 0.192\ in^2/FT.$

1600 EAST DESERT INN ROAD SUITE 106 | LAS VEGAS, NEVADA 89109-2594 (702) 731-6226

Lucia Collins 12-19-84.

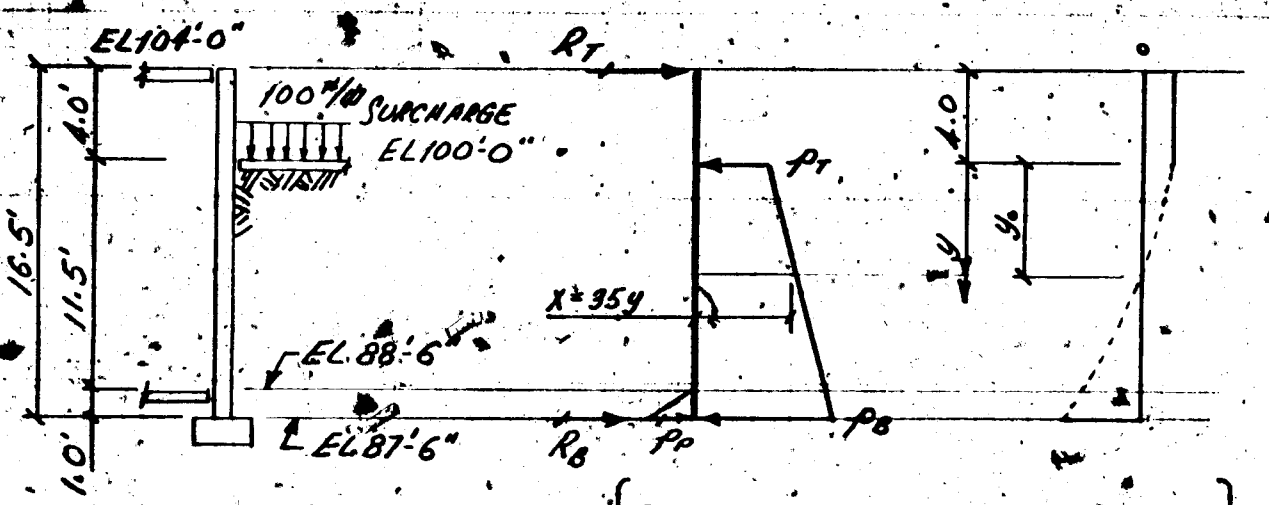
STRAUSS & LOFTFIELD
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CLIENT/ SHEET/ 8 OF 317
PROJECT/ PROJECT # 82017
DATE/ OCT '82
ENGINEER/ HS

BASEMENT WALLS continued

AT GRID (12):

COMPUTER FLR T.O.C. EL 88'-6"
AT GRID 12 T.O. FTG · EL 87'-6".



$\frac{100\#/\square}{100\#/FT^3} = 1.0'$ EQ. SOIL HT

@ Y=0 → y = y_o & M = MAX

$V = 853.2 - 35(y) - (35/2)(y^2) = 0$

$17.5y^2 + 35y = 853.2$

$y = \pm 7.05 - 1 = 6.05' = y_o$

$p_T = (35\#/FT^3)(1.0') = 35\#/\square \rightarrow H_1 = (p_T \times 1.0)(12.5) = 437.5$

$p_B = (\text{ do })(1.0 + 12.5') = 472.5\#/\square \rightarrow H_2 = (p_B - p_T)(1.0)(12.5/2) = 2734.4$

$p_P = (300\#/FT^3)(1.0') = 300\#/\square \rightarrow H_3 = (-p_P \times 1.0)(1.0/2) = -(150.0)$

$\Sigma H = 3021.9\#$

$R_T = \left[(H_1 \times 12.5/2) + (H_2 \times 12.5/3) + (H_3 \times 1.0/3)\right] / 16.5 = 853.2\#$

$R_B = (3021.9 - R_T) = 2168.7\#$

$M_{MAX} = 853.2(10.05') - (35 \times 6.05^2/2) - (640.5 \times 6.05/3) = 6643^{\#FT}$

$M_U = 1.7(6.65^{KFT}) = 11.3^{KFT}$

$d = \left[8 - 3/4\ CL - \frac{6/8}{2}\right] = 6.875$

$F = 12(6.875)^2/12000 = 0.0473$

$K_U = 11.3/.0473 = 239 \rightarrow \rho \geq .00469$

$A_S \geq \rho(12 \times 6.875) = 0.387\ IN^2/FT$

USE 8" THK CONC WALL #6 VERT @12" O.C. INSIDE & #4 VERT @18" O.C. SOIL FACE, #5 HORIZ @18" O.C.

WALL AT GRID (12)

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BSMT. WALL @ LINE (2)

BM. B20, SEE SHT. 47

$P_u = \frac{71.8^K \times 1.6}{7'} = 16.41^{KLF}$

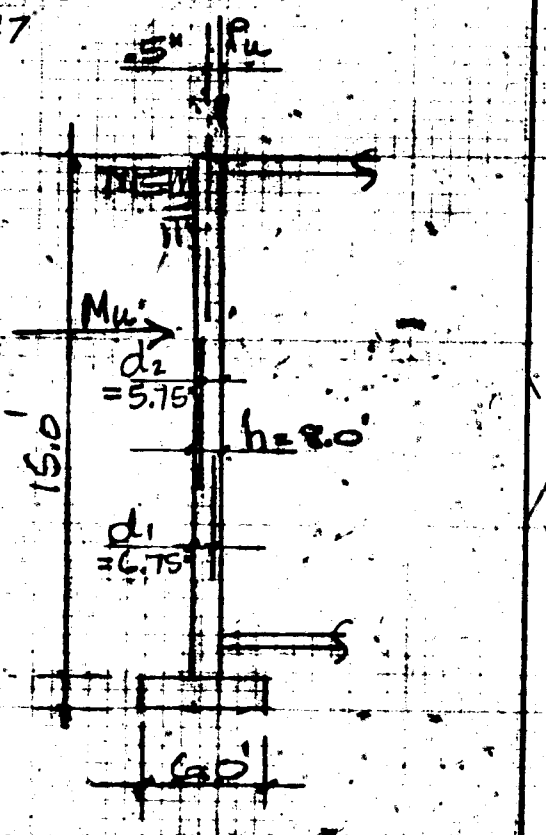
$M_u = 17.0^{IK/FT.}$ SEE SHT. 7.

EQUIV. UNIF. LOAD:

$q_u = \frac{8 \times 17.0}{(14.5)^2} = 0.647^{KLF}$

$d_1 = 8 - .75 - .5 = 6.75"$

$d_2 = 8 - 2 - .25 = 5.75"$



FOOTING DESIGN:

$P = \frac{71.8^K}{7'} + 15.0 \times .100 = 11.76^{KLF}$

USE FTG. 6'-0 x 1'-0

$S.D. = \frac{71.8}{7' \times 6'} + .15 = 1.86^{KSF}$

$W_u = 1.6(1.86 - .15) = 2.74^{KSF}$

$M_u = \frac{2.74(2.67)^2}{2} = 9.77^{IK/FT.}$ $F = \frac{(8.5)^2}{1000} = .0723$

$K_u = \frac{9.77}{.0723} = 135$ $A_s = .0026 \times 12 \times 8.5 = 0.27$

USE #5 @ 12" BOT.

$A_s = .31$

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WALL REINFORCING:

CASE I: LL+DL ON WALL @ 1" ACCIDENTAL e (TO LEFT) + ACTIVE EARTH PRESSURE.

INPUT: (HP-41-C PROGRAM)

$P_{u_1} = 16.41^K$

$P_{u_2} = 7.5' \times \frac{8"}{12"} \times .15 \times 1.4 = 1.05^K$

$h = 8.0"$

$d = 6.75"$

$e = 1.0"$

$q_u = .647^{K_{LF}}$

$K l_u = 174"$

$f'_c = 3.0^{KSI}$

$f_y = 60.0^{KSI}$

OUTPUT:

$A_s = 0.74$ (.77%)

$E_c = .0016 < .0020$

$\phi M_R = 244.82^{"K}$

$M_A = 241.37^{"K}$

USE #8@18" VERT.
ON BSMT. SIDE OF WALL
$A_s = 0.79$

CASE II: LL+DL ON WALL NO ACT. EARTH PRESS.

INPUT:

$P_{u_1} = 16.41^K$

$P_{u_2} = 1.05^K$

$h = 8.0"$

$d = 5.75"$

$e = .5"$

$q_u = 0$

$K l_u = 174"$

$f'_c = 3.0^{KSI}$

$f_y = 60.0^{KSI}$

OUTPUT:

$A_s = .01$ (.02%)

$E_c = .00086 < .002$

$\phi M_R = 63.10^{"K}$

$M_A = 31.31^{"K}$

USE #4@18 VERT.
ON EARTH SIDE OF WALL
$A_s = .13$

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BSMT. WALL @ LINE (A) (MAKE LINE (N) THE SAME)

BM. B24, SEE SHT. 49

$P_u = 34.2^K \times 1.6 = 54.7^K$

FOR FTG. DESIGN,

$P_u = \frac{54.7^K}{30.0'} = 1.82\ ^K/FT.$

FOR WALL DESIGN,

$\frac{54.7}{7'} = 7.81\ ^K/FT.$

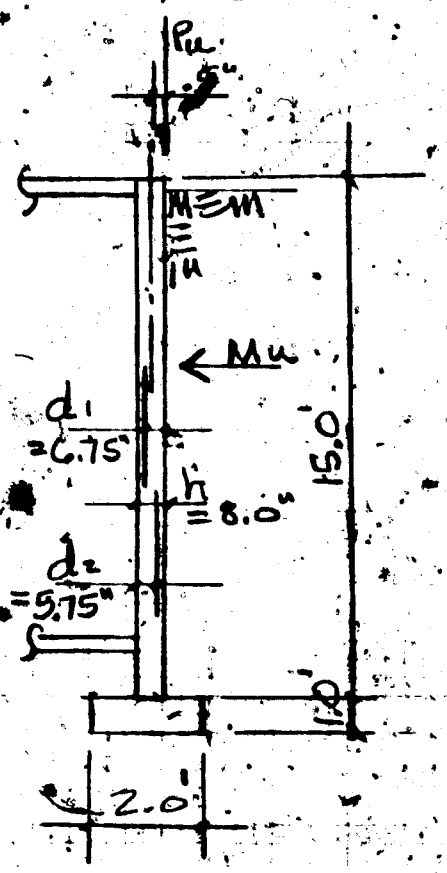
$M_u = 17.0^{IK}/FT.$ SEE SHT. 7.

EQUIV. UNIF. LOAD:

$q_u = \frac{8 \times 17.0}{(14.5)^2} = .647^{KLF}$

$d_1 = 8 - 3/4 - 1/2 = 6.75"$

$d_2 = 8 - 2 - 1/4 = 5.75"$



FOOTING DESIGN:

$P = \frac{34.2^K}{30'} + 15.0 \times .100 = 2.64^{KLF}$

USE FTG. 2'-0 x 1'-0

$S.B. = \frac{2.64}{2} + .15 = 1.47\ KSF$

USE #4 @ 18" BOT.

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WALL REINFORCING:

CASE I:

LL+DL ON WALL @ 1" ACCIDENTAL ℄ (TO THE RIGHT)
+ ACTIVE EARTH PRESSURE

INPUT: (HP-41-C PROGRAM)

$P_{u_1} = 7.81^K$
$P_{u_2} = 1.05^K$
$h = 8.0"$
$d = 6.75"$
$e = 1.0"$
$q_u = .647^{K/F}$
$kl_u = 174"$
$f'_c = 8.0^{ksi}$
$f_y = 60.0^{ksi}$

OUTPUT:

$A_s = .68$ (.71%)
$E_c = .0013 < .0020$
$\phi M_R = 226.26^{"K}$
$M_A = 221.08^{"K}$

USE #8@12" VERT.
ON BSMT. SIDE OF WALL

USE #4@18 VERT
ON DIRT SIDE OF WALL

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BSMT. WALL ON LINE (12)

$P_{u(LL)} = 1.4 \times 12.5 = 17.5$

$P_{u(DL)} = 1.7 \times 9.8 = 16.7^K$

34.2^K (SEE BMS BM SHT. 4)

$P_{u(LL+DL)} = \frac{34.2^K}{7'} = 4.89^{KLF}$

$P_{u(DL)} = \frac{16.7^K}{7'} = 2.39^{KLF}$

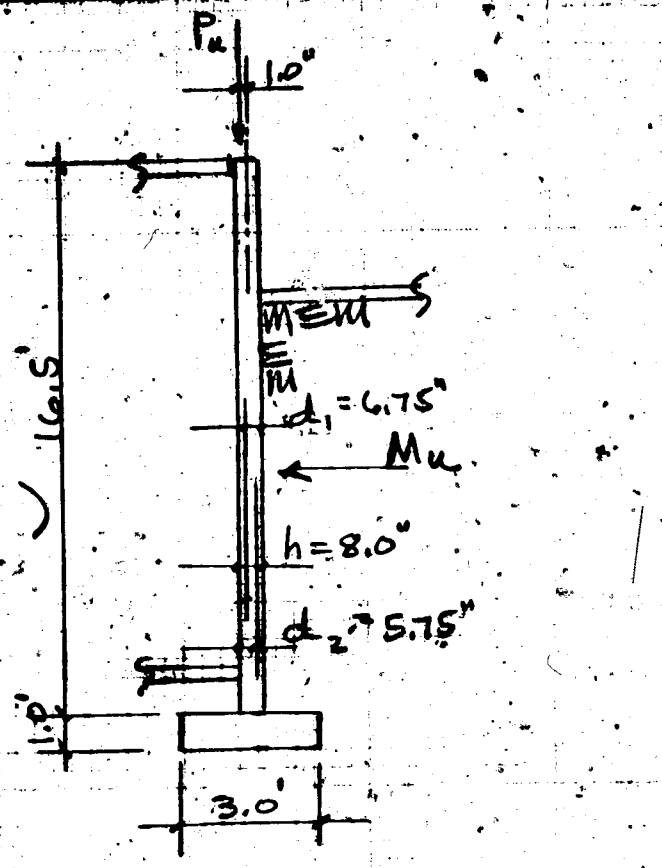
$M_u = 11.3^{IK}/FT.$ (SEE SHT. 8)

EQUIV. UNIF. LOAD:

$q_a = \frac{8 * 11.3}{(16.0)^2} = .353^{KLF}$

$d_1 = 8 - .75 - .5 = 6.75"$

$d_2 = 8 - 2 - .25 = 5.75"$



FOOTING DESIGN:

$P = \frac{12.5^{K\,LL} + 9.8^{K\,DL}}{7'} + 16.5^{WALL} \times .100 = 4.84^{KLF}$

USE FTG. = 3'-0 x 1'-0

$SB_1 = \frac{4.84}{3.0} + .15 = 1.76^{KSF}$

$W_u = 1.6(1.76 - .15) = 2.58^{KSF}$

$M_u = \frac{2.58(1.17)^2}{2} = 1.77^{IK}/FT.$ $\quad F = \frac{(8.5)^2}{1000} = .0723$

$K_u = \frac{1.77}{.0723} = 24$ $\quad A_s = .001 \times 12 \times 8.5 = 0.10\ IN^2/FT.$

USE #4 @ 12" BOT.

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WALL REINFORCING:

CASE I — LL + DL ON WALL + ACT. EARTH PRESSURE

INPUT: (HP-41-C PROGRAM)

$P_{u_1} = 4.89^K$

$P_{u_2} = 8' \times \frac{8}{12} \times .15 \times 1.4 = 1.12^K$

$h = 8.0"$

$d = 6.75"$

$e = -1.0"$

$q_u = .353^{KLF}$

$Kl_u = 16' \times 12 = 192"$

$f'_c = 3.0^{KSI}$

$f_y = 60.0^{KSI}$

OUTPUT:

$A_s = .41$ (.43%)

$E_C = .00095 < .0020$

$\phi M_R = 146.56^{11K}$

$M_A = 142.46^{11K}$

CASE II — DL ON WALL + ACT. EARTH PRESSURE

INPUT:

$P_{u_1} = 2.39^K$

$P_{u_2} = 1.12^K$

$h = 8.0"$

$d = 6.75"$

$e = -1.0"$

$q_u = .353^{KLF}$

$Kl_u = 192"$

$f'_c = 3.0^{KSI}$

$f_y = 60.0^{KSI}$

OUTPUT:

$A_s = .41$ (.43%)

$E_C = .00089 < .0020$

$\phi M_R = 143.07^{11K}$

$M_A = 139.3^{11K}$

USE #6 @ 12" VERT.

ON BSMT. SIDE OF WALL

$A_s = .44$

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CASE III — LL+DL ON WALL NO ACT. EARTH PRESS.

INPUT:

$P_{u_1} = 4.89^K$
$P_{u_2} = 1.12^K$
$h = 8.0"$
$d = 5.75"$
$e = 1.0"$
$q_u = 0$
$K\ell_u = 192"$
$f'_c = 3.0^{KSI}$
$f_y = 60.0^{KSI}$

OUTPUT:

$A_s = .01$ (.01%)
$E_c = .0004 < .0020$
$\phi M_R = 24.48^{"K}$
$M_A = 11.54^{"K}$

USE #4 @ 18" VERT. ON EARTH SIDE OF WALL

$A_s = .13$

CASE IV — LL+DL ON WALL @ 1" ACCIDENTAL e (TO RIGHT) + ACTIVE EARTH PRESS.

INPUT:

$P_{u_1} = 4.89^K$
$P_{u_2} = 1.12^K$
$h = 8.0"$
$d = 5.75"$
$e = 1.0"$
$q_u = .353^{KLF}$
$K\ell_u = 192"$
$f'_c = 3.0^{KSI}$
$f_y = 60.0^{KSI}$

OUTPUT:

$A_s = 0.43$ (.44%)
$E_c = .0097 < .002$
$\phi M_R = 150.92$
$M_A = 147.41$

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BSMT WALL @ STAIR OPGS.

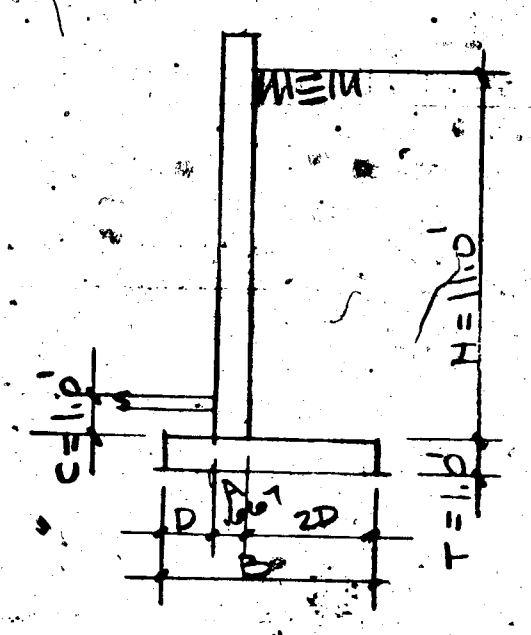
HP-41-C PROGRAM:

INPUT:

SB = 2000 PSF
AP = 35 PCF
PP = 350 PCF
W = 100 PCF
SURCH = 200 PSF
WTST = 100 PSF
CF = 0.4
A = .667'
C = 1.0'
D = 2.0' (EST.)
H = 11.0'
T = 1.0'

OUTPUT:

P_1 = 1949 PSF
P_2 = 307 PSF
B = 7.67'
D = 2.33'
R = 0.00'
SF = 2.66



M_1 = 20399 1#/FT
M_2 = 9618.
M_3 = 3450
M_4 = 7636
M_5 = 12994
M_6 = 0
V_1 = 4909
V_2 = 4538

STEM WALL REINF:

M_u = 20.4 1K/FT (M1)

$d = 8 - 2 - \frac{3}{8} = 5.63"$

$F = \frac{(5.63)^2}{1000} = .0316$

$K_u = \frac{20.4}{.0316} = 645$, $A_s = .0144 \times 12 \times 5.63 = 0.97$

USE #7@6" IN O.F. UP TO 3'-0" ABOVE FTG.

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STEMWALL REINF., CONT.

$M_u = 9.6$ IK/FT. (M_2) $\quad F = .0316$

$K_u = \frac{9.6}{.0316} = 304$, $A_s = .0061 \times 12 \times 5.6\tfrac{3}{4} = .41$

USE #6@12" IN O.F. ABOVE 3'-0

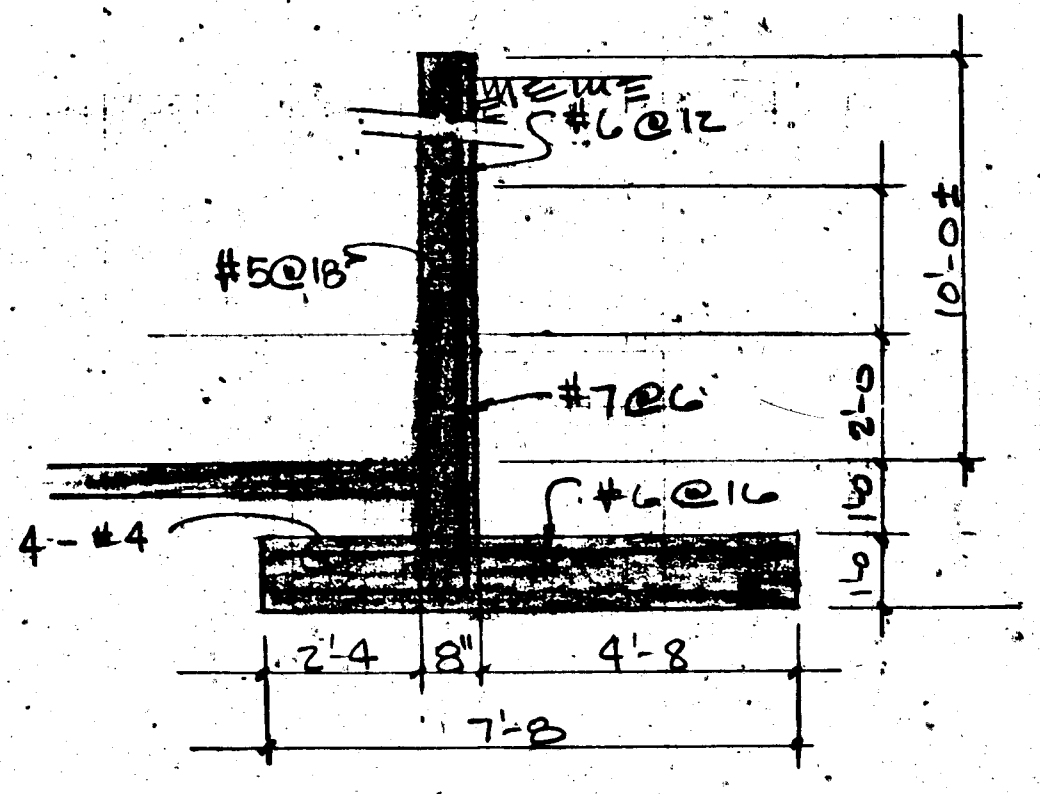
FTG. REINF:

$M_u = 13.0$ IK/FT. (M_5) $\quad d = 12 - 2 - \tfrac{3}{8} = 9.63"$

$F = \frac{(9.63)^2}{1000} = .0926 \quad K_u = \frac{13.0}{.0926} = 140$

$A_s = .0028 \times 12 \times 9.63 = 0.32$

USE #6@16" TOP



3'-6"

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CONCRETE PIERS /

$f_c = 3000$ $f_y = 60{,}000$ * all Revised

PIER	COL. LOAD	P_u	COL. & BASE PL SIZE *	PIER SIZE
A-10	96.5	154.4	H W10x33, 1'-2x1'-4	2'-0x2'-0
A-12	59.6	95.4	H W8x24, 8x10	" x "
B-12	213.7	341.9	I W10x45, 1'-2x1'-4	" x "
F-12	324.0	518.4	I W10x60, 1'-4x1'-8	" x "
J-12	237.1	379.4	I W10x49, 1'-4x1'-8	" x "
N-2	163.1	261.0	H W8x40, 1'-0x1'-2	" x "
N-12	231.5	370.4	I W10x45, 1'-2x1'-4	" x "

USE SQUARE TIED COLUMNS 24" x 24"

MAX: $\ell_u = 16.5'$, $K = 1.0$, $r = .30 \times 24 = 7.2"$

$$\frac{K\ell_u}{r} = \frac{16.5 \times 12}{7.2} = 27.5 > 34 - 12\frac{M_1}{M_2} = 22$$

MAX. $M_1 = M_2 = .70 \times 24" \times 518.4^K = 1244.2^{"K}$

$$I_g = \frac{24(24)^3}{12} = 27648, \quad E_c = 3.2 \times 10^3 \quad \beta_d = \frac{1.7}{3.1} = .55$$

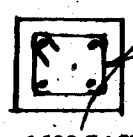
$$EI = \frac{3.2 \times 10^3 \times 27648/2.5}{1 + .55} = 22.83 \times 10^6$$

$$P_c = \frac{\pi^2 \times 22.83 \times 10^6}{(16.5 \times 12)^2} = 827{,}600^K, \quad C_m = 1.0$$

$$\delta = \frac{1.0}{1 - (518.4/.70 \times 827{,}600)} = 1.0009$$

$e = 0.1t$ USE 4-#11 VERTS.

GOOD FOR 1301^K @ $f'_c = 4.0$ PER 1978 CRSI, Pg. 3-23



#3@18" MIDDLE OF COL.
#3@9" AT ENDS OF COL. FOR 3'-0"
ADD 3-#3 ⊡ IN TOP 5" OF COL.

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CONCRETE PIERS continued

RECTANGULAR 17" x 24"

$P_U = 519^K$ & $L_U = 16.5' = 198"$

$e_{min} = 0.1(17") = 1.7"$

$M_2 = M_U = P_U(e) = 519^K(1.7"/12) = 74.0^{K'FT}$

$M_c = \delta M_2 = 1.74\ (74.0) = 129^{K'FT}$

WHERE: $\delta = \dfrac{C_m}{1 - \dfrac{P_U}{\phi P_c}} = \dfrac{1}{1 - \dfrac{519}{0.7(1.748 \times 10^3)}} = 1.74$

& $P_c = \dfrac{\pi^2 EI}{(kl_u)^2} = \dfrac{\pi^2(6945 \times 10^3)}{(1 \times 198)^2} = 1.748 \times 10^3$

& $EI = \dfrac{E_c I_g / 2.5}{1 + \beta_d} = \dfrac{(3.3 \times 10^3)(24 \times 17^3/12)}{2.5(1 + 0.45)} = 6945 \times 10^3$

$0.01(17 \times 25) = 4.08 IN^2$ MIN

TRY 4-#10 $\rightarrow A_s = 5.08 IN^2$

$\gamma = 0.65$

$\rho_g = \dfrac{4(1.27)}{17 \times 24} = .012$

$\dfrac{\delta(e)}{h} = \dfrac{1.74(1.7)}{17} = 0.174$

$\dfrac{P_u}{A_g} = 1.42 KSI$

USE: 17"x24" CONC PIER w/ 4-#10. #3 TIES

$P_{u\ ACCEPTABLE} = 1.42(17 \times 24) = 579^K > 519^K$ OK

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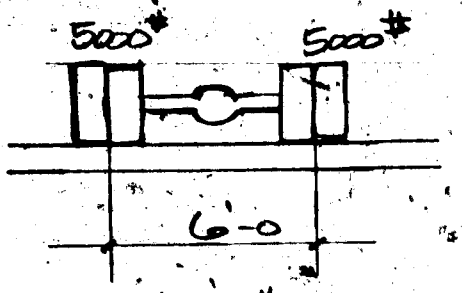
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DATE 11/1/82
REVIEW JRL

TUNNEL

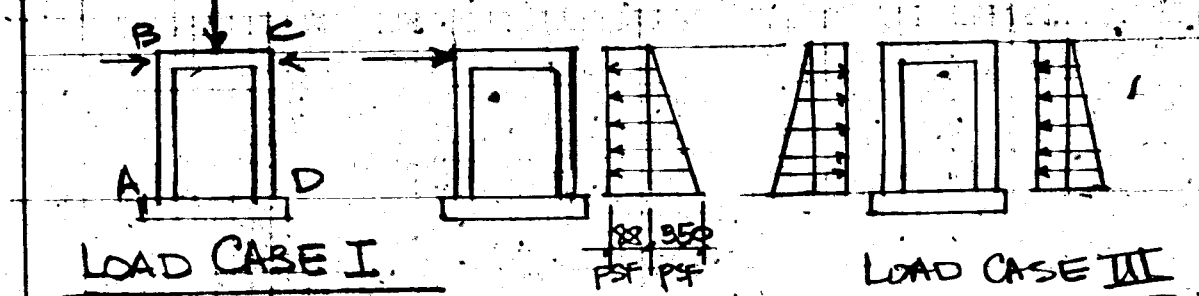
SAY MAX. AXLE LOAD = 10,000#
(PICK-UP TRUCK OR FORK LIFT)



ASSUME A 3'-0" WIDE SECTION OF SLAB TAKES THE LOAD FROM EACH WHEEL.

$P = \frac{5.0^{K}}{3'} = 1.67^{K}/FT.$

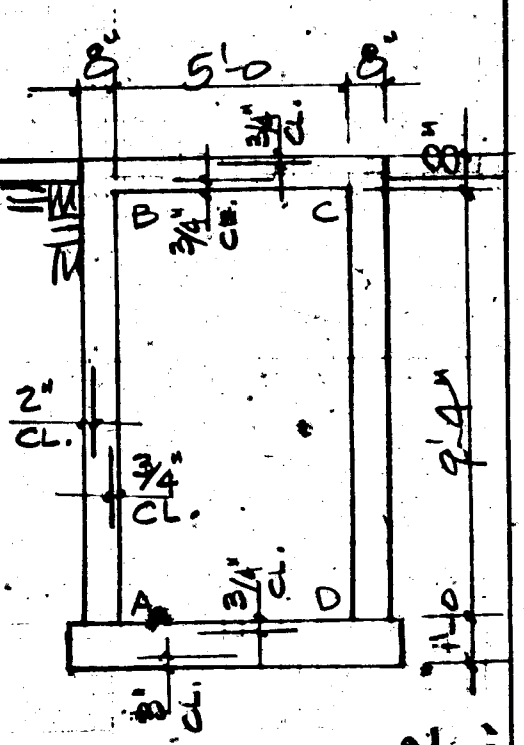
UNIF. LOAD ON TOP SLAB = 250 PSF
ACT. EARTH PRESS. = 35 PCF
SURCH. = 250 PSF = 2.5' OF EARTH.



LOAD CASE I.

LOAD CASE II

LOAD CASE III



See Sht #24 for Redesign Walls for Surcharge from Eqpt.

NOTE ON DWG:
BACKFILL BOTH SIDES OF TUNNEL SIMULTANEOUSLY.

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TOP SLAB B-C

$P_u = 1.67^K \times 1.7 = 2.84^K/FT.$

MAX. POS. $M_u < \frac{2.84^K \times 5.67'}{4} = 4.02^{1K}/FT.$

$d = 8" - 3/4" - 3/8 = 6.88"$ $F = \frac{(6.88)^2}{1000} = .0473$

$K_u = \frac{4.02}{.0473} = 85$ $A_s = .0014 \times 12 \times 6.88 = 0.13$

USE #5 @ 16" BOT.
$A_s = 0.23$

MAX. NEG. $M_u < \frac{2.84^K \times 5.67'}{8} = 2.01^{1K}/FT.$

SEE MAX. NEG. MOM. IN WALLS @ TOP

SIDEWALLS A-B & C-D

MAX. POS. $M_u < 1.7\left[\frac{.088(10)^2}{8} + \frac{.350(10)^2}{15.6}\right] = 5.68^{1K}/FT.$

$d = 8" - 3/4" - 3/8 = 6.88"$ $F = \frac{(6.88)^2}{1000} = .0473$

$K_u = \frac{5.68}{.0473} = 120$ $A_s = .0023 \times 12 \times 6.88 = 0.19$

USE #5 @ 12, I.F.
$A_s = .31$

MAX. NEG. M_u @ TOP $< 1.7\left[\frac{.088(10)^2}{12} + \frac{1}{15} \times .35 \times \frac{10'}{2} \times 10\right]$
$= 3.23^{1K}/FT.$

$d = 8 - 2" - 3/8" = 5.62"$ $F = \frac{(5.62)^2}{1000} = .0316$

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$K_u = \frac{3.23}{.0316} = 102$ $A_s = .0020 \times 12 \times 5.62 = 0.13$

USE #5 @ 16"
$A_s = 0.23$

MAX. NEG. M_u @ BOT. $< 1.7\left[\frac{.088(10)^2}{12} + \frac{1}{16} \times .35 \times \frac{10'}{2} \times 10'\right]$

$= 4.22$ K/FT.

$K_u = 102 \times \frac{4.22}{3.23} = 133$, $A_s = .0026 \times 12 \times 5.62 = 0.18$

USE #5 @ 16"
$A_s = 0.23$

FOOTING SLAB:

D.L. WALLS $= 9.33' \times .10$ KSF $= .93$ K/FT. EA.
D.L. TOP SLAB $= 6.33' \times .10$ KSF $= .63$ K/FT.
LL TOP SLAB $= 1.67$ K/FT.

$W_u = 1.4(2 \times .93 + .63) + 1.7 \times 1.67 = 6.75$ K/FT.

MAX. POS. $M_u < \frac{6.75^K \times 5.67'}{8} = 4.78$ K/FT.

$d = 12 - 1\frac{1}{2} - \frac{3}{8} = 10.12"$ $F = \frac{(10.12)^2}{1000} = .102$

$K_u = \frac{4.78}{.102} = 47$ $A_s = .0015 \times 12 \times 10.12 = 0.18$

USE #5 @ 16"
$A_s = .23$

MAX. NEG. M_u

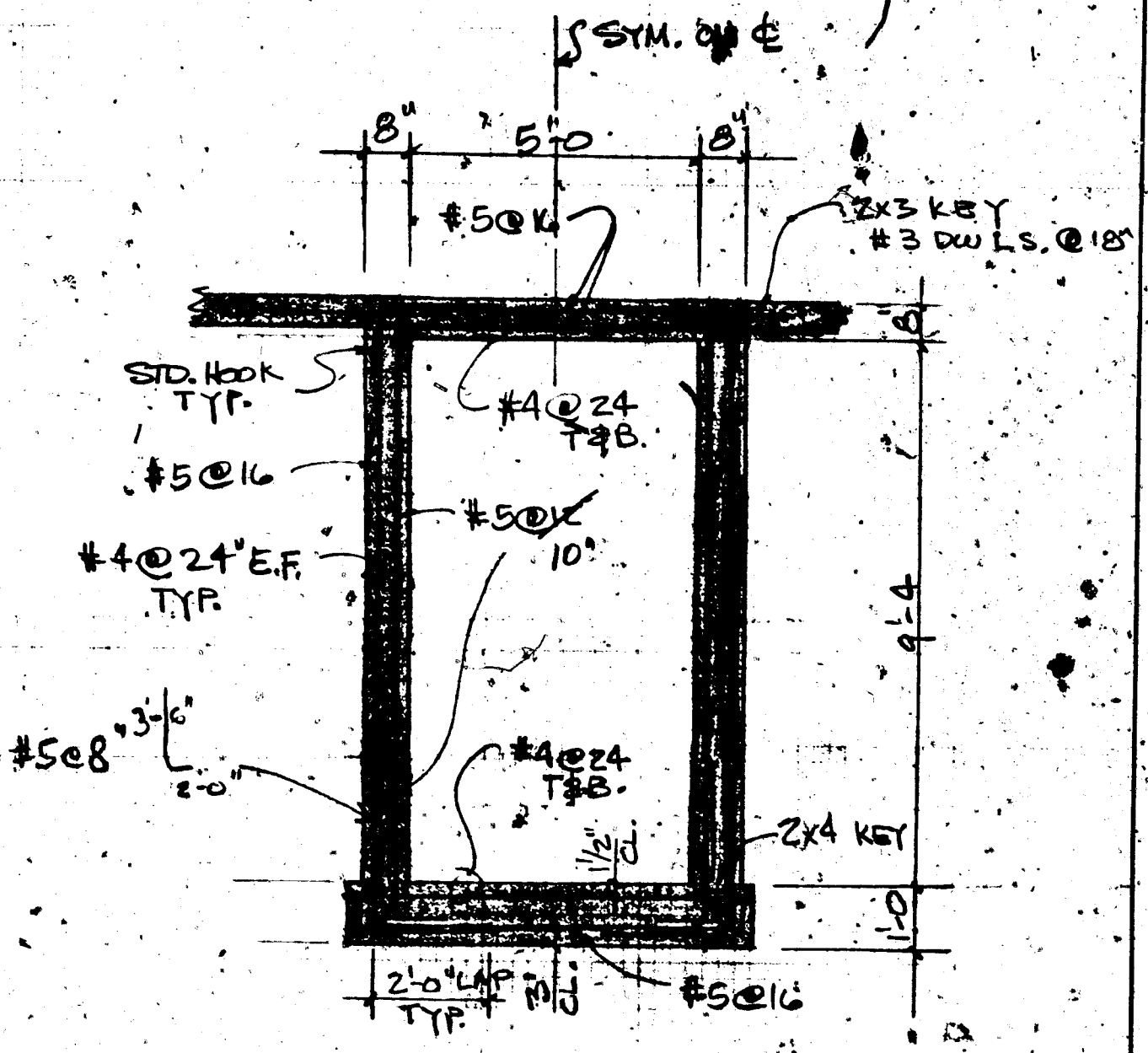
SEE MAX. NEG. M_u BOT. OF WALLS

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Typ. Section thru Tunnel

3/8" = 1'-0

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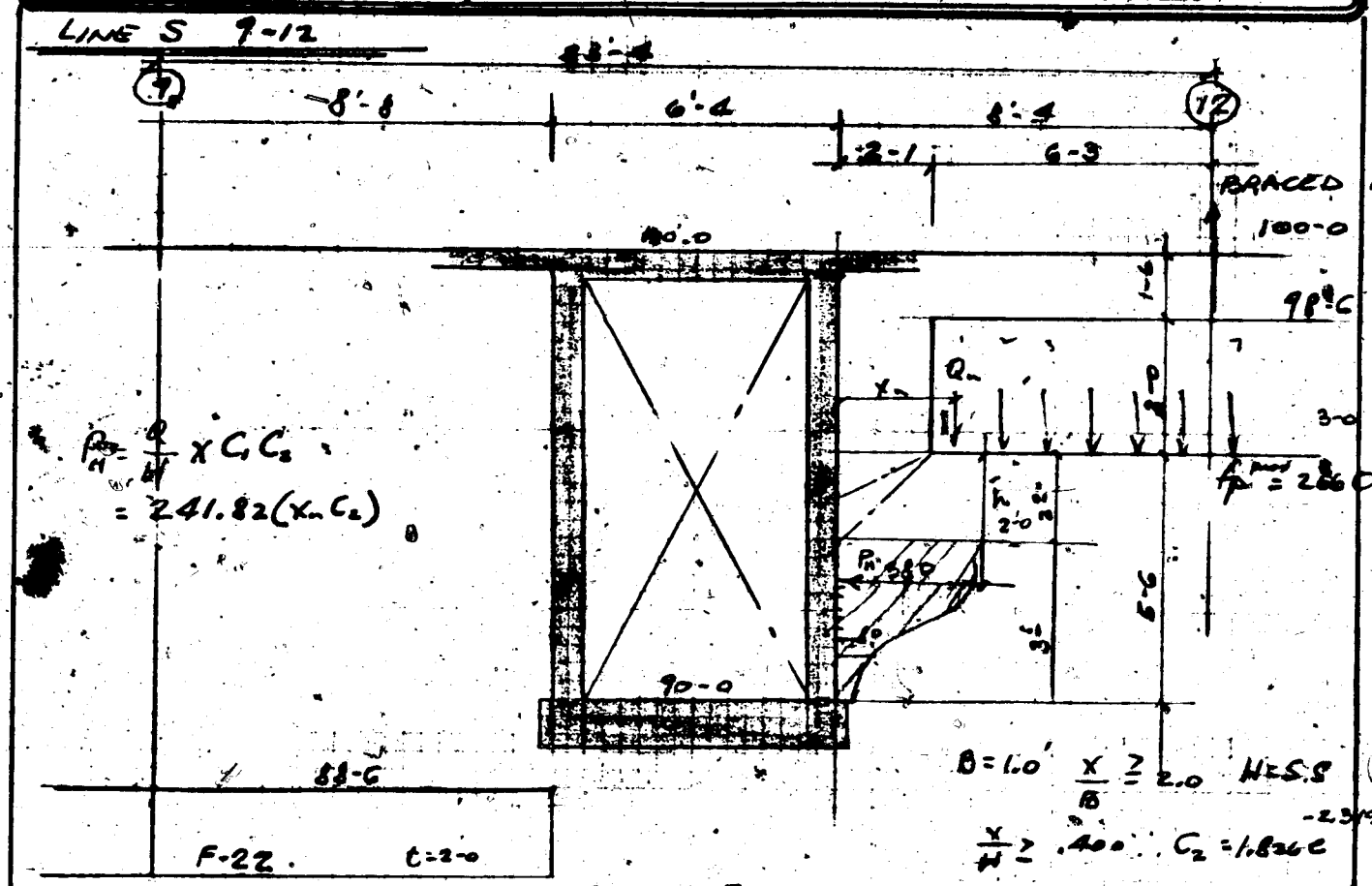
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ENGINEER/ [illegible]

LINE S 9-12



$P_n = \frac{Q}{H} \times C_1 C_2$

$= 241.82 (x_n C_2)$

$B = 1.0' \quad \frac{X}{B} \geq 2.0 \quad$ NES.S

$\frac{X}{H} \geq .400 \therefore C_2 = 1.826$

	x_n	x/H	C_{2n}	P_n	n	$\bar{h}$
X_1	2.5	.455	.628	379.7	.486	2.573
X_2	3.5	.636	.418	353.6	.589	2.962
X_3	4.5	.818	.273	297.1	.592	3.256
X_4	5.5	1.000	.180	238.9	.634	3.487
X_5	6.5	1.182	.118	185.1	.669	3.681
X_6	7.5	1.364	.077	140.1	.699	3.847
X_7	8.5	1.545	.051	104.2	.726	3.992
X_8	9.5	1.727	.033	76.4	.749	4.121

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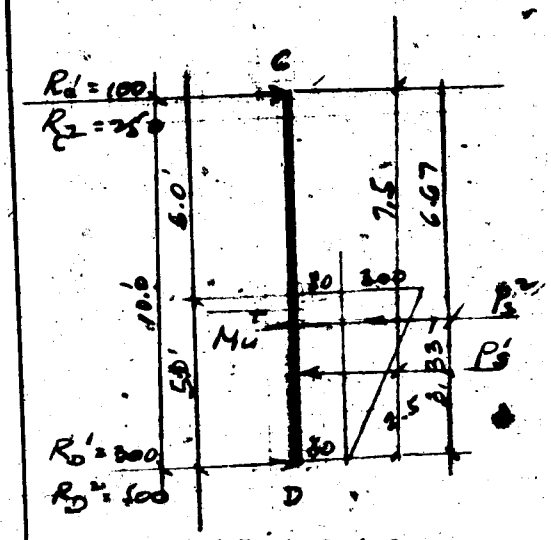
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TUNNEL NEAR LINE (5) (12) Side

1.0' Strip



$P_3' = 80(5.0) = 400^{\#}$

$P_3'' = 200(\tfrac{5.0}{2}) \cdot \tfrac{5}{3} = 750$

$M_u^C = 1.7(750)\,6.67(3.33)^2 \div 10^2 = 943^{'\#}$
(Top) $+ 1.7(400)\,7.5(2.5)^2 \div 100 = 319$
$1262^{'\#}$

$M_u^D = 1.7(750)(6.67)^2 3.33 \div 100 = 1723$
(Bott) $+ 1.7(400)(7.5)^2 2.5 \div 100 = 952$
$2669^{'\#}$

$R_1 = 400 \times 2.5 \div 10 = 100$

$R_2 = 750 \times 3.33 \div 10 = 250^{\#}$

$M_u^+ = 1.7(100+250)6.67 - M_u^C$
$= 3968.7 - 1262.0 = 2707^{'\#}$

$A_s = \rho bd$

			F	K_u	P	A_s
Σ Mom.	Top	$M_u = 1.26 + 5.23 = 4.49^{1k}$	.0316	142.09	.0027	.22
					#5@16	
	Bott.	$M_u = 2.69 + 4.22 = 6.91^{1k}$	.0316	218.67	.0049	.33
					#5@10	
		$M_u^+ = 2.71 + 5.68 = 8.39^{1k}$	.0473	177.38	.0033	.23
					#5@12	

ΣV_u Top $= 1.7(100+250) + 1.7\left[\frac{880}{2} + \left(\frac{350 \times 10}{2} \times \frac{1}{3}\right)\right]$
$= 595 + 1741 = 2335^{\#}$

Bott $= 1.7(300+500) + 1.7\left[\frac{880}{2} + \left(\frac{350 \times 10}{2} \times \frac{2}{3}\right)\right]$
$= 1360 + 2732 = 4092^{\#}$

$v_u = \frac{4092}{12(.85)6.88} = 58.3\ psi < 2\sqrt{f'_c} = 109.5$

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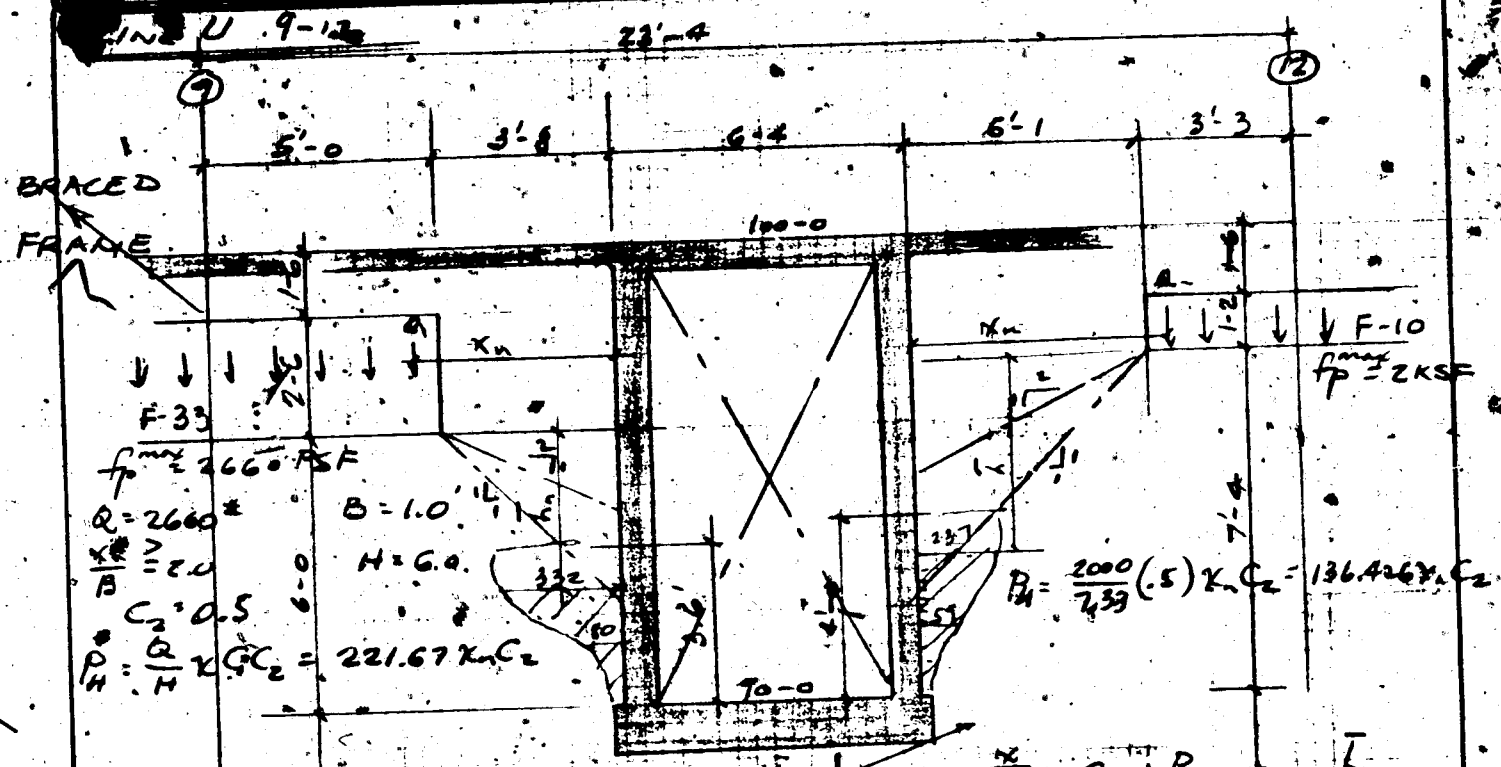
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LINE U .9-12



	x_n	$\frac{x}{H}$	C_2	P_n	n	$\bar{L}$
x_1	4.17	.70	.36	332.7	.559	3.85
x_2	5.17	.86	.25	286.6	.602	3.61
x_3	6.17	1.03	.17	232.5	.640	3.84
x_4	7.17	1.20	.113	179.0	.672	4.04
x_5	8.17	1.36	.078	141.0	.679	4.19
x_6	9.17	1.528	.053	107.3	.723	4.34
x_7	10.17	1.695	.036	80.1	.745	4.47
x_8	11.583	1.580	.047	73.9	.731	5.36
	12.583	1.717	.034	58.5	.748	5.48
	5.583	.762	.318	287.6	.527	4.227
	6.583	.898	.228	204.8	.611	4.481
	7.583	1.034	.166	174.8	.641	4.700
	8.583	1.171	.121	141.5	.667	4.89
	9.583	1.307	.088	115.9	.690	5.06
	10.583	1.444	.064	92.6	.712	5.22

$C_2 > 0.4$ $C_2 = 1.826 e^{-2.519(\frac{x}{H})}$

and $n = .634 + .211 \ln(\frac{x}{H})$

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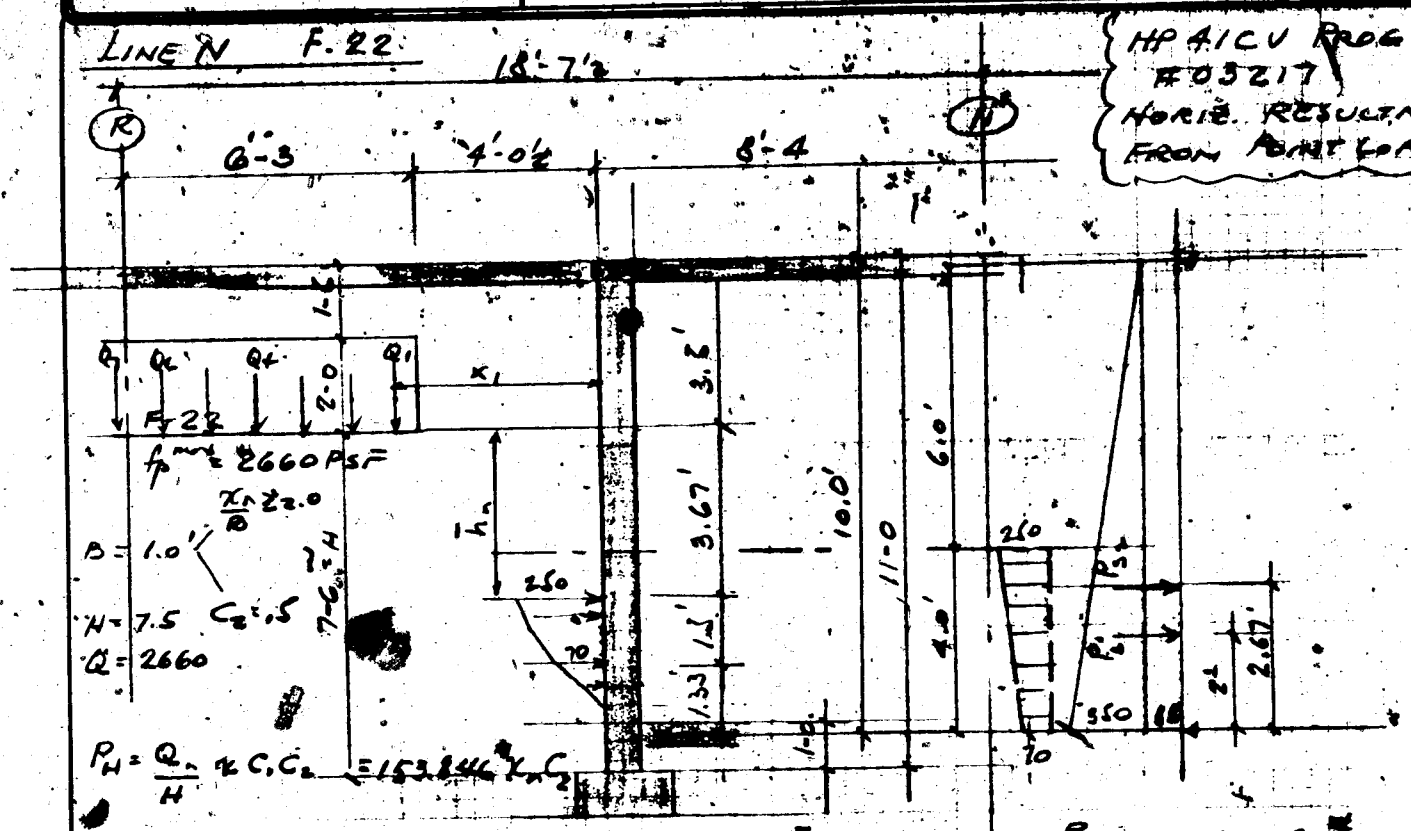
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Basement Walls
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FTG SURCHARGE
ENGINEER/

LINE N F.22

HP 41CV PROG
#03217
HORIZ. RESULTANT
FROM POINT LOADS



$P_H = \frac{Q_n}{H} \times C_1 C_2 = 153.846 \times C_2$

	x_n	x_n/H	C_2	P_{H_n}	n	$\bar{h}_n$
x_1	4.5	.692	.383	251.3	.56	8.64'
x_2	5.5	.846	.257	217.4	.610	9.90
x_3	6.5	1.000	.180	180.0	.634	4.12
x_4	7.5	1.154	.126	143.3	.664	4.32
x_5	8.5	1.308	.088	115.0	.691	4.49
x_6	9.5	1.462	.062	90.6	.714	4.64
x_7	10.5	1.615	.043	69.5	.735	4.78

$C_2 = 2.319(\frac{x}{H})$

$> 0.4 \therefore C_2 = 1.826 \frac{x_n}{H}$

and $n = 0.634 + .211 \ln(\frac{x}{H})$

$\bar{h} = H_n$

$P_5' = 70 \times 4 = 280^{\#}$

$P_6^2 = 180 \times 4 \times .5 = 360^{\#}$

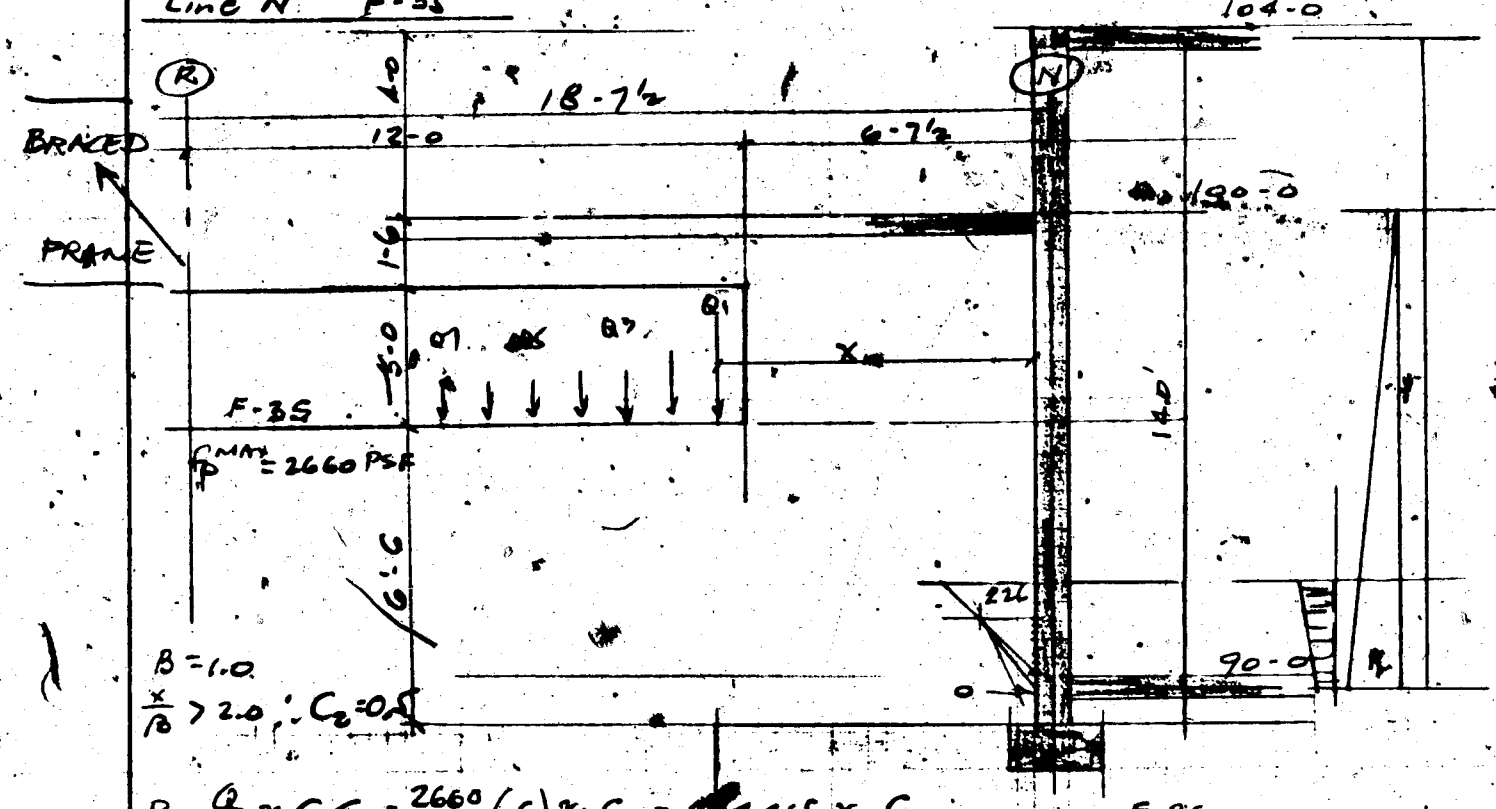
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Basement Walls
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Adjacent Ftg. - Surcharge
ENGINEER/ JM

Line N F-35



$P_H = \frac{Q}{H} \times C_1 C_2 = \frac{2660}{6.5}(.5) X_n C_2 = 204.615\, X_n C_2$

	X_n	X/H	C_2	P_H	n	$\bar{h}_n$
X_1	6.75	1.04	.164	226	.642	4.2
X_2	7.75	1.19	.116	184	.671	4.4
X_3	8.75	1.35	.080	143	.697	4.53
X_4	9.75	1.50	.056	118	.719	4.67
X_5	10.75	1.654	.039	86	.740	4.81
X_6	11.75	1.808	.028	66	.759	4.93
X_7	12.75	1.962	.019	50	.776	5.05
X_8	13.75	2.115	.014	38	.792	5.15

$C_2 = 1.826\, e^{-2.319(\frac{X}{H})}$

$n = .634 + .211 \ln(\frac{X}{H})$

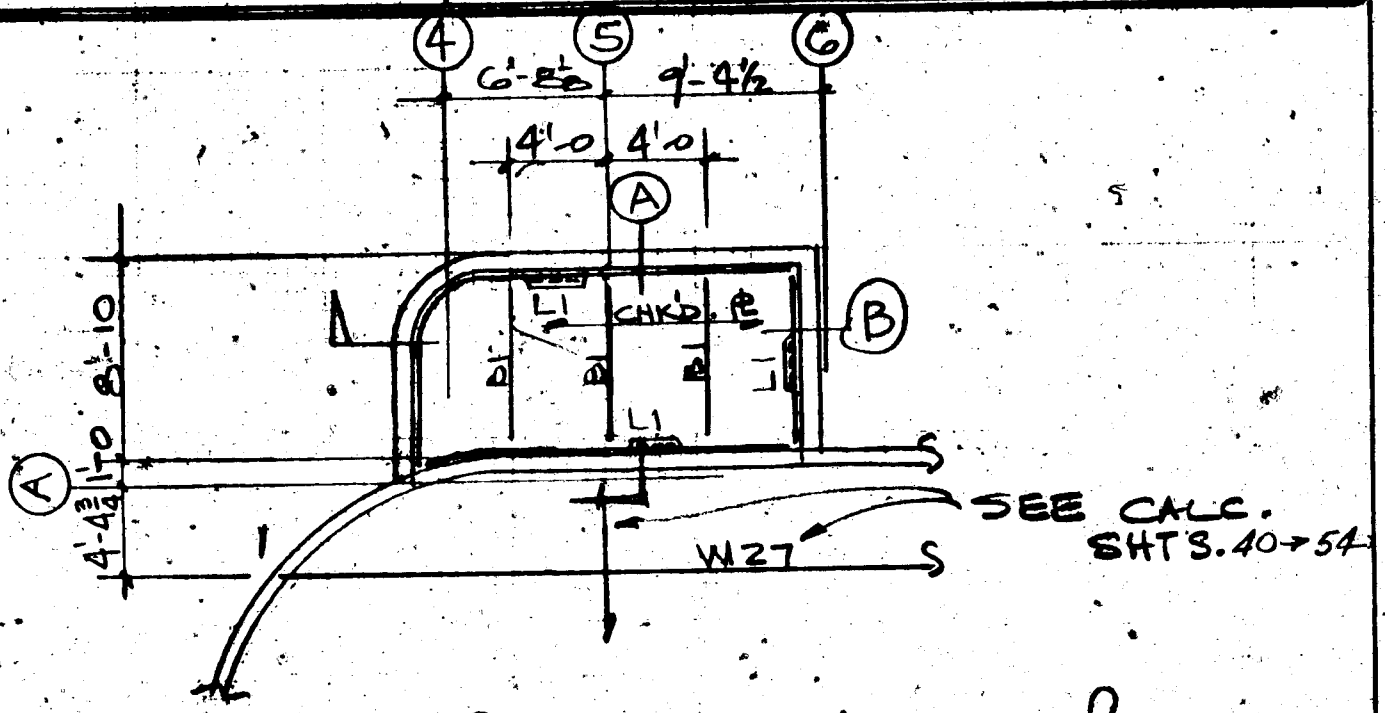
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GENERATOR ACCESS ROOM

FRAMING PLAN

1/8" = 1'-0

CHK'D. PL COVER:

LL = 250 PSF SIMPLE SPAN = 4'-0 DL = 20 PSF ±

$M = \frac{270(4)^2}{8} = 540$ 1#/FT. $S_R = \frac{540 \times 12}{20000} = 0.324$

USE 1/2" CHK'D PL COVER $S = \frac{12(.5)^2}{6} = .500$

$f_b = \frac{540 \times 12}{.500} = 12960$ PSI

APPROX. WT. OF EA. PIECE OF PL = 4' x 8' x 21 = 672#

$\Delta = \frac{.54(4)^2}{80.6 \times .50 \times .50} = 0.43"$ OK

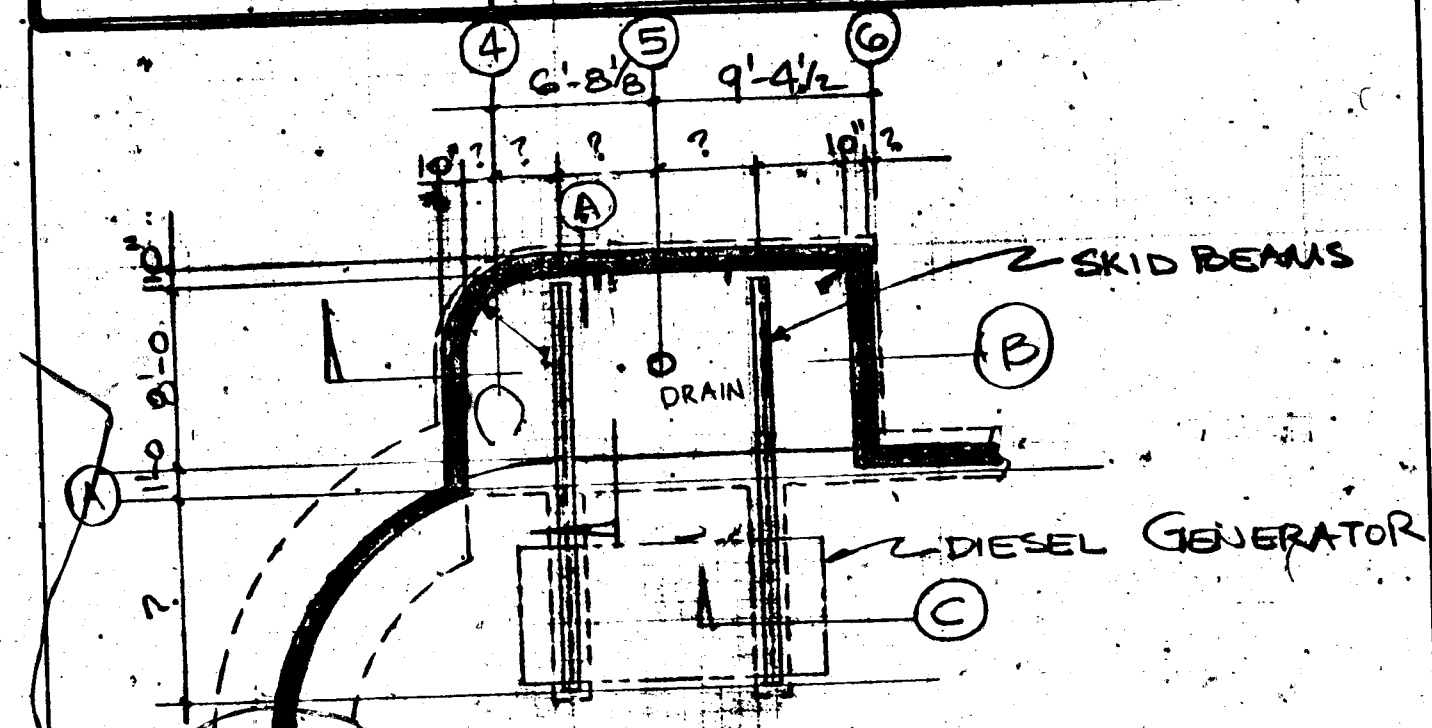
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GENERATOR ACCESS ROOM
FDN. PLAN
1/8" = 1'-0"

SKID BEAMS

WT. OF GEN. = 15.5K
ASSUMED MAX. LOAD AT EA. SUPPORT = $\frac{15.5}{4} \times 1.5 = 5.8^K$
USE A FTG. 1'-0" WIDE, ASSUME 2000 PSF BEARING,
MAX. BENDING IN BEAM < $\frac{2.0(1.45)}{2} = 2.1^K$
USE W10 X 22

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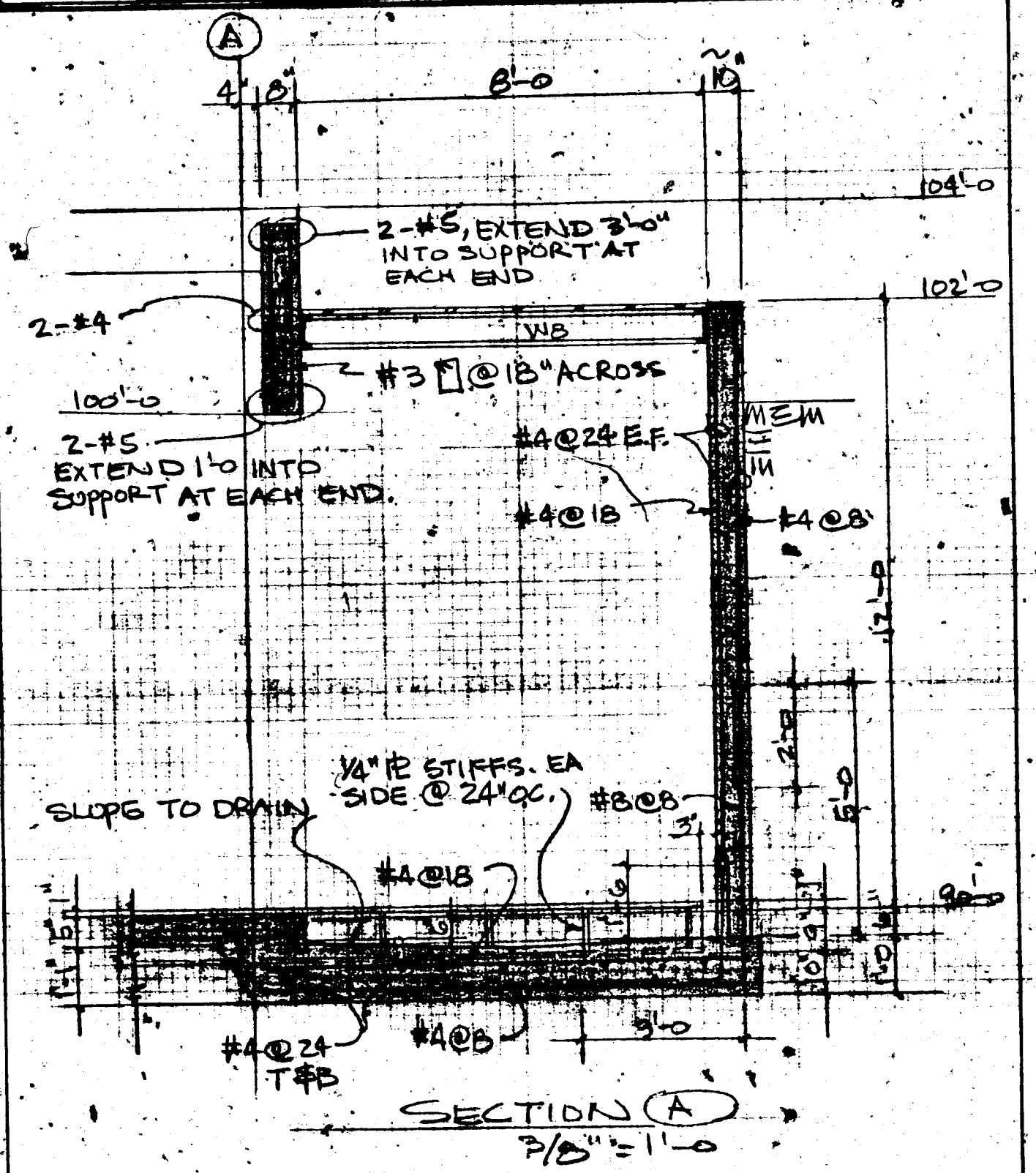
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SECTION (A)
3/8" = 1'-0

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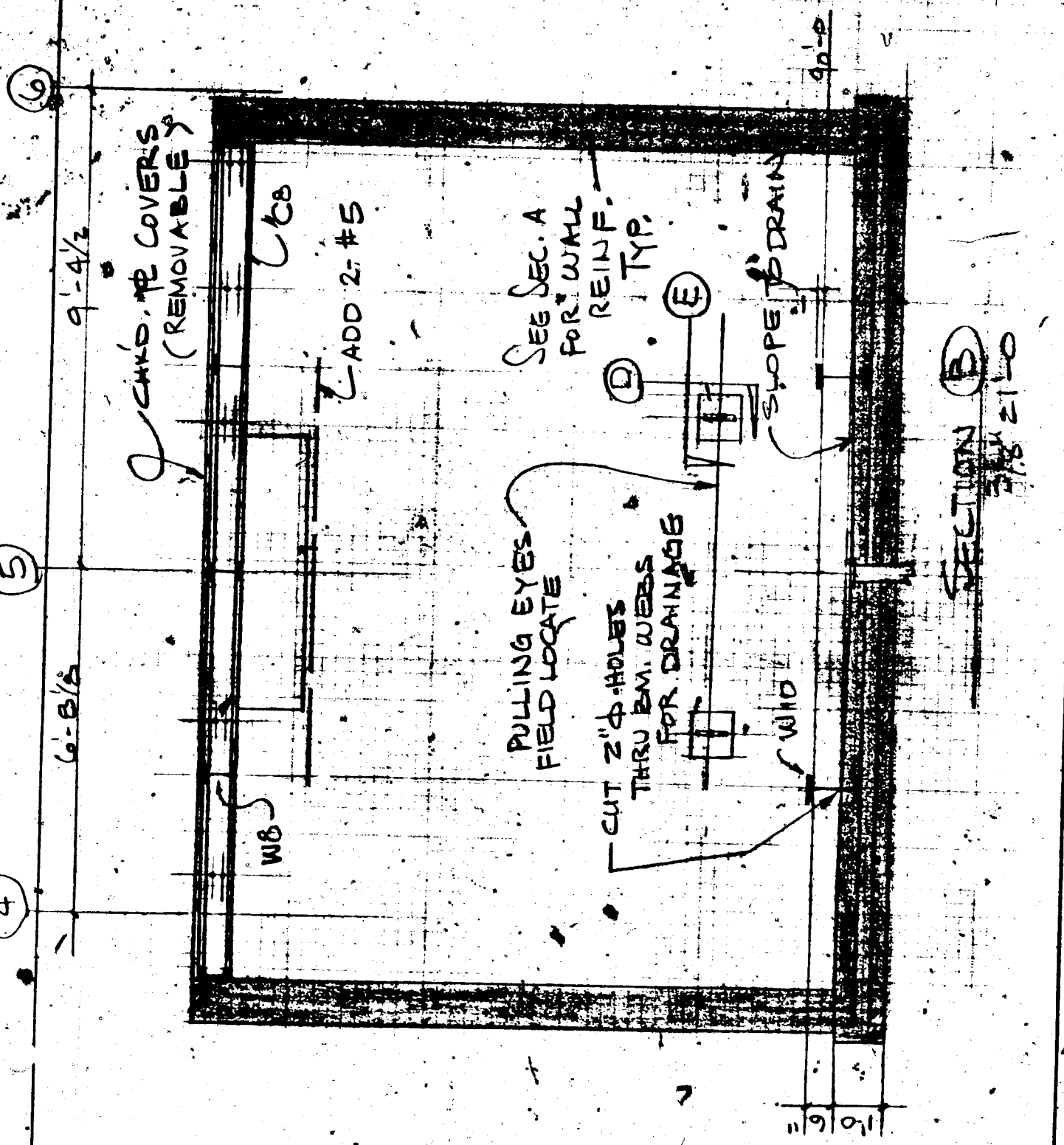
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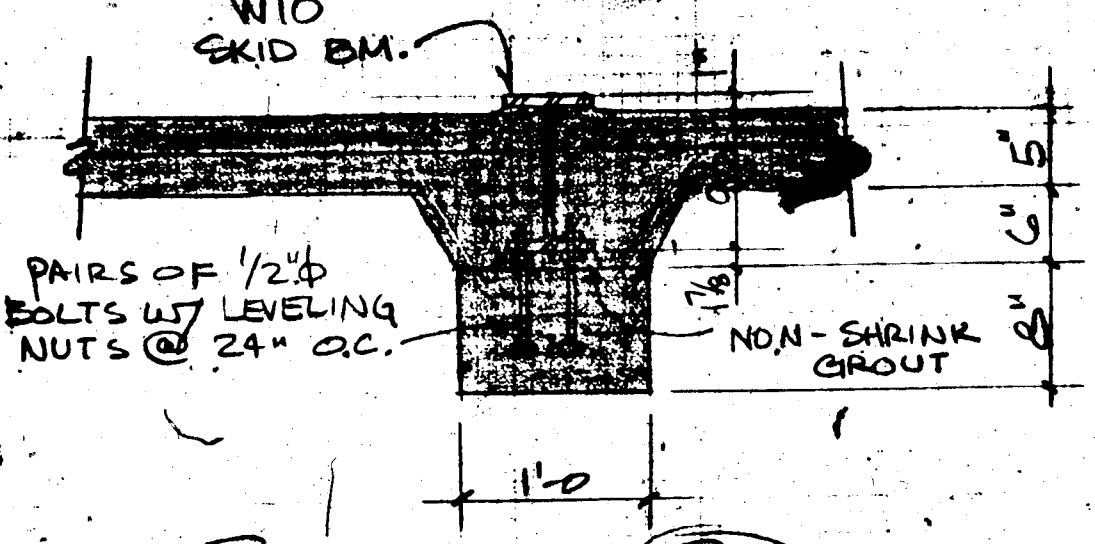
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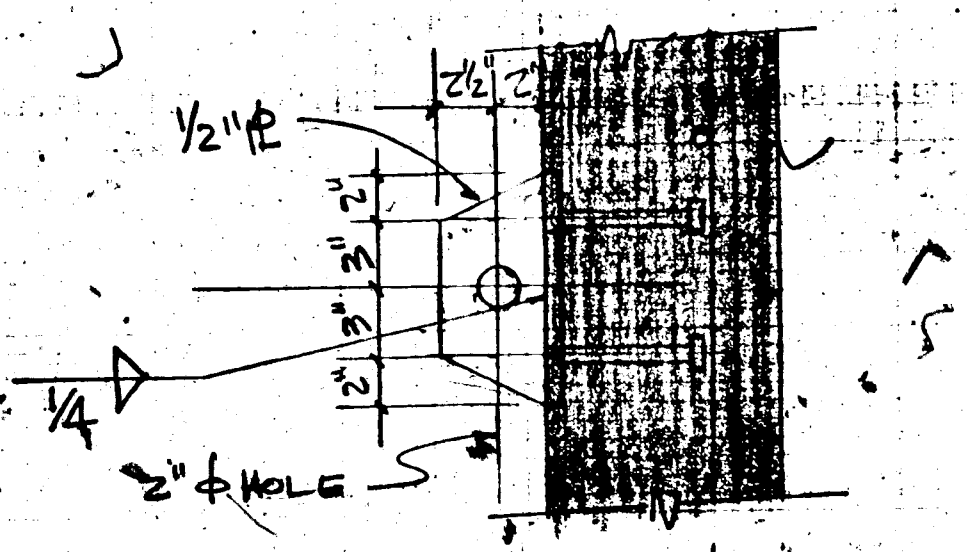
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SECTION Ⓒ
1" = 1'-0



SEC. Ⓓ
1½" = 1'-0

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BEAMS B1

SPAN = 8'-0 $\quad w = 4'\left(\overset{LL}{250}+\overset{DL}{20}\right) = 1080$ PLF.

$M = \frac{1.08(4)^2}{8} = 2.16^{1K}$ $\quad R = 2.16^{K}$

USE W8X10

LEDGER L1

MAX. SPAN BETWEEN BOLTS = 36"

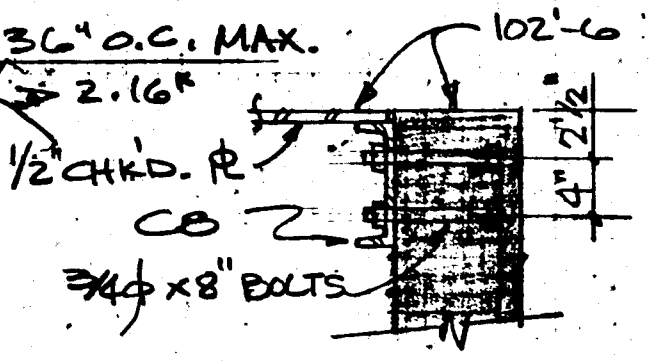
MAX. $M < \frac{2.16^{K} \times 3.0'}{4} = 1.62^{1K}$

USE C8 x 11.5

MAX. $f_b = \frac{1.62 \times 12}{8.14} = 2.4^{KSI}$

USE: 2-3/4ϕ BOLTS @ 36" O.C. MAX.

GOOD FOR: $2 \times 3.0 = 6.0^{K} > 2.16^{K}$



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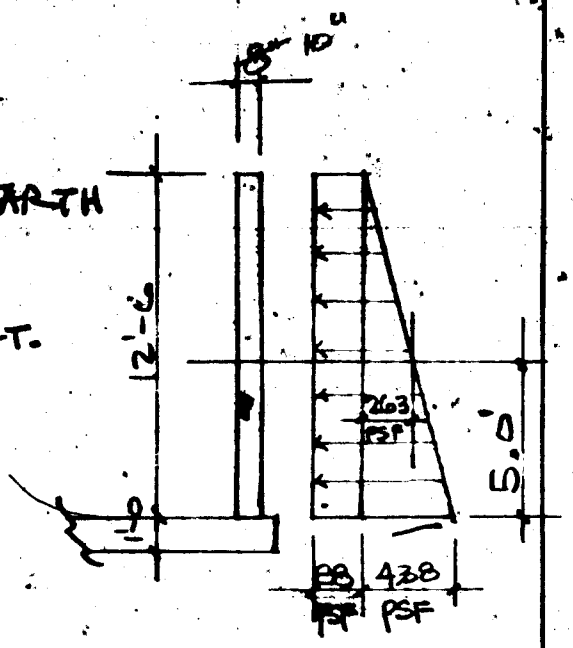
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ENGINEER/ JRL

GEN. ACCESS ROOM WALL

ACT. EARTH PRESS. = 35 PCF
SURCH. = 250 PSF = 2.5' OF EARTH

$$M = \frac{.088(12.5)^2}{2} + \frac{.438(12.5)^2}{6} = 18.31^K/FT.$$



$M_u = 1.7 \times 18.3 = 31.1^K/FT.$

$d = 10 - 2\frac{1}{2} = 7.5"$

$F = \frac{(7.5)^2}{1000} = .0563$

$K_u = \frac{31.1}{.0563} = 553$

$A_s = .0120 \times 12 \times 7.5 = 1.08 \text{ in}^2/FT.$

USE #8 @ 8" VERT. UP TO 5' ABOVE THE FTG.

@ 5' ABOVE FTG.:

$$M = \frac{.088(7.5)^2}{2} + \frac{.263(7.5)^2}{6} = 4.94^K/FT.$$

$M_u = 1.7 \times 4.94 = 8.40^K/FT.$

$K_u = \frac{8.40}{.0563} = 149$

$A_s = .0028 \times 12 \times 7.5 = 0.25 \text{ in}^2/FT.$

USE #4 @ 8" VERT.
$A_s = .30$

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CONC. BEAM OVER GEN. ACCESS ROOM

SPAN = 16.8' 8" x 44" BM

$W = 2.4'(\overset{DL}{200}+\overset{LL}{100}) + 4.0'(\overset{LL}{250}+\overset{DL}{20}) + \overset{BM.}{100}\times 4'$

$= 2200\#/FT.$ DL = 960 PLF

$w_u = 1.4\times 2.20 + 1.7\times .96 = 4.71\ K/FT.$

$M_u = \frac{4.71(16.8)^2}{12} = 110.8^{IK}$ TOP

55.4 IK BOT.

$d = 44" - 2\ 1/4 = 41.75"$ $F = \frac{8(41.75)^2}{12000} = 1.162$

$K_u = \frac{110.8}{1.162} = 95$

$A_s = .0018\times 8\times 41.75 = 0.60\ IN^2$

USE 2-#5 TOP & BOT. CONT.

CHECK SHEAR:

$V_u = (\frac{16.8}{2} - 3.48')\ 4.71 = 23.2^K$

$v_u = \frac{23,200}{.85\times 8\times 41.75} = 82\ psi$ $v_c = 2\sqrt{3000} = 110\ psi$

Min. $A_v = 50\ \frac{8\times 18}{40,000} = 0.18$

USE #3 ⊓ @ 18" ACROSS

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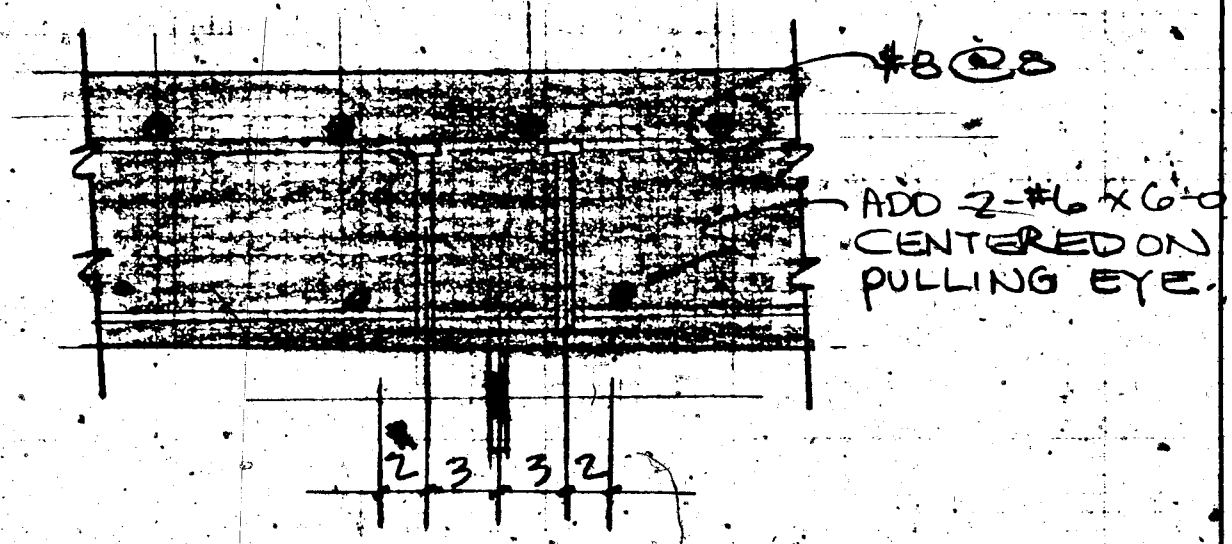
DESIGN OF PULLING EYES

WT. OF GENERATOR = 15.5^K , Say $M = 25$ (STEEL ON STEEL)

$.25 \times 15.5 = 3.9^K$

USE TWO PULLING EYES:
ASSUME 1- PULLING EYE TAKES ALL OF THE LOAD.

USE 4- 3/4ϕ x 8" STUDS IN TENSION @ 6 o.c.
GOOD FOR $4 \times \frac{2 \times 2.25}{3'} = 6.0^K > 3.9^K$
(TABLE 26-G, UBC)



SEC. (E)
1/2" = 1'-0

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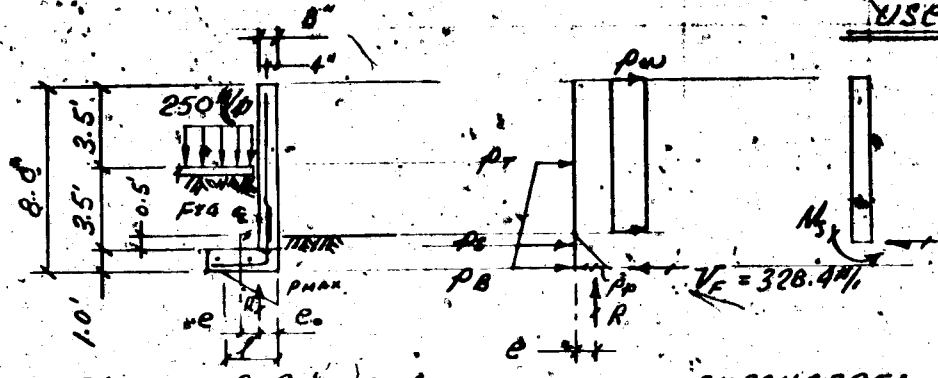
Lyle Collins 12-19-84

STRAUSS & LOFTFIELD
STRUCTURAL ENGINEERS

CLIENT/ SHEET 38 OF 317
PROJECT/ PROJECT # 82017
DATE/ OCT '82
ENGINEER/ HS

MISC CONC WALLS

ADJACENT TO WALK AT N.E. PROPERTY LINE



USE 8" THK CONC WALL
#4 VERT @ 15" oc CENTERED
#4 HORIZ @ 12" o.c.
CONT FTG 3'-0" x 12" THK
2-#4 BOTT CONT.

$V_S = (H_W + H_1 + H_S) = 604.7^{\#}$

CONC WALL CONTROL JTS AT 40'-0" O.C. MAX.

WIND: $\rho_W = C_e C_q q_s I$
$= (1.2)(1.3)(15)(1) = 24\,PSF$

SURCHARGE: $\frac{250^{\#}/ft}{100^{\#}/FT^3} = 2.5'$ EQUIV HT.

$\rho_W = 24^{\#}/ft$ ⟶ $H_W = \rho_W \times 6.5' = 156.0^{\#}$
$\rho_T = (35^{\#}/FT^3)(2.5') = 87.5^{\#}/ft$ ⟶ $H_1 = \rho_T \times 4.5' = 393.8^{\#}$
$\rho_S = (\ do\ )(2.5+3.5') = 210.0^{\#}/ft$ ⟶ $H_S = (\rho_S - \rho_T)(3.5/2) = 216.4^{\#}$
$\rho_B = (\quad)(2.5+4.5') = 245.0^{\#}/ft$ ⟶ $H_2 = (\rho_B - \rho_T)(4.5/2) = 354.4^{\#}$
$\rho_P = (300^{\#}/FT^3)(1.5') = 450.0^{\#}/ft\ MAX$ ⟶ $H_3 = (-\rho_P)(1.5/2) = (337.5^{\#})$
$\Sigma H = 564.7^{\#} = V_E$

$M_S = (H_W \times 3.75' + H_1 \times 3.5/2 + H_S \times 3.5/3) = 1524^{\#FT}/FT$
$M_U = 1.7 M_S = 2.6^{KFT}/FT$ $d = 8"/2 = 4"$ $\xi_F = 12(4.0)/2000 = 0.016$.
$K_U = 2.6/0.016 = 163 \rightarrow \rho_{req'd} \geq .00314$.
$A_S = \rho(12 \times 4.0) = 0.151\ in^2/FT \rightarrow$ #4 @ 15" oc = .16 in^2/ft

WALL 7.0' x (8/12)(150)	= 0.70 K	x 0.33'	= 0.23 KFT	
FTG 3.0 x 1.0 (do) EST	= 0.45 K	x 1.50'	= 0.68	
SOIL & SUR. 6.0 x 2.33 (100)	= 1.40 K	x 1.83'	= 2.56	
$R = \Sigma W =$	2.55 K		$M_R =$	3.47 KFT

$M_O = (H_W \times 4.15' + H_1 \times 2.25 + H_2 \times 1.50 + H_3 \times 0.50) = 1990^{\#FT} = 1.99^{KFT}$
$M_R > 1.5 M_O = 2.99^{KFT}$ OK
$e_o = (M_R - M_O)/R = 0.581'$ → $e = (\frac{3.0}{2} - e_o) = 0.919' > \frac{3.0}{6} = 0.50$ ∴ PRESS. DISTRIBU. IS TRIANGULAR
$\rho = 3(e_o) = 1.749'$
$\rho_{MAX} = \frac{2R}{\rho \times 1} = 2.93^{K}/\phi \simeq (4/3)(2.0^{K}/\phi) = 2.67$ SAY OK

CHECK SLIDING:
$\mu R = 0.3(2550^{\#}) = 765^{\#} > V_E = 565^{\#}$ OK

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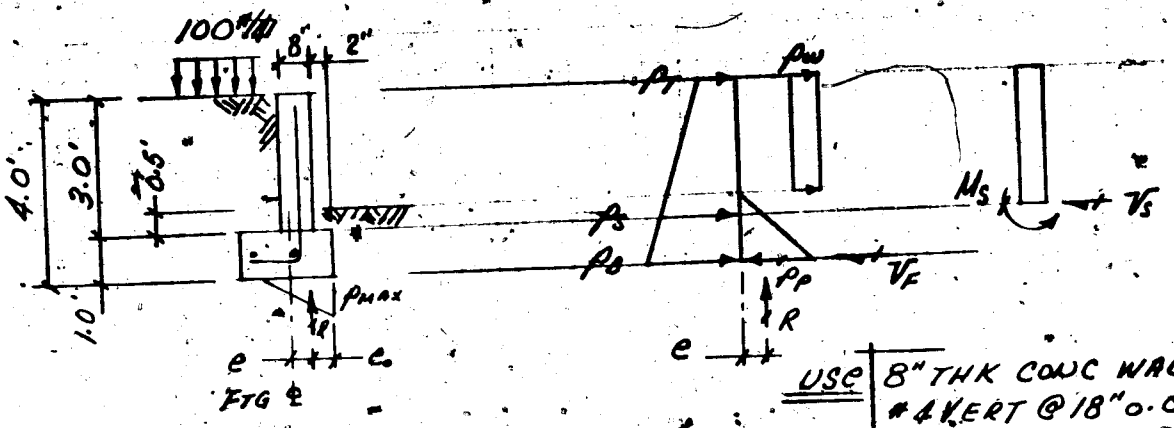
Lucas Collins 12-19-84

STRAUSS & LOFTFIELD
STRUCTURAL ENGINEERS

CLIENT/ SHEET 39 OF 317
PROJECT/ PROJECT # 82017
DATE/ OCT '82
ENGINEER/ HS

MISC CONC WALLS

RETAINERS AT S.W.



USE 8" THK CONC WALL
#4 VERT @ 18" O.C.
#4 HORIZ @ 12" O.C.
CONT FTG 2'-0" x 12" THK
2-#4 BOTT CONT

WIND: ρ_W = 24PSF REF SHT N° 38

SURCHARGE: 100#/ft / 100#/ft³ = 1.0 EQ. SOIL HT.

ρ_W = 24#/ft → $H_W = \rho_W \times 2.5' = 60.0^{\#}$
$\rho_T = (35^{\#}/FT^3)(1.0') = 35.0^{\#}/ft$ → $H_1 = \rho_T \times 4.0' = 140.0$
$\rho_S = (\ do\ )(1.0+3.0) = 140.0$ → $H_S = (\rho_S - \rho_T)(3.0/2) = 157.5^{\#}$
$\rho_B = (\ do\ )(1.0+4.0) = 175.0$ → $H_2 = (\rho_B - \rho_T)(4.0/2) = 280.0$
$\rho_P = (300^{\#}/FT^3)(1.5) = 450.0$ → $H_3 = (-\rho_P)(1.5/2) = (337.5)$
$\Sigma H = 142.5 = V_E$

$V_S = (H_W + H_1 + H_S) = 357.5^{\#}$
$M_S = (H_W \times 1.50' + H_1 \times 1.50' + H_2 \times 8.0/3) = 580^{\#FT}$
$M_U = 1.7 M_S = 1.0^{KFT}$

$K_U = 1.0/0.016 = .63 \rightarrow \rho = .0012$
$A_S = \rho(12 \times 4) = 0.058\ in^2/ft$
$A_{S\,MIN} = .0012(12 \times 8) = 0.115\ in^2/ft$ GOVERNS

WALL	3.0 x 8/12 x (.150)	= 0.30K	x 0.50'	= 0.15 KFT
FTG	2.0 x 1.0 x (do)	= 0.30	x 1.00'	= 0.30 KFT
SOIL & SURCH	4.0 x 1.17 x (.10)	= 0.47	x 1.42'	= 0.67 KFT
	$R = \Sigma W =$	1.07K		1.12 KFT

$M_O = (H_W \times 2.75 + H_1 \times 4.0/2 + H_2 \times 4.0/3 + H_3 \times 0.5) = 650^{KFT}$
$M_R > 1.5 M_O = 0.98^{KFT}$
$e_o = (M_R - M_O)/R = 0.439' \rightarrow e = \left(\frac{2.0}{2} - e_o\right) = 0.561' > \frac{2.0}{6} = 0.333'$ ∴ TRIANGULAR SOIL PRESS. DISTRIBU.
$\ell = 3(e_o) = 1.317'$
$\rho_{MAX} = 2R/(\ell \times 1) = 1.63^K/\phi < (1/3)(2.0^K/\phi)$ OK

CHECK SLIDING:
$\mu R = 0.3(1070) = 321^{\#} > V_E = 148^{\#}$ OK

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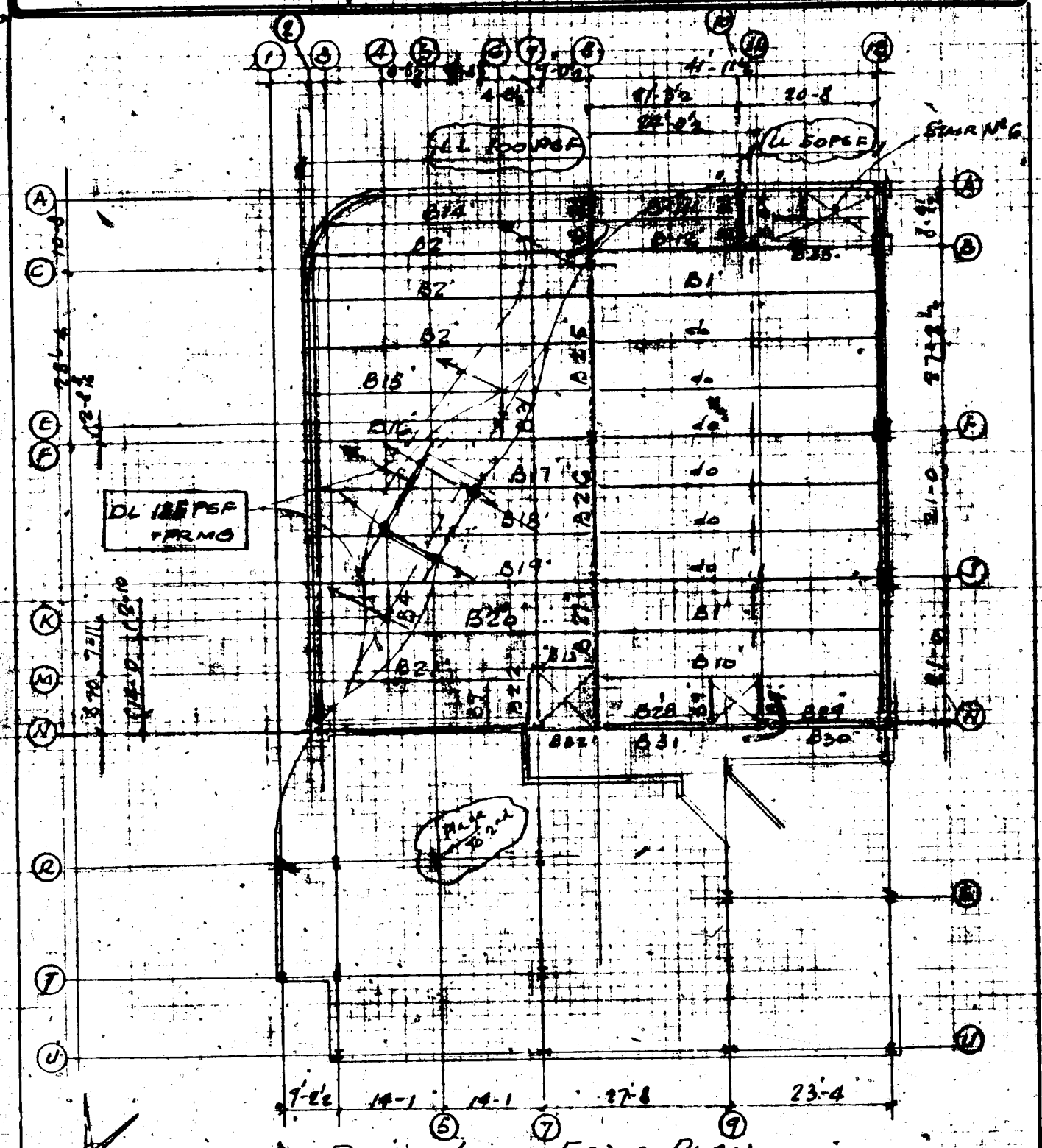
Lisa Collins 12-19-84

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CLIENT/
PROJECT/

SHEET 40 OF 317
PROJECT # 82017
DATE/ OCT '82
ENGINEER/

PLAZA FLOOR FRAMING



PLAZA LEVEL FRMG PLAN SCALE 1"= 20'-0"

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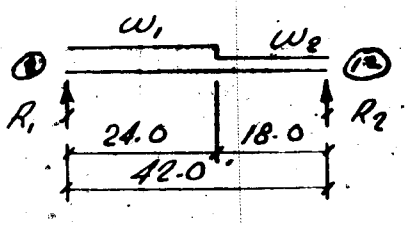
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CLIENT/
PROJECT/
SHEET/ 41 OF 317
PROJECT # 82017
DATE/ OCT.'82
ENGINEER/ H.S.

PLAZA LEVEL FRMG B-1 THRU B-34

(B-5 THRU B-8 NOT USED)

B-1



(58+14 FRMG) = 72 PSF
(78+ do) = 92 PSF

50#/ft LL ON 18.0' PORTION
100#/ft LL ON 24.0' PORTION
∴ TRIB EFF = 7.0'(42'-24') = 126 ft < 150 ft
→ LL = 50#/ft

$\omega_1 = 7'(.072^K/ft_D + .100^K/ft_L) = (.50^{K'}_D + .70^{K'}_L) = 1.20^{K'}$

$\omega_2 = 7'(.092^K/ft_D + .500^K/ft_L) = (.64^{K'}_D + .35^{K'}_L) = 0.99^{K'}$

$R_1 = (11.04^K_D + 13.35^K_L) = 24.39^K$

$R_2 = (12.48^K_D + 9.75^K_L) = 22.23^K$

$M_{20.325} = 247.9^{KFT}$

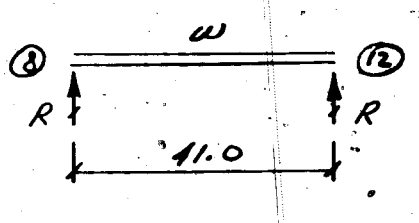
W24 x 68 $\quad \Delta_{D+L} = (1034.48 \times 10^{-6})(42^2 \times 19.32)/29.73 = 1.486''$

$M_{L\ 19.07} = 127.3^{KFT}$ $\quad \Delta_L = 0.763'' \simeq L/660$

$f_{b_L} = M_L/154 = 9.92^{KSI}$ $\quad \Delta_D = 0.723''$

USE | W 24 x 68
T.O.S. EL 109'-7"

B-2



(185#/ft + 15#/ft FRMG) = 200#/ft

$\omega = 7'(.20^K/ft_D + .10^K/ft_L) = (1.40^{K'}_D + 0.70^{K'}_L) = 2.10^{K'}$

$R = (28.70^K_D + 14.35^K_L) = 43.05^K$

$M = 441.3^{KFT}$

$\Delta_{D+L} = \frac{5(2.10)(41)^4(1728)}{384(29\times10^3)I} = \frac{4604}{I}$ (1.41")

$\Delta_L = (0.70/2.10)(4604/I) = \frac{1535}{I}$

$\Delta_D = (1.40/2.10)(\ do\ .) = \frac{3069}{I}$

W27x94 $\quad \Delta_L = 1534/3270 = 0.469'' \simeq L/1049$

$\Delta_D = 3069/3270 = 0.939''$

USE | W 27 x 94
T.O.S. EL 102'-9

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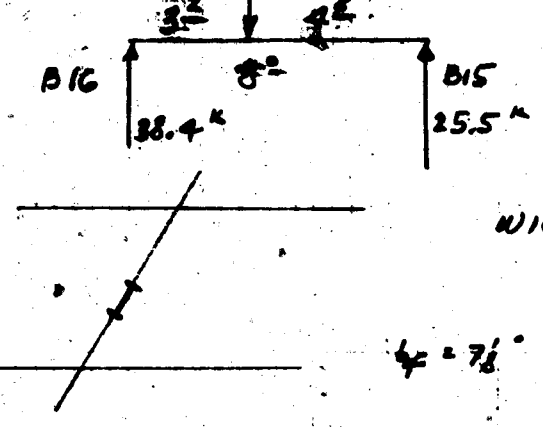
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CLIENT/ SHEET 42 OF 317
PROJECT/ PROJECT # 8807
DATE/ 10-82
PLAZA FLOOR FRAMING ENGINEER Dan

SHORT BEAMS SUPPORTING COLS FROM ABOVE

B-3 (Col 6-E) above

P=63.9^K W10x49



$P_{col\ 6E} = 57.1 + 6.8 = 63.9^K$ (D: 89% L: 11%)

(SIZE TO ACCOMODATE COL 6-E B.P.)

$R_{max} = 38.4^K \div 7.7 = 5.02 = 6$ Bolts — 3/4" ϕ A 325

$M = 38.4(3.2) = 122.9^{IK}$

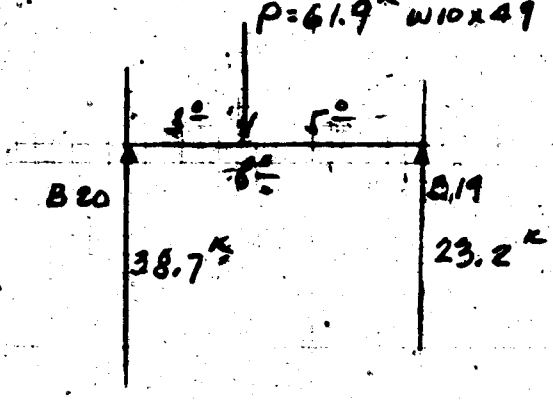
W16x57 $M_R = 184$ $S = 92.2$ $d = 16.375$

$\Delta = \frac{123.0(8)^2}{80.6(92.2)16.38} = .06$ $V = 102$ $R = 56.6$

USE W16x67 (Add Stiff Rs @ Col Flgs. (STD CONN 3 ROWS A325)

B-4 (Col 4-K) above

P=61.9^K W10x49



$P_{col\ K4} = 53.1 + 8.8 = 61.9^K$ (D: .86 L: .14)

(SIZE TO FIT COL 4K B.P.)

same as B-3

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Lucia Collins 12-19-84

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PROJECT/
DATE/ 10-82
ENGINEER/ dm

SHEET 49 OF 317
PROJECT # 82017

W10x49 d=10" bf=10"
Col $t_w = \frac{5}{16}$ $t_f = \frac{9}{16}$

BASE PL / BEAM & PLATE FOR

BEAMS
bf = 10" V
W16x67 93.5
14x61 75.5
12x58 63.6
12x53 60.3
E K
10x49 49.4

Col E-G & K-4

$P_{EL} = 68.9$
$P_{ult} = 61.9$
$\approx 65^k$

R 12x12x$\frac{3}{4}$
4-$\frac{3}{4}$" ⌀ BOLTS.

4
G

1½" = 1'-0"

STRUCT. SLAB

W16x67

EL 102'-9"

$\frac{3}{8}$" STIFF PL
E.S. (EACH
COL FLANGE)

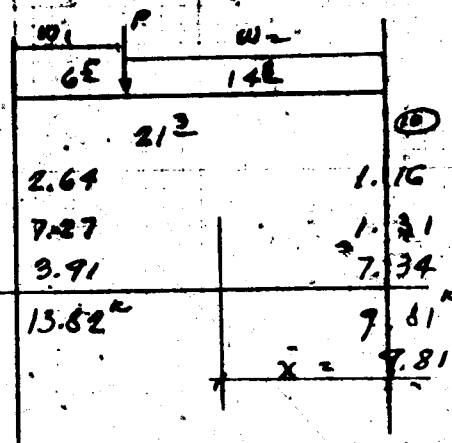
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Luca Callins 12-19-84

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PROJECT/ PROJECT # 82917
DATE/ 10-82
PLAZA LEVEL FRAMING INITIALS

BEAM B-11 ⑧-⑩



V_P	2.64	1.16
V_{W1}	7.27	1.31
V_{W2}	3.91	7.34
R =	13.82 K	9.81 K

$\bar{x}$ = 9.81 ÷ .76 = 12.91'

$P = 30'(21 PSF)6' = 3.8^K$ 185+15+30 58+14=72

$W_1 = 4.4'(200+100) = 880 + 440 = 1.32$ KLF

$W_2 = 4.4(72+100) = 317 + 440 = .76$ KLF

$W_1 = 1.32(4.5) = 6.58^K$ 5.80 5.75D 2.83

$W_2 = .76(14.8) = 11.25$ = 4.73D + 6.53L

4.25 9.36 = 23.64 K

$M_{REQ'D} = 9.81(12.91).5 = 63.32^{IK}$

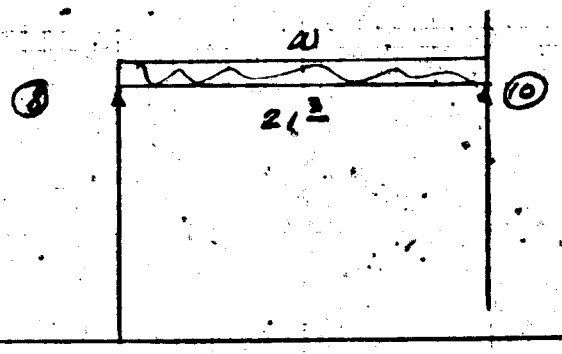
W14×30 S=42 d=13.9 $M_R = 84^{IK}$ $\Delta \simeq \frac{63.32(21.3)^2}{80.6(42)13.9} = .61" \; TL = L/419$

$\Delta_{LL} = .14.28/29.64(.61) = .37" = L/688$

$\Delta_{DL} = .24" = L/1067$

USE W14×30
TOS 102-X9

BEAM B-12 8-10



$W = 5.3'(72+100) = 982 + 530 = .92^{KLF}$

$W = .92(21.3) = 19.6^K$ $R = 9.8^K$

$M = 19.6(21.3) \div 8 = 52.2^{IK}$

W14×30 $M_R = 84^{IK}$ S=42 d=13.9

$\Delta = \frac{52.2(21.3)^2}{80.6(42)13.9} = .50" = L/508$

B,13 $\ell = 9'$ $W = 3'(72+100) = 216^{\#}$ $= .52^{KLF}$

$W = .52(9) = 4.68^K$ $R = 2.3^K$

$M = 4.68(9) \div 8 = 5.3^{IK}$

W8×10

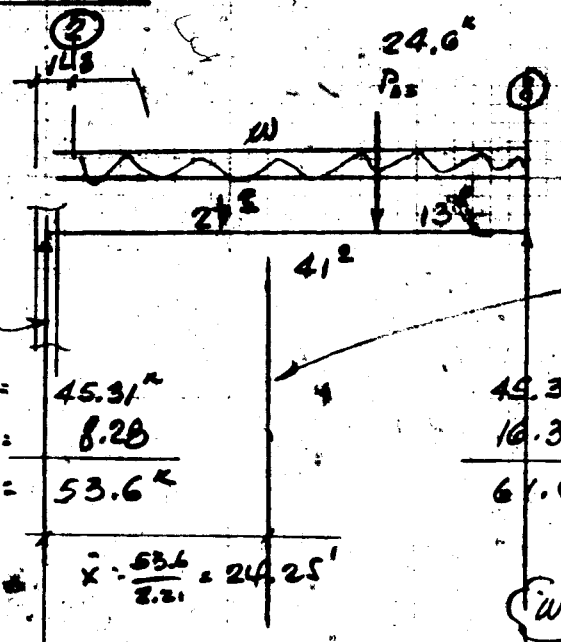
USE W14×30
TOS 102-X9

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STRAUSS & LOFTFIELD
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PROJECT/ PROJECT NO. 82017
DATE/ 12-82
PLAZA FLR. FRMG ENGINEER/

BEAM B-15



V_w = 45.31k
V_P = 8.28
R = 53.6k

45.31k
16.32
61.6k

$\bar{x} = \frac{53.6}{2.21} = 24.25'$

W33×118 M_R = 718 > 650.
S=359
Δ = 1.15" TL = L/428
.88" DL = L/556
.27" LL =

assume ≈ 210 PLF

$w = 7.0(185 + 80) + 7.0(100)$
$= 1505_D + 700_L = 2.21$ k/ft
$P = 24.6^k = 22.0^D + 2.6^L$

$M = 53.6(24.25) - 5 = 649.9$ ft-k

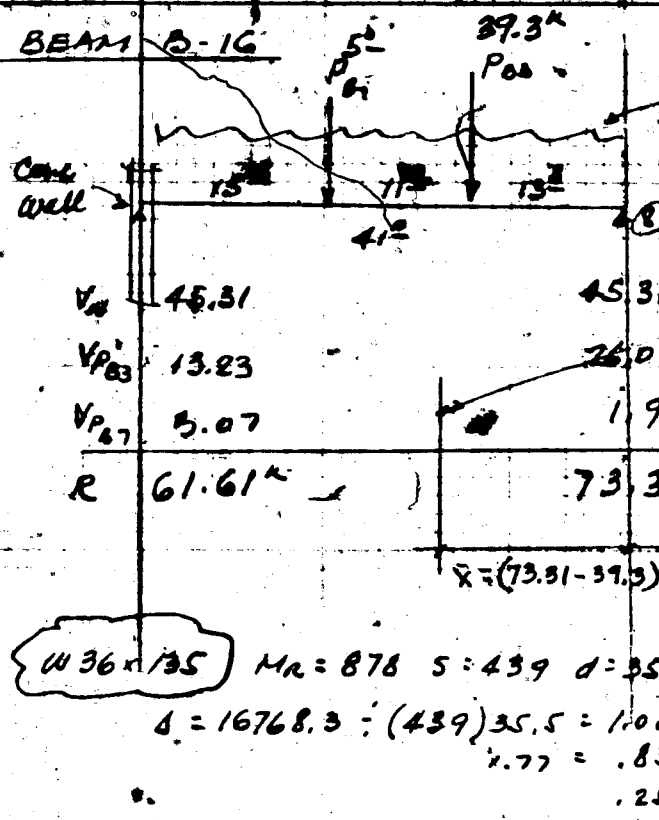
77½% DL

$\frac{L}{400} = 1.23$

$\Delta \cong \frac{649.9(41)^2}{80.6(S)A} = \frac{13,555}{SA} = .423$

$SA = 11020$ d=33 S=334
d=36 S=306

BEAM B-16



V_{w_B} 45.31
$V_{P_{B3}}$ 13.23
$V_{P_{B7}}$ 3.07
R 61.61k

45.31
26.07
1.93
73.31k

$\bar{x} = (73.31 - 39.3) \div 2.21 = 15.39'$

W36×135 M_R = 878 S = 439 d = 35.5
Δ = 16768.3 ÷ (439)35.5 = 1.08" TL = L/457
x.77 = .83" DL L/594
.25" LL

$w = 2.21$ k/ft

$P_{B3} = 39.3^k = 35.0^D + 4.3^L$

$M = 73.3'(15.39) = 1128.2$
$-2.21(15.39)^2 \cdot .5 = 261.2$
$-39.3(15.39 - 13.5) = 62.5$
-329.2
804.0 ft-k

L/400

$\Delta \cong \frac{804(41)^2}{80.6\,SA} = \frac{16768.3}{SA} \leq 1.23$
$SA = 13632.75$

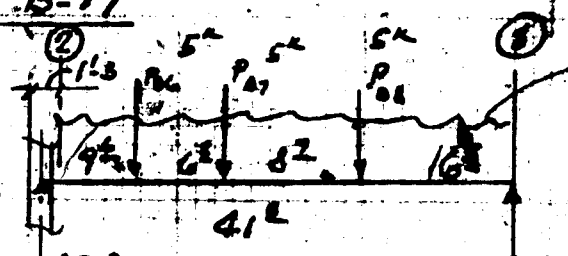
d=33 $S_{req'd}$ = 413, W36×141
d=36 $S_{req'd}$ = 379 W36×135

Lula Collins · 12-19-84

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PROJECT/ PROJECT # 82017
DATE/ 10-82
PLAZA FLR. FRMG. ENGINEER/ Jm

BEAM B-17



w = 2.21 KLF

	D	L
W_w = 90.62	= 61.62	+ 29.00
$P_{6,7,8}$		15.00
105.62	61.62	+ 44.00
	58	42 %

V_w 45.31 45.31
V_p 2.01 2.99
3.07 1.73
3.83 1.17
R = 54.22^k 51.40^k

$\bar{x}$ = (51.4 - 5.0) : 2.21

M = 51.4(21.0) = 1079.2
- 2.21(21)^2 : 2 = 487.3
- 5(21 - 11.5) = 22.5
- 509.8
569.4 ^{1k}

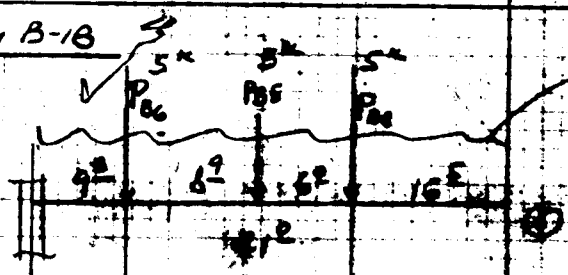
$\Delta = \frac{570(41)^2}{80.6(Sd)} = \frac{11888}{Sd} \leq \frac{L}{400} = 1.23$

Sd = 9665 d = 33 S_x = 293 ^{33} × 118
d = 27 S_x = 358 ^{27} × 146
d = 30 S_x = 322 ^{30} × 116

W 33 × 118 M_R = 718 S = 359 d = 32.8"

Δ = 11888 ÷ (359) 32.8 = 1.01" TL = L/487
.59" DL = L/820
.42" LL = L/977

BEAM B-18



w = 2.21 KLF

USE W 33 × 118 ✓

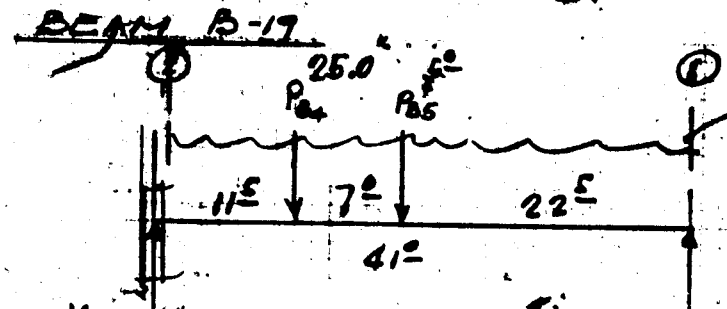
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Lula Collins 12-19-84

STRAUSS & LOFTFIELD
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CLIENT/ SHEET 47 OF 317
PROJECT/ PROJECT # 82017
DATE/ 10-82
PLAZA FLR. FRMG ENGINEER/ JM

BEAM B-17



V_W 45.31
P_{B4} 17.99
P_{B5} 2.74
R = 66.04^k

45.31
7.01
2.26
54.58^k

$\bar{x} = \frac{(54.58-5.0)}{22.43} = 2.21'$
$= 22.43 = 22.5'$

W = 2121 KLF D = 1.51 L = .70
P_{B5} = 5.0^k L .68 .32
P_{B4} = 21.5 + 3.5 = 25.0^k
D L
ΣR_L = 90.62 + 25.0 + 5.0 = 120.6^k
ΣD_L = 61.62 + 21.5 = 83.12
DL = .69 LL = .31

$M = 54.58(22.5).5 = 614^{k'}$

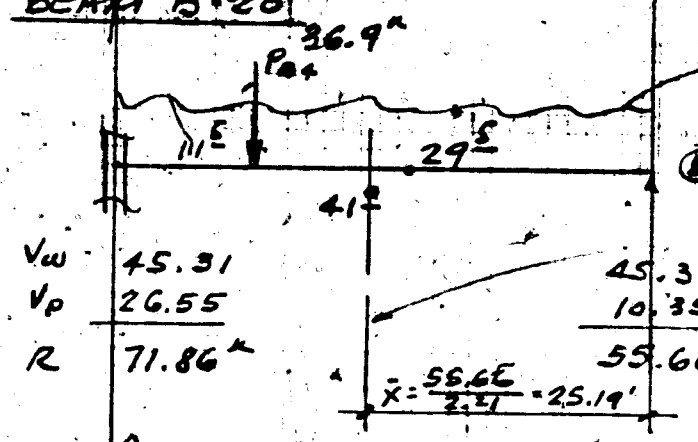
$\Delta = \frac{614(41)^2}{80.6\,S_x} = \frac{18806}{S_x} \leq \frac{L}{360} = 1.23$

$S_x = 1041^{in^3}$ $d = 33.5 = 31.5$

W33x118 M_R = 748 S = 357 d = 32.7

$\Delta = 12806 \div (357)32.7 = 1.09'' \; T_L = L/450$
.75" $D_L = L/855$
.34" LL =

BEAM B-20



V_W 45.31
V_P 26.55
R 71.86^k

45.31
10.35
55.66^k

$\bar{x} = \frac{55.6E}{2.21} = 25.19'$

W = 2.21 KLF
P_{B4} = 31.7 + 5.2 = 36.9
D L
.84 .16

$M = 55.66(25.19).5 = 700.9^{k'}$

$\Delta \simeq \frac{700.9(41)^2}{80.6(32)} = \frac{14618}{S_x} \leq \frac{L}{400} = 1.23$
d 33
$S_x = 11885$ 360

W33x130 M_R = 812 S = 406 d = 33

$\Delta = 14618 \div 406(33) = 1.09'' = L/450$ T_L
.80 = L/616 D_L
.29 = L_L

36.9(.16) = 31.7
90.62(.68) = 61.62
127.52
72.32 = 127.52 L .78 ok

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PROJECT/ PLAZA FLR. FRMG
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ENGINEER/ Jm

BEAM B-21 3-7 near (M)

L = 32' W = 7.0(200+100) = 1.4 + .7 = 2.1 KLF

M = 2.1(32')² = 67.2 K R = 33.6 K

M = 67.2(32) ÷ 8 = 268.8 K

W24×68 ϕM_R = 308' S_x = 154 I_x = 23.8

$\Delta = \frac{269(32)^2}{80.6(154)23.8} = .93" = L/412$ LL

.62" = L/200 DL

.31" LL

USE W24×68 OR W18×102'-7

B-22 LINE (7) M-N

W24 68 33.6 K

7' 1.8

(N) (M)

6.8'

1.8 6.9 8.7 K

1.8 26.7 28.5 K

R

Wall MISC.
W = 14(21) + 100 = 400 PLF

M = 28.5(1.8) = 51.3 IK
-.4(1.8)²·5

51.3 IK

W18×35 M_R = 115 IK S = 57.6 d = 17.8

$\Delta = \frac{51.3(6.8)^2}{80.6(57.6)17.8}$ negligible

Facilitate W24 connection

B-34 B.O.S 96-10 Stair No 6 Landing LINE (D)

L = 8.8' W = 9.0'(50+10.0) = 450 + 900 = 1.35

W = 1.35(8.8) = 12.0 K R = 6.0 K

M = 12.0(8.8) ÷ 8 = 13.2 IK

USE W12×19

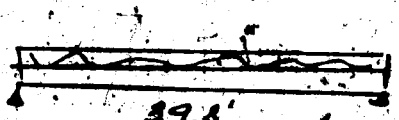
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BEAM B14 ③-Ⓐ



$W = 4.4'(.200_D + .100_L) + .08 + .44 = 1.32^{K}$

$W = 1.32(39.8) = 52.64^{K}, \quad R = 26.3^{K}$

$M = 62.64(39.8) \div 8 = 261.4^{IK}$

$\Delta = \frac{261.4(39.8)^2}{80.6(S)d} \left\{ \frac{5137.3}{Sd} = \frac{39.8\times12}{400} \right.$

W27×84 $S = 213$ $d = 26.75$ $M_R = 426$ $\quad Sd = 4303$

$\Delta = \frac{261.4(39.8)^2}{80.6(213)26.75} = .90'' = L/530\ TL$ $\quad d = 27\ S = 159$

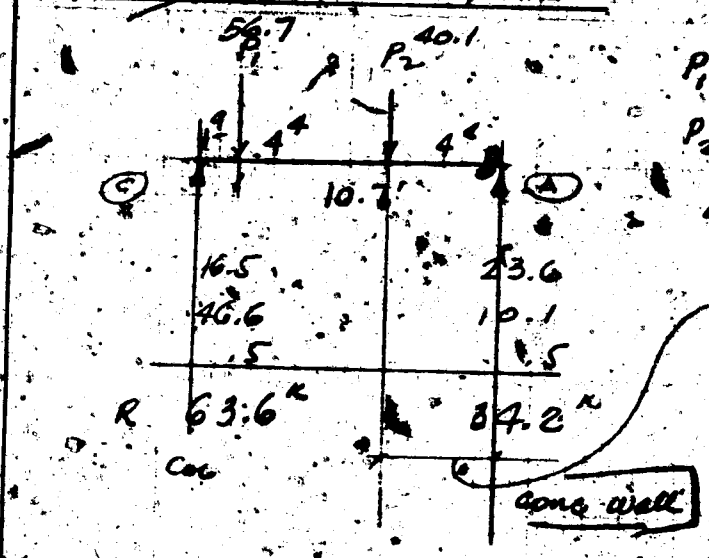
$.60'' = L/796\ DL$

$.30'' \} \ L/1592\ LL$

USE W27×84

Tos = 102-9

BEAM B24 : LINE 8, A-C



$P_1 = 2'(30')21 + 43.1 + 7.8 = 56.70^{K}$ (3.8 PSF; B2, B12)

$P_2 = 26.3 + 13.8 = 40.1^{K}$ (B14, B11)

$W_L = 100\ PSF$

$M_{max} = 34.2 \times 4.4 = 150.48$
$- .100(4.4)^2 .5 = 0$ } 150 IK

W24×55 $M_R = 228$ $\quad \phi = 1/4\ d = 23.6$

$V_{allow} = 135$

$\Delta = \frac{150(10.7)^2}{80.6(114)23.6} = .08$

USE W24×55

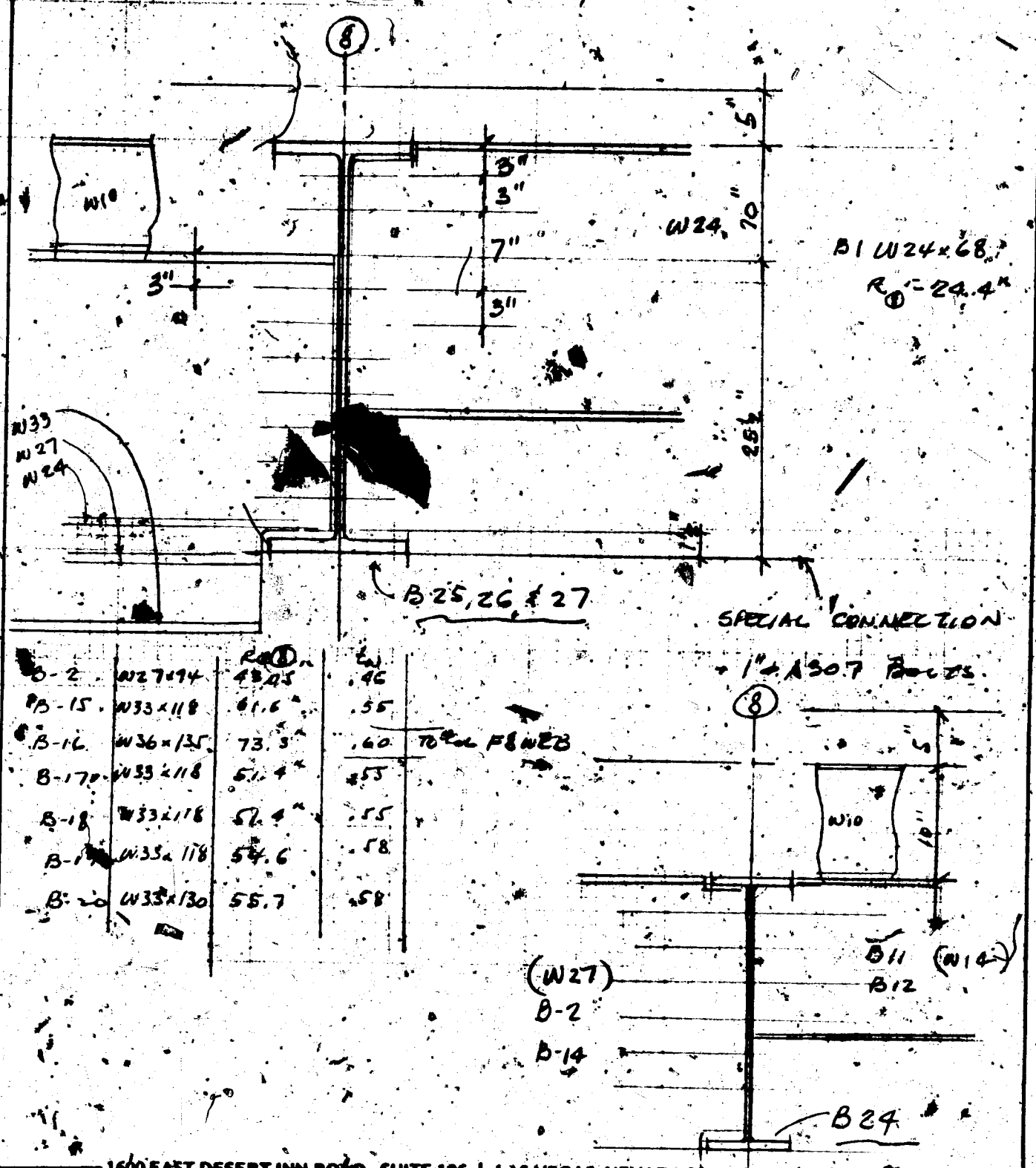
Tos 102-9

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BEAMS ON LINE (8) B-24 see previous sheet



		R① k	tw
B-2	W27x94	43.45	.46
B-15	W33x118	61.6	.55
B-16	W36x135	73.3	.60
B-17	W33x118	51.4	.55
B-18	W33x118	52.4	.55
B-19	W33x118	54.6	.58
B-20	W33x130	55.7	.58

Total F&WEB

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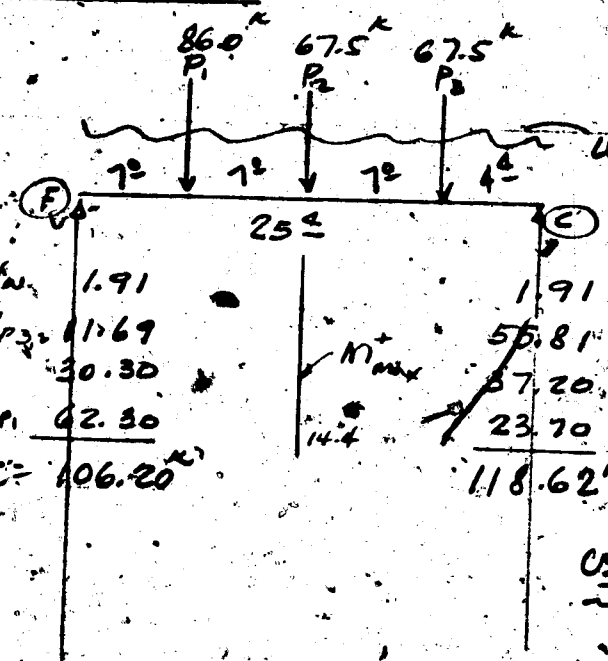
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BEAMS ON LINE (8)

B-25 C-F



$P_1 = 61.6^{B15} + 24.4^{B1} = 86.0^k$

$P_2 = 43.1^{B2} + 24.4^{B1} = 67.5^k$

$P_3 = 67.5^k$

$W = 150\ PLF \quad W = 3.82^k$

$M_{max} = 118.62 \times 11.4 = 1352.3$

$-6.75(7) = 47.25$

$-.18(11\frac{4}{12})^2.5 = 9.8$ $\Big\}$ -487.3

870.0^{IK}

W36x135 MR = 878

USE → W36x150 MR = 1010

I = 9040 S = 504

$f_b = \frac{870 \times 12}{504} = 20.7\ ksi$ ✓

Δ_{max} @ 14.4' from ©

$\Delta_{P_1} = \frac{86.0(18.4)(7.6)}{6EI(25.4)}\left[(25.4)^2 - (7.6)^2 - (4.0)^2\right] = 29,084.60/EI$

$\Delta_{P_2} = \frac{67.5(14.0)^2(11.4)^2}{6EI(25.4)} = 22,563.92/EI$

$\Delta_{P_3} = \frac{67.5(4.4)(14.0)}{6EI(25.4)}\left[(25.4)^2 - (4.4)^2 - (14.0)^2\right] = 11,726.43/EI$

$= \frac{63,374.95 \times 1.728}{29.0(I)}$

$= \frac{3776}{I} \leq \frac{264 \times 12}{400}$

$= .76$

$R_{req}\ I = 3776 \div .76 = 4968$

$\Delta_{W36x150} = \frac{3776}{9040} = .42"\ TL$ ✓

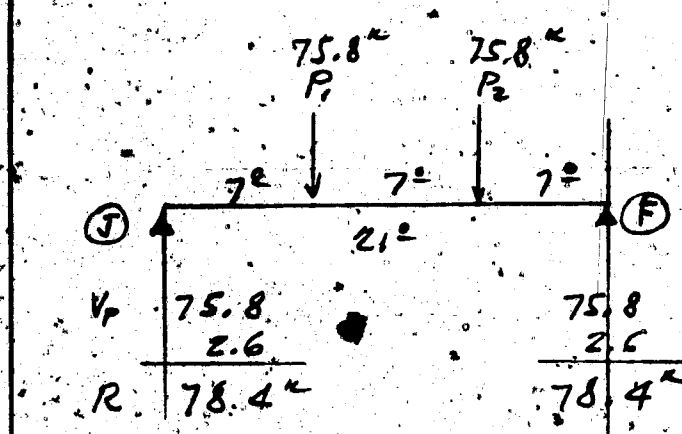
$= L/729$

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BEAM B-26 LINE (8) J-F



$P_1 = {}^{B1}24.4 + {}^{B18}51.4 = 75.8^K$

$P_2 = {}^{B1}24.4 + {}^{B17}51.4 = 75.8^K$

$W = 100 + 150 = .25$ KLF $W = 6.26^K$

$R = 2.63$

V_P	75.8	75.8
	2.6	2.6
R	78.4K	78.4K

$M = 75.8 \times 7.0 = 530.6$
$+ 5.2(21)\frac{21}{2} = 13.7$
544.3^K

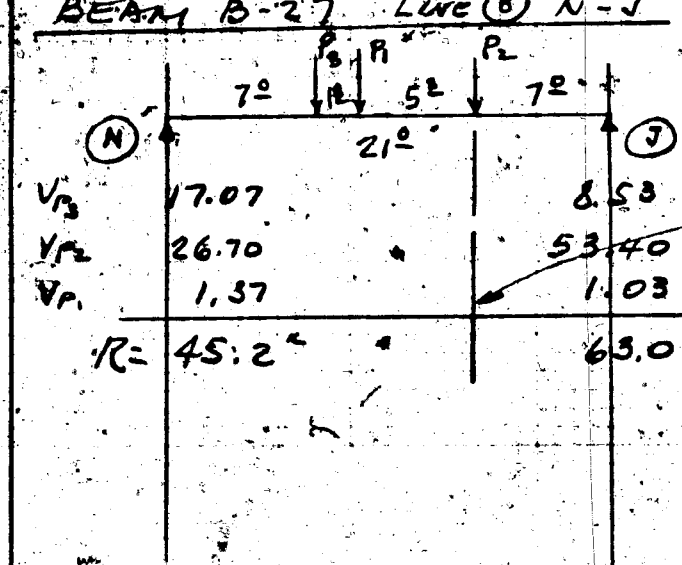
$\Delta_L = \frac{75.8(7.0)}{24EI}\left(3(21)^2 - 4(7)^2\right)^{1127} = \frac{24916 \times 1.728}{29I}{}^{K\,FT^3} = \frac{1485}{I} \leq \frac{L}{400} = .63 \quad I = 2357$

W36 x 135 $M_R = 878$ $S = 439$ $I = 7800$

$f_s = \frac{544.3 \times 12}{439} = 14.88$

$\Delta = 1485 \div 7800 = .19$

BEAM B-27 LINE (B) N-J



$P_1 = {}^{B13}2.4^K$

$P_2 = {}^{B20}56.7 + {}^{B1}24.4 = 80.1^K$

$P_3 = {}^{B-10}25.6^K$

$M = 63.0(7.0) = 441^K$

V_{P3}	17.07	8.53
V_{P2}	26.70	53.40
V_{P1}	1.37	1.03
R=	45.2K	63.0K

USE W36 x 135

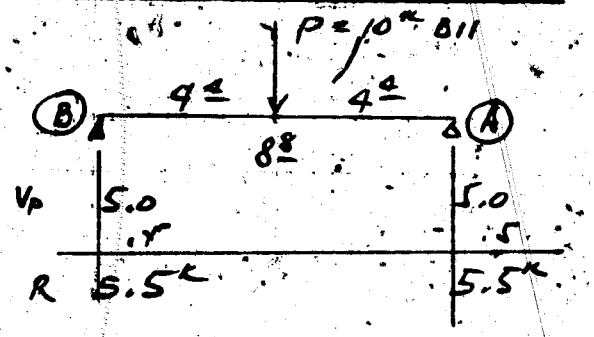
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BEAM B-23 LINE (10) A-B



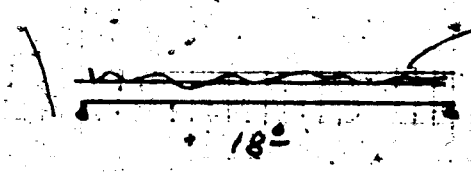
W = .10 KLF

M = 10(8.8)/4 = 22.0^IK
.1(8.8)²÷8 = 1.0
} 23.0^IK

USE W14x22 Tos = 102'-9"

(B11 is W14x30)

B28 LINE (N) 8-bow. stair



W = 4(72+100) = 290+400 = 690 PLF

W = .69(18) = 12.42^K R = 6.21^K

M = 12.42(18)÷8 = 28.0^K

W12x19 Mr = 43 S = 21.3 d = 12"

Δ = 28(18)² / 80.6(21.3)12 = .44" TL = 1/490
.18" DL = 1/1175
.26" LL = 1/831

B29 LINE (N) 11-12

L = 17'-11" = 18.0 W = same as B-28

USE ~~W12x19~~

USE W14x43 for COMBINED BENDG & AXIAL LOAD FRM-N

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PLAZA FOR PRMG
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BEAM B-30 LINE Ⓝ 11-12 + 5" CONC SLAB = 68 PSF

L = 18.0' CD = .6 RLR W = 10.8 K R = 5.4 K

M = 10.8(18) ÷ 8 = 24.3 IK

LL 100
MISC 37
200 PSF
W = × 3
.6 KLF

W 12x19 Mn = 43 S = 21.3 d = 12

Δ = 24.3(18)² / 80.6(21.3)12 = .88" TL = L/242
.19 IL
.19 LL

USE ~~W12x19~~ USE W14x43 for COMBINED LOADS

B-31 LINE Ⓔ 8-11

8.4 PSF = 8.9 - 0.2Ⓑ = 2.0 + 6.4 = 8.4

W = 5(200) = 1.0 KLF

Ⓑ Ⓛ

W 12.0 K
24 K
R 14.1 K
x̄ = 14.1/1.0 = 14.1'

12.0
6.3
18.3 K

M1 = 14.1 K (14.1)(.5) = 99.4 IK

Unsupported Top Flg L = 24' = 288"

W 18x60 rT = 1.97 L/rT = 5.27 L/Af = 8.94

Fb = 12(10³) ÷ 2(L/Af) = 12.94 KSI

fb = 99.4(12) / 108 = 11.04 KSI < Fb

Δ = 99.4(24)² / 80.6(10d)18 = .47" TL = L/788

98-2 11/12

B 32 LINE Ⓝ 7-8

L = 9.0 W = 1.0 KLF N = 9.0 R = 4.5

M = 9(9) ÷ 8 = 10.2 IK

W8x10 Mn = 16.1

Δ = 10.2(9)² / 80.6(7.81)7.9 = .19" TL = L/550

B33 LINE Ⓔ 10-12

L = 20.7' W = 4.5(78 PSF) + 4.5(100) = 405 + 450 = .86 KLF

W = .86(20.7) = 17.8 K R = 8.9 K

M = 17.8(20.9) ÷ 8 = 46.1 IK

~~W14x30~~ Mn = 84 IK S = 42 d = 13.9

USE W14x43 for COMBINED BEND'G & AXIAL LOAD ERM-B

Δ = 46.1(20.7)² / 80.6(42)3.9 = .42" TL = L/592

.20 DL
.22 LL

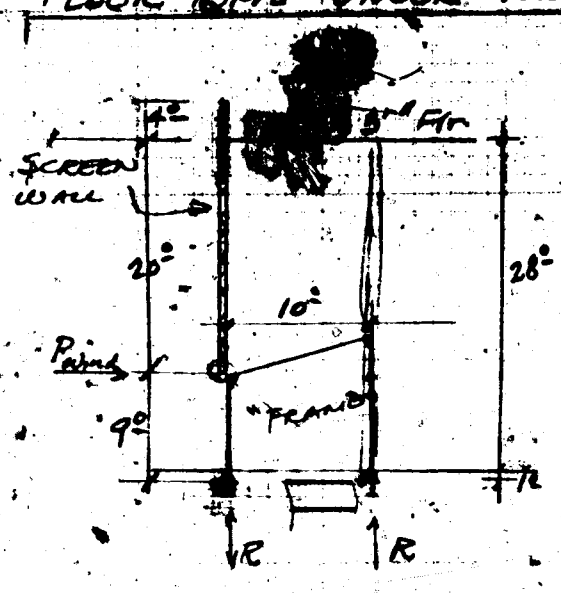
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CLIENT/ SHEET 55 OF 317
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PLAZA FLR FRMG BY/ JM

FLOOR BMS UNDER TUBE FRAMES L = 7'



$P_{wind} = (6+14)\ 10'\ (27\ PSF) = 6.7^K$ (tributary width)

$M_{OT} = 5.4(7.0) = 48.6^{IK}$

$R = 48.6 \div 10 = \pm 4.86^K$

Say 5^K

BEAMS B5, B6, B7 & B8 L = 7.5'

ASSUME MAX $M = 5^K \times 7' \div 4 = 8.8^{IK}$

$5^K \times 8 \div 4 = 10.0^{IK}$

$= 5^K$ ea.

AISC 1978 102-7

$W8 \times 24$ (MS)

$L_b = 6'$

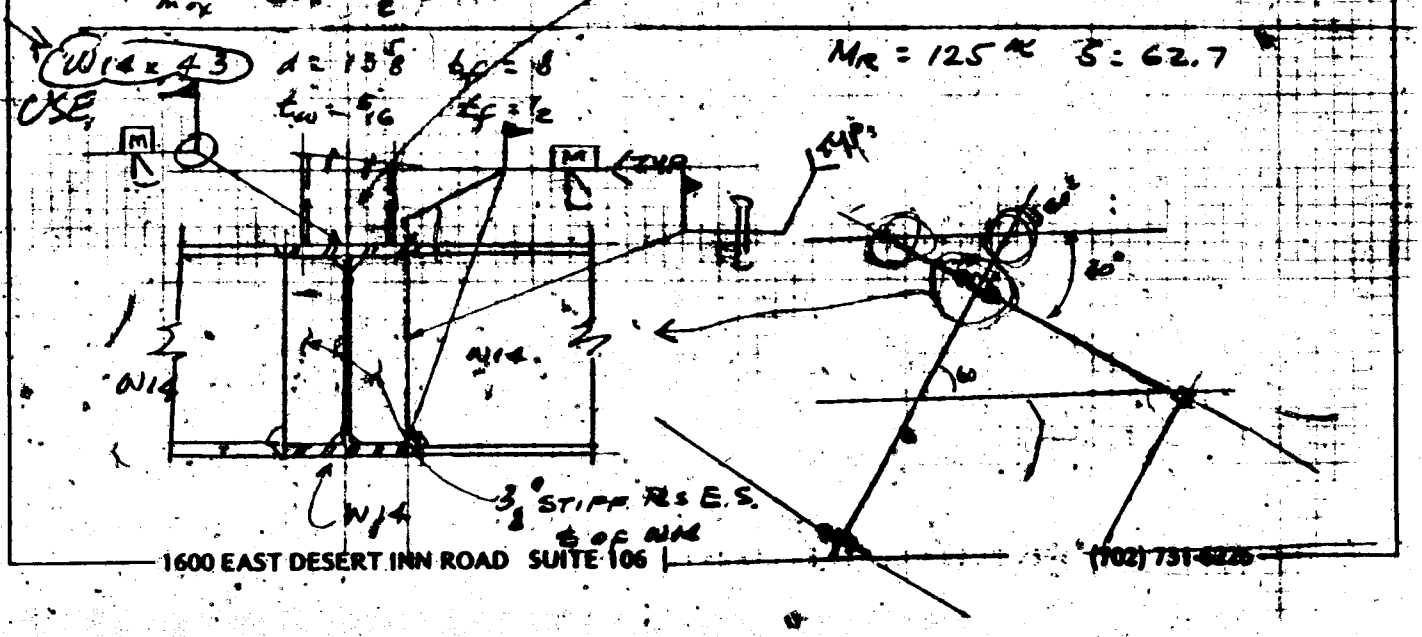
$M_R = 82^{IK}$

$S = 20.9$ $d = 7.8$

$\Delta = \frac{0.8(5^K)^3 \cdot 8}{30.4(10^3)7.8} = .184''$

$M_{max} = 8.4 \times \frac{9}{2} = 24.3^{IK}$

T.S. 6 × 6 × ½

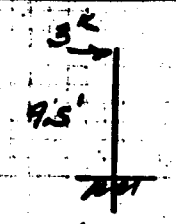


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ENGINEER/

ISOLATE FRONT Col.



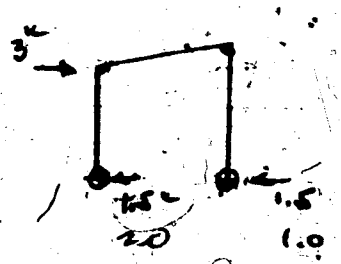
$M = 3 \times 9.5 = 28.5^{k'}$

$\Delta = \frac{Pl^3}{3EI} = \frac{3.0(9.5)^3 1.728}{3(29)I} = \frac{51.09}{I} \leq \frac{L}{360} = .32"$

$I = 51.09 \div .32 = 160$



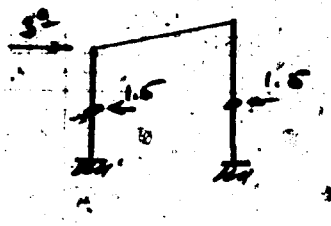
A$_1$ FRAME Planar beam



$M_L = 9.5(1.5) = 14.25$

$M_R = 1.5(14.5) = 21.75$

A$_2$ FRAME FIXED BASE



$M_L = 1.5(9.5).5 = 7.125$

$M_R = 1.5(14.5).5 = 10.875$

T.S. 6x6x½" $f_s = 10.875 \times 12 \div 16.8 = 7.77$ ksi

Longit. FORCE FRONT FRAME

WALL $10' \times 25 PSF \times 35' = 8750^{\#}$

$F_p = ZIC_p W_p$

$= .375(1.5).8(8750)$

$= 3940^{\#}$

Say 4^k

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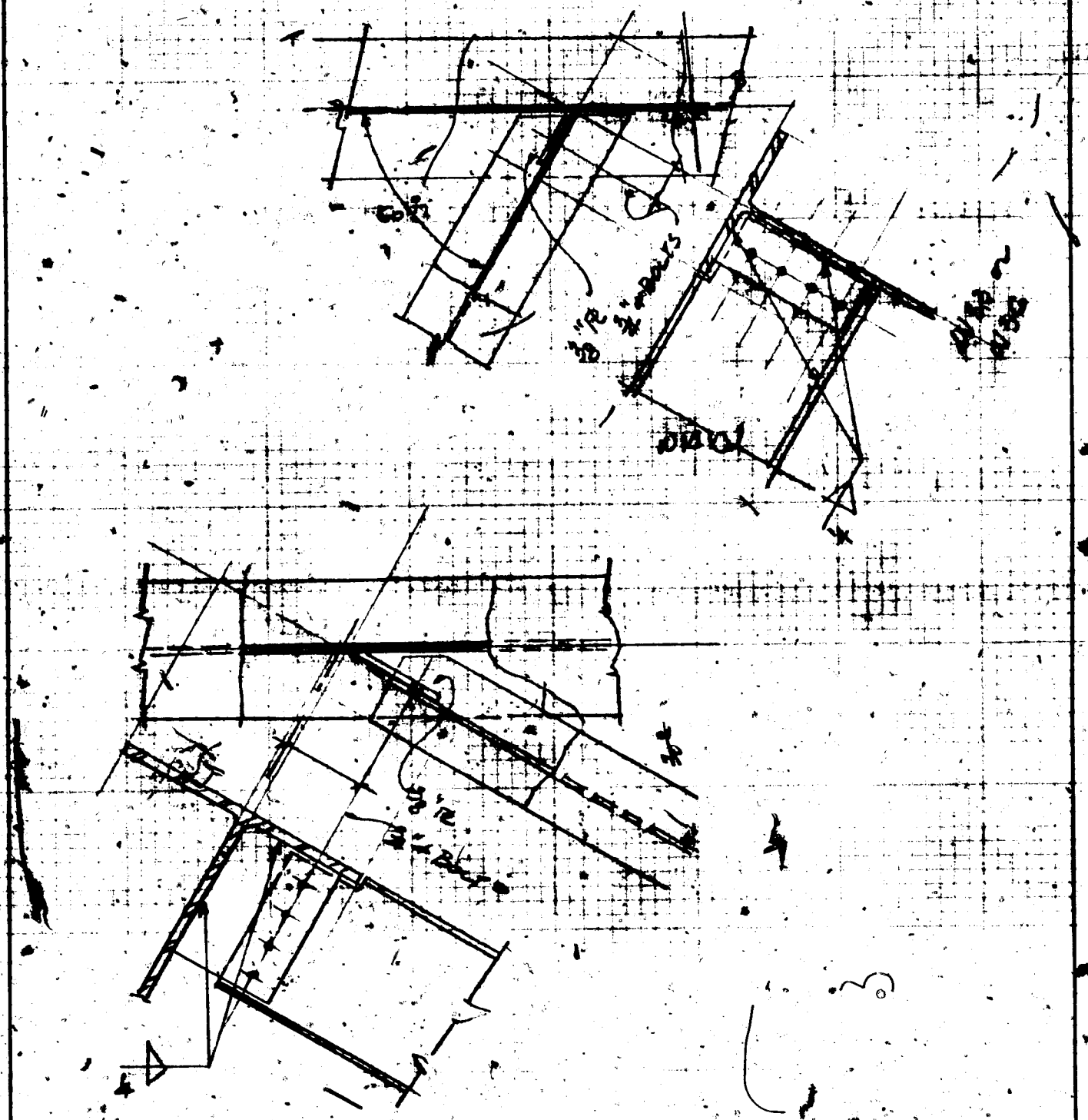
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DATE/ 10-8-

PLAZA ENTRY FRAMES

ENGINEER/



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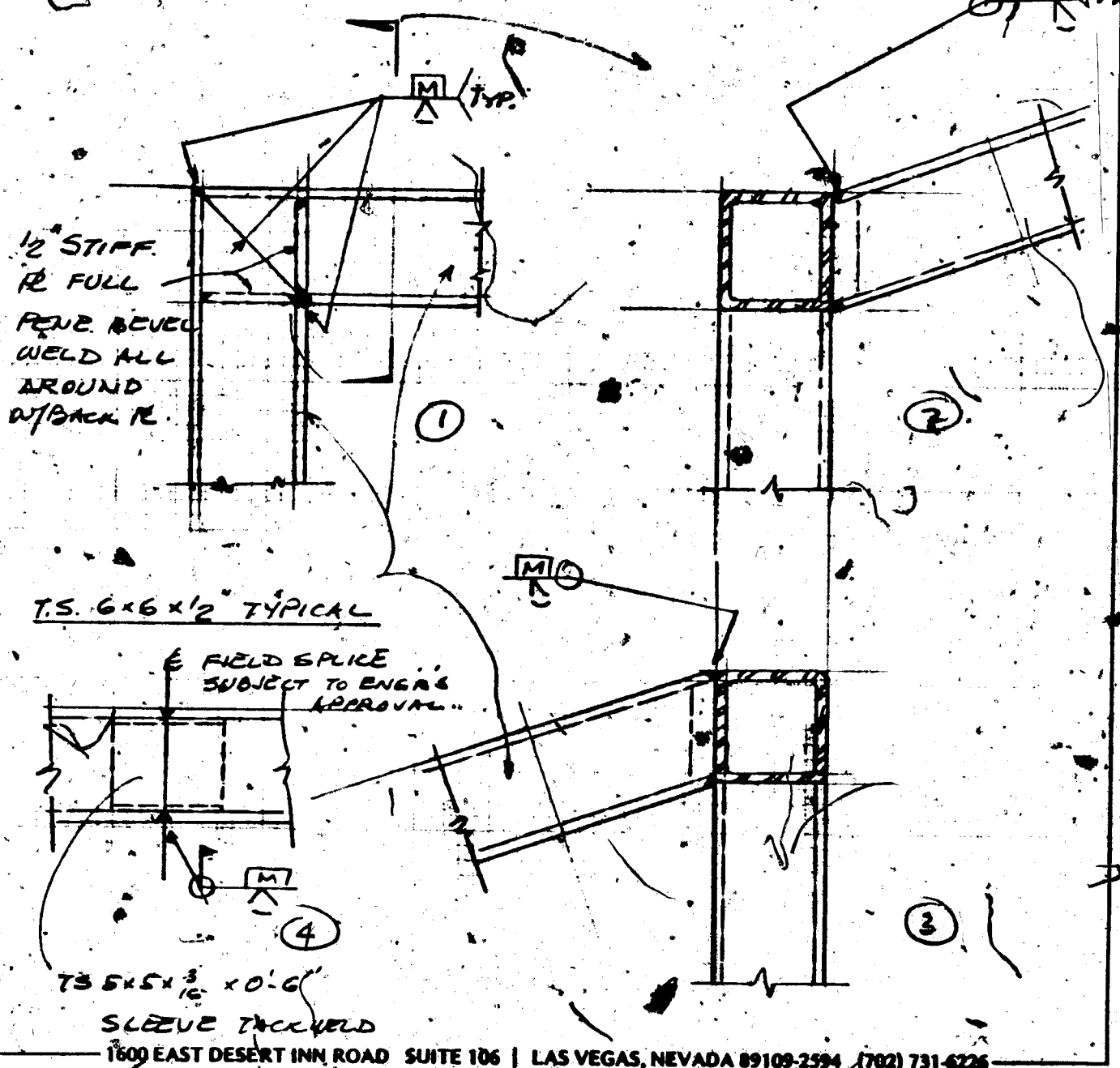
PLAZA ENTRY

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PROJECT # 2017

DATE 10-82

ENGINEER



1600 EAST DESERT INN ROAD SUITE 106 | LAS VEGAS, NEVADA 89109-2594 (702) 731-6226

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SHT NO 59 OF 347

PLANE FRAME ANALYSIS PROGRAM

STRAUSS & LOFTFIELD,

FRAME I.D.: SIDE FRAME

NUMBER OF JOINTS 4
NUMBER FRAME MEMBERS 3
NUMBER OF RESTRAINED JOINTS 2
MODULUS OF ELASTICITY IS 29000 KSI

JOINT COORDINATES:

JOINT	X (FT.)	Y (FT.)
1	0.00	0.00
2	0.00	9.00
3	11.00	14.30
4	11.00	0.00

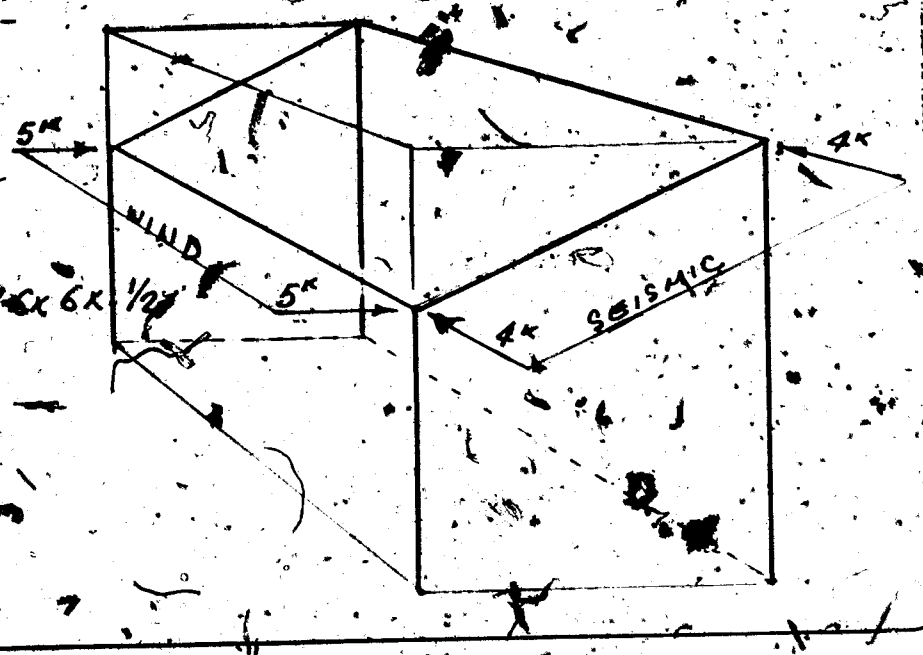
MEMBER INFORMATION:

MEM. #	TYPE #	JT #1	JT #2	AREA IN^2	I Z-Z IN^4	LENGTH FEET
1	1	1	2	10.40	50.50	9.00
2	1	2	3	10.40	50.50	12.21
3	1	3	4	10.40	50.50	14.30

JOINT RESTRAINTS:

JOINT	JR1(H)	JR2(V)	JR3(R)
1	1	1	1
4	1	1	1

UPPER BAND WIDTH IS



ALL MEMBERS TS 6x6x1/2

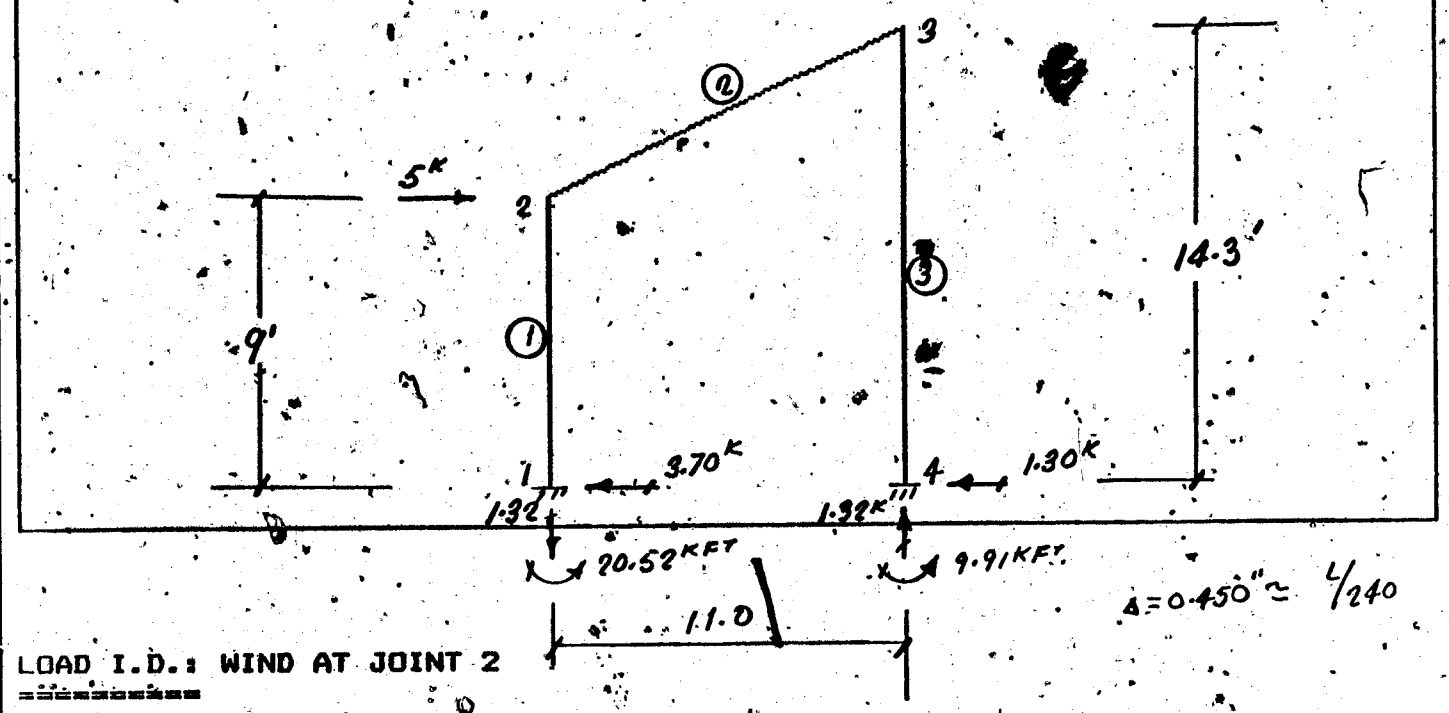
Calcs (2)
501 N. Casino Center

Lucas Collins 12-19-84

SHT N°60

PAGE 2

FRAME GEOMETRY



LOAD I.D.: WIND AT JOINT 2

JOINT LOADS:

JT. #	HOR. (KIPS)	VERT. (KIPS)	MOMENT (FT-K)
2	5.00	0.00	0.00

JOINT DISPLACEMENTS:

JT. #	HORIZONTAL (INCHES)	VERTICAL (INCHES)	ROTATION (RADIAN)
1	0.00000	0.00000	0.000000
2	0.44957	0.00047	-0.003409
3	0.44984	-0.00075	-0.000898
4	0.00000	0.00000	0.000000

Luis Calleja 12-14-84

SHT N°61

MEMBER FORCES:

MEMBER NO.	LEFT END AXIAL (KIP)	LEFT END SHEAR (KIP)	LEFT END MOMENT (FT-K)	RIGHT END AXIAL (KIP)	RIGHT END SHEAR (KIP)	RIGHT END MOMENT (FT-K)
1	-1.32	3.70	20.52	1.32	-3.70	12.81
2	0.59	-1.76	-12.81	-0.59	1.76	-8.63
3	1.32	1.30	8.63	-1.32	-1.30	-9.91

SUPPORT REACTIONS:

JOINT NO.	HORIZONTAL (KIPS)	VERTICAL (KIPS)	MOMENT (FT-K)
1	-3.70	-1.32	20.52
4	-1.30	1.32	9.91

SAME FRAME NEW LOADS:
########################

LOAD I.D.: SEISMIC AT JOINT 2

JOINT LOADS:

JT. #	HOR. (KIPS)	VERT. (KIPS)	MOMENT (FT-K)
2	4.00	0.00	0.00

JOINT DISPLACEMENTS:

JT. #	HORIZONTAL (INCHES)	VERTICAL (INCHES)	ROTATION (RADIAN)
1	0.00000	0.00000	0.000000
2	0.35966	0.00038	-0.002727
3	0.35988	-0.00060	-0.000719
4	0.00000	0.00000	0.000000

MEMBER FORCES:

MEMBER NO.	LEFT END AXIAL (KIP)	LEFT END SHEAR (KIP)	LEFT END MOMENT (FT-K)	RIGHT END AXIAL (KIP)	RIGHT END SHEAR (KIP)	RIGHT END MOMENT (FT-K)
1	-1.06	2.96	16.42	1.06	-2.96	10.25
2	0.47	-1.41	-10.25	-0.47	1.41	-6.90
3	1.06	1.04	6.90	-1.06	-1.04	7.93

Lula Collins 12-19-84

SHT N°62

SUPPORT REACTIONS:

JOINT NO.	HORIZONTAL (KIPS)	VERTICAL (KIPS)	MOMENT (FT-K)
1	-2.96	-1.06	16.42
4	-1.04	1.06	7.93

Lisa Collins 12-19-84

SHT N° 63

FRAME I.D.: FRONT FRAME

NUMBER OF JOINTS 4
NUMBER FRAME MEMBERS 3
NUMBER OF RESTRAINED JOINTS 2
MODULUS OF ELASTICITY IS 29000 KSI.

JOINT COORDINATES:

JOINT	X (FT.)	Y (FT.)
1	0.00	0.00
2	0.00	9.00
3	12.00	9.00
4	12.00	0.00

MEMBER INFORMATION:

MEM. #	TYPE #	JT #1	JT #2	AREA IN^2	I-Z-Z IN^4	LENGTH FEET
1	1	1	2	10.40	50.50	9.00
2	1	2	3	10.40	50.50	12.00
3	1	3	4	10.40	50.50	9.00

JOINT RESTRAINTS:

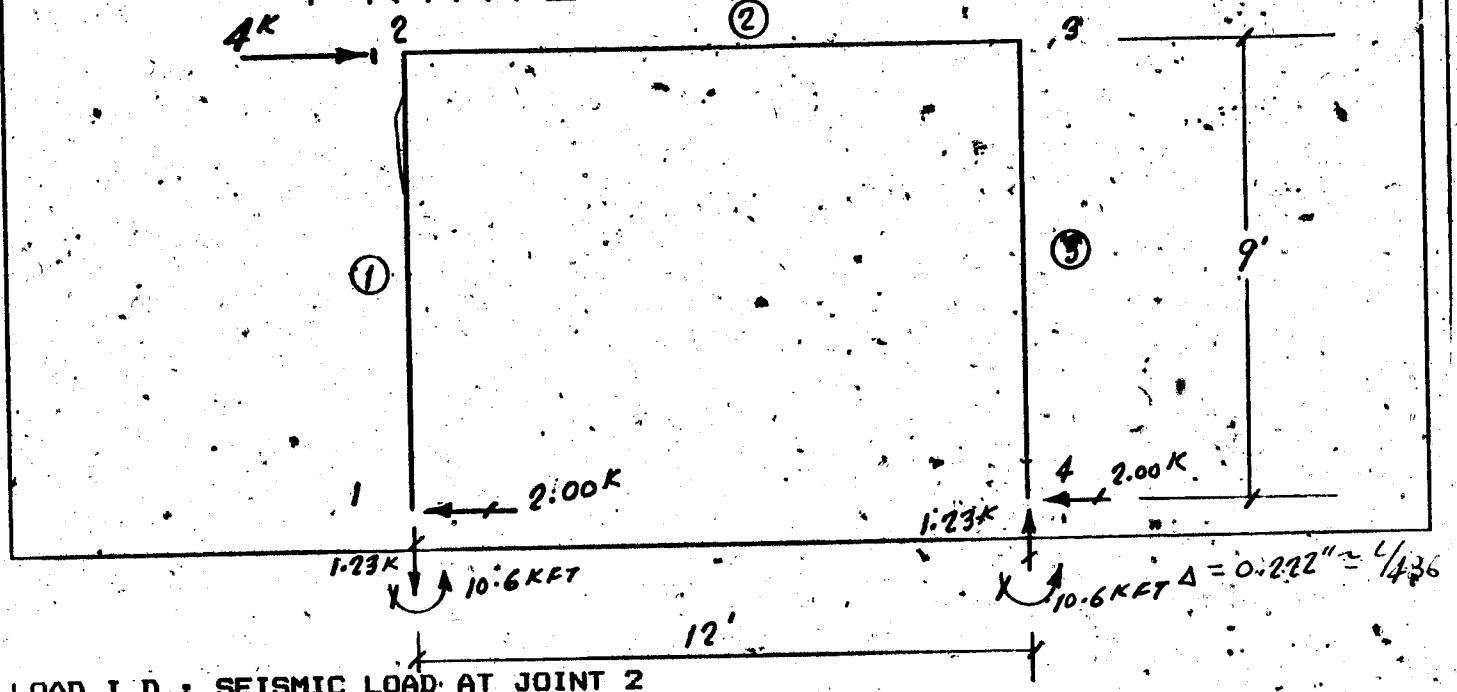
JOINT	JR1(H)	JR2(V)	JR3(R)
1	1	1	1
4	1	1	1

UPPER BAND WIDTH IS 6

Lucia Collins 12-19-84

SNT N°64
PAGE 6

FRAME GEOMETRY



LOAD I.D.: SEISMIC LOAD AT JOINT 2

JOINT LOADS:

JT. #	HOR. (KIPS)	VERT. (KIPS)	MOMENT (FT-K)
2	4.00	0.00	0.00

JOINT DISPLACEMENTS:

JT. #	HORIZONTAL (INCHES)	VERTICAL (INCHES)	ROTATION (RADIAN)
1	0.00000	0.00000	0.000000
2	0.22230	0.00044	-0.001458
3	0.22135	-0.00044	-0.001448
4	0.00000	0.00000	0.000000

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SHT NO 65
PAGE 7

MEMBER FORCES:

MEMBER NO.	LEFT END AXIAL (KIP)	LEFT END SHEAR (KIP)	LEFT END MOMENT (FT-K)	RIGHT END AXIAL (KIP)	RIGHT END SHEAR (KIP)	RIGHT END MOMENT (FT-K)
1	-1.23	2.00	10.66	1.23	-2.00	7.37
2	2.00	-1.23	-7.37	-2.00	1.23	-7.35
3	1.23	2.00	7.35	-1.23	-2.00	10.62

SUPPORT REACTIONS:

JOINT NO.	HORIZONTAL (KIPS)	VERTICAL (KIPS)	MOMENT (FT-K)
1	-2.00	-1.23	10.66
4	-2.00	1.23	10.62

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FRAME I.D.: REAR FRAME

NUMBER OF JOINTS 4
NUMBER FRAME MEMBERS 3
NUMBER OF RESTRAINED JOINTS 2
MODULUS OF ELASTICITY IS 29000 KSI.

JOINT COORDINATES:

JOINT	X (FT.)	Y (FT.)
1	0.00	0.00
2	0.00	14.30
3	12.00	14.30
4	12.00	0.00

MEMBER INFORMATION:

MEM. #	TYPE #	JT #1	JT #2	AREA IN^2	I Z-Z IN^4	LENGTH FEET
1	1	1	2	10.40	50.50	14.30
2	1	2	3	10.40	50.50	12.00
3	1	3	4	10.40	50.50	14.30

JOINT RESTRAINTS:

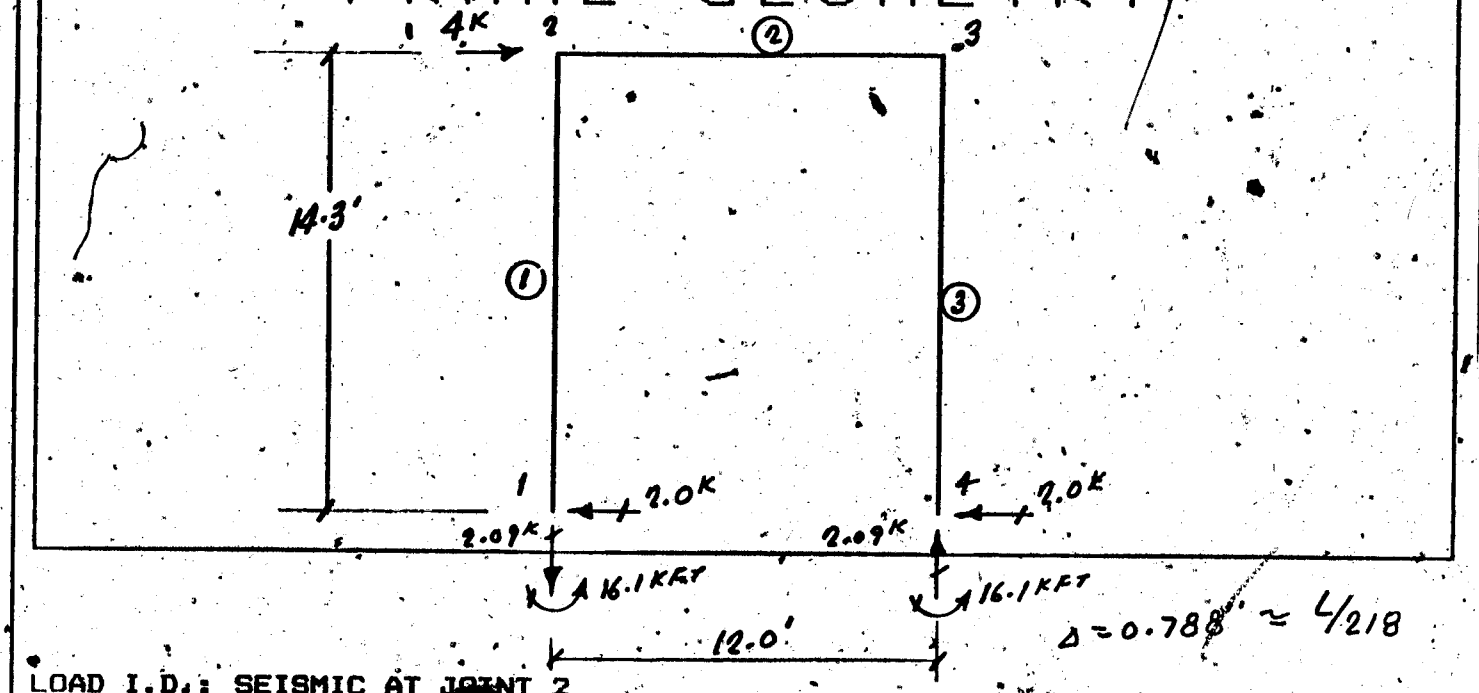
JOINT	JR1(H)	JR2(V)	JR3(R)
1	1	1	1
4	1	1	1

UPPER BAND WIDTH IS 6

Lisa Collins · 12-19-84

SHT NO 67
PAGE 9

FRAME GEOMETRY



LOAD I.D.: SEISMIC AT JOINT 2

JOINT LOADS:

JT. #	HOR. (KIPS)	VERT. (KIPS)	MOMENT. (FT-K)
2	4.00	0.00	0.00

JOINT DISPLACEMENTS:

JT. #	HORIZONTAL (INCHES)	VERTICAL (INCHES)	ROTATION (RADIAN)
1	0.00000	0.00000	0.000000
2	0.78845	0.00119	-0.002484
3	0.78750	-0.00119	-0.002479
4	0.00000	0.00000	0.000000

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MEMBER FORCES:

MEMBER NO.	LEFT END AXIAL (KIP)	LEFT END SHEAR (KIP)	LEFT END MOMENT (FT-K)	RIGHT END AXIAL (KIP)	RIGHT END SHEAR (KIP)	RIGHT END MOMENT (FT-K)
1	-2.09	2.00	16.07	2.09	-2.00	12.54
2	2.00	-2.09	-12.54	-2.00	2.09	-12.53
3	2.09	2.00	12.53	-2.09	-2.00	16.06

SUPPORT REACTIONS:

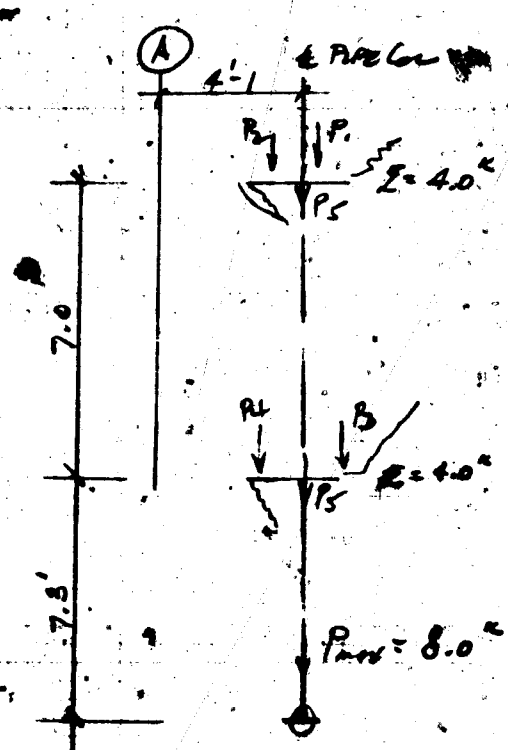
JOINT NO.	HORIZONTAL (KIPS)	VERTICAL (KIPS)	MOMENT (FT-K)
1	-2.00	-2.09	16.07
4	-2.00	2.09	16.06

Lilla Cellini 12-19-84

STRAUSS & LOFTFIELD
STRUCTURAL ENGINEERS

CLIENT/ SHEET 69 OF 317
PROJECT/ PROJECT # 8201.7
STAIR #6 DATE/ 10-82
ENGINEER/ Jim

POST @ INNER STRINGERS 4'-6 ± EAST (RIGHT) OF (A) (10)
LEVEL 104.0± THRU 97.3± TO FDN UNDER 90.0



$P_1 = 4.6'(1.6')(50+100) = 368 + 736 = 1105^{\#}$ (7.36)

$P_2 = 6.0(1.6)(50+100) = 480 + 960 = 1440^{\#}$

$P_3 = P_{R2} = 1440^{\#}$

$P_4 = P_1 = 1105^{\#}$

$P_5 = \text{landing} = (50\ PSF + 100)[2.4(3.75)]$ (9.0)

$450 + 900 = 1350$

Pmisc = 8.0"

USE 3" ϕ STD STL PIPE COL

e = 1' $M_e = 8.0^{\#} \times 6" = 8"^{\#} = 8000^{\#}$

P = 8.0 $\frac{P}{A} = \frac{8000}{2.28} = 3.59$

3" ϕ STD. r = 1.16

$\ell = 7.3(12) = 87.6$ $kl/r = 75.5$ $F_a = 15.85$ $\frac{}{} = .23$

$M = 8000^{\#}$ $f_b = 465\ psi$

$S = 472$ $F_b = 20000$ $\frac{}{} = .23$

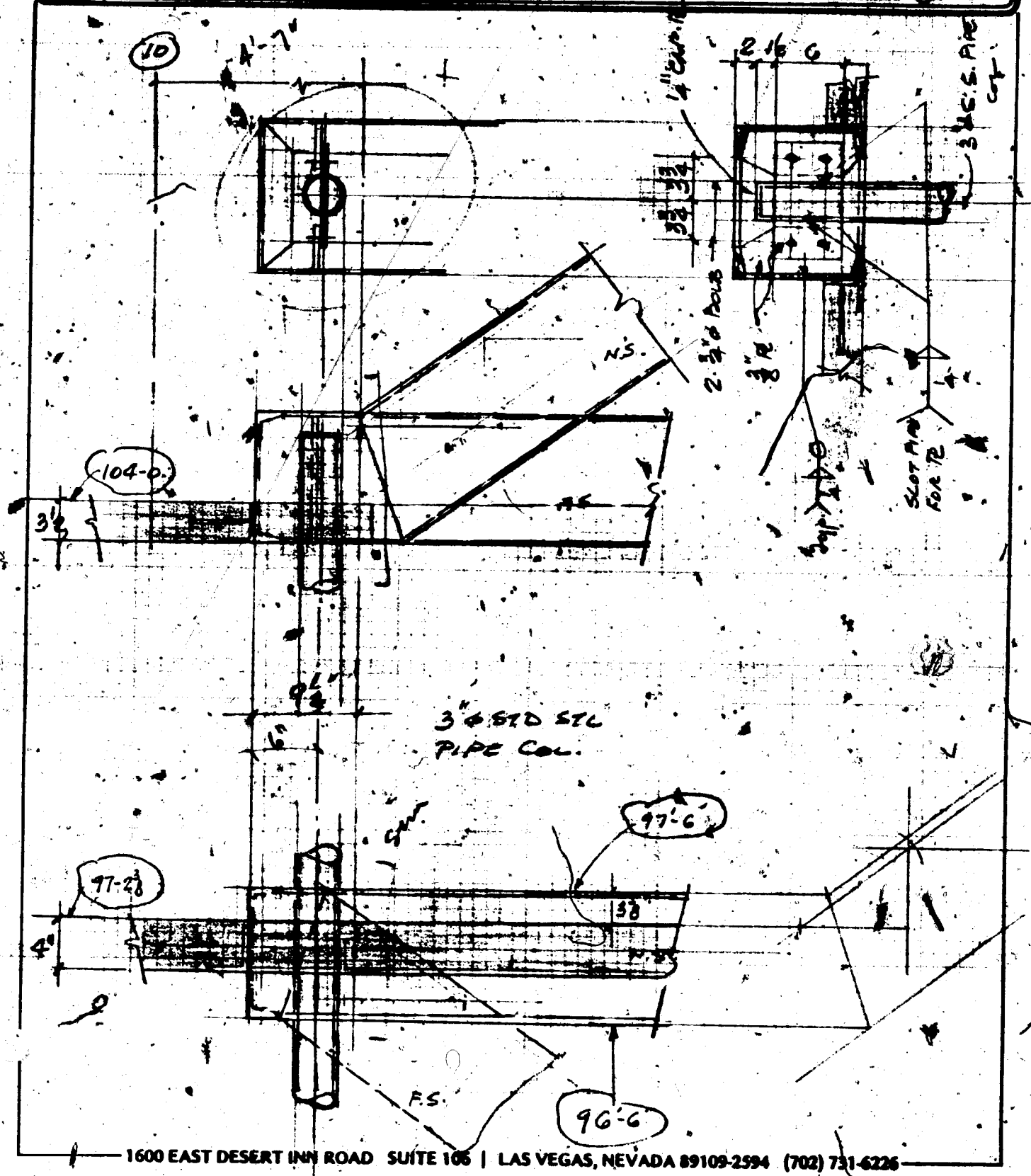
.46 < 1.0

Lucia Collins 12-19-84

STRAUSS & LOFTFIELD
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CLIENT/
PROJECT/
STAIR # 6

SHEET/ 70 OF 317
PROJECT # 6246.17
DATE/ 10-8-84
ENGINEER/ JM



1600 EAST DESERT INN ROAD SUITE 105 | LAS VEGAS, NEVADA 89109-2594 (702) 731-6226

Lucia Gables 12-19-84

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CLIENT/ SHEET/ 71 OF 317
PROJECT/ PROJECT # 82017
DATE/ 10-82
STAIR LANDINGS ENGINEER

1½" B deck 20 ga. w/ 3½ lwt conc. DECK FILLED Conc + 20# Const
as. form W = 30 + 2.5 + 20 = 52.5 = 55 PSF

$I_{req'd} = (1.144(W_D) + K_1 L) L^3 \times 10^{-5}$

$K_1 = .727$ $W_D = 55$ $L = 7.5$

$\frac{L}{180} = .5"$

$= \left(1.144(55) + .727(7.5)\right) 7.5^3 \times 10^{-5}$

$= [(62.92) + 5.45]\ 421.875 \times 10^{-5} = .288 \div .222 = I_D$

SHORE

$\frac{K_1 L^4 \times 10^{-5}}{I} \pm \frac{.727(7.5)^4 \times 10^{-5}}{.222} = 0.104 < 1.0$

≥ 1.0 causes ponding failure. OK

$I_{tw} = (.858 W_D + K_2 L) L^3 \times 10^{-6}$

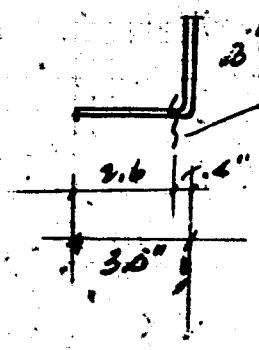
$= [(.858(55) + (.442 \times 7.5)] 7.5^3 \times 10^{-6}$

421.88

$= .021 < .222$

EDGE ANGLE

deck $R = (\frac{D}{50 \text{ to } 100})^4 7.5/2 = 562.5^{\#}/_{1}$



$M = 562.5(2.6)^2 .5 = 1901^{\#}/_{1}$

$S_{req} = \frac{12(.18)^2}{6} = .070$

$f_b = 1901 \div .070 = 27.2^{ksi}$ > 20.

USE L 3 x 3 x ⅜

$S_{leg} = \frac{12(.375)^2}{6} = .281$

$f_b = 6.8$ ksi < 20

c 7.5' span under c stringer. L 3x3x¼

$S_{leg} = 2(.25)^2 = .125$

$f_b = 15.24$ ksi

Lucia Collins 12-19-84

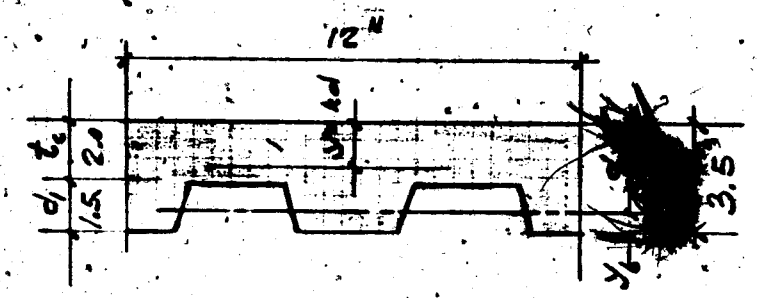
STRAUSS & LOFTFIELD
STRUCTURAL ENGINEERS

CLIENT/ SHEET 72 OF 317
PROJECT/ PROJECT # 82017
DATE/ 10-82
ENGINEER/

1½" B DECK 20 GA. — Reg. Wt. Conc.

$I_R = .249$ $S_t = .270$ $y_b = .908$
$I_D = .222$ $S_b = .265$ $A_s = .663$
} INRYCO MANUEL 21-13

n = 9
deck
$F_y = 33$ ksi



$d = t - y_b = 3.5 - .908 = 2.592$

$\rho = A_s \div 12d = .663 \div 12(2.592) = .021$

$k = [(2\rho n + (\rho n)^2]^{1/2} - (\rho n) = [(2 \times .021 \times 9) + (.021 \times 9)^2]^{1/2} - (.021 \times 9) = .454$

$t_c = t - d_1 = 3.5 - 1.5 = 2.0$

$kd = .454 \times 2.592 = 1.177 \leq t_c$ (if $kd > t_c$, $kd = t_c$)

$Y = kd$

$I_c = \frac{4Y^3}{n} + A_s(d-Y)^2 + I_f = \frac{4(1.177)^3}{9} + .663(2.592 - 1.177)^2 + .249$

$= 0.725 + 1.327 + .249$

$= \underline{2.301} = I_c$

$S_T = I_c n / Y = 2.301 \times 9 \div 1.177 = \underline{17.598} = S_T$

$S_c = I_c / (t - Y) = 2.301 \div (3.5 - 1.177) = \underline{.991} = S_c$

Composite / unshored:

$W_0 = .3 f'_c S_T \div L^2 = .3(3000)\,17.598 \div 7.5^2 = 281$ PSF IMPOSED BENDING

$W_1 = 43{,}704 \frac{I_c^{2.50}}{L^{3.5}} = 238.4$ PSF DEFL. $< L/360$

$W_2 = 2V_R \div L = 2(1135) \div 7.5 = 302.7$ PSF DECK END SHEAR

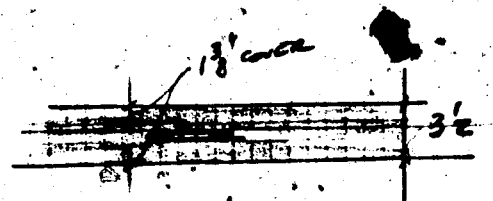
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Lyle Allen 12-19-84

STRAUSS & LOFTFIELD
STRUCTURAL ENGINEERS

CLIENT/ | SHEET/ 73 OF 317
PROJECT/ | PROJECT #
DATE/
STAIR LANDINGS | ENGINEER/

3½" SLAB $f'_c = 3ksi$ $F_y = 60$ A_s #3



$d = 3.5 \div 2 = 1\frac{3}{4}" = 1.75$

$\frac{3}{8} + \frac{3}{8} = \left(\frac{3}{4} + 3\frac{1}{2}\right) = 2\frac{3}{4} \div 2 = 1\frac{3}{8}$" COVER TYP.

3 c 12 $A_s = .11^{0"}$ $M_u = .11(60).9(1.75) \div 12 = .87$ 'k

4 c 12 $A_s = .20$ $M_u = .20(60).9(1.50) \div 12 = 1.35$ 0.12" 1.62 @ 10"

$w = 1.4(50) + 1.7(100) = 70 + 170 = .240$ k/f

$L_{min} = 7.5'$ $M_u = .240(7.5)^2 \div 8 = 1.69$ 'k Long span
$V_u = .240(7.5).5 = 900$ #/' $v = 21.4$ psi ✓

$L_{typ} = 3.2'$ $M_u = .240(3.2)^2 \div 8 = .31$ 'k < .87
$V_u = .240(3.2).5 = .38$ k/' $v = \frac{380}{12(25)1.75} = 21.3$
$\frac{1}{(\ )} 3.5 = 10.6$

USE 1½" B DECK W/ TOTAL THICKNESS 3½" on Δ"

USE #3 c 10" EW in MID SLAB.
USE ⅜" ϕ x 10" DZL "NELSON BAR" ANCHOR @ 10" oc

EXTEND 2'-0" INTO MAIN FLR DECK SLAB.

$L = 4.6$
$M_u = .240(4.6)^2 \div 8 = .63$ 'k < .87
$V_u = 1.240(4.6).5 = 540$ #/' $v = \frac{540}{12(3.5)} = 12.9$ ✓

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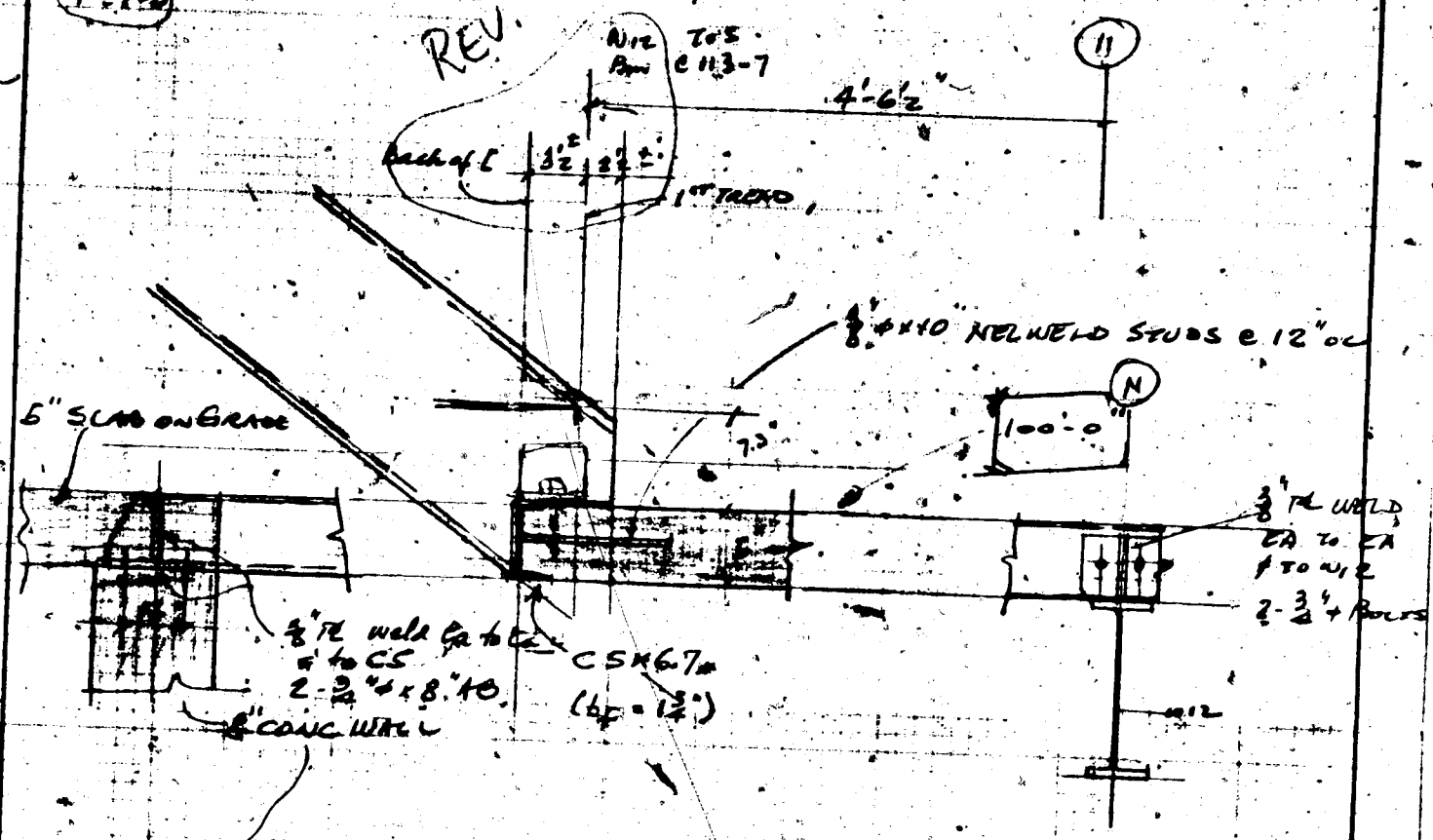
Lula Collins 12-19-84

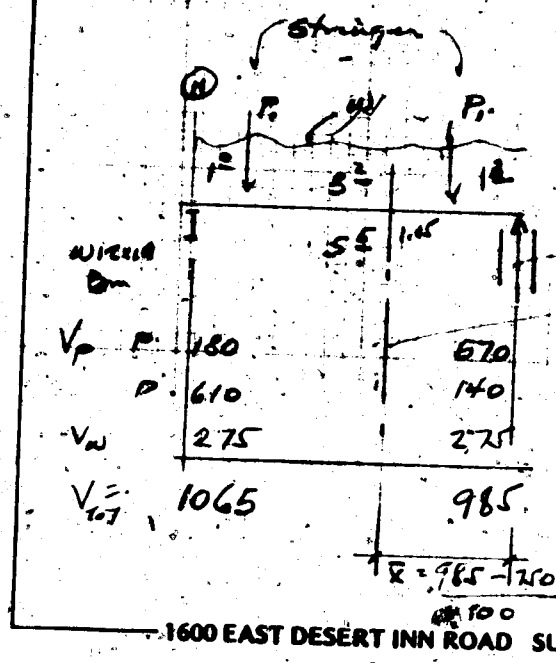
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CLIENT/
PROJECT/
SHEET/ 74 OF 317
PROJECT # 8207
DATE/ 10-82
STAIR #5
ENGINEER/

1" = 1'-0"

REV.





$P_1 = 5'(50 + 100) = 250 + 500 = 750$ PLF

Beam 10
Slab: $\frac{5}{12} \times 150 \times .5 = 25$
$W = 50$ PLF D
$+ 50$ L
$W = 100$ PLF

$M = 985(2.35) = 2,315$ ft-k
$-750(1.15) = -788$
$-100(2.35)^2/2 = -277$
-1065
$= 1250$ ft-k
$= 15000$ in-k

C8x11.5 $s = 8.14$ $f_s = 1.85$ ksi.

$\Delta \simeq \frac{1.25(5.5)^2}{30.6(8.14)8} = .007"$

C5x6.7 $I3 = 3.0$ $f_s = 5.0$ $\Delta = .031"$

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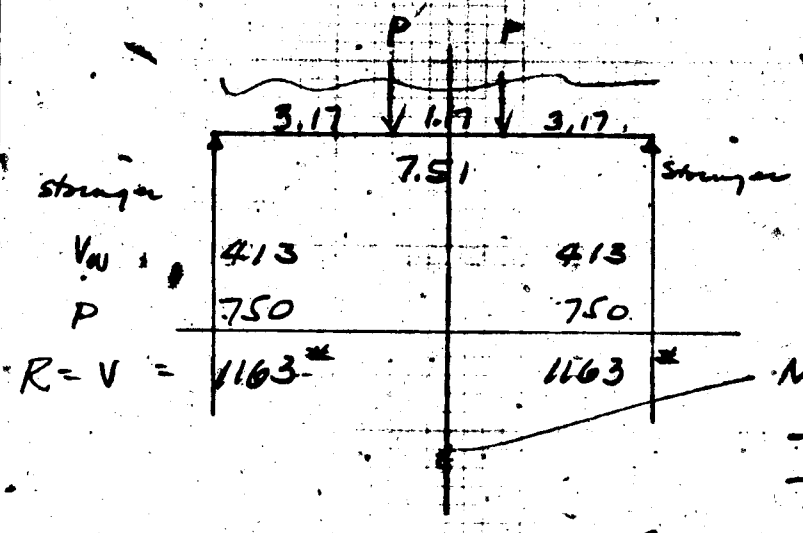
Lola Collins 12-19-84

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CLIENT/ SHEET 75 OF 317
PROJECT/ PROJECT # 82017
DATE: 10-82
STAIR #5 ENGINEER

LANDING @ 107-3"

W6 Carry 4 STRINGER + Landing T.A.



P = 5'(50+100) = 250+500
= 750 #

W slab = $\frac{3.5}{12}$ x 150 x 2.5'
= 110 PLF

W = 826

M = 1163 x 7.51 (.5) = 4367 #

$\left.\begin{array}{l} -750(1.17).5 = -440 \\ -110\left(\frac{7.51}{2}\right)^2.5 = -775 \end{array}\right\}$ -1215

M = 3152 '#
= 3.2 'K

W6x16 M_R = 20 S = 10.2 d = 6.25

$\Delta = \frac{3.2(7.5)^2}{30.6(10.2)6.25} = .035"$ ✓

OSC (a) S5x16 M_R = 17 · 5 = 8.51 d = 5

$\Delta = \frac{3.2(7.51)^2}{\quad (7.51)5} = .05"$ ✓

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Lucia Collins 12-19-84

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CLIENT/

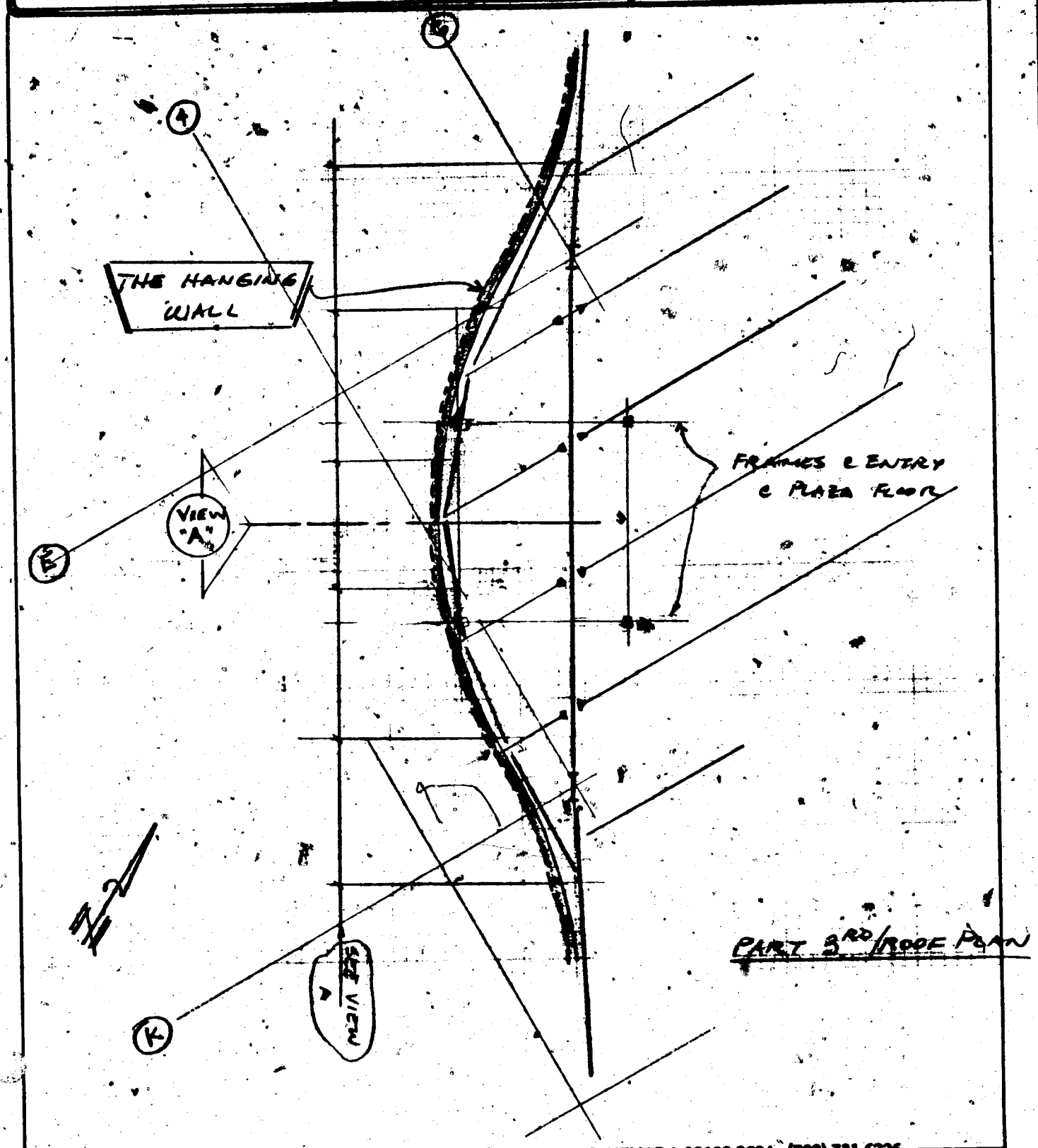
PROJECT/ PLAZA ENTRY

SHEET# 76 OF 317

PROJECT # 82017

DATE/ 10-82

ENGINEER/



PART 3RD/ROOF PLAN

1600 EAST DESERT INN ROAD SUITE 106 | LAS VEGAS, NEVADA 89109-2594 (702) 731-6226

2

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STRUCTURAL ENGINEERS

CLIENT/

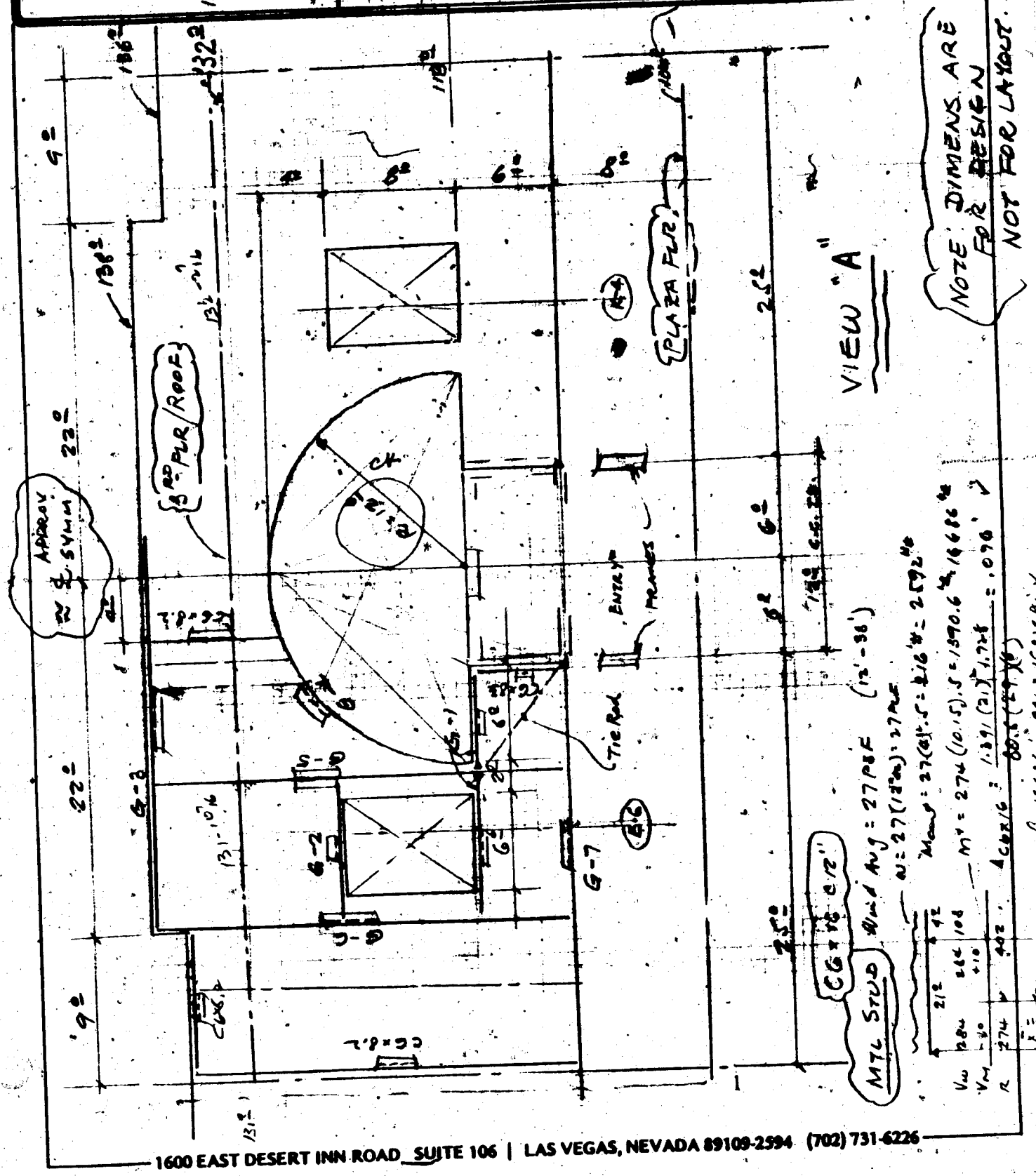
PROJECT/ EXTERIOR WALL PLAZA ENTRANCE HANGAR

SHEET 77 OF 117

PROJECT # 82017

DATE/ 10-82

ENGINEER Jm

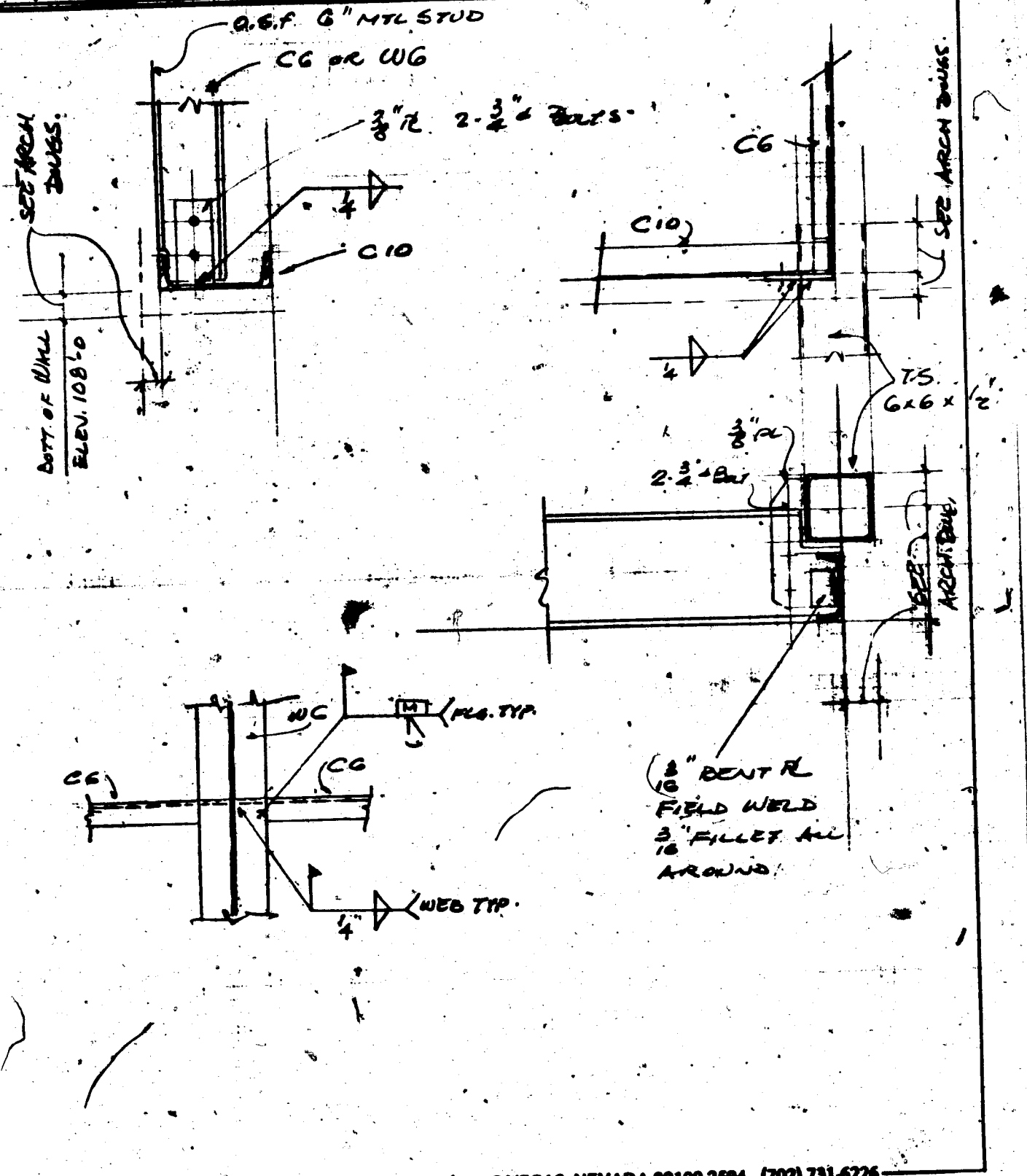


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Linda Collins 12-19-84

STRAUSS & LOFTFIELD
STRUCTURAL ENGINEERS

CLIENT/ SHEET/ 78 OF 317
PROJECT/ PROJECT # 8217
DATE/ 10-82
HANGING WALL - PLAZA ENTRY ENGINEER/



1600 EAST DESERT INN ROAD SUITE 106 | LAS VEGAS, NEVADA 89109-2594 (702) 731-6226

Lula Collins 12-19-84

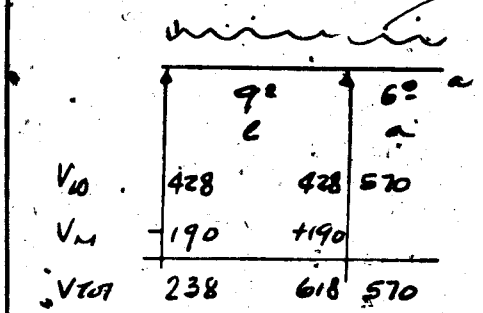
STRAUSS & LOFTFIELD
STRUCTURAL ENGINEERS

CLIENT/ SHEET 79 OF 317
PROJECT/ PROJECT # 82017
PLAZA ENTRY WALL DATE/ 10-82
ENGINEER/ JM

WIND = 27 PSF

HORIZ GIRT G-1

$w = 3.5'(27) = 95$ PLF



$\bar{x} = 2.3$ $\delta = .95 = 2.51'$ $M^- = 238(2.51).5 = 298'^{\#}$

$M_{max} = 95(6.0)^2 .5 = 1710'^{\#} < 20,620'^{\#}$

$\Delta = \frac{wa}{24EI}(4a^2\ell - \ell^2 + 3a^3) =$

$= \frac{1215(.095)6.0(1.728)}{24(29).I} = \frac{1.72}{I}$

CG = 8.2 $f_s = 4.7$ ksi ✓
$\Delta = .13"$

CB = 11.5 $f_s = 2.52$ ksi ✓
$\Delta = .05"$

HORIZ. GIRT G-2

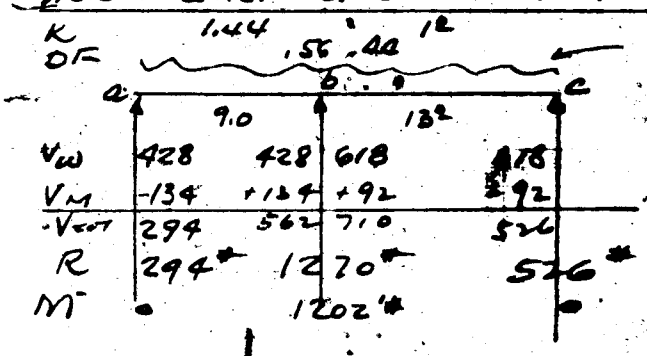
$L = 9.0'$ $w = 3.5(27) = 95$ PLF $M^- = 855^{\#}$ $R = 428^{\#}$

$M = 855(9) \div 8 = 962'^{\#} = 11543"^{\#}$

CG = 8.2 $f_s = 2.8$ ksi

$\Delta = \frac{.962(9)^2}{80.6(9.38)6} = .04"$

HORIZ GIRT G-3. @ TOP OF WALL



$w = 95$ PLF $M_9 = 95(9)^2 \div 8 = 962$

$M_{13} = 95(13)^2 \div 8 = 1391$ $M_{13} - M_9 = 429$

$M_b = 962 + (429).56 = 1202'^{\#}$
$= 14427"^{\#}$

CG = 8.2

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10-82
DESIGN

DOUBLE CURVED G-4

$L = 18'$

$W = 18(50) = 900^{\#}$ $R = 450^{\#}$

$M = 900(18) \div 8 = 2025'^{\#} = 24300''^{\#}$

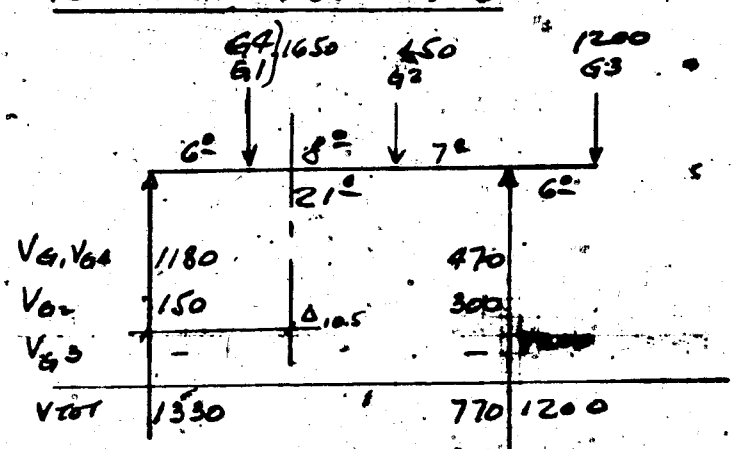
C6x8.2

USE $2 \times 67 = 54^{\#} \rightarrow$ 50 PLF

$f_b = 5.4$ ksi

$\Delta = \frac{2.025(18)^2}{80.6(4.38)6} = .31$

VERTICAL GIRT G-5



$G1 = 1200^{\#}$
$G2 = 450^{\#}$
$G3 = 1200^{\#}$
$G4 = 450$

$M_{cant} = 1200(60) = 72000''^{\#}$
$86400''^{\#}$

$M^+ = 1000(6.0) = 6,000^{\#}$
$72000''^{\#}$

DEFLECTION

@ OVERHANG

$\Delta = \frac{1200(5)^2(2146)^{1728}}{6EI} = 23.17 \div I \downarrow$

$= \frac{1650(6)15(60)(27)^{1728}}{6EI(21)} = 11.38 \div I \uparrow$

$\frac{450(14)7(6.0)27(1728)}{6EI(21)} = 3.38 \div I \uparrow$

$= 8.41 \div I \downarrow$

W6x15 = .29"
W6x16 = .26"
W6x20 = .20"
W6x25 = .16"

@ SPAN

$\Delta_{10.5} = \frac{1200(6)10}{6EI21}\left(441^{341} - 100\right)1728 = 11.61 \div I \uparrow$

$= \frac{450(7)10.5(441^{287} - 49 - 110)1728}{6EI(21)} = 4.41 \div I \downarrow$

$= \frac{1650(6)10.5(287)1728}{6EI(21)} = 13.86 \div I \downarrow$

$= 6.66 \div I \downarrow$

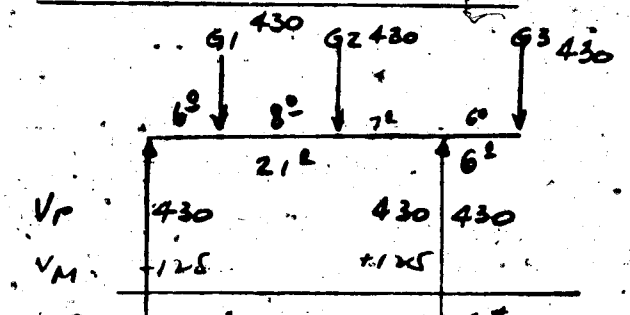
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DATE/ 10-82
PLAZA ENTRY WALL ENGINEER/

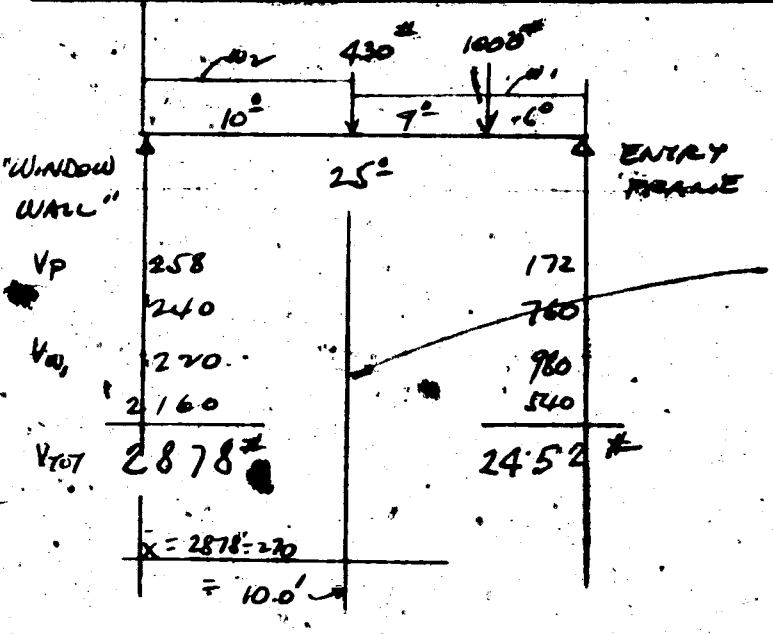
VERTICAL STRUT G-6



$M_{end} = 430 \times 6 = 2580$ #

$M_{span} = 305(6) = 1830$ #

HORIZONTAL GIRT G-7 @ "BOTTOM" OF WALL L = ±25'-1"



$w_1 = 3 \times 27 = 80$ PLF $\approx w_1$ 100

$w_2 = 10 \times 27 = 270$ PLF $\approx w_2$ 300

$M_{MAX} = 2878 \times 10 = 28.78$ ik

$\Delta = \frac{28.78(25)^2}{80.6(Sd)} = \frac{21712}{Sd} = .83$

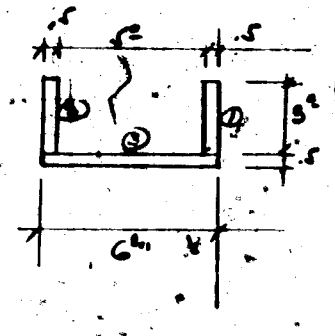
$Sd = 194.20$

Limit $d = 6"$ $S = 32.03$

Limit $\Delta = \frac{25 \times 12}{360} = .83$

$d = 8"$ $S = 24.8$ use 31

$d = 7$



	A	y	x̄	Ay	Ax	I_G
1	1.5	.25	.38	0.10	.08	
2	1.5	5.75	8.63	49.47	.03	
3	3.0	3.0	9.00	27.00	1.13	
	6.0		18.01	76.72	+ 1.19) = 77.9	
			x̄ = 3.0		-6(9) = -54.0	= 23.9 = I

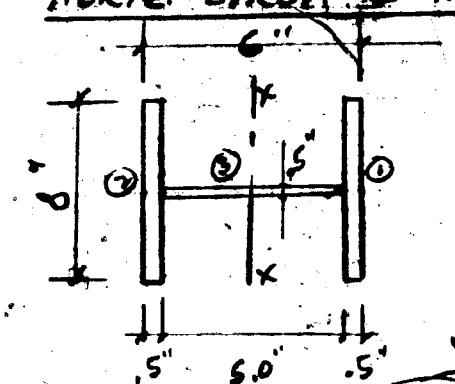
$S = \frac{23.9}{3} \approx 7.9$ < 31

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HORIZ. STRUT, G-7 @ BOTTOM OF WALL



	A	$\bar{x}$	$A\bar{x}$	$A\bar{x}^2$	I_o
①	4.0	.25	1.0	.25	
②	4.0	5.75	23.0	132.25	
③	2.5	3.0	7.5	22.50	
	10.5		31.5	155.0 − 10.5(3)² =	I_{xx}

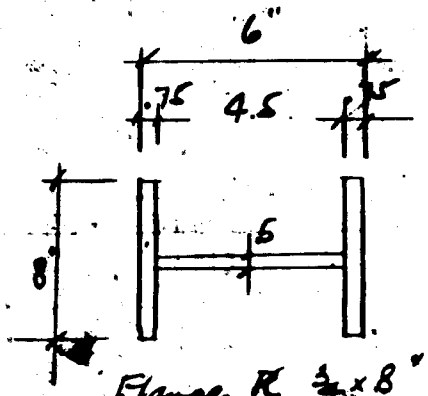
$\bar{x} = 3.0$

$60.5 = I_{xx}$

$S_{xx} = \frac{60.5}{3} = 20.2$

< 33

NG



Flange PL ¾ × 8"
Web PL ½ × 4.5"

NG

	A	$\bar{x}$	$A\bar{x}$	$A\bar{x}^2$	I_o
①	6.0	.375	2.25	.84	.28
②	6.0	5.625	33.81	190.52	.28 3.80
③	2.25	3.0	6.75	20.25	
	14.25		42.81	211.61 − 14.25(9²) =	I_{xx}

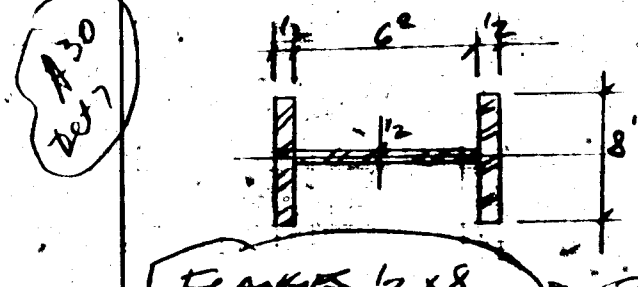
$\bar{x} = 3.0$

$= 87.72 = I_{xx}$

$\frac{87.72}{3.0} = 29.24\ S_{xx}$

< 33.0

DEEPEN THE BEAM i.e. d = 8"



A 30 Def 7

FLANGES ½ × 8
WEB ½ × 6

NG

	A	$\bar{x}$	$A\bar{x}$	$A\bar{x}^2$	I_o
	4.0	.25	1.0	.25	.08
	4.9	6.75	27.0	182.25	.08
	3.0	3.5	10.5	36.75	9.00
	11.0		38.5	219.25 + 9.16 =	

$\bar{x} = 3.5$

$11(3.5)^2 = 134.75$

$I_{xx} = 93.66$

$S_{xx} = 26.76$

CHECK A C10 or C12

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HORIZ. GIRT G:7

$\Delta \leq L/360 \leq .83$ $S_d = 198.20$ if d = 10" $S = 11.82$ C10×30 (20.7)
if d = 12" $S = 16.52$ C12×20.7 (21.5)

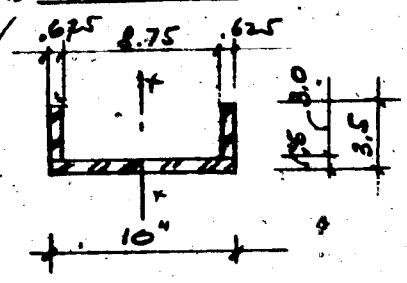
USE C10×30

d=10" $t_w = 11/16$" $b_f = 3$" t_f avg. $= 7/16$ $A = 8.82$ $S = 20.7$ $I = 103$

THIS MEMBER MUST BE CURVED TO MATCH WALL CURVE
OUTSIDE FACE OF STUD = O.S.F. C10.

OR

ALTERNATE



A.	$\bar{x}$	$A\bar{x}$	Ax^2	I_o
1.875	.313	.587	.18	.06
1.875	9.688	18.165	175.98	.06
4.375	5.0	21.875	109.38	41.67
8.125		40.627	285.54	41.79
			+041.79	
			327.38	

$\bar{x} = 5.0$
$Ax^2 = 203.125$ → 203.13
124.20 = I_{xx}
= 5.0 × 24.8 719.82

SHOP MADE WEB ½×10" CUT TO MATCH WALL CURVATURE

FLANGES ⅝"×3" ROLLED TO MATCH WALL CURVE.

WELD FULL PENE BUTT W/ BACK BEAD
GRIND O.S.F. FLG. WELD SMOOTH

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PROJECT/ HANGING WALL @ PLAZA ENTRY
SHEET/ 84 OF 317
PROJECT # 82017
DATE/ 10-82
ENGINEER/ dm

WALL WEIGHT

TYP WALL = 21 PSF + 4 = 25 PSF

@ 3rd LEVEL ROOF W_{MAX} = 25 PSF × 25' = 625 PLF

{C6 × 16.9 # @ 12" oc

$P_{W6\times25}$ = 25(27)5 = 3.38 K
+ 6 × 6 × 25 = .90
+ 4 × 10 (25) = 1.00
} = 5.3 K

$P_{C6\times8.2}$ = 25 × 25 (9÷) = 5.6 K MAX
= 25 × 12 (9') = 2.7 K MIN

CURVED ANGLE SPANS BETWEEN ROOF BEAMS (7° oc)
(MATCH WALL CURVATURE)

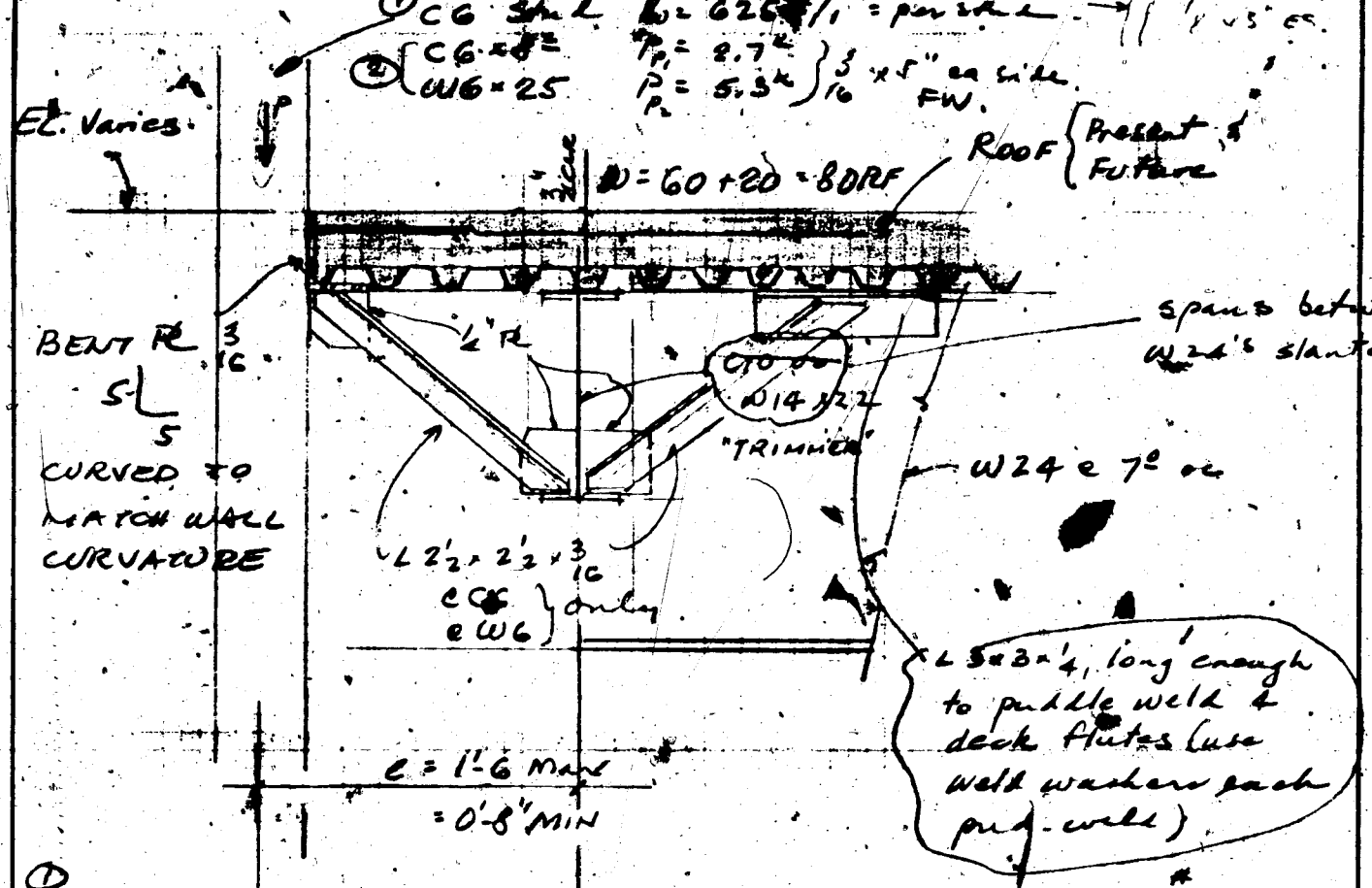
L = 8.0' CONTINUOUS 2 SPAN MIN.

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① Slab Reinf Carries w_{shed} = 625 #/' × P_{shed} × 1.4 = 875 # = P_u

w_{roof} = 60(1.4) + 20(1.7) = 84 + 34 = 120 #/' = w_u

M_u = 875(1.5') + 120(1.5)².5 = 1313 + 135 = 1.5 ^k/'

A_s = #4 @ 12 = .20" d = 5 - 1.5 - ½ = 2.5" f_y 60

M_u = .20(60).9(2.5) ÷ 12 = 2.25 ^k/' > 1.5

TYPICAL { ½" ϕ x 12" NELWELD STUDS @ 12" oc
4 x 3'-6" long @ 12" oc

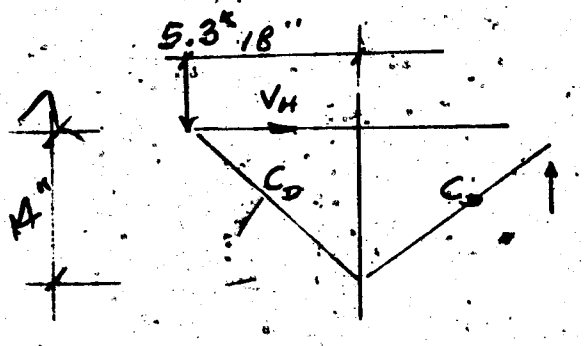
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SHEET/ 86 OF 317
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DATE/ 10-82
ENGINEER/ Sm

(2) W20 x 86 end for W6 to Bent PR Slab from Brace diag to Trim Beam bottom flange and kick back up to inner deck



$L_{diag} = \sqrt{18^2 + 14^2} = 22.8"$

Compression Diag $= 5.3 \times 22.8 \div 14$
$= 8.63^k$

$V_H = 5.3 \times 18 \div 14 = 6.81$

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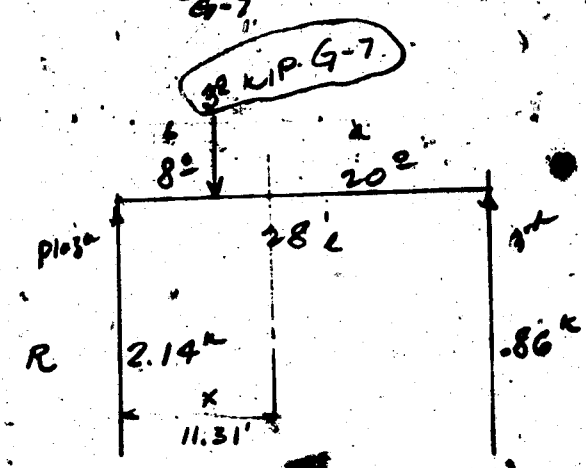
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PROJECT/

SHEET 87 OF 317
PROJECT # 82017
DATE/ 10-82
ENGINEER/ JM

VERTICAL @ ENDS OF H.W. @ MULLION WALL

$R_{G-7} = 2.878^{K}$



$M = 8(2.14^{K}) = 17.12^{K}$

$\Delta = \frac{Pab(a+2b)\sqrt{3a(a+2b)}}{27EIl}$

$= \frac{3.0(20)8(20+16)\sqrt{3(20)(20+16)}}{27E\,I(28)}$ $\quad I_{req'd}$

$= \frac{63.3}{I} \leq \frac{28\times12}{360} \leq .93 = 67.82$

$= \frac{L}{\Delta} \leq 480 \quad \leq .70 = 90.43$

USE W10×22 $\quad d \quad b_f$ $\quad 10\frac{1}{8} \times 5\frac{3}{4}$ $\quad S = 23.2 \quad I = 118$

$M_R = 46$ $\quad f_b = 6.72(12) \div 23.2 = 3.5\ ksi$

$\Delta = 63.3 \div 118 = 0.54" = L/626$

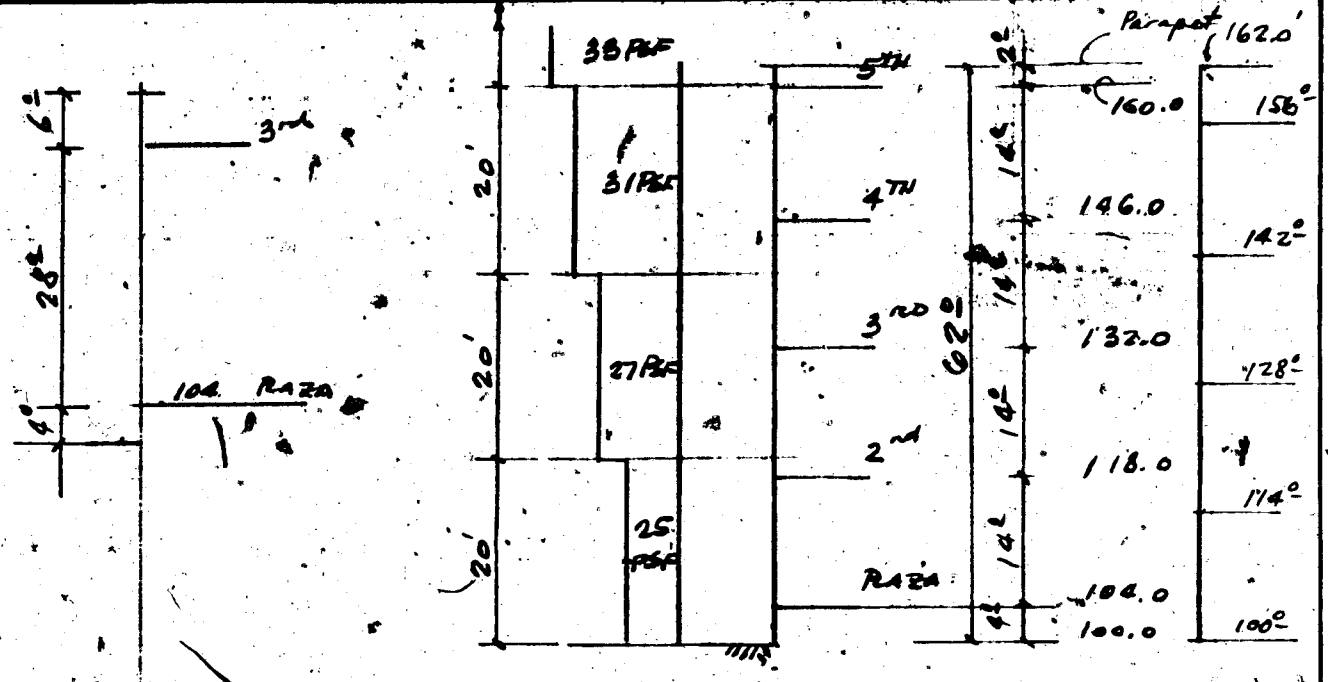
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CLIENT/
PROJECT/ LINE (1) TO LINE (12)
EXTERIOR WALLS 6" MTL STUDS

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PROJECT # 82017
DATE/ 10-82
ENGINEER



WIND = 75 MPH.

WIND

$P = C_e C_q q_s I$

$= C_e (1.2) 15 (1.15)$

$= C_e (20.70)$

$P_{0-20} = 25$ PSF

$P_{20-40} = 27$ PSF

$P_{40-60} = 31$ PSF

$P_{60-100} = 33$ PSF

I = 1.15, Q_s = 15, C_q = 1.2. C_e = 1.2 (0'-20'), 1.3 (20'-40'), 1.5 (40'-60'), 1.6 (60'-100') EXPOSURE "C"

↳ ESSENTIAL FACTOR

INRYCO / MILCOR 'C" STUDS

C-C x ___ ga @ 16" oc

Limit $\Delta_{wind} = L/360$

	L	P_w	L_{allow} @16"		
PLAZA (1ST) TO 2ND	14.0'	25 PSF	15.7 14.7	16 ga 18 ga	PRESENT
2ND TO 3RD	14.0	27 PSF	15.2 14.2	16 ga 18 ga	C-C x 18 ga C 16" oc
3RD TO 4TH	14.0	31 PSF	14.8 13.8	16 ga 18 ga	FUTURE

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PROJECT/
Exterior Walls

SHEET/ 89 OF 317
PROJECT # 82017
DATE/
ENGINEER/

PARAPETS

6' cantilever
6' low bldg
Present 3rd/Roof M1 = 27PSF(6')²1.33(.5) = 646.2 ft#
S = 7757 in#

C6x16ga M12 = 29,730 in# OK
C6x18ga M12 = 15,180 in# OK

FUTURE 5th/ROOF M1 = 32(6')²1.33(.5) = 766.1 ft# = 9193 in#

C6x16ga @16" oc OK
C6x18ga @16" oc OK

ASSUME
1- Each stud is attached to Each Floor and the vertical load of each stud is taken out at each Floor
2- All parapet conditions {4'0" / 6'0"} are continuous studs

C6x18 @ 16" oc
C6x16 @ 16" oc 14'0" Story Ht

Max Combined Loading
$P_a = 31PSF(1.33)\frac{14}{2} \approx 200^{\#}$
$f_a = \frac{200}{.44} = .450$ ksi
$kl/r = 14(12)/2.26 = 74.1$ $F_a = 16.0$

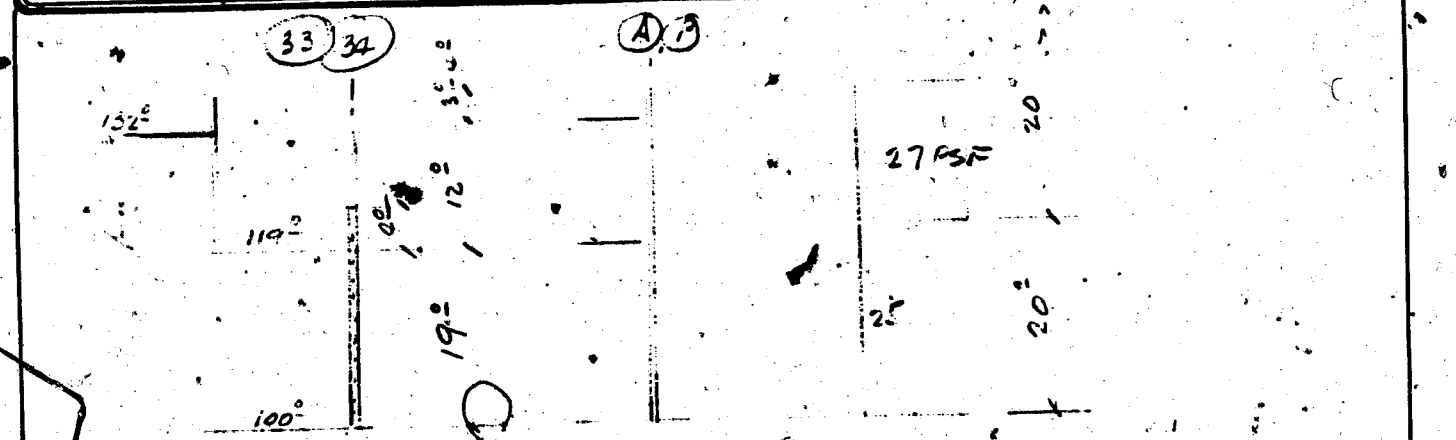
$M_1 = 31(14)^2 1.33 \div 8 = 1010 \times 12 = 12122^{in\#}$
$M_R = 29750$

Studs @ Plaza Lobby Wall
L = 28.0' WIND = 27PSF (CW10x14 @ 12" OC)
$W_{allow} = (29.4 + 27.6).5$
= 28.5 PSF > 27

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CLIENT/
PROJECT/ LINE (12) TO (34) EXTERIOR WALLS
SHEET/ 90 OF 317
PROJECT # 82017
DATE/ 10-8-
ENGINEER/



$\ell/360$

Line (A) same as 1 to (B)
2 rows @ 16" o/c

1st to 2nd L 19.0 25 PSF 19.2' USE CWG - 16ga. @12" OC
Line 33 34 A & B

2nd to Roof L 12° PSF 14'2 USE C6x18.9# @16" OC

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CLIENT/

PROJECT/ HIGH PARAPETS

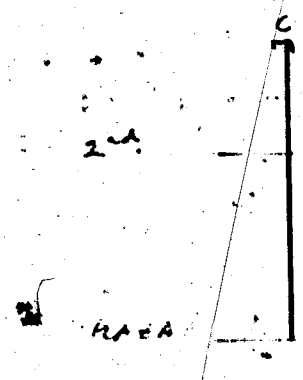
SHEET/ 91 OF 317

PROJECT # 8201

DATE/ 10-8-

ENGINEER/

LINE U T.O.P. 124.00



C16

Wind = 27 PSF × 1.33 = 36 PLF

$M_{cant} = 36(10)^2 .5 = 1,800'^{\#} = 216.00''^{\#}$

C6×16 C16

$M_{12} = 2973.0''^{\#}$

$\Delta_{cant} = \frac{wa}{24EI}(4a^2l - l^3 - 3a^3)$ I=?

$= \frac{.036(10)}{24(29)} (4(100)14 - (14)^3 - 3(10)^3)$ I=?

$= 5.23 : I$ TOO

C14" OC

$I = \frac{.027}{.036}(5.23) : I$

$= 3.9 : I$

CW 6×14 C12"

$I = 4.15$

$\Delta = .95"$ TOO MUCH

EXTEND COL. U-7, U-9 × U-12

[illegible]

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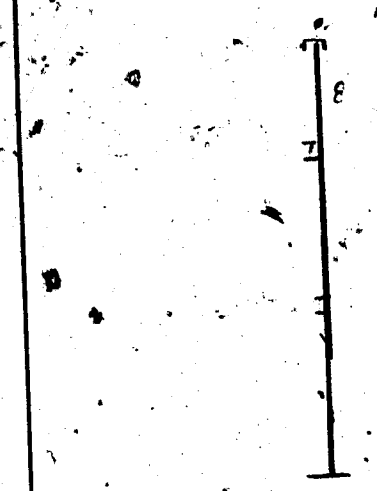
PROJECT/

SHEET/ 92 OF 317

PROJECT # 8207

DATE/ 10-8-

ENGINEER/



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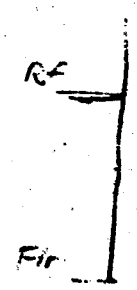
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PROJECT/
SHEET/ 93 OF 317
PROJECT # 8207.00
DATE/ 10-82
EXTERIOR WALLS METAL STUD ENGINEER/

BLDG. HEIGHT 0' - 40'

STUD SPAN	SIZE, GAGE, SPCG	
12 & 14'	CGx5 c 16"	
19'	CW6x14 c 12"	
21' + 6" Parapet	CGx16 c 12"	(c Mansard wall & Plaza ENT.)
28'	CW10x14 c 12"	Plaza Curved Wall

NOTE: ALL PARAPET STUDS ARE CONTINUOUS FROM FLOOR TO ROOF TO PARAPET TOP



at least

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SHEET/ 94 OF 317
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DATE/ OCT '84
ENGINEER/ HS

BEAM BFG R-3

PLAZA LEVEL FRMG B-2 W27x94 { $b_f = 7.990"$, $t_f = 0.745"$, $t_w = 0.470"$, $k = 1\frac{7}{16}"$

$R = (28.7^k_D + 14.4^k_L) = 43.1^k$

$R_U = (1.4 \times 28.7 + 1.7 \times 14.4) = 64.7^k$

$N \geq \left[(43.1^k)/(0.75 \times 36^{ksi} \times 0.470)\right] - 1\frac{7}{16} = 1.82"$

USE 4" N.F.

WITH $\not{\text{E}}$ 1½" CL FROM INSIDE FACE OF WALL AND
WITH $E \geq b_f - 1" = 12" \rightarrow A_2 \geq (4"\times 2 \times 1\frac{1}{2}")(12" \times 2.\frac{1}{2}") = 108 in^2$

$F_p = \phi(.85) f'_c \sqrt{A_2/A_1} \rightarrow \sqrt{A_2/A_1} \leq 2$ MAX

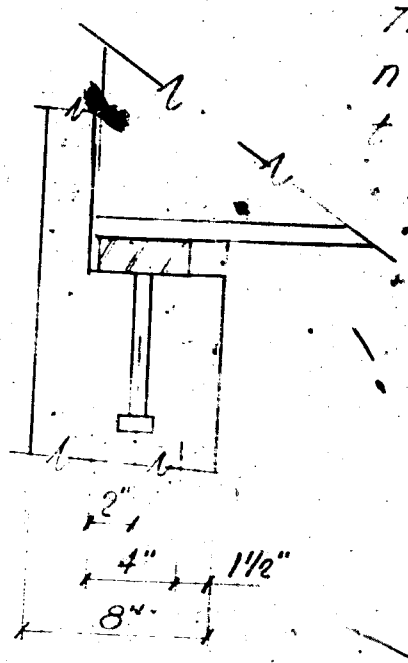
$= 0.7(.85)(3)\sqrt{\frac{108}{(4\times12)}} = 2.64^{ksi}$

$\therefore A \geq 64.7^k / 2.64^{ksi} = 25 in^2$

TRY (MIN) $\not{\text{E}}$ 4" x 12" $\rightarrow A = 48 in^2$ & $f_p = \frac{43.1^k}{48 in^2} = 0.90^{ksi}$

$n = (12"/2) - 1\frac{7}{16} = 4.57"$

$t \geq \sqrt{\frac{3(0.90)(4.57)^2}{27}} = 1.45"$



USE BFG $\not{\text{E}}$ 1½" x 4" x 1'-0"
w/ 2- ¾ ϕ x 6" HEADED
WELD STUDS @ 9" O.A.
TO W27x94

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BEAM BRG RQS

PLAZA LEVEL FRMG B-1 W24x68 $\left\{ \begin{array}{l} b_f = 8.965", t_f = 0.585" \\ t_w = 0.415", k = 1\,3/8" \end{array} \right.$

$R = (12.5^K_D + 9.8^K_L) = 22.3^K$

$R_U = (1.4 \times 12.5 + 1.7 \times 9.8) = 34.2^K$

$N \geq \left[(22.3^K) / (0.75 \times 36 KSI \times 0.415) \right] - 1\,3/8 = 0.62"$

USE 4" MIN

WITH Ⓡ 1½" CL FROM INSIDE FACE OF WALL AND

WITH $B \geq b_f + 2(1") = 11" \longrightarrow A_2 \geq (4+2\times1\,1/2)(11+2\times1\,1/2) = 98 in^2$

$F_p = 0.7(.85)(3KSI)\sqrt{\frac{98}{4\times11}} = 2.66KSI < 1.19 f'c$ MAX

$\therefore A \geq 34.2^K / 2.66KSI = 13 in^2$

TRY MIN Ⓡ 4x11 $\longrightarrow A = 44 in^2$ & $f_p = \frac{22.3^K}{44 in^2} = 0.51KSI$

$n = (11"/2) - 1\,3/8" = 4.13"$

$t \geq \sqrt{\frac{3(0.51)(4.13)^2}{27}} = 0.99"$

USE BRG Ⓡ 1" x 4" x 0'-11" w/ 2- 3/4" Ø x 6" HEADED WELD STUDS @ 8" GA AT W24x68

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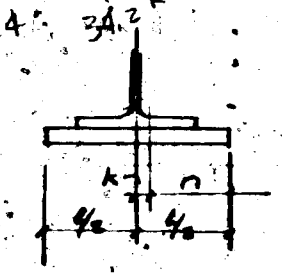
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PLAZA FLOOR DETAILS
ENGINEER/

BEAMS TO CONCRETE WALL — SEE DETAIL FOR B2

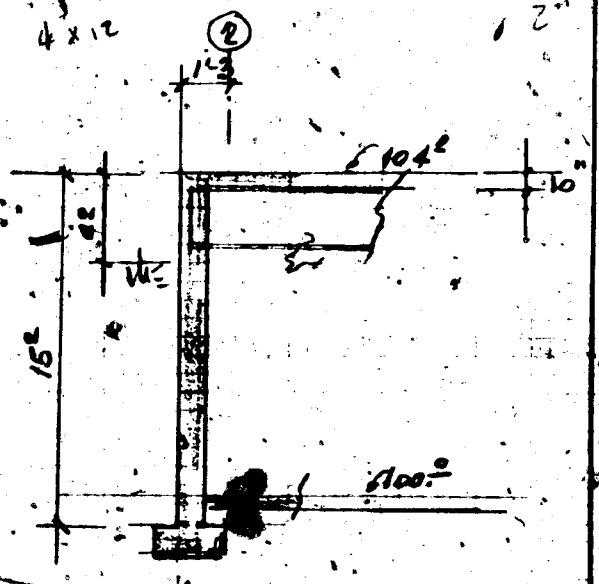
BEAM	R	R_u	SIZE	R (bolted)	t_f	Brg PL	k	n	f_p	Plate t	
B14	26.5	42.1	W 24×65	51.3	7.0	4×12	15/16	5.06	.55	1.25	1½
B15	53.6	85.8	W 33×118	75.2	11.5	5×14	1 1/16	5.94	.77	1.74	2"
B16	61.6	98.6	W 36×135	84.0	12"	5×14	1⅛	5.94	.88	1.85	2"
B17	54.2	86.7	W 33×118	75.2	11.5	5×14	1 1/16	5.94	.77	1.74	2"
B18	54.2	86.7	W 33×118	75.2	11.5	5×14	1 1/16	5.94	.77	1.74	2"
B19	66.1	105.8	W 33×118	75.2	11.5	5×14	1 1/16	5.94	.94	1.92	2"
B20	71.8	114.9	W 36×130	81.2	11.5	~~5×16~~ 6×16	1 1/16	~~6.94~~ 6.94	~~.90~~ .75	~~2.5~~ 2.0	2"
B21	35.6										

$n = \frac{b}{2} - k$ $\quad t = \sqrt{\frac{3(f_p)n^2}{27}} = \sqrt{\frac{(f_p)n^2}{9}}$

B24 34.2

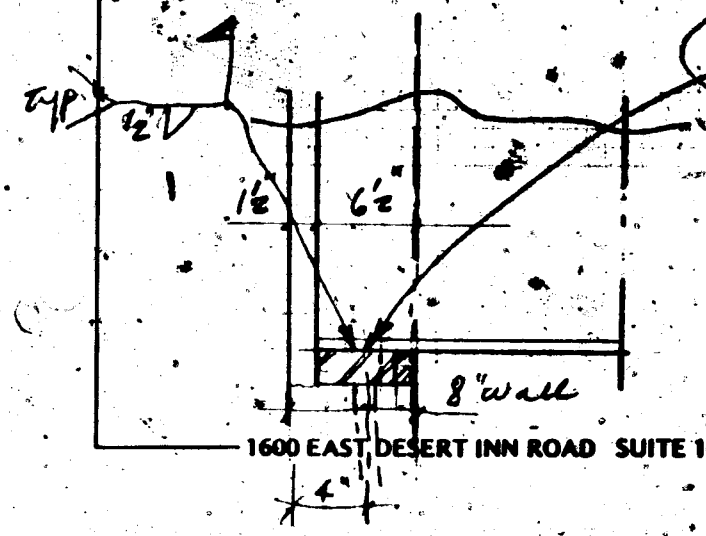


4×12



℄ LINE 2

PL 6×16×2"
w/ 2 - ¾"ϕ × 6" HEADED WELD STUDS @ 9" oc.



℄ LINE 12 Q sheet

PL 4×12×1½
w/ 2 - ¾"ϕ × 6" HEADED WELD STUDS @ 9" oc

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DATE/ OCT '82
ENGINEER/ H.S

SLAB ON GRADE.

REF I PCA - "DESIGN OF CONC. FLOORS ON GROUND"
REF II PCA - "CONCRETE FLOORS ON GROUND." by R.E. SPEARS

LOAD CRITERIA

25^K AXIAL LOAD
SINGLE PNEUMATIC TIRE WHEELS
TIRE INFLATION PRESSURE 110 PSI MAX ASSUMED
TIRE CONTACT AREA $(25^K/2)(10^3)/110\ PSI = 113\ in^2$ MIN

from REF I.
FLOOR CLASSIFICATION BY USE = CLASS 4
∴ $f'_c = 4000$ PSI MIN
3" MAX SLUMP
$f_t = 4.6\sqrt{4000} = 291$
LOAD CORRECTION FOR FIG. 1 $= \left(\frac{300}{291}\right)(25^K/2) = 12.9^K$
FIG. 1 EXTRAPOLATED → 7.2" THK REQ.

from REF II
WHEEL SPAC'G = 60". ASSUMED
SUBGRADE MODULUS ≃ 80 in^2/in ASSUMED
CONC. MODULUS OF RUPTURE = M.R. $= 7.5\sqrt{4000} = 474$ psi
SAFETY FACTOR = S.F. = 1.5
CONC. WORK'G STRESS = W.S. = M.R./S.F. = 316 PSI
SLAB STRESS PER KIP OF AXLE LOAD $= \frac{316\ PSI}{25^K} = 12.6$ PSI
FIG. 4 → 7.5" THK REQ. ← USE

REINFORCEMENT. REF II

for JOINTS SPACED < 20' o.c.
$A_S = \frac{F L w}{2 f_s'} = \frac{(2.0)(20.0')(94\ ^{\#}/_{ft})}{2(20000\ PSI)} = .094\ in^2/FT$ → #3@14" o.c

for JOINTS SPACED < 45' o.c. $A_S = (45/20)(.094) = 0.21\ in^2/FT$
DISTRIBUTED STL AT 0.5% → $A_S = (0.5\%)(7.5 \times 12) = 0.45\ in^2/FT$ ← use

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STRUCTURAL SLABS ON COMPOSITE MTL DECK

1½" B-DECK 20 GA
w/ 3½" REG CONC COVER
(5" TOTAL THICKNESS)

7'-0" MAX SPAN
2-SPAN (MIN) CONT.
UNSHORED

250#/ft² ALLOWABLE SUPERIMPOSED LOAD
301#/ft² TOTAL D+L

NEGATIVE REINF for SUPERIMPOSED-LOAD MOMENT

AT 100#/ft² LL

$w_u = 1.4(.010) + 1.7(.100) = 0.184^{K/ft}$

$M_u = (0.184)(7.0)^2/10 = 0.902^{KFT/FT\ wide}$

$d \simeq 3\frac{1}{2} - \frac{3}{4} - \frac{3/8}{2} = 2.56"$

$F = 12(2.56)^2/12000 = .00655$

$K_u = 0.902/.00655 = 138 \rightarrow \rho \geq .00264$

$A_s \geq \rho(12 \times 2.56) = 0.081 in^2/FT$

use 6x6 - W4xW4 (6x6 - 4/4) $A_s = .080 in^2/FT$

AT 50#/ft² LL

$w_u = 1.4(.010) + 1.7(.500) = 0.099^{K/ft}$

$M_u = (0.099)(7.0)^2/10 = 0.485^{KFT/FT}$

$K_u = 0.485/.00655 = 74 \rightarrow \rho \geq .00139$

$A_s \geq \rho(12 \times 2.56) = 0.043 in^2/FT$

use 6x6 - W2.1xW2.1 (6x6 - 8/8) $A_s = .041 in^2/FT$

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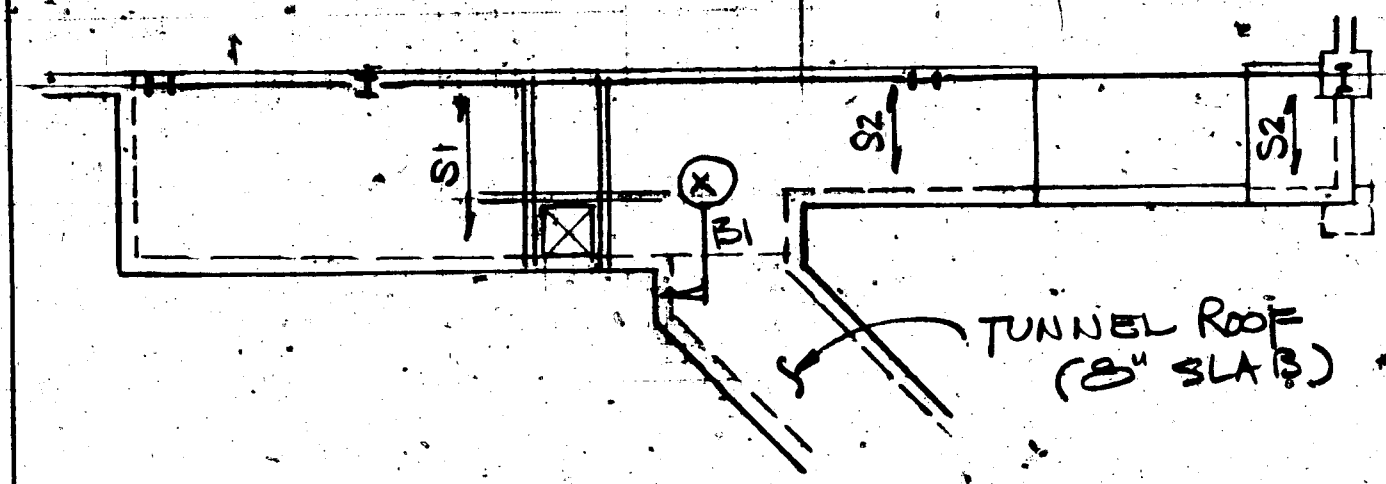
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ENGINEER/ JRL

CONC. SLAB OVER SALLE PORTE



SLAB S1

5" SLAB SPAN = 8'± LL = 100 PSF

$W_u = 1.4 \times 63 + 1.7 \times 100 = 258$ PSF

$M_u = \frac{.258(8)^2}{8} = 2.06$ K/FT.

$d = 5 - \frac{3}{4} - \frac{3}{16} = 3.88"$ $F = \frac{(3.88)^2}{1000} = .0150$

$K_u = \frac{2.06}{.015} = 137$ $A_s = .0027 \times 12 \times 3.88 = 0.13$

USE #4 @ 12 BOT. MAIN STEEL

#4 @ 16 TEMP. STEEL

SLAB S2

USE SAME AS FOR S1

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BEAM B1

SPAN = 5⁶ ± $W_u = \frac{8'}{2} \times .258^{k}/_{SF} = 1.03^{KLF}$

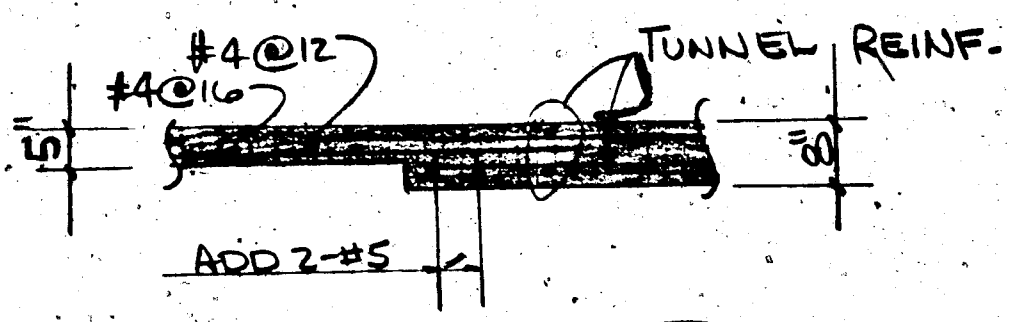
USE A BM. 12" x 8"

$M_u = \frac{1.03(5.5)^2}{8} = 3.89^{IK}$ $d = 5 \div 3/4 - 3/8 = 3.88"$

$F = \frac{(3.88)^2}{1000} = .0150$ $K_u = \frac{3.89}{.0150} = 260$

$A_s = .0052 \times 12 \times 3.88 = 0.24$

ADD 2-#5 BOT. IN LAST 12" OF 8" TUNNEL SLAB



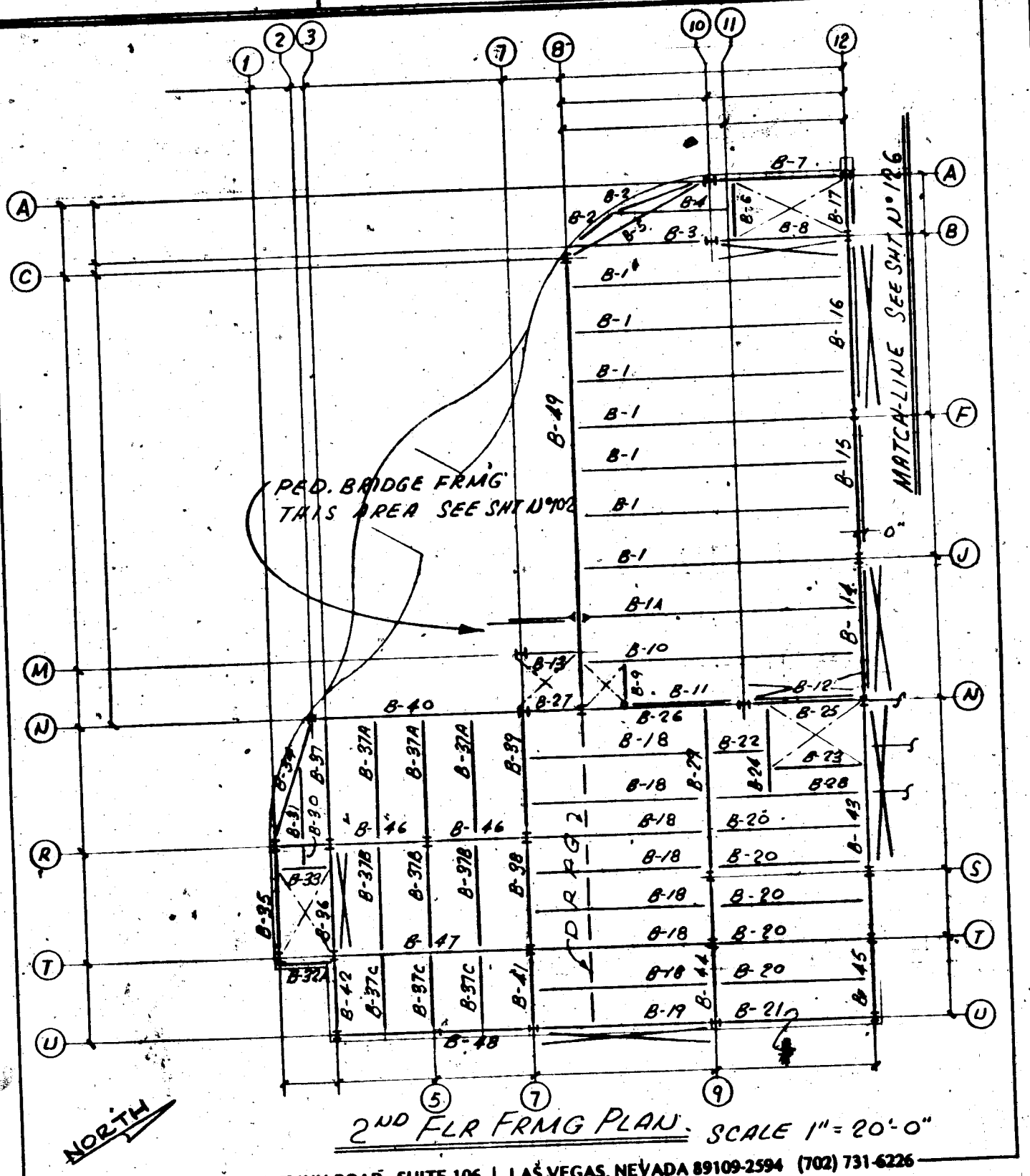
SECTION (X)
1/2" = 1'-0

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2ND LEVEL SOUTH HALF
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2ND FLR FRMG PLAN - SCALE 1" = 20'-0"

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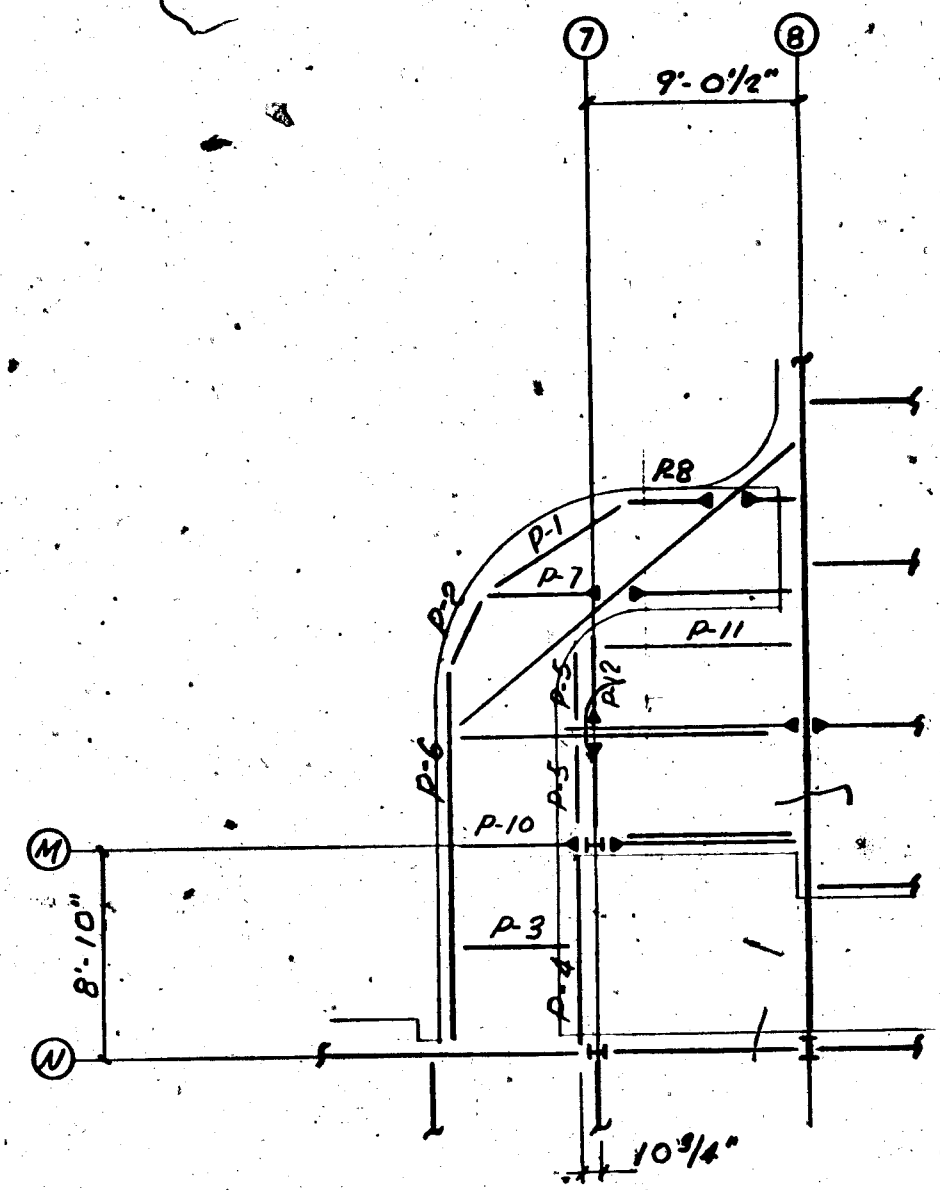
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2ND LEVEL SOUTH HALF

ENGINEER/ HS



2ND LEVEL FRMG PLAN DETAIL AT PED. BRIDGE

SCALE 1/8"=1'-0"

NORTH

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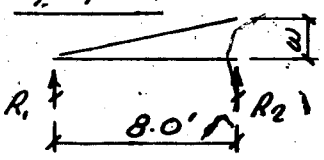
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2ND LEVEL SOUTH HALF ENGINEER/ HS

PEDESTRIAN BRIDGE FRMG – 2ND LEVEL P-1 THRU P-10

P-1



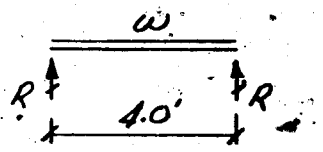
$w = \left(\frac{5.0^2}{2\times4}\right)(0.066^K/\square_D + 0.100^K/\square_L) = (.21^K/'_D + .32^K/'_L) = .53^K/'$

$R_1 = (0.28^K_D + 0.43^K_L) = 0.71^K$

$R_2 = (0.56^K_D + 0.85^K_L) = 1.41^K$

$M = 2.2^{KFT} < M_{MIN} = 2(8)/4 + 0.21(8.0)^2/8 = 5.7^{KFT}$

P-2

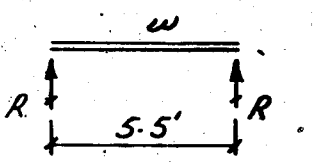


$w = \left(\frac{4.5^2}{2\times3}\right)(.066+.100) = (0.22^K/'_D + 0.34^K/'_L) = 0.56^K/'$

$R = (0.44^K_D + 0.68^K_L) = 1.12^K$

$M = 1.2^{KFT} < M_{MIN} = 2.5^{KFT}$

P-3

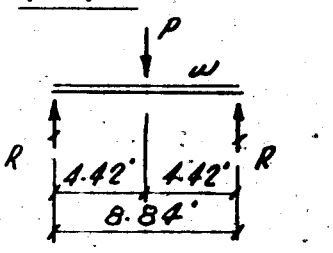


$w = \left(\frac{8.84}{2}\right)(.066+.100) = (0.29^K/'_D + 0.45^K/'_L) = 0.74^K/'$

$R = (0.80^K_D + 1.24^K_L) = 2.04^K$

$M = 2.8^{KFT} < M_{MIN} = 3.9^{KFT}$

P-4



$w = 8'(.008^K/\square) = 0.12^K/'_D$

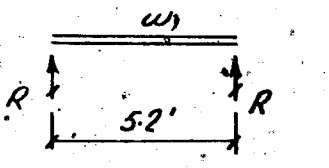
$P = (0.80^K_D + 1.24^K_L) = 2.04^K$

$R = (0.93^K_D + 0.62^K_L) = 1.55^K$

$M = 5.7^{KFT} < M_{MIN} = 7.4^{KFT}$

C12x20.7
USE ~~C10x20~~ for P-1 THRU P-5

P-5



BM // TO DECK SPAN

$w = .05^K/'_D$

$R = 0.13^K_D$

$M = 0.2^{KFT} < M_{MIN} = 2.8^{KFT}$

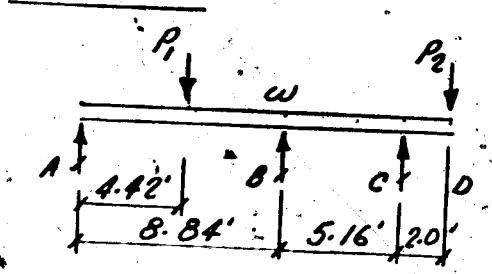
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$\omega = 0.05^{K}/_{L}$
$P_1 = (0.80^{K}_{D} + 1.24^{K}_{L}) = 2.04^{K}$
$P_2 = (0.44^{K}_{D} + 0.68^{K}_{L}) = 1.12^{K}$

CASE I D. ONLY

	BA	BC	CB	CD
	0.37	0.63	–	–
M_F	-1.82	-0.32	-0.98	+0.98
D	+0.79	+1.35		
	-1.03	+1.03		

$R_A = 0.505^{K}$
$R_B = 0.876^{K}$
$R_C = 0.659^{K}$
$+M = 1.8^{KFT}$

CASE II D. + (LL AT P_1 ONLY)

	BA	BC	CB	CD
	0.37	0.63	–	–
M_F	-3.87	-0.32	-0.98	+0.98
D	+1.55	+2.64		
	-2.32	+2.32		

$R_A = 0.979^{K}$
$R_B = 1.892^{K}$
$R_C = 0.409^{K}$
$+M = 3.9^{KFT}$

CASE III D + (LL AT P_2 ONLY)

	BA	BC	CB	CD
	0.37	0.63	–	–
M_F	-1.87	-1.00	-2.34	+2.34
D	+1.06	+1.81		
	-0.81	+0.81		

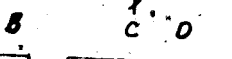
$R_A = 0.529^{K}$
$R_B = 0.545^{K}$
$R_C = 1.646^{K}$
$+M = 1.9^{KFT}$

CASE IV (D+L)

	BA	BC	CB	CD
	0.37	0.63	–	–
M_F	-3.81	-1.00	-2.34	+2.34
D	+1.80	+3.07		
	-2.01	+2.07		

$R_A = 1.007^{K}$
$R_B = 1.552^{K}$
$R_C = 1.401^{K}$
$+M = 4.0^{KFT}$

MODIFIED FIXED END MOMENTS:



	BC	CB	CD
	–	1.0	0
M_F	+0.11	-0.11	+0.98
D.	–	-0.87	0
CO	-0.43	0	0
D	0	0	0
	-0.32	-0.98	+0.98

D. ONLY

	BC	CB	CD
	–	1.0	0
M_F	+0.11	-0.11	+2.34
D	–	-2.23	-0
CO	-1.11	0	0
D	–	0	0
	-1.00	-2.34	+2.34

D+L

SUMMARY

$+M_{MAX} = 4.0^{KFT} > M_{MIN}$
$-M_{MAX} = 2.4^{KFT} < M_{MIN} = 4.1^{KFT}$
$R_A = 1.01^{K}$ MAX
$R_B = 1.89^{K}$ MAX
$R_C = 1.65^{K}$ MAX

C12x20.7
USE ~~C10x20~~

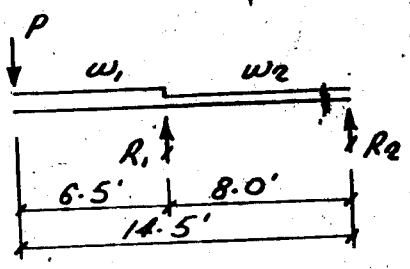
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P-7



$w_1 = 4.5'(.066^K/_{\square'} + .100^K/_{\square'}) = (0.30^K/_{'D} + 0.45^K/_{'L}) = .75^K/_{'}$

$w_2 = 3.0'(\ d_0 + d_0\ ) = (0.20^K/_{'D} + 0.30^K/_{'L}) = .50^K/_{'}$

$P = (0.28+0.44)_D + (0.43+0.68)_L$

$P = (0.72^K{}_D + 1.11^K{}_L) = 1.83^K$

$R_1 = (4.85^K_D + 7.33^K_L) = 12.18^K$

$R_2 = (-0.58^K_D + 0.89^K_L) = -1.47^K$ UPLIFT

$-M = 27.8^{KFT}$

w/o LL ON OVERHANG:

$R_1 = (4.85^K_D + 1.20^K_L) = 6.05^K$

$R_2 = (-0.58^K_D + 1.20^K_L) = 0.62^K$

$+M = 0.4^{KFT}$

AT OVRHNG: $\Delta_L = \dfrac{1728}{(29\times10^3)(I)}\left[\dfrac{(0.45)(6.5)^3(32.0+19.5)}{24} + \dfrac{(1.11)(6.5)^2(14.5)}{3}\right]$

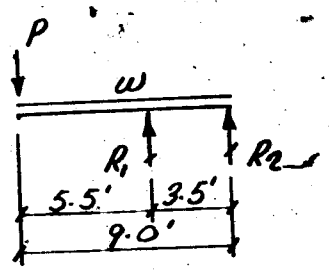
$\Delta_L = \dfrac{29.31}{I} \le 1/8"$ $\quad I \ge 8(29.31) = 235\ IN^4$

USE ~~W10x49~~ W14x43

W10x49 $I = 272\ IN^4$
$M_R = 109$

STL DEPTH LIMITED TO ~~10"MAX~~ CHANGED TO 14"MAX

P-8



$w = 3.0(.066 + .100) = (0.20^K/_{'D} + 0.30^K/_{'L}) = 0.50^K/_{'}$

$P = (0.56^K_D + 0.85^K_L) = 1.41^K$

$R_1 = (3.75^K_D + 5.66^K_L) = 9.41^K$

$R_2 = (-1.39^K_D - 2.11^K_L) = -3.50^K$ UPLIFT

$-M = 15.4^{KFT}$

w/o LL ON OVRHNG:

$R_1 = (3.75^K_D + 0.53^K_L) = 4.28^K$

$R_2 = (-1.39^K_D + 0.53^K_L) = -0.86^K$ UPLIFT

AT OVRHNG: $\Delta_L = \dfrac{1728}{(29\times10^3)(I)}\left[\dfrac{(0.30)(5.5)^3(14.0+16.5)}{24} + \dfrac{(0.85)(5.5)^2(9.0)}{3}\right] = \dfrac{8.38}{I}$

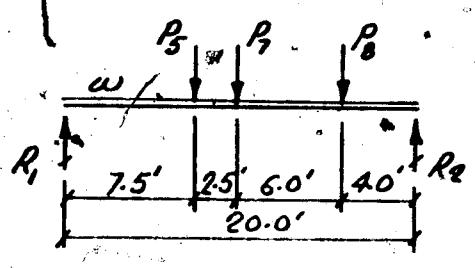
USE SAME AS P-7

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P-9



$\omega = 3.0(.066^K/_{ft} + .100^K/_{ft}) = (.20^K/_{ft_D} + .30^K/_{ft_L}) = 0.50^K/_{ft}$

$P_5 = (0.13^K_D + 0^K_L) = 0.13^K$

$P_7 = (4.85^K_D + 7.33^K_L) = 12.18^K$

$P_8 = (3.75^K_D + 5.66^K_L) = 9.41^K$

$R_1 = (5.26^K_D + 7.80^K_L) = 13.06^K$

$R_2 = (7.47^K_D + 11.19^K_L) = 18.66^K$

$M_{10.0} = 105.3^{KFT}$

$$\Delta_T \& \Delta_L = \frac{1728}{(29\times10^3)(I)}\left[\frac{(7.33^K)(20)^3}{48} + \frac{(5.66^K)(4\times10)(20^2-4^2-10^2)}{6(20)}\right] = \frac{104.7}{I}$$

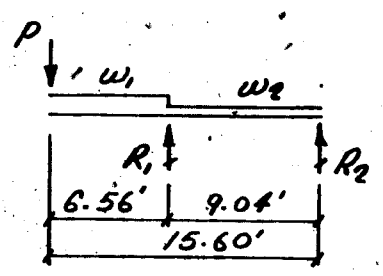
LIMITING Δ_L TO 1/4" MAX FOR VIBRATION $I > \frac{104.7}{1/4} = 419 IN^4$

W10x68 $M_R = 151^{KFT}$
$I = 394 IN^4$
$\Delta_L = 0.266" \simeq 1/4"$ OK

USE ~~W10x68~~ W14x48

RAISE T.O.S ~~3/16"~~ 1/16"
TO EL 103'-7 ~~3/16"~~ 1/16"
BM P-9 ONLY

P-10



$\omega_1 = (9.6/_2)(.066 + .100) = (.32^K/_{ft_D} + .48^K/_{ft_L}) = 0.80^K/_{ft}$

$\omega_2 = 0.05^K/_{ft_D}$

$P = (0.88^K_D + 1.01^K_L) = 1.89^K$

$R_1 = (4.61^K_D + 6.03^K_L) = 10.64^K$

$R_2 = (-1.17^K_D - 1.88^K_L) = -3.05^K$ UPLIFT

$-M = 29.6^{KFT}$

w/o LL ON OVRHNG:

$R_1 = (4.61^K_D + 0) = 4.61^K$

$R_2 = (-1.17^K_D + 0) = -1.17^K$ UPLIFT

AT OVRHNG $\Delta_L = \frac{1728}{(29\times10^3)(I)}\left[\frac{(.48)(6.56)^3(36.76+19.68)}{24} + \frac{(1.89)(6.56)^2(15.60)}{3}\right]$

$\Delta_L = \frac{43.99}{I}$

w/W10x49 $\Delta_L = 43.99/_{272} = 0.162 \simeq 4/_{486}$

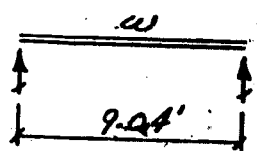
USE ~~W10x49~~ W14x34

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P-11



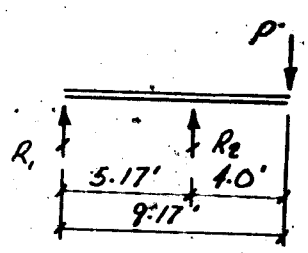
$w = \left(\frac{5.5^2}{2 \times 40}\right)(.066^{K/ft} + .100^{K/ft}) = (0.25^{K/ft}_{D} + 0.38^{K/ft}_{L}) = 0.63^{K/ft}$

$R = (1.13^{K}_{D} + 1.72^{K}_{L}) = 2.85^{K}$

$M = 5.5^{KFT}$

USE | SAME AS P-12

P-12



NOTE: REINF STR. SLAB FOR OVRHNG ⊥ TO DECK SPAN ∴ 2' TRIB

$w = 2.0\,(.066 + .100) = (0.14^{K/ft}_{D} + 0.20^{K/ft}_{L}) = 0.34^{K/ft}$

$P = (1.13^{K}_{D} + 1.72^{K}_{L}) = 2.85^{K}$

$R_1 = (-0.73^{K}_{D} - 1.12^{K}_{L}) = -1.85^{K}$ UPLIFT

$R_2 = (3.14^{K}_{D} + 4.68^{K}_{L}) = 7.82^{K}$

$-M = 14.2^{KFT}$

W/O LL ON OVRHNG:

$R_1 = (-0.73^{K} + 0.52^{K}_{L}) = -0.21^{K}$ UPLIFT

$R_2 = (3.14^{K} + 0.52^{K}_{L}) = 3.66^{K}$

AT OVRHNG $\Delta_L = \frac{1728}{(29 \times 10^3)(I)}\left[\frac{(.20)(4.0)^3(20.68+12.0)}{24} + \frac{(1.72)(4.0)^2(\quad)}{3}\right]$

$\Delta_L = \frac{6.05}{I} \leq 1/8" \longrightarrow I > 48.4\,in^4$

$I = 88.6\,in^4$

$M_R = 27^{KFT}$

USE | W 14 x 22

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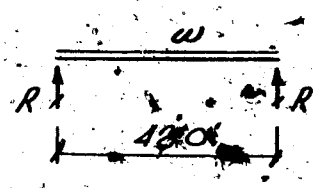
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2ND. LEVEL SOUTH HALF
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2ND. LEVEL FRMG. B-1 THRU B-49

B-1



TRIB 7.0 x 42.0 = 294# > 150#

$R_{MAX} = 23.1(1 + 8c/50) > 40\%$ MAX

$R = (.08\%)(294-150) = 11.5\% \rightarrow LL = 0.885 \times 50 = 45^{\#}/\#$

$w = 7.0\,(.08^{K}/\square_0 + .045^{K}/\square_L) = (0.60^{K}/_0 + 0.32^{K}/_L) = 0.92^{K}/_L$

$R = (12.60^{K}_0 + 6.72^{K}_L) = 19.32^{K}$

$M = 203^{K\text{-}FT}$

$\Delta_L = \frac{5(0.32)(42)^4(1728)}{384(29\times10^3)(I)} = \frac{772.6}{I} \leq \frac{42\times12}{360} = 1.4"$

$I > 772.6/1.4 = 552\ in^4$

W24x55 $M_R = 228^{K\text{-}FT}$
$I = 1350\ in^4$

$\Delta_L = 772.6/1350 = 0.572" \simeq L/881$

$\Delta_0 = (0.60/0.32)(0.572) = 1.073"$

TRY W24x55 $\rightarrow \Delta_D = 1/21.4 > 1/20$ ∴ ✓

CHECK FLOOR "BOUNCE"

REF. "DESIGN TO PREVENT FLOOR VIBRATIONS" by J.M. MURRAY
AISC ENGINEERING JOURNAL, VOL 12, N°3 1975

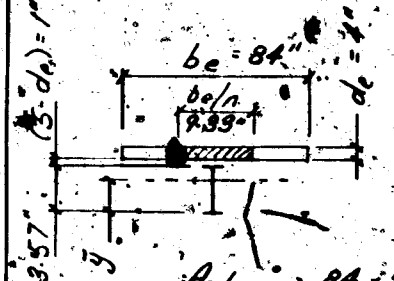
$g = 32.2^{FT}/SEC^2 = 386^{IN}/SEC^2$

$L = 42.0' \times 12 = 504"$

$b_e = 7.0' \times 12 = 84"$ & $b_e/n = 1.33"$

$d_2 = (50^{\#}/\square / 150^{\#}/FT^3)(12) = 4"$

$W = [(50+8^{\#})(7') + 55^{\#}/_L](42') = 19362^{\#}$



$A_c/n = \frac{84\times4}{9} = 37.33\ in^2$ & $\bar{y} = \frac{37.33(26.57) + 16.2(23.57/2)}{37.33 + 16.2} = 22.10"$

SECTION	AREA	d	$A(\bar{y}-d)^2$		
CONC 9.33x4	37.33	4.470	745.9	9.33(4)³/12 =	49.8
W24x55	16.20	10.315	929.7		1350.0
			2069.6		1399.8

$I_t = 3869\ in^4$

$f = 1.57\left[\frac{g\,E\,I_t}{W L^3}\right]^{1/2} = 1.57\left[\frac{(386)(29\times10^3)(3869)}{(19.36)(504)^3}\right]^{1/2} = 6.56$

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B-1 continued

DYNAMIC LOAD FACTOR (DLF)

with $t_d/T = 0.05 f = 0.05(6.56) = 0.328$

from GRAPH → DLF = 0.96

$A_{oc} = (DLF)\frac{600L^3}{48EI_L} = 0.96\ \frac{600 \times 504^3}{48 \times 29 \times 10^6 \times 3869} = 0.01369$

with: $S/d_c = 84/4 = 21$

& $L^4/I_L = 504^4/3869 = 16.68 \times 10^6$

from GRAPH → $N_{eff} = 2.9$

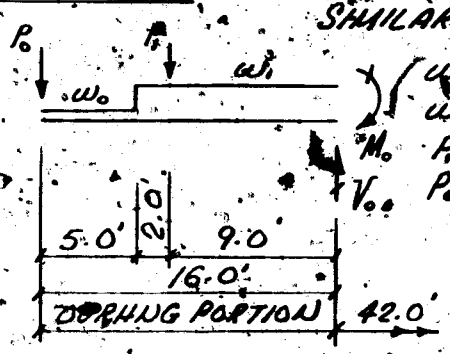
$\therefore A_o = A_{oc}/N_{eff} = 0.01369/2.9 = .00472$

from GRAPH → POINT PLOTS IN THE LOWER HALF OF "SLIGHTLY PERCEPTIBLE" RANGE
∴ BEAM IS CONSIDERED SATISFACTORY BUT FOR REDUCED VIBRATION PERCEPTIBILITY INCREASE BM TO NEXT LARGER W24

USE W24 x 62

B-1A

SIMILAR TO B-1. BUT WITH 16.0' OVRHNG.



$w_i = 5.17(.066 + .10P_i) = (0.34^{K/'}_D + 0.58^{K/'}_L) = 0.86^{K/'}$

$w_o = 4.0'_{AVG}(d_o + d_o) = (0.27^{K/'}_D + 0.40^{K/'}_L) = 0.67^{K/'}$

$P_i = (3.14^K_D + 4.68^K_L) = 7.82^K$ REF. P-12

$P_o = (0.66 + 5.26)_D + (0.99 + 7.80)_L = (5.92^K_D + 8.79^K_L) = 14.71^K$
REF P-6 & P-9

$V_o = (14.15^K_D + 21.19^K_L) = 35.34^K$

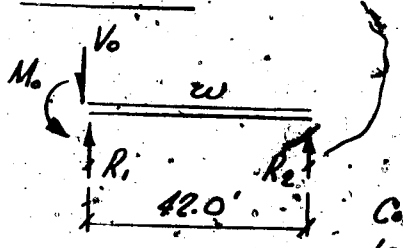
$M_o = (162^{KFT}_D + 241^{KFT}_L) = 403^{KFT}$

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B-1A continued



w/o "w" LOAD'G $\begin{cases} R_1 = (18.01^K_D + 26.93^K_L) = 44.94^K \\ R_2 = (-3.86^K_D + -5.74^K_L) = -9.60^K \text{ UPLIFT} \end{cases}$

$V_o = (14.15_D + 21.19_L) = 35.34^K$

$M_o = (162^{KFT}_D + 241^{KFT}_L) = 403^{KFT}$

$w = (0.60^{K/'}_D + 0.32^{K/'}_L) = 0.92^{K/'}$ REF B-1

COMBINED LOAD'G $\begin{cases} R_1 = [(12.60 + 18.01)_D + (6.72 + 26.93)_L] = (30.61^K_D + 33.65^K_L) \\ R_1 = 64.26^K \\ R_2 = [(12.60 - 3.86)_D + (6.72 - 5.74)_L] = (8.74^K_D + 0.98^K_L) \\ R_2 = 9.72^K \\ +M_{10.565} = 514^{KFT} \quad , -M = 403^{KFT} \end{cases}$

USE BUILT-UP SECTION AT OVRHNG

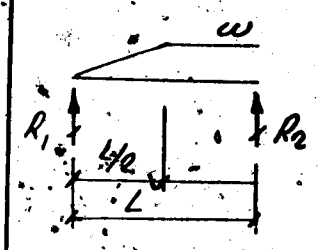
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B-2



$w = 2.5(.086^K/_{D} + .050^K/_{L}) = (0.22^K/_{D} + 0.13^K/_{L}) = 0.35^K/_{'}$

FOR $L = 14.0'$:

$R_1 = (0.90^K_D + 0.53^K_L) = 1.43^K$

$R_2 = (1.41^K_D + 0.83^K_L) = 2.24^K$

$M_{@.4} = 7.2^{KFT} < M_{MIN} = 11.5^{KFT}$

FOR $L = 7.0'$:

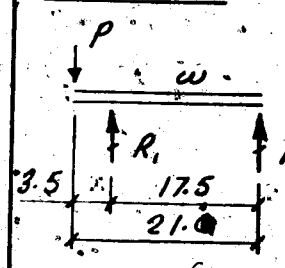
$R_1 = (0.45^K_D + 0.27^K_L) = 0.72^K$

$R_2 = (0.71^K_D + 0.42^K_L) = 1.13^K$

$M_{3.23} = 1.9^{KFT} < M_{MIN} = 4.7^{KFT}$

USE | C12 x 20.7

B-3



$w = \left(\frac{10.6}{2}\right)(.086 + .050) = (0.46_D + 0.27_L) = 0.73^K/_{'}$

$P = (0.45^K_D + 0.27^K_L) = 0.72^K$

$R_1 = (6.34^K_D + 3.73^K_L) = 10.07^K$

$R_2 = (3.77^K_D + 2.21^K_L) = 5.98^K$

$-M = 7.0^{KFT}$

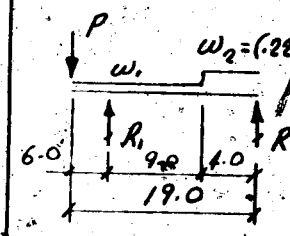
USE | SAME AS B-4

w/ LL ON OVRHNG: $R_1 = (6.34^K_D + 2.36^K_L) = 8.70^K$

$R_2 = (3.77^K_D + 2.36^K_L) = 6.13^K$

$+M_{8.40} = 25.8^{KFT}$

B-4



$w_1 = 4.4(.086 + .050) = (0.38^K/_{D} + 0.22^K/_{L}) = 0.60^K/_{'}$

$P = \left[(0.71 + 0.90)_D + (0.42 + 0.53)_L\right] = (1.61^K_D + 0.95^K_L) = 2.56^K$

$R_1 = (7.53^K_D + 4.58^K_L) = 12.11^K$

$R_2 = (0.66^K_D + 1.43^K_L) = 2.09^K$

$-M = 26.2^{KFT}$

USE | W12 x 26.

w/ LL ON OVRHNG: $R_1 = (7.53^K_D + 1.56^K_L) = 9.09^K$

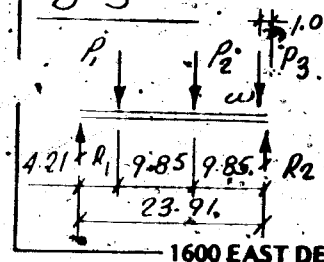
$R_2 = (0.66^K_D + 2.17^K_L) = 2.83^K$

$+M_{@13} = 6.1^{KFT}$

AT OVRHNG $\Delta_L = \frac{1728}{(29\times10^3)(I)}\left[\frac{.95(6)^2(22)}{3} + \frac{.22(6)^3(106)}{24}\right] = 26.7/I \le 0.2''$

$I \ge 133.5 in^4$

B-5



$w = 0.05^K/_{D}$

$P_1 = (6.34^K_D + 3.73^K_L) = 10.07^K$

$P_2 = (7.93^K_D + 4.58^K_L) = 12.11^K$

$P_3 = (1.41^K_D + 0.83^K_L) = 2.24^K$

$R_1 = (8.98^K_D + 5.00^K_L) = 13.98^K$

$R_2 = (7.50^K_D + 4.14^K_L) = 11.64^K$

$M_{@R_2} = 95.2^{KFT}$

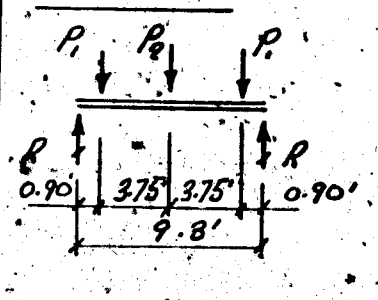
USE | W18 x 40

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B-6



$w = 0.10^{K}/_{LF}$

$P_1 = (0.83^{K}_{D} + 1.67^{K}_{L}) = 2.50^{K}$

$P_2 = (2\times0.83 + 0.66)_D + (2\times1.67 + 2.17)_L = (2.32^{K}_{D} + 5.51^{K}_{L}) = 7.83^{K}$

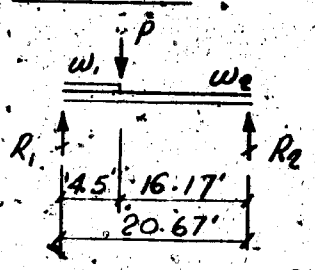
$R = (2.46^{K}_{D} + 4.43^{K}_{L}) = 6.89^{K}$

$M = 21.6^{KFT}$

USE | W12x16

STAIR-WELL

B-7



$w_1 = (4.4/2)(.050^{K}/_{ft_D} + .100^{K}/_{ft_L}) = (0.11^{K}_{D} + 0.22^{K}_{L}) = 0.33^{K}/_{LF}$

$w_2 = 16_{MAX}(.021^{K}/_{\phi})_D + .04^{K}/_{LF_D} = 0.38^{K}/_{LF_D}$

$P = (2.46^{K}_{D} + 4.43^{K}_{L}) = 6.89^{K}$

$R_1 = (6.29^{K}_{D} + 4.35^{K}_{L}) = 10.64^{K}$

$R_2 = (4.52^{K}_{D} + 1.07^{K}_{L}) = 5.59^{K}$

$M_{14.71} = 41.2^{KFT}$ @ $l_u = 16.17'$

$\Delta \simeq (1094.48\times10^{-6})(20.67)^2 (f_b/d)_2 \leq \frac{248}{360} = 0.688''$

$\therefore (f_b/d) \leq 1.556$

for W12x40 $(f_b/d) = \frac{9.6^{KSI}}{11.94} = 0.80 < 1.556$ ✓

@ $l_u = 16.17$ $M_n = 104^{KFT} > 41.2^{KFT}$ ✓

$I_y = 44.1\ in^4 > 37.2\ in^4$ ✓

USE W12x40

WIND GIRT:

$R = C_e C_g g_s I$

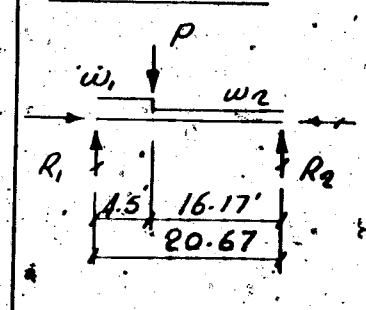
$= (1.3)(1.2)(15)(1.15) = 27^{\#}/_{LF}$

$M_w = (.027^{K}/_{LF}\times14')(16.17')^2/8 = 12.4^{KFT}$

$\Delta_w = \frac{5(.378^{K}/_{in})(16.17')^4(1728)}{384(29\times10^3)\ I} = \frac{20.05}{I} < 0.539''$

$\rightarrow I_y \geq \frac{20.05}{0.539} = 37.2\ in^4$

B-8



$(4.4/2)(.050 + .100) = 0.11^{K}/_{LF_D} + 0.22^{K}/_{LF_L}$

$(6.2/2)(.086 + .050) = 0.27^{K}/_{LF_D} + 0.16^{K}/_{LF_L}$

$w_1 = (0.38^{K}/_{LF_D} + 0.38^{K}/_{LF_L}) = 0.76^{K}/_{LF}$

$w_2 = \left(\frac{5.4^2}{2\times4.4}\right)(.086 + .050) = (0.29^{K}/_{LF_D} + 0.17^{K}/_{LF_L}) = 0.46^{K}/_{LF}$

$P = (2.46^{K}_{D} + 4.43^{K}_{L}) = 6.89^{K}$

$R_1 = (5.28^{K}_{D} + 6.07^{K}_{L}) = 11.35^{K}$

$R_2 = (3.58^{K}_{D} + 2.82^{K}_{L}) = 6.40^{K}$

$M_{13.91} = -44.6^{KFT}$

AXIAL LOAD = $78.1^{K}\times1.25$
from SHT N° 300.

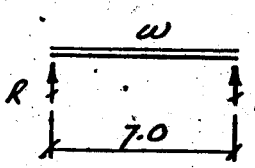
USE W14x43

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B-9



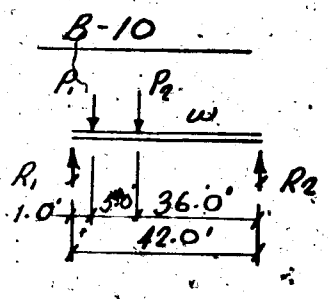
$\omega = 0.10^{K}/_{0}$

$R = 0.35^{K}_{0}$

$M = 0.6^{KFT} < M_{MIN} = 4.1^{KFT}$

USE | W 8x10

B-10



$\omega = (0.60^{K}/_{0} + 0.32^{K}/_{L}) = 0.92^{K}/_{L}$ REF B-1

$P_1 = (0.52^{K}_{0} + 1.00^{K}_{L}) = 1.52^{K}$

$P_2 = (0.87^{K}_{0} + 1.00^{K}_{L}) = 1.87^{K}$

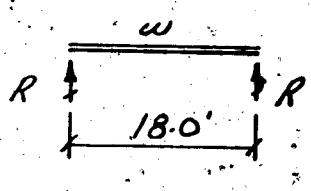
$R_1 = (13.85^{K}_{0} + 8.55^{K}_{L}) = 22.40^{K}$

$R_2 = (12.74^{K}_{0} + 6.89^{K}_{L}) = 19.63^{K}$

$M = 209.5^{KFT}$

USE | SAME AS B-1

B-11



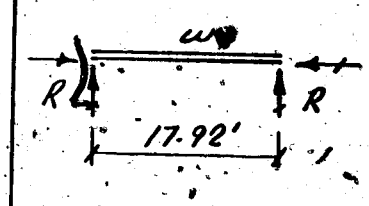
$\omega = 3.5(.086^{K}/_{\square} + .050^{K}/_{\square}) = (0.30^{K}/_{0} + 0.18^{K}/_{L}) = 0.48^{K}/_{L}$

$R = (2.70^{K}_{0} + 1.62^{K}_{L}) = 4.32^{K}$

$M = 19.5^{KFT} < M_{MIN} = 21.8^{KFT}$

USE | W12x19

B-12



$\omega = (0.30^{K}/_{0} + 0.18^{K}/_{L}) = 0.48^{K}/_{L}$

$R = (2.69^{K}_{0} + 1.62^{K}_{L}) = 4.31^{K}$

$M = 19.3^{KFT}$

AXIAL LOAD = 93.9 x 1.25
from SHT N° 300

USE | W14x43

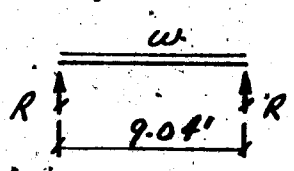
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B-13



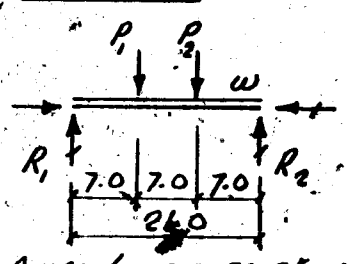
$w = 3.0(0.086^K/_{\Phi_D} + 0.100^K/_{\Phi_L}) = (0.26^K/_D + 0.30^K/_L) = 0.56^K/_\Phi$

$R = (1.18^K_D + 1.36^K_L) = 2.54^K$

$M = 5.8^{KFT} < M_{MIN} = 7.2^{KFT}$

USE W 8x10

B-14



AXIAL LOAD = 56.5^K x 1.25
from SHT N° 299

$w = 0.20^K/_D$

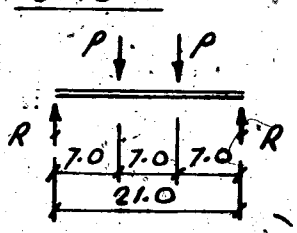
TRIB 42.0'/2 x 21 = 441$^\Phi$
→ R = (.08%)(441-150) = 28% → LL = .77(50) = 39$^\Phi/_\Phi$

$P_1 = (12.74^K_D + 5.74^K_L) = 18.48^K$
$P_2 = (8.74_D + 5.74^K_L) = 14.48^K$

$R_1 = (13.51^K_D + 5.74^K_L) = 19.25^K$
$R_2 = (12.17^K_D + 5.74^K_L) = 17.91^K$
$M_{7.0} = 129.9^{KFT}$

USE W 24 x 55

B-15

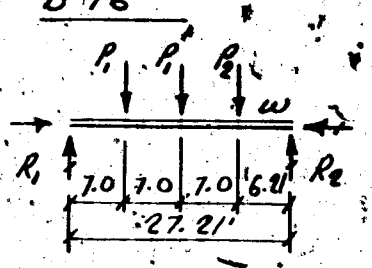


$w = 0.20^K/_D$
LL = 39$^\Phi/_\Phi$ REF B-14

$P_1 = (12.60^K_D + 5.74^K_L) = 18.34^K$
$R = (14.70^K_D + 5.74^K_L) = 20.44^K$
$M_{10.5} = 139.4^{KFT}$

USE W 21 x 44

B-16



AXIAL LOAD = 47.9 x 1.25
from SHT N° 299

$w = 0.20^K/_D$

TRIB = (42.9/2)(27.21) = 571$^\Phi$
→ R = (.08%)(571-150) = 33% → LL = .67(50) = 34$^\Phi/_\Phi$

$P_1 = (12.60^K_D + 5.00^K_L) = 17.60^K$
$P_2 = (11.97^K_D + 4.72^K_L) = 16.69^K$

$R_1 = (20.93^K_D + 7.22^K_L) = 28.15^K$
$R_2 = (21.68^K_D + 7.50^K_L) = 29.18^K$
$M_{14.0} = 251.3^{KFT}$

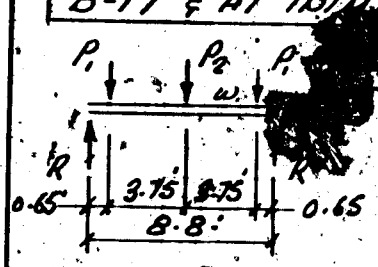
USE W 24 x 68

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B-17 @ ATTIC LANDGS



$\omega = 0.10^{K/'}$

$P_1 = [(2 \times 0.83^K)_D + (2 \times 1.67^K)_L] = (1.66^K_D + 3.34^K_L) = 5.0^K$

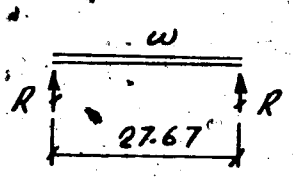
$P_2 = [(4)(.05^{K/\square}_D + .10^{K/\square}_L)(4.5'/2)] = (.45^K_D + .90^K_L) = 1.35^K$

$R = (2.33^K_D + 3.79^K_L) = 6.12^K$

$M = 7.2^{K'T}$

USE | W 8x10

B-18



$\omega = 6.88(.086^{K/\square} + .050^{K/\square}) = (0.59^{K/'}_D + 0.35^{K/'}_L) = 0.94^{K/'}$

$R = (8.16^K_D + 4.84^K_L) = 13.00^K$

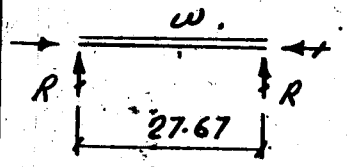
$M = 90.0^{K'T}$

$\Delta_L = \frac{5(.35)(27.67)^4(1728)}{384(29\times10^3)(I)} = \frac{159.2}{I} \leq \frac{27.67\times12}{2(360)} = 0.46"$

$I > 159.2/0.46 = 346 IN^4$

USE | W18x35

B-19



$\omega = 3.0(.086 + .050) = (0.26^{K/'}_D + 0.15^{K/'}_L) = 0.41$

$R = (3.60^K_D + 2.08^K_L) = 5.68^K$

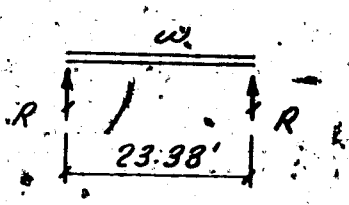
$M = 39.3^{K'T}$

USE | W18x40

AXIAL-LOAD = 47.0K x 1.25
from SHT N° 300

332"/20 = 16.6" MIN

B-20



$\omega = 8.0(.086 + .050) = (0.52^{K/'}_D + 0.30^{K/'}_L) = 0.82^{K/'}$

$R = (6.07^K_D + 3.50^K_L) = 9.57^K$

$M = 55.8^{K'T}$

$\Delta_L = \frac{5(.30)(23.33)^4(1728)}{384(29\times10^3)(I)} = \frac{69.0}{I} \leq \frac{280}{2\times360} = 0.388"$

$I > 69.0/0.388 = 178 IN^4$

USE | W16x26

280/20 = 14" MIN

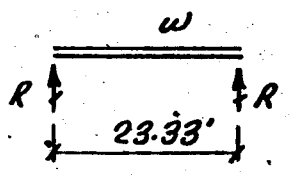
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B-21



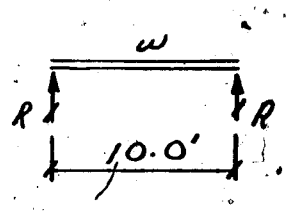
$w = 3.0(.086+.050) = (0.26^{K/'}_{D} + 0.15^{K/'}_{L}) = 0.41^{K/'}$

$R = (3.04^{K}_{D} + 1.75^{K}_{L}) = 4.79^{K}$

$M = 27.9^{KFT} < M_{MIN} = 29.4^{KFT}$

USE | SAME AS B-20

B-22



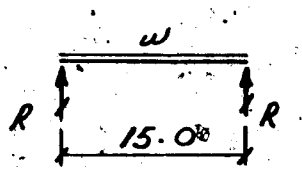
$w = 6.88(.086+.050) = (0.59^{K/'}_{D} + 0.35^{K/'}_{L}) = 0.94^{K/'}$

$R = (2.95^{K}_{D} + 1.75^{K}_{L}) = 4.70^{K}$

$M = 11.8^{KFT} < M_{MIN} = 12.4^{KFT}$

USE | SAME AS B-23

B-23



$w = 4.0(.086+.050) = (0.35^{K/'}_{D} + 0.20^{K/'}_{L}) = 0.55^{K/'}$

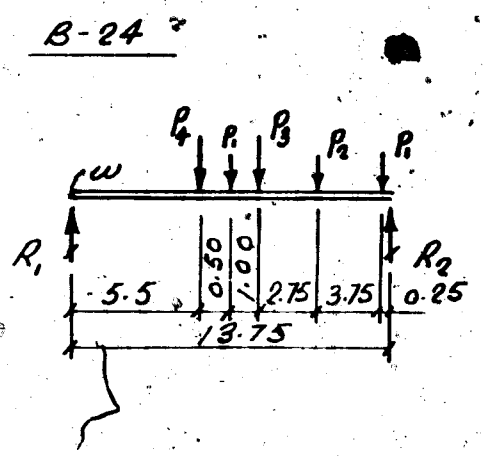
$R = (2.63^{K}_{D} + 1.50^{K}_{L}) = 4.13^{K}$

$M = 15.5^{KFT} < M_{MIN} = 17.4^{KFT}$

USE | W12 x 14

$180''/20 = 9.0''_{MIN}$

B-24



$w = 0.04^{K/'}$

$P_1 = (0.83^{K}_{D} + 1.67^{K}_{L}) = 2.50^{K}$

$P_2 = (1.66^{K}_{D} + 3.34^{K}_{L}) = 5.00^{K}$

$P_3 = (2.95_{D} + 1.75^{K}_{L}) = 4.70^{K}$

$P_4 = (2.63_{D} + 1.50^{K}_{L}) = 4.13^{K}$

$R_1 = (4.27^{K}_{D} + 3.70^{K}_{L}) = 7.97^{K}$

$R_2 = (5.18^{K}_{D} + 6.23^{K}_{L}) = 11.41^{K}$

$M_{7.0} = 46.1^{KFT}$

USE | W12 x 26

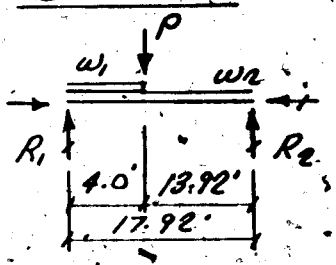
STAIR-WELL

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B-25

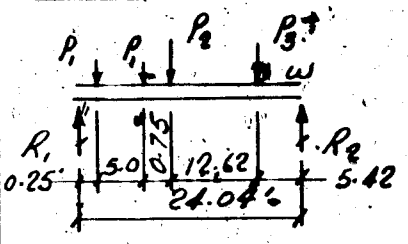


AXIAL LOAD = 74.9K
from SHT N° 300

$w_1 = (6.88/12)(.05+.10) = (0.17^{K/'}_D + 0.35^{K/'}_L) = 0.52^{K/'}$
$w_2 = 0.04^{K/'}_D$
$P = (5.18^K_D + 6.23^K_L) = 11.41^K$
$R_1 = (4.99^K_D + 6.08^K_L) = 11.07^K$
$R_2 = (1.59^K_D + 1.55^K_L) = 3.14^K$
$M_{4.0} = 39.8^{KFT}$

USE W 14 x 43

B-26

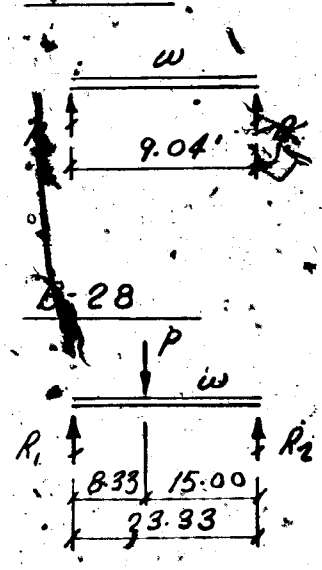


TRIB $(24.04 \times 6.88/12) + (1/2)(8\text{-}29\ \text{TRIB}) = 415^{\#} \rightarrow LL = 40^{K/\#}$
$w = (6.88/12)(.050+.100) = (0.17^{K/'}_D + 0.35^{K/'}_L) = 0.52^{K/'}$
$P_1 = (1.52^K_D + 1.00^K_L) = 1.52^K$
$P_2 = (0.95^K + 2.70^K)_D + (0+1.30^K)_L = (3.65^K_D + 1.30^K_L) = 4.35^K$
$P_3 = [20.15^K_D + (40/89)(7.02^K_L)] = (20.15^K_D + 9.36^K_L) = 29.51^K$
P_3 from B-29

$R_1 = (9.80^K_D + 9.06^K_L) = 18.86^K$
$R_2 = (18.53^K_D + 12.01^K_L) = 30.54^K$
$M = 157.9^{KFT}$

USE W 24 x 55

B-27



$w = (0.90^{K/'}_D + 0.18^{K/'}_L) = 0.48^{K/'}$
$R = (1.36^K_D + 0.82^K_L) = 2.18^K$
$M = 4.9^{KFT} < M_{MIN} = 7.6^{KFT}$

USE W 8 x 10

$w = (11.75/12)(.086+.050) = (0.51^{K/'}_D + 0.29^{K/'}_L) = 0.80^{K/'}$
$P = (4.27^K_D + 3.70^K_L) = 7.97^K$
$R_1 = (8.70^K_D + 5.76^K_L) = 14.46^K$
$R_2 = (7.47^K_D + 4.70^K_L) = 12.17^K$
$M_{8.33} = 92.7^{KFT}$

USE W 18 x 35

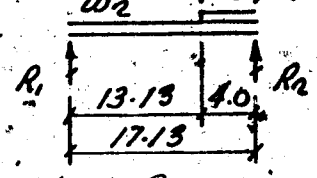
Calcs (3)
501 N. Casino Center

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B-35



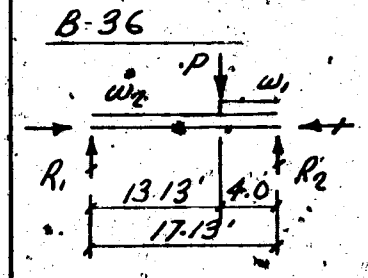
WIND GIRT:
$p_w = 27^{\#}/\text{ft}$ REF B-7
$M_w = (.027 \times 144)(13.13)^2/8 = 8.2^{KFT}$
$\Delta_w = \frac{5(.378)(13.13)^4(1728)}{384(29\times10^3)\,I} = \frac{8.72}{I} < 0.437$
$I_y > 8.72/.437 = 19.96\,in^4$

$\omega_1 = (4.6'/2)(.05^K/\text{ft}_D + .10^K/\text{ft}_L) = (0.12^{K/'}_D + 0.23^{K/'}_L) = 0.35^{K/'}$
$\omega_2 = 16'\text{Max}(.021^K/\text{ft}^2)_D + 0.04^{K/'}_D = 0.38^{K/'}$
$P = (2.07^K_D + 3.80^K_L) = 5.87^K$
$R_1 = (3.79^K_D + 1.00^K_L) = 4.79^K$
$R_2 = (5.27^K_D + 3.73^K_L) = 9.00^K$
$M_{@2.605} = 30.2^{KFT}$ @ $l_u = 13.13'$

$\Delta = (1034.48\times10^{-6})(17.13)^2(f_b/d) \le \frac{205}{360} = .569$
$\therefore (f_b/d) \le 1.874$
for W12x30 $(f_b/d) = \frac{9.99}{12.34} = .761$ ✓
@ $l_u = 13.13$ $M_R = 56^{KFT}$
$I_y = 20.3\,in^4$ ✓

USE W12x30

B-36

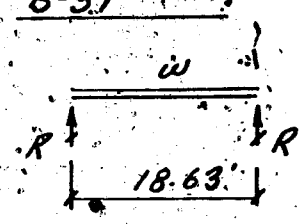


AXIAL LOAD = 128.0 x1.25
from SNT N° 900

$\omega_1 = (0.12^{K/'}_D + 0.23^{K/'}_L) = 0.35^{K/'}$ REF B-35
$\omega_2 = (7.04/2)(.066^K/\text{ft}^2_D + .250^K/\text{ft}^2_L) = (0.23^{K/'}_D + 0.88^{K/'}_L) = 1.11^{K/'}$
$P = (2.07^K_D + 3.80^K_L) = 5.87^K$
$R_1 = (2.51^K_D + 8.53^K_L) = 11.04^K$
$R_2 = (3.98^K_D + 11.26^K_L) = 15.24^K$
$M_{@9.46} = 54.9^{KFT}$

USE W14x43

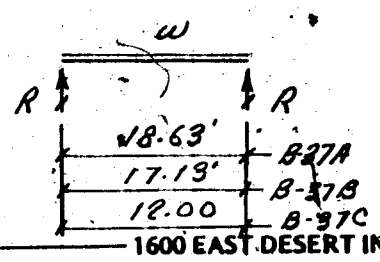
B-37



$\omega = (11.65/2)(.066_D + .250_L) + (0.38^{K/'}_D + 1.46^{K/'}_L) = 1.84^{K/'}$
$R = (3.54^K_D + 13.60^K_L) = 17.14^K$
$M = 79.9^K$
$\Delta_L = \frac{5(1.46)(18.63)^4(1728)}{384(29\times10^3)\,I} = \frac{136.5}{I} \le \frac{223.5}{360} = 0.62$
$\therefore I > 136.5/0.62 = 220$

USE W16x31

B-37A, B-37B, & B-37C



$\omega = 7.04(.066 + .250) = (0.47^{K/'}_D + 1.76^{K/'}_L) = 2.23^{K/'}$

B-37A { $R = (4.38^K_D + 16.39^K_L) = 20.77^K$, $M = 96.8^{KFT}$ } USE W18x35

B-37B { $R = (4.03^K_D + 15.07^K_L) = 19.10^K$, $M = 81.8^{KFT}$ } USE W16x31

B-37C { $R = (2.82^K_D + 10.56^K_L) = 13.38^K$, $M = 70.2^{KFT}$ } USE W14x22

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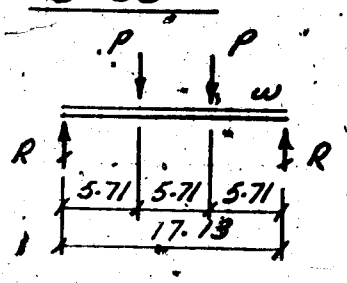
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B-38



$\omega = (7.04/2)(.066^{K/ft}_{D} + .250^{K/ft}_{L}) = (0.23^{K/'}_{D} + 0.88^{K/'}_{L}) = 1.11^{K/'}$

TRIB $.17 \times 13\,(27.67/2) = 2.37\ \Phi$

$R = (.08\%)(237-150) = 7\% \rightarrow LL = 46.5^{\#/\Phi}$

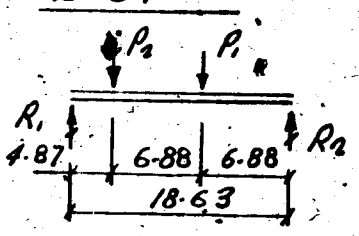
$P = (5.71)(.086_{D} + .047_{L})(27.67/2) = (6.79^{K}_{D} + 3.71^{K}_{L}) = 10.50^{K}$

$R = (8.76^{K}_{D} + 11.25^{K}_{L}) = 20.01^{K}$

$M = 100.7^{K\text{-}FT}$

USE | W18 x 35

B-39



$\omega = (0.23^{K/'}_{D} + 0.88^{K/'}_{L}) = 1.11^{K/'}$ (REF B-38)

TRIB $18.63\,(27.67/2) = 258\ \Phi$

$R = (.08\%)(258-150) = 8\% \rightarrow LL = 46^{\#/\Phi}$

$P_1 = (6.88)(.086 + .046)(27.67/2) = (8.19^{K}_{D} + 4.38^{K}_{L}) = 12.57^{K}$

$P_2 = (11.75/2)(\ \ +\ \ )(\ \ ) = (6.99^{K}_{D} + 3.74^{K}_{L}) = 10.73^{K}$

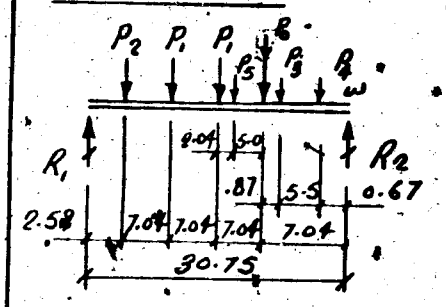
$R_1 = (10.33^{K}_{D} + 12.58^{K}_{L}) = 22.91^{K}$

$R_2 = (9.14^{K}_{D} + 11.94^{K}_{L}) = 21.08^{K}$

$M_{9.375} = 117.6^{K\text{-}FT}$

USE | W18 x 40

B-40



$P_1 = (4.38^{K}_{D} + 16.39^{K}_{L}) = 20.77^{K}$

$P_2 = (3.54^{K}_{D} + 13.60^{K}_{L}) = 17.14^{K}$

$P_D = (4.38+0.94)_{D} + (16.39+1.81_{L}) = (5.32^{K}_{D} + 18.20^{K}_{L}) = 23.52^{K}$

$P_5 = (0.94^{K}_{D} + 1.81^{K}_{L}) = 2.75^{K}$

$P_3 = (0.51^{K}_{D} + 0.50^{K}_{L}) = 1.01^{K}$

$P_4 = (0.93^{K}_{D} + 0.62^{K}_{L}) = 1.55^{K}$

$\omega = 0.08^{K/'}_{D}$

$R_1 = (11.19^{K}_{D} + 36.21^{K}_{L}) = 47.40^{K}$

$R_2 = (11.27^{K}_{D} + 31.30^{K}_{L}) = 42.57^{K}$

$M_{16.67} = 391.5$

$(1034.48 \times 10^{-6})(30.75)^2 (f_b/d) \leq \frac{369}{360} = 1.025''$

$(f_b/d) \leq 1.04T$

for W24x84 $\rightarrow (f_b/d) = (23.97/24.10) = 0.995$

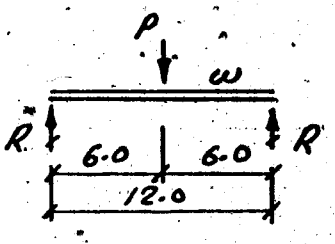
USE | W27 x 84
OR IF SPACE LIMITED
W24 x 84 OK

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B-41



$\omega = (0.23^{K/l}_{D} + 0.88^{K/l}_{L}) = 1.11^{K/l}$ REF B-38

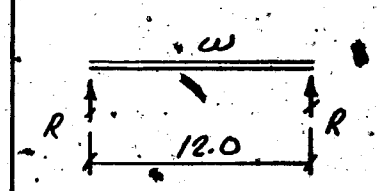
$P = (6.0)(.086_D + .050_L)(27.67/2) = (7.14^{K}_{D} + 4.15^{K}_{L}) = 11.29^{K}$

$R = (4.95^{K}_{D} + 7.36^{K}_{L}) = 12.31^{K}$

$M = 53.9^{KFT}$

USE W16 x 26

B-42



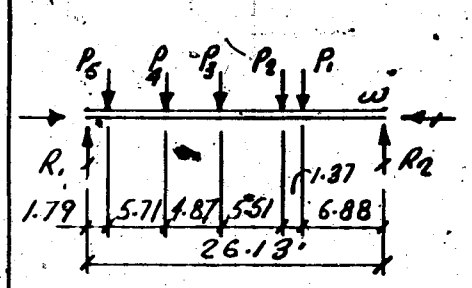
$\omega = \left(\frac{8.25^2}{2 \times 7.04}\right)(.066_D + .250_L) = (0.32^{K/l}_{D} + 1.21^{K/l}_{L}) = 1.53^{K/l}$

$R = (1.92^{K}_{D} + 7.26^{K}_{L}) = 9.18^{K}$

$M = 27.6^{KFT}$

USE W12 x 14

B-43



AXIAL LOAD = 97.2 x 1.25
from SHT N° 299

TRIB $(26.13 - 8.25)(28.33/2) = 208\,\Phi$

$R = (.08\%)(208 - 150) = 4\% \rightarrow LL = 48^{\#/\Phi}$

$P_1 = (6.88)(.066_D + .100_L)(19.71/2) = (4.48_D + 6.78_L) = 11.26^{K}$

$P_2 = (4.00)(.086_D + .048_L)(15.0/2) = (2.58_D + 1.44_L) = 4.02^{K}$

$P_3 = (7.47 + 2.24)_D + (4.50 + 3.39)_L = (9.71_D + 7.89_L) = 17.60^{K}$

$P_4 = (5.29)(.086_D + .048_L)(23.33/2) = (5.31_D + 2.96_L) = 8.27^{K}$

$P_5 = (5.71)(\ d_D + d_D\ )(\ d_D\ ) = (5.73_D + 3.20_L) = 8.93^{K}$

$\omega = 0.05^{K/l}_{D}$

$R_1 = (16.88^{K}_{D} + 11.49^{K}_{L}) = 28.37^{K}$

$R_2 = (12.23^{K}_{D} + 10.79^{K}_{L}) = 23.02^{K}$

$M_{12.37} = 212.4^{KFT}$

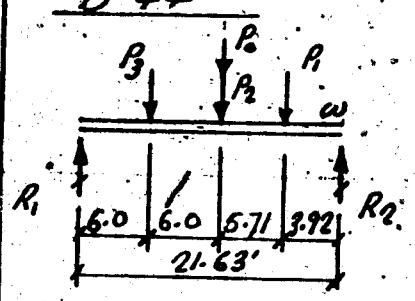
USE W24 x 62

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B-44



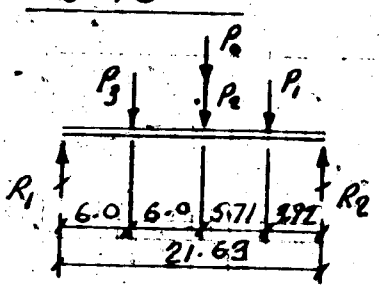
NOTE:
P_o IS LOAD FROM THE 3RD FLR COL. T-9 WHICH CARRIES ROOF L.L. ONLY AT THIS TIME. FUTURE EXPANSION HAS DESIGNED-OUT THIS COL. SEE FUTURE 3RD FLR FRMG PLAN.

TRIB $21.63 \times 51.0/2 = 552\#$
$R = (.08\%)(552-150) = 32\% \rightarrow LL = 34\#/\square'$
$P_1 = (5.71)(.086_D + .034_L)(51.0/2) = (12.52^K_D + 4.95^K_L) = 17.47^K$
$P_2 = (5.86)(\ do_D + do_L)(\ do\ ) = (12.85^K_D + 5.08^K_L) = 17.93^K$
$P_3 = (6.00)(\ do_D + do_L)(\ do\ ) = (13.16^K_D + 5.20^K_L) = 18.36^K$
$P_o = (11.61^K_D + 2.12^K_L) = 13.73^K$ from TEMP. COL @ 3RD LEVEL/ROOF
$w = 0.05^K/l'_D$

$R_1 = (18.04^K + 5.17\ )_D + (6.92^K + 0.94^K)_L$
$R_1 = (23.21^K_D + 7.86^K_L) = 31.07^K$ -6.11
$R_2 = (21.57^K + 6.44^K)_D + (8.31^K + 1.18^K)_L$
$R_2 = (28.01^K_D + 9.49^K_L) = 37.50^K$ -7.32
$M_{12.0} = 259.0^{KFT}$

USE | W 24 x 62

B-45



NOTE:
P_o IS LOAD FROM THE 3RD FLR COL. T-12 WHICH CARRIES ROOF LL ONLY AT THIS TIME. SEE NOTE ABOVE AT B-44

TRIB $21.63 \times 23.39/2 = 252\#$
$R = (.08\%)(252-150) = 8\% \rightarrow LL = 46\#/\square'$
$P_1 = (5.71)(.086_D + .046_L)(23.39/2) = (5.73^K_D + 3.06^K_L) = 8.79^K$
$P_2 = (5.86)(\ do_D + do_L)(\ do\ ) = (5.88^K_D + 3.15^K_L) = 9.03^K$
$P_3 = (6.00)(\ do_D + do_L)(\ do\ ) = (6.02^K_D + 3.22^K_L) = 9.24^K$
$P_o = (5.40^K_D + 1.21^K_L) = 6.61^K$ from TEMP. COL @ 3RD LEVEL/ROOF
$w = 0.05^K/l'_D$

$R_1 = (8.55^K + 2.40^K)_D + (4.28^K + 0.54^K)_L$
$R_1 = (10.95^K_D + 4.82^K_L) = 15.74^K$ -2.94
$R_2 = (10.16^K + 3.00^K)_D + (5.15^K + 0.67^K)_L$
$R_2 = (13.16^K_D + 5.82^K_L) = 18.98^K$ -3.67
$M_{12.0} = 130.2^{KFT}$

USE | W 21 x 44

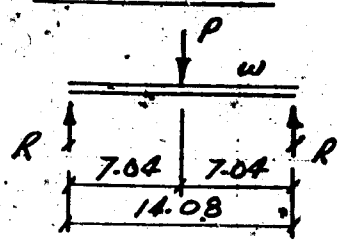
1600 EAST DESERT INN ROAD SUITE 106 | LAS VEGAS, NEVADA 89109-2594 (702) 731-6226

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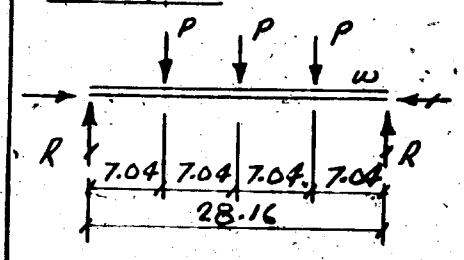


$P = (4.38^K + 4.03^K)_D + (16.39^K + 15.07^K)_L = (8.41^K_D + 31.46^K_L) = 39.87^K$
$\omega = 0.05^K/_{ft}$

$R = (4.56^K_D + 15.73^K_L) = 20.29^K$
$M = 141.6^{KFT}$

USE W 21 x 44

B-47



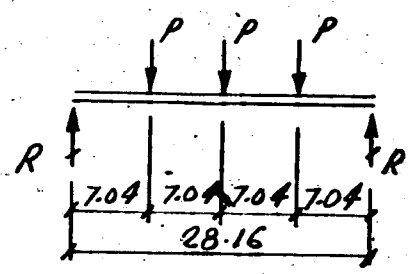
$P = (1.03^K + 2.82^K)_D + (15.07^K + 10.56^K)_L = (6.85^K_D + 25.63^K_L) = 32.48^K$
$\omega = 0.10^K/_{ft}$

$R = (11.68^K_D + 38.45^K_L) = 50.13^K$
$M = 467.3^{KFT}$

USE W 27 x 94

AXIAL LOAD = 1.25 x 44.5^K
from SHT N°

B-48



$P = (2.82^K_D + 10.56^K_L) = 13.38^K$
$\omega = 0.06^K/_{ft}$

$R = (5.08^K_D + 15.84^K_L) = 20.92^K$
$M = 194.4^{KFT}$

USE W 24 x 55

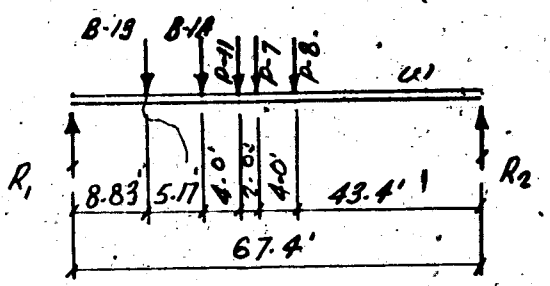
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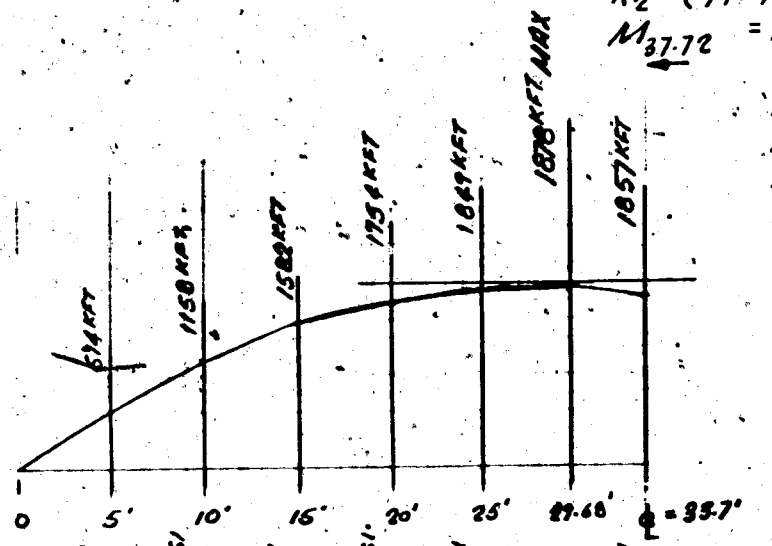


TRIB 67.4 x 42.0/2 = 1415 #
R = (.08%)(1415-150) > 40% MAX → LL = 30 #/ft

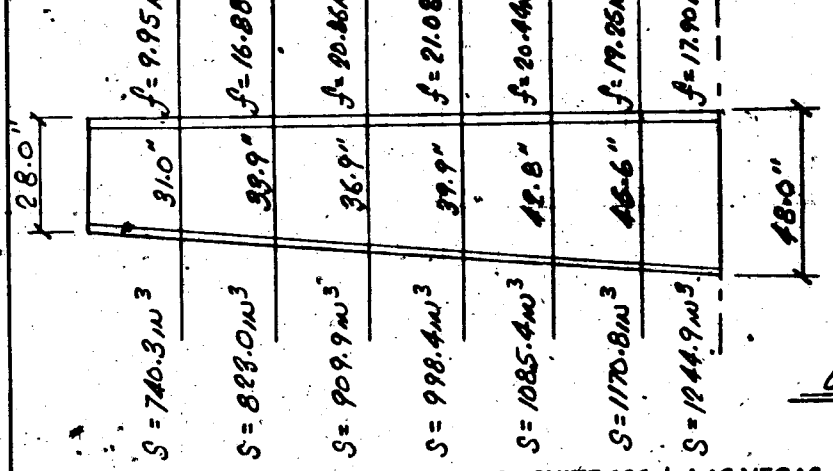
$w = (42.0/2)(.086^{K}/_{ft_D} + .030^{K}/_{ft_L}) + 0.20^{K}/_{ft}$
$w = (2.01^{K}/_{ft_D} + 0.63^{K}/_{ft_L}) = 2.64^{K}/_{ft}$

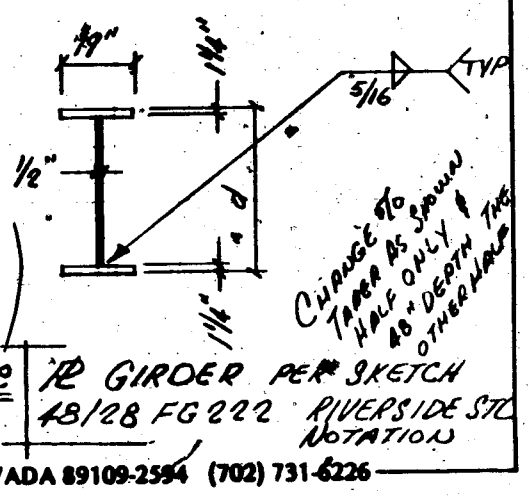
P-7 = $(-0.58^{K}_{D} + 1.20^{K}_{L}) = 0.62^{K}$ OMIT (-1.47^K MIN)
P-8 = $(-1.39^{K}_{D} + 0.53^{K}_{L}) = -0.86^{K}$ UPLIFT (-3.50^K MIN)
P-11 = $(1.13^{K}_{D} + 1.72^{K}_{L}) = 2.85^{K}$
B-1A = $(18.01^{K}_{D} + 26.93^{K}_{L}) = 44.94^{K}$
B-19 = $(1.18^{K}_{D} + 1.36^{K}_{L}) = 2.54^{K}$

$R_1 = (83.45^{K}_{D} + 45.85^{K}_{L}) = 129.30^{K}$
$R_2 = (71.76^{K}_{D} + 27.82^{K}_{L}) = 99.58^{K}$
$M_{37.72} = 1878^{KFT}$



$M_5 = 614^{KFT}$
$M_{10} = 1158^{KFT}$
$M_{15} = 1582^{KFT}$
$M_{20} = 1754^{KFT}$
$M_{25} = 1849^{KFT}$
$M_{29.68} = M_{37.72} = 1878^{KFT}$
$M_{33.7=\ell} = 1857^{KFT}$





USE PC GIRDER PER SKETCH
48/28 FG 222 RIVERSIDE STD NOTATION

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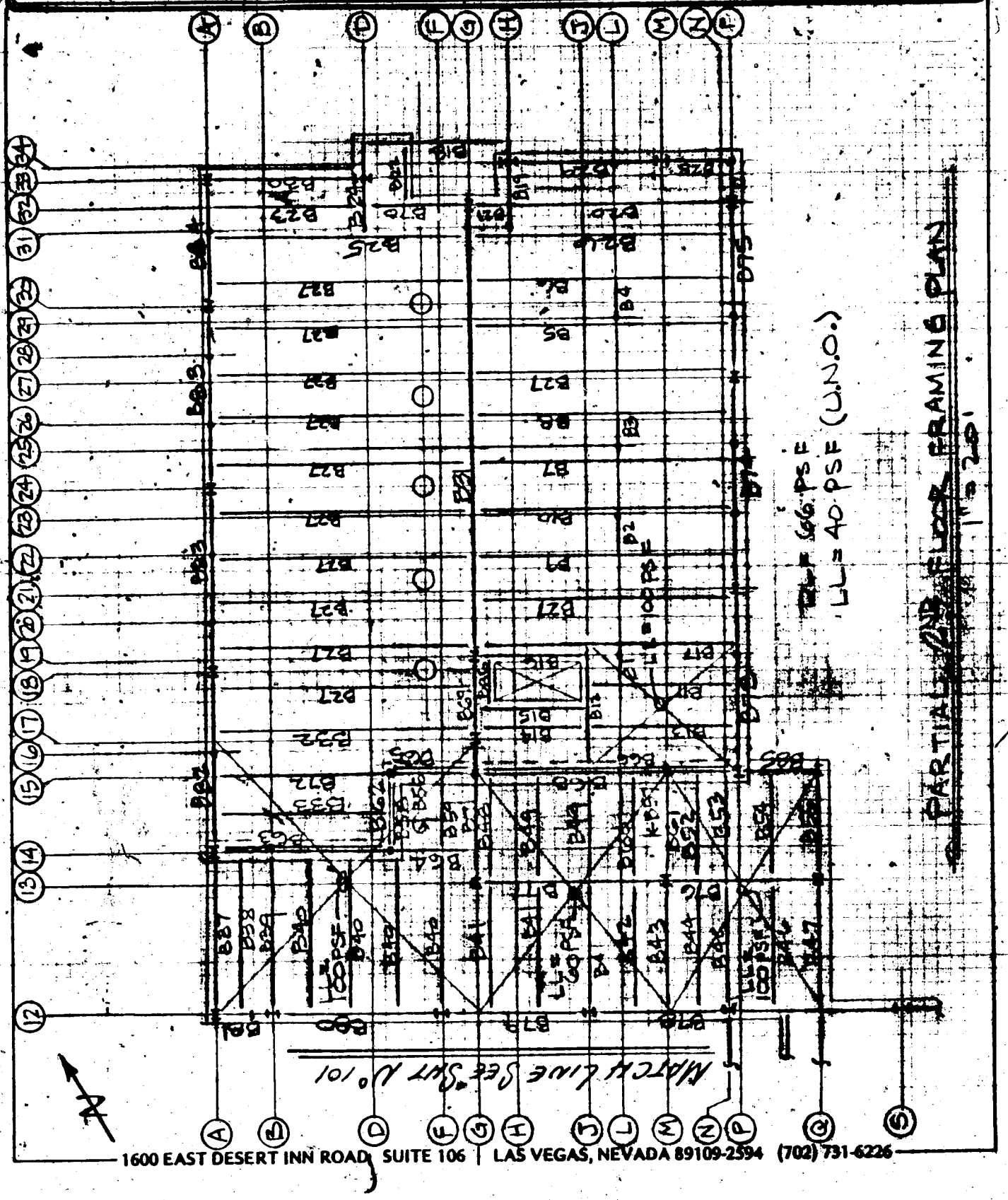
2ND LEVEL NORTH HALF

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PROJECT #

DATE/ 10/5/82

ENGINEER/ JRL



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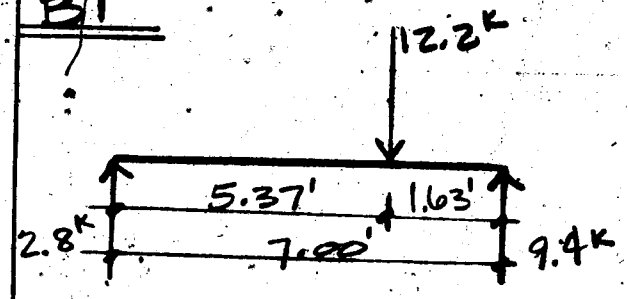
CLIENT/
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2ND LEVEL NORTH HALF

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ENGINEER/

2ND FLOOR BMS - NORTH

B-1 THRU B-86

B1

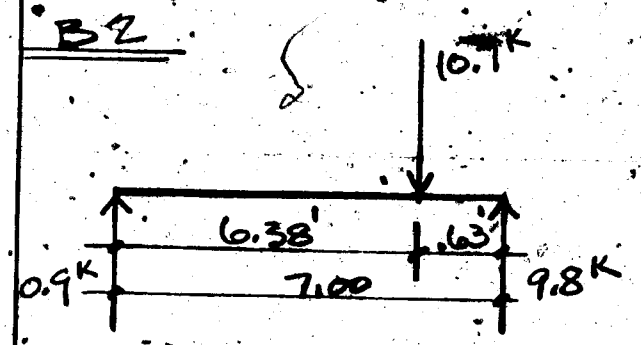


$P = (2.4^{B10} + 5.3^{B49} + 6.0^{B51}) \times \frac{32}{36} = 12.2^K$ ← LL REDUCTION

$M = 1.63' \times 9.4^K = 15.3^{IK}$

USE W12x14.
$M_R = 30$

B2

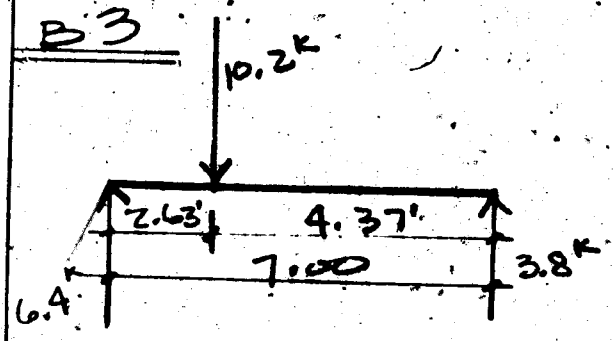


$P = (3.9^{B12} + 5.3^{B49} + 8.8 \times 9' \times .036^{K}_{SF}{}^{FUTURE\ BM}) \times \frac{32}{36}$ ← LL REDUCTION
$= 10.7^K$

$M = .63' \times 9.8^K = 6.2^{IK}$

USE W12x14
$M_R = 30$

B3



$P = (3.9^{B12} + 4.8^{B48} + 8.4' \times 9' \times .036^{K}_{SF}) \times \frac{32}{36}$ ← LL REDUCTION
$= 10.2^K$

$M = 4.37' \times 3.8^K = 16.6^{IK}$

USE W12x14
$M_R = 30$

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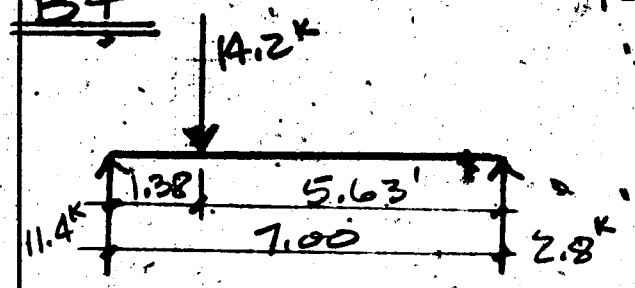
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ENGINEER/ TSL

2ND FLOOR BMS. - NORTH

B4

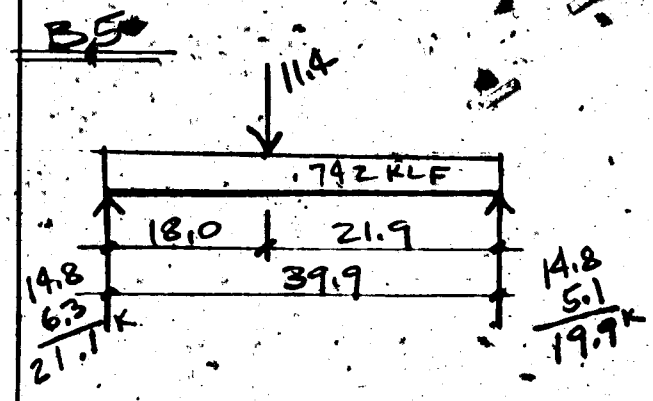


$P = (4.8^{B48} + 3.6^{B47} + 17.0' \times 8.7 \times .036^{K}_{SF}$ (FUTURE BM.)
$+ 7.0' \times 9.0' \times .036^{K}_{SF}) \times \frac{32}{36} = 14.2^{K}$

$M = 5.63' \times 2.8^{K} = 15.8^{IK}$

USE W12x14
$M_R = 30$

B5



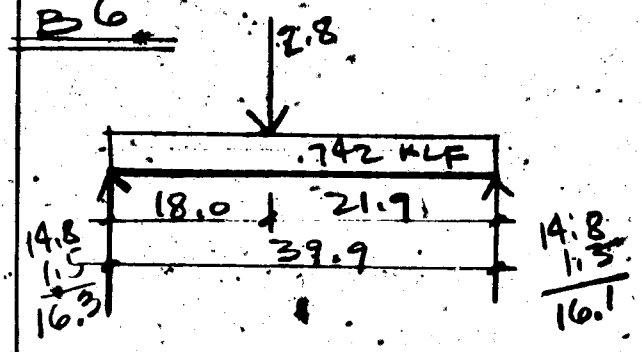
$W = 7'(40^{LL} + 66^{DL}) = 742$ PLF

$M = 258.9^{IK}$

USE W21x68
$M_R = 280$

(W24x62)

B6



$W = 742$ PLF

$M = 173.9^{IK}$

USE W21x50
$M_R = 189$

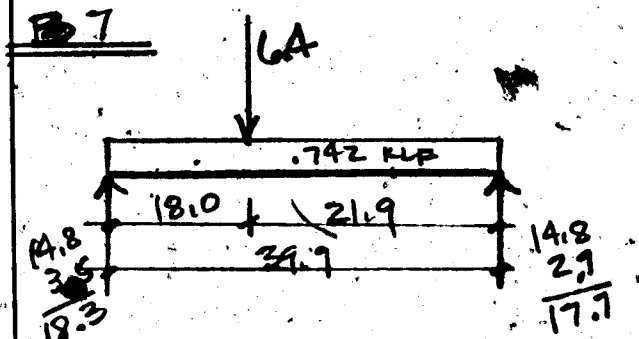
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B7

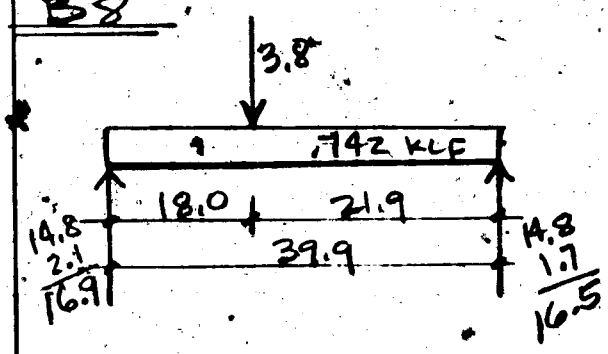


M = 209.5 IK

USE W21 X 57
M_R = 222

(W24 x 55)

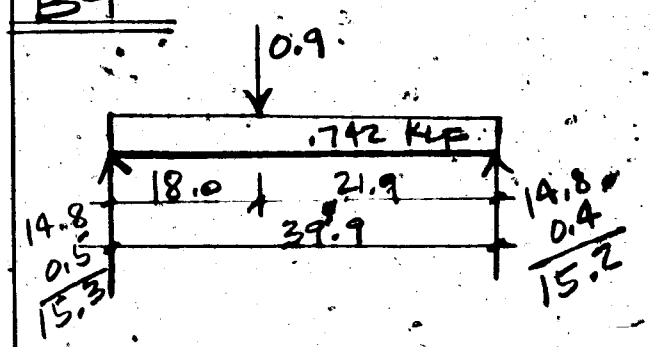
B8



M = 183.8 IK

USE W21 X 50
M_R =

B9



M = 155.9 IK

USE W21 x 44
M_R =

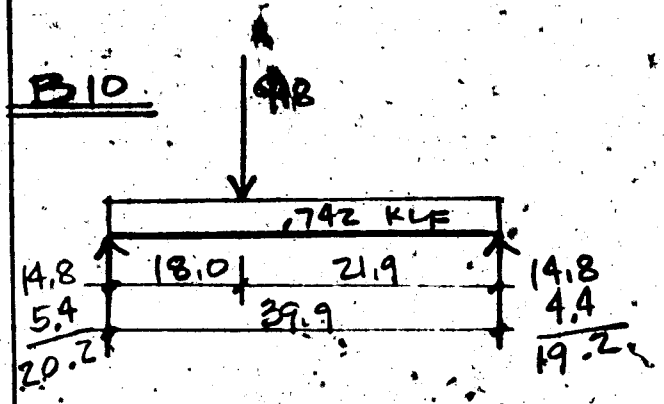
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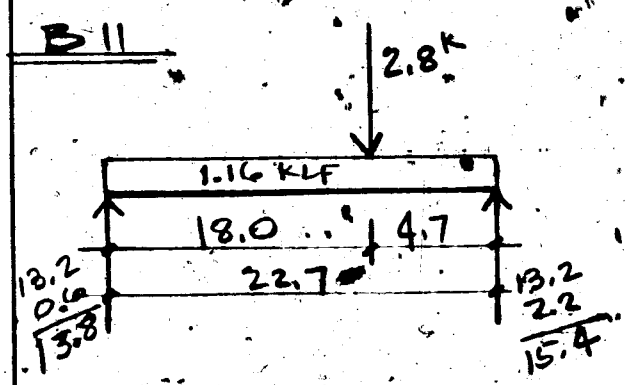
B10



M = 248.1K

USE W21 x 62
M_R =

B11



W = 7'(1.00 + 0.66) = 1162 PLF

M = 81.41K

USE W 16 x 31
M_R = 94

B12

M = 114.0 1K

USE W18 x 40
M_R = 137

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2ND FLOOR BMS. - NORTH

B13

SPAN = 22.7 A_T = LL = 100

$w = 6.3(100+66) = 1046$ $M = \frac{1.046(22.7)^2}{8} = 67.4^{1K}$ $R = 11.9^{K}_{DL}$

USE W16x26
$M_R = 77$

B 14

SPAN = 17.2 A_T = LL = 40

$w = 4.3(40+66) = 456$ $M = \frac{.456(17.2)^2}{8} = 16.9^{1K}$ $R = 3.9^{K}_{DL}$

USE W12x14
$M_R = 35$

B 15

SPAN = 17.2 A_T = LL = 40

$w = 2'(40+66) + 11' \times 15^{PSF}_{WALL} = 377$ $M = \frac{.377(17.2)^2}{8} = 13.9^{1K}$ $R = 3.2^{}_{DL}$

USE W8x10
$M_R = 16$

B16

SPAN = 17.2 A_T = LL =

$w = 1'(40+66) + 11' \times 15\,PSF = 271$ $M = \frac{.271(17.2)^2}{8} = 10.0^{1K}$ $R = 2.3^{}_{DL}$

USE W8x10
$M_R = 16$

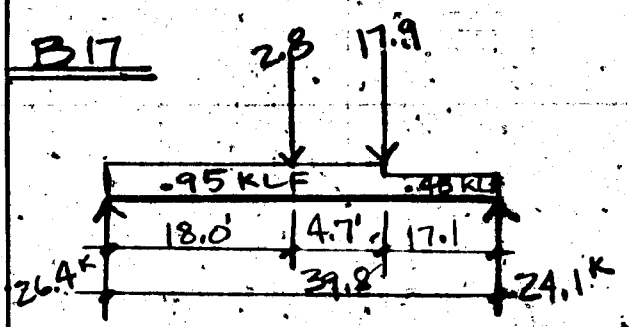
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B17



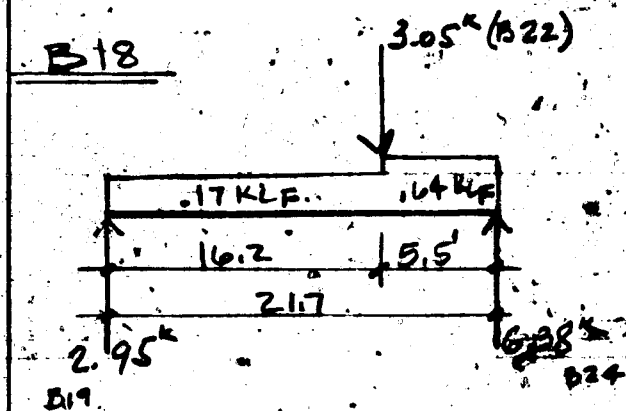
$W_1 = 3.5'(100+66) + 3.5'(40+66)$
$= 952$ PLF

$W_2 = 4.5'(100+66) = 477$ PLF

$M = 17.1 \times ___ - .48\frac{(17.1)^2}{2} = 341.9^{IK}$

USE W24x76
$M_R = 352$

B18



TOP FLANGE UNSUPPORTED FOR 16.2'

$W_1 = 11' \times 15 PSF = 165$

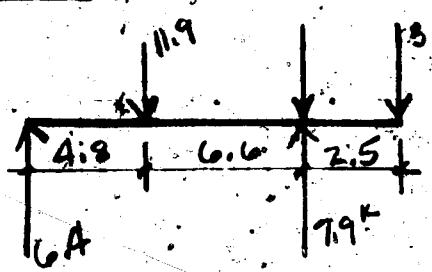
$W_2 = 4.5'(40^{LL}+66^{DL}) + 11' \times 15 PSF = 642$ (DL = 462)

$M = 2.95(16.2) - .17(16.2)^2 .5 = 25.4^{IK}$

USE W6x20
$M_R = 2__^{IK}$ @ $L_b = 16.2'$

(NO LOAD FROM STAIR #8)

B19



$M_- = 3.0^K \times 2.5' = 7.5^{IK}$

$M_+ = 6.4^K \times 4.8' = 30.7^{IK}$

USE W12x1_
$M_R = 34$

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2ND FLOOR BMS. — NORTH

B20

SPAN = 34.0' A_T = LL = 40

$w = 5.7'(40+66) = 604$ $M = \frac{.604(34.0)^2}{8} = 87.3^{1K}$ $R = 10.3$ DL =

USE W18X35

$M_R = 115$

$\Delta = \frac{87.3(34.0)^2}{80.6 \times 57.6 \times 18} = 1.21" = \text{SPAN}/338$

B21

NO LOAD FROM STAIRS

SPAN = 5.9' A_T = LL =

$w = 3.4'(40+66) + 11' \times 15 PSF = 525$ (WALL)

$M = \frac{.525(5.9)^2}{8} = 2.3^{1K}$ $R = 1.16^K$ DL =

USE W8X10

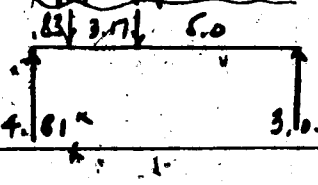
$M_R = 16$

$P_1 = P_2 = \frac{4.17}{2}(50+100)8' = 654 + 248 = 1902$

B22

SPAN = 9.0' A_T = LL =

$w = 3(50+100) = 450$ PLF



$M = 3.05(5.0) - \frac{.450(5.0)^2}{2} = 9.6^{1K}$ $R = 4.81$ B70, 3.95 B18

DL =

USE W8X10

$M_R = 16$

B23

SPAN = 24.0' A_T = LL = 40

$w = 4.7'(\underset{LL}{40} + \underset{DL}{66}) = 498'$ $M = \frac{.498(24.0)^2}{8} = 35.9^{1K}$ $R = 6.0^K$ DL =

USE W14X22

$M_R = 58$

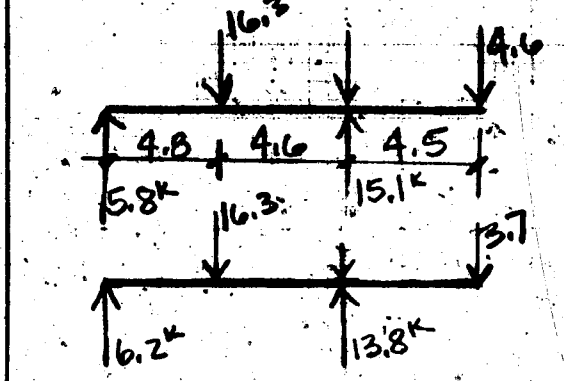
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2ND FLOOR BMS. - NORTH

B24



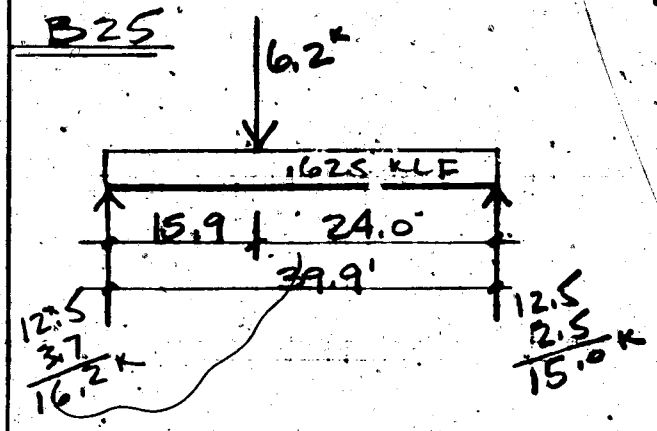
$M_- = 4.6^K \times 4.5' = 20.7^{IK}$

$M_+ = 6.2^K \times 4.8' = 29.8^{IK}$

USE W12x19

$M_R = 43^{IK}$ @ $L_b = 4.2'$

B25



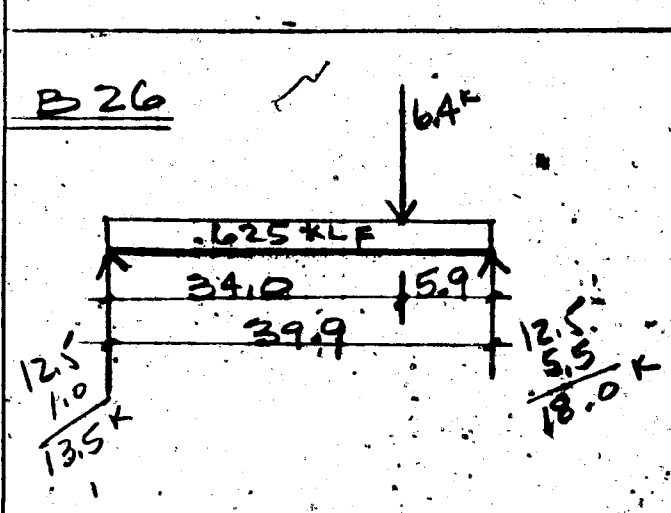
$W = 5.9'(40^{LL} + 66^{DL}) = 625$

$M = \frac{(15)^2}{2 \times .625} = 180.0^{IK}$

USE W21x50

$M_R = 189$

B26



$W = 5.9'(40^{LL} + 66^{DL}) = 625$

$M = \frac{(13.9)^2}{2 \times .625} = 145.8^{IK}$

USE W21x44

$M_R =$

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2ND FLOOR BMS. - NORTH

B27

SPAN = 39.9' A_T = LL = 40

$w = 1.0(40+0.6) = 742$ $M = \frac{.742(39.9)^2}{8} = 147.7^{IK}$ $R = 14.8$ (DL =)

USE W21×44

$\Delta = \frac{147.7(39.9)^2}{80.6 \times 81.6 \times 21} = 1.70'' = \frac{SPAN}{281}$ $M_R = 163$, $\Delta_{LL} = \frac{40}{106} \times 1.70 = .64'' = \frac{SPAN}{746}$

B 28'

SPAN = 10.6 A_T = LL =

$w = 4.3'(\overset{LL}{40}+\overset{DL}{66}) = 456^{PLF}$ $M = \frac{.456(10.6)^2}{8} = 6.4^{IK}$ $R = 2.4^K$ (DL =)

USE W8×10

$M_R = 16$

Axial Load from x-brace

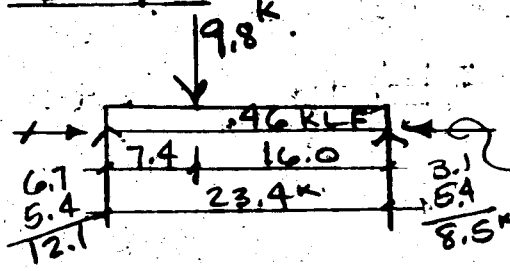
B29

$w = 4.3'(40+66) = 456$ PLF

$P = 16' \times 17' (\overset{ROOF}{20}+16) = 9.8^K$

$M = 16.0' \times 8.5^K - \frac{.46(16)^2}{2} = 77.1^{IK}$

AXIAL LOAD = (1.25 × 20.1K)



USE W16×36

$M_R = 113$

B 30

SPAN = 24.0 A_T = LL =

$w = 3.3'(40+66) = 350$ $M = \frac{.85(24)^2}{8} = 25.2$ $R = 4.2$ (DL =)

USE W12×14

$M_R = 30$

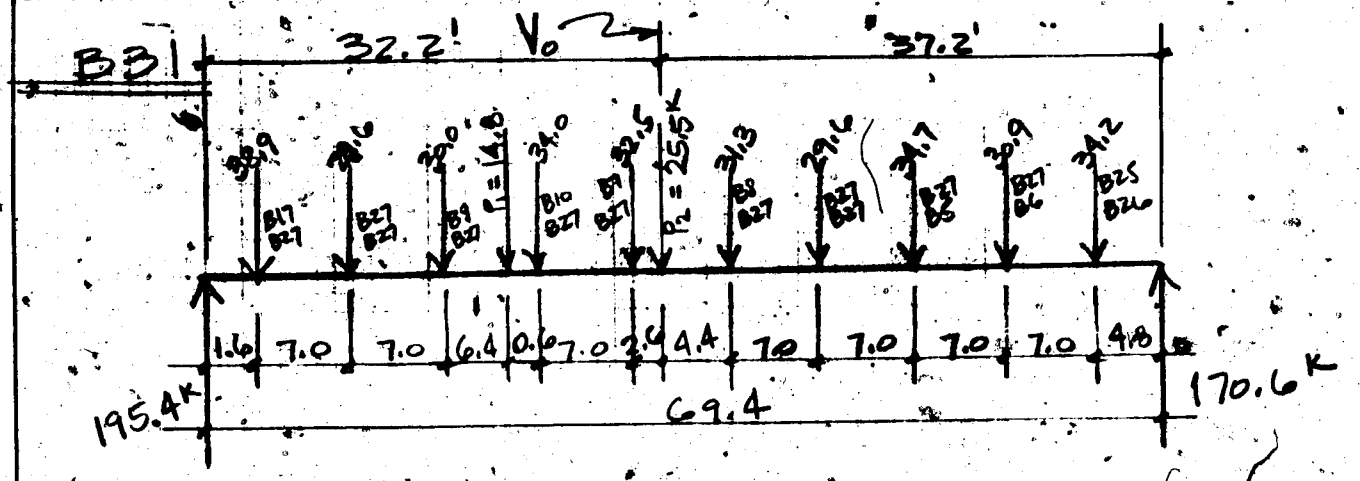
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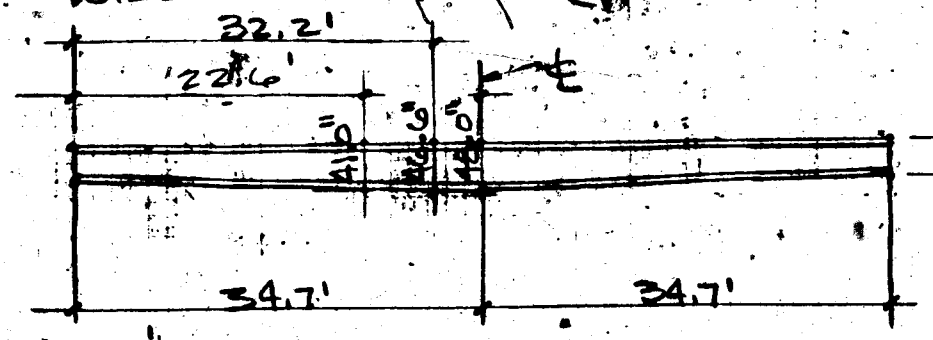
$P_1 = (3.9 + 12.2 + 0.6) \times \frac{32}{36} = 14.8^K$ (B12, B44, B32; LL REDUCTION)

$P_2 = (24.2 + 3.9 + 0.6) \times \frac{32}{36} = 25.5^K$ (B33, B12, B32)

$M = 37.2' \times 170.6^K - 4.4 \times 31.3 - 11.4 \times 29.6 - 18.4 \times 34.7 - 25.4 \times 30.9 - 32.4 \times 34.2 = 3339.7^{IK}$

EQUIV. UNIF. LOAD $= \frac{8 \times 3339.7}{(69.4)^2} = 5.55^{K/FT.}$

LARGEST RIVERSIDE ~~48/28~~ TAPERED GIRDER WILL NOT WORK. (GOOD FOR 3832 PLF)



MOM. @ 22.6' FROM LEFT END
$= 22.6' \times 195.4^K - .6' \times 14.8 - 7.0' \times 30.0 - 14.0' \times 29.6 - 21.0' \times 38.9$
$= 2965.9^{IK}$

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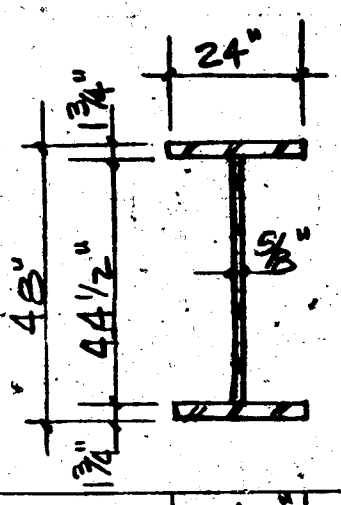
2

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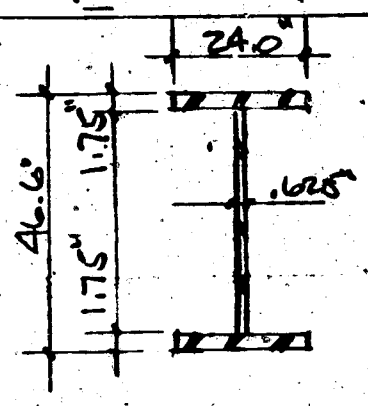
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B31, CONT.



SECTION @ ℄

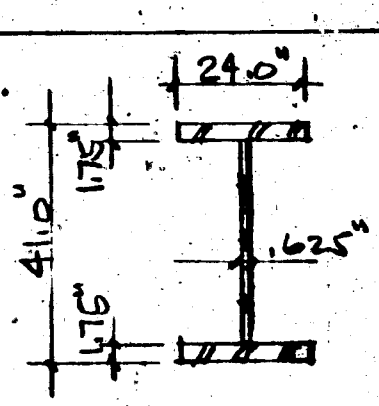
A = 111.8
I_x = 49510.0
S_x = 2062.9



SECTION @ 32.2' FROM LEFT END

A = 110.9
I_x = 46411.9
S_x = 1991.9

$$f_b = \frac{*3339.7 \times 12}{1991.9} = 20.12 \text{ KSI}$$



SECTION @ 22.6' FROM LEFT END

A = 107.4
I_x = 35098.4
S_x = 1712.1

$$f_b = \frac{2965.9 \times 12}{1712.1} = 20.79 \text{ KSI}$$

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B31, CONT.

CHECK WEB:

MAX. $h/t = \frac{44.5}{.625} = 71$

h/t @ SUPPORT $= \frac{24.5}{.625} = 39$

ALLOW. SHEAR = 14.5 KSI

MAX. $f_v = \frac{195.4^K}{.625 \times 28} = 11.2^{KSI} < 14.5$

WEB STIFFS. NOT REQD.
(1.10-1)
(TABLE 10-36)
(1.10.5.3)

CHECK FLANGES:

$\frac{w}{t} = \frac{12"}{1.75} = 6.9 < \frac{95}{\sqrt{36}} = 15.8$ (1.9.1.2)

CHECK FOR WEB CRIPPLING AT COL. 25-9.

$P = 25.5^K$ $\frac{25.5^K}{.625(6" + 2 \times D)} = 6.8^{KSI}$ OK (1.10-8)

WEB STIFFS. NOT. REQD.

FLANGE DEVELOPMENT

$1.75 \times \frac{127}{\sqrt{36}} = 37"$, MAX. WELD SPACING = 12" (1.18.2.3)

AT THE LEFT END REACTION:

$V = 195.4^K$
$Q = 24" \times 1.75" \times 13.13" = 551\ IN^3$
$I_x = 15,236\ IN^4$

$\frac{VQ}{I} = \frac{195.4 \times 551}{15236} = 7.07^{K/11}$

USE 5/16" FILLETS CONTINUOUS BA. SIDE
GOOD FOR $2 \times 4.6 = 9.2^{K/11}$

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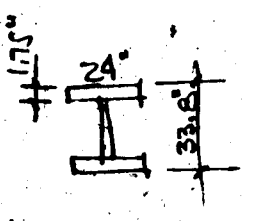
AT 10' FROM THE LEFT END:

$V = 195.4 - 38.9 - 29.6 = 126.9^K$

$Q = 1.75" \times 24" \times 16.03" = 673.0\ IN^3$

$I_x = 23020\ IN^4$

$$\frac{VQ}{I} = \frac{126.9 \times 673}{23020} = 3.71^K/11$$



USE 5/16" FILLETS
6" LONG @ 12" O.C.
EA. SIDE
GOOD FOR $\frac{2 \times 6" \times 4.6}{12"} = 4.6^K/11$

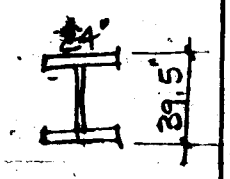
AT 20' FROM THE LEFT END:

$V = 195.4 - 38.9 - 29.6 - 30.0 = 96.9^K$

$Q = 1.75" \times 24" \times 18.88" = 792.7\ IN^3$

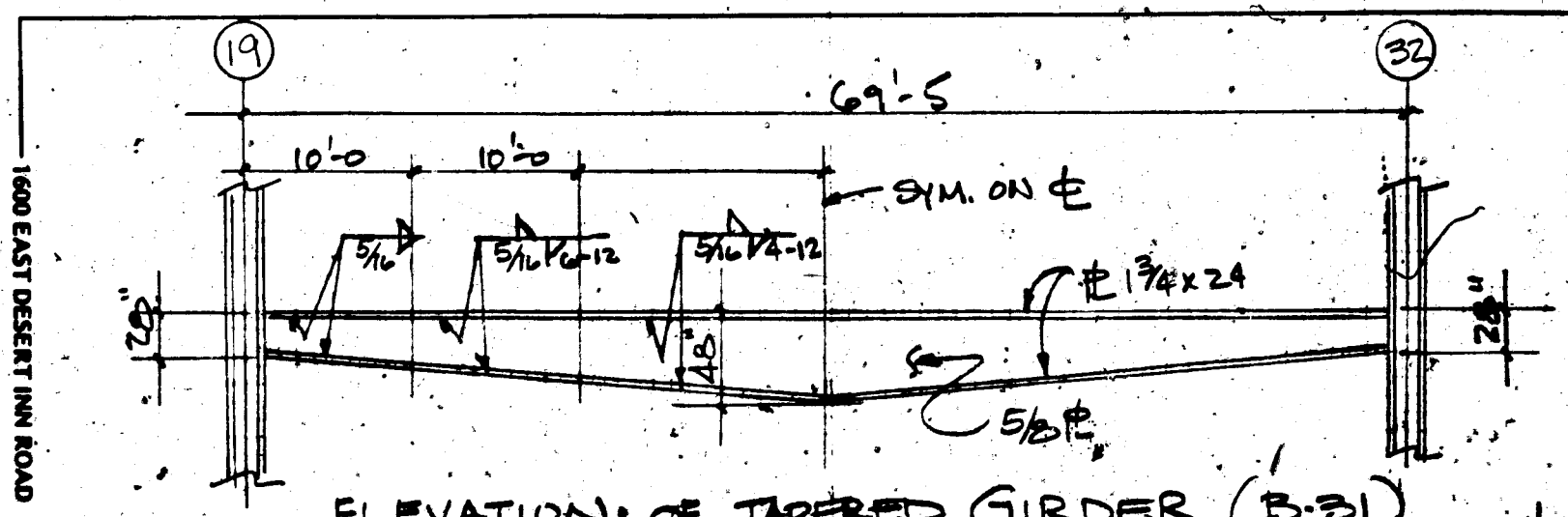
$I_x = 32,356\ IN^4$

$$\frac{VQ}{I} = \frac{96.9 \times 792.7}{32,356} = 2.37^K/11$$



USE 5/16" FILLETS
4" LONG @ 12" O.C.
EA. SIDE
GOOD FOR $\frac{2 \times 4" \times 4.6}{12"} = 3.07^K/11$

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ELEVATION OF TAPERED GIRDER (B-31)

AVERAGE $I_x = \frac{49510 + 15236}{2} = 32373 \text{ IN}^4$ (℄ / END.)

AVERAGE DEPTH $= \frac{28+48}{2} = 38.0"$

AVERAGE $S_x = \frac{32373}{.5 \times 38} = 1703.8 \text{ IN}^3$

APPROX. $\Delta = \frac{3339.7^{K} \times (69.4)^2}{80.6 \times 1703.8 \times 38} = 3.08"$ (CONSERVATIVE)

APPROX. $\Delta_{LL} = \frac{40}{106} \times 3.08" = 1.16" = \frac{\text{SPAN}}{723}$

APPROX. $\Delta_{DL} = 3.08 - 1.16" = 1.92"$.

CAMBER 2", PARABOLIC

B31 GIRT.

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PROJECT # 82017

10/20/82

JRL

Texas Colliseum 12-19-84

Lucia Collins 12-19-84

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2ND FLOOR BMS. - NORTH

B32

SPAN = 39.9' A_T = LL = {100 / 40

$w = 2.9'(\frac{40}{100}+\frac{66}{66}) + 3.6'(\frac{40}{45}+\frac{66}{66}) = 852$ PLF

$M = \frac{.852(39.9)^2}{8} = 169.6$ $R = 17.0^K$ $R_{DL} =$

USE W21x50
$M_R = 189$

B33

SPAN = 28.0' A_T = LL =

$w = 5.8(100+66) = 963.$ $M = \frac{.963(28)^2}{8} = 94.4^{IK}$ $R = 13.5^K$ $R_{DL} =$

USE W18x35
$M_R = 115$

B34

SPAN = 11.7' A_T = LL =

$w = 5'(40+66) + 5'x15PSF = 605$ PLF $M = \frac{.605(11.7)^2}{8} = 10.4^{IK}$ $R = 3.5$ $R_{DL} =$

USE W8x10
$M_R = 16$

B35

SPAN = 11.7' A_T = LL =

$w = 6'(40+66) = 636$ $M = \frac{.636(11.7)^2}{8} = 10.9$ $R = 3.7^K$ $R_{DL} =$

USE W8x10
$M_R = 16$

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2ND FLOOR BMS. - NORTH

B36

SPAN = 28.0' A_T =

$w = 3.9'(100+66) = 647$ $M = \frac{647(28.0)^2}{8} = 63.4$ LL =

R = 9.1
DL =

USE W16x26
$M_R = 77$

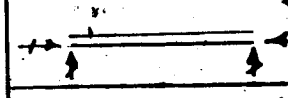
Axial Load from x-brace

B37

SPAN = 24.2' A_T = LL =

$w = 3.2'(100+66) = 531$ $M = \frac{531(24.2)^2}{8} = 38.9$ R = 6.4
DL =

USE W14 x 34
$M_R = 58$



B38

SPAN = 24.2 A_T = LL =

$w = 4.4'(100+66) = 730$ $M = \frac{730(24.2)^2}{8} = 53.4$ R = 8.8
DL =

USE W14x22
$M_R = 58$

B39

SPAN = 24.2' A_T = LL =

$w = 5.3'(100+66) = 880$ $M = \frac{880(24.2)^2}{8} = 64.4$ R = 10.6
DL =

USE W16x26
$M_R = 77$

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2ND FLOOR BMS. - NORTH

B40

SPAN = 24.2' A_T = LL = 100

$w = 7.0'(100+66) = 1162$ $M = \frac{1.162(24.2)^2}{8} = 85.1$ $R = 14.1$ DL =

USE W16X31

$M_R = 94$

B41

SPAN = 19.7' A_T = LL = 60

$w = 7.0'(60+66) = 882$ $M = \frac{.882(19.7)^2}{8} = 42.8$ $R = 8.7$ DL =

USE W14X22

$M_R = 58$

B42

SPAN = 19.7 A_T = LL = 60

$w = 6'(60+66) = 756$ $M = \frac{.756(19.7)^2}{8} = 36.7$ $R = 7.5$ DL =

USE W12X19

$M_R = 43$

B43

SPAN = 19.7 A_T = LL = {60 / 100

$w = 2.5'(60+66) + 2.2'(100+66) = 680$ $M = \frac{.68(19.7)^2}{8} = 33.0$ $R = 6.7$ DL =

USE W12X19

$M_R = 43$

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2ND FLOOR BMS. – NORTH

B44

SPAN = 19.7 A_T = LL =

$w = 4.5'(100+66) = 747$ $M = \frac{.747(19.7)^2}{8} = 36.2$ $R = 7.4$ DL =

USE W12x19

$M_R = 43$

B45

SPAN = 19.7 A_T = LL =

$w = 5.6'(100+66) \pm 930$ $M = \frac{.93(19.7)^2}{8} = 45.1$ $R = 9.2$ DL =

USE W14x22

$M_R = 58$

B46

SPAN = 19.7 A_T = LL =

$w = 6.9(100+66) = 1145$ $M = \frac{1.145(19.7)^2}{8} = 55.6$ $R = 11.3$ DL =

USE W16x26

$M_R = 77$

B47

SPAN = 19.7 A_T = LL =

$w = 4.4'(100+66) = 730$ $M = \frac{.73(19.7)^2}{8} = 35.4$ $R = 7.2$ DL =

USE W12x19

$M_R = 43$

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2ND FLOOR BMS. — NORTH

B48

SPAN = 16.2' A_T = LL =

$w = 5'(60+66) = 630$ $M = \frac{.63(16.2)^2}{8} = 20.7$ $R = 5.1$ DL =

USE W12×14

$M_R = 30$

B49

SPAN = 16.2' A_T = LL =

$w = 7.0(60+66) = 882$ $M = \frac{.882(16.2)^2}{8} = 28.9$ $R' = 7.1$ DL =

USE W12×16

$M_R = 34$

B50

SPAN = 16.2 A_T = LL =

$w = 6'(60+66) = 756$ $M = \frac{.756(16.2)^2}{8} = 24.8$ $R = 6.1$ DL =

USE W12×14

$M_R = 30$

B51

SPAN = 16.2 A_T = LL =

$w = 2.5'(60+66)'$
$+2.2'(100+66) = 680$ $M = \frac{.168(16.2)^2}{8} = 22.3$ $R = 5.5$ DL =

USE W12×14

$M_R = 30$

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2ND FLOOR BMS. — NORTH

B52

SPAN = 16.2 A_T = LL =

$w = 4.5(100+66) = 747$ $M = \frac{.747(16.2)^2}{8} = 24.5$ R = 6.1 DL =

USE W12x14

$M_R = 30$

B53

SPAN = 16.2 A_T = LL =

$w = 5.6(100+66) = 930$ $M = \frac{.93(16.2)^2}{8} = 30.5$ R = 7.5 DL =

USE W12x16

$M_R = 34$

B54

SPAN = 16.2 A_T = LL =

$w = 6.9(100+66) = 1145$ $M = \frac{1.145(16.2)^2}{8} = 37.6$ R = 9.3 DL =

USE W12x19

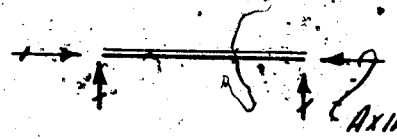
$M_R = 43$

Axial Load From x-brace

B55

SPAN = 16.2 A_T = LL =

$w = 4A'(100+66) = 730$ $M = \frac{.73(16.2)^2}{8} = 24.0$ R = 5.9 DL =



USE W12x26

$M_R = 67$

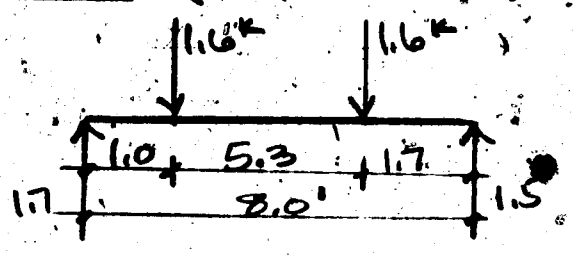
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2ND FLOOR BMS. - NORTH

B56 (STAIR BM.)

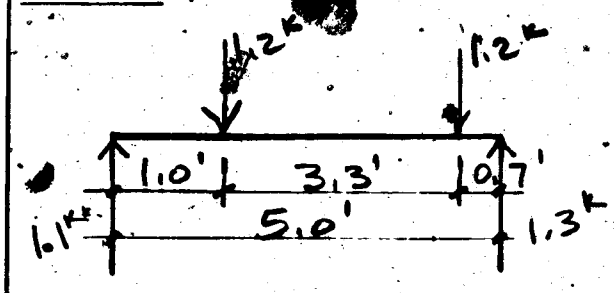


$P = \frac{5.3'}{2} \times \frac{8'}{2}\left(\frac{LL}{100} + \frac{DL}{50}\right) = 1590\#$

$M = 1.5^K \times 1.7' = 2.6'^K$

USE W8X10
$M_R = 16$

B57 (STAIR BM.)

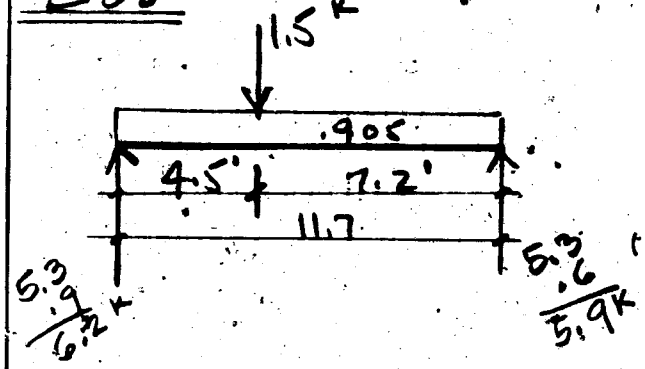


$P = \frac{3.3'}{2} \times \frac{10'}{2}\left(\frac{LL}{100} + \frac{DL}{50}\right) = 1238\#$

$M = 1.1^K \times 1.0' = 1.1'^K$

USE W8X10
$M_R = 16$

B58



$W = 5'\left(\frac{LL}{100} + \frac{DL}{66}\right) + 5' \times 15\ PSF = 905\ PLF$

$M = \frac{(5.9)^2}{2 \times .905} = 19.2'^K$

USE W12X14
$M_R = 30$

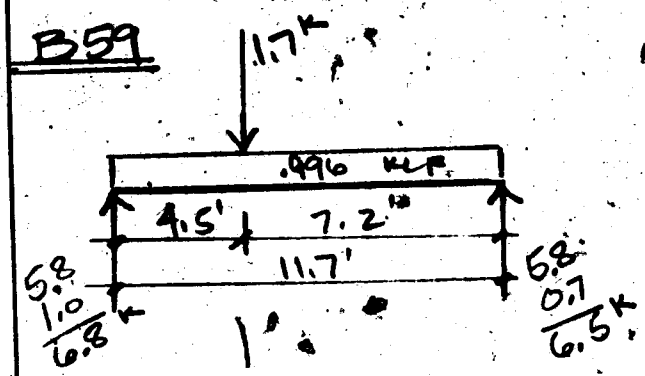
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2ND FLOOR BMS. - NORTH

B59

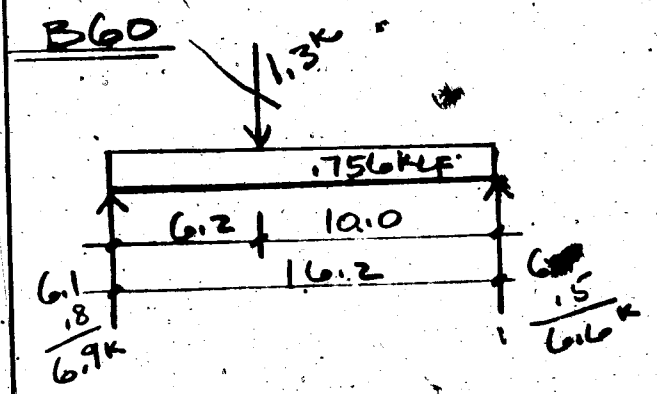


$W = 6'(\frac{LL}{100} + \frac{DL}{66}) = 996$

$M = \frac{(6.5)^2}{2 \times .996} = 21.2^{1K}$

USE W12x14
$M_R = 30^{1K}$

B60

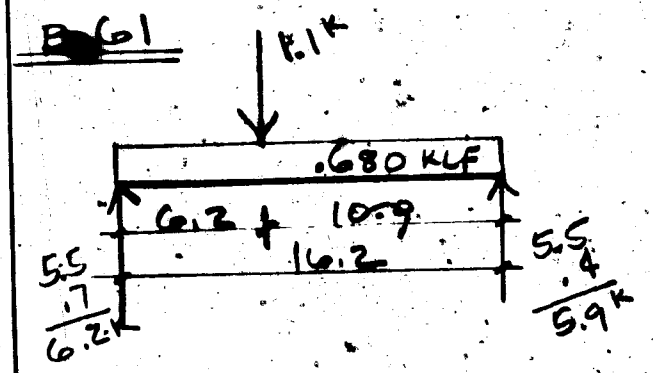


$W = 6'(\frac{LL}{60} + 66) = 756$

$M = \frac{(6.6)^2}{2 \times .756} = 28.8^{1K}$

USE W12x16
$M_R = 34$

B61



$W = 2.5'(\frac{LL}{60} + 66)$
$+ 2.2'(\frac{LL}{100} + 66) = 680$

$M = \frac{(5.9)^2}{2 \times .756} = 23.0^{1K}$

USE W12x14
$M_R = 30$

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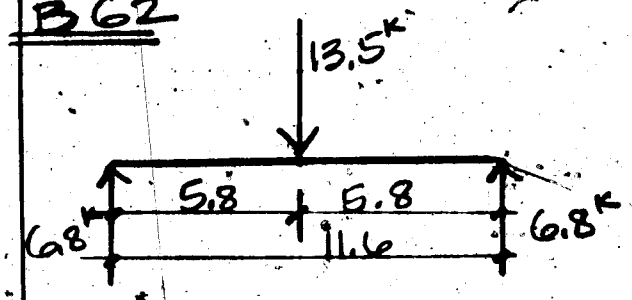
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2ND FLOOR BMS. - NORTH

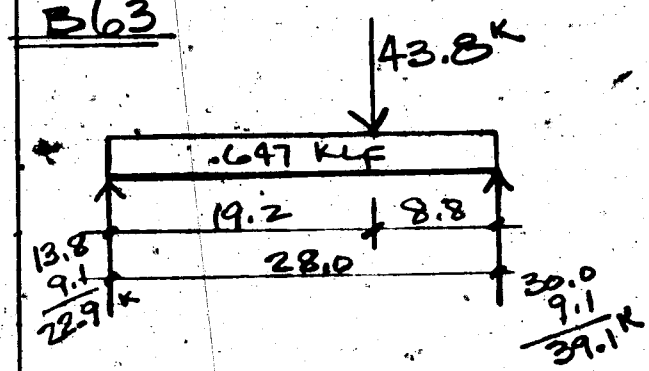
B62



$M = 6.8^K \times 5.8' = 39.4^{IK}$

USE W12x19
$M_R = 43$

B63



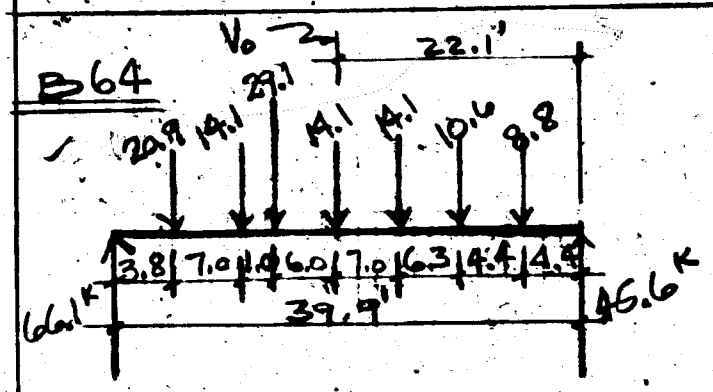
$P = \underset{B15}{11.5} + \underset{B05}{3.2} + \underset{B06}{19.4} + \underset{B09}{3.1}$ (ROOF BEAMS, TYP.) $+ .200 KLF \times \frac{8.8'}{2} + \frac{11.5^K}{2} = 43.8^K$

$W = 3.9'(100+66) = 647 PLF$

$M = 39.1^K \times 8.8' - \frac{.647(8.8)^2}{2} = 319.0^{IK}$

USE W24x76
$M_R =$

B64



$M = 22.1' \times 45.6^K - 7.0' \times 14.1 - 13.3' \times 10.6 - 17.7' \times 8.8 = 612.3^{IK}$

USE W33x118
$M_R = 718$

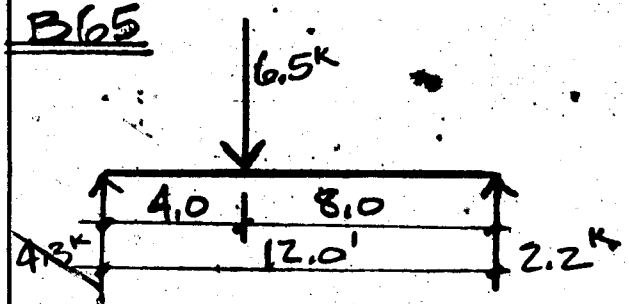
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2ND FLOOR BMS. - NORTH

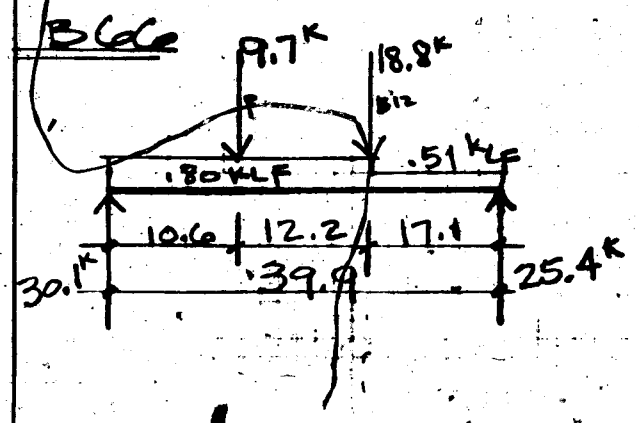
B65



$M = 8' \times 2.2^K = 17.6^{IK}$

USE W10X12
$M_R = 22$

B66



$w_1 = 4.8'(^{LL}100 + ^{DL}66) = 797$ PLF

$w_2 = 4.8'(^{LL}40 + ^{DL}66) = 509$ PLF

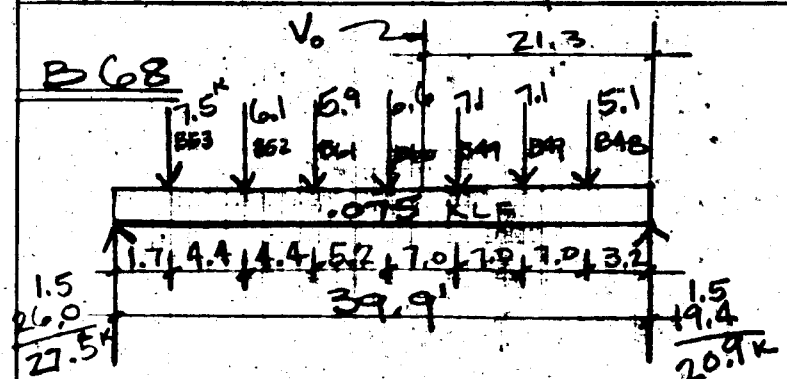
$P = {}^{B69}4.6 + {}^{B63}5.1 = 9.7^K$ (ROOF BMS.)

$M = 17.1' \times 25.4^K - .51\frac{(17.1)^2}{2}$

$= 359.8^{IK}$

USE W27X84
$M_R = 426$

B68



$w = 5' \times 15$ PSF $= 75$ PLF

$M = 21.3' \times 20.9^K - 4.1' \times 7.1^K$
$- 11.1' \times 7.1^K - 18.1' \times 5.1^K$
$= 244.9^{IK}$

USE W24X62
$M_R = 262$

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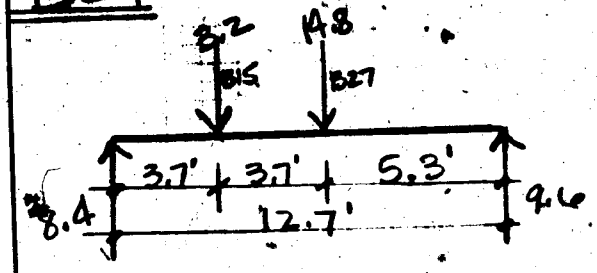
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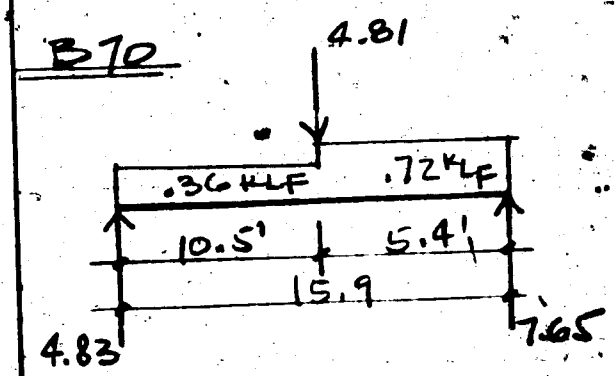
B69



$M = 5.3' \times 9.6^K = 50.9^{IK}$

USE W14x22
$M_R = 58$

B70



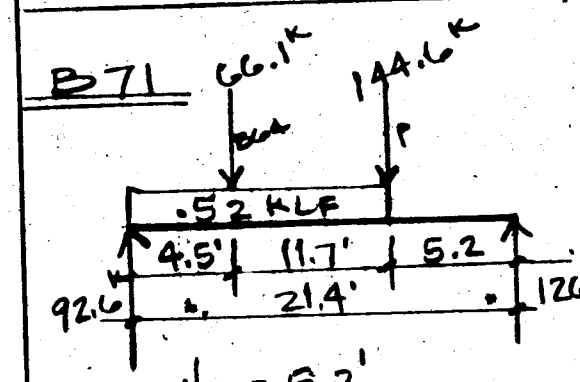
$W_1 = 3.4'(40+66) = 360\ PLF$

$W_2 = 6.8'(40+66) = 720\ PLF$

$M = 7.65(5.4') - .72(5.4^2).5 = 30.8^{IK}$

USE W 12x49 (a)
$M_R = 43.0$

B71



$W = 1.5'(60+66) + 2.0'(100+66) = 520\ PLF$

$P = \overset{B68}{20.9} + \overset{B66}{25.4} + \overset{B72}{26.2} + \overset{B65}{4.3}$
Roof BMS — $\overset{B64}{+26.1} + \overset{B66}{4.8} + \overset{B73}{26.0} + \overset{B41}{10.9} = 144.6^K$

$M = 5.2' \times 126.6^K = 658.3^{IK}$

USE W33x118
$M_R = 718$ @ $L_b = 12.0'$

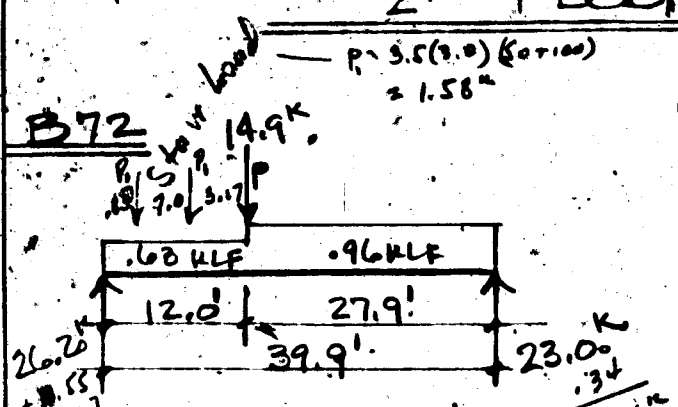
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2ND FLOOR BMS. - NORTH

B72



$W_1 = 3.8'\left(\frac{LL}{100}+66\right) = 1630$ PLF

$W_2 = 5.8'(100+66) = 963$ PLF

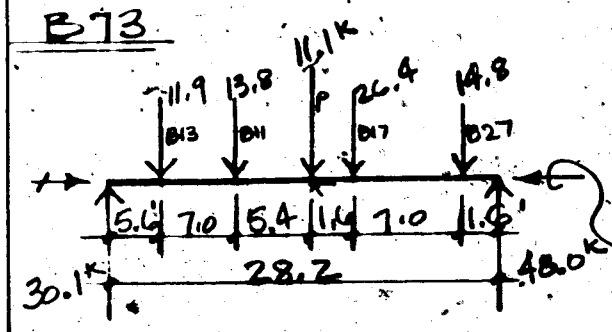
$P_2 = \overset{BG5}{2.2} + \overset{BG2}{6.8} + \overset{BS8}{5.9} = 14.9^K$

$M = \frac{(23.0)^2}{2\times.96} = 275.5^{IK}$

USE W24x68

$M_R = 308$

B73



$P_2 = \overset{BS2}{4.3} + \overset{B10}{2.4} + 11'\times 10'\left(\frac{LL}{20}+\frac{DL}{20}\right)$ ← ROOF BMS.

$= 11.1^K$

$M = 10.2'\times 48.0^K - 1.6'\times 26.4 - 8.6'\times 14.8^K$

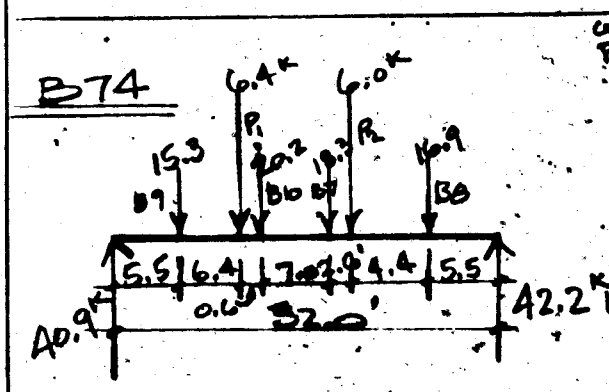
$= 320.1^{IK}$

AXIAL LOAD = (1.25x15.8K)

USE W24x76

$M_R = 352$

B74



COL. P-23: $P_1 = 16.1'\times 10'\left(\frac{LL}{20}+\frac{DL}{20}\right) = 6440 = 6.4^K$

COL. P-25: $P_2 = 15.0'\times 10'(20+20) = 6000 = 6.0^K$

$M = 12.5'\times 40.9^K - .6'\times 6.4 - 7.0'\times 15.3$

$= 400.3^{IK}$

USE W27x84

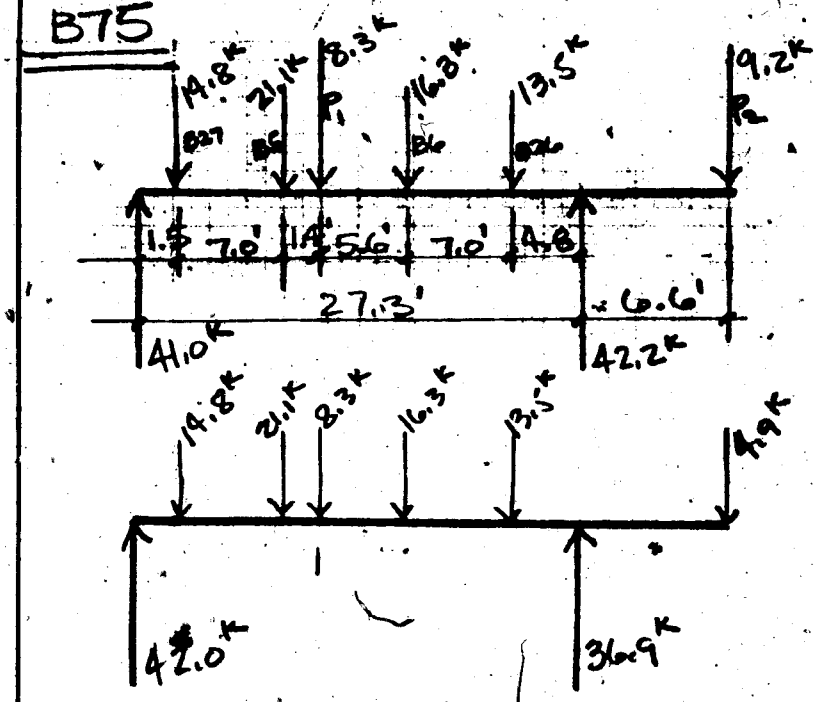
$M_R = 426$

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B75



GL. P-29

$P_1 = 23' \times 10' \left(\frac{LL}{(ROOF)}\ 16 + \frac{DL}{20}\right) = 8280 = 8.3^K$

$P_2 = 17' \times 10' \left(\frac{LL}{(ROOF)}\ 20 + \frac{DL}{20}\right) + \underset{(FLOOR)}{B28}\ 2.4^K = 9.2^K$

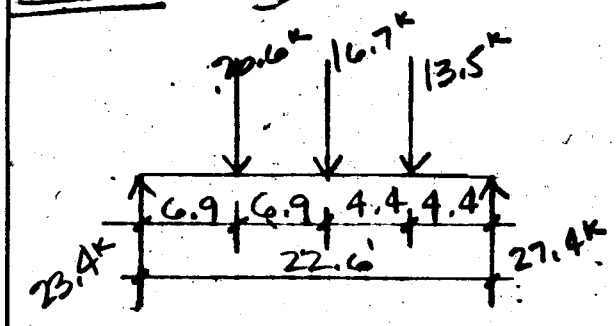
DL = [redacted] + 2.4 x 66/100 = 4.9K

MAX. $M_- = 9.2^K \times 6.6'$
$= 60.7^{IK}$

MAX. $M_+^f = 9.9' \times 42.0^K$
$- 1.4' \times 21.1^K - 8.4' \times 14.8^K$
$= 261.9^{IK}$

USE W24x68
$M_R = 308$ @ $L_b = 9.5'$

B76



$M = 8.8' \times 27.4^K - 4.4' \times 13.5^K$
$= 181.7^{IK}$

USE W21x50
$M_R = 189$

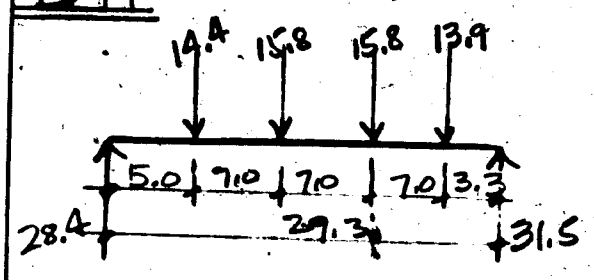
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2ND FLOOR BMS. - NORTH

B77

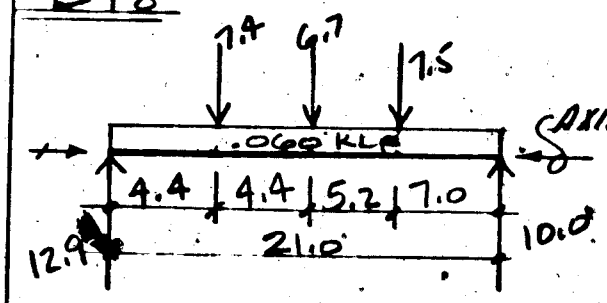


$M = 239.9^{IK}$

USE W24x62

$M_R = 262$

B78



$W = 4' \times 15\ PSF = .060^{KLF}$

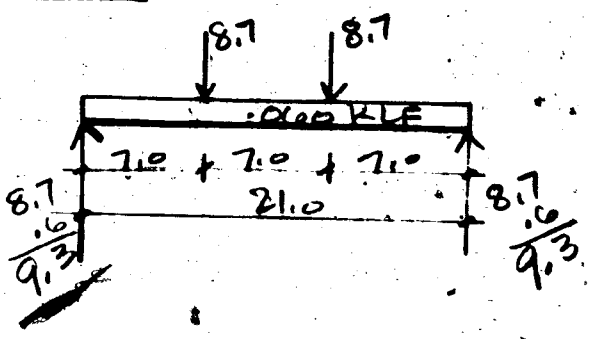
$M = 78.4^{IK}$

USE W16x36

$M_R = 113$

B79

Axial Load from x-brace



$W = 4' \times 15\ PSF = .060^{KLF}$

$M = 10.5' \times 9.3^{K} - 3.5' \times 8.7 - \frac{.06(10.5)^2}{2} = 63.9^{IK}$

USE W16x26

$M_R = 77$

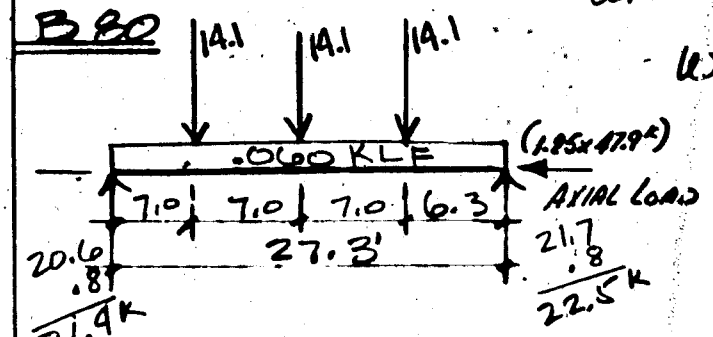
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2ND FLOOR BMS. - NORTH

B80



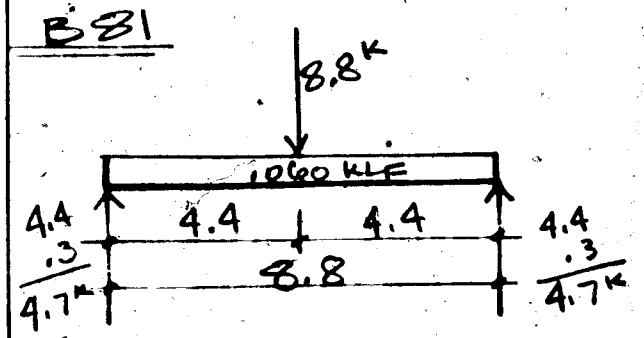
Axial Load from x-brace

$W = 4' \times 15\ PSF = 60\ PLF$

$M = 13.3' \times 22.5^K + 7.0 \times 14.1 - \frac{.06(13.32)^2}{2} = 195.4^{IK}$

USE W24x55 ✓
$M_R = 228$

B81

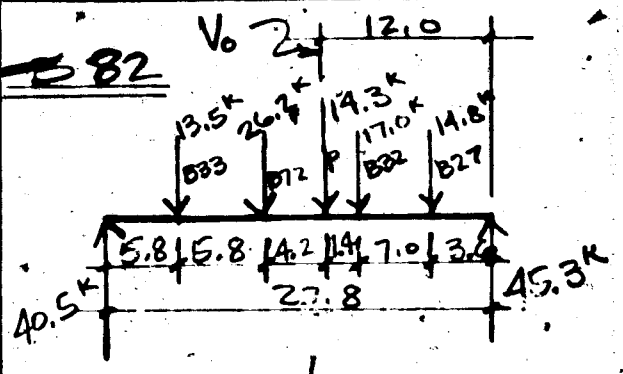


$W = 60\ PLF$ (SEE B80)

$M = 4.4' \times 4.7^K - \frac{.06(4.4)^2}{2} = 20.1^{IK}$

USE W12x14
$M_R = 30$

B82



$P = {}^{B31}4.8 + {}^{B36}7.7$ (ROOF BMS.) $+ 8' \times 5.5' (^{LL}20 + ^{DL}20)$

$= 14.3^K$

$M = 12.0' \times 45.3^K - 1.4 \times 17.0 - 8.4 \times 14.8$

$= 395.5^{IK}$

USE W27x84
$M_R = 426$

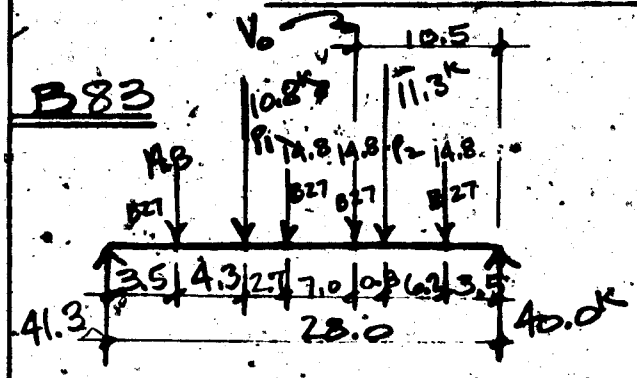
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2ND FLOOR BMS. - NORTH

B83



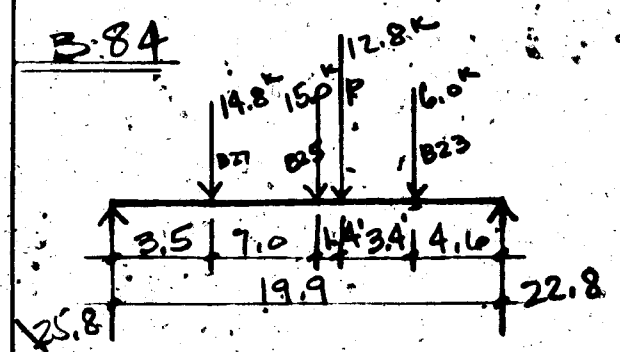
Col. A-20 B37 B42 ROOF BMS
$P_1 = 4.8 + 6.0 = 10.8^K$

Col. A-22 B37 B43 ROOF BMS.
$P_2 = 4.8 + 6.5 = 11.3^K$

$M = 10.5' * 40.0^K - .8 \times 11.3 - 7.0 \times 14.8$
$= 307.4^{1K}$

USE W24x76
$M_R = 362$

B84

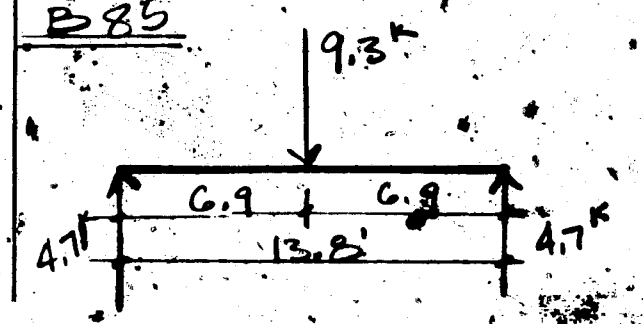


Col. A-31 B37 B54 ROOF BMS.
$P = 4.8 + 4.6 + 13' \times 6.5' (20+20)$
$= 12.8^K$

$M = 167.5^{1K}$

USE W21x50
$M_R = 189$

B85



$M = 4.7^K \times 6.9' = 32.4^{1K}$

USE W12x19
$M_R = 43$

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2ND FLOOR BMS. — NORTH

B86 SPAN = 9'± A_T = LL =
W = NONE M = R = DL =
STAIR #7 USE (2)8X10 M_R =
Same as STAIR 8 B22

B SPAN = A_T = LL =
W = M = R = DL =
USE M_R =

B SPAN = A_T = LL =
W = M = R = DL =
USE M_R =

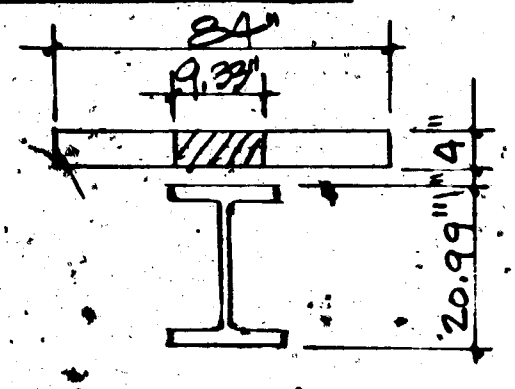
B SPAN = A_T = LL =
W = M = R = DL =
USE M_R =

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VIBRATION ANALYSIS: BEAMS B27
(W21x62)



SLAB WIDTH = 7'-0
$n = 9$, $be = 84/9 = 9.33"$

SPAN = 39.9' = 479"

$I_t = 3616$ (BY HP-41-C PROGRAM) $I_x = 1330$ $A = 18.3$

$W = 7' \times 66\ PSF \times 39.9' = 18430\# = 18.4^K$

$$f = 1.57\left[\frac{386 \times 29000 \times 3616}{18.4\ (479)^3}\right]^{1/2} = 7.02\ cps$$

$$\frac{A_{OT}}{(DLF)_{MAX}} = \frac{600(479)^3}{48 \times 29 \times 10^6 \times 3616} = .0131$$

$.05f = .05 \times 7.02 = 0.35$

$(DLF)_{MAX} = 0.95$

$A_{OT} = .95 \times .0131 = .012$

$S/de = \frac{84"}{4"} = 21.0$ $L^4/I_t = \frac{(479)^4}{3616} = 14.6 \times 10^6$

Neff = 2.6 (FROM CHART), $A_0 = \frac{A_{OT}}{2.6} = \frac{.012}{2.6} = .0046$

$\bar{x} = 147.7/25.4 + 24" = 29.8"$

THESE BEAMS FALL INTO
MIDDLE OF "SLIGHTLY PERCEPTIBLE"
RANGE

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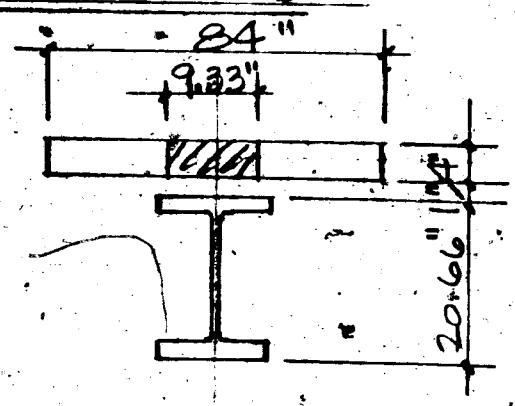
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ENGINEER/ JRL

VIBRATION ANALYSIS: BEAMS B27 (W21x44)

SLAB WIDTH = 7'-0
$n = 9$, $b_e = 84/9 = 9.33"$



SPAN = 39.9' = 479"

$I_x = 843$ $A = 13.0$

$I_t = 2606$ (BY HP-41-C PROGRAM)

$W = 7' \times 66 PSF \times 39.9' = 18430\# = 18.4K$

$$f = 1.57\left[\frac{386 \times 29000 \times 2606}{18.4\,(479)^3}\right]^{1/2} = 5.96 \text{ cps}$$

$$\frac{A_{OT}}{(DLF)_{MAX}} = \frac{600\,(479)^3}{48 \times 29 \times 10^6 \times 2606} = .0182$$

$0.05f = .05 \times 5.96 = 0.30$

$(DLF)_{MAX} = 0.9$ (FROM CHART)

$A_{OT} = .9 \times .0182 = .016$

$T_b = \frac{147.7}{163} \times 24 = 21.7$ K

$S/de = \frac{84"}{4} = 21.0$ $\quad L^4/I_t = \frac{(479)^4}{2606} = 20.2 \times 10^6$

$N_{eff} = 3.2$ (FROM CHART), $A_0 = \frac{A_{OT}}{3.2} = \frac{.016}{3.2} = .005$

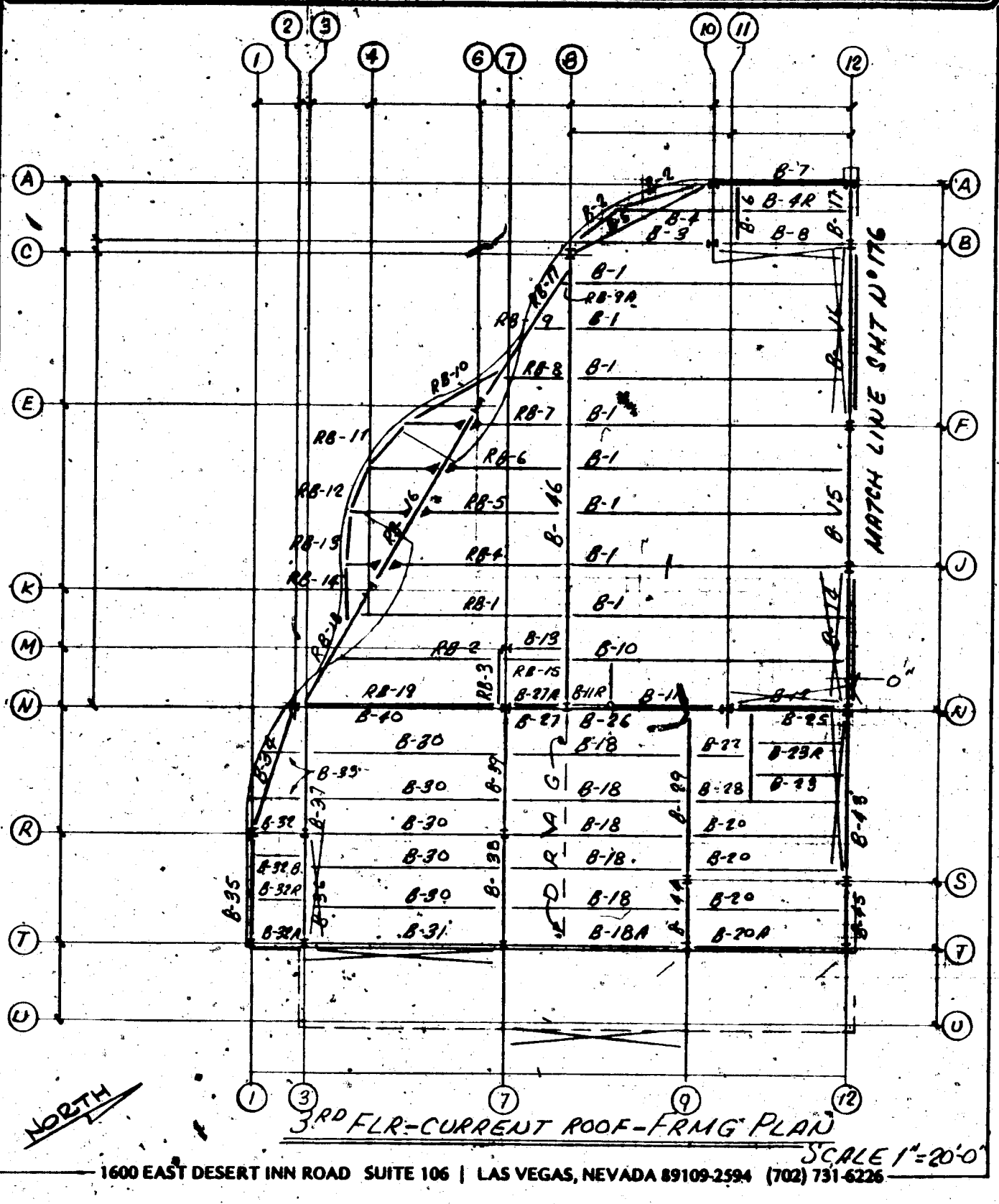
THESE BEAMS FALL INTO MIDDLE OF "SLIGHTLY PERCEPTIBLE" RANGE

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3RD FLR-CURRENT ROOF-FRMG PLAN
SCALE 1"=20'-0"

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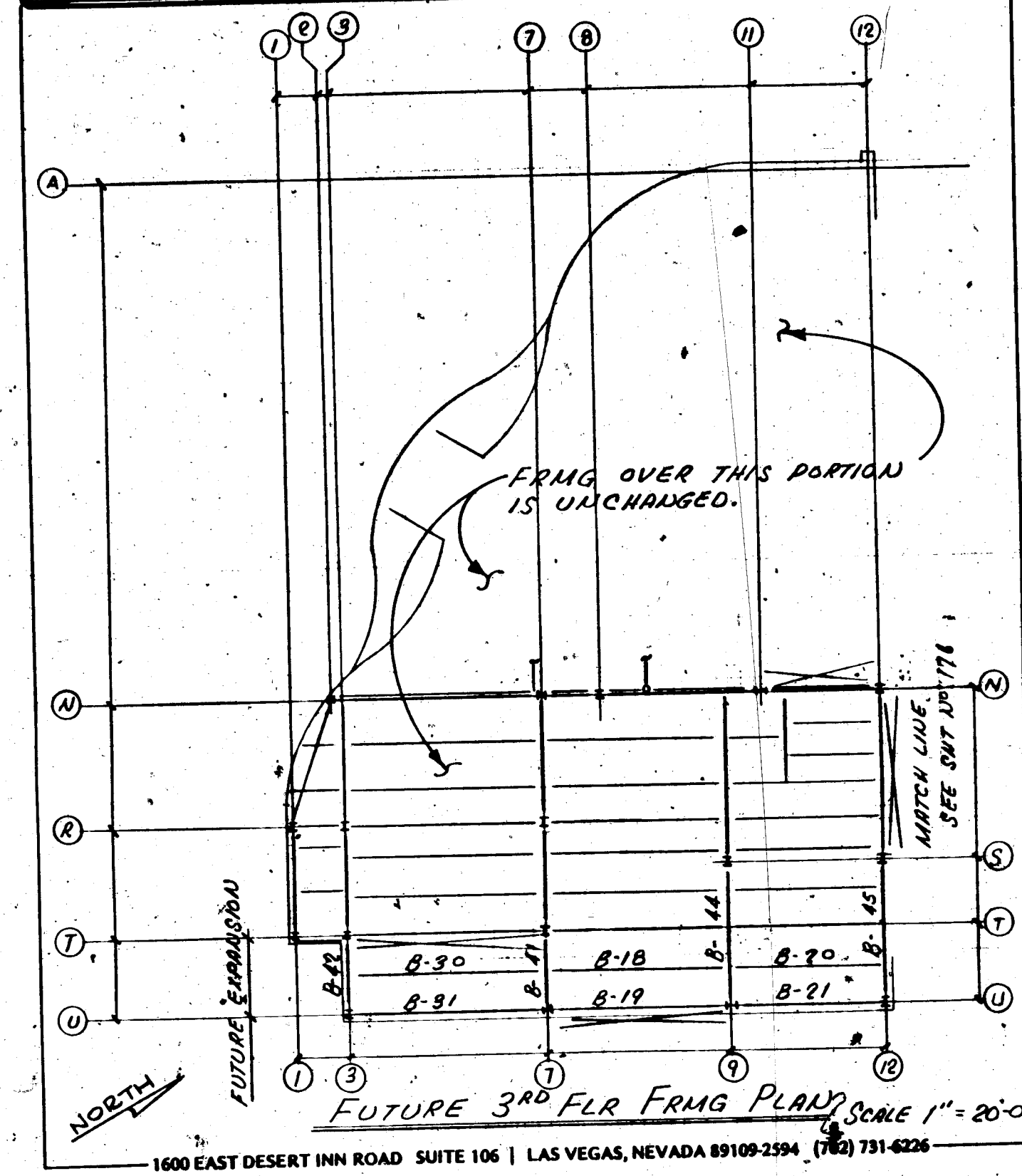
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FUTURE 3RD FLR FRMG PLAN SCALE 1" = 20'-0"

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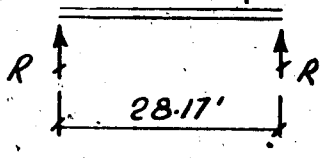
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3RD LEVEL SOUTH HALF ENGINEER/ HS

3RD LEVEL FRMG B-1 THRU B-46 & RB-1 THRU RB-19

FOR BMS B-1 THRU B-29. SEE 2ND LEVEL FRMG

NOTE: FUTURE FLR LOADS GOVERN { ROOF LOAD'G = (76PSF$_{DL}$ + 6PSF$_{FRMG}$ + 20PSF$_{LL}$) = 102 PSF
FLR LOAD'G = (78PSF$_{DL}$ + 8PSF$_{FRMG}$ + 30PSF$_{LL\ MIN}$) = 116PSF$_{MIN}$

B-30



TRIB 28.17(6.88) = 193 ft

R = (.08%)(193-150) = 3% → LL = 49 PSF/ft

w = 6.88(.086 K/ft + .049 K/ft) = (.59 K$_D$ + .34 K$_L$) = 0.93 K/ft

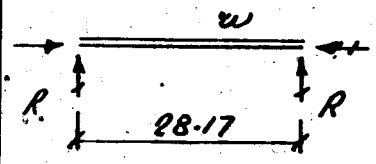
R = (8.31 K$_D$ + 4.79 K$_L$) = 13.10 K

M = 92.3 K-FT

(1/20)(28.17 x 12 in.) = 16.9" → W18$_{MIN}$

USE W18 x 35

B-31



AXIAL LOAD = 44.5 x 1.25 from SNT N°

w = (5.71/2)(.086$_D$ + .050$_L$) = (0.25 K/ft$_D$ + 0.14 K/ft$_L$) = 0.39 K/ft

R = (3.52 K$_D$ + 1.97 K$_L$) = 5.49 K

M = 38.7 K-FT

FOR FUTURE EXPANSION:

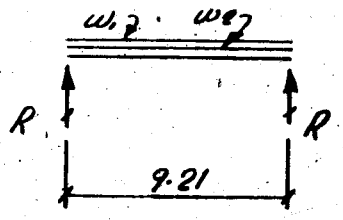
w = ((5.71 + 6.0)/2)(.086 + .050$_L$) = (.51 K/ft$_D$ + .29 K/ft$_L$) = 0.80 K/ft

R = (7.18 K$_D$ + 4.09 K$_L$) = 11.27 K

M = 79.4 K-FT

USE W14 x 53

B-32



w$_1$ = (4.88/2)(.086 + .050) = (.21 K/ft$_D$ + .13 K/ft$_L$) = 0.34 K/ft

w$_2$ = (4.00/2)(.050 + .100) = (.10 K/ft$_D$ + .20 K/ft$_L$) = 0.30 K/ft

(.31 K/ft$_D$ + .33 K/ft$_L$) = 0.64 K/ft

R = (1.43 K$_D$ + 1.52 K$_L$) = 2.95 K

M = 6.8 K-FT

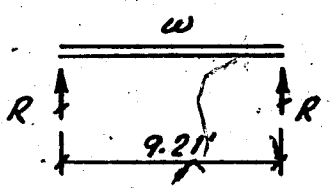
USE W8 x 10

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B-32 A



$w = 16'(.021^{K}/\phi_D) + 0.03^{K}/_{D} = 0.37^{K}/_{D}$

$R = 1.70^{K}_{D}$
$M = 4.0^{KFT}$ & $L_u = 9.2'$

WIND GIRT:

$p_w = 27^{\#}/\phi$ REF B-7

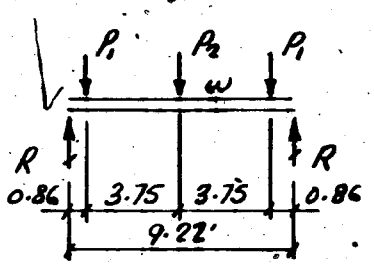
$M_w = (.027^{K}/\phi \times 14')(9.21)^2/8 = 4.0^{KFT}$

$\Delta_w = \frac{5(.378^{K}/_{in})(9.21)^3(1728)}{384\,(29\times10^3)\,I} = \frac{2.11}{I} < 0.30$

$I_y > 2.11/0.30 = 7.1\,in^4$

USE W8x21

B-32B



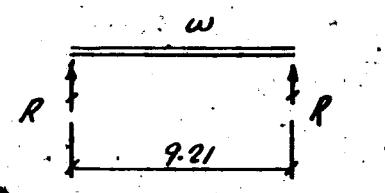
$w = (4.0/2)(.050^{K}/\phi_D + .100^{K}/\phi_L) = (0.10^{K}/_{D} + 0.20^{K}/_{L}) = 0.30^{K}/$

$P_1 = (0.83^{K}_{D} + 1.67^{K}_{L}) = 2.50^{K}$
$P_2 = (1.66^{K}_{D} + 3.34^{K}_{L}) = 5.0^{K}$

$R = (2.12^{K}_{D} + 4.26^{K}_{L}) = 6.38^{K}$
$M = 16.9^{KFT}$

USE W12x16

B-32R



ROOF LL APPLIES - TO BE REMOVED FOR FUTURE EXPANSION

$w = 7(.082^{K}/\phi + .020^{K}/\phi) = (.58^{K}/_{D} + .14^{K}/_{L}) = 0.72^{K}/$

$R = (2.67^{K}_{D} + 0.65^{K}_{L}) = 3.32^{K}$
$M = 7.7^{KFT}$

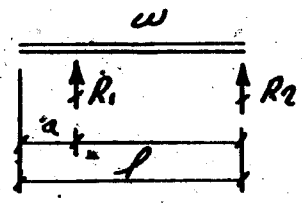
USE W8x10

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B-33



@ $l = 9.0'$ & $a = 1.5'$

$w = 5.88(.086_D + .050_L) = (.51^{K/'}_{D} + .30^{K/'}_{L}) = 0.81^{K/'}$

$R_1 = (2.75^{K}_{D} + 1.62^{K}_{L}) = 4.37^{K}$
$R_2 = (1.84^{K}_{D} + 1.08^{K}_{L}) = 2.92^{K}$
$-M = 0.9^{KFT}$

w/o LL ON OVRHNG: $R_1 = (2.75^{K}_{D} + 1.13^{K}_{L}) = 3.88^{K}$
$R_2 = (1.84^{K}_{D} + 1.13^{K}_{L}) = 2.97^{K}$
$+M_{3.667} = 5.5^{KFT}$

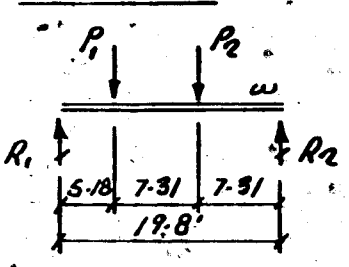
@ $l = 7.0'$ & $a = 2.0'$

$w = .6.88(.086_D + .050_L) = (.59^{K/'}_{D} + .35^{K/'}_{L}) = 0.94^{K/'}$
$R_1 = (2.89^{K}_{D} + 1.72^{K}_{L}) = 4.61^{K}$
$R_2 = (1.24^{K}_{D} + 0.74^{K}_{L}) = 1.98^{K}$
$-M = 1.9^{KFT}$

w/o LL ON OVRHNG: $R_1 = (2.89^{K}_{D} + 0.88^{K}_{L}) = 3.77^{K}$
$R_2 = (1.24^{K}_{L} + 0.88^{K}_{L}) = 2.12^{K}$
$+M_{2.355} = 2.4^{KFT}$

USE | W8x10

B-34



$w = 0.02^{K/'}$
$P_1 = (2.75^{K}_{D} + 1.62^{K}_{L}) = 4.37^{K}$
$P_2 = (2.89^{K}_{D} + 1.72^{K}_{L}) = 4.61^{K}$

$R_1 = (3.30^{K}_{D} + 1.88^{K}_{L}) = 5.13^{K}$
$R_2 = (2.74^{K}_{D} + 1.51^{K}_{L}) = 4.25^{K}$
$M_{7.31} = 30.6^{KFT}$

USE | W14x22

B-35

ROOF LOADING LESS CRITICAL
THAN FUTURE FLR LOADING
WITH WIND GIRT LOADING
∴ SEE B-35 2ND LEVEL FRMG → USE | W12x30

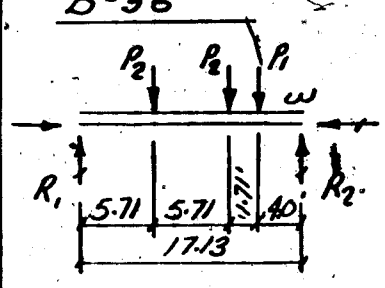
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B-36



TRIB 17.13 x 28.17/2 = 241 #
R = (.08%)(241-150) = 7% → LL = 47 #/ft

ω = 0.04 K/ft
$P_1 = (1.43^K_D + 1.45^K_L) = 2.88^K$
$P_2 = (5.71)(.086_D + .047_L)(28.17/2) = (6.92^K_D + 3.78^K_L) = 10.70^K$

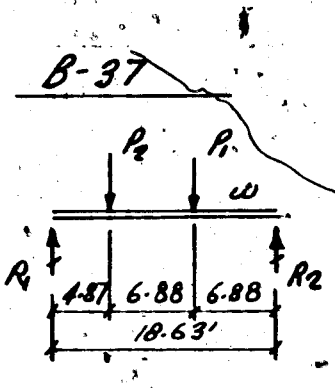
$R_1 = (7.60^K_D + 4.12^K_L) = 11.72^K$
$R_2 = (8.36^K_D + 4.89^K_L) = 13.25^K$
$M_{11.42} = 70.2^{KFT}$ AS FLR BM

AXIAL LOAD = 1.25 x 188.0 K from SHT N°

CHECK AS ROOF BM (INCREASED TRIB) $P_1 = P_2 = 5.71(.082 + .016)(18.69) = (8.75^K_D + 1.71^K_L) = 10.46^K$
$R = (9.10^K_D + 1.71^K_L) = 10.81^K$
$M = 61.2 < 70.2^{KFT}$

USE W14 x 43

B-37



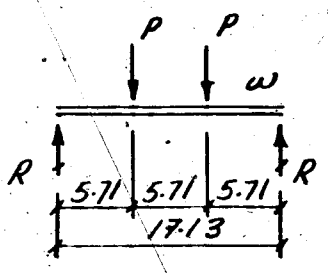
TRIB = 18.63 x 18.69 = 348 #
R = (.08)(348-150) = 15.8% → LL = 42 #/ft

ω = 0.04 K/ft
$P_1 = (6.88)(.086_D + .042_L)(18.69) = (11.06^K_D + 5.40^K_L) = 16.46^K$
$P_2 = (5.88)($ ~~$.086_D + .042_L$~~ $)(18.69) = (9.45^K_D + 4.62^K_L) = 14.07^K$

$R_1 = (11.44^K_D + 5.41^K_L) = 16.85^K$
$R_2 = (9.82^K_D + 4.61^K_L) = 14.43^K$
$M_{6.88} = 98.4^{KFT}$

USE W18x35

B-38



TRIB = 17.13 x 27.92 = 478 #
R = (.08%)(478-150) = 26% → LL = 37 #/ft

ω = 0.04 K/ft
$P = (5.71)(.086_D + .037_L)(27.92) = (13.71^K_D + 5.90^K_L) = 19.61^K$

$R = (14.05^K_D + 5.90^K_L) = 19.95^K$
$M = 113.5^{KFT}$

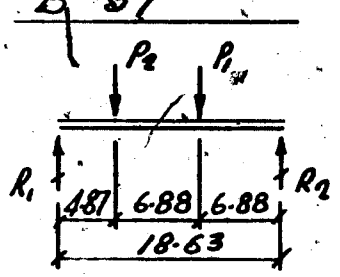
USE W18x35

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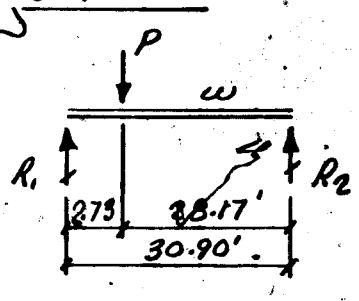
B-39



TRIB 18.63 x 27.92 = 520 ϕ
R = (.08%)(520 - 150) = 29.6% → LL = 35 #/ft
ω = 0.05 K/ft
P1 = (6.88)(.086 + .035)(27.92) = (16.52 K_D + 6.72 K_L) = 23.24 K
P2 = (5.88)(do + do) (do) = (14.12 K_D + 5.75 K_L) = 19.87
R1 = (17.00 K_D + 6.73 K_L) = 23.73 K
R2 = (14.58 K_D + 5.74 K_L) = 20.32 K
M 6.88 = 138.7 K-FT

USE W 21 x 44

B-40



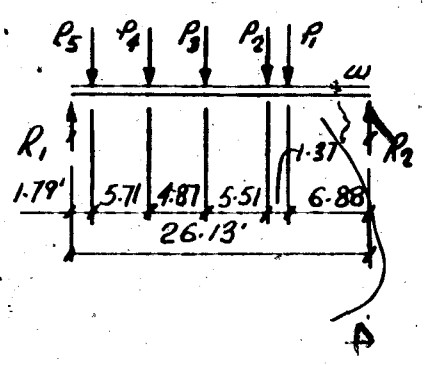
TRIB 6.88 x 30.9 + 348/2 = 386 ϕ
R = (.08%)(386 - 150) = 18% → LL = 41 #/ft
ω = (6.88/2)(.086 + .041) = (0.30 K/ft_D + 0.14 K/ft_L) = 0.44 K/ft
P = (9.82 K_D + 4.61 K_L) = 14.43 K
R1 = (13.59 K_D + 6.37 K_L) = 19.96 K
R2 = (5.50 K_D + 2.57 K_L) = 8.07 K
M 18.34 = 74.0 K-FT

30.9 x 12/20 = 18.5" → W18 MIN

USE W18 x 35

B-41 & B-42 NOT USED

B-43



TRIB (26.13 - 8.25)(23.33/2) = 208 ϕ
R = (.08%)(208 - 150) = 4.6% → LL = 48 #/ft

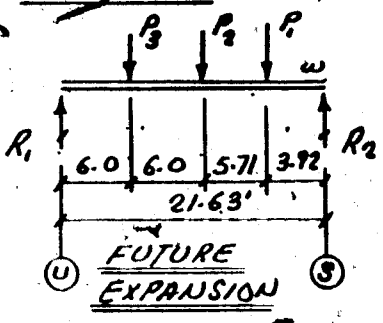
SAME AS 2ND LEVEL BM B-42 → W24 x 62

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B-44



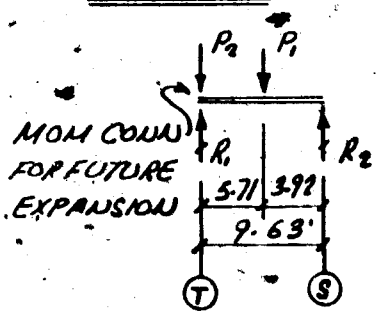
SIZE FOR FUTURE EXPANSION

TRIB = 21.63 x 51.0/2 = 552 ♯
R = (.08%)(552-150) = 32% → LL = 34 ♯/♯

ω = 0.05 K/L
P1 = (5.71)(.086D + .034L)(51.0/2) = (12.52 KD + 4.95 KL) = 17.47 K
P2 = (5.86)(do + do)(do) = (12.85 KD + 5.08 KL) = 17.93 K
P3 = (6.00)(do + do)(do) = (13.16 KD + 5.20 KL) = 18.36 K

R1 = (18.04 KD + 6.92 KL) = 24.96 K
R2 = (21.57 KD + 8.31 KL) = 29.88 K
M12.0 = 185.8 KFT

USE W 24 x 55
EXTEND ♯/COL "T"



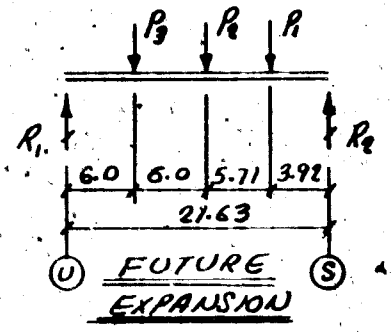
LOADS TO TEMPORARY COL AT GRID "T":

ROOF TRIB 9.63 x 51.0/2 = 245 ♯ → LL = 16 ♯/♯

ω = 0.05 K/L
P1 = (5.71)(.086D + .016L)(51.0/2) = (12.52 KD + 2.33 KL) = 14.85 K
P2 = (2.86)(do + do)(do) = (6.27 KD + 1.17 KL) = 7.44 K

R1 = (11.61 KD + 2.12 KL) = 13.73 K
R2 = (7.66 KD + 1.38 KL) = 9.04 K

B-45



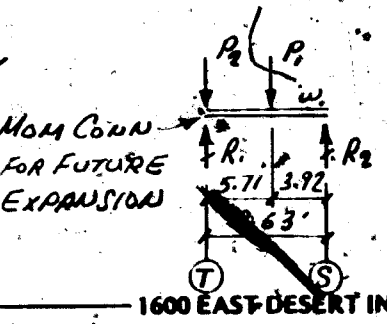
SIZE FOR FUTURE EXPANSION

TRIB 21.63 x 23.33/2 = 252 ♯
R = (.08%)(252-150) = 8.2% → LL = 46 ♯/♯

ω = 0.05 K/L
P1 = (5.71)(.086D + .046L)(23.33/2) = (5.73 KD + 3.06 KL) = 8.79 K
P2 = (5.86)(do + do)(do) = (5.88 KD + 3.15 KL) = 9.03 K
P3 = (6.00)(do + do)(do) = (6.02 KD + 3.22 KL) = 9.24 K

R1 = (8.55 KD + 4.28 KL) = 12.83 K
R2 = (10.16 KD + 5.15 KL) = 15.31 K
M12.0 = 94.9 KFT

USE W 18 x 35
EXTEND ♯/COL "T"



LOADS TO TEMPORARY COL AT GRID "T":

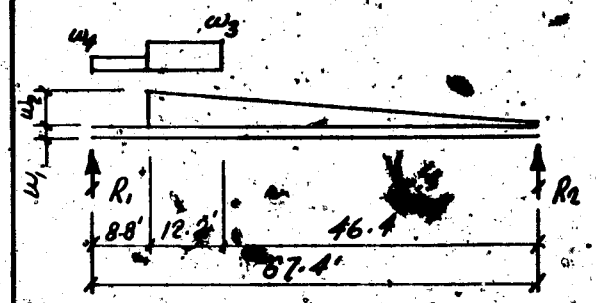
ω = 0.04 K/L
P1 = (5.71)(.086D + .02CL)(23.33/2) = (5.73 KD + 1.33 KL) = 7.06 K
P2 = (2.86)(do + do)(do) = (2.87 KD + 0.67 KL) = 3.54 K
R1 = (5.40 KD + 1.21 KL) = 6.61 K
R2 = (3.59 KD + 0.79 KL) = 4.38 K

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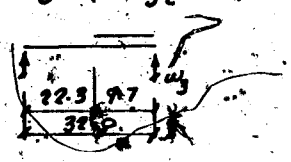
FOR TRIB 67.4 x 42.0/2 = 1415 #
R = (.08%)(1415 - 150) > 40% MAX → LL = 30 #/#

ROOF TRIB (1/2)(67.4 - 8.8)(34.0/2) = 498 #
→ ROOF LL = 16 #/#

$\omega_1 = (42.0/2)(.086_D + .090_L) = (1.81^{K/'}_D + 0.63^{K/'}_L) = 2.44^{K/'}$

$\omega_2 = (34.0/2)(.084_D + .016_L) = (1.43^{K/'}_D + 0.27^{K/'}_L) = 1.70^{K/'}$

$\omega_3 = \left(\frac{9.7 \times 27.15}{32}\right)(0.100_L) = 0.82^{K/'}_L$



$\omega_4 = (9.7/2)(.084_D + .016_L) = (0.41^{K/'}_D + 0.08^{K/'}_L) = 0.49^{K/'}$

$R_1 = (88.66^K_D + 34.27^K_L) = 122.93^K$

$R_2 = (78.84^K_D + 26.81^K_L) = 105.65^K$

$V = \omega_1(x) - \left(\frac{\omega_2}{58.2}\right)(x^2/2)$

$@\ V=0 \rightarrow \left(\frac{\omega_2}{117.2}\right)x^2 + (\omega_1)x = 105.65^K$

$x^2 + 168.21x = 7283.635$

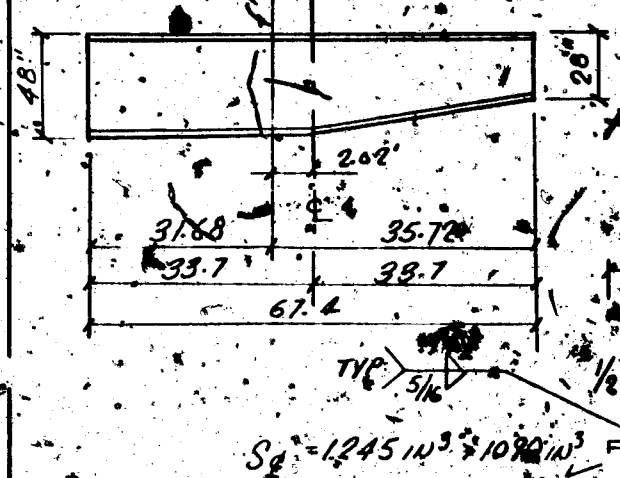
$(x + 84.108)^2 = 7283.635 + 84.108^2$

$x = \pm 119.824 - 84.108$

$x = 35.716'$ FROM R_2

$M_{35.7K} = 1996.9^{KFT}$

$S = 1997(12)/22 = 1090\ IN^3$



$S_{@} = 1245\ IN^3 > 1090\ IN^3$ ✓

USE ℄ GIRDER PER SKETCH
48/28 PG 122 RIVERSIDE STL
NOTATION
MODIFIED AS SHOWN
PARABOLIC CAMBER 1½"

1600 EAST DESERT INN ROAD SUITE 106 | LAS VEGAS, NEVADA 89109-2594 (702) 731-6226

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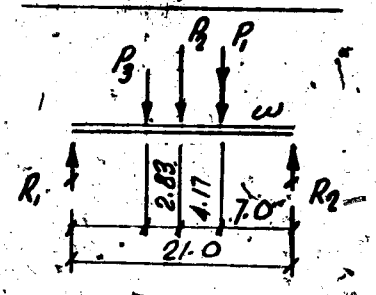
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B-14 M & B-15 M MODIFIED FOR HIGH R.O.F 1½ AT MECH

B-14 M

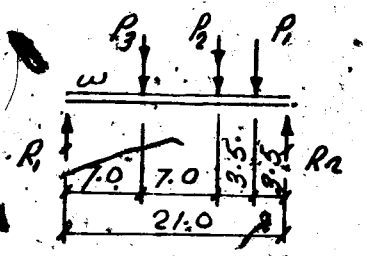


$P_1 = (18.48^K + 8.8^K) = 27.28^K$
$P_2 = 3.0^K$
$P_3 = 18.48^K$
$\omega = 0.20^{K/L}$

$R_1 = 25.11^K$
$R_2 = 27.85^K$
$M_{1.0} = 190.1^{KFT}$

USE W24x55

B-15 M



$\omega = 0.20^{K/L}$
$P_1 = 17.40^K$
$P_2 = (18.34 + 7.70) = 26.04^K$
$P_3 = (18.34 + 10.30) = 28.64^K$

$R_1 = 32.77^K$
$R_2 = 43.51^K$
$M_{7.0} = 238.8^{KFT}$

USE W24x62

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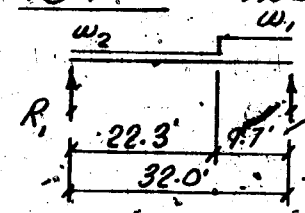
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NOTE: 3RD LEVEL BMS WHICH REMAIN ROOF BMS & DO NOT PROVIDE STRUCTURAL CAPABILITY IN SUSTAINING FLR L.L. ARE INDICATED HERE WITH THE DESIGNATION "RB-" FOR ROOF BM.

RB-1



NOTE: ω_1 PROVIDES L.L. CAPABILITY FOR FUTURE ELEV. LANDG.

$\omega_1 = (12.2/2)(.084^K/\phi_D + .100^K/\phi_L) = (0.51^K/'_D + 0.61^K/'_L) = 1.12^K/'$

$\omega_2 = 7.0(.082^K/\phi + .020^K/\phi) = (0.57^K/'_D + 0.14^K/'_L) = 0.71^K/'$

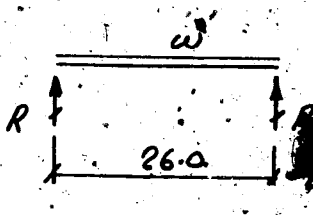
$R_1 = (9.03^K_D + 2.93^K_L) = 11.96^K$

$R_2 = (8.63^K_D + 6.11^K_L) = 14.74^K$

$M_{16.8'} = 100.8^{K'}$

$\frac{1}{(1/20)(32\times12)} = 19.2''$ USE W18x40

RB-2



TRIB 26.0 x 7.0 = 182 ϕ → LL = 20 $^K/\phi$

$\omega = 7.0(.082_D + .020_L) = (0.57^{K'}_D + 0.14^{K'}_L) = 0.71^{K'}$

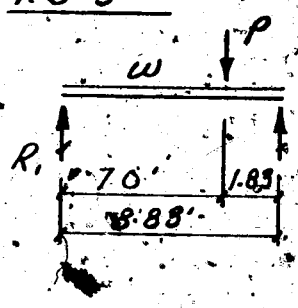
$R = (7.41^K_D + 1.82^K_L) = 9.23^K$

$M = 60.0^{K'}$

$\frac{5(0.14)(26)^4(1728)}{384(29\times10^3)I} = \frac{49.7}{I} < \frac{312}{360} = 0.86$

$I > 49.7/0.86 = 57.8\ in^4$ USE W16x26

RB-3



$\omega = 0.02^{K'}/'_D$

$P = (7.41^K + 1.75^K)_D + (1.82^K + 0.44^K)_L = (9.16^K_D + 2.19^K_L) = 11.35^K$

$R_1 = (1.99^K_D + 0.45^K_L) = 2.44^K$

$R_2 = (7.35^K_D + 1.74^K_L) = 9.09^K$

$M_{7.0} = 16.6^{K'}$

USE W12x16

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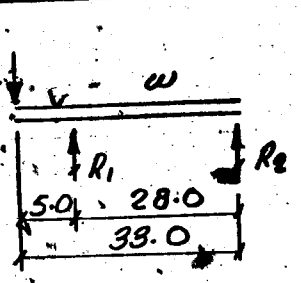
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RB-4



TRIB 28.0x7.0 = 196# → LL = 20#/ft

$w = 7.0(.082^{K/ft}_{D} + .020^{K/ft}_{L}) = (0.57^{K/ft}_{D} + 0.14^{K/ft}_{L}) = 0.71^{K/ft}$

$P = (2.46^{K}_{S} + 2.99^{K})_{D} + (0.06^{K} + 0.05^{K})_{L} = (5.39^{K}_{D} + 0.11^{K}_{L}) = 5.50^{K}$

$R_1 = (17.44^{K}_{D} + 2.85^{K}_{L}) = 20.29^{K}$

$R_2 = (6.76^{K}_{D} + 1.88^{K}_{L}) = 8.64^{K}$

$-M = 36.4^{KFT}$

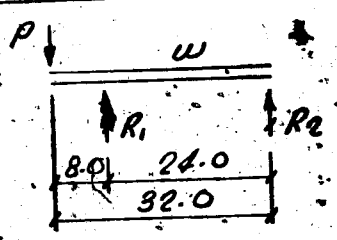
w/o LL ON OVRHNG: $R_1 = (17.44^{K}_{D} + 1.96^{K}_{L}) = 19.40^{K}$

$R_2 = (6.76^{K}_{D} + 1.96^{K}_{L}) = 8.72^{K}$

$+M_{@\ 28.0} = 53.6^{KFT}$

USE SAME AS RB-6

RB-5



$w = (0.57^{K/ft}_{D} + 0.14^{K/ft}_{L}) = 0.71^{K/ft}$ REF RB-4

$P = (2.78^{K} + 2.46^{K})_{D} + (0.08^{K} + 0.06^{K})_{L} = (5.24^{K}_{D} + 0.14^{K}_{L}) = 5.38^{K}$

$R_1 = (19.15^{K}_{D} + 3.17^{K}_{L}) = 22.32^{K}$

$R_2 = (4.33^{K}_{D} + 1.45^{K}_{L}) = 5.78^{K}$

$-M = 65.8^{KFT}$

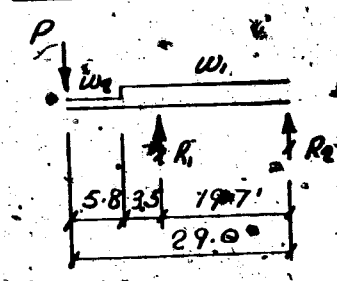
w/o LL ON OVRHNG: $R_1 = (19.15^{K}_{D} + 1.68^{K}_{L}) = 20.83^{K}$

$R_2 = (4.33^{K}_{D} + 1.68^{K}_{L}) = 6.01^{K}$

$+M_{@\ 8.46S} = 25.5^{KFT}$

USE SAME AS RB-6

RB-6



$w_1 = (0.57^{K/ft}_{D} + 0.14^{K/ft}_{L}) = 0.71^{K/ft}$ REF RB-4

$w_2 = (0.29^{K/ft}_{D} + 0.07^{K/ft}_{L}) = 0.36^{K/ft}$

$P = (3.22^{K} + 2.78^{K})_{D} + (0.11^{K} + 0.08^{K})_{L} = (6.00^{K}_{D} + 0.19^{K}_{L}) = 6.19^{K}$

$R_1 = (18.85^{K}_{D} + 2.73^{K}_{L}) = 21.58^{K}$

$R_2 = (2.06^{K}_{D} + 1.11^{K}_{L}) = 3.17^{K}$

$-M = 75.3^{KFT}$ @ $l_0 = 9.3'$

USE W24x55

w/o LL ON OVRHNG: $R_1 = (18.85^{K}_{D} + 1.38^{K}_{L}) = 20.23^{K}$

$R_2 = (2.06^{K}_{D} + 1.38^{K}_{L}) = 3.44^{K}$

$+M_{@\ 8.46S} = 8.4^{KFT}$

$I \geq 312/0.31 = 1007\ in^4 \rightarrow$ W24x55

AT OVRHNG:

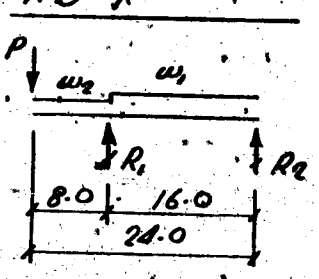
$$\Delta_{OVHG} = \frac{1728}{(29\times10^{3})(I)}\left\{\frac{(6.79^{K})(1.3)^{2}(29.0)}{3} + \frac{(0.71^{K/ft})(9.3)[4(9.3)^{2}(19.7) - (19.7)^{3} + 3(9.3)^{3}]}{24}\right\} = \frac{312}{I}$$

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RB-7



$P = (5.88^K + 3.22^K)_D + (0.24^K + 0.11^K)_L = (9.10^K_D + 0.35^K_L) = 9.45^K$
$\omega_1 = (0.57^{K/'}_D + 0.14^{K/'}_L) = 0.71^{K/'}$ REF RB-4
$\omega_2 = (0.41^{K/'}_D + 0.10^{K/'}_L) = 0.51^{K/'}$

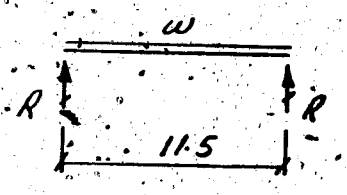
$R_1 = (22.31^K_D + 2.65^K_L) = 24.96^K$
$R_2 = (-0.81^K_D + 0.75^K_L) = -(0.06^K)$ UPLIFT
$-M = 91.9^{KFT}$ @ $l_u \approx 15.6'$

W/O LL ON OVRHNG: $R_1 = (22.31^K_D + 1.12^K_L) = 23.43^K$
$R_2 = (-0.81^K_D + 1.12^K_L) = 0.31^K$
$+M_{@0.1'} = 0.1^{KFT}$

$W24\times55 \rightarrow M_R = 128^{KFT}$ @ $l_u = 15.5'$
$I_{REQD} \simeq$ RB-6

USE: SAME AS RB-6

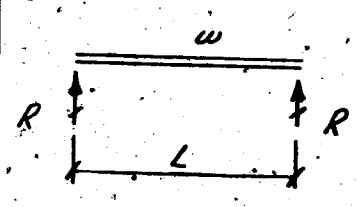
RB-8



$\omega = (0.57^{K/'}_D + 0.14^{K/'}_L) = 0.71^{K/'}$
$R = (3.28^K_D + 0.81^K_L) = 4.09^K$
$M = 11.8^{KFT}$

USE W8x10

RB-9 & RB-9A



$\omega = (0.57^{K/'}_D + 0.14^{K/'}_L) = 0.71^{K/'}$

RB-9: $L = 6.5'$.
$R = (1.85^K_D + 0.46^K_L) = 2.31^K$
$M = 3.8^{KFT}$
USE W8x10

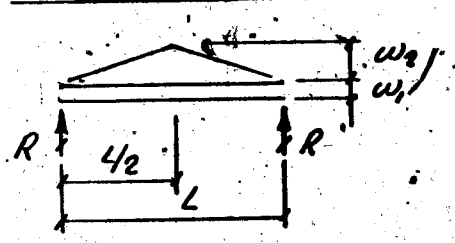
RB-9A: $L = 2.0'$
$R = (0.57^K_D + 0.14^K_L) = 0.71^K$
$M = 0.4^{KFT}$
USE L3x3x1/4

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RB-10 THRU RB-14



$\omega_1 = 26'(.021^{K/\#_D}) + 5'(.012^{K/\#_D}) = 0.61^{K/'}$ ALL

RB-10: $L = 16.0'$

$\omega_2 = 3.0\left[(.076^{K/\#} + .006^{K/\#})_D + (.020^{K/\#})_L\right]$

$\omega_2 = (0.25^{K/'}_D + 0.06^{K/'}_L) = 0.31^{K/'}$

$R = (5.88^{K}_D + 0.24^{K}_L) = 6.12^{K}$

$M = 26.2^{KFT}$

RB-11: $L = 9.0'$

$\omega_2 = 2.5(.082_D + .020_L) = (0.21^{K/'}_D + 0.05^{K/'}_L) = 0.26^{K/'}$

$R = (3.22^{K}_D + 0.11^{K}_L) = 3.33^{K}$

$M = 8.0^{KFT}$

RB-12: $L = 8.0'$

$\omega_2 = 2.0(.082_D + .020_L) = (0.17^{K/'}_D + [illegible]^{K/'}_L) = 0.21^{K/'}$

$R = (2.78^{K}_D + 0.08^{K}_L) = 2.86^{K}$

$M = 6.0^{KFT}$

RB-13: $L = 7.3'$

$\omega_2 = 7.5(.082_D + .020_L) = (0.13^{K/'}_D + 0.03^{K/'}_L) = 0.16^{K/'}$

$R = (2.46^{K}_D + 0.06^{K}_L) = 2.52^{K}$

$M = 4.8^{KFT}$

RB-14: $L = 9.0$

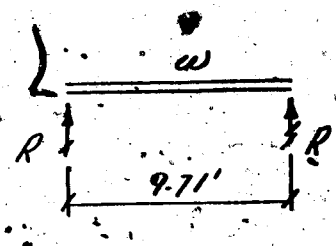
$\omega_2 = 1.0(.082_D + .020_L) = 0.10^{K/'}$

$R = (2.99^{K}_D + 0.05^{K}_L) = 2.98^{K}$

$M = 6.[illegible]^{KFT}$

USE C12x20.7
RB-10 THRU RB-14

RB-15



$\omega = (8.89/2)(.082 + .020) = (.36^{K/'}_D + .09^{K/'}_L) = 0.45^{K/'}$

$R = (1.75^{K}_D + 0.44^{K}_L) = 2.19^{K}$

$M = 5.3^{KFT}$

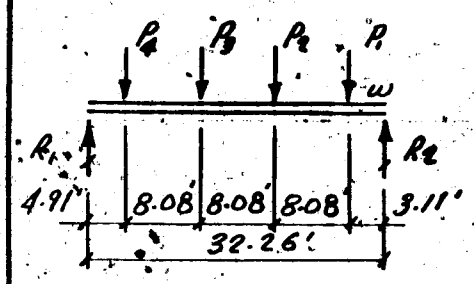
USE W8x10

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RB-16



17.0'/cos 30° = 8.08'
2.69'/ do = 3.11'
4.25'/ do = 4.91'

201# < TRIB ≤ 600# → LL = 16 #/ft

$w = 2.5(.082^K/_{\phi_D} + .016^K/_{\phi_L}) = (.21^K/_D + .04^K/_L) = 0.25^K/_L$
$P_1 = (22.31^K_D + 2.12^K_L) = 24.43^K$
$P_2 = (18.85^K_D + 2.18^K_L) = 21.03^K$
$P_3 = (19.15^K_D + 2.54^K_L) = 21.69^K$
$P_4 = (17.44^K_D + 2.28^K_L) = 19.72^K$

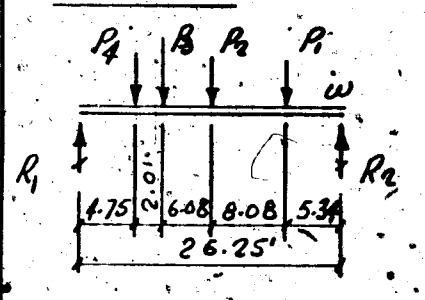
$R_1 = (38.30^K_D + 5.06^K_L) = 43.36^K$
$R_2 = (46.22^K_D + 5.35^K_L) = 51.57^K$
$M_{12.99} = 382.8^{K'}$

$f_b = \frac{383 \times 12}{196} = 23.45 KSI$

$\Delta_{DL} = (1034.48 \times 10^{-6})(32.26^2 \times 23.45)/24.10 = 1.05" = L/369$

USE W24x84
TOS EL +1/4" ABOVE MOM CONN BMS

RB-17



22'-8¾"/cos 30 = 26.25'
$w = (.21^K/_D + .04^K/_L) = 0.25^K/_L$ REF RB-16

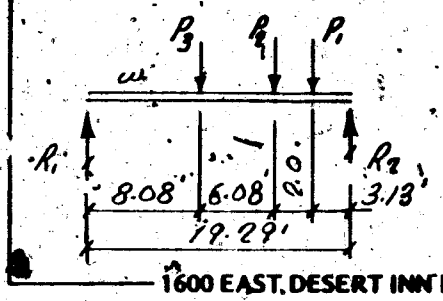
$P_1 = (0.57^K_D + 0.11^K_L) = 0.68^K$
$P_2 = (1.85^K_D + 0.37^K_L) = 2.22^K$
$P_3 = (5.88^K_D + 0.19^K_L) = 6.07^K$
$P_4 = (3.28^K_D + 0.65^K_L) = 3.93^K$

$R_1 = (10.87^K_D + 1.41^K_L) = 12.28^K$
$R_2 = (6.22^K_D + 0.96^K_D) = 7.18^K$
$M_{17.12} = 70.1^{KFT}$

USE W16x31

W16x31
$\Delta_{DL} = (1034.48 \times 10^{-6})(26.25^2 \times 17.83)/15.88 = 0.80"$
$\approx L/394$

RB-18



16'-8¼"/cos 30 = 19.28'
$w = (.21^K/_D + .04^K/_L) = 0.25^K/_L$ REF RB-16
$P_1 = (9.03^K_D + 2.93^K_L) = 11.96^K$
$P_2 = (2.93^K_D + 0.05^K_L) = 2.98^K$
$P_3 = (7.41^K_D + 1.82^K_L) = 9.23^K$
$R_1 = (8.58^K_D + 1.93^K_L) = 10.51^K$
$R_2 = (14.84^K_D + 3.64^K_L) = 18.48^K$
$M_{8.08} = 76.8^{KFT}$

USE W16x31

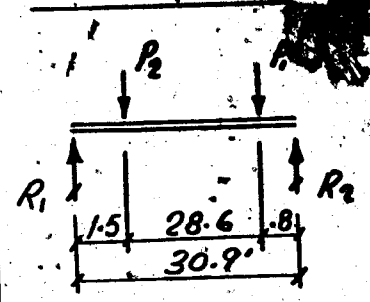
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RB-19



$w = (7.0/\ell)(.082^{K}/_{ft_D} + .020^{K}/_{ft_L}) = (.29^{K}/_{ft_D} + .07^{K}/_{ft_L}) = 0.36^{K}/_{ft}$

$P_1 = (1.99^{K}_{D} + 0.45^{K}_{L}) = 2.44^{K}$

$P_2 = (8.58^{K}_{D} + 1.93^{K}_{L}) = 10.51^{K}$

$R_1 = (12.70^{K}_{D} + 2.93^{K}_{L}) = 15.63^{K}$

$R_2 = (6.84^{K}_{D} + 1.61^{K}_{L}) = 8.45^{K}$

$M_{14.7'} = 52.2^{KFT}$

USE | W16 x 26

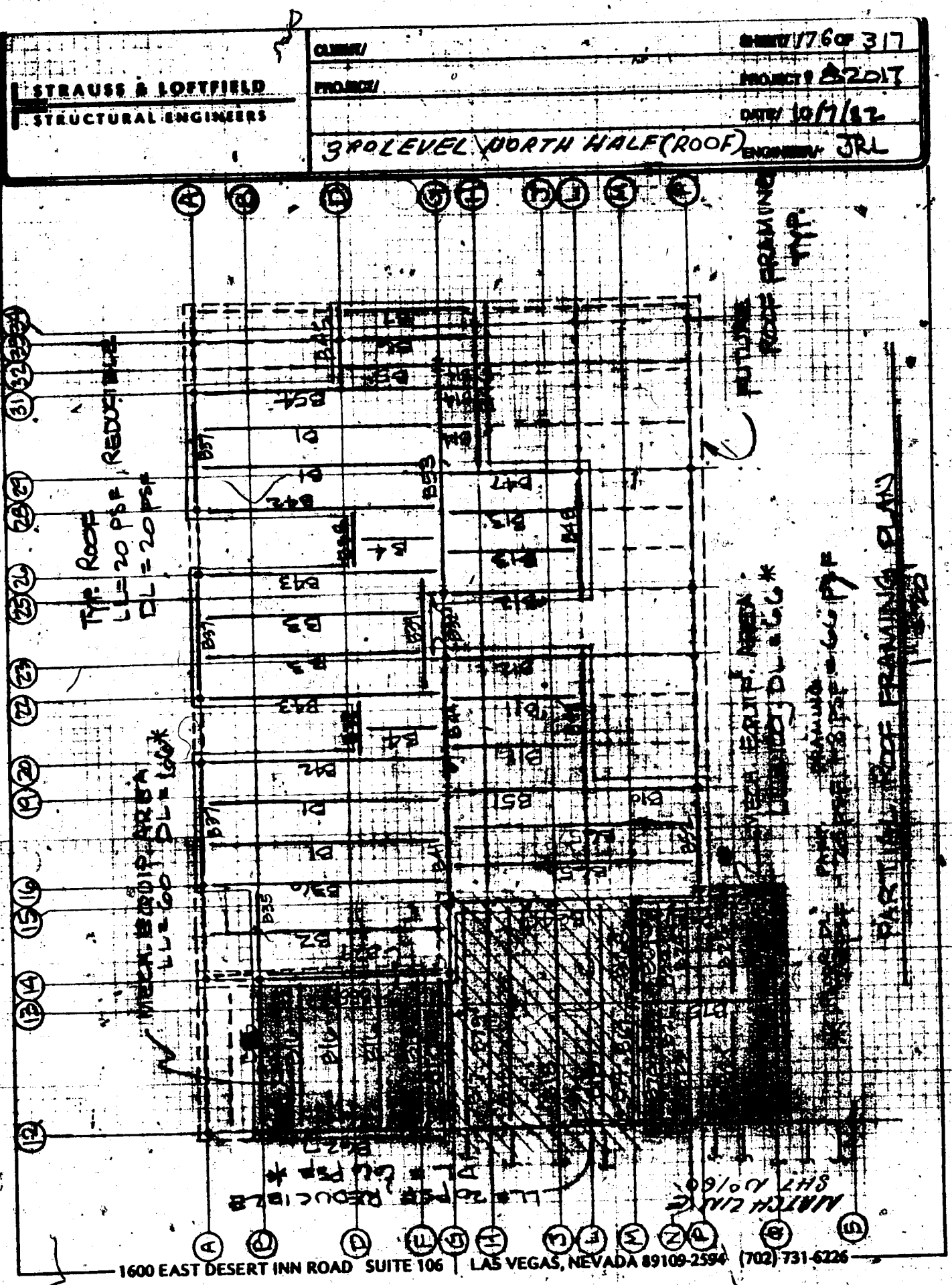
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3RD LEVEL NORTH HALF (ROOF)

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3RD LEVEL NORTH HALF (ROOF) BY JJT

ROOF BEAMS - NORTH ROOF

B-1 THRU B-75

B1

SPAN = 39.9' $A_T = 39.9' \times 6.6' = 263^{SF}$ LL = 16^{PSF}

$w = 6.6(\frac{LL}{16} + \frac{DL}{20}) = 238^{PLF}$ $M = \frac{238(39.9)^2}{8} = 47.4^{IK}$ $R = 4.8^{K}_{DL=}$

USE W16x26 $M_R = 77$

$\Delta = 47.4(39.9)^2 / 80.6 \times 38.4 \times 16 = 1.52" = SPAN/314$

B2

SPAN = 31.0 $A_T = 31.0 \times 8 = 248^{SF}$ LL = 16^{PSF}

$w = 8(\frac{LL}{16} + \frac{DL}{20}) = 288$ $M = \frac{288(31)^2}{8} = 34.6$ $R = 4.5^{K}_{DL=}$

USE W14x22 $M_R = 58$

$\Delta = 34.6(31)^2 / 80.6 \times 29 \times 14 = 1.02" = SPAN/366$

B3

SPAN = 36.4' $A_T = 36.4 \times 6.6 = 240^{SF}$ LL = 16^{PSF}

$w = 6.6(\frac{LL}{16} + \frac{DL}{20}) = 238^{PLF}$ $M = \frac{238(36.4)^2}{8} = 39.4$ $R = 4.3^{K}_{DL=}$

USE W16x26 $M_R = 77$

B4

SPAN = 14.3 $A_T = 14.3 \times 5.1 = 73^{SF}$ LL = 20

$w = 5.1(20+20) = 204$ $M = \frac{204(14.3)^2}{8} = 5.2^{IK}$ $R = 1.5^{K}_{DL=}$

USE W8x10 $M_R = 16$

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BY/ JPT

ROOF BEAMS - NORTH ROOF

B5

SPAN = 15.8' A_T = LL = 20

$w = 4'(20+20) = 160^{PLF}$ $M = \frac{.160(15.8)^2}{8} = 5.0^{IK}$ $R = 1.3^K$ DL =

USE W8X10

$M_R = 16$

B6

SPAN = 21.7' $A_T = 21.7 \times 4.5 = 98^{SF}$ LL = 20

$w = 4.5(20+20) = 180$ $M = \frac{.180(21.7)^2}{8} = 10.6^{IK}$ $R = 2.0^K$ DL =

USE W12X14

$M_R = 30$

B7

SPAN = 21.7' A_T = LL = 20

$w = 3.3'(20+20) = 132$ $M = \frac{.132(21.7)^2}{8} = 7.8^{IK}$ $R = 1.4^K$ DL = 0.7^K

USE W8X10

$M_R = 16$

$\Delta = \frac{7.8(21.7)^2}{30.6 \times 7.8 \times 8} = 0.73'' = \frac{SPAN}{357}$

B8

SPAN = 17.0 A_T = LL = 20

$w = 6.0(20+20) = 240$ $M = \frac{.240(17)^2}{8} = 8.7$ $R = 2.0$ DL =

USE W8X10

$M_R = 16$

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ROOF BEAMS - NORTH ROOF

B9

SPAN = 28.7' A_T = LL = 20

$w = 6'(20+20) = 240$ PLF ~~$M = \frac{24(22.7)^2}{8} = 15.5^{1K}$~~ R = 2.7K DL =

USE W12X14

$M_R = 30$

B10

SPAN = 18.0' A_T = LL = 20

$w = 6.7'(20+20) = 268$ PLF $M = \frac{268(18)^2}{8} = 10.9^{1K}$ R = 2.4K DL =

USE W8X10

$M_R = 16$

B11

SPAN = 21.9' $A_T = 21.9 \times 7.3 = 160$ LL = 20

$w = 7.3(20+20) = 292$ PLF $M = \frac{292(21.9)^2}{8} = 17.5^{1K}$ R = 8.6K DL =

USE W12X14

$M_R = 30$

B12

SPAN = 21.9' A_T = L_T = 20

$w = 8.8'(20+20) = 352$ $M = \frac{352(21.9)^2}{8} = 21.1^{1K}$ R = 3.9K DL =

USE W12X14

$M_R = 30$

Calcs (4)
501 N. Casino Center

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ROOF BEAMS - NORTH ROOF

B13

SPAN = 21.9' A_T = LL = 20

$w = 6.6'(20+20) = 264$ $M = \frac{.264(21.9)^2}{8} = 15.8^{1K}$ $R = 2.9^K$ DL =

USE W12x14

$M_R = 30$

B14

SPAN = 5.8' A_T = LL = 20

$w = 6.6'(20+20) = 264$ $M = \frac{.264(5.8)^2}{8} = 1.1^{1K}$ $R = 0.8^K$ DL =

USE W8X10

$M_R = 16$

B

SPAN = A_T = LL =

w = M = R = DL =

USE

M_R =

B

SPAN = A_T = LL =

w = M = R = DL =

USE

M_R =

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ROOF BEAMS - NORTH ROOF

B15

SPAN = 24.3' A_T = LL = 60

$w = 7.5'\left(\frac{LL}{60}+\frac{DL}{66}\right) = 945\ PLF$ $M = \frac{.945(24.3)^2}{8} = 69.8^{IK}$ $R = 11.5^{K}_{DL=}$

USE W16X26
$M_R = 77$

B16

SPAN = 24.3' A_T = LL = 60

$w = 7.0'\left(\frac{LL}{60}+\frac{DL}{66}\right) = 882\ PLF$ $M = \frac{.882(24.3)^2}{8} = 65.1^{IK}$ $R = 10.7^{K}_{DL=}$

USE W16X26
$M_R = 77$

B17

SPAN = 35.8' $A_T = 35.8 \times 5' = 179\ SF$ LL = 20 PSF

$w = 5'\left(\frac{LL}{20}+\frac{DL}{66}\right) = 430\ PLF$ $M = \frac{.43(35.8)^2}{8} = 68.9^{IK}$ $R = 7.7^{K}_{DL=}$

USE W16X31

$\Delta = \frac{68.9(35.8)^2}{80.6 \times 47.2 \times 16} = 1.45'' = \frac{SPAN}{296}$ $M_R = 77$

B18

SPAN = 35.8' $A_T = 35.8 \times 7' = 251\ SF$ LL = 16

$w = 7'(16+66) = 574\ PLF$ $M = \frac{574(35.8)^2}{8} = 92.0$ $R = 10.3^{K}_{DL=}$

USE W18X35
$M_R = 115$

$\Delta = \frac{92(35.8)^2}{80.6 \times 57.6 \times 18} = 1.41'' = \frac{SPAN}{304}$

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ROOF BEAMS - NORTH ROOF

B19

SPAN = 19.7' A_T = .5

$w = 2.2'(\frac{LL}{100} + \frac{DL}{66}) + 2.5'(\frac{LL}{20} + \frac{DL}{66}) = 580$ PLF

$M = \frac{.58(19.7)^2}{8} = 28.1^{IK}$

LL = 100 PSF / 20 PSF

$R = 5.7^K$ DL =

USE W12x16

$M_R = 34$

B20

SPAN = 16.2' A_T =

$w = 580$ PLF (SEE B19)

$M = \frac{.58(16.2)^2}{8} = 19.0^{IK}$

LL = 100 PSF / 20 PSF

$R = 4.7^K$ DL =

USE W12x14

$M_R = 34$

B21

SPAN = 19.7' A_T =

$w = 4A'(\frac{LL}{100} + \frac{DL}{66}) = 730$

$M = \frac{.73(19.7)^2}{8} = 35.4^{IK}$

LL = 100

$R = 7.2^K$ DL =

USE W12x19

$M_R = 43$

B22

SPAN = 16.2' A_T =

$w = 4.4'(\frac{LL}{100} + \frac{DL}{66}) = 730$

$M = \frac{.73(16.2)^2}{8} = 24.0^{IK}$

LL = 100

$R = 5.9^K$ DL =

USE W12x14

$M_R = 30$

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ROOF BEAMS - NORTH ROOF

B23

SPAN = 19.7' · A_T = LL = 100

$w = 5.6'(\frac{LL}{100} + \frac{DL}{66}) = 930$ $M = \frac{.93(19.7)^2}{8} = 45.1^{IK}$ $R = 9.2^K$ R_{DL}=

USE W14X22

$M_R = 50$

B24

SPAN = 16.2' · A_T = LL = 100

$w = 5.6'(100+66) = 930$ $M = \frac{.93(16.2)^2}{8} = 30.5^{IK}$ $R = 7.5^K$ R_{DL}=

USE W12X19

$M_R = 43$

B25

SPAN = 19.7' A_T = LL = 100

$w = 6.7'(100+66) = 1112^{PLF}$ $M = \frac{1.112(19.7)^2}{8} = 53.9^{IK}$ $R = 11.0^K$ R_{DL}=

USE W14X22

$M_R = 50$

B26

SPAN = 16.2' A_T = LL = 100

$w = 6.7'(100+66) = 1112^{PLF}$ $M = \frac{1.112(16.2)^2}{8} = 36.5^{IK}$ $R = 9.0^K$ R_{DL}=

USE W12X19

$M_R = 43$

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ROOF BEAMS - NORTH ROOF

B27

SPAN = 19.7' A_T = LL = 100

$w = 4.3'(\frac{LL}{100}+\frac{DL}{66}) = 714$ PLF $M = \frac{.714(19.7)^2}{8} = 34.6^{IK}$ $R = 7.0^K$ DL =

USE W12x19

$M_R = 43$

B28

Axial Load from x-bracing

SPAN = 16.2' A_T = LL = 100

$w = 4.3'(100+66) = 714$ PLF $M = \frac{.714(16.2)^2}{8} = 23.4^{IK}$ $R = 5.8^K$ DL =

USE W12x26

(AXIAL LOAD = (1.25x37.9^K)) $M_R = 67$

B29

SPAN = 31.0' A_T = LL = 20

$w = 5'(\frac{LL}{20}+\frac{DL}{20}) = 200$ PLF $M = \frac{.20(31)^2}{8} = 24.0^{IK}$ $R = 3.1^K$ DL =

USE W14x22

$M_R = 58$

B30

SPAN = 17.0 A_T = LL = 20

$w = 4'(20+20) = 160$ PLF $M = \frac{.16(17)^2}{8} = 5.8^{IK}$ $R = 1.4^K$ DL =

USE W8x10

$M_R = 16$

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ROOF BEAMS - NORTH ROOF

B31

SPAN = 22.7' A_T =

$w = 4'(20+20) = 160$ PLF $M = \frac{.16(22.7)^2}{8} = 10.8^{1K}$

LL = 20

$R = 1.8^K$ DL =

USE W12x14

$M_R = 20$

B32

SPAN = 3.5' A_T =

$w = 8.8'(20+20) = 352$ $M = \frac{.352(3.5)^2}{8} = 0.5^{1K}$

LL = 20

$R = 0.6^K$ DL =

USE W8x10

$M_R = 16$

B33

SPAN = A_T =

w = M =

LL =

R = DL =

USE

M_R =

B34

SPAN = A_T =

w = M =

LL =

R = DL =

USE

M_R =

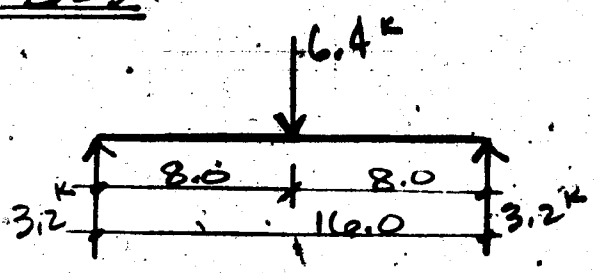
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ROOF BEAMS - NORTH ROOF

B35



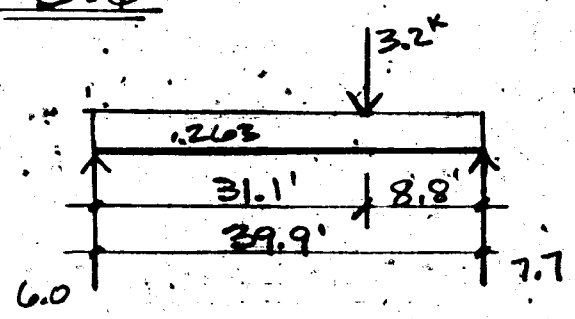
$A_T = 8.0' \times (15.5 + 4.5) = 160\ SF$ LL=20

$P = 160\ SF (^{LL}20 + ^{DL}20) = 6400\#$

$M = 8 \times 3.2 = 25.6^{IK}$

USE W12x16
$M_R = 34$

B36

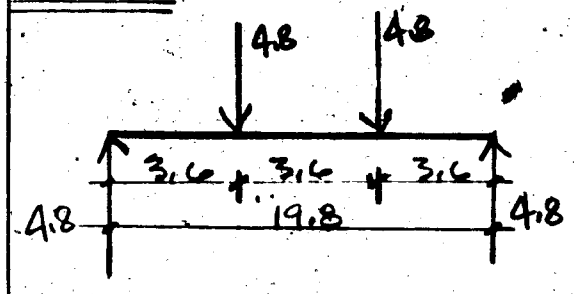


$W = 7.3' (^{LL}16 + ^{DL}20) = 263\ PLF$

$M = 67.4^{IK}$

USE W16x26
$M_R = 77$

B37



$M = 3.6' \times 4.8^{K} = 17.3^{IK}$

USE W12x14
$M_R = 30$

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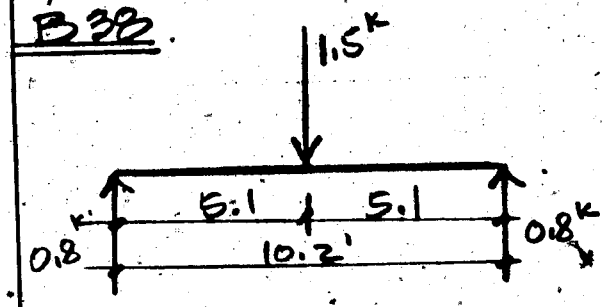
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ENGINEER/ JRL

ROOF BEAMS - NORTH ROOF

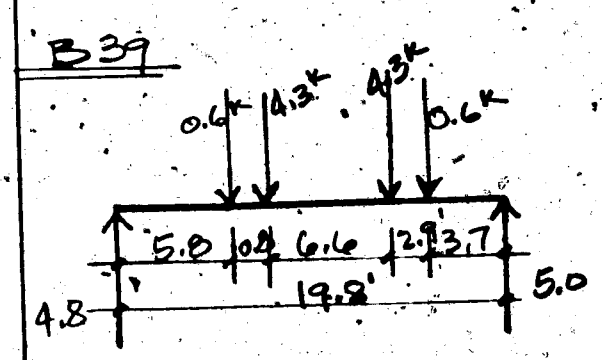
B38



$M = 5.1' \times 0.8^K = 4.1^{IK}$

USE W8X10
$M_R = 16$

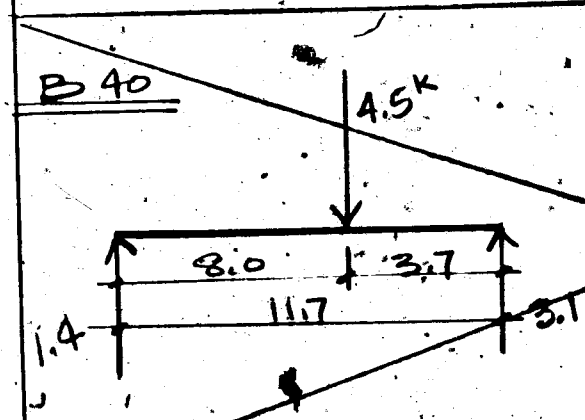
B39



$M = 31.4^{IK}$

USE W12X19
$M_R = 43$

B40



$M = 3.7' \times 3.1^K \rightarrow 11.5^{IK}$

USE W10X12
$M_R = 22$

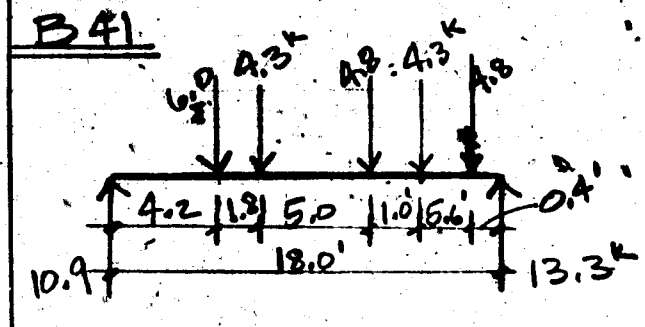
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ROOF BEAMS- NORTH ROOF

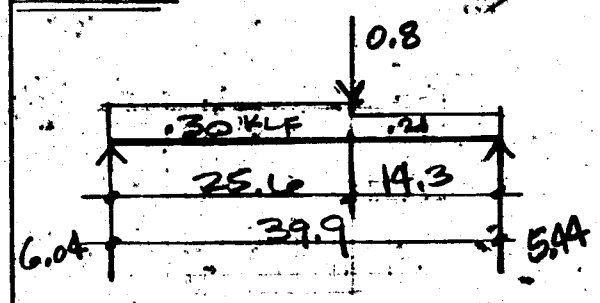
B41



$M = 57.3^{1K}$

USE W16X26
$M_R = 77$

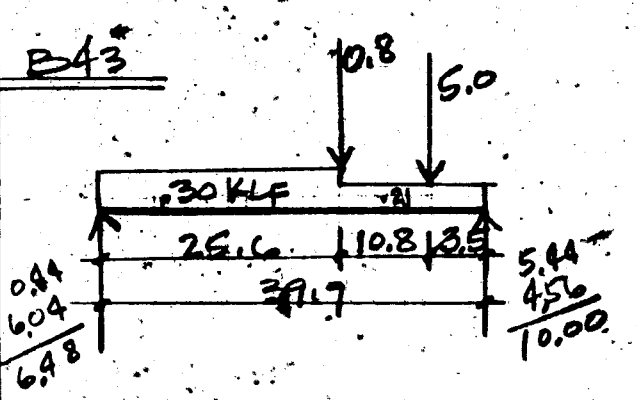
B42



$L = 16$
$W_1 = 8.4'(16+20) = 302$
$W_2 = 5.8'(16+30) = 209$
$M = \frac{(6.04)^2}{2 \times .30} = 60.8^{1K}$

USE W16X31
$M_R = 94$

B43



$W = .30$ } SEE B42
$W_2 = .21$ }

$M = \frac{(6.48)^2}{2 \times .30} = 70.0^{1K}$

USE W16X31
$M_R = 94$

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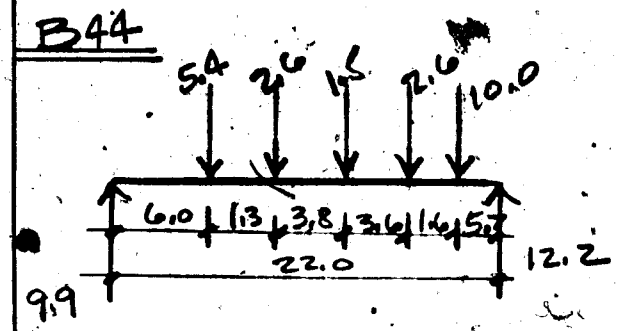
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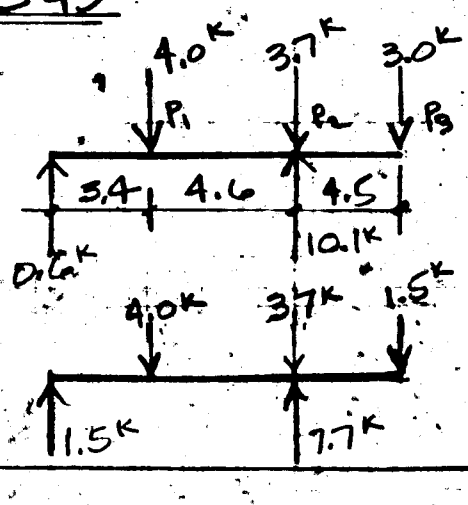
B44



$M = 73.3^{1K}$

USE W16x31
$M_R = 94$

B45



$P_1 = 5.0'(20+20) \times 19.9' = 3980^{\#} = 4.0^K$

$P_2 = 4.0'(20+20) \times 22.9' = 3664^{\#} = 3.7^K$

$P_3 = 3.3'(20+20) \times 22.9' = 3028^{\#} = 3.0^K$

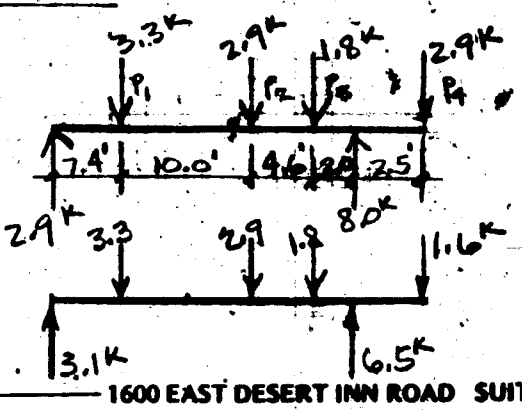
DL = 1.5 K

MAX. $M_+ = 3.4' \times 1.5^K = 5.1^{1K}$

MAX. $M_- = 4.5' \times 3.0^K = 13.5^{1K}$

USE W12x14
$M_R = 30^{1K}$ @ $L_b = 4.2'$

B46



$P_1 = 8.3'(16+20) \times 11.0' = 3287 = 3.3^K$

$P_2 = 7.3'(16+20) \times 11.0' = 2890 = 2.9^K$

$P_3 = 4.5'(16+20) \times 10.9' = 1766 = 1.8^K$

$P_4 = 3.3(16+20) \times 10.9'$
$+ 5.5'(16+20) \times 8.0' = 2880 = 2.9^K$

MAX. $M_+ = 3.1^K \times 7.4' = 22.9^{1K}$ DL = 1.6

USE W12x14
$M_R = 30$

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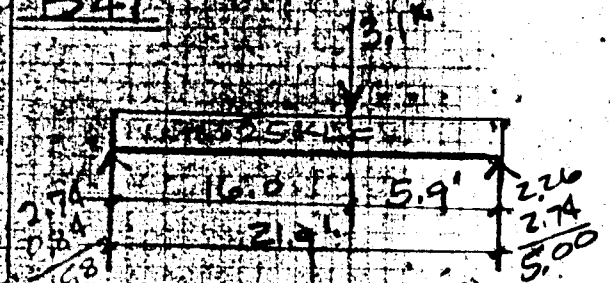
5

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ROOF BEAMS - NORTH ROOF

B47

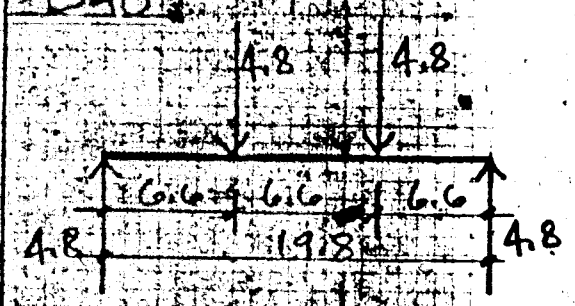


$W = 7.0'(16+20) = 252$ PLF

$M = \frac{(3.58)^2}{2 \times .25} = 25.6^{1K}$

USE W12 x 14
$M_R = 30$

B48



$P = 6.6'(16+20) \times 20.0' = 4752\#$
$= 4.8^K$

$M = 4.8^K \times 6.6' = 31.7^{1K}$

USE W12 x 19
$M_R = 43$

B49

$P = 7.3(16+20) \times 20.0' = 5256\#$
$= 5.3^K$

$M = 7.3' \times 5.3^K = 38.7^{1K}$

USE W12 x 19
$M_R = 43$

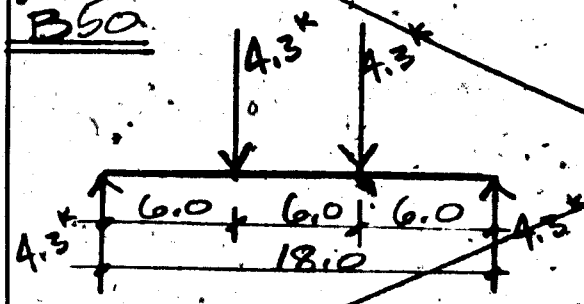
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ENGINEER/ JRL

ROOF BEAMS- NORTH ROOF

B50

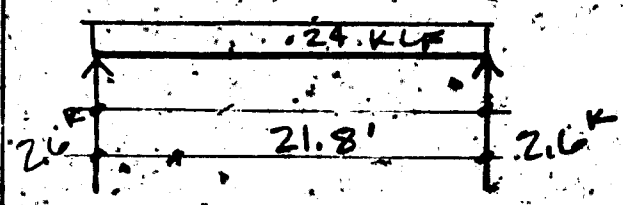


P=6.0(16+20)x20.0= 4320#.
= 4.3K

M=6.0'x4.3K= 25.8 1K

USE W12x16
M_R=34

B51



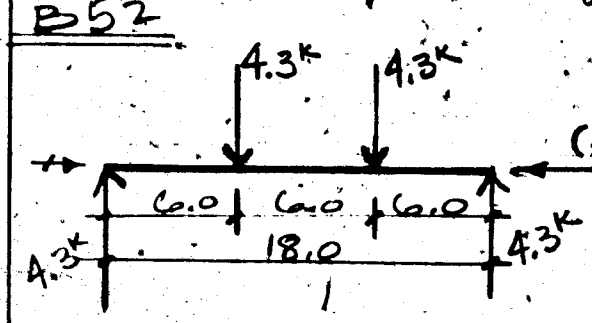
W=6.7'(16+20) = 241 PLF

$M = \frac{.24(21.8)^2}{8.} = 14.3^{1K}$

USE W10x12
M_R=22

B52

axial Load from x-brace



M=6.0'x4.3K=25.8 1K

USE W12x16
M_R=34

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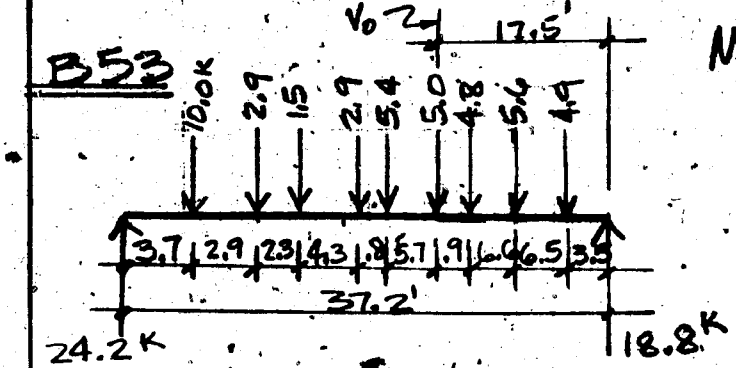
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ENGINEER/ JRL

ROOF BEAMS- NORTH ROOF

B53

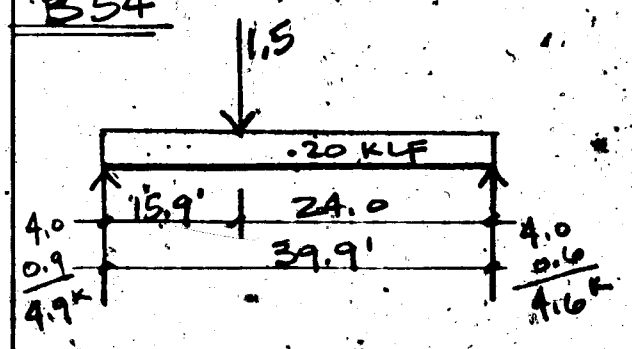


$M = 18.8^{K} \times 17.5' - 4.8 \times 9 - 5.6 \times 7.5 - 4.9 \times 14.0 = 214.1^{1K}$

USE 4x62
$M_R = 262$

APPROX. $\Delta = \frac{214.1 \times (37.2)^2}{80.6 \times 131 \times 24} = 1.17'' = \frac{SPAN}{382}$

B54

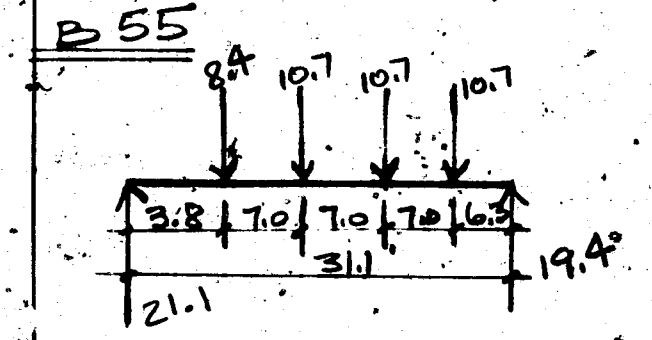


$W = 5.0'(\frac{LL}{20} + \frac{DL}{20}) = 200 PLF$

$M = \frac{(4.6)^2}{2 \times .2} = 52.9^{1K}$

USE W16x26
$M_R = 77$

B55



$M = 183.1^{1K}$

USE W21x50
$M_R = 189$

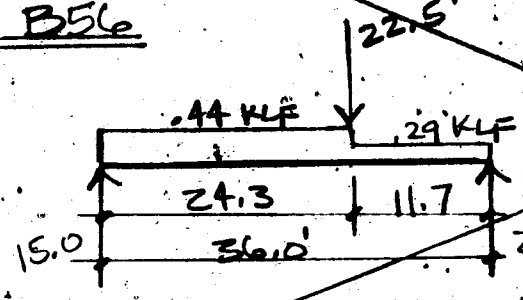
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B56



$P = 21.1^{BSS} + 1.4^{DLO} = 22.5^K$

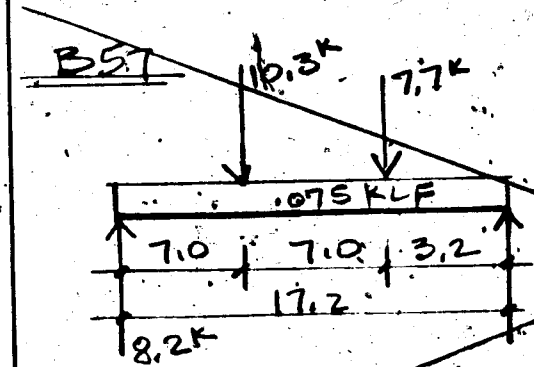
$W_1 = 2.5'(20^{LL} + 66^{DL}) + 1.5'(20^{LL} + 66^{DL})$
$= 444$ PLF

$W_2 = 2.5'(20^{LL} + 66^{DL}) + 5' \times 15\,PSF^{WALL}$
$= 290$ PLF

$M = 24.3' \times 15.0^K - \frac{.44(24.3)^2}{2} = 234.6'^K$

USE W24x62
$M_R = 262$

B57

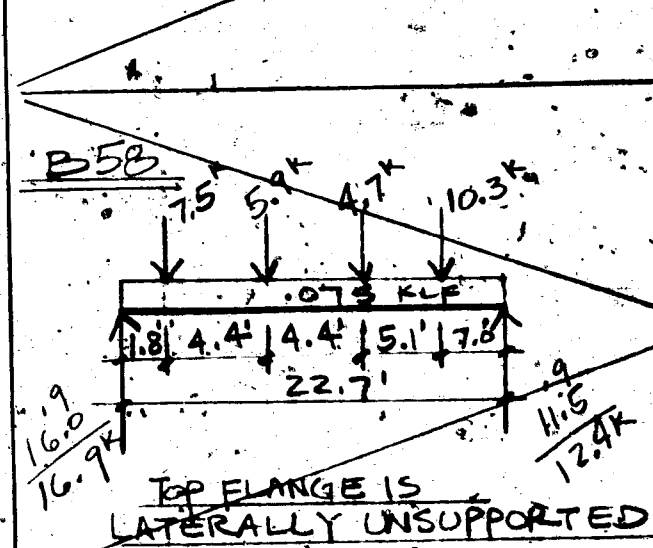


$W = 5' \times 15\,PSF^{WALL} = 75$ PLF

$M = 55.5'^K$

USE W16x26
$M_R = 77$

B58



$W = 5' \times 15\,PSF = 75$ PLF

$M = 12.1' \times 12.4^K - 5.1' \times 10.3^K - \frac{.075(12.1)^2}{2} = 92.0'^K$

USE W10x49
$M_R = 100'^K$ @ $L_b = 22.7'$

TOP FLANGE IS LATERALLY UNSUPPORTED

APPROX. $\Delta = \frac{92(22.7)^2}{80.6 \times 54.6 \times 10} = 1.08''$ DRAN 2 = 2.52

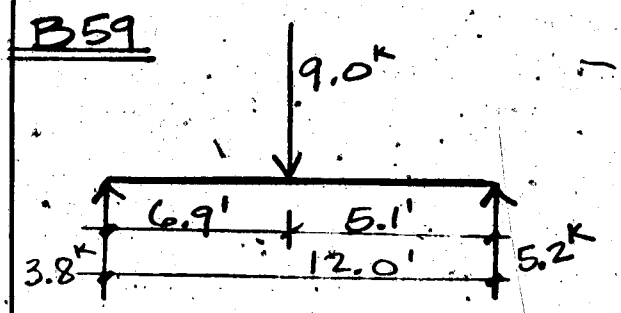
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ENGINEER/ JRT

ROOF BEAMS - NORTH ROOF

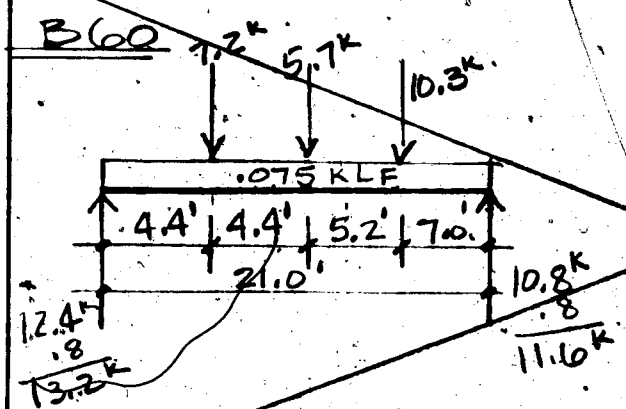
B59



$M = 5.1' \times 5.2^K = 26.5^{IK}$

USE W12x14
$M_R = 30$

B60



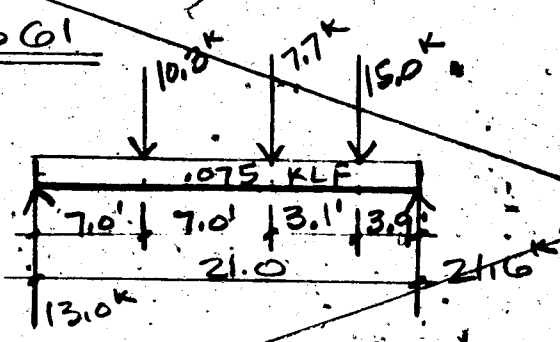
$W = 5' \times 15 PSF = 75 PLF$

$M = 12.2' \times 11.6^K - 5.2' \times 10.3^K - \frac{.075(12.2)^2}{2}$

$= 82.4^{IK}$

USE W16x31
$M_R = 94$

B61



$W = 5' \times 15 PSF = 75 PLF$

$M = 102.6^{IK}$

USE W18x35
$M_R =$

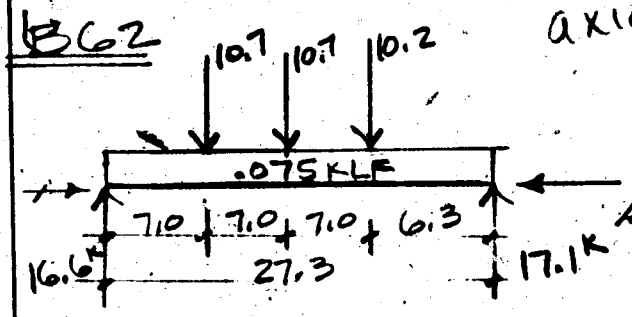
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ROOF BEAMS - NORTH ROOF

B62



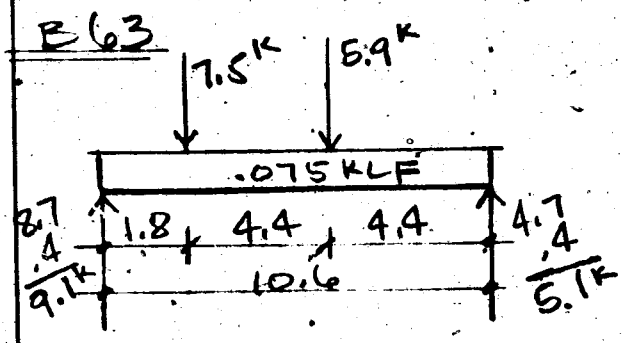
axial Load from x-brace
$W = 5' \times 15 PSF = 75 PLF$

$M = 149.4^{IK}$

AXIAL LOAD = (1.25 x 43.5K)

USE W21x44 ✓
$M_R = 163$

B63

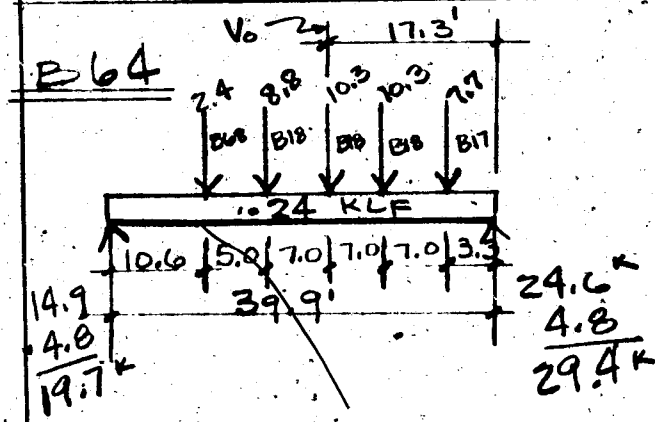


$W = 5' \times 15 PSF = 75 PLF$

$M = 5.1^{K} \times 4A' - \frac{.075(4.4)^2}{2} = 21.7^{IK}$

USE W12x14
$M_R = 30$

B64



$W = 6'(\frac{LL}{20} + \frac{PL}{20}) = 240 PLF$

$M = 29.4^{K} \times 17.3' - 10.3^{K} \times 7.0' - 7.7^{K} \times 14.0'$
$- \frac{.24(17.3)^2}{2} = 292.8^{IK}$

USE W24x68 ✓
$M_R = 308$ ✓

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ROOF BEAMS - NORTH ROOF

B65

SPAN = 39.9' $A_T = 39.9 \times 6.0 = 239$ SF LL = 16

$w = 6'(\frac{LL}{16}+\frac{DL}{20}) = 216$ PLF $M = \frac{.216(39.9)^2}{8} = 43.0$ $R = 4.3^{K}_{DL=}$

USE W16X26

$M_R = 77$

B66

SPAN = 39.9 $A_T = 39.9 \times 4' = 160$ LL = 20

$w = 6'(\frac{LL}{20}+\frac{DL}{20}) = 240$ $M = \frac{.240(39.9)^2}{8} = 47.8$ $R = 4.8^{K}_{DL=}$

USE W16X26

$M_R = 77$

B67

SPAN = 19.7' $A_T =$ LL =

$w = 3.5'(20+6.6) = 300$ $M = \frac{.30(19.7)^2}{8} = 14.6$ $R = 3.0^{K}_{DL=}$

USE ~~W10~~ X12

$M_R = 22$

B68

SPAN = 16.2' $A_T =$ LL =

$w = 3.5'(20+6.6) = 300$ $M = \frac{.30(16.2)^2}{8} = 9.8$ $R = 2.4^{K}_{DL=}$

USE W8X10

$M_R = 16$

2

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ROOF BEAMS - NORTH ROOF

B69

SPAN = 16.2' A_T =

$w = 3'(100+66) + 5' \times 15\ PSF = 573\ PLF$

$M = \frac{.573(16.2)^2}{8} = 18.8^{IK}$ LL =

R = 4.6 DL =

USE W12 x 14

$M_R = 30$

B70

SPAN = 19.7' A_T =

$w = 3'(100+66) + 5' \times 15\ PSF = 573\ PLF$

$M = \frac{.573(19.7)^2}{8} = 27.8$ LL =

R = 5.6 DL =

USE W12 x 16

$M_R = 34$

B71

SPAN = 24.3' A_T =

$w = 3'(60+66) + 5' \times 15\ PSF = 453\ PLF$

$M = \frac{.453(24.3)^2}{8} = 33.4$ LL =

R = 5.5 DL =

USE W12 x 19

$M_R = 43$

BB72

SPAN = A_T = LL =

w = M = R = DL =

USE

M_R =

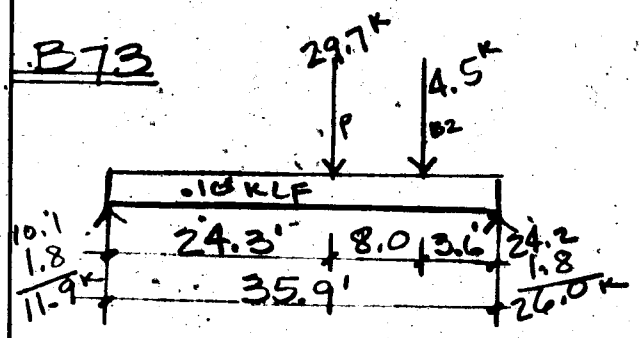
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PROJECT/
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DATE/ 10/22/82
ENGINEER/ JR

ROOF BEAMS - 1.0K H. Roof

B73



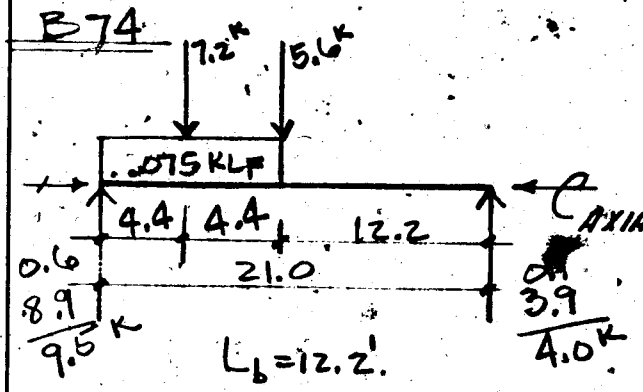
$P = 5.5^{B71} + 21.1^{B66} + 3.1^{B29} = 29.7^{K}$

$W = 2.5'(\frac{LL}{20} + \frac{DL}{20}) = 100\ PLF$

$M = 24.3' \times 11.9^{K} - \frac{.10(24.3)^2}{2} = 269.7^{'K}$

USE W24x68
$M_R = 308$

B74



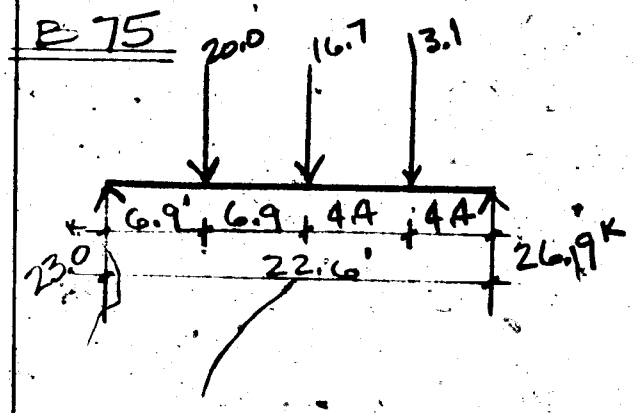
$W = 5' \times 15\ PSF = 75\ PLF$

$M = 12.2' \times 4.0^{K} = 48.8^{'K}$

$L_b = 12.2'$

USE W14x38
$M_R = 90^{'K}$ @ $L_b = 12.2'$

B75



$M = 8.8' \times 26.9 - 4.4' \times 13.1$
$= 179.1^{'K}$

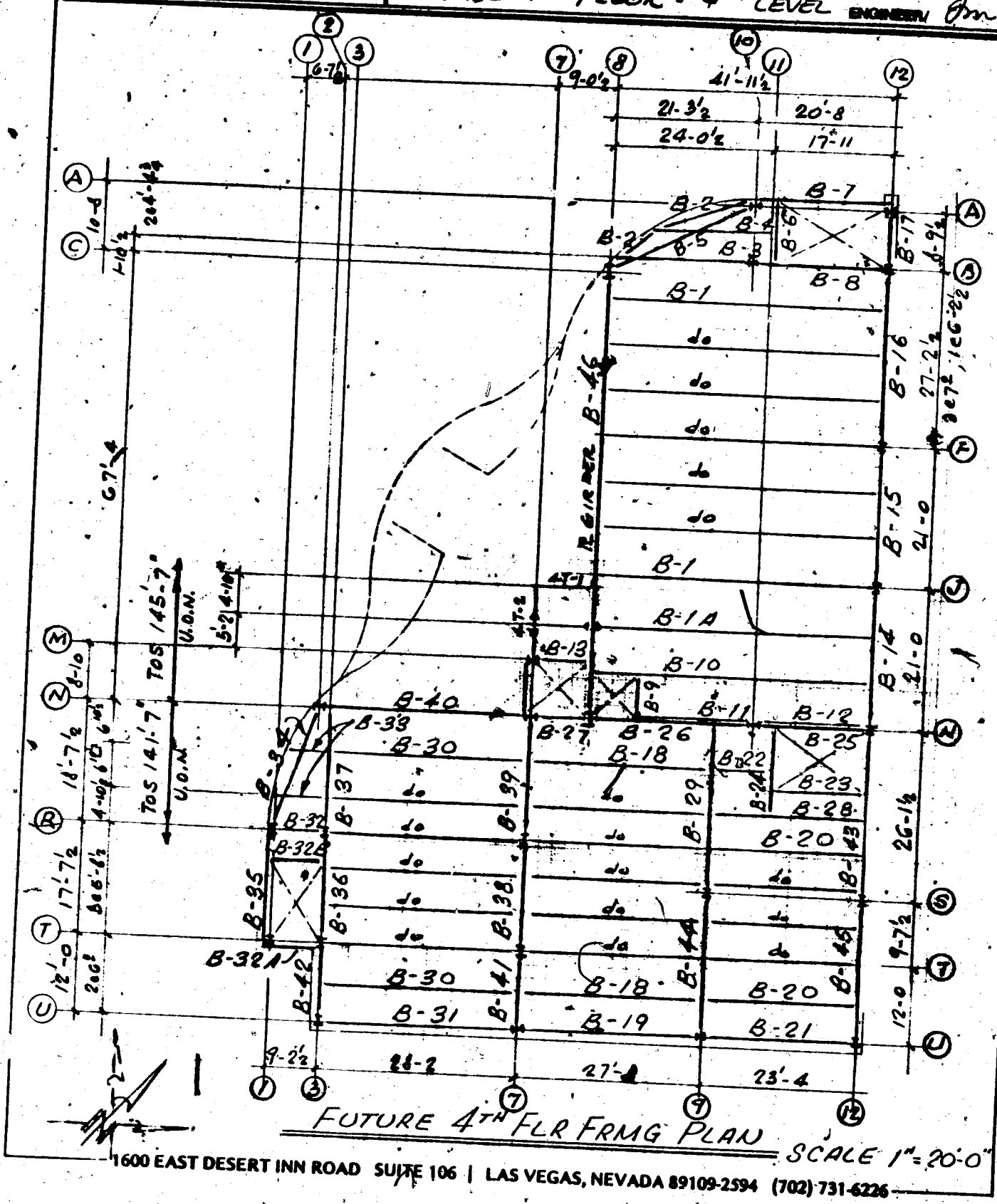
USE W21x50
$M_R = 189$

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ENGINEER/ Jm

FUTURE 4TH FLOOR - 4TH LEVEL



FUTURE 4TH FLR FRMG PLAN SCALE 1"=20'-0"

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JOB # 82017
OCT '82
ENGINEER/ HS

4TH LEVEL FRMG B-1 THRU B-46

FOR BMS B-1 THRU B-29 SEE 2ND LEVEL FRM'G

FOR BMS B-30 THRU B-40 SEE 3RD LEVEL FRM'G

B-41 THRU B-46 FOLLOW FOR REACTIONS ONLY

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PROJECT/

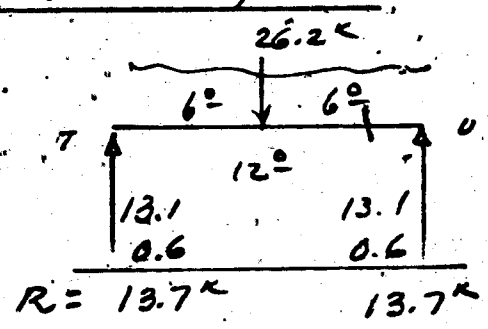
PROJECT # 82017

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FUTURE 4TH FLOOR

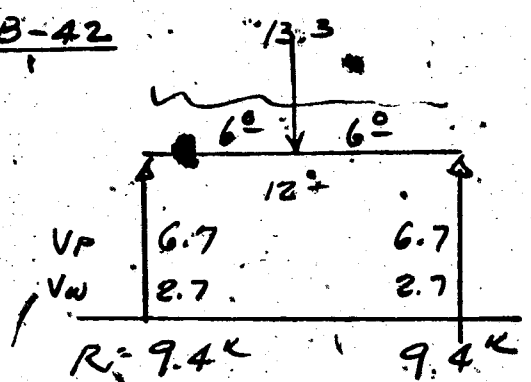
ENGINEER/ JM

B-41 LINE 7, T-U



B30 B19
P = 13.3 + 12.9 = 26.2K
ω = 100 PLF

B-42



B30
P = 13.3K
ω = 14(25) + 100 = 450 PLF
wall

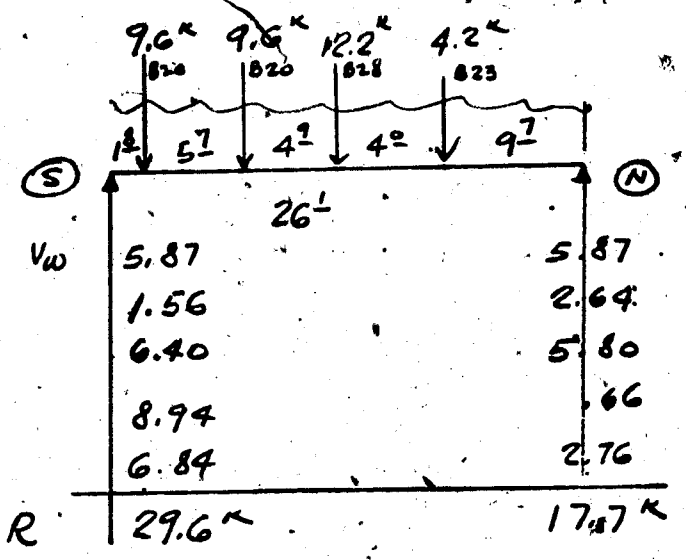
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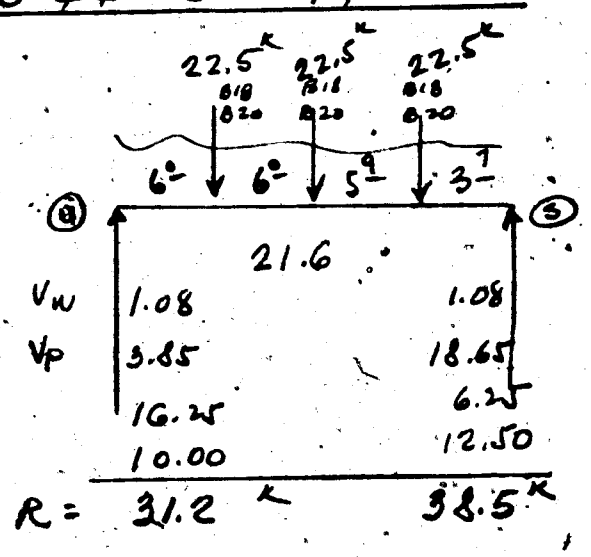
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PROJECT/ PROJECT # 82017
DATE/ 10-82
FUTURE 4TH FLOOR ENGINEER/ Jm

BEAM B-43 LINE 12, S-N



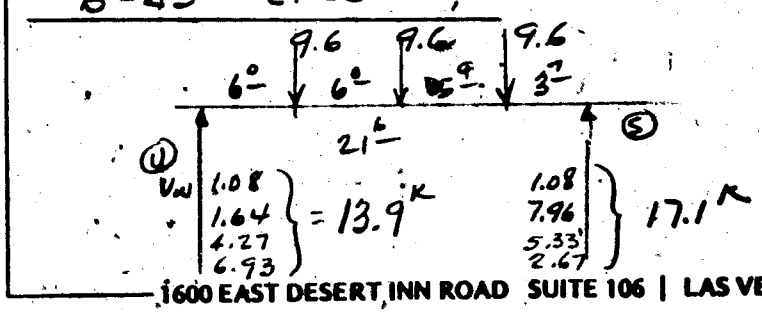
W2 100+14(25) = 450 PLF

B-44 LINE 9, S-U



B18 B20
P= 12.9 + 9.6 = 22.5K
W= 100 PLF

B-45 LINE 12, S-U



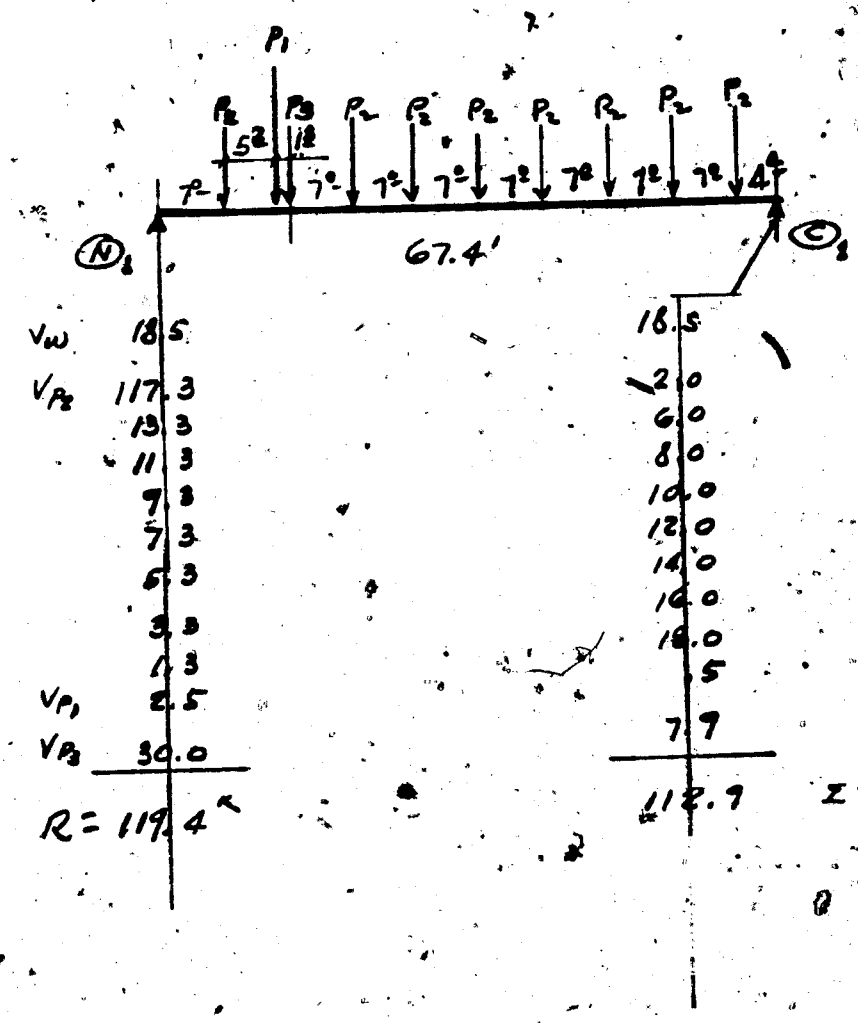
B20
P= 9.6K
W= 100 PLF

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FUTURE 4TH FLOOR ENGINEER

PLATE GIRDER B-46



$P_2 = 481 = 19.3^k$

$P_3 = 481_{1M} = 37.9^k$

$P_1 = 481_{3M} = 3.0^k$

$w = .14(25)(.200) = 550$ PLF

$W = .5(67.4) = 37.0$

$\Sigma P_2 = 8(19.3) = 154.4$

$P_1 = 3.0$

$P_3 = 37.9$

$\Sigma = 232.3$

19.3/674 = .2864

V_W	18.5	18.5
V_{P_2}	117.3	2.0
	13.3	6.0
	11.3	8.0
	9.3	10.0
	7.3	12.0
	5.3	14.0
	3.3	16.0
	1.3	18.0
V_{P_1}	2.5	.5
V_{P_3}	30.0	7.9
	$R = 119.4^k$	112.9

$\Sigma = 232.3$

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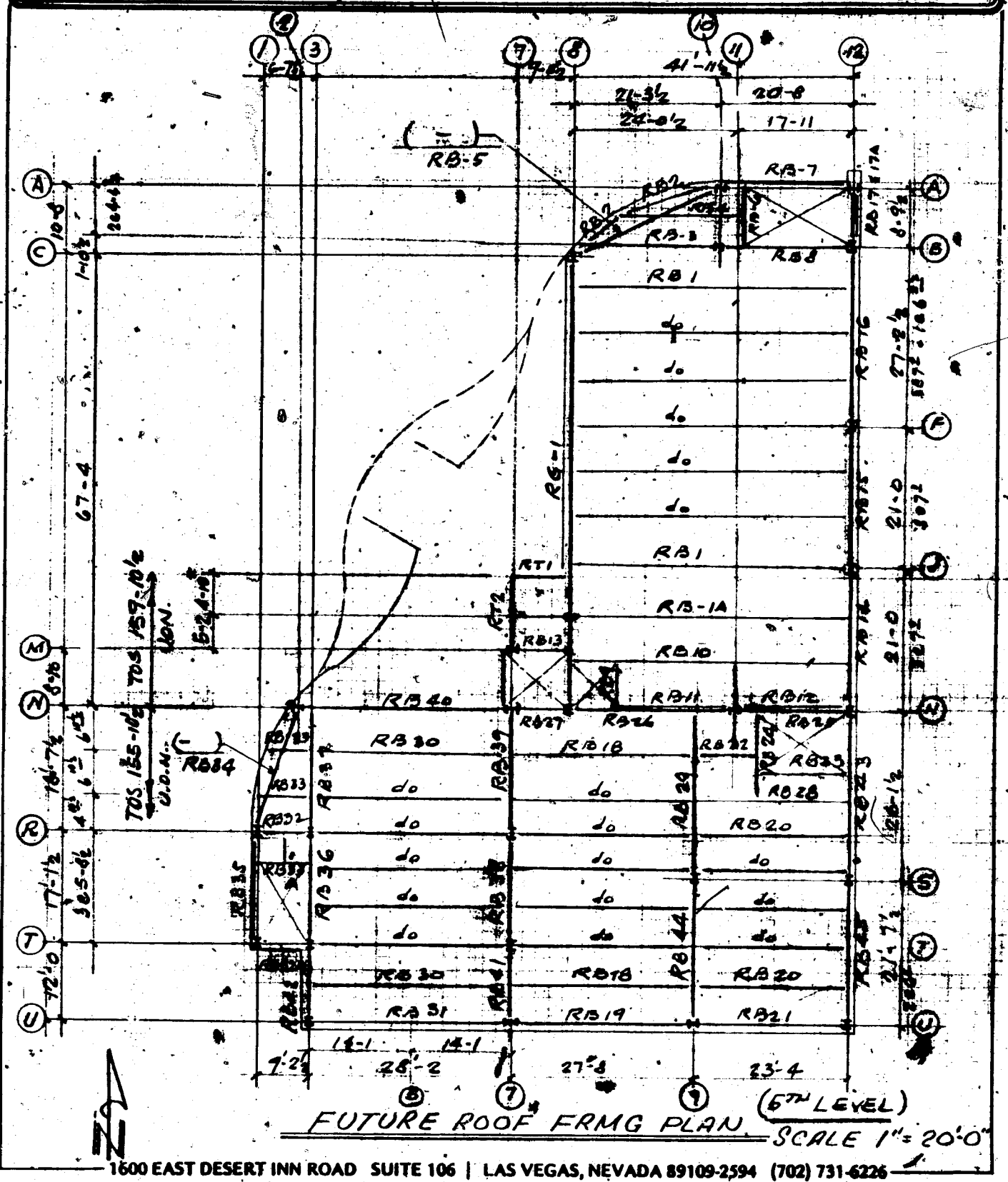
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DATE/ OCT '82

ENGINEER/ dm

FUTURE ROOF - 5TH LEVEL



FUTURE ROOF FRMG PLAN (5TH LEVEL) SCALE 1"=20'-0"

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FUTURE ROOF, 5TH LEVEL ENGINEER/

DL = 16 PSF + BM. LL = 20 PSF (NOT REDUCED) {SEE SH. 1}
EXTERIOR WALLS 25 PSF

BEAM RB-1 @ 7.0' oc

L = 42' W = 7.0 (16+8 + 20) = 168 + 140 = 308 PLF (D, L, TL)

V = .308 (42) = 12.94 K R = 6.47 K

M = 12.94 (42) ÷ 8 = 68.0 IK

TRIM BEAM RB-2

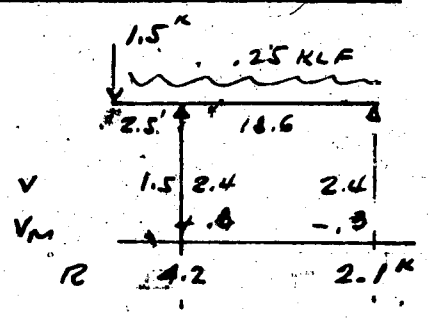
L = 14.0' MIN W = 3.0' (16+8 + 20) + 25 (3+7) (D, L, parapet + wall)

14.0' MIN = 72.0 + 250 + 60 = 352 + 60 = 412 PLF (D, L, TL)

W = .412 (14) = 5.8 K R = 2.9

M = 5.8 (14) ÷ 8 = 10.2 IK

OUTLOOKER BEAM RB-3

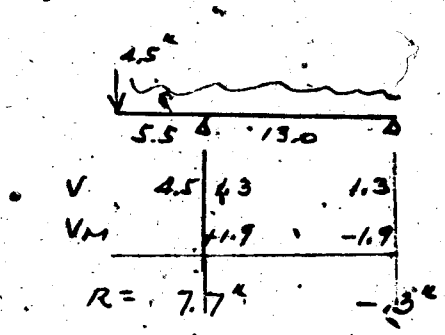


W = 5.5' (24 + 20) = 132 + 110 = 242 PLF

P = 7/14 (2.9) = 1.5 K

M cant = .25 (2.5)² .5 = .78 + 1.5 (2.5) = 3.75 } ≈ 4.6 IK

OUTLOOKER BEAM RB-4



P = 2.9 + .5 (2.9) = 4.5

W = 4.5 (24 + 20) = 108 + 90 = 200 PLF

M cant = 4.5 (5.5) = 24.8 IK

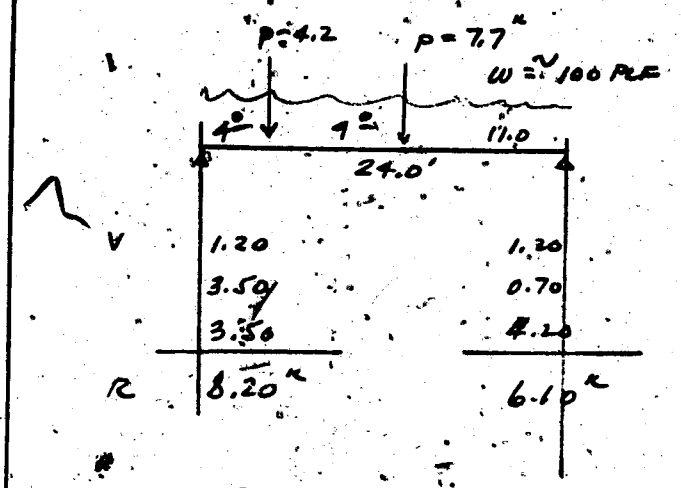
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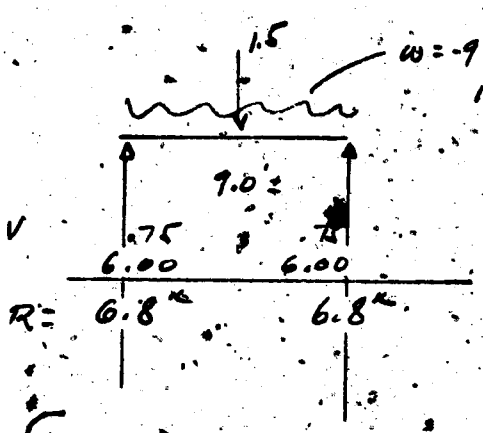
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FUTURE ROOF - 5th Level
ENGINEER/

GIRDER BEAM RB.5

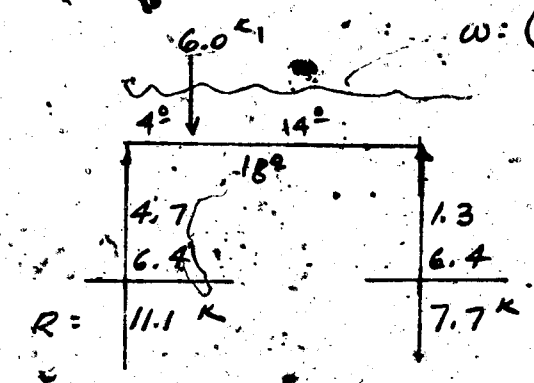


BEAM RB-6 FRONT OF STAIR



DL LL
w = 9'(20+100) = 180 + 900 = ~~1080 PLF~~
10(25) wall = 250
430 + 900 = 1330 PLF

BEAM RB-7 EXTERIOR



w = (3+7)25 + 40 = 290 PLF
Parapet
7x25 = 175
6x20 = 120 120
585 D + 120 L
= 705 PLF

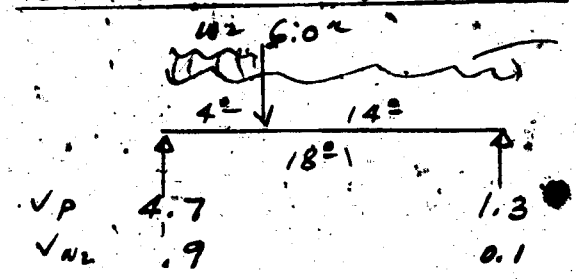
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PROJECT/ FUT. RF 5TH LEVEL

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ENGINEER/ JM

STAIR TRIM BEAM - RB-8 (interior) LINE (B)



V_P	4.7	1.3
V_{W_2}	.9	0.1
V_{W_1}	3.4	5.4
R=	9.0 K	6.8 K

$W_1 = 3.1(24+20) = 75 + 62$ (D + L)
$10 \times 25 \frac{1}{2} = 250$
$6(20+20) = 120 + 120$
$445 + 185 = 630$ PLF

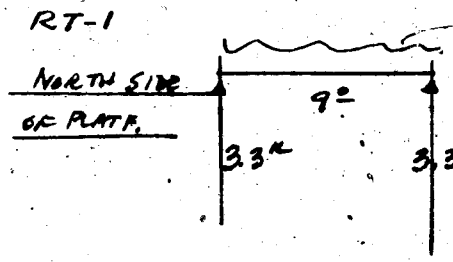
$W_2 = 5.4(24+20) = 130 + 110 = 240$

STAIR TRIM RB-9 near line "N" & "8"

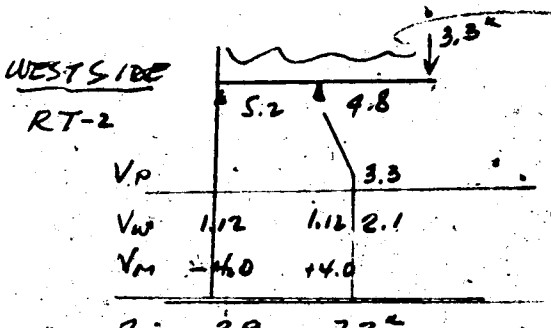
L= 7.0' $W = 2.0(24+20) = 48+40 = 88$ PLF
$W = 616^{\#}$ $R = 508^{\#}$ $M = .54^{HK}$

TRIM AROUND ELEV. LANDING (159-10½)

RT-1



$W = 2.5(24+100) + 17'(25) = 485 + 250 = 735$ PLF (W or LL)
$W = 9(735) = 6.6^K$ $R = 3.3^K$
$M = 6.6(9) \div 8 = 7.5^K$



$W = 17'(25) = 425 = .43$ KLF

$M_{cant} = 3.3^K(4.8') = 15.8$
$.43(4.8)^2 \div 2 = 5.0$
20.8^{HK}

WEST SIDE ELEV. LINE ⑦, M-N.

L= 9.0 $W = 14(25) + 100 = 450$
W = 4.06K R = 2.03K

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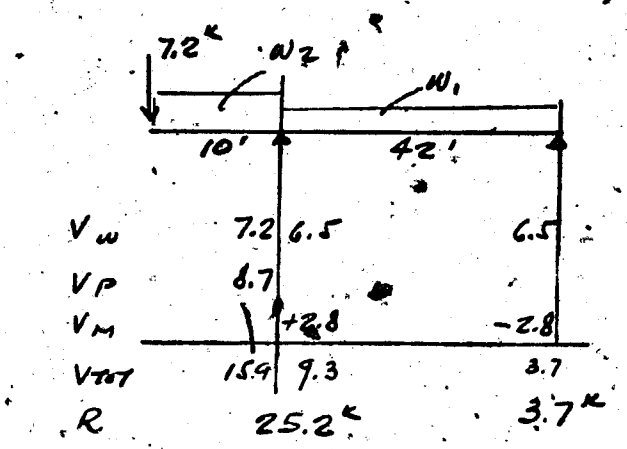
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FUTURE ROOF - 5TH LEVEL ENGINEER/

ROOF BEAM RB-1A. cantilever picks up ELEVATOR PLATFORM

w_1 = 308 PLF LL

$w_2 = 7(24 + 100) = 168 + 700 = 868$ PLF

$M_{cant} = 7.2(10) = 72$
$.87(10)^2 .5 = 43.5$ } $= 115.5^{IK}$



{ RB-10 Same as RB-1 }

RB-11 (LINE N)

parapet wall: LL

$\ell = 18'$ $w = 3.5(24+20) + 5'(25) = 70 + 209 = 280$ PLF

$W = .280(18) = 5.0^K$ $R = 2.5^K$

$M = 5.0 \times 18 \div 8 = 11.3^{IK}$

RB-12 (LINE N)

$\ell = 18'$ SAME AS RB-11 { add ½ PENTHOUSE ROOF: ½ × 10/2 (20+20) = 200; + 6 × 25 = 150 } 350 × 9 = 3.2K W

R = 1.6

Roof add = 2.5 + 1.6 = 4.1K

63 260 HVAC & LL

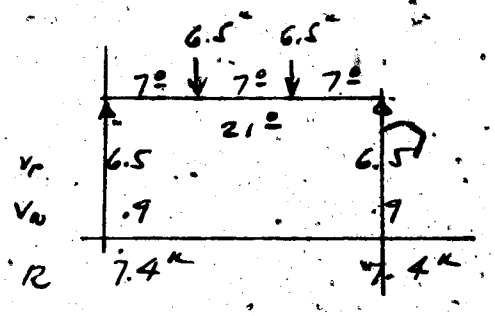
$M = 6.2(18) \div 8 = 18.5^{IK}$

ELEV. TRIM NORTHSIDE RB-13

$\ell = 9'$ $w = 2.6(24+100) + 13(25) = 390 + 260 = 650$ PLF (325)

$W = 9(650) = 5.9$ $R = 3.0^K$ $M = 6.0(9) \div 8 = 6.8^{IK}$

RB-[redacted] & RB-15 (LINE 13)



P = 6.5K

w = 5'(25) + 50 = 175 PLF

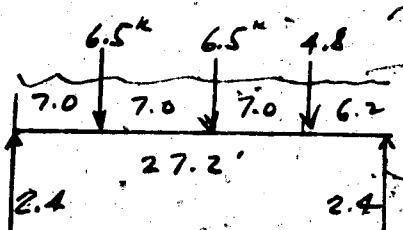
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FUTURE ROOF - 5TH LEVEL ENGINEER/

RB-16 (LINE (12))

$P_1 = 6.5^k$ $P_2 = \frac{6.17}{7.0}(6.5) = 4.8^k$



V_w =	2.4	2.4
P	4.8	2.7
	3.2	3.3
	1.1	3.7
R =	11.5k	11.1k

RB-17 EAST SIDE STAIR @ LINE (A)

$L = 8.8'$ $w = (3+4')25 + 25 = 175 + 25 = 200$ #/'

$W = 8.8(.2) = 1.76$ say 2^k $R = 1^k$

RB-17a Landing UNDER RB-17

$L = 8.8$ $w = 8'(25^D + 100^L) + 200 = 400^D + 800^L = 1.2$ KLF

$W = 8.8(1.2) = 10.6$ $R = 5.3$

$M = 10.6(8.8) \div 8 = 11.7^{IK}$

RB-18 6.9' max oc

$w = 6.9(24 + 20) = 166 + 138 = 304$ PLF

$L = 27.7'$ $W = 27.7(304) = 8.42^k$ $R = 4.21^k$

$M = 8.42(27.7) \div 8 = 29.2^{IK}$

RB-19 LINE (U) (7-9)

$L = 27.7'$ $w = 3(24 + 20) + (3+7)25 = 60^{LL} + 322^{DL} = 382$ PLF

$W = 27.7(.382) = 10.6^k$ $R = 5.3^k$

$M = 10.6(27.7) \div 8 = 36.7^{IK}$

RB-21 LINE (U) (9-12)

$L = 23.3'$ $w = 382$ $W = 9.0^k$ $R = 4.5^k$

$M = 9.0(23.3) \div 8 = 26.2^{IK}$

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FUTURE ROOF - 5TH LEVEL ENGINEER/

BEAM RB-20 $L = 23.3'$ $W = 6.9'(24+20) = 304$

$W = 23.3(304) = 7.2^k$ $R = 3.6^k$

$M = 7.2(23.3) \div 8 = 21.0^{ik}$

RB-23 STAIR TRIM

$L = 16'$ $W = 3(24+20) + 6(40) = 325 + 60 = 385$ (k, ℓ)

$W = .365(16) = 6.2^k$ $R = 3.1^k$
$.240(16) = 3.8$ $R = 1.9$
10.0 5.0^k

$M = 10(16) \div 8 = 20^{ik}$

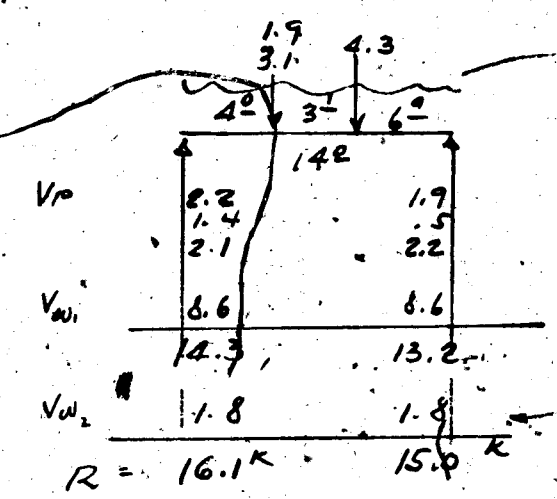
$120 + 120 = 240$
625

RB-22 $L = 10'$ $w = 6.9(24+100) = 169 + 690 = 860\ \#/'$

$W = 860 \times 10 = 8.6^k$ $R = 4.3^k$

$M = 8.6(10) \div 8 = 10.8^{ik}$

RB-24 face of Stairwell ℄ Line (N)

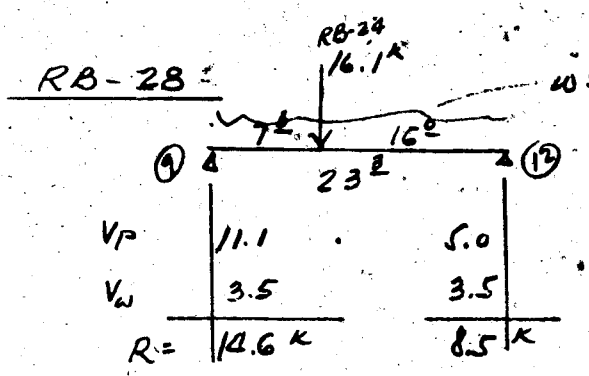


$w_1 = 9(25+100) = 225 + 900 = 1225$ PLF

add Penthouse wall

$w_2 = 250$

RB-28



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ENGINEER/ JM

RB-25 LINE "N" (11-12)

RB-24
15.0
2'
16'
18'

13.3 | 1.7
4.4 | 4.4
17.7 K | 6.1 K

R

W = 10(25) = 250
6(40) = 120 + 120
370 + 120 = 490 PLF
D L

RB-29 Line ⑨ - (3-N)

RB-21, 3.6
RB-14 2.2
7.8

W = 70 + 40 = 110

7.8 | 7.8 | 7.8 | 7.8
1.7 | 5.7 | 4.9 | 6.9 | 6.9
26.1

V_W

1.5 | 1.5
2.1 | 5.7
4.1 | 3.7
5.6 | 2.2
7.3 | .5
20.6 K | 13.6 K
SOUTH | NORTH

RB-26 Line N (8-11)

2.8
13.6 K
W = 3.5 (2L + 100) = 84 + 350 = 435 PLF
6.0 | 12.5 | 5.5
24.0

V_W

5.22 | 5.22
3.12 | 10.48
2.10 | 0.70
10.44 K | 16.40 K

310
240
2.8

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STRAUSS & LOFTFIELD
STRUCTURAL ENGINEERS

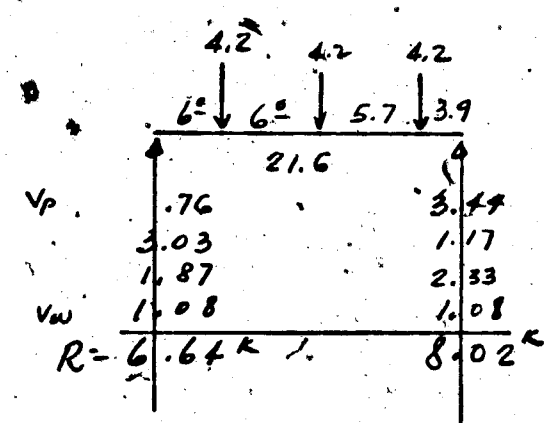
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SHEET/ 212 OF 317
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DATE/ 10-82
ENGINEER/

RB-27 FRONT OF ELEVATOR (155-10½)

L = 9.0' W = 3.5(24+100) + 10(25) + 4.5(40)
= 440 + 424 = 864 PLF
(LL) (DL)

W = .864(9.0) = 7.8K R = 3.9K
M = 7.8(9) ÷ 8 = 8.8 IK

RB-44 LINE 9 S-J



RB-31 LINE U, 3-7 EXTERIOR

L = 28.2' W = 4(24+20) + 10'(25) = 346 + 80 = 426 PLF
(D) (L)

W = 426(28.2) = 12.0K R = 6.0K

M = 12(28.2) ÷ 8 = 42.30 IK

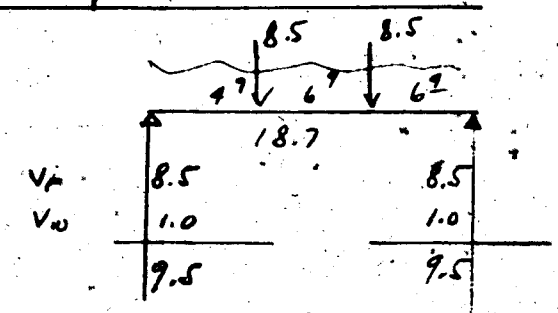
RB-30 (3-7)

L = 28.2 W = 6.9(24+20) = 166 + 138 = 304 PLF.

W = 304(28.2) = 8.6K R = 4.3K

M = 8.6(28.2) ÷ 8 = 30.3 IK

RB-39 LINE 7 R-N



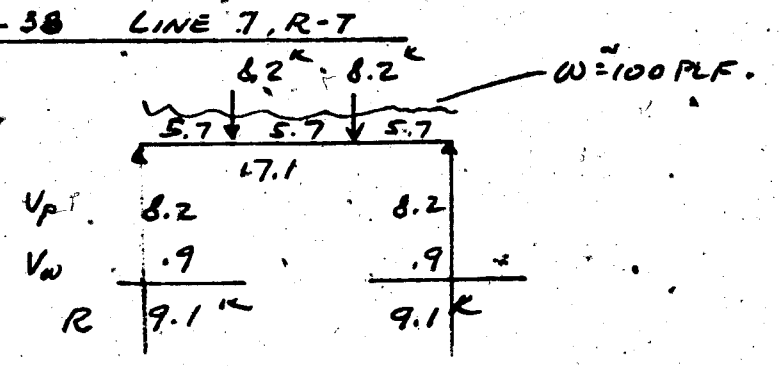
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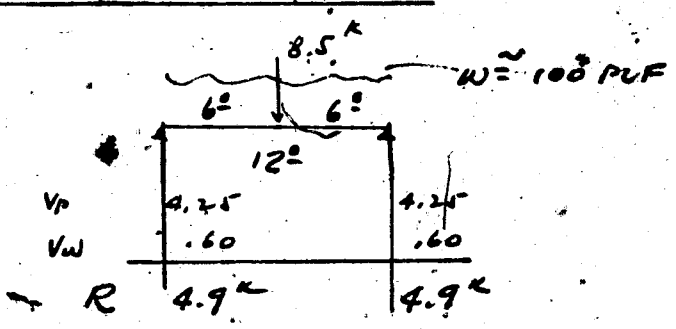
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ENGINEER/

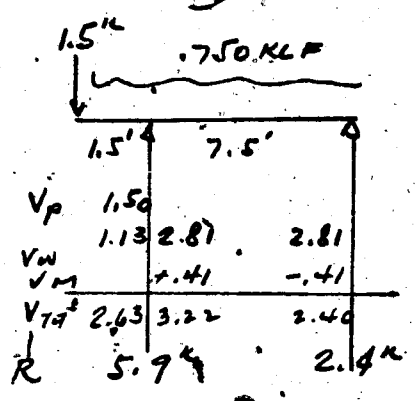
RB-38 LINE 7, R-T



RB-41 LINE 7, T-U



RB-33 near Ⓡ 1-3



p = 6'(25 x 10') = 1.5K per exterior wall

w = 6(24+100) = 144+600 = 744 PLF

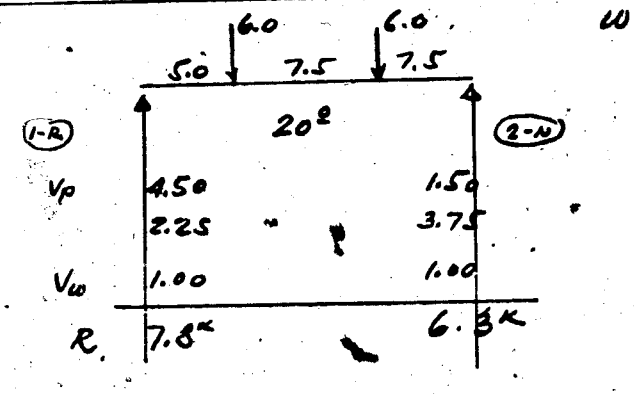
$M_{cant} = 1.5(1.5) + .75(1.5)^2 .5 = 2.25 + .84 = 3.10^{IK'}$

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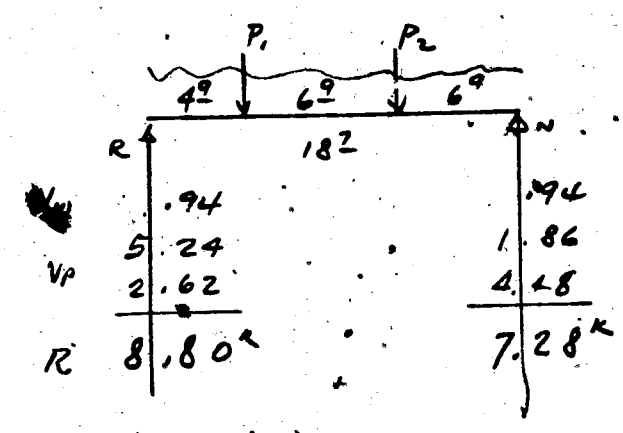
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FUTURE ROOF - 5TH LEVEL
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UNDER BEAM RB-34



$W \cong 100$ PLF

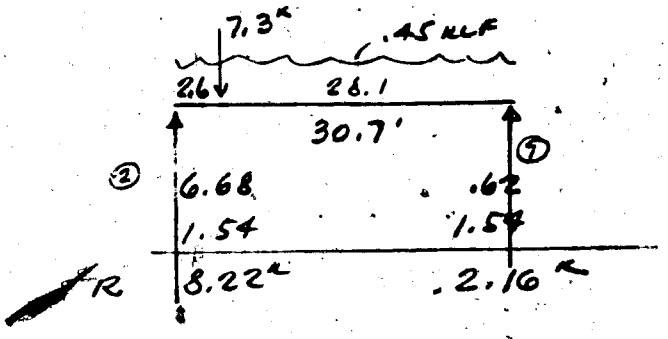
RB-37 Line (3) R-N



$P_1 = P_2 = 2.8 + 4.3 = 7.1^K$

$W \cong 100$ PLF

RB-40 LINE N, 2-7



$w = .4(30 + 20) + (3+7).25$ (w = wall, ext. wall)

$= 370 + 80 = .45$ KLF

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FUTURE ROOF - 5TH LEVEL ENGINEER

STAIRWELL R-7, 1-3 Allow 10' Walls + Same Roof

RB-32 (R), 1-3 (RECHECK RB-7, 8, 6 & 17)

L = 9.2' W = 5'(24+100) = 120+500 = 620 PLF + 250 (wall) = 870

w = 870(9.2) = 8.0 K R = 4.0 K

M = 8.0(9.2) ÷ 8 = 9.0 IK

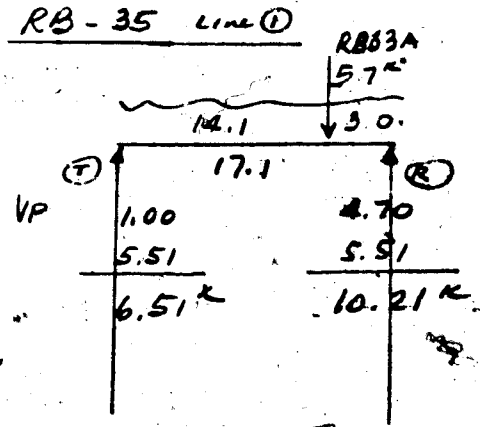
RB-33A

L = 9.2 w = (2.5 + 7.5)(24 + 80) (plate, stair) = 240 + 1000 = 1.24 KLF

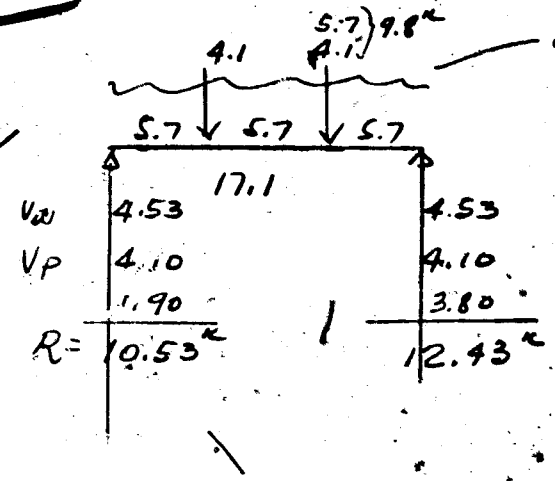
W = 1.24(9.2) = 11.4 K R = 5.7 K

M = 11.4(9.2) ÷ 8 = 13.2 IK

RB-35 LINE ①



RB-36 LINE ③ T-R



Wall: w = (10+7) 25 D + 4.6'(20+20) L + 40 D (Penthouse Roof)

w = 555 D + 90 L = 645 PLF

w = 100 + 10(25) + 90 L + 90 = 440 + 90 = 530 PLF

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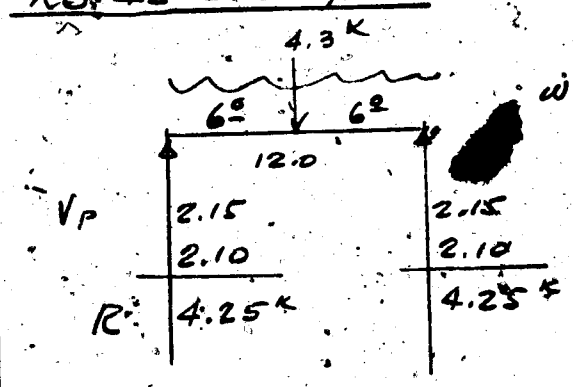
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FUTURE ROOF - 5TH LEVEL
ENGINEER

RB-32A LINE T 1-3

L=9.2' ; W = 10+7(25) = 425 PLF W = .425(9.2) = 3.91 K R = 2.0 K

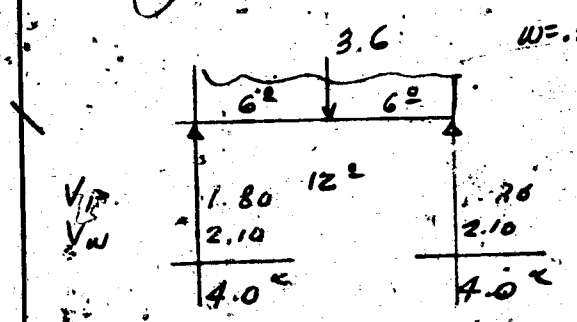
M = 3.91(9.2) ÷ 8 = 4.5 K

RB-42 LINE 3, T-U



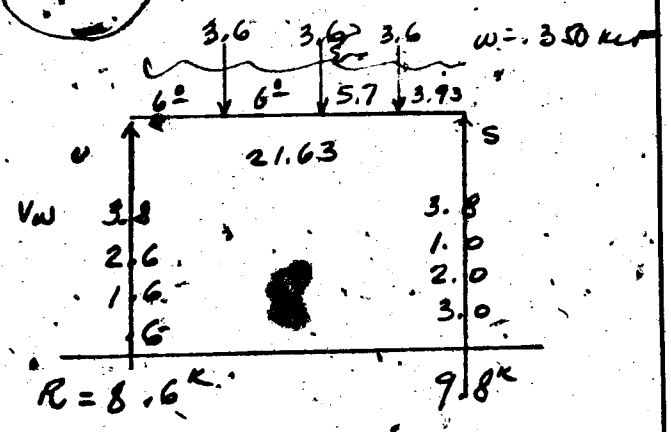
w = 100 + 10'(25') = .350 KLF

RB-45 : Line 12, T-U

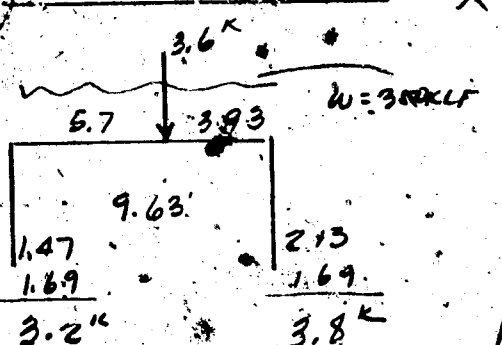


RB-45

RB-45C - Line 12, S-U (No col T12)



RB-4C Line 12; T-S

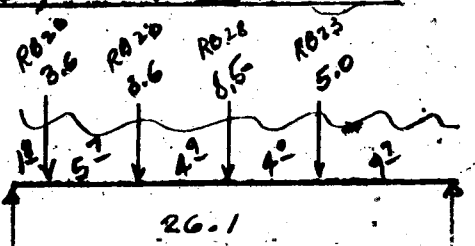


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FUTURE ROOF - 5TH LEVEL ENGINEER Jm

RB-43, LINE (12) S-N



WIND 1.

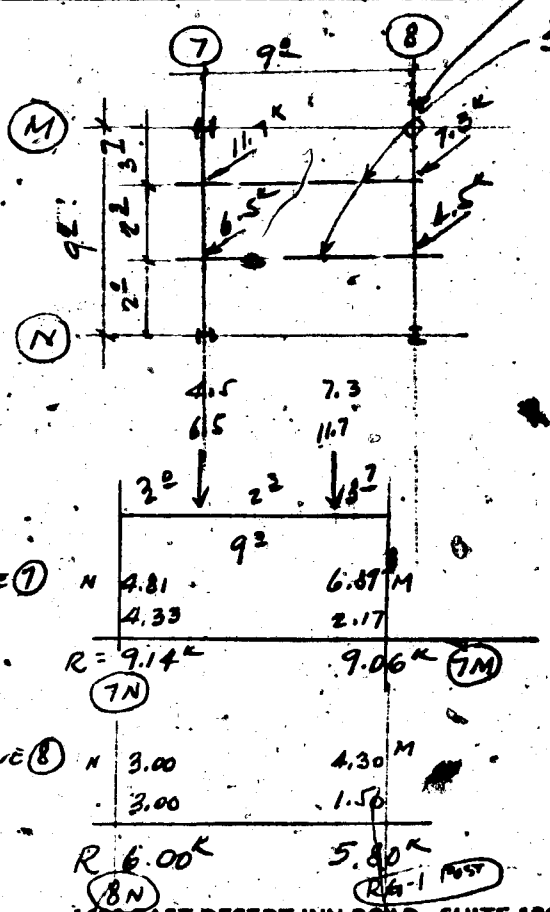
W = 100 + 10(25) = 350 PLF

V_P	3.35	.25
	2.47	1.03
	4.46	4.04
	1.86	3.14
V_W	4.57	4.57
R =	16.7 K	13.0 K

ELEVATOR PENTHOUSE

Post Down to RG-1

SHEAR BMS:



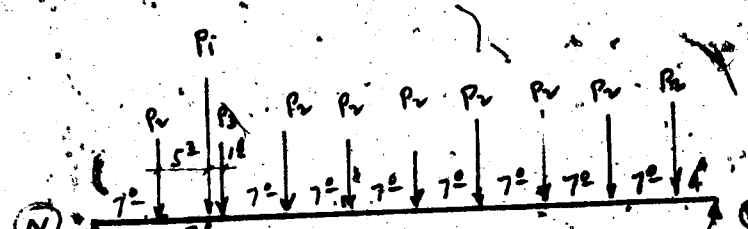
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FUTURE ROOF - 5TH LEVEL

ROOF GIRDER RG-1 LINE (8), C - N



P_2 = RB-10 / RB-1 = 6.5^K

P_3 = RB-1A = 25.2^K

P_1 = Elev Post : 5.8 / RB 13 : 3.0 } = 8.8^K

$W = 10^{\text{wall}}(25) + 200^{\text{RB}} = 450$ PLF

$W = 450(67.4) = 30.33$

$\div 2 = 15.2$

V_W	15.2	15.2	15.2	30.4	
V_{P_2}	0.4		6.1		
	1.1		5.4		
	1.8		4.7		
	2.5		4.0		
	3.1		3.4		
	3.8		2.7		
	4.5		2.0		
	5.8	23.0	0.7	29.0	$\Sigma = 52.0 \div 6.5 = 8$ ✓
V_{P_1}	7.0		1.8	$\Sigma = 8.8$	
V_{P_3}	20.0	27.0	5.2	$\Sigma = 25.2$	
			51.2^K	$\Sigma = 116.4 = 116.4$	

R = 65.20^K

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℄ GIRDER CONN.

BEAM [redacted]31 N. 2ND LEVEL

R = 195ᴷ MAX
7/8" Ø A325 N SS → 12.6ᴷ EA } 195ᴷ/12.6 = 15.5 → 16 BOLTS

8 - 7/8" Ø A325 N EA SIDE → (7 SPA @ 3" + 2 x 1¼") = 23½"

AISC TABLE III WELD A w/ ANGLE LENGTH = 23½"

5/16" WELD & t_w = 0.64" MIN → 222ᴷ ALW

∴ (222ᴷ)(0.625/0.64) = 216ᴷ ALW for 5/8" WEB

L 4 x 3½ x 3/8

AISC TABLE II-A BOLT SHEAR w/ 3/8" L THK = 202ᴷ

AISC TABLE II-C L SHEAR w/ do = 209ᴷ

USE | DBL L 4x3½x3/8 x 1'-11½"
8-7/8" Ø A325 EA SIDE
@ 3" o.c.
5/16" WELD A
CAPACITY = 202ᴷ

BEAM B-49 2ND LEVEL & B-46 3RD LEVEL SOUTH ½

R = 130ᴷ MAX
7/8" Ø A325 N S/S 12.6ᴷ EA } 130ᴷ/12.6 = 10.3 → 12 BOLTS

6 - 7/8" Ø A325 N EA SIDE (5 SPA @ 3½" + 2 x 1½") = 20½"

AISC TABLE III WELD A w/ ANGLE LENGTH = 20½"

¼" WELD & t_w = 0.51" MIN → 158ᴷ ALW

∴ (158ᴷ)(0.50/0.51) = 155ᴷ ALW for ½" WEB

L 4 x 3½ x 5/16

BOLT SHEAR 12(12.6) = 151ᴷ

ANGLE SHEAR (20.5 - 6 x 15/16)(5/16)(17.4KSI)(2) = 162ᴷ

USE | DBL L 4x3½x5/16 x 1'-8½"
6-7/8" Ø A325 EA SIDE
@ 3½" o.c.
¼" WELD A
CAPACITY = 151ᴷ

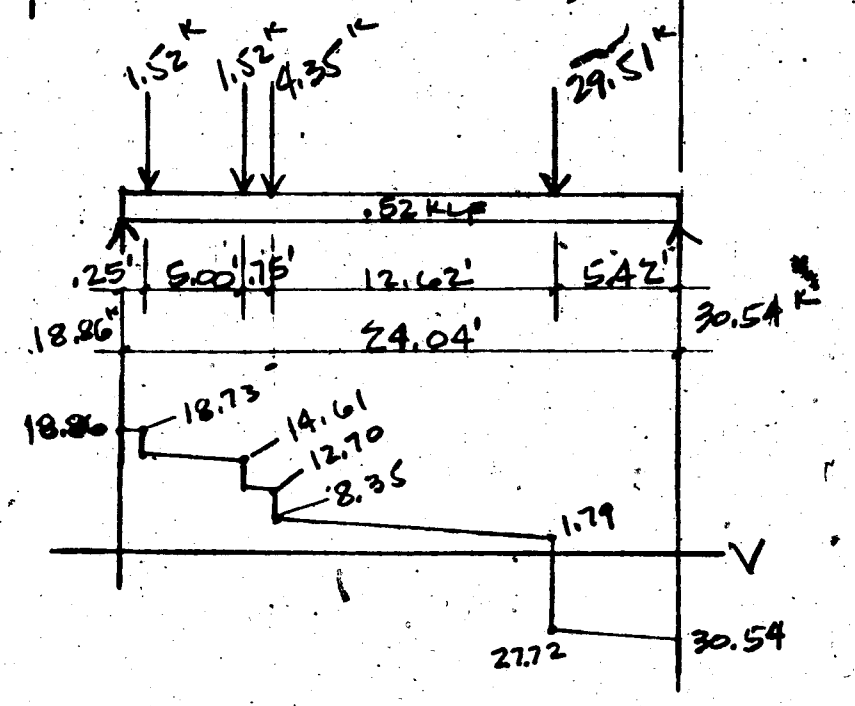
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OPG. THRU WEBS OF BMS. B26 (W24x55) 2ND & 3RD LEVELS

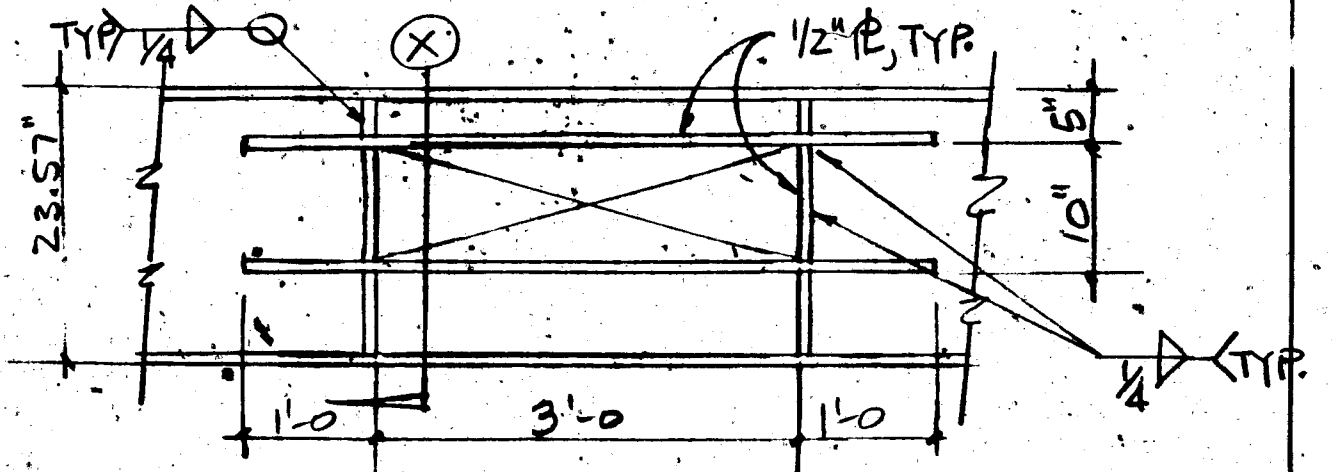
OPG. TO BE 36" x 10", NEAR THE TOP FLANGE



PLACE OPG. @ CTR. OF BM:

$M = 12.02' \times 30.54^K - 6.00' \times 29.51^K - \frac{.52(12.02)^2}{2} = 134.8^{IK}$

$V = 30.54 - 29.51 - .52 \times 12.02 = 5.22^K$



1600 EAST DESERT INN ROAD SUITE 106 | LAS VEGAS, NEVADA 89109-2594 (702) 731-6226

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ASSUME ENTIRE BEAM MOMENT IS TAKEN BY FLANGES ONLY:

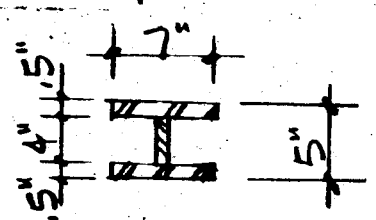
$$f_b = \frac{Mc}{I} = \frac{134.8^{IK} \times 12 \times 23.57"}{2 \times 2 \times 7.005 \times .505 \left(\frac{23.57 - .505}{2}\right)^2}$$

$$= 20.26 \text{ KSI}$$

~~SHEAR~~ SHEAR TAKEN BY UPPER PORTION OF WEB:

$$V = \frac{6"}{13.57"} \times 5.22^K = 1.92^K$$

$$M = 1.92^K \times \frac{36"}{2} = 34.6"K$$

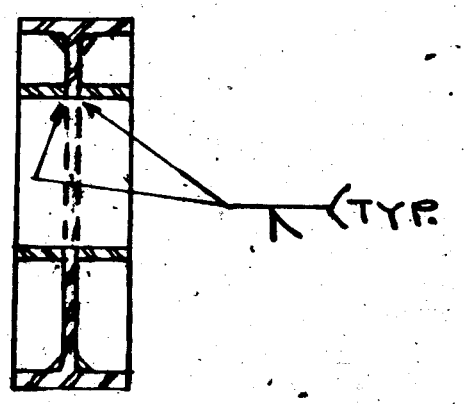


$$\text{APPROX. } I = 2 \times .5 \times 7 \times \left(\frac{4.5}{2}\right)^2 = 35.4 \text{ in}^4$$

$$f_b = \frac{Mc}{I} = \frac{34.6 \times 2.5}{35.4} = 2.44 \text{ KSI}$$

$$\text{MAX. } f_b = 20.26 + 2.44 = 22.7 \text{ KSI}$$

SEE pg. 4.1-23, "DESIGN OF WELDED STRUCTURES" BLODGETT



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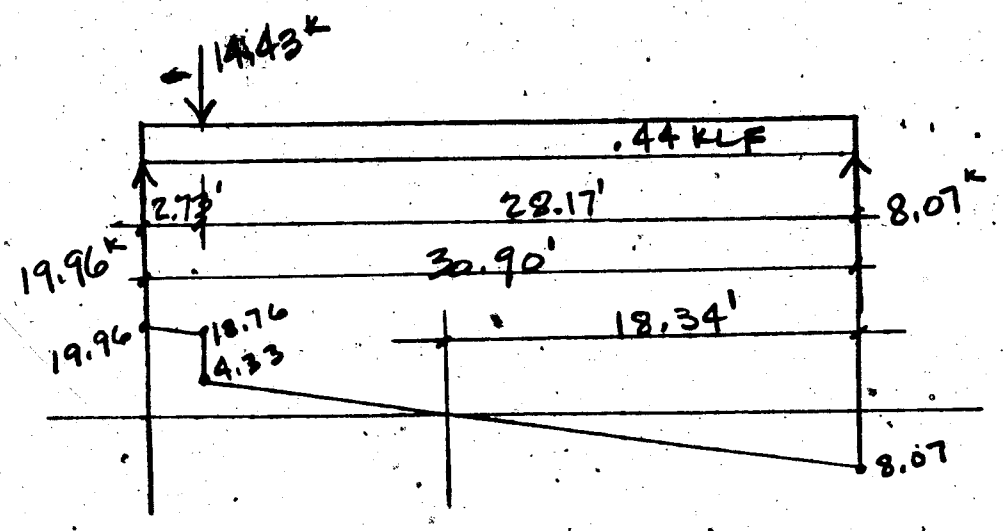
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SHEET/ 222 OF 317
PROJECT # 82017
DATE/ 10/27/82
ENGINEER/ JRL

· OPG. THRU WEB OF BM. B40 (W18x35)
3RD FLOOR

OPG. TO BE 28"x8", NEAR THE TOP FLANGE

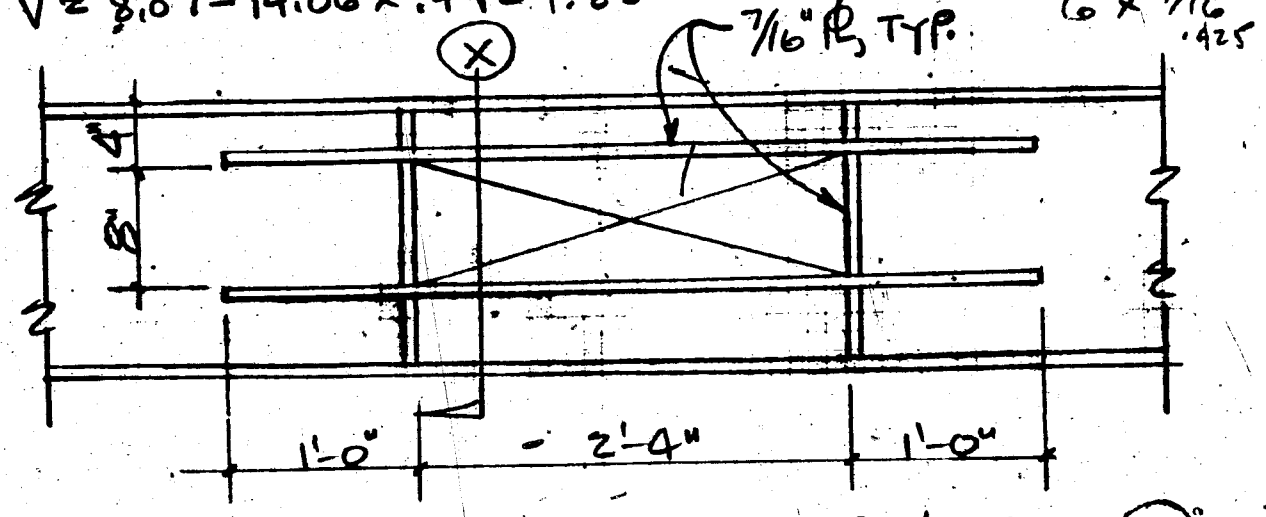


PLACE OPG. @ CTR. OF BM:

$M = 14.06' \times 8.07^K - \frac{.44(14.06)^2}{2} = 79.01^K$

$V = 8.07 - 14.06 \times .44 = 1.88K$

d = 17.70
6" x 7/16
.425



SEE BM B26 FOR WELDING & SEC. (X)

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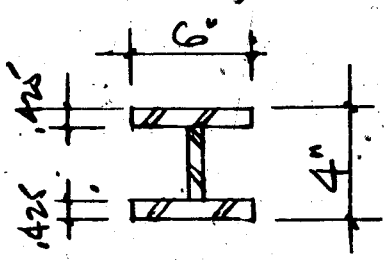
ASSUME ENTIRE BEAM MOMENT IS TAKEN BY THE FLANGES ONLY:

$$f_b = \frac{MC}{I} = \frac{70 \times 12 \times 17.70}{2 \times 2 \times 6 \times .425 \times \left(\frac{17.70 - .425}{2}\right)^2} = 19.54 \text{ KSI}$$

SHEAR TAKEN BY UPPER PORTION OF WEB:

$$V = \frac{4''}{9.70''} \times 1.88^K = 0.78^K$$

$$M = 0.78^K \times \frac{28''}{2} = 10.92 \text{ "K}$$



APPROX. $I = 2 \times .425 \times 6 \times \left(\frac{3.58}{2}\right)^2$

$= 16.3 \text{ in}^4$

$$f_b = \frac{MC}{I} = \frac{10.92 \times 2.0}{16.3} = 1.34 \text{ KSI}$$

MAX. $f_b = 19.54 + 1.34 = 20.88 \text{ KSI}$

SEE pg. 4.1-23, "DESIGN OF WELDED STRUCTURES" BLODGETT

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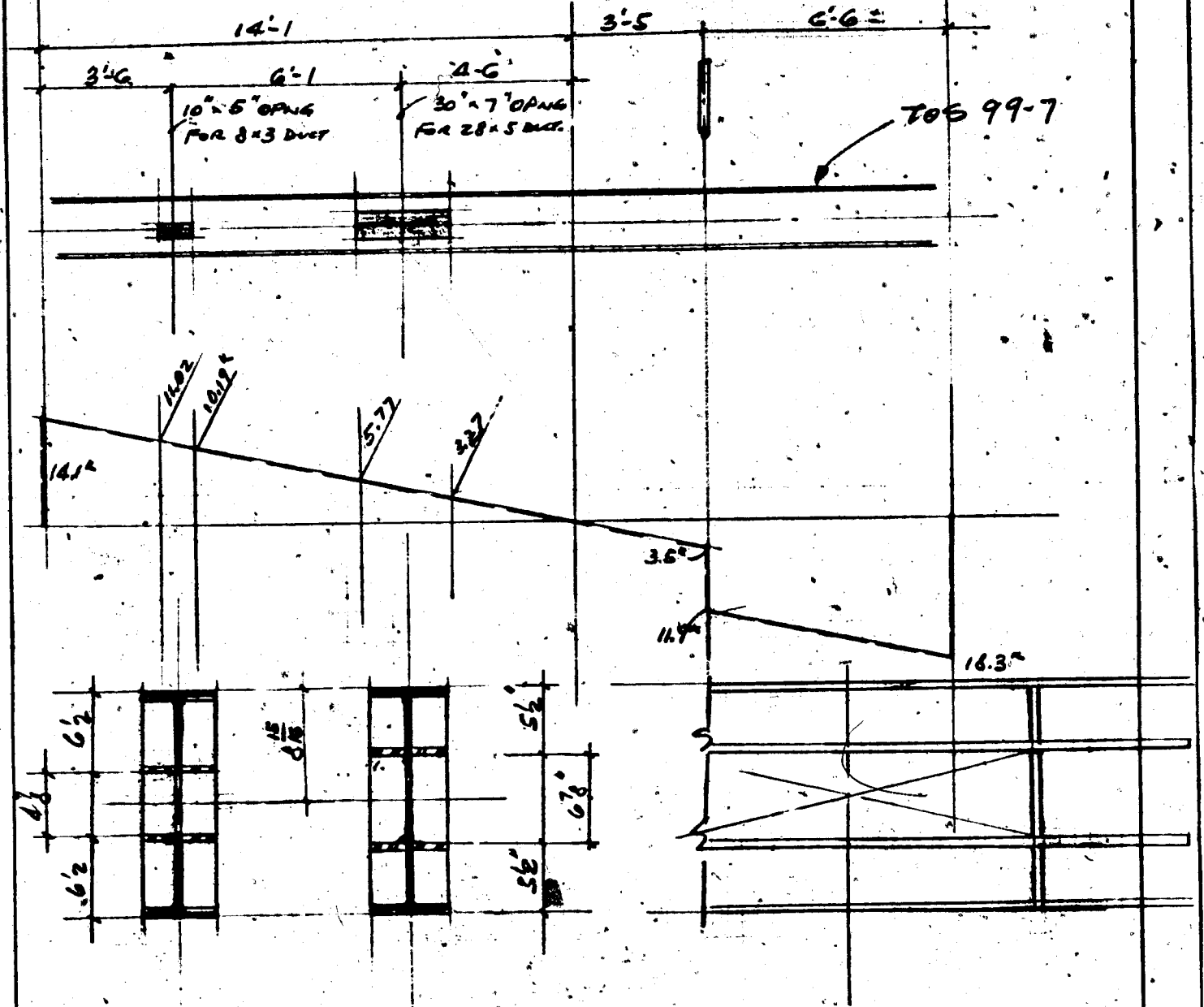
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PROJECT # 82017

$W = 1.0\,RLF$ $P_{min\,cov.} = 8.4^{\#}_{SF}$ $R_6 = 14.1^{\#}$ $R_{11} = 16.3^{\#}$

W18 × 40 $b_f = 6"$ $d = 17\frac{7}{8}$ $A = 11.8^{in^2}$
$t_f = 1/2"$ $t_w = 5/16$



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DATE/ 10/24/82
ENGINEER/ JRL

COLUMNS - NORTH HALF OF BLDG.

A-12	A-14	A-16	A-18
159'-10 — 8.7*	131'-0 ROOF — 8.8K	131'-0 ROOF — 14.3K	ROOF
145'-7 — 12.2*	118'-7 — 79.6K	W12x26 L=12.4'	
131'-7 ROOF — 12.2*	113'-7 — 52.0K		86.6K
126'-0 ROOF — 2.6K	W10x49 SEISMIC = ±102.0 KL = 13.0' (102.0+14.4)x 1.25/1.33 = 227.8K		W8x31 KL = 19.6'
117'-7 2ND — 12.2*			
113'-7 2ND — 11.1K			
W8x24 SEISMIC = ±16.6' KL = 14.6' (16.6+59.0)x 1.25/1.33 = 71.1K			
100'-0 — 59.9K	99'-0 — 140.4K		99'-0 — 86.6K
PILASTER = 9.6K			
SPECIAL FTG.	SPECIAL FTG.	FOOTING:	~~FOOTING~~ F11
ROOF LOADS 5.5' x 12' (20+20) = 2.6K (NORTH SIDE ONLY)	ROOF LOADS 5.5' x 40' (20+20) = 8.8K	ROOF LOADS 5.5' x 8' (20+20) = 1.8K B36 = 7.7 B37 = 4.8 4.3K	ROOF LOADS
2ND FLOOR LOADS B37 = 6.4 B81 = 4.7 11.1K (NORTH SIDE ONLY)	2ND FLOOR LOADS B82 = 40.5 B63 = 39.1 79.6 B37 = 6.4 B64 = 45.6 52.0	2ND FLOOR LOADS	2ND FLOOR LOADS B82 = 45.3 B83 = 41.3 86.6

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* LOADS FROM SOUTH HALF OF BLDG.

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COLUMNS - NORTH HALF OF BLDG.

A-20	A-22	A-24	A-26
131'-0 ROOF 10.8K W10X33 L=12.4' 118'-7	131'-0 ROOF 11.3K W10X33 L=12.4'	ROOF	131'-0 ROOF 11.3K W10X33 L=12.4'
113'-7 FOOTING:	FOOTING:	80.0K W8X31 KL=19.7' 99'-0 80.0K FOOTING: F11	FOOTING.
ROOF LOADS B37 = 4.8 B42 = 6.0 10.8 K	ROOF LOADS B37 = 4.8 B43 = 6.5 11.3 K	ROOF LOADS	ROOF LOADS B37 = 4.8 B43 = 6.5 11.3 K
2ND FLOOR LOADS	2ND FLOOR LOADS	2ND FLOOR LOADS B83 = 40.0 B83 = 40.0 80.0	2ND FLOOR LOADS

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COLUMNS - NORTH HALF OF BLDG.

A-28	A-30	A-31	A-33
131'-0 ROOF 10.8K W10X33 L=12.4' 118'-7 113'-7 FOOTING:	ROOF 67.1K W8X31 KL=19.6' 99'-0 67.1K FOOTING: F9	131'-0 ROOF 12.8K W10X33 FOOTING:	131'-0 ROOF 14.7K 27.0K W8X24 KL=19.6' 99'-0 31.7K FOOTING: F6
ROOF LOADS B37 = 4.8 B42 = 6.0 10.8K	ROOF LOADS	ROOF LOADS 6.5'x13'(20+20) = 3.4 B37 = 4.8 B54 = 4.6 12.8	ROOF LOADS: 13'x9'(20+20) = 4.7K
2ND FLOOR LOADS	2ND FLOOR LOADS B83 = 41.3 B84 = 25.8 67.1	2ND FLOOR LOADS	2ND FLOOR LOADS B84 = 22.8 B30 = 4.2 27.0

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COLUMNS - NORTH HALF OF BLDG.

B-12

159'-10
145'-7
131'-7
126'-0
117'-7
113'-7
103'-7
100'-0

19.3*
41.8*
41.8* ROOF
31.2
2ND
41.8*
2ND
37.8
W10 x 60
SEISMIC = 102.0
KL = 102.0
(213.7 + 102.0) x 1.25/1.33 = 290.7K
8.9*
213.7K
PILASTER = 9.6K

SPECIAL FTG.

ROOF LOADS
5.5' x 12' (20+20) = 2.6K
B15 = 11.5
B62 = 17.1
31.2K

2ND FLOOR LOADS
B39 = 10.6
B81 = 4.7
B80 = 22.5
37.8K

B-14

131-2 ROOF
126-0
118'-7
40.8K
W10 x 33
L = 12.6'

FOOTING:

ROOF LOADS
4.6' x 20' (20+20) = 3.6K
B15 = 11.5
B29 = 3.1
B35 = 3.2
B55 = 19.4
40.8K

2ND FLOOR LOADS

D-33

131-6 ROOF
10.1K
L = 12.9'
19.3K
W14 x 120
KL = 19.6'
99'-2
29.4K

FOOTING: F5

ROOF LOADS
B45 = 10.1K

2ND FLOOR LOADS
B24 = 15.1
B30 = 4.2
19.3K

F-12

159'-10
146'-7
131'-7
126'-0
117'-7
113'-7
103'-7
100'-0

25.4*
C61*
68.1* ROOF
27.3
2ND
68.0*
2ND
44.8
W10 x 77
SEISMIC = +93.4
KL = 10.0'
(324.0 + 93.4) x 1.25/1.33 = 392.3K
22.3*
324.0K
PILASTER = 9.6K

SPECIAL FTG.

ROOF LOADS
B62 = 16.6
B16 = 10.7
27.3

2ND FLOOR LOADS
B40 = 14.1
B79 = 9.3
B80 = 21.4
44.8K

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* LOADS FROM SOUTH HALF OF BLDG.

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COLUMNS - NORTH HALF OF BLDG.

G-13	G-15	G-17	G-19
ROOF	131-10 ROOF	ROOF	131-10 ROOF
	67.8K		25.8K
	W10X33 L=13.2'		L=13.2'
118'-7	76.8K		
113'-7	144.6K	135.0K	205.0K
124.1K		W10X45 KL=19.6'	W12X40 KL=19.6'
W8X31 KL=14.6'			
99'-0 124.1K		99'-0 135.0K	99'-0 230.8K
FOOTING: F14	FOOTING:	FOOTING: F15	FOOTING: F21
ROOF LOADS	ROOF LOADS B41 = 10.9 B73 = 26.0 B64 = 26.1 B66 = 4.8 67.8	ROOF LOADS	ROOF LOADS B41 = 13.3 B44 = 9.9 B51 = 2.6 25.8
2ND FLOOR LOADS B71 = 92.6 B77 = 31.5 124.1K	2ND FLOOR LOADS B68 = 20.9 B66 = 25.4 B72 = 26.2 B65 = 4.3 76.8K	2ND FLOOR LOADS B71 = 126.6 B69 = 8.4 135.0	2ND FLOOR LOADS B31 = 195.4 B69 = 9.6 205.0

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COLUMNS - NORTH HALF OF BLDG.

G-23.	G-25	G-32	H-34
131-10 ROOF 16.7K W10X33 L=13.2' 118'-7 113'-7 FOOTING:	131-10, ROOF 28.7K W10X33 L=13.2' FOOTING:	131-10 ROOF 20.9K L=13.2' 175.6K W10x49 K=1.2 L=19.6' 99'-0 196.6K FOOTING: SPEC. F19	131-8 ROOF 8.0K L=13.1' 13.2K W12 x 170 SEISMIC = ±40.4 KL = 19.6' (40.4+21.2)x 1.2/1.33 = 57.9K 99'-0 21.2K SPECIAL FTG.
ROOF LOADS B44 = 12.2 B12 = 3.9 B32 = 0.6 16.7K	ROOF LOADS B53 = 24.2 B12 = 3.7 B32 = 0.6 28.7	ROOF LOADS B59 = 18.8 B5 = 1.3 B14 = 0.8 20.9	ROOF LOADS B46 = 8.0K
2ND FLOOR LOADS	2ND FLOOR LOADS	2ND FLOOR LOADS B31 = 170.6 B70 = 3.4 B21 = 1.6	2ND FLOOR LOAD B19 = 7.9 B29 = 5.3 13.2

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COLUMNS - NORTH HALF OF BLDG.

J-12

159'-10
21.3*
146'-7
57.9*
131'-7 ROOF
57.9*
14.3
117'-7 2ND
57.7*
113'-7 2ND
28.0
W10X68
SEISMIC = ±132.5
KL = 10.0'
(132.5+237.1) x 1.25/1.33 = 347.4K
103'-7
22.3*
100'-0
237.1K

PILASTER = 9.6K

SPECIAL FTG.

ROOF LOADS
B18 = 10.3
B74 = 4.0
14.3K

2ND FLOOR LOADS
B78 = 10.0
B79 = 9.3
B41 = 8.7
28.0

L-19

121'-5 ROOF
13.7K
W10X33
L = 12.8'
118'-7

FOOTING:

ROOF LOADS
B10 = 2.4
B49 = 5.3
B51 = 6.0
13.7K

2ND FLOOR LOADS

L-23

131-5 ROOF
12.4K
W10X33
L = 12.8'

FOOTING:

ROOF LOADS
8.8'x9' (20+20) = 3.2K
B12 = 3.9
B49 = 5.3
12.4

2ND FLOOR LOADS

L-25

131-5 ROOF
1.7K
W10X33
L = 12.8'

FOOTING:

ROOF LOADS
8.4'x9' (20+20) = 3.0K
B12 = 3.9
B48 = 4.8
11.7

2ND FLOOR LOADS

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* LOADS FROM SOUTH HALF OF BLDG.

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COLUMNS.- NORTH HALF OF BLDG.

SEE SHT. 235 FOR M15

L-29	L-34	M-13	M-34
131-5 ROOF 14.3K W10x33 L=12.8' 118'-7 113'-7	131-5 ROOF 9.8K	ROOF	ROOF
FOOTING:	FOOTING:	68.7K W8x24 KL=14.6' 99'-0 68.7K FOOTING: F10	14.5K W8x24 SEISMIC = ±40.4 KL = 14.6' (40.4+14.5)x 1.25/1.33 = 54K 99'-0 14.5K SPECIAL FTG- F08
ROOF LOADS 17'x 8.7' (20+20) = 5.9K B47 = 3.6 B48 = 4.8 14.3K	ROOF LOADS 16'x17' (20+16) = 9.8K	ROOF LOADS	ROOF LOADS
2ND FLOOR LOADS	2ND FLOOR LOADS	2ND FLOOR LOADS B43 = 6.7 B61 = 6.2 B77 = 28.4 B76 = 27.4 68.7	2ND FLOOR LOADS B29 = 12.1 B28 = 2.4 14.5K

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COLUMNS - NORTH HALF OF BLDG.

N-12

159'-10
145'-7
131'-7 ROOF
126'-0 ROOF
113'-7 2ND
103'-7
100'-0

30.6*
44.6*
50.0*
22.1
49.9*
22.1
12.2*
231.5K

W10x88
SEISMIC = ±247.7 x 1.25/1.33
KL = 10.0'
(247.7 + 231.5) x 1.25/1.33 = 450.4K

PILASTER = 9.6K
SPECIAL FTG.

ROOF LOADS
B23 = 9.2
B74 = 9.5
18.7

2ND FLOOR LOADS
B78 = 12.9
B45 = 9.2
22.1

P-15

131'-0 ROOF
126'-9
118'-7
113'-7
99'-0

39.8K
60.2K
32.2K
132.2K

W10x39
SEISMIC = ±31.6
KL = 14.6'
(31.6 + 132.2) x 1.25/1.33 = 154.0K

SPECIAL FTG. F30

ROOF LOADS
B52 = 4.3
B59 = 5.2
B68 = 9.1
B64 = 16.4
B66 = 4.8
39.8K

2ND FLOOR LOADS
B66 = 30.1
B73 = 30.1
60.2K

B68 = 27.5
B85 = 4.7
32.2K

P-19

131'-0 ROOF

11.1K

W10x33
L = 12.4'

FOOTING:

ROOF LOADS
11'x10' (20+20) = 4.4
B10 = 2.4
B52 = 4.3
11.1

2ND FLOOR LOADS

P-21

ROOF

88.9K

W10x39
SEISMIC = 31.6
KL = 19.6'
(31.6 + 88.9) x 1.25/1.33 = 113.3K

99'-0 88.9K

SPECIAL FTG. F29

ROOF LOADS

2ND FLOOR LOADS
B73 = 48.0
B74 = 40.9
88.9

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* LOADS FROM SOUTH HALF OF BLDG.

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COLUMNS - NORTH HALF OF BLDG.

P-23	P-25	P-27	P-32
131-0 ROOF 6.4K	131-0 ROOF 6.0K	ROOF	ROOF
118'-7			
113'-7		84.2K W10x33 KL=19.6' 99'-0 84.2K	52.5K W8x28 KL=19.6' 99'-0 52.5K
FOOTING:	FOOTING:	FOOTING: F11	FOOTING: F8
ROOF LOADS 16.1' x 10' (20+20) = 6.4K	ROOF LOADS 15' x 10' (20+20) = 6.0K	ROOF LOADS	ROOF LOADS
2ND FLOOR LOADS	2ND FLOOR LOADS	2ND FLOOR LOADS B74 = 42.2 B75 = 42.0 84.2	2ND FLOOR LOADS B75 = 42.2 B20 = 10.3 52.5K

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COLUMNS - NORTH HALF OF BLDG.

P-34

131'-0 Roof
16.8K
118'-7
113'-7
FOOTING:

ROOF LOADS
17½'x10' (20+20)
= 6.8K

2ND FLOOR LOADS

Q-13

126'-5 Roof
12.8K
L = 12.8'
W8x31
99'-0
SEISMIC = ±80.5
KL = 14.6'
25.9K
(80.5+25.9)x 1.25/1.33
= 100.0K
SPECIAL FTG.

ROOF LOADS
B27 = 7.0
B28 = 5.8
12.8K

2ND FLOOR LOADS
B47 = 7.2
B55 = 5.9
13.1

Q-15

126'-9 Roof
9.6K
L = 13.1'
W8x31
99'-0
SEISMIC = ±80.5
KL = 14.6'
20.2K
(80.5+20.2)x 1.25/1.33
= 94.6K
SPECIAL FTG.

ROOF LOADS
B28 = 5.8
B59 = 3.8
9.6K

2ND FLOOR LOADS
B55 = 5.9
B85 = 4.7
10.6K

M-15

131'-3 Roof
9.7K
L = 12.6'
W10x33
FOOTING:

ROOF LOADS
B69 = 4.6
B63 = 5.1
9.7K

2ND FLOOR LOADS

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COLUMN LOAD SUMMARY

LINE (1) THRU (12) *TOTAL LOADS.

COLUMN	FUTURE ROOF 5TH		FUTURE 4TH		PRESENT ROOF 5TH		
A-10	RB5 6.10 RB7 11.10	17.2	B5 11.7 B7 10.9	22.6 (39.8)	B5 11.7 B7 10.9	22.6	(62.4)
A-12	RB7 7.7 RB17 1.0	8.7	B7 6.0 B17 6.2	12.2 (20.9)	B7 6.0 B17 6.2	12.2	(33.1)
B-10	RB3 2.4 RB8 9.0	11.4	B3 6.0 B8 11.4	17.4 (28.8)	B9 6.0 B8 11.4	17.4	(46.2)
B-12	RB8 6.8 RB16 11.5 RB17 1.0	19.3	B8 6.4 B16 29.2 B17 6.2	41.8 (61.1)	B8 6.4 B16 29.2 B17 6.2	41.8	(102.9)
C-8	RB5 8.2 RG-1 51.2	59.4	B5 14.0 B-46 112.9	126.9 (186.3)	B5 14.0 B46 105.7	119.7	(246.6)
F-12	RB1 6.5 RB15 7.4 RB16 11.5	25.4	B1 19.4 B15 20.5 B16 28.2	68.1 (93.5)	B1 19.4 B15 20.5 B16 28.2	68.1	(161.6)
J-12	RB1 6.5 RB14 7.4 RB15 7.4	21.3	B1 19.4 B14 18.0 B15 20.5	57.9 (79.2)	B1 19.4 B14 18.0 B15 20.5	57.9	(137.1)
M-7	RT2 1.2 2.0 RB13 3.0 ELEV. 9.1	15.3	T2 1.2 2.0 B13 3.0	6.2 (21.5)	B13 3.0 RB3 9.1 RB18 10.5	12.1 22.6	(33.6)
N-2	RB34 6.5 RB40 8.3	14.6	B34 9.2 B40 21.5	30.7 (45.3)	B34 4.8 B40 20.0 RB19 15.7	56.5	(95.8)
N-7	RB27 3.9 RB40 2.2 ELEV 9.1 RB39 7.3	22.5	B27 2.8 B40 7.7 B39 24.4	39.4 (61.9)	B27 12.2 B27 R 2.2 B40 8.1 RB19 8.5 B37 20.4	41.4	(103.3)
N-8	RB26 10.5 RB27 3.9 RG-1 65.2 ELEV 6.0	85.6	B26 18.9 B27 2.8 B-46 119.4	141.1 (226.7)	B26 16.9 B27 2.2 B27A 2.2 B11/R8 5.4 B46 123.0	150.7	(377.4)
N-11	RB11 2.5 RB12 4.1 RB25 17.7 RB26 16.4	40.7	B11 2.4 B12 4.4 B25 11.1 B26 30.6	50.5 (91.2)	B11 4.4 B12 4.4 B25 11.1 B26 30.6	50.5	(141.7)

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GRAV. LOAD SUMMARY

LINE (1) THRU (12) - TOTAL LOADS

COLUMN	FUT. ROOF - 5TH		FUTURE 4TH		PRES. RF 3RD		
N-12	RB12 4.1 RB14 7.4 RB25 6.1 RB43 13.0	30.6	B12 4.4 B14 19.3 B25 3.2 B43 17.7	44.6 (75.2)	B12 4.4 B14 19.3 B25 3.2 B43 23.1	50.0	(125.2)
R-1	RB32 4.0 RB34 7.8 RB35 10.2	22.0	B32 4.6 B34 9.2 B35 8.6	22.4 (44.4)	B32 5.0 B34 5.2 B35 9.0	19.2	(63.6)
R-3	RB30 4.3 RB32 4.0 RB36 12.5 RB37 8.6	29.6	B30 13.3 B32 4.6 B36 16.9 B37 20.4	57.2 (86.8)	B30 13.3 B32 3.0 B36 13.3 B37 16.8	46.4	(133.2)
R-7	RB18 4.2 RB30 4.3 RB38 9.1 RB39 9.5	27.1	B18 12.9 B30 13.3 B38 27.1 B39 30.0	83.3 (110.4)	B18 13.0 B30 13.3 B38 20.0 B39 23.8	70.1	(180.5)
S-9	RB29 20.6 RB44 8.1	28.7	B29 45.5 B44 38.5	83.0 (111.7)	B29 44.4 B44* 30.0 future	74.4	(186.1)
S-12	RB43 16.7 RB45 9.8	26.5	B43 29.6 B45 17.1	46.7 (73.2)	B43 28.4 B45* 15.3 future	43.7	(116.9)
I-1	RB32A 2.0 RB35 6.5	8.5	B32A 2.0 B35 4.9	6.9 (15.4)	B32A 2.0 B35 5.0	7.0	(22.4)
I-3	RB30 4.3 RB32A 2.0 RB36 10.5 RB42 4.3	21.1	B30 13.3 B32A 2.0 B36 15.2 B42 9.4	39.9 (61.0)	B30 13.3 B32A 2.0 B36 11.8 B42 9.4	36.5	(97.5)
I-7	RB18 4.2 RB30 4.3 RB38 9.1 RB41 5.0	22.6	B18 12.9 B30 13.3 B38 27.1 B41 13.7	67.0 (89.6)	B18 13.0 B30 13.3 B38 20.0 B41 13.7	60.0	(149.6)
U-3	RB31 6.9 RB42 4.3	10.3	B31 5.8 B42 9.4	15.2 (25.5)	B31 5.8 B42 9.4	15.2	(40.7)
U-7	RB19 4.5 RB31 6.0 RB41 5.0	15.5	B19 5.7 B31 5.8 B41 13.7	25.2 (40.7)	B19 5.7 B31 5.8 B41 13.7	25.2	(65.7)

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COL. LOAD SUMMARY

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LINE (1) THRU (12) TOTAL LOADS

COL.	FUT. RF 5TH	FUT. 4TH	PRES. RF 3RD
U-9	RB19 5.3 RB21 4.5 RB44 6.7 } 16.5	B19 5.7 B21 4.8 B44 31.2 } 41.7 58.2	B19 6.7 B21 5.0 B44 25.0 future } 35.7 93.9 *
U-12	RB21 4.5 RB45 8.6 } 13.1	B21 4.5 B45 13.9 } 18.4 31.5	B21 5.0 B45 12.8 future } 17.8 49.3
E-6 (PLAZA - 3RD)			RB16 51.6 RB17 12.3 } 63.9 to Bm in Plaza Flr.
K-4 (PLAZA - 3RD)			RB16 43.4 RB18 18.5 } 61.9 to Bm in Plaza Flr.
T-9 (2ND TO 3RD)			B18A 13.0 B20A 9.6 B47 14.9 } 24.5 To 2nd Flr Bm
T-12 (2ND TO 3RD)	OUT		B20A 9.6 B45 6.6 } 16.2 To 2nd Flr Bm

OUT IN FUTURE

E-6, K-4 → W10x49 $L_u = 30' = 107^K$

T-9, T-12 → W8x24 $L_u = 14' = 88^K$

1600 EAST DESERT INN ROAD SUITE 106 | LAS VEGAS, NEVADA 89109-2594 (702) 7316226

Jack Collins 12-19-84

STRAUSS & LOFTFIELD
STRUCTURAL ENGINEERS

CLIENT/ SHEET/ 259 OF 517
PROJECT/ PROJECT # 8017
DATE/ 10-82
COLUMN LOAD SUMMARY ENGINEER/

LINE (A) THRU (12) TOTAL LOADS

COL.	2ND	PLAZA	COL SIZE
A-10	B6 11.1 B7 10.9 } 22.6 (850)	PB 23 5.5 PB 34 6.0 } 11.5 (965)	W10 x 33 L_u = 14' = 141"
* A-12	B7 6.0 B17 6.2 } 12.2 (545.3)		
B-10	B3 6.0 B8 11.4 } 17.4 (63.6)	PB12 9.8 PB23 6.6 PB23 8.9 PB34 6.0 } 30.2 (93.8)	W10 x ~~33~~ 68 L_u = 16' = 187" SEISMIC = ± 190.7K (190.7 + 127) x 1.25/1.33 = 298.6K
* B-12	B8 6.4 B16 29.2 B17 6.2 } 41.8 (144.7)	PB 33 [illegible] (153)	
C-8	B5 14.0 B~~7~~ 99.8 } 113.8 (~~360.4~~)	PB24 63.6 PB25 118.6 } 182.2 (569.6)	W14 x 120 L_u = 16' = 694"
* F-12	B1 19.3 B15 20.5 B16 28.2 } 68.0 (229.6)	PB 1 22.3 (2519)	* SEE NORTH BLDG FOR COL.
* J-12	B1 19.5 B14 17.7 B15 20.5 } 57.7 (194.8)	PB 1 22.3 (217.1)	
M-7	P10 10.7 P6 ~~2~~ B13 2.6 P4 1.6 } 15.1 (48.7)	PB13 [illegible] 32.9 PB22 28.5 (81.6)	~~W8 x 35~~ W10 x 33 L_u = 20 = 19.7 = 199"
N-2	B34 19.9 B40 47.4 } 67.3 (168.1)	Plaster + 9.6 (k)	~~W8 x 40~~ W8 x 40 L_u = 14' = 177"
N-7	B27 2.2 B37 21.1 B40 42.6 P4 2.1 } 68.0 (171.3)	PB22 8.7 PB32 4.5 } 13.2 (184.5)	W10 x 49 L_u = 18' = 228"
N-8	B26 18.9 B27 2.2 B49 129.3 } 150.4 (527.8)	PB28 [illegible] PB 31 14.1 PB 32 4.6 PB27 45.2 } 70.0 (597.8)	W14 x 120 L_u = 16' = 644"
N-11	B11 4.3 B12 4.3 B25 11.1 B24 30.6 } 50.3 (192.0)	PB 9 - 1.9 PB 29 - 6.2 PB 30 - 6.4 PB 31 - 14.8 } 30.9 (222.9)	W10 x ~~100~~ 112 L_u = 15' SEISMIC = ± 247.7 = 274K (247.7 + 274) x 1.25/1.33 = 490.9K

1600 EAST DESERT INN ROAD SUITE 106 | LAS VEGAS, NEVADA 89109-2994 (702) 731-6226

* Plus loads from North half of Bldg

Calcs (5)
501 N. Casino Center

Lula Collins 12-19-84

STRAUSS & LOFFFIELD
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CLIENT/ SHEET/ 240 OF 317
PROJECT/ PROJECT # 82017
DATE/ 10.-82
COL. LOAD SUMMARY ENGINEER/ JM

LINE (1) THRU (12) TOTAL LOADS

COL.	2ND	PLAZA	
* N-12	B12 4.3 B25 3.2 B14 19.3 B45 23.1 } 49.9 (175.1)	PB 29 6.8 PB 50 5.4 } 12.2 (187.3)	SEE NORTH BLDG. FOR COL.
R-1	B32 5.1 B34 16.9 B35 9.0 } 31.0 (94.6)		W8x31 L_u = 15' = 131K
R-3	B32 5.1 B36 15.2 B37 17.2 B46 20.3 } 57.8 (191.0)		W10x ~~49~~ 112 (L_u = 15' = 235K SEISMIC = ±299.5 (299.5+235) x 1.25/1.33 = 502.4K
R-7	B18 13.0 B38 20.1 B39 22.9 B46 20.3 } 76.3 (256.8)		W10x60 L_u = 15' = 289K
S-9	B37 44.5 B44 30.2 } 74.7 (260.8)		W10x60 L_u = 15' = 289K
S-12	B43 28.4 B45 15.3 } 43.7 (160.6)	SEISMIC = ±147.5K (47.5+1[illegible]) x 1.25/1.33	W10x ~~45~~ 100 L_u = 15' = 190K = 317.2K
T-1	B35A 4.8 B32A 2.0 } 6.8 (29.2)		W8x31 L_u = 15' = 131K
T-3	B32 2.0 B36 14.1 B42 9.2 B47 50.2 } 72.5 (170.0)		W10x ~~45~~ 100 L_u = 15' = 190K SEISMIC = ±299.5 (299.5+190) x 1.25/1.33 = 460.1K
T-7	B18 13.0 B38' 20.1 B41 12.3 B47 50.2 } 95.6 (245.2)		W10x ~~54~~ 60 L_u = 15' = 259K SEISMIC = ±22.1 (22.1+259) x 1.25/1.33 = 264.2
U-3	B42 9.2 B48 21.0 } 30.2 (70.9)		W8x31 L_u = 15' = 131K
U-7	B19 5.7 B41 12.3 B48 21.0 } 39.0 (104.7)		W8x ~~31~~ 48 L_u = 15' = 131K SEISMIC = ±83.8K (83.8+131) x 1.25/1.33 = 201.9K

1600 EAST DESERT INN ROAD SUITE 106 | LAS VEGAS, NEVADA 89109-2594 (702) 731-6226

* Plus loads from North half of Bldg.

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CLIENT/
PROJECT/
COL. LOAD SUMMARY

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PROJECT # 82017
DATE/ 10-82
ENGINEER/ JM

LINE (1) THRU (12) TOTAL LOADS

COL.	2ND	PLAZA	
U-9.	B19 5.7 B21 4.8 B44 25.0 } 35.5 (129.4)		W8 x 58 (L = 15') SEISMIC = ±83.8 (83.8+148) x 1.25/1.33 = 217.9 K = 148 K
U-12	B21 4.8 B45 12.8 } 17.6 (66.9)		W8 x 31 L = 15' = 131 K
R-5 (2nd to Plaza Flr)	B37A 20.8 B37B 19.1 B46 20.3 B46 20.3 } 80.5 (80.5)		W8 x 31 L = 15' = 131 K
F-8 Bsmt - Plaza		PB1 24.4 PB16 73.4 PB25 106.2 PB26 78.4 } 282.4	W12 x 65 L = 16' = 326 K
J-8 Bsmt - Plaza		PB1 24.4 PB19 54.6 PB26 78.4 PB27 63.6 } 220.4	W10 x 49 L = 16' = 228 K

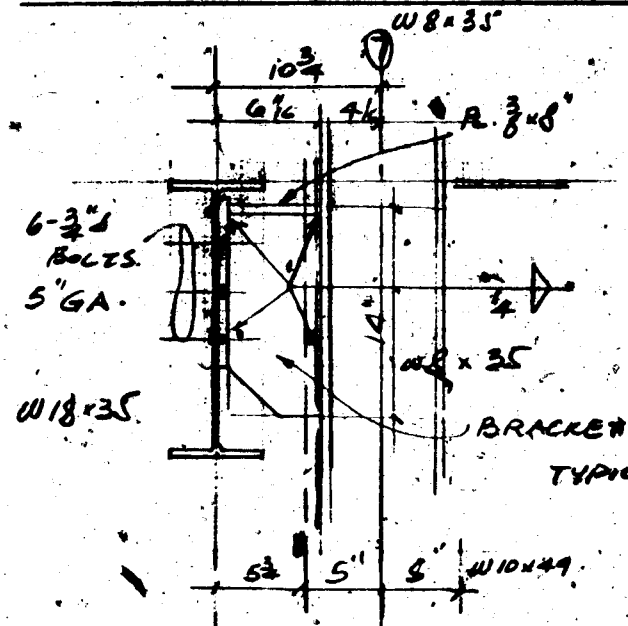
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ENGINEER/

BRACKET TO M-7 & N-7



LEVEL	COL	P_{TL}	e	Mecc
PLATE	M7	28.5 K	10.75"	25.53 IK
	N7	8.7 K	10.75"	7.79 K

BRACKET e_{min} = 6¾"

M_{min} = 28.5(6.75) = 192.38 "K

$T_{req'd}$ = 192.38 ÷ 13 = 14.8 K

÷8" = 1.85 K/"

¼" DBL. FILLET

2nd Level - Std Type Conn. to Beams.

3rd Level -- connect to Bm @ Line N

BRACKET @ M-7
SAME AS PLATE EXCEPT REDUCE depth from 14" to 11"
Bolts to 4 Bolts.

W12×16

Lira Calcs 12-19-84

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ENGINEER/

COL M-7 Combined Axial & Bkg Ecc. Mom.

@ Plaza W8×35 A = 10.3 M_{ecc} = 25.53 ^{IK} MAX

P = 81.6 ^{K} S_{xx} = 31.2 Col Above = Col Below

L = 19.7' BMT - PLAZA r_{xx} = 3.51 = 45% 11.49 ^{IK} Col

r_{yy} = 2.03 10% 2.55 ^{IK} Bm/Slab

$\frac{Kl}{r_{yy}} = \frac{19.7(12)}{2.03} = 116.5$ $F_a = 10.78$

$f_a = \frac{P}{A} = \frac{81.6}{10.3} = 7.92$ ksi $\frac{f_a}{F_a} = .735$

$f_{bxx} = \frac{11.49\,(12)}{31.2} = 4.42$ ksi

$F_{bxx} = 22.0$ ksi

$C_{mx} = 1.0$ $\frac{C_{mx} f_{bxx}}{\left(1 - \frac{f_a}{F'_{exx}}\right) F_{bx}} = \frac{1.0(4.42)}{\left(1 - \frac{7.92}{32.94}\right)22} = .265$

$\frac{f_a}{F_a} + \frac{C_{mx} f_{bxx}}{\left(1 - \frac{f_a}{F'_{exx}}\right) F_{bx}} = 1.0 \leq 1.0$

$\frac{Kl}{r_{xx}} = \frac{19.7(12)}{3.57} = 67.35$

$F'_{exx} = 32.94$

W8×35 ✓

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DATE/ 10/25/82
ENGINEER/ JRL

COLUMN BASE PL'S

COL. SIZE.		MAX. LOAD	BASE PL	F_p *
6½x8	W8x24	68.7	BP-1	1.05 ksi
	W8x28	52.5		
8x8	W8x31	124.1	BP-2	1.05 ksi
	W8x35	140.4		
	W8x40	163.1		
8x10	W10x33	132.2	BP-3	1.05 ksi
	W10x95	231.5		
10x10	W10x49	237.1	BP-4	1.05 ksi
	W10x54	245.2		
	W10x60	324.0		
12x12	W12x65	282.4	BP-5	2.10 ksi
14½x14½	W14x120	597.8	BP-6	2.10 ksi

$$t_p = \frac{m}{n}\sqrt{\frac{f_p}{9.0}}$$
FORMULA 1

$$t_p = n'\sqrt{\frac{f_p}{9.0}}$$
FORMULA 2

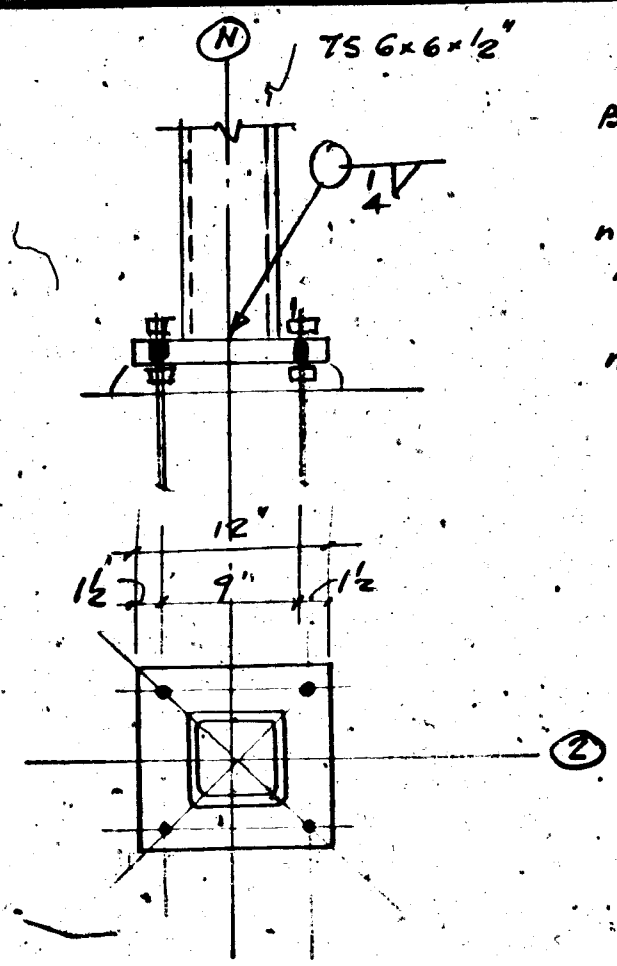
	B	n	N	m	f_p	t_p FORMULA 1	n'	t_p FORMULA 2	BASE PL
BP-1	8	1.40	10	1.20	.86 ksi	0.43"	2.77	0.86"	1x8x0'-10
BP-2	12	2.80	14	3.20	.97	1.05	3.14	1.03	1¼x12x1'-2
BP-3	14	3.80	16	4.20	1.03	1.42	3.42	1.16	1¼x14x1'-4
BP-4	16	4.00	20	5.25	1.01	1.76	3.92	1.31	1⅜x16x1'-8
BP-5	14	2.20	14	1.30	1.44	0.88	4.77	1.91	2x14x1'-2
BP-6	18	3.20	20	3.11	1.66	1.37	5.64	2.42	2½x18x1'-8

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$P = 163.1^{K}$ DL

BP = 12" x 12" x t

$f_{p} = \frac{163100}{(12)^2} = 1.133^{KSI} < 2.10$

$n = 3.0$

$M = 1.133(3.0)^2 .5 = 5.099^{IK/in}$

$n = 3.0\sqrt{2} = 4.243"$

$t = 4.243\sqrt{\frac{1.133}{4}} = 1.505$ 1½" ±

USE PL 1½" x 12" x 0'-12"

4 - 1" ø A36 as in Typ.

1600 EAST DESERT INN ROAD SUITE 106 | LAS VEGAS, NEVADA 89109-2594 (702) 731-6226

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BASE PLATES & ANCHOR BOLTS FOR BRACED COLUMNS

(USE 1.25 X ACTUAL LOAD W/O 1/3 INCREASE)

COL.	SIZE	NET UPLIFT	SHEAR	TYPE	BOLTS FOR UPLIFT	INCHES OF SHEAR LUG
R-3 T-3	W10x49 W10x45	204.0 214.5	66.4 66.4	I	2-3"ϕ	33"
B-12	W10x45	(A) 162.3 (B) 65.0	(A) — (B) 47.9	(A) ← I ↓ (B)	2-3"ϕ	24"
F-12	W10x60	—	47.9	I	—	24"
J-12	W10x49	—	56.5	I	—	28"
N-12	W10x45	(A) 21.2 (B) 36.2 (C) 136.4	(A) 56.5 (B) — (C) —	C ↑ (TWO) ← I ↓ (B)	2-3"ϕ	28"
S-12	W10x45	67.2	95.6	I	2-2"ϕ	47"
H-34 M-34	W8x24 W8x34	28.5 31.7	17.3 17.3	I	2-2"ϕ	9"
A-12 A-14	— W8x35	— 45.0	— —	— —	2-2"ϕ	—
B-10	W10x33	143.8	78.1	H →	2-3"ϕ	38"
N-11	W10x54	136.2	74.9	H →	2-3"ϕ	37"
P-15 P-21	W10x33 W10x33	— —	15.2 15.2	H →	—	8"
Q-13 Q-15	W8x24 W8x24	68.9 71.5	37.9 37.9	H →	2-2"ϕ	19"
T-3 T-7	— —	— —	— —	—	—	—
U-7 U-9	W8x31 W8x35	31.5 19.1	29.4 29.4	H →	2-2"ϕ	15"
A-12.4	W8x48	85.4	88.3	H →	4-1½"ϕ	44"

1600 EAST DESERT INN ROAD SUITE 106 LAS VEGAS, NEVADA 89109-2594 (702) 731-6226

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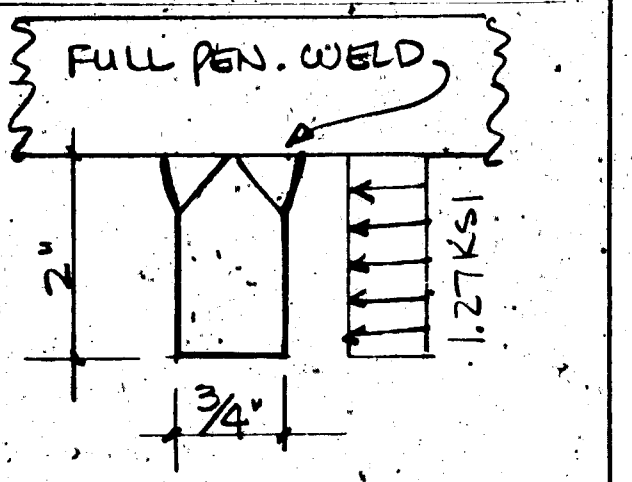
SHEAR LUGS FOR BOTTOM OF BASE PLATES

$F_p = .7 f'_c = 2.10^{KSI}$

$F_b = .75 f_y = 27.0^{KSI}$

$M = \frac{1.27(2)^2}{2} = 2.54^{"K/"}$

$f_b = \frac{2.54 \times 6}{(1)(.75)^2} = 27.0^{KSI}$



ALLOW. SHEAR
$= 2 \times 1.27 = \underline{3.54^{K/"}}$

ALLOW. TENSION FOR ANCH. BOLTS (A-36)

1½"ϕ = 1.767 IN² × 19.1 KSI = 33.7 K EA.
2"ϕ = 3.142 IN² × 19.1 KSI = 60.0 K EA.
2¼"ϕ = 3.976 × 19.1 = 75.9 K EA.
2½"ϕ = 4.909 × 19.1 = 93.8 K EA.
3"ϕ = 7.069 × 19.1 = 135.0 K

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BASE ℄ TYPE A

MAX. UPLIFT = 214.5^K = 2-3" ϕ BOLTS
MAX. SHEAR = 74.9^K = 37" OF SHEAR LUG

MAX. TENS. EA. BOLT = $\frac{1.25 \times 214.5}{2}$ = 134^K

LENGTH OF WELD = 3℄ x 2 = 18.8"

$\frac{134^K}{18.8}$ = 7.13^K/" USE 1/2" FILLET

BEARING ON BOT. ℄ = $\frac{1.25 \times 214.5}{18" \times 8" - 2 \times \pi (1.5)^2}$

= 2.068^{KSI} < 2.10

MAX. MOM. IN ℄ = $\frac{2.10 (3.5)^2}{2}$ = 12.86"^{K}/IN.

$f_b = \frac{12.86 \times 6}{(1)(1.75)^2}$ = 25.2^{KSI} < 27.0

~~USE~~ 1 3/4" ℄ *

WELD, BASE ℄ TO ~~SHEAR~~ ℄:

$\frac{74.9^K \times 1.25}{2 \times 24"}$ = 1.95^K/" USE 1/4" FILLET

* CHANGE WASHER ℄'s TO FIT INSIDE 19" WIDE PIER

℄ . t x 11 x 14"

$f_{bearing} = \frac{268.13}{154 - 2\pi(1.5)^2}$ = 1.917 < 2.10

$\frac{11-3}{2} = x"$

$M = 1.917 (4)^2 .5 = 15.337$ "K/"

$f_b = \frac{15.337 (6)}{1 (1.75)^2} = 30.1 > 27.0$

$f_b = \frac{(\quad)}{(2.0)2} = 23.01 < 27.0$

USE 2" x 11" x 1'-2

1600 EAST DESERT INN ROAD SUITE 106 | LAS VEGAS, NEVADA 89109-2594 (702) 731-6226

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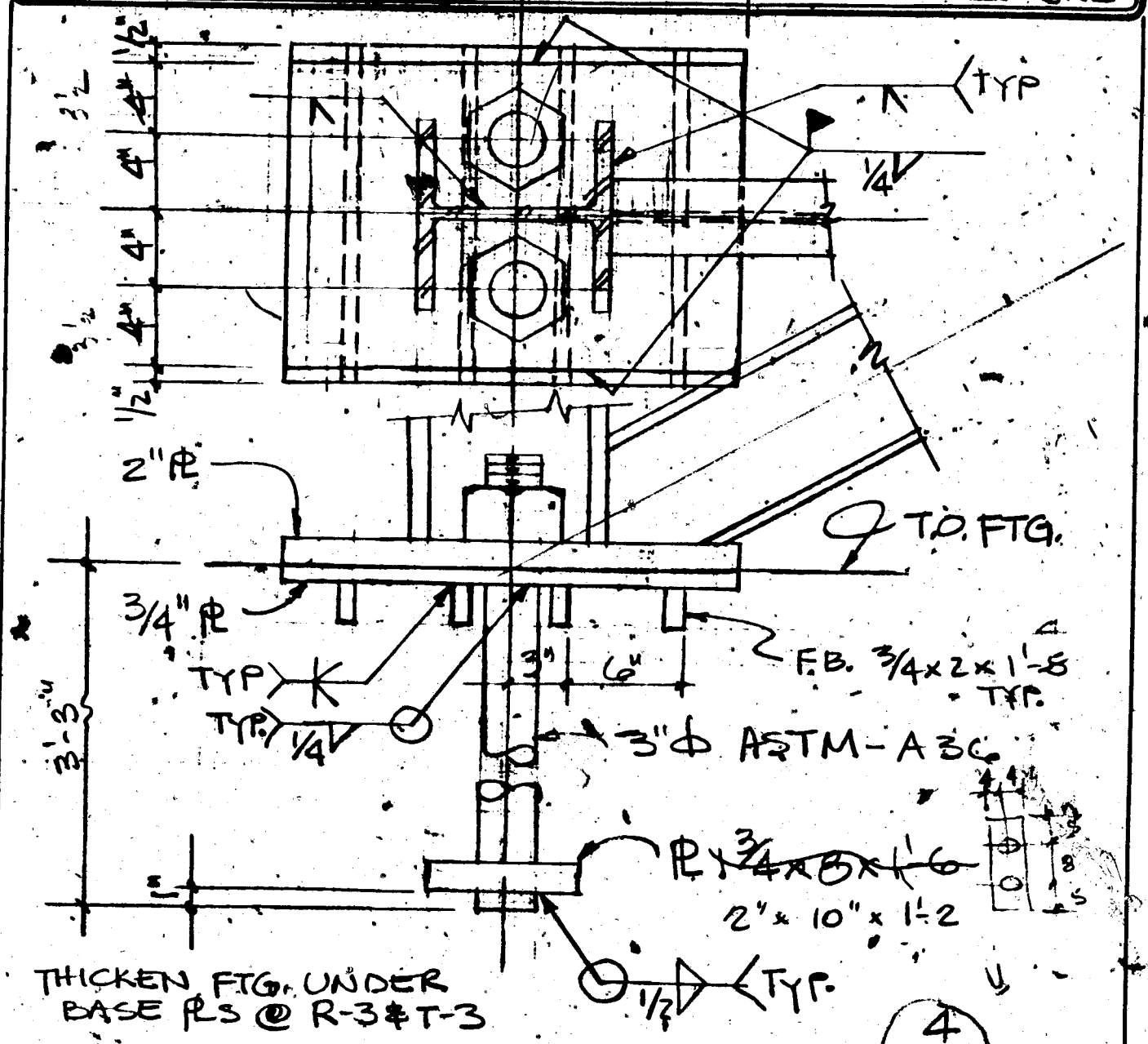
PROJECT/ 10 MIN. OR AS REQ'D FOR DIAG. BRACE

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BASE PL - TYPE A

USE FOR COLS: R-3, T-3, B-12, N-12, B-10, N-11

4/S-8

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Lucia Collins 12-19-84

5

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PROJECT # 82017
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ENGINEER/ JRL

BASE PL - TYPE B

MAX. UPLIFT = 85.4K = 2 - 2"ϕ BOLTS

MAX. SHEAR = 95.6K = 47" OF SHEAR LUG

MAX. TENS. EA. BOLT = $\frac{1.25 \times 85.4}{2}$ = 53.4K

LENGTH OF WELD = $2\pi \times 2$ = 12.6"

$\frac{53.4^K}{12.6"}$ = 4.24 K/" USE 3/8" FILLET

BEARING ON BOT. PL = $\frac{1.25 \times 85.4}{16 \times 8 - 2 \times \pi (1)^2}$

= 0.88 KSI < 2.10

MAX. MOM. IN PL = $\frac{.88 (3)^2}{2}$ = 3.96 "K/"

$f_b = \frac{3.96 \times 6}{(1)(1)^2}$ = 23.8 KSI < 27.0

~~USE 1" PL~~

WELD, BASE PL TO SHEAR PL:

$\frac{95.6^K \times 1.25}{2 \times 24}$ = 2.49 K/" USE 1/4" FILLET

SHORTEN PL:

t x 10 x 14

$\frac{10-2}{2}$ = 4"

$f_{bg} = \frac{106.8}{140 - 2\pi(1)^2}$ = .80 KSI < 2.10

$M = .80(4)^2 \cdot .5$ = 6.4 "K/"

$f_b = \frac{6.4(6)}{1(1.5)^2}$ = 17.1 < 27.0

USE

PL 1/2 x 10" x 1'-2"

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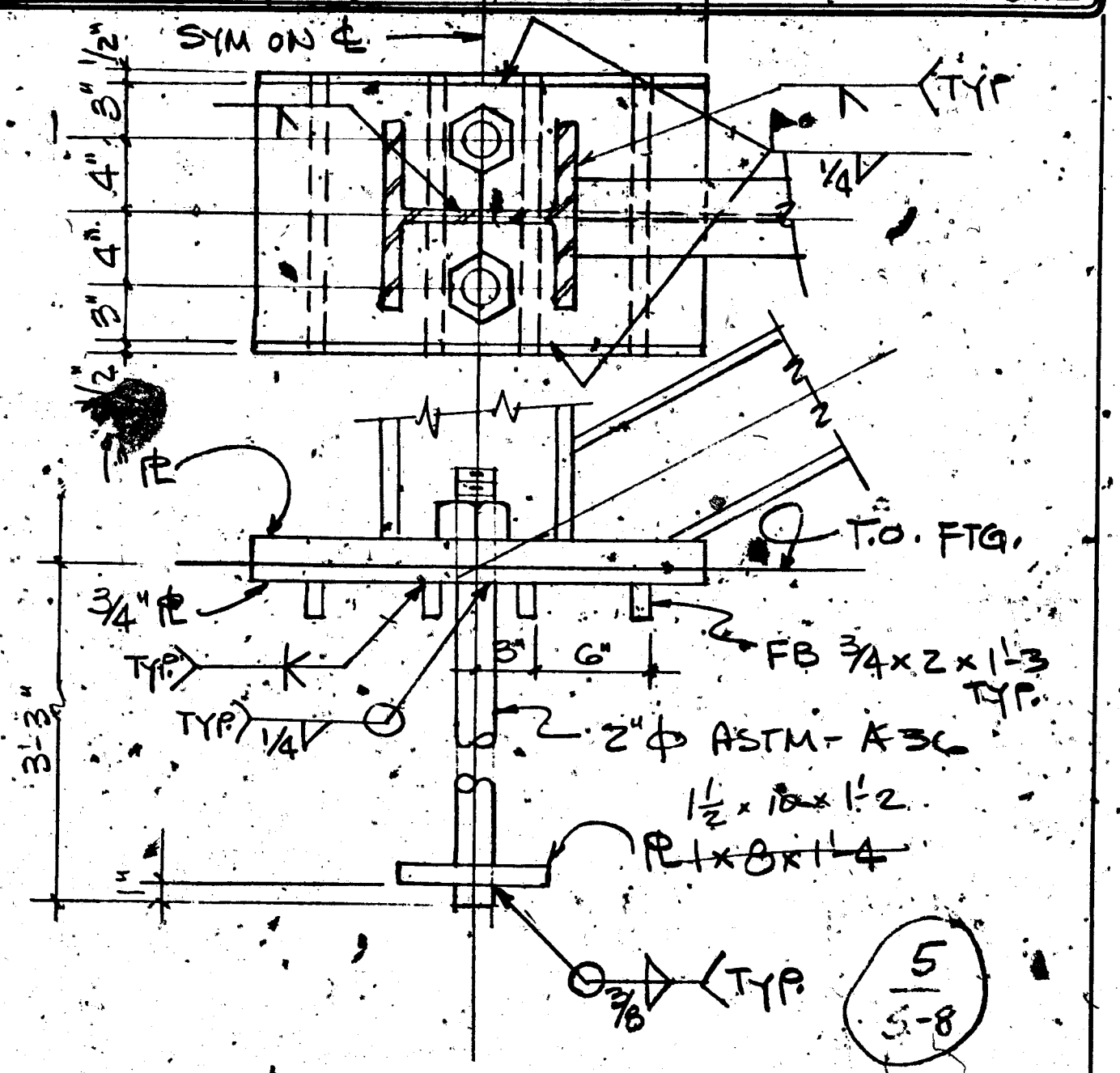
PROJECT/ ILO MIN. OR AS REQ'D. FOR DIAG. BRACE.

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BASE PL - TYPE B

USE FOR COLS:

F-12	A-14	U-7
J-12	P-15	U-9
S-12	P-21	
H-34	Q-13	
M-34	Q-15	

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ENGINEER/ JRL

BASE PL - TYPE C

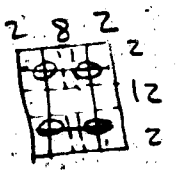
UPLIFT = 85.4^K = 4-1½" ϕ BOLTS
SHEAR = 88.3^K = 44" OF SHEAR LUG

MAX. TENS. EA. BOLT = $\frac{1.25 \times [illegible]4}{4}$ = 26.7^K

LENGTH OF WELD = 1.5π x 2 = 9.4"

$\frac{26.7^K}{9.4"}$ = 2.84^K/" USE 1/4" FILLET WELDS

BEARING ON BOTTOM PL = $\frac{85.4^K \times 1.25}{4[4 \times 4 - \pi(.75)^2]}$



= 1.88 KSI < 2.10

MAX. MOM. IN PL = $\frac{1.88(1.25)^2}{2}$ = 1.47 IN^K/"

$f_b = \frac{1.47 \times 6}{(1)(.75)^2}$ = 15.7 KSI

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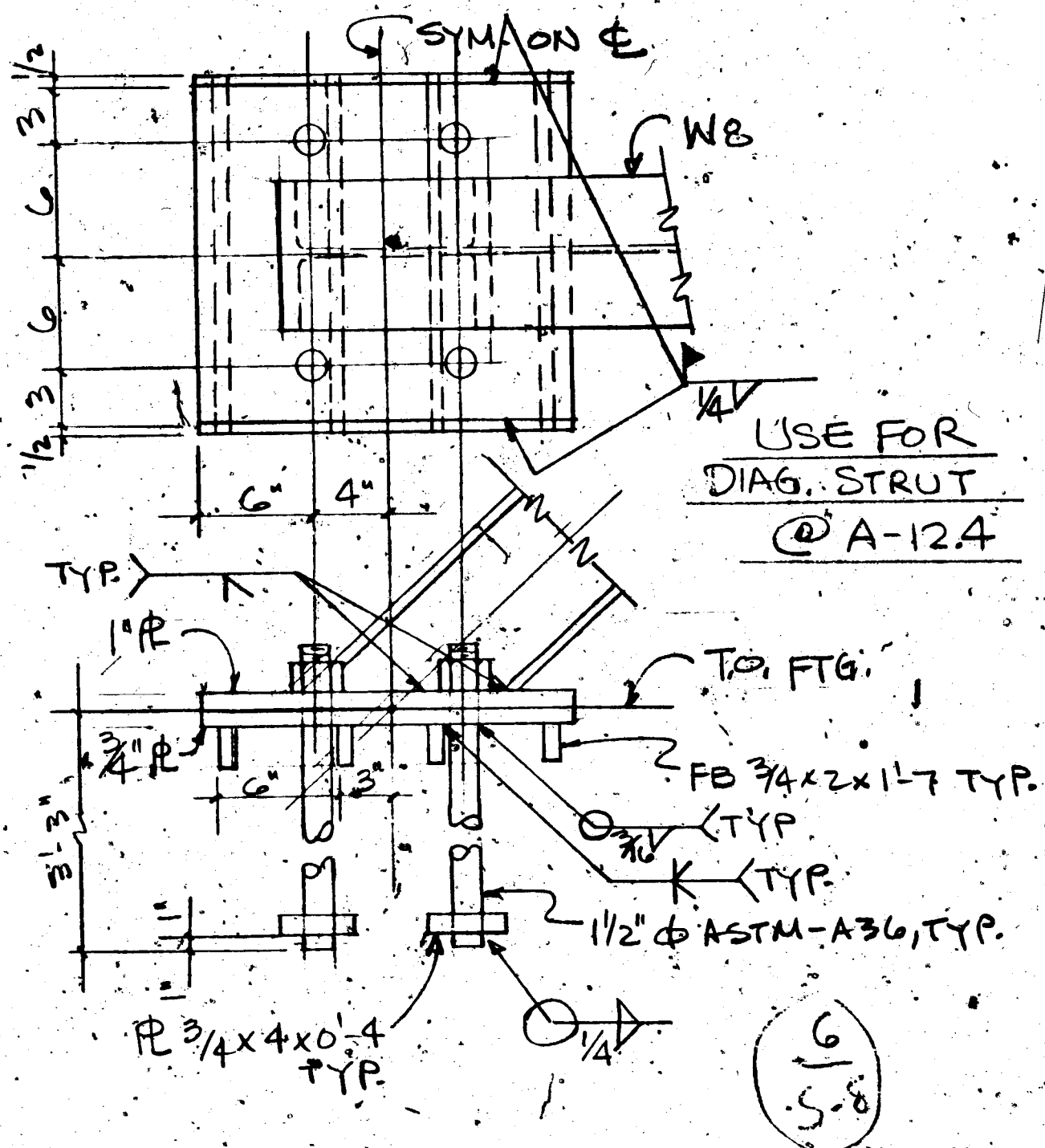
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BASE PL'-TYPE C



USE FOR DIAG. STRUT @ A-12.4

6/S-8

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SPREAD FOOTINGS *

ALLOW. S.B. = 2.00 KSF

FTG.	SIZE	REINF.	ALLOW. COL. LOAD
F1	2'-0 SQ x 1'-0	2- #4 E.W. BOT.	7 K
F2	2'-6 SQ x 1'-0	3- #4 " "	12 K
F3	3'-0 SQ x 1'-0	3- #4 " "	17 K
F4	3'-6 SQ x 1'-0	3- #5 " "	23 K
F5	4'-0 SQ x 1'-0	4 - #5 " "	30 K
F6	4'-6 SQ x 1'-0	4 - #5 " "	37 K
F7	5'-0 SQ x 1'-0	7 - #4 " "	46 K
F8	5'-6 SQ x 1'-0	5 - #5 " "	56 K
F9	6'-0 SQ x 1'-0	6 - #5 " "	67 K
F10	6'-6 SQ x 1'-2	7 - #5 " "	77 K
F11	7'-0 SQ x 1'-2	7 - #5 " "	90 K
F12	7'-6 SQ x 1'-4	6 - #6 " "	101 K
F13	8'-0 SQ x 1'-4	7 - #6 " "	115 K
F14	8'-6 SQ x 1'-6	8 - #6 " "	129 K
F15	9'-0 SQ x 1'-6	8 - #6 " "	144 K
F16	9'-6 SQ x 1'-6	7 - #7 " "	161 K
F17	10'-0 SQ x 1'-8	8 - #7 " "	175 K
F18	10'-6 SQ x 1'-8	16 - #5 " "	193 K
F19	11'-0 SQ x 1'-10	9 - #7 " "	209 K
F20	11'-6 SQ x 1'-10	10 - #7 " "	229 K
F21	12'-0 SQ x 2'-0	11 - #7 " "	245 K
F22	12'-6 SQ x 2'-0	10 - #9 " "	265 K
F23	13'-0 SQ x 2'-2	12 - #7 " "	283 K
F24	18'-6 SQ x 2'-9	16 - #9 " "	543 K
F25	19'-6 SQ x 2'-10	17 - #9 " "	598 K
F26	14'-6 SQ x 2'-3	12 - #8 " "	349 K

* SEE REVISED / COMBINED FTGS. WHICH MODIFY SCHEDULE ABOVE.

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FOOTING STRUTS

COL.	TO COL.	AXIAL LOAD	LENGTH
U7	U9	29.4K	18'
S12	N12	9.5.6K	13'
P15	P21	15.2K	20'
H34	M34	17.3K	15'

USE 24" x 24" COMP. MEMBERS ; $r = .30 \times 24 = 7.2"$

MAX. $\frac{Klu}{r} = \frac{20' \times 12}{7.2"} = 33.3 < 34$

MAX. $P_u = 47.8^K \times 1.4 = 66.9^K$.

USE 4-#11 VERTS

GOOD FOR $130^1{}^K$ (@ $f'_c = 4.0^{ksi}$)
PER 1978 CRSI, pg. 3-23

USE #4 ▭ @ 18" O.C.

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X-BRACED COLUMN/FOOTINGS

ALLOW. S.B. = 2000 PSF + 1/3 FOR SEISMIC

COL.	LL+DL	DL ONLY	SEISMIC VERT.	SEISMIC SHEAR	OTM. @ BASE K-FT	BRACE TYPE
R-3 T-3	191.0 190.0	95.5 85.0	±299.5 ±299.5	132.7	5151	
R-12 F-12	213.7 324.0	28.4 157.5	±93.4 ±93.4	95.8	2540	
J-12 N-12	237.1 231.5	133.3 111.3	±132.5 ±132.5	113.0	2783	
N-12 S-12	231.5 160.6	111.3 20.3	±147.5 ±147.5	— 95.6	3894	
H-34 M-34	2M2 14.5	11.9 8.7	±40.4 ±40.4	34.6	945	
					SEE A-12.4	
A-12 A-14	59.0 140.4	28.4 57.0	±16.6K ±102.0K	— —	1682	
B10 B12	93.8 213.7	46.9 28.4	±190.7 ±190.7	78.1 —	3948	
N-11 N-12	222.9 231.5	111.5 111.3	±247.7 ±247.7	74.9 —	4434	
P-15 P-21	132.2 88.9	52.9 44.5	±31.6 ±31.6	30.3	889	
Q-13 Q-15	25.9 20.2	11.6 9.0	±80.5 ±80.5	75.7	1304	
T-3 T-7	170.0 245.2	85.0 122.6	±22.1 ±22.1	— —	623	
U-7 U-9	104.7 129.4	52.3 64.7	±83.8 ±83.8	58.8	2321	
A-12.4	—	—	±85.4	88.3	—	

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DERIVATION OF DEAD LOADS:

SOUTH BLDG., FLOORS:

$LL = 40 + 20^{\text{PART.}} = 60$

$DL = 78.^{\text{PART.}} - 20 + 8^{\text{FRAMING}} = \frac{66}{126}$

$DL = \frac{66}{126} \times \text{TOTAL LOAD} = .52 \times \text{TOTAL LOAD}$

USE DL = .50 x TOTAL LOAD FOR COLUMN LOADS SOUTH OF LINE (12)

NORTH BLDG., FLOORS (LOADS NORTH OF LINE (12))

LL = 40 PSF
DL = 66/106 $\quad DL = \frac{66}{106} = .62$

USE DL = .60 x TOTAL LOAD

LL = 60
DL = 66/126 $\quad DL = \frac{66}{126} = .52$

USE DL = .50 x TOTAL LOAD

LL = 100
DL = 66/166 $\quad DL = \frac{66}{166} = .40$

USE DL = .40 x TOTAL LOAD

NORTH BLDG., ROOF (LOADS NORTH OF LINE (12))

LL = 20
DL = 20/40 $\quad DL = \frac{20}{40} = .50$

USE DL = .50 x TOTAL LOAD

LL = 60
DL = 66/126 $\quad DL = \frac{66}{126} = .52$

USE DL = .50 x TOTAL LOAD

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LL=20
DL=66/86

DL = 66/86 = .77

USE DL = .75 x TOTAL LOAD

LL=100
DL=66/166

DL = 66/166 = .40

USE DL = .40 x TOTAL LOAD

COL. R3

DL = 191.3K x .5 = 95.5K

COL. T-3

DL = 170.0K x .5 = 85.0K

COL. B-12

DL = .5(8.7+12.2+12.2+12.2+2.6) + .4 x 11.1 = 28.4K

COL. F-12

DL = .5(25.4+68.1+68.1+68.0+22.3+27.3) + .4x44.8
= 157.5K

COL. J-12

DL = .5(21.3+57.9+57.9+57.7+22.3) + .75x14.3
+.5x28.0 = 133.3K

COL. N-12

DL = .5(30.6+44.6+50.0+49.9+12.2) + .4x22.1
+.4x22.1 = 111.3K

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COL. S-12

DL = .5 X 160.6 = 80.3K

COL. H-34

DL = .5 X 8.0 + .6 X 13.2 = 11.9K

COL. M-24

DL = .6 X 14.5 = 8.7K

COL. A-12

DL = .5(8.7 + 12.2 + 12.2 + 12.2) + .5 X 2.6 + .4 X 11.1 = 28.4K

COL. A-14

DL = .5 X 8.8 + .4(79.6 + 52.0) = 57.0K

COL. B-10

DL = .5 X 93.8 = 46.9K

COL. N-11

DL = .5 X 222.9 = 111.5K

COL. P-15

DL = .4 X 39.8 + .4(60.2 + 32.2) = 52.9K

COL. P-21

DL = .5 X 88.9 = 44.5K

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COL. Q-13

DL = .5x12.8 + .4x13.1 = 11.6^K

COL. Q-15

DL = .5x9.6 + .4x10.6 = 9.0^K

COL. T-7

DL = .5x245.2 = 122.6

COL. U-7

DL = .5x104.7 = 52.3^K

COL. U-9

DL = .5x129.4 = 64.7^K

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COMBINED FOOTING F-2F @ R-3, T-3' & U-3

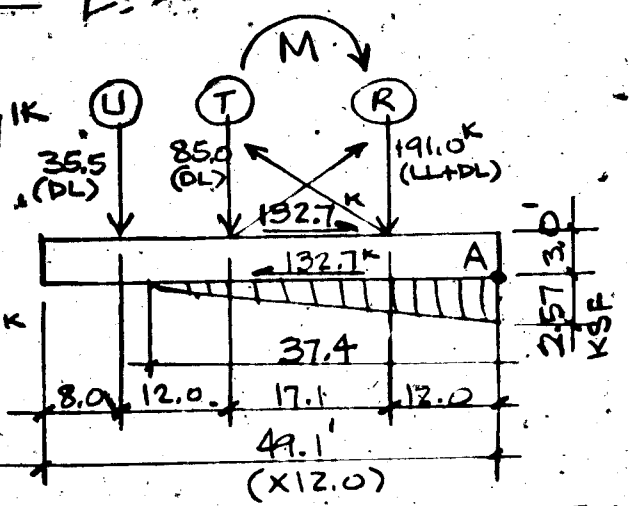
$OTM_A = 5151 + 132.7 \times 3.0' = 5549.1^{IK}$

RM_A:

FTG. $= 49.1 \times 12.0 \times 3.0 \times .14$
$= 265.1^K \times 24.55' = 6508.2^{IK}$
(R) $= 191.0 \times 12.0 = 2292.0$
(T) $= 85.0 \times 29.1 = 2473.5$
(U) $= 35.5 \times 41.1 = 1459.0$
576.6^K $12,732.7^{IK}$

$\bar{X} = \frac{12732.7 - 5549.11}{576.6} = 12.46'$

MAX. S.B. $= \frac{2 \times 576.6}{3 \times 12.46 \times 12.0} = 2.57^{KSF} < 2.66$



LOAD. CASE I

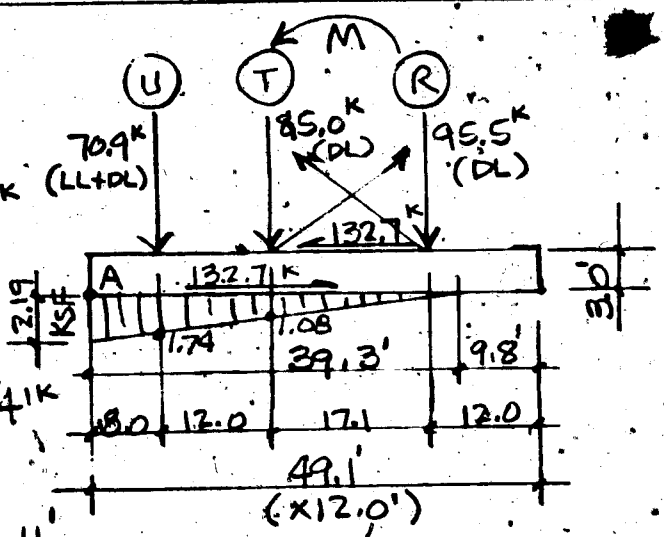
$OTM_A = 5549.1^{IK}$

RM_A:

FTG. $= 265.1 \times 24.55' = 6508.2^{IK}$
(R) $= 95.5 \times 37.1 = 3543.0$
(T) $= 85.0 \times 20.0 = 1700.0$
(U) $= 70.4 \times 8.0 = 567.2$
516.5^K $12,318.4^{IK}$

$\bar{X} = \frac{12318.4 - 5549.1}{516.5^K} = 13.11'$

MAX. S.B. $= \frac{2 \times 516.5^K}{3 \times 13.11' \times 12.0'} = 2.19^{KSF}$



LOAD CASE II

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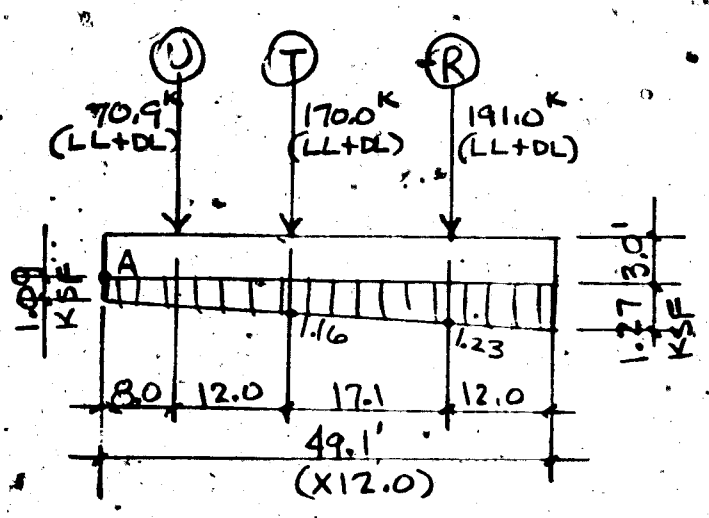
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(R-3, T-3, U-3, CONT.)

M_A:

FTG. = 265.1 × 24.55 = 6508.2
(R) = 191.0 × 37.1 = 7086.1
(T) = 170.0 × 20.0 = 3400.0
(U) = 70.9 × 8.0 = 567.2
697.0 17,561.5



$\bar{X} = \frac{17561.5}{697.0} = 25.2'$

$e = \frac{49.1}{2} - 25.2 = 0.65'$

LOAD CASE III

$S.B. = \frac{697.0}{49.1 \times 12.0} \pm \frac{6 \times 697.0 \times 0.65}{12(49.1)^2} = 1.18 \pm 0.09$

$= 1.09$ KSF
1.27 KSF

TOP REINFORCING, LONGITUDINAL

FOR LOAD CASE III (BETWEEN (T) & (R)) $M_u = \frac{1.7(1.20-.45)(17.1)^2}{10} = 37.3^{1K}/_{FT.}$

FOR LOAD CASE I, (@ (T)) $M_u = 1.2\left[\frac{.45(20)^2}{2} + 12.0 \times \frac{35.5}{12}\right] = 150.6^{1K}/_{FT.}$

$d = 36 - 2\frac{1}{2} = 33.5"$, $F = \frac{(33.5)^2}{1000} = 1.1223$

$K_u = \frac{150.6}{1.1223} = 134$ $A_s = .0026 \times 12 \times 33.5 = 1.05$

USE #3 @ 8" TOP LONGIT. $A_s = 1.19$
ALT. UP TO #3 @ 16

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TOP REINF., TRANSVERSE (R-3, T-3; U/3; CONT.)

USE #6@16

BOT. REINFORCING - LONGITUDINAL

LOAD CASE II: (@ ⓣ) $M_u = 1.2\left[\frac{(1.08-.45)(20)^2}{2} + \frac{1.11(20)^2}{3} - 12 \times \frac{70.9}{12}\right]$

$= 203.1^{IK}/FT.$

$d = 36 - 3\frac{1}{2} = 32.5"$ $F = \frac{(32.5)^2}{1000} = 1.0563$

$K_u' = \frac{203.1}{1.0563} = 192$ $A_s = .0042 \times 12 \times 32.5 = 1.64$

USE #11 @ 10" $A_s = 1.87$

BOT. REINFORCING - TRANSVERSE

MAX. $M_u = 1.2 \times \frac{(2.57-.45)(6)^2}{2} = 45.8^{IK}/FT.$

$d = 36 - 3 - 1\frac{1}{2} = 31.5"$ $F = \frac{(31.5)^2}{1000} = .9923$

$K_u = \frac{45.8}{.9923} = 46$ $A_s = .0015 \times 12 \times 31.5 = 0.57$

USE #8 @ 12 $A_s = 0.79$

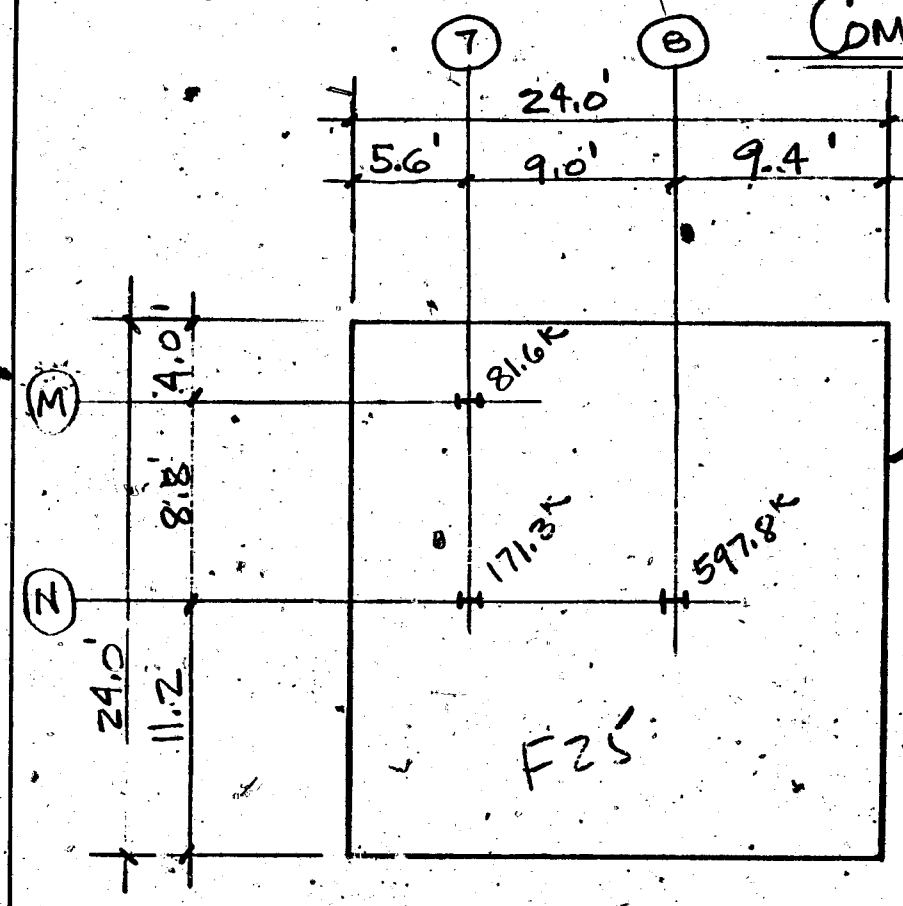
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COMBINED FOOTING



2 1/2'-0" THICK MAT
W = 0.45 KSF

81.6K x 5.6 = 457.0
171.3 x 5.6 = 959.3
597.8 x 14.6 = 8727.9
850.0K 10144.1 IK

$\bar{X} = \frac{10144.1}{850.0} = 11.93'$

$e = \frac{24.0'}{2} - 11.93 = .07'$

171.3K x 11.2 = 1918.6
597.8 x 11.2 = 6695.4
81.6 x 20.0 = 1632.0
850.0K 10,246.0

$\bar{Y} = \frac{10246.0}{850.0} = 12.05'$

$e = \frac{24.0}{2} - 12.05 = .05'$

$MAX. SP. = \frac{259}{(24)^2} + \frac{6 \times 259 \times (.05 + .07)}{24(24)^2} + .45 = 1.48 + .04 + .45$

$= 1.97$ KSF

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$$\text{MAX. } M_u = \frac{(1.97-.45)(12.8)^2}{2} \times 1.6 = 199.2 \text{ K'/FT.}$$

$d = 36 - 3\frac{1}{2} = 32.5''$ $\quad F = \frac{(32.5)^2}{1000} = 1.0563$

$$K_u = \frac{199.2}{1.0563} = 189$$

$A_s = .0037 \times 12 \times 32.5 = 1.44 \text{ in}^2/\text{FT.}$

USE #11@12" E.W. BOT.

USE 24 - #11 E.W. BOT.

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FTG. B-12

LL+DL = 213.7 + PIER = 9.6
DL = 28.4 + PIER = 9.6 K
SEISMIC = ± 190.7 K

USE FTG. 16'-0 x 11'-0 x 2'-0

F = 4.0)

CASE I, LL+DL+SEISMIC

S.B. = $\frac{213.7+9.6+190.7}{16\times11}$ + .30 = 2.65 K_{SF} < 2.66

CASE II, LL+DL

S.B. = $\frac{213.7+9.6}{16\times11}$ + .30 = 1.57 K_{SF} < 2.00

CASE III DL + UPLIFT

DL = 28.4
PIER = 9.6
FTG = 52.8
90.8 K − 93.4 K = − 2.6 K (UPLIFT)

REMAINING UPLIFT TAKEN BY WALLS

LONGIT. $M_u = 1.2 \frac{(2.65-.30)(8)^2}{2} = 90.2$ IK/FT.

d = 24 − 3½ = 20.5" $F = \frac{(20.5)^2}{1000} = .420$

$K_u = \frac{90.2}{.420} = 215$, $A_s = .0043 \times 12 \times 20.5 = 1.06$

1.06 x 11' = 11.7 IN²

USE 10 - #10 BOT. LONGIT.

TRANSVERSE $M_u = 1.2 \frac{(2.65-.30)(5.5)^2}{2} = 42.7$ IK/FT

d = 24 − 4½ = 19.5" $F = \frac{(19.5)^2}{1000} = .380$

$K_u = \frac{42.7}{.380} = 112$ $A_s = .0022 \times 12 \times 19.5 = 0.51$

16' x 0.51 = 8.16 IN²

USE 14 - #7 BOT. TRANSVERSE

USE #6 @ 16" E.W. TOP

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FTG. F-12

LL+DL = 324.0 + PIER = 9.6
DL = 157.5 + PIER = 9.6
SEISMIC = ± 93.6

USE FTG. 14'-6 x 14'-6 x 2'-3
W/ 12-#8 E.W. BOT.
F-26

CASE I, LL+DL+SEISMIC

$$SB = \frac{324.0 + 9.6 + 93.6}{(14.5)^2} + .34 = 2.37^{KSF} < 2.66$$

CASE II, LL+DL

$$SB = \frac{324.0 + 9.6}{(14.5)^2} + .34 = 1.93^{KSF} < 2.00$$

CASE III, DL + UPLIFT

DL = 157.5
PIER = 9.6
FTG. = 63.1
230.2^K > 93.6^K UPLIFT

FTG. J-12

LL+DL = 237.1 + PIER = 9.6
DL = 133.3 + PIER = 9.6
SEISMIC = ± 132.5

USE FTG. 13'-0 x 13'-0 x 2'-2
W/ 12-#7 E.W. BOT.
F-23

CASE I, LL + DL + SEISMIC

$$S.B. = \frac{237.1 + 9.6 + 132.5}{(13)^2} + .33 = 2.57^{KSF} < 2.66$$

CASE II LL + DL

$$S.B. = \frac{237.1 + 9.6}{(13)^2} + .33 = 1.79^{KSF} < 2.00$$

CASE III DL + UPLIFT

DL = 133.3 > 132.5 UPLIFT OK

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FTG. N-12

LL+DL = 231.5 + PIER = 9.6
DL = 111.3 + PIER = 9.6
SEISMIC (E-W) = ±132.5^K, ±147.5
SEISMIC (N-S) ± 247.7^K

USE FTG. 14'-6 x 14'-6 x 2'-3
W/ 12-#8 E.W. BOT.
& 12-#5 E.W. TOP

CASE I, LL+DL+SEISMIC

$S.B. = \frac{231.5 + 9.6 + 247.7}{(14.5)^2} + .34 = 2.66\ ^K/_{SF}$ OK

CASE II, LL+DL

$SB. = \frac{231.5 + 9.6}{(14.5)^2} + .34 = 1.47\ ^K/_{SF} < 2.00$

CASE III, DL + UPLIFT

DL = 111.3
PIER = 9.6
FTG = $(14.5)^2 \times 2.25 \times .15$ = 71.0
WALL = 16.5' x 25' x .10$^K/_{SF}$ = 41.3
EARTH = 7.0 x 14.5 x 12.5 x .10$^K/_{CF}$ = 126.9^K
360.1^K > UPLIFT 247.7^K

FTG. S-12

LL+DL = 160.6
DL = 80.3
SEISMIC = ±147.5

USE FTG. 12'-6 x 12'-6 x 3'-0
W/ 10-#7 E.W. BOT.
& 10-#6 E.W. TOP

CASE I LL+DL

$S.B. = \frac{160.6}{(12.5)^2} + .45 = 1.48\ ^K/_{SF} < 2.00$ F.S.

CASE II LL+DL+SEISMIC

$S.B. = \frac{160.6 + 147.5}{(12.5)^2} + .45 = 2.42 < 2.66$

CASE III DL+UPLIFT

$DL = 80.3 + (12.5)^2 \times 3.0 \times .15 = 150.6^K > 147.5$

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FTG. H-34

LL+DL = 21.2
DL = 11.9
SEISMIC = ±40.4

USE FTG. 9'-0 x 9'-0 x 2'-6
W/ 8-#5 E.W. BOT.
& 8 #5 E.W. TOP

CASE I, LL+DL

$S.B. = \frac{21.2}{(9)^2} + .38 = 0.64 \text{ KSF} < 2.00$ *

CASE II, LL+DL+SEISMIC

$SB = \frac{21.2 + 40.4}{(9)^2} + .38 = 1.14 \text{ KSF} < 2.66$

CASE III, DL + UPLIFT

$DL = 11.9 + (9)^2 \times 2.5 \times .15 = 42.3^K > 40.4$

FTG. M-34

LL+DL = 14.5
DL = 8.7
SEISMIC = ±40.4

USE FTG. 9'-6 x 9'-6 x 2'-6
W/ 8-#5 E.W. BOT.
& 8-#5 E.W. TOP

CASE I LL+DL

OK SEE (H-34)

F-.28

CASE II LL+DL+SEISMIC

OK (SEE H-34)

CASE III DL + UPLIFT

$DL = 8.7 + (9.5)^2 \times 2.5 \times .15 = 42.5^K > 40.4$

* See Rev Q-Calcs.

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PROJECT/ FTGS - COL G-32 & H-34

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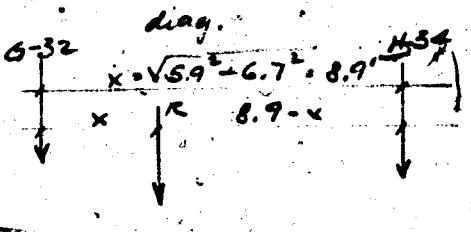
G-32	D	L	TL
4 R	12.5	8.4	20.9
2	105.4	70.2	175.6
Σ	117.9	78.6	196.5

H-34	D	L	TL	SEIS.
R	4.0	4.0	8.0	
2	7.9	5.3	13.2	
Σ	11.9	7.3	21.2	40.4

11' SQ x 1'-10 THK
A = 121 SF
9" wide x Long = 121
L = 13.44 = 13'-6"
A = 9 x 13.5 = 121.5 SF

9' SQ x 2'-6" TH PRIMARILY FOR HOLD DOWN
W = (9)² 2.5 (.150) = 30.38 K FTG DL
TRY 6' x 9' x 4' (.15) = 32.4 K

TRY COMBINED



TL
196.5 x = (8.9 - x) 21.2
x = .869'

TL + SEIS.
196.5 x = (8.9 - x) 61.6
x = 2.14'

TRY SEPARATE

H-34 6' x 9' x 4'

CASE I D + L
SB = 21.2/54 + .60 = .99 < 2.0

CASE II D + L + EQ
SB = 21.2 + 40.4/54 + .60 = 1.74 < 2.66

CASE III D + UPLIFT
DL = 11.9 + 54(.60) = 44.3 > 40.4

REINF 8 - #5 SHORT (14.5" oc)
8 - #5 LONG (9" oc)

W_{FTG} = .40 KSF

G-32 9' x 13'-6" x 2'-8"

REINF 13 #6 LONG.
13 #6 SHO.27

d = 32 - 5 = 27

CASE I = f_p^{D+L} = 196.5 ÷ (9' x 13.5) = 1.62 KSF < 2.0

L = 13.5 ÷ 2 = 6.75' V_u = 1.6 (196.5) = 314.40 K

$v_u = \frac{314400}{27(.85)6(12)} = 190$ psi <

$4\sqrt{f'_c}$ = 219

M_u = (1.6)1.62 (6.75)².5 = 59.05 K/ft x 9 = 531.5 K

$A_s = \frac{59.05(12)}{60(.9)27} = .49$ in² #6 @ 10" n = ½(13.5 ÷ 12) + 1 = 13 - #6 = 13(.44) = 5.72 in²

M_u capac = 5.72(60).9(27) ÷ 12 = 695 K > 531.5

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COL. A-12

LL+DL = 59.0 + PIER = 9.6
DL = 28.4 + PIER = 9.6
SEISMIC = ± 16.6

USE FTG. 6'-0 x 6'-0 x 1'-0
W/ 6 - #5 E.W. BOT.
F-9

CASE I, LL+DL

$S.B. = \frac{59.0+9.6}{(6)^2} + .15 = 2.05^{KSF} \simeq 2.00$

CASE II, LL+DL+SEISMIC

$S.B. = \frac{51.0+9.6+16.6}{(6)^2} + .15 = 2.52^{KSF} < 2.66$

CASE III, DL+UPLIFT

DL = 28.4 > 16.6 UPLIFT OK

COL. A-14

LL+DL = 140.4
DL = 57.0
SEISMIC = ± 102.0^K

USE FTG. 10'-6 x 10'-6 x 3'-0
W/ 8 - #6 E.W. BOT.
& 8 - #5 E.W. TOP
F-38

CASE I, LL+DL

$S.B. = \frac{140.4}{(10.5)^2} + .45 = 1.72^{KSF} < 2.00$

CASE II LL+DL+SEISMIC

$SB = \frac{140.4+102.0}{(10.5)^2} + .45 = 2.65^{KSF} < 2.66$

CASE III, DL + UPLIFT

$DL = 57.0 + (10.5)^2 \times 3 \times .15 = 106.6^K > 102.0$

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COL. B-10

LL+DL = 93.8
DL = 46.9
SEISMIC = ±190.7

USE FTG. 8'-0 x 24'-0 x 5'-0

CASE I LL+DL

$S.B. = \frac{93.8}{8 \times 24} + .75 = 1.24^{KSF} < 2.00$

CASE II LL+DL+SEISMIC

$SB = \frac{93.8 + 190.7}{8 \times 24} + .75 = 2.23 < 2.66$

CASE III DL+UPLIFT

$DL = 46.9 + 8 \times 24 \times 5 \times .15 = 190.9^{K} > 190.7$

$MAX.\ M_u = 1.2 \frac{(2.23 - .75)(12)^2}{2} = 127.9^{1K/FT.}$

$d = 60 - 3\frac{1}{2} = 56.5"$ $\quad F = \frac{(56.5)^2}{1000} = 3.1923$

$K_u = \frac{127.9}{3.1923} = 40$ $\quad A_s = .0010 \times 12 \times 56.5 = 0.68$

USE 7-#8 BOT LONGIT.
USE 16-#6 BOT: TRANSV.
USE #6 @ 16" E.W. TOP

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COL. N-11

LL+DL = 222.9 K
DL = 111.5 K
SEISMIC = ± 247.7 K

USE FTG. 18'-0 x 13'-0 x 4'-0.

CASE I, LL+DL

$S.B. = \frac{222.9}{18 \times 13} + .60 = 1.55 \text{ KSF} < 2.00$

CASE II LL+DL+SEISMIC

$S.B. = \frac{222.9 + 247.7}{18 \times 13} + .60 = 2.61 \text{ KSF} < 2.66$

CASE III DL+UPLIFT

$DL = 111.5 + 18 \times 13 \times 4 \times .15 = 251.9 \text{ K} > 247.7$

$\text{MAX. } M_u = 1.2 \frac{(2.61 - .60)(9)^2}{2} = 97.7 \text{ IK/FT.}$

$d = 48 - 3\frac{1}{2} = 44.5"$ $\quad F = \frac{(44.5)^2}{1000} = 1.9803$

$K_u = \frac{97.7}{1.9803} = 49$ $\quad A_s = .0010 \times 12 \times 44.5 = 0.53$

USE 12 - #7 BOT. LONGIT.

USE 14 - #7 BOT. TRANSV.

USE #6 @ 16" E.W. TOP

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FTG. P-15

LL+DL = 132.2K
DL = 52.9K
SEISMIC = ± 31.6K

USE FTG. 9'-0 x 9'-0 x 2'-0
W/ 8-#6 E.W. BOT.
& 8-#5 E.W. TOP

CASE I, LL+DL

$S.B._1 = \frac{132.2}{(9)^2} + .30 = 1.93^{KSF} < 2.00$

CASE II LL+DL+SEISMIC

$S.B._1 = \frac{132.2 + 31.6}{(9)^2} + .30 = 2.32^{KSF} < 2.66$

CASE III DL + UPLIFT

$DL = 52.9^K > 31.6^{UPLIFT}$

FTG. P-21

LL+DL = 88.9
DL = 44.5
SEISMIC = ±31.6

USE FTG. 7'-6 x 7'-6 x 2'-0
W/ 7-#5 E.W. BOT.
& 5-#5 E.W. TOP

CASE I, LL+DL

$S.B._1 = \frac{88.9}{(7.5)^2} + .30 = 1.88^{KSF} < 2.00$

CASE II, LL+DL+SEISMIC

$S.B._1 = \frac{88.9 + 31.6}{(7.5)^2} + .30 = 2.44^{KSF} < 2.66$

CASE III, DL + UPLIFT

$DL = 44.5 > 31.6$

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FTG. Q-13

LL+DL = 25.9
DL = 11.6
SEISMIC = ± 80.5

USE FTG. 11'-0 x 11'-0 x 4'-0
W/ 9-#6 E.W. BOT.
& 9-#5 E.W. TOP

CASE I, LL+DL

$S.B._1 = \frac{25.9}{(11)^2} + .60 = 0.81 \text{ KSF} < 2.00$

CASE II, LL+DL+SEISMIC

$SB = \frac{25.9 + 80.5}{(11)^2} + .60 = 1.48 \text{ KSF} < 2.66$

CASE III, DL+UPLIFT

$DL = 11.6 + 11 \times 11 \times 4 \times .15 = 84.2^{K} > 80.5$

FTG. Q-15

LL+DL = 20.2
DL = 9.0
SEISMIC = ± 80.5

USE FTG. 11'-0 x 11'-0 x 4'-0
W/ 9-#6 E.W. BOT.
& 9-#5 E.W. TOP

CASE I, LL+DL

$SB = \frac{20.2}{(11)^2} + .60 = 0.77 \text{ KSF} < 2.00$

CASE II, LL+DL+SEISMIC

$S.B._1 = \frac{20.2 + 80.5}{(11)^2} + .60 = 1.43 \text{ KSF} < 2.00$

CASE III, DL+UPLIFT

$DL = 9.0 + 11 \times 11 \times 4 \times .15 = 81.6^{K} > 80.5$

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FTG. T-7

LL+DL = 245.2 K
DL = 122.6
SEISMIC = ± 22.1

AN F-22 FTG. IS OK BY INSPECTION.

FTG. U-7

LL+DL = 104.7 K
DL = 52.3 K
SEISMIC = ± 83.8 K

USE FTG. 9'-6 x 9'-6 x 3'-0
W/ 8 - #6 E.W. BOT.
& 8 - #5 E.W. TOP

CASE I, LL+DL

$SB = \frac{104.7}{(9.5)^2} + .45 = 1.61 < 2.00$

CASE II, LL+DL+SEISMIC

$SB = \frac{104.7 + 83.8}{(9.5)^2} + .45 = 2.53 < 2.66$

CASE III, DL + UPLIFT

$DL = 52.3 + (9.5)^2 \times 3 \times .15 = 92.9^K > 83.8$

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FTG. U-9

LL+DL = 129.4
DL = 64.7
SEISMIC = ±83.8

USE FTG. 10'-0 x 10'-0 x 2'-6
W/ 8-#6 E.W. BOT.
8-#5 E.W. TOP

CASE I, LL+DL

$S.B. = \frac{129.4}{(10)^2} + .38 = 1.66^{K}_{SF} < 2.00$

CASE II, LL+DL + SEISMIC

$S.B. = \frac{129.4 + 83.8}{(10)^2} + .38 = 2.50^{K}_{SF} < 2.66$

CASE III, DL + UPLIFT

$DL = 64.7 + (10)^2 \times 2.5 \times .15 = 102.2^{K} > 83.8$

FTG. R-1

LL+DL = 94.6K
SEISMIC = 0

USE FTG. 5'-0 x 11'-0 x 2'-6

$S.B. = \frac{94.6}{5 \times 11} + .23 = 1.95^{K}_{SF} < 2.00$

LONGIT. $M_u = 1.6 \frac{(1.95 - .23)(5.5)^2}{2} = 41.6^{IK}/_{FT.}$

$d = 30 - 3\frac{1}{2} = 26.5"$ $\quad F = \frac{(26.5)^2}{1000} = .7023$

$K_u = \frac{41.6}{.7023} = 59$ $\quad A_s = .0010 \times 12 \times 26.5 = 0.32$

USE 4-#6 BOT. LONGIT.

USE 10-#5 BOT. TRANSV.

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FTG. AT 12.4

L.L + D.L = 0
D.L = 0
SEISMIC = ± 85.4K

F-7

USE FTG. 16'-0 x 12'-0 x 4'-0
W/ 10 - #6 E.W. BOT.
& 10 - #5 E.W. TOP

CASE I, SEISMIC DOWN

$SB = \frac{85.4}{12 \times 16} + .60 = 1.04 \text{ KSF} < 2.66$

CASE II, SEISMIC UPLIFT.

$D.L = 16' \times 12' \times 4' \times .15 = 115.2^K > 85.4$

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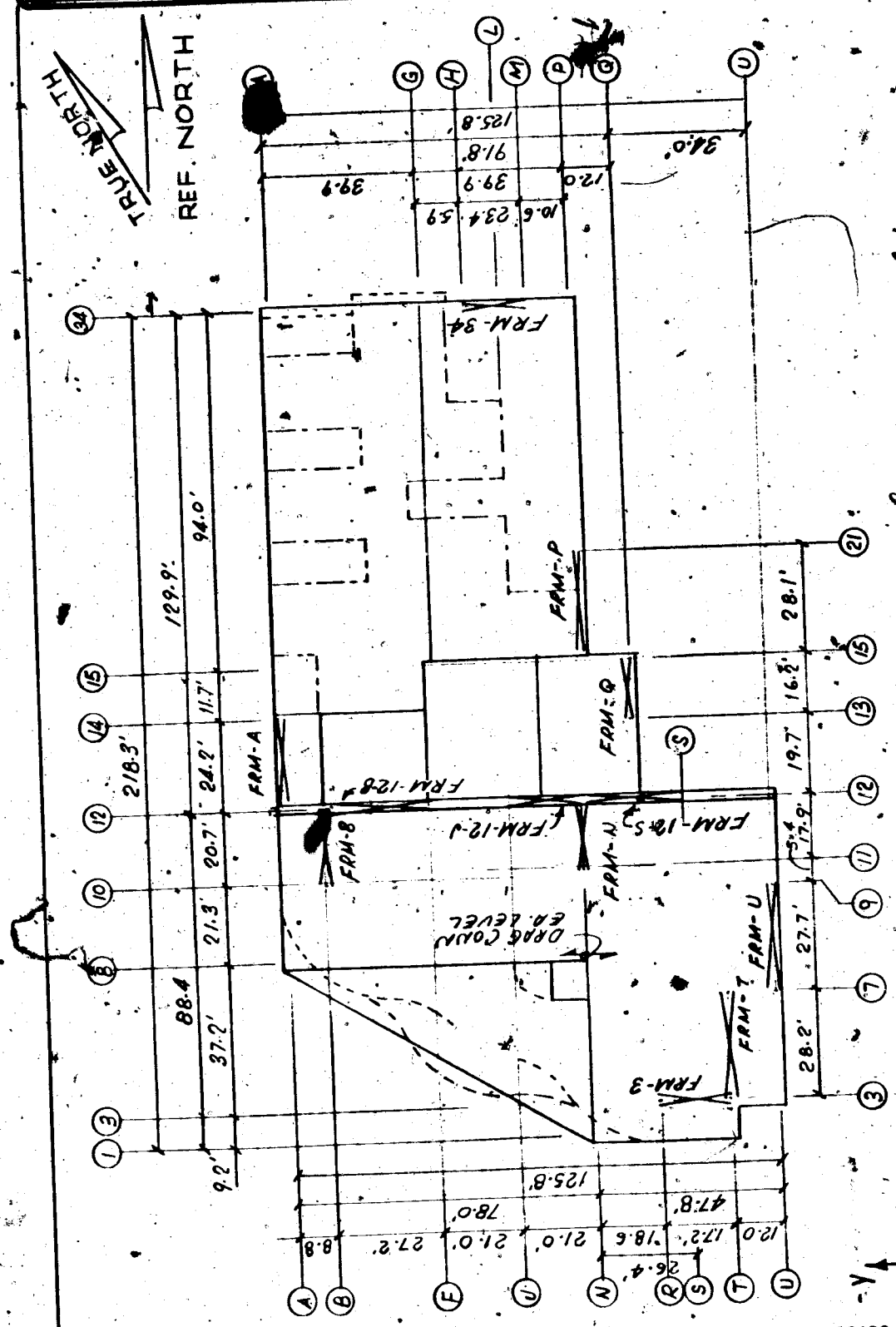
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LATERAL ANALYSIS



DLAN CONFIGURATION for LATERAL ANALYSIS

SCALE: 1" = 40'

NOTE: DASHED LINES INDICATE THE OUTLINE OF ACTUAL STRUCTURE WHERE IT DEPARTS FROM THE ANALYTICAL MODEL SHOWN IN HARD LINE.

X- FRAMES ARE NAMED WITH RESPECT TO THE COL. GRID ON WHICH THEY APPEAR.

XX INDICATES "X-BRACED" FRM.

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5TH LEVEL DIAPHRAGMS (FUTURE ROOF)

SEISMIC LOADS: (F_x/w_x) (100% GLOADS)
5TH LEVEL EL 160-0 = (26.3/168.3) (do) (30.1/198.1) (do)
5TH LEVEL EL 156-0 = (30.1/198.1) (do)

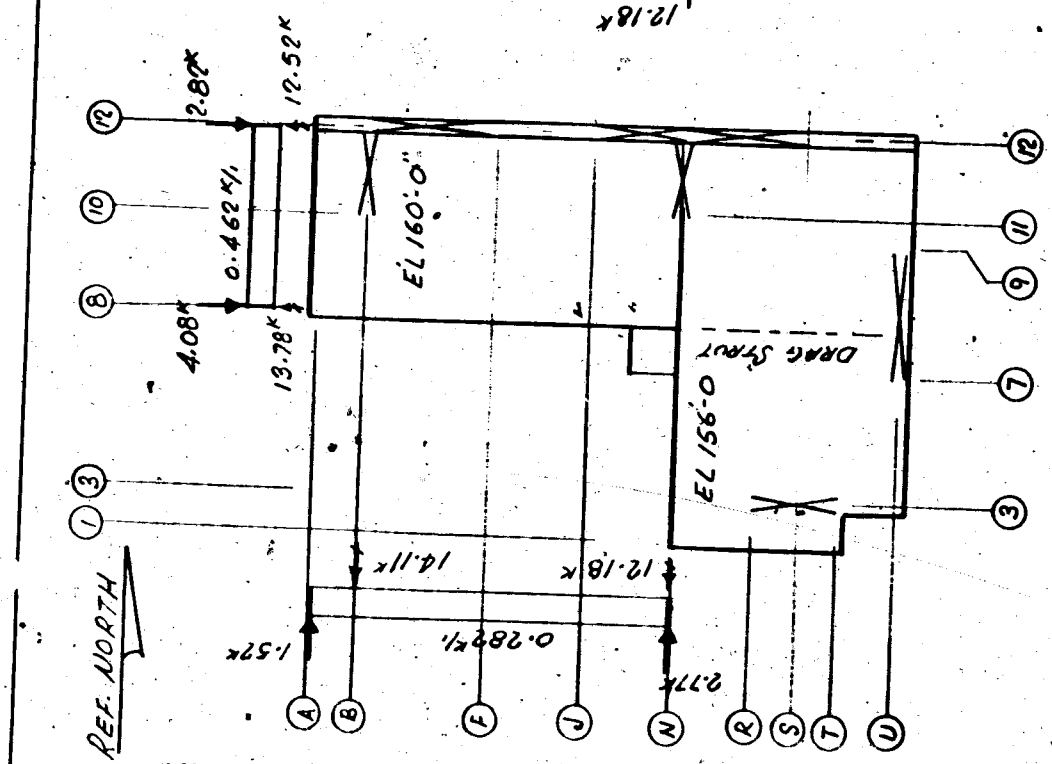
E-W
(26.3/168.3) (104.8K/42') = 0.390K/'
(do) (19.4K/42') = 0.072K/'
0.462K/'
(do) (36.1/2) = 2.82K
(do) (36.1/2 + 8.0) = 4.08K

N-S
(26.3/168.3) (104.8K + 36.1K)/78' = 0.282K/'
(do) (19.4/2) = 1.52K
(do) (19.4K + 8.0K) = 2.77K

E-W
(30.1/198.1) (135.2K + 40.8K)/88.4' = 0.303K/'
(do) (22.1/2) = 1.67K

N-S
(30.1/198.1) (135.2K + 22.1K)/47.8' = 0.500K/'
(do) (40.8K/2) = 3.10K

NOTE: FLEXIBLE DIAPHRAGM AT ROOF
∴ LOADS TO FRMS BY TRIB AREAS



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4TH LEVEL DIAPHRAGMS (FUTURE FLR)

SEISMIC LOAD'G = $(F_x/\omega_x)(100\%\ G\ LOADS)$

4TH LEVEL EL 146-0 = $(45.1/352.4)$ (d_G) (d_S)

4TH LEVEL EL 142-0 = $(48.9/449.5)$ (d_G) (d_S)

EL 146-0

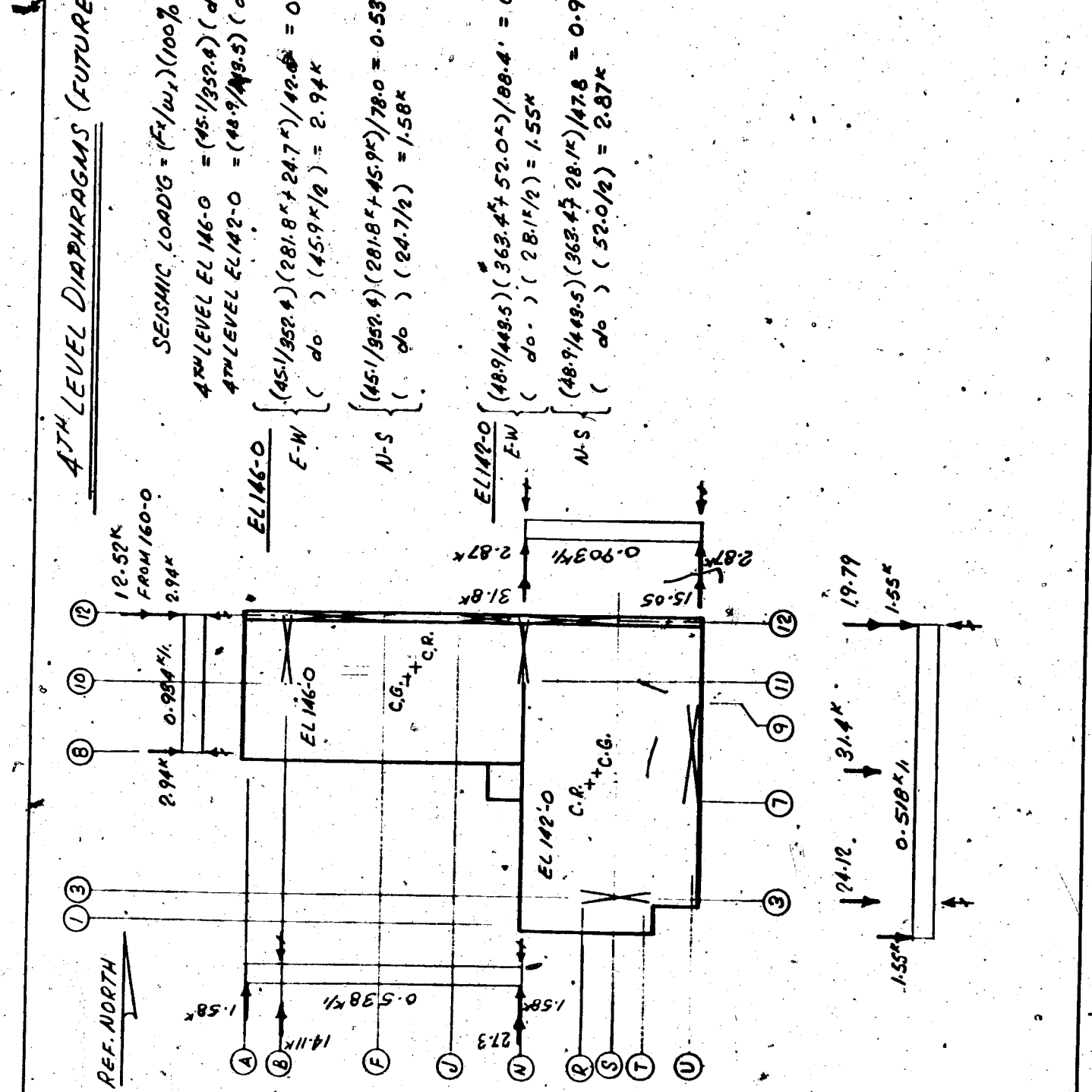
E-W { $(45.1/352.4)(281.8^K + 24.7^K)/42.6 = 0.934^{K/'}$; (do) $(45.9^K/2) = 2.94^K$

N-S { $(45.1/352.4)(281.8^K + 45.9^K)/78.0 = 0.538^{K/'}$; (do) $(24.7/2) = 1.58^K$

EL 142-0

E-W { $(48.9/449.5)(363.4^K + 52.0^K)/88.4' = 0.518^{K/'}$; (do) $(28.1^K/2) = 1.55^K$

N-S { $(48.9/449.5)(363.4^K + 28.1^K)/47.8 = 0.903^{K/'}$; (do) $(52.0/2) = 2.87^K$



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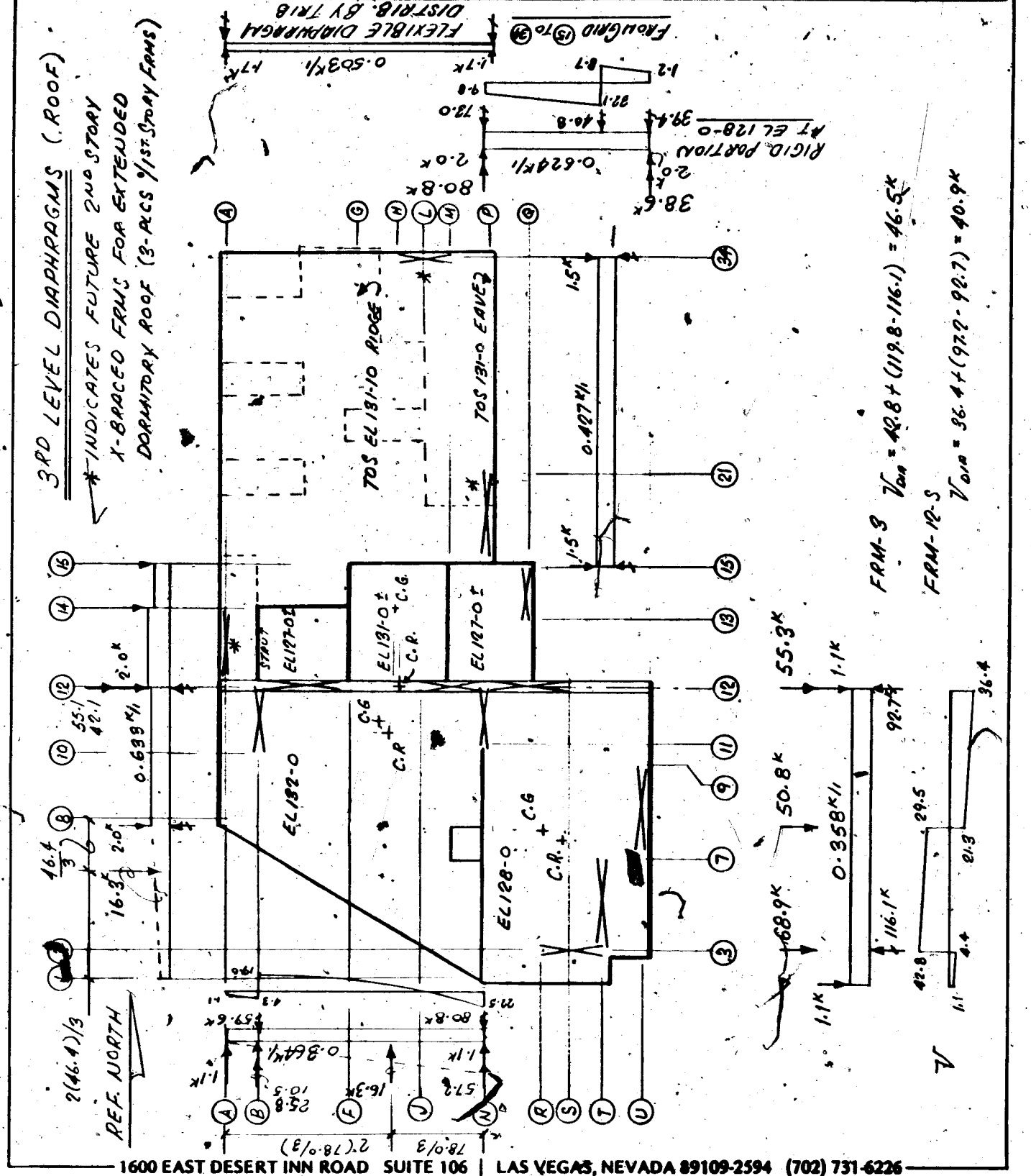
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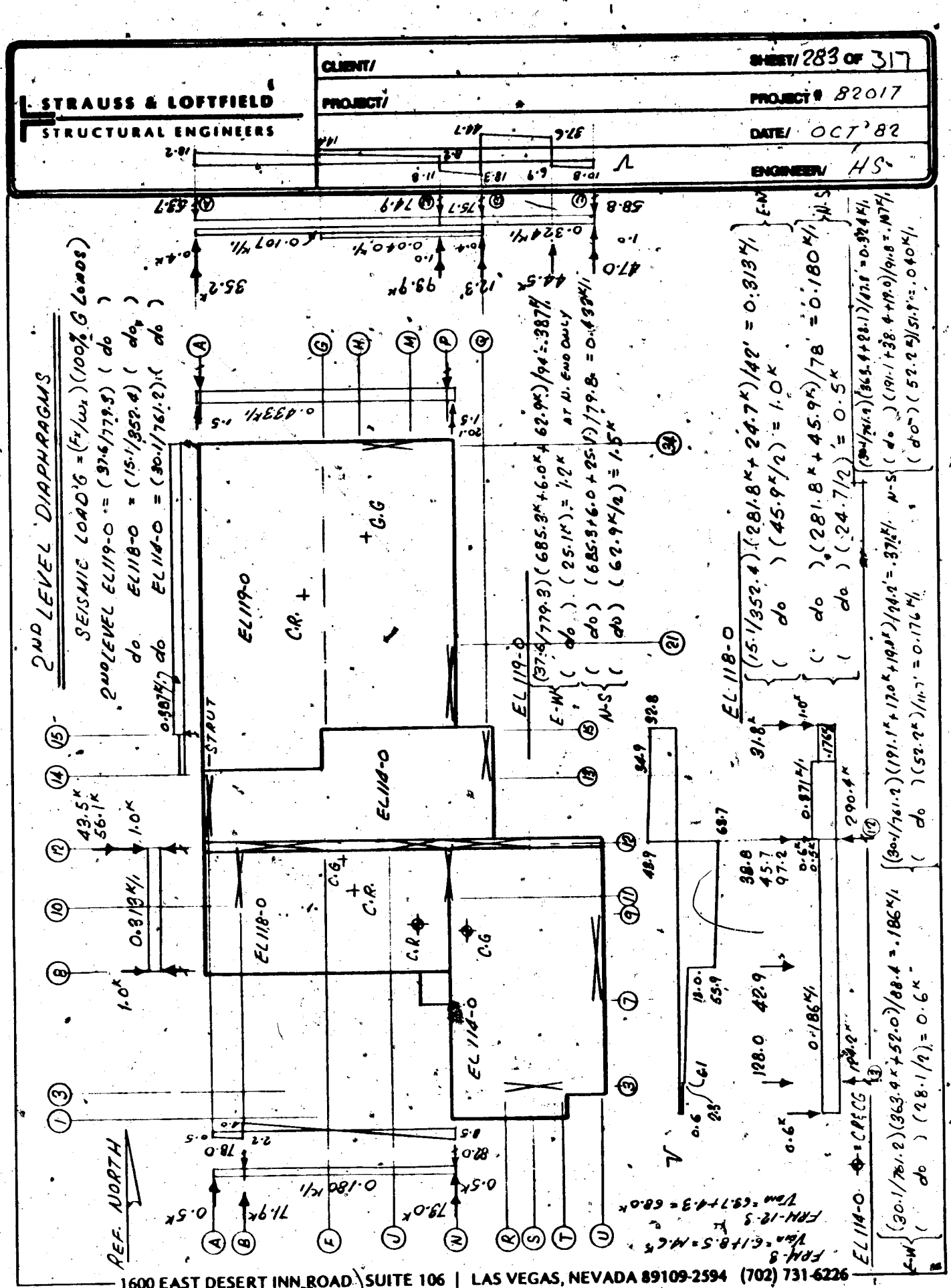
2ND LEVEL DIAPHRAGMS

SEISMIC LOAD'G = $(F_x/\omega_x)(100\%\ G\ Loads)$

2ND LEVEL EL 119-0 = (37.6/779.3) (do) (25.1#) = 1.2#

do EL 118-0 = (15.1/352.4) (do) (25.1#) = 1.0#

do EL 114-0 = (30.1/761.2) (do) (52.2#) = 1.5#



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LATERAL ANALYSIS

GRAVITY LOADS

5TH LEVEL (FUTURE ROOF) [FLEXIBLE DIAPHRAGM → DISTR. BY TRIB.]

EL 160'-0 ROOF & PARTITIONS (42'x78')(.022K/□ + .010K/□) = 104.8K
WALLS: E&W 2(7.0+4.0')(.021K/□)(42.0') = 19.4K
N&S 2(do+do)(do)(78.0') = 36.1K
160.3K

EL 156'-0 ROOF & PARTITIONS (47.8'x88.4')(.022K/□ + .010K/□) = 135.2K
WALLS: E&W 2(7.0+4.0)(.021K/□)(88.4') = 40.8K
N&S 2(do+do)(do)(47.8') = 22.1K
198.1K

EL 160'-0 PENTHOUSE & MECH. EQUIP 8.0K

4TH LEVEL (FUTURE FLR) [RIGID DIAPHRAGM → DISTR. BY C.G. & C.R.]

EL 146'-0 FLR & PARTITIONS (42'x78')(.086K/□) = 281.8K
WALLS: E&W 2(14.0')(.021K/□)(42.0') = 24.7K
N&S 2(do)(do)(78.0') = 45.9K
352.4K

EL 142'-0 FLR & PARTITIONS (47.8'x88.4')(.086K/□) = 363.4K
WALLS: E&W 2(14.0)(.021K/□)(88.4') = 52.0K
N&S 2(do)(do)(47.8') = 28.1K
443.5K

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LATERAL ANALYSIS

GRAVITY LOADS

3RD LEVEL (PRESENT ROOF) [RIGID DIAPHRAGM → DISTR. BY C.R. & C.G. & FLEXIBLE " PORTION → DISTR. BY TRIB.]

EL 131'-10 "FLEXIBLE" ROOF PORTION

ROOF & PARTITIONS (.022K/□ F. .020K/□)(39.9')(105.7+94.0) = 334.7K
WALLS: E&W - (12/2 + 3')(.021K/□)(105.7+94.0) = 37.8K
N&S BTWN (do) (do)(79.8)(6) = 90.5K
463.0K

EL 130'-131' "RIGID" PORTION @ MECH FAN RM.

ROOF (29.3' x 35.9')(.072K/□) = 75.8K
WALLS E&W (17/2 + 1')(.015K/□)(35.9')(2) = 10.3K
N&S (do)(do)(29.3)(2) = 8.4K
94.5K

EL 127' AVG "RIGID" PORTION @ GAME RM

ROOF (24.2' x 31.3')(.072K/□) = 54.6K
WALLS: W (13/2 + 7)(.021K/□)(24.2') = 6.9K
N (13/2 + 7)(do)(31.3') = 8.9K
MECH EQUIP 2(1K EA) + 1(5.6K) = 7.6K
78.0K

EL 127' AVG "RIGID" PORTIONS @ MECH CHILLER RM.

ROOF (22.6' x 35.9')(.072K/□) = 58.4K
WALLS: E (13/2 + 7)(.021K/□)(35.9') = 10.2K
N (do)(do)(22.6) = 6.4K
MECH EQUIP 2(3K EA) = 6.0K
81.0K

EL 132'-0 "RIGID" PORTION AT ADMIN AREA (FUTURE)

ROOF/FLR (42' x 78')(.086K/□) = 281.8K
ROOF (1/2)(46.4 x 78')(.082K/□) = 148.4K
WALLS: E&W 2(14.0')(.021K/□)(42') = 24.7K
N&S 2(do)(do)(78') = 45.9K
ENTRANCE (15+6)(do)(91') = 40.1K
540.9K
1257.4K

EL 128'-0 "RIGID" PORTION AT ADMIN AREA (FUTURE)

ROOF/FLR (47.8 x 88.4)(.086K/□) = 363.4K
WALLS: E&W 2(14.0')(.021K/□)(88.4') = 52.8K
N&S 2(do)(do)(47.8') = 28.1K
443.5K

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CLIENT/
PROJECT/
SHEET/ 286 OF 317
PROJECT # 82011
DATE/ OCT '82
ENGINEER/ HS

LATERAL ANALYSIS

GRAVITY LOADS

2ND LEVEL

[RIGID DIAPHRAGM → DISTR. BY C.R. & C.G.]

EL 119'-0

FLR	(.086 K/ℓ)(39.9)(105.7 + 94.0)	=	685.3K
WALLS: E&W	(9.5+5.5)(.021 K/ℓ)(105.7+94.0')	=	62.9K
N	(do)(do)(79.8')	=	25.1K
MECH EQUIP	2(1.0 K/EA) + 1(2.5 K/EA) + 3(0.5 K/EA)	=	6.0K
			779.3K

EL 118'-0

FLR	(.086 K/ℓ)(42' x 78')	=	281.8K
WALLS: E&W	2(14.0)(.021 K/ℓ)(42.0')	=	24.7K
N	(do)(do)(78.0')	=	45.9K
			352.4K

EL 114'-0

MECH FLR	(.086 K/ℓ)(24.2' x 91.8')	=	191.1K
do	(do)(11.7 x 51.9')	=	52.2K
WALLS: E&W	(13.5')(.021 K/ℓ)(24.2+35.9')	=	17.8K
N	(13.5')(do)(91.8)	=	26.0K
S	(do)(.010 K/ℓ)(do)	=	12.4K
MECH EQUIP	(1.8K + 3.2K + 2.5K) + 3(0.5K) + 2(5.0K)	=	19.0K
			317.7K

EL 114'-0

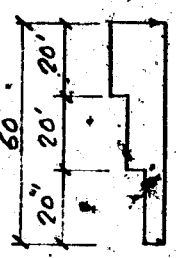
FLR	(.086 K/ℓ)(47.8' x 88.4')	=	363.4K
WALLS: E&W	2(14.0)(.021 K/ℓ)(88.4')	=	52.0K
N&S	2(do)(do)(47.8')	=	28.1K
			443.5K

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WIND BASE-SHEAR



$P = C_e C_q q_s I$

$P_1 = 1.5\ (1.4)\ (15PSF)\ (1.15) = 36.3$ PSF
$P_2 = 1.3\ (\ do\ )\ (\ do\ )\ (\ do\ ) = 31.4$ PSF
$P_3 = 1.2\ (\ do\ )\ (\ do\ )\ (\ do\ ) = 29.0$ PSF

$W_{N-S} = [(36.3 \times 20') + (31.4 \times 20') + (29.0 \times 13')]\ (128')/10^3 = 222$ K

$W_{E-W} = \{[\ do\ ](90') + [(31.4 \times 12') + (29.0 \times 13')](130')\}/10^3 = 254$ K

SEISMIC BASE-SHEAR

$V = ZIKCSW = (3/8)(1.5)(1.0)(0.14)W = 0.079\ W$

$V = 0.079\ (4756^K) = 376^K$ < WIND ∴ SEISMIC GOVERNS N-S & E-W

	w_x	h_x	$w_x h_x$	$\frac{w_x h_x}{\Sigma w_x h_x}$	F_x	V_x	h	$V_x h + \Delta M_x$	M_x
ROOF 160'-0	168.3	60	10098	0.07	26.3	—	—	—	
ROOF 156'-0	198.1	56	11094	0.08	30.1	26.3			FRMS M_x
4TH 146'-0	352.4	46	16210	0.12	45.1	56.4			
4TH 142'-0	443.5	42	18627	0.13	48.8	101.5			
3RD 132'-0	1257.4	32	40237	0.29	109.0	150.4	SEE	INDIVIDUAL FOR ΔM_x	
3RD 128'-0	443.5	28	12418	0.09	33.8	259.4			
2ND 119'-0	779.3	19	14807	0.10	37.6	293.2			
2ND 118'-0	352.4	18	6343	0.04	15.1	330.8			
2ND 114'-0	761.2	44	10657	0.08	30.1	345.9			
E	4756.1	—	140491		376.0	376.0			

$T = \frac{0.05\ h_n}{\sqrt{D}} = \begin{cases} (.05 \times 80)/\sqrt{88.4} = 0.32\ \text{SEC N-S} \\ (.05 \times 80)/\sqrt{125.8} = 0.27\ \text{SEC E-W} \end{cases} > 0.7\ \text{SEC} \therefore F_t = 0$

$F_x = \frac{(V - F_t)\ w_x h_x}{\Sigma_{i=1}^{n} w_i h_i}$

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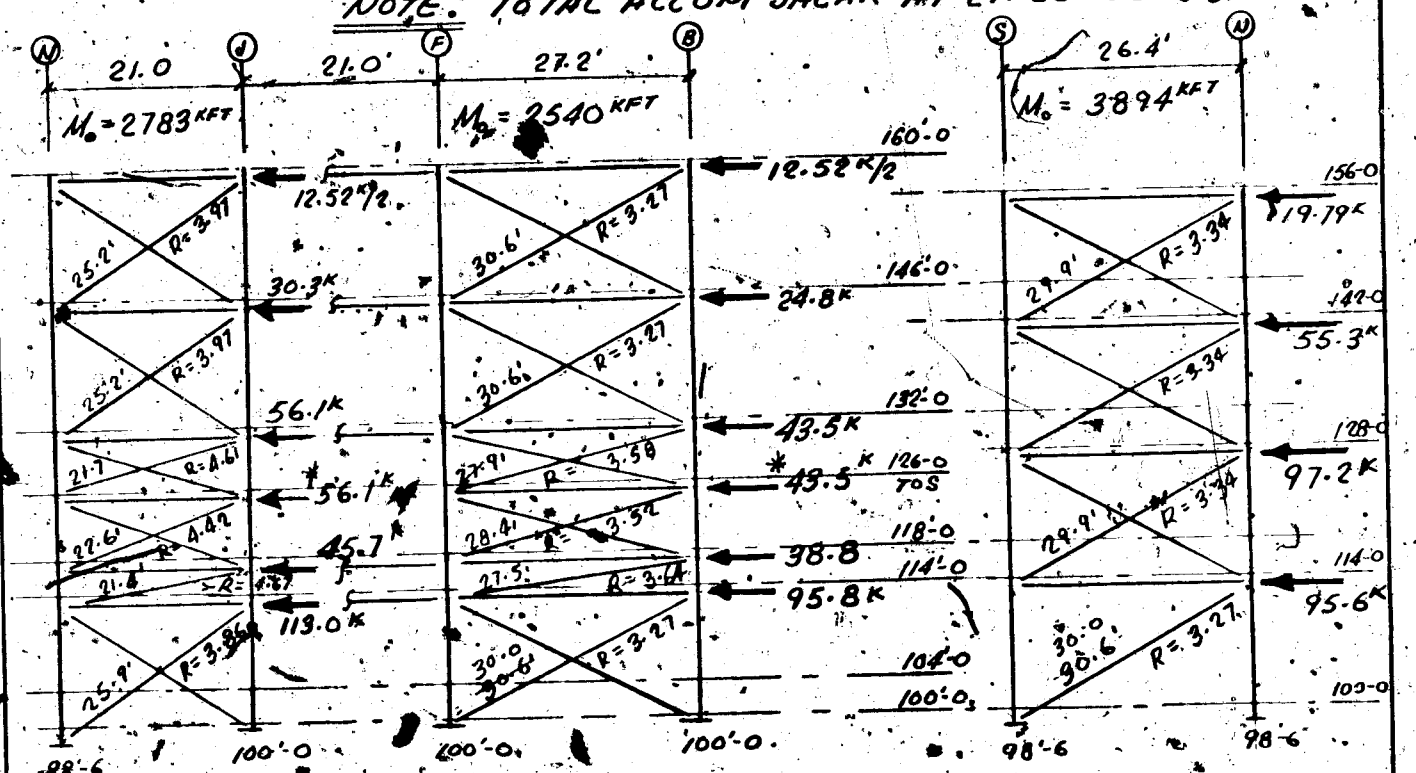
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BRACED FRMS.

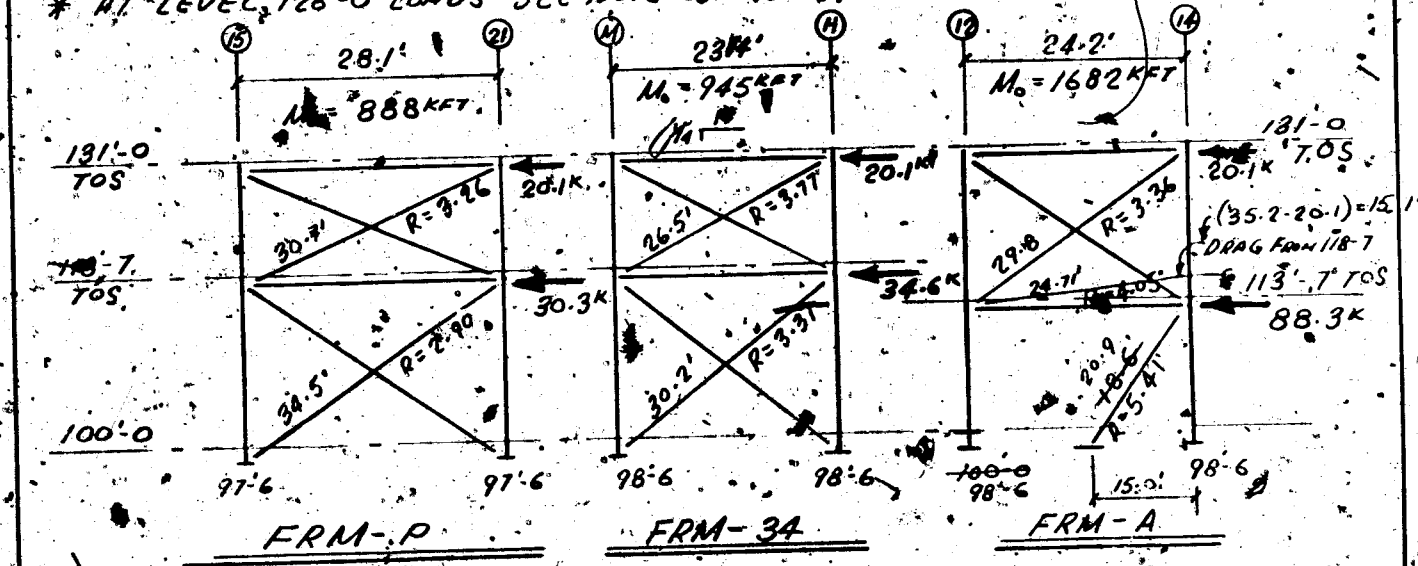
NOTE: TOTAL ACCUM SHEAR AT EA LEVEL IS SHOWN



FRMS 12-J & 12-B

FRM - 12-S

* AT LEVEL 126'-0 LOADS - SEE NOTE SHT NO 294



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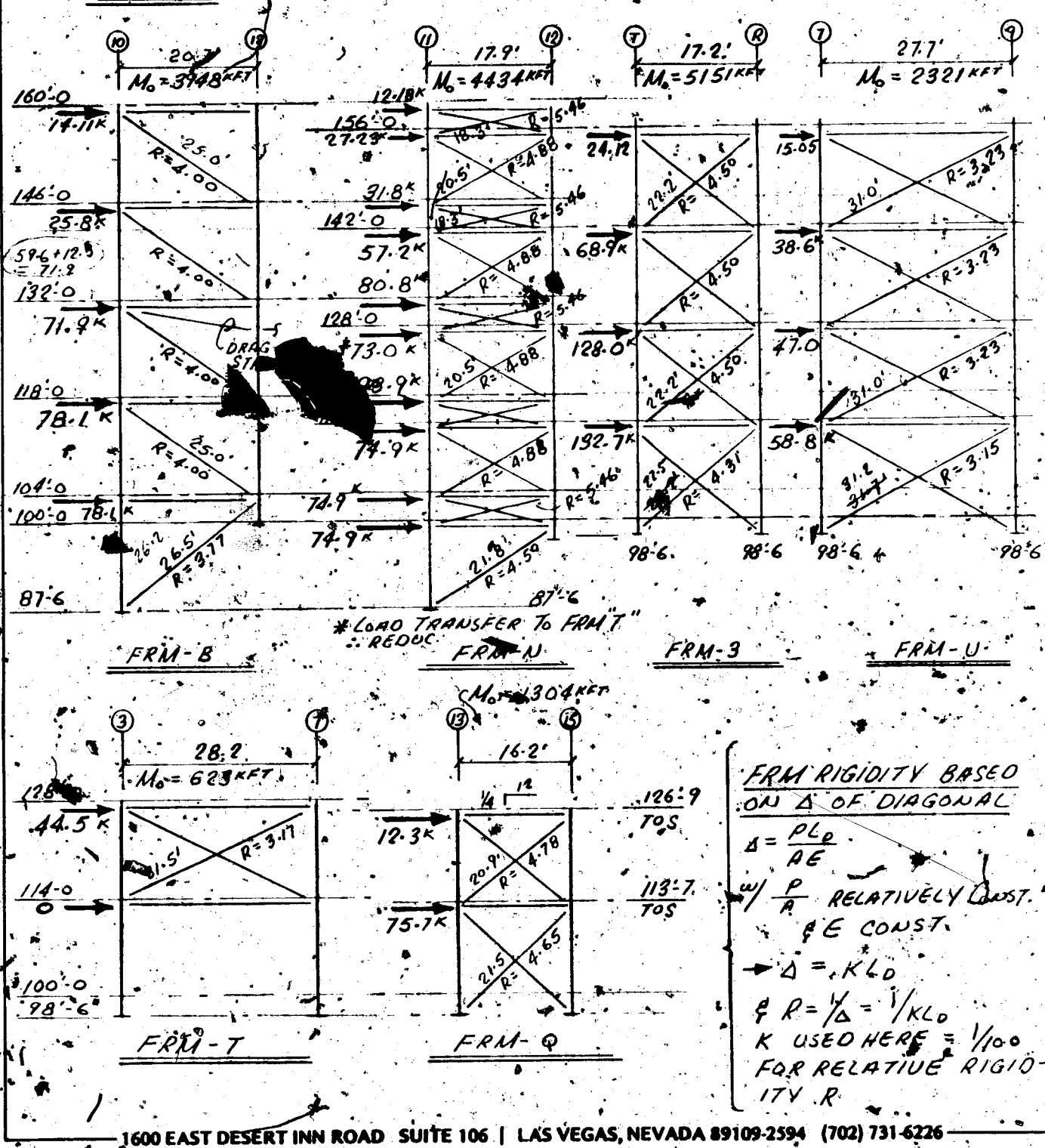
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BRACED FRMS

NOTE: TOTAL ACCUM SHEAR AT EA LEVEL IS SHOWN



FRM RIGIDITY BASED ON Δ OF DIAGONAL

$\Delta = \frac{PL_D}{AE}$

w/ $\frac{P}{A}$ RELATIVELY CONST. & E CONST.

$\rightarrow \Delta = KL_D$

& $R = 1/\Delta = 1/KL_D$

K USED HERE = 1/100 FOR RELATIVE RIGIDITY R

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CENTER OF RIGIDITY C.R. & CENTER OF GRAVITY C.G.

• 4TH LEVEL EL 146-0

C.R. N-S EM_{12}

FRM	R	X	R(x)
12-B	3.27	0	0
12-J	3.97	0	0
8	3.92	42.0	164.64
	ER = 11.16		ER(x) = 164.64

C.R. E-W EM_A

	R	Y	R(Y)
B	6.00	8.80	35.20
N	3.46	78.00	425.88
	ER = 9.46		ER(y) = 461.08

$\bar{x} = ER(x)/ER = 14.7'$ SOUTH OF GRID 12

$\bar{y} = ER(y)/ER = 48.7'$ EAST OF GRID A

C.G. E-W EM_A

P	Y	P(Y)
1.58K	0	0
14.11K	8.8	124.2
28.88K	78.0	2252.6
41.96K	39.0	1636.4
86.53K		4013.2 KFT

$\bar{y} = EP(y)/EP = 46.4'$ EAST OF GRID A

C.G. N-S EM_{12}

	X	P(X)
15.46K	0	0
2.94K	42.0	123.5
39.23K	21.0	823.8
57.63K		947.3 KFT

$\bar{x} = EP(x)/EP = 16.4'$ SOUTH OF GRID 12

$e_x = (16.4' - 14.7') = 1.7'$
$e_y = (48.7' - 46.4') = 2.3'$

4TH LEVEL EL 142-0

FRM	R	X	R(x)
12-S	3.34	0	0
3	4.50	79.2	356.40
	7.84		356.40

$\bar{x} = 45.5'$

	Y	R(Y)
N	4.88	78.0	380.64
U	3.23	125.8	406.33
	8.11		786.97

$\bar{y} = 97.0'$

C.R. $\bar{x} = 45.5'$ SOUTH OF GRID 12
$\bar{y} = 97.0'$ EAST OF GRID A

P	X	P(x)
21.34	0	0
31.4	42.0	1318.8
24.12	79.2	1910.3
1.55	88.4	137.0
45.79	44.2	2023.9
124.20		5390.0

$\bar{x} = 43.4'$

Y	P(Y)
34.67	78.0	2704.3
17.92	125.8	2254.3
43.16	101.9	4398.0
95.75		9356.6

$\bar{y} = 97.7$

$e_x = (45.5 - 43.4') = 2.1'$
$e_y = (97.7 - 97.0) = 0.7'$

C.G. $\bar{x} = 43.4'$ S. OF GRID 12
$\bar{y} = 97.7'$ E. OF GRID A

Lic. Columns 12-19-84

4TH LEVEL RIGID DIAPHRAGMS

EL 146'-0"

N-S { $P = 57.6^K$; $M = P(e_y) = P(2.9') = 132.5^{KFT}$; $M_T = P(0.05 \times 78') = 224.6^{KFT}$

E-W { $P = 86.5^K$; $M = P(e_x) = P(1.7') = 147.1^{KFT}$; $M_T = P(0.05 \times 78') = 337.4^{KFT}$

FRM	R	d	Rd	Rd^2	$P_{N-S}\frac{R}{\Sigma R}$	$M\frac{Rd}{\Sigma Rd^2}$	$M_T\frac{Rd}{\Sigma Rd^2}$	F	V_{DIA}
B	4.00	39.9	160	6368	24.4	+ 1.4	± 2.3	26.7	25.8
N	5.46	(29.3)	160	4687	33.2	- 1.4	± 2.3	35.5	31.8
ΣR = 9.46					57.6			62.2	57.6
12-B	3.27	14.7	48	707	—	- 0.4	± 0.7	LESS CRITICAL THAN E-W LOAD'G	
12-J	3.97	14.7	59	858	—	- 0.5	± 0.8		
8	3.92	(27.3)	107	2922	—	+ 0.9	± 1.5		
ΣR = 11.16			ΣRd^2 = 15542						

$P_{E-W}\frac{R}{\Sigma R}$	$M\frac{Rd}{\Sigma Rd^2}$	$M_T\frac{Rd}{\Sigma Rd^2}$	F	V_{DIA}
—	± 1.5	± 3.5	LESS CRITICAL THAN N-S LOAD'G	
—	- 1.5	± 3.5		
25.3	- 0.5	± 1.0	26.3	24.8
30.8	- 0.5	± 1.3	32.1	30.3
30.4	+ 1.0	± 2.3	32.7	31.4
86.5			91.1	86.5

EL 142'-0"

N-S { $P = 95.8^K$; $M = P(e_y) = P(0.7') = 67.1^{KFT}$; $M_T = P(0.05 \times 88.4') = 428.5^{KFT}$

E-W { $P = 124.2^K$; $M = P(e_x) = P(2.1') = 260.9^{KFT}$; $M_T = P(0.05 \times 88.4') = 549.0^{KFT}$

FRM	R	d	Rd	Rd^2	$PR/\Sigma R$	$MRd/\Sigma Rd^2$	$M_T Rd/\Sigma Rd^2$	F	V_{DIA}
N	4.88	(19.0)	93	1762	57.6	- 0.4	± 2.4	60.0	57.2
U	3.23	28.8	93	2679	38.2	+ 0.4	± 2.4	40.6	38.6
ΣR = 8.11					95.8			100.6	95.8
12-S	3.34	45.5	152	6915	—	+ 0.6	± 3.9	LESS CRITICAL THAN E-W LOAD'G	
3	4.50	(33.7)	152	5111	—	- 0.6	± 3.9		
ΣR = 7.84			ΣRd^2 = 16467						

$PR/\Sigma R$	$MRd/\Sigma Rd^2$	$M_T Rd/\Sigma Rd^2$	F	V_{DIA}
—	- 1.5	± 3.1	LESS CRITICAL THAN N-S LOAD'G	
—	+ 1.5	± 3.1		
52.9	+ 2.4	± 5.1	58.0	55.3
71.3	- 2.4	± 5.1	76.4	68.9
124.2			134.4	124.2

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3RD LEVEL DIAPHRAGMS

SEISMIC LOAD'G = (F_x/w_x) (10.0% G LOADS)

3RD LEVEL EL 132-0 = (109.0/1257.4) (do)
3RD LEVEL EL 128-0 = 33.8/443.5) (do)

FLEXIBLE DIAPHRAGM PORTION OF ROOF.

(109.0/1257.4)·(334.7^K + 37.8^K + 90.5)/94' = 0.427 K/' E-W LOAD'G

(do)·(do)/79.8' = 0.503 K/' N-S LOAD'G

E-W LOAD'G:

R = (0.427 K/')(94'/2) = 20.07^K
M = (do)(94)^2/8 = 471.6 KFT
v_{DIA} = (20.07^K x 10^3)/79.8' = 252 #/'
CHORD = 471.6 KFT / 79.8' = 5.9^K

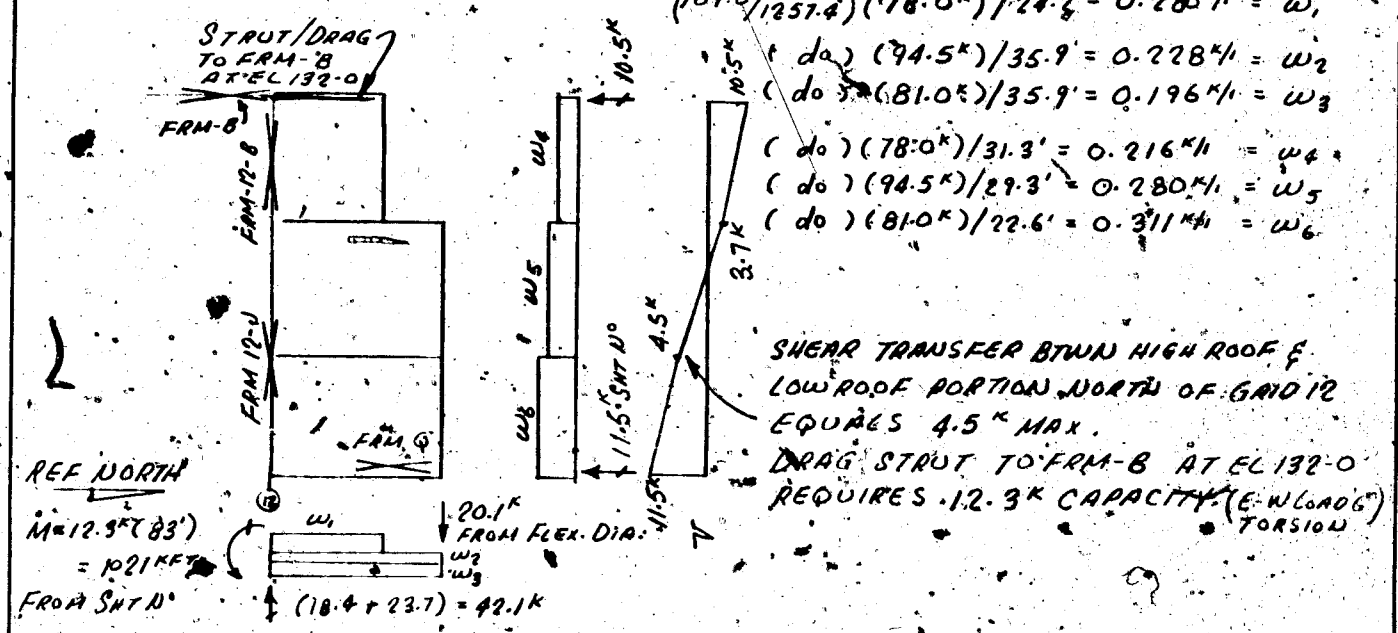
N-S LOAD'G:

R = (0.503 K/')(79.8)/2 = 20.07^K
M = (do)(79.8)^2/8 = 400.4 KFT
v_{DIA} = (20.07 x 10^3)/94.0 = 214 #/'
CHORD = 400.4 KFT / 94.0 = 4.3^K

F = 14.26 + 40.1(1/3) = 28 → SEMI-FLEX.
1½" B-DECK
20 GA
3 WIDTH
7-WELD PAT.
BUTTON PUNCH
@ MARG. WELDS @ 12"
330 #/' ALW

CHORD FORCE < 6^K MIN CONN.

RIGID PORTION OF ROOF NORTH OF GRID 12



(109.0/1257.4)(78.0^K)/24.2' = 0.280 K/' = ω_1
(do)(94.5^K)/35.9' = 0.278 K/' = ω_2
(do)(81.0^K)/35.9' = 0.196 K/' = ω_3
(do)(78.0^K)/31.3' = 0.216 K/' = ω_4
(do)(94.5^K)/29.3' = 0.280 K/' = ω_5
(do)(81.0^K)/22.6' = 0.311 K/' = ω_6

SHEAR TRANSFER BTWN HIGH ROOF & LOW ROOF PORTION NORTH OF GRID 12 EQUALS 4.5^K MAX.
DRAG STRUT TO FRM-B AT EL 132-0 REQUIRES 12.3^K CAPACITY (E-W LOAD'G TORSION)

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3RD LEVEL DIAPHRAGMS continued

SEISMIC LOAD'G

RIGID PORTION OF ROOF EL 132-0 & SOUTH OF GRID 12

E-W
- (109.0/1257.4)(281.8K + 24.7K)/42' = 0.633K/'
- (do)(45.9/2) = 2.0K
- (do)(148.4K + 40.1K) = 16.3K

N-S
- (109.0/1257.4)(281.8K + 45.9)/78' = 0.364K/'
- (do)(148.4K + 40.1K) = 16.3K
- (do)(24.7K/2) = 1.1K

} REFER TO SKETCH SHT N°

RIGID PORTION OF ROOF EL 128-0

E-W
- (33.8/443.5)(363.4 + 52.0)/88.4' = 0.358K/'
- (do)(28.1K/2) = 1.1K

N-S
- (33.8/443.5)(363.4 + 28.1)/47.8' = 0.624K/'
- (do)(52.0/2) = 2.0K

} REFER TO SKETCH SHT N°

C.G. & C.R. AT 3RD LEVEL EL 128-0.

FRM	R	Y	R(Y)
N	4.88	78.0	380.6
T	3.17	113.8	360.7
U	3.23	125.8	406.3
	41.28		1147.6

$\bar{y}$ = 101.7'

	R	X	R(X)
12-S	3.34	0	0
3	4.50	79.2	356.4
	7.84		356.4

$\bar{x}$ = 45.5'

C.R. $\bar{x}$ = 45.5' SOUTH OF GRID 12
$\bar{y}$ = 101.7' EAST OF GRID A

P	y	P(y)
29.8	101.9	3036.6
82.8	78.0	6458.4
40.6	125.8	5107.5
153.2		14602.5

$\bar{y}$ = 95.3'

P	x	P(x)
31.6	44.2	1396.7
56.4	0	0
50.8	42.0	2133.6
68.9	79.2	5456.9
1.1	88.4	97.2
208.8		9084.4

$\bar{x}$ = 43.5'

C.G. $\bar{x}$ = 43.5' SOUTH OF GRID 12
$\bar{y}$ = 95.3' EAST OF GRID A

$e_x = (45.5 - 43.5) = 2.0'$
$e_y = (101.7 - 95.3) = 6.4'$

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3RD LEVEL EL 127-0± TO EL 131-0±
RIGID PORTION OF ROOF DIAPHRAGM NORTH OF GRID 12

NOTE: THE MASS AT THIS PORTION IS CONSERVATELY ASSUMED TO IMPART LOADS UP TO THE HIGHER OF THE TWO LEVELS OF BRC'G BTWN. EL 132-0 & 126-0 ALONG GRID 12 DUE TO THE CONTINUITY OF DIAPHRAGM CROSSING THESE LEVELS.

FRM	R	Y	R(y)
B	4.00	8.8	35.2
Q	4.78	91.8	438.8
	8.78		474.0
$\bar{y}$ = 54.0'			
		X	R(x)
12-B	3.58	0	0
12-J	4.61	0	0
	8.19		0
$\bar{x}$ = 0			

C.R. $\bar{x}$ = 0 ∴ ON GRID 12
$\bar{y}$ = 54.0' EAST OF GRID A

P	y	P(y)
6.76K	24.45'	165.3
8.19K	50.65'	414.8
7.02K	80.50'	565.1
21.97K		1145.2
	x	P(x)
6.76K	-12.10'	-18.9
8.19K	-17.95'	-147.0
7.02K	-17.95'	-126.0
20.10K	-35.90'	-721.6
42.07K		-1013.5

e_x = (24.1-0) = 24.1'
e_y = (54.0-52.1) = 1.9'

C.G $\bar{x}$ = -24.1' ∴ NORTH OF GRID 12
$\bar{y}$ = 52.1' EAST OF GRID A

3RD LEVEL EL 132-0
RIGID PORTION SOUTH OF GRID 12

FRM.	R	Y.	R(y)
B	4.00	8.8	35.2
N	5.46	78.0	425.9
	9.46		461.1
$\bar{y}$ = 48.7'			
		X	R(x)
12-B	3.58	0	0
12-J	4.61	0	0
B	3.92	42.0	164.6
	12.11		164.6
$\bar{x}$ = 13.6'			

C.R. $\bar{x}$ = 13.6' SOUTH OF GRID 12
$\bar{y}$ = 48.7' EAST OF GRID A

P	y	P(y)
28.4K	39.0'	1107.6
16.3K	52.0'	847.6
1.1K	0	0
36.3K	8.8	319.4
58.3K	78.0	4547.4
140.4K		6822.0

$\bar{y}$ = 48.6'

P	x	P(x)
25.6	21.0'	537.6
2.0	42.0	84.0
99.2	0	0
16.3	57.5'	937.3
143.1K		1558.9

$\bar{x}$ = 10.9'

C.G $\bar{x}$ = 10.9' SOUTH OF GRID 12
$\bar{y}$ = 48.6' EAST OF GRID A

e_x = (13.6-10.9) = 2.7'
e_y = (48.7-48.6) = 0.1'

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RIGID DIAPHRAGMS

3RD LEVEL RIGID DIAPHRAGM N. OF GRID 12

EL 127-0 ± TO 131-0 ± PORTION N. OF GRID 12

N-S { ΣP = 27.0K; M' = P(e_y) = P(1.9') = 42 K-FT; M_T = P(.05 x 83') = 92 K-FT

FRM	R	d	Rd	Rd²	M_T Rd/ΣRd²	F	V_DIA
B	4.00	45.2	181	8[illegible]2	± 1.1	11.1	10.5
Q	4.78	(37.8)	181	6830	± 1.1	13.1	11.5
	ΣR = 8.78					24.2	22.0
12-B	3.58	0	0	0	0	0	0
12-J	4.61	0	0	0	0	0	0
	ΣR = 8.19			ΣRd² = 15002			

E-W { P = 42.1'; M = P(e_y) = P(2.7') = 387 K-FT; M_T = P(.05 x 88.4') = 633 K-FT

FRM	R	d'	Rd'	Rd²	PR/ΣR	M Rd/ΣRd²	M_T Rd/ΣRd²	F'	V_DIA'
B	4.00	39.9	160	6368	59.4	± 0.2	± 6.3	65.7	59.6
N	5.46	(29.3)	160	4687	81.0	- 0.2	± 6.3	87.3	80.8
	ΣR = 9.46				140.4			153.0	140.4
12-B	3.58	13.6	49	662	—	+ 0.1	± 1.9	LESS CRITICAL	
12-J	4.61	13.6	63	853	—	+ 0.1	± 2.5	THAN E-W	
8	3.92	28.4	112	3162	—	- 0.1	± 4.4	LOAD'G	
	ΣR = 12.11			ΣRd² = 15737					

E-W { P = 42.1'; M = P(e_y) = P(2.7') = 387 K-FT; M_T = P(.05 x 88.4') = 633 K-FT

PR/ΣR	M Rd/ΣRd²	M_T Rd/ΣRd²	F	V_DIA
—	+ 12.3	± 2.1		
—	- 12.3	± 2.1		
18.4	0	0		
23.7	0	0		
42.1				

3RD LEVEL RIGID DIAPHRAGM S. OF GRID 12

EL 132-0 PORTION S. OF GRID 12

N-S { P = 140.4K; M = P(e_y) = P(0.1') = 14.0 K-FT; M_T = P(.05 x 88.4') = 621 K-FT

PR/ΣR	M Rd/ΣRd²	M_T Rd/ΣRd²	F	V_DIA
59.4	+ 0.2	± 6.3	65.7	59.6
81.0	- 0.2	± 6.3	87.3	80.8
140.4			153.0	140.4
—	+ 0.1	± 1.9	LESS CRITICAL	
—	+ 0.1	± 2.5	THAN E-W	
—	- 0.1	± 4.4	LOAD'G	

E-W { P = 143.1; M = P(e_x) = P(2.7') = 387 K-FT; M_T = P(.05 x 88.4') = 633 K-FT

PR/ΣR	M Rd/ΣRd²	M_T Rd/ΣRd²	F	V_DIA
—	+ 3.9	± 6.4	LESS CRITICAL	
—	- 3.9	± 6.4	THAN N-S	
			LOAD'G	
42.3	+ 1.2	± 2.0	44.3	43.5
54.5	+ 1.6	± 2.5	57.0	56.1
46.3	- 2.8	± 4.5	50.8	43.5
143.1			152.1	143.1

3RD LEVEL RIGID DIAPHRAGMS continued

EL 106-0

N-S { P = 153.2K; M = P(e_y) = P(6.4') = 981 KFT; M_T = P(.05 x 88.4) = 677 KFT

E-W { P = 208.8K; M = P(e_x) = P(2.0') = 418 KFT; M_T = P(.05 x 88.4') = 923 KFT

FRM	R	d	Rd	Rd²	PR/ΣR	MRd/ΣRd²	M_TRd/ΣRd²	F	V_DIA
N	4.88	23.7	116	2741	66.3	+ 6.7	± 4.6	73.0	73.0
T	3.17	(12.1)	38	464	43.0	- 2.2	± 1.5	44.5	40.8
U	3.23	(24.1)	78	1876	43.9	- 4.5	± 3.1	47.0	39.4
ΣR =	11.28				153.2			164.5	153.2
12-S	3.34	45.5	152	6915	—	+ 8.7	± 6.0	LESS CRITICAL	
3	4.50	(33.7)	152	5111	—	- 8.7	± 6.0	THAN E-W	
ΣR =	7.84		ΣRd² = 17107					LOAD'G	

PR/ΣR	MRd/ΣRd²	M_TRd/ΣRd²	F	V_DIA
—	+ 2.8	± 6.3	LESS CRITICAL	
—	- 0.9	± 2.1	THAN N-S	
—	- 1.9	± 4.2	LOAD'G	
89.0	+ 3.7	± 8.2	97.2	92.7
119.8	3.7	± 8.2	128.0	116.1
			225.2	208.8

2ND LEVEL RIGID DIAPHRAGMS

EL 119-0

N-S { P = 57.7K; M = P(e_y) = P(20.5') = 1183 KFT; M_T = P(.05 x 105.7) = 305 KFT

E-W { P = 57.7; M = P(e_x) = P(19.1') = 1102 KFT; M_T = P(.05 x 105.7) = 305 KFT

FRM	R	d	Rd	Rd²	PR/ΣR	MRd/ΣRd²	M_TRd/ΣRd²	F	V_DIA
A	4.05	(33.3)	135	4491	33.6	- 6.2	± 1.6	35.2	27.4
P	2.90	46.5	135	6271	24.1	+ 6.2	± 1.6	30.3	30.3
ΣR =	6.95				57.7			65.5	57.7
15	3.56	(46.3)	161	7305	—	- 7.3	± 1.9	LESS CRITICAL	
34	3.31	48.7	161	7850	—	+ 7.3	± 1.9	THAN E-W	
ΣR =	6.87		ΣRd² = 25917					LOAD'G	

PR/ΣR	MRd/ΣRd²	M_TRd/ΣRd²	F	V_DIA
—	- 5.7	± 1.6	LESS CRITICAL	
—	+ 5.7	± 1.6	THAN N-S.	
			LOAD'G	
29.9	- 6.8	± 1.9	31.8	23.1
27.8	+ 6.8	± 1.9	34.6	34.6
57.7			66.4	57.7

STRAUSS & LOFTFIELD
STRUCTURAL ENGINEERS

CLIENT/
PROJECT/
DATE/ OCT 82
ENGINEER/ HS
PROJECT # 82017
SHEET/ 296 OF 317

1600 EAST DESERT INN ROAD - SUITE 106 | LAS VEGAS, NEVADA 89109-2594 (702) 731-6226

Lula Collins 12-19-84

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SHEET/ 297 OF 317
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DATE/ OCT '82
ENGINEER/ HS

CENTER OF RIGIDITY C.R. & CENTER OF GRAVITY C.G.

2ND LEVEL EL 118-0

FRM	R	Y	R(Y)
B	4.00	8.8	35.2
N	4.88	78.0	380.6
	8.88		415.8
$\bar{y}$ = 46.8			
		X	R(x)
12-B	3.27	0	0
12-J	3.86	0	0
8	3.79	42.0	159.2
	10.92		159.2
$\bar{x}$ = 14.6'			

C.R. $\bar{x}$ = 14.6' SOUTH OF GRID 12
$\bar{y}$ = 46.8' EAST OF GRID A

R	Y	P(Y)
0.5	0	0
71.9	8.8	632.7
14.1	39.0	549.9
73.5	78.0	5733.0
160.0		6915.6
$\bar{y}$ = 43.2'		

P	X	P(X)
100.6	0	0
13.2	21.0	277.2
1.0	42.0	42.0
114.8		319.2
$\bar{x}$ = 2.8		

CG $\bar{x}$ = 2.8' SOUTH OF GRID 12
$\bar{y}$ = 43.2' EAST OF GRID A

$e_x = (14.6 - 2.8) = 11.8'$
$e_y = (46.8 - 43.2) = 3.6'$

2ND LEVEL EL 119-0

FRM	R	Y	R(Y)
A ORIG	4.05	0	0
P	2.90	79.8	231.4
	6.95		231.4
$\bar{y}$ = 33.3' E. OF A			
		X	R(X)
15 ORIG	3.56	-35.9	- 127.8
34	3.31	-129.9	- 430.0
	6.87		- 557.8
$\bar{x}$ = -81.2' N. OF 12			

P	Y	P(Y)
34.6	39.9	1380.5
1.5	0	0
21.6	79.8	1723.7
57.7		3104.2
$\bar{y}$ = 53.8' E. OF A		

P	X	P(X)
36.4	- 82.9	- 3017.6
21.3	-129.9	- 2766.9
57.7		- 5784.5
$\bar{x}$ = -100.3' N. OF 12		

$e_x = (100.3 - 81.2) = 19.1'$
$e_y = (53.8' - 33.3') = 20.5'$

2ND LEVEL EL 114-0

FRM.	R	Y	R(Y)	X	R(x)
U	3.15	125.8	396.3	—	—
Q	4.65	91.8	426.9	—	—
N	4.88	78.0	380.6	—	—
A	5.41	0	0	—	—
	18.09		1203.8		
$\bar{y}$ = 66.5' & $\bar{x}$ = 25.9'					
3	4.31	—	—	88.4	381.0
12-B	3.27	—	—	0	0
12-J	3.86	—	—	0	0
12-S	3.27	—	—	0	0
	14.71				381.0

P	Y	P(Y)
35.6	0	0
94.9	78.0	7402.2
12.7	91.8	1165.9
44.5	113.8	5064.1
48.0	125.8	6038.4
9.8	45.9	449.8
2.1	65.9	138.4
15.5	101.9	1579.5
263.1		21838.3

$e_x = (27.4 - 25.9) = 1.5'$
$e_y = (83.0 - 66.5) = 16.5'$

$\bar{y}$ = 83.0'
$\bar{x}$ = 27.4'

P	X	P(X)
32.8	- 35.9	- 1177.5
182.8	0	0
42.9	42.0	1801.8
128.0	79.2	10137.6
0.6	88.4	53.0
2.1	-30.1	- 63.2
9.0	- 12.1	- 108.9
16.4	44.2	724.9
414.6		11367.7

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2ND LEVEL RIGID DIAPHRAGMS continued

EL 118-0

N-S { P = 160.0K; M = P(e_y) = P(3.6') = 576KFT; M_T = P(.05x78') = 624KFT }

E-W { P = 114.8; M = P(e_x) = P(11.8') = 1355KFT; M_T = P(.05x78') = 448KFT }

FRM	R	d	Rd	Rd²	PR/ER	MRd/ERd²	M_TRd/ERd²	F	V_DIA
B	4.00	38.0	152	5776	72.1	+ 5.9	± 6.0	78.1	78.0
N	4.88	(31.2)	152	4750	87.9	- 5.9	± 6.0	93.9	82.0
ER=	8.88							172.0	160.0
12-B	3.27	14.6	48	697	—	+ 1.9	± 2.0	Less Critical	
12-J	3.86	14.6	56	823	—	+ 2.2	± 2.3	than E-W	
B	3.[illegible]	(27.4)	104	2845	—	- 4.1	± 4.3	Load G	
ER=	10.92		ERd² = 14891						

PR/ER	MRd/ERd²	M_TRd/ERd²	F	V_DIA
—	+ 13.8	± 4.6	Less Critical	
—	- 13.8	± 4.6	than N-S	
			Load G	
34.4	+ 4.4	± 1.4	38.8	38.8
40.6	+ 5.1	± 1.7	45.7	45.7
39.8	- 9.5	± 3.1	42.9	30.3
114.8			127.4	114.8

EL 114-0

N-S { P = 263.1K; M = P(e_x) = P(16.5') = 4342KFT; M_T = P(.05x125.8) = 1655KFT }

E-W { P = 414.6; M = P(e_x) = P(1.5') = 622KFT; M_T = P(.05x125.8) = 2608KFT }

FRM	R	d	Rd	Rd²	PR/ER	MRd/ERd²	M_TRd/ERd²	F	V_DIA
U	3.15	59.8	187	11077	45.8	+ 13.0	± 5.0	58.8	58.8
Q	4.65	25.3	117	2976	67.6	+ 8.1	± 3.1	75.7	75.7
N	4.88	11.5	56	645	71.0	+ 3.9	± 1.5	74.9	74.9
A	5.41	(66.5)	360	23924	78.7	- 25.0	± 9.6	88.3	53.7
ER	18.09				263.1			297.7	263.1
3	4.31	62.5	269	16836	—	+ 18.7	± 7.1	Less Critical	
12-B	3.27	(25.9)	85	2194	—	- 5.9	± 2.2	than E-W	
12-J	3.86	(25.9)	100	2589	—	- 7.0	± 2.7	Load G	
12-S	3.[illegible]	(25.9)	84	2194	—	- 5.8	± 2.2		
ER=	14.71		ERd² = 62435						

PR/ER	MRd/ERd²	M_TRd/ERd²	F	V_DIA
—	+ 1.9	± 7.8	Less Critical	
—	+ 7.2	± 4.9	than N-S	
—	+ 0.5	± 2.3	Load G	
—	- 3.6	± 15.0		
121.5	+ 2.7	± 11.2	132.7	124.2
92.2	+ 0.9	± 3.6	95.8	91.3
108.8	- 1.0	± 4.2	113.0	107.8
92.1	- 0.8	± 3.5	95.6	91.3
414.6			437.1	414.6

STRAUSS & LOFTFIELD
STRUCTURAL ENGINEERS

CLIENT/
PROJECT/
DATE 10-7-82
PROJECT # 82017
SHEET 298 OF 317
ENGINEER [illegible]

.501 N CASINO CTR 1
Fire Station

Dave Hoot 12/31/87

TRAUSS & LOFTFIELD
STRUCTURAL ENGINEERS

CLIENT/ HARRIS SHARP & ASSOCIATES SHEET/ OF
PROJECT/ CITY OF LAS VEGAS PROJECT # 82017
FIRE STATION COMPLEX DATE/
FIRE STATION NO:1 ENGINEER/

STRUCTURAL CALCULATIONS INDEX

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CLIENT: HARRIS SHARP & ASSOC SHEET: 1 OF 317
PROJECT: CITY OF LAS VEGAS PROJECT #: 82017
FIRE SERVICES COMPLEX DATE: OCT '82
FIRE STATION N°1 ENGINEER: HS

TWO STORIED STRUCTURE WITH BASEMENT

INCLUDED CAPACITY FOR ADDITIONAL TWO STORIES

—SEE SKETCH SHT N°13—

DESIGN CRITERIA

UNIFORM BUILDING CODE 1982 EDITION

WIND:

BASIC SPEED	75 MPH
STAGNATION PRESSURE	15 PSF
EXPOSURE	C
IMPORTANCE FACTOR	1.15

SEISMIC ZONE N°2
OCCUPANCY IMPORTANCE FACTOR = 1.5
Z = 3/8

NON SNOW LOAD AREA

REGISTERED PROFESSIONAL ENGINEER — STATE OF NEVADA — No. 4259 — STRAUSS STRUCTURAL — Jan '88

DEAD LOADS

ROOF

FOR ALL LOCATIONS EXCEPT AS NOTED BELOW

4-PLY B.U. ROOF'G & GRAVEL	6.0 PSF
1 1/2" B-DECK	2.0
BATT INSULATION	1.8
GYP CEIL'G	2.8
FIRE SPRINKLERS	1.5
MISC MECH & ELEC	1.4
	15.5 PSF + FRM'G

ROOF

FOR ROOFS OVER THE ATRIUM & APPAR. BAY

4-PLY B.U. ROOF'G & GRAVEL	6.0 PSF
4 1/2" AVG. THICK VERMICULITE	12.0
3 1/2" CONC W/ 1 1/2" B-DECK	51.0
BATT INSULATION	1.8
GYP CEIL'G.	2.8
FIRE SPRINKLERS	1.5
MISC MECH & ELEC	0.9
	76.0 PSF + FRM'G

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DEADLOADS continued

FLOOR

FOR ALL LOCATIONS EXCEPT AS NOTED BELOW	FINISH FLOOR'G	1.5 PSF
	3½" CONC °/ 1½" B-DECK	51.0
	GYP CEIL'G	2.8
	FIRE SPRINKLERS	1.5
	PARTITIONS	20.0
	MISC MECH & ELEC	1.2
		78.0 PSF + FRMG

FLOOR

		1.5 PSF
SLAB OVER BASEMENT INTERIOR	3½" CONC °/ 1½" B-DECK	51.0
	GYP CEIL'G	2.8
	FIRE SPRINKLERS	1.5
	MISC MECH & ELEC	1.2
		58.0 PSF + FRMG

FLOOR

SLAB OVER BASEMENT EXTERIOR	STAMPED CONC PAVERS 10" max	125.0
	3/8" B.U. SEAL'G MEMBRANE	3.0
	3½" CONC °/ 1½" B-DECK	51.0
	GYP CEIL'G	2.8
	FIRE SPRINKLERS	1.5
	MISC MECH & ELEC	1.7
		185.0 PSF + FRMG

STAIRS

STEEL PAN & CONC. FILL	50.0 PSF

WALLS (EXT.)

TILE & GROUT °/ MTL LATH	15.5 PSF
GYP °/ MTL STUDS @ 16" O.C.	3.7
BATT INSULATION	1.8
	21.0 PSF

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LIVE LOADS

ROOF	
ALL - EXCEPT AS NOTED BELOW	20 PSF
FLOOR	
DORMITORY	40 PSF
OFFICE	50 PSF
STORAGE (RECORDS)	250 PSF
GYM & GAME RMS	100 PSF
MECH RMS	
FAN RM & ROOF @ GAME RM	60 PSF
CHILLER RM	100 PSF
BOILER RM	100 PSF
COOL'G TOWER PLTFM.	100 PSF
PLAZA & LOBBY	100 PSF
STAIRS, LAND'GS & PED. BRIDGES	100 PSF

*NOTE: ONLY ROOF, DORMITORY, & OFFICE LIVE LOADS ARE REDUCIBLE BY TRIBUTARY AREA.

SOILS CRITERIA

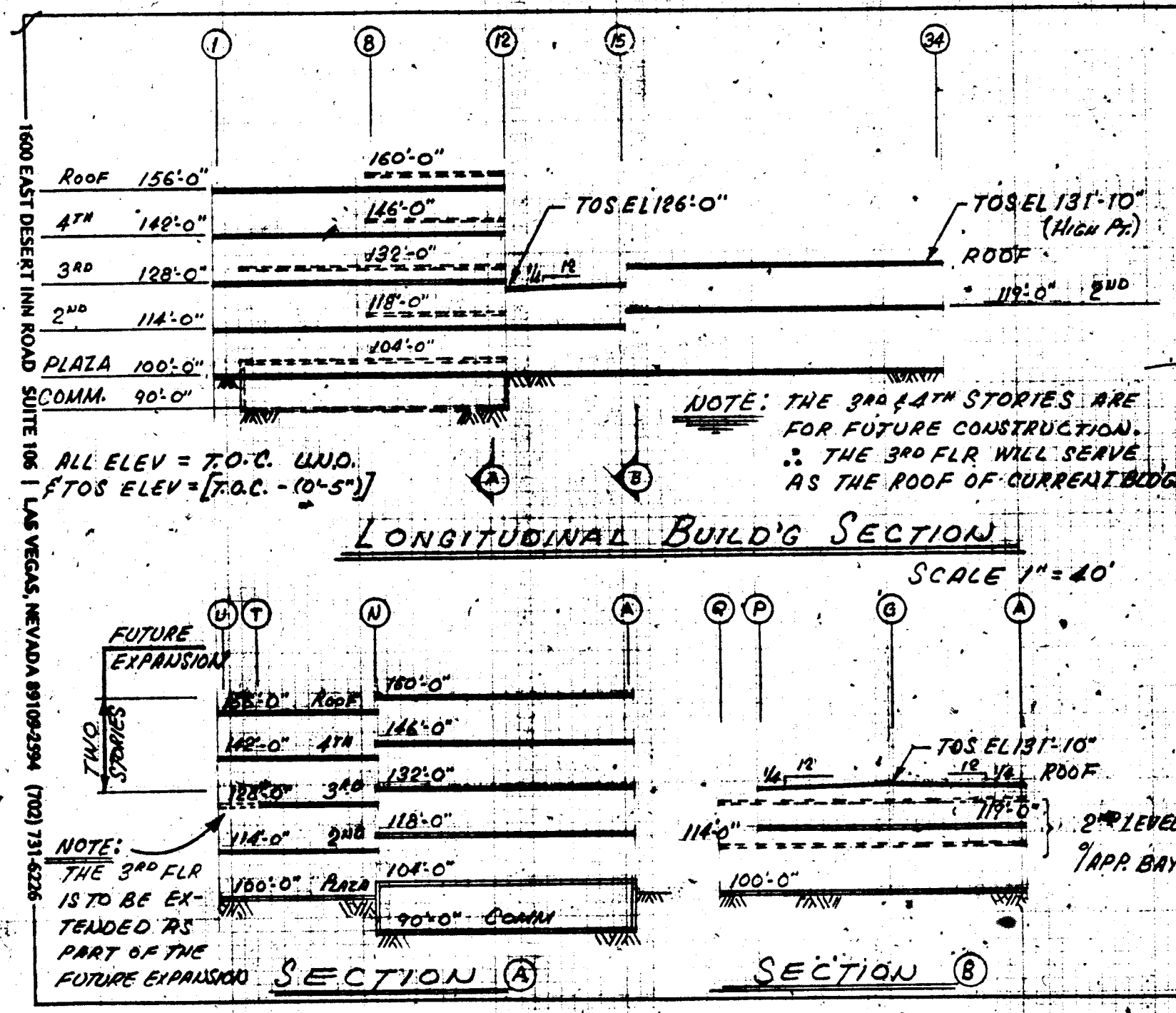
REPORT BY: J.H. KLEINFELDER & ASSOC JUNE 18, '82

DESIGN SOIL PRESSURES:

BEARING	2000 PSF
ACTIVE	35 PSF/FT
PASSIVE	300 PSF/FT
COEF. FRICTION CONC @/ SOIL	0.30
SPECIFIC WT	100 → 113 PCF

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SCHEMATIC SECTIONS
PROJECT # 82017
DATE OCT '82
SHEET 4 OF 17
ENGINEER HS

Work Sheet 12/31/87

Donna Hasali 12/31/87

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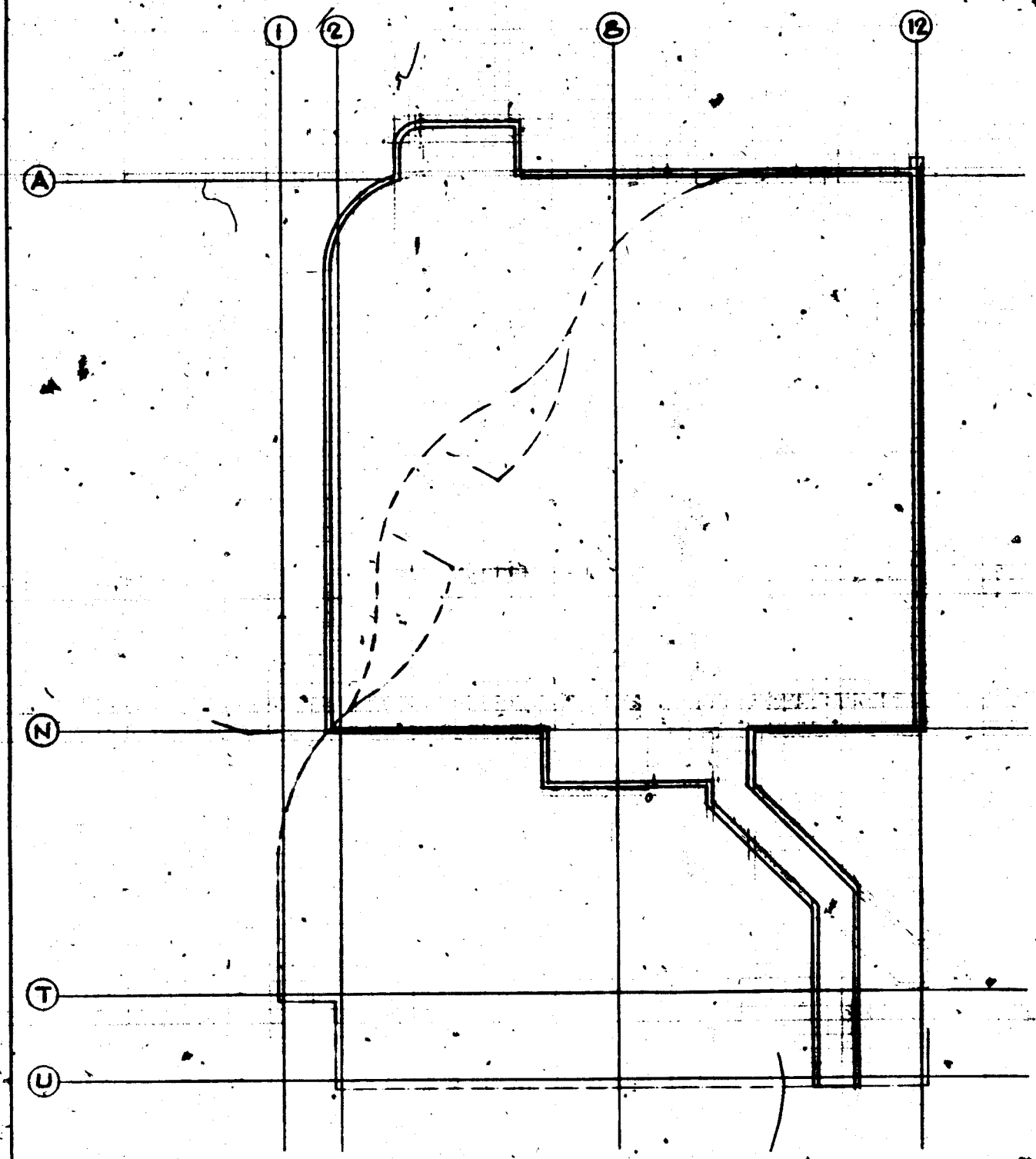
PROJECT/

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DATE/ OCT '82

ENGINEER/ HS



NORTH

COMMUNICATION LEVEL PLAN SCALE 1"=20'-0"

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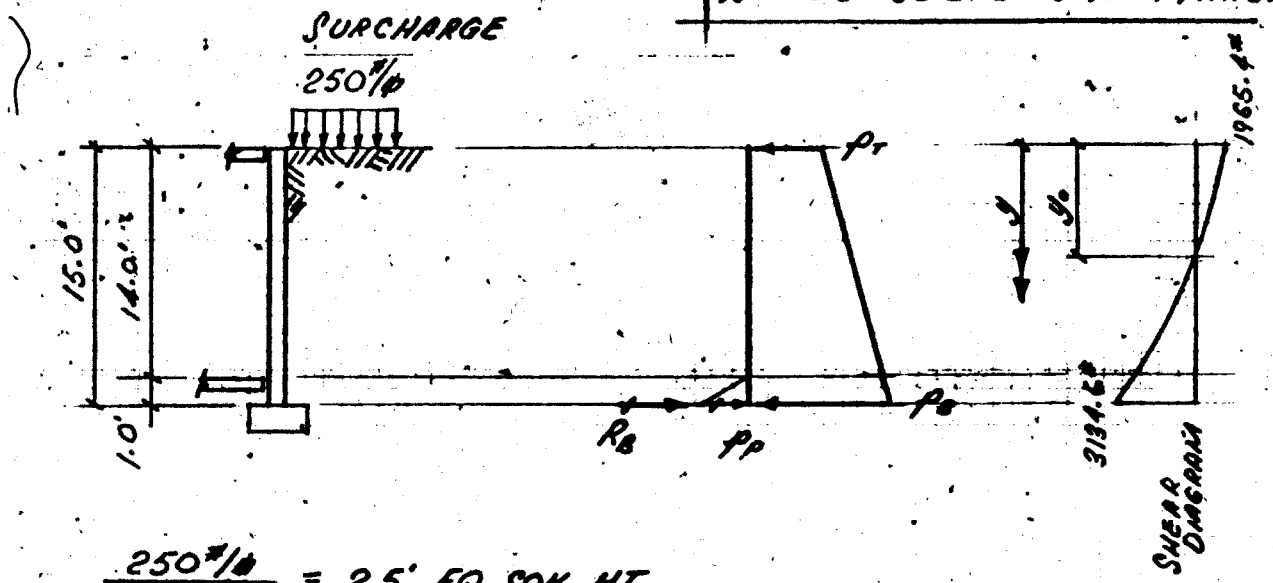
CLIENT/
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DATE/ OCT'83
ENGINEER/ HS

BASEMENT WALLS — GRIDS Ⓐ Ⓦ & ⑫

f'_c = 3000 PSI
F_y = 60 KSI

SOIL PRESSURE
ACTIVE 35#/FT³ EQ. FLUID PRESSURE
PASSIVE 300#/FT³ do
SPECIFIC WT 100#/FT³
COEF FRICTION μ = 0.3 ; CONC. ON SOIL

NOTE: LATERAL LOADING ONLY IS SHOWN. FOR COMBINED LOADING ON WALLS SEE SHTS N°9 THRU N°15



$\frac{250\#/ft}{100\#/FT^3}$ = 2.5' EQ. SOIL HT.

p_T = (35#/FT³)(2.5') = 87.5#/ft → H_1 = (p_T x 1.0')(15.0) = 1312.5#
p_B = (do)(2.5'+15.0') = 612.5#/ft → H_2 = (p_B-p_T)(1.0')(15.0'/2) = 3937.5#
p_p = (300#/FT³)(1.0') = 300.0#/ft → H_3 = (-p_p x 1.0')(1.0'/2) = -(150.0#)

ΣH = 5100.0#

$\frac{(H_1 \times 15.0/2) + (H_2 \times 15.0/3) + (H_3 \times 1.0/3)}{15.0}$ = 1965.4#

R_B = (5100.0# - R_T) = 3134.6#

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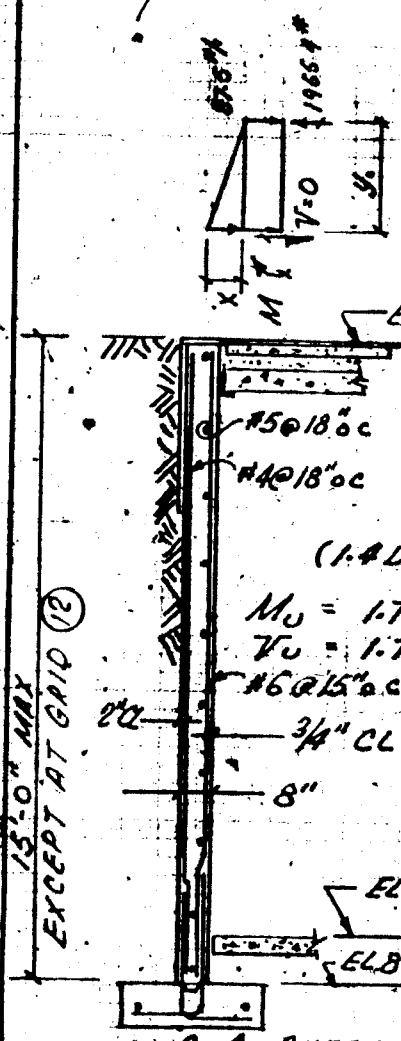
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ENGINEER/ HS

BASEMENT WALLS

GRIDS Ⓐ Ⓝ & ②



$X = 35(y)$

$\Sigma V = 1965.4^{\#} - 87.5(y) - (35/2)(y^2)$

@ $V=0 \rightarrow y = y_0$ & $M = MAX$

$17.5y^2 + 87.5y = 1965.4$

$y^2 + 5y = 112.31$

$(y+2.5)^2 = 112.31 + 2.5^2 = 118.56$

$y + 2.5 = \pm 10.89$

$y = \pm 10.89 - 2.5 = 8.39 = y_0$

$M_{MAX} = (1965.4 \times 8.39) - 87.5(8.39)^2/2 - 17.5(8.39)^3/3$

$M_{MAX} = 9965^{\#FT}$

(1.4D + 1.7L + 1.7H)

$M_U = 1.7(9.97^{KFT}) = 17.0^{KFT}$ AT 8.39' DN. FROM TOP OF WALL

$V_U = 1.7(3.14^{K}) = 5.4^{K}$ AT BOTTOM OF WALL

$h = 8"$:

$d = (8" - 3/4"CL - d_b/2) = 6.875$

$F = 12(6.875)^2/12000 = 0.0473$

$K_U = 17.0/.0473 = 360 \rightarrow \rho = .0073$

$A_S = \rho(12 \times 6.875) = 0.61\ IN^2/FT$

$V_C = 2\sqrt{3000}(12 \times 6.875)/10^3 = 9.04^{K}\ ALW > V_U = 5.4^{K}$ OK

$V_C = 2\sqrt{3000}(12 \times 3.5)/10^3 = 4.6^{K} < V_U = 5.4^{K}$

∴ BAL OF 0.8^{K} SHEAR FRICTION

MIN REINF W/GR60

$A_g = 12 \times 8 = 96\ IN^2$

#5 & SMALLER: $A_H \geq .0020 A_g = 0.192\ IN^2/FT$
$A_V \geq .0012 A_g = 0.1152\ IN^2/FT$

#6 & LARGER: $A_H \geq .0025 A_g = 0.240\ IN^2/FT$
$A_V \geq .0015 A_g = 0.144\ IN^2/FT$

USE 8" THK CONC BASEMENT WALL
#8 VERT @ 12" o.c. INSIDE FACE & #4 VERT @ 18" o.c SOIL FACE
#5 HORIZ @ 18" o.c. $A_S = 0.21\ IN^2/FT > 0.192\ IN^2/FT$

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Work Sheet 12/31/87

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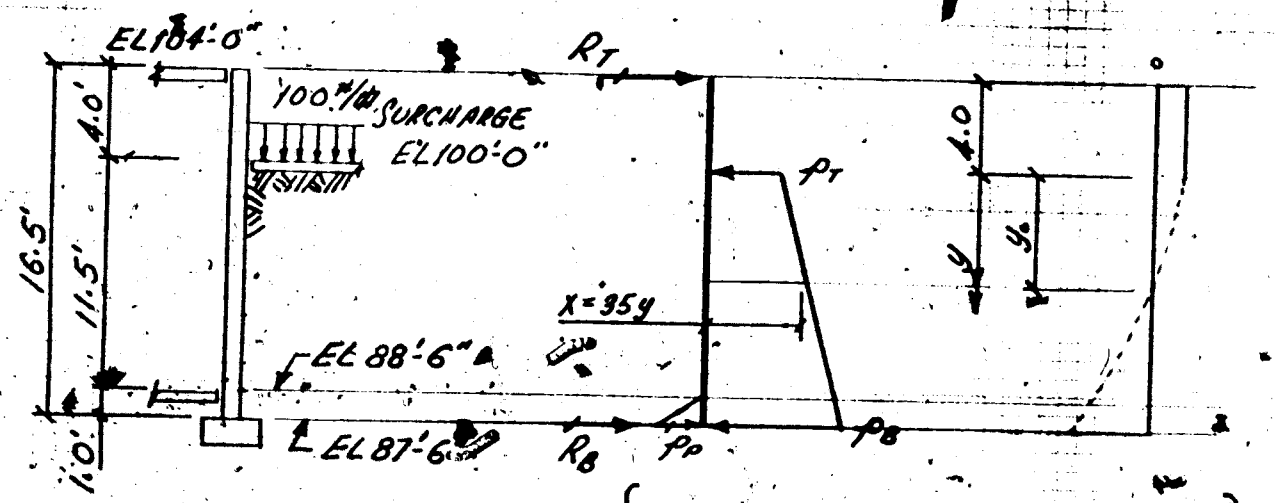
CLIENT/
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DATE/ OCT '82
ENGINEER HS

BASEMENT WALLS. continued

AT GRID (12):

COMPUTER FLR T.O.C. EL 88'-6"

AT GRID 12 T.O. PTG EL 87'-6"



$\frac{100\#/ft^2}{100\#/FT^3} = 1.0'$ EQ. SOIL HT

$$\left\{\begin{array}{l} @\ V=0 \rightarrow y = y_o \ \&\ M = MAX \\ V = 853.2 - 35(y) - (35/2)(y^2) = 0 \\ 17.5y^2 + 35y = 853.2 \\ y = \pm 7.05 - 1 = 6.05' = y_o \end{array}\right.$$

$p_T = (35\#/FT^3)(1.0') = 35\#/ft \rightarrow H_1 = (p_T \times 1.0)(12.5) = 437.5$

$p_B = (\ do\ )(1.0' + 12.5') = 472.5\#/ft \rightarrow H_2 = (p_B - p_T)(1.0)(12.5/2) = 2734.4$

$p_p = (300\#/FT^3)(1.0') = 300\#/ft \rightarrow H_3 = (-p_p \times 1.0)(1.0/2) = -(150.0)$

$\Sigma H = 3021.9\#$

$R_T = \left[(H_{MAX} \times 12.5/2) + (H_2 \times 12.5/3) + (H_3 \times 1.0/3)\right] / 16.5 = 853.2\#$

$R_B = (3021.9 - R_T) = 2168.7\#$

$M_{MAX} = 853.2(10.05') - (35 \times 6.05^2/2) - (640.5 \times 6.05/3) = 6643\#FT$

$M_U = 1.7\ (6.65^{KFT}) = 11.3^{KFT}$

$d = \left[8 - 3/4\ CL - \frac{\#6/8}{2}\right] = 6.875$

$F = 12(6.875)^2/12000 = 0.0473$

$K_U = 11.3/.0473 = 239 \rightarrow \rho \geq .00469$

$A_S \geq \rho(12 \times 6.875) = 0.387\ IN^2/FT$

USE
8" THK CONC WALL
#6 VERT @12" O.C. INSIDE
& #4 VERT @18" OC SOIL FACE
# 5 HORIZ @18" OC

WALL AT GRID (12)

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BY JRL

BSMT. WALL @ LINE 1

BM. B20, SEE SHT. 47

$P_u = \frac{71.8^K \times 1.6}{7'} = 16.41^{K}/_{LF}$

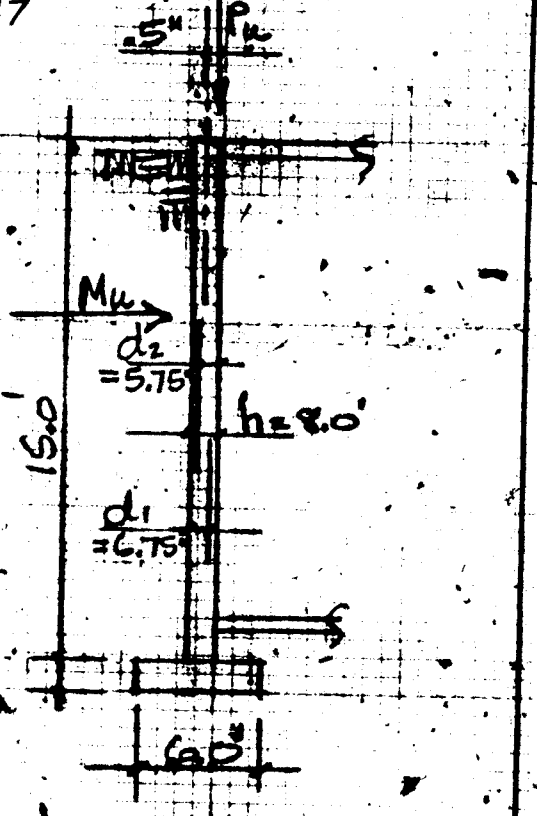
$M_u = 17.0^{IK}/_{FT}$ SEE SHT. 7

EQUIV. UNIF. LOAD:

$q_u = \frac{8 \times 17.0}{(14.5)^2} = 0.647\ K_{LF}$

$d_1 = 8 - .75 - .5 = 6.75"$

$d_2 = 8 - 2 - .25 = 5.75"$



FOOTING DESIGN:

$P = \frac{71.8^K}{7'} + 15.0 \times .100 = 11.76\ K_{LF}$

USE FTG. 6'-0 x 1'-0

$S.B. = \frac{71.8}{7' \times 6'} + .15 = 1.86\ K_{SF}$

$W_u = 1.6(1.86 - .15) = 2.74\ K_{SF}$

$M_u = \frac{2.74(3.67)^2}{2} = 9.77^{IK}/_{FT}$ $F = \frac{(8.5)^2}{1000} = .0723$

$K_u = \frac{9.77}{.0723} = 135$ $A_s = .0026 \times 12 \times 8.5 = 0.27$

USE #5 @ 12" BOT.

$A_s = .31$

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WALL REINFORCING:

CASE I:

LL+DL ON WALL @ 1" ACCIDENTAL e (TO LEFT) + ACTIVE EARTH PRESSURE.

INPUT: (HP-41-C PROGRAM)

$P_{u_1} = 16.41^K$

$P_{u_2} = 7.5' \times \frac{8"}{12"} \times .15 \times 1.4 = 1.05^K$

$h = 8.0"$

$d = 6.75"$

$e = 1.0"$

$q_u = .647^{K}/_{LF}$

$Kl_u = 174"$

$f'_c = 3.0^{KSI}$

$f_y = 60.0^{KSI}$

OUTPUT:

$A_s = 0.74$ (.77%)

$E_c = .0016 < .0020$

$\phi M_R = 244.82^{"K}$

$M_A = 241.37^{"K}$

USE #8@12" VERT. ON BSMT. SIDE OF WALL

$A_s = 0.79$

CASE II:

LL+DL ON WALL
NO ACT. EARTH PRESS.

INPUT:

$P_{u_1} = 16.41^K$

$P_{u_2} = 1.05^K$

$h = 8.0"$

$d = 5.75"$

$e = .5"$

$q_u = 0$

$Kl_u = 174"$

$f'_c = 3.0^{KSI}$

$f_y = 60.0^{KSI}$

OUTPUT:

$A_s = .01$ (.02%)

$\varepsilon_c = .00086 < .00?$

$\phi M_R = 63.10^{"K}$

$M_A = 31.31^{"K}$

USE #4@18 VERT. ON EARTH SIDE OF WALL

$A_s = .13$

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BSMT. WALL @ LINE (A) (MAKE LINE (N) THE SAME)

BM#B24, SEE SHT. 49

$P_u = 34.2^K \times 1.6 = 54.7^K$

FOR FTG. DESIGN,

$P_u = \frac{54.7^K}{30.0'} = 1.82\ ^K/FT.$

FOR WALL DESIGN,

$P_u = \frac{54.7}{7'} = 7.81\ ^K/FT.$

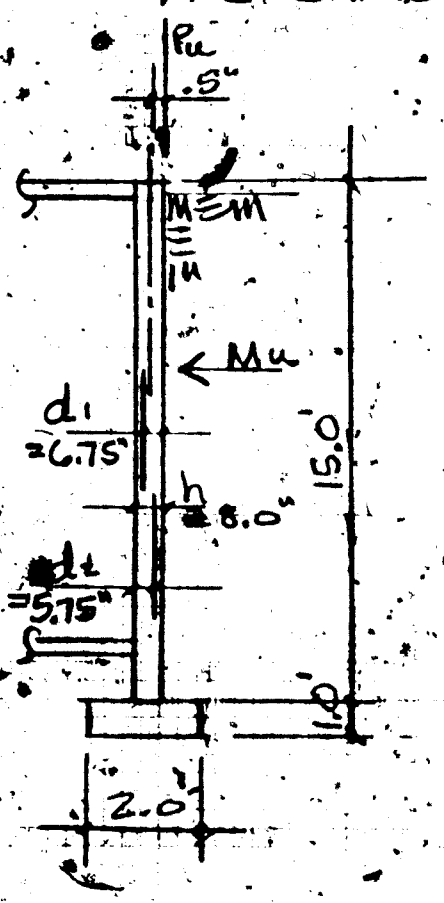
$M_u = \text{[illegible]}^{IK}/FT.$ SEE SHT. 7

EQUIV. UNIF. LOAD:

$q_u = \frac{8 \times 17.0}{(14.5)^2} = .647^{KLF}$

$d_1 = 8 - 3/4 - 1/2 = 6.75"$

$d_2 = 8 - 2 - 1/4 = 5.75"$



FOOTING DESIGN:

$P = \frac{34.2^K}{30'} + 15.0 \times .100 = 2.64^{KF}$

USE FTG. 2'-0 x 1'-0

S.B. $\geq \frac{2.64}{2} + .15 = 1.47$ KSF

USE #4 @ 18" BOT.

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WALL REINFORCING:

CASE I:

LL + DL ON WALL @ ACCIDENTAL e (TO THE RIGHT) + ACTIVE EARTH PRESSURE

INPUT: (HP-41-C PROGRAM)

$P_{u_1} = 7.81^K$
$P_{u_2} = 1.95^K$
$h = 8.0"$
$d = 6.75"$
$e = 1.0"$
$q_u = .647^{KLF}$
$klu = 174"$
$f'_c = 3.0 ksi$
$f_y = 60.0 ksi$

OUTPUT:

$A_s = .68.$ (.71%)
$E_c = .0013 < .0020$
$\phi M_R = 226.26^{"K}$
$M_A = 221.08^{"K}$

USE #8 @ 12" VERT. ON BSMT. SIDE OF WALL

USE #4 @ 18 VERT ON DIRT SIDE OF WALL

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BSMT. WALL ON LINE (12)

$P_{u(LL)} = 1.4 \times 12.5 = 17.5^K$

$P_{u(DL)} = 1.7 \times 9.8 = 16.7^K$

34.2^K } SEE BM. SCH. SHT. 41

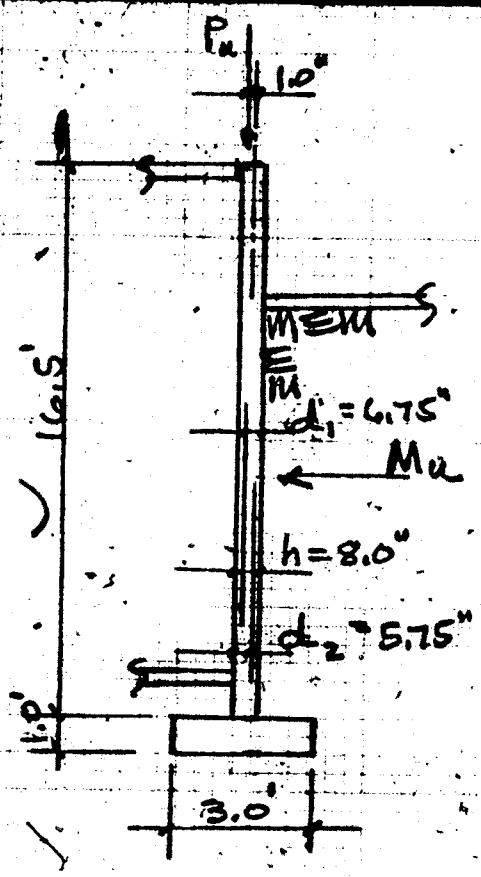
$P_{u(LL+DL)} = \frac{34.2^K}{7'} = 4.89^{KLF}$

$P_{u(DL)} = \frac{16.7^K}{7'} = 2.39^{KLF}$

$M_u = 11.3^{IK}/FT.$ (SEE SHT. 8)

EQUIV. UNIF. LOAD:

$q_u = \frac{8 \times 11.3}{(16.0)^2} = .353^{KLF}$



$d_1 = 8 - .75 - .5 = 6.75"$

$d_2 = 8 - 2 - .25 = 5.75"$

FOOTING DESIGN:

$P = \frac{12.5^K_{LL} + 9.8^K_{DL}}{7'} + 16.5 \times .100^{WALL} = 4.84^{KLF}$

USE FTG. 3'-0" x 1'-0"

$SB_1 = \frac{4.84}{3.0} + .15 = 1.76^{KSF}$

$W_u = 1.6(1.76 - .15) = 2.58^{KSF}$

$M_u = \frac{2.58(1.17)^2}{2} = 1.77^{IK}/FT.$ $F = \frac{(8.5)^2}{1000} = .0723$

$K_u = \frac{1.77}{.0723} = 24$ $A_s = .001 \times 12 \times 8.5 = 0.10\ IN^2/FT.$

USE #4 @ 12" BOT.

Done Hand, 12/31/84

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WALL REINFORCING:

CASE I — LL+DL ON WALL + ACT. EARTH PRESSURE

INPUT: (HP-41-C PROGRAM)

$P_{u_1} = 4.89^K$

$P_{u_2} = 8' \times \frac{8}{12} \times .15 \times 1.4 = 1.12^K$

$h = 8.0"$

$d = 6.75"$

$e = -1.0"$

$q_u = .353^{KLF}$

$Kl_u = 16' \times 12 = 19.2"$

$f'_c = 3.0^{KSI}$

$f_y = 60.0^{KSI}$

OUTPUT:

$A_s = .41$ (.43%)

$E_c = .00095 < .0020$

$\phi M_R = 146.56^{11K}$

$M_A = 142.46^{11K}$

CASE II — DL ON WALL + ACT. EARTH PRESSURE

INPUT:

$P_{u_1} = 2.39^K$

$P_{u_2} = 1.12^K$

$h = 8.0"$

$d = 6.75"$

$e = -1.0"$

$q_u = .353^{KLF}$

$l_u = 192"$

$f'_c = 3.01^{KSI}$

$f_y = 60.0^{KSI}$

OUTPUT:

$A_s = .41$ (.43%)

$E_c = .00089 < .0020$

$\phi M_R = 143.07^{11K}$

$M_A = 139.13^{11K}$

USE #6@12" VERT.

ON BSMT. SIDE OF WALL

$A_s = .44$

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CASE III LL+DL ON WALL NO ACT. EARTH PRESS.

INPUT:

$P_{u_1} = 4.89^K$
$P_{u_2} = 1.12^K$
$h = 8.0"$
$d = 5.75"$
$e = 1.0"$
$q_u = 0^{K/'}$
$Kl_u = 192"$
$f'_c = 3.0^{KSI}$
$f_y = 60.0^{KSI}$

OUTPUT:

$A_s = .01$ (.01%)
$E_c = .0004 < .0020$
$\phi M_R = 24.48^{"K}$
$M_A = 11.54^{"K}$.

USE #4 @ 18" VERT. ON EARTH SIDE OF WALL

$A_s = .13$

CASE IV LL+DL ON WALL @ 1" ACCIDENTAL e (TO RIGHT) + ACTIVE EARTH PRESS.

INPUT:

$P_{u_1} = 4.89^K$
$P_{u_2} = 1.12^K$
$h = 8.0"$
$d = 6.75"$
$e = 1.0"$
$q_u = .353^{KLF}$
$Kl_u = 192"$
$f'_c = 3.0^{KSI}$
$f_y = 60.0^{KSI}$

OUTPUT:

$A_s = 0.43$ (.44%)
$E_c = .0097 < .002$
$\phi M_R = 150.92$
$M_A = 147.41$

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BSMT WALL @ STAIR OPGS.

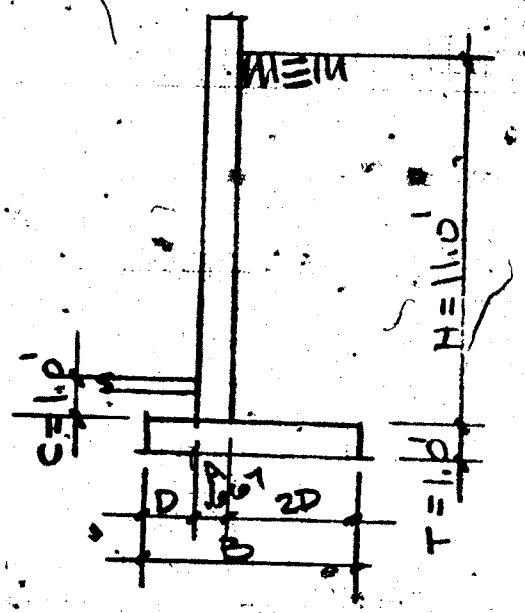
HP-41-C PROGRAM:

INPUT:

SB = 2000 PSF
AP = 35 PCF
PP = 350 PCF
W = 100 PCF
SURCH = 200 PSF
WTST = 100 PSF
CF = 0.4
A = .667'
C = 1.0'
D = 2.0' (EST.)
H = 11.0'
T = 1.0'

OUTPUT:

P_1 = 1949 PSF
P_2 = 307 PSF
B = 7.67'
D = 2.33'
R = 0.00'
SF = 2.66



M_1 = 20399 1#/FT
M_2 = 9618
M_3 = 3450
M_4 = 7636
M_5 = 12994
M_6 = 0
V_1 = 4909
V_2 = 4538

STEMWALL REINF:

M_u = 20.4 1K/FT. (M_1)

$d = 8 - 2 - 3/8 = 5.63"$

$F = \frac{(5.63)^2}{1000} = .0316$

$K_u = \frac{20.4}{.0316} = 645$, $A_s = .0144 \times 12 \times 5.63 = 0.97$

USE #7@6" IN OF UP TO 3'-0" ABOVE FTG.

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STEMWALL REINF., CONT.

$M_u = 9.6$ IK/FT. (M_2) $F = .0316$

$K_u = \frac{9.6}{.0316} = 304$, $A_s = .0061 \times 12 \times 5.63 = 0.41$

USE #6@12" IN O.F. ABOVE 3'-0

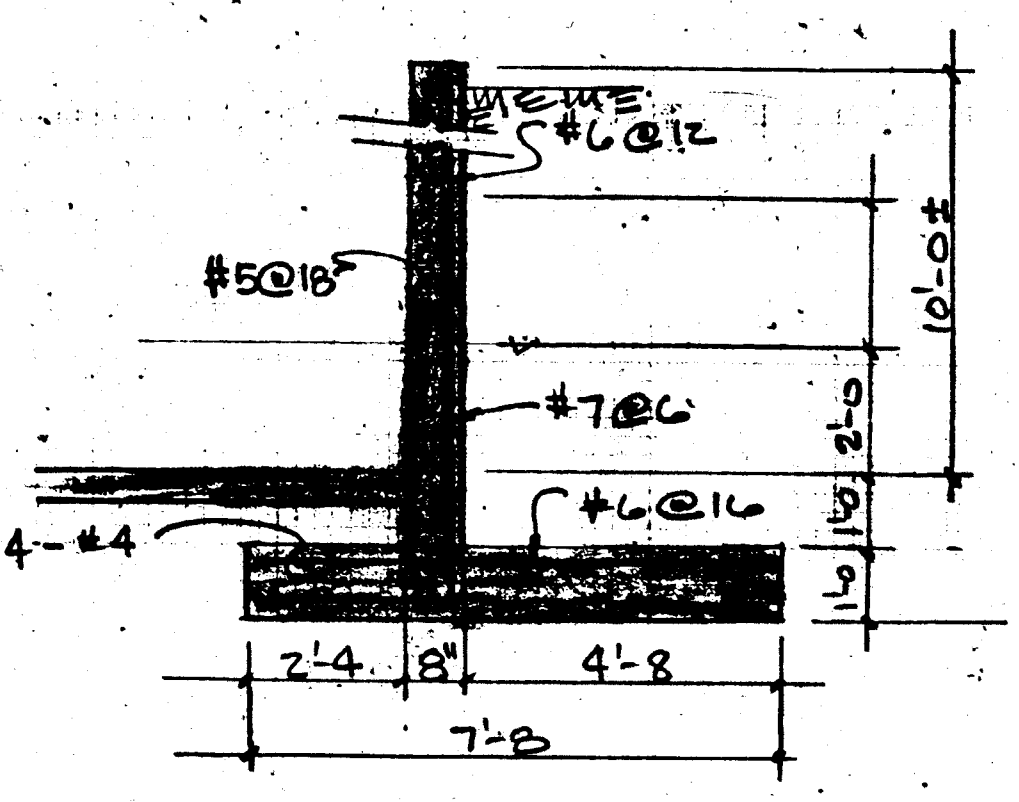
FTG. REINF:

$M_u = 13.0$ IK/FT. (M_5) $d = 12 - 2\frac{1}{2} - \frac{3}{8} = 9.63$"

$F = \frac{(9.63)^2}{1000} = .0926$ $K_u = \frac{13.0}{.0926} = 140$

$A_s = .0028 \times 12 \times 9.63 = 0.32$

USE #6@16" TOP



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CONCRETE PIERS

$f'_c = 3000$ $f_y = 60{,}000$ * all Revised

PIER	COL. LOAD	P_u	COL. & BASE PL SIZE *	PIER SIZE
A-10	96.5	154.4	H W10x33, 1'-2x1'-4	2'-0x2'-0
A-12	59.6	95.4	H W8x24, 8 x 10	" x "
B-12	213.7	341.9	I W10x45, 1'-2 x 1'-4	" x "
F-12	324.0	518.4	I W10x60, 1'-4 x 1'-8	" x "
J-12	237.1	379.4	I W10x49, 1'-4 x 1'-8	" x "
N-2	163.1	261.0	H W8x40, 1'-0x1'-2	" x "
N-12	231.5	370.4	I W10x45, 1'-2 x 1'-4	" x "

USE SQUARE TIED COLUMNS 24" x 24"

MAX. $\ell_u = 16.5'$, $K = 1.0$, $r = .30 \times 24 = 7.2"$

$$\frac{K\ell_u}{r} = \frac{16.5 \times 12}{7.2} = 27.5 > 34 - 12\frac{M_1}{M_2} = 22$$

MAX. $M_1 = M_2 = .10 \times 24" \times 518.4^K = 1244.2^{"K}$

$$I_g = \frac{24(24)^3}{12} = 27648, \quad E_c = 3.2 \times 10^3 \quad \beta_d = \frac{1.7}{3.1} = .55$$

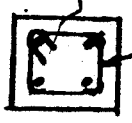
$$EI = \frac{3.2 \times 10^3 \times 27648/2.5}{1 + .55} = 22.83 \times 10^6$$

$$P_c = \frac{\pi^2 \times 22.83 \times 10^6}{(16.5 \times 12)^2} = 827{,}600^K, \quad C_m = 1.0$$

$$\delta = \frac{1.0}{1 - (518.4/.70 \times 827{,}600)} = 1.0009$$

$e = 0.1t$ USE 4-#11 VERTS.

GOOD FOR 1301^K @ $F'_c = 4.10$ PER 1978 CRSI, Pg. 3-23



#3@18" MIDDLE OF COL.
#3@9" AT ENDS OF COL. FOR 3'-0"
ADD 3-#3 ⊡ IN TOP 5" OF COL.

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CONCRETE PIERS continued

RECTANGULAR 17" x 24"

$P_U = 519^K$ & $L_U = 16.5' = 198"$

$e_{min} = 0.1(17") = 1.7"$

$M_2 = M_U = P_U(e) = 519^K(1.7"/12) = 74.0^{K}FT$

$M_c = \delta M_2 = 1.74\ (74.0) = 129^{K}FT$

WHERE: $\delta = \dfrac{C_m}{1 - \dfrac{P_U}{\phi P_c}} = \dfrac{1}{1 - \dfrac{519}{0.7(1.748 \times 10^3)}} = 1.74$

& $P_c = \dfrac{\pi^2 EI}{(kl_u)^2} = \dfrac{\pi^2(6.945 \times 10^3)}{(1 \times 198)^2} = 1.748 \times 10^3$

& $EI = \dfrac{E_c I_g / 2.5}{1 + \beta_d} = \dfrac{(3.3 \times 10^3)(24 \times 17^3/12)}{2.5(1 + 0.45)} = 6.945 \times 10^3$

$0.01(17 \times 25) = 4.08 IN^2$ MIN

TRY 4-#10 $\rightarrow A_S = 5.08 IN^2$

$\gamma = 0.65$

$\rho_g = \dfrac{4(1.27)}{17 \times 24} = .012$

$\dfrac{\delta(e)}{h} = \dfrac{1.74(1.7)}{17} = 0.174$

$\dfrac{P_o}{A_g} = 1.42\ KSI$

$P_{o\ ALLOWABLE} = 1.42(17 \times 24) = 579^K > 519^K$ OK

USE 17"x24" CONC PIER w/ 4-#10 #3 TIES

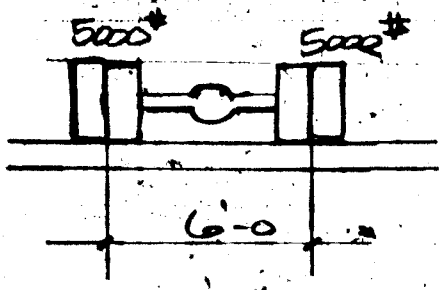
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CLIENT/ SHEET 20 OF 317
PROJECT/ [redacted] 8207
DATE 1/1/82
ENGINEER JRL

TUNNEL

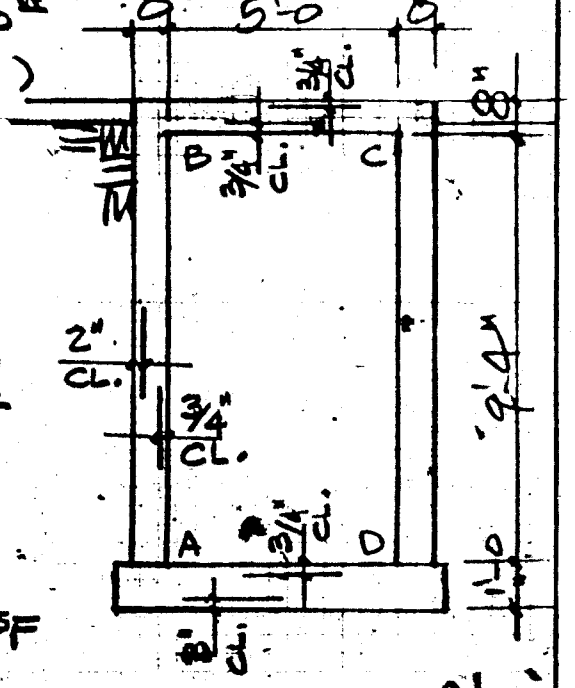
SAY MAX AXLE LOAD = 10,000#
(PICK-UP TRUCK OR FORK LIFT)

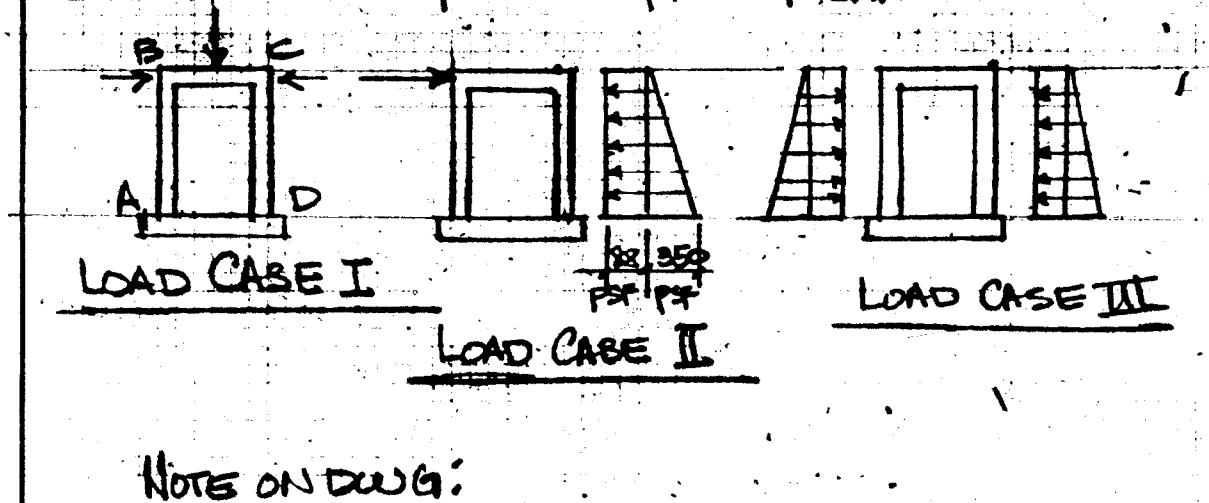


ASSUME A 3'-0" WIDE SECTION OF SLAB TAKES THE LOAD FROM EACH WHEEL.

$P = \frac{5.0^{k}}{3'} = 1.67^{k}/FT.$

UNIF. LOAD ON TOP SLAB = 250 PSF
ACT. EARTH PRESS. = 35 PCF
SURCH. = 250 PSF = 2.5' OF EARTH.





NOTE ON DWG:
BACK FILL BOTH SIDES OF TUNNEL SIMULTANEOUSLY.

See Sht D1 & 2 for Redesign Walls for Surcharge from Fig's.

1600 EAST DESERT INN ROAD SUITE 106 | LAS VEGAS, NEVADA 89109-2594 (702) 731-6226

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CLIENT/ SHEET/ 21 OF 317
PROJECT/ PROJECT # 82017
DATE/ 11/1/82
ENGINEER/ JRL

TOP SLAB B-C

$P_u = 1.67^K \times 1.7 = 2.84^K/FT.$

MAX. POS. $M_u < \frac{2.84^K \times 5.67'}{4} = 4.021^K/FT.$

$d = 8" - 3/4" - 3/8 = 6.88"$ $\quad F = \frac{(6.88)^2}{1000} = .0473$

$K_u = \frac{4.02}{.0473} = 85$ $\quad A_s = .0016 \times 12 \times 6.88 = 0.13$

USE #5 @ 16" BOT.
$A_s = 0.23$

MAX. NEG. $M_u < \frac{2.84^K \times 5.67'}{18} = 2.01^K/FT.$

SEE MAX. NEG. MOM. IN WALLS @ TOP

SIDEWALLS A-B & C-D

MAX. POS. $M_u < 1.7\left[\frac{.088(10)^2}{8} + \frac{.350(10)^2}{15.6}\right] = 5.68^K/FT.$

$d = 8" - 3/4" - 3/8 = 6.88"$ $\quad F = \frac{(6.88)^2}{1000} = .0473$

$K_u = \frac{5.68}{.0473} = 120$, $\quad A_s = .0023 \times 12 \times 6.88 = 0.19$

USE #5 @ 12, I.F.
$A_s = .31$

MAX. NEG. M_u @ TOP $< 1.7\left[\frac{.088(10)^2}{12} + \frac{1}{15} \times .35 \times \frac{10}{2} \times 10\right]$

$= 3.23^K/FT.$

$d = 8 - 2" - 3/8" = 5.62"$ $\quad F = \frac{(5.62)^2}{1000} = .0316$

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$K_u = \frac{3.23}{.0316} = 102$ $A_s = .0020 \times 12 \times 5.62 = 0.13$

USE #5@16"
$A_s = 0.23$

MAX. NEG. M_u @ BOT. $< 1.7\left[\frac{.088(18)^2}{12} + \frac{1}{10} \times .35 \times \frac{10'}{2} \times 10'\right]$

$= 4.22$ K/FT.

$K_u = 102 \times \frac{4.22}{3.23} = 133$, $A_s = .0026 \times 12 \times 5.62 = 0.18$

USE #5 @ 16"
$A_s = 0.23$

FOOTING SLAB:

D.L. WALLS $= 9.33' \times .10^{KSF} = .93$ K/FT. EA.
D.L. TOP SLAB $= 6.33' \times .10^{KSF} = .63$ K/FT.
LL TOP SLAB $= 1.67$ K/FT.

$W_u = 1.4(2 \times .93 + .63) + 1.7 \times 1.67 = 6.75$ K/FT.

MAX. POS. $M_u < \frac{6.75^K \times 5.67'}{8} = 4.78$ K/FT.

$d = 12 - 1\frac{1}{2} - \frac{3}{8} = 10.12"$ $F = \frac{(10.12)^2}{1000} = .102$

$K_u = \frac{4.78}{.102} = 47$ $A_s = .0015 \times 12 \times 10.12 = 0.18$

USE #5@16"
$A_s = .23$

MAX. NEG. M_u

SEE MAX. NEG. M_u BOT. OF WALLS

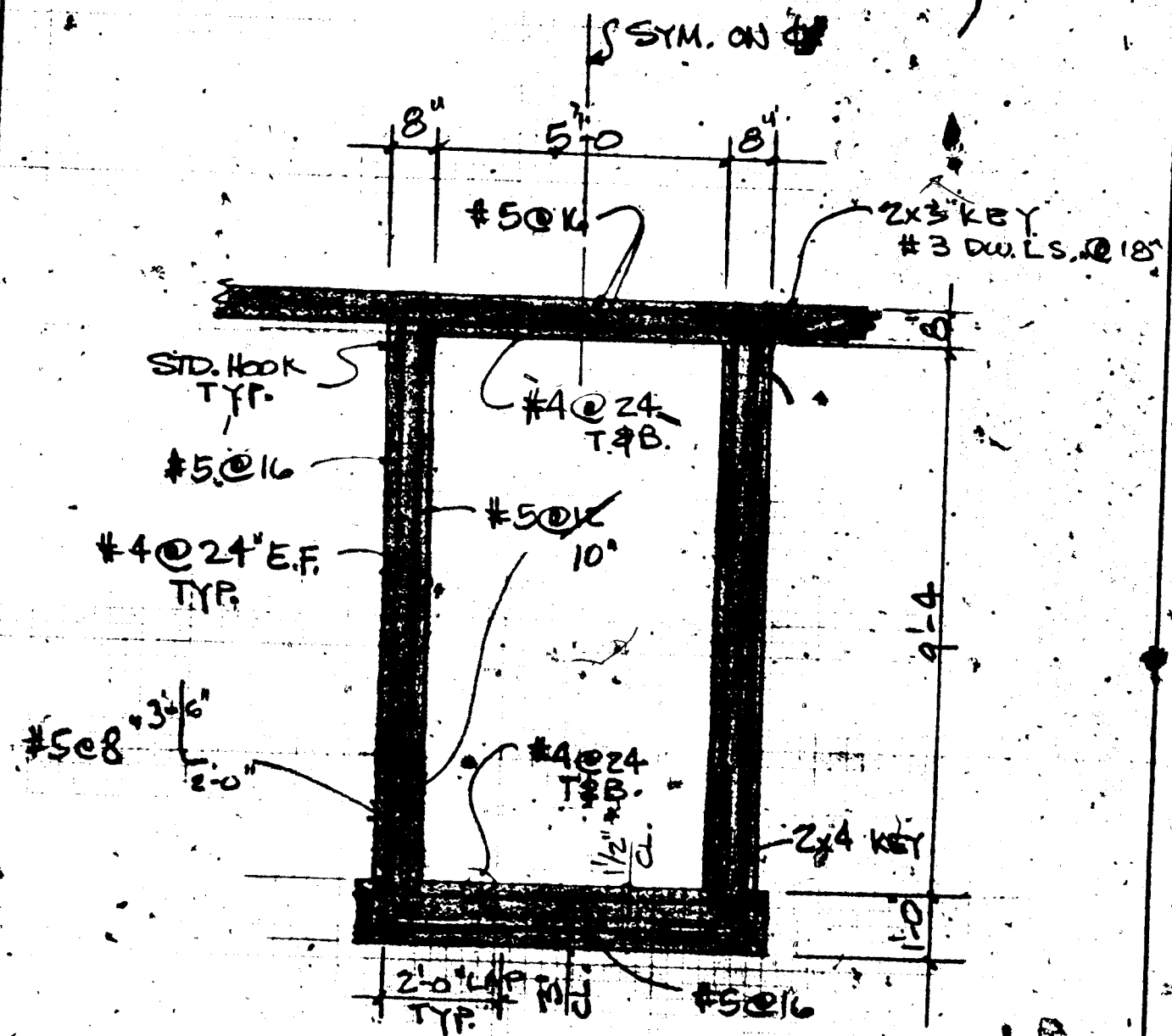
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SHEET 23 OF 317
PROJECT # 82017
DATE/ 11/1/82
ENGINEER JJS



Typ. SECTION THRU TUNNEL
3/8" = 1'-0

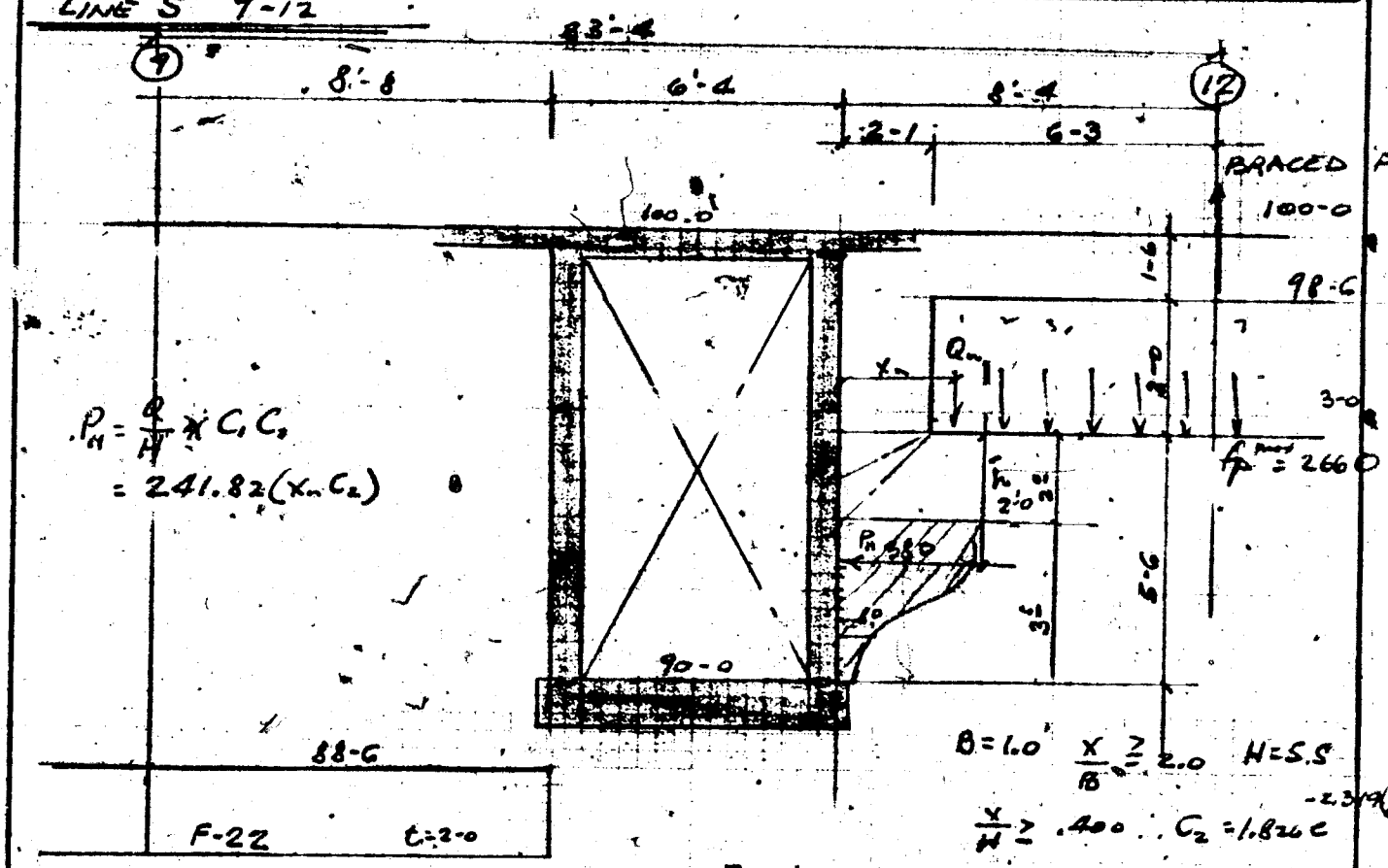
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CLIENT/ SHEET/ 24 OF 317
PROJECT/ PROJECT # 82017
DATE/ 11-11-87
ENGINEER/

LINE S 9-12



$P_n = \frac{Q}{H} * C_1 C_2$

$= 241.82(x_m C_2)$

B = 1.0' $\frac{X}{B} \geq 2.0$ H = 5.5

$\frac{X}{H} \geq .400 \therefore C_2 = 1.826 e^{-2.3(X/H)}$

$C_1 m = .634 + .211 \ln \frac{X}{H}$

	x_m	X/H	C_2	P/H	m	$\bar{h}$
X_1	2.5	.455	.628	379.7	.486	2.573
X_2	3.5	.636	.418	353.6	.589	2.962
X_3	4.5	.818	.273	292.1	.592	3.256
X_4	5.5	1.000	.180	238.9	.634	3.487
X_5	6.5	1.182	.118	185.1	.669	3.681
X_6	7.5	1.364	.077	140.1	.699	3.847
X_7	8.5	1.545	.051	1442	.726	3.992
X_8	9.5	1.727	.033	76.4	.749	4.121

N.P. 41CV PROGRAM
03217

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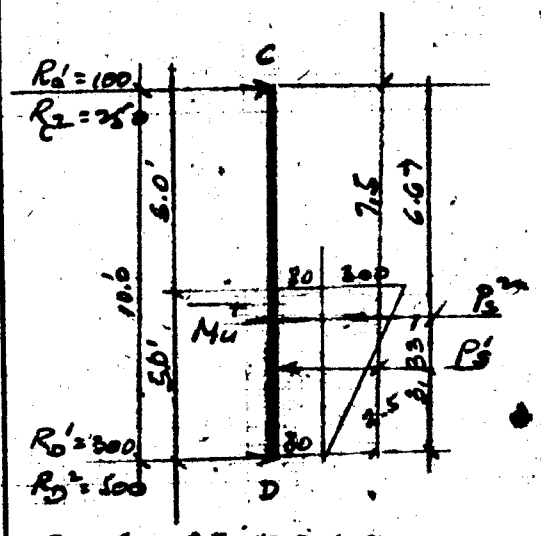
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STRUCTURAL ENGINEERS

CLIENT/ SHEET 25 OF 317
PROJECT/ PROJECT # 82017
DATE/ 11-15-82
BSMT @ TUNNEL WALLS. ENGINEER/

TUNNEL NEAR LINE (5) (12) side

1.0' strip



$R_3' = 80(5.0) = 400^{\#}$

$P_2^2 = 200(5.0).5 = 750$

$M_u^C = 1.7(750)6.67(3.33)^2 \div 10^2 = 943^{'\#}$
(Top) $+1.7(400)7.5(2.5)^2 \div 100 = 319$
$1262^{'\#}$

$M_u^D = 1.7(750)(6.67)3.33 \div 100 = 1723$
(Bott) $+1.7(400)(7.5)2.5 \div 100 = 1956$
$2689^{'\#}$

$R_1 = 400 \times 2.5 \div 10 = 100$

$R_2 = 750 \times 3.33 \div 10 = 250^{\#}$

$M_u^+ = 1.7(100+250)6.67 - M_u^{3.33}$
$= 3968.7 - 1262.0 = 2707^{'\#}$

$A_s = \rho bd$

Σ Mom.

		F	K_u	P	A_s
Top	$M_u = 1.26 + 3.23 = 4.49^{'K}$	.0316	142.09	.0027	.22
				#5@16	
Bott	$M_u = 2.69 + 4.22 = 6.91^{'K}$	.0316	218.67	.0049	.33
				#5@10	
	$M_u^+ = 2.71 + 5.68 = 8.39^{'K}$	.0473	177.38	.0033	.23
				#5@12	

ΣV_u · Top $= 1.7(100+250) + 1.7\left[\frac{880}{2} + \left(\frac{350 \times 10}{2} \times \frac{1}{3}\right)\right]$
$= 595 + 1741 = 2335^{\#}$

Bott. $= 1.7(300+500) + 1.7\left[\frac{880}{2} + \left(\frac{350 \times 10}{2} \times \frac{2}{3}\right)\right]$
$= 1360 + 2732 = 4092^{\#}$

$v_u = \frac{4092}{12(.85)6.88} = 58.3\ psi < 2\sqrt{f_c} = 109.5$

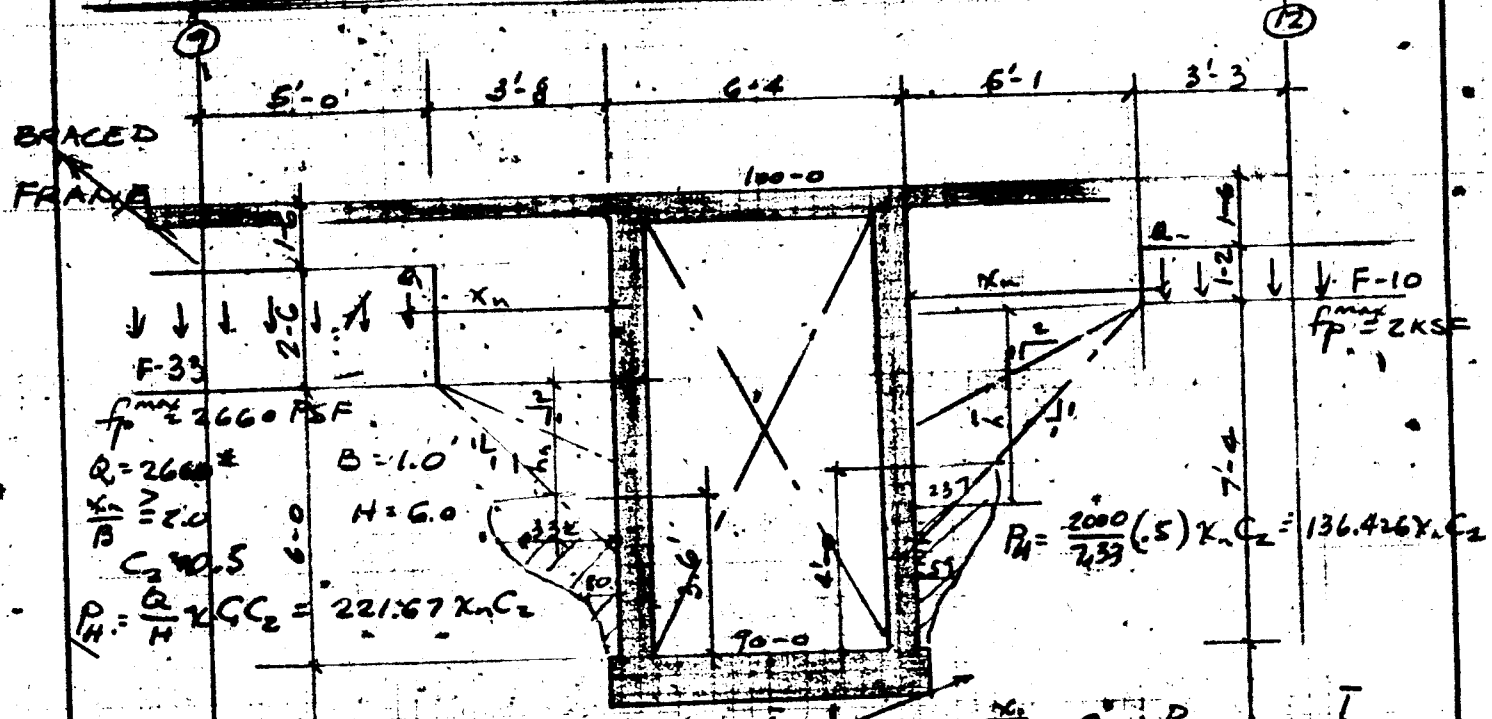
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ENGINEER/

LINE U 9=12



	x_n	x/H	C_2	P_n	n	$\bar{h}$	x_n	$\frac{x_n}{H}$	C_2	P_n	n	$\bar{L}$
X_1	4.17	.70	.36	332.7	.559	3.35	5.583	.762	.312	237.6	.637	4.227
X_2	5.17	.86	.25	286.6	.602	3.61	6.583	.898	.228	204.8	.671	4.481
X_3	6.17	1.03	.17	232.5	.640	3.84	7.583	1.034	.166	174.8	.661	4.700
X_4	7.17	1.20	.113	179.0	.672	4.04	8.583	1.171	.121	141.5	.667	4.89
X_5	8.17	1.36	.078	141.0	.679	4.19	9.583	1.307	.088	115.5	.690	5.06
X_6	9.17	1.528	.053	107.3	.723	4.34	10.583	1.444	.064	92.6	.712	5.22
X_7	10.17	1.695	.036	80.1	.745	4.47	11.583	1.580	.047	73.9	.731	5.36
							12.583	1.717	.034	58.5	.748	5.48

$P_n = 2.3 \log(\frac{5}{n})$ x_8

> 0.4 $C_2 = 1.826\, e$

and $n = .634 + .211 L_n(\frac{x}{H})$

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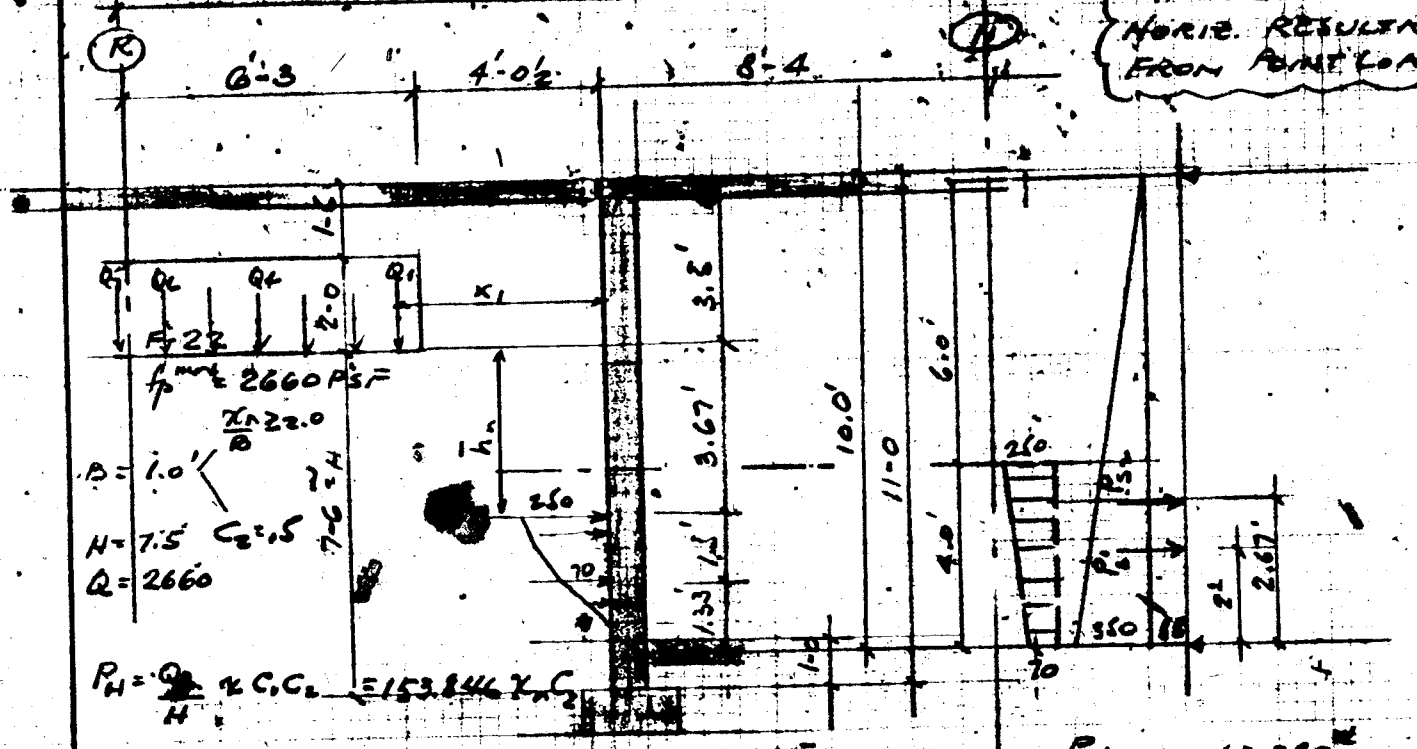
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STRUCTURAL ENGINEERS

CLIENT/ SHEET# 27 OF 317
PROJECT/ PROJECT # 82017
Basement Walls DATE/ 11-11-82
FTG. SURCHARGE ENGINEER Jm

LINE N F.22 18'-7½

HP 41CV PROG #05217 NOTE: RESULTANT FROM POINT LOADS



	x_n	$\frac{x_n}{H}$	C_2	P_{H_n}	n	$\bar{h}_n$
x_1	4.5	.692	.583	251.2	.56	8.64'
x_2	5.5	.846	.357	217.4	.590	3.910
x_3	6.5	1.000	.180	180.0	.634	4.12
x_4	7.5	1.154	.126	145.3	.664	4.32
x_5	8.5	1.308	.084	115.0	.691	4.49
x_6	9.5	1.462	.062	90.6	.714	4.64
x_7	10.5	1.615	.043	67.5	.735	4.78

$\Sigma = 2.319 \left(\frac{x}{2}\right)$

$P_{S1} = 70 \times 4 = 280^{\#}$

$P_{S2} = 180 \times 4 \times .5 = 360^{\#}$

$\geq 0.4 \therefore C_2 = 1.826$ ©

and $n = 0.634 + .211 \bar{h}_n$ (#)

$\bar{h} = H_n$

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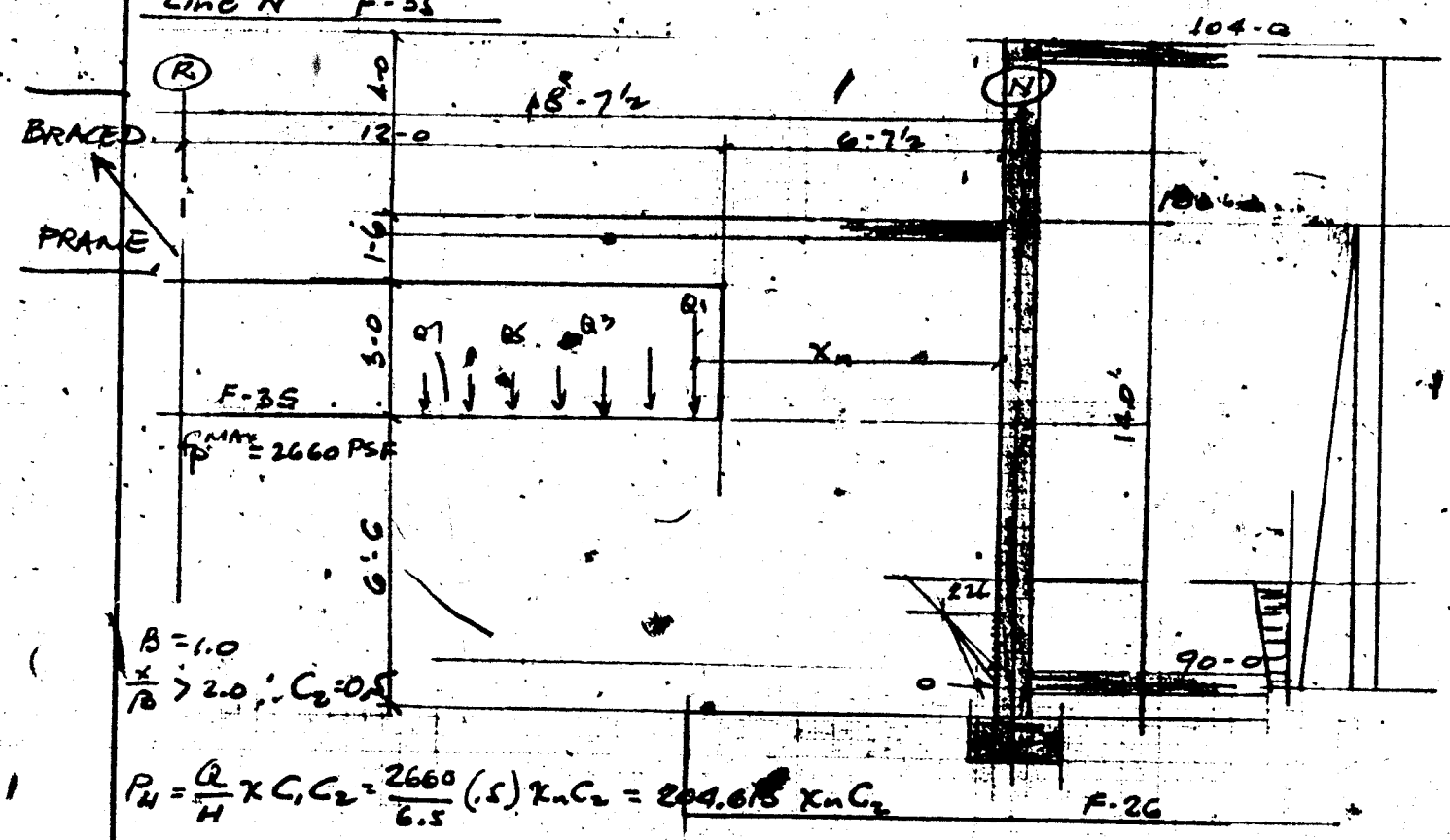
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STRUCTURAL ENGINEERS

CLIENT/
PROJECT/ Basement Walls
Adjacent Ftg -- Surcharge

SHEET/ 28 OF 317
PROJECT # 82017
DATE/ 11-11-82
ENGINEER/ JM

Line N F-35



B = 1.0
$\frac{x}{B} > 2.0$ ∴ $C_2 = 0.5$

$P_H = \frac{Q}{H} \times C_1 C_2 = \frac{2660}{6.5}(.5) X_n C_2 = 204.6 X_n C_2$

	X_n	X/H	C_2	P_H	n	$\bar{h}_n$
X_1	6.75	1.04	.169	22C	.642	4.2
X_2	7.75	1.19	.116	184	.671	4.4
X_3	8.75	1.35	.080	143	.697	4.53
X_4	9.75	1.50	.056	118	.719	4.67
X_5	10.75	1.654	.039	86	.740	4.81
X_6	11.75	1.808	.028	66	.759	4.93
X_7	12.75	1.962	.019	50	.776	5.05
X_8	13.75	2.115	.014	38	.792	5.15

$C_2 = 1.826 e^{-2.319(\frac{x}{H})}$

$n = .634 + .211 \ln(\frac{x}{H})$

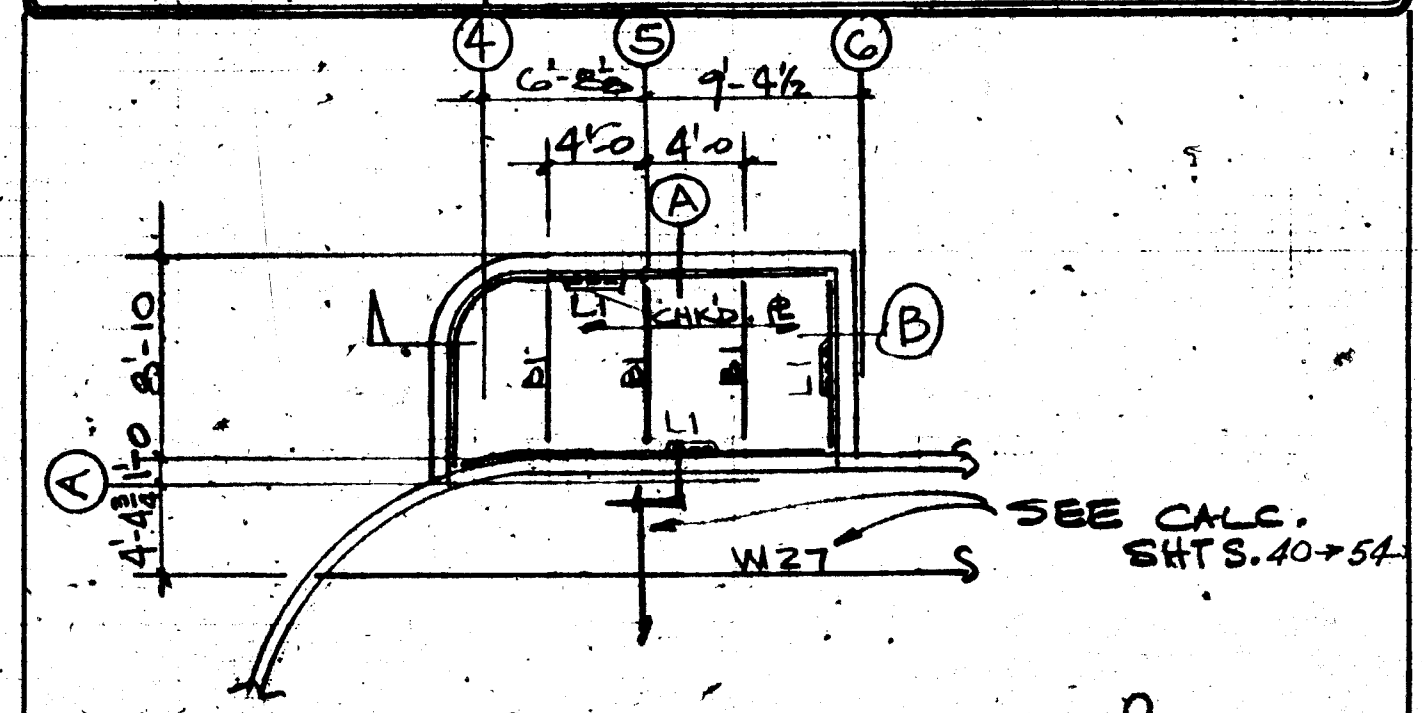
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STRAUSS & LOFTFIELD
STRUCTURAL ENGINEERS

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PROJECT# 82017
DATE/ 10/28/82
ENGINEER/ JRL



GENERATOR ACCESS ROOM
FRAMING PLAN
1/8" = 1'-0

CHKD. PL COVER:

LL = 250 PSF SIMPLE SPAN = 4'-0 DL = 20 PSF ±

$M = \frac{270(4)^2}{8} = 540$ #/FT. $S_R = \frac{540 \times 12}{20000} = 0.324$

USE ½" CHKD. PL COVER $S = \frac{12(.5)^2}{6} = .50$

APPROX. WT. OF EA. PIECE OF PL = 4' x 8' x 21 = 672#

$f_b = \frac{540 \times 12}{.50} = 12,960$ PSI

$\Delta = \frac{.54(4)^2}{80.6 \times .50 \times .50} = 0.43"$ OK

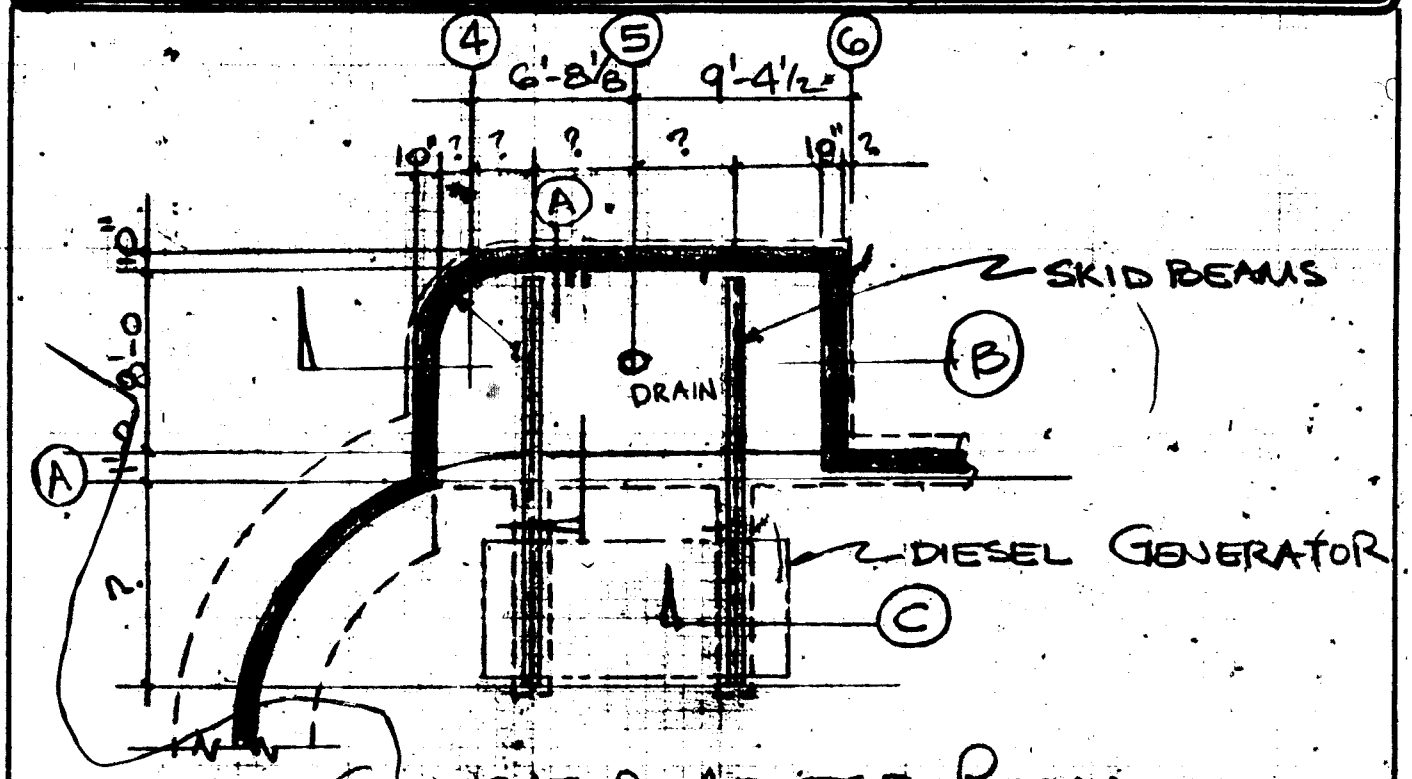
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PROJECT # 82017
DATE/ 10/29/82
ENGINEER/ JRL



GENERATOR ACCESS ROOM
FDN. PLAN
1/8"=1'-0"

SKID BEAMS

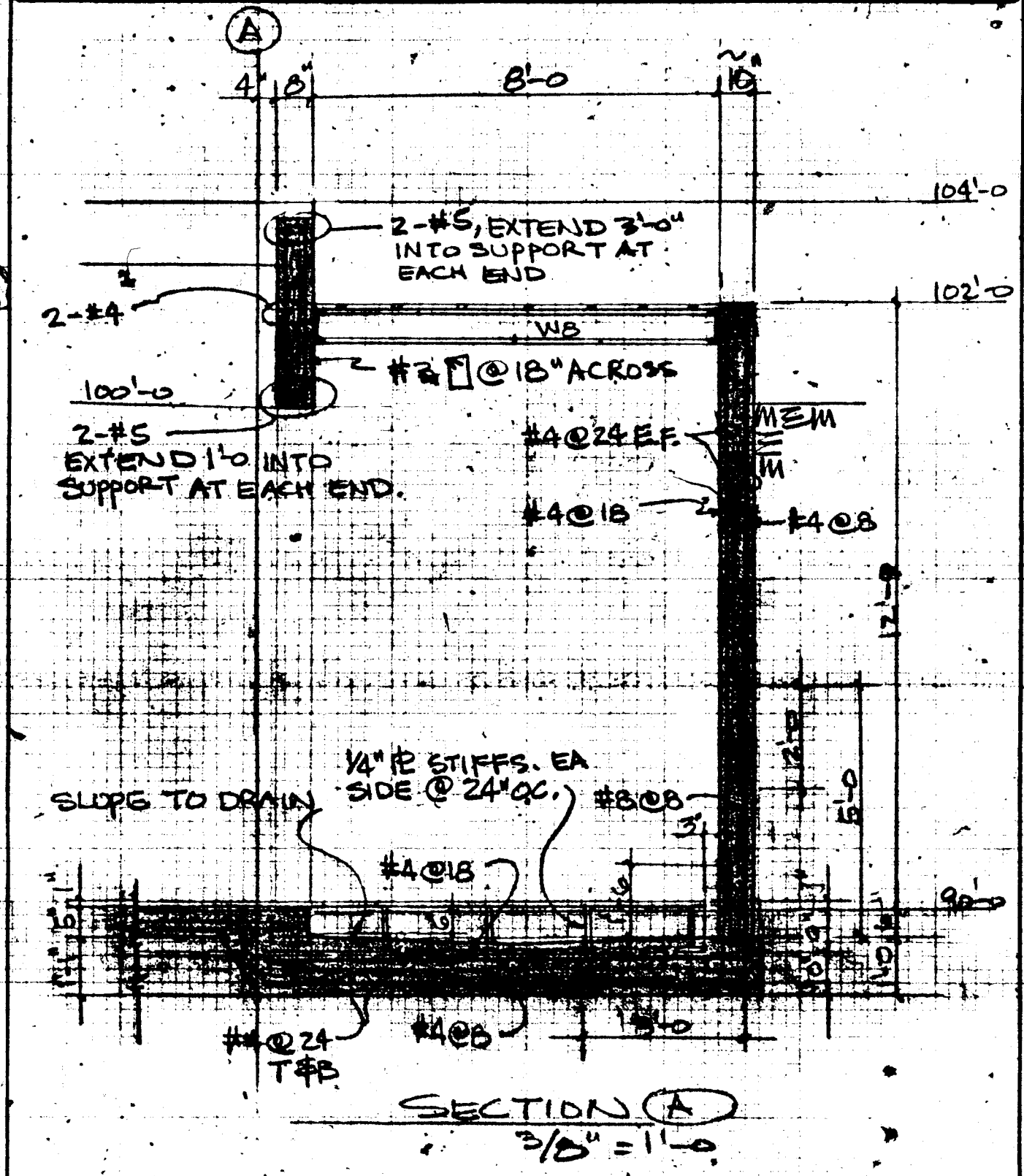
WT. OF GEN. = 15.5K
ASSUMED MAX. LOAD AT EA. SUPPORT = $\frac{15.5}{4} \times 1.5 = 5.8^K$
USE A FTG. 1'-0" WIDE, ASSUME 2000 PSF BEARING
MAX. BENDING IN BEAM < $\frac{2.0(1.45)}{2} = 2.1^K$
USE W10 X 22

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ENGINEER/ JRL



SECTION (A)
3/8" = 1'-0

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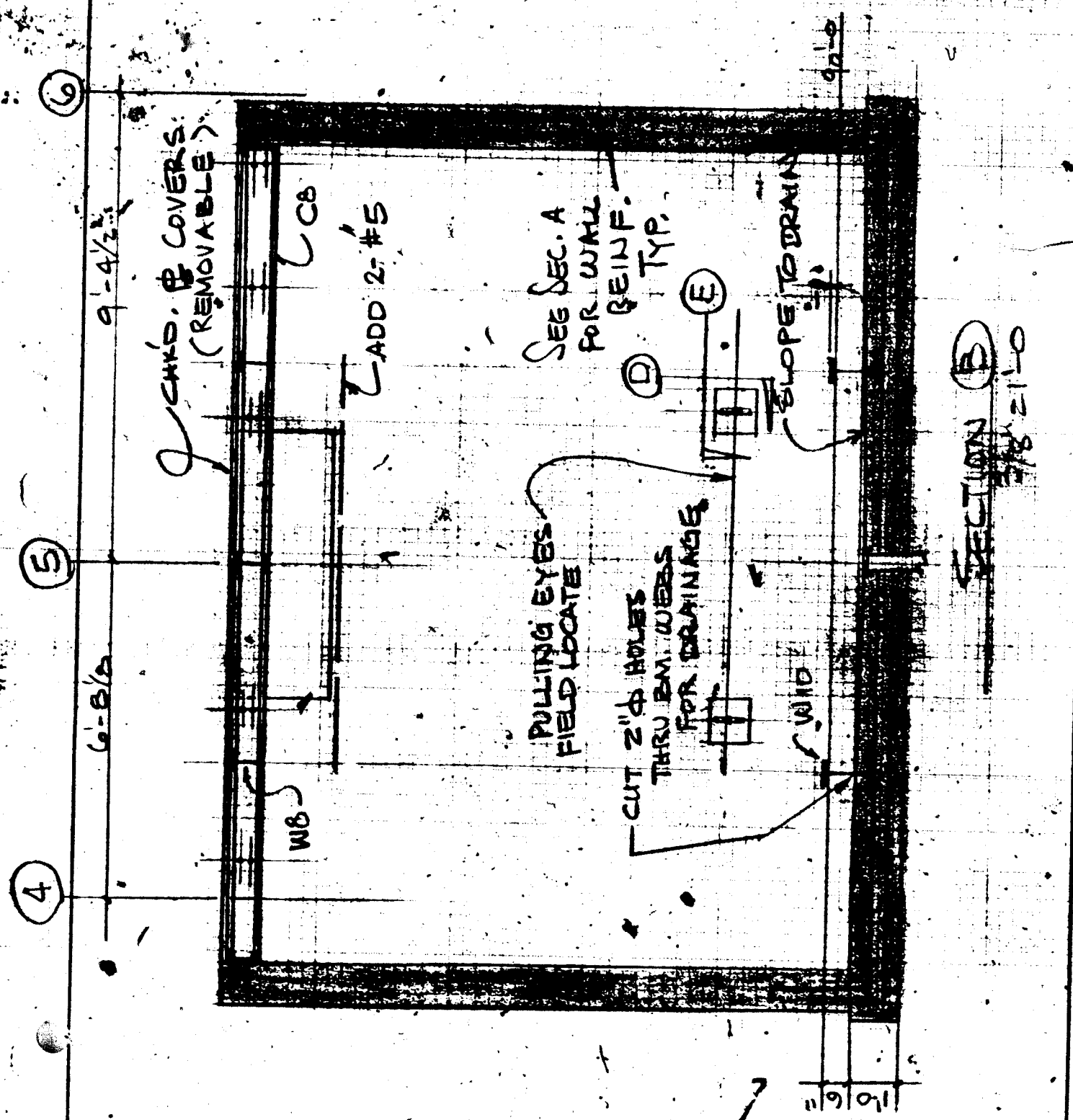
PROJECT/

SHEET/ 32 OF 317

PROJECT #

DATE/

ENGINEER/



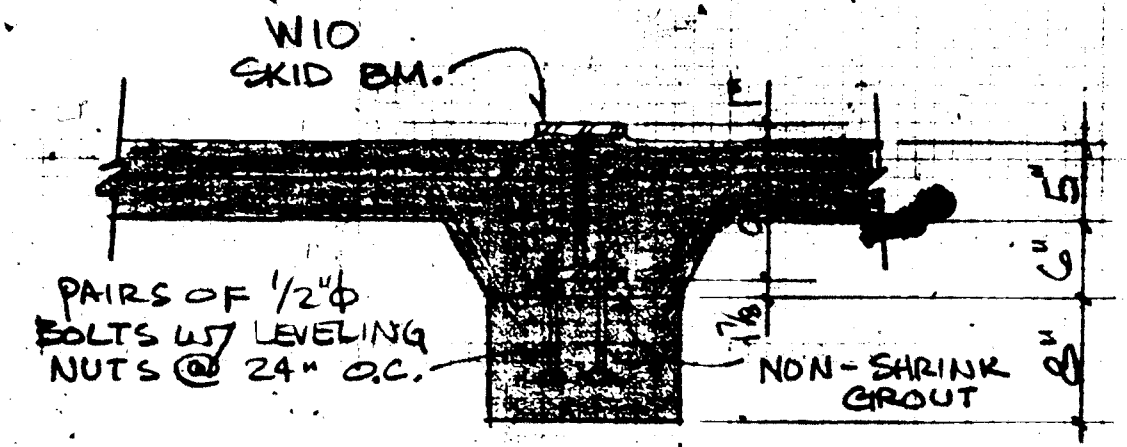
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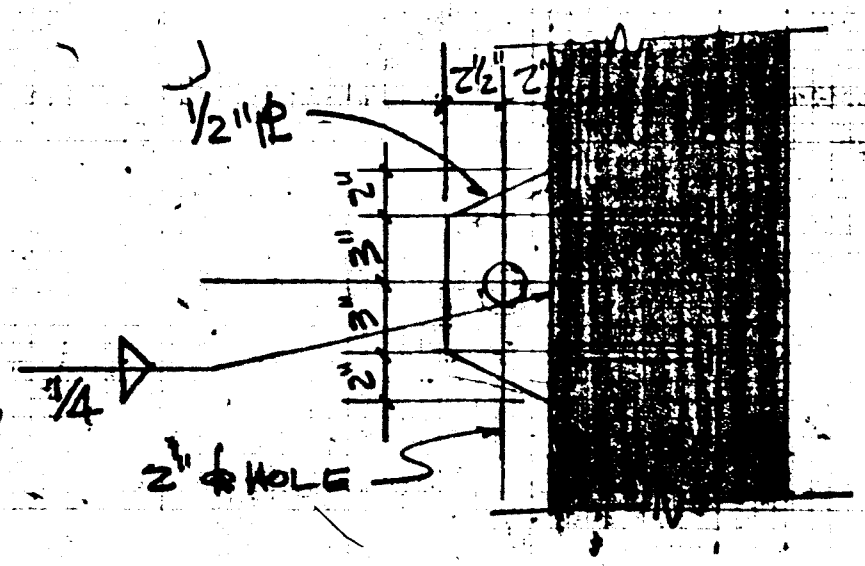
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DATE/ 10/29/82
ENGINEER/ JRL



SECTION (C)
1" = 1'-0



SEC. (D)
1½" = 1'-0

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STRAUSS & LOFTFIELD
STRUCTURAL ENGINEERS

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PROJECT/
SHEET/ 34 OF 317
PROJECT # 82017
DATE/ 10/29/82
ENGINEER/ JRL

BEAMS B1

SPAN = 8'-0 $w = 4'(\overset{LL}{250}+\overset{DL}{20}) = 1080$ PLF

$M = \frac{1.08(4)^2}{8} = 2.16^{1K}$ $R = 2.16^{K}$

USE W8X10

LEDGER L1

MAX. SPAN BETWEEN BOLTS = 36"

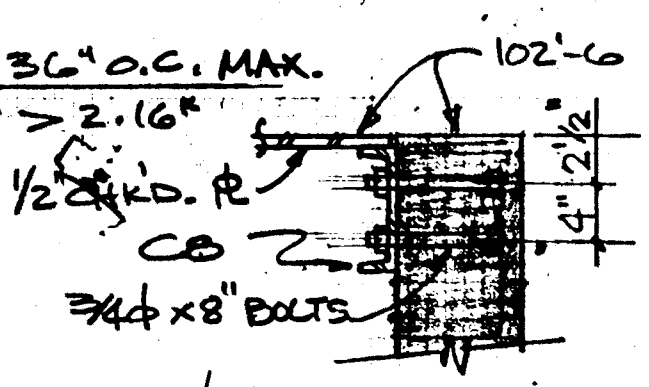
MAX. $M < \frac{2.16^{K} \times 3.0'}{4} = 1.62^{1K}$

USE C8 x 11.5

MAX. $f_b = \frac{1.62 \times 12}{8.14} = 2.4^{KSI}$

USE 2-3/4ϕ BOLTS @ 36" O.C. MAX.

GOOD FOR $2 \times 3.0 = 6.0^{K} > 2.16^{K}$

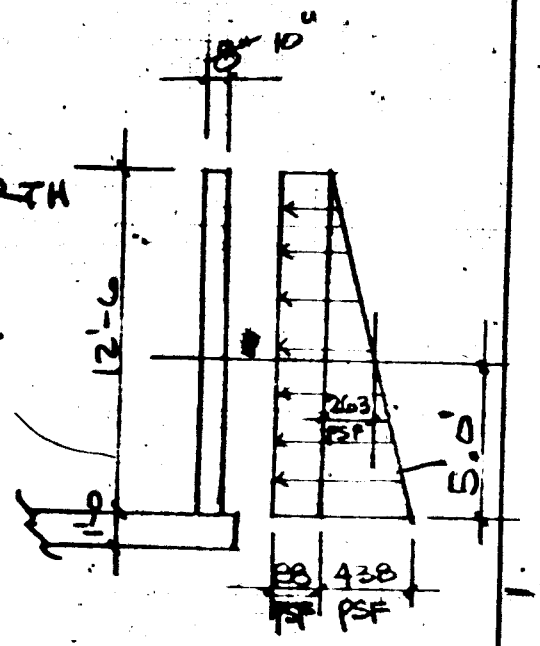


Done Hand, 12/31/87

STRAUSS & LOFTFIELD
STRUCTURAL ENGINEERS

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PROJECT/
SHEET/ 35 OF 317
PROJECT # 82017
DATE/ 10/29/82
ENGINEER/ JRL

GEN. ACCESS ROOM WALL



ACT. EARTH PRESS. = 35 PCF
SURCH. = 250 PSF = 2.5' OF EARTH

$M = \frac{.088(12.5)^2}{2} + \frac{.438(12.5)^2}{6} = 18.31^{K}/FT.$

$M_u = 1.7 \times 18.3 = 31.1^{K}/FT.$

$d = 10 - 2\frac{1}{2} = 7.5"$

$F = \frac{(7.5)^2}{1000} = .0563$

$K_u = \frac{31.1}{.0563} = 553$

$A_s = .0120 \times 12 \times 7.5 = 1.08 \text{ in}^2/FT.$

USE #8 @ 8" VERT. UP TO 5' ABOVE THE FTG.

@ 5' ABOVE FTG.;

$M = \frac{.088(7.5)^2}{2} + \frac{.263(7.5)^2}{6} = 4.94^{K}/FT.$

$M_u = 1.7 \times 4.94 = 8.40^{K}/FT.$

$K_u = \frac{8140}{.0563} = 149$

$A_s = .0028 \times 12 \times 7.5 = .025 \text{ in}^2/FT.$

USE #4 @ 8" VERT.
$A_s = .30$

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Don Hocal, 12/31/87

STRAUSS & LOFTFIELD
STRUCTURAL ENGINEERS

CLIENT/
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PROJECT # 82017
DATE/ 10/29/82
ENGINEER/ JRL

CONC. BEAM OVER GEN. ACCESS ROOM

SPAN = 16.8' 8" x 44" BM

$W = 2.4'(\overset{DL}{200}+\overset{LL}{100}) + 4.0'(\overset{LL}{250}+\overset{DL}{20}) + \overset{BM.}{100} \times 4'$

$= 2200\#/FT.$ $DL = 960$ PLF

$w_u = 1.4 \times 2.20 + 1.7 \times .96 = 4.71$ K/FT.

$M_u = \frac{4.71(16.8)^2}{12} = 110.8^{1K}$ TOP

55.4^{1K} BOT.

$d = 44" - 2\ 1/4 = 41.75"$ $F = \frac{8(41.75)^2}{12000} = 1.162$

$K_u = \frac{110.8}{1.162} = 95$

$A_s = .0018 \times 8 \times 41.75 = 0.60\ IN^2$

USE 2-#5 TOP & BOT. CONT.

CHECK SHEAR:

$V_u = (\frac{16.8}{2} - 3.48') 4.71 = 23.2K$

$v_u = \frac{23,200}{.85 \times 8 \times 41.75} = 82.$ psi $v_c = 2\sqrt{3000} = 110$ psi

Min. $A_v = 50 \frac{8 \times 18}{40,000} = 0.18$

USE #3 ⊓ @ 18" ACROSS

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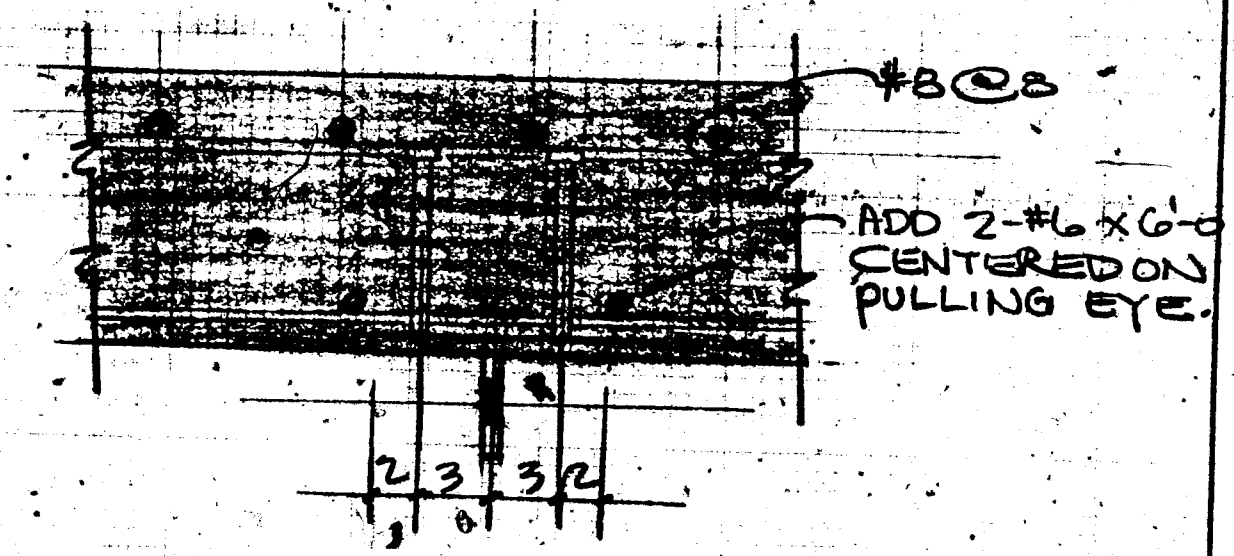
DESIGN OF PULLING EYES

WT. OF GENERATOR = 15.5^k , Say $\mu = .25$
(STEEL ON STEEL)

$.25 \times 15.5 = 3.9^k$

USE TWO PULLING EYES;
ASSUME 1 - PULLING EYE TAKES ALL OF THE LOAD.

USE 4 - 3/4ϕ x 8" STUDS IN TENSION @ 6 o.c.
GOOD FOR $4 \times \frac{2 \times 2.25}{3} = 6.0^k > 3.9^k$
(TABLE 26-G, UBC)



SEC E
1½" = 1'-0

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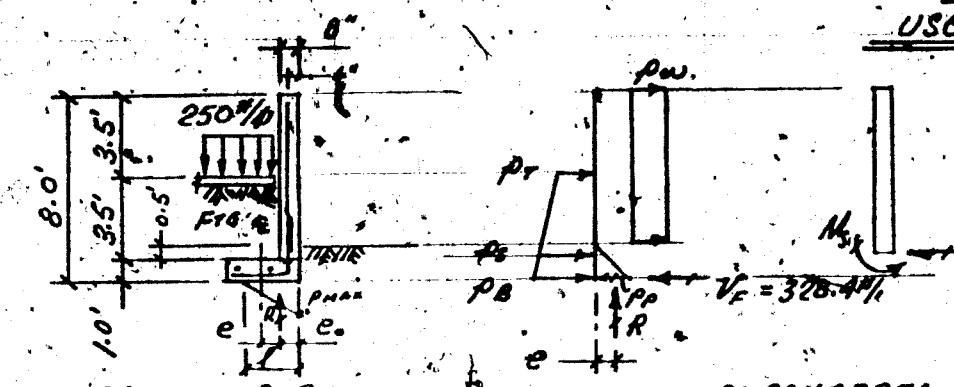
Work Sheet 12/31/87

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CLIENT/ SHEET 38 OF 317
PROJECT/ PROJECT # 82017
DATE OCT '82
BY HS

MISC CONC WALLS

ADJACENT TO WALK AT N.E. PROPERTY LINE



USE 8" THK CONC WALL
#4 VERT @ 15" oc CENTERED
#4 HORIZ @ 12" o.c.
CONT FTG 3'-0" x 12" THK
2-#4 BOTT CONT.

CONC WALL CONTROL JTS AT 40'-0" O.C. MAX

WIND: $\rho_W = C_e C_q q_s I$
$= (1.2)(1.9)(15)(1) = 24 PSF$

SURCHARGE: $\frac{250^{\#}/ft}{100^{\#}/FT^3} = 2.5'$ EQ. SOIL

$\rho_W = 24^{\#}/ft$ ⟶ $H_W = \rho_W \times 6.5' = 156.0^{\#}$
$\rho_T = (35^{\#}/FT^3)(2.5') = 87.5^{\#}/ft$ ⟶ $H_1 = \rho_T \times 4.5' = 393.8^{\#}$
$\rho_S = (\text{do})(2.5+3.5') = 210.0^{\#}/ft$ ⟶ $H_S = (\rho_S - \rho_T)(3.5/2) = 214.4^{\#}$
$\rho_B = (\quad)(2.5+4.5') = 245.0^{\#}/ft$ ⟶ $H_2 = (\rho_B - \rho_T)(4.5/2) = 354.4^{\#}$
$\rho_P = (300^{\#}/FT^3)(1.5') = 450.0^{\#}/ft\ MAX$ ⟶ $H_3 = (-\rho_P)(1.5/2) = -(337.5^{\#})$
$\Sigma H = 564.7^{\#} = V_F$

$M_S = (H_W \times 3.75' + H_1 \times 3.5/2 + H_S \times 3.5/3) = 1524^{\#FT/FT}$

$M_U = 1.7 M_S = 2.6^{KFT/FT}$ $d = 8"/2 = 4"$ $\xi F = 12(4.0)^2/1000 = 0.016$

$K_U = 2.6/0.016 = 163 \rightarrow \rho_{REQ'D} \geq .00314$

$A_S = \rho(12 \times 4.0) = 0.151\ IN^2/FT \rightarrow$ #4 @ 15" oc = .16 IN²/ft.

WALL 7.0' x (8/12) (150)	= 0.70^K	x 0.33'	= 0.23^KFT
FTG 3.0 x 1.0 (do) EST	= 0.45^K	x 1.50'	= 0.68
SOIL & SUR. 6.0 x 2.33 (100)	= 1.40^K	x 1.83'	= 2.56
$R = \Sigma W =$	2.55^K	$M_R =$	3.47^KFT

$M_O = (H_W \times 4.75' + H_1 \times 2.25 + H_2 \times 1.50 + H_3 \times 0.50) = 1990^{\#FT} = 1.99^{KFT}$

$M_R > 1.5 M_O = 2.99^{KFT}$ OK

$e_o = (M_R - M_O)/R = 0.581'$ → $e = (\frac{3.0}{2} - e_o) = 0.919' > \frac{3.0}{6} = 0.50$ ∴ PRESS. DISTRIBU. IS TRIANGULAR

$\ell = 3(e_o) = 1.743'$

$\rho_{MAX} = \frac{2R}{\ell \times 1} = 2.93^{K/ft} \simeq (4/3)(2.0^{K/ft}) = 2.67$ SAY OK

CHECK SLIDING:
$\mu R = 0.3(2550^{\#}) = 765^{\#} > V_F = 565^{\#}$ OK

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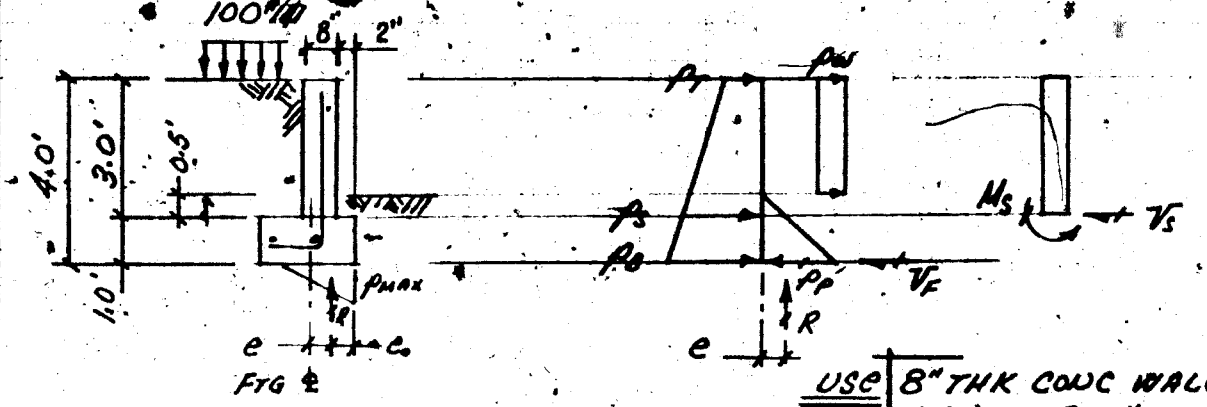
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CLIENT/ SHEET/ 39 OF 317
PROJECT/ PROJECT # 82017
DATE/ OCT '82
ENGINEER/ HS

MISC CONC WALLS

PLANTERS AT S.W.



USE: 8" THK CONC WALL
#4 VERT @ 18" O.C.
#4 HORIZ @ 12" O.C.
CONT FTG 2'-0" x 12" THK
2-#4 BOTT CONT

WIND: ρ_W = 24PSF REF SHT No 38

SURCHARGE: 100#/ft / 100#/ft³ = 1.0 EQ. SOIL HT.

ρ_W = 24#/ft ⟶ $H_W = \rho_W \times 2.5' = 60.0^{\#}$
$\rho_T = (35^{\#}/FT^3)(1.0') = 35.0^{\#}/ft$ ⟶ $H_1 = \rho_T \times 4.0' = 140.0$
$\rho_S = (\ do\ )(1.0+3.0) = 140.0$ ⟶ $H_S = (\rho_S - \rho_T)(3.0/2) = 157.5^{\#}$
$\rho_B = (\ do\ )(1.0+4.0) = 175.0$ ⟶ $H_2 = (\rho_B - \rho_T)(4.0/2) = 280.0$
$\rho_P = (300^{\#}/FT^3)(1.5) = 450.0$ ⟶ $H_3 = (-\rho_P)(1.5/2) = (337.5)$
$\Sigma H = 142.5 = V_F$

$V_S = (H_W + H_1 + H_S) = 357.5^{\#}$
$M_S = (H_W \times 1.50' + H_1 \times 1.50' + H_2 \times 2.0/3) = 580^{\#FT}$
$M_D = 1.7 M_S = 1.0^{KFT}$

$K_u = 1.0/0.016 = 63 \rightarrow \rho = .0012$
$A_S = \rho(12 \times 4) = 0.058\ in^2/ft$
$A_{S\,MIN} = .0012(12 \times 8) = 0.115^{in^2}/ft$ GOVERNS

WALL	$3.0 \times 8/12 \times (.150)$	$= 0.30^K$	$\times 0.50' =$	0.15^{KFT}
FTG	$2.0 \times 1.0 \times (do)$	$= 0.30$	$\times 1.00' =$	0.30^{KFT}
SOIL @ SURF	$4.0 \times 1.17 \times (.10)$	$= 0.47$	$\times 1.42' =$	0.67^{KFT}
	$R = \Sigma W =$	1.07^K		1.12^{KFT}

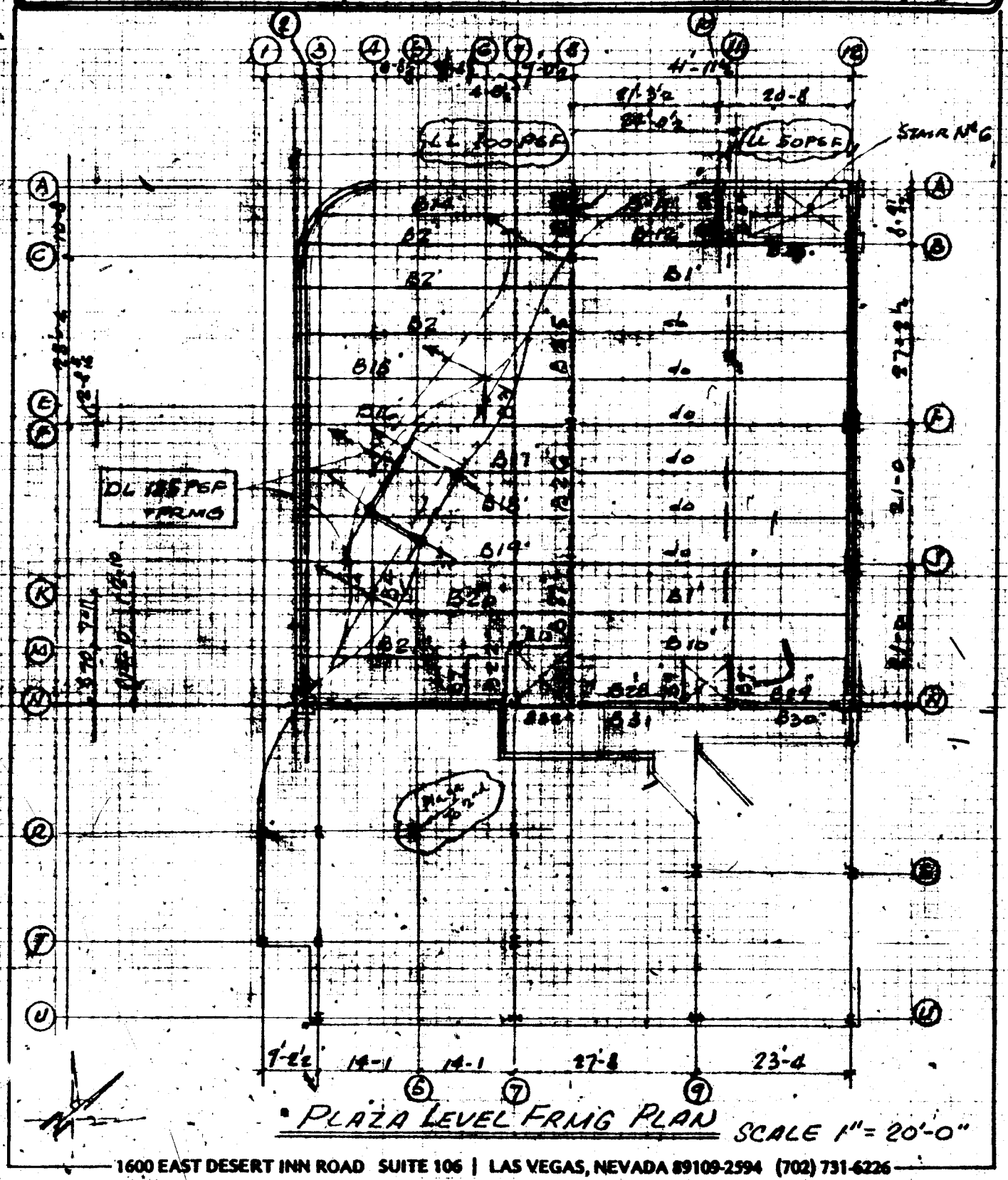
$M_O = (H_W \times 2.75 + H_1 \times 4.0/2 + H_2 \times 4.0/3 + H_3 \times 0.5) = 650^{\#FT}$
$M_R > 1.5 M_O = 0.98^{KFT}$
$e_o = (M_R - M_O)/R = 0.439' \rightarrow e = (\frac{2.0}{2} - e_o) = 0.561' > \frac{2.0}{6} = 0.333'$ ∴ TRIANGULAR SOIL PRESS. DISTRIBU.
$f = 3(e_o) = 1.317'$
$\rho_{MAX} = 2R/(f \times 1) = 1.63^K/ft < (1/3)(2.0^K/ft)$ OK

CHECK SLIDING:
$\mu R = 0.3(1070) = 321^{\#} > V_F = 148^{\#}$ OK

Done Hand, 12/31/87

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CLIENT/ SHEET/ 40 OF 317
PROJECT/ PROJECT # 8201.7
DATE/ OCT '82
PLAZA FLOOR FRAMING ENGINEER/



PLAZA LEVEL FRMG PLAN SCALE 1"= 20'-0"

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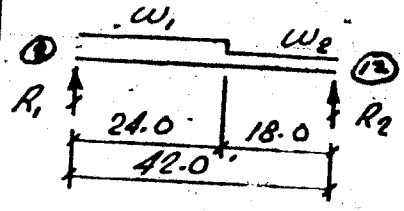
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ENGINEER/ HS

PLAZA LEVEL FRMG B-1 THRU B-34

(B-5 THRU B-8 NOT USED)

B-1



(58+14 FRMG) = 72 PSF
(78+ do) = 92 PSF

50#/ℓ LL ON 18.0' PORTION
100#/ℓ LL ON 24.0' PORTION

∴ TRIB EFF = 7.0'(42'-24") = 126ℓ < 150ℓ
→ LL = 50#/ℓ

$w_1 = 7'(.072^K/\ell_D + .100^K/\ell_L) = (.50^{K/'}_D + .70^{K/'}_L) = 1.20^{K/'}$

$w_2 = 7'(.092^K/\ell_D + .500^K/\ell_L) = (.64^{K/'}_D + .35^{K/'}_L) = 0.99^{K/'}$

$R_1 = (11.04^K_D + 13.35^K_L) = 24.39^K$

$R_2 = (12.48^K_D + 9.75^K_L) = 22.23^K$

$M_{20.325} = 247.9^{KFT}$

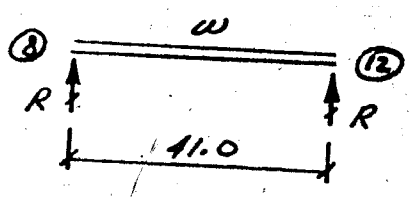
W24 x 68 $\Delta_{D+L} = (1034.48 \times 10^{-6})(42^2 \times 19.32)/23.73 = 1.486"$

$M_{L\ 19.67} = 127.3^{KFT}$ $\Delta_L = 0.763" \simeq L/660$

$f_{b_L} = M_L/154 = 9.92^{KSI}$ $\Delta_D = 0.723"$

USE W 24 x 68
T.O.S. EL 103'-9"

B-2



(185#/ℓ + 15#/ℓ FRMG) = 200#/ℓ

$w = 7'(.20^K/\ell_D + .10^K/\ell_L) = (1.40^{K/'}_D + 0.70^{K/'}_L) = 2.10^{K/'}$

$R = (28.70^K_D + 14.35^K_L) = 43.05^K$

$M = 441.3^{KFT}$

$\Delta_{D+L} = \frac{5(2.10)(41)^4(1728)}{384(29\times10^3)I} = \frac{4604}{I}$ (1.41")

$\Delta_L = (0.70/2.10)(4604/I) = \frac{1535}{I}$

$\Delta_D = (1.40/2.10)(\ do\ ) = \frac{3069}{I}$

W27 x 94 $\Delta_L = 1534/3270 = 0.469" \simeq L/1049$

$\Delta_D = 3069/3270 = 0.939"$

USE W27 x 94
TOS EL 102'-9"

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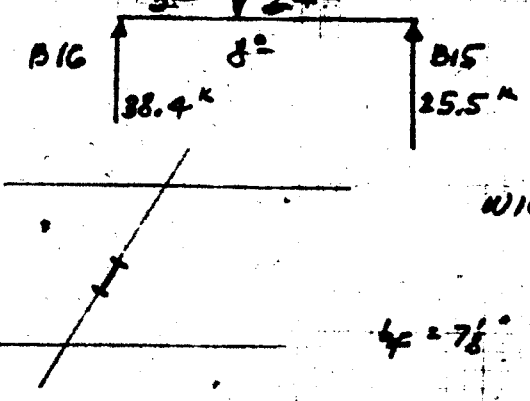
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PROJECT/ PROJECT # 82017
DATE/ 10-82
PLAZA FLOOR FRAMING ENGINEER/ DM

SHORT BEAMS SUPPORTING COLS FROM ABOVE

B-3 (Col G-E) above

$P_{col\,GE} = 57.1^{D} + 6.8^{L} = 63.9^{K}$
89% 11%

P=63.9K W10x49



{SIZE TO ACCOMODATE Col G-E B.P.}

$R_{max} = 38.4^{K} \div 7.7 = 5.02 = 6$ Bolt
$\frac{5}{4}$ Φ A 325

$M = 38.4(3.2) = 122.9^{IK}$

W16x57 $M_n = 184$ $S = 92.2$ $d = 16.97S$

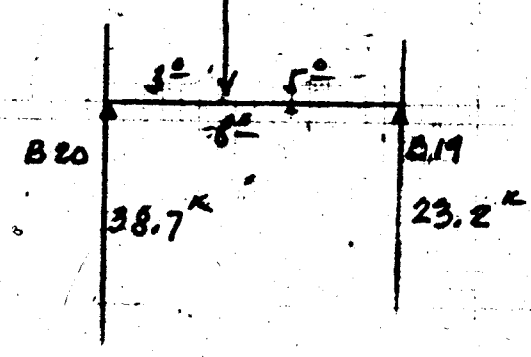
$\Delta = \frac{123.0(8)^2}{80.6(92.2)16.38} = .06$ $V = 102$ $R = 56.6$

USE W16x67 add Stiff Rs @ Col Flgs.
(STD CONN 3 ROWS A325)

B-4 (Col 4-K) above

$P_{col\,K4} = 53.1^{D} + 8.8^{L} = 61.9^{K}$
.86 .14

P=61.9K W10x49



{SIZE TO FIT Col 4K B.P.}

same as B-3

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ENGINEER/ dm

W10x49 d=10" b_f=10"
Col $t_w = \frac{5}{16}$ $t_f = \frac{9}{16}$

BASE PL / BEAM & PLATE FIR.

BEAM
b_f=10" V
W16x67 93.5
14x61 75.5
12x58 63.6
12x53 60.3
E K
W10x49 44.2

Col E-G & K-4

P_{EL} = 68.9
P_{int} = 61.9
} ≈ 65^k

PL 12x12x$\frac{3}{4}$
4-$\frac{3}{4}$" ⌀ BOLTS.

1½"=1'0

4
G

STRUCT. SLAB

¼ V

W16x67

EL 102'-9"

⅜" STIFF PL
E.S. (EACH Col FLANGE)

4

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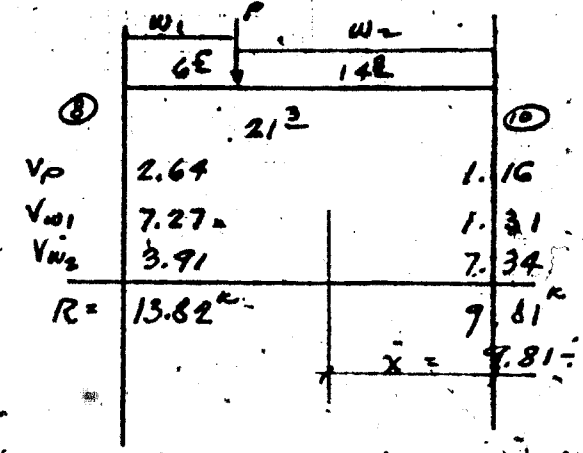
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PROJECT/ PROJECT # 8217
DATE/ 10-82
PLAZA LEVEL - FRAMING ENGINEER

185+35 = 220
58+14 = 72

BEAM B-11 ⑧-⑩



V_P	2.64	1.16
V_{W1}	7.27	1.31
V_{W2}	3.91	7.34
R =	13.82 K	9.81 K

$x = 9.81 \div .76 = 12.91'$

$P = 30'(21 \text{ PSF})\ 6' = 3.8^K$

$W_1 = 4.4'(200+100) = 880 + 440 = 1.32$ KLF

$W_2 = 4.4(72+100) = 317 + 440 = .76$ KLF

$W_1 = 1.32(1.5) = 5.58^K$	5.80	5.750	2.83
$W_2 = .76(14.5) = 11.25$	=	4.73 D	6.53 L
	14.28	9.36	= 23.64

$M_{12.91} = 9.81(12.91).5 = 63.32^{IK}$

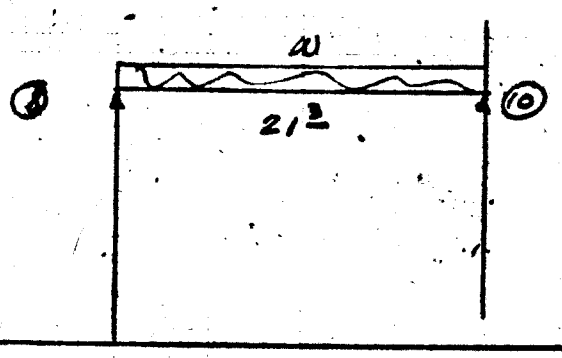
W14x30 S=42 $I = 13.9$ $M_R = 84^{IK}$ $\Delta \simeq \frac{63.32(21.3)^2}{80.6(42)13.9} = .61"$ TL

$\Delta_L = 14.28/23.64(.61) = .37"$ DL = L/694

$\Delta_L = .24"$ LL = L/1069

USE W14x30
TOS 102-X9

BEAM B-12 8-10



$W = 5.3'(72+100) = 382+530 = .92$ KLF

$W = .92(21.3) = 19.6^K$ $R = 9.8^K$

$M = 19.6(21.3) \div 8 = 52.2^{IK}$

W14x30 $M_R = 84^{IK}$ S=42 $I = 13.9$

$\Delta = \frac{52.2(21.3)^2}{80.6(42)13.9} = .50" = L/508$ TL

B13 $\ell = 9'$ $W = 3'(72+100) = 216+300$

$W = .52(9) = 4.68^K$ $R = \frac{4}{2} = 2.34^K$ $= .52$ KLF

$M = 4.68(9) \div 8 = 5.3^{IK}$

W8x10

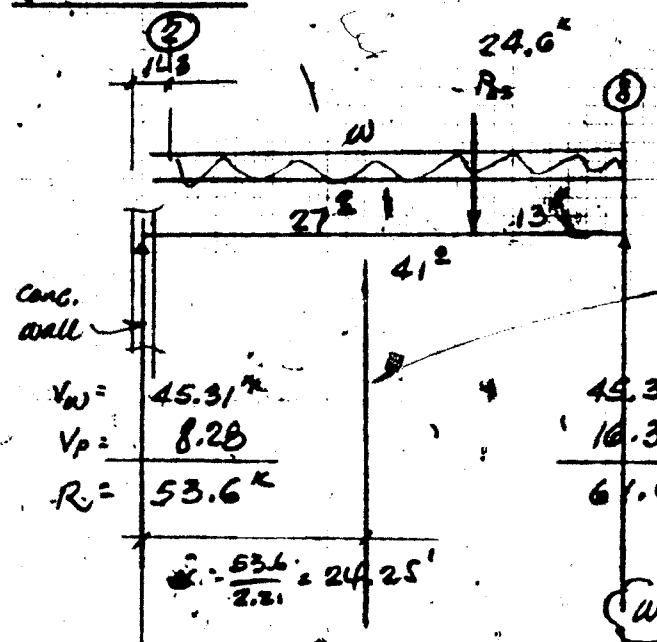
USE W14x30
TOS 102-X9

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PROJECT/ PROJECT # 2017
DATE/ 10-82
PLAZA FLR. FRMG ENGINEER

BEAM B-15



V_w = 45.31^k
V_P = 8.28
R = 53.6^k

$\bar{x}$ = 53.6 / 2.21 = 24.25'

45.31^k
16.32
61.6^k

$w = 7.0(185+80) + 7.0(100)$ (assumed ≈ 210 PLF)
$= 1505 + 700 = 2.21$ KLF
D L
$P = 24.6^k = 22.0^D + 2.6^L$

$M = 53.6(24.25).5 = 649.9^{IK}$

77% DL

$\frac{L}{400} = 1.23$

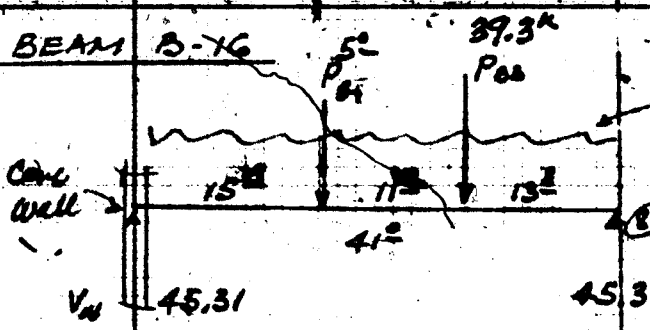
$\Delta \simeq \frac{649.9(41)^2}{30.6(5)d} = \frac{13,555}{5d} = 1.23$

$5d = 11020$ $d = 33$ $5 = 334$
$d = 36$ $5 = 306$

W33×118 $M_R = 718 > 650$
Δ = 1.15" TL = L/428
.88" DL = L/556
.27" LL

S = 359

BEAM B-16



V_W 45.31
$V_{P_{B3}}$ 13.23
$V_{P_{B7}}$ 3.07
R 61.61^k

45.31
26.07
1.93
73.31^k

$\bar{x} = (73.31 - 39.3) \div 2.21 = 15.39'$

$P_{B3} = 39.3^k = 35.0^D + 4.8^L$

$M = 73.31(15.39) = 1128.2$
$-8.21(15.39)^2.5 = 261.7$
$-39.3(15.39-13.5) = 62.5$
-324.2
$= 804.0^{IK}$

$\frac{L}{400}$

$\Delta \simeq \frac{804(41)^2}{30.6\ 5d} = \frac{16768.3}{5d} \leq 1.23$
$5d = 13632.75$

$d = 33$ $S_{req'd}$ 413 W33×141
$d = 36$ $S_{req'd}$ = 379 W36×135

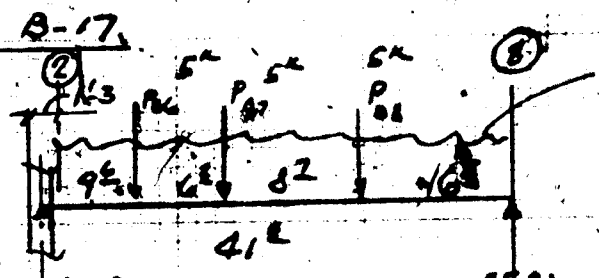
W36×135 $M_R = 878$ $S = 439$ $d = 35.5$
$\Delta = 16768.3 \div (439)35.5 = 1.08$" TL = L/457
.77 = .83" DL L/594
.25" LL

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STRAUSS & LOFTFIELD
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CLIENT/ SHEET 46 of 317
PROJECT/ PROJECT # 8207
DATE/ 10-82
PLAZA FLR. FRMG.

BEAM B-17



	D	L
W_N = 90.62	= 61.62	+ 29.00
		15.00
$P_{6,7,8}$ 105.62	61.62	+ 44.00
	.58	.42 %

V_N	45.31	45.31
V_P	2.01	2.99
	3.07	1.93
	3.83	1.17
	R = 54.22k	51.40k

$M = 61.40(21.0) = 1079.2$
$-2.21(21)^2.5 = 487.3$
$-6(21-11.5) = 42.5$
-509.8
569.4^{1k}

$\Delta = \frac{570(41)^2}{30.6(Sd)} = \frac{11888}{Sd} \leq \frac{L}{400} = 1.23$

$\bar{x} = (51.4-50) \cdot 2.21$

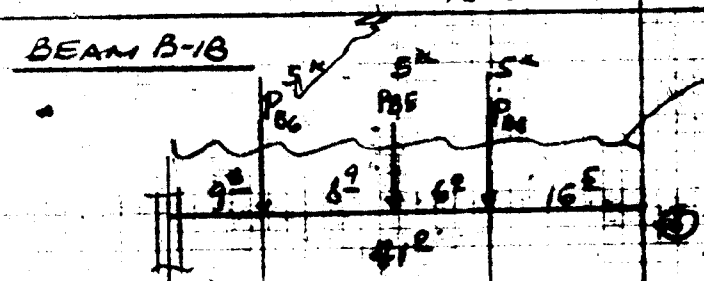
W33x118 M_R = 718 $S = \frac{718}{2.1} = 341$ $d = 32.8$

$A = 11888 \div (359) 32.8 = 1.01$" TL = L/487
.59" DL = L/870
.42" LL = L/1171

Sd = 9666

d = 33 S_x = 293 33x118
d = 27 S_x = 358 27x146
d = 30 S_x = 322 30x116

BEAM B-18



USE W33x118

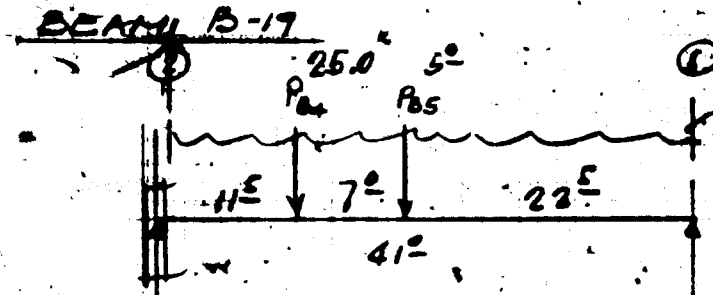
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Dana Hasel 12/31/87

STRAUSS & LOFTFIELD
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CLIENT/ SHEET 47 OF 317
PROJECT/ PROJECT # 8201T
DATE 10-82
PLAZA FLR. FRMG ENGINEER Jm

BEAM B-17

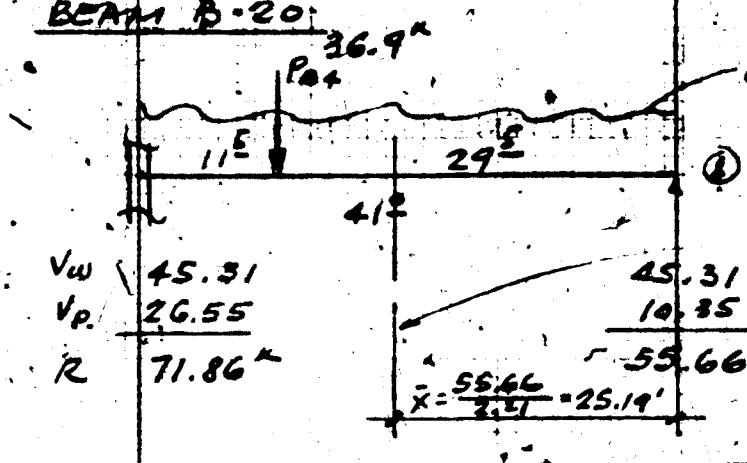


W = 2.21*KLF = 1.51 + .70
P_B5 = 5.0k L .41 .32
P_B4 = 21.5 + 3.5 = 25.0k
D L
Σ R = 90.62 + 25.0 + 5.0 = 120.6k
Σ DL = 61.62 + 21.5 = 83.12
DL = .69 LL = .31

V_W	45.31	45.31
P_B4	17.99	7.01
P_B5	2.74	2.24
R =	66.04k	54.58k

M = 54.58(22.5) - 5 = 614'k
Δ = 614(41)² / 80.6 SL = 18806 / SL = 1.23"
SL = 10411 L = 335 = .315
x̄ = (54.58 - 5.0) ÷ 2.2 = 22.43 = 22.5'
W33x118 Mr = 718 S = 357 d = 32.7
Δ = 42606 ÷ (357) 32.7 = 1.09" TL = L/450
.75" DL = L/655
.34" LL

BEAM B-20



W = 2.21KLF
P_B4 = 37.1 - 5.2 = 31.9
.86 .14
M = 55.66(25.19) - 5 = 700.9'k
Δ ≃ 700.9(41)² / 80.6(SL) = 14618 / SL = L/360 = 1.23"
SL = 11885 33 360

V_W	45.31	45.31
V_P	26.55	10.35
R	71.86k	55.66k

x̄ = 55.66 / 2.21 = 25.19'

W33x130 Mr = 812 'k S = 406 d = 33
Δ = 14618 ÷ 406 (33) = 1.09" = L/440 TL
.80 = L/604 DL
.29 LL

90.62(.86) = 77.92
127.52 - 77.92 = 49.6
73.22 ÷ 127.52 = .78 % W

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ENGINEER Jm

BEAM B-21 3-7 near (M)

L = 32' $w = 7.0\left(\frac{200+100}{200}\right) = 1.4 + .7 = 2.1$ KLF.

$W = 2.1(32') = 67.20^K$ $R = 33.6^K$

$M = 67.2(32) \div 8 = 268.8^{ft\text{-}k}$

W24×68 M = 308 S = 154 d = 23.8

$\Delta = \frac{269(32)^2}{80.6(154)23.8} = .93"$ = 4/4.12 LL

.62" = T/200 DL

.31" LL

USE W24×68 for 102.7

B-22 LINE (7) M-N

B21 W24

33.6

7^K 18^K

(N) (M)

8.8'

1.8 26.7 28.5^K

6.9

8.7^K

10^K/FT W

R

Wall Misc.
$w = 14(21) + 100 = 400$ PLF

$M = 28.5(1.8) = 51.3^{ft\text{-}k}$
$-.4(1.8)^2.5$

51.3 ft-k

W18×35 $M_R = 115^{ft\text{-}k}$ S = 57.6 d = 18.

$\frac{51.3(8.8)^2}{80.6(57.6)17.8}$ negligible.

Facilitate W24 connection.

B-34 B.O.S. 96-19. Stair No 6 Landing LINE (10)

L = 8.8' $w = 9.0\left(\frac{50+100}{200}\right) = 450^{\#} + 100 = 1.35$

$W = 1.35(8.8) = 12.0^K$ $R = 6.0^K$

$M = 12.0(8.8) \div 8 = 13.2^{ft\text{-}k}$

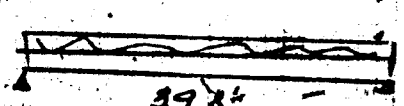
USE W12×19.

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PLAZA LEVEL FRAMING ENGINEER JM

BEAM B14 ③-Ⓐ



$W = 4.4'(.200 + .100) = .88 + .44 = 1.32^K$

$W = 1.32(39.8) = 52.64^K$ $R = 26.3^K$

$M = 52.64(39.8) \div 8 = 261.4^{IK}$

$\Delta = \frac{261.4(39.8)^2}{80.6(S)d} = \frac{5137.3}{Sd} = \frac{39.8\times12}{400}$

W27×84 $S = 213$ $d = 26.75$ $M_R = 426$

$Sd = 4303$

$\Delta = \frac{261.4(39.8)^2}{80.6(213)26.75} = .90'' = L/530.7L$

$H = 27.5 = 159$

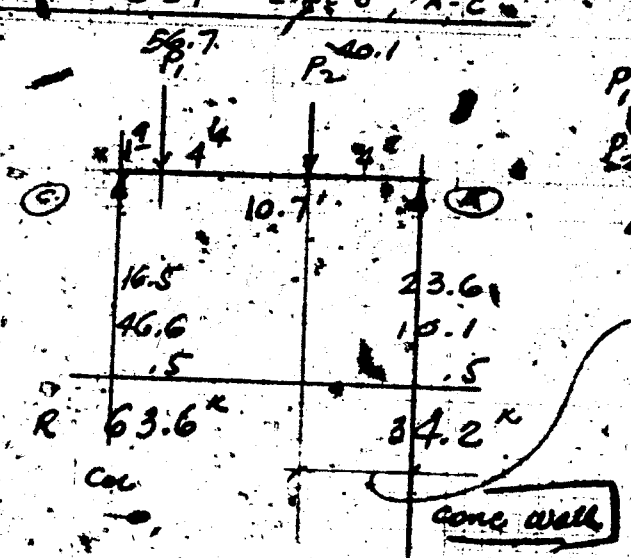
$.60'' \; L/796\,DL$

$.30'' \; L/1592\,LL$

USE W27×84 #

TOS 102-29

BEAM B24 LINE 8, A-C



$P_1 = 4'(30')21 + 43.1 + 7.8 = 56.70^K$ (32 PSF, B2, B12)

$P_2 = 26.3 + 13.8 = 40.1^K$ (B14, B11)

$LL = 100\,PSF$

$W_{conc} = 54.2 \times 1.4 = 150.48$
$+ .150(4.4)^2.5 = 4$ } 150^{IK}

W24×55 $M_R = 228$ $S = 114$ $d = 23.6$

$V_{allow} = 135$

$\Delta = \frac{\sqrt{50}(10.7)^2}{80.6(114)23.6} = .68$

USE W24×55

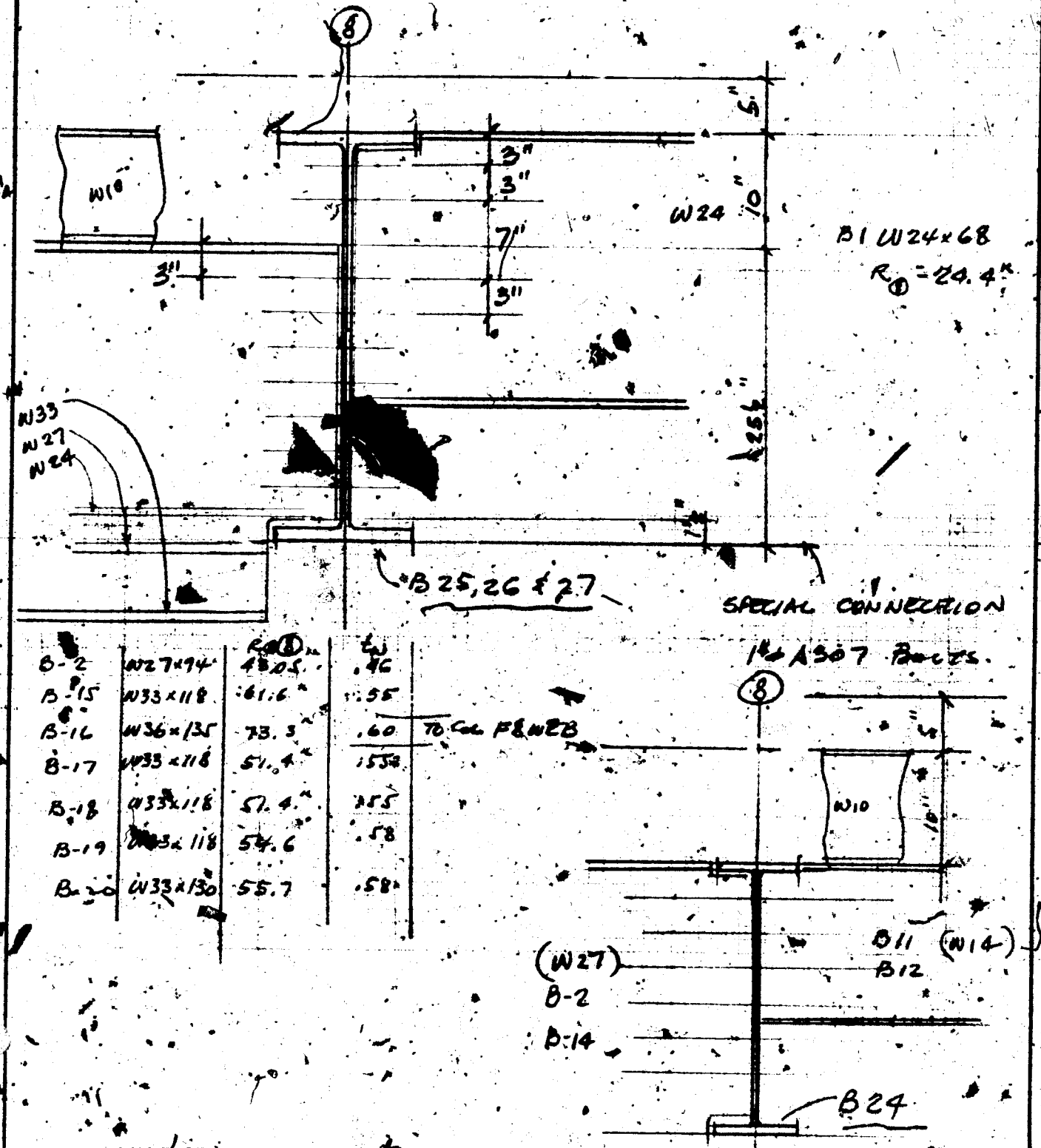
TOS 102-9

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BEAMS ON LINE (8). B-24 see previous sheet



		$R_{@8}$	f_v	
B-2	W27×94	48.5 K	.46	
B-15	W33×118	61.6 K	.55	
B-16	W36×135	73.3 K	.60	To Col F&NEB
B-17	W33×118	51.4 K	.55	
B-18	W33×118	51.4 K	.55	
B-19	W33×118	54.6	.58	
B-20	W33×130	55.7	.58	

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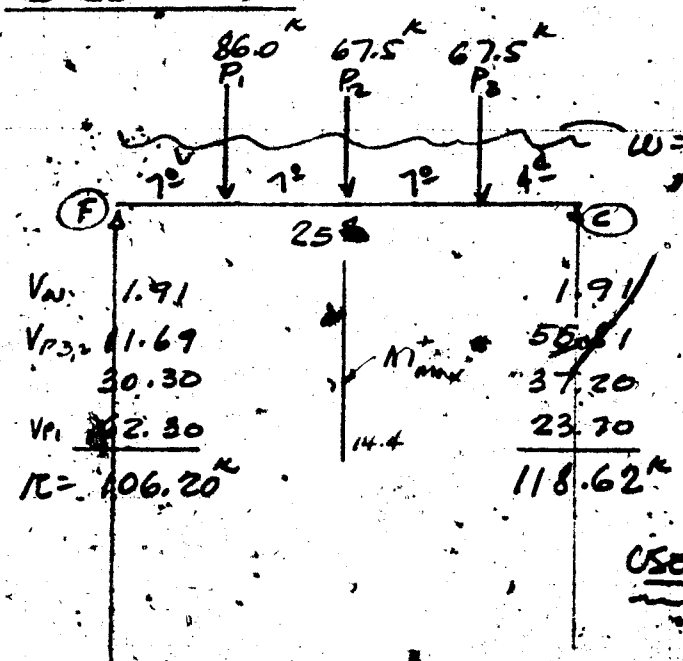
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ENGINEER/ JM

BEAMS ON LINE (8)

B-25 C-F



$P_1 = 61.6^{B15} + 24.4^{B1} = 86.0^{K}$

$P_2 = 43.1^{B2} + 24.4^{B1} = 67.5^{K}$

$P_3 = 67.5^{K}$

$M_{max} = 118.62 \times 11.4 = 1352.3$
$- 67.5(7) = 472.5$
$- .15(11.4)^2 \cdot 5 = 9.8$ } $= 487.3$

870.0^{IK}

W36x135 $M_R = 878$

USE W36x150 $M_R = 1010$

$I = 9040$ $S = 504$

$f_b = \frac{870 \times 12}{504} = 20.7 \text{ ksi}$ ✓

Δ_{max} @ 14.4' from (C)

$\Delta P_1 = \frac{86.0(18.4)(7.0)}{6EI(25.4)}\left[(25.4)^2 - (7.0)^2 - (14.4)^2\right] = 29,084.40/EI$

$\Delta P_2 = \frac{67.5(14.0)^2(11.4)^2}{2EI(25.4)} = 82,563.92/EI$

$\Delta P_3 = \frac{67.5(4.4)(21.0)}{6EI(25.4)}\left[(25.4)^2 - (4.4)^2 - (4.0)\right] = 11,726.43/EI$

$= \frac{63,374.95 \times 1.728}{89.0(I)}$

$= \frac{3776}{I} \leq \frac{25.4 \times 12}{400}$

$= .76$

$R_M I = 3776 \div .76 = 4968.$

$\Delta_{W36x150} = \frac{3776}{9040} = .42'' \text{ TL}$ ✓

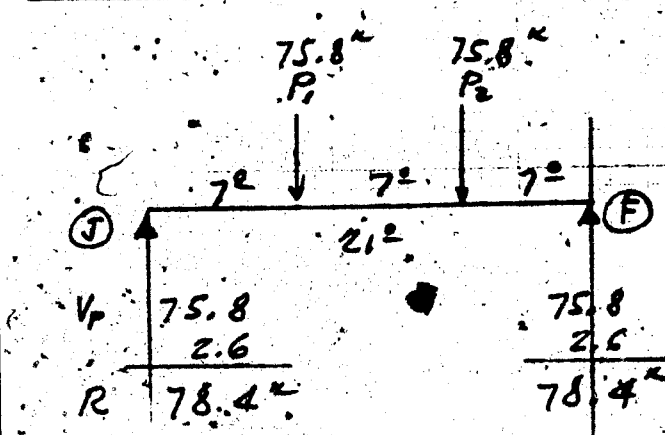
$= L/729$

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PLAZA FLR FRMG ENGINEER

BEAM B-26 LINE (8) J-F



$P_1 = {}^{B1}24.4 + {}^{B18}51.4 = 75.8^{k}$

$P_2 = {}^{B1}24.4 + {}^{B19}51.4 = 75.8^{k}$

$w = 100 + 150 = .25$ KLF $W = 6.26^{k}$

$R = 2.63$

$M = 75.8 \times 7.0 = 530.6$
$+ 5.2(21) \div 8 = 13.7$ } 544.3^{1k}

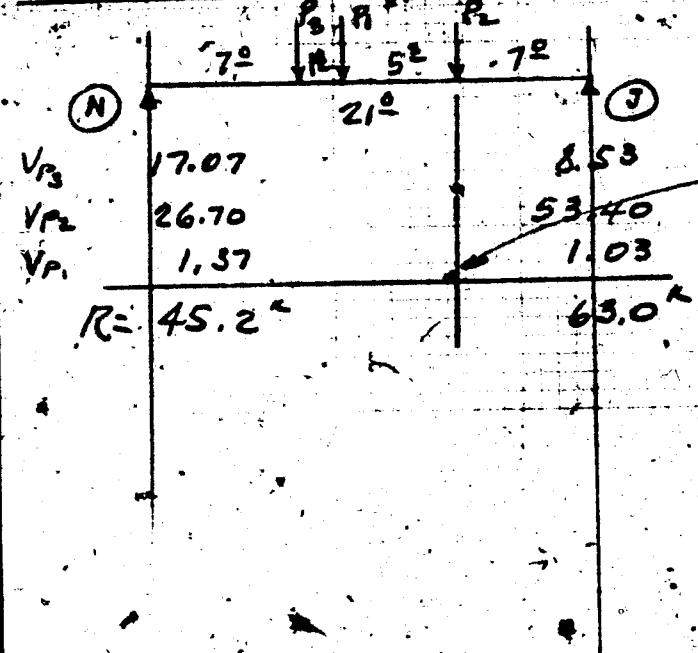
$\Delta_L = \frac{75.8(7.0)}{24EI}\left(3(21)^2 - 4(7)^2\right)^{1127} = \frac{24916^{k\,ft^3} \times 1.728}{29I} = \frac{1485}{I} \leq \frac{L}{400} = .63 \quad I = 2357$

W36 x 135 $M_R = 878$ $S = 439$ $I = 7800$

$f_b = \frac{544.3 \times 12}{439} = 14.88$

$\Delta = 1485 \div 7800 = .19$

BEAM B-27 LINE (8) N-J



$P_1 = {}^{B13}2.4^{k}$

$P_2 = {}^{B20}56.7 + {}^{B1}24.4 = 80.1^{k}$

$P_3 = {}^{B-10}25.6^{k}$

$M = 63.0(7.0) = 441^{1k}$

USE W36 x 135

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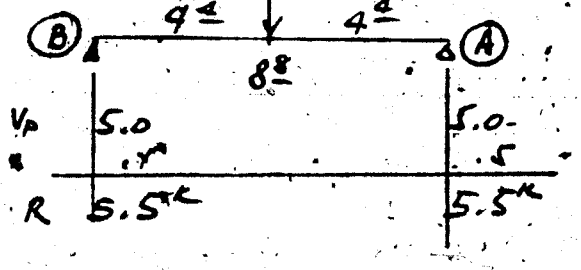
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BEAM B-23 LINE (10) A-B

P = 10^K from B11

W = .10 KLF



$M = \frac{10(8.8)}{4} = 22.0^{IK}$

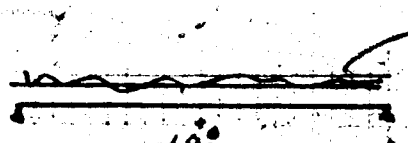
$+ .1(8.8)^2 \div 8 = 1.0$

23.0^{IK}

USE W14x22 Tot = 102'-9

(B11 is W14x30)

B28 LINE (N) 8-hour stair



W = 4(72+100) = 290+400 = 690 PLF

W = .69(18) = 12.42^K R = 6.21^K

M = 12.42(18) ÷ 8 = 28.0^K

W12x19 Mr = 43 S = 21.3 d = 12"

$\Delta = \frac{28(18)^2}{80.6(21.3)12} = .44'$ IL = 4/490

.18" DL = 4/1173

.26" LL = 4/831

B29 LINE (N), 11-12

L = 17'-11" = 18.0 W = same as B-28

USE ~~W12x19~~

USE W14x43' for COMBINED BENDG & AXIAL LOAD FRM-N

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PLAZA FLR FRMG
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BEAM B-30 LINE (N) 11-12

L = 18.0' W = .6 KLF W = 10.8 K R = 5.4 K

M = 10.8(18) ÷ 8 = 24.3 IK

W 12x19 Mr = 43 S = 21.3 d = 12

$\Delta = \frac{24.3(18)^2}{80.6(21.3)12} = .88" T_L = L/242$

.19 DL
.19 LL

5" CONC SLAB = 60 PSF

LL 100.
MISC 37
200 PSF
W = x 3
.6 KLF

USE ~~W12x19~~ USE W14x43 for COMBINED LOADG

B-32 LINE (N) 8-11

8.4 K = 89 + 82B = 2.0 + 6.4 = 8.4 K

6.0 K

W = 5(200) = 1.0 KOF

M = 14.1 K (14.1').5 = 99.4 IK

W 18x60

Unsupported Top Flg L = 24'
= 288"

$r_T = 1.97$ $L/r_T = 3.22$

$F_b = 12(10^3) \div e(L/A_f) = 12.94$ KSI

$f_b = \frac{99.4(12)}{108} = 11.04$ KSI < F_b

$\frac{L}{Ay} = 8857$

98-2 1/2

$\Delta = \frac{99.4(24)^2}{80.6(108)18} = .47" T_L = L/788$

B 32 LINE (N) 7-8

L = 9.0 w = 1.0 KLF W = 9.0 R = 4.5

M = 9(9) ÷ 8 = 10.2 IK

W 8x10 M_R = 16

$\Delta = \frac{10.2(96)^2}{80.6(7.81)7.9} = .17" T_L = L/650$

B 33 LINE (Q) 10-12

L = 20.7' W = 45(75 PSF) + 45(100) = 405 + 450 = .86 KLF

W = .86 (20.7) = 17.8 K R = 8.9 K

M = 17.8 (20.7) ÷ 8 = 46.1 IK

~~W 14x30~~ M_R = 84 IK S = 42 d_1 = 13.9

USE W14x43 for COMBINED END'G & AXIAL LOAD FRM-B

$\Delta = \frac{46.1(20.7)^2}{80.6(42)3.9} = .42" T_L = L/592$

.20 DL
.22 LL

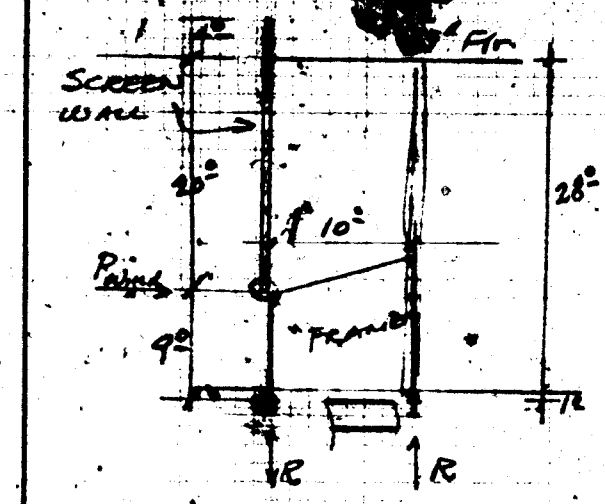
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PLAZA FLR FRMG BY/ JM

FLOOR BMS @ TUBE FRAMES L=7'



$P_{wind} = (6+14)\ 10'\ (27\ PSF) = 6.7^K$

$M_{OT} = 5.4(7.0) = 48.6^{IK}$

$R = 48.6 \div 10 = \pm 4.86^K$

Say 5^K

TOS 102-7

BEAMS B5, B6, B7 & B8 L=7'

ASSUME M_{MX} $M = 5^K \times 7' \div 4 = 8.8^{IK}$
$5^K \times 8 \div 4 = 10.0^{IK}$
$= 5^K$ ea.

$M_{MX} = P$ @ B16, B17, B18

$M_{max} = 5^K \frac{9}{6} = 24.3^{IK}$

W8x24 (M5) $L_p = 6.5'$

$M_R = 42^K$

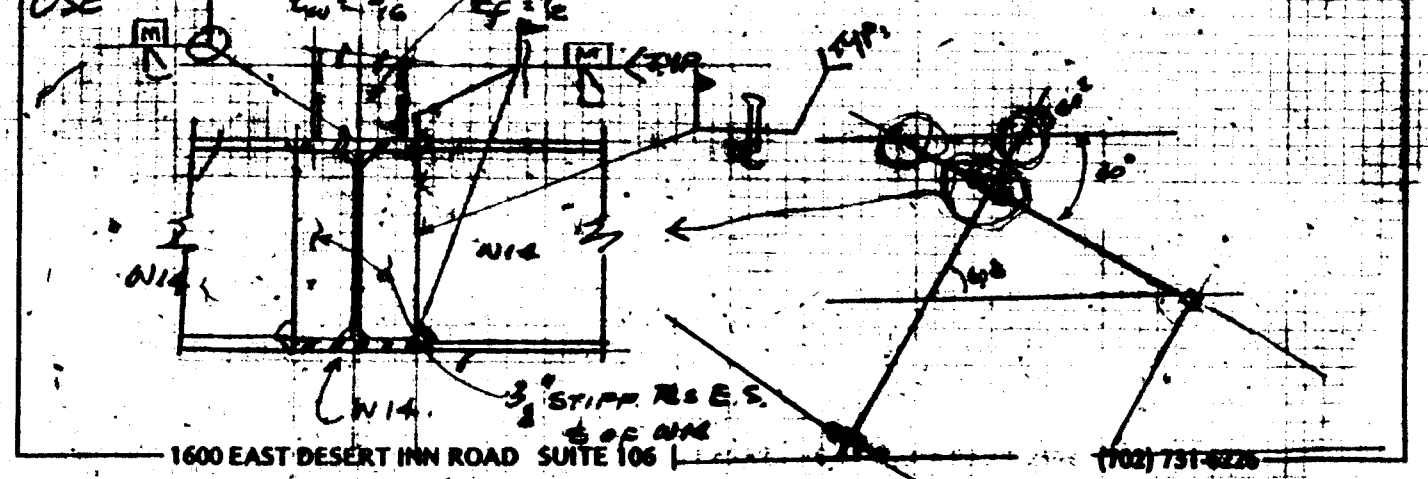
$S: 20.9 \quad d: 7.8$

$\Delta = \frac{8.8(7.0)^2 .8}{29{,}000(20.9)7.8} = .04"$

W14x43 $A = 12.6$ $t_w = .4$ $t_f = .6$ $b_f = 8$ $k = 1.2$

USE

$M_R = 125^K \quad S = 62.7$

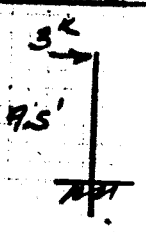


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ISOLATE FRONT COL.



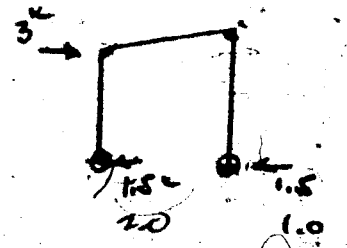
$M = 3 \times 9.5 = 28.5^{k'}$

$\Delta = \frac{Pl^3}{6EI} = \frac{3.0(9.5)^3 1.728}{3(29)I} = \frac{61.09}{I} \leq \frac{L}{360} = .32"$

$I = 61.09 \div .32 = 190$



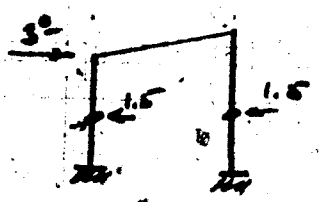
A5 FRAME Pinned base



$M_L = 9.5(1.5) = 14.25$

$M_R = 1.5(14.5) = 21.75$

A5 FRAME FIXED BASES



$M_L = 1.5(9.5).5 = 7.125$

$M_R = 1.5(14.5).5 = 10.875$

TS 6x6x 1/2" $f_s = 10.875 \times 12 \div 16.8$
$= 7.77 ksi$

Longit. FORCE FRONT FRAME

WALL $10' \times 25 PSF \times 35' = 8750^{\#}$

$F_p = ZI C_p W_p$
$= .375(1.5).8(8750)$
$= 3940^{\#}$
Say 4K

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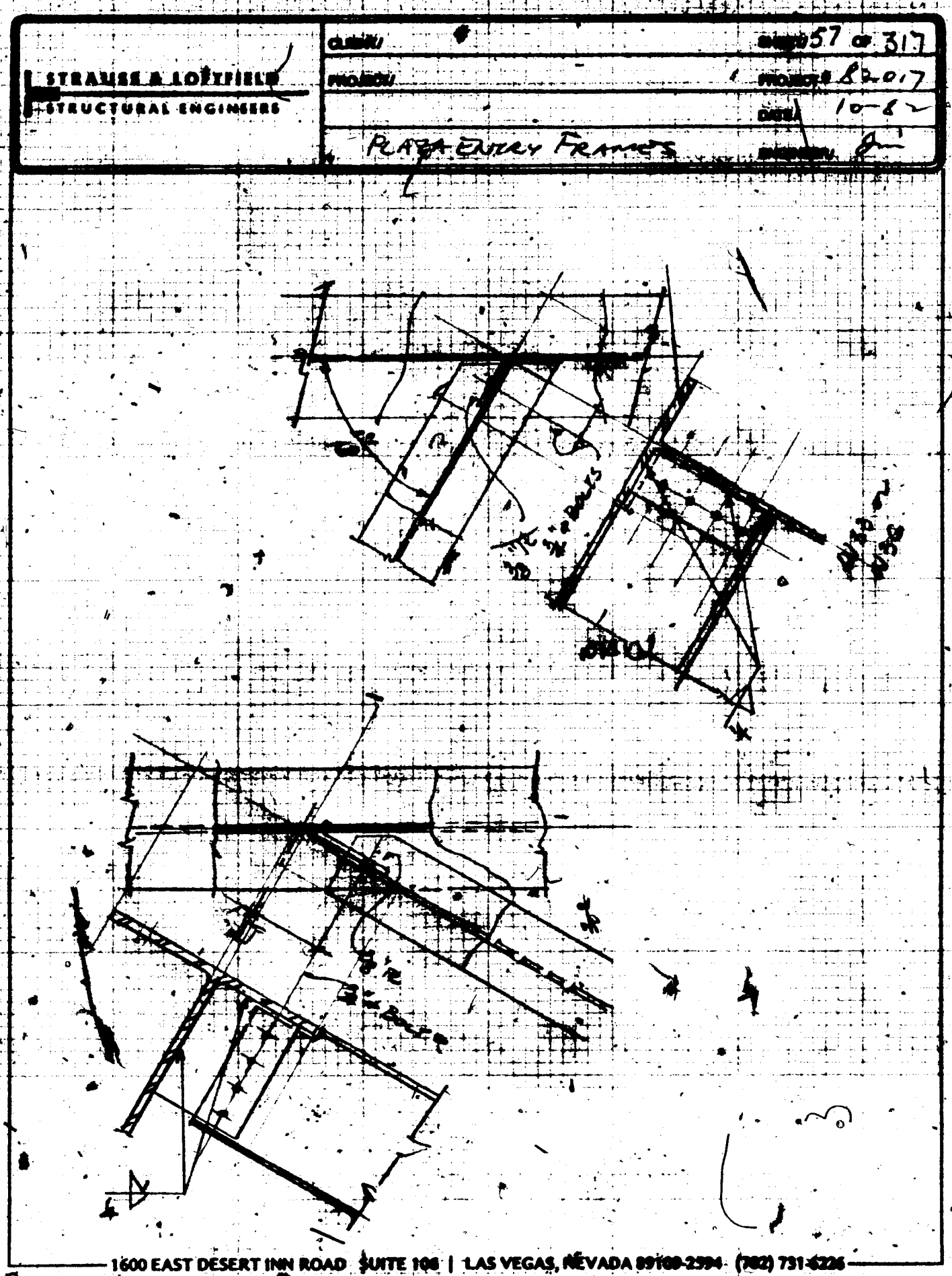
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DATE 10-87

PLAZA ENTRY FRAMES

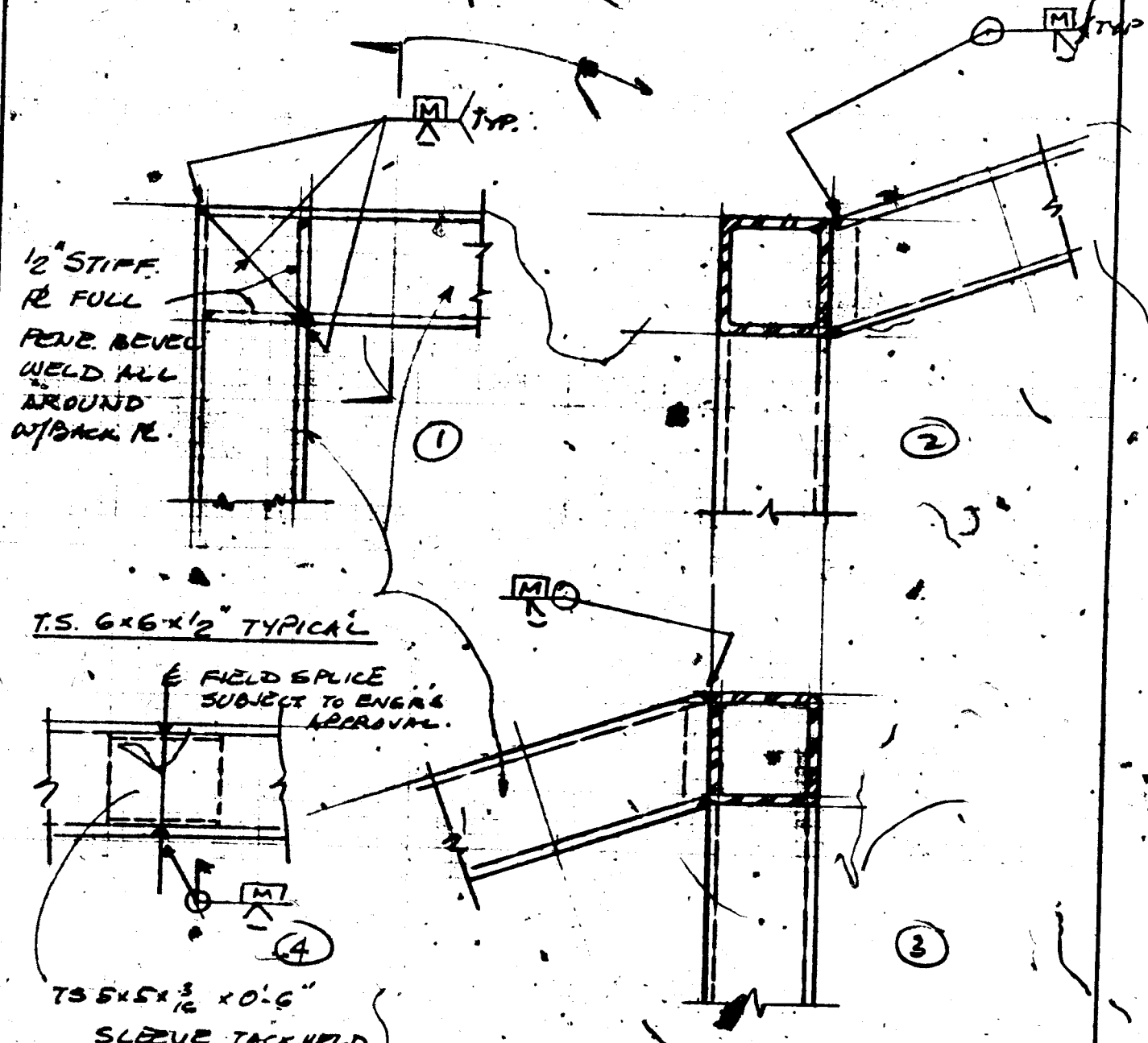


1600 EAST DESERT INN ROAD SUITE 108 | LAS VEGAS, NEVADA 89109-2594 (702) 731-6226

Done Hasti 12/31/87

STRAUSS & LOFTFIELD
STRUCTURAL ENGINEERS

CLIENT/ SHEET/ 58 OF 317
PROJECT/ PROJECT # 2017
DATE/ 10-82
PLAZA ENTRY
ENGINEER/



1600 EAST DESERT INN ROAD SUITE 106 | LAS VEGAS, NEVADA 89109-2994 · (702) 731-6226

Dora Hacal. 12/31/87

SHT NO 59 OF 917

PLANE FRAME ANALYSIS PROGRAM

STRAUSS & LOFTFIELD

FRAME I.D.: SIDE FRAME

NUMBER OF JOINTS 4.
NUMBER FRAME MEMBERS 3.
NUMBER OF RESTRAINED JOINTS 2.
MODULUS OF ELASTICITY IS 29000 KSI.

JOINT COORDINATES:

JOINT	X (FT.)	Y (FT.)
1	0.00	0.00
2	0.00	9.00
3	11.00	14.30
4	11.00	0.00

MEMBER INFORMATION:

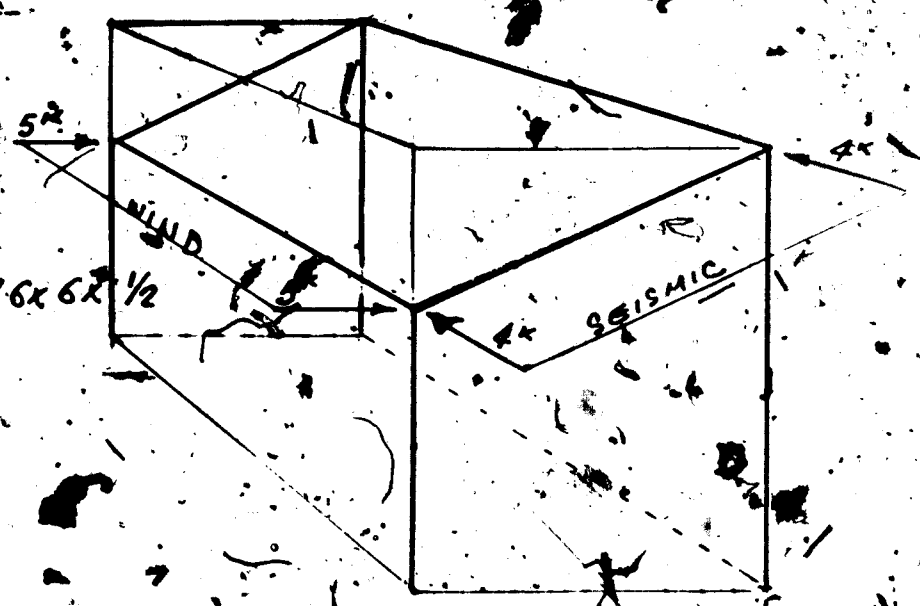
MEM. #	TYPE #	JT #1	JT #2	AREA IN^2	I Z-Z IN^4	LENGTH FEET
1	1	1	2	10.40	50.50	9.00
2	1	2	3	10.40	50.50	12.21
3	1	3	4	10.40	50.50	14.30

JOINT RESTRAINTS:

JOINT	JR1(H)	JR2(V)	JR3(R)
1	1	1	1
4	1	1	1

UPPER BAND WIDTH IS 6

ALL MEMBERS TS 6x6x1/2



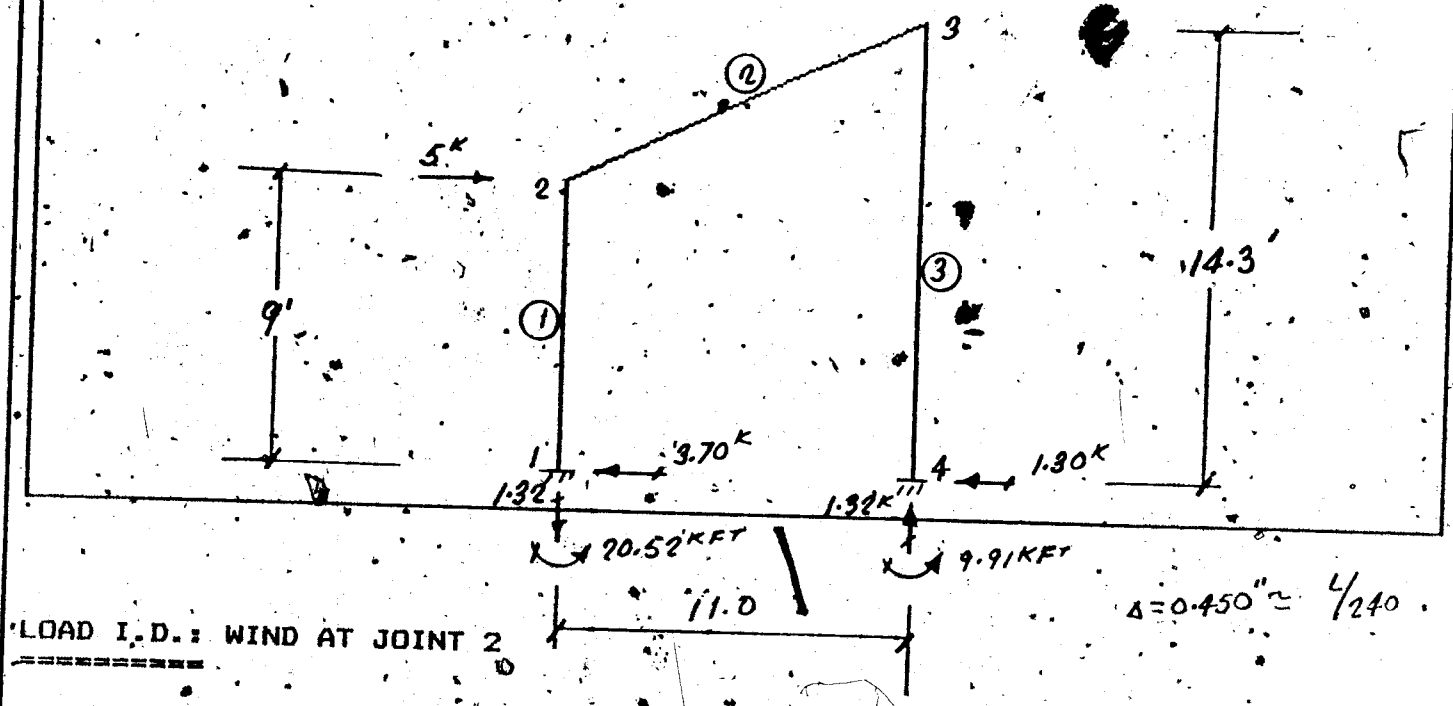
.501 N CASINO CTR 2
Fire Station

Dave Hasel, 12/31/87

SHT N°60

PAGE 2

FRAME GEOMETRY



Δ=0.450" ≃ L/240

LOAD I.D.: WIND AT JOINT 2

JOINT LOADS:

JT. #	HOR. (KIPS)	VERT. (KIPS)	MOMENT (FT-K)
2	5.00	0.00	0.00

JOINT DISPLACEMENTS:

JT. #	HORIZONTAL (INCHES)	VERTICAL (INCHES)	ROTATION (RADIAN)
1	0.00000	0.00000	0.000000
2	0.44957	0.00047	-0.003409
3	0.44984	-0.00075	-0.000898
4	0.00000	0.00000	0.000000

Don Hasek 12/31/87

SHT NO 61

MEMBER FORCES:

MEMBER NO.	LEFT END AXIAL (KIP)	LEFT END SHEAR (KIP)	LEFT END MOMENT (FT-K)	RIGHT END AXIAL (KIP)	RIGHT END SHEAR (KIP)	RIGHT END MOMENT (FT-K)
1	-1.32	3.70	20.52	1.32	-3.70	12.81
2	0.59	-1.76	-12.81	-0.59	1.76	-8.66
3	1.32	1.30	8.63	-1.32	-1.30	9.91

SUPPORT REACTIONS:

JOINT NO.	HORIZONTAL (KIPS)	VERTICAL (KIPS)	MOMENT (FT-K)
1	-3.70	-1.32	20.52
4	-1.30	1.32	9.91

SAME FRAME NEW LOADS:
######################

LOAD I.D.: SEISMIC AT JOINT 2

JOINT LOADS:

JT. #	HOR. (KIPS)	VERT. (KIPS)	MOMENT (FT-K)
2	4.00	0.00	0.00

JOINT DISPLACEMENTS:

JT. #	HORIZONTAL (INCHES)	VERTICAL (INCHES)	ROTATION (RADIAN)
1	0.00000	0.00000	0.000000
2	0.35966	0.00038	-0.002727
3	0.35988	-0.00060	-0.000719
4	0.00000	0.00000	0.000000

MEMBER FORCES:

MEMBER NO.	LEFT END AXIAL (KIP)	LEFT END SHEAR (KIP)	LEFT END MOMENT (FT-K)	RIGHT END AXIAL (KIP)	RIGHT END SHEAR (KIP)	RIGHT END MOMENT (FT-K)
1	-1.06	2.96	16.42	1.06	-2.96	10.25
2	0.47	-1.41	-10.25	-0.47	1.41	-6.90
3	1.06	-1.04	6.90	-1.06	-1.04	7.93

Dave Hasli 12/31/87

SHT N°62

SUPPORT REACTIONS:

JOINT NO.	HORIZONTAL (KIPS)	VERTICAL (KIPS)	MOMENT (FT-K)
1	-2.96	-1.06	16.42
4	-1.04	1.06	7.93

Alan Hosal, 12/31/87.

SHT No. 63

FRAME I.D.: FRONT FRAME

NUMBER OF JOINTS 4
NUMBER FRAME MEMBERS 3
NUMBER OF RESTRAINED JOINTS 2
MODULUS OF ELASTICITY IS 29000-KSI.

JOINT COORDINATES:

JOINT	X (FT.)	Y (FT.)
1	0.00	0.00
2	0.00	9.00
3	12.00	9.00
4	12.00	0.00

MEMBER INFORMATION:

MEM. #	TYPE #	JT #1	JT #2	AREA IN^2	I Z-Z IN^4	LENGTH FEET
1	1	1	2	10.40	50.50	9.00
2	1	2	3	10.40	50.50	12.00
3	1	3	4	10.40	50.50	9.00

JOINT RESTRAINTS:

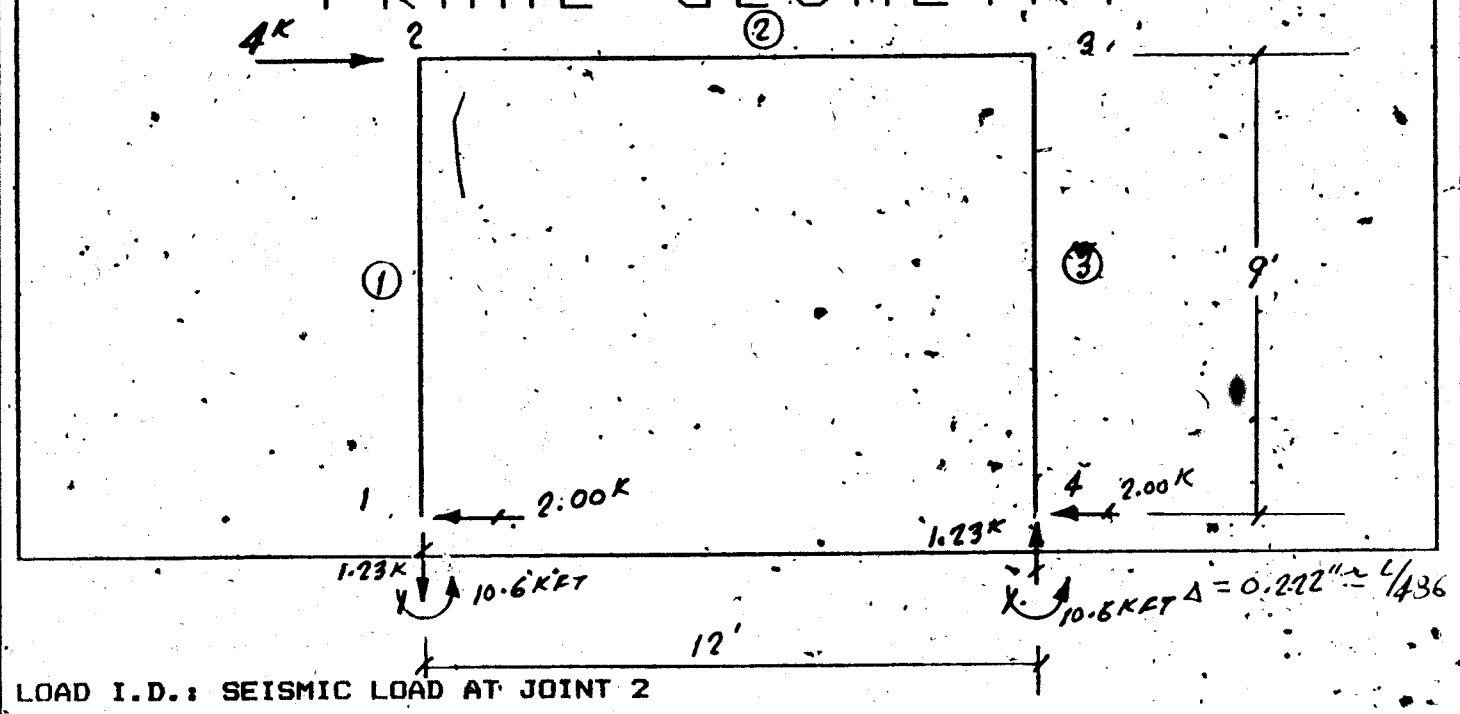
JOINT	JR1(H)	JR2(V)	JR3(R)
1	1	1	1
4	1	1	1

UPPER BAND WIDTH IS 6

Dora Hasel 12/31/87

SNT N°64
PAGE 6

FRAME GEOMETRY



LOAD I.D.: SEISMIC LOAD AT JOINT 2

JOINT LOADS:

JT. #	HOR. (KIPS)	VERT. (KIPS)	MOMENT (FT-K)
2	4.00	0.00	0.00

JOINT DISPLACEMENTS:

JT. #	HORIZONTAL (INCHES)	VERTICAL (INCHES)	ROTATION (RADIAN)
1	0.00000	0.00000	0.000000
2	0.22230	0.00044	-0.001458
3	0.22135	-0.00044	-0.001448
4	0.00000	0.00000	0.000000

Dave Hasel 12/31/87

SHT NO 65

MEMBER FORCES:

MEMBER NO.	LEFT END AXIAL (KIP)	LEFT END SHEAR (KIP)	LEFT END MOMENT (FT-K)	RIGHT END AXIAL (KIP)	RIGHT END SHEAR (KIP)	RIGHT END MOMENT (FT-K)
1	-1.23	2.00	10.66	1.23	-2.00	7.37
2	2.00	-1.23	-7.37	-2.00	1.23	-7.35
3	1.23	2.00	7.35	-1.23	-2.00	10.62

SUPPORT REACTIONS:

JOINT NO.	HORIZONTAL (KIPS)	VERTICAL (KIPS)	MOMENT (FT-K)
1	-2.00	-1.23	10.66
4	-2.00	1.23	10.62

Dave Hosel 12/31/87

SHT N°66

FRAME I.D.: REAR FRAME

NUMBER OF JOINTS 4
NUMBER FRAME MEMBERS 3
NUMBER OF RESTRAINED JOINTS 2
MODULUS OF ELASTICITY IS 29000 KSI.

JOINT COORDINATES:

JOINT	X (FT.)	Y (FT.)
1	0.00	0.00
2	0.00	14.30
3	12.00	14.30
4	12.00	0.00

MEMBER INFORMATION:

MEM. #	TYPE #	JT #1	JT #2	AREA IN^2	I Z-Z IN^4	LENGTH FEET
1	1	1	2	10.40	50.50	14.30
2	1	2	3	10.40	50.50	12.00
3	1	3	4	10.40	50.50	14.30

JOINT RESTRAINTS:

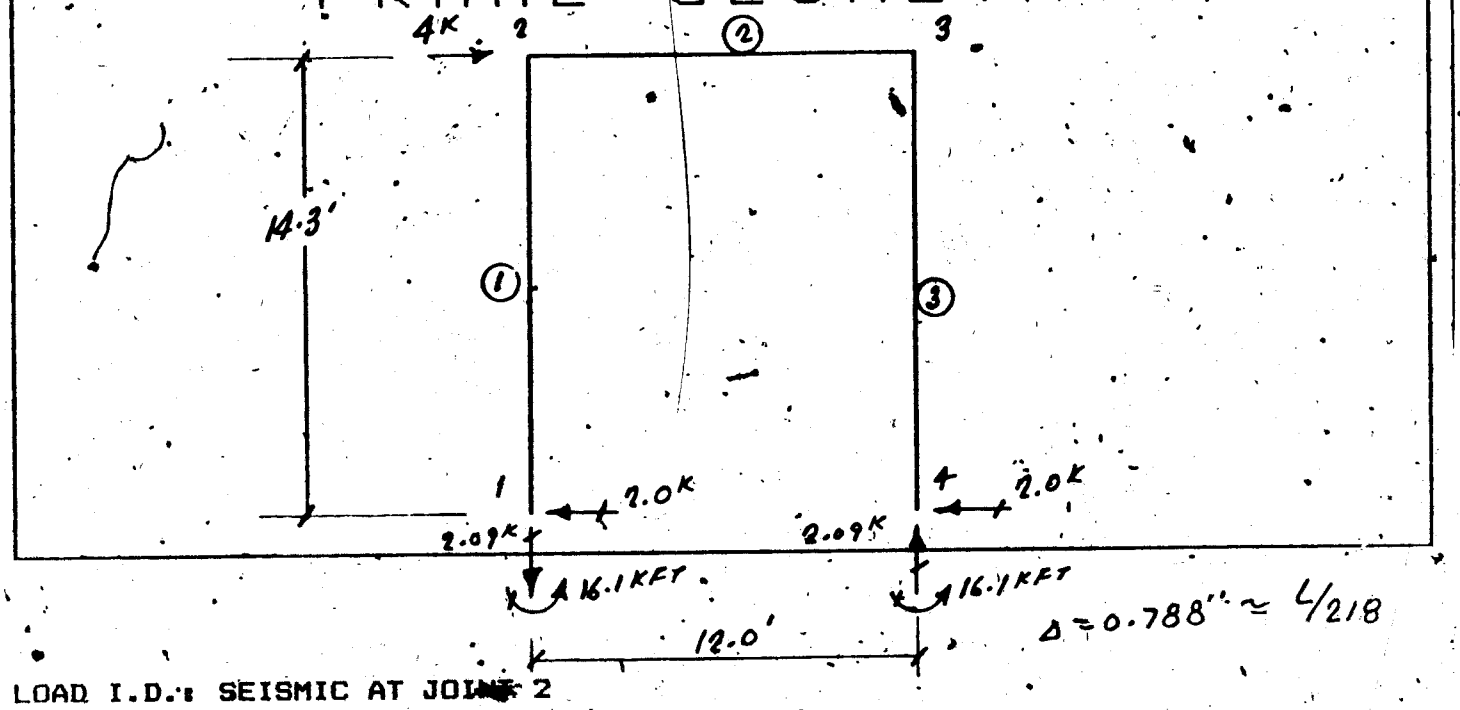
JOINT	JR1(H)	JR2(V)	JR3(R)
1	1	1	1
4	1	1	1

UPPER BAND WIDTH IS 6

Dave Hoesl 12/31/87

SHT NO 67
PAGE 9

FRAME GEOMETRY



LOAD I.D.: SEISMIC AT JOINT 2

JOINT LOADS:

JT. #	HOR. (KIPS)	VERT. (KIPS)	MOMENT (FT-K)
2	4.00	0.00	0.00

JOINT DISPLACEMENTS:

JT. #	HORIZONTAL (INCHES)	VERTICAL (INCHES)	ROTATION (RADIAN)
1	0.00000	0.00000	0.000000
2	0.78845	0.00119	-0.002484
3	0.78750	-0.00119	-0.002479
4	0.00000	0.00000	0.000000

Dorn Hassel 12/31/87

MEMBER FORCES:

MEMBER NO.	LEFT END AXIAL (KIP)	LEFT END SHEAR (KIP)	LEFT END MOMENT (FT-K)	RIGHT END AXIAL (KIP)	RIGHT END SHEAR (KIP)	RIGHT END MOMENT (FT-K)
1	-2.09	2.00	16.07	2.09	-2.00	-12.54
2	2.00	-2.09	-12.54	-2.00	2.09	-12.53
3	2.09	2.00	12.53	-2.09	-2.00	16.06

SUPPORT REACTIONS:

JOINT NO.	HORIZONTAL (KIPS)	VERTICAL (KIPS)	MOMENT (FT-K)
1	-2.00	-2.09	16.07
4	-2.00	2.09	16.06

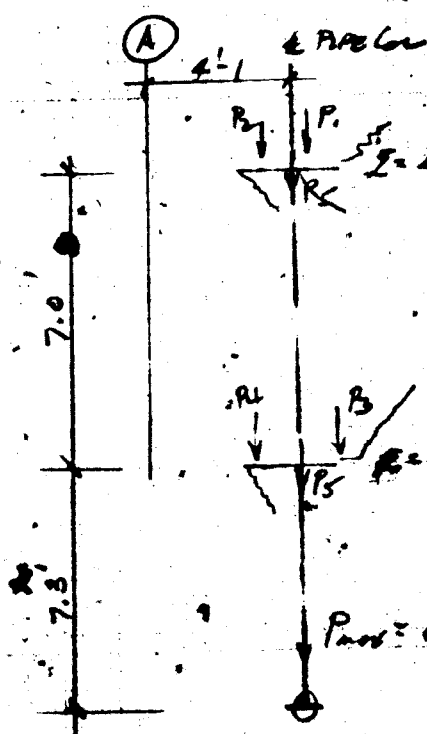
[redacted] 11/11/82

Dora Hacal 12/31/87

STRAUSS & LOFTFIELD
STRUCTURAL ENGINEERS

CLIENT/
PROJECT/ STAIR 6
SHEET/ 69 OF 317
PROJECT # 8207
DATE/ 10-8-87
ENGINEER/ JM

POST @ INNER STRINGERS @ EAST (RIGHT) OF (10)
LEVEL 104.0± THRU 97.3 TO FDN UNDER 90.0



$P_1 = .6'(1.6')(50+100) = 368 + 736 = 1105^{\#}$ (7.36)

$P_2 = .0(1.6)(50+100) = 480 + 960 = 1440^{\#}$

$P_3 = P_2' = 1440^{\#}$

$P_4 = P_1 = 1105^{\#}$

$P_5 = \text{landing} = (50\ PSF + 100)[2.4'(3.75)]$ (9.0)

$450 + 900 = 1350$

USE 3" ϕ STD STL PIPE COL

$e = 1'$ $M_e = 8.0^{k} \times 1' = 8^{'k} = 8000^{\#}$

$P = 8.0$ $\frac{P}{A} = \frac{8000}{2.23} = 3.59$

3" ϕ STD. $r = 1.16$

$\ell = 7.3(12) = 87.6$ $k\ell/r = 75.5$ $F_a = 15.85$ $= .23$

$M = 8000^{\#}$ $f_b = 1465\ psi$ $= .23$

$S = 1.72$ $E_c = 29000$

$.46 < 1.0$

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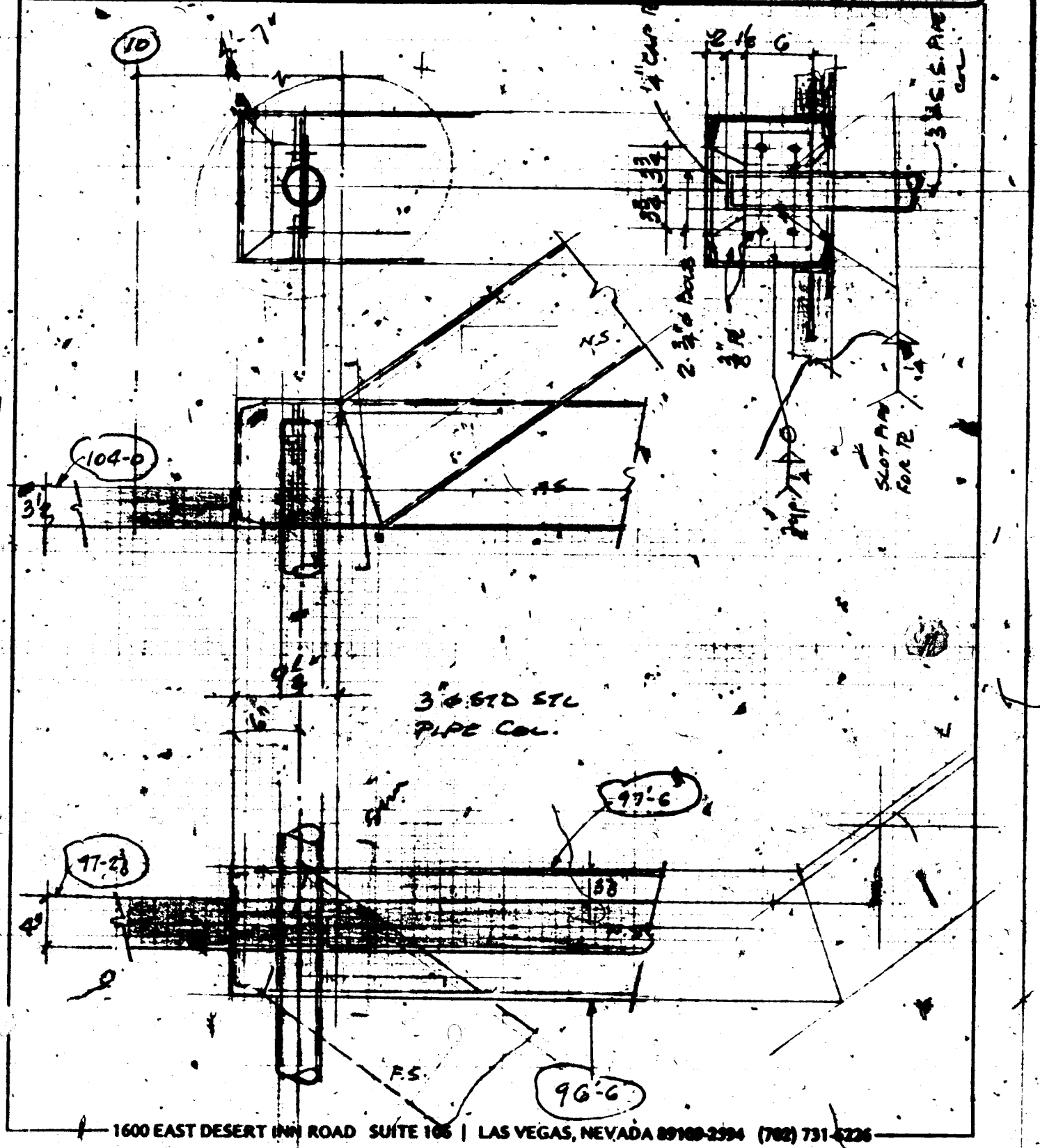
Doris Hall 12/31/87

5

STRAUSS & LOFTFIELD
STRUCTURAL ENGINEERS

CLIENT/
PROJECT/
STAIR # 6

SHEET/ 70 OF 317
PROJECT # 87017
DATE/ 10-87
ENGINEER/ JM



1600 EAST DESERT INN ROAD SUITE 106 | LAS VEGAS, NEVADA 89109-2994 (702) 731-5226

Dom. Hotel 12/31/87

STRAUSS & LOFTFIELD
STRUCTURAL ENGINEERS

CLIENT/
PROJECT/ STAIR LANDINGS
SHEET/ 71 OF 317
PROJECT # 82017
DATE/ 10-82
ENGINEER JM

1½" Deck 20 ga 3" min lwt unit { DECK FILLET Conc + 20# Const
as form. W = 30 + 2.5 + 20 = 52.5 = 55 PSF

$I_{req} = (1.44(W_D) + K_1 L) \cdot L^3 \times 10^{-5}$

$K_1 = .727$ $W_D = 55$ $L = 7.5$

$\frac{L}{180} = 2.5$

$= \left(1.44(55) + .727(7.5)\right) 7.5^3 \times 10^{-5}$

$= [(62.92) + 5.45] \cdot 421.875 \times 10^{-5} = .288$ 7.222 $= I_D$

SHORE

$\frac{K_1 L^4 \times 10^{-5}}{I_D} = \frac{.727(7.5)^4 \times 10^{-5}}{.222} = 0.104 < 1.0$ OK

No cause ponding failure.

$I_{tw} = (.858 W_D + K_2 L) L^3 \times 10^{-6}$

$= \left[(.858(55) + (.454 \times 7.5)\right] 7.5^3 \times 10^{-6}$ 421.88

$= .021 <$

EDGE ANGLE

deck $R = \left(\frac{D}{2} + \frac{L}{100}\right) 7.5/2 = 568.5$ #/'

3"-8"

$M = 562.5 (2.6)^2 .5 = 1901$ #-'

2.6 1.4"

3.25"

$\frac{3}{10}$" K_1 $S = \frac{12(.18)^2}{6} = .070$

$f_b = 1901 \div .070 = 27.2$ ksi. 27.0

USE L 3×3×⅜

$S_{req} = \frac{12(.375)^2}{6} = .281$

$f_b = 6.8$ ksi < 20

@ 7.5 span onto @ Stringer L 8×3×¼

$S_{req} = 2(.25)^2 = .125$

$f_b = 15.21$ ksi

Don Haesl 12/31/87.

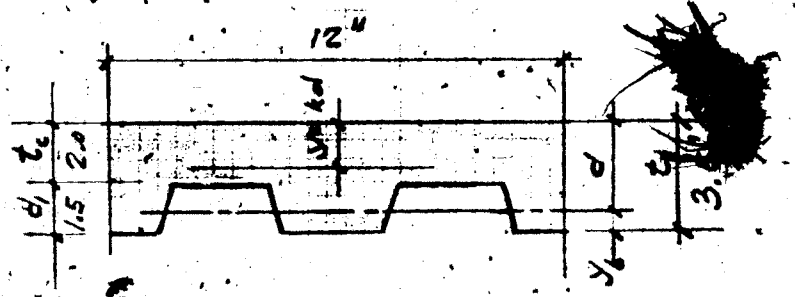
STRAUSS & LOFTFIELD
STRUCTURAL ENGINEERS

CLIENT/
PROJECT/
SHEET/ 72 OF 317
PROJECT # 82017
DATE/ 10-82
ENGINEER/

1½" B DECK 20 GA.
Reg. Wt. Conc.

I_p = .249 S_t = .270 y_b = .908
I_D = .222 S_b = .255 A_s = .663
} INRYCO MANUEL 21-13

n = 9
deck
F_y = 33ksi



$d = t - y_b = 3.5 - .908 = 2.592$

$\rho = A_s \div 12d = .663 \div 12(2.592) = .021$

$k = [(2\rho n + (\rho n)^2]^{1/2} - (\rho n) = [(2 \times .021 \times 9) + (.021 \times 9)^2]^{1/2} - (.021 \times 9) = .454$

$t_c = t - d_1 = 3.5 - 1.5 = 2.0$

$kd = .454 \times 2.592 = 1.177 \leq t_c$ (if $kd > t_c$, $kd = t_c$)

$Y = kd$

$I_c = \frac{4Y^3}{n} + A_s(d-Y)^2 + I_f = \frac{4(1.177)^3}{9} + .663(2.592 - 1.177)^2 + .249$

$= 0.725 + 1.327 + .249$

$= \underline{2.301} = I_c$

$S_T = I_c n / Y = 2.301 \times 9 \div 1.177 = \underline{17.598} = S_T$

$S_c = I_c / (t - Y) = 2.301 \div (3.5 - 1.177) = \underline{.991}\ in^4 = S_c$

IMPOSED

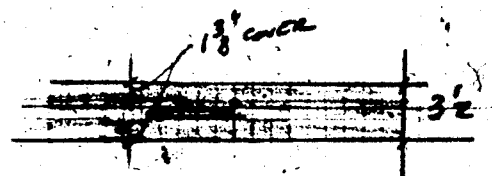
composite $W_{bf} = .3 f'_c S_T \div L^2 = .3(3000)\ 17.598 \div 7.5^2 = 281$ PSF BENDING
unshored $W_d = 43{,}704\ I_c \div L^3 = 238.4$ PSF DEFL. $L/360$
$W_s = .2 V_R \div L = 2(1135) \div 7.5 = 302.7$ PSF DECK END SHEAR

Dora Hasel 12/31/87

STRAUSS & LOFTFIELD
STRUCTURAL ENGINEERS

CLIENT/ SHEET/ 73 OF 317
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DATE/
STAIR LANDINGS ENGINEER/

3½" SLAB f'_c = 3KSI F_y = 60 ksi #3



$d = 3.5 \div 2 = 1\frac{3}{4}" = 1.75$

$\frac{3}{8} + \frac{3}{8} = \left(\frac{5}{4} - 3\frac{1}{2}\right) = 2\frac{3}{4}" \div 2 = 1\frac{3}{8}"$ COVER TYP.

3 @ 12 $A_s = .11^{0"}$ $M_u = .11(60).9(1.75) \div 12 = .87$ 'k
4 @ 12 $A_s = .20$ $M_u = .20(60).9(1.60) \div 12 = 1.35$ @ 12" 1.62 @ 10"

$w = 1.4(50) + 1.7(100) = 70 + 170 = 240$ #/LF

$L_{max} = 7.5'$ $M_u = .240(7.5)^2 \div 8 = 1.69$ 'k Long Span
$V_u = .240(7.5).5 = 900$ #/1 $v = 21.4$ psi ✓

$L_{typ} = 3.2'$ $M_u = .240(3.2)^2 \div 8 = .31$ 'k < .87

$V_u = .240(3.2).5 = .38$ #/1 $v = \frac{880}{12(.25)1.75} = 21.3$

$\frac{1}{(\ )} 3.5 = 10.6$

USE 1½" B DECK W/ TOTAL THICKNESS 3½" on 4"

~~USE~~ # 3 @ 10" EW @ MID SLAB.

USE ⅜" ϕ x 10" DZL NELSON BAR • ANCHOR @ 10" OC

EXTEND 2'-0" INTO ~~SLAB~~ MAIN FLR. DECK SLAB.

L = 4.6
$M_u = .240(4.6)^2 \div 8 = 1.63$ 'k < .87
$V_u = .240(4.6).5 = 540$ #/1 $v = \frac{540}{12(3.5)} = 12.9$ ✓

1600 EAST DESERT INN ROAD SUITE 106 | LAS VEGAS, NEVADA 89109-2594 (702) 731-6226

Done Hand 12/31/84

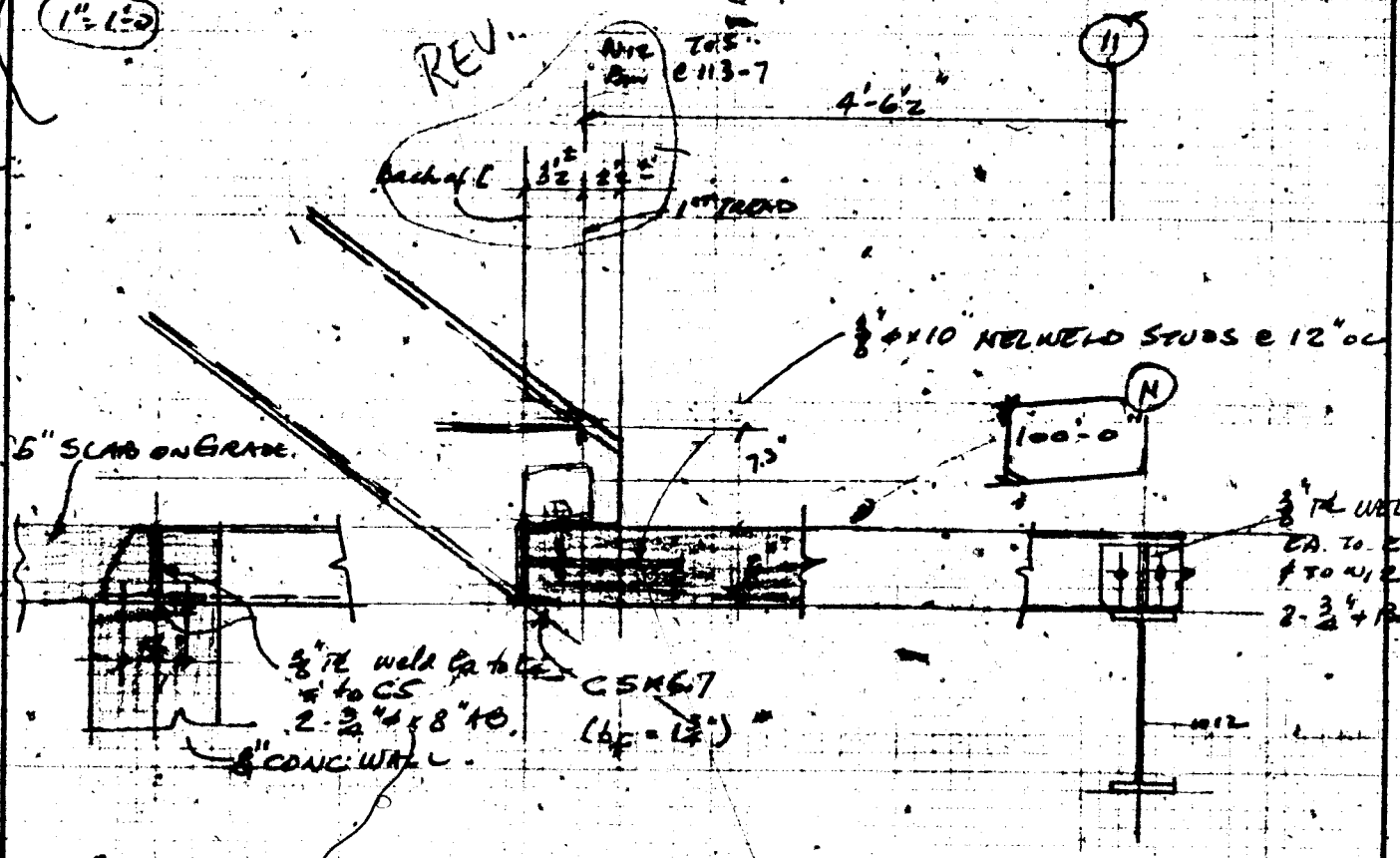
STRAUSS & LOFTFIELD
STRUCTURAL ENGINEERS

CLIENT/
PROJECT/
STAIR #5

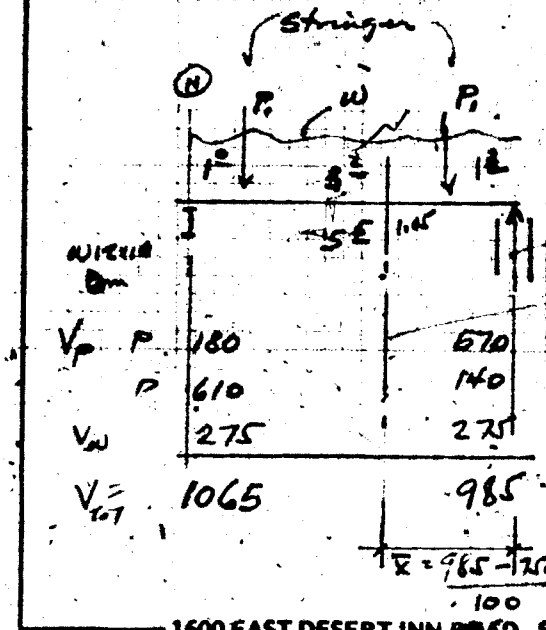
SHEET/ 74 OF 317
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DATE/ 10-82
ENGINEER/

1" = 1'-0"

REV.



CHANNEL



$P_1 = 5'(60 + 100) = 250 + 500 = 750$ PLF

Bm 10
Slab: $\frac{5}{12} \times 140 \times .5 = 25$
W = 50 PLF
+ 50
W = 100 PLF

M = 985 (2.35) = 2,315 ft-k
− 750 (1.0) = −750
− 100 (2.35)²/2 = −277
= −1065
= 1250 ft-k
= 15000 in-k

C8x11.5 S = 8.14 f_s = 1.85 ksi
$\Delta \simeq \frac{1.25(5.5)^2}{30.6(8.14)8} = .007$"

C5x6.7 S = 3.0 f_s = 5.0 Δ = .031"

1600 EAST DESERT INN ROAD SUITE 106 | LAS VEGAS, NEVADA 89109-2594 (702) 731-6226

Dana Hasil 12/31/87

STRAUSS & LOFTFIELD
STRUCTURAL ENGINEERS

CLIENT/ SHEET 75 OF 317
PROJECT/ PROJECT # 82017
DATE/ 10-82
STAIR #5
ENGINEER/

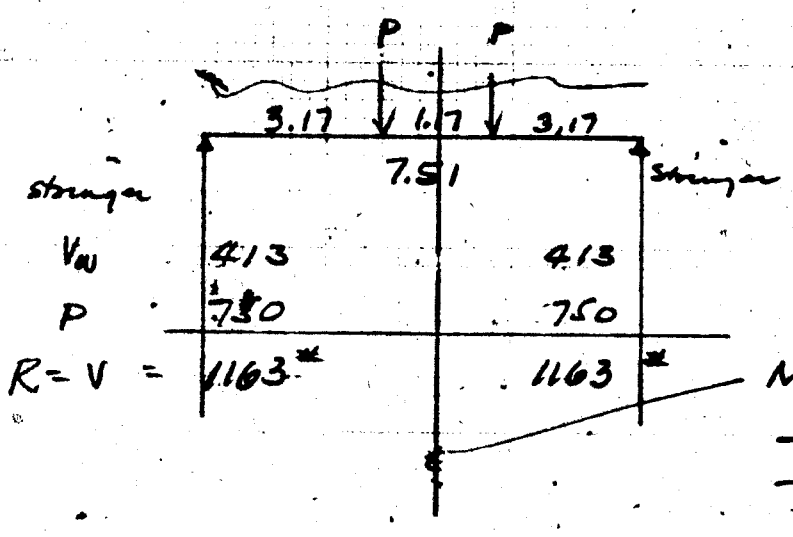
LANDING @ 107-3"

W6 Carry 4 STRINGER + Landing T.A.

$P = 5'(50+100) = 250+500$
$= 750^{\#}$

$W_{self} = \frac{3.5}{12} \times 150 \times 2.5' = 110$ PLF

$W = 826$



$M = 1163 \times 7.51(.5) = 4367^{\#}$
$-750(1.17).5 = -440$
$-110(\frac{7.51}{2})^2.5 = -775$ } -1215
$M = 3152^{\#}$
$= 3.2^{IK}$

W6x16 $M_R = 20$ $S = 10.2$ $d = 6.25$

$\Delta = \frac{3.2(7.51)^2}{30(10.2)6.25} = .035"$ ✓

USE W5x16 $M_R = 17$ $S = 8.51$ $d = 5$

$\Delta = \frac{3.2(7.51)^2}{30(8.51)5} = .05"$

Show Hosel - 12/31/87

STRAUSS & LOFTFIELD
STRUCTURAL ENGINEERS

CLIENT/

SHEET/ 76 OF 317

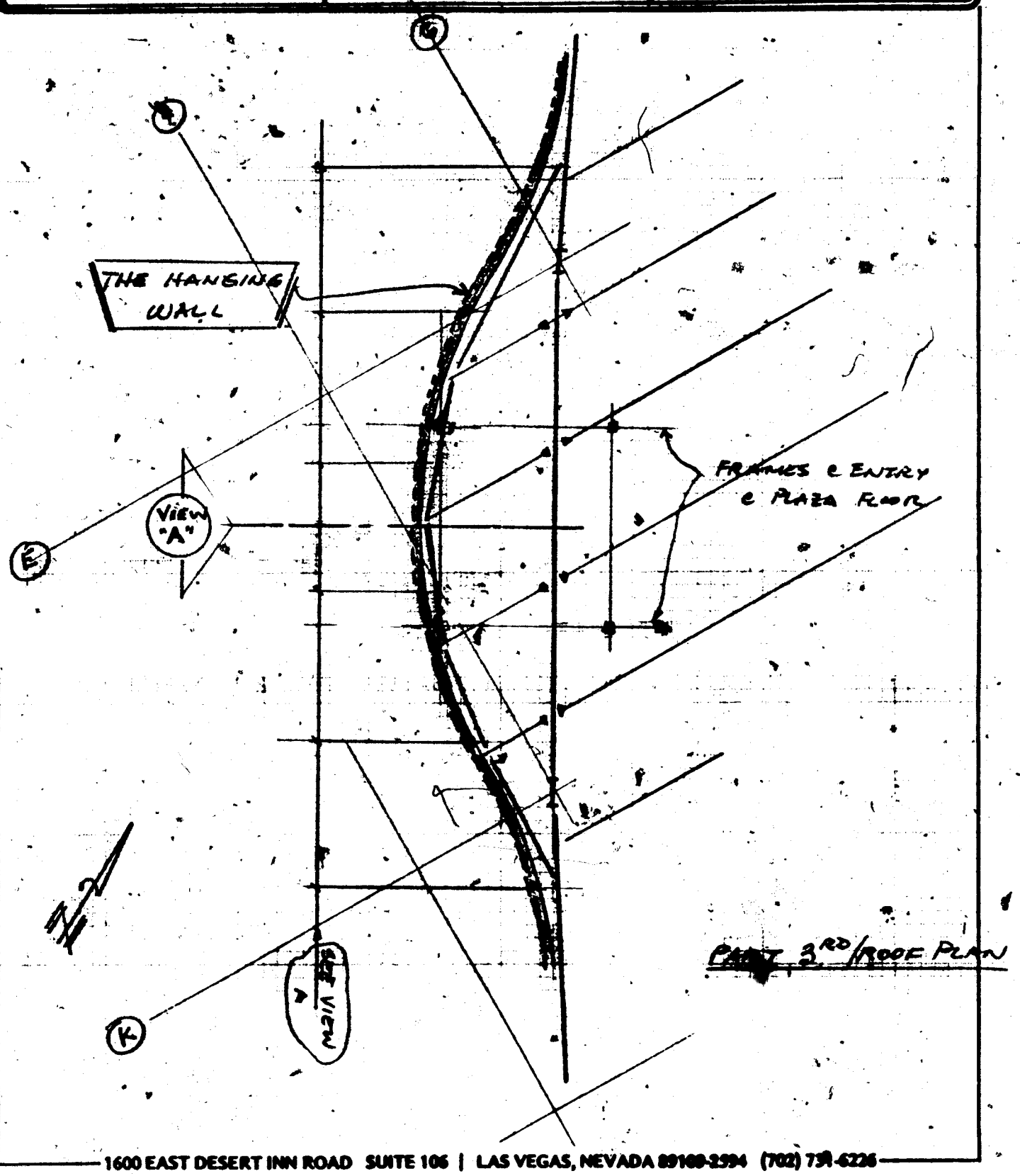
PROJECT/

PROJECT # 82017

PLAZA ENTRY

DATE/ 10-82

ENGINEER/ dm



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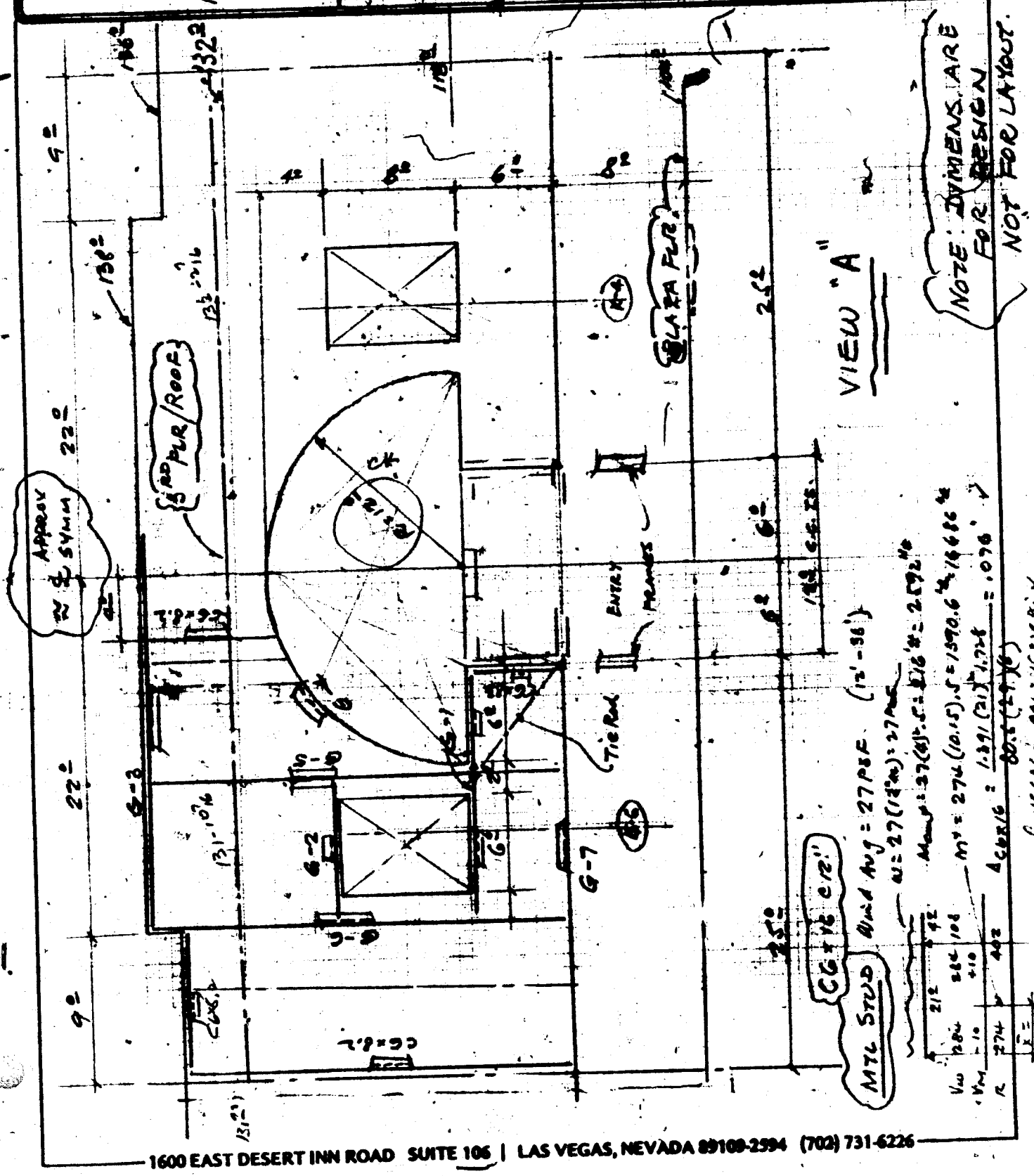
2

Dona Hoisl 12/31/87

STRAUSS & LOFTFIELD
STRUCTURAL ENGINEERS

CLIENT/
PROJECT/ EXTERIOR WALL PLAZA ENTRANCE HANGAR

SHEET/ 77 of 317
PROJECT # 82017
DATE/ 10-82
ENGINEER JM

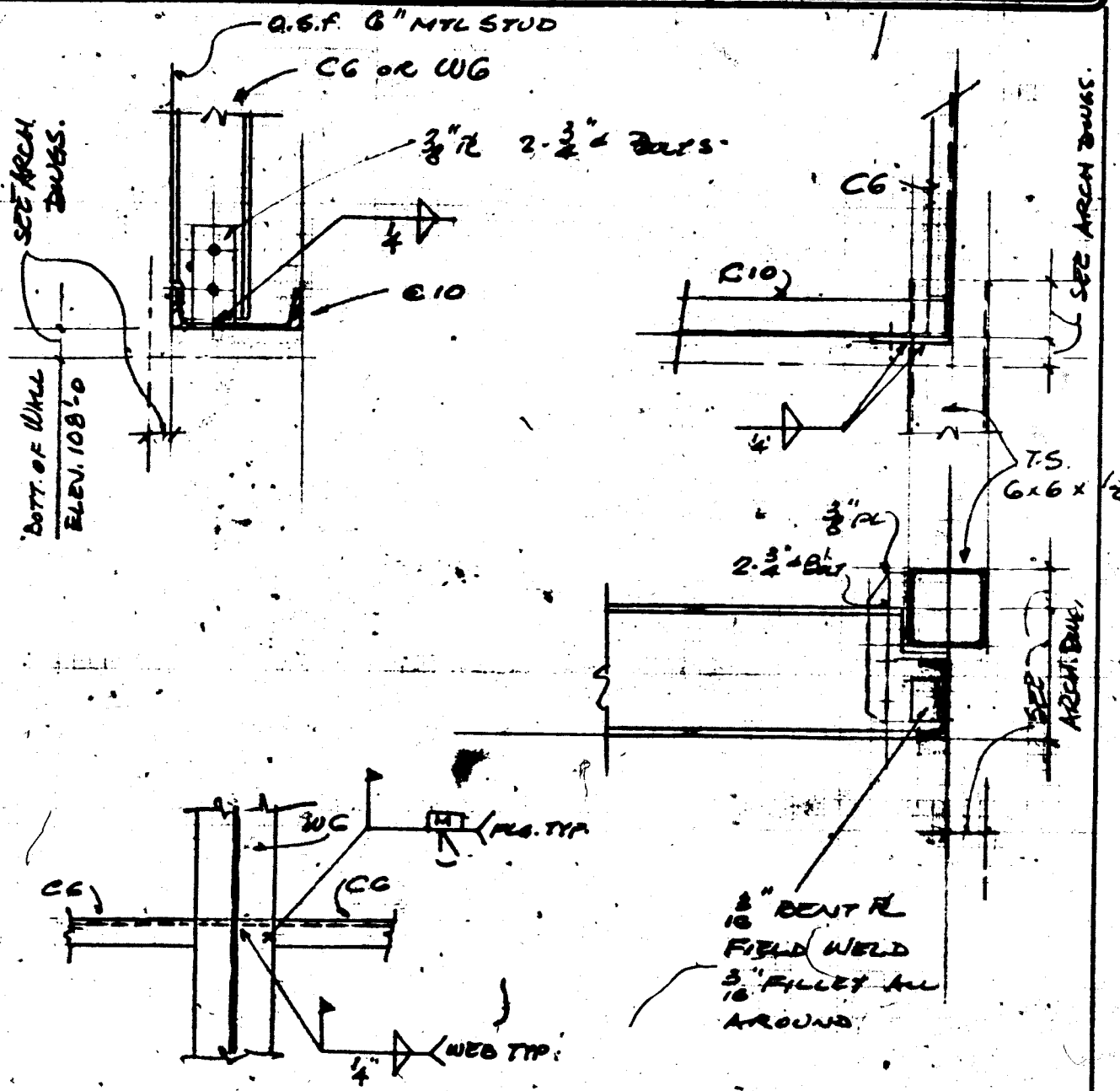


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Work Hardening 12/31/87

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CLIENT/
PROJECT/
SHEET/ 78 OF 317
PROJECT # 82017
DATE/ 10-82
HANGING WALL - PLAZA ENTRY. ENGINEER



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Dora Hasel 12/31/87

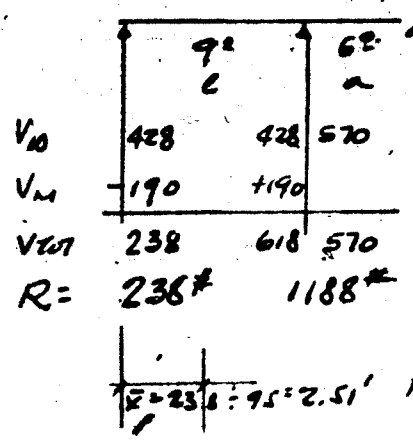
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CLIENT/
PROJECT/ PLAZA ENTRY WALL
SHEET/ 79 OF 317
PROJECT # 82017
DATE/ 10-82
ENGINEER/ JM

WIND = 27 PSF

HORIZ GIRT G-1

$w = 3.5'(27) = 95$ PLF



$M_{max} = 95(6.0)^2 .5 = 1710'' = 20,520''$

$\Delta_a = \frac{wa}{24EI}(4a^2\ell - \ell^2 + 3a^3) = \frac{1215(.095)6.0(1728)}{24(29)I} = \frac{1.72}{I}$

$M = 238(2.51).5 = 298''$

CG×6.2 $f_s = 4.7$ ksi ✓ $\Delta = .13''$

CG×11.5 $f_s = 2.52$ ksi ✓ $\Delta = .05''$

HORIZ. GIRT G-2

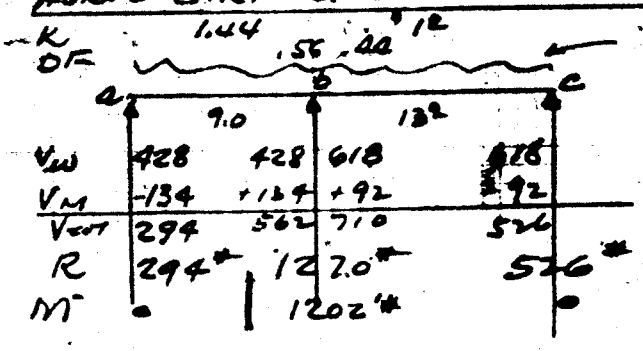
$L = 9.0'$ $w = 3.5(27) = 95$ PLF $V = 855\#$ $R = 428\#$

$M = 855(9) \div 8 = 962'' = 11543''$

CG×8.2 $f_s = 2.8$ ksi

$\Delta = \frac{.962(9)^2}{80.6(4.38)6} = .04''$

HORIZ GIRT G-3 @ TOP OF WALL



$w = 95$ PLF

$M_9 = 95(9)^2 \div 8 = 962$

$M_{13} = 95(13)^2 \div 8 = 1391$ $M_{13} - M_9 = 429$

$M_b = 962 + (429).56 = 1202''$ (min) $= 1242.7''$

CG×8.2

Done Hand. 12/31/87

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CLIENT/ SHEET/ 80 OF 317
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DOUBLE CURVED G-4

$L = 18'$ $W = 18(50) = 900^{\#}$ $R = 450^{\#}$

$M = 900(18) \div 8 = 2025'^{\#} = 24300''^{\#}$

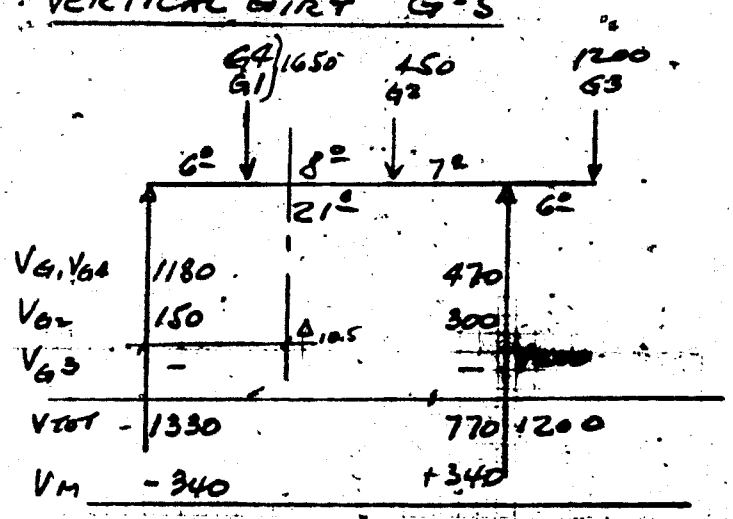
$W = 2 \times 27 = 54 \rightarrow 50 PLF$

C6x8.2

$f_b = 5.4 ksi$

$\Delta = \frac{2.025(18)^2}{80.6(4.38)6} = .31$

VERTICAL GIRT G-5



G1 = 1200#
G2 = 450#
G3 = 1200#
G4 = 450#

$M_{cant} = 1200(6.0) = 7200'^{\#}$
$86400''^{\#}$

$M^{+} = 1000(6.0) = 6,000^{\#}$
$72000''^{\#}$

DEFLECTION

@ OVERHANG $\Delta = \frac{1200(6)^2(21+6)}{3EI}(1728) = 23.17 \div I \downarrow$

$= \frac{1650(6)15(60)(27)(1728)}{6EI(21)} = 11.38 \div I \uparrow$

$\frac{450(14)7(6.0)27(1728)}{6EI(21)} = 3.38 \div I \uparrow$

$= 8.41 \div I \downarrow$

W6x15 = .29"
W6x16 = .26"
W6x20 = .20"
W6x25 = .16"

@ SPAN $\Delta_{10.5} = \frac{1200(6)10}{6EI\,21}(441-100)(1728) = 11.61 \div I \uparrow$

$= \frac{450(7)10.5(441-49-110)(1728)}{6EI(21)} = 4.41 \div I \downarrow$

$= \frac{1650(6)10.5(287)(1728)}{6EI(21)} = 13.86 \div I \downarrow$

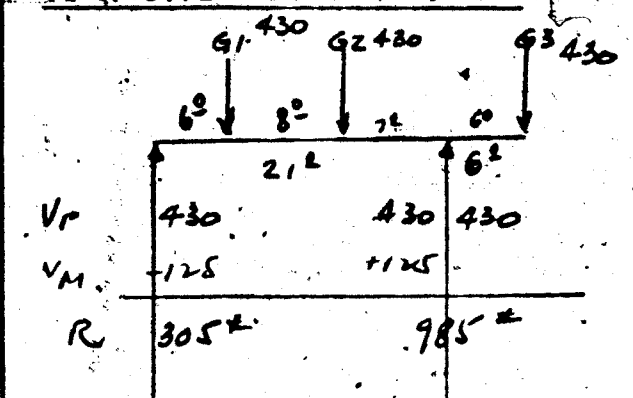
$= 6.66 \div I \downarrow$

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CLIENT/ SHEET/ 81 OF 317
PROJECT/ PROJECT # 82017
DATE/ 10-82
PLAZA ENTRY WALL ENGINEER/

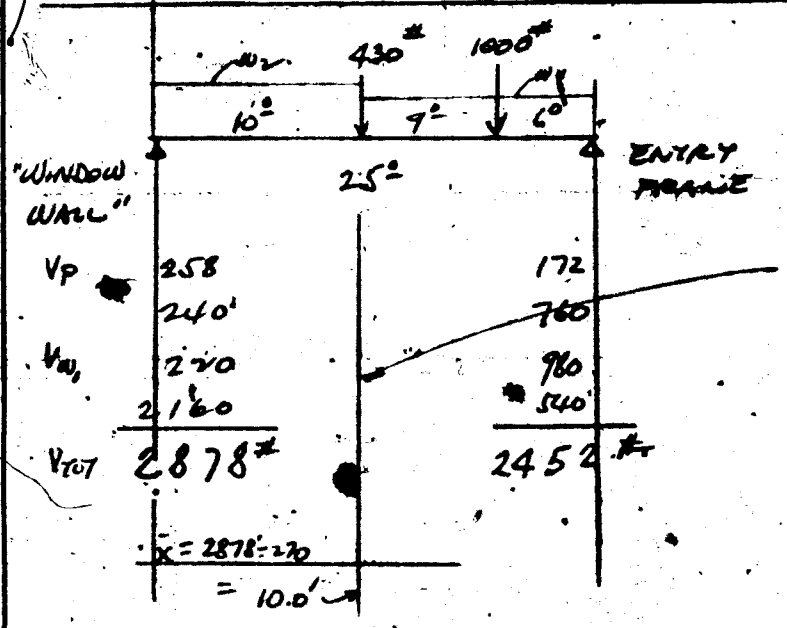
VERTICAL STRUT G-6



$M_{cant} = 430 \times 6 = 2580$ ft-lb

$M_{span} = 305(6) = 1830$ ft-lb

HORIZONTAL GIRT G-7 @ "BOTTOM" OF WALL L = 25'-1"



$w_1 = 3 \times 27 = 80$ PLF (W1 1200)

$w_2 = 10 \times 27\# = 270$ PLF (W2 2700)

$M_{MAX} = 2878 \times 10 = 28.78$ ft-k

$\Delta = \frac{28.78(25)^2}{80.6(Sd)} = \frac{217.12}{Sd} = .83$

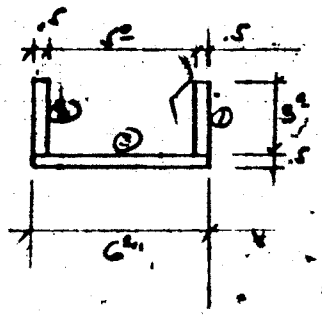
$Sd = 198.20$

Limit $d = 6"$ $S = 33.03$

Limit $\Delta = \frac{25 \times 12}{360} = .83$

$d = 8"$ $S = 24.8$ W8×31

$d = 7$



	A	$\bar{x}$	Ay	Ax	I_o
1	1.5	.25	.38	0.10	.08
2	1.5	5.75	8.63	49.62	.03
3	3.0	3.0	9.00	27.00	1.13
	6.0		18.01	(76.72	+ 1.19) = 77.9
		$\bar{x}$ = 3.0			-6(9) = -54.0

$S = \frac{23.9}{3} = 7.9$ < 33

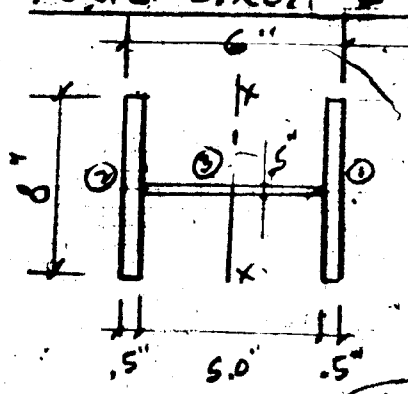
= 23.9 = I

Dana Hasel 12/31/87

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PROJECT/ PROJECT # 8207
DATE/ 10-82
ENGINEER

HORIZ. STRUT. G-7 @ BOTTOM OF WALL



	A	$\bar{x}$	$A\bar{x}$	$A\bar{x}^2$	I_o
①	4.0	.25	1.0	.25	
②	4.0	5.75	23.0	132.25	
③	2.5	3.0	7.5	22.50	
	10.5		31.5	155.0	$-10.5(3)^2 = I_{xx}$

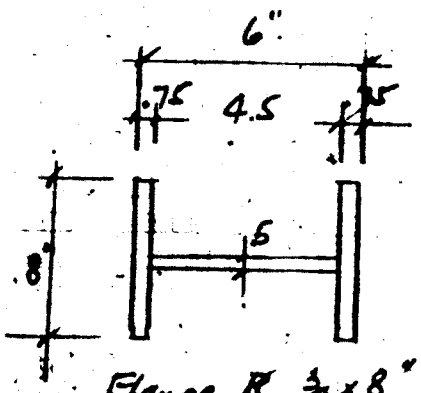
$\bar{x} = 3.0$

$60.5 = I_{xx}$

$S_{xx} = \frac{60.5}{3} = 20.2$

< 33

NG



Flange R ¾ × 8"
Web R ½ × 4.5"

NG

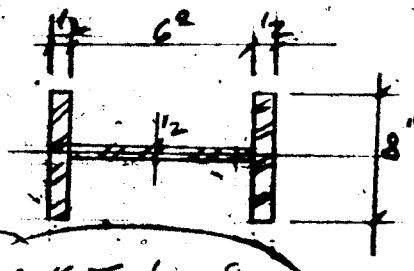
	A	$\bar{x}$	$A\bar{x}$	$A\bar{x}^2$	I_o
①	6.0	.375	2.25	.84	.28
②	6.0	5.635	33.81	190.52	.28
③	2.25	3.0	6.75	20.25	3.80
	14.25		42.81	211.61	$-14.25(9^2)$
				-4.36	$= 87.72 = I_{xx}$

$\bar{x} = 3.0$

$\frac{87.72}{3.0} = 29.24\ S_{xx}$

< 33.0

DEEPEN THE BEAM i.e. d = 8"



FLANGES ½ × 8
WEB ½ × 6

NG

	A	$\bar{x}$	$A\bar{x}$	$A\bar{x}^2$	I_o
	6.0	.25	1.0	.25	.08
	4.0	6.75	27.0	182.25	.08
	3.0	4.5	10.5	36.75	9.00
	11.0		38.5	219.25	$+ 9.16 = 228.41$

$\bar{x} = 3.5$

$11(3.5)^2 = 134.75$

$I_{xx} = 93.66$

$S_{xx} = 26.76$

CHECK A C10 or C12

Dora Hotel 12/31/87

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SHEET 83 OF 317
PROJECT # 8207
DATE/ 10-82
ENGINEER

HORIZ. GIRT G-7.

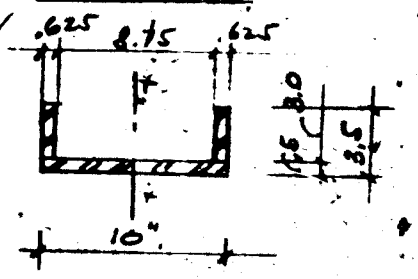
$\Delta \leq L/360 \leq .83$ $Sd = 198.20$ if $d = 10"$ $S = 19.82$ C10x30 (20.7)
if $d = 12"$ $S = 16.52$ C12x20.7 (21.5)

USE C10x30

$d=10"$ $t_w = 1/16"$ $b_f = 3"$ $t_f = 7/16$ avg. $A = 8.82$ $S = 20.7$ $I = 103$

OR THIS MEMBER MUST BE CURVED TO MATCH WALL CURVE
OUTSIDE FACE OF STUD = O.S.F. C10.

ALTERNATE



A	$\bar{x}$	$A\bar{x}$	$A\bar{x}^2$	I_o
1.875	.313	.587	.18	.06
1.875	7.688	18.165	175.98	.06
4.375	5.0	21.875	109.38	41.67
8.125		40.627	285.54	41.79
			+041.79	
			327.38	
			- 203.13	
			124.20 = I_{xx}	
			÷5.0 = 24.8	19.82

$\bar{x} = 5.0$

$A\bar{x}^2 = 203.125$

SHOP MAKE WEB 1/2 x 10" CUT TO MATCH WALL CURVATURE

FLANGES: 5/8" x 3" ROLLED TO MATCH WALL CURVE

WELD FULL PENE BUTT. W/ BACK REAR GRIND O.S.F. FLG. WELD SMOOTH

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Door Hook 12/30/87

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PROJECT/ PROJECT # 82017
DATE/ 10-82
HANGING WALL @ PLAZA ENTRY ENGINEER

WALL WEIGHT

TYP WALL = 21 PSF + 4 = 25 PSF

@ 3rd Level Roof. W_{max} = 25PSF x 25' = 625 PLF.

C6 x 16 g.a. C 12'oc

$P_{W6\times25}$ = 25(27)5 = 3.38 k
+ 6 x 6 x 25 = .90
+ 4 x 10 (25) = 1.00
= 5.3 k

$P_{C6\times8.2}$ = 25' x 25 (9/) = 5.6 k MAX

= 25 x 12 (9') = 2.7 k MIN

CURVED ANGLE SPANS BETWEEN ROOF BEAMS (7° oc)
(MATCH WALL CURVATURE)

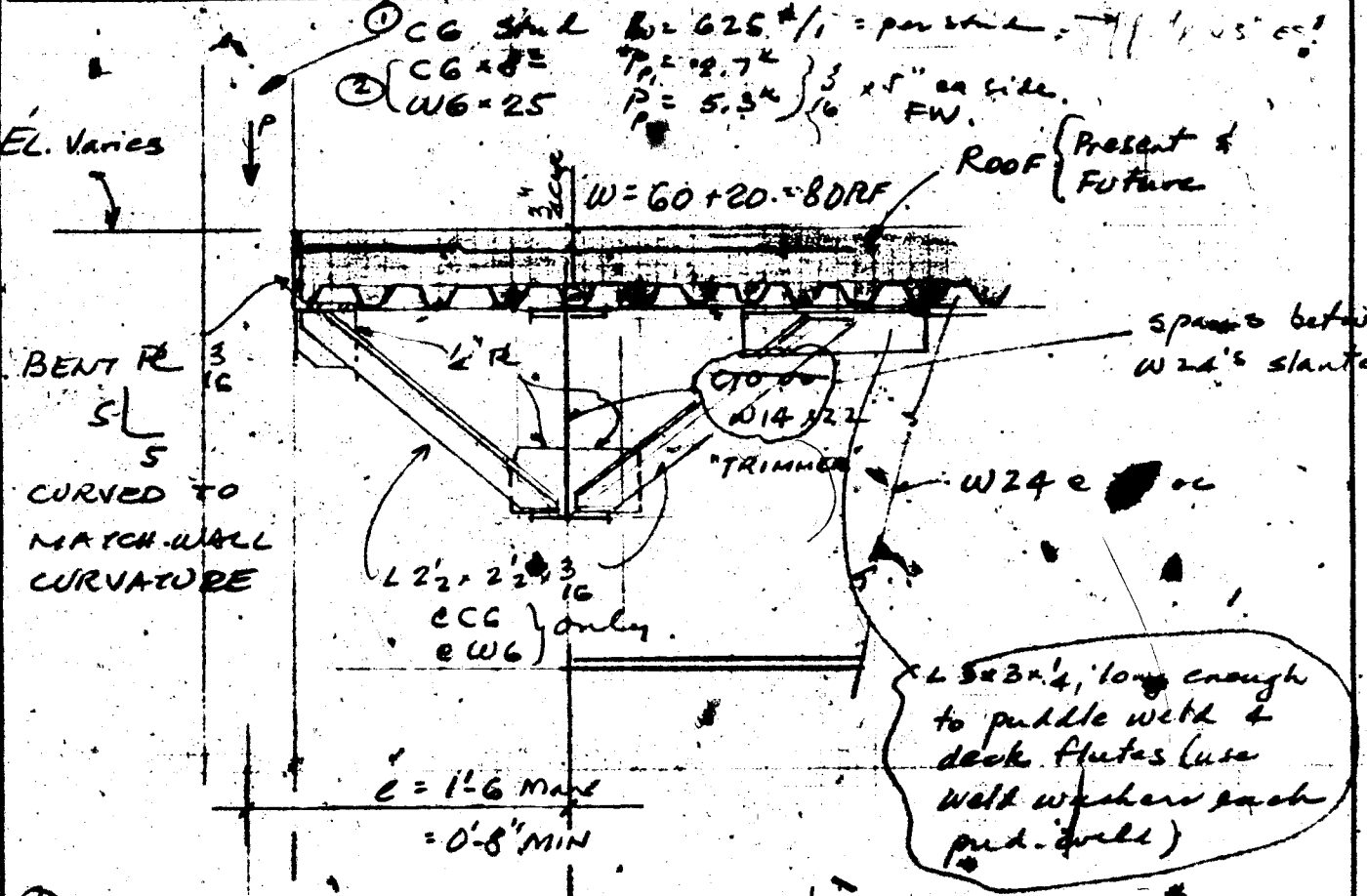
L = 8.0' CONTINUOUS 2 SPAN MIN.

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Home Heat, 12/31/87

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DATE/ 10-82.
ENGINEER/ Jim



① Slab Reinf carries $w_{slab} = 625\ \#/l \Rightarrow P_{slab} \times 1.4 = 875\ \# = P_u$

$w_{roof} = 60(1.4) + 20(1.7) = 84 + 34 = 120\ \#/l = w_u$

$M_u = 875(1.5') + 120(1.5)^2 \cdot .5 = 1313 + 135 = 1.5\ ^{K}/_{l}$

$A_s = \#4 @ 12 = .20"$ $d = 5 - 1.5 - 1 = 2.5"$ F_y 60

$M_u = .20(60) \cdot .9(2.5) \div 12 = 2.25\ ^{K}/_{l} > 1.5$

TYPICAL { ½" ø x 12" NELWELD STUDS @ 12" oc
4 x 3'-6" long @ 12" oc

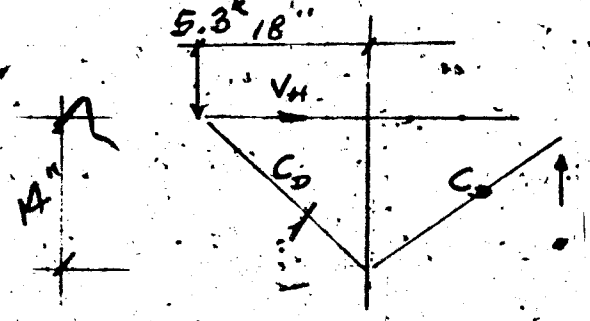
1600 EAST DESERT INN ROAD SUITE 106 | LAS VEGAS, NEVADA 89109-2594 (702) 731-6226

Down Hand 12/31/87

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CLIENT/
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PROJECT # 82017
DATE/ 10-82
ENGINEER/ Ann

② Web cg bet/or W6 to Bent Pl Slab trim Brace diag to Trim Beam bottom flange and kick back up to inner deck



$L_{diag} = \sqrt{18^2+14^2} = 22.8"$

Compression Diag $= 5.3 \times 22.8 \div 14$
$= 8.63^k$

$V_H = 5.3 \times 18 \div 18 = 6.81$

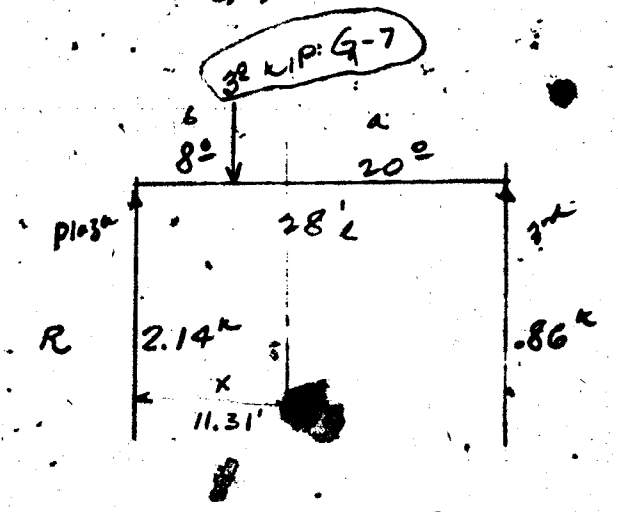
Dona Hasel, 12/31/87

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CLIENT/
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SHEET 876 OF 317
PROJECT # 82017
DATE/ 10-82
ENGINEER/ Jm

VERTICAL @ ENDS OF H.W. @ MULLION WALL

$R_{G-7}'' = 2878^{\#}$ (25 psf)



$M = 8(2.14) = 17.12^{k}$

$\Delta = \frac{Pab(a+2b)\sqrt{3a(a+2b)}}{27EIl}$

$= \frac{3.0(20)8(20+16)\sqrt{3(20)(20+16)}}{27EI(28)}$

$= \frac{63.3}{I} \leq \frac{28\times12}{360} \leq .93 = 67.82$ $I_{req'd}$

$\leq \frac{L}{480} \leq .70 = 90.93$

USE W10 x 22 (d, bf) $10\frac{1}{8} \times 5\frac{3}{4}$ $S = 23.2$ $I = 118$

$M_p = 46$ $f_b = 6.72(12) \div 23.2 = 3.5$ ksi

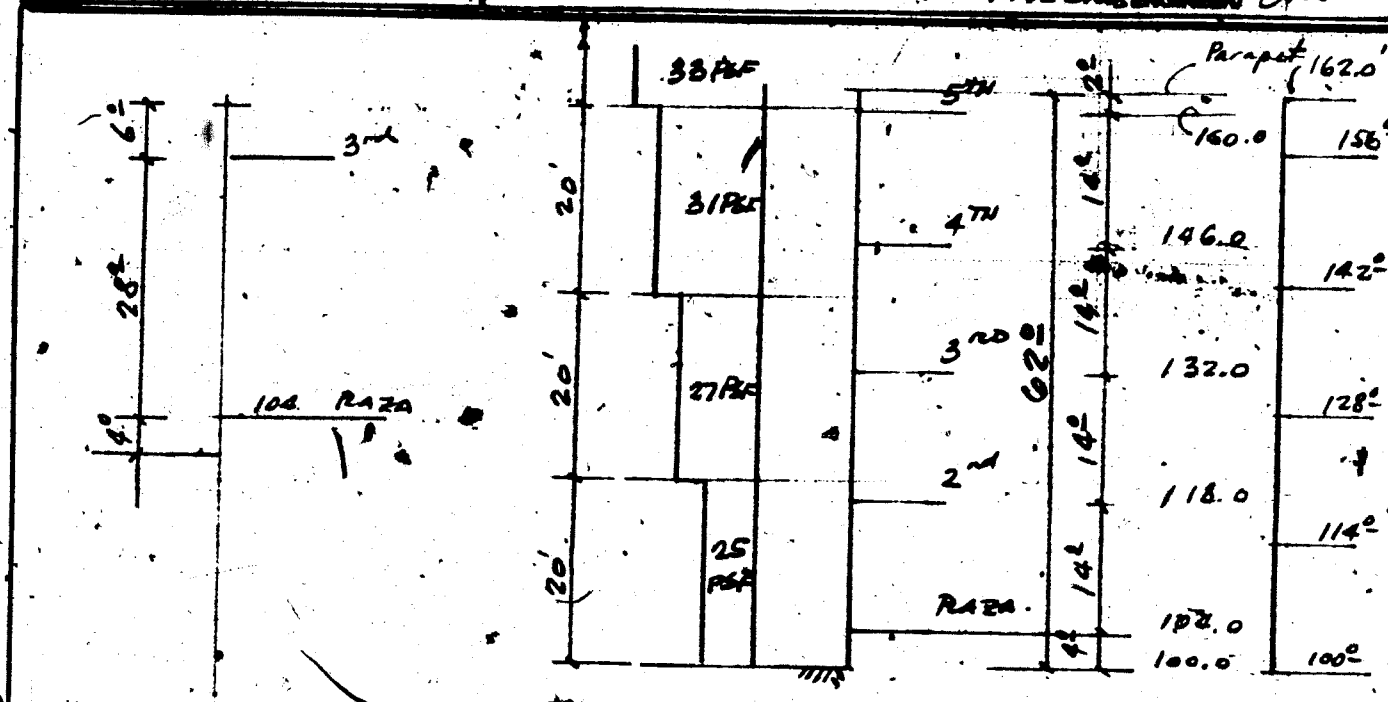
$\Delta = 63.3 \div 118 = 0.54" = 1/626$

1600 EAST DESERT INN ROAD, SUITE 106 | LAS VEGAS, NEVADA 89109-2594 (702) 731-6286

Done Hasel — 12/31/87

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STRUCTURAL ENGINEERS

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SHEET/ 88 OF 317
PROJECT/
PROJECT # 82017
LINE ① TO LINE (12)
DATE/ 15-82
EXTERIOR WALLS .6" MTL STUD ENGINEERING



WIND = 75 MPH

WIND

$P = C_e C_q q_s I$

$= C_e (1.2)(15)(1.15)$

$= C_e (20.70)$

$P_{0-20} = 25$ PSF

$P_{20-40} = 27$ PSF

$P_{40-60} = 31$ PSF

$P_{60-100} = 33$ PSF

$I = 1.15$, $q_s = 15$, $C_q = 1.2$ & ESSENTIAL FACTOR

C_e		
1.2	0'-20'	EXPOSURE "C"
1.3	20'-40'	
1.5	40'-60'	
1.6	60'-100'	

INRYCO / MILCOR "C" STUDS

C-C x ___ ga. @ 16" oc.

Limiting wind = L/360

	L	P_w	L allow @ 16"		
PLAZA (1ST) TO 2ND	14.0'	25 PSF	15.7	16 ga	PRESENT
			14.7	18 ga	
2ND TO 3RD	14.0	27 PSF	15.2	16 ga	C 6 x 18 ga C 16" oc
			14.2	18 ga	
3RD TO 4TH	14.0	31 PSF	14.8	16 ga	FUTURE
			13.8	18 ga	

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Done Hand 12/31/87

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PROJECT/ PROJECT # 82017
DATE/
EXTERIOR WALLS ENGINEER/

PARAPETS

e Low Bldg 6' cantilever

Present 3rd/Roof $M = 27PSF(6')^2 1.33(.5) = 646.3^{\#}$
$= 7757^{\#}$

C6x16ga $M_R = 29,730^{\#}$ OK
C6x18ga $M_R = 15,810^{\#}$ OK

FUTURE 5TH/ROOF $M = 32(6')^2 1.33(.5) = 766.1^{\#} = 9193^{\#}$

C6x16ga @16" oc OK
C6x18ga @16" oc OK

ASSUME
1. Each stud is attached to Each Floor and the vertical load of each stud is taken out a each Floor
2. All parapet conditions $\left\{\begin{matrix}4'\text{-}0" \\ 6'\text{-}0"\end{matrix}\right\}$ are continuous studs

C6x18 @ 16" oc
C6x16 @ 16" oc 14'-0" Story Ht

Combined Loading

$P_a = 27PSF(1.33)\frac{14}{2} \simeq 200^{\#}$

$\frac{P}{A} = \frac{200}{444} = .450\ ksi$ $\quad F_a = 16.0 - .03 = 0.43$

$kl/r = 14(12)/2.76 = 74.1 \quad F_a = 16.0$

$M = 27(14)^2 1.33 \div 8 = 1010 \times 12 = 12122^{IN\text{-}\#}$ $\quad = .41 < 1.33$

$M_R = 29750$

Studs @ Plaza Lobby Wall

L = 28.0' WIND = 27PSF (CW10x14 @ 12" oc)

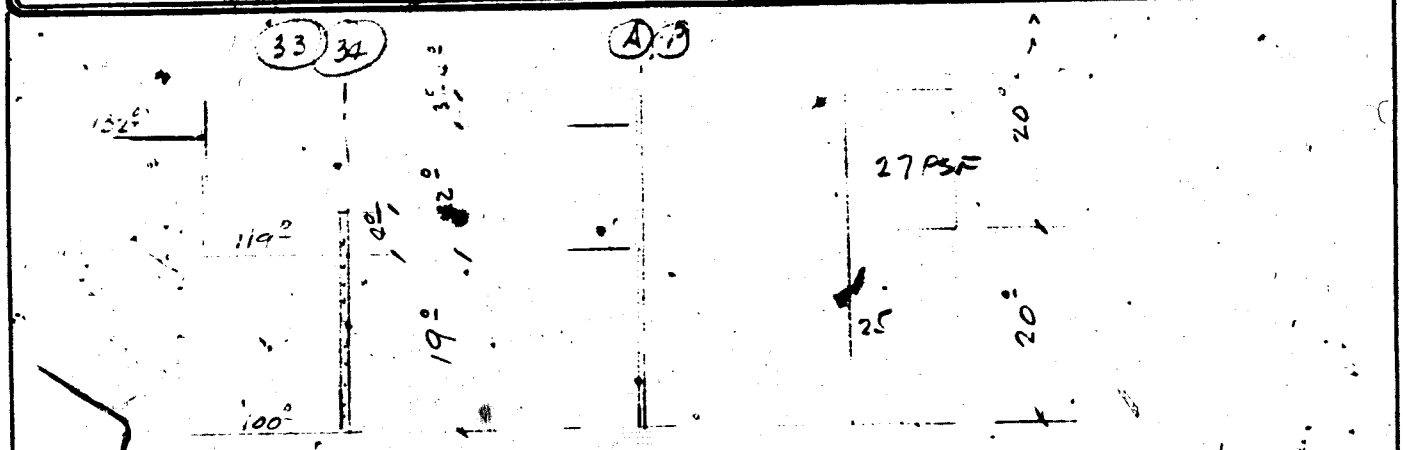
$W_{Panel} = (29.4 + 27.6).5$
$= 28.5\ PSF > 27$

Done Hand, 12/31/87

STRAUSS & LOFTFIELD
STRUCTURAL ENGINEERS

CLIENT/
PROJECT/ LINE (32) TO (34)
EXTERIOR WALLS

SHEET/ 90 OF 317
PROJECT # 2017
DATE/ 10-88
ENGINEER/ SM



L/360

LINE (M) SAME AS (L) TO (K)

1ST TO 2ND LINE 33 34 A & B	L	19.0	PSF	16	19.3'	USE CWS 16GA @ 16" O/C
2nd to Roof	L	12'	27 PSF	16	14.2	USE C6x18.9# @ 16" O/C

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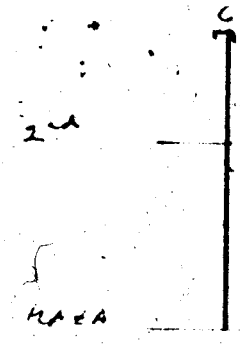
Done Hand 12/31/87

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CLIENT/
PROJECT/
HIGH PARAPETS.

SHEET/ 91 OF 317
PROJECT # 8207
DATE/ 10 OCT.
ENGINEER/

LINE U TOP 124.00



(SEE A14)

C16

Wind = 27 PSF × 1.33 = 36 #/LF

$M_{cant} = 36(10)^2 .5 = 1,800'^{\#} = 21600''^{\#}$

C6 = C16

$M_{1/2} = 29730''^{\#}$

$\Delta_{cant} = \frac{wa}{24EI}(4a^2\ell - \ell^3 - 3a\ell^2)$ 1/2 @ 8

$= \frac{.036(10)}{24(29)} 4(100)(14) - (14)^3 - 3(10)(14)^2$ 28

$= 5.23 : I$ TOO

C12" OC

$I = \frac{.027}{.036}(5.23) : I$

$= 3.92 : \Delta$

CW 6×14 @ 12" OC

$I = 4.15$

$\Delta = .95"$ TOO MUCH

EXTEND COL. U-7, U-9 = U-11

[illegible] CHANNEL

[illegible]

$\Delta = \frac{13.9(2[illegible])^3}{80.6(5a)} = \frac{\Delta_{allow}}{5a} = \frac{L}{360}$

$5a = 10.35$

[illegible]

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PROJECT/ HIGH [illegible]

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DATE/ 10-8-

ENGINEER/



Line (2)

W = 26 [illegible]

N1 = For 2.2 K = 115.2 K = [illegible]

Δ = .036(8) [4.64 + 1 - 3(8)²] / 24(29 ksi)

= 1.70 / I CG = 18 I = 200.6 4 =

= .171

CG = 6'

C6x16 @ 12"

Δ = 27 / 36(ST) = .83. TOO [illegible]

EXTEND COL U12, S12, N12 TO [illegible]

AND C8x11.5 [illegible]

EXTEND W14 FL. PLAN LINE [illegible]

(MIN COL T12 [illegible])

CR LINE = 26.5 - 1.4 = CB x 11.5 NL

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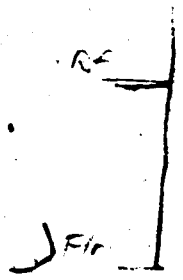
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PROJECT/ PROJECT # 8720.7
DATE/ 12-8-
EXTERIOR WALLS METAL STUD ENGINEER/

BLDG HEIGHT 0' - 40'

STUD SPAN	SIZE, GAGE, SPACING
12'-1"	CW6x16 @ 16"
19'-1"	CW6x14 @ 12"
21' + 6" Parapet	CW6x16 @ 12" (Le Mansion wall & Plaza Entry)
28'	CW10x14 @ 12" (Plaza Curved Wall)

NOTE: ALL DIAGONAL STUDS ARE FRAMING FROM FLOOR TO ROOF TO DIAGONAL



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PROJECT/ PROJECT # 82-017
DATE/ 10-7-82
ENGINEER/ FJL

BEAM B-3 @ B-2

PLAZA LEVEL FRMG B-2 - W27x94 { b_f = 9.990" ; t_f = 0.74" ; t_w = 0.490" ; k = 1 3/16" }

$R = (28.7^k + 14.4^k_L) = 43.1^k$

$R_u = (1.4 \cdot 28.7 + 1.7 \times 14.4) = 64.7^k$

$d \geq (43.1^k)/(0.75 \times 36^{ksi} \times 0.175") - 1\ 7/16" = 1.82"$

USE 4" PL

WITH R_u 1½" FROM INSIDE FACE OF WALL AND

WIDTH ℓ_b = 4" + 8" = 12" → $A_2 \geq (4"+8"+1½")(12") = 186 in^2$

$F_b = \phi(0.85 f'_c \sqrt{A_2/A_1}) \rightarrow \sqrt{A_2/A_1} \leq 2$

$= 0.70(0.85)(3)\sqrt{\frac{186}{(4 \times 12)}} = 2.64 ksi$

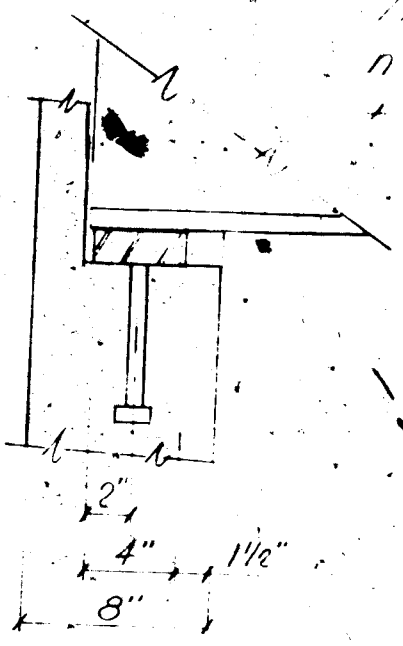
$\therefore A \geq 64.7^k / 2.64 ksi = 25 in^2$

TRY (1) PL 4" x 12" → $A = 48 in^2$, $f_{br} = \frac{4.5^k}{48 in^2} = 0.1 ksi$

$n = (12"/2) - 1\ 7/16" = 4.57"$

$t \geq \sqrt{\frac{3(0.90)(4.57)^2}{27}} = 1.45"$

USE BFG PL 1½" x 4" x 1'-0" w/ 2- 3/4 ϕ x 6" HEADED STUDS WELDED TO TOP FLG OF W27x94



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BEAM BRG ℞S

PLAZA LEVEL FRMG B-1 · W24×68 $\left\{ \begin{array}{l} b_f = 8.965", t_f = 0.585" \\ t_w = 0.415", k = 1\frac{3}{8}" \end{array} \right.$

$R = (12.5^K_D + 9.8^K_L) = 22.3^K$

$R_U = (1.4 \times 12.5 + 1.7 \times 9.8) = 34.2^K$

$N \geq \left[(22.3^K) / (0.75 \times 36 KSI \times 0.415) \right] - 1\frac{3}{8} = 0.62"$

USE 4" MIN

WITH ℞ 1½" ℄ FROM INSIDE FACE OF WALL AND
WITH $B \geq b_f + 2(1") = 11"$ $\longrightarrow A_2 \geq (4+2\times1\frac{1}{2})(11+2\times1\frac{1}{2}) = 98 in^2$

$F_p = 0.7(.85)(3KSI)\sqrt{\frac{98}{4\times11}} = 2.66KSI < 1.19 f'_c$ MAX

$\therefore A \geq 34.2^K / 2.66KSI = 13 in^2$

TRY MIN ℞ 4×11 $\rightarrow A = 44 in^2$ & $f_p = \frac{22.3^K}{44 in^2} = 0.51KSI$

$\ell_a = (11"/2) - 1\frac{3}{8}" = 4.13"$

$t \geq \sqrt{\frac{3(0.51)(4.13)^2}{27}} = 0.99"$

USE | BRG ℞ 1" × 4" × 0'-11"
w/ 2 - 3/4" Φ × 7" HEADED
WELD STUDS @ 8" GA
AT W24×68

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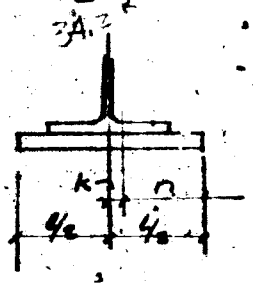
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PLAZA FLOOR DETAILS ENGINEER/

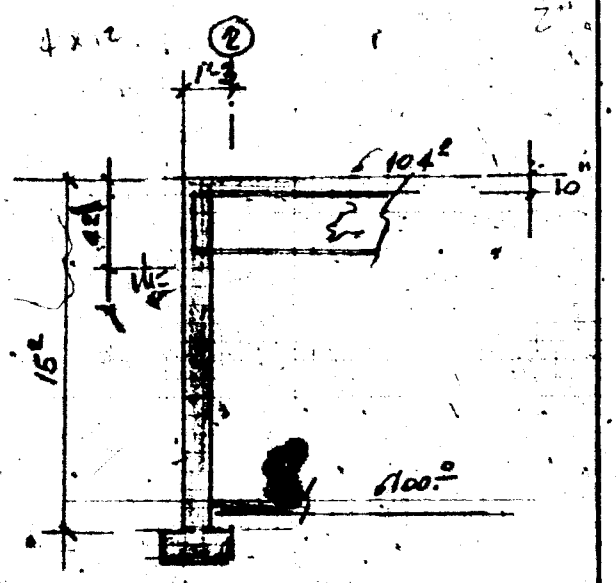
BEAMS TO CONCRETE WALL . SEE DETAIL FOR B2

BEAM	R	R_u	SIZE	8½"ling R	t_f	Brg PL	k	n	f_p	Plate t
B14	26.3	42.1	W 24×65	51.3	7.0	4×12	15/16	5.06	.55	1.25 1½
B15	53.6	85.8	W 33×118	75.2	11.5	5×14	1⅛	6.94	.77	1.74 2"
B16	61.6	98.6	W 36×135	84.0	12"	5×14	1⅛	5.92	.88	1.85 2"
B17	54.2	86.7	W 33×118	75.2	11.5	5×14	1 1/16	5.94	.77	1.74 2"
B18	54.2	86.7	W 33×[illegible]	75.2	11.5	5×14	1⅛	6.94	.77	1.74 2"
B19	66.1	105.8	W 3[illegible]18	75.2	11.5	5×14	1 1/16	5.94	.94	1.92 2"
B20	71.8	114.9	W 33×130	81.2	11.5	~~5×16~~ 4×16	1 1/16	6.94 6.95	.70 .75	2.5 2.0 2"
B21	33.6									

$n = \frac{b}{2} - k$ $\quad t = \sqrt{\frac{3(f_p)n^2}{27}} = \sqrt{\frac{(f_p)n^2}{9}}$

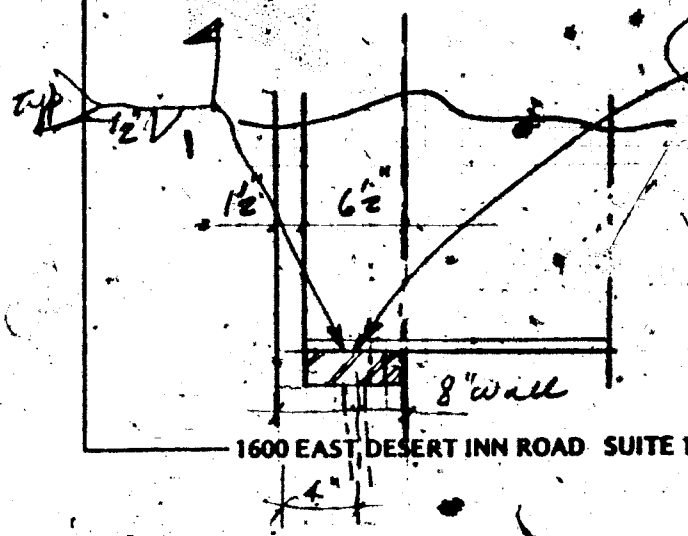
B24





℄ LINE (2)

PL 6×16×2"
w/ 2-¾"ϕ×6" HEADED WELD STUDS @ 9" oc.



℄ LINE (12) Q'sheet.

TR 4×12×1½
w/ 2-¾"ϕ×6" HEADED WELD STUDS @ 9" oc

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SLAB ON GRADE

REF I PCA - "DESIGN OF CONC. FLOORS ON GROUND"

REF II PCA - "CONCRETE FLOORS ON-GROUND" by R.E. SPEARS

LOAD CRITERIA

25^K AXIAL LOAD
SINGLE PNEUMATIC TIRE WHEELS
TIRE INFLATION PRESSURE ~ 110 PSI MAX ASSUMED
TIRE CONTACT AREA $(25^K/2)(10^3)/110\ PSI = 113\ in^2$ MIN

from REF I

FLOOR CLASSIFICATION BY USE = CLASS 4

$\therefore f'_c = 4000$ PSI MIN
3" MAX SLUMP

$f_t = 4.6\sqrt{4000} = 291$

LOAD CORRECTION FOR FIG. 1 $= \left(\frac{300}{291}\right)(25^K/2) = 12.9^K$

FIG. 1 EXTRAPOLATED → 7.2" THK REQ.

from REF II

WHEEL SPAC'G ≈ 60" ASSUMED
SUBGRADE MODULUS ≈ 80 in^2/in ASSUMED
CONC. MODULUS OF RUPTURE = M.R. $= 7.5\sqrt{4000} = 474$ psi
SAFETY FACTOR = S.F. = 1.5
CONC. WORK'G STRESS = W.S. = M.R/S.F. = 316 psi
SLAB STRESS PER KIP OF AXLE LOAD $= \frac{316\ PSI}{25^K} = 12.6$ psi

FIG. 4 → 7.5" THK REQ. ← USE

REINFORCEMENT REF II

for JOINTS SPACED < 20' O.C.

$A_S = \frac{F L w}{2 f_s} = \frac{(2.0)(20.0')(94\#/ft)}{2(20000\ PSI)} = .094\ in^2/FT$ → #3@14" o.c.

for JOINTS SPACED < 45' O.C. $A_S = (45/20)(.094) = 0.21\ in^2/FT$

DISTRIBUTED STL AT 0.5% → $A_S = (0.5\%)(7.5 \times 12) = 0.45\ in^2/FT$ ← USE

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STRUCTURAL SLABS ON COMPOSITE MTL DECK.

1 1/2" B-DECK 20 GA
W/ 3 1/2" REG CONC COVER
(5" TOTAL THICKNESS)

7'-0" MAX SPAN
2-SPAN (MIN) CONT.
UNSHORED.

250#/ft ALLOWABLE SUPERIMPOSED LOAD.
301#/ft TOTAL D+L

NEGATIVE REINF for SUPERIMPOSED-LOAD MOMENT

AT 100#/ft LL

$w_u = 1.4(.010) + 1.7(.100) = 0.184^{K/ft}$

$M_u = (0.184)(7.0)^2/10 = 0.902^{KFT/FT\ WIDTH}$

$d \approx 3\frac{1}{2} - \frac{3}{4} - \frac{3/8}{2} = 2.56"$

$F = 12(2.56)^2/12000 = .00655$

$K_u = 0.902/.00655 = 138 \rightarrow \rho \geq .00264$

$A_s \geq \rho(12 \times 2.56) = 0.081\ in^2/FT$

USE 6x6 - W4 x W4 (6x6 - 4/4) $A_s = .080\ in^2/FT$

AT 50#/ft LL

$w_u = 1.4(.010) + 1.7(.500) = 0.099^{K/ft}$

$M_u = (0.099)(7.0)^2/10 = 0.485^{KFT/FT}$

$K_u = 0.485/.00655 = 74 \rightarrow \rho \geq .00139$

$A_s \geq \rho(12 \times 2.56) = 0.043\ in^2/FT$

USE 6x6 - W2.1 x W2.1 (6x6 - 8/8) $A_s = .041\ in^2/FT$

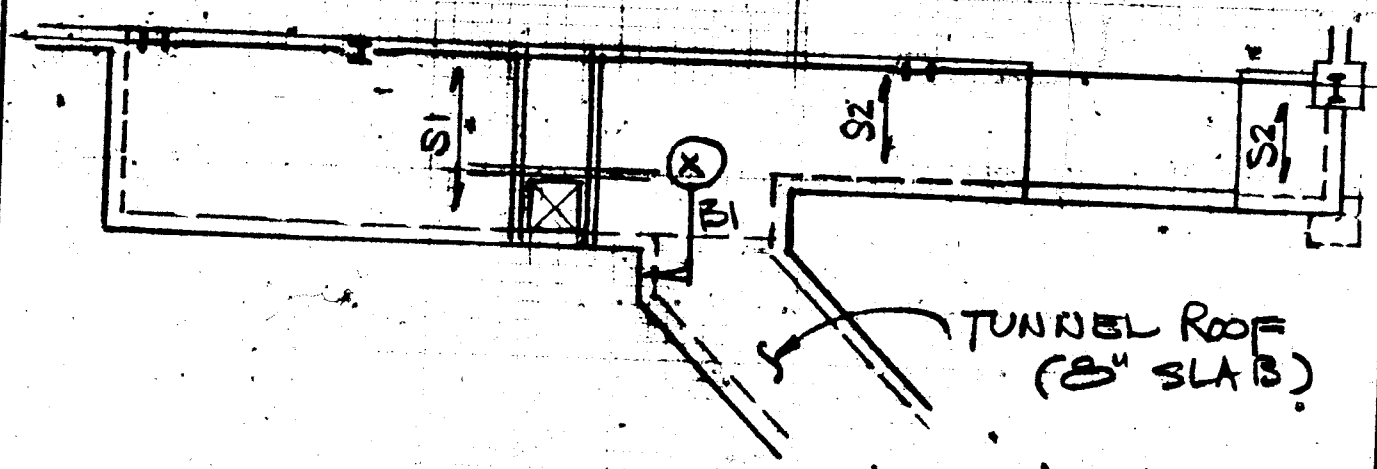
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CONC. SLAB OVER SALLE PORTE



SLAB S1

5" SLAB SPAN = 8'± LL = 100 PSF

$W_u = 1.4 \times 63 + 1.7 \times 100 = 258$ PSF

$M_u = \frac{.258(8)^2}{8} = 2.06$ IK/FT.

$d = 5 - \frac{3}{4} - \frac{3}{8} = 3.88"$ $F = \frac{(3.88)^2}{1000} = .0150$

$K_u = \frac{2.06}{.015} = 137$ $A_s = .0027 \times 12 \times 3.88 = 0.13$

USE #4 @ 12 BOT. MAIN STEEL

#4 @ 16 TEMP. STEEL

SLAB S2

USE SAME AS FOR S1

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BEAM B-1

SPAN = 5'-6" ± $W_u = \frac{8'}{2} \times .258^{K}/_{LF} = 1.03^{K}/_{LF}$

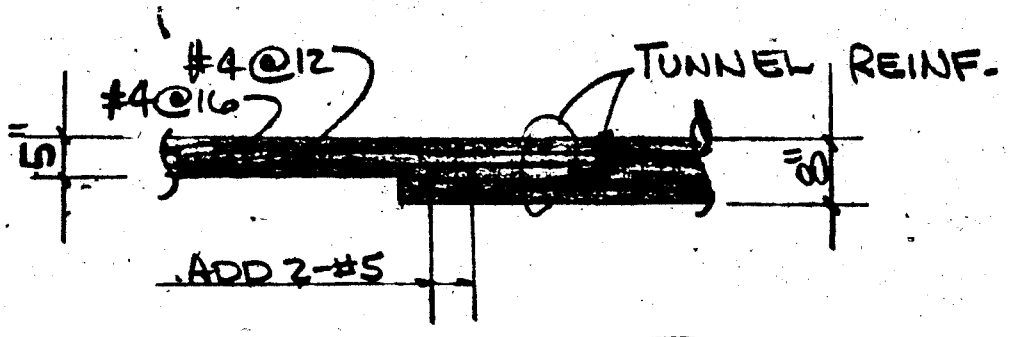
USE A BM. 12" x 8"

$M_u = \frac{1.03(5.5)^2}{8} = 3.89^{IK}$ $d = 5 - 3/4 - 3/8 = 3.88"$

$F = \frac{(3.88)^2}{1000} = .0150$ $K_u = \frac{3.89}{.0150} = 260'$

$A_s = .0052 \times 12 \times 3.88 = 0.24$

ADD 2-#5 BOT. IN LAST 12" OF 8" TUNNEL SLAB



SECTION (X)
1/2" = 1'-0"

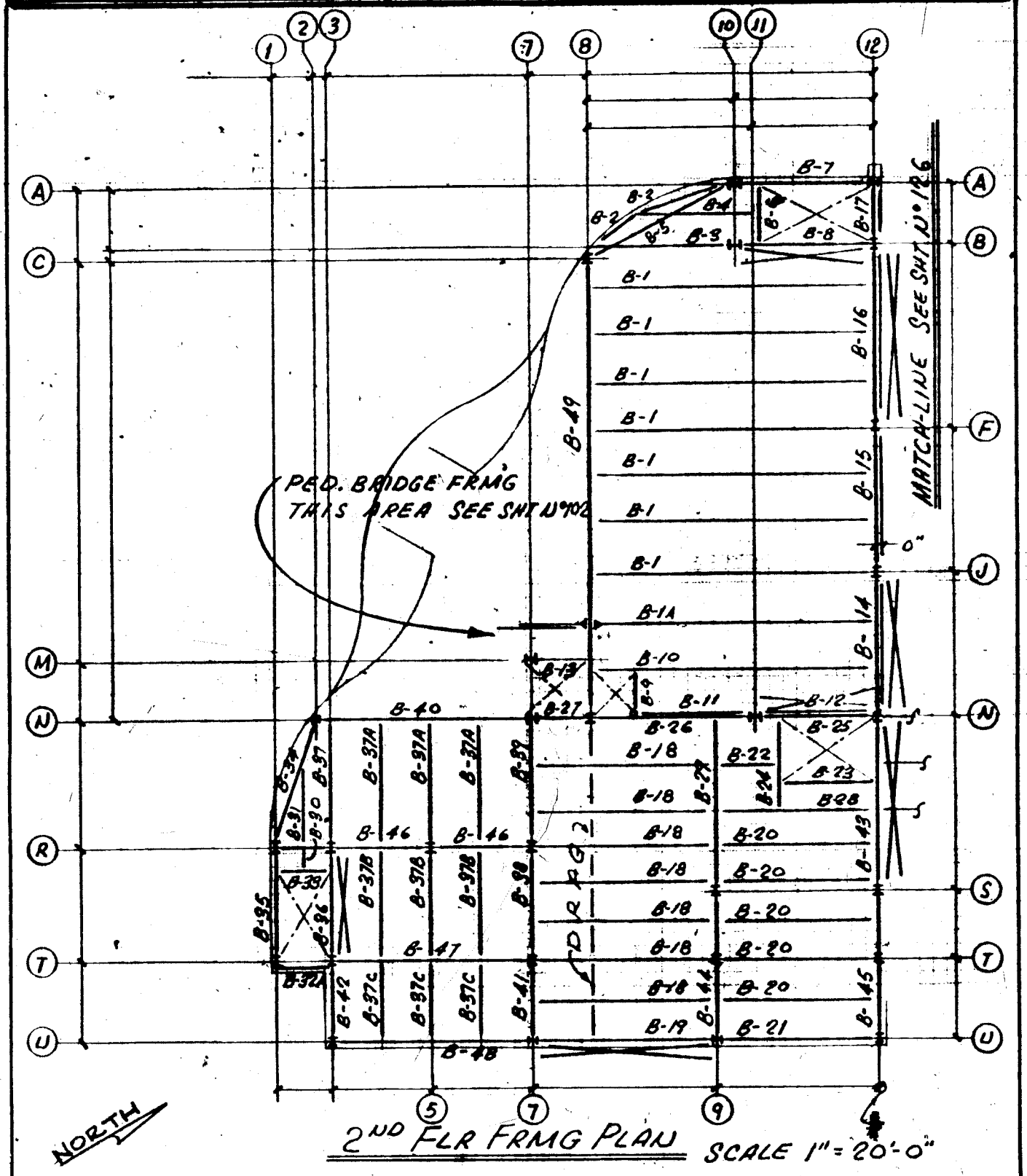
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2ND LEVEL SOUTH HALF



2ND FLR FRMG PLAN SCALE 1" = 20'-0"

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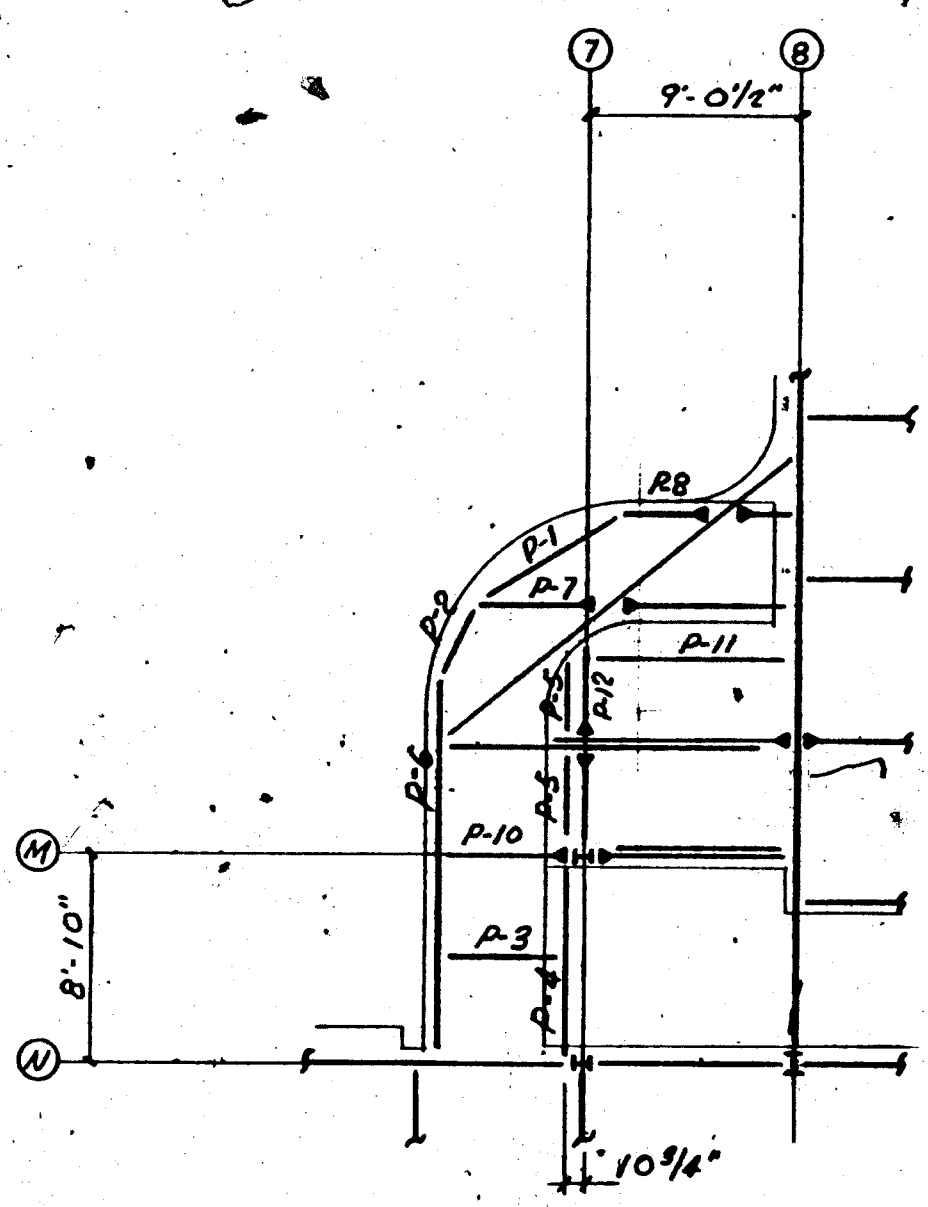
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2ND LEVEL SOUTH HALF

ENGINEER/ HS



2ND LEVEL FRMG PLAN DETAIL AT RED. BRIDGE

SCALE 1/8"=1'-0"

NORTH

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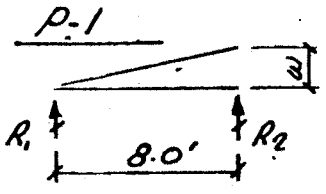
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DATE/ OCT '82
2ND LEVEL SOUTH HALF ENGINEER/ HS

PEDESTRIAN BRIDGE FRM'G - 2ND LEVEL, P-1 THRU P-10

P-1



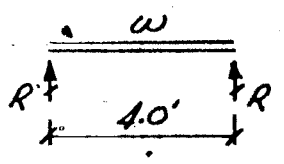
$w = \left(\frac{5.0^2}{2\times4}\right)(0.066^{K/\square'}_{D} + 0.100^{K/\square'}_{L}) = (.21^{K/'}_{D} + .32^{K/'}_{L}) = .53^{K/'}$

$R_1 = (0.28^{K}_{D} + 0.43^{K}_{L}) = 0.71^{K}$

$R_2 = (0.56^{K}_{D} + 0.85^{K}_{L}) = 1.41^{K}$

$M = 2.2^{KFT} < M_{MIN} = 2(8)/4 + 0.24(8.0)^2/8 = 5.7^{KFT}$

P-2

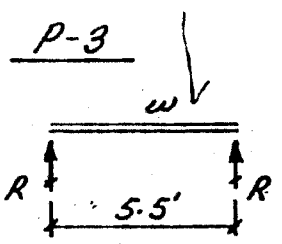


$w = \left(\frac{4.5^2}{2\times3}\right)(.066+.100) = (0.22^{K/'}_{D} + 0.34^{K/'}_{L}) = 0.56^{K/'}$

$R = (0.44^{K}_{D} + 0.68^{K}_{L}) = 1.12^{K}$

$M = 1.2^{KFT} < M_{MIN} = 2.5^{KFT}$

P-3

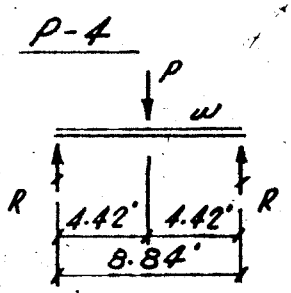


$w = \left(\frac{8.84}{2}\right)(.066+.100) = (0.29^{K/'}_{D} + 0.45^{K/'}_{L}) = 0.74^{K/'}$

$R = (0.80^{K}_{D} + 1.24^{K}_{L}) = 2.04^{K}$

$M = 2.8^{KFT} < M_{MIN} = 3.9^{KFT}$

P-4



$w = 15'(.008^{K/\square'}) = 0.12^{K/'}_{D}$

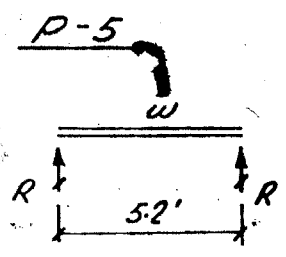
$P = (0.80^{K}_{D} + 1.24^{K}_{L}) = 2.04^{K}$

$R = (0.93^{K}_{D} + 0.62^{K}_{L}) = 1.55^{K}$

$M = 5.7^{KFT} < M_{MIN} = 7.4^{KFT}$

USE ~~C10x20~~ C12x20.7 for P-1 THRU P-5

P-5



BM // TO DECK SPAN.

$w = .05^{K/'}_{D}$

$R = 0.13^{K}_{D}$

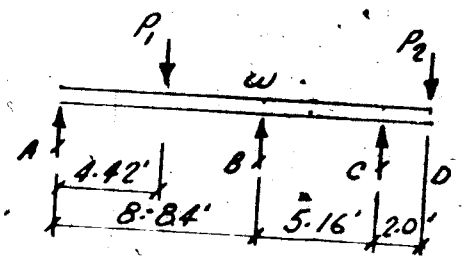
$M = 0.2^{KFT} < M_{MIN} = 2.8^{KFT}$

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P-6



$w = 0.05^{K}/_{L}$
$P_1 = (0.80^{K}_{D} + 1.24^{K}_{L}) = 2.04^{K}$
$P_2 = (0.44^{K}_{D} + 0.68^{K}_{L}) = 1.12^{K}$

CASE I D. ONLY

	BA	BC	CB	CD
	0.37	0.63	–	–
M_F	-1.82	-0.32	+0.98	+0.98
D	+0.79	+1.35		
	+1.03	+1.03		

$R_A = 0.505^{K}$
$R_B = 0.876^{K}$
$R_C = 0.659^{K}$
$+M = 1.8^{KFT}$

CASE II D. + (LL AT P_1 ONLY)

	BA	BC	CB	CD
	0.37	0.63	–	–
M_F	-3.87	-0.32	-0.98	+0.98
D	+1.55	+2.64		
	-2.32	+2.32		

$R_A = 0.979^{K}$
$R_B = 1.892^{K}$
$R_C = 0.409^{K}$
$+M = 3.9^{KFT}$

CASE III D + (LL AT P_2 ONLY)

	BA	BC	CB	CD
	0.37	0.63	–	–
M_F	-1.87	-1.00	-2.34	+2.34
D	+1.06	+1.81		
	-0.81	+0.81		

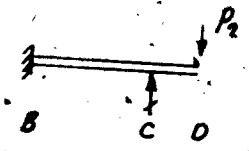
$R_A = 0.529^{K}$
$R_B = 0.545^{K}$
$R_C = 1.646^{K}$
$+M = 1.9^{KFT}$

CASE IV (D+L)

	BA	BC	CB	CD
	0.37	0.63	–	–
M_F	-3.87	-1.00	-2.34	+2.34
D	+1.80	+3.07		
	-2.07	+2.07		

$R_A = 1.007^{K}$
$R_B = 1.552^{K}$
$R_C = 1.401^{K}$
$+M = 4.0^{KFT}$

MODIFIED FIXED END MOMENTS:



D. ONLY

	BC	CB	CD
	–	1.0	0
M_F	+0.11	-0.11	+0.98
D	–	-0.87	0
CO	-0.43	0	0
D	0	0	0
	-0.32	-0.98	+0.98

D+L

	BC	CB	CD
	–	1.0	0
M_F	+0.11	-0.11	+2.34
D	–	-2.23	0
CO	-1.11	0	0
D	–	0	0
	-1.00	-2.34	+2.34

SUMMARY

$+M_{MAX} = 4.0^{KFT} > M_{MIN}$
$-M_{MAX} = 2.4^{KFT} < M_{MIN} = 4.1^{KFT}$
$R_A = 1.01^{K}$ MAX
$R_B = 1.89^{K}$ MAX
$R_C = 1.65^{K}$ MAX

USE ~~C10x20~~ C12x20.7

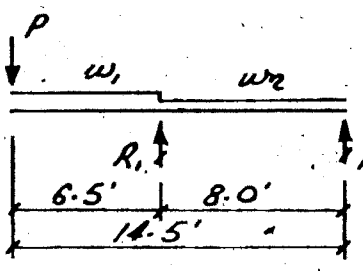
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P-7



$w_1 = 4.5'(.066^K/_\square + .100^K/_\square) = (0.30^K/_D + 0.45^K/_L) = .75^K/_L$

$w_2 = 3.0'(\ d_\square + d_\square\ ) = (0.20^K/_D + 0.30^K/_L) = .50^K/_L$

$P = (0.28+0.44)_D + (0.43+0.68)_L$

$P = (0.72^K_D + 1.11^K_L) = 1.83^K$

$R_1 = (4.85^K_D + 7.33^K_L) = 12.18^K$

$R_2 = (-0.58^K_D - 0.89^K_L) = -1.47^K$ UPLIFT

$-M = 27.8^{KFT}$

w/Δ LL ON OVERHANG:

$R_1 = (4.85^K_D + 1.20^K_L) = 6.05^K$

$R_2 = (-0.58^K_D + 1.20^K_L) = 0.62^K$

$+M = 0.4^{KFT}$

AT OVRHNG: $\Delta_L = \frac{1728}{(29\times10^3)(I)}\left[\frac{(0.45)(6.5)^3(32.0+19.5)}{24} + \frac{(1.11)(6.5)^2(14.5)}{3}\right]$

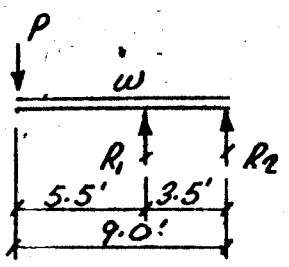
$\Delta_L = \frac{29.31}{I} \le 1/8"$ $\quad I \ge 8(29.31) = 235\ IN^4$

USE ~~W10x49~~ W14x43

~~W10x49~~ $I = 272\ IN^4$
$M_R = 109$

STL DEPTH LIMITED TO ~~10" MAX~~ CHANGED TO 14" MAX

P-8



$w = 3.0(.066 + .100) = (0.20^K/_D + 0.30^K/_L) = 0.50^K/_L$

$P = (0.56^K_D + 0.85^K_L) = 1.41^K$

$R_1 = (3.75^K_D + 5.66^K_L) = 9.41^K$

$R_2 = (-1.39^K_D - 2.11^K_L) = -3.50^K$ UPLIFT

$-M = 15.4^{KFT}$

w/o LL ON OVRHNG:

$R_1 = (3.75^K_D + 0.53^K_L) = 4.28^K$

$R_2 = (-1.39^K_D + 0.53^K_L) = -0.86^K$ UPLIFT

AT OVRHNG: $\Delta_L = \frac{1728}{(29\times10^3)(I)}\left[\frac{(0.30)(5.5)^3(14.0+16.5)}{24} + \frac{(0.85)(5.5)^2(9.0)}{3}\right] = \frac{8.38}{I}$

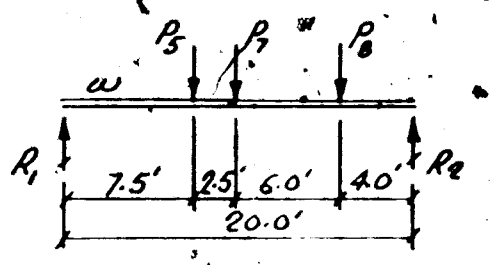
USE SAME AS P-7

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P-9



$\omega = 3.0(.066^K/_{\text{ft}} + .100^K/_{\text{ft}}) = (.20^K/_{D} + .30^K/_{L}) = 0.50^K/_{\text{ft}}$

$P_5 = (0.13^K_D + 0^K_L) = 0.13^K$

$P_7 = (4.85^K_D + 7.33^K_L) = 12.18^K$

$P_8 = (3.75^K_D + 5.66^K_L) = 9.41^K$

$R_1 = (5.26^K_D + 7.80^K_L) = 13.06^K$

$R_2 = (7.47^K_D + 11.19^K_L) = 18.66^K$

$M_{10.0} = 105.3^{K\text{FT}}$

$$\text{AT } \ell \quad \Delta_L = \frac{1728}{(29\times10^3)(I)}\left[\frac{(7.33^K)(20)^3}{48} + \frac{(5.66^K)(4\times10)(20^2-4^2-10^2)}{6(20)}\right] = \frac{104.7}{I}$$

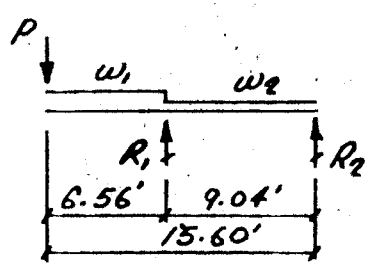
LIMITING Δ_L TO 1/4" MAX FOR VIBRATION $I > \frac{104.7}{1/4} = 419\ in^4$

W10x68 $M_R = 151^{K\text{FT}}$
$I = 394\ in^4$
$\Delta = 0.266" \simeq 1/4"$ OK

USE ~~W10x68~~ W14x48

RAISE T.O.S ~~3/16"~~ 1/16"
TO EL 103'-7 ~~3/16"~~ 1/16"
BM P-9 ONLY

P-10



$\omega_1 = (9.6/2)(.066 + .100) = (.32^K/_{D} + .48^K/_{L}) = 0.80^K/_{\text{ft}}$

$\omega_2 = 0.05^K/_{D}$

$P = (0.88^K_D + 1.01^K_L) = 1.89^K$

$R_1 = (4.61^K_D + 6.03^K_L) = 10.64^K$

$R_2 = (-1.17^K_D - 1.88^K_L) = -3.05^K$ UPLIFT

$-M = 29.6^{K\text{FT}}$

w/ LL ON OVRHNG:

$R_1 = (4.61^K_D + 0) = 4.61^K$

$R_2 = (-1.17^K_D + 0) = -1.17^K$ UPLIFT

AT OVRHNG $\Delta_L = \frac{1728}{(29\times10^3)(I)}\left[\frac{(.48)(6.56)^3(36.16+19.68)}{24} + \frac{(1.89)(6.56)^2(15.60)}{3}\right]$

$\Delta_L = \frac{42.99}{I}$

w/ W10x49 $\Delta_L = 42.99/272 = 0.162 \simeq 4/486$

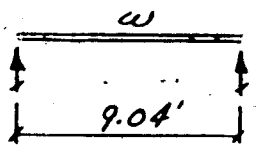
USE ~~W10x49~~ W14x34

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P-11



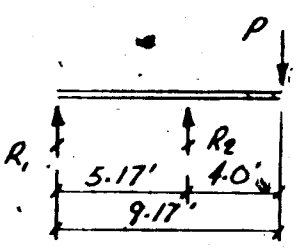
$w = \left(\frac{5.5^2}{2 \times 4.0}\right)(.066^K/_{ft} + .100^K/_{ft}) = (0.25^K/_{ft_D} + 0.38^K/_{ft_L}) = 0.63^K/_{ft}$

$R = (1.13^K_D + 1.72^K_L) = 2.85^K$

$M = 6.5^{KFT}$

USE | SAME AS P-12

P-12



NOTE: REINF STR. SLAB FOR OVRHNG ⊥ TO DECK SPAN ∴ 2' TRIB

$w = 2.0(.066 + .100) = (0.14^K/_{ft_D} + 0.20^K/_{ft_L}) = 0.34^K/_{ft}$

$P = (1.13^K_D + 1.72^K_L) = 2.85^K$

$R_1 = (-0.73^K_D - 1.12^K_L) = -1.85^K$ UPLIFT

$R_2 = (3.14^K_D + 4.68^K_L) = 7.82^K$

$-M = 14.2^{KFT}$

w/o LL ON OVRHNG:

$R_1 = (-0.73^K + 0.52^K_L) = -0.21^K$ UPLIFT

$R_2 = (3.14^K + 0.52^K_L) = 3.66^K$

AT OVRHNG $\Delta_L = \frac{1728}{(29 \times 10^3)(I)}\left[\frac{(.20)(4.0)^3(20.68+12.0)}{24} + \frac{(1.72)(4.0)^2(9.17)}{3}\right]$

$\Delta_L = \frac{6.05}{I} \leq 1/8" \longrightarrow I > 48.4 \text{ in}^4$

$I = 88.6 \text{ in}^4$

$M_R = 27^{KFT}$

USE | W 14 x 22

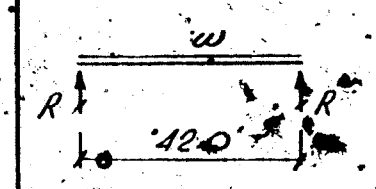
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2ND LEVEL SOUTH HALF ENGINEER/ HS

2ND LEVEL FRMG B-1 THRU B-49

B-1



TRIB 7.0 x 42.0 = 294# > 150#
R_{MAX} = 23.1(1 + 86/50) = 40% MAX
R = (.08%)(294-150) = 11.5% → LL = 0.885 x 50 = 45#/#

w = 7.0 (.086#/#$_D$ + .045#/#$_{LL}$) = (0.60#$_D$ + 0.32#$_{LL}$) = 0.92#
R = (12.60#$_D$ + 6.72#$_{LL}$) = 19.32#
M = 203#-FT

$$\Delta = \frac{5(0.32)(42)^4(1728)}{384(29\times10^3)(I)} = \frac{772.6}{I} \le \frac{42\times12}{360} = 1.4"$$

$I \ge 772.6/1.4 = 552$ IN^4

W24 x 55 M_R = 228#-FT
I = 1350 IN^4 Δ_L = 772.6/1350 = 0.572" ≈ L/881

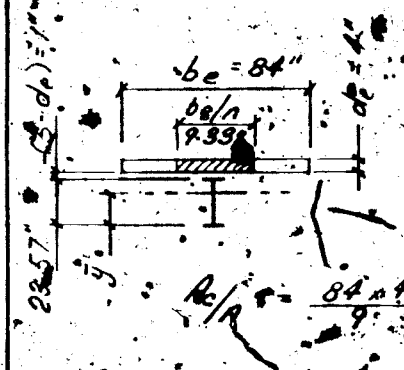
Δ_D = (0.60/0.82)(0.572) = 1.073"

TRY W24 x 55 → Δ_D = L/21.4 > L/20 ∴ OK

CHECK FLOOR "BOUNCE"

REF: "DESIGN TO PREVENT FLOOR VIBRATIONS" by T.M. MURRAY
AISC ENGINEERING JOURNAL VOL 12, NO 3 1975

g = 32.2 FT/SEC^2 = 386 IN/SEC^2
L = 42.0' x 12 = 504"
b_e = 7.0' x 12 = 84" b_e/n = 9.33"
d_2 = (50#/#/150#/FT^3)(12") = 4"



W = [(50+8)(7') + 55#](42') = 19362#

$A_c/R = \frac{84\times4}{9} = 37.33$ IN^2 $\bar{y} = \frac{37.33(26.57)+16.2(23.57/2)}{37.33+16.2} = 22.10"$

SECTION	AREA	$\bar{d}$	$A(\bar{d})^2$	I_o
CONC 9.33x4	37.33	4.476	745.9	9.33(4)^3/12 = 49.8
W24x55	16.20	10.976	1723.7	1350.0
			2469.6	1399.8

I_t = 3869 IN^4

$$f = 1.57\left[\frac{g\,E\,I_t}{W L^3}\right]^{1/2} = 1.57\left[\frac{(386)(29\times10^3)(3869)}{(19.36)(504)^3}\right]^{1/2} = 6.56$$

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B-1 continued

DYNAMIC LOAD FACTOR (DLF)

with $t_d/T = 0.05f = 0.05(6.56) = 0.328$

from GRAPH → DLF = 0.96

$$A_{oc} = (DLF)\frac{600L^3}{48EI_t} = 0.96\ \frac{600 \times 504^3}{48 \times 29 \times 10^6 \times 3869} = 0.01369$$

with: $S/d_e = 84/4 = 21$

& $L^4/I_t = 504^4/3869 = 16.68 \times 10^6$

from GRAPH → $N_{eff} = 2.9$

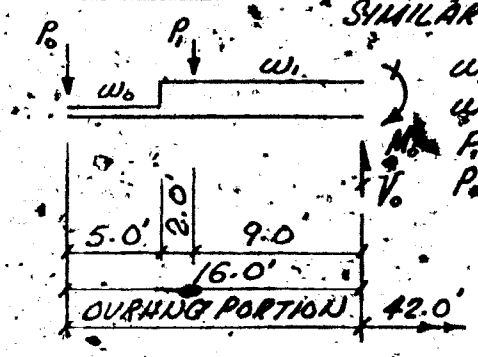
$\therefore A_o = A_{oc}/N_{eff} = 0.01369/2.9 = .00472$

from GRAPH → POINT PLOTS IN THE LOWER HALF OF "SLIGHTLY PERCEPTIBLE" RANGE
∴ BEAM IS CONSIDERED SATISFACTORY BUT FOR REDUCED VIBRATION PERCEPTIBILITY INCREASE BM TO NEXT LARGER W24

USE W24 x 62

B-1A

SIMILAR TO B-1 BUT WITH 16.0' OVRHNG.



$w_1 = 5.17(.066 + .100) = (0.34^{K/'}_D + 0.52^{K/'}_L) = 0.86^{K/'}$

$w_o = 4.0'_{AVG}(d_o + d_o) = (0.27^{K}P_D + 0.40^{K/'}_L) = 0.67^{K/'}$

$P_1 = (3.14^K_D + 4.68^K_L) = 7.82^K$ REF. P-12

$P_{oo} = (0.66 + 5.26)_D + (0.99 + 7.80)_L = (5.92^K_D + 8.79^K_L) = 14.7^K$
REF. P-6 & P-9

$V_o = (14.15^K_D + 21.19^K_L) = 35.34^K$

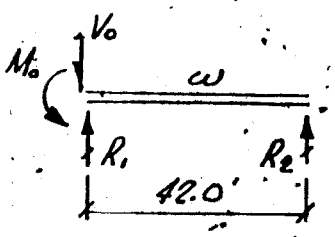
$M_o = (162^{K'}_D + 241^{K'}_L) = 403^{K'}$

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B-1A continued



W/ "ω" LOAD'G
$R_1 = (18.01^K_D + 26.93^K_L) = 44.94^K$
$R_2 = (-3.86^K_D - 5.74^K_L) = -9.60^K$ UPLIFT

$V_o = (14.15_D + 21.19_L) = 35.34^K$

$M_o = (162^{KFT}_D + 241^{KFT}_L) = 403^{KFT}$

$\omega = (0.60^{K/'}_D + 0.32^{K/'}_L) = 0.92^{K/'}$ REF B-1

COMBINED LOAD'G

$R_1 = [(12.60 + 18.01)_D + (6.72 + 26.93)_L] = (30.61^K_D + 33.65^K_L)$
$R_1 = 64.26^K$
$R_2 = [(12.60 - 3.86)_D + (6.72 - 5.74)_L] = (8.74^K_D + 0.98^K_L)$
$R_2 = 9.72^K$
$+M_{10.565} = 51.4^{KFT}$, $-M_o = 403^{KFT}$

* USE BUILT-UP SECTION AT OVRHG

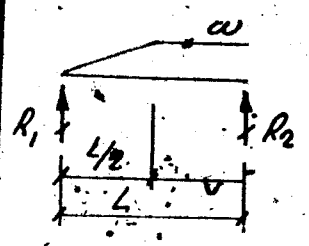
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B-2



$\omega = 2.5(.086^K/_{\square_0} + .050^K/_{\square_L}) = (0.22^K/_{\square_0} + 0.13^K/_{\square_L}) = 0.35^K/_{\square}$

FOR $L = 14.0'$:

$R_1 = (0.90^K_D + 0.53^K_L) = 1.43^K$

$R_2 = (1.41^K_D + 0.83^K_L) = 2.24^K$

$M_{6.4} = 7.2^{KFT} < M_{MIN} = 11.5^{KFT}$

FOR $L = 7.0'$:

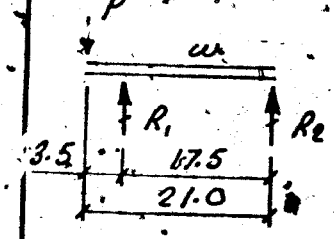
$R_1 = (0.45^K_D + 0.27^K_L) = 0.72^K$

$R_2 = (0.71^K_D + 0.42^K_L) = 1.13^K$

$M_{3.23} = 1.9^{KFT} < M_{MIN} = 4.7^{KFT}$

USE | C12 x 20.7

B-3



$\omega = \left(\frac{10.6}{2}\right)(.086 + .050) = (0.46_D + 0.27_L) = 0.73^K/_{\square}$

$P = (0.45^K_D + 0.27^K_{\omega}) = 0.72^K$

$R_1 = (6.34^K_D + 3.73^K_L) = 10.07^K$

$R_2 = (3.77^K_D + 2.21^K_L) = 5.98^K$

$-M = 7.0^{KFT}$

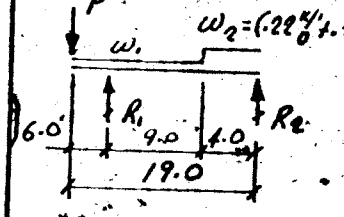
USE | SAME AS B-4

4% LL ON OVRHNG: $R_1 = (6.34^K_D + 2.36^K_L) = 8.70^K$

$R_2 = (3.77^K_D + 2.86^K_L) = 6.13^K$

$+M_{8.40} = 25.8^{KFT}$

B-4



$\omega = 4.4(.086 + .050) = (0.38^K/_{\square_D} + 0.22^K/_{\square_L}) = 0.60^K/_{\square}$

$R = \sqrt{[(0.71 + 0.90)_D + (0.42 + 0.53)_L]^2} = (1.61^K_D + 0.95^K_L) = 2.56^K$

$R_1 = (7.53^K_D + 4.58^K_L) = 12.11^K$

$R_2 = (0.66^K_D + 1.43^K_L) = 2.09^K$

$-M = 26.2^{KFT}$

USE | W12 x 26

4% LL ON OVRHNG: $R_1 = (7.53^K_D + 1.56^K_L) = 9.09^K$

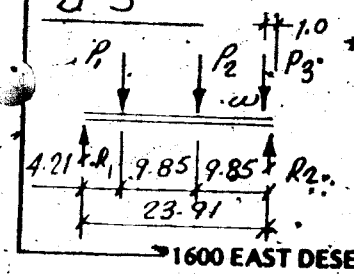
$R_2 = (0.66^K_D + 2.17^K_L) = 2.83^K$

$+M_{4317} = 6.1^{KFT}$

AT OVRHNG $\Delta_L = \frac{1728}{(29 \times 10^3)(I)}\left[\frac{.95(6)^2(22)}{3} + \frac{.22(6)^3(106)}{24}\right] = 26.7/I \le 0.2''$

$I \ge 133.5 in^4$

B-5



$\omega = 0.05^K/_{\square}$

$P_1 = (6.34^K_D + 3.73^K_L) = 10.07^K$

$P_2 = (7.53^K_D + 4.58^K_L) = 12.11^K$

$P_3 = (1.41^K_D + 0.83^K_L) = 2.24^K$

$R_1 = (8.98^K_D + 5.00^K_L) = 13.98^K$

$R_2 = (7.50^K_D + 4.14^K_L) = 11.64^K$

$M_{9.85} = 95.4^{KFT}$

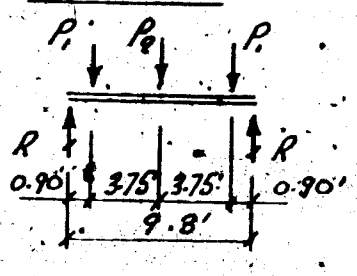
USE | W18 x 40

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B-6



$w = 0.10^{K}/_{ft}{}_{D}$

$P_1 = (0.83^{K}_{D} + 1.67^{K}_{L}) = 2.50^{K}$

$P_2 = (2\times0.83 + 0.66)_D + (2\times1.67 + 2.17)_L = (2.32^{K}_{D} + 5.51^{K}_{L}) = 7.83^{K}$

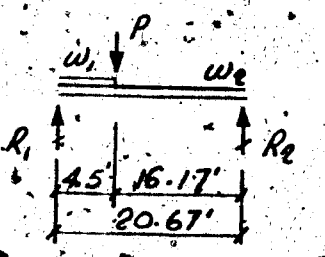
$R = (2.46^{K}_{D} + 4.43^{K}_{L}) = 6.89^{K}$

$M = 21.6^{KFT}$

USE | W12x16

STAIR-WELL

B-7



$w_1 = (4.4/2)(.050^{K}/_{ft} + .100^{K}/_{ft}) = (0.11^{K}_{D} + 0.22^{K}_{L}) = 0.33^{K}/_{ft}$

$w_2 = 16_{MAX}(.021^{K}/_{ft})_D + 0.04^{K}/_{ft}{}_{D} = 0.38^{K}/_{ft}{}_{D}$

$P = (2.46^{K}_{D} + 4.43^{K}_{L}) = 6.89^{K}$

$R_1 = (6.29^{K}_{D} + 4.35^{K}_{L}) = 10.64^{K}$

$R_2 = (1.52^{K}_{D} + 1.07^{K}_{L}) = 5.59^{K}$

$M_{@7.71} = 41.2^{KFT}$ @ $\ell_u = 16.17'$

$\Delta \simeq (1034.18\times10^{-6})(20.67)^2 (f_b/d) \leq \frac{.248}{360} = 0.688''$

$\therefore (f_b/d) \leq 1.556$

WIND GIRT:

$p = C_e C_g g_s I$

$= (1.30)(1.2)(15)(1.15) = 27^{\#}/_{ft}$

$M_w = (.027^{K}/_{ft}\times14')(16.17')^2/8 = 12.4^{KFT}$

$\Delta_w = \frac{5(.378^{K}/_{in})(76.17)^4(1728)}{384(29\times10^3)\,I} = \frac{20.05}{I} < 0.538''$

$\rightarrow I_y \geq \frac{20.05}{0.589} = 37.2^{in^4}$

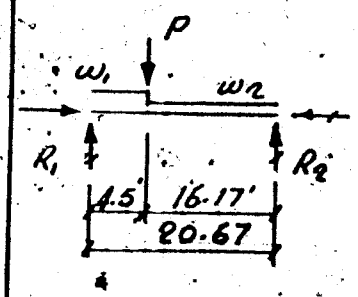
for W12x40 $(f_b/d) = \frac{9.6^{KSI}}{11.94} = 0.80 < 1.556$ ✓

@ $\ell_u = 16.17'$ $M_R = 104^{KFT} > 41.2^{KFT}$ ✓

$I_y = 44.1^{in^4} > 37.2^{in^4}$ ✓

USE | W12x40

B-8



$(4.4/2)(.050 + .100) = 0.11^{K}/_{ft}{}_{D} + 0.22^{K}/_{ft}{}_{L}$

$(6.2/2)(.086 + .050) = 0.27^{K}/_{ft}{}_{D} + 0.16^{K}/_{ft}{}_{L}$

$w_1 = (0.38^{K}/_{ft}{}_{D} + 0.38^{K}/_{ft}{}_{L}) = 0.76^{K}/_{ft}$

$w_2 = \left(\frac{5.4^2}{2\times4.4}\right)(.086 + .050) = (0.29^{K}/_{ft}{}_{D} + 0.17^{K}/_{ft}{}_{L}) = 0.46^{K}/_{ft}$

$P = (2.46^{K}_{D} + 4.43^{K}_{L}) = 6.89^{K}$

$R_1 = (5.28^{K}_{D} + 6.07^{K}_{L}) = 11.35^{K}$

$R_2 = (3.58^{K}_{D} + 2.82^{K}_{L}) = 6.40^{K}$

$M_{@9.91} = 44.6^{KFT}$

AXIAL LOAD = $78.1^{K}\times1.25$
from SHT N° 300

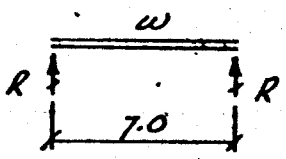
USE | W14x43

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B-9



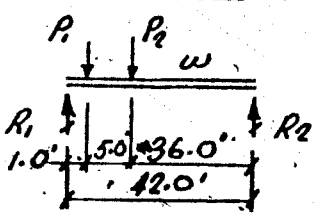
$w = 0.10^{K}/_{0}$

$R = 0.35^{K}_{0}$

$M = 0.6^{KFT} < M_{ALLOW} = 4.1^{KFT}$.

USE | W 8x10

B-10



$w = (0.60^{K}/_{0} + 0.32^{K}/_{L}) = 0.92^{K}/_{L}$ REF B-1

$P_1 = (0.52^{K}_{0} + 1.00^{K}_{L}) = 1.52^{K}$

$P_2 = (0.87^{K}_{0} + 1.00^{K}_{L}) = 1.87^{K}$

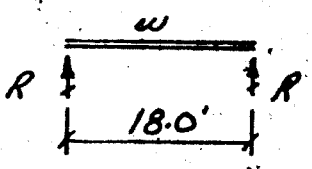
$R_1 = (13.85^{K}_{0} + 8.55^{K}_{L}) = 22.40^{K}$

$R_2 = (12.74^{K}_{0} + 6.89^{K}_{L}) = 19.63^{K}$

$M_{@\ 37} = 209.5^{KFT}$

USE | SAME AS B-1

B-11



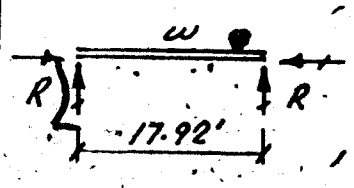
$w = 3.5(.086^{K}/_{\square} + .050^{K}/_{\square}) = (0.30^{K}/_{0} + 0.18^{K}/_{L}) = 0.48^{K}/_{L}$

$R = (2.70^{K}_{0} + 1.62^{K}_{L}) = 4.32^{K}$

$M = 19.5^{KFT} < M_{ALLOW} = 21.2^{KFT}$

USE | W12x19

B-12



$w = (0.30^{K}/_{0} + 0.18^{K}/_{L}) = 0.48^{K}/_{L}$

$R = (2.69^{K}_{0} + 1.62^{K}_{L}) = 4.31^{K}$

$M = 19.3^{KFT}$

AXIAL LOAD = 93.9 x 1.25
FROM SHT N° 300

USE | W14x43

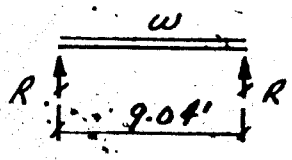
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B-13



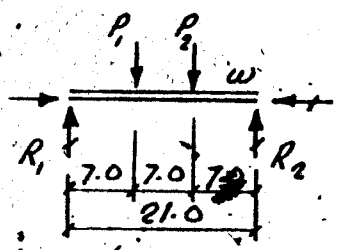
$w = 3.0(0.086^K/_{ft_D} + 0.100^K/_{ft_L}) = (0.26^K/_{ft_D} + 0.30^K/_{ft_L}) = 0.56^K/_{ft}$

$R = (.18^K_D + 1.36^K_L) = 2.54^K$

$M = 5.8^{KFT} < M_{min} = 7.2^{KFT}$

USE W 8 x 10

B-14



AXIAL LOAD = 56.5^K x 1.25
from SHT N° 299

$w = 0.20^K/_{ft_D}$

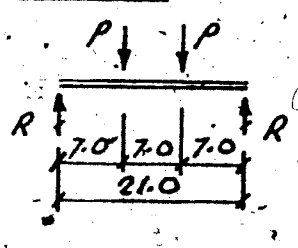
TRIB 42.0/2 x 21 = 441 ft²
→ R = (.08%)(441-150) = 28% → LL = .77(50) = 39 #/ft

$P_1 = (12.74^K_D + 5.74^K_L) = 18.48^K$
$P_2 = (8.74_D + 5.74_L) = 14.48^K$

$R_1 = (13.51^K_D + 5.74^K_L) = 19.25^K$
$R_2 = (12.17^K_D + 5.74^K_L) = 17.91^K$
$M_{7.0} = 129.9^{KFT}$

USE W24 x 55

B-15

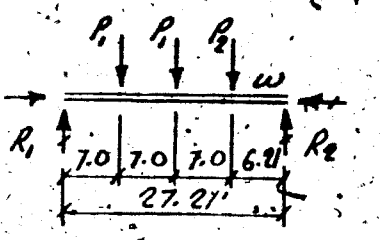


$w = 0.20^K/_{ft_D}$
$LL = 39^{\#}/_{ft}$ REF B-14

$P = (12.60^K_D + 5.74^K_L) = 18.34^K$
$R = (14.70^K_D + 5.74^K_L) = 20.44^K$
$M_{10.5} = 139.4^{KFT}$

USE W21 x 44

B-16



AXIAL LOAD = 47.9 x 1.25
from SHT N° 299

$w = 0.20^K/_{ft_D}$

TRIB = (42.0/2)(27.21) = 571 ft²
→ R = (.08%)(571-150) = 33% → LL = .67(50) = 34 #/ft

$P_1 = (12.60^K_D + 5.00^K_L) = 17.60^K$
$P_2 = (11.97^K_D + 4.72^K_L) = 16.69^K$

$R_1 = (20.93^K_D + 7.22^K_L) = 28.15^K$
$R_2 = (21.68^K_D + 7.50^K_L) = 29.18^K$
$M_{14.0} = 251.3^{KFT}$

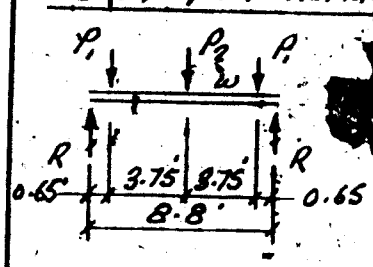
USE W24 x 68.

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B-17 & AT INTM. LANDINGS



$\omega = 0.10^{K/'}$

$P_1 = [(2 \times 0.83^K)_D + (2 \times 1.67^K)_L] = (1.66^K_D + 3.34^K_L) = 5.0^K$

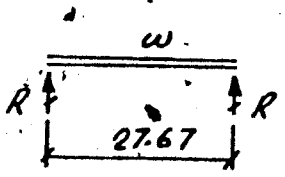
$P_2 = [(4)(.05^{K/\#}_D + .10^{K/\#}_L)(4.5'/2)] = (.45^K_D + .90^K_L) = 1.35^K$

$R = (2.33^K_D + 3.79^K_L) = 6.12^K$

$M = 7.2^{K\text{-}FT}$

USE W 8x10

B-18



$\omega = 6.88(.086^{K/\#} + .050^{K/\#}) = (0.59^{K/'}_D + 0.35^{K/'}_L) = 0.94^{K/'}$

$R = (8.16^K_D + 4.84^K_L) = 13.00^K$

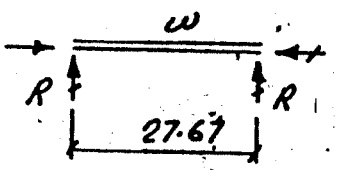
$M = 90.0^{K\text{-}FT}$

$\Delta_L = \frac{5(.35)(27.67)^4(1728)}{384(29\times10^3)(I)} = \frac{159.2}{I} \leq \frac{27.67\times12}{2(360)} = 0.46''$

$I > 159.2/0.46 = 346\ IN^4$

USE W18x35

B-19



AXIAL LOAD = 47.0K x 1.25
from SHT N° 300

$\omega = 3.0(.086 + .050) = (0.26^{K/'}_D + 0.15^{K/'}_L) = 0.41$

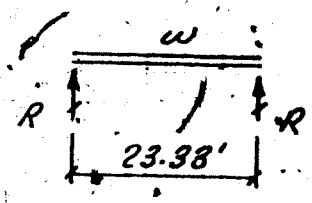
$R = (3.60^K_D + 2.08^K_L) = 5.68^K$

$M = 39.3^{K\text{-}FT}$

USE W18x40

332"/20 = 16.6" MIN

B-20



$\omega = 6.0(.086 + .050) = (0.52^{K/'}_D + 0.30^{K/'}_L) = 0.82^{K/'}$

$R = (6.07^K_D + 3.50^K_L) = 9.57^K$

$M = 53.8^{K\text{-}FT}$

$\Delta_L = \frac{5(.30)(23.33)^4(1728)}{384(29\times10^3)(I)} = \frac{69.0}{I} \leq \frac{280}{2\times360} = 0.388''$

$I > 69.0/0.388 = 178\ IN^4$

USE W16 x 26

280/20 = 14" MIN

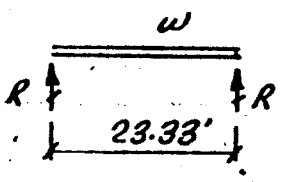
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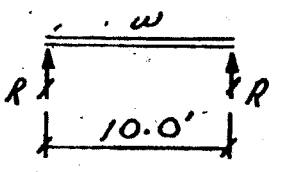
B-21



$w = 3.0(.086+.050) = (0.26^{K/'}_{D} + 0.15^{K/'}_{L}) = 0.41^{K/'}$
$R = (3.04^{K}_{D} + 1.75^{K}_{L}) = 4.79^{K}$
$M = 27.9^{KFT} < M_{MIN} = 29.4^{KFT}$

USE | SAME AS B-20

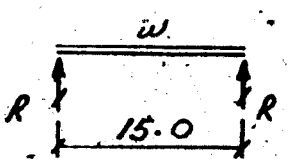
B-22



$w = 6.88(.086+.050) = (0.59^{K/'}_{D} + 0.35^{K/'}_{L}) = 0.94^{K/'}$
$R = (2.95^{K}_{D} + 1.75^{K}_{L}) = 4.70^{K}$
$M = 11.8^{KFT} < M_{MIN} = 12.4^{KFT}$

USE | SAME AS B-23

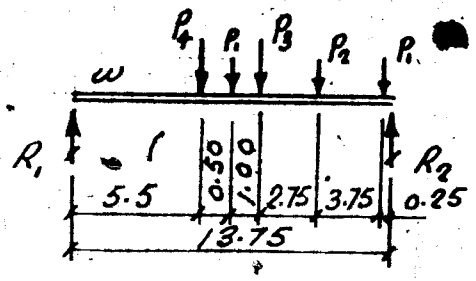
B-23



$w = 4.0(.086+.050) = (0.35^{K/'}_{D} + 0.20^{K/'}_{L}) = 0.55^{K/'}$
$R = (2.63^{K}_{D} + 1.50^{K}_{L}) = 4.13^{K}$
$M = 15.5^{KFT} < M_{MIN} = 17.4^{KFT}$

USE | W12x14
$180''/20 = 9.0''$ MIN

B-24



$w = 0.04^{K/'}$
$P_1 = (0.83^{K}_{D} + 1.67^{K}_{L}) = 2.50^{K}$
$P_2 = (1.66^{K}_{D} + 3.34^{K}_{L}) = 5.00^{K}$
$P_3 = (2.95_{D} + 1.75^{K}_{L}) = 4.70^{K}$
$P_4 = (2.63_{D} + 1.50^{K}_{L}) = 4.13^{K}$

$R_1 = (4.27^{K}_{D} + 3.70^{K}_{L}) = 7.97^{K}$
$R_2 = (5.18^{K}_{D} + 6.23^{K}_{L}) = 11.41^{K}$
$M_{7.0} = 46.1^{KFT}$

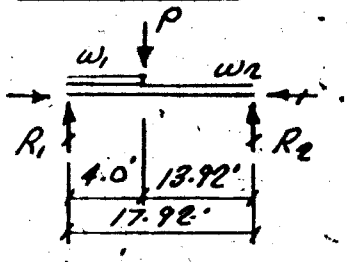
USE | W12x26
STAIR-WELL

Work Sheet 12/31/87

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B-25

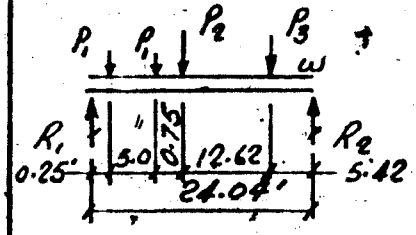


AXIAL LOAD = 74.9K
from SHT N° 300

$\omega_1 = (6.88/2)(.05+.10) = (0.17^{K/'}_D + 0.35^{K/'}_L) = 0.52^{K/'}$
$\omega_2 = 0.04^{K/'}_D$
$P = (5.18^K_D + 6.23^K_L) = 11.41^K$
$R_1 = (4.99^K_D + 6.08^K_L) = 11.07^K$
$R_2 = (1.59^K_D + 1.55^K_L) = 3.14^K$
$M_{4.0} = 39.8^{K\text{-}FT}$

USE W14x43

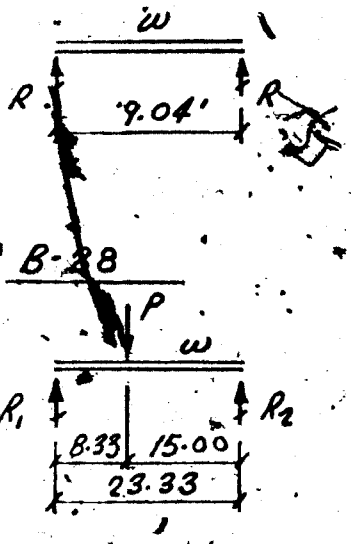
B-26



TR18 (24.04 x 6.88/2) + (1/2)(B-29 TR18) = 415# → LL = 40#/FT
$\omega = (6.88/2)(.050+.100) = (0.17^{K/'}_D + 0.35^{K/'}_L) = 0.52^{K/'}$
$P_1 = (0.58^K_D + 1.00^K_L) = 1.52^K$
$P_2 = (0.35^K + 2.70^K)_D + (0 + 1.30^K)_L = (3.05^K_D + 1.30^K_L) = 4.35^K$
$P_3 = [20.15^K_D + (40/80)(7.02^K_L)] = (20.15^K_D + 9.36^K_L) = 29.51^K$
P_3 from B-29
$R_1 = (9.80^K_D + 9.06^K_L) = 18.86^K$
$R_2 = (18.53^K_D + 12.01^K_L) = 30.54^K$
$M = 157.9^{K\text{-}FT}$

USE W24x55

B-27



$\omega = (0.30^{K/'}_D + 0.18^{K/'}_L) = 0.48^{K/'}$
$R = (1.36^K_D + 0.82^K_L) = 2.18^K$
$M = 4.9^{K\text{-}FT} < M_{MIN} = 7.6^{K\text{-}FT}$

USE W8x10

B-28

$\omega = (11.75/2)(.086+.060) = (0.51^{K/'}_D + 0.29^{K/'}_L) = 0.80^{K/'}$
$P = (4.27^K_D + 3.70^K_L) = 7.97^K$
$R_1 = (8.70^K_D + 5.76^K_L) = 14.46^K$
$R_2 = (7.47^K_D + 4.70^K_L) = 12.17^K$
$M_{8.33} = 92.7^{K\text{-}FT}$

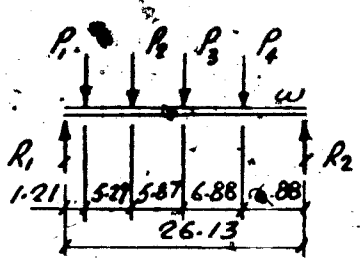
USE W18x35

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B-29



TRIB $(51.0/2)(26.19) = 666^{\#}$

$\rightarrow R = (.08\%)(666-150) = 40^{\#}$ MIN $\rightarrow LL = 0.6(50) = 30^{\#/ft}$

$P_1 = 5.71(.086+.030)(51.0/2) = (12.52^{K}_{D} + 4.97^{K}_{L}) = 16.89^{K}$

$P_2 = 5.29(\ do\ +\ do\ )(\ do\ ) = (11.60^{K}_{D} + 4.05^{K}_{L}) = 15.65^{K}$

$P_3 = (7.59+8.70)_D + (2.65+3.46)_L = (16.29^{K}_{D} + 6.11^{K}_{L}) = 22.40^{K}$

$P_4 = (8.16+2.95)_D + (2.91+1.05)_L = (11.11^{K}_{D} + 3.96^{K}_{L}) = 15.07^{K}$

$\omega = 0.06^{K/ft}_{D}$

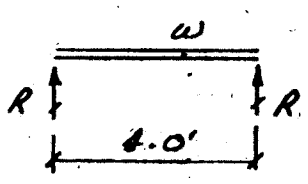
$R_1 = (32.94^{K}_{D} + 11.47^{K}_{L}) = 44.41^{K}$

$R_2 = (20.45^{K}_{D} + 7.02^{K}_{L}) = 27.17^{K}$

$M_{13.7c} = 264.5^{K-FT}$

USE | W24 x 68

B-30



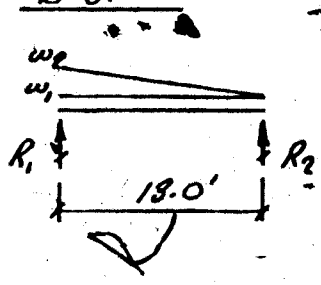
$\omega = (9.22/2)(0.05^{K/ft}_{D} + 0.10^{K/ft}_{L}) = (0.23^{K/ft}_{D} + 0.46^{K/ft}_{L}) = 0.69^{K/ft}$

$R = (0.46^{K}_{D} + 0.92^{K}_{L}) = 1.38^{K}$

$M = 1.4^{K-FT} < M_{MIN} = 2.5^{K-FT}$

USE | SAME AS B-33

B-31



$\omega_1 = (4.61/2)(.066^{K/ft}_{D} + .250^{K/ft}_{L}) = (.15^{K/ft}_{D} + .58^{K/ft}_{L}) = 0.73^{K/ft}$

$\omega_2 = (\ do\ )(\ do\ +\ do\ ) = (\ do\ +\ do\ ) = do$

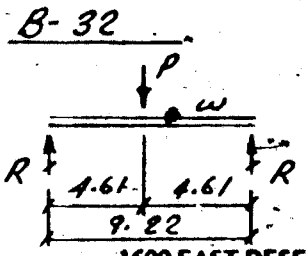
$R_1 = (1.63^{K}_{D} + 6.28^{K}_{L}) = 7.91^{K}$

$R_2 = (1.30^{K}_{D} + 5.03^{K}_{L}) = 6.38^{K}$

$M_{6.86} = 23.3^{K-FT}$

USE | W12 x 14

B-32



$\omega = 0.08^{K/ft}_{D}$

$P = (0.46+1.63)_D + (0.92+6.28)_L = (2.09^{K}_{D} + 7.20^{K}_{L}) = 9.29^{K}$

$R = (1.42^{K}_{D} + 3.60^{K}_{L}) = 5.02^{K}$

$M = 22.3^{K-FT}$

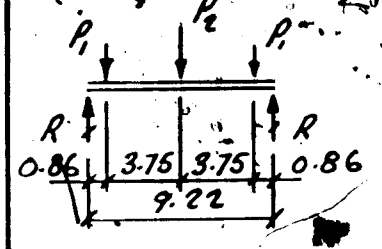
USE | W12 x 14

Worn Hoist 12/31/87

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B-33



$\omega = 0.04^{K}/_{LF}$

$P_1 = (0.83^{K}_{D} + 1.67^{K}_{L}) = 2.50^{K}$

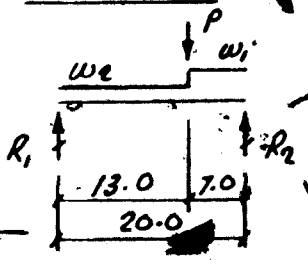
$P_2 = (1.66^{K} + 0.46^{K})_{D} + (3.34^{K} + 0.98^{K})_{L} = (2.12^{K}_{D} + 4.26^{K}_{L}) = 6.38^{K}$

$R = (2.07^{K}_{D} + 3.80^{K}_{L}) = 5.87^{K}$

$M = 17.3^{K\text{-}FT}$

USE W12 x 14

B-34



$w_1 = \left(\frac{7.0^2}{2 \times 4.0}\right)(.066^{K}/_{LF})_{D} + .250^{K}/_{LF}) = (.35^{K}/_{LF})_{D} + 1.33^{K}/_{LF})_{L}) = 1.68^{K}/_{LF}$

$w_2 = \left(\frac{6.0^2}{2 \times 4.0}\right)(.066^{K}/_{LF})_{D} + .250^{K}/_{LF}) = (.30^{K}/_{LF})_{D} + 1.13^{K}/_{LF})_{L}) = 1.43^{K}/_{LF}$

$P = (1.30^{K}_{D} + 5.03^{K}_{L}) = 6.33^{K}$

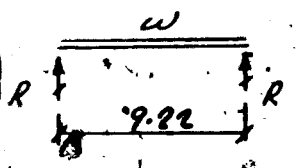
$R_1 = (3.52^{K}_{D} + 13.91^{K}_{L}) = 16.83^{K}$

$R_2 = (4.13^{K}_{D} + 15.72^{K}_{L}) = 19.85^{K}$

$M_{@ 7.69} = 99.1^{K\text{-}FT}$

USE W18 x 35

B-32 A



$\omega = {}^{1}/_{16}{}_{MAX}(.021^{K}/_{LF})_{D} + 0.04^{K}/_{LF})_{D} = 0.98^{K}/_{LF}$

$R = 1.75^{K}_{D}$

$M = 4.1^{K\text{-}FT} < M_{MIN} = 8.7^{K\text{-}FT}$ @ $L_b = 9.22'$

For W8 x 24: $M_R = 38^{K\text{-}FT}$ @ $L_b = 9.22'$, $M_{RV} = 11.^{K\text{-}FT}$, $I_y = 18.3\ IN^4$

WIND GUST:

$\omega = 27^{\#}/_{FT}$ REF B-7.

$M_\omega = (.027^{K}/_{FT} \times 14')(9.22')^2/8 = 4.1^{K\text{-}FT}$

$\Delta_\omega = \frac{5(.378^{\#})(9.22')^4(1728)}{384(29 \times 10^3)\,I} = \frac{2.12}{I} < 0.307"$

$I_y > {}^{2.12}/_{0.307} = 6.91\ IN^4$

USE W 8 x 24

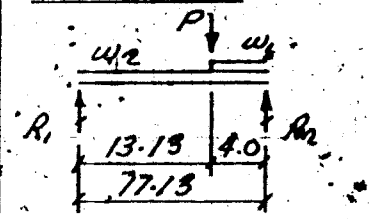
.501 N CASINO CTR 3
Fire Station

Work Sheet 12/31/87

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B-35



$\omega_1 = (4.61/2)(.05^K/\#_D + .10^K/\#_L) = (0.12^{K/'}_D + 0.23^{K/'}_L) = 0.35^{K/'}$

$\omega_2 = 16'_{MAX}(.021^K/\#)_D + 0.04^{K/'}_D = 0.38^{K/'}$

$P = (2.07^K_D + 3.80^K_L) = 5.87^K$

$R_1 = (3.79^K_D + 1.00^K_L) = 4.79^K$

$R_2 = (5.27^K_D + 3.73^K_L) = 9.00^K$

$M_{@12.605} = 30.2^{K\text{-}FT}$ & $\ell_D = 13.13'$

WIND GIRT:

$p_w = 27^\#/\text{ft}$ REF B-7

$M_w = (.027 \times 14')(13.13')^2/8 = 8.2^{K\text{-}FT}$

$\Delta_w = \frac{5(.378)(13.13)^4(1728)}{384(29\times10^3)I} = \frac{8.72}{I} < 0.437$

$I_y > 8.72/.437 = 19.96\ in^4$

$\Delta = (1034.48\times10^{-6})(17.13)^2(\ell_b/d) \le \frac{205}{360} = .569$

$\therefore (\ell_b/d) \le 1.874$

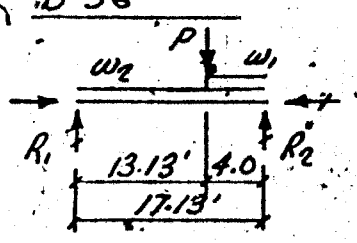
for W12x30 $(\ell_b/d) = \frac{9.99}{12.34} = .761$ ✓

@ $\ell_b = 13.13'$, $M_a = 56^{K\text{-}FT}$

$I_y = 20.3\ in^4$ ✓

USE W12x30

B-36



AXIAL LOAD = 128.0 x1.25
From SHT N° 300

$\omega_1 = (0.12^{K/'}_D + 0.23^{K/'}_L) = 0.35^{K/'}$ REF B-35

$\omega_2 = (7.04/2)(.066^K/\#_D + .250^K/\#_L) = (0.23^{K/'}_D + 0.88^{K/'}_L) = 1.11^{K/'}$

$P = (2.07^K_D + 3.80^K_L) = 5.87^K$

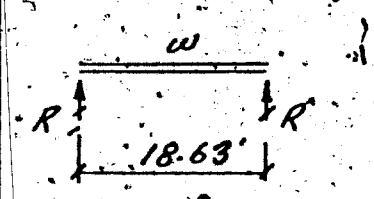
$R_1 = (2.51^K_D + 8.53^K_L) = 11.04^K$

$R_2 = (3.98^K_D + 11.26^K_L) = 15.24^K$

$M_{@9.946} = 54.9^{K\text{-}FT}$

USE W14x48

B-37



$\omega = (11.65/2)(.066_\ell + .250_L) = (0.38^{K/'}_D + 1.46^{K/'}_L) = 1.84^{K/'}$

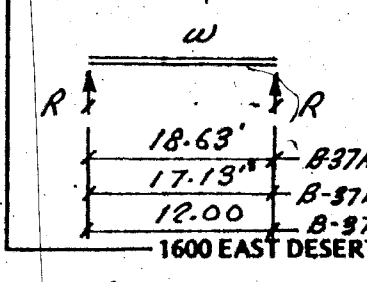
$R = (3.54^K_D + 13.60^K_L) = 17.14^K$

$M = 79.9^K$

$\Delta_L = \frac{5(1.46)(18.63)^4(1728)}{384(29\times10^3)I} = \frac{136.5}{I} \le \frac{223.5}{360} = 0.62$

$I > 136.5/0.62 = 220$ USE W16x31

B-37A, B-37B, & B-37C



$\omega = 7.04(.066 + .250) = (0.47^{K/'}_D + 1.76^{K/'}_L) = 2.23^{K/'}$

B-37A: $R = (4.38^K_D + 16.39^K_L) = 20.77^K$, $M = 96.8^{K\text{-}FT}$ USE W18x35

B-37B: $R = (4.03^K_D + 15.07^K_L) = 19.10^K$, $M = 81.8^{K\text{-}FT}$ USE W16x31

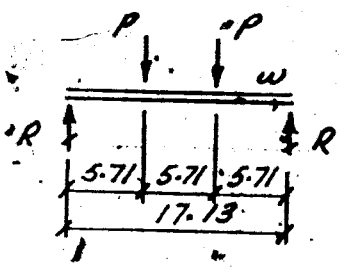
B-37C: $R = (2.82^K_D + 10.56^K_L) = 13.38^K$, $M = 40.2^{K\text{-}FT}$ USE W14x22

Dana Hasel 12/31/87

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B-38



$\omega = (7.04/2)(.066^{K/ft}_{D} + .250^{K/ft}_{L}) = (0.23^{K/ft}_{D} + 0.88^{K/ft}_{L}) = 1.11^{K/ft}$

TRIB 17.13 (27.67/2) = 237 ft

$R = (.08\%)(237-150) = 7\% \rightarrow LL = 46.5^{\#/ft}$

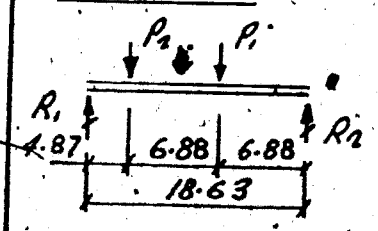
$P = (5.71)(.086_{D} + .047_{L})(27.67/2) = (6.79^{K}_{D} + 3.71^{K}_{L}) = 10.50^{K}$

$R = (8.76^{K}_{D} + 11.25^{K}_{L}) = 20.01^{K}$

$M = 100.7^{K\text{-}FT}$

USE W18 x 35

B-39



$\omega = (0.23^{K/ft}_{D} + 0.88^{K/ft}_{L}) = 1.11^{K/ft}$ REF B-38

TRIB 18.63 (27.67/2) = 258 ft

$R = (.08\%)(258-150) = 8\% \rightarrow LL = 46^{\#/ft}$

$P_1 = (6.88)(.086 + .046)(27.67/2) = (8.19^{K}_{D} + 4.38^{K}_{L}) = 12.57^{K}$

$P_2 = (11.75/2)(.086 + .046)(.086) = (6.99^{K}_{D} + 3.74^{K}_{L}) = 10.73^{K}$

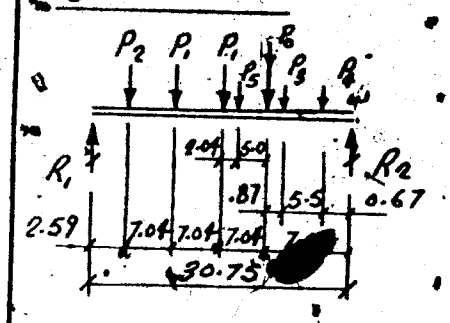
$R_1 = (10.33^{K}_{D} + 12.58^{K}_{L}) = 22.91^{K}$

$R_2 = (9.14^{K}_{D} + 11.94^{K}_{L}) = 21.08^{K}$

$M_{9.315} = 117.6^{K\text{-}FT}$

USE W18 x 40

B-40



$P_1 = (4.38^{K}_{D} + 16.39^{K}_{L}) = 20.77^{K}$

$P_2 = (3.54^{K}_{D} + 13.60^{K}_{L}) = 17.14^{K}$

$P_D = (4.38+0.94)_{D} + (16.39+1.81_{L}) = (5.32^{K}_{D} + 18.20^{K}_{L}) = 28.52^{K}$

$P_5 = (0.94^{K}_{D} + [illegible]^{K}_{L}) = 2.75^{K}$

$P_3 = (0.51^{K}_{D} + 0.50^{K}_{L}) = 1.01^{K}$

$P_4 = (0.93^{K}_{D} + 0.62^{K}_{L}) = 1.55^{K}$

$\omega = 0.08^{K/ft}_{D}$

$R_1 = (11.19^{K}_{D} + 36.21^{K}_{L}) = 47.40^{K}$

$R_2 = (11.27^{K}_{D} + 31.30^{K}_{L}) = 42.57^{K}$

$M_{16.67} = 391.5$

$(1034.48 \times 10^{-6})(30.75)^2 (f_b/d) \leq \frac{369}{360} = 1.025^{in}$

$(f_b/d) \leq 1.047$

for W24x84 $\rightarrow (f_b/d) = (23.97/24.10) = 0.995$

USE W27 x 84
OR IF SPACE LIMITED
W24 x 84 OK.

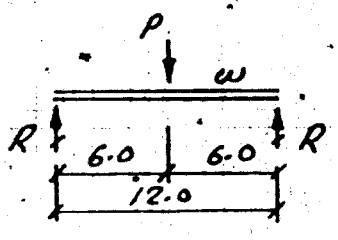
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B-41



$w = (0.23^{K/l}_{D} + 0.88^{K/l}_{L}) = 1.11^{K/l}$ REF B-38

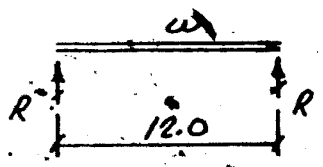
$P = (6.0)(.086_D + .350_L)(27.67/2) = (7.14^{K}_{D} + 4.15^{K}_{L}) = 11.29^{K}$

$R = (4.95^{K}_{D} + 7.36^{K}_{L}) = 12.31^{K}$

$M = 53.9^{K FT}$

USE W18 x 26

B-42



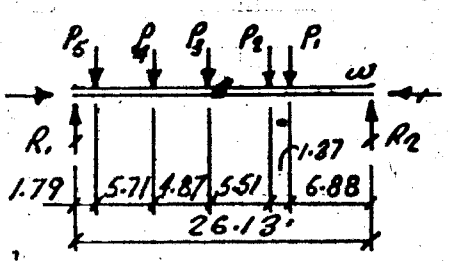
$w = \left(\frac{8.25^2}{2 \times 7.04}\right)(.066_D + .250_L) = (0.32^{K/l}_{D} + 1.21^{K/l}_{L}) = 1.53^{K/l}$

$R = (1.92^{K}_{D} + 7.26^{K}_{L}) = 9.18^{K}$

$M = 27.6^{K FT}$

USE W 12 x 14

B-43



AXIAL LOAD = 97.2 x 1.25
from SHT Nº 299

TRIB (26.13 - 6.25)(28.33/2) = 208 ☐

R = (.08%)(208 - 150) = 4% → LL = 48 ☐

$P_1 = (6.88)(.066_D + .100_L)(19.71/2) = (4.48_D + 6.78_L) = 11.26^{K}$

$P_2 = (4.00)(.086_D + .048_L)(15.0/2) = (2.58_D + 1.44_L) = 4.02^{K}$

$P_3 = (7.47 + 2.24)_D + (4.50 + 3.39)_L = (9.71_D + 7.89_L) = 17.60^{K}$

$P_4 = (5.29)(.086_D + .048_L)(23.33/2) = (5.31_D + 2.96_L) = 8.27^{K}$

$P_5 = (5.71)(\ d_o + d_o\ )(\ d_o\ ) = (5.73_D + 3.20_L) = 8.93^{K}$

$w = 0.05^{K/l}_{D}$

$R_1 = (16.88^{K}_{D} + 11.49^{K}_{L}) = 28.37^{K}$

$R_2 = (12.23^{K}_{D} + 10.79^{K}_{L}) = 23.02^{K}$

$M_{12.37} = 212.4^{K FT}$

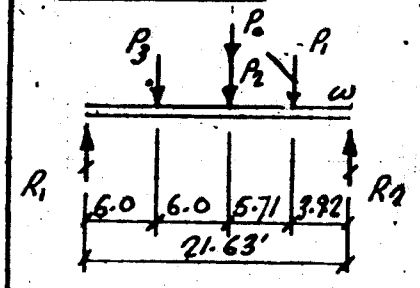
USE W24 x 62

Dist. Hasal [illegible] 12/31/87.

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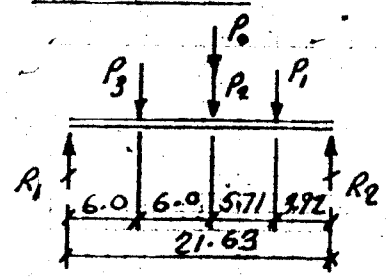
NOTE:
P_o IS LOAD FROM THE 3RD FLR COL. T-9 WHICH CARRIES ROOF L.L. ONLY AT THIS TIME. FUTURE EXPANSION WILL BE DESIGNED-OUT THIS COL. SEE FUTURE 3RD FLR FRMG PLAN.

TRIB $21.63 \times 51.0/2 = 552^{\#}$
$R = (.08\%)(552-150) = 32\% \rightarrow LL = 34^{\#}/\square$
$P_1 = (5.71)(.086_D + .034_L)(51.0/2) = (12.52^K_D + 4.95^K_L) = 17.47^K$
$P_2 = (5.86)(\ do_D + do_L)(\ do\ ) = (12.85^K_D + 5.08^K_L) = 17.93^K$
$P_3 = (6.00)(\ do_D + do_L)(\ do\ ) = (13.16^K_D + 5.20^K_L) = 18.36^K$
$P_o = (11.61^K_D + 2.12^K_L) = 13.73^K$ from TEMP. COL @ 3RD LEVEL/ROOF
$w = 0.05^K/'_D$

$R_1 = (18.04^K + 5.17^K)_D + (6.92^K + 0.94^K)_L$
$R_1 = (23.21^K_D + 7.86^K_L) = 31.07^K$ -6.11
$R_2 = (21.57^K + 6.44^K)_D + (8.31^K + 1.18^K)_L$
$R_2 = (28.01^K_D + 9.49^K_L) = 37.50^K$ -7.32
$M_{12:0} = 259.0^{KFT}$

USE | W24 x 62

B-45



NOTE:
P_o IS LOAD FROM THE 3RD FLR COL. T-12 WHICH CARRIES ROOF LL ONLY AT THIS TIME.
SEE NOTE ABOVE AT B-44

TRIB $21.63 \times 23.39/2 = 252^{\#}$
$R = (.08\%)(252-150) = 8\% \rightarrow LL = 46^{\#}/\square$
$P_1 = (5.71)(.086_D + .046_L)(23.39/2) = (5.73^K_D + 3.06^K_L) = 8.79^K$
$P_2 = (5.86)(\ do_D + do_L)(\ do\ ) = (5.88^K_D + 3.15^K_L) = 9.03^K$
$P_3 = (6.00)(\ do_D + do_L)(\ do\ ) = (6.02^K_D + 3.22^K_L) = 9.24^K$
$P_o = (5.40^K_D + 1.21^K_L) = 6.61^K$ from TEMP. COL @ 3RD LEVEL/ROOF
$w = 0.05^K/'_D$

$R_1 = (8.55^K + 2.40^K)_D + (4.28^K + 0.54^K)_L$
$R_1 = (10.95^K_D + 4.82^K_L) = 15.77^K$ -2.94
$R_2 = (10.16^K + 3.00^K)_D + (5.15^K + 0.67^K)_L$
$R_2 = (13.16^K_D + 5.82^K_L) = 18.98^K$ -3.67
$M_{12:0} = 130.2^{KFT}$

USE | W21 x 44

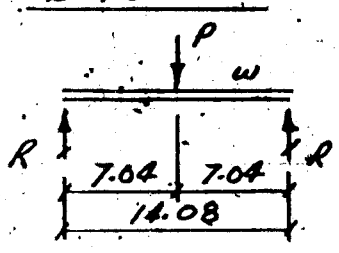
1600 EAST DESERT INN ROAD SUITE 106 | LAS VEGAS, NEVADA 89109-2594 (702) 731-6226

Done Local 12/31/87

STRAUSS & LOFTFIELD
STRUCTURAL ENGINEERS

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ENGINEER/ HS

B-46

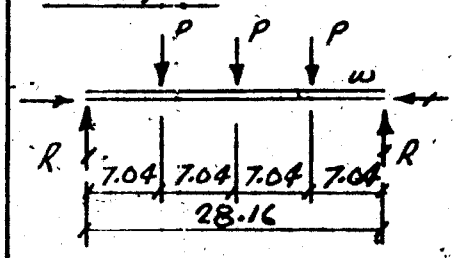


$P = (4.38^K + 4.09^K)_D + (16.39^K + 15.07^K)_L = (8.41^K_D + 31.46^K_L) = 39.87^K$
$w = 0.05^K/'$

$R = (4.56^K_D + 15.73^K_L) = 20.29^K$
$M = 141.6^{KFT}$

USE W 21 x 44

B-47



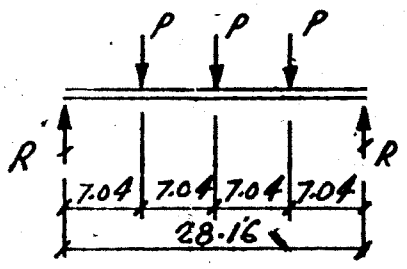
$P = (1.03^K + 2.82^K)_D + (15.07^K + 10.56^K)_L = (6.85^K_D + 25.63^K_L) = 32.48^K$
$w = 0.10^K/'$

$R = (11.68^K_D + 38.45^K_L) = 50.13^K$
$M = 467.3^{KFT}$

USE W 27 x 94

AXIAL LOAD = 1.25 x 44.5^K
from SHT. N°

B-48



$P = (2.82^K_D + 10.56^K_L) = 13.38^K$
$w = 0.06^K/'$

$R = (5.08^K_D + 15.84^K_L) = 20.92^K$
$M = 194.4^{KFT}$

USE W 24 x 55

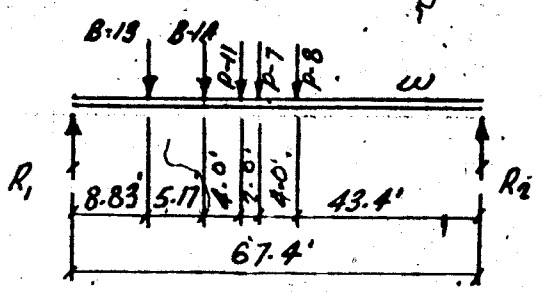
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PROJECT/
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DATE/ OCT '82
ENGINEER/ HS

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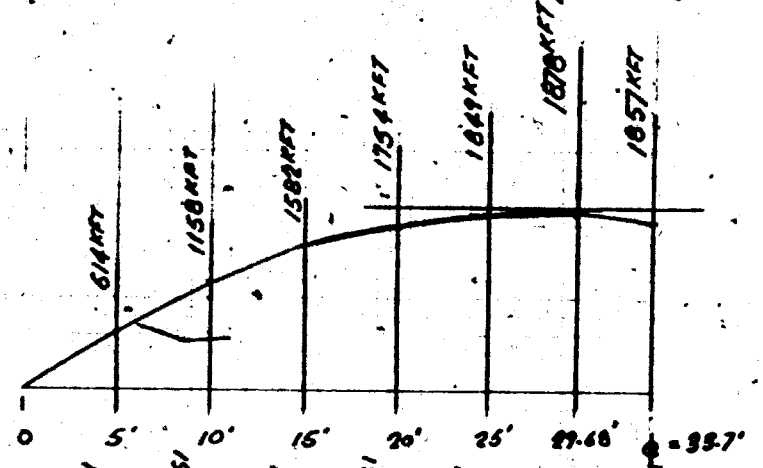


TRIB 67.4 x 42.0/2 = 1415 #
R = (.08%)(1415-150) > 40% MAX → LL = 30 #/ft

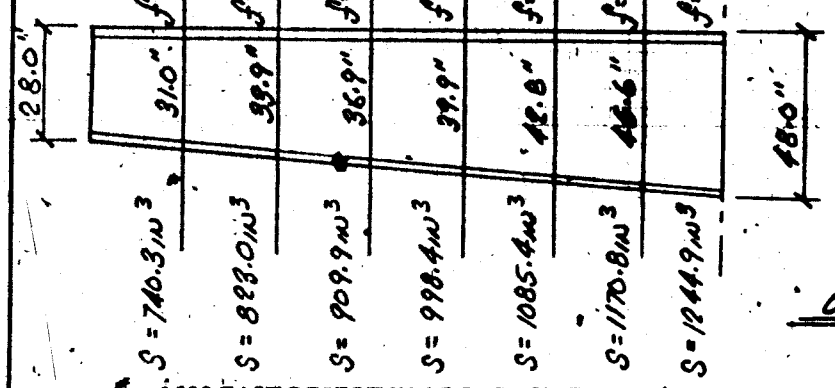
$w = (42.0/2)(.086^{K}/_{ft_D} + .030^{K}/_{ft_L}) + 0.20^{K}/_{ft}$
$w = (2.01^{K}/_{ft_D} + 0.63^{K}/_{ft_L}) = 2.64^{K}/_{ft}$

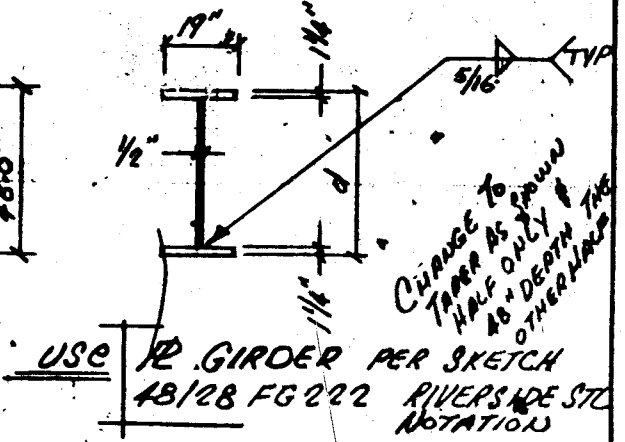
$P\text{-}7 = (-0.58^{K}_{D} + 1.20^{K}_{L}) = 0.62^{K}$ (-1.47K MIN)
$P\text{-}8 = (-1.39^{K}_{D} + 0.53^{K}_{L}) = -0.86^{K}$ OMIT UPLIFT (-3.50K MIN)
$P\text{-}11 = (1.13^{K}_{D} + 1.72^{K}_{L}) = 2.85^{K}$
$B\text{-}1A = (18.01^{K}_{D} + 26.93^{K}_{L}) = 44.94^{K}$
$B\text{-}13 = (1.18^{K}_{D} + 1.36^{K}_{L}) = 2.54^{K}$

$R_1 = (83.45^{K}_{D} + 45.85^{K}_{L}) = 129.30^{K}$
$R_2 = (71.76^{K}_{D} + 27.82^{K}_{L}) = 99.58^{K}$
$M_{37.72} = 1878^{KFT}$



$M_5 = 614^{KFT}$
$M_{10} = 1158^{KFT}$
$M_{15} = 1582^{KFT}$
$M_{20} = 1754^{KFT}$
$M_{25} = 1849^{KFT}$
$M_{29.68} = M_{37.72} = 1878^{KFT}$
$M_{38.7=\ell} = 1857^{KFT}$





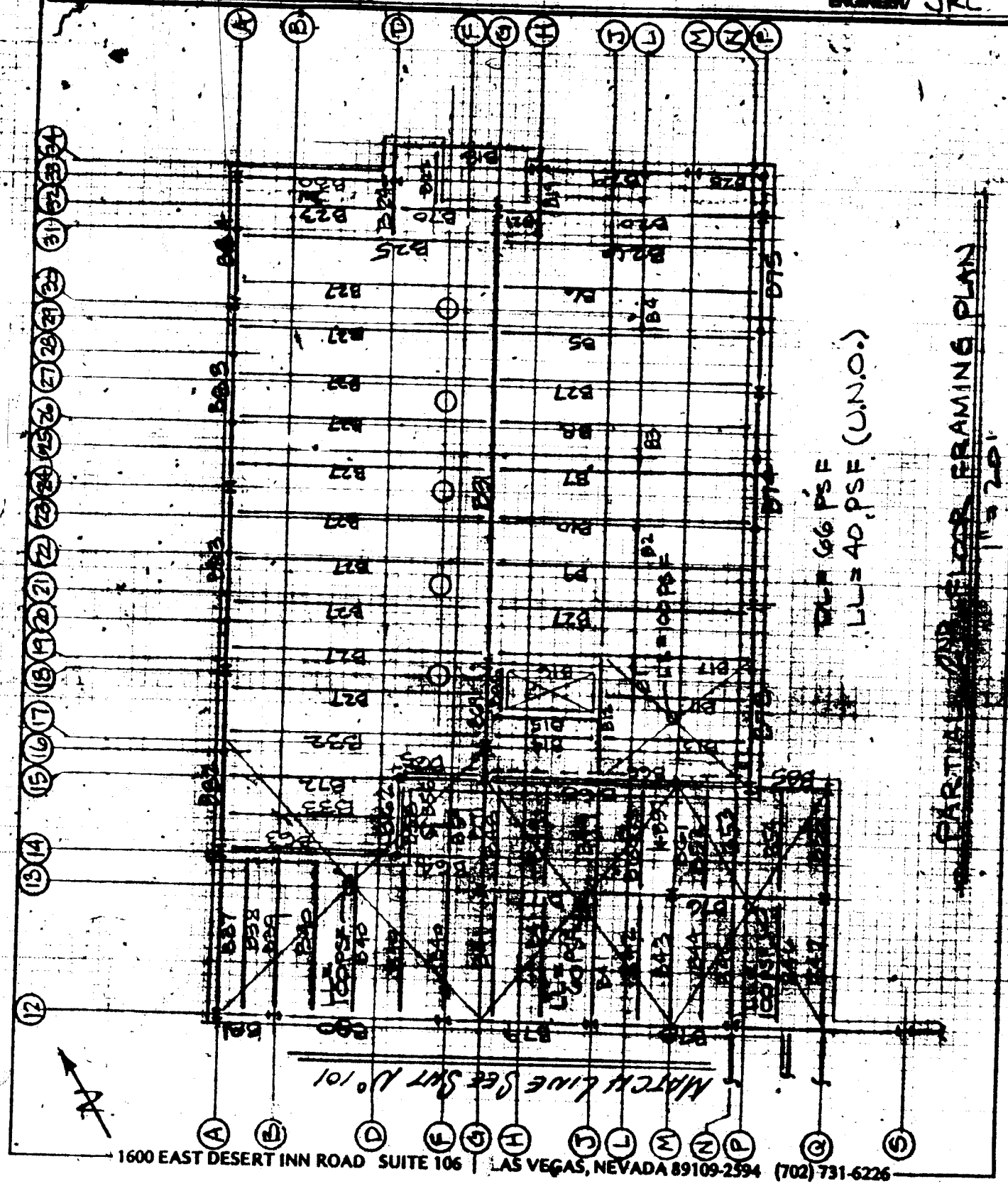
USE 42 GIRDER PER SKETCH
48/28 FG 222 RIVERSIDE STD NOTATION

Done Hand, 12/31/87

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ENGINEER/ JRL

2ND LEVEL NORTH HALF



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Doris Hasel 12/31/87

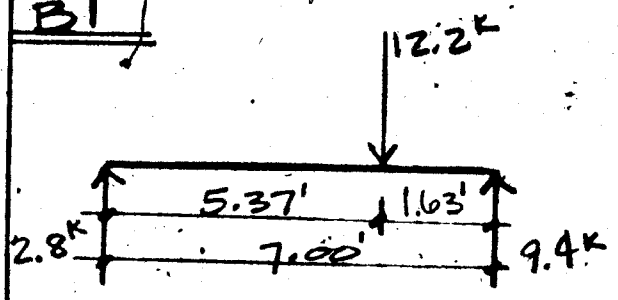
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ENGINEER/

2ND FLOOR BMS. - NORTH

B-1 THRU B-86

B1

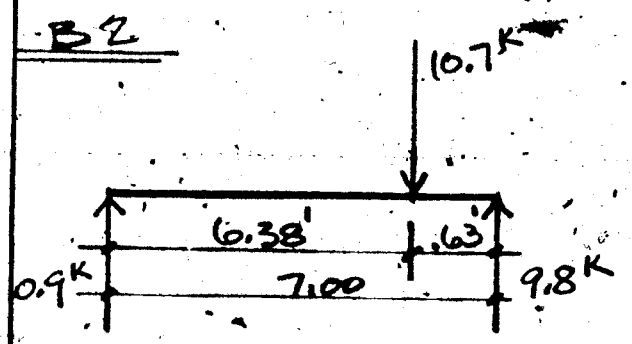


$P = (2.4^{B10} + 5.3^{B49} + 6.0^{B51}) \times \frac{32}{36} = 12.2^K$ ← LL REDUCTION

$M = 1.63' \times 9.4^K = 15.3^{IK}$

USE W12x14
$M_R = 30$

B2

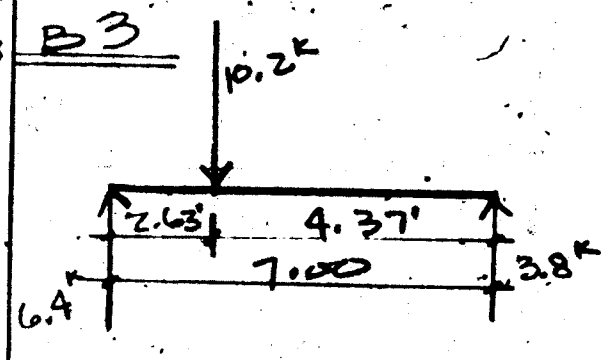


$P = (3.9^{B12} + 5.3^{B49} + 8.8 \times 9' \times .036^{K}_{SF}{}^{FUTURE\ BM}) \times \frac{32}{36}$ ← LL REDUCTION
$= 10.7^K$

$M = .63' \times 9.8^K = 6.2^{IK}$

USE W12x14
$M_R = 30$

B3



$P = (3.9^{B12} + 4.8^{B48} + 8.4' \times 9' \times .036^{K}_{SF}) \times \frac{32}{36}$ ← LL REDUCTION
$= 10.2^K$

$M = 4.37' \times 3.8^K = 16.6^{IK}$

USE W12x14
$M_R = 30$

1600 EAST DESERT INN ROAD SUITE 106 | LAS VEGAS, NEVADA 89109-2594 (702) 731-6226

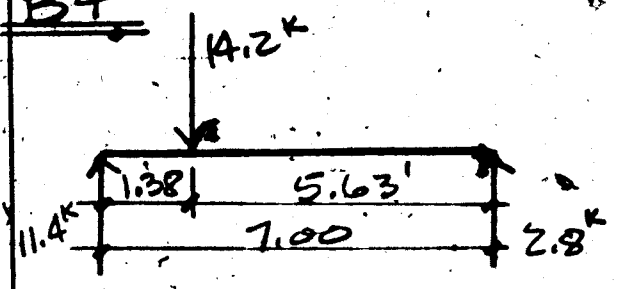
Don Hosel 12/31/87

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STRUCTURAL ENGINEERS

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ENGINEER/

2ND FLOOR BMS. - NORTH

B4

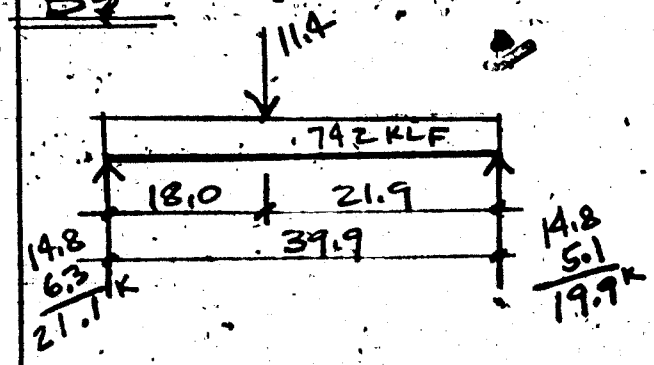


$P = (4.8^{B18} + 3.6^{B17} + 17.0' \times 8.7' \times .036^{KSF}$ FUTURE BM.
$+ 7.0' \times 9.0' \times .036^{KSF}) \times \frac{32}{36} = 14.2^{K}$

$M = 5.63' \times 2.8^{K} = 15.8^{IK}$

USE W12 x 14
$M_R = 30$

B5



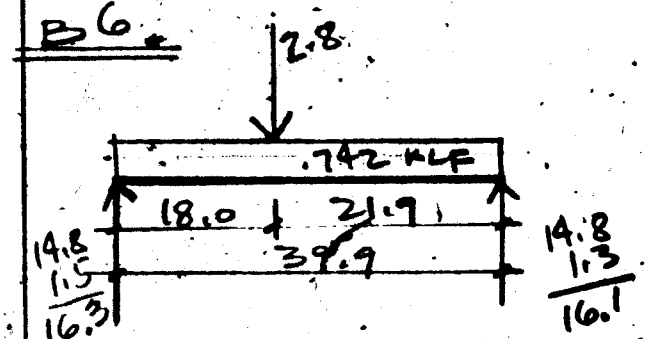
$W = 7'(40^{LL} + 66^{DL}) = 742$ PLF

$M = 258.9^{IK}$

USE W 21 x 68
$M_R = 280$

(W24 x 62)

B6



$W = 742$ PLF

$M = 173.9^{IK}$

USE W21 x 50
$M_R = 189$

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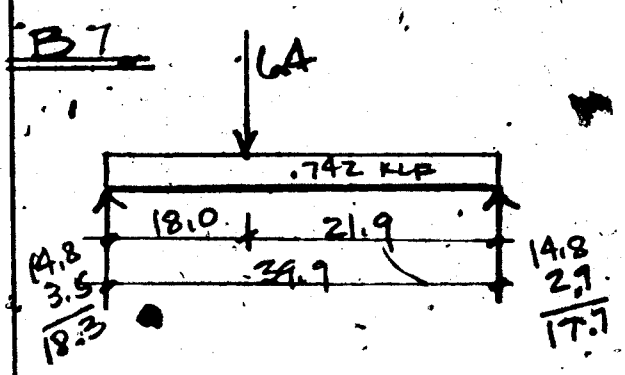
Dora Hacal, 12/31/87

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ENGINEER/

2ND FLOOR BMS. - NORTH

B7

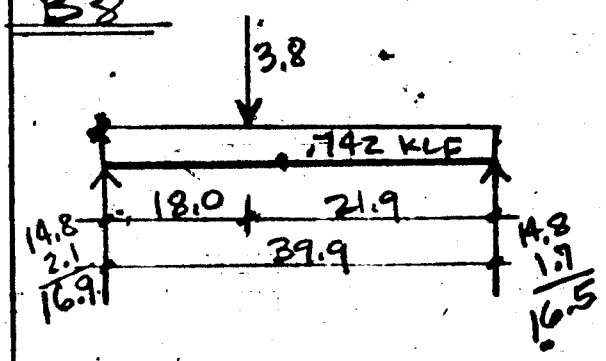


M = 209.5 IK

USE W21 x 57
M_R = 222

(W24 x 55)

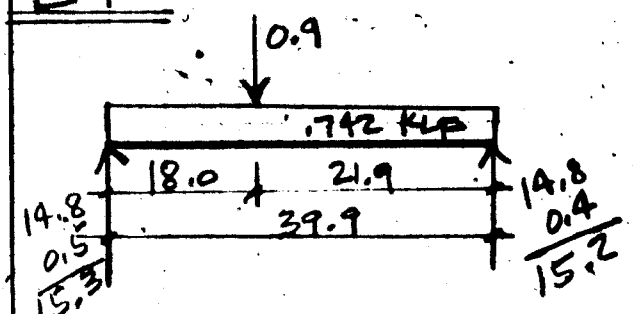
B8



M = 183.8 IK

USE W21 x 50
M_R =

B9



M = 155.9 IK

USE W21 x 44
M_R =

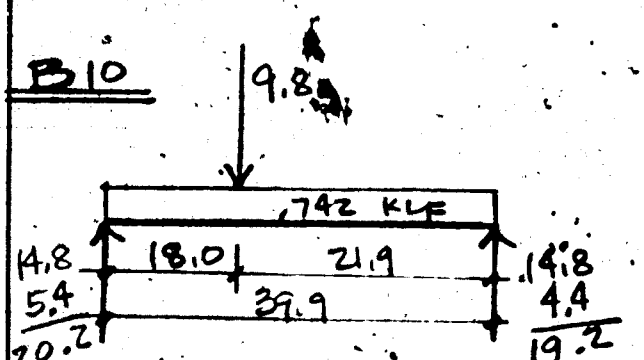
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ENGINEER/ JDL

2ND FLOOR BMS. - NORTH

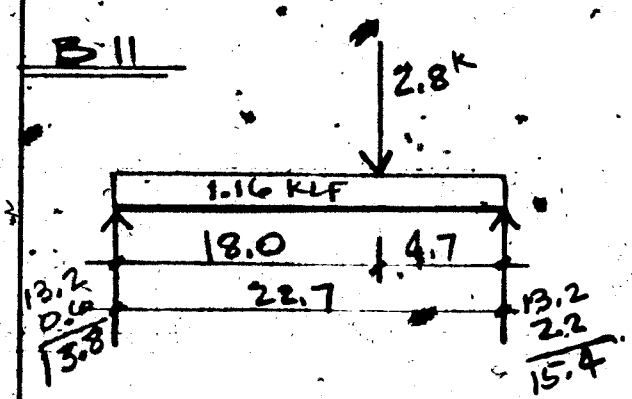
B10



$M = 248.1^{K}$

USE W21 x 62
$M_R =$

B11

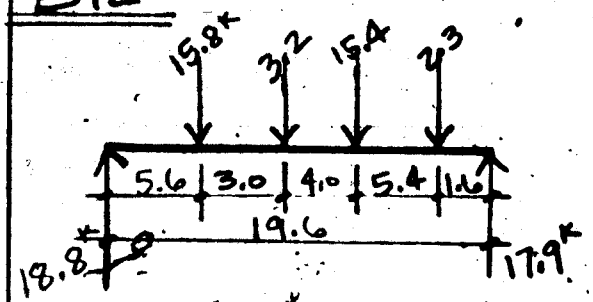


$W_E = 7'(108^{LL} + 66^{DL}) = 1162 PLF$

$M = 81.4^{K}$

USE W16 x 31
$M_R = 94$

B12



$M = 114.0^{K}$

USE W18 x 40
$M_R = 137$

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2ND FLOOR BMS. – NORTH

B13

SPAN = 22.7' A_T = LL = 100

W = 6.3'(100+66) = 1046 $M = \frac{1.046(22.7)^2}{8} = 67.4^{IK}$ $R = 11.9^{K}_{DL=}$

USE W16x26
$M_R = 77$

B14

SPAN = 17.2' A_T = LL = 40

W = 4'(40+66) = 456 $M = \frac{.456(17.2)^2}{8} = 16.9^{IK}$ $R = 3.9^{K}_{DL=}$

USE W12x14
$M_R = 30$

B15

SPAN = 17.2' A_T = LL = 40

W = 2'(40+66) + 11'x15 PSF = 377 (WALL) $M = \frac{.377(17.2)^2}{8} = 13.9^{IK}$ $R = 3.2^{K}_{DL=}$

USE W8x10
$M_R = 16$

B16

SPAN = 17.2' A_T = LL =

W = 1'(40+66) + 11'x15 PSF = 271 $M = \frac{.271(17.2)^2}{8} = 10.0^{IK}$ $R = 2.3^{K}_{DL=}$

USE W8x10
$M_R = 16$

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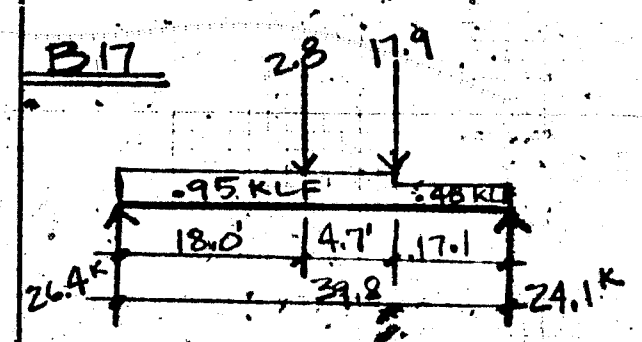
Leon Hasel 12/31/87

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ENGINEER/

2ND FLOOR BMS. - NORTH

B17



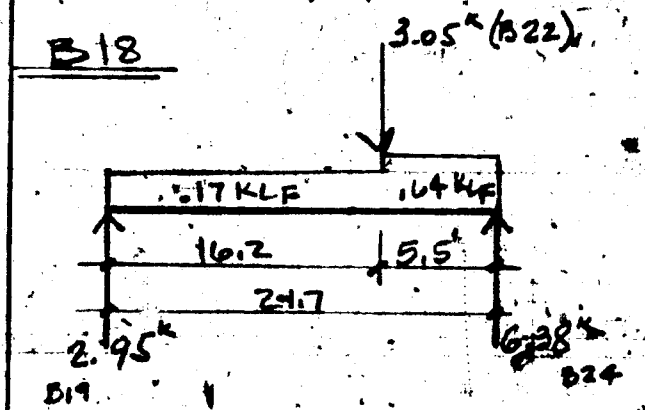
$W_1 = 3.5'(100+[illegible]) + 3.5'(40+66)$
$= [illegible]$ PLF

$W_2 = 4.5(40+66) = 477$ PLF

$M = 17.1 \times 24.1 - \frac{.48(17.1)^2}{2} = 341.9$ IK

∴ USE W24x[illegible]76
$M_R = 352$

B18



TOP FLANGE UNSUPPORTED FOR 16.2'

$W_1 = 11' \times 15 PSF = 165$

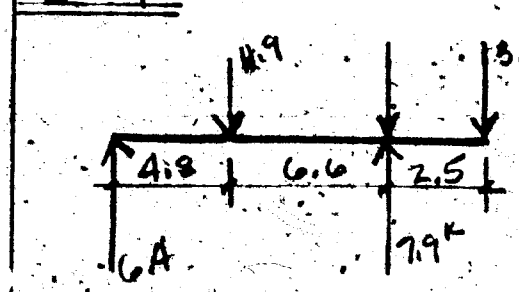
$W_2 = 4.5'(\frac{LL}{40}+\frac{DL}{66}) + 11' \times 15 psf = 642$
(DL = 462)

$M = 2.95(16.2) - .17(16.2)^2 .5 = 25.4$ IK

USE W6x20
$M_R = 29$ IK @ $L_b = 16.2'$

(NO LOAD FROM STAIR #8)

B19



$M_- = 3.0^K \times 2.5' = 7.5$ IK

$M_+ = 6.4^K \times 4.8' = 30.7$ IK

USE W12x14
$M_R = 34$

Work: Local 12/31/87

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2ND FLOOR RMS. – NORTH

B20

SPAN = 34.0 A_T = LL = 40

$w = 5.7(40+66) = 604$ $M = \frac{.604(34.0)^2}{8} = 87.3^{1K}$ $R = 10.3$ DL =

USE W18X35

$M_R = 115$

$\Delta = \frac{87.3(34.0)^2}{80.6 \times 57.6 \times 18} = 1.21" = \text{SPAN}/338$

B21

NO LOAD FROM STAIRS

SPAN = 5.9 A_T = LL =

$w = 3.4'(40+66) + 11' \times 15 PSF = 525$ WALL

$M = \frac{.525(5.9)^2}{8} = 2.3^{1K}$ $R = 1.16^K$ DL =

USE W8X10

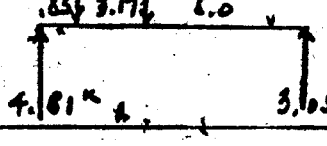
$M_R = 16$

B22

$P_1 = P_2 = \frac{3.17}{2}(50+100)8^2 = 634+1268 = 1902$

SPAN = 9.0' A_T = LL =

$w = 3(50+100) = 450 PLF$ $M = 3.05(5.0) - \frac{.450(5.0)^2}{2} = 7.6^{1K}$ $R = 4.81^{B70}\ 3.05^{B18}$ DL =



USE W8X10

$M_R = 16$

B23

SPAN = 24.0' A_T = LL = 40

$w = 4.7(\overset{LL}{40} + \overset{DL}{66}) = 498$ $M = \frac{.498(24.0)^2}{8} = 35.9^{1K}$ $R = 6.0^K$ DL =

USE W14X22

$M_R = 58$

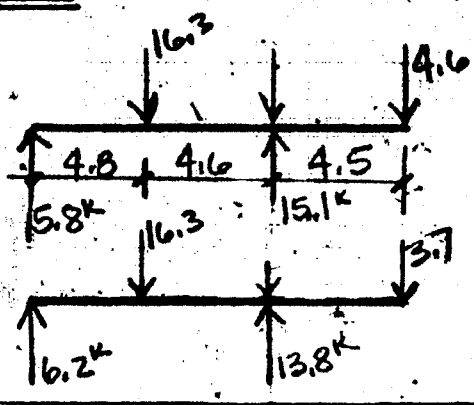
Don Hasel 12/31/84

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ENGINEER/ JRL

2ND FLOOR BMS. - NORTH

B24



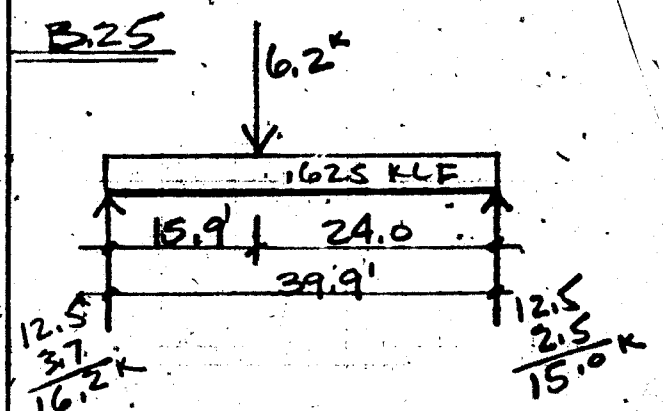
$M_- = 4.6^K \times 4.5' = 20.7^{IK}$

$M+ = 6.2^K \times 4.8' = 29.8^{IK}$

USE. W12x19

$M_R = 43^{IK}$ @ $L_b = 4.2'$

B25



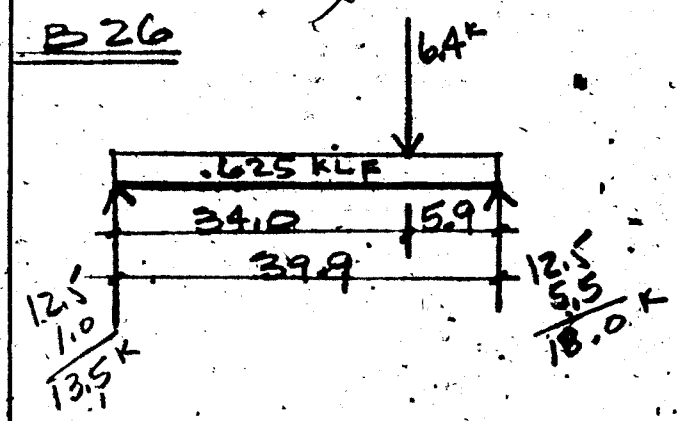
$W = 5.9'(\overset{LL}{40} + \overset{DL}{66}) = 625$

$M = \frac{(15')^2}{2 \times .625} = 180.0^{IK}$

USE W21x50

$M_R = 189$

B26



$W = 5.9'(\overset{LL}{40} + \overset{DL}{66}) = 625$

$M = \frac{(13.5)^2}{2 \times .625} = 145.8^{IK}$

USE W21x44

$M_R =$

Dana Hazel 12/21/87

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ENGINEER/ JRL

2ND FLOOR BMS. – NORTH

B27

SPAN = 39.9' A_T = LL = 40

$w = 7.0(40+106) = 742$ $M = \frac{.742(39.9)^2}{8} = 147.7^{IK}$ $R = 14.8$ R_{DL} =

USE W21x44

$\Delta = \frac{147.7(39.9)^2}{80.6 \times 81.6 \times 21} = 1.70" = \frac{SPAN}{281}$, $M_R = 163$, $\Delta_{LL} = \frac{40}{106} \times 1.70 = .64" = \frac{SPAN}{746}$

B28

SPAN = 10.6 A_T = LL =

$w = 4.3'(\overset{LL}{40}+\overset{DL}{106}) = 456^{PLF}$ $M = \frac{.456(10.6)^2}{8} = 6.4^{IK}$ $R = 2.4^K$ R_{DL} =

USE W8x10

$M_R = 16$

B29

Axial Load from x-brace

$w = 4.3'(40+66) = 456$ PLF

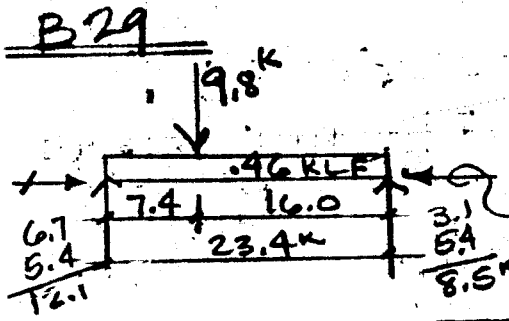
$P = 16' \times 17' (\overset{ROOF}{20}+16) = 9.8^K$

$M = 16.0' \times 8.5^K - \frac{.46(16)^2}{2} = 77.1^{IK}$

AXIAL LOAD = (1.25 x 20.1K)

USE 10x16x36

$M_R = 113$



B30

SPAN = 24.0 A_T = LL =

$w = 3.3'(40+66) = 350$ $M = \frac{.35(24)^2}{8} = 25.2$ $R = 4.2$ R_{DL} =

USE W12x14

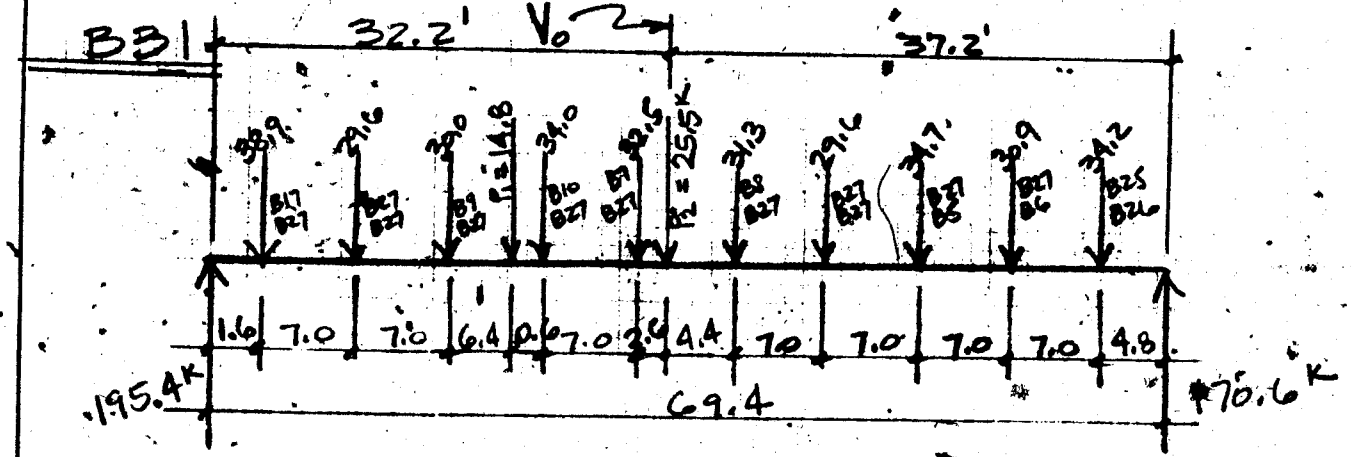
$M_R = 30$

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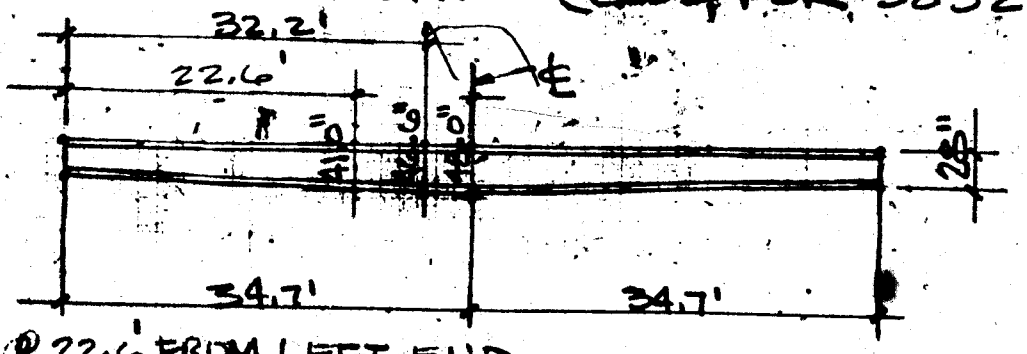
$P_1 = (3.9^{B12} + 12.2^{B44} + 0.6^{B32}) \times \frac{32}{36}$ (LL REDUCTIONS) $= 14.8^K$

$P_2' = (24.2^{B53} + 3.9^{B12} + 0.6^{B32}) \times \frac{32}{36} = 25.5^K$

$M = 37.2' \times 170.6^K - 4.4 \times 31.3 - 11.4 \times 29.6 - 18.4 \times 34.7 - 25.4 \times 30.9 - 32.4 \times 34.2 = 3339.7^{IK}$

EQUIV. UNIF. LOAD $= \frac{8 \times 3339.7^*}{(69.4)^2} = 5.55^{K}/_{FT.}$

LARGEST RIVERSIDE 48/28 TAPERED GIRDER WILL NOT WORK. (GOOD FOR 3832 PLF)



MOM. @ 22.6' FROM LEFT END
$= 22.6' \times 195.4^K - .6' \times 14.8 - 7.0' \times 30.0 - 14.0' \times 29.6 - 21.0' \times 38.9$
$= 2965.9^{IK}$

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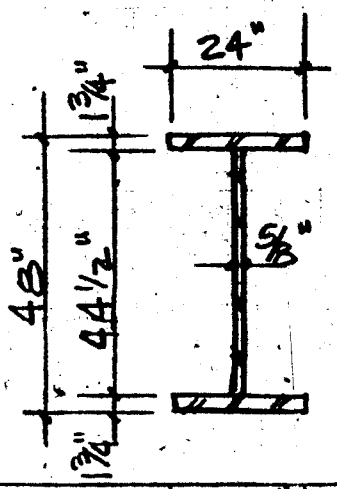
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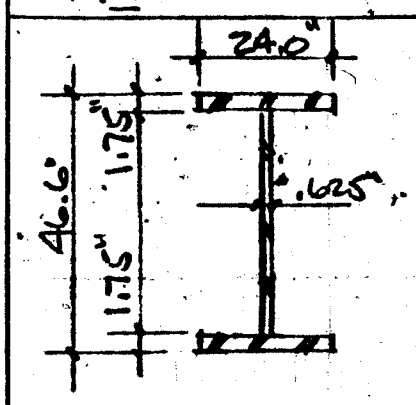
BBI, CONT.

SECTION @ ℄



A = 111.8
I_x = 49510.0
S_x = 2062.9

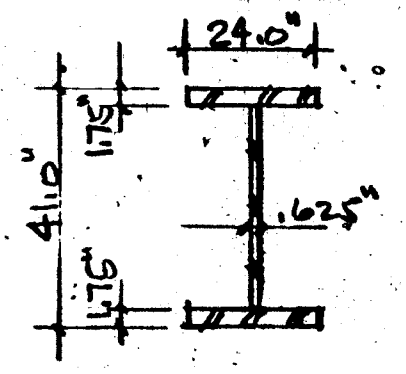
SECTION @ 32.2' FROM LEFT END



A = 110.9
I_x = 46411.9
S_x = 1991.9

$$f_b = \frac{3339.7 \times 12}{1991.9} = 20.12 \text{ ksi}$$

SECTION @ 22.6' FROM LEFT END



A = 107.4
I_x = 35098.4
S_x = 1712.1

$$f_b = \frac{2965.9 \times 12}{1712.1} = 20.79 \text{ ksi}$$

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B31, CONT.

CHECK WEB:

MAX. $h/t = \frac{44.5}{.625} = 71$

h/t @ SUPPORT $= \frac{24.5}{.625} = 39$

ALLOW. SHEAR = 14.5 KSI

MAX. $f_v = \frac{195.4^K}{.625 \times 28} = 11.2 KSI < 14.5$

WEB STIFFS., NOT REQD.
(1.10-1)
(TABLE 10-36)
(1.10.5.3)

CHECK FLANGES:

$\frac{w}{t} = \frac{12"}{1.75} = 6.9 < \frac{95}{\sqrt{36}} = 15.8$ (1.9.1.2)

CHECK FOR WEB CRIPPLING AT COL. 25-G.

$P = 25.5^K$ $\frac{25.5^K}{.625(6" + 2 \times 0)} = 6.8 KSI$ OK (1.10-8)

WEB STIFFS. NOT REQ'D.

FLANGE DEVELOPMENT

$1.75 \times \frac{127}{\sqrt{36}} = 37"$, MAX. WELD SPACING = 12" (1.18.2.3)

AT THE LEFT END REACTION:

$V = 195.4^K$
$Q = 24" \times 1.75" \times 13.13" = 551 IN^3$
$I_x = 15,236 IN^4$

$\frac{VQ}{I} = \frac{195.4 \times 551}{15236} = 7.07^K/11$

USE 5/16" FILLETS CONTINUOUS BA. SIDE
GOOD FOR $2 \times 4.6 = 9.2^K/11$

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B31, CONT.

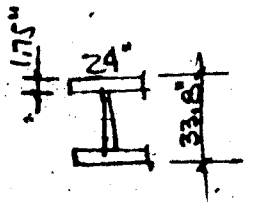
AT 10' FROM THE LEFT END:

$V = 195.4 - 38.9 - 29.6 = 126.9^K$

$Q = 1.75" \times 24" \times 16.03" = 673.0\ IN^3$

$I_x = 23020\ IN^4$

$$\frac{VQ}{I} = \frac{126.9 \times 673}{23020} = 3.71^K/11$$



USE 5/16" FILLETS
6" LONG @ 12" O.C.
EA. SIDE
GOOD FOR $\frac{2 \times 6" \times 4.6}{12"} = 4.6^K/11$

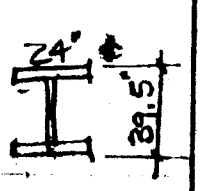
AT 20' FROM THE LEFT END:

$V = 195.4 - 38.9 - 29.6 - 30.0 = 96.9^K$

$Q = 1.75" \times 24" \times 18.88" = 792.7\ IN^3$

$I_x = 32,356\ IN^4$

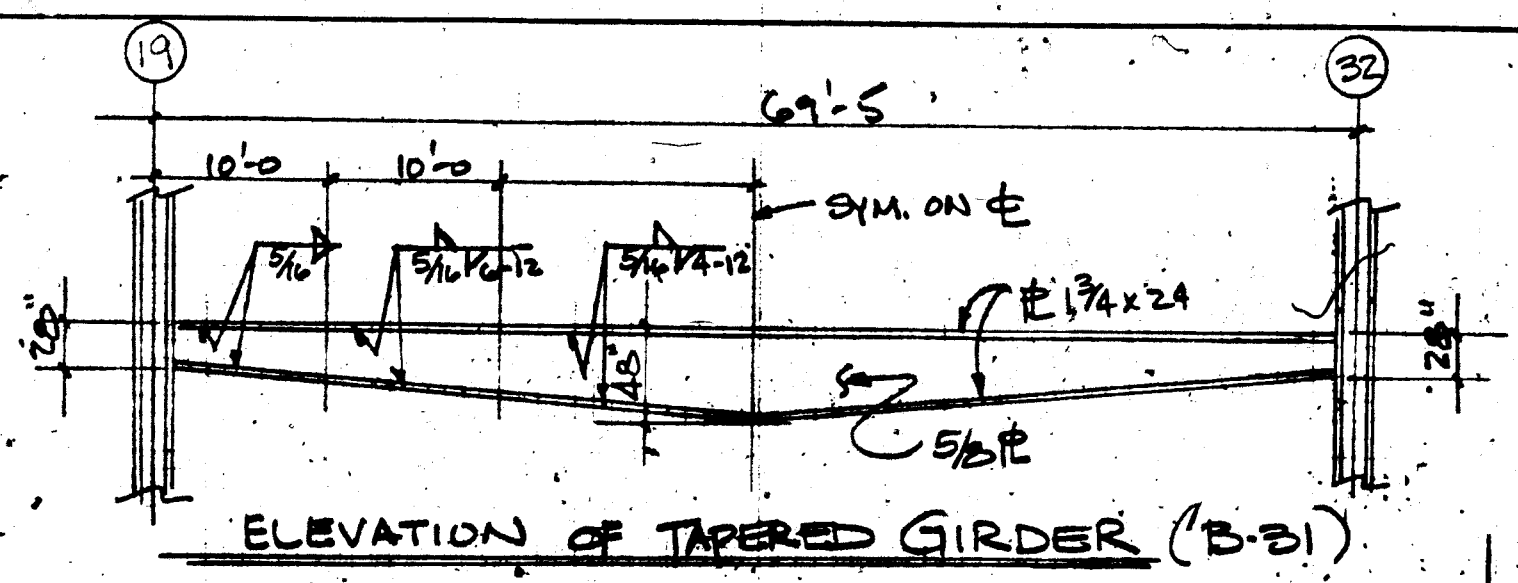
$$\frac{VQ}{I} = \frac{96.9 \times 792.7}{32,356} = 2.37^K/11$$



USE 5/16" FILLETS
4" LONG @ 12" O.C.
EA. SIDE
GOOD FOR $\frac{2 \times 4" \times 4.6}{12"} \doteq 3.07^K/11$

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ELEVATION OF TAPERED GIRDER (B-31)

AVERAGE $I_x = \frac{\text{℄ } 49510 + \text{END } 15236}{2} = 32373 \text{ IN}^4$

AVERAGE DEPTH $= \frac{28+48}{2} = 38.0"$

AVERAGE $S_x = \frac{32373}{.5 \times 38} = 1703.8 \text{ IN}^3$.

APPROX. $\Delta = \frac{3339.7^{1K} \times (69.4)^2}{80.6 \times 1703.8 \times 88} = 3.08"$ (CONSERVATIVE)

APPROX. $\Delta_L = \frac{40}{106} \times 3.08" = 1.16" = \frac{\text{SPAN}}{723}$

APPROX. $\Delta_{DL} = 3.08 - 1.16" = 1.92"$

CAMBER 2", PARABOLIC

B31 CONT.

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2ND FLOOR BMS. – NORTH

B32

SPAN = 39.9' A_T =

$w = 2.9'(\frac{LL}{100}+\frac{DL}{66}) + 3.5'(\frac{LL}{40}+\frac{DL}{66}) = 852$ PLF

$M = \frac{.852(39.9)^2}{8} = 169.6$

$R = 17.0^K$ (DL=)

LL = {100 / 40

USE W21x50

$M_R = 189$

B33

SPAN = 28.0' A_T =

$w = 5.8'(100+66) = 963$

$M = \frac{.963(28)^2}{8} = 94.4^{IK}$

$R = 13.5^K$ (DL=)

LL =

USE W18x35

$M_R = 115$

B34

SPAN = 11.7' A_T =

$w = 5'(40+66) + 5'x15PSF = 1605$ PLF

$M = \frac{1.605(11.7)^2}{8} = 10.4^{IK}$

$R = 3.5$ (DL=)

LL =

USE W8x10

$M_R = 16$

B35

SPAN = 11.7' A_T =

$w = 6'(40+66) = 636$

$M = \frac{.636(11.7)^2}{8} = 10.9$

$R = 3.7^K$ (DL=)

LL =

USE W8x10

$M_R = 16$

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2ND FLOOR BMS. – NORTH

B36

SPAN = 28.0' A_T = LL =

$w = 3.9'(100+66) = 647$ $M = \frac{647(28.0)^2}{8} = 63.4$ R = 9.1 DL =

USE W16x26 $M_R = 77$

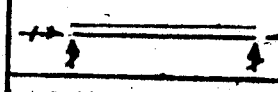
Axial Load from x-brace

B37

SPAN = 24.2' A_T = LL =

$w = 3.2'(100+66) = 531$ $M = \frac{531(24.2)^2}{8} = 38.9$ R = 6.4 DL =

USE W14x34 $M_R = 58$



B38

SPAN = 24.2 A_T = LL =

$w = 4.4'(100+66) = 730$ $M = \frac{730(24.2)^2}{8} = 53.4$ R = 8.8 DL =

USE W14x22 $M_R = 58$

B39

SPAN = 24.2' A_T = LL =

$w = 5.3'(100+66) = 880$ $M = \frac{880(24.2)^2}{8} = 64.4$ R = 10.6 DL =

USE W16x26 $M_R = 77$

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2ND FLOOR BMS. — NORTH

B40

SPAN = 24.2' A_T = LL = 100

w = 7.0'(100+66) = 1162 $M = \frac{1.162(24.2)^2}{8} = 851$ R = 14.1 DL =

USE W16x31

M_R = 94

B41

SPAN = 19.7' A_T = LL = 60

w = 7.0'(60+66) = 882 $M = \frac{.882(19.7)^2}{8} = 42.8$ R = 8.7 DL =

USE W14x22

M_R = 58

B42

SPAN = 19.7 A_T = LL = 60

w = 6'(60+66) = 756 $M = \frac{.756(19.7)^2}{8} = 36.7$ R = 7.5 DL =

USE W12x19

M_R = 43

B43

SPAN = 19.7 A_T = LL = {60 / 100

w = 2.5'(60+66) + 2.2'(100+66) = 680 $M = \frac{.68(19.7)^2}{8} = 33.0$ R = 6.7 DL =

USE W12x19

M_R = 43

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2ND FLOOR BMS. – NORTH

B44

SPAN = 19.7 A_T = LL =

$w = 4.5'(100+66) = 747$ $M = \frac{.747(19.7)^2}{8} = 36.2$ R = 7.4 DL =

USE W12x19

$M_R = 43$

B45

SPAN = 19.7 A_T = LL =

$w = 5.6'(100+66) = 930$ $M = \frac{.93(19.7)^2}{8} = 45.1$ R = 9.2 DL =

USE W14x22

$M_R = 58$

B46

SPAN = 19.7 A_T = LL =

$w = 6.9(100+66) = 1145$ $M = \frac{1.145(19.7)^2}{8} = 55.6$ R = 11.3 DL =

USE W16x26

$M_R = 77$

B47

SPAN = 19.7 A_T = LL =

$w = 4.4'(100+66) = 730$ $M = \frac{.73(19.7)^2}{8} = 35.4$ R = 7.2 DL =

USE W12x19

$M_R = 43$

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2ND FLOOR BMS. – NORTH

B48

SPAN = 16.2' A_T = LL =

w = 5'(60+66) = 630 $M = \frac{.63(16.2)^2}{8} = 20.7$ R = 5.1 DL =

USE W12x14

$M_R = 30$

B49

SPAN = 16.2' A_T = LL =

w = 7.0(60+66) = 882 $M = \frac{.882(16.2)^2}{8} = 28.9$ R = 7.1 DL =

USE W12x16

$M_R = 34$

B50

SPAN = 16.2 A_T = LL =

w = 6'(60+66) = 756 $M = \frac{.756(16.2)^2}{8} = 24.8$ R = 6.1 DL =

USE W12x14

$M_R = 30$

B51

SPAN = 16.2 A_T = LL =

w = 2.5'(60+66) + 2.2'(100+66) = 680 $M = \frac{.168(16.2)^2}{8} = 22.3$ R = 5.5 DL =

USE W12x14

$M_R = 30$

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2ND FLOOR BMS. – NORTH

B52

SPAN = 16.2 A_T = LL =

$w = 4.5(100+66) = .747$ $M = \frac{.747(16.2)^2}{8} = 24.5$ R = 6.1 DL =

USE W12x14

$M_R = 30$

B53

SPAN = 16.2 A_T = LL =

$w = 5.6'(100+66) = 930$ $M = \frac{.93(16.2)^2}{8} = 30.5$ R = 7.5 DL =

USE W12x16

$M_R = 34$

B54

SPAN = 16.2 A_T = LL =

$w = 6.9'(100+66) = 1145$ $M = \frac{1.145(16.2)^2}{8} = 37.6$ R = 9.3 DL =

USE W12x19

$M_R = 43$

Axial Load From x-brace.

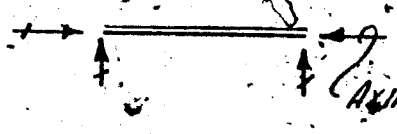
B55

SPAN = 16.2 A_T = LL =

$w = 4A'(100+66) = 730$ $M = \frac{.73(16.2)^2}{8} = 24.0$ R = 5.9 DL =

USE W12x26

$M_R = 67$



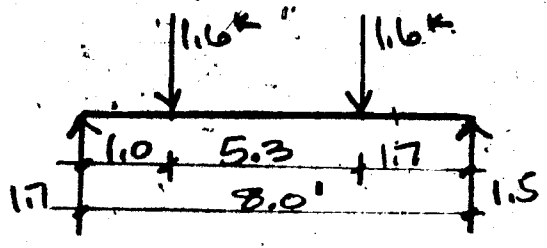
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B56 (STAIR BM.)

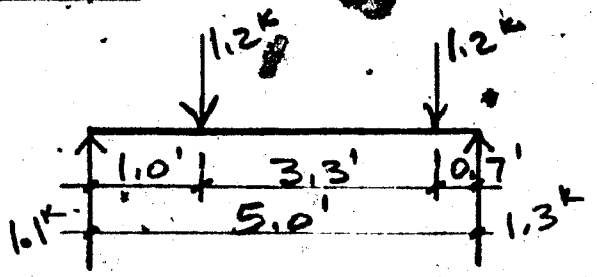


$P = \frac{5.3'}{2} \times 1K \times \frac{8'}{2} \left(\frac{LL}{100} + \frac{DL}{50}\right) = 1590\ lb$

$M = 1.5^K \times 1.7' = 2.6\ ^{IK}$

USE W8X10
$M_R = 16$

B57 (STAIR B[illegible].)

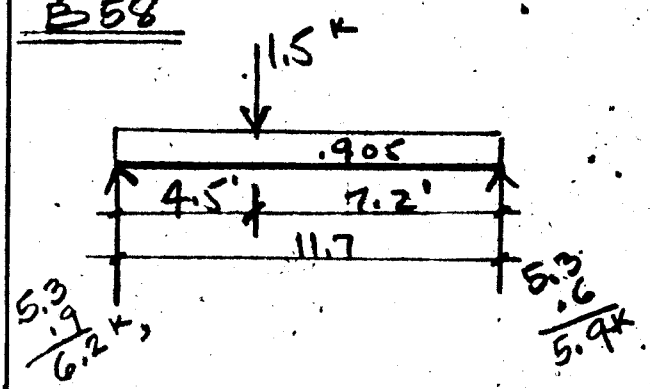


$P = \frac{3.3'}{2} \times \frac{10'}{2} \left(\frac{LL}{100} + \frac{DL}{50}\right) = 1238\ lb$

$M = 1.1^K \times 1.0' = 1.1\ ^{IK}$

USE W8X10
$M_R = 16$

B58



$W = 5'\left(\frac{LL}{100} + \frac{DL}{66}\right) + 5' \times 15\ PSF$
$= 905\ PLF$

$M = \frac{(5.9)^2}{2 \times .905} = 19.2\ ^{IK}$

USE W12X14
$M_R = 30$

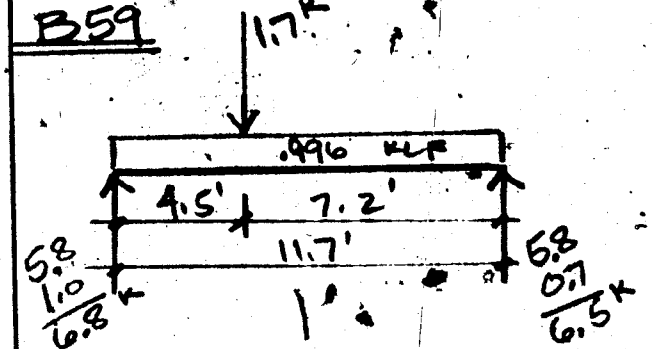
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2ND FLOOR BMS. - NORTH

B59

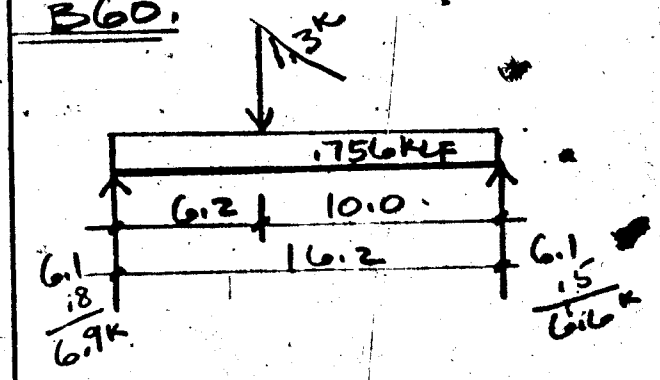


$W = 6'(\frac{LL}{100} + \frac{DL}{66}) = 996$

$M = \frac{(6.5)^2}{2 \times .996} = 21.2^{1K}$

USE W12x14
$M_R = 30$

B60

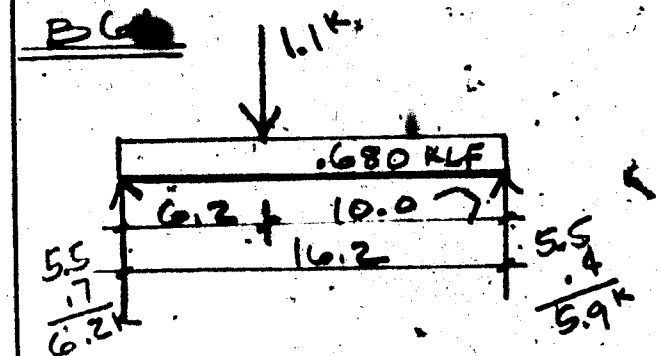


$W = 6'(\frac{LL}{60} + 66) = 756$

$M = \frac{(6.6)^2}{2 \times .756} = 28.8^{1K}$

USE W12x16
$M_R = 34$

B61



$W = 2.5'(\frac{LL}{60} + 66)$
$+ 2.2'(\frac{LL}{100} + 66) = 680$

$M = \frac{(5.9)^2}{2 \times .756} = 23.0^{1K}$

USE W12x14
$M_R = 30$

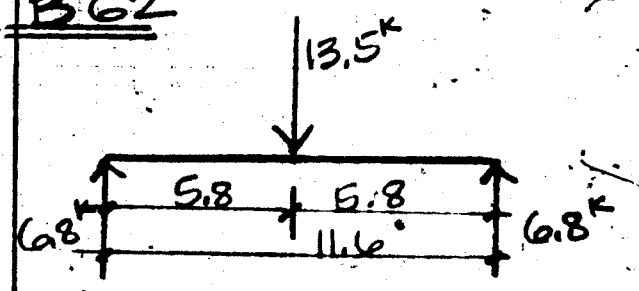
Dora Hacal 12/31/87

STRAUSS & LOFTFIELD
STRUCTURAL ENGINEERS

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DATE/ 10/21/82
ENGINEER/ JRT

2ND FLOOR BMS. - NORTH

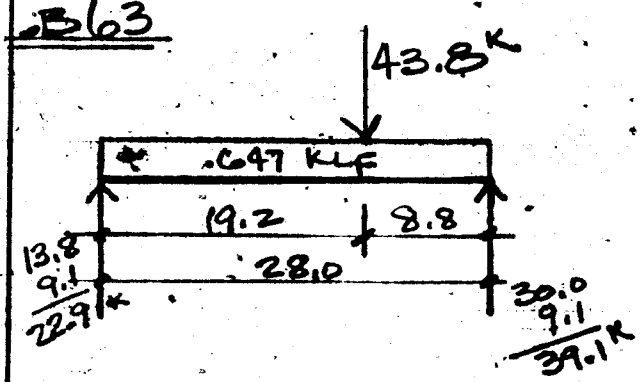
B62



$M = 6.8^K \times 5.8' = 39.4^{IK}$

USE W12x19
$M_R = 43$

B63



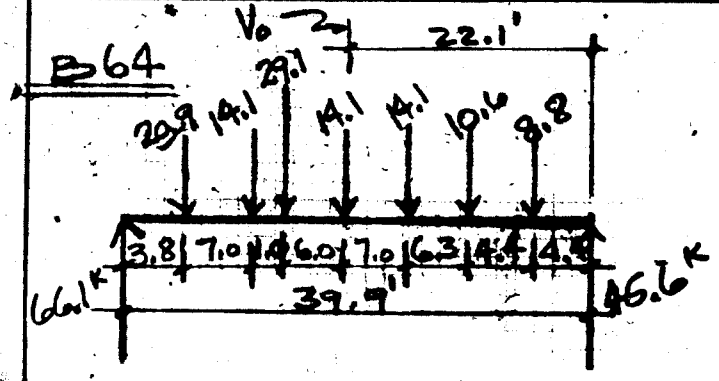
$P = {}^{B15}_{11.5} + {}^{B26}_{3.2} + {}^{B66}_{19.4} + {}^{B29}_{3.1}$ ROOF BEAMS, TYP.
$+ .200 KLF \times \frac{8.8'}{2} + \frac{11.5^K}{2} = 43.8^K$

$W = 3.9'(100+66) = 647 plf$

$M = 39.1^K \times 8.8' - \frac{.647(8.8)^2}{2} = 319.0^{IK}$

USE W24x76
$M_R =$

B64



$M = 22.1' \times 45.6^K - 7.0' \times 14.1 - 13.3' \times 10.6$
$- 17.7' \times 8.8 = 612.3^{IK}$

USE W33x118
$M_R = 718$

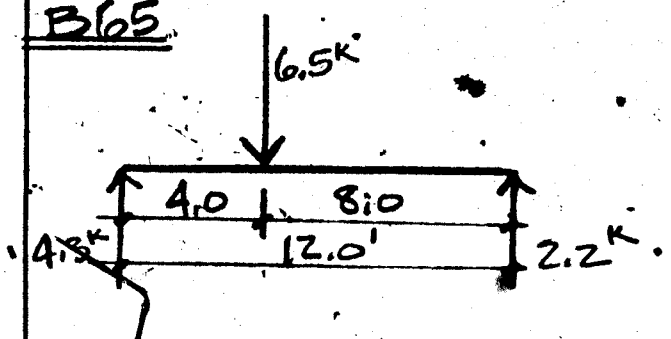
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STRUCTURAL ENGINEERS

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ENGINEER/ JRL

2ND FLOOR BMS. - NORTH

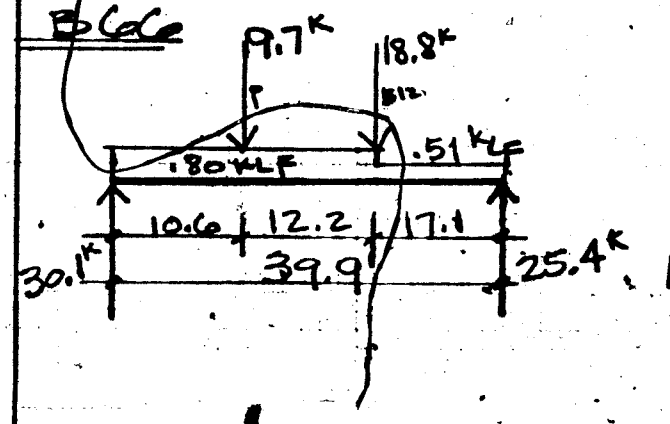
B65



$M = 8' \times 2.2^K = 17.6^{IK}$

USE W10X12
$M_R = 22$

B66



$W_1 = 4.8'(\overset{LL}{100} + \overset{DL}{66}) = 797$ PLF

$W_2 = 4.8'(\overset{LL}{40} + \overset{DL}{66}) = 509$ PLF

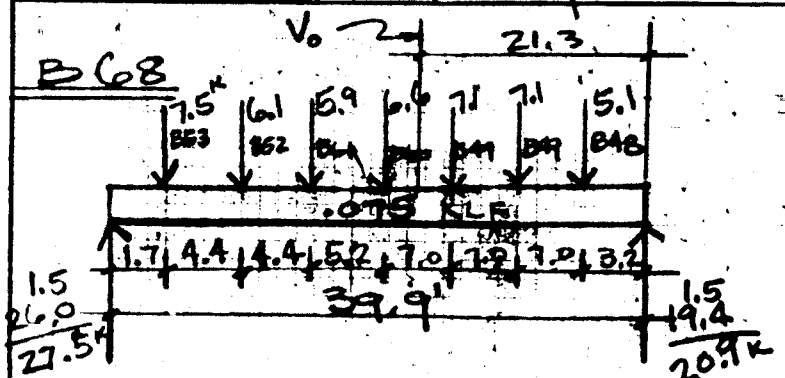
$P = \overset{B69}{4.6} + \overset{B63}{5.1} = 9.7^K$ (ROOF BMS.)

$M = 17.1' \times 25.4^K - .51\frac{(17.1)^2}{2}$

$= 359.8^{IK}$

USE W27X84
$M_R = 426$

B68



$W = 5' \times 15 psf = 75$ PLF

$M = 21.3' \times 20.9^K - 4.1' \times 7.1^K$
$- 11.1' \times 7.1^K - 18.1' \times 5.1^K$
$= 244.9^{IK}$

USE W24X62
$M_R = 262$

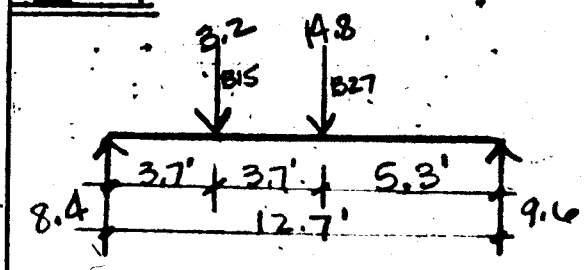
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2ND FLOOR BMS. - NORTH

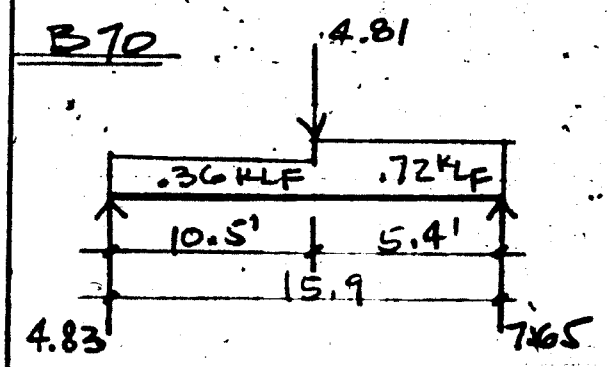
B69



$M = 5.3' \times 9.6^K = 50.9^{IK}$

USE W14x22
$M_R = 58$

B70



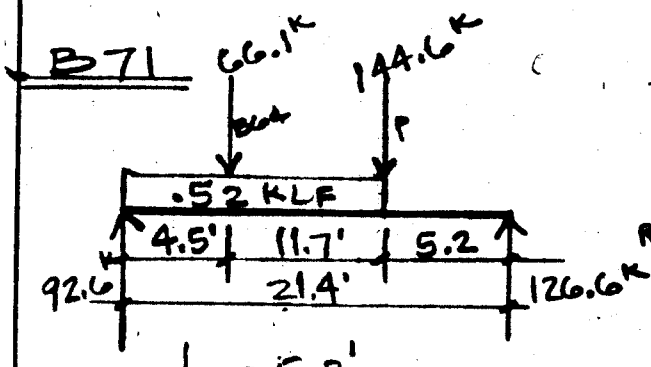
$W_1 = 3.4'(40+66) = 360$ PLF

$W_2 = 6.8'(40+66) = 720$ PLF

$M = 7.65(5.4') - .72(5.4^2) = 30.8^{IK}$

USE W 12x49 (a)
$M_R = 43.0$

B71



$L_b = 5.2'$

$W = 1.5'(60+66) + 2.0'(100+66) = 520$ PLF

$P = {}^{B68}20.9 + {}^{B66}25.4 + {}^{B72}26.2 + {}^{B65}4.3$
$+ {}^{\text{Roof Bms}\to B64}26.1 + {}^{B66}4.8 + {}^{B73}26.0 + {}^{B41}10.9 = 144.6^K$

$M = 5.2' \times 126.6^K = 658.3^{IK}$

USE W33x118
$M_R = 718$ @ $L_b = 12.0'$

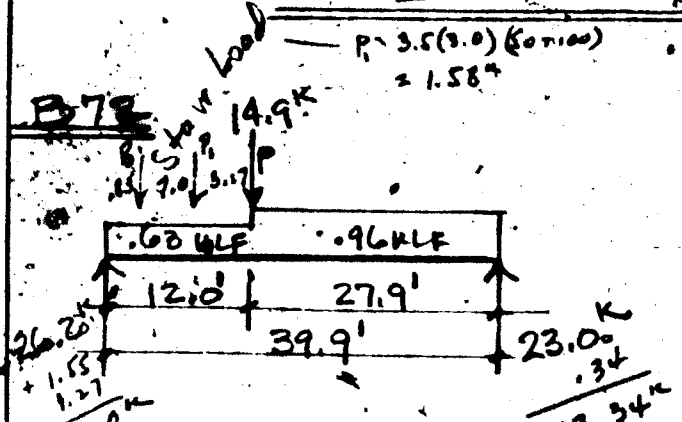
Loma Vista 12/31/87

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STRUCTURAL ENGINEERS

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ENGINEER/ JRL

2ND FLOOR BMS. - NORTH

B73



$W_1 = 5.8'(\frac{LL}{100}+66) = 630$ PLF

$W_2 = 5.8'(100+66) = 963$ PLF

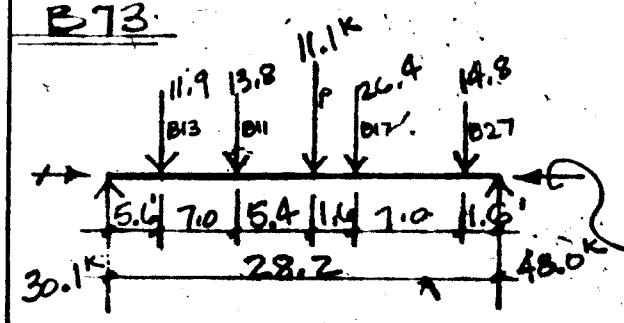
$P = {}^{BG5}2.2 + {}^{BG2}6.8 + {}^{BS8}5.9 = 14.9^K$

$M = \frac{(23.0)^2}{2 \times .96} = 275.5^{IK}$

USE W24x68

$M_R = 308$

B73



$P = {}^{BS2}4.3 + {}^{B10}2.4 + 11.1' \times 10'(\frac{LL}{20}+\frac{DL}{20})$ ← ROOF BMS.

$= 11.1^K$

$M = 10.2' \times 48.0^K - 1.6' \times 26.4 - 8.6' \times 14.8^K$

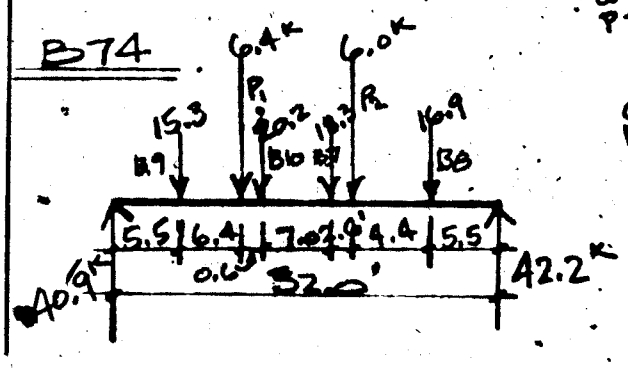
$= 320.1^{IK}$

AXIAL LOAD = (1.25)(5.8K)

USE W24x76

$M_R = 352$

B74



COL. P-23

$P_1 = 16.1' \times 10'(\frac{LL}{20}+\frac{DL}{20}) = 6440 = 6.4^K$

COL. P-25

$P_2 = 15.0' \times 10'(20+20) = 6000 = 6.0^K$

$M = 12.5' \times 40.9^K - .6' \times 6.4 - 7.0' \times 15.3$

$= 400.3^{IK}$

USE W27x84

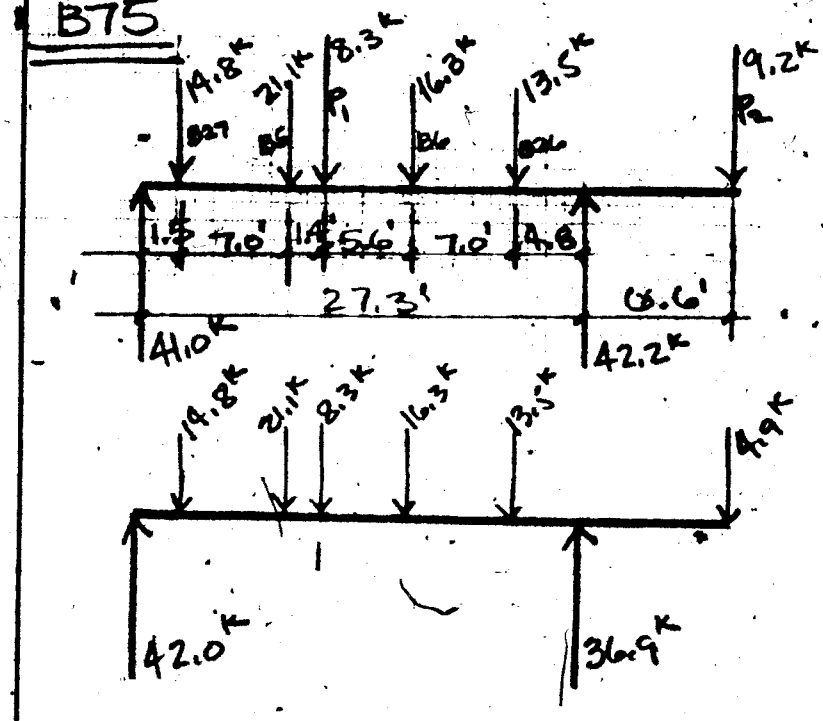
$M_R = 426$

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2ND FLOOR BMS. - NORTH ENGINEER JRL

B75



GL. P-29

$P_1 = 23' \times 10' \left(\frac{LL}{(ROOF)}\ 16 + \frac{DL}{20}\right) = 8280 = 8.3^K$

$P_2 = 17' \times 10' \left(\frac{LL}{(ROOF)}\ 20 + \frac{DL}{20}\right) + \underset{(FLOOR)}{B28}\ 2.4^K = 9.2^K$

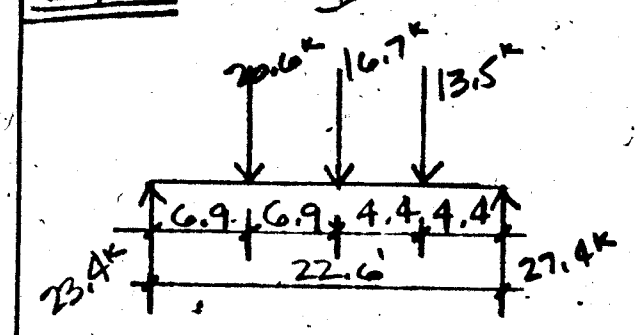
$DL = 3.4 + 2.4 \times \frac{66}{106} = 4.9^K$

MAX. $M_- = 9.2^K \times 6.6'$
$= 60.7^{IK}$

MAX. $M_+ = 9.9' \times 42.0^K - 1.4' \times 21.1^K - 8.4' \times 14.8^K$
$= 261.9^{IK}$

USE W24x68
$M_R = 308$ @ $L_b = 9.5'$

B76



$M = 8.8' \times 27.4^K - 4.4' \times 13.5^K$
$= 181.7^{IK}$

USE W21x50
$M_R = 189$

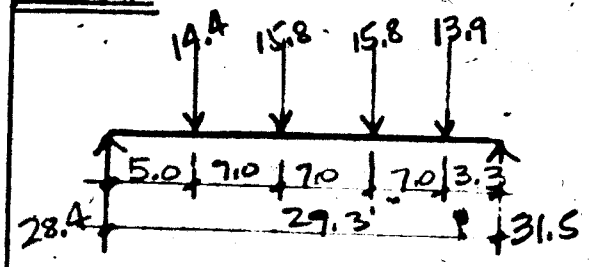
Dave Hasil 12/31/87

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2ND FLOOR BMS. - NORTH

B77

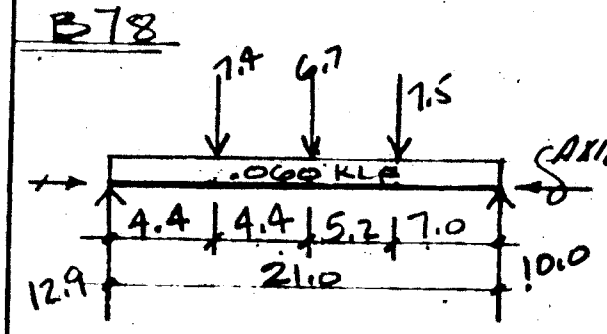


$M = 239.9^{1K}$

USE W24x62

$M_R = 262$

B78



$W = 4' \times 15\ PSF = .060^{KLF}$

AXIAL LOAD = (1.25 x 56.5K)

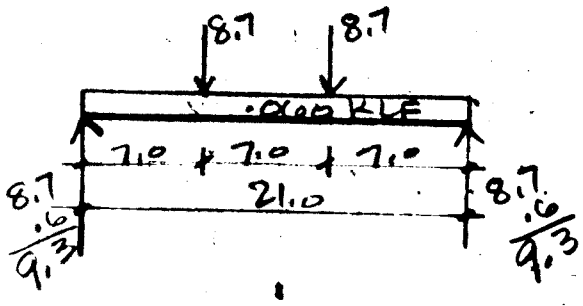
$M = 78.41K$

USE W16x36

$M_R = 113$

B79

Axial Load from x-brace



$W = 4' \times 15\ PSF = .060^{KLF}$

$M = 10.5' \times 9.3^{K} - 3.5' \times 8.7 - \frac{.06(10.5)^2}{2} = 63.9^{1K}$

USE W16x26

$M_R = 77$

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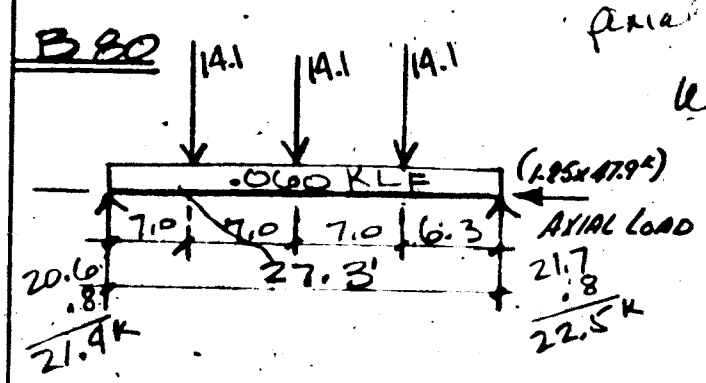
Done Hand, 12/31/87

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2ND FLOOR BMS. - NORTH

B80



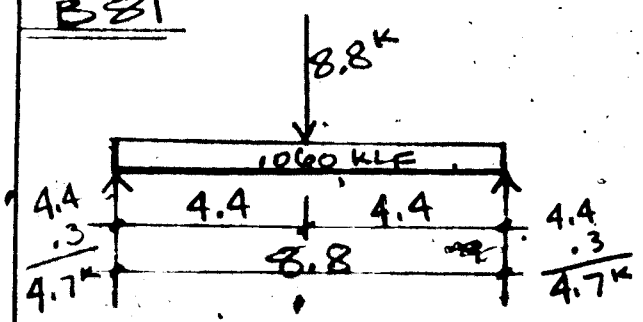
Axial Load from x-brace

$W = 4' \times 15\ PSF = 60\ PLF$

$M = 13.3' \times 22.5^K - 7.0 \times 14.1 - \frac{.06(13.3)^2}{2} = 195.4^{IK}$

USE W24x55 ✓
$M_R = 228$

B81

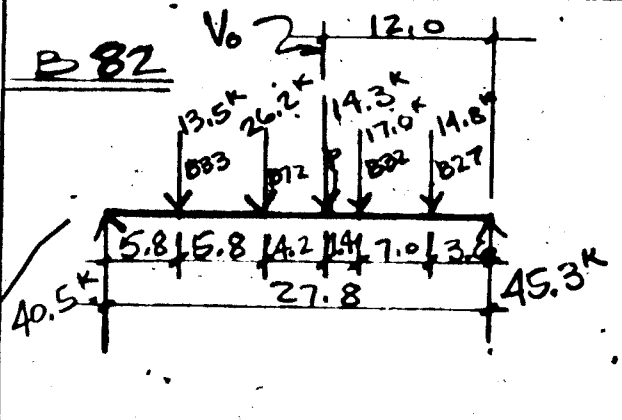


$W = 60\ PLF$ (SEE B80)

$M = 4.4' \times 4.7^K - \frac{.06(4.4)^2}{2} = 20.1^{IK}$

USE W12x14
$M_R = 30$

B82



$P_2 = \overset{B37}{4.8} + \overset{B36}{7.7} + 8' \times 5.5' \left(\overset{LL}{20} + \overset{DL}{20}\right)$ ← ROOF BMS.

$= 14.3^K$

$M = 12.0' \times 45.3^K - 1.4 \times 17.0 - 8.4 \times 14.8$

$= 395.5^{IK}$

USE W27x84
$M_R = 426$

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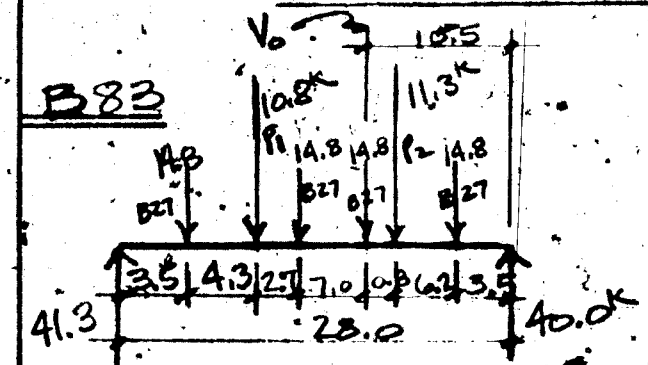
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2ND FLOOR BMS. - NORTH

B83



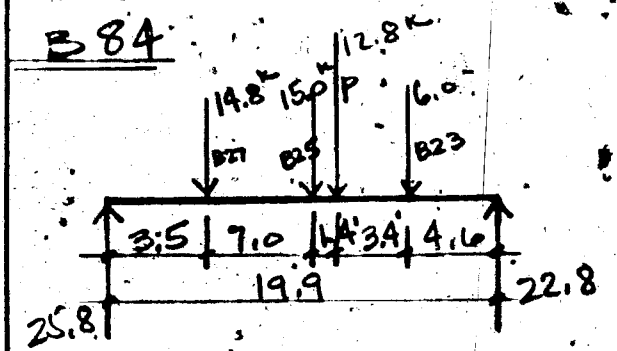
Col. A-20 — Roof Bms
$P_1 = 4.8^{B37} + 6.0^{B42} = 10.8^K$

Col. A-22 — Roof Bms
$P_2 = 4.8^{B37} + 6.5^{B43} = 11.3^K$

$M = 10.5' \times 40.0^K - .8 \times 11.3 - 7.0 \times 14.8$
$= 307.4^{1K}$

USE W24x76
$M_R = 362$

B84

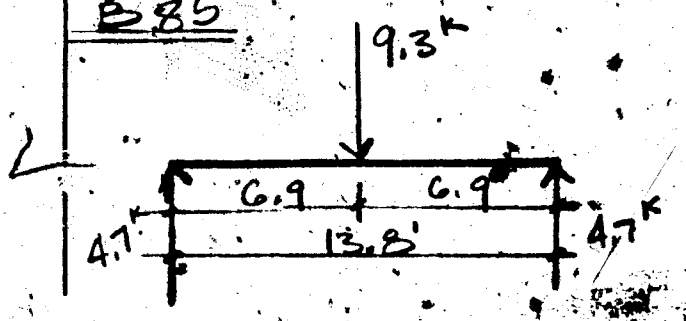


Col. A-31 — Roof Bms.
$P = 4.8^{B37} + 4.6^{B54} + 13' \times 6.5' (20+20)$
$= 12.8^K$

$M = 167.5^{1K}$

USE W21x50
$M_R = 189$

B85



$M = 4.7^K \times 6.9' = 32.4^{1K}$

USE W12x19
$M_R = 43$

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2ND FLOOR BMS. – NORTH

B36

SPAN = 9'± A_T = LL =

W = NONE M = R = DL =

STAIR #7 Same as STAIR & B22 USE W8X10 M_R =

B

SPAN = A_T = LL =

W = M = R = DL =

USE M_R =

B

SPAN = A_T = LL =

W = M = R = DL =

USE M_R =

B

SPAN = A_T = LL =

W = M = R = DL =

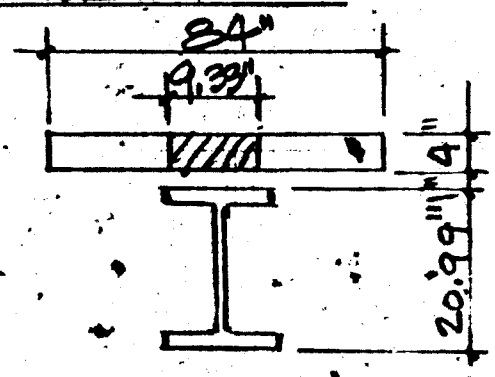
USE M_R =

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VIBRATION ANALYSIS: BEAMS B27
(W21x62)



SLAB WIDTH = 7'-0
$n = 9$, $b_e = 84/9 = 9.33"$

SPAN = 39.9' = 479"

$I_t = 3616$ (BY HP-41-C PROGRAM) $I_x = 1330$ $A = 18.3$

$W = 7' \times 66 \text{ psf} \times 39.9' = 18430\# = 18.4^K$

$$f = 1.57\left[\frac{386 \times 29000 \times 3616}{18.4\,(479)^3}\right]^{1/3} = 7.02 \text{ cps}$$

$$\frac{A_{OT}}{(DLF)_{MAX}} = \frac{600(479)^3}{48 \times 29 \times 10^6 \times 3616} = .0131$$

$0.05f = .05 \times 7.02 = 0.35$

$(DLF)_{MAX} = 0.95$

$A_{OT} = .95 \times .0131 = .012$

$S/de = \frac{84"}{4"} = 21.0$ $L^4/I_t = \frac{(479)^4}{3616} = 14.16 \times 10^6$

$N_{eff} = 2.6$ (FROM CHART), $A_0 = \frac{A_{OT}}{2.6} = \frac{.012}{2.6} = .0046$

$f_x = \frac{147}{24} + 24 = 14.$

THESE BEAMS FALL INTO MIDDLE OF "SLIGHTLY PERCEPTIBLE" RANGE

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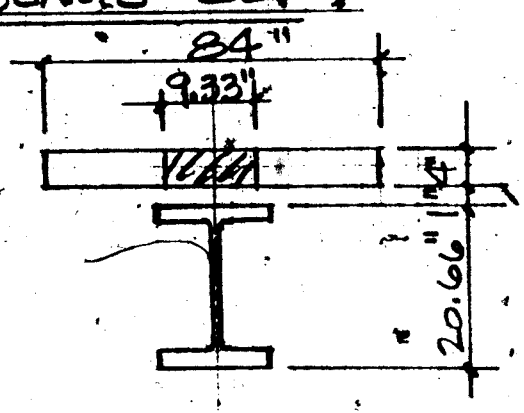
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PROJECT/ PROJECT #
DATE/ 10/27/82
ENGINEER/ JRL

VIBRATION ANALYSIS: BEAMS B27

(W21x44)



SLAB WIDTH = 7'-0
$n = 9$, $b_e = 84/9 = 9.33"$

SPAN = 39.9' = 479" $I_x = 843$ $A = 13.0$

$I_t = 2606$ (BY HP-41-C PROGRAM)

$W = 7' \times 66 PSF \times 39.9' = 18430\# = 18.4K$

$$f = 1.57\left[\frac{386 \times 29000 \times 2606}{18.4\,(479)^3}\right]^{1/2} = 5.96 \text{ cps}$$

$\frac{A_{OT}}{(DLF)_{MAX}} = \frac{600\,(479)^3}{48 \times 29 \times 10^6 \times 2606} = .0182$

$0.05f = .05 \times 5.96 = 0.30$

$(DLF)_{MAX} = 0.9$ (FROM CHART)

$A_{OT} = .9 \times .0182 = .016$

$S/de = \frac{84"}{4} = 21.0$, $L^4/I_t = \frac{(479)^4}{2606} = 20.2 \times 10^6$

$N_{eff} = 3.2$ (FROM CHART), $A_o = \frac{A_{OT}}{3.2} = \frac{.016}{3.2} = .005$

THESE BEAMS FALL INTO MIDDLE OF "SLIGHTLY PERCEPTIBLE" RANGE

$I_t = \frac{147.7}{16.2} \times 24 = 217 K$

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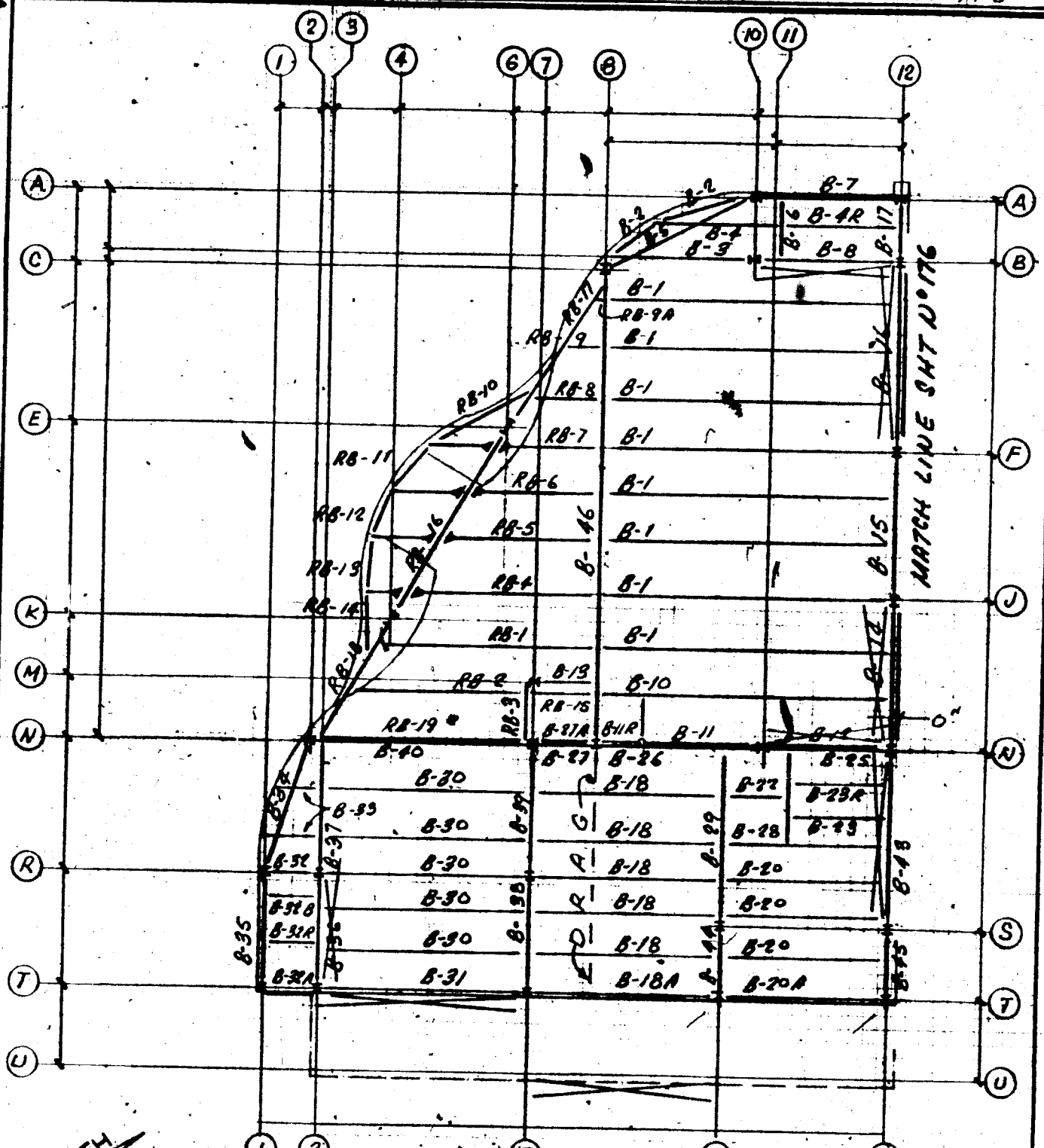
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PROJECT # 82017

DATE/ OCT '82

ENGINEER/ HS

3RD LEVEL SOUTH HALF



3RD FLR-CURRENT ROOF-FRMG PLAN

SCALE 1"=20'-0"

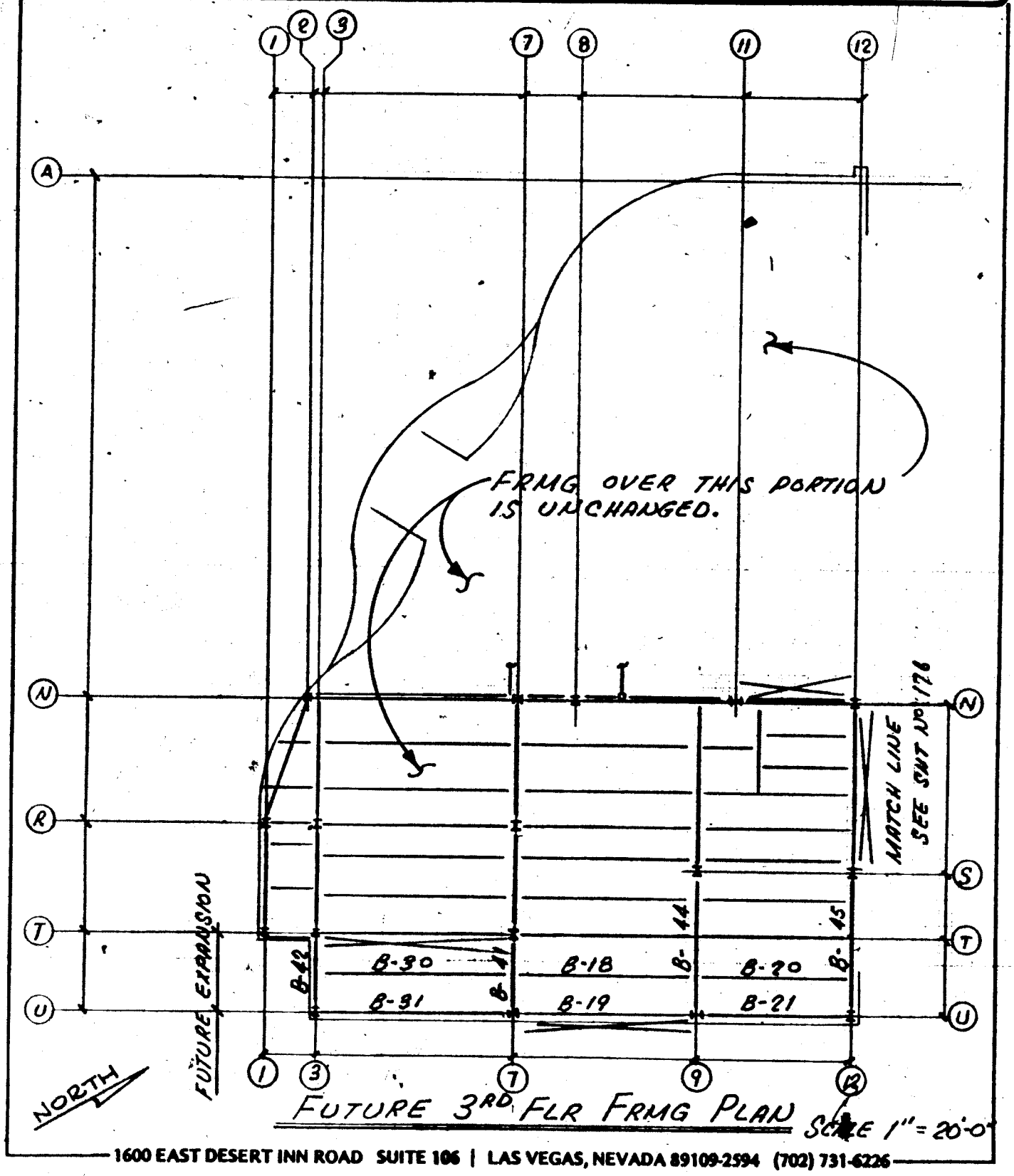
1600 EAST DESERT INN ROAD SUITE 106 | LAS VEGAS, NEVADA 89109-2594 (702) 731-6226

Dona Hocal 12/31/87

STRAUSS & LOFTFIELD
STRUCTURAL ENGINEERS

CLIENT/
PROJECT/
SHEET/ 161 OF 317
PROJECT # 8207
DATE/ OCT '82
ENGINEER/ HS

3RD LEVEL SOUTH HALF



FUTURE 3RD FLR FRMG PLAN SCALE 1" = 20'-0"

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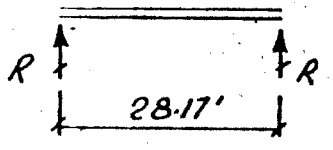
CLIENT/ SHEET 162 OF 317
PROJECT/ PROJECT # 82017
DATE/ OCT '82
3RD LEVEL SOUTH HALF ENGINEER/ HS

3RD LEVEL FRMG B-1 THRU B-46 & RB-1 THRU RB-19

FOR BMS B-1 THRU B-29 SEE 2ND LEVEL FRMG

NOTE: FUTURE FLR LOADS GOVERN { ROOF LOAD'G = (76 PSF$_{DL}$ + 6 PSF$_{FRMG}$ + 20 PSF$_{LL}$) = 102 PSF
FLR LOAD'G = (78 PSF$_{DL}$ + 8 PSF$_{FRMG}$ + 30 PSF$_{LL\ MIN}$) = 116 PSF$_{MIN}$

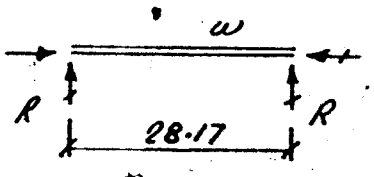
B-30



TRIB 28.17 (6.88) = 193 #
R = (.08%)(193 - 150) = 3% → LL = 49 #/ft
w = 6.88 (.086 K/ft + .049 K/ft) = (.59 K/ft$_D$ + .34 K/ft$_L$) = 0.93 K/ft
R = (8.31 K$_D$ + 4.79 K$_L$) = 13.10 K
M = 92.3 K-FT
(1/20)(28.17 x 12") = 16.9" → W18$_{MIN}$

USE W18 x 35

B-31



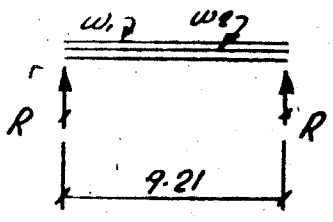
AXIAL LOAD = 44.5 x 1.25 from SHT N°

w = (5.71/2)(.086$_D$ + .050$_L$) = (0.25 K/ft$_D$ + 0.14 K/ft$_L$) = 0.39 K/ft
R = (3.52 K$_D$ + 1.97 K$_L$) = 5.49 K
M = 38.7 K-FT

FOR FUTURE EXPANSION:
w = ((5.71 + 6.0)/2)(.086 + .050$_L$) = (.51 K/ft$_D$ + .29 K/ft$_L$) = 0.80 K/ft
R = (7.18 K$_D$ + 4.09 K$_L$) = 11.27 K
M = 79.4 K-FT

USE W14 x 53

B-32



w$_1$ = (4.88/2)(.086 + .050) = (.21 K/ft$_D$ + .13 K/ft$_L$) = 0.34 K/ft
w$_2$ = (4.00/2)(.050 + .100) = (.10 K/ft$_D$ + .20 K/ft$_L$) = 0.30 K/ft
(.31 K/ft$_D$ + .33 K/ft$_L$) = 0.64 K/ft
R = (1.43 K$_D$ + 1.52 K$_L$) = 2.95 K
M = 6.8 K-FT

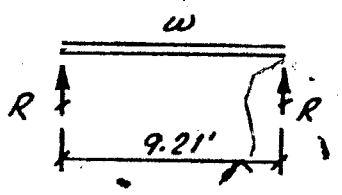
USE W8 x 10

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B-32 A



$w = 16'(.021^K/\text{ft}_D) + 0.03^K/\text{ft}_D = 0.37^K/\text{ft}_D$

$R = 1.70^K_D$

$M = 4.0^{K\text{FT}}$ @ $\ell_u = 9.2'$

WIND GIRT:

$p_w = 27^\#/\text{ft}$ REF B-7

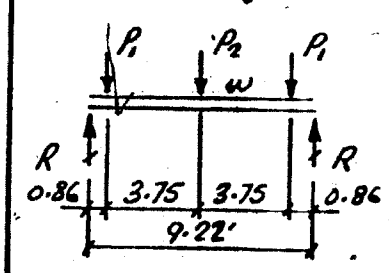
$M_w = (.027^K/\text{ft} \times 14')(9.21)^2/8 = 4.0^{K\text{FT}}$

$\Delta_w = \frac{5(.378^K/\text{in})(9.21)^4(1728)}{384\,(29\times10^3)\,I} = \frac{2.11}{I} < 0.30$

$I_Y > 2.11/0.30 = 7.1\,\text{in}^4$

USE W8x21

B-32B



$w = (4.0/2)(.050^K/\text{ft}_D + .100^K/\text{ft}_L) = (0.10^K/\text{ft}_D + 0.20^K/\text{ft}_L) = 0.30^K/\text{ft}$

$P_1 = (0.83^K_D + 1.67^K_L) = 2.50^K$

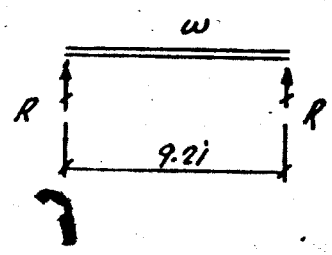
$P_2 = (1.66^K_D + 3.34^K_L) = 5.0^K$

$R = (2.12^K_D + 4.26^K_L) = 6.38^K$

$M = 16.9^{K\text{FT}}$

USE W12x16

B-32R



ROOF LL APPLIES - TO BE REMOVED FOR FUTURE EXPANSION

$w = 7(.082^K/\text{ft} + .020^K/\text{ft}) = (.58^K/\text{ft}_D + .14^K/\text{ft}_L) = 0.72^K/\text{ft}$

$R = (2.67^K_D + 0.65^K_L) = 3.32^K$

$M = 7.7^{K\text{FT}}$

USE W8x10

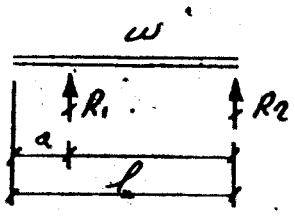
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B-33



@ $l = 9.0'$ & $a = 1.5'$

$w = 5.88(.086_D + .050_L) = (.51^{K/'}_D + .30^{K/'}_L) = 0.81^{K/'}$

$R_1 = (2.75^K_D + 1.62^K_L) = 4.37^K$
$R_2 = (1.84^K_D + 1.08^K_L) = 2.92^K$
$-M = 0.9^{K\text{-}FT}$

w/o LL ON OVRHNG: $R_1 = (2.75^K_D + 1.13^K_L) = 3.88^K$
$R_2 = (1.84^K_D + 1.13^K_L) = 2.97^K$
$+M_{3.667} = 5.5^{K\text{-}FT}$

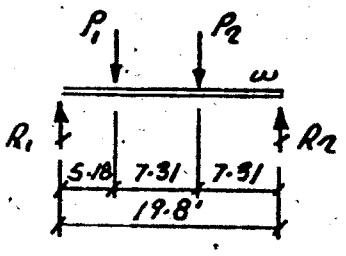
@ $l = 7.0'$ & $a = 2.0'$

$w = 6.88(.086_D + .050_L) = (.59^{K/'}_D + .35^{K/'}_L) = 0.94^{K/'}$
$R_1 = (2.89^K_D + 1.72^K_L) = 4.61^K$
$R_2 = (1.24^K_D + 0.74^K_L) = 1.98^K$
$-M = 1.9^{K\text{-}FT}$

w/o LL ON OVRHNG: $R_1 = (2.89^K_D + 0.88^K_L) = 3.77^K$
$R_2 = (1.24^K_L + 0.88^K_L) = 2.12^K$
$+M_{2.755} = 2.4^{K\text{-}FT}$

USE W8x10

B-34



$w = 0.02^{K/'}$
$P_1 = (2.75^K_D + 1.62^K_L) = 4.37^K$
$P_2 = (2.89^K_D + 1.72^K_L) = 4.61^K$

$R_1 = (3.30^K_D + 1.83^K_L) = 5.13^K$
$R_2 = (2.74^K_D + 1.51^K_L) = 4.25^K$
$M_{7.31} = 30.6^{K\text{-}FT}$

USE W14x22

B-35

ROOF LOAD'G LESS CRITICAL THAN FUTURE FLR LOAD'G WITH WIND GIRT LOADS
∴ SEE B-35 2ND LEVEL FRMG → USE W12x30

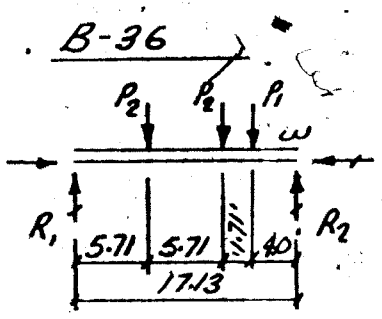
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Dave Hasel 12/31/87

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B-36



TRIB 17.13 x 28.17/2 = 241 #
R = (.08%)(241-150) = 7% → LL = 47 #/ft

ω = 0.04 K/l'
$P_1 = (1.43^K_D + 1.45^K_L) = 2.88^K$
$P_2 = (5.71)(.086_D + .047_L)(28.17/2) = (6.92^K_D + 3.78^K_L) = 10.70^K$

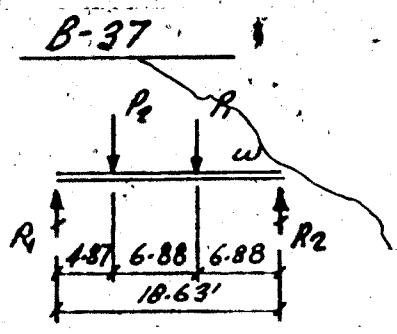
$R_1 = (7.60^K_D + 4.12^K_L) = 11.72^K$
$R_2 = (8.36^K_D + 4.89^K_L) = 13.25^K$
$M_{11.42} = 70.2^{K\text{-}FT}$ AS FLR BM

AXIAL LOAD = 1.25 x 128.0 K from 3RD N°

CHECK AS ROOF BM (INCREASED TRIB) $P_1 = P_2 = 5.71(.082 + .016)(18.69) = (8.75^K_D + 1.71^K_L) = 10.46^K$
$R = (9.10_D + 1.71_L) = 10.81^K$
$M = 61.2 < 70.2^{K\text{-}FT}$

USE W14 x 43

B-37



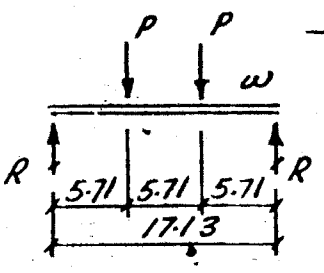
TRIB = 18.63 x 18.69 = 348 #
R = (.08)(348-150) = 15.8% → LL = 42 #/ft

ω = 0.04 K/l'
$P_1 = (6.88)(.086_D + .042_L)(18.69) = (11.06^K_D + 5.40^K_L) = 16.46^K$
$P_2 = (5.88)(\ \ +\ \ )(\ \ ) = (9.45^K_D + 4.62^K_L) = 14.07^K$

$R_1 = (11.44^K_D + 5.41^K_L) = 16.85^K$
$R_2 = (9.82^K_D + 4.61^K_L) = 14.43^K$
$M_{6.88} = 98.4^{K\text{-}FT}$

USE W18 x 35

B-38



TRIB = 17.13 x 27.92 = 478 #
R = (.08%)(478-150) = 26% → LL = 37 #/ft

ω = 0.04 K/l'
$P = (5.71)(.086_D + .037_L)(27.92) = (13.71^K_D + 5.90^K_L) = 19.61^K$

$R = (14.05^K_D + 5.90^K_L) = 19.95^K$
$M = 113.5^{K\text{-}FT}$

USE W18 x 35

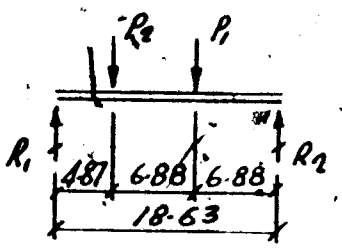
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Aloha Hotel 12/31/87

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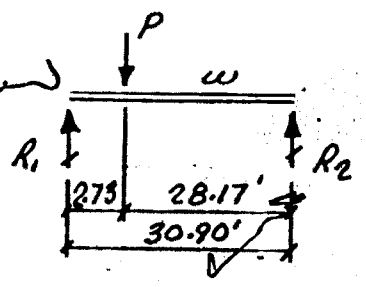
B-39.



TRIB 18.63 x 27.92 = 520#
R=(.08%)(520-150) = 29.6% → LL = 35#/ft
w = 0.05 K/ft
P_1 = (6.88)(.086+.035)(27.92) = (16.52^K_D + 6.72^K_L) = 23.24^K
P_2 = (5.88)(.086+.035)(27.92) = (14.12^K_D + 5.75^K_L) = 19.87
R_1 = (17.00^K_D + 6.73^K_L) = 23.73^K
R_2 = (14.58^K_D + 5.74^K_L) = 20.32^K
$M_{6.88}$ = 138.7 K-FT

USE W21x44

B-40



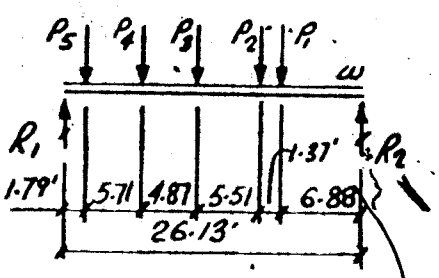
TRIB 6.88 x 30.9 + 348/2 = 386#
R=(.08%)(386-150) = 18% → LL = 41#/ft
w = (6.88/12)(.086+.041) = (0.30^K_D + 0.14^K_L) = 0.44K/ft
P = (9.82^K_D + 4.61^K_L) = 14.43^K
R_1 = (13.59^K_D + 6.37^K_L) = 19.96^K
R_2 = (5.50^K_D + 2.57^K_L) = 8.07^K
$M_{18.34}$ = 74.0 K-FT

30.9 x 12/20 = 18.5" → W18 MIN

USE W18x35

B-41 & B-42 NOT USED

B-43



TRIB (26.13+8.25)(23.33/2) = 208#
R=(.08%)(208-150) = 4.6% → LL = .48#/ft

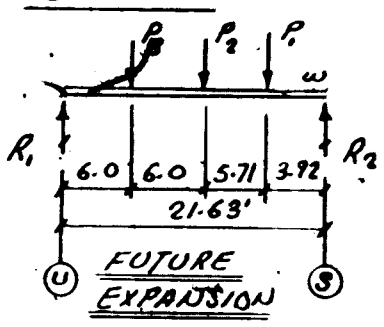
SAME AS 2ND LEVEL BM B-43 → W24x62

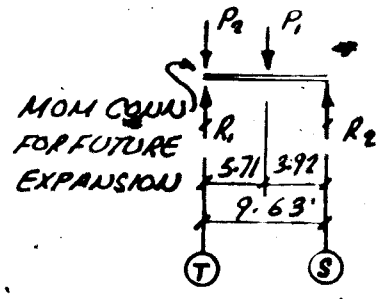
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B-44





SIZE FOR FUTURE EXPANSION

TRIB = 21.63 x 51.0/2 = 552 #
R = (.08%)(552 - 150) = 32% → LL = 34 #/#

ω = 0.05 K/'
P_1 = (5.71)(.086$_D$ + .094$_L$)(51.0/2) = (12.52^K_D + 4.95^K_L) = 17.47^K
P_2 = (5.86)(do + do)(do) = (12.85^K_D + 5.08^K_L) = 17.93^K
P_3 = (6.00)(do + do)(do) = (13.16^K_D + 5.20^K_L) = 18.36^K

R_1 = (18.04^K_D + 6.92^K_L) = 24.96^K
R_2 = (21.57^K_D + 8.31^K_L) = 29.88^K
$M_{12.0}$ = 185.8 K'FT

USE W 24 x 55 EXTEND TO COL. "T"

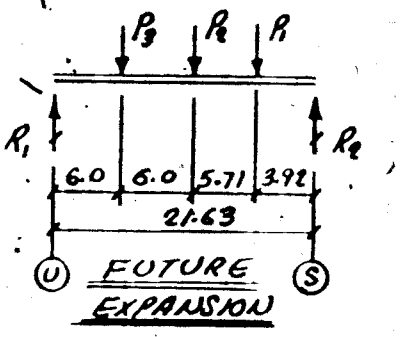
LOADS TO TEMPORARY COL AT GRID "T":

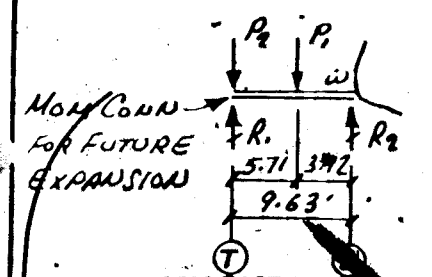
ROOF TRIB 9.63 x 51.0/2 = 245 # → LL = 16 #/#

ω = 0.05 K/'
P_1 = (5.71)(.086$_D$ + .016$_L$)(51.0/2) = (12.52^K_D + 2.33^K_L) = 14.85^K
P_2 = (2.86)(do + do)(do) = (6.27^K_D + 1.17^K_L) = 7.44^K

R_1 = (11.61^K_D + 2.12^K_L) = 13.73^K
R_2 = (7.66^K_D + 1.38^K_L) = 9.04^K

B-45





SIZE FOR FUTURE EXPANSION

TRIB 21.63 x 23.33/2 = 252 #
R = (.08%)(252 - 150) = 8.2% → LL = 46 #/#

ω = 0.05 K/'
P_1 = (5.71)(.086$_D$ + .046$_L$)(23.33/2) = (5.73^K_D + 3.06^K_L) = 8.79^K
P_2 = (2.86)(do + do)(do) = (5.88^K_D + 3.15^K_L) = 9.03^K
P_3 = (6.00)(do + do)(do) = (6.02^K_D + 3.22^K_L) = 9.24^K

R_1 = (8.55^K_D + 4.28^K_L) = 12.83^K
R_2 = (10.16^K_D + 5.15^K_L) = 15.31^K
$M_{12.0}$ = 94.9 K'FT

USE W18 x 35 EXTEND TO COL "T"

LOADS TO TEMPORARY COL AT GRID "T":

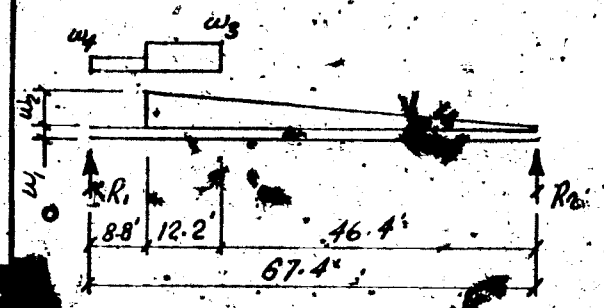
ω = 0.04 K/'
P_1 = (5.71)(.086$_D$ + .020$_L$)(23.33/2) = (5.73^K_D + 1.33^K_L) = 7.06^K
P_2 = (2.86)(do + do)(do) = (2.87^K_D + 0.67^K_L) = 3.54^K
R_1 = (5.40^K_D + 1.21^K_L) = 6.61^K
R_2 = (3.59^K_D + 0.79^K_L) = 4.38^K

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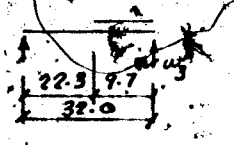
FLR TRIB 67.4 x 42.0/2 = 1415 #
R = (.08%)(1415-150) > 40% MAX → LL = 30 #/ft

ROOF TRIB (½)(67.4-8.8)(34.0/2) = 498 #
→ ROOF LL = 16 #/ft

$\omega_1 = (42.0/2)(.086_D + .030_L) = (1.81^{K/'}_D + 0.63^{K/'}_L) = 2.44^{K/'}$

$\omega_2 = (34.0/2)(.084_D + .016_L) = (1.43^{K/'}_D + 0.27^{K/'}_L) = 1.70^{K/'}$

$\omega_3 = \left(\frac{9.7 \times 27.5}{32}\right)(0.100_L) = 0.82^{K/'}_L$



$\omega_4 = (9.7/2)(.084_D + .016_L) = (0.41^{K/'}_D + 0.08^{K/'}_L) = 0.49^{K/'}$

$R_1 = (88.66^K_D + 34.27^K_L) = 122.93^K$

$R_2 = (78.84^K_D + 26.81^K_L) = 105.65^K$

$V = R_2 - \omega_1(x) - \left(\frac{\omega_2}{58.6}\right)(x^2/2)$

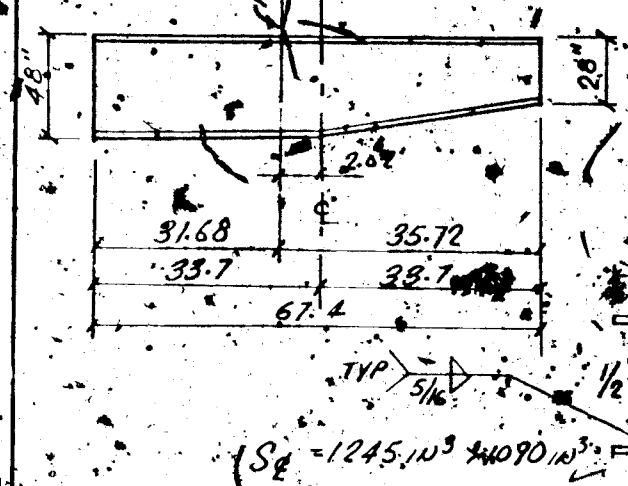
@ $V = 0 \rightarrow \left(\frac{\omega_2}{58.6 \cdot 2}\right)x^2 + (\omega_1)x = 105.65$

$x^2 + (168.216)x = 7283.635$

$(x + 84.108)^2 = 7283.635 + 84.108^2$

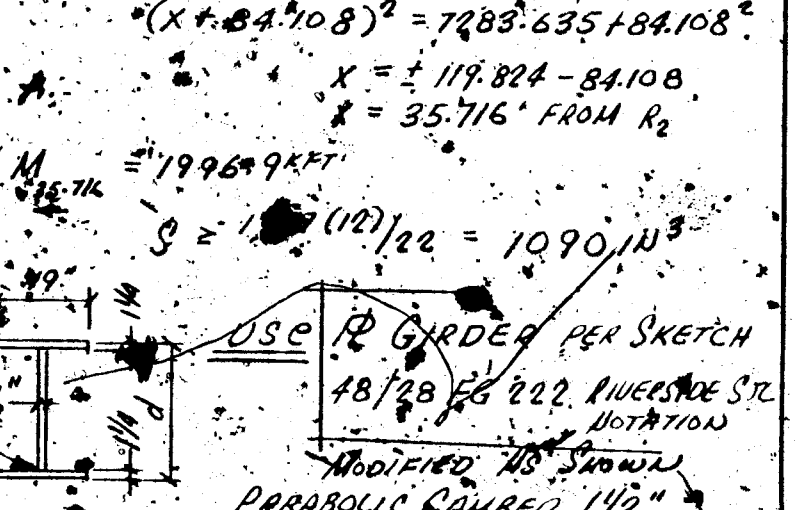
$x = \pm 119.824 - 84.108$

$x = 35.716'$ FROM R_2



$M_{35.71K} = 1996.9^{K-FT}$

$S \geq 1(12)/22 = 1090^{IN^3}$



USE ℄ GIRDER PER SKETCH
48/28 EG 222 RIVERSIDE STL
NOTATION
MODIFIED AS SHOWN
PARABOLIC CAMBER 1½"

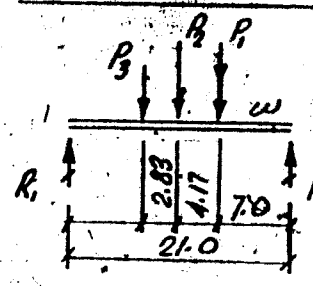
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B-14M & B-15M MODIFIED FOR HIGH ROOF 10½ AT MECH

B-14M

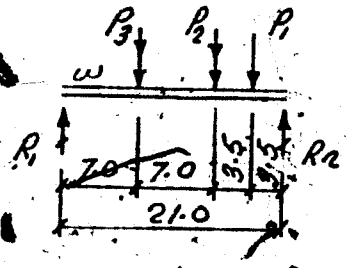


$P_1 = (18.48^K + 8.8^K) = 27.28^K$
$P_2 = 3.0^K$
$P_3 = 18.48^K$
$w = 0.20^{K/L}$

$R_1 = 25.11^K$
$R_2 = 27.85^K$
$M_{1.0} = 190.1^{K\text{-}FT}$

USE W24x55

B-15M



$w = 0.20^{K/L}$
$P_1 = 17.40^K$
$P_2 = (18.34 + 7.70) = 26.04^K$
$P_3 = (18.34 + 10.90) = 28.64^K$

$R_1 = 32.77^K$
$R_2 = 43.51^K$
$M_{1.0} = 238.8^{K\text{-}FT}$

USE W24x62

1980 EAST DESERT INN ROAD. SUITE 106 | LAS VEGAS, NEVADA 89109-2594 (702) 731-6226

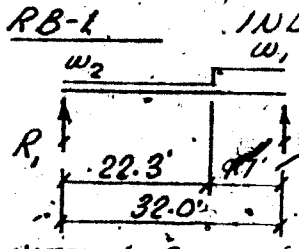
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NOTE: 3RD LEVEL BMS WHICH REMAIN ROOF BMS & DO NOT PROVIDE STRUCTURAL CAPABILITY IN SUSTAING FLR L.L. ARE INDICATED HERE WITH THE DESIGNATION "RB-" FOR ROOF BM.

RB-1



NOTE: ω_1 PROVIDES LL CAPABILITY FOR FUTURE ELEV. LANDG.

$\omega_1 = (12.2/2)(.084^K/\phi_D + .100^K/\phi_L) = (0.51^K/\phi_D + 0.61^K/\phi_L) = 1.12^K/\phi$

$\omega_2 = 7.0(.082^K/\phi + .020^K/\phi) = (0.57^K/\phi_D + 0.14^K/\phi_L) = 0.71^K/\phi$

$R_1 = (9.03^K_D + 2.93^K_L) = 11.96^K$

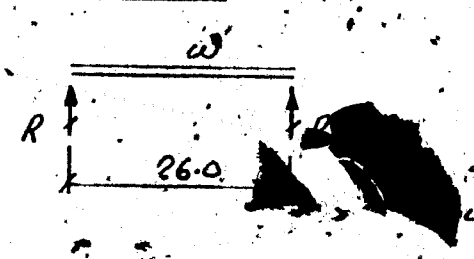
$R_2 = (8.63^K_D + 6.11^K_L) = 14.74^K$

$M_{16.6'} = 100.8^{KFT}$

$(1/20)(32\times12) = 19.2"$

USE W18 x 40

RB-2



TRIB 26.0 x 7.0 = 182 ⌀ → LL = 20 ⌀

$\omega = 7.0(.082_D + .020_L) = (0.57^K/\phi_D + 0.14^K/\phi_L) = 0.71^K/\phi$

$R = (7.41^K_D + 1.82^K_L) = 9.23^K$

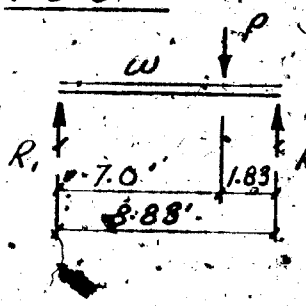
$M = 60.0^{KFT}$

$\frac{5(0.14)(26)^4(1728)}{384(29\times10^3)I} = \frac{49.7}{I} < \frac{312}{360} = 0.86$

$I > 49.7/0.86 = 57.8\ IN^4$

USE W16 x 26

RB-3



$\omega = 0.02^K/\phi_D$

$P = (7.41^K + 1.75^K)_D + (1.82^K + 0.44^K)_L = (9.16^K_D + 2.19^K_L) = 11.35^K$

$R_1 = (1.99^K_D + 0.45^K_L) = 2.44^K$

$R_2 = (7.35^K_D + 1.74^K_L) = 9.09^K$

$M_{7.0} = 16.6^{KFT}$

USE W12 x 16

1600 EAST DESERT INN ROAD SUITE 106 | LAS VEGAS, NEVADA 89109-2594 (702) 734-6226

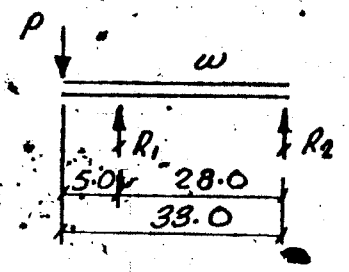
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RB-4



TRIB 28.0 x 7.0 = 196 ft² → LL = 20 #/ft²

$w = 7.0(.082^{K}/_{ft_D} + .020^{K}/_{ft_L}) = (0.57^{K}/_{ft_D} + 0.14^{K}/_{ft_L}) = 0.71^{K}/_{ft}$

$P = (2.46^{K} + 2.99^{K})_D + (0.06^{K} + 0.05^{K})_L = (5.39^{K}_D + 0.11^{K}_L) = 5.50^{K}$

$R_1 = (17.44^{K}_D + 2.85^{K}_L) = 20.29^{K}$

$R_2 = (6.76^{K}_D + 1.88^{K}_L) = 8.64^{K}$

$-M = 36.4^{K\text{-}FT}$

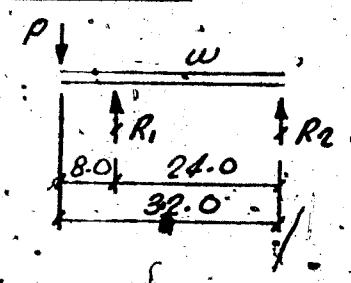
w/o LL ON OVRHNG: $R_1 = (17.44^{K}_D + 1.96^{K}_L) = 19.40^{K}$

$R_2 = (6.76^{K}_D + 1.96^{K}_L) = 8.72^{K}$

$+M_{12.2\,ft} = 53.6^{K\text{-}FT}$

USE SAME AS RB-6

RB-5



$w = (0.57^{K}/_{ft_D} + 0.14^{K}/_{ft_L}) = 0.71^{K}/_{ft}$ REF RB-4

$P = (2.78^{K} + 2.46^{K})_D + (0.08^{K} + 0.06^{K})_L = (5.24^{K}_D + 0.14^{K}_L) = 5.38^{K}$

$R_1 = (19.15^{K}_D + 3.17^{K}_L) = 22.32^{K}$

$R_2 = (4.33^{K}_D + 1.45^{K}_L) = 5.78^{K}$

$-M = 65.8^{K\text{-}FT}$

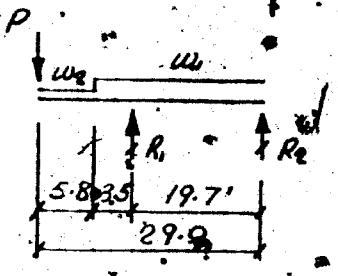
w/o LL ON OVRHNG: $R_1 = (19.15^{K}_D + 1.68^{K}_L) = 20.83^{K}$

$R_2 = (4.33^{K}_D + 1.68^{K}_L) = 6.01^{K}$

$+M_{8.2\,ft} = 25.5^{K\text{-}FT}$

USE SAME AS RB-6

RB-6



$w_1 = (0.57^{K}/_{ft_D} + 0.14^{K}/_{ft_L}) = 0.71^{K}/_{ft}$ REF RB-4

$w_2 = (0.29^{K}/_{ft_D} + 0.07^{K}/_{ft_L}) = 0.36^{K}/_{ft}$

$P = (3.22^{K} + 2.78^{K})_D + (0.11^{K} + 0.08^{K})_L = (6.00^{K}_D + 0.19^{K}_L) = 6.19^{K}$

$R_1 = (18.85^{K}_D + 2.73^{K}_L) = 21.58^{K}$

$R_2 = (2.06^{K}_D + 1.11^{K}_L) = 3.17^{K}$ USE W24x55

$-M = 75.3^{K\text{-}FT}$ @ $R_2 = 9.3'$

w/o LL ON OVRHNG: $R_1 = (18.85^{K}_D + 1.38^{K}_L) = 20.23^{K}$

$R_2 = (2.06^{K}_D + 1.38^{K}_L) = 3.44^{K}$

$+M_{8.2\,ft} = 8.4^{K\text{-}FT}$

AT OVRHNG: $I = {}^{31}/_{0.31} = 100.7\ in^4 \rightarrow W24x55$

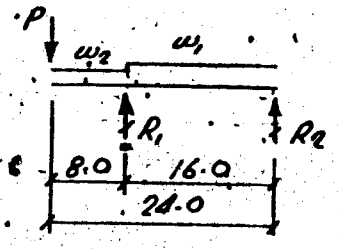
$$\Delta_{OVR} = \frac{1728}{(29\times10^3)(I)}\left\{\frac{(6.19^{K})(9.3)^2(29.0)}{3} + \frac{(0.71^{K}/_{ft})(9.3)\left[4(9.3)^2(19.7) - (19.7)^3 + 3(9.3)^3\right]}{24}\right\} = \frac{312}{I}$$

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RB-7



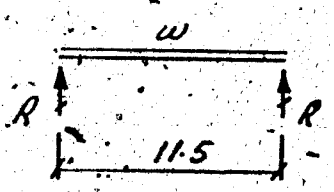
$P = (5.88^K + 3.22^K)_D + (0.24^K + 0.11^K)_L = (9.10^K_D + 0.35^K_L) = 9.45^K$
$\omega_1 = (0.57^{KI'}_D + 0.14^{KI'}_L) = 0.71^{KI'}$ REF RB-4
$\omega_2 = (0.41^{KI'}_D + 0.10^{KI'}_L) = 0.51^{KI'}$

$R_1 = (22.31^K_D + 2.65^K_L) = 24.96^K$
$R_2 = (-0.81^K_D + 0.75^K_L) = -(0.06^K)$ UPLIFT
$-M = 91.9^{KFT}$ @ $l_u \simeq 15.6'$
w/o LL ON OVRHNG: $R_1 = (22.31^K_D + 1.12^K_L) = 23.43^K$
$R_2 = (-0.81^K_D + 1.12^K_L) = 0.31^K$
$+M_{@11.5} = 0.1^{KFT}$

$W24\times55 \rightarrow M_R = 128^{KFT}$ @ $l_u = 15.5'$
$I_{REQD} \simeq$ RB-6.

USE | SAME AS RB-6

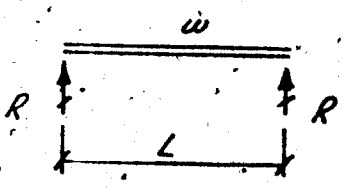
RB-8



$\omega = (0.57^{KI'}_D + 0.14^{KI'}_L) = 0.71^{KI'}$
$R = (3.28^K_D + 0.81^K_L) = 4.09^K$
$M = 11.8^{KFT}$

USE | W8x10

RB-9 & RB-9A



$\omega = (0.57^{KI'}_D + 0.14^{KI'}_L) = 0.71^{KI'}$

RB-9: $L = 6.5'$
$R = (1.85^K_D + 0.46^K_L) = 2.31^K$
$M = 3.8^{KFT}$

USE | W8x10

RB-9A: $L = 2.0'$
$R = (0.57^K_D + 0.14^K_L) = 0.71^K$
$M = 0.4^{KFT}$

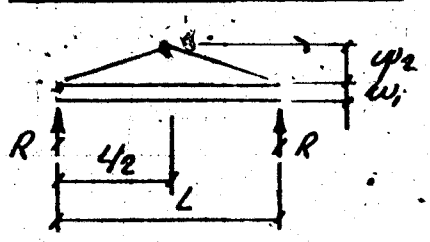
USE | L3x3x1/4

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RB-10 THRU RB-14



$w_1 = 26'(.021^K/\#_D) + 5'(.012^K/\#_D) = 0.61^K/'$ DLL

RB-10: $L = 16.0'$

$w_2 = 3.0[(.076^K/\# + .006^K/\#)_D + (.020^K/\#)_L]$

$w_2 = (0.25^K/'_D + 0.06^K/'_L) = 0.31^K/'$

$R = (5.88^K_D + 0.24^K_L) = 6.12^K$

$M = 26.2^{KFT}$

RB-11: $L = 9.0'$

$w_2 = 2.5(.082_D + .020_L) = (0.21^K/'_D + 0.05^K/'_L) = 0.26^K/'$

$R = (3.22^K_D + 0.11^K_L) = 3.33^K$

$M = 8.0^{KFT}$

RB-12: $L = 8.0'$

$w_2 = 2.0(.082_D + .020_L) = (0.[illegible]^K/'_D + 0.04^K/'_L) = 0.21^K/'$

$R = (2.78^K_D + 0.08^K_L) = 2.86^K$

$M = 6.0^{KFT}$

RB-13: $L = 7.3'$

$w_2 = 1.5(.082_D + .020_L) = (0.13^K/'_D + 0.03^K/'_L) = 0.16^K/'$

$R = (2.46^K_D + 0.06^K_L) = 2.52^K$

$M = 4.8^{KFT}$

RB-14: $L = 9.0$

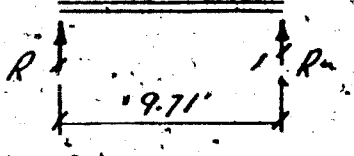
$w_2 = 1.0(.082_D + .020_L) = 0.10^K/'$

$R = (2.93^K_D + 0.05^K_L) = 2.98^K$

$M = 6.9^{KFT}$

USE C12x 20.7
RB-10 THRU RB-14

RB-15



$w = (8.83/12)(.082 + .020) = (.36^K/'_D + .09^K/'_L) = 0.45^K/'$

$R = (1.75^K_D + 0.44^K_L) = 2.19^K$

$M = 5.3^{KFT}$

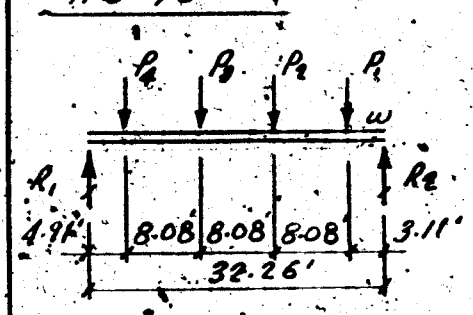
USE W8x10

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RB-16



T.O'/cos 30° = 8.08'
2.69'/do = 3.11'
4.25'/do = 4.91'

201# < TRIB < 600# → LL = 16#/ft

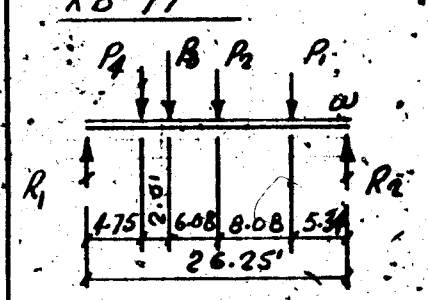
$\omega = 2.5(.082^{K}/ft_D + .016^{K}/ft_L) = (.21^{K}/ft_D + .04^{K}/ft_L) = 0.25^{K}/ft$
$P_1 = (22.31^{K}_D + 2.12^{K}_L) = 24.43^{K}$
$P_2 = (18.85^{K}_D + 2.18^{K}_L) = 21.03^{K}$
$P_3 = (19.15^{K}_D + 2.54^{K}_L) = 21.69^{K}$
$P_4 = (17.44^{K}_D + 2.28^{K}_L) = 19.72^{K}$
$R_1 = (38.30^{K}_D + 5.06^{K}_L) = 43.36^{K}$
$R_2 = (46.22^{K}_D + 5.35^{K}_L) = 51.57^{K}$
$M_{12.99} = 382.8^{K\text{-}FT}$

$f_b = \frac{383 \times 12}{196} = 23.45 KSI$

$\Delta_{DL} = (1034.48 \times 10^{-6})(32.26^2 \times 23.45)/24.10 = 1.05'' = L/369$

USE W24x84
TOS EL +1/4" ABOVE MOM CONN BMS

RB-17



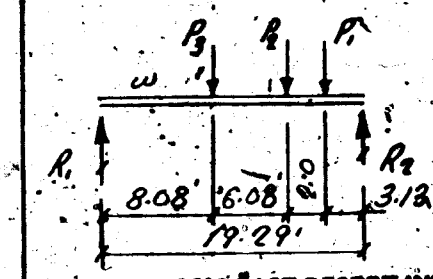
22'-8¼"/cos 30 = 26.25'
$\omega = (.21^{K}/ft_D + .04^{K}/ft_L) = 0.25^{K}/ft$ REF RB-16

$P_1 = (0.57^{K}_D + 0.11^{K}_L) = 0.68^{K}$
$P_2 = (1.86^{K}_D + 0.37^{K}_L) = 2.22^{K}$
$P_3 = (5.88^{K}_D + 0.19^{K}_L) = 6.07^{K}$
$P_4 = (3.28^{K}_D + 0.65^{K}_L) = 3.93^{K}$
$R_1 = (10.87^{K}_D + 1.41^{K}_L) = 12.28^{K}$
$R_2 = (6.22^{K}_D + 0.96^{K}_D) = 7.18^{K}$
$M_{12.12} = 70.1^{K\text{-}FT}$

USE W16x31

W16x31
$\Delta_{DL} = (1034.48 \times 10^{-6})(26.25^2 \times 17.83)/15.88 = 0.80''$
$\approx L/394$

RB-18'



16'-8½"/cos 30 = 19.29'
$\omega = (.21^{K}/ft_D + .04^{K}/ft_L) = 0.25^{K}/ft$ REF RB-16
$P_1 = (9.03^{K}_D + 2.93^{K}_L) = 11.96^{K}$
$P_2 = (2.93^{K}_D + 0.05^{K}_L) = 2.98^{K}$
$P_3 = (7.41^{K}_D + 1.82^{K}_L) = 9.23^{K}$
$R_1 = (8.58^{K}_D + 1.93^{K}_L) = 10.51^{K}$
$R_2 = (14.84^{K}_D + 3.64^{K}_L) = 18.48^{K}$
$M_{8.08} = 76.8^{K\text{-}FT}$

USE W16x31

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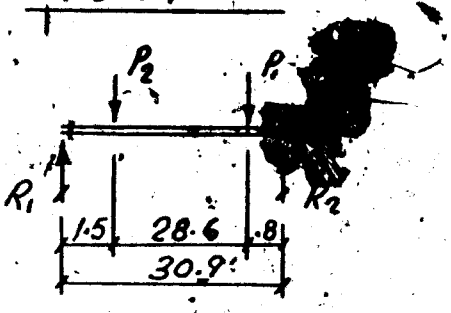
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RB-T9



$w = (7.0/\ell)(.082^{K/'}_{D} + .020^{K/'}_{L}) = (.29^{K/'}_{D} + .07^{K/'}_{L}) = 0.36^{K/'}$

$P_1 = (1.99^{K}_{D} + 0.45^{K}_{L}) = 2.44^{K}$

$P_2 = (8.58^{K}_{D} + 1.99^{K}_{L}) = 10.51^{K}$

$R_1 = (12.70^{K}_{D} + 2.93^{K}_{L}) = 15.63^{K}$

$R_2 = (6.84^{K}_{D} + 1.61^{K}_{L}) = 8.45^{K}$

$M_{10.92\ell} = 52.2^{K'}$

USE W16 x 26

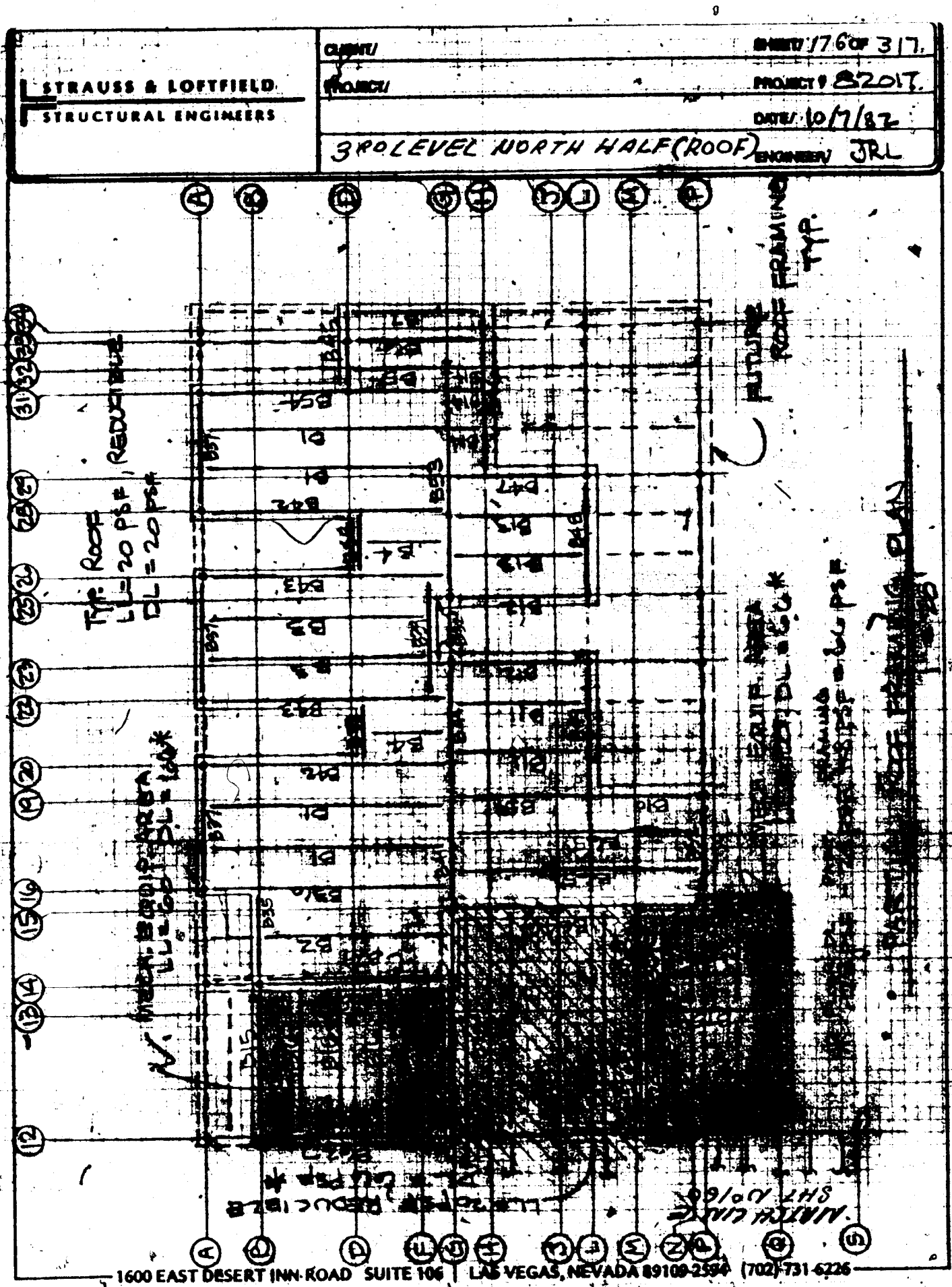
1600 EAST DESERT INN ROAD SUITE 106 | LAS VEGAS, NEVADA 89109-2394 (702) 731-6226

Don Hasel 12/31/87

STRAUSS & LOFTFIELD
STRUCTURAL ENGINEERS

CLIENT/
PROJECT/

SHEET 176 OF 317.
PROJECT # 8201T.
DATE/ 10/7/87
3RD LEVEL NORTH HALF (ROOF) ENGINEER JRL


FUTURE ROOF FRAMING TYP.
REDUCIBLE
Typ. Roof LL=20 PSF DL=20 PSF
Roof DL=20 PSF
Typ. Roof LL=20 PSF DL=20 PSF
Roof DL=20 PSF
Roof LL=60 PSF DL=20 PSF
Roof LL=60 PSF DL=20 PSF
Roof LL=60 PSF

Dora Hazel, 12/31/87

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CLIENT/ SHEET 77 OF 317
PROJECT/ PROJECT # 87017
DATE/ 10/8/82
3RD LEVEL NORTH HALF (ROOF) ENGINEER JRT

ROOF BEAMS - NORTH ROOF

B-1 THRU B-75

B1

SPAN = 39.9' $A_T = 39.9' \times 6.6' = 263^{SF}$ LL = 16^{PSF}

$w = 6.6(\frac{LL}{16} + \frac{DL}{20}) = 238^{PLF}$ $M = \frac{238(39.9)^2}{8} = 47.4^{IK}$ $R = 4.8^{K}_{DL=}$

USE W16x26. $M_R = 77$

$\Delta = \frac{47.4(39.9)^2}{80.6 \times 38.4 \times 16} = 1.52'' = SPAN/314$

B2

SPAN = 31.0 $A_T = 31.0 \times 8 = 248^{SF}$ LL = 16^{PSF}

$w = 8(\frac{LL}{16} + \frac{DL}{20}) = 288$ $M = \frac{288(31)^2}{8} = 346$ $R = 4.5^{K}_{DL=}$

USE W14x22 $M_R = 58$

$\Delta = \frac{34.6(31)^2}{80.6 \times 29 \times 14} = 1.03'' = SPAN/366$

B3

SPAN = 36.4' $A_T = 36.4 \times 6.6 = 240^{SF}$ LL = 16^{PSF}

$w = 6.6'(\frac{LL}{16} + \frac{DL}{20}) = 238^{PLF}$ $M = \frac{238(36.4)^2}{8} = 39.4$ $R = 4.3^{K}_{DL=}$

USE W16x26 $M_R = 77$

B4

SPAN = 14.3 $A_T = 14.3 \times 5.1 = 73^{SF}$ LL = 20

$w = 5.1(20+20) = 204$ $M = \frac{204(14.3)^2}{8} = 5.2$ $R = 1.5^{K}_{DL=}$

USE W8x10 $M_R = 16$

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DATE/ 10/8/82
ENGINEER/ JPT

ROOF BEAMS - NORTH ROOF

B5

SPAN = 15.8' A_T = LL = 20

$w = 4'(20+20) = 160^{PLF}$ $M = \frac{.160(15.8)^2}{8} = 5.0^{IK}$ $R = 1.3^{K}$ DL =

USE W8X10

$M_R = 16$

B6

SPAN = 21.7' $A_T = 21.7 \times 4.5 = 98^{SF}$ LL = 20

$w = 4.5(20+20) = 180$ $M = \frac{.180(21.7)^2}{8} = 10.6^{IK}$ $R = 2.0^{K}$ DL =

USE W12X14

$M_R = 30$

B7

SPAN = 21.7' A_T = LL = 20

$w = 3.3'(20+20) = 132$ $M = \frac{.132(21.7)^2}{8} = 7.8^{IK}$ $R = 1.4^{K}$ DL = 0.7^K

USE W8X10

$M_R = 16$

$\Delta = \frac{7.8(21.7)^2}{30.6 \times 7.8 \times 8} = 0.78'' = SPAN/357$

B8

SPAN = 17.0 A_T = LL = 20

$w = 8.0(20+20) = 240$ $M = \frac{.24(17)^2}{8} = 8.7$ $R = 2.0$ DL =

USE W8X10

$M_R = 16$

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PROJECT/ PROJECT # 87017
DATE/ 10/8/87
ENGINEER/ JT

ROOF BEAMS - NORTH ROOF

B9

SPAN = 28.7' A_T = LL = 20

$w = 6'(20+20) = 240$ PLF $M = \frac{w(22.7)^2}{8} = 15.5^{1K}$ $R = 2.7^K$ $R_{LL} = 0$

USE W12X14 $M_R = 30$

B10

SPAN = 18.0 A_T LL = 20

$w = 6.7'(20+20) = 268$ PLF $M = \frac{w(18)^2}{8} = 10.9^{1K}$ $R = 2.4^K$ $R_{DL} =$

USE W8X10 $M_R = 16$

B11

SPAN = 21.9' $A_T = 21.9 \times 7.3 = 160$ LL = 20

$w = 7.3(20+20) = 292$ PLF $M = \frac{292(21.9)^2}{8} = 17.5^{1K}$ $R = 2.6^K$ $R_{DL} =$

USE W12X14 $M_R = 30$

B12

SPAN = 21.9' $A_T =$ LL = 20

$w = 8.8'(20+20) = 352$ $M = \frac{352(21.9)^2}{8} = 21.1^{1K}$ $R = 3.9^K$ $R_{DL} =$

USE W12X14 $M_R = 30$

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501 N CASINO CTR 4
Fire Station

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STRUCTURAL ENGINEERS

CLIENT/
PROJECT/
SHEET/ 180 OF 317
PROJECT # 82617
DATE/ 10/8/82
ENGINEER/ JJF

ROOF BEAMS, - NORTH ROOF

B13

SPAN = 21.9' A_T = LL = 20

$w = 6.6'(20+20) = 264$ $M = \frac{264(21.9)^2}{8} = 158^{1K}$ $R = 2.9^K$ DL =

USE W12x14

$M_R = 30$

B14

SPAN = 5.8' A_T = LL = 20

$w = 6.6'(20+20) = 264$ $M = \frac{264(5.8)^2}{8} = 1.1^{1K}$ $R = 0.8^K$ DL =

USE W8X10

$M_R = 16$

B

SPAN = A_T = LL =

w = M = R = DL =

USE

M_R =

B

SPAN = A_T = LL =

w = M = R = DL =

USE

M_R =

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DATE/ 10/8/87
ENGINEER/ JRT

ROOF BEAMS - NORTH ROOF

B15

SPAN = 24.3' A_T = LL = 60

$w = 7.5'\left(\frac{LL}{60}+\frac{DL}{66}\right) = 945^{PLF}$ $M = \frac{.945(24.3)^2}{8} = 69.8^{IK}$ $R = 11.5^{K}_{DL}$

USE W16X26

$M_R = 77$

B16

SPAN = 24.3' A_T = LL = 60

$w = 7.0'\left(\frac{LL}{60}+\frac{DL}{66}\right) = 882^{PLF}$ $M = \frac{.882(24.3)^2}{8} = 65.1^{IK}$ $R = 10.7^{K}_{DL}$

USE W16X26

$M_R = 77$

B17

SPAN = 35.8' $A_T = 35.8 \times 5' = 179^{SF}$ LL = 20 PSF

$w = 5'\left(\frac{LL}{20}+\frac{DL}{66}\right) = 430^{PLF}$ $M = \frac{.43(35.8)^2}{8} = 68.9^{IK}$ $R = 7.7^{K}_{DL}$

USE W16X31

$M_R = 77$

$\Delta = \frac{68.9(35.8)^2}{80.6 \times 47.2 \times 16} = 1.45'' = \frac{SPAN}{296}$

B18

SPAN = 35.8' $A_T = 35.8 \times 7 = 251^{SF}$ LL = 16

$w = 7'(16+66) = 574^{PLF}$ $M = \frac{.574(35.8)^2}{8} = 92.0$ $R = 10.3^{K}_{DL}$

USE W18X35

$M_R = 115$

$\Delta = \frac{92(35.8)^2}{80.6 \times 57.6 \times 18} = 1.41'' = \frac{SPAN}{304}$

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ENGINEER/ JRT

ROOF BEAMS - NORTH ROOF

B19

SPAN = 19.7' A_T = 0

$w = 2.2'(\frac{LL}{100} + \frac{DL}{66}) + 2.5'(\frac{LL}{20} + \frac{DL}{66}) = 580$ PLF

$M = \frac{.58(19.7)^2}{8} = 28.1^{IK}$

LL = 100 PSF / 20 PSF

$R = 5.7^K$ DL =

USE W12x16

$M_R = 34$

B20

SPAN = 16.2' A_T =

$w = 580$ PLF (SEE B19)

$M = \frac{.58(16.2)^2}{8} = 19.0^{IK}$

LL = 100 PSF / 20 PSF

$R = 4.7^K$ DL =

USE W12x14

$M_R = 30$

B21

SPAN = 19.7' A_T =

$w = 4.4'(\frac{LL}{100} + \frac{DL}{66}) = 730$

$M = \frac{.73(19.7)^2}{8} = 35.4^{IK}$

LL = 100

$R = 7.2^K$ DL =

USE W12x19

$M_R = 43$

B22

SPAN = 16.2' A_T =

$w = 4.4'(\frac{LL}{100} + \frac{DL}{66}) = 730$

$M = \frac{.73(16.2)^2}{8} = 24.0^{IK}$

LL = 100

$R = 5.9^K$ DL =

USE W12x14

$M_R = 30$

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Work Sheet, 5 . 10/31/87

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ROOF BEAMS - NORTH ROOF

B23

SPAN = 19.1' . A_T = LL=100

$w = 5.6'(\frac{LL}{100} + \frac{DL}{66}) = 930$ ∴ $M = \frac{.93(19.7)^2}{8} = 45.1^{IK}$ $R = 9.2^K$ R_{DL}=

USE W14X22
$M_R = 50$

B24

SPAN = 16.2' A_T = LL = 100

$w = 5.6'(100+66) = 930$ $M = \frac{.93(16.2)^2}{8} = 30.5^{IK}$ $R = 7.5^K$ R_{DL}=

USE W12X19
$M_R = 43$

B25

SPAN = 19.7' A_T = LL = 100

$w = 6.7'(100+66) = 1112^{\#}/LF$ $M = \frac{1.112(19.7)^2}{8} = 53.9^{IK}$ $R = 11.0^K$ R_{DL}=

USE W14X22
$M_R = 68$

B26

SPAN = 16.2' A_T = LL = 100

$w = 6.7'(100+66) = 1112^{\#}/LF$ $M = \frac{1.112(16.2)^2}{8} = 36.5^{IK}$ $R = 9.0^K$ R_{DL}=

USE W12X19
$M_R = 43$

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ROOF BEAMS - NORTH ROOF

B27

SPAN = 19.7' A_T = LL = 100

$w = 4.3'(\overset{LL}{100}+\overset{DL}{66}) = 714$ PLF $M = \frac{.714(19.7)^2}{8} = 34.6^{IK}$ $R = 7.0^{K}$ DL =

USE W12x19

$M_R = 43$

B28

Axial Load from x-brace

SPAN = 16.2' A_T = LL = 100

$w = 4.3'(100+66) = 714$ PLF $M = \frac{.714(16.2)^2}{8} = 23.4^{IK}$ $R = 5.8^{K}$ DL =

USE W12x26

AXIAL LOAD = (1.25 x 37.9^{K}) $M_R = 67$

B29

SPAN = 31.0' A_T = LL = 20

$w = 5'(\overset{LL}{20}+\overset{DL}{20}) = 200$ PLF $M = \frac{.20(31)^2}{8} = 24.0^{IK}$ $R = 3.1^{K}$ DL =

USE W14x22

$M_R = 58$

B30

SPAN = 17.0 A_T = LL = 20

$w = 4'(20+20) = 160$ PLF $M = \frac{.16(17)^2}{8} = 5.8^{IK}$ $R = 1.4^{K}$ DL =

USE W8x10

$M_R = 16$

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ROOF BEAMS - NORTH ROOF

B31

SPAN = 22.7' A_T = LL = 20

$w = 4'(20+20) = 160$ PLF $M = \frac{16(22.7)^2}{8} = 10.81^K$ $R = 1.8^K$ DL =

USE W12X14 $M_R = 20$

B32

SPAN = 3.5' A_T = LL = 20

$w = 8.8'(20+20) = 352$ $M = \frac{352(3.5)^2}{8} = 0.51^K$ $R = 0.6^K$ DL =

USE W8X10 $M_R = 16$

B33

SPAN = A_T = LL =

w = M = R = DL =

USE M_R =

B34

SPAN = A_T = LL =

w = M = R = DL =

USE M_R =

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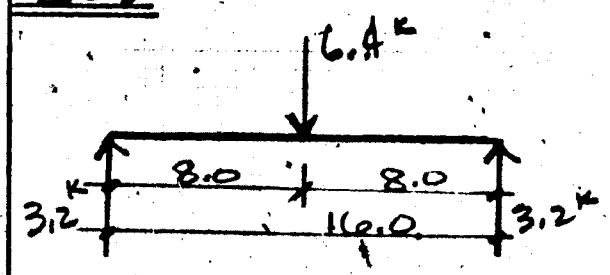
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ENGINEER/ SJR

ROOF BEAMS - NORTH ROOF

B35



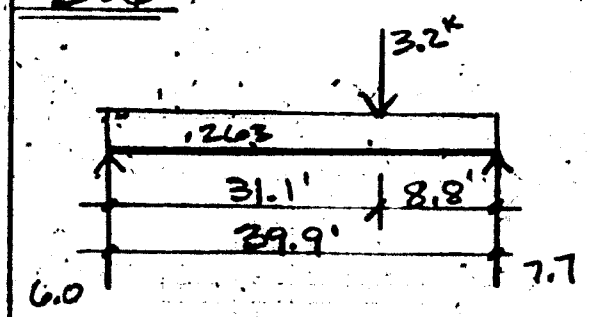
$A_T = 8.0' \times (15.5 + 4.5) = 160\ SF$ LL=20

$P = 160\ SF(^{LL}20 + ^{DL}20) = 6400$

$M = 8 \times 3.2 = 25.6\ ^{1K}$

USE W12x16
$M_R = 34$

B36

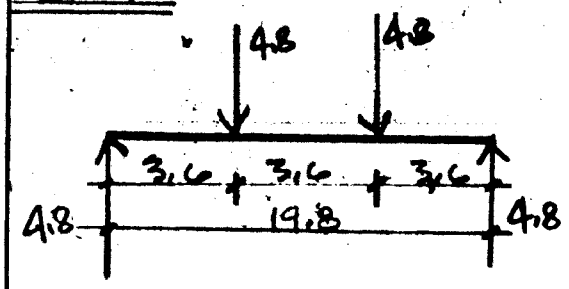


$W = 7.3'(^{LL}160 + ^{DL}20) = 263\ PLF$

$M = 67.4\ ^{1K}$

USE W16x26
$M_R = 77$

B37



$M = 3.6' \times 4.8^K = 17.3\ ^{1K}$

USE W12x14
$M_R = 30$

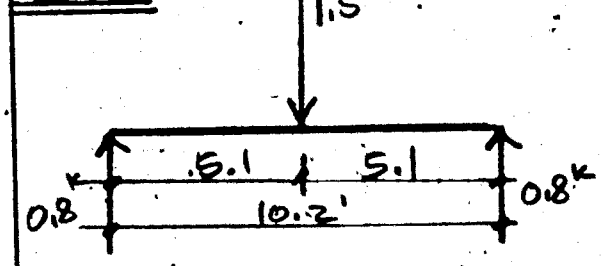
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ROOF BEAMS- NORTH ROOF

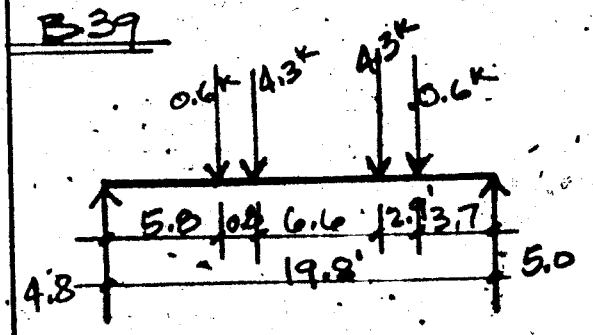
B38



$M = 5.1' \times 0.8^K = 4.1^{IK}$

USE W8X10
$M_R = 16$

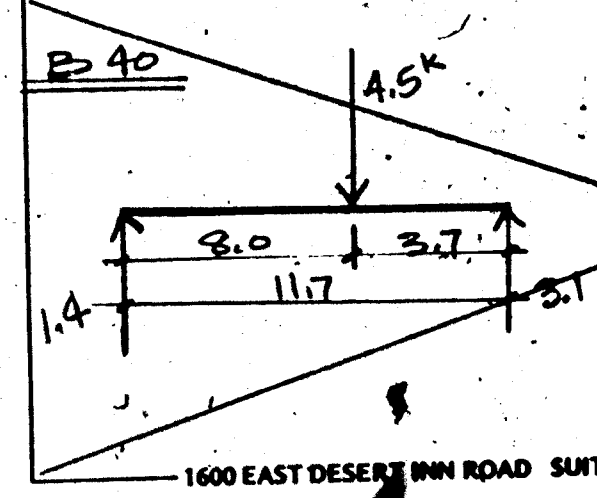
B39



$M = 31.4^{IK}$

USE W12X19
$M_R = 43$

B40



$M = 3.7' \times 3.1K = 11.5^{IK}$

USE W10X12
$M_R = 22$

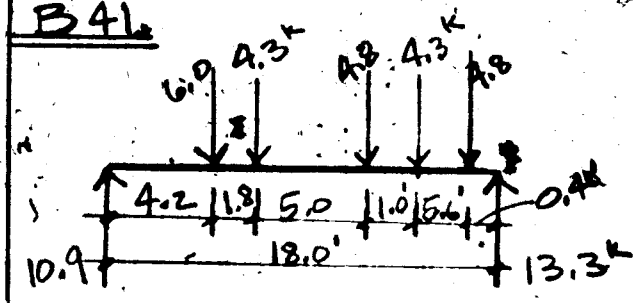
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ROOF BEAMS- NORTH ROOF

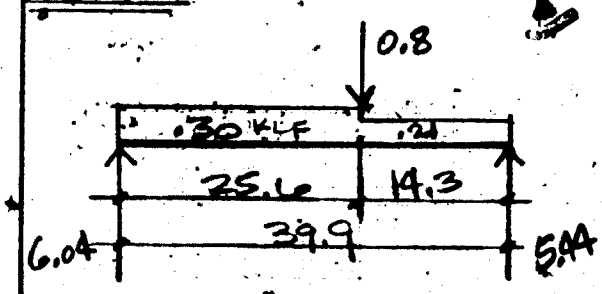
B41



$M = 57.3^{1K}$

USE W16x26
$M_R = 77$

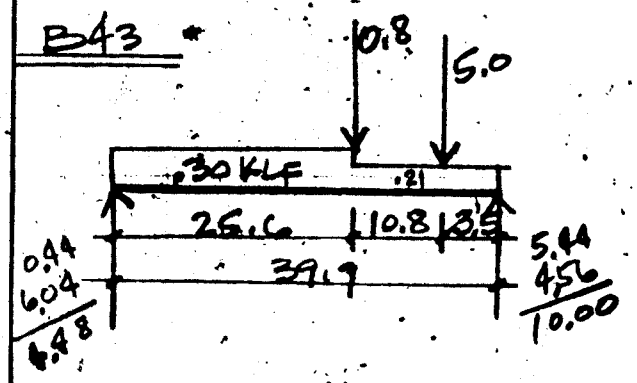
B42



LL=16
$W_1 = 8.4'(16+20) = 302$
$W_2 = 5.8'(16+20) = 209$
$M = \frac{(6.04)^2}{2 \times .30} = 60.8^{1K}$

USE W16x31
$M_R = 94$

B43



$W_1 = .30$ } SEE B42
$W_2 = .21$ }

$M = \frac{(6.48)^2}{2 \times .30} = 70.0^{1K}$

USE W16x31
$M_R = 94$

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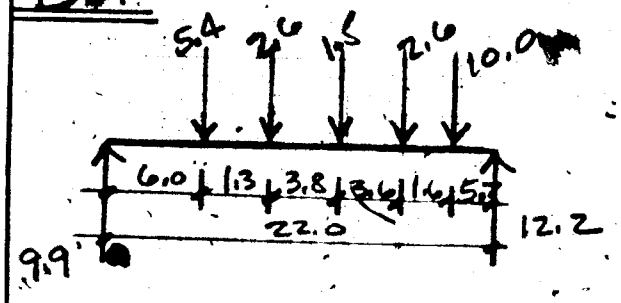
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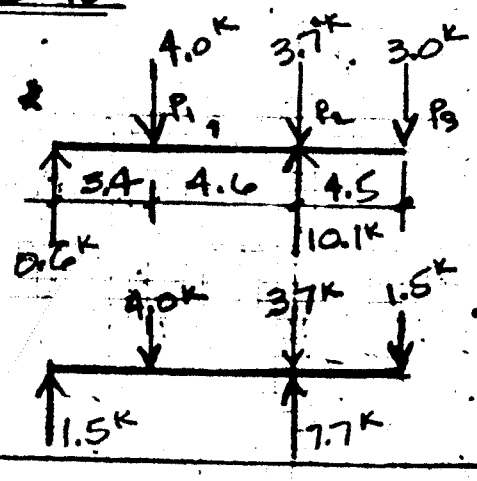
B44



$M = 73.3^{IK}$

USE W16X31
$M_R = 94$

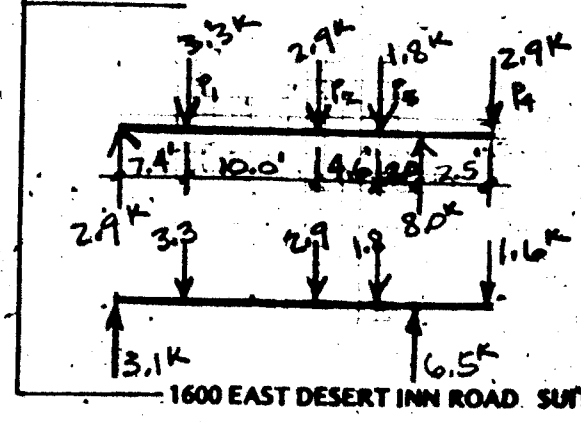
B45



$P_1 = 5.0'(20+20) \times 19.9' = 3980^{\#} = 4.0^K$
$P_2 = 4.0'(20+20) \times 22.9' = 3664^{\#} = 3.7^K$
$P_3 = 3.3'(20+20) \times 22.9' = 3023^{\#} = 3.0^K$
DL = 1.5^K
MAX. $M_+ = 3.4' \times 1.5^K = 5.1^{IK}$
MAX. $M_- = 4.5' \times 3.0^K = 13.5^{IK}$

USE W12X14
$M_R = 30^{IK}$ @ $L_b = 4.2'$

B46



$P_1 = 8.3'(16+20) \times 11.0' = 3287 = 3.3^K$
$P_2 = 7.3'(16+20) \times 11.0' = 2890 = 2.9^K$
$P_3 = 4.5'(16+20) \times 10.9' = 1766 = 1.8^K$
$P_4 = 3.3(16+20) \times 10.9'$
$+5.5'(16+20) \times 8.0' = 2880 = 2.9^K$
MAK. $M_+ = 3.1^K \times 7.4' = 22.9^{IK}$ DL = 1.6

USE W12X14
$M_R = 30^K$

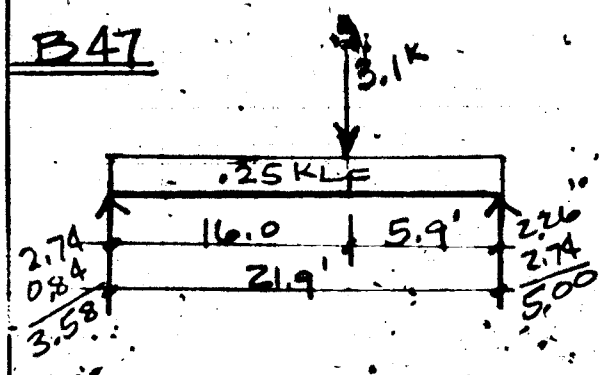
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ENGINEER/ RT

ROOF BEAMS - NORTH ROOF

B47

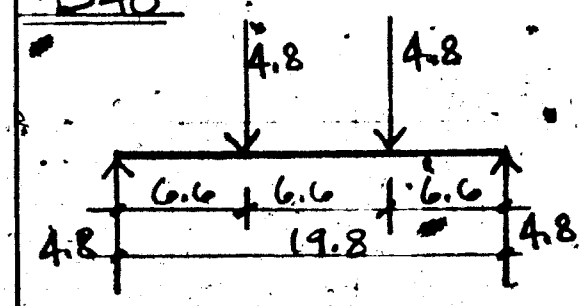


$W = 7.0(16+20) = 252$ PLF

$M = \frac{(3.58)^2}{2 \times .25} = 25.61^K$

USE W12 x 14
$M_R = 30$

B48

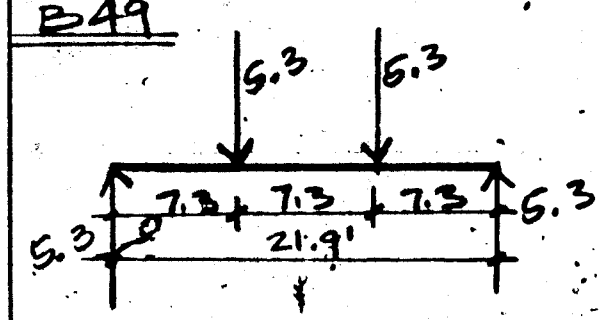


$P = 6.6(16^{LL} + 20^{DL}) \times 20.0' = 4752\#$
$= 4.8^K$

$M = 4.8^K \times 6.6' = 31.7^{1K}$

USE W12 x 19
$M_R = 43$

B49



$P = 7.3(16+20) \times 20.0' = 5256\#$
$= 5.3^K$

$M = 7.3' \times 5.3^K = 38.7^{1K}$

USE W12 x 19
$M_R = 43$

1600 EAST DESERT INN ROAD · SUITE 106 | LAS VEGAS, NEVADA 89109-2994 (702) 731-6226

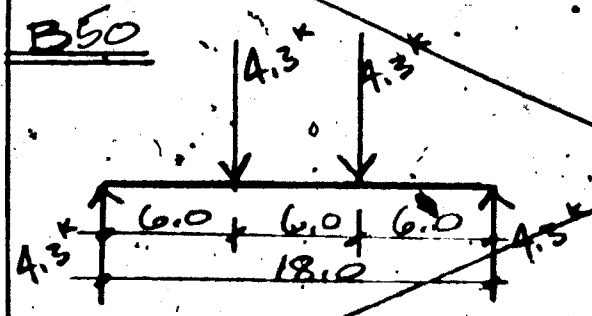
Done Hand, 12/31/87

STRAUSS & LOFTFIELD
STRUCTURAL ENGINEERS

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DATE/ 10/12/82
ENGINEER/ JSL

ROOF BEAMS - NORTH ROOF

B50

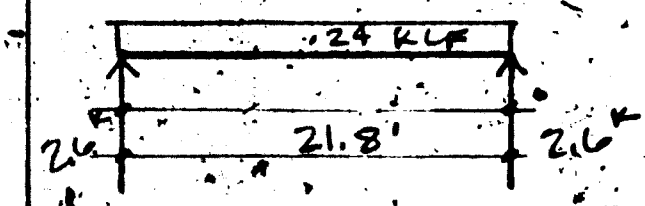


P = 6.0 (16+20) * 200 = 4320 * = 4.3K

M = 6.0' x 4.3K = 25.8 IK

USE W12x16
M_R = 34

B51

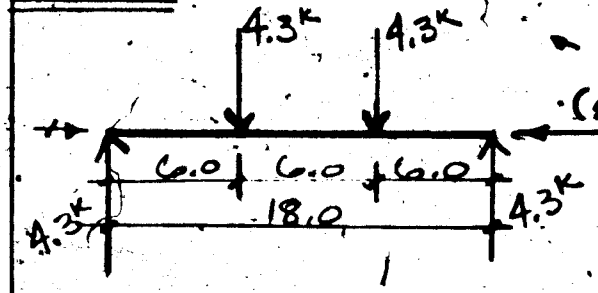


w = 6.7'(16+20) = 241 PLF

$M = \frac{.24(21.8)^2}{8} = 14.3^{IK}$

USE W10x12
M_R = 22

B52



axial Load from x-brace

M = 6.0' x 4.3K = 25.8 IK

(20.1K x 1.25)

USE W12x16
M_R = 34

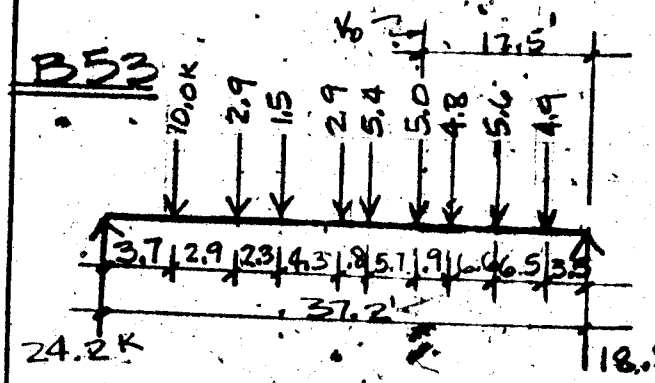
Don Hackl 12/31/87

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ENGINEER JRL

ROOF BEAMS- NORTH ROOF

B53

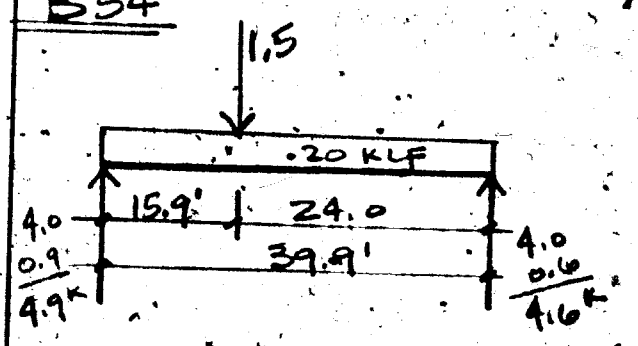


$M = 18.8^K \times 17.5' - 5.6 \times 7.5 - 4.9 \times$ [illegible] $= 214.1^{IK}$

USE W24x62
$M_R = 262$

APPROX. $\Delta = \frac{214.1 \times (37.2)^2}{80.6 \times 131 \times 24} = 1.17'' = \text{SPAN}/382$

B54

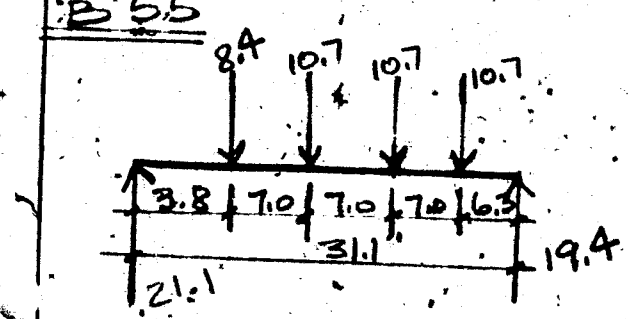


$W = 5.0' \left(\frac{LL}{20} + \frac{DL}{20}\right) = 200 PLF$

$M = \frac{(4.6)^2}{2 \times .2} = 52.9^{IK}$

USE W16x26
$M_R = 77$

B55



$M = 183.1^{IK}$

USE W21x50
$M_R = 189$

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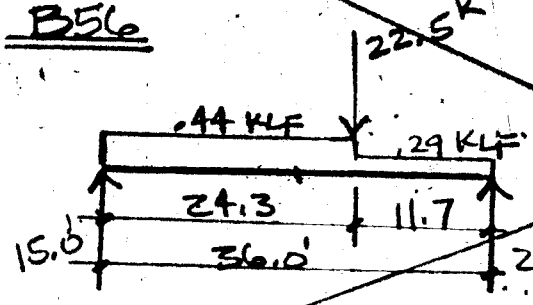
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DATE/ 10/19/82
ENGINEER/ JRL

ROOF BEAMS - NORTH ROOF

B56



$P_{\#}$ (B55 DL + B10 DL) $= 21.1 + 1.4 = 22.5^K$

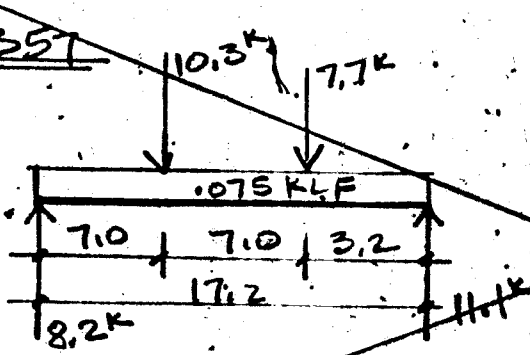
$W_1 = 2.5'(\frac{LL}{100} + \frac{DL}{66}) + 1.5'(\frac{LL}{20} + \frac{DL}{66}) = 444$ PLF

$W_2 = 2.5'(\frac{LL}{20} + \frac{DL}{66}) + 5' \times 15\,PSF^{WALL} = 290$ PLF

$M = 24.3' \times 15.0^K - \frac{.44(24.3)^2}{2} = 234.6^K$

USE W24x62
$M_R = 262$

B57

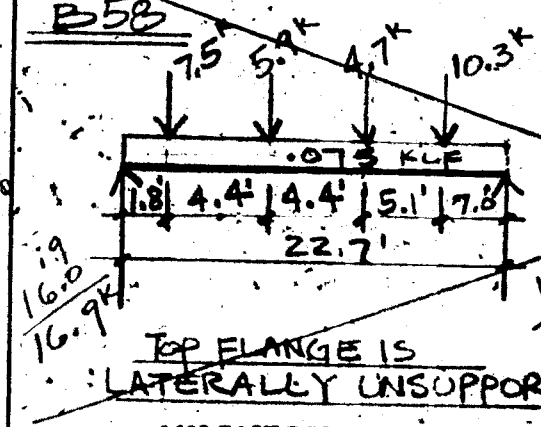


$W = 5' \times 15\,PSF^{WALL} = 75$ PLF

$M = 55.5^K$

USE W16x26
$M_R = 77$

B58



$W = 5' \times 15\,PSF = 75$ PLF

$M = 12.1' \times 12.4^K - 5.1' \times 10.3^K - \frac{.075(12.1)^2}{2} = 92.0^{IK}$

USE W10x49
$M_R = 100^{IK}$ @ $L_b = 22.7'$

TOP FLANGE IS LATERALLY UNSUPPORTED

APPROX. $\Delta = \frac{92(22.7)^2}{80.6 \times 54.6 \times 10} = 1.08''$ < RAN $\frac{1}{360}$

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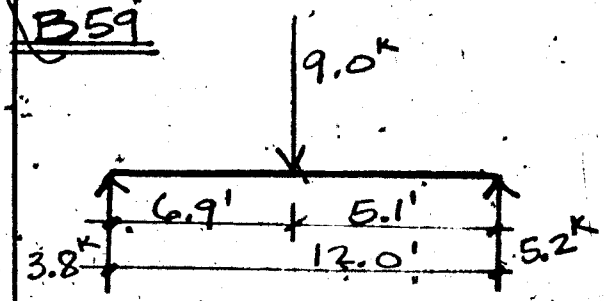
Don Hasel 12/31/87

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STRUCTURAL ENGINEERS

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ENGINEER/ JRT

ROOF BEAMS - NORTH ROOF

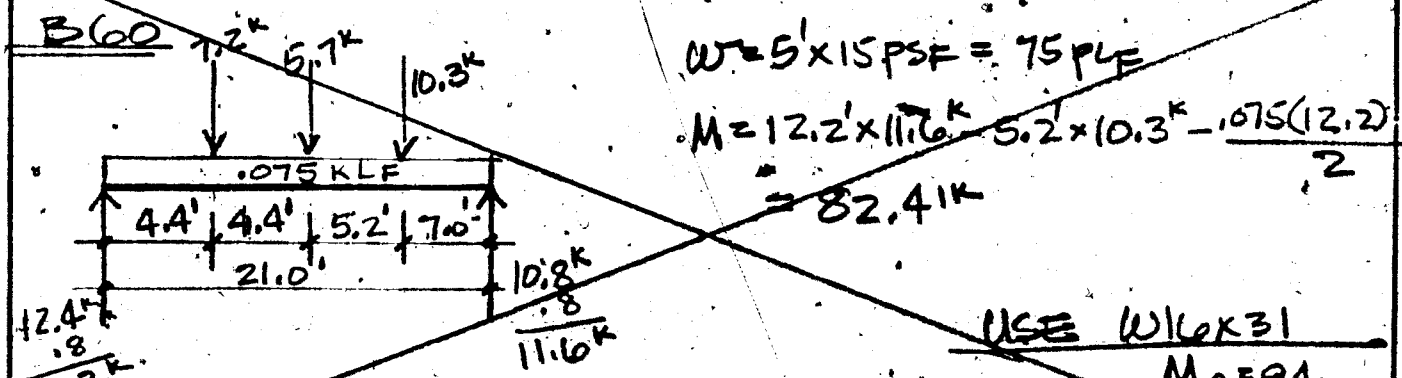
B59



$M = 5.1' \times 5.2^K = 26.5^{1K}$

USE W12x14
$M_R = 30$

B60



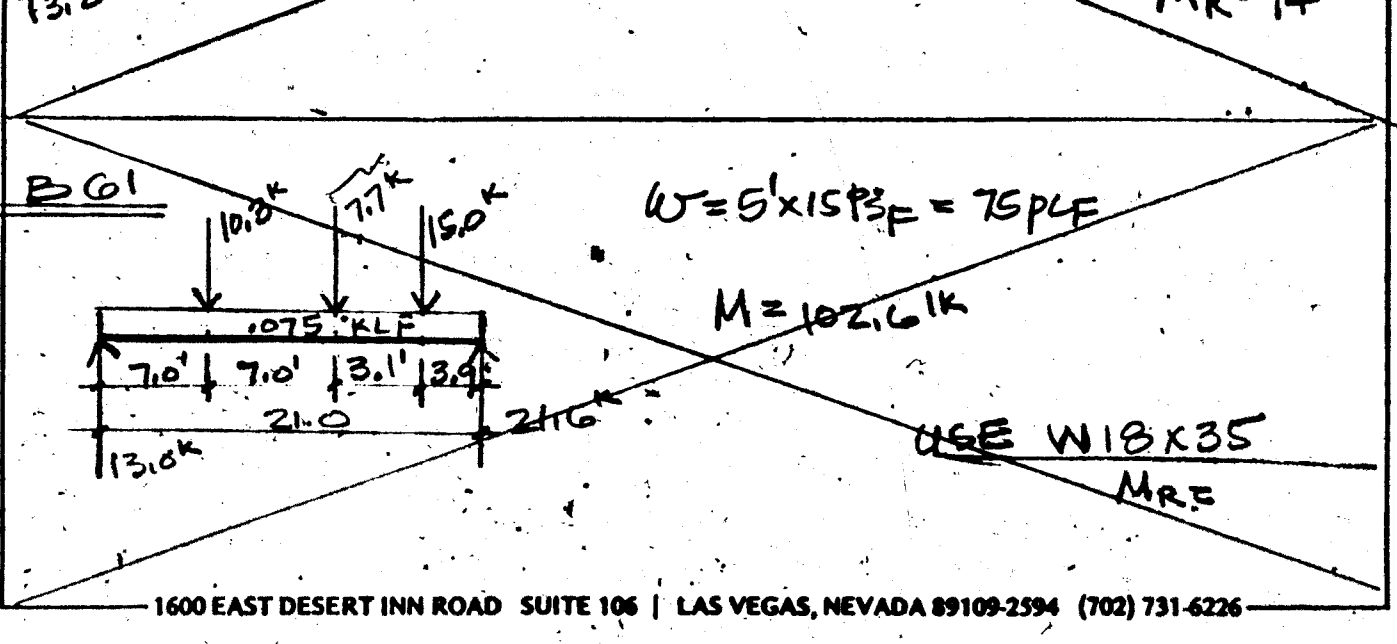
$w = 5' \times 15 PSF = 75 PLF$

$M = 12.2' \times 11.6^K - 5.2 \times 10.3^K - \frac{.075(12.2)^2}{2}$

$= 82.4^{1K}$

USE W16x31
$M_R = 94$

B61



$w = 5' \times 15 PSF = 75 PLF$

$M = 102.6^{1K}$

USE W18x35
$M_R =$

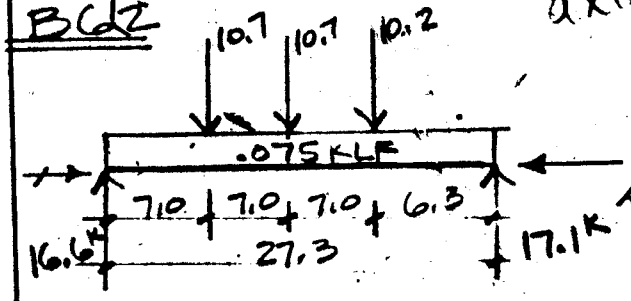
Dave Hasel, 12/31/87

STRAUSS & LOFTFIELD
STRUCTURAL ENGINEERS

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ENGINEER/ JRL

ROOF BEAMS - NORTH ROOF

B62



axial Load from x-brace.

$W = 5' \times 15 PSF = 75 PLF$

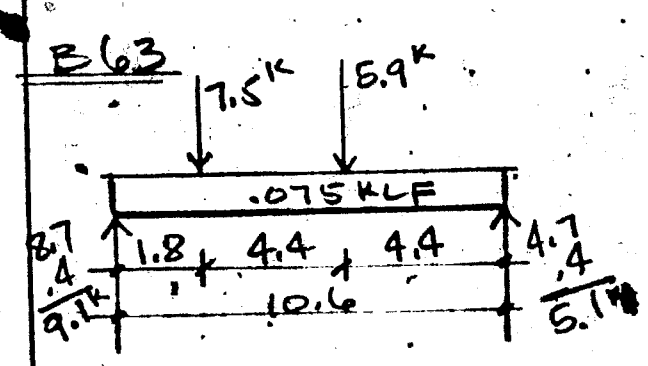
$M = 144.4^{IK}$

AXIAL LOAD = (1.25 x 43.5K)

USE W21x44 ✓

$M_R = 163$

B63



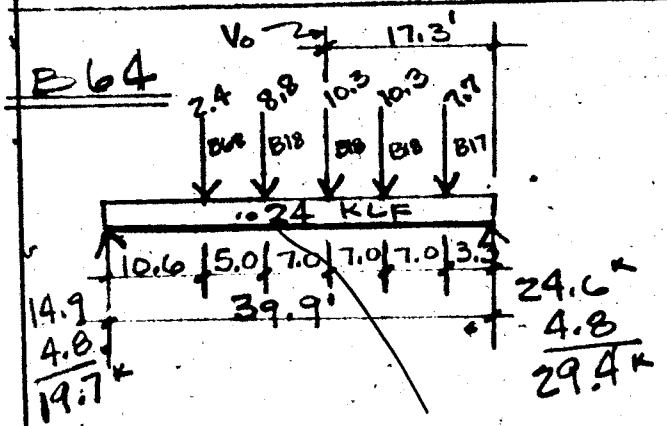
$W = 5' \times 15 PSF = 75 PLF$

$M = 5.1^K \times 4.4' - \frac{.075(4.4)^2}{2} = 21.7^{IK}$

USE W12x14

$M_R = 30$

B64



$W = 6'(\overset{LL}{20} + \overset{DL}{20}) = 240 PLF$

$M = 29.4^K \times 17.3' - 10.3^K \times 7.0' - 7.7^K \times 14.0' - \frac{.24(17.3)^2}{2} = 292.8^{IK}$

USE W24x68

$M_R = 308$

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DATE/
ENGINEER JRL

ROOF BEAMS - NORTH ROOF

B65

SPAN = 39.9' A_T = 39.9 x 6.0 = 239 SF LL = 16

$w_T = 6'(\frac{LL}{16}+\frac{DL}{20}) = 216$ PLF $M = \frac{.216(39.9)^2}{8} = 43.0$ $R = 4.3_{DL}$

USE W16X26

$M_R = 77$

B66

SPAN = 39.9 A_T = 39.9 x 4' = 160 LL = 20

$w = 6'(\frac{LL}{20}+\frac{DL}{20}) = 240$ $M = \frac{240(39.9)^2}{8} = 47.8$ $R = 4.8_{DL}$

USE W16X26

$M_R = 77$

B67

SPAN = 19.7' A_T = LL =

$w = 3.5'(20+66) = 300$ $M = \frac{.30(19.7)^2}{8} = 14.6$ $R = 3.0^{K}_{DL}$

USE W10X12

$M_R = 22$

B68

SPAN = 16.2' A_T = LL =

$w = 3.5'(20+66) = 300$ $M = \frac{.30(16.2)^2}{8} = 9.8$ $R = 2.4_{DL}$

USE W8X10

$M_R = 16$

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DATE/
ENGINEER/ JRE

ROOF BEAMS - NORTH ROOF

B69

SPAN = 16.2' A_T =

w = 3'(100+66) + 5'x15 PSF = 573 PLF

$M = \frac{.573(16.2)^2}{8} = 18.8^{IK}$

USE W12x14

$M_R = 30$

LL =
$R = 4.6^{K}$
DL =

B70

SPAN = 19.7' A_T =

w = 3'(100+66) + 5'x15 PSF = 573 PLF

$M = \frac{.573(19.7)^2}{8} = 27.8$

USE W12x16

$M_R = 34^{IK}$

LL =
$R = 5.6^{K}$
DL =

B71

SPAN = 24.3' A_T =

w = 3'(60+66) + 5'x15 PSF = 453 PLF

$M = \frac{.453(24.3)^2}{8} = 33.4$

USE W12x19

$M_R = 43^{K}$

LL =
$R = 5.5$
DL =

BB72

SPAN = A_T =

w = M =

USE

M_R =

LL =
R =
DL =

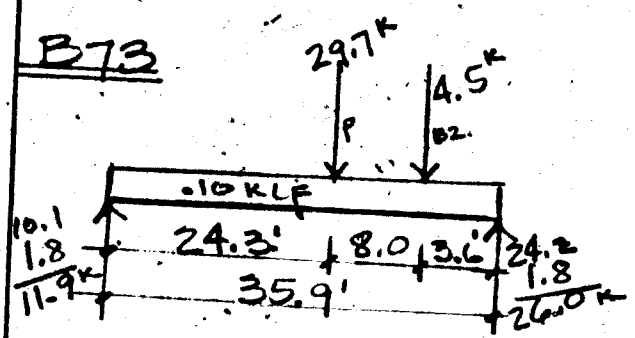
Dona Vocal 12/3/87

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DATE/ 10/22/82
ENGINEER/ JR

ROOF BEAMS - 10K" H ROOF

B73



$P = 5.5 + 21.1 + 3.1 = 29.7^K$ (B71, B66, B29)

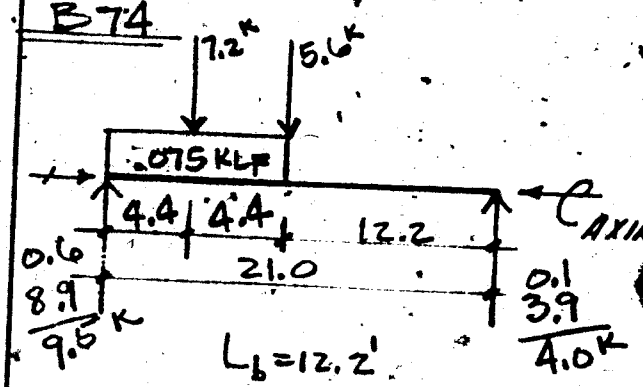
$w = 2.5'(\frac{LL}{20} + \frac{DL}{20}) = 100\ PLF$

$M = 24.3' \times 11.9^K - \frac{.10(24.3)^2}{2} = 269.7^{'K}$

USE W24x68

$M_R = 308$

B74



$L_b = 12.2'$

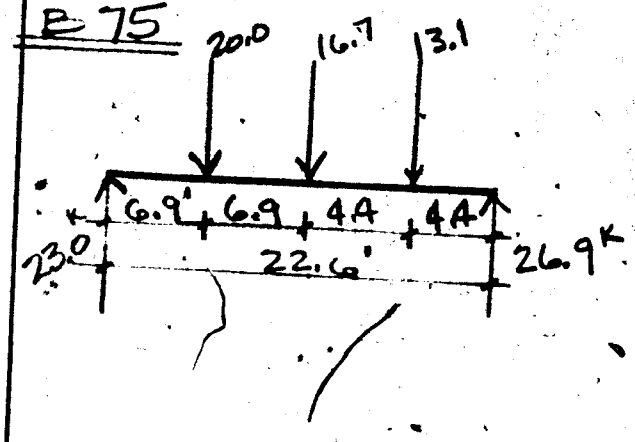
$w = 5' \times 15\ PSF = 75\ PLF$

$M = 12.2' \times 4.0^K = 48.8^{'K}$

USE W14x38

$M_R = 90^{'K}$ @ $L_b = 12.2'$

B75



$M = 8.8' \times 26.9 - 4.4' \times 13.1$

$= 179.1^{'K}$

USE W21x50

$M_R = 189$

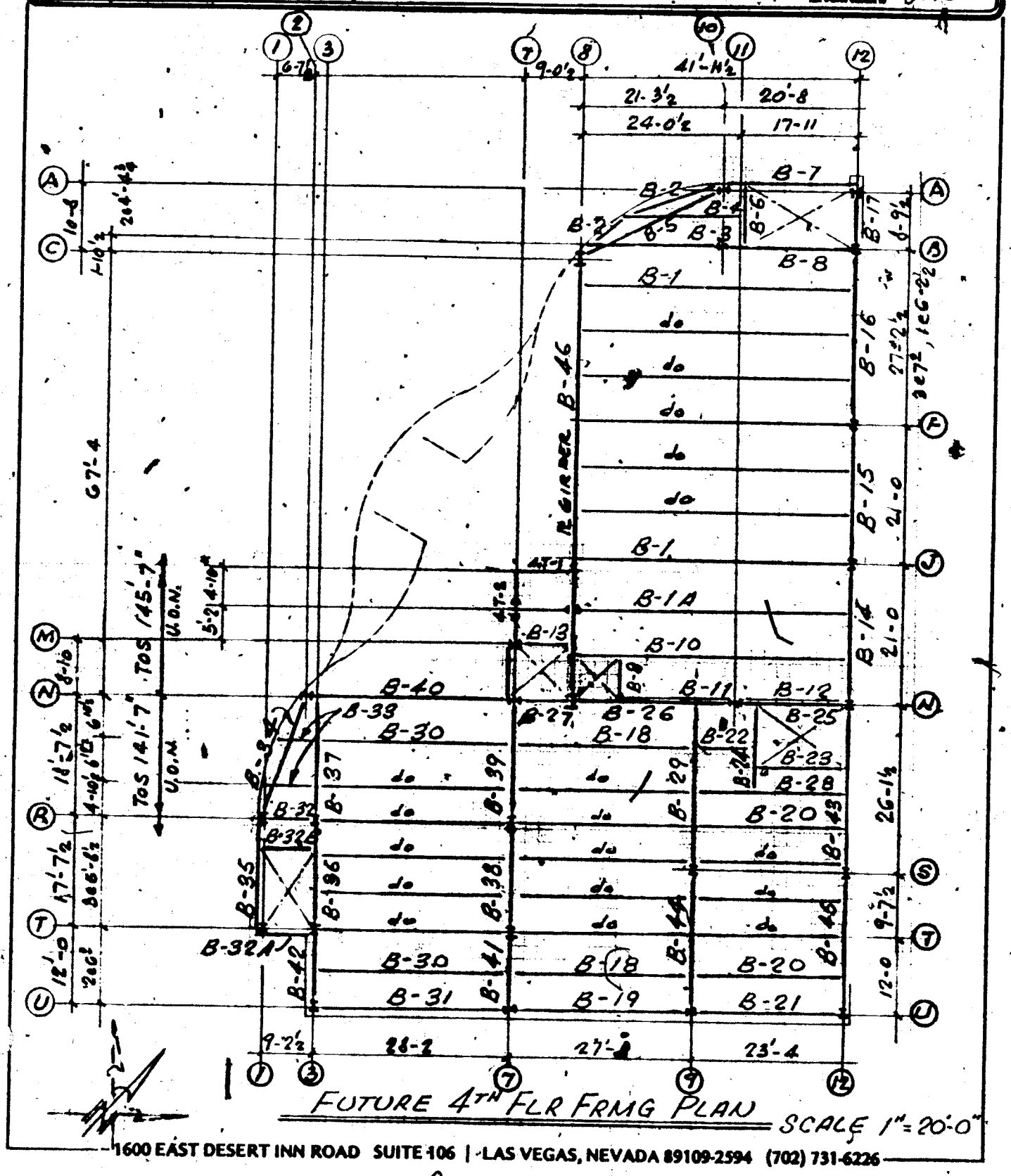
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FUTURE 4TH FLOOR - 4TH LEVEL



FUTURE 4TH FLR FRMG PLAN SCALE 1"=20'-0"

1600 EAST DESERT INN ROAD SUITE 106 | LAS VEGAS, NEVADA 89109-2594 (702) 731-6226

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PRO[redacted]8201.7
DAT[redacted]CT'82
ENGINEER HS

4TH LEVEL FRM'G B-1 THRU B-46

FOR BMS B-1 THRU B-29 SEE 2ND LEVEL FRM'G

FOR BMS B-30 THRU B-40 SEE 3RD LEVEL FRM'G

B-41 THRU B-46 FOLLOW FOR REACTIONS ONLY

1600 EAST DESERT INN ROAD SUITE 106 | LAS VEGAS, NEVADA 89109-2594 (702) 731-6226

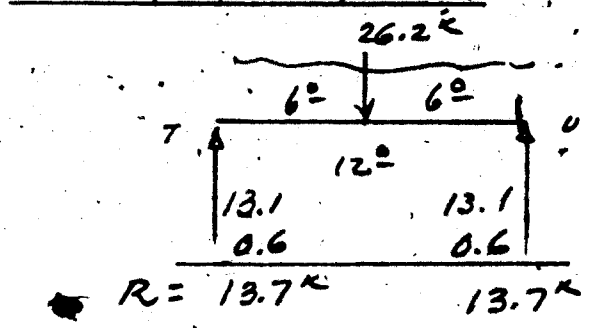
Done Hand, 12/31/87

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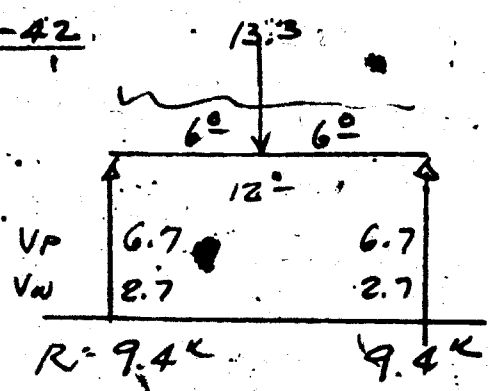
B-41 LINE 7, T-U:



$P = 13.3^{B30} + 12.9^{B11} = 26.2^K$

$w = 100$ PLF

B-42



$P = 13.3^{K}$ (B30)

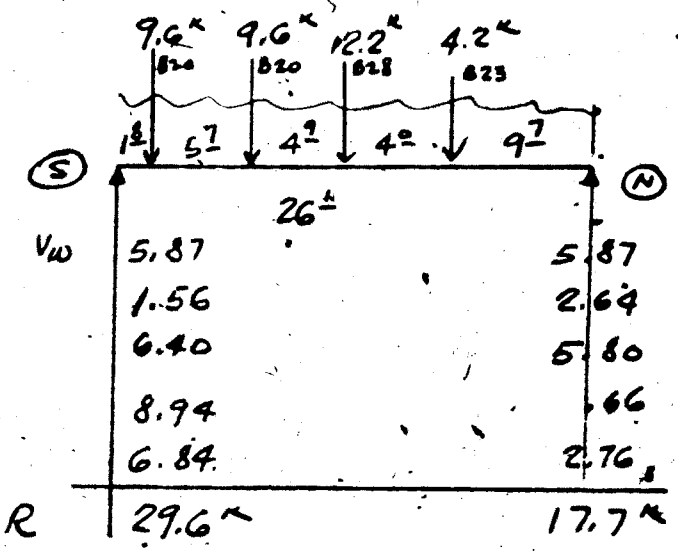
$w = 14(25)_{wall} + 100 = 450$ PLF

Don Hasel 12/31/87

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STRUCTURAL ENGINEERS

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PROJECT/ FUTURE 4TH FLOOR
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PROJECT # 8207
DATE/ 10-82
ENGINEER

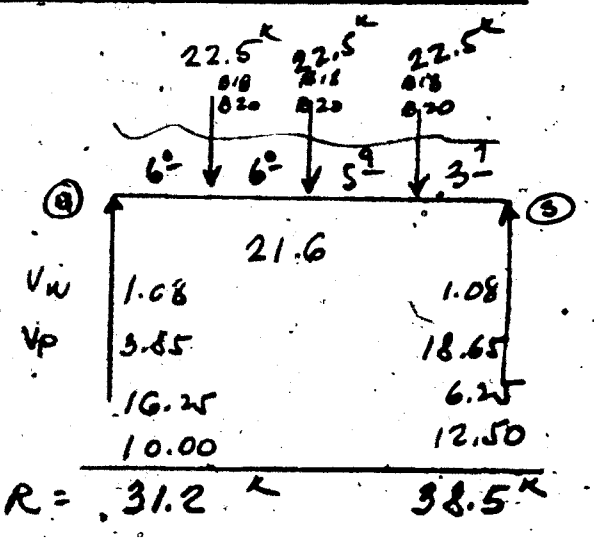
BEAM B-43 LINE 12, S-N



V_W	5.87	5.87
	1.56	2.64
	6.40	5.80
	8.94	.66
	6.84	2.76
R	29.6K	17.7K

$W = 100 + 14(26) = 450$ PLF

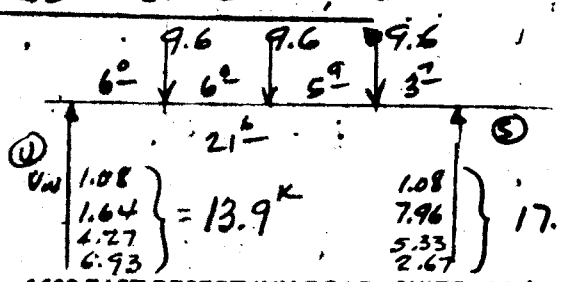
B-44 LINE 9, S-U



V_W	1.08	1.08
V_P	3.85	18.65
	16.25	6.25
	10.00	12.50
R =	31.2K	38.5K

B18 B20
$P = 12.9 + 9.6 = 22.5^K$
$W = 100$ PLF

B-45 LINE R, S-W



V_W	1.08	1.08
	1.64	7.96
	4.27	5.33
	6.93	2.67
	= 13.9K	17.1K

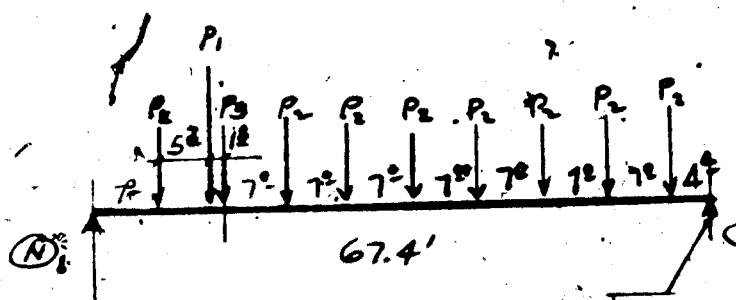
B20
$P = 9.6^K$
$W = 100$ PLF

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FUTURE 4TH FLOOR ENGINEER

PLATE GIRDER B-46



V_W	18.5
V_{P_2}	17.3
	13.31
	11.3
	9.3
	7.3
	5.3
	3.3
	1.3
V_{P_1}	2.5
V_{P_3}	30.0
R =	119.4

$\frac{19.3}{67.4} = .2864$

	18.5
	2.0
	6.0
	8.0
	10.0
	12.0
	14.0
	16.0
	18.0
	1.5
	7.9
	112.9

Σ = 232.3

P_2 4@1' = 14.3^k
P_2 = 4@1.4m = 37.9^k
P_1 = 4@.75 = 3.0^k
$W = 14(26) + 200 = 550$ PLF

$W = .55(67.4) = 37.0$
$\Sigma P_2 = 8(19.3) = 154.4$
$P_1 = 3.0$
$P_3 = 37.9$
$\Sigma = 232.3$ ^k

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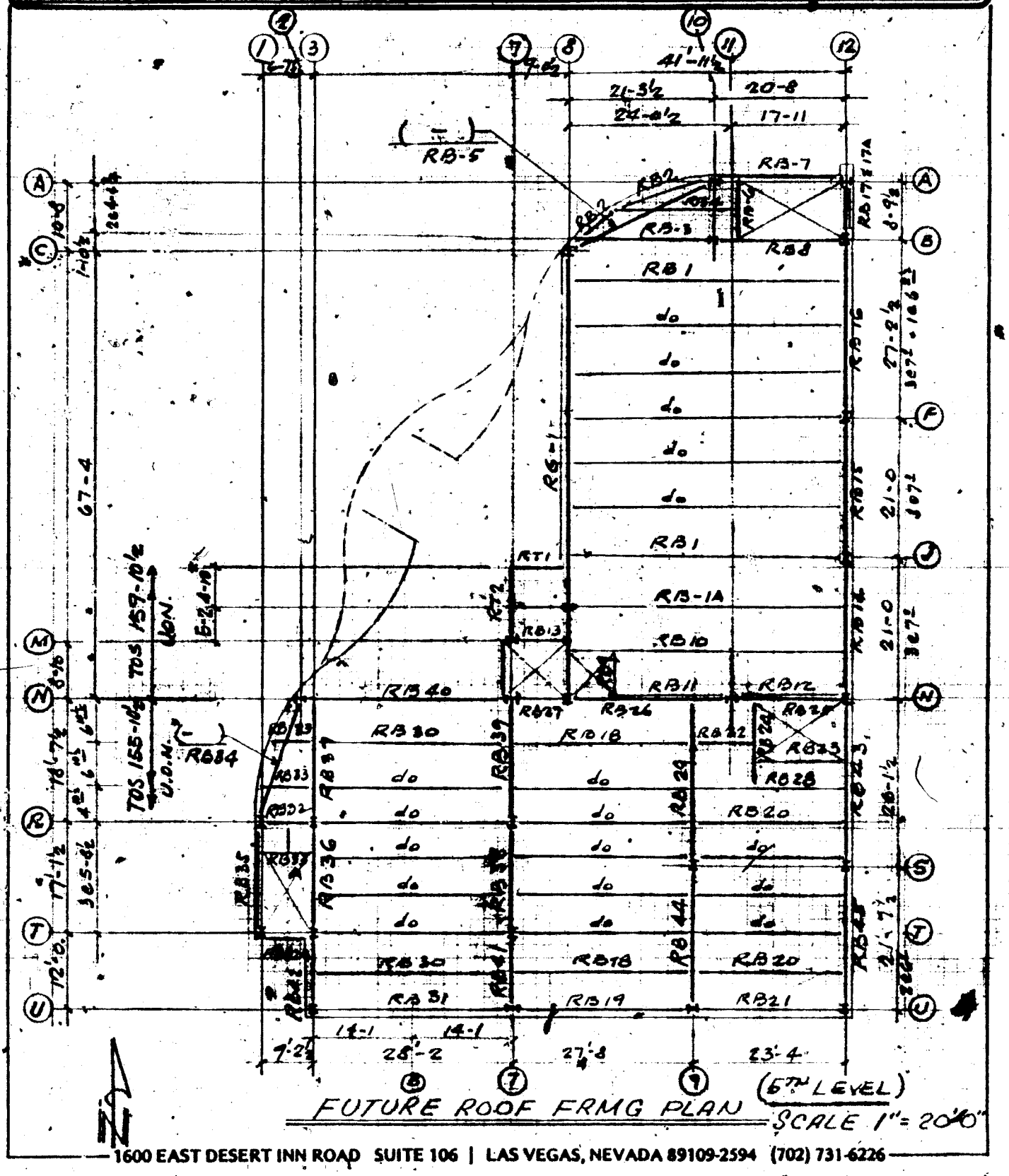
SHEET# 204 OF 317

PROJECT # 82017

DATE/ OCT '82

ENGINEER/ DM

FUTURE ROOF - 5TH LEVEL



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FUTURE ROOF. 3RD LEVEL ENGINEER/

DL = 16 PSF + BM. LL = 20 PSF (NOT REDUCED) {SEE SN. 1}

EXTERIOR WALLS 25 PSF

BEAM RB-1 @ 7.0' oc

L = 42' W = 7.0 (16+8 +20) = 168 + 140 = 308 PLF
(D, L, TL)

W = .308 (42) = 12.94 K R = 6.47 K

M = 12.94 (42) ÷ 8 = 68.0 IK

TRIM BEAM RB-2

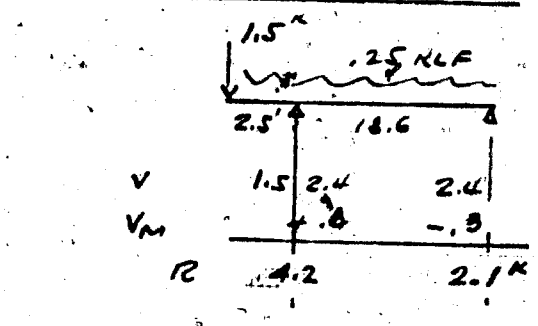
L = 14.0' MIN W = 3.0' (16+8 +20) + 25 (3+7)
(D, L, parapet + wall)

7.0 MIN = 72.0 + 250 + 60 = 352 + 60 = 412 PLF
(L)

W = .412 (14) = 5.8 K R = 2.9 K

M = 5.8 (14) ÷ 8 = 10.2 IK

OUTLOOKER BEAM RB-3

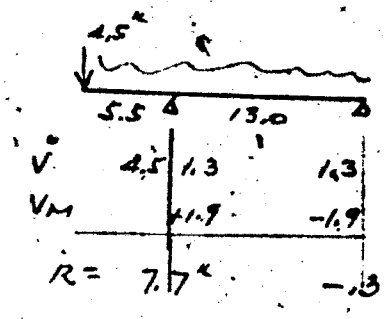


W = 55 (24 +20) = 132 + 110 = 242 PLF

P = 7/14 (2.9)' = 1.5 K

M_{cant} = .25 (2.5)² .5 = .78
+ 1.5 (2.5) = 3.75
} ≈ 4.6 IK

OUTLOOKER BEAM RB-4



P = 2.9 + .5 (2.9) = 4.5

W = 4.5 (24 +20) = 108 + 90 = 200 PLF

M_{cant} = 4.5 (5.5) = 24.8 IK

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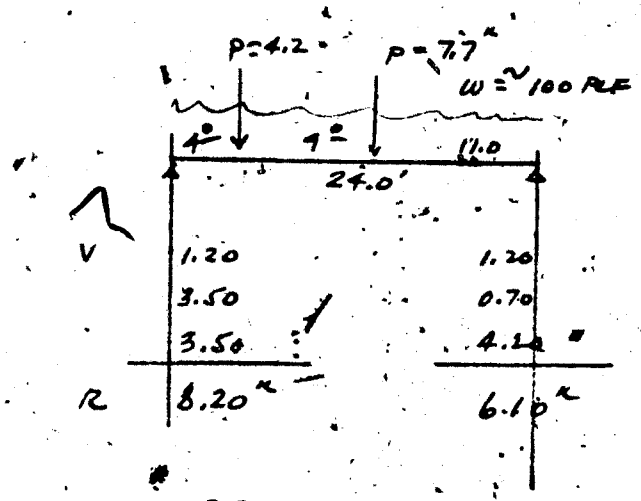
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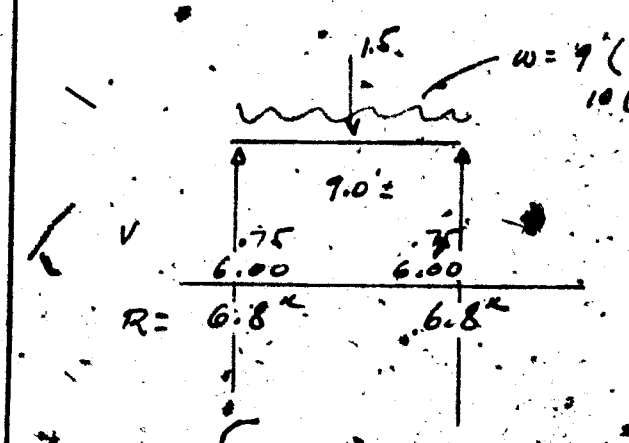
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ENGINEER/

UNDER BEAM RB-5

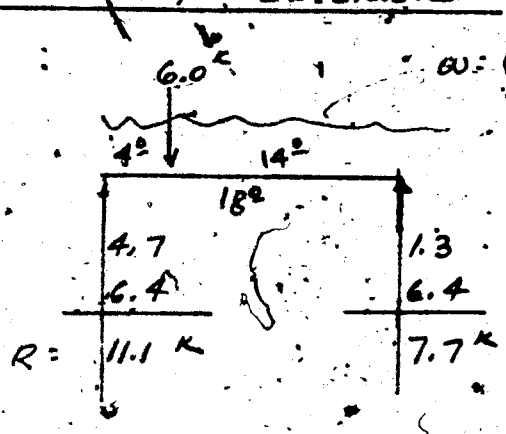


BEAM RB-6 FRONT OF STAIR



DL LL
w = 4'(20+100) = 180 + 900 = ~~1080 PLF~~
10(25) WALL = 250
430 + 900 = 1330 PLF

BEAM RB-7 EXTERIOR



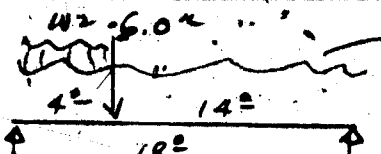
w = (3+7)25 + 40 = 290 PLF
Parapet
7×25 = 175
6×20 = 120 1.20
585 D + 120 L
= 705 PLF

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FUT. R.F. 3RD LEVEL ENGINEER/ JM

STAIR TRIM BEAM - RB-8 (interior) LINE (B)



$W_1 = 3.1(24+20) + \underset{D}{.75} + \underset{L}{62}$
$10\times25^{\#} \quad 250$
$6(20+20) \quad 120 + 120$
$445 + 185 = 630$ PLF

V_P	4.7	1.3
V_{W_2}	.9	0.1
V_{W_1}	3.4	5.4
R =	9.0K	6.8K

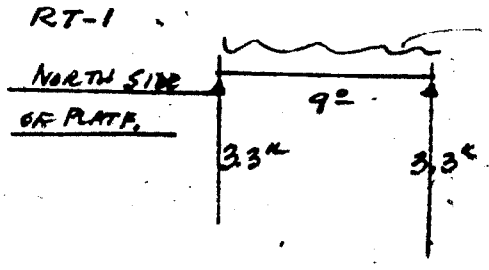
● $W_2 = 5.4(24+20) = 130 + 110 = 240$

STAIR TRIM BEAM A-9 near Line "N" 6'8"

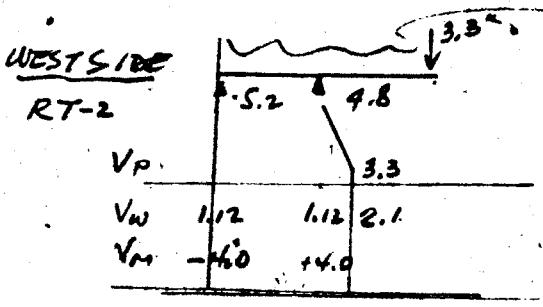
L = 7.0' $W = 2.0'(24+20) = 48+40 = 88$ PLF
$W = 616^{\#}$ $R = 308^{\#}$ $M = .5K^{'K}$

TRIM AROUND ELEV. LANDING (159-10½)

RT-1



$W = 2.5(24 + \underset{LL}{100}) + 17'(25) = \underset{Wall}{485} + \underset{LL}{250} = 735$ PLF
$W = 9(735) = 6.6^K$. $R = 3.3^K$
$M = 6.6(4) \div 8 = 7.5^K$



$W = 17'(25) = 425 = .43$ KLF

$M_{conc} = 3.3^K(4.8') = 15.8$
$.43(4.8)^2 \cdot .5 = 5.0$
$20.8^{'K}$

WEST SIDE ELEV. LINE ⑦, M-N

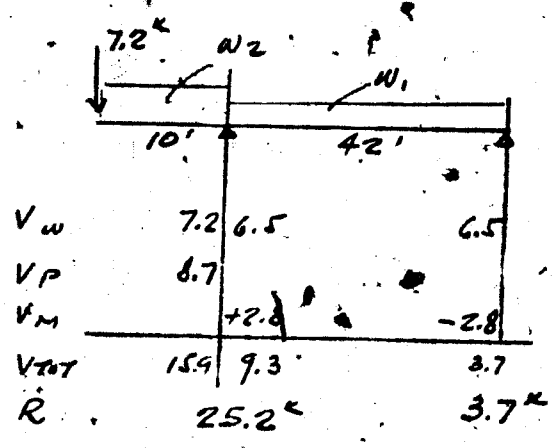
L = 9.0 $W = 14(25) + 100 = 450$
$W = 4.06^K$ $R = 2.03^K$

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ROOF BEAM RB-1A : Cantilever picks up ELEVATOR PLATFORM



w_1 = 608 PLF

$w_2 = 7(24 + 100) = 168 + 700 = 868$ PLF (LL)

$M_{cant} = 7.2(10) = 72$
$\quad .87(10)^2 .5 = 43.5$ } $= 115.5^{ft\text{-}k}$

{ RB-10 · Same as RB-1 }

RB-11 (LINE N)

L = 18' $w = 3.5(24+20) + 5'(25) = 70 + 209 = 280$ PLF (proj. wall, LL)

18-0½

$W = .280(18) = 5.0^k$ $R = 2.5^k$

$M = 5.0 \times 18 \div 8 = 11.3^{ft\text{-}k}$

RB-12 (LINE N)

17-11 L = 18' SAME AS RB-11 { add ½ PENTHOUSE Roof $w = \frac{10}{2}(20+20) = 200$ $+ 6 \times 25 = 150$ } $350 \times 9' = 3.2^k$ W

$R = 1.6$

Roof $= 2.5 + 1.6 = 4.1^k$ (63 DL, 260 LL)

$M = 8.2(18) \div 8 = 18.5^{ft\text{-}k}$

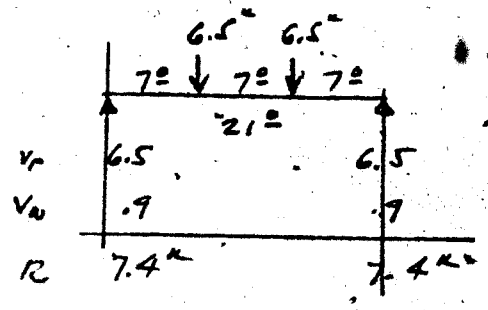
ELEV. TRIM NORTHSIDE RB-13

L = 9' $w = 2.6(24 + 100) + 13(25) = 390 + 260 = 650$ PLF (DL, LL)

$W = 9(650) = 5.9$ $R = 3.0^k$

$M = 6.0(9) \div 8 = 6.8^{ft\text{-}k}$

RB-14 & [illegible]-15 (LINE 13)



$P = 6.5^k$

$w = 5'(25) + 50 = 175$ PLF

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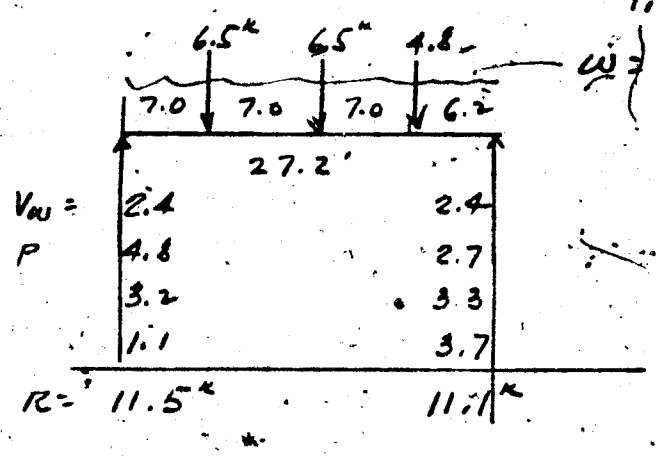
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RB-16 (LINE (12))

$P_1 = 6.5^k$ $P_2 = \frac{6.17}{7.0}(6.5) = 4.8^k$

$w = 175$ PLF



V_w =	2.4	2.4
P	4.8	2.7
	3.2	3.3
	1.1	3.7
R =	11.5k	11.1k

RB-17 EAST SIDE STAIR @ LINE (A)

$L = 8.8'$ $w = (3+4')25 + 25 = 175 + 25 = 200^{\#}/_{'}$

$W = 8.8(.2) = 1.76$ say 2^k $R = 1^k$

RB-17a Landing UNDER RB-17

$L = 8.8$ $w = 8'(\overset{D}{25} + \overset{L}{100}) + 200 = \overset{D}{400} + \overset{L}{800} = 1.2$ KLF

$W = 8.8(1.2) = 10.6$ $R = 5.3$

$M = 10.6(8.8) \div 8 = 11.7^{IK}$

RB-18 6.9' max ht

$w = 6.9(24 + 20) = 166 + 138 = 304$ PLF

$L = 27.7'$ $W = 27.7(304) = 8.42^k$ $R = 4.21^k$

$M = 8.42(27.7) \div 8 = 29.2^{IK}$

RB-19 LINE (U) (7-9)

$L = 27.7'$ $w = 3(24 + 20) + (3+7)25 = 60 + 322 = 382$ PLF (wall, LL, DL)

$W = 27.7(.382) = 10.6^k$ $R = 5.3^k$

$M = 10.6(27.7) \div 8 = 36.7^{IK}$

RB-21 LINE (U) (9 - 12)

$L = 23.3'$ $w = 382$ $W = 9.0^k$ $R = 4.5^k$

$M = 9.0(23.3) \div 8 = 26.2^{IK}$

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FUTURE ROOF - 5TH LEVEL ENGINEER Jm

BEAM RB-20 $L = 23.3'$ $W = 6.9'(24+20) = 304$

$W = 23.3(304) = 7.2^k$ $R = 3.6^k$

$M = 7.2(23.3) \div 8 = 21.0^{ik}$

RB-23 STAIR TRIM

$L = 16'$ $W = 3(24+20) + 10(25) = 325 + 60 = 385$ (60 = 6(40))

$W = .365(16) = 6.2^k$ $R = 3.1^k$ (120 + 120 = 240)

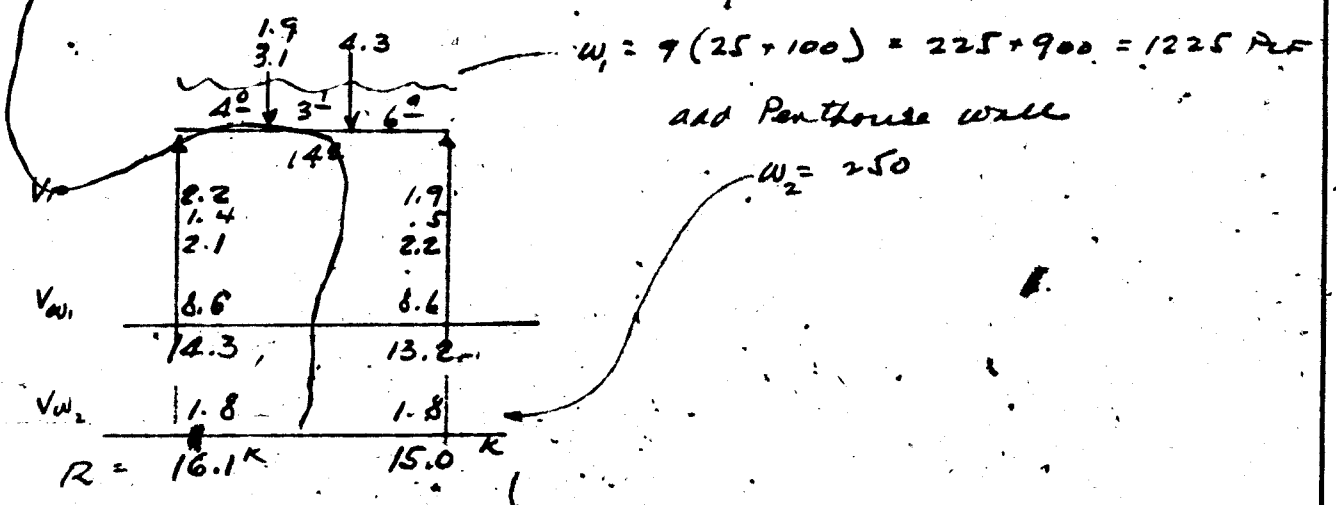
$M = 10(16) \div 8 = 20^{ik}$ $.240(16) = \frac{3.8}{10.0}$ $R = 1.9$ } 5.0^k (625)

RB-22 $L = 10'$ $W = 6.9(24+100) = 169+690 = 860\ ^{\#}/_{'}$

$W = 860 \times 10 = 8.6^k$ $R = 4.3^k$

$M = 8.6(10) \div 8 = 10.8^{ik}$

RB-24 face of Stairwell ℄ Ⓝ

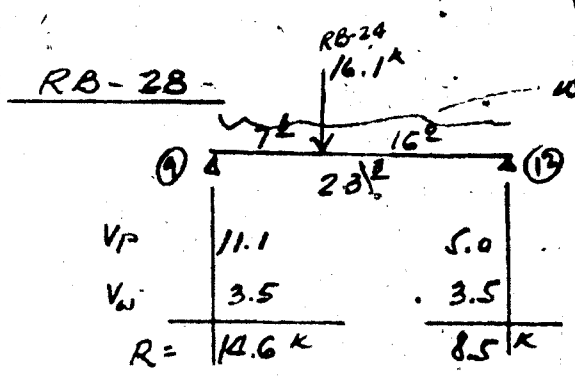


$w_1 = 9(25+100) = 225+900 = 1225$ PLF

add Penthouse wall

$w_2 = 250$

RB-28

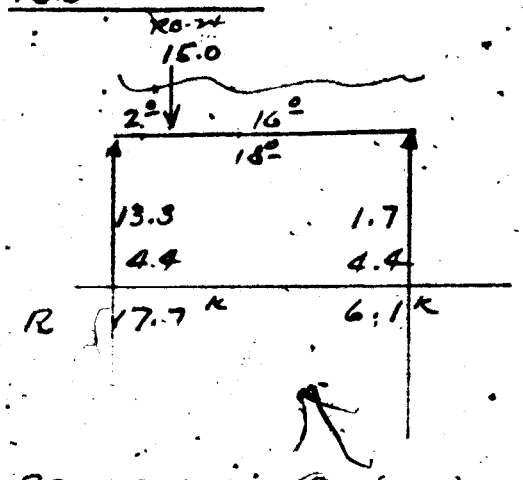


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STRAUSS [illegible] OFFFIELD
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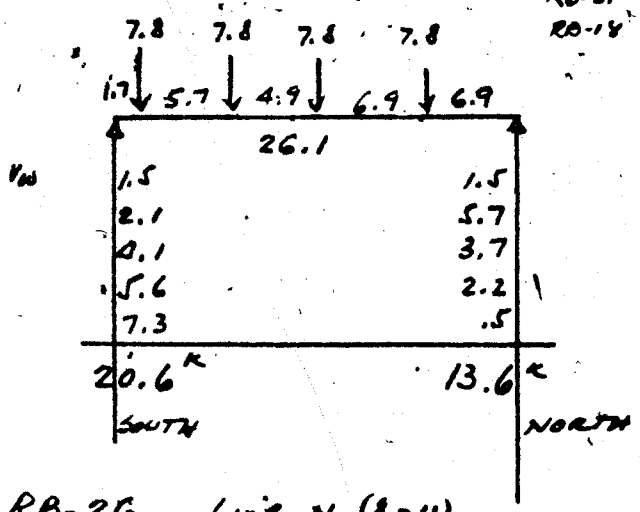
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FUTURE ROOF - 5TH LEVEL ENGINEER/

RB-25 ..LINE "N" (11-12)



W = 10(25) = 250
6(40) = 120 + 120
370 D + 120 L
= 490 PLF

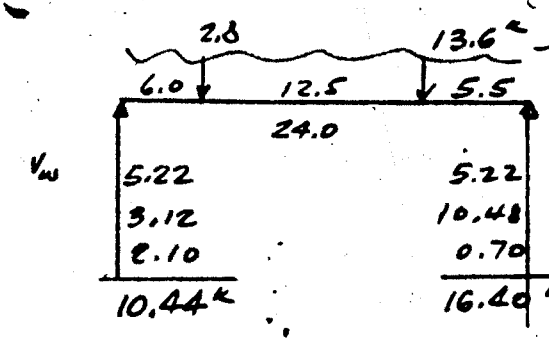
RB-29 Line (9) -(S-N)



RB-21 3.6
RB-18 4.2
7.8

W = 70 + 40 = 110

RB-26 Line N (8-11)



W = 3.5 (2L + 100) = 84 + 350 = 435 PLF

310
2.8
2.8

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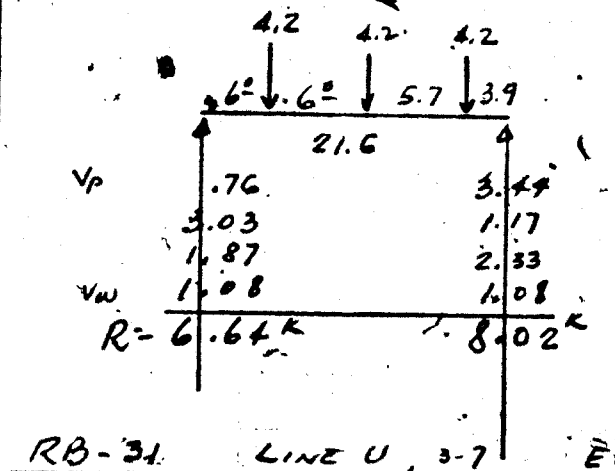
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FUTURE ROOF - 5TH LEVEL
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RB-27 FRONT OF ELEVATOR (155'-10½")

L = 9.0' $w = 3.5(24+100) + 10(25) + 4.5(40)$
$= 440_{LL} + 424_{DL} = 864$ PLF

$W = .864(9.0) = 7.8^K$ $R = 3.9^K$
$M = 7.8(9) \div 8 = 8.8^{IK}$

RB-44 LINE 9 S-J



RB-31 LINE U, 3-7 EXTERIOR

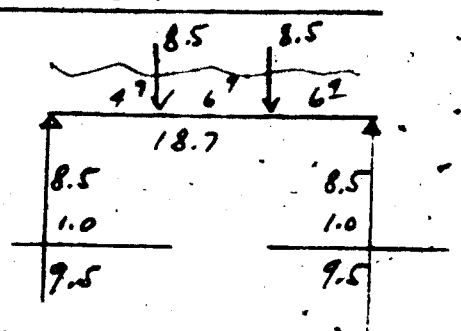
L = 28.2' $w = 4(24+20) + 10'(25) = 346_{L} + 80_{D} = 426$ PLF
$W = 426(28.2) = 12.0^K$ $R = 6.0^K$
$M = 12(26.2) \div 8 = 42.30^{IK}$

RB-30 (3-7)

L = 28.2 $w = 6.9(24+20) = 166 + 138 = 304$ PLF
$W = 304(28.2) = 8.6^K$ $R = 4.3^K$
$M = 8.6(28.2) \div 8 = 30.3^{IK}$

RB-39 LINE 7 R-N

4.3
4.2
8.5



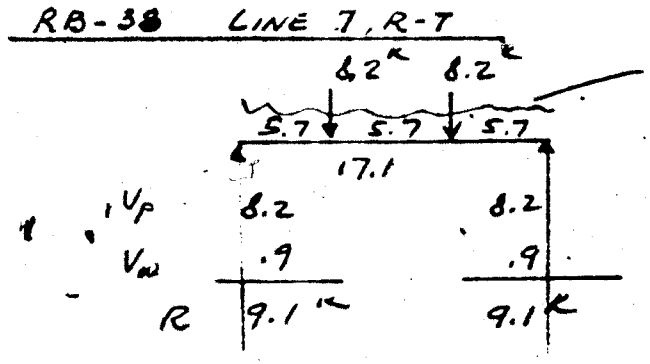
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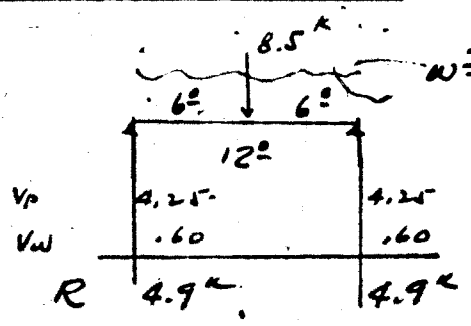
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FUTURE ROOF - 5TH LEVEL ENGINEER/ JM

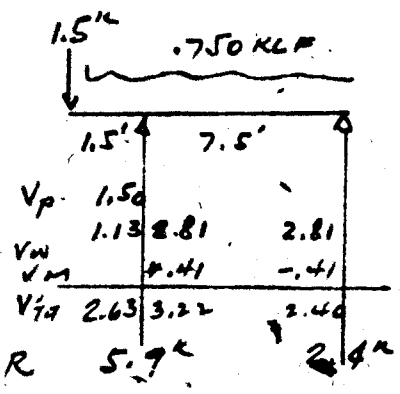
RB-38 LINE 7, R-7



RB-41 LINE 7, T-U



RB-33 Near Ⓡ 1-3



$p = 6'(\frac{25}{\text{per}} \times 10') = 1.5^k$ $\frac{\text{exterior}}{\text{wall}}$

$w = 6(24+100) = 144+600 = 744$ PLF

$M_{cant} = 1.5(1.5) + .75(1.5)^2 .5 = 2.25 + .84 = 3.10^{ik}$

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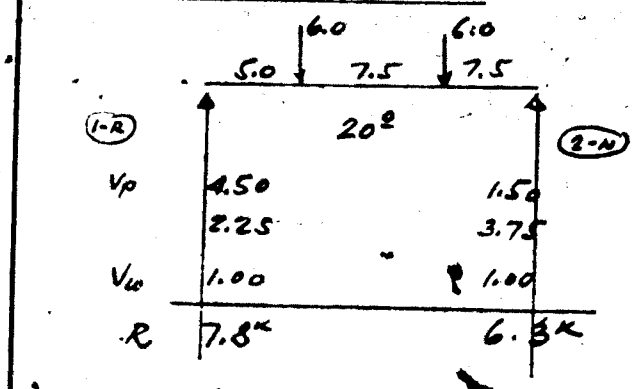
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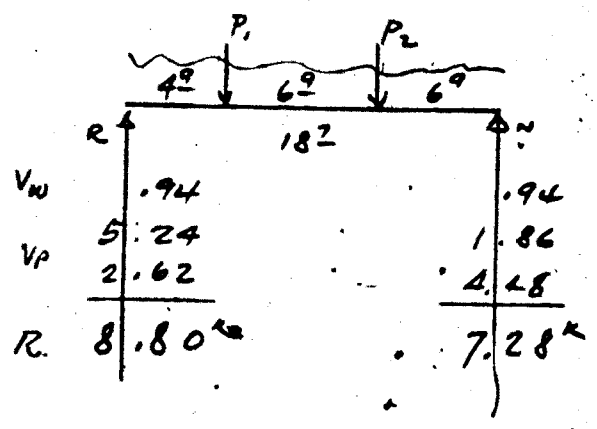
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ENGINEER/ JM

FUTURE ROOF - 5TH LEVEL

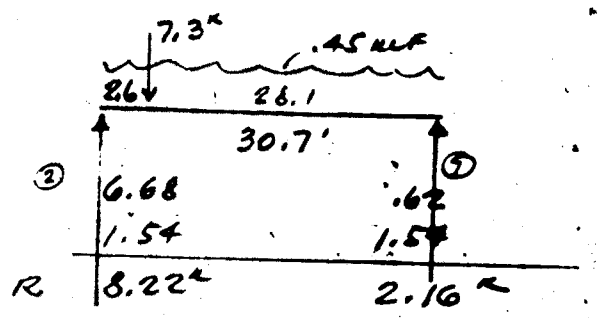
UNDER BEAM RB-34



RB-37 Line (3) R-N



RB-40 LINE N, 2-7



$P_1 = P_2 = 2.8 + 4.3 = 7.1^K$

$w \cong 100$ PLF

wt. wall

$w = 4(30 + 30) + (3+7)25$

$= 370 + 80 = .45$ KLF

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DATE/ 10-82
FUTURE ROOF - 5TH LEVEL ENGINEER

STAIRWELL R-7 1-3 allow 10' walls + same Roof

RB-32 (R) 1-3 (RECHECK RB-7, 8, 6 & 17)

L = 9.2' W = 5'(24+100) = 120+500 = 620 PLF wall +250 = 870

w = 870(9.2) = 8.0 k R = 4.0 k

M = 8.0(9.2) ÷ 8 = 9.0 IK

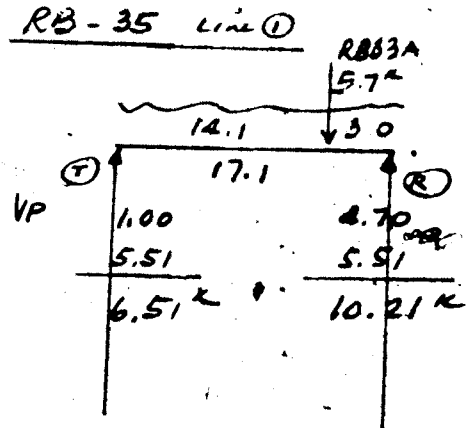
RB-33A

L = 9.2 w = (2.5 + 7.5)(24+100) = 240 + 1000 = 1.24 KLF (plan, stair)

W = 1.24(9.2) = 11.4 k R = 5.7 k

M = 11.4(9.2) ÷ 8 = 13.2 IK

RB-35 Line ①

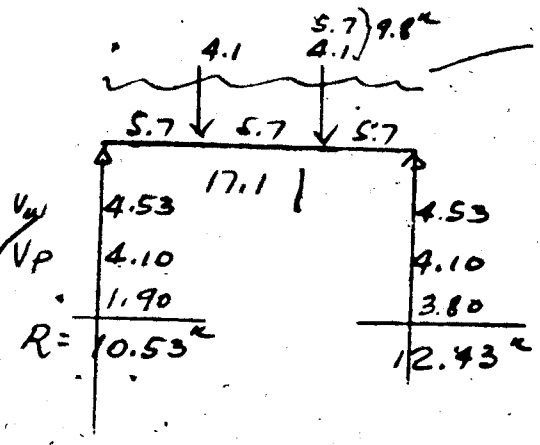


wall Rooftrans Roof

w = (10+7) 25 + 4.6'(20+20) + 40
D D L D

555 + 90 = 645 PLF
D L

RB-36 LINE ③ T-R



w = 100 + 10(25) + 90 + 90 = 440 + 90 = 530 PLF

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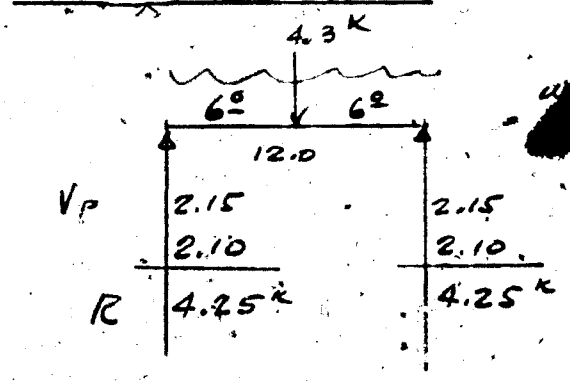
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STRUCTURAL ENGINEERS

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DATE/ 10-82
FUTURE ROOF - 5TH LEVEL ENGINEER/

RB-32A LINE T 1-3

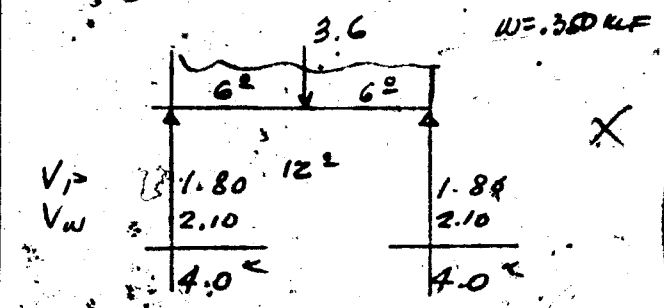
L=9.2' W= 10+7(25) = 425 PLF W=.425(9.2)= 3.91K R=2.0K
M= 3.91(9.2) ÷ 8 = 4.5 FK

RB-42 LINE 3, T-U



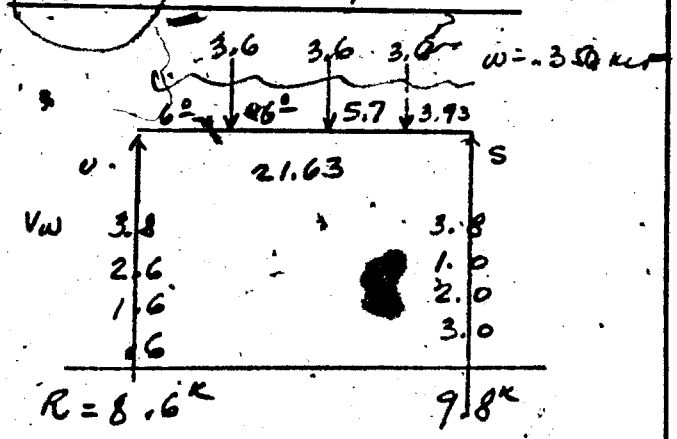
WALL
W= 100 + 10'(25) = .350 KLF

RB-45 Line 12, T-U

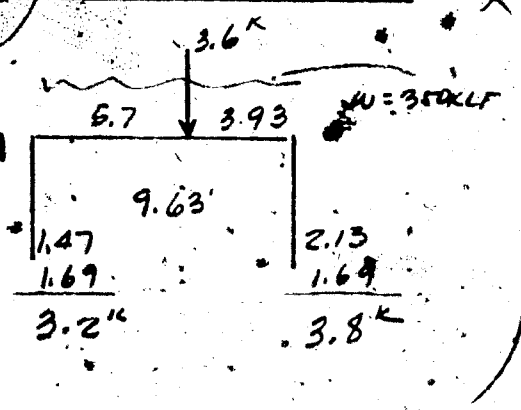


RB-45

~~RB-45C~~ Line 12, T-S (No col T12)



RB-45C Line 12, T-S

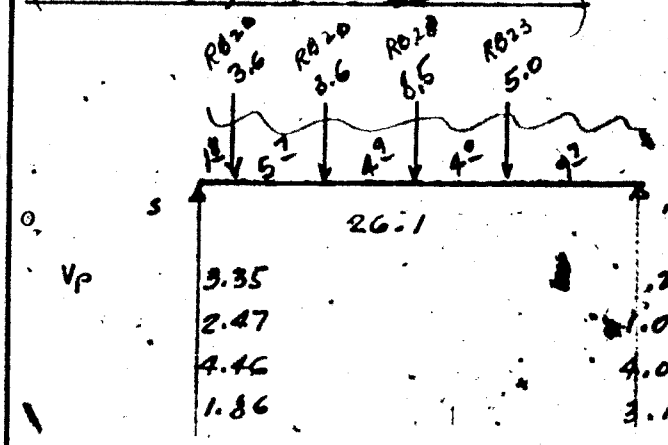


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DATE/ 10-82
FUTURE ROOF - 5TH LEVEL ENGINEER Jmc

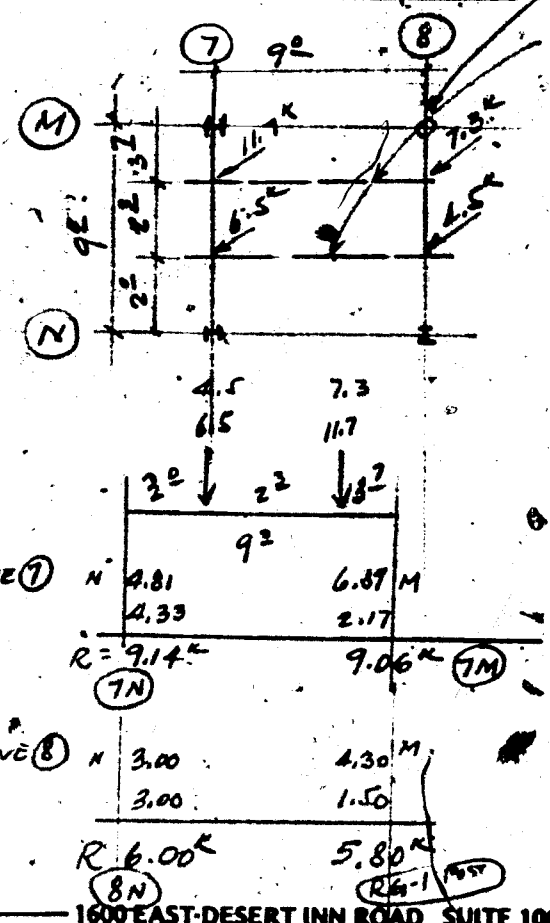
RB-43 LINE (12) S-N



V_P	3.35	.25
	2.47	1.03
	4.46	4.04
	1.86	3.14
V_W	4.57	4.57
	R = 16.7 K	13.0 K

will
$\omega = 100 + 10(25) = 350$ PCF

ELEVATOR PENTHOUSE



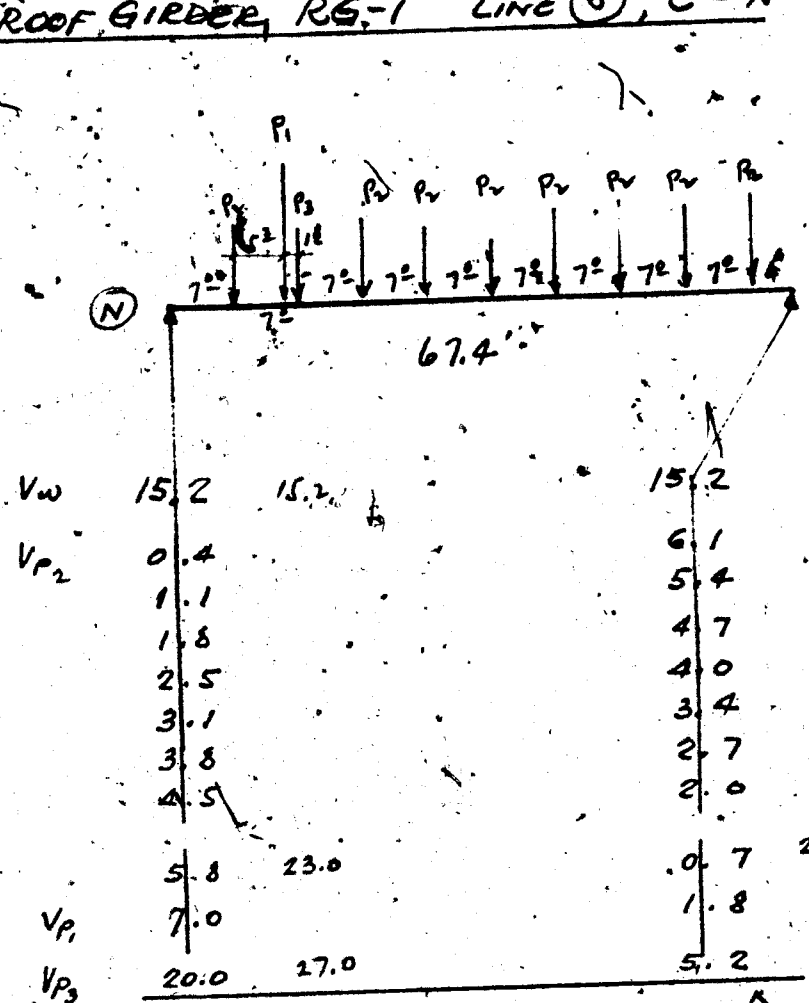
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DATE/ 10-82
FUTURE ROOF - 5TH LEVEL ENGINEER JM

ROOF GIRDER RG-1 LINE (8), C - N



P_2 = RB-1 = 6.5^k (RB-10)
P_3 = RB-1A = 25.2^k
P_1 = ELEV. POST = 5.8 + RB 13 = 3.0 } = 8.8^k
$W = 10(25) + 200 = 450$ PLF (wall, A)
$W = .450(67.4) = 30.33$
$\frac{1}{2} = 15.2^k$

V_W	15.2	15.2		15.2	30.4		
V_{P_2}	0.4			6.1			
	1.1			5.4			
	1.8			4.7			
	2.5			4.0			
	3.1			3.4			
	3.8			2.7			
	4.5			2.0			
	5.8	23.0		.07	29.0	$\Sigma = 52.0 - 6.5 = 8$ ✓	
V_{P_1}	7.0			1.8	$\Sigma = 8.8$		
V_{P_3}	20.0	27.0		5.2	$\Sigma = 25.2$		
	R = 65.20^k			51.2^k	$\Sigma = 116.4 = 116.4$		

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@ GIRDER CONN.

BEAM B-[illegible] N. 2ND LEVEL

R = 195^K MAX
7/8" Φ A325-N SS → 12.6^K EA

195^K/12.6 = 15.5 → 16 BOLTS.

8 - 7/8" Φ A325 N EA SIDE → (7-SPA@3" + 2 x 1¼") = 23½"

AISC TABLE III WELD A w/ ANGLE LENGTH = 23½"

5/16" WELD & t_w = 0.64" MIN → 222^K ALW.

∴ (222^K)(0.625/0.64) = 216^K ALW. for 5/8" WEB

L 4 x 3½ x 3/8

AISC TABLE II-A BOLT SHEAR w/ 3/8" L THK = 202^K

AISC TABLE II-C L SHEAR w/ do = 209^K

USE | DBL L 4x3½x3/8 x 1'-11½"
8-7/8" Φ A325 EA SIDE @ 3" o.c.
5/16" WELD A
CAPACITY = 202^K

BEAM B-49 2ND LEVEL & B-46 3RD LEVEL South ½

R = 130^K MAX
7/8" Φ A[illegible]5 N SS 12.6^K EA

130^K/12.6 = 10.3 → 12 BOLTS

6 - 7/8" Φ A325 N EA SIDE (5-SPA@3½" + 2 x 1½") = 20½"

AISC TABLE III WELD A w/ ANGLE LENGTH = 20½"

¼" WELD & t_w = 0.51" MIN → 158^K ALW

∴ (158^K)(0.50/0.51) = 155^K ALW for ½" WEB

L 4 x 3½ x 5/16

BOLT SHEAR 12(12.6) = 151^K

ANGLE SHEAR (20.5 - 6x15/16)(5/16)(17.4KSI)(2) = 162^K

USE | DBL L 4x3½ x 5/16 x 1'-8½
6-7/8" Φ A325 EA SIDE @ 3½" o.c.
¼" WELD A
CAPACITY = 151^K

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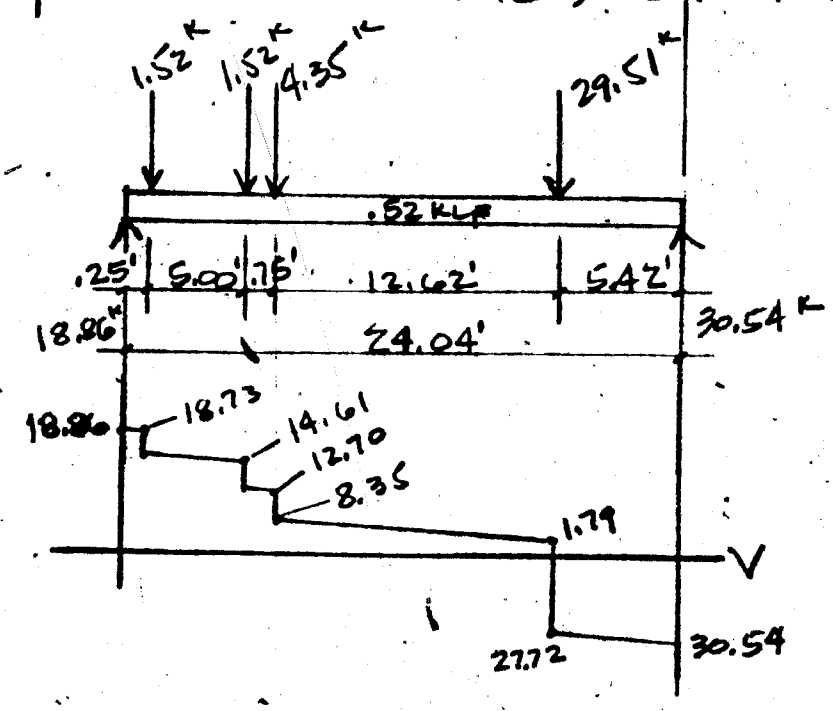
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OPG. THRU WEBS OF BM'S. B26 (W24x55) 2ND & 3RD LEVELS.

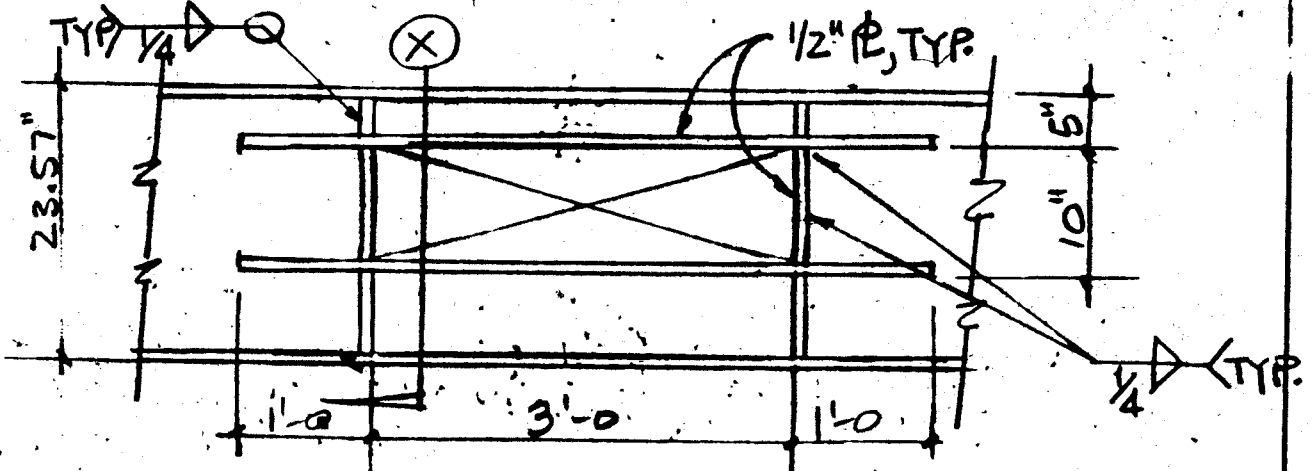
OPG. TO BE 36" x 10", NEAR THE TOP FLANGE



PLACE OPG. @ CTR. OF BM:

$M = 12.02' \times 30.54^K - 6.60' \times 29.51 - .52 \frac{(12.02)^2}{2} = 134.81^K$

$V = 30.54 - 29.51 - .52 \times 12.02 = 5.22^K$



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ASSUME ENTIRE BEAM MOMENT IS TAKEN BY FLANGES ONLY:

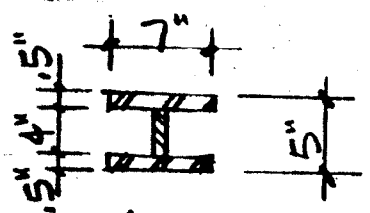
$$f_b = \frac{Mc}{I} = \frac{134.8^{k} \times 12 \times 23.57''}{2 \times 2 \times 7.005 \times .505 \left(\frac{23.57 - .505}{2}\right)^2}$$

$$= 20.26 \text{ KSI}$$

~~SHEAR~~ SHEAR TAKEN BY UPPER PORTION OF WEB:

$$V = \frac{5''}{13.57''} \times 5.22^{k} = 1.92^{k}$$

$$M = 1.92^{k} \times \frac{36''}{2} = 34.6''k$$

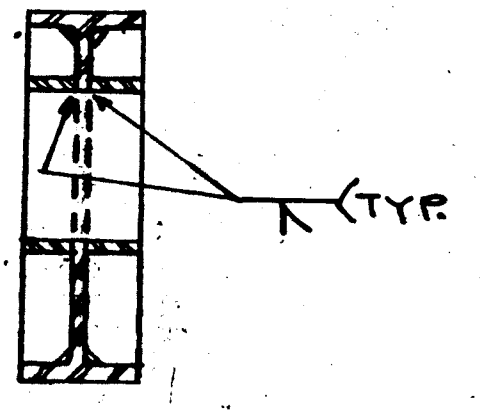


$$\text{APPROX. } I = 2 \times .5 \times 7 \times \left(\frac{4.5}{2}\right)^2 = 35.4 \text{ in}^4$$

$$f_b = \frac{Mc}{I} = \frac{34.6 \times 2.5}{35.4} = 2.44 \text{ KSI}$$

$$\text{MAX. } f_b = 20.26 + 2.44 = 22.7 \text{ KSI}$$

SEE pg. 4.1-23, "DESIGN OF WELDED STRUCTURES" BLODGETT



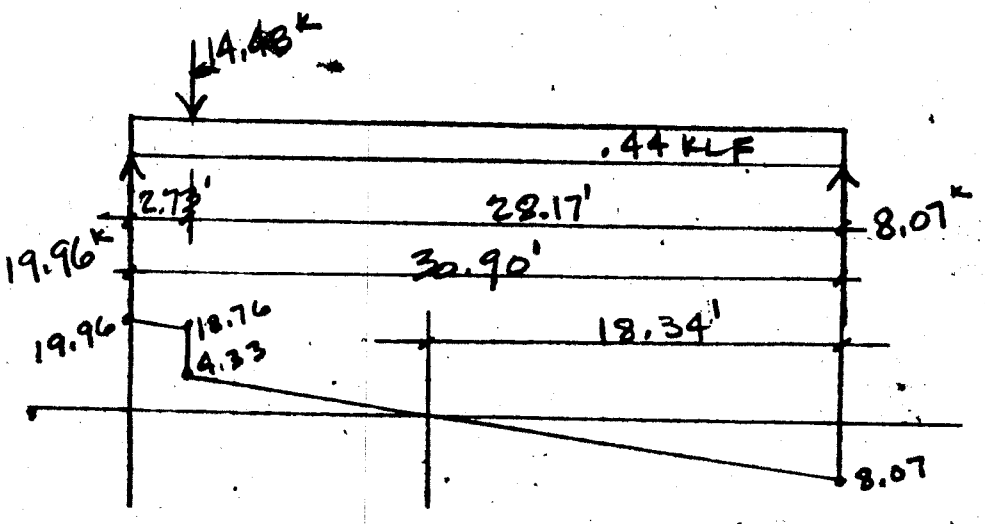
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BY/CHKD BY/ JRL

OPG. THRU WEB OF BM. B40 (W18x35)
3RD FLOOR

OPG. TO BE 28"x8", NEAR THE TOP FLANGE

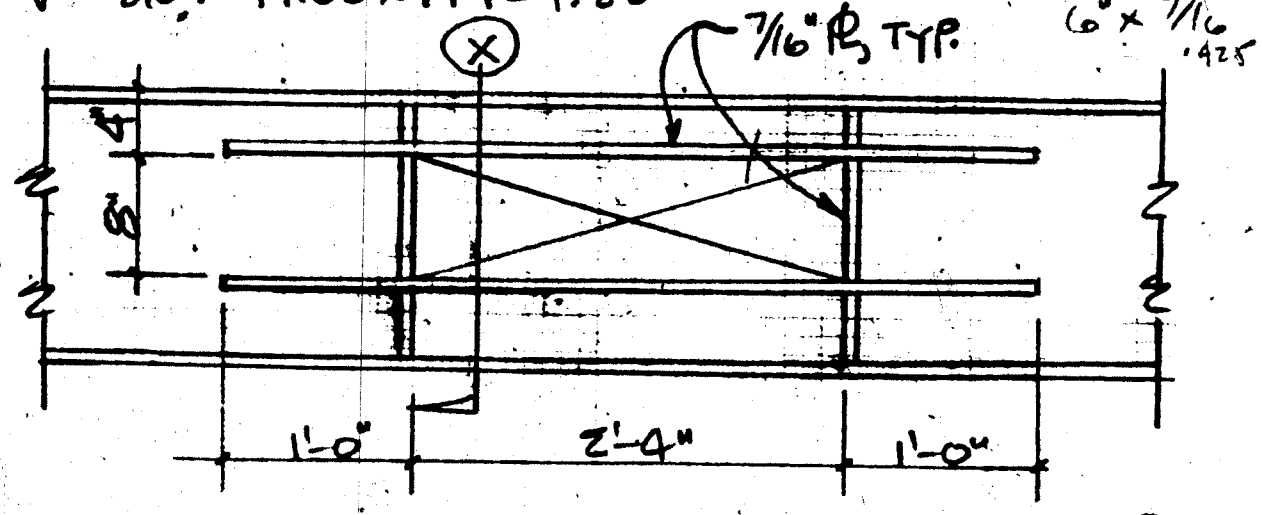


PLACE OPG. @ CTR. OF BM:

$M = 14.06' \times 8.07^K - \frac{.44(14.06)^2}{2} = 70.01K$

$V = 8.07 - 14.06 \times .44 = 1.88K$

d = 17.70
6" x 7/16
.425



SEE BM B26 FOR WELDING & SEC. (X)

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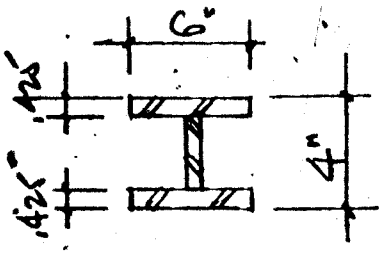
ASSUME ENTIRE BEAM MOMENT IS TAKEN BY THE FLANGES ONLY:

$$f_b = \frac{MC}{I} = \frac{70 \times 12 \times 17.70}{2 \times 2 \times 6 \times .425 \times \left(\frac{17.70 - .425}{2}\right)^2} = 19.54 \text{ KSI}$$

SHEAR TAKEN BY UPPER PORTION OF WEB:

$$V = \frac{4"}{9.70"} \times 1.88^K = 0.78^K$$

$$M = 0.78^K \times \frac{2.8"}{2} = 10.92 \text{ "K}$$



$$\text{APPROX. } I = 2 \times .425 \times 6 \times \left(\frac{3.58}{2}\right)^2$$

$$= 16.3 \text{ in}^4$$

$$f_b = \frac{MC}{I} = \frac{10.92 \times 2.0}{16.3} = 1.34 \text{ KSI}$$

$$\text{MAX. } f_b = 19.54 + 1.34 = 20.88 \text{ KSI}$$

SEE pg. 4.1-23, "DESIGN OF WELDED STRUCTURES" BLODGETT

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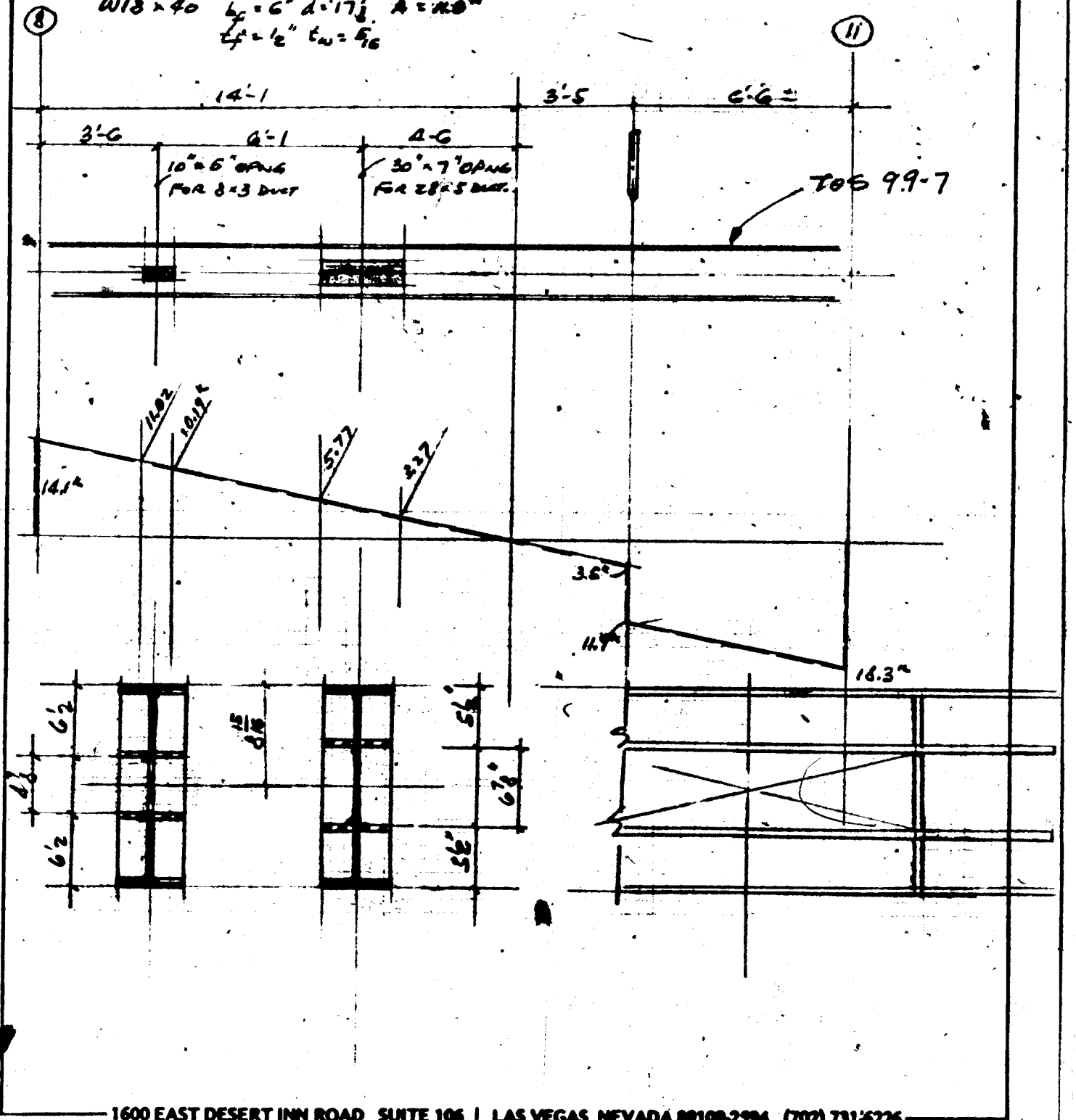
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ENGINEER/

$W = 1.0 \times LP$ $P_{PIPECAP} = 8.4^k$ $R_8 = 14.1^k$ $R_{11} = 18.3^k$

W18 x 40 $t_w = .6"$ $d = 17\frac{7}{8}"$ $A = 11.8^{in^2}$
$t_f = .12"$ $t_w = .36$



1600 EAST DESERT INN ROAD SUITE 106 | LAS VEGAS, NEVADA 89109-2594 (702) 731-6226

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ENGINEER/ JRL

COLUMNS - NORTH HALF OF BLDG.

A-12

159'-10
8.7*
195'-7
12.2*
131'-7 ROOF
12.2*
126'-0 ROOF
2.6K
117'-7 2ND
12.2*
113'-7 2ND
11.1K
W8x24
SEISMIC = ±16.6
KL = 14.6'
(16.6+59.0)x 1.25/1.33 = 71.1K
100'-0
59.9K
PILASTER = 9.6K
SPECIAL FTG.

ROOF LOADS
5.5'x12'(20+20)
= 2.6K
(NORTH SIDE ONLY)

2ND FLOOR LOADS
B37 = 6.4
B81 = 4.7
11.1K
(NORTH SIDE ONLY)

A-14

131'-0 ROOF
8.8K
118'-7
79.6K
113'-7
52.0K
W10x49
SEISMIC = ± 102.0
KL = 13.6'
(102.0+140.4)x 1.25/1.33 = 227.8K
99'-0
140.4K
SPECIAL FTG.

ROOF LOADS
5.5'x40'(20+20)
= 8.8K

2ND FLOOR LOADS
B82 = 40.5
B63 = 39.1
79.6
B37 = 6.4
B64 = 45.6
52.0

A-16

131'-0 ROOF
14.3K
W8x28
L = 12.4'
FOOTING:

ROOF LOADS
5.5'x 8'(20+20)
= 1.8K
B36 = 7.7
B37 = 4.8
4.3K

2ND FLOOR LOADS

A-18

ROOF
86.6K
W8x31
KL = 19.6'
99'-0
86.6K
FOOTING: F11

ROOF LOADS

2ND FLOOR LOADS
B82 = 45.3
B83 = 41.3
86.6

1600 EAST DESERT INN ROAD SUITE 106 | LAS VEGAS, NEVADA 89109-2594 (702) 731-6226

* LOADS FROM SOUTH HALF OF BLDG.

Done Hand, 12/31/87

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DATE 10/24/82
BY JK

COLUMNS - NORTH HALF OF BLDG.

A-20	A-22	A-24	A-26
131'-0 Roof 10.8K W10x33 L=12.4' 118'-7	131'-0 Roof 11.3K W10x33 L=12.4'	Roof	131'-0 Roof 11.3K W10x33 L=12.4'
113'-7		80.0K W8x31 KL=19.7' 99'-0 80.0K	
FOOTING:	FOOTING:	FOOTING: F11	FOOTING.
ROOF LOADS B37 = 4.8 B42 = 6.0 10.8 K	ROOF LOADS B37 = 4.8 B43 = 6.5 11.3 K	ROOF LOADS	ROOF LOADS B37 = 4.8 B43 = 6.5 11.3 K
2ND FLOOR LOADS	2ND FLOOR LOADS	2ND FLOOR LOADS B83 = 40.0 B83 = 40.0 80.0	2ND FLOOR LOADS

Done Hand, 12/31/87

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PROJECT # 82017
DATE/ 10/24/82
ENGINEER/ JKL

COLUMNS - NORTH HALF OF BLDG.

A-28	A-30	A-31	A-33
131'-0 ROOF 10.8K W10X33 L=12.4' 118'-7	ROOF	131'-0 ROOF 12.8K W10X33	131'-0 ROOF 14.7K
113'-7	67.1K W8X31 KL=19.6' 99'-0 67.1K		27.0K W8X24 KL=19.6' 99'-0 31.7
FOOTING:	FOOTING: F9	FOOTING:	FOOTING: F6
ROOF LOADS B37 = 4.8 B42 = 6.0 10.8K	ROOF LOADS	ROOF LOADS 6.5'x13'(20+20) = 5.4 B37 = 4.8 B54 = 4.6 12.8	ROOF LOADS 13'x9'(20+20) = 4.7K
2ND FLOOR LOADS	2ND FLOOR LOADS B83 = 41.3 B84 = 25.8 67.1	2ND FLOOR LOADS	2ND FLOOR LOADS B84 = 22.8 30 = 4.2 27.0

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DATE/ 10/24/02
ENGINEER/ JKL

COLUMNS - NORTH HALF OF BLDG.

B-12

159'-10
19.3*
145'-7
41.8*
131'-7
41.8* ROOF
126'-0
31.2
117'-7
41.8* 2ND
113'-7
37.8
W10x66
SEISMIC = 102.0
KL = 10.0
(213.7+102.0) x 1.25/1.33 = 296.7K
103'-7
8.9*
100'-0
213.7K
PILASTER = 9.6K
SPECIAL FTG.

ROOF LOADS
5.5' x 12' (20+20)
= 2.6K
B15 = 11.5
B62 = 17.1
31.2K

2ND FLOOR LOADS
B39 = 10.6
B81 = 4.7
B80 = 22.5
37.8K

B-14

131'-2 ROOF
126'-0
40.8K
W10x33
L = 12.6'
118'-7

FOOTING:

ROOF LOADS
4.5' x 20' (20+20)
= 3.6K
B15 = 11.5
B29 = 8.1
B35 = 8.3
B55 = 19.4
40.8K

2ND FLOOR LOADS

D-33

131'-6 ROOF
10.1K
L = 12.9'
19.3K
W12x170
KL = 19.6'
99'-0
79.1K

FOOTING
P5

ROOF LOADS
B45 = 10.1K

2ND FLOOR LOADS
B24 = 15.1
B30 = 4.2
19.3K

F-12

159'-10
25.4*
145'-7
68.1*
131'-7 ROOF
68.1
126'-0 ROOF
27.3
117'-7 2ND
68.0*
113'-7 2ND
44.8
W10x77
SEISMIC = +93.4
KL = 10.0
(324.0+93.4) x 1.25/1.33 = 392.3K
103'-7
22.3*
100'-0
224.0K
PILASTER = 9.6K
SPECIAL FTG.

ROOF LOADS
B62 = 16.6
B16 = 10.7
27.3

2ND FLOOR LOADS
B46 = 14.1
B79 = 9.3
B80 = 21.4
44.8

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* LOADS FROM SOUTH HALF OF BLDG.

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DATE/ 10/24/82
ENGINEER/ JRL

-COLUMNS- NORTH HALF OF BLDG.

G-13	G-15	G-17	G-19
ROOF	131'-10" ROOF	ROOF	131'-10" ROOF
	67.8K		25.8K
	W10X33 L = 13.2'		L = 13.2'
118'-7"	76.8K		
113'-7"	144.6K	135.0K	205.0K
124.1K		W10X45 KL = 19.6'	W12X60 KL = 19.6'
W18X31 KL = 14.6'			
99'-0" 124.1K		99'-0" 135.0K	99'-0" 230.8K
FOOTING: F14	FOOTING:	FOOTING: F15	FOOTING: F21
ROOF LOADS	ROOF LOADS B41 = 16.9 B63 = 26.0 B64 = 26.1 B66 = 4.8 67.8	ROOF LOADS	ROOF LOADS B41 = 12.3 B44 = 9.9 B51 = 2.6 25.8
2ND FLOOR LOADS B71 = 92.6 B77 = 31.5 124.1K	2ND FLOOR LOADS B68 = 20.9 B66 = 25.4 B72 = 26.2 B65 = 4.3 76.8K	2ND FLOOR LOADS B71 = 126.6 B69 = 8.4 135.0	2ND FLOOR LOADS B31 = 195.4 B69 = 9.6 205.0

Don Hasel 12/31/87

STRAUSS & LOFTFIELD
STRUCTURAL ENGINEERS

CLIENT/ SHEET/ 230 OF 317
PROJECT/ PROJECT # 82017
DATE/ 10/24/82
ENGINEER/ JRL.

COLUMNS - NORTH HALF OF BLDG.

G-23

131'-10 ROOF
16.7K
W10X33
L=13.2'
118'-7"
113'-7"

FOOTING:

ROOF LOADS
B44 = 12.2
B12 = 3.9
B32 = 0.6
16.7K

2ND FLOOR LOADS

G-25

131'-10 ROOF
28.7K
W10X33
L=13.2'

FOOTING:

ROOF LOADS
B53 = 24.2
B12 = 3.9
B32 = 0.6
28.7

2ND FLOOR LOADS

G-32

131'-10 ROOF
20.9K
W10X49
L=13.2'
175.6K
KL=19.6'
99'-0"
196.5K

FOOTING: SPEC. F19

ROOF LOADS
B59 = 18.8
B5 = 1.3
B14 = 0.8
20.9

2ND FLOOR LOADS
B31 = 170.6
B70 = 3.4
B215 = 1.6

H-34

131'-8 ROOF
8.0K
W12 x 170
L=13.1'
13.2K
SEISMIC = ± 40.4
KL = 19.6'
99'-0"
21.2K+

SPECIAL FTG.

ROOF LOADS
B46 = 8.0K

2ND FLOOR LOADS
B19 = 7.9
B29 = 5.3
13.2

Done Hand, 12/31/87

1

STRAUSS & LOFTFIELD
STRUCTURAL ENGINEERS

CLIENT/
PROJECT/
SHEET 231 OF 317
PROJECT # 82017
DATE/ 10/24/82
ENGINEER/ JKL

COLUMNS - NORTH HALF OF BLDG.

J-12

159'-10
21.3*
146'-7
57.9*
131'-7 ROOF
57.9*
14.3
117'-7 2ND
57.7*
113'-7 2ND
28.0
W10X68 SEISMIC = ±132.5 KL = 10.0'
(132.5+237.1) x 1.25/1.33 = 347.4K
103'-7
22.3*
100'-0 235.1K
PILASTER = 9.6K
SPECIAL FTG.

ROOF LOADS
B18 = 10.3
B74 = 4.0
14.3K

2ND FLOOR LOADS
B78 = 10.0
B79 = 9.3
B41 = 8.7
28.0

L-19

131'-5 ROOF
13.7K
W10X33
L = 12.8
118'-7

FOOTING:

ROOF LOADS
B10 = 2.4
B49 = 5.3
B51 = 6.0
13.7K

2ND FLOOR LOADS

L-23

131'-5 ROOF
12.4K
W10X33
L = 12.8

FOOTING:

ROOF LOADS
8.8'x9' (20+20) = 3.2K
B12 = 3.9
B49 = 5.0
12.4

2ND FLOOR LOADS

L-25

131'-5 ROOF
11.7K
W10X33
L = 12.8

FOOTING:

ROOF LOADS
8.4'x9' (20+20) = 3.0K
B12 = 3.9
B48 = 4.8
11.7

2ND FLOOR LOADS

1600 EAST DESERT INN ROAD SUITE 206 | LAS VEGAS, NEVADA 89109-2594 (702) 731-6226

* LOADS FROM SOUTH HALF OF BLDG.

Dana Hasel 12/31/87

STRAUSS & LOFFFIELD
STRUCTURAL ENGINEERS

CLIENT/
PROJECT/
SHEET/ 232 OF 317
PROJECT # 82017
DATE/ 10/24/82
ENGINEER/ JRL

COLUMNS - NORTH HALF OF BLDG.

SEE SHT. 235 FOR M15

L-29	L-34	M-13	M-34
131-5 ROOF 14.3K W12x33 L=12.8' 118'-7 113'-7	131-5 ROOF 9.8K 118'-7 113'-7	ROOF	ROOF
FOOTING:	FOOTING:	68.7K W8x24 KL=14.6' 99'-0 68.7K FOOTING: F10	14.5K W8x24 SEISMIC: ±40.4 KL=14.6' 99'-0 14.5K (40.4+14.5)x 1.25/1.33 = 51.6K SPECIAL FTG. F16
ROOF LOADS 17'x 8.7' (20+20) = 5.9K B47 = 3.6 B48 = 4.8 14.3K	ROOF LOADS 16'x17' (20+16) = 9.8K	ROOF LOADS	ROOF LOADS
2ND FLOOR LOADS	2ND FLOOR LOADS	2ND FLOOR LOADS B43 = 6.7 B61 = 6.2 B77 = 28.4 B76 = 27.4 68.7	2ND FLOOR LOADS B29 = 12.1 B28 = 2.4 14.5K

Alpine Hotel 12/31/87

STRAUSS & LOFTFIELD
STRUCTURAL ENGINEERS

CLIENT/
PROJECT/
SHEET/ 233 OF 317
PROJECT # 82017
DATE/ 10/24/82
ENGINEER/ JKL

COLUMNS - NORTH HALF OF BLDG.

N-12

159'-10
145'-7
131'-7"
126'-0 ROOF
113'-7
103'-7
100'-0

30.6*
44.6*
50.0* ROOF
22.1
2.2*
231.5K

W10X88
SEISMIC = ±247.7K
KL = 10.0'
(247.7+231.5) x 1.25/1.33 = 454.4K

PILASTER = 9.6K

SPECIAL FTG.

ROOF LOADS
B23 = 9.2
B74 = 9.5
18.7

2ND FLOOR LOADS
B78 = 12.9
B45 = 9.2
22.1

P-15

131-0 ROOF
126-9
118'-7
113'-7
99'-0

39.8K
60.2K
32.2K
132.2K

W10X39
SEISMIC = ±31.6K
KL = 14.3'
(31.6+132.2) x 1.25/1.33 = 154.0K

SPECIAL FTG. F30

ROOF LOADS
B52 = 4.3
B59 = 5.2
B63 = 9.1
B64 = 16.4
B66 = 4.8
39.8K

2ND FLOOR LOADS
B66 = 30.1
B73 = 30.1
60.2K
B68 = 27.5
B85 = 4.7
32.2K

P-19

131-0 ROOF
11.1K

W10X33
KL = 12.4'

FOOTING:

ROOF LOADS
11'x10' (20+20) = 4.4
B10 = 2.4
B52 = 4.3
11.1

2ND FLOOR LOADS

P-21

ROOF

88.9K
88.9K
99'-0

W10X39
SEISMIC = ±31.6K
KL = 19.6'
(31.6+88.9) x 1.25/1.33 = 113.3K

SPECIAL FTG. F29

ROOF LOADS

2ND FLOOR LOADS
B73 = 48.0
B74 = 40.9
88.9

1600 EAST DESERT INN ROAD SUITE 106 | LAS VEGAS, NEVADA 89109-2594 (702) 731-6225

* LOADS FROM SOUTH HALF OF BLDG.

Dona Hasel 12/31/87

STRAUSS & LOFTFIELD
STRUCTURAL ENGINEERS

CLIENT/
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SHEET/ 234 OF 317
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DATE/ 10/24/82
ENGINEER/ JKL

COLUMNS - NORTH HALF OF BLDG.

P-23	P-25	P-27	P-32
131-0 ROOF 6.4K 118'-7	131-0 ROOF 6.0K	ROOF	ROOF
113'-7		84.2K W10x33 KL=19.6' 99'-0 84.2K	52.5K W8x28 KL=19.6' 99'-0 52.5K
FOOTING:	FOOTING:	FOOTING: F11	FOOTING: F8
ROOF LOADS 16.1' x 10' (20+20) =6.4K	ROOF LOADS 15' x 10' (20+20) =6.0K	ROOF LOADS	ROOF LOADS
2ND FLOOR LOADS	2ND FLOOR LOADS	2ND FLOOR LOADS B14 = 42.2 B15 = 42.0 84.2	2ND FLOOR LOADS B15 = 42.2 B20 = 10.3 52.5K

Dana Hocal 12/31/87

STRAUSS & LOFTFIELD
STRUCTURAL ENGINEERS

CLIENT/
PROJECT/
SHEET/ 235 OF 317
PROJECT # 2017
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ENGINEER/ JKL

COLUMNS - NORTH HALF OF BLDG.

P-34	Q-13	Q-15	M-15
131-0 ROOF 6.8K	131-0 ROOF 12.8K	126-9 ROOF 9.6K	131-3 ROOF 9.7K
118'-7"	L=12.8'	L=13.1'	W10X33 L=12.9'
113'-7"	13.1K SEISMIC=±80.5 KL=14.6' (80.5+25.9)x 1.25/1.33 = 100.0K W8X31 99'-0" 25.9K	10.6K SEISMIC=±80.5 KL=14.6' (80.5+20.2)x 1.25/1.33 = 94.6K W8X31 99'-0" 20.2K	
FOOTING:	SPECIAL FTG.	SPECIAL FTG.	FOOTING:
ROOF LOADS 17'x10' (20+20) = 6.8K	ROOF LOADS B27 = 7.0 B28 = 5.8 12.8K	ROOF LOADS B28 = 5.8 B69 = 3.8 9.6K	ROOF LOADS B69 = 4.6 B63 = 5.1 9.7K
2ND FLOOR LOADS	2ND FLOOR LOADS B47 = 7.2 B55 = 5.9 13.1	2ND FLOOR LOADS B55 = 5.9 B85 = 4.7 10.6K	2ND FLOOR LOADS

Dona Hasel 12/31/87

STRAUSS & LOFTFIELD
STRUCTURAL ENGINEERS

CLIENT/ SHEET/ 236 OF 317
PROJECT/ PROJECT # 82017
DATE/ 10-8-
COLUMN LOAD SUMMARY. ENGINEER

LINE (1) THRU (12) TOTAL LOADS.

COLUMN	FUTURE ROOF 5TH	FUTURE 4TH	PRESENT ROOF 5RD
A-10	RB5 6.10 RB7 11.10 } 17.2	B5 11.7 B7 10.9 } 22.6 (39.8)	B5 11.7 B7 10.9 } 22.6 (62.4)
A-12	RB7 7.7 RB17 1.0 } 8.7	B7 6.0 B17 6.2 } 12.2 (20.9)	B7 6.0 B17 6.2 } 12.2 (33.1)
B-10	RB3 2.4 RB8 9.0 } 11.4	B3 6.0 B8 11.4 } 17.4 (28.8)	B3 6.0 B8 11.4 } 17.4 (46.2)
B-12	RB8 6.8 RB16 11.5 RB17 1.0 } 19.3	B8 6.4 B16 29.2 B17 6.2 } 41.8 (61.1)	B8 6.4 B16 29.2 B17 6.2 } 41.8 (102.9)
C-8	RB5 8.2 RG-1 51.2 } 59.4	B5 14.0 B-46 112.9 } 126.9 (186.3)	B5 14.0 B46 105.7 } 119.7 (246.6)
F-12	RB1 6.5 RB15 7.4 RB16 11.5 } 25.4	B1 19.4 B15 20.5 B16 28.2 } 68.1 (93.5)	B1 19.4 B15 x 20.5 B16 28.2 } 68.1 (161.6)
J-12	RB1 6.5 RB14 7.4 RB15 7.4 } 21.3	B1 19.4 B14 18.0 B15 20.5 } 57.9 (79.2)	B1 19.4 B14 x 18.0 B15 x 20.5 } 57.9 (137.1)
M-7	RT2 1.2 2.0 RB13 3.0 ELEV. 9.1 } 15.3	T2 1.2 2.0 B13 3.0 } 6.2 (21.5)	B13 3.0 RB3 9.1 } 12.1 (33.6) RB18 10.5
N-2	RB34 6.3 RB40 8.3 } 14.6	B34 9.2 B40 21.5 } 30.7 (45.3)	B34 12.8 B40 20.0 RB19 15.7 } 50.5 (95.8)
N-7	RB27 3.9 RB40 2.2 ELEV 9.1 RB39 7.3 } 22.5	B27 2.8 B40 7.7 B39 24.4 } 39.4 (61.9)	B27 2.2 B27 R 2.2 B40 8.1 RB19 8.5 B27 20.4 } 41.4 (103.3)
N-8	RB26 10.5 RB27 3.9 RG-1 65.2 ELEV 6.0 } 85.6	B26 18.9 B27 2.8 B-46 119.4 } 141.1 (226.7)	B26 18.9 B27 2.2 B27A 2.2 B11R 3.5 B46 123.0 } 150.7 (377.4)
N-11	RB11 2.5 RB12 4.1 RB25 17.7 RB26 16.4 } 40.7	B11 4.4 B12 4.4 B25 11.1 B26 30.6 } 50.5 (91.2)	B11 4.4 B12 4.4 B25 11.1 B26 30.6 } 50.5 (141.7)

Don Hasel 12/31/87

STRAUSS & LOFTFIELD
STRUCTURAL ENGINEERS

CLIENT/
PROJECT/
SHEET/ 297 OF 317
PROJECT # 82017
DATE/ 10-82
COL. LOAD SUMMARY
ENGINEER/

LINE (1) THRU (12) TOTAL LOADS

COLUMN	FUT. ROOF 5TH			FUTURE 4TH			PRES. RF= 3RD		
N-12	RB 12	4.1	30.6	B12	4.4	44.6	B12	4.4	50.0 *
	RB 14	7.4		B14	19.3		B14	19.8	
	RB 25	6.1		B25	3.2		B25	3.2	
	RB 43	13.0		B43	17.7	(75.2)	B43	23.1	(125.2)
R-1	RB 32	4.0	22.0	B32	4.6	22.4	B32	5.0	19.2
	RB 34	7.8		B34	9.2		B34	5.2	
	RB 35	10.2		B35	8.6	(44.4)	B35	9.0	(63.6)
R-3	RB 30	4.3	29.6	B30	13.3	57.2	B36	13.3	46.4
	RB 32	4.0		B32	4.6		B32	3.0	
	RB 36	12.5		B36	16.9		B36	13.3	
	RB 37	8.1		B37	21.4	(86.8)	B37	16.8	(133.2)
R-7	RB 18	4.2	27.1	B18	12.9	83.3	B18	13.0	70.1
	RB 30	4.3		B30	13.3		B30	13.30	
	RB 38	7.1		B38	27.1		B38	20.0	
	RB 39	9.5		B39	30.0	(110.4)	B39	23.8	(180.5)
S-9	RB 29	20.6	28.7	B29	45.5	83.0	B29	44.4	74.4
	RB 44	8.1		B44	38.5	(111.7)	B44* future	30.0	(186.1)
S-12	RB 43	16.7	26.5	B43	29.6	46.7	B43	28.4	43.7
	RB 45	9.8		B45	17.1	(73.2)	B45* future	15.3	(116.9)
T-1	RB 32A	2.0	8.5	B32A	2.0	6.9	B32A	2.0	7.0
	RB 35	6.5		B35	4.9	(15.4)	B35	5.0	(22.4)
T-3	RB 30	4.3	21.1	B30	13.3	39.9	B30	13.3	36.5
	RB 32A	2.0		B32A	2.0		B32A	2.0	
	RB 36	10.5		B36	15.2		B36	11.8	
	RB 42	4.3		B42	9.4	(61.0)	B42	9.4	(97.5)
T-7	RB 18	4.2	22.6	B18	12.9	67.9	B18	13.0	60.0
	RB 30	4.3		B30	13.3		B30	13.3	
	RB 36	9.1		B38	27.1		B38	20.0	
	RB 41	5.0		B41	13.7	(89.6)	B41	13.7	(149.6)
U-3	RB 31	6.0	10.3	B31	5.8	15.2	B31	5.8	15.2
	RB 42	4.3		B42	9.4	(25.5)	B42	9.4	(40.7)
U-7	RB 19	4.5	15.5	B19	5.7	25.2	B19	5.7	25.2
	RB 31	6.0		B31	5.8		B31	5.8	
	RB 41	5.0		B41	13.7	(40.7)	B41	13.7	(65.7)

Dona Hasel 12/31/87

STRAUSS & LOFTFIELD
STRUCTURAL ENGINEERS

CLIENT/
PROJECT/
COL. LOAD SUMMARY

SHEET/ 238 OF 317
PROJECT # 82017
DATE/ 10-87
ENGINEER/

LINE ① THRU ⑫ TOTAL LOADS

COL.	FUT. RF 5TH	FUT. 4TH	PRES. RF 3RD
U-9	RB19 5.3 RB21 4.5 RB44 6.7 } 16.5	B19 5.7 B21 4.8 B44 31.2 } 41.7 58.2	B19 5.7 B21 5.0 B44* 25.0 future } 35.7 93.9 *
U-12	RB21 4.5 RB45 8.6 } 13.1	B21 4.5 B45 13.9 } 18.4 31.5	B21 5.0 B45* 12.8 future } 17.8 49.3
E-6 (PLAZA - 3RD)	0	0	RB16 51.6 RB17 12.3 } 63.9 to Bm in Plaza Flr.
K-4 (PLAZA - 3RD)	0	0	RB16 43.4 RB18 18.5 } 61.9 TO Bm in Plaza Flr.
T-9 (2ND TO 3RD)	0	0	B18A 13.0 B20A 9.6 B44 #4.9 } 24.5 K To 2nd Flr. Bm
T-12 (2ND TO 3RD)	OUT 0	0	B20A 9.6 B45 6.6 } 16.2 K To 2nd Flr. Bm

E-6, K-4: W10x49 $L_u = 30' = 107^K$

T-9, T-12: W8x24 $L_u = 14' = 88^K$

"OUT IN FUTURE"

1600 EAST DESERT INN ROAD SUITE 106 | LAS VEGAS, NEVADA 89109-2994 (702) 731-6226

Done Hand. 12/31/87

STRAUSS & LOFTFIELD
STRUCTURAL ENGINEERS

CLIENT/ SHEET 299 OF 317
PROJECT/ PROJECT # 8207
/ DATE 10-82
COLUMN LOAD SUMMARY ENGINEER JW

LINE (1) THRU (12) TOTAL LOADS

COL.	2ND		PLAZA		COL SIZE
A-10	B6 11.7, B7 10.9	22.6 (850)	PB 23 5.5, PB 24 6.0	11.5 (96.5)	W10x33 L_u=14' : 142^K
A-12	B7 6.0, B17 6.2	12.2 (45.5)			
B-10	B3 6.0, B8 11.4	17.4 (63.6)	PB 12 8.8, PB 23 6.6, PB 23 8.9, PB 24 6.0	30.2 (93.8)	W10x~~33~~ 68 L_u=16' : 127^K SEISMIC = ±190.7^K (190.7+127)x 1.25/1.33 = 298.6^K
* B-12	B8 6.4, B16 29.2, B17 6.2	41.8 (144.7)	PB 8 8.9	(153.6)	
C-8	B5 14.0, B49 99.8	113.8 (380.4)	PB 24 63.6, PB 25 118.6	182.2 (562.6)	W18x120 L_u=16 = 694^K
* F-12	B1 19.3, B15 20.5, B16 28.2	68.0^K (329.6)	PB 1 22.3	(251.9)	* See North Bldg For Info.
* J-12	B1 19.3, B14 37.7, B15 20.5	57.7 (194.8)	PB 1 22.3	(217.1)	
M-7	P10 10.7, P6 .2, B13 2.6, P4 1.6	15.1 (48.7)	PB 13 9.4, PB 22 23.5	32.9 (81.6)	W8x35 L_u = 20 = 19'-7 x 109^K
N-2	B34 19.9, B40 47.4	67.3 (169.1)	P/Pastern 9.6^K		~~TS 6"x6"x1/2~~ L_u=14' W8x40 = 197^K
N-7	B27 2.2, B37 21.1, B40 42.6, P4 2.1	68.0 (171.3)	PB 22 8.7, PB 32 4.5	13.2 (184.5)	W10x49 L_u=10' = 228^K
N-8	B26 18.9, B27 2.2, B49 129.8	150.4 (527.8)	PB 28 6.7, PB 31 14.1, PB 32 4.5, PB 37 45.2	70.0 (597.8)	W14x120 L_u=16 = 644^K
N-11	B11 4.3, B12 4.3, B25 11.1, B26 30.6	50.3 (192.0)	PB 9 1.0, PB 29 6.2, PB 30 6.4, PB 31 18.3	30.9 (222.9)	W10x~~33~~ 100 L_u=' SEISMIC = ±247.7 = 21 (247.7+214)x 1.25/1.33 = 490.3^K

1600 EAST DESERT INN ROAD SUITE 106 | LAS VEGAS, NEVADA 89109-2304 (702) 361-6226

* Pile loads from North Half of Bldg.

501 N CASINO CTR 5
Fire Station

Don Hall 12/31/87

STRAUSS & LOFTFIELD
STRUCTURAL ENGINEERS

CLIENT/
PROJECT/
SHEET/ 240 OF 317
PROJECT # 82017
DATE/ 10-82
ENGINEER/ JM

COL LOAD SUMMARY

LINE (1) THRU (12) TOTAL LOADS

COL.	2ND	PLAZA	
* N-12	B12 4.3 B25 3.2 B14 19.3 B43 23.1 } 49.9 (175.1	PB 29 6.8 PB 30 5.4 } 12.2 (187.3	* SEE NORTH BLDG FOR COL:
R-1	B32 5.1 B34 6.9 B35 9.0 } 31.0 (94.6		W8 x 31 L_u = 15' = 131 K
R-3	B32 5.1 B36 15.2 B37 17.2 B46 20.3 } 57.8 (191.0		W10 x ~~49~~ 112 (L_u = 15' SEISMIC = ±299.5 } = 235 K (299.5+235) x 1.25/1.33 = 502.4 K
R-7	B18 13.0 B38 20.1 B39 22.9 B46 20.3 } 76.3 (256.8		L_u = 15' W10 x 60 = 289 K
S-9	B29 44.5 B44 30.2 } 74.7 (260.8		W10 x 60 L_u = 15' = 289 K
S-12	B43 28.4 B45 15.3 } 43.7 (160.2	SEISMIC = ± 47.5 K (47.5+190) x 1.25/1.33	W10 x ~~45~~ 68 L_u = 15' = 317.2 K = 190 K
T-1	B31 4.8 B32A 2.0 } 6.8 (29.2		W8 x 31 L_u = 15' = 131 K
T-3	B32A 2.0 B36 11.1 B42 9.2 B47 50.2 } 72.5 (170.0		W10 x ~~45~~ 100 (L_u = 15' SEISMIC = ±299.5 } = 190 K (299.5+190) x 1.25/1.33 = 460.1 K
T-7	B18 13.0 B38 20.1 B41 12.3 B47 50.2 } 95.6 (245.2		W10 x ~~54~~ 60 (L_u = 15' SEISMIC = ± 22.1 } = 259 K (22.1+259) x 1.25/1.33 = 264.2
U-3	B42 9.2 B48 21.0 } 30.2 (70.9		W8 x 31 L_u = 15' = 131 K
U-7	B19 5.7 B41 12.3 B48 21.0 } 39.0 (104.7		W8 x ~~31~~ 48 (L_u = 15' SEISMIC = ± 83.8 K } = 131 K (83.8+131) x 1.25/1.33 = 201.9 K

1600 EAST DESERT INN ROAD SUITE 106 | LAS VEGAS, NEVADA 89109-2594 (702) 731-6226

* Plus loads from North half of Bldg.

Elton Hotel 12/31/82

STRAUSS & LOFTFIELD
STRUCTURAL ENGINEERS

CLIENT/
PROJECT/
SHEET/ 241 OF 317
PROJECT # 82017
DATE/ 10-82
COL. LOAD SUMMARY
ENGINEER/ JM

LINE (1) THRU (12) TOTAL LOADS

COL	2ND	PLAZA	
U-9	B19' 5.7 B21' 4.8 B44 25.0 } 35.5 (129.4)		W8x 58/35 (Lu = 15' = 148K) SEISMIC = ±83.8 83.8+148) x 1.25 / 1.33 = 217.9K
U-12	B21' 4.8 B45 12.8 } 17.6 (66.9)		W8 x 31 Lu = 15' = 131K
R-5 (2nd to Plaza Flr)	B37A 20.8 B37B 19.1 B46 20.3 B46 20.3 } 80.5 (80.5)		W8 x 31 Lu = 15' = 131K
F-8 Bsmt - Plaza		PB1 24.4 PB16 73.4 PB25 106.2 PB26 78.4 } 282.4	W12 x 65 Lu = 16' = 326K
J-8 Bsmt - Plaza		PB1 24.4 PB19 54.6 PB26 78.4 PB27 63.0 } 220.4	W10 x 49 Lu = 16' = 228K

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BRACKET TO M-7 & N-7.

W8x35
W10x49

LEVEL	COL	P_{TL}	e	Mcc
PLATE	M7	28.5^K	10.75"	25.53^{IK}
	N7	8.7^K	10.75"	7.79^{IK}

BRACKET e_{min} = 6¾"

M_{cc} = 28.5(6.75) = 192.38$^{"K}$

T_{typ} = 192.38 ÷ 13 = 14.8^K

÷ 8" = 1.85$^{K/"}$

¼" DBL FILLET

2nd Level - Std Type Conn. To Beams.

3rd Level -- connect to Bm @ CL of N

BRACKET @ M-7

SAME AS PLATE. EXCEPT REDUCE depth from 14" to 11" Bolts to 4 BOLTS.

W12x12

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COL M-7 Combined Axial & Bend Ecc. Mom.

@ Plaza

$P = 81.6^K$

$L = 19.7'$ LIMIT - PLAZA

W8×35 $A = 10.3$ $S_{xx} = 31.2$ $r_{xx} = 3.51$ $r_{yy} = 2.03$

$M_{ecc} = 25.53^{IK}$ MAX

Col Above = Col Below
= 45% 11.49 ^{IK} Col
1.0% 2.55 Bm/Slab

$\frac{Kl}{r_{xx}} = \frac{19.7(12)}{12.03} = 116.5$ $F_a = 10.78$

$f_a = \frac{P}{A} = \frac{81.6}{10.3} = 7.92$ ksi $\quad \frac{f_a}{F_a} = .735$

$f_{bxx} = \frac{11.49\,(12)}{31.2} = 4.42$ ksi

$F_{bxx} = 22.0$ ksi

$C_{mx} = 1.0$ $\quad \frac{C_{mx} f_{bxx}}{\left(1 - \frac{f_a}{F'_{exx}}\right) F_{bx}} = \frac{1.0(4.42)}{\left(1 - \frac{7.92}{32.94}\right)22} = .265$

$1.0 \leq 1.0$

$\frac{Kl}{r_{xx}} = \frac{19.7(12)}{3.51} = 67.35$

$F'_{exx} = 32.94$

W8×35 ✓

Core Steel 12/31/87

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COLUMN BASE PL'S

COL. SIZE.	MAX. LOAD	BASE PL.	F_p
6½x8 { W8x24 / W8x28	68.7 / 52.5	BP-1	1.05 ksi
8x8 { W8x31 / W8x35 / W8x40	124.1 / 140.4 / 163.1	BP-2	1.05 ksi
8x10 { W10x33 / W10x95	132.2 / 231.5	BP-3	1.05 ksi
10x10 { W10x49 / W10x54 / W10x60	237.1 / 245.2 / 324.0	BP-4	1.05 ksi
12x12	W12x65 282.4	BP-5	2.10 ksi
14½x14½	W14x120 597.8	BP-6	2.10 ksi

$t_p = \frac{m}{n}\sqrt{\frac{f_p}{9.0}}$ FORMULA 1

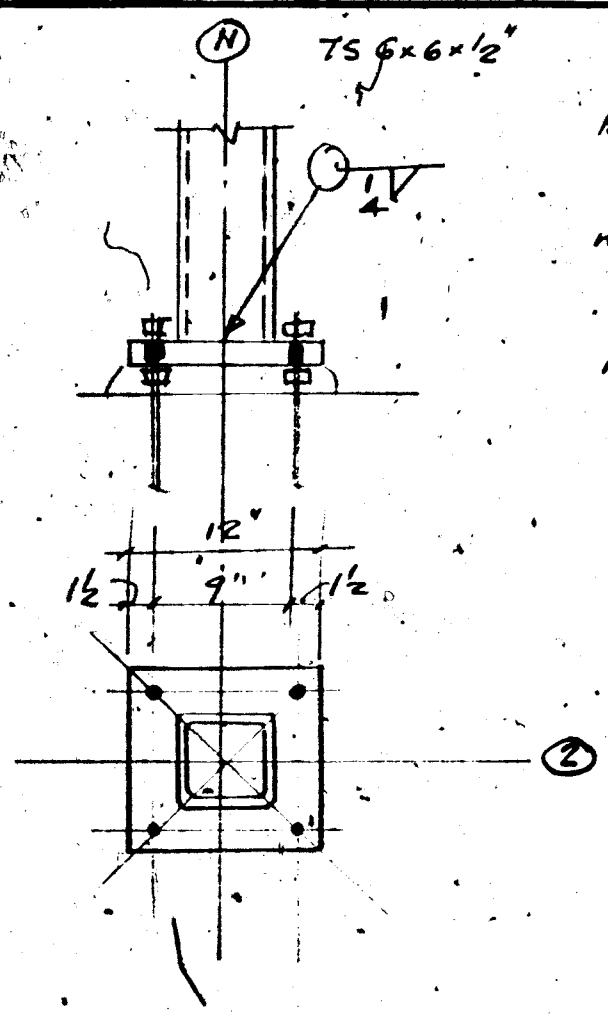
$t_p = n'\sqrt{\frac{f_p}{9.0}}$ FORMULA 2

	B	n	N	m	f_p	t_p FORMULA 1	n'	t_p FORMULA 2	BASE PL
BP-1	8	1.40	10	1.20	.86 ksi	0.43"	2.77	0.86"	1x8x0'-10
BP-2	12	2.80	14	3.20	.97	1.05	3.14	1.03	1¼x12x1'-2
BP-3	14	3.80	16	4.20	1.03	1.42	3.42	1.16	1¼x14x1'-4
BP-4	16	4.00	20	5.25	1.01	1.76	3.92	1.31	1⅜x16x1'-8
BP-5	14	2.20	14	1.30	1.44	0.88	4.77	1.91	2x14x1'-2
BP-6	18	3.20	20	3.11	1.66	1.37	5.64	2.42	2½x18x1'-8

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P = 163.1 K TL

BP = 12" x 12" x t

$f_p = \frac{163100}{(12)^2} = 1.133^{KSI} < 2.10$

n = 3.0

M = 1.133(3.0)².5 = 5.099 IK/in

n = 3.0√2 = 4.243"

$t = 4.243\sqrt{\frac{1.133}{9}} = 1.505$ " 1 1/2" TK

USE PL 1 1/2" x 12" x 0'-12"

4 - 1" ϕ AB as in Typ.

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BASE PLATES & ANCHOR BOLTS FOR BRACED COLUMNS
(USE 1.25 x ACTUAL LOAD W/O 1/3 INCREASE)

COL.	SIZE	NET UPLIFT	SHEAR	TYPE	BOLTS FOR UPLIFT	INCHES OF SHEAR LUG
R-3	W10x49	204.0	66.4	I ↓	2-3"ϕ	33"
T-3	W10x45	214.5	66.4			
B-12	W10x45	(A) 162.3 (B) 65.10	(A) — (B) 47.9	(A) ← I ↓ (B)	2-3"ϕ	24"
F-12	W10x60	+	47.9	I	—	24"
J-12	W10x49	—	56.5	I ↓	—	28"
N-12	W10x45	(A) 21.2 (B) 36.2 (C) 136.4	(A) 56.5 (B) — (C) —	C (TWO) ← I ↓ (B)	2-3"ϕ	28"
S-12	W10x45	67.2	95.6	I	2-2"ϕ	47"
H-34	W8x24	28.5	17.3	I ↓	2-2"ϕ	9"
M-34	W8x34	31.7	17.3			
A-12	—	—	—	—		
A-14	W8x35	45.0	—	—	2-2"ϕ	—
B-10	W10x33	143.8	78.1	H →	2-3"ϕ	38"
N-11	W10x54	136.2	74.9	H →	2-3"ϕ	37"
P-15	W10x33	—	15.2	H →	—	8"
P-21	W10x33	—	15.2			
Q-13	W8x24	68.9	37.9	H →	2-2"ϕ	19"
Q-15	W8x24	71.5	37.9			
T-3	—	—	—	—	—	—
T-7	—	—	—			
U-7	W8x31	31.5	29.4	H →	2-2"ϕ	15"
U-9	W8x35	19.1	29.4			
A-12.4	W8x48	85.4	88.3	H →	4-1½"ϕ	44"

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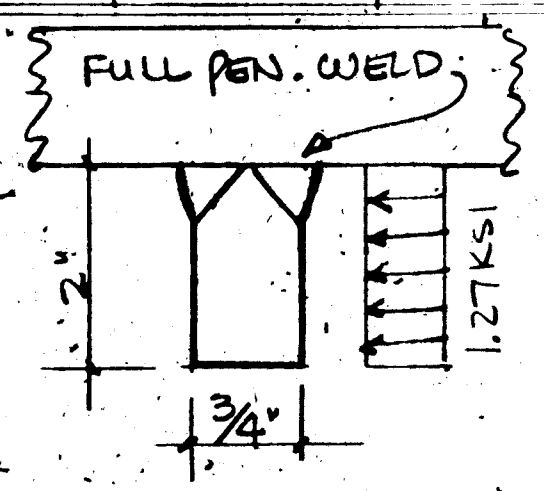
SHEAR LUGS FOR BOTTOM OF BASE PLATES

$F_p = .7 f'_c = 2.10^{KSI}$

$F_b = .75 f_y = 27.0^{KSI}$

$M = \frac{1.27(2)^2}{2} = 2.54^{"K/"}$

$f_b = \frac{2.54 \times 6}{(1)(.75)^2} = 27.0^{KSI}$



ALLOW. SHEAR
$= 2 \times 1.27 = \underline{2.54^{K/"}}$

ALLOW. TENSION FOR ANCH. BOLTS (A-36)

1½"Φ = 1.767 IN^2 × 19.1 KSI = 33.7^K EA.
2"Φ = 3.142 IN^2 × 19.1 KSI = 60.0^K EA.
2¼"Φ = 3.976 × 19.1 = 75.9^K EA.
2½"Φ = 4.909 × 19.1 = 93.8^K EA.
3"Φ = 7.069 × 19.1 = 135.0^K

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BASE PL TYPE A

MAX. UPLIFT = 214.5^K = 2-3" ϕ BOLTS
MAX. SHEAR = 74.9^K ≈ 37" OF SHEAR LUG

MAX. TENS. EA. BOLT = $\frac{1.25 \times 214.5}{2}$ = 134^K

LENGTH OF WELD = 3π x 2 = 18.8"

$\frac{134^K}{18.8}$ = 7.13^K/" USE 1/2" FILLET

BEARING ON BOT. PL = $\frac{1.25 \times 214.5}{18" \times 8" - 2 \times \pi (1.5)^2}$

= 2.06 KSI < 2.10

MAX. MOM. IN PL = $\frac{2.10 (3.5)^2}{2}$ = 12.86"^{K}/IN.

$f_b = \frac{12.86 \times 6}{(1)(1.75)^2}$ = 25.2 KSI < 27.0

~~USE~~ 1 3/4" PL *

WELD, BASE PL TO SHEAR PL:

$\frac{74.9^K \times 1.25}{2 \times 24"}$ = 1.95^K/" USE 1/4" FILLET

* CHANGE WASHER PL's TO FIT INSIDE 17" WIDE PIER

PL t. x 11 x 14"

$\frac{11-3}{2} = 4"$

$f_{bearing} = \frac{268.13}{154 - 2\pi(1.5)^2}$ = 1.917 < 2.10

M = 1.917 (4) .5 = 15.337 "^{K}/"

$f_b = \frac{15.337 (6)}{1 (1.75)^2}$ = 30.1 > 27.0

$f_b = \frac{(\quad)}{(2.0)^2}$ = 23.01 < 27.0

USE 2" x 11" x 1'-2"

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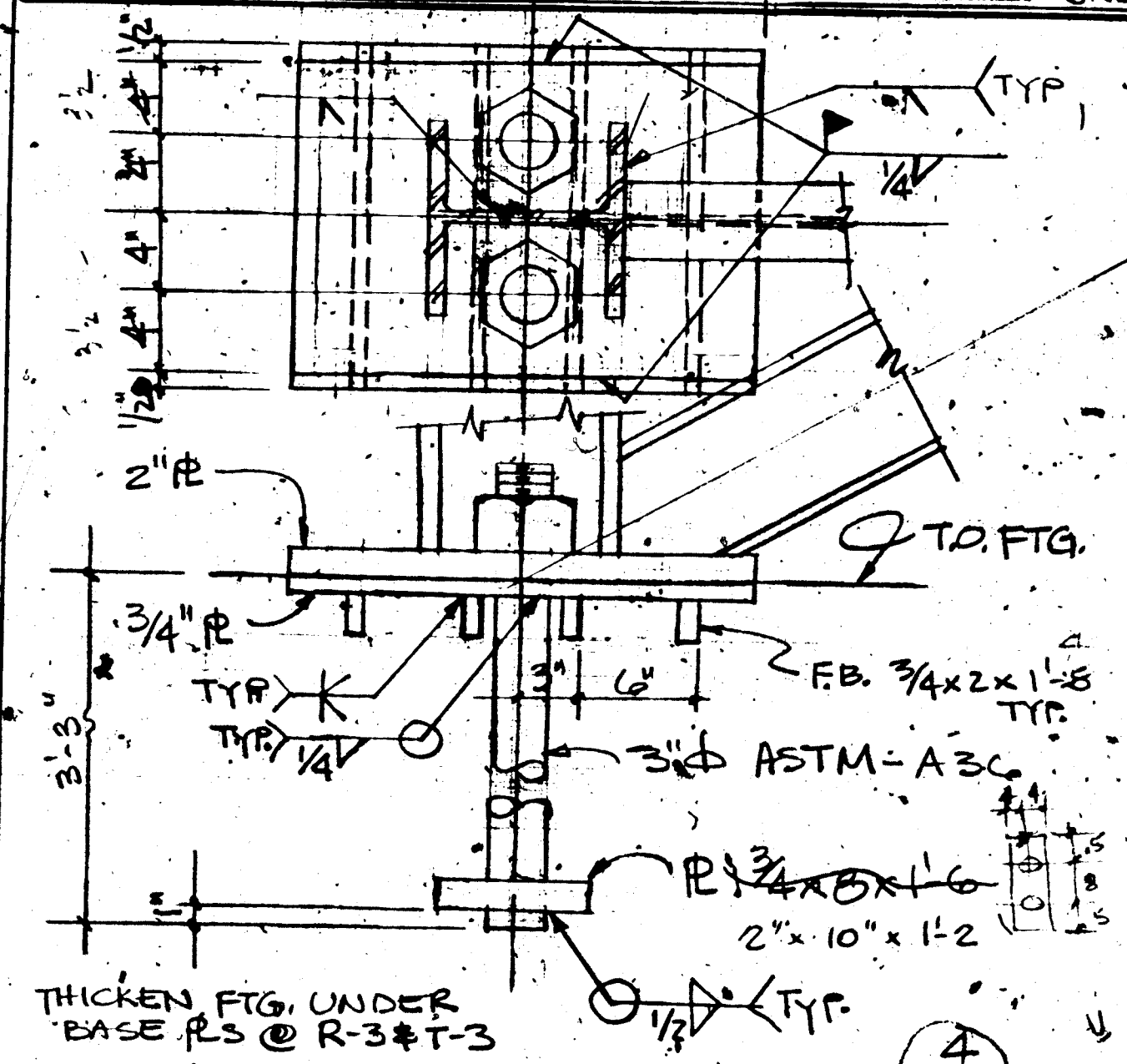
PROJECT/ 1'-0 MIN. OR AS REQD FOR DIAG. BRACE

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4/S-8

BASE ℄ - TYPE A

USE FOR COLS: R-3, T-3, B-12, N-12, B-10, N-11

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BASE PL. - TYPE B

MAX. UPLIFT = 85.4K = 2 - 2"ϕ BOLTS
MAX. SHEAR = 95.6K = 47" OF SHEAR LUG

MAX. TENS. EA. BOLT = $\frac{1.25 \times 85.4}{2}$ = 53.4K

LENGTH OF WELD = 2π x 2 = 12.6"

$\frac{53.4^K}{12.6"}$ = 4.24 K/" USE 3/8" FILLET

BEARING ON BOT. PL = $\frac{1.25 \times 85.4}{16 \times 8' - 2 \times \pi (1)^2}$

= 0.88 KSI < 2.10

MAX. MOM. IN PL = $\frac{.88 (3)^2}{2}$ = 3.96 "K/"

$f_b = \frac{3.96 \times 6}{(1)(1)^2}$ = 23.8 KSI < 27.0

~~USE 1" PL~~

WELD, BASE PL TO SHEAR PL:

$\frac{95.6^K \times 1.25}{2 \times 24}$ = 2.49 K/". USE 1/4" FILLET

* SHORTEN PL:
t x 10 x 14

$\frac{10-2}{2}$ = 4"

$f_{beg} = \frac{106.8}{140 - 2\pi(1)^2}$ = .80 ksi < 2.10

M = .80 (4)" .5 = 6.4 "K/"

$f_b = \frac{6.4(6)}{1(1.5)^2}$ = 17.1 < 27.0

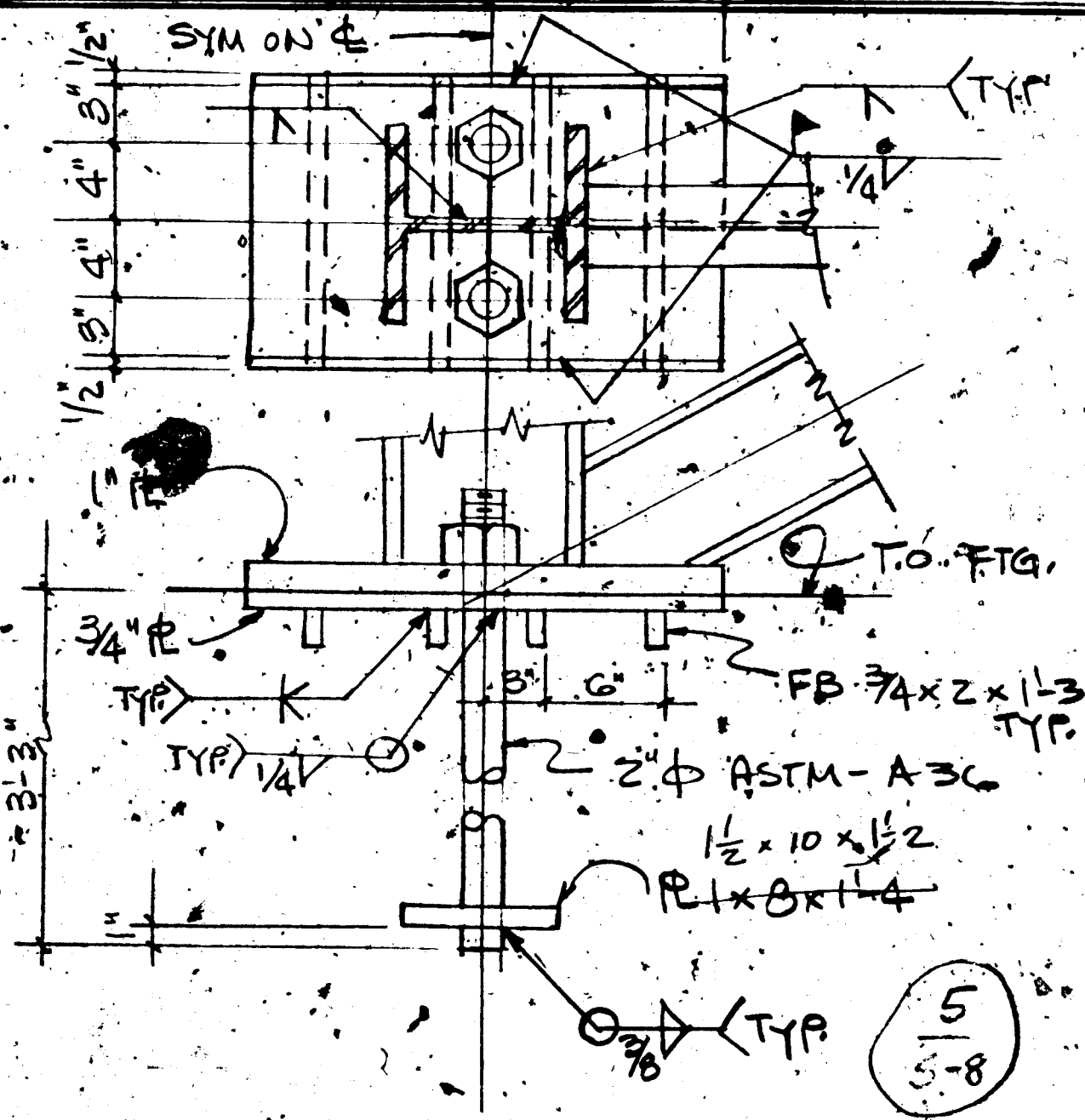
USE
PL 1/2 x 10" x 1'-2"

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CLIENT/
PROJECT/ 10 MIN. OR AS REQ'D. FOR DIAG. BRACE.

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BASE PL - TYPE B

USE FOR COLS: F-12, J-12, S-12, H-34, M-34, A-14, P-15, P-21, Q-13, Q-15, U-7, U-9

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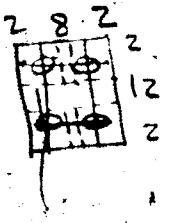
BASE PL - TYPE C

- UPLIFT = 85.4^K = 4-1½" ϕ BOLTS
  SHEAR = 88.3^K = 44" OF SHEAR ~~RING~~

- MAX. TENS. EA. BOLT = $\frac{1.25 \times 85.4}{4} = 26.7^K$

LENGTH ~~OF~~ WELD = 1.5π x 2 = 9.4"

$\frac{26.7^K}{9.4"} = 2.84^K/"$ USE ¼" FILLET WELDS



BEARING ON BOTTOM PL = $\frac{85.4^K \times 1.25}{4[4 \times 4 - \pi(.75)^2]}$

$= 1.88^K/"^2 < 2.10$

MAX. MOM. IN PL = $\frac{1.88(1.25)^2}{2} = 1.47^{"K}/"$

$f_b = \frac{1.47 \times 6}{(1)(.75)^2} = 15.7^K/"^2$

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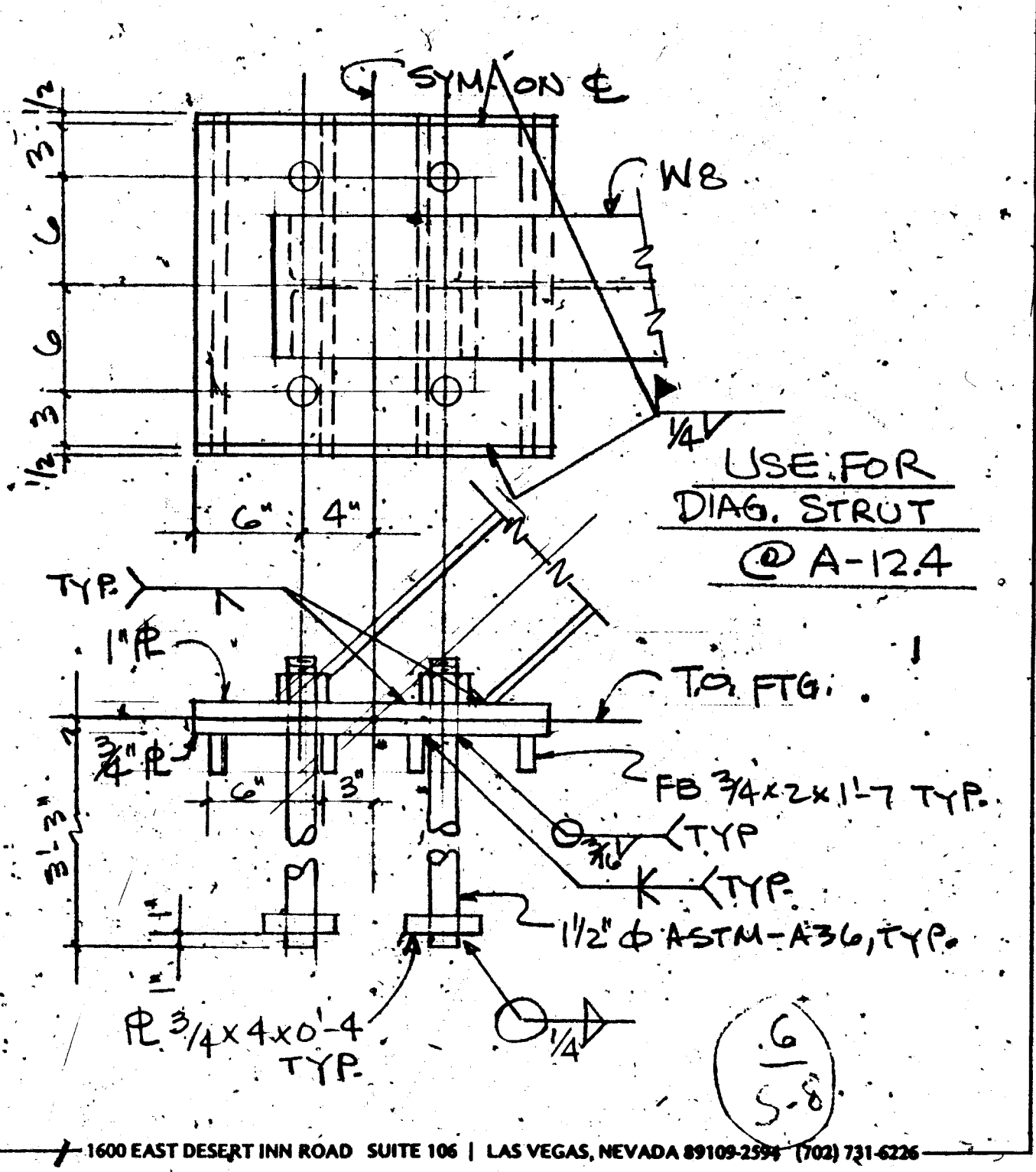
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BASE PL - TYPE C



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SPREAD FOOTINGS *

ALLOW. S.B. = 2.00 KSF

FTG.	SIZE	REINF.	ALLOW. COL. LOAD
F1	2'-0 SQ. x 1'-0	2 - #4 E.W. @ BOT.	7 K
F2	2'-6 SQ x 1'-0	3 - #4 " "	12 K
F3	3'-0 SQ. x 1'-0	3 - #4 " "	17 K
F4	3'-6 SQ x 1'-0	3 - #5 " "	23 K
F5	4'-0 SQ x 1'-0	4 - #5 " "	30 K
F6	4'-6 SQ x 1'-0	4 - #5 " "	37 K
F7	5'-0 SQ x 1'-0	7 - #4 " "	46 K
F8	5'-6 SQ x 1'-0	5 - #5 " "	56 K
F9	6'-0 SQ x 1'-0	6 - #5 " "	67 K
F10	6'-6 SQ x 1'-2	7 - #5 " "	77 K
F11	7'-0 SQ x 1'-2	7 - #5 " "	90 K
F12	7'-6 SQ x 1'-4	6 - #6 " "	101 K
F13	8'-0 SQ x 1'-4	7 - #6 " "	115 K
F14	8'-6 SQ x 1'-6	8 - #6 " "	129 K
F15	9'-0 SQ x 1'-6	8 - #6 " "	144 K
F16	9'-6 SQ x 1'-6	7 - #7 " "	161 K
F17	10'-0 SQ x 1'-8	8 - #7 " "	175 K
F18	10'-6 SQ x 1'-8	16 - #5 " "	193 K
F19	11'-0 SQ x 1'-10	9 - #7 " "	209 K
F20	11'-6 SQ x 1'-10	10 - #7 " "	229 K
F21	12'-0 SQ x 2'-0	11 - #7 " "	245 K
F22	12'-6 SQ x 2'-0	10 - #9 " "	265 K
F23	13'-0 SQ x 2'-2	12 - #7 " "	283 K
F24	18'-6 SQ x 2'-9	16 - #9 " "	543 K
F25	19'-6 SQ x 2'-10	17 - #9 " "	598 K
F26	14'-6 SQ x 2'-3	12 - #8 " "	349 K

* SEE REVISED / COMBINED FTGS WHICH MODIFY SCHEDULE ABOVE

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FOOTING STRUTS

COL.	TO. COL.	AXIAL LOAD	LENGTH
U7	→ U9	29.4K	18'
S12	→ N12	95.6K	13'
F15	→ P21	15.2K	20'
H34	→ M34	17.3K	15'

USE 24" x 24" COMP. MEMBERS, $r = .30 \times 24 = 7.2"$

MAX. $\frac{Kl_u}{r} = \frac{20' \times 12}{7.2"} = 33.3 < 34$

MAX. $P_u = 47.8^K \times 1.4 = 66.9^K$

USE 4-#11 VERTS

GOOD FOR $130\,1^K$ (@ $f'_c = 4.0^{ksi}$)
PER 1978 CRSI, pg. 3-23

USE #4 □ @ 18" O.C.

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ENGINEER/ JRL

X-BRACED COLUMN FOOTINGS

ALLOW. S.B. = 2000 PSF + 1/3 FOR SEISMIC

COL.	LL+DL	DL ONLY	SEISMIC VERT.	SEISMIC SHEAR	OTM @ BASE FT.	BRACE TYPE
R-3 T-3	191.0 170.0	95.5 85.0	± 299.5 ± 299.5	132.7	5151	
B-12 F-12	213.7 329.0	28.4 157.5	± 93.4 ± 93.4	95.8	2540	
J-12 N-12	237.1 231.5	133.3 111.3	± 132.5 ± 132.5	113.0	2783	
N-12 S-12	231.5 160.6	111.3 20.3	± 147.5 ± 147.5	— 95.6	3894	S N
H-34 M-34	21.2 14.5	11.9 8.7	± 40.4 ± 40.4	34.6	945	
					SEE A-12.4	
A-12 A-14	59.0 140.4	28.4 57.0	± 16.6K ± 102.0K	— —	1682	12 14
B10 B12	93.8 213.7	46.9 28.4	± 190.7 ± 190.7	78.1 —	3948	10 13
N-11 N-12	222.9 231.5	111.5 111.3	± 247.7 ± 247.7	74.9 —	4434	11 12
P-15 P-21	132.2 88.9	58.9 44.5	± 31.6 ± 31.6	30.3	889	
Q-13 Q-15	25.9 20.2	11.6 9.0	± 80.5 ± 80.5	75.7	1304	
T-3 T-7	170.0 245.2	85.0 122.6	± 22.1 ± 22.1	— —	623	
U-7 U-9	104.7 129.4	52.3 64.7	± 83.8 ± 83.8	58.8	2321	7 9
A-12.4	—	—	± 85.4	88.3	—	12.4

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DERIVATION OF DEAD LOADS:

SOUTH BLDG., FLOORS:

LL = 40 + 20 (PART.) = 60

DL = 78 (PART.) − 20 + 8 (FRAMING) = 66 / 126

DL = $\frac{66}{126}$ x TOTAL LOAD = .52 x TOTAL LOAD

USE DL = .50 x TOTAL LOAD FOR COLUMN LOADS. SOUTH OF LINE (12)

NORTH BLDG., FLOORS (LOADS NORTH OF LINE (12))

LL = 40 PSF
DL = $\frac{66}{106}$ DL = $\frac{66}{106}$ = .62

USE DL = .60 x TOTAL LOAD

LL = 60
DL = $\frac{66}{126}$ DL = $\frac{66}{126}$ = .52

USE DL = .50 x TOTAL LOAD

LL = 100
DL = $\frac{66}{166}$ DL = $\frac{66}{166}$ = .40

USE DL = .40 x TOTAL LOAD

NORTH BLDG.; ROOF (LOADS NORTH OF LINE (12))

LL = 20
DL = $\frac{20}{40}$ DL = $\frac{20}{40}$ = .50

USE DL = .50 x TOTAL LOAD

LL = 60
DL = $\frac{66}{126}$ DL = $\frac{66}{126}$ = .52

USE DL = .50 x TOTAL LOAD.

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LL=20
DL=66/86 DL = 66/86 = .77

USE DL = .75 x TOTAL LOAD

LL=100
DL=66/166 DL = 66/166 = .40

USE DL = .40 x TOTAL LOAD

COL. R3

DL = 191.0K x .5 = 95.5K

COL. T-3

DL = 170.0K x .5 = 85.0K

COL. B-12

DL = .5(8.7 + 12.2 + 12.2 + 12.2 + 2.6) + .4 x 11.1 = 28.4K

COL. F-12

DL = .5(25.4 + 68.1 + 68.1 + 68.0 + 22.3 + 27.3) + .4 x 44.8
= 157.5K

COL. J-12

DL = .5(21.3 + 57.9 + 57.9 + 57.7 + 22.3) + .75 x 14.3
+ .5 x 28.0 = 133.3K

COL. N-12

DL = .5(20.6 + 44.6 + 50.0 + 49.9 + 12.2) + .4 x 22.1
+ .4 x 22.1 = 111.3K

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COL. S-12

DL = .5 X 160.6 = 80.3K

COL. H-34

DL = .5X 8.0 + .6X 13.2 = 11.9K

COL. M-24

DL = .6 x 14.5 = 8.7K

COL. A-12

DL = .5(8.7+12.2+12.2+12.2) + .5 x 2.6 + .4x 11.1 = 28.4K

COL. A-14

DL = .5x 8.8 + .4(79.6+52.0) = 57.0K

COL. B-10

DL = .5 x 93.8 = 46.9K

COL. N-11

DL = .5X 222.9 = 111.5K

COL. P-15

DL = .4x 39.8 + .4(60.2+32.2) = 52.9K

COL. P-21

DL = .5 x 88.9 = 44.5K

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COL. Q-13

DL = .5x12.8 + .4x13.1 = 11.6^K

COL. Q-15

DL = .5x9.6 + .4x10.6 = 9.0^K

COL. T-7

DL = .5x245.2 = 122.6

COL. U-7

DL = .5x104.7 = 52.3^K

COL. U-9

DL = .5x129.4 = 64.7^K



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COMBINED FOOTING: @ R-3, T-3 & U-3

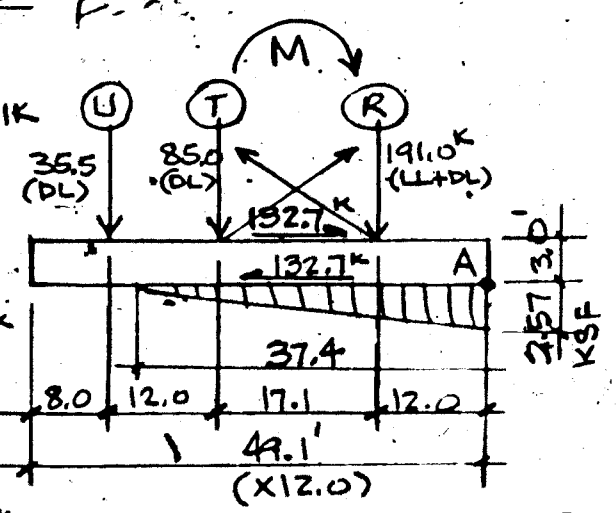
F-27

$OTM_A = 5151 + 132.7 \times 3.0' = 5549.1^{IK}$

RM_A:

FTG. $= 49.1 \times 12.0 \times 3.0 \times .14$
$= 265.1^K \times 24.55' = 6508.2^{IK}$

(R) $= 191.0 \times 12.0 = 2292.0$
(T) $= 85.0 \times 29.1 = 2473.5$
(U) $= 35.5 \times 41.1 = 1459.0$
$576.6^K \qquad 12,732.7^{IK}$



LOAD CASE I

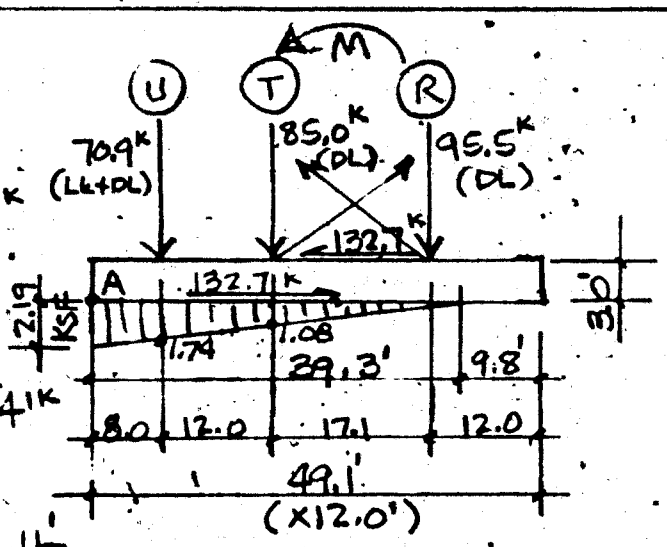
$\bar{X} = \frac{12732.7 - 5549.1}{576.6} = 12.46'$

MAX. SB. $= \frac{2 \times 576.6}{3 \times 12.46 \times 12.0} = 2.57^{KSF} < 2.66$

$OTM_A = 5549.1^{IK}$

RM_A:

FTG. $= 265.1 \times 24.55' = 6508.2^{IK}$
(R) $= 95.5 \times 37.1 = 3543.0$
(T) $= 85.0 \times 20.0 = 1700.0$
(U) $= 70.9 \times 8.0 = 567.2$
$516.5^K \qquad 12,318.4^{IK}$



LOAD CASE II

$\bar{X} = \frac{12318.4 - 5549.1}{516.5^K} = 13.11'$

MAX. SB. $= \frac{2 \times 516.5^K}{3 \times 13.11' \times 12.0'} = 2.19^{KSF}$

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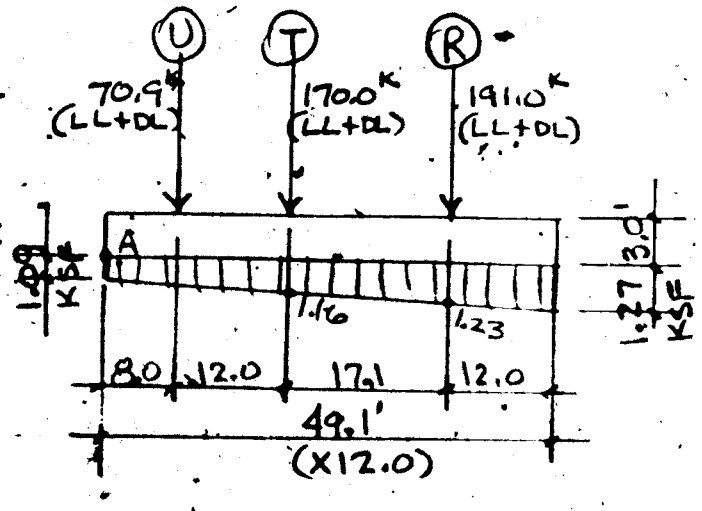
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(R-3, T-3, U-3, CONT.)

M_A:

FTG. = 265.1 x 24.55 = 6508.2
(R) = 191.0 x 37.1 = 7086.1
(T) = 170.0 x 20.0 = 3400.0
(U) = 70.9 x 8.0 = 567.2
697.0 17,561.5



$\bar{X} = \frac{17561.5}{697.0} = 25.2'$

$e = \frac{49.1}{2} - 25.2 = 0.65'$

LOAD CASE III

$S.B. = \frac{697.0}{49.1 \times 12.0} \pm \frac{6 \times 697.0 \times 0.65}{12(49.1)^2} = 1.18 \pm 0.09$

$= 1.09$ KSF
1.27 KSF

TOP REINFORCING, LONGITUDINAL

FOR LOAD CASE III (BETWEEN (T) & (R)) $M_u = \frac{1.7(1.20-.45)(17.1)^2}{10} = 37.31^K/FT.$

FOR LOAD CASE I, (@ (T)) $M_u = 1.2\left[\frac{.45(20)^2}{2} + 12.0 \times \frac{35.5}{12}\right] = 150.61^K/FT.$

$d = 36 - 2\frac{1}{2} = 33.5"$ $R = \frac{(33.5)^2}{1000} = 1.1223$

$K_w = \frac{150.6}{1.1223} = 134$ ∴ $A_s = .0026 \times 12 \times 33.5 = 1.05$

USE #8 @ 8" TOP LONGIT. $A_s = 1.19$
ALT. USE #8 @ 16

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TOP REINF., TRANSVERSE (R-3, T-3, U-3 CONT.)

USE #6@16

BOT. REINFORCING - LONGITUDINAL

LOAD CASE II: (@ T), $M_u = 1.2\left[\frac{(1.08-.45)(20)^2}{2} + \frac{1.11(20)^2}{3} - 12 \times \frac{70.9}{12}\right]$

$= 203.1^{IK}/FT.$

$d = 36 - 2\frac{1}{2} = 32.5"$ $\quad F = \frac{(32.5)^2}{1000} = 1.0563$

$K_u = \frac{203.1}{1.0563} = 192$ $\quad A_s = .0042 \times 12 \times 32.5 = 1.64$

USE #11 @ 10" $\quad A_s = 1.87$

BOT. REINFORCING - TRANSVERSE

MAX. $M_u = 1.2 \times \frac{(2.57-.45)(6)^2}{2} = 45.8^{IK}/FT.$

$d = 36 - 3 - 1 - \frac{1}{2} = 31.5"$ $\quad F = \frac{(31.5)^2}{1000} = .9923$

$K_u = \frac{45.8}{.9923} = 46$ $\quad A_s = .0015 \times 12 \times 31.5 = 0.57$

USE #8 @ 12 $\quad A_s = 0.79$

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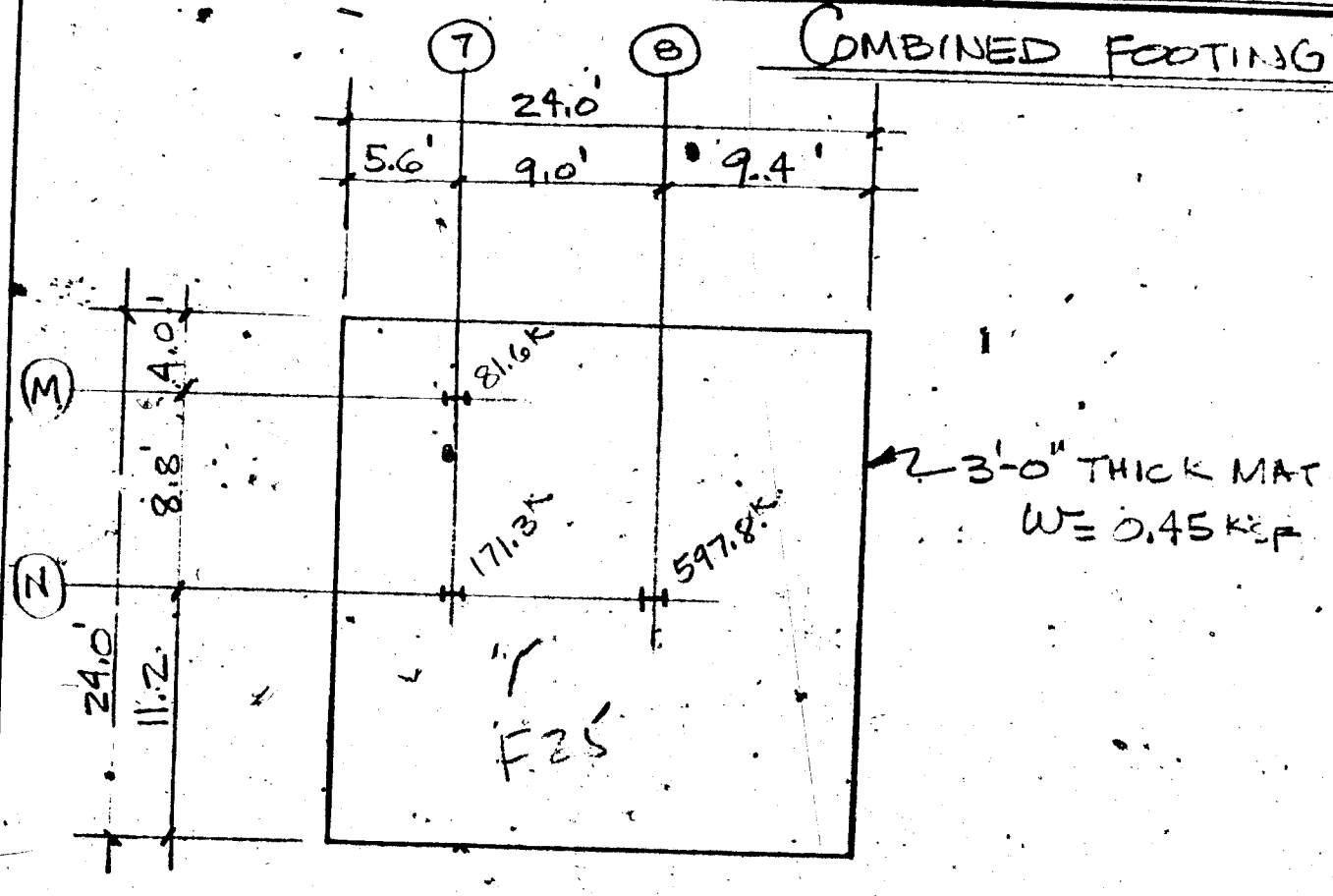
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COMBINED FOOTING



3'-0" THICK MAT
W = 0.45 KSF

81.6K x 5.6 = 457.0
171.3 x 5.6 = 959.3
597.8 x 14.6 = 8727.9
850.0K 10144.1K.

171.3K x 11.2 = 1918.6
597.8 x 11.2 = 6695.4
81.6 x 20.0 = 1632.0
850.0K 10,246.0

$\bar{x} = \frac{10144.1}{850.0} = 11.93'$

$e = \frac{24.0'}{2} - 11.93 = .07'$

$\bar{y} = \frac{10246.0}{850.0} = 12.05'$

$e = \frac{24.0}{2} - 12.05 = .05'$

$MAX. SP. = \frac{850}{(24)^2} + \frac{6 \times 850 \times (.05 + .07)}{24 (24)^2} + .45 = 1.48 + .04 + .45$

$= 1.97$ KSF

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MAX. $M_u = \frac{(1.97-.45)(12.8)^2}{2} \times 1.6 = 199.2$ IK/FT.

$d = 36 - 3\frac{1}{2} = 32.5''$ $F = \frac{(32.5)^2}{1000} = 1.0563$

$K_u = \frac{199.2}{1.0563} = 189$

$A_s = .0037 \times 12 \times 32.5 = 1.44 in^2/FT.$

USE #11@12' E.W. BOT.

USE 24 - #11 E.W. BOT.

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FTG. B-12

LL+DL = 213.7 + PIER = 9.6
DL = 28.4 + PIER = 9.6 K
SEISMIC = ± 190.7 K

USE FTG. 16'-0 x 11'-0 x 2'-0

F = 2.0

CASE I, LL + DL + SEISMIC

$$S.B. = \frac{213.7 + 9.6 + 190.7}{16 \times 11} + .30 = 2.65\ KS_F < 2.66$$

CASE II, LL + DL

$$S.B. = \frac{213.7 + 9.6}{16 \times 11} + .30 = 1.97\ KS_F < 2.00$$

CASE III. DL + UPLIFT

DL = 28.4
PIER = 9.6
FTG = 52.8
90.8 K − 93.4 K (UPLIFT) = − 2.6 V K

REMAINING UPLIFT TAKEN BY WALLS

$$\text{LONGIT. } M_u = 1.2\ \frac{(2.65-.30)(8)^2}{2} = 90.2\ ^{IK}/_{FT.}$$

$d = 24 - 3\frac{1}{2} = 20.5"$ $\quad F = \frac{(20.5)^2}{1000} = .420$

$K_u = \frac{9012}{.420} = 215$, $A_s = .0043 \times 12 \times 20.5 = 1.06$

$1.06 \times 11' = 11.7\ IN^2$

USE 10 - #10 BOT. LONGIT.

$$\text{TRANSVERSE } M_u = 1.2\ \frac{(2.65-.30)(5.5)^2}{2} = 42.7\ ^{IK}/_{FT}$$

$d = 24 - 4\frac{1}{2} = 19.5"$ $\quad F = \frac{(19.5)^2}{1000} = .380$

$K_u = \frac{42.7}{.380} = 112$ $\quad A_s = .0022 \times 12 \times 19.5 = 0.51$

$16' \times 0.51 = 8.16\ IN^2$

USE 14 - #7 BOT., TRANSVERSE

USE #6 @ 16" E.W. TOP

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FTG. F-12

LL+DL = 324.0 + PIER = 9.6
DL = 157.5 + PIER = 9.6
SEISMIC = ± 93.6

USE FTG. 14'-6 x 14'-6 x 2'-3
W/ 12-#8 E.W. BOT.
F-26

CASE I, LL+DL+SEISMIC

$$SB = \frac{324.0+9.6+93.6}{(14.5)^2} + .34 = 2.37^{KSF} < 2.66$$

CASE II, LL+DL

$$SB = \frac{324.0+9.6}{(14.5)^2} + .34 = 1.93^{KSF} < 2.00$$

CASE III, DL + UPLIFT

DL = 157.5
PIER = 9.6
FTG. = 63.1
230.2^K > 93.6^K UPLIFT

FTG. J-12

LL+DL = 237.1 + PIER = 9.6
DL = 133.3 + PIER = 9.6
SEISMIC = ± 132.5

USE FTG. 13'-0 x 13'-0 x 2'-2
W/ 12-#7 E.W. BOT.
F-23

CASE I, LL + DL + SEISMIC

$$SB. = \frac{237.1+9.6+132.5}{(13)^2} + .33 = 2.57^{KSF} < 2.66$$

CASE II LL+DL

$$SB. = \frac{237.1+9.6}{(13)^2} + .33 = 1.79^{KSF} < 2.00$$

CASE III DL+UPLIFT

DL = 133.3 ≥ 132.5 (UPLIFT) OK

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FTG. N-12

LL+DL = 231.5 + PIER = 9.6
DL = 111.3 + PIER = 9.6
SEISMIC (E-W) = ±132.5^K, ±147.5.
SEISMIC (N-S) ± 247.7^K

USE FTG, 14'-6 x 14'-6 x 2'-3
W/ 12-#8 E.W. BOT.
& 12-#5 E.W. TOP

CASE I, LL+DL+SEISMIC

$S.B. = \frac{231.5 + 9.6 + 247.7}{(14.5)^2} + .34 = 2.66^{KSF}$ OK

CASE II, LL+DL

$S.B. = \frac{231.5 + 9.6}{(14.5)^2} + .34 = 1.47^{KSF} < 2.00$

CASE III, DL + UPLIFT

DL = 111.3
PIER = 9.6
FTG = (14.5)² x 2.25 x .15 = 71.0
WALL = 16.5' x 25 x .10^KSF = 41.3
EARTH = 7.0 x 14.5 x 12.5 x .10^KCF = 126.9^K
360.1^K > 247.7^K UPLIFT

FTG. S-12

LL+DL = 160.6
DL = 80.3
SEISMIC = ±147.5

USE FTG. 12'-6 x 12'-6 x 3'-0
W/ 10-#7 E.W. BOT.
& 10-#6 E.W. TOP.

CASE I LL+DL

$S.B. = \frac{160.6}{(12.5)^2} + .45 = 1.48^{KSF} < 2.00$ F.S.

CASE II LL+DL+SEISMIC

$S.B. = \frac{160.6 + 147.5}{(12.5)^2} + .45 = 2.42 < 2.66$

CASE III DL+UPLIFT

DL = 80.3 + (12.5)² x 3.0 x .15 = 150.6^K > 147.5

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FTG. H-34

LL+DL = 21.2
DL = 11.9
SEISMIC = ±40.4

USE FTG. 9'-0 x 9'-0 x 2'-6
W/ 8-#5 E.W. BOT.
& 8 #5 E.W. TOP

CASE I, LL+DL

$S.B. = \frac{21.2}{(9)^2} + .38 = 0.64\ KSF < 2.00$ *

CASE II, LL+DL+SEISMIC

$SB = \frac{21.2 + 40.4}{(9)^2} + .38 = 1.14\ KSF < 2.66$

CASE III, DL + UPLIFT

$DL = 11.9 + (9)^2 \times 2.5 \times .15 = 42.3^K > 40.4$

FTG. M-34

LL+DL = 14.5
DL = 8.7
SEISMIC = ±40.4

USE FTG. 9'-6 x 9'-6 x 2'-6
W/ 8-#5 E.W. BOT.
& 8-#5 E.W. TOP

CASE I LL+DL

OK SEE (H-34)

F-28

CASE II LL+DL+SEISMIC

OK (SEE H-34)

CASE III DL + UPLIFT

$DL = 8.7 + (9.5)^2 \times 2.5 \times .15 = 42.5^K > 40.4$

* See Rev Q-Calcs.

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FTGS - COL G-32 & H-34 ENGINEER/

G-32	D	L	TL
R	12.5	8.4	20.9
Σ	105.4	70.2	175.6
Σ	117.9	78.6	196.5

11² SQ x 1'-10 THK

A = 121 SF

9' wide x Long = 121 L = 13.44 = 13'-6"

A = 9 x 13.5 = 121.5 ✓

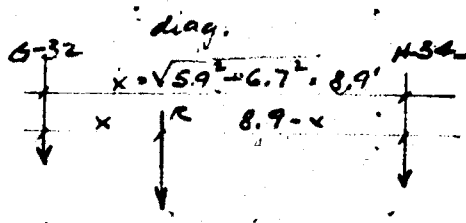
H-34	D	L	TL	SEIS.
R	4.0	4.0	8.0	
Σ	7.9	5.3	13.2	
Σ	11.9	7.3	21.2	= 40.4

9² Sq x 2'6TH PRIMARILY FOR HOLD DOWN

W = (9)² 2.5 (.150) = 30.38 K FTG DL

TRY 6² x 9² x 4² (.15) = 32.4 K

TRY COMBINED



TL

196.5 x = (8.9 - x) 21.2

x = .869'

TL + SEIS.

196.5 x = (8.9 - x) 61.6

x = 2.14'

TRY SEPARATE

H-34 6² x 9² x 4²

CASE I D + L

SB = 21.2 / 54 + .60 = .99 < 2.0

CASE II D + L + EQ

SB = (21.2 + 40.4) / 54 + .60 = 1.74 < 2.66

CASE III D + UPLIFT

DL = 11.9 + 54 (.60) = 44.3 > 40.4

REINF 8 - #5 SHORT (14 EA WAY)
8 - #5 LONG (9' OC)

G-32 9² x 13'-6" x 2'-8" REINF 13 #6 LONG, 13 #6 SHORT

W_{FTG} = .60 KSF

d = 32 - 5 = 27

CASE I = f_p = 196.5 ÷ (9² x 13.5) = 1.62 KSF < 2.0

L = 13.5 ÷ 2 = 6.75' V_u = 1.6 (196.5) = 314.40 K v_u = 314400 / 27(.85)6(12) = 190 psi <

M_u = (1.6)1.62 (6.75)² .5 = 59.05 K/' x 9 = 531.5 K .4 $\sqrt{f'_c}$ = 219

A_s = 59.05 (12) / 60 (.9) 27 = .49 in² #6 @ 10" n = (1.5 x 12 ÷ 10) = 18 - #6 = 13 (.44) = 5.72 in²

$M_{u\ capac}$ = 5.72 (60) .9 (27) ÷ 12 = 695 K > 531.5

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COL. A-12

LL+DL = 59.0 + PIER = 9.6
DL = 28.4 + PIER = 9.6
SEISMIC = ± 16.6

USE FTG. 6'-0 x 6'-0 x 1'-0
W/ 6-#5 E.W. BOT.
F-9

CASE I, LL+DL

$S.B. = \frac{59.0+9.6}{(6)^2} + .15 = 2.05\ ^{K}/_{SF} \approx 2.00$

CASE II, LL+DL+SEISMIC

$S.B. = \frac{59.0+9.6\pm16.6}{(6)^2} + .15 = 2.52\ ^{K}/_{SF} < 2.66$

CASE III, DL + UPLIFT

DL = 28.4 > 16.6 UPLIFT OK

COL. A-14

LL+DL = 140.4
DL = 57.0
SEISMIC = ± 102.0 K

USE FTG. 10'-6 x 10'-6 x 3'-0
W/ 8-#6 E.W. BOT.
& 8-#5 E.W. TOP
F-38

CASE I, LL+DL

$S.B. = \frac{140.4}{(10.5)^2} + .45 = 1.72\ ^{K}/_{SF} < 2.00$

CASE II LL+DL+SEISMIC

$SB = \frac{140.4+102.0}{(10.5)^2} + .45 = 2.65\ ^{K}/_{SF} < 2.66$

CASE III, DL + UPLIFT

$DL = 57.0 + (10.5)^2 \times 3 \times .15 = 106.6^{K} > 102.0$

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COL. B-10

LL+DL = 93.8
DL = 46.9
SEISMIC = ±190.7

USE FTG. 8'-0 x 24'-0 x 5'-0

CASE I LL+DL

$S.P._1 = \frac{93.8}{2 \times 24} + .75 = 1.24 \text{ KSF} < 2.00$

CASE II LL+DL+SEISMIC

$S.P. = \frac{93.8 + 190.7}{8 \times 24} + .75 = 2.23 < 2.66$

CASE III DL+UPLIFT

$DL = 46.9 + 8 \times 24 \times 5 \times .15 = 190.9^K > 190.7$

$\text{MAX. } M_u = 1.2 \frac{(2.23 - .75)(12)^2}{2} = 127.9 \text{ IK/FT.}$

$d = 60 - 3\frac{1}{2} = 56.5"$ $\quad f = \frac{(56.5)^2}{1000} = 3.1923$

$K_u = \frac{127.9}{3.1923} = 40$ $\quad A_s = .0010 \times 12 \times 56.5 = 0.68$

USE 7-#8 BOT. LONGIT.
USE 16-#6 BOT. TRANSV.
USE #6@16" E.W. TOP

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COL. N-11

LL+DL = 222.9 K
DL = 111.5 K
SEISMIC = ± 247.7 K

USE FTG. 18'-0 x 13'-0 x 4'-0

CASE I, LL+DL

$S.B. = \frac{222.9}{18 \times 13} + .60 = 1.55$ KSF < 2.00

CASE II LL+DL+SEISMIC

$S.B. = \frac{222.9 + 247.7}{18 \times 13} + .60 = 2.61$ KSF < 2.66

CASE III DL+UPLIFT

DL = 111.5 + 18 x 13 x 4 x .15 = 251.9 K > 247.7

MAX. $M_u = 1.2 \frac{(2.61 - .60)(9)^2}{2} = 97.7$ IK/FT.

$d = 48 - 3\frac{1}{2} = 44.5"$ $\quad F = \frac{(44.5)^2}{1000} = 1.9803$

$K_u = \frac{97.7}{1.9803} = 49$ $\quad A_s = .0010 \times 12 \times 44.5 = 0.53$

USE 12-#7 BOT. LONGIT.

USE 14-#7 BOT. TRANSV.

USE #6 @ 16" E.W. TOP

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FTG: P-15

LL+DL = 132.2K
DL = 52.9K
SEISMIC = ± 31.6K

USE FTG. 9'-0 x 9'-0 x 2'-0
W/ 8-#6 E.W. BOT.
& 8-#5 E.W. TOP
(F1)

CASE I, LL+DL

$SB_1 = \frac{132.2}{(9)^2} + .30 = 1.93^{KSF} < 2.00$

CASE II LL+DL+SEISMIC

$SB_1 = \frac{122.2 + 31.6}{(9)^2} + .30 = 2.32\ KSF < 2.66$

CASE III DL+UPLIFT

$DL = 52.9^K > 31.6^{UPLIFT}$

FTG. P-21

LL+DL = 88.9
DL = 44.5
SEISMIC = ± 31.6.

USE FTG. 7'-6 x 7'-6 x 2'-0
W/ 7-#5 E.W. BOT.
& 5-#5 E.W. TOP.
(F2)

CASE I, LL+DL

$SB_1 = \frac{88.9}{(7.5)^2} + .30 = 1.88^{KSF} < 2.00$

CASE II, LL+DL+SEISMIC

$SB_1 = \frac{88.9 + 31.6}{(7.5)^2} + .30 = 2.44\ KSF < 2.66$

CASE III, DL+UPLIFT

$DL = 44.5 > 31.6$

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FTG. Q-15

LL+DL = 25.9
DL = 11.6
SEISMIC = ± 30.5

USE FTG. 11'-0 x 11'-0 x 4'-0
W/ 9-#6 E.W. BOT.
& 9-#5 E.W. TOP

CASE I, LL+DL

$S_B = \frac{25.9}{(11)^2} + .60 = 0.81 \text{ KSF} < 2.00$ (F = 1)

CASE I, LL+DL+SEISMIC

$S_B = \frac{25.9 + 30.5}{(11)^2} + .60 = 1.48 \text{ KSF} < 2.66$

CASE II, DL+UPLIFT.

$DL = 11.6 + 11 \times 11 \times 4 \times .15 = 84.2^K > 80.5$

FTG. Q-15

LL+DL = 20.2
DL = 9.0
SEISMIC = ± 80.5

USE FTG. 11'-0 x 11'-0 x 4'-0
W/ 9-#6 E.W. BOT.
& 9-#5 E.W. TOP

CASE I, LL+DL

$S_B = \frac{20.2}{(11)^2} + .60 = 0.77 \text{ KSF} < 2.00$ ($F_1 = 1$)

CASE II, LL+D.+SEISMIC

$S.B. = \frac{20.2 + 80.5}{(11)^2} + .60 = 1.43 \text{ KSF} < 2.00$

CASE III, DL + UPLIFT

$DL = 9.0 + 11 \times 11 \times 4 \times .15 = 81.6^K > 80.5$

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FTG. T-7

LL+DL = 245.2
DL = 122.6
SEISMIC = ± 22.1

AN F-22 FTG. IS OK BY INSPECTION

FTG. U-7

LL+DL = 104.7 K
DL = 52.3 K
SEISMIC = ± 33.8 K

USE FTG. 9'-6 x 9'-6 x 3'-0
W/ 8 - #6 E.W. BOT.
& 8 - #5 E.W. TOP

CASE I, LL+DL

$S.B. = \frac{104.7}{(9.5)^2} + .45 = 1.61 < 2.00$

CASE II, LL+DL+SEISMIC

$SB = \frac{104.7 + 33.8}{(9.5)^2} + .45 = 2.53 < 2.66$

CASE III, DL + UPLIFT

$DL = 52.3 + (9.5)^2 \times 3 \times .15 = 92.9^K > 8$

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FTG. U-9

LL+DL = 129.4
DL = 64.7
SEISMIC = ±83.8

USE FTG. 10'-0 x 10'-0 x 2'-6
W/ 8-#6 E.W. BOT.
8-#5 E.W. TOP

CASE I, LL+DL

$S.B. = \frac{129.4}{(10)^2} + .38 = 1.66^{KSF} < 2.00$ (F = 2)

CASE II, LL+DL+SEISMIC

$S.B. = \frac{129.4 + 23.8}{(10)^2} + .38 = 2.50^{KSF} < 2.66$

CASE III, DL + UPLIFT

$DL = 64.7 + (10)^2 \times 2.5 \times .15 = 102.2^{K} > 83.8$

FTG. R-1

LL+DL = 94.6^K
SEISMIC = 0

(F = 3+)

USE FTG. 5'-0 x 11'-0 x 2'-6

$S.B. = \frac{94.6}{5 \times 11} + .23 = 1.95^{KSF} < 2.00$

LONGIT. $M_u = 1.6 \frac{(1.95 - .23)(5.5)^2}{2} = 41.6^{IK/FT.}$

$d = 30 - 3\frac{1}{2} = 26.5"$ $F = \frac{(26.5)^2}{1000} = .7023$

$K_u = \frac{41.6}{.7023} = 59$ $A_s = .0010 \times 12 \times 26.5 = 0.32$

USE 4-#6 BOT. LONGIT.

USE 10-#5 BOT. TRANSV.

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FTG. A-12.4 (F-27)

LL+DL = 0
DL = P
SEISMIC = ± 85.4K

USE FTG. 16'-0 x 12'-0 x 4'-0
W/ 10 - #6 E.W. BOT.
& 10 - #5 E.W. TOP

CASE I, SEISMIC (DOWN)

$$SB = \frac{85.4}{12 \times 16} + .60 = 1.04 \text{ KSF} < 2.66$$

CASE II, SEISMIC UPLIFT.

DL = 16' x 12' x 4' x .15 = 115.2K > 85.4

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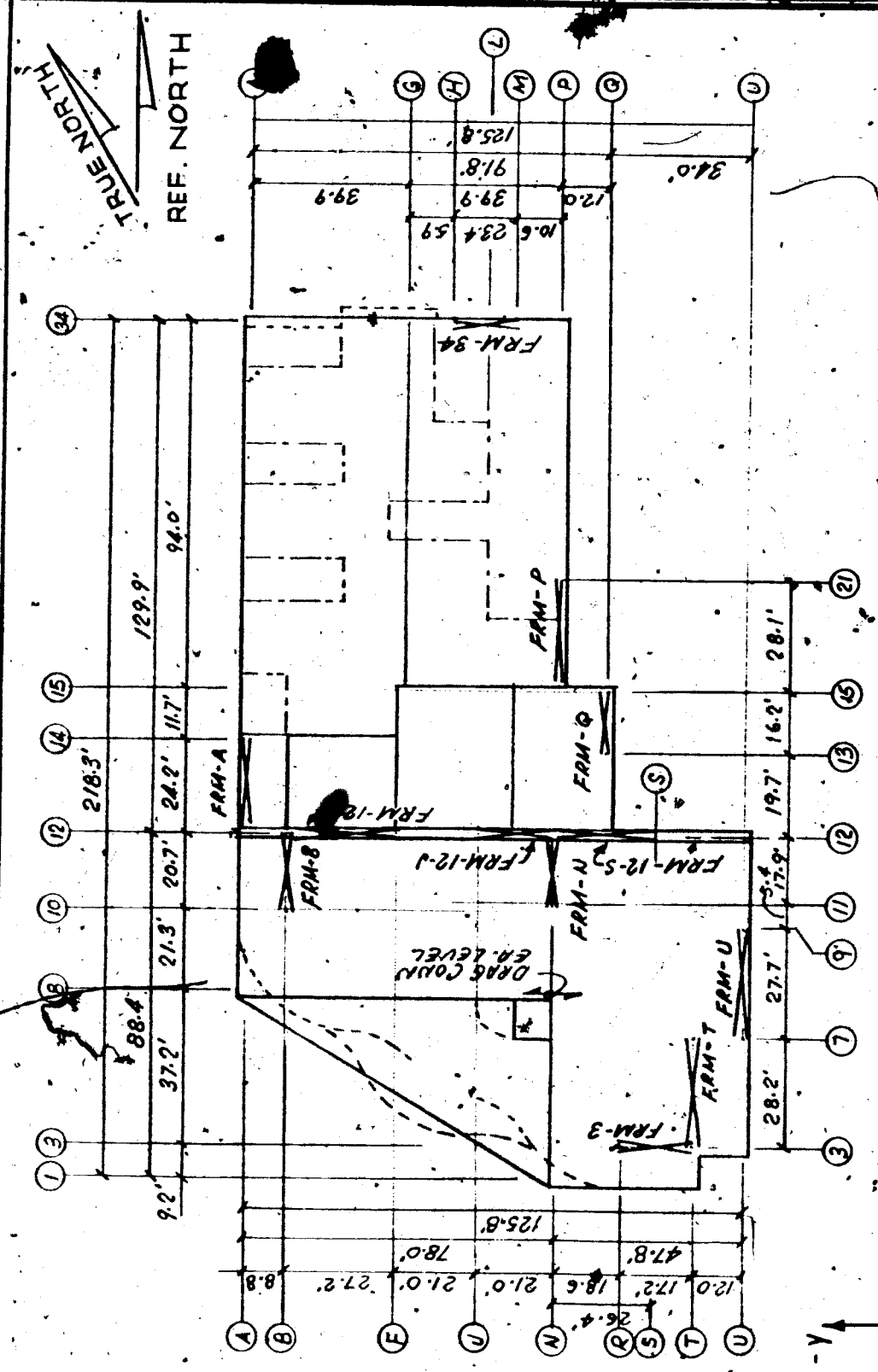
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LATERAL ANALYSIS



PLAN CONFIGURATION for LATERAL ANALYSIS

SCALE: 1" = 40'

DASHED LINES INDICATE THE OUTLINE OF ACTUAL STRUCTURE WHERE IT DIFFERS FROM THE ANALYTICAL MODEL SHOWN AS HARD LINE.

X-FRAMES ARE NAMED WITH RESPECT TO THE COL GRID ON WHICH THEY APPEAR.

NOTE: ═══ INDICATES "X-BRACED" FRM.

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5TH LEVEL DIAPHRAGMS (FUTURE ROOF)

SEISMIC LOADS $= (F_x/\omega_x)$ (100% Loads)
5TH LEVEL EL 160-0 = (26.3/168.3) (do) (do)
5TH LEVEL EL 156-0 = (30.1/198.1) (do) (do)

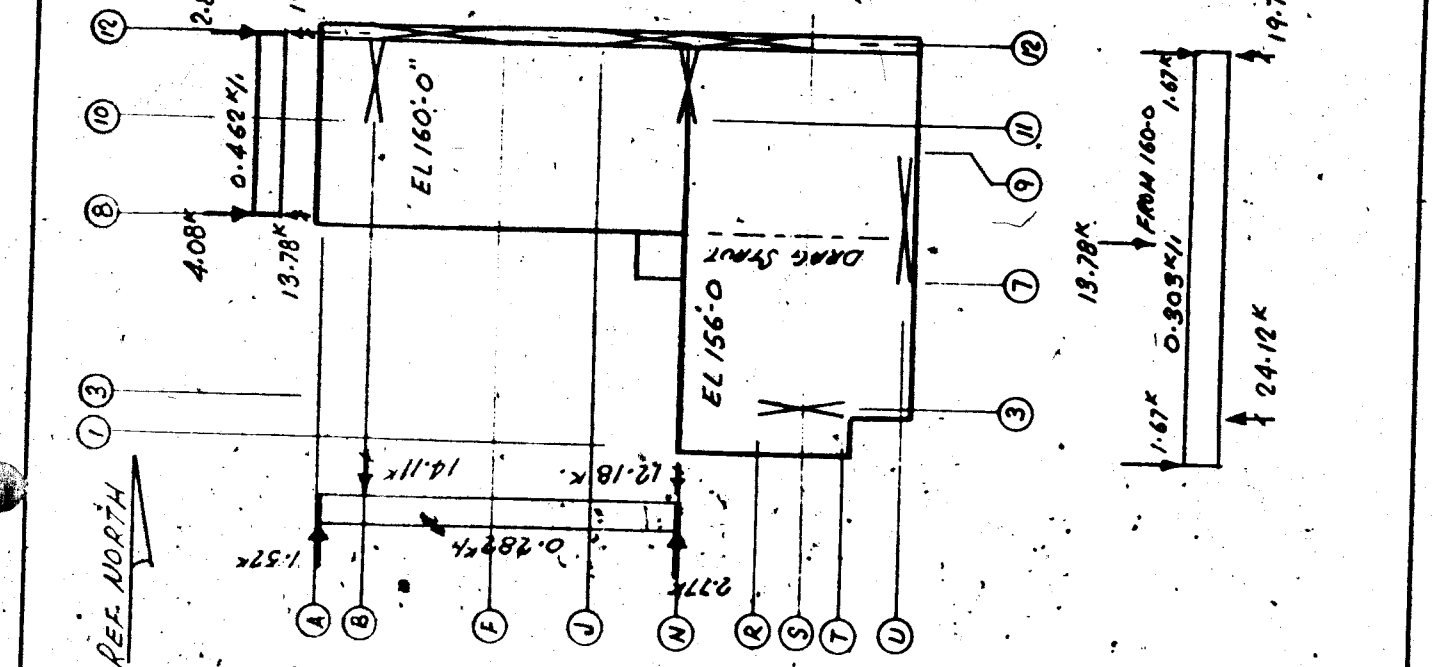
E-W
(26.3/168.3) (104.8K/42') = 0.390K/'
(do) (19.4K/42') = 0.072K/'
0.462K/'
(do) (36.1/2') = 2.82K
(do) (96.1/2 + 8.0) = 4.08K

S-N
(26.3/168.3) (104.8K + 36.1K)/78' = 0.282K/'
(do) (19.4K/2) = 1.52K
(do) (19.4K + 8.0K) = 2.77K

E-W
(30.1/198.1) (135.2K + 40.8K)/88.4' = 0.903K/'
(do) (2[illegible]/2) = 1.67K

N-S
(30.1/198.1) (135.2K + 22.1K)/[illegible]78' = 0.500K/'
(do) (40.8K/2) = 3.10K

NOTE: FLEXIBLE DIAPHRAGM AT ROOF
∴ LOADS TO FRMS BY TRIB AREAS



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4TH LEVEL DIAPHRAGMS (FUTURE FLR)

SEISMIC LOAD'G = $(F_x/\omega_x)(100\%\ G\ LOADS)$

4TH LEVEL EL 146-0 = (45.1/352.4)(d₀)(281.8ᴷ + 24.7ᴷ)/42.0' = 0.934ᴷ/ᴵ
4TH LEVEL EL 142-0 = (48.9/449.5)(d₀)(363.4ᴷ + 52.0ᴷ)/88.4' = 0.518ᴷ/ᴵ

EL 146-0

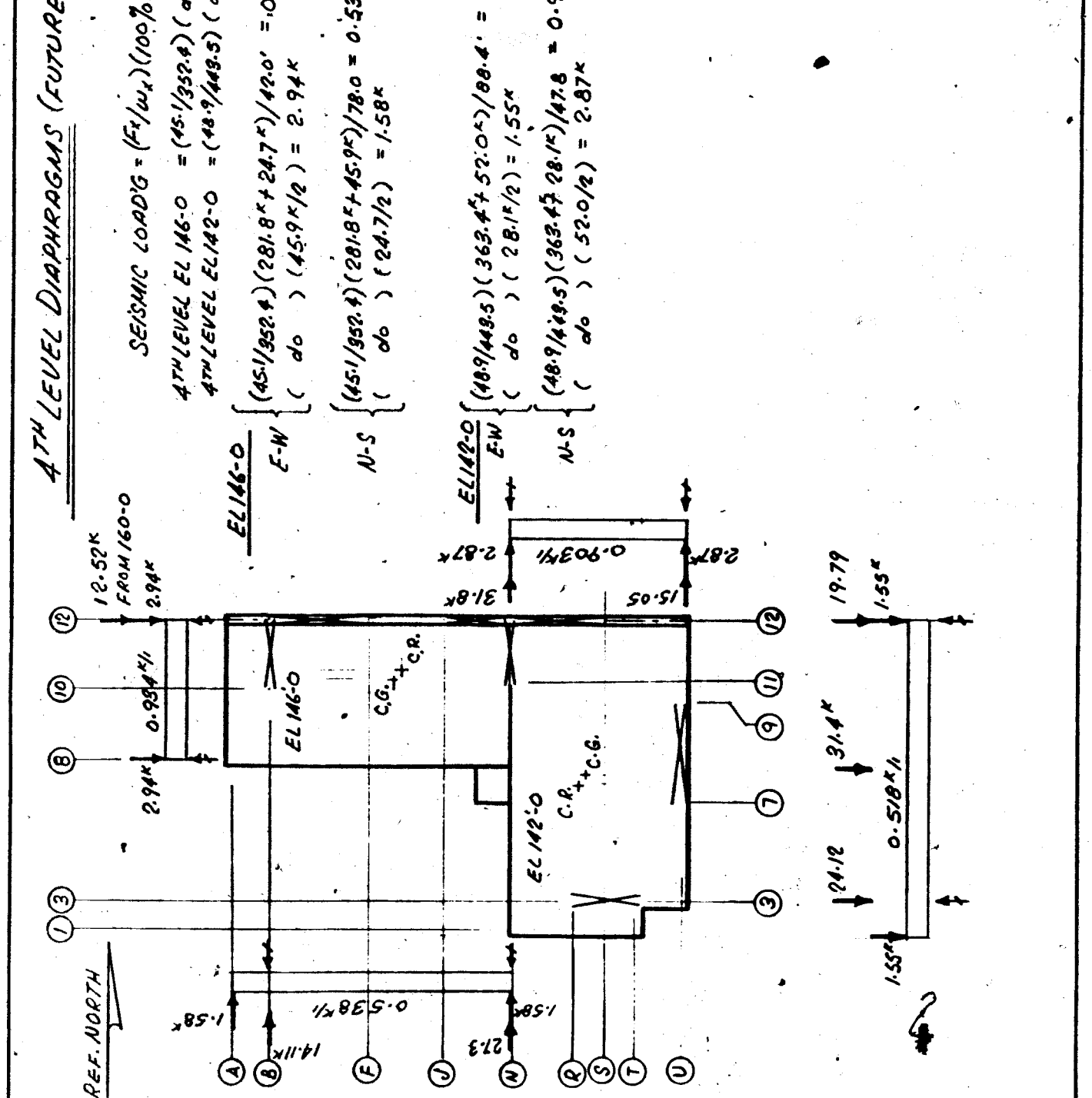
E-W { (45.1/352.4)(281.8ᴷ + 24.7ᴷ)/42.0' = 0.934ᴷ/ᴵ ; (d₀)(45.9ᴷ/2) = 2.94ᴷ

N-S { (45.1/352.4)(281.8ᴷ + 45.9ᴷ)/78.0 = 0.538ᴷ/ᴵ ; (d₀)(24.7/2) = 1.58ᴷ

EL 142-0

E-W { (48.9/449.5)(363.4ᴷ + 52.0ᴷ)/88.4' = 0.518ᴷ/ᴵ ; (d₀)(28.1ᴷ/2) = 1.55ᴷ

N-S { (48.9/449.5)(363.4ᴷ + 28.1ᴷ)/47.8 = 0.903ᴷ/ᴵ ; (d₀)(52.0/2) = 2.87ᴷ



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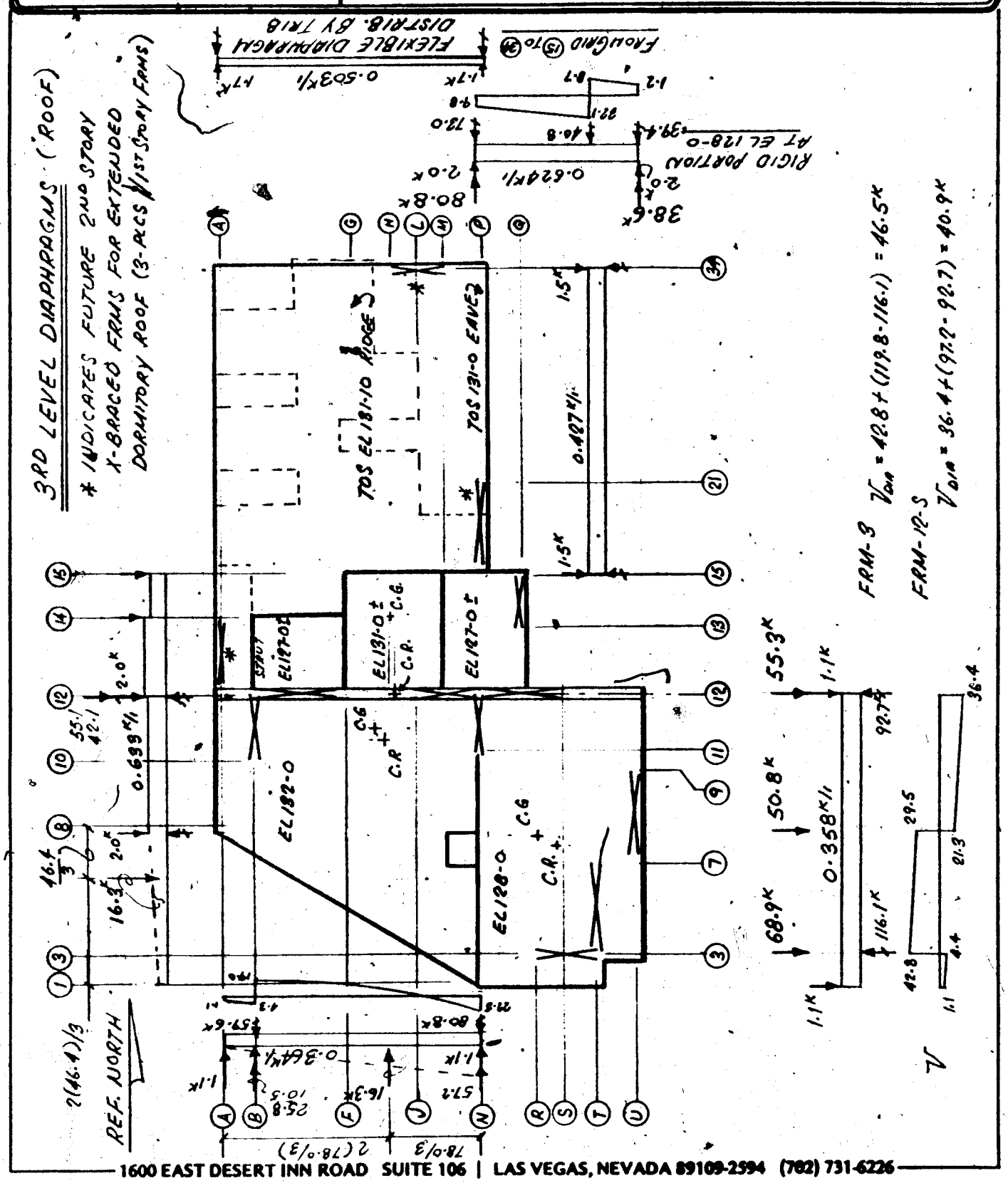
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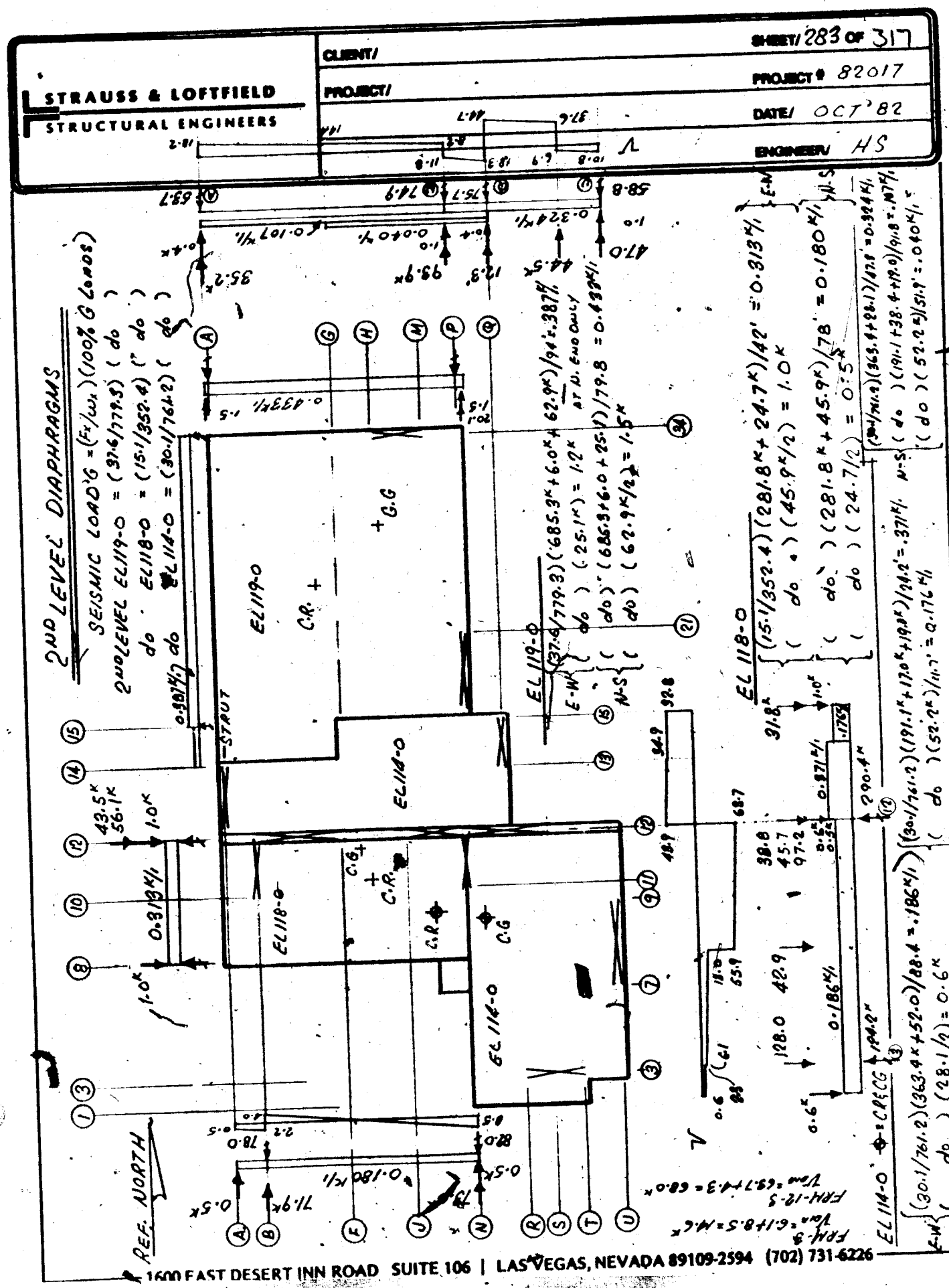
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LATERAL ANALYSIS

GRAVITY LOADS

5TH LEVEL (FUTURE ROOF) [FLEXIBLE DIAPHRAGM → DISTR. BY TRIB.]

EL 160'-0 ROOF & PARTITIONS (42'x78')(.022K/□ + .010K/□) = 104.8K
WALLS: E&W 2(7.0+4.0')(.021K/□)(42.0') = 19.4K
N&S 2(do+do)(do)(78.0') = 36.1K
160.3K

EL 156'-0 ROOF & PARTITIONS (47.8'x88.4')(.022K/□ + .010K/□) = 135.2K
WALLS: E&W 2(7.0+4.0)(.021K/□)(88.4') = 40.8K
N&S 2(do+do)(do)(47.8') = 22.1K
198.1K

EL 160'-0 PENTHOUSE & MECH. EQUIP 8.0K

4TH LEVEL (FUTURE FLR) [RIGID DIAPHRAGM → DISTR. BY C.G. & C.R.]

EL 146'-0 FLR & PARTITIONS (42'x78')(.086K/□) = 281.8K
WALLS: E&W 2(14.0')(.021K/□)(42.0') = 24.7K
N&S 2(do)(do)(78.0') = 45.9K
352.4K

EL 142'-0 FLR & PARTITIONS (47.8'x88.4')(.086K/□) = 363.4K
WALLS: E&W 2(14.0)(.021K/□)(88.4') = 52.0K
N&S 2(do)(do)(47.8') = 28.1K
443.5K

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LATERAL ANALYSIS

GRAVITY LOADS

3RD LEVEL (PRESENT ROOF) [RIGID DIAPHRAGM → DISTR. BY C.R. & C.G. & FLEXIBLE " PORTION → DISTR. BY TRIB.]

EL 131'-10 "FLEXIBLE" ROOF PORTION

ROOF & PARTITIONS (.022K/# + .020K/#)(39.9')(105.7+94.0)	=	334.7K
WALLS: E&W (12/2 + 3')(.021K/#)(105.7+94.0)	=	37.8K
N&S BTWN (do) (do)(79.8)(6)	=	90.5K
		463.0K

EL 130'-131' "RIGID" PORTION W/ MECH FAN RM.

ROOF (29.3' x 35.9')(.072K/#)	=	75.8K
WALLS E&W (17/2+1')(.015K/#)(35.9')(2)	=	10.3K
N&S (do) (do)(29.3')(2)	=	8.4K
		94.5K

EL 127' AVG "RIGID" PORTION W/ GAME RM

ROOF (24.2' x 31.3')(.072K/#)	=	54.6K
WALLS: W (13/2 +7)(.021K/#)(24.2')	=	6.9K
N (13/2 +7)(do)(31.3')	=	8.9K
MECH EQUIP 2(1K EA) + 1(5.6K)	=	7.6K
		78.0K

EL 127' AVG "RIGID" PORTION W/ MECH CHILLER RM

ROOF (22.6' x 35.9')(.072K/#)	=	58.4K
WALLS: E (13/2+7)(.021K/#)(35.9)	=	10.2K
N (do)(do)(22.6)	=	6.4K
MECH EQUIP 2(3K EA)	=	6.0K
		81.0K

EL 132'-0 "RIGID" PORTION AT ADMIN AREA (FUTURE)

ROOF/FLR (42'x78')(.086K/#)	=	281.8K
ROOF (1/2)(46.4x78')(.082K/#)	=	148.4K
WALLS: E&W 2(14.0')(.021K/#)(42')	=	24.7K
N&S 2(do)(do)(78')	=	45.9K
ENTRANCE (15+6)(do)(9')	=	40.1K
		540.9K
		1257.4K

EL 128'-0 "RIGID" PORTION AT ADMIN AREA (FUTURE)

ROOF/FLR (47.8 x 88.4)(.086K/#)	=	363.4K
WALLS: E&W 2(14.0')(.021K/#)(88.4')	=	52.0K
N&S 2(do)(do)(47.8')	=	28.1K
		443.5K

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2ND LEVEL — [RIGID DIAPHRAGM → DISTR. BY C.R. & C.G.]

EL 119'-0 FLR (.086 K/ft²)(39.9)(105.7 + 94.0) = 685.3 K
WALLS: E & W (9.5 + 5.5)(.021 K/ft²)(105.7' + 94.0') = 62.9 K
N (do)(do)(79.8') = 25.1 K
MECH EQUIP 2(1.0 K EA) + 1(2.5 K EA) + 3(0.5 K EA) = 6.0 K
779.3 K

EL 118'-0 FLR (.086 K/ft²)(42' x 78') = 281.8 K
WALLS: E & W 2(14.0)(.021 K/ft²)(42.0') = 24.7 K
N (do)(do)(78.0') = 45.9 K
352.4 K

EL 114'-0 MECH. FLR (.086 K/ft²)(24.2' x 91.8') = 191.1 K
do (do)(71.7 x 51.9') = 52.2 K
WALLS: E & W (13.5')(.021 K/ft²)(24.2' + 35.9') = 17.0 K
N (13.5')(do)(91.8) = 26.0 K
S (do)(.010 K/ft²)(do) = 12.4 K
MECH EQUIP (1.8 K + 3.2 K + 2.5 K) + 3(0.5 K) + 2(5.0 K) = 19.0 K
317.7 K

EL 114'-0 FLR (.086 K/ft²)(47.8' x 88.4') = 368.4 K
WALLS: E & W 2(14.0)(.021 K/ft²)(88.4') = 52.0 K
N & S 2(do)(do)(47.8') = 28.1 K
443.5 K

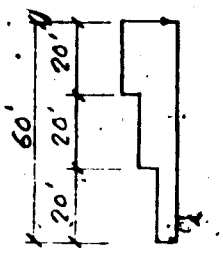
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WIND BASE-SHEAR



$p = C_e C_q q_s I$

$p_1 = 1.5\ (1.4)\ (15PSF)\ (1.15) = 36.3\ PSF$
$p_2 = 1.3\ (\ do\ )\ (\ do\ )\ (\ do\ ) = 31.4\ PSF$
$p_3 = 1.2\ (\ do\ )\ (\ do\ )\ (\ do\ ) = 29.0\ PSF$

$W_{N-S} = [(36.3 \times 20') + (31.4 \times 20') + (29.0 \times 13')]\ (128')/_{10^3} = 222^K$
$W_{E-W} = \{[\ do\ 490') + [(31.4 \times 12') + (29.0 \times 15')]\ (130')\}/_{10^3} = 254^K$

SEISMIC BASE-SHEAR

$V = ZIKCSW = (3/8)(1.5)(1.0)(0.14)W = 0.079\ W$
$V = 0.079\ (4756^K) = 376^K$ > WIND ∴ SEISMIC GOVERNS N-S & E-W

	w_x	h_x	$w_x h_x$	$\frac{w_x h_x}{\Sigma w_x h_x}$	F_x	V_x	h	$V_x h = \Delta M_x$	M_x
ROOF 160'-0	168.3	60	10098	0.07	26.3	—	—	—	
ROOF 156'-0	198.1	56	11094	0.08	30.1	26.3			FRMS
4TH 146'-0	352.4	46	16240	0.12	45.1	56.4			& M_x
4TH 142'-0	443.5	42	18627	0.13	48.9	101.5			
3RD 132'-0	1257.4	32	40237	0.29	109.0	150.4		INDIVIDUAL FOR ΔM_x	
3RD 128'-0	443.5	28	12418	0.09	33.8	259.4	5'		
2ND 119'-0	779.3	19	14807	0.10	37.6	293.2			
2ND 118'-0	352.4	18	6343	0.04	15.1	330.8			
2ND 114'-0	761.2	14	10657	0.08	30.1	345.9			
Σ	4756.1	—	140491		376.0	376.0			

$T = \frac{0.05\ h_n}{\sqrt{D}} = \begin{cases} (.05 \times 60)/\sqrt{88.4} = 0.32\ SEC\ N\text{-}S \\ (.05 \times 60)/\sqrt{125.8} = 0.27\ SEC\ E\text{-}W \end{cases} < 0.7\ SEC \therefore F_t = 0$

$F_x = \frac{(V - F_t)\ w_x h_x}{\Sigma_{i=1}^{n} w_i h_i}$

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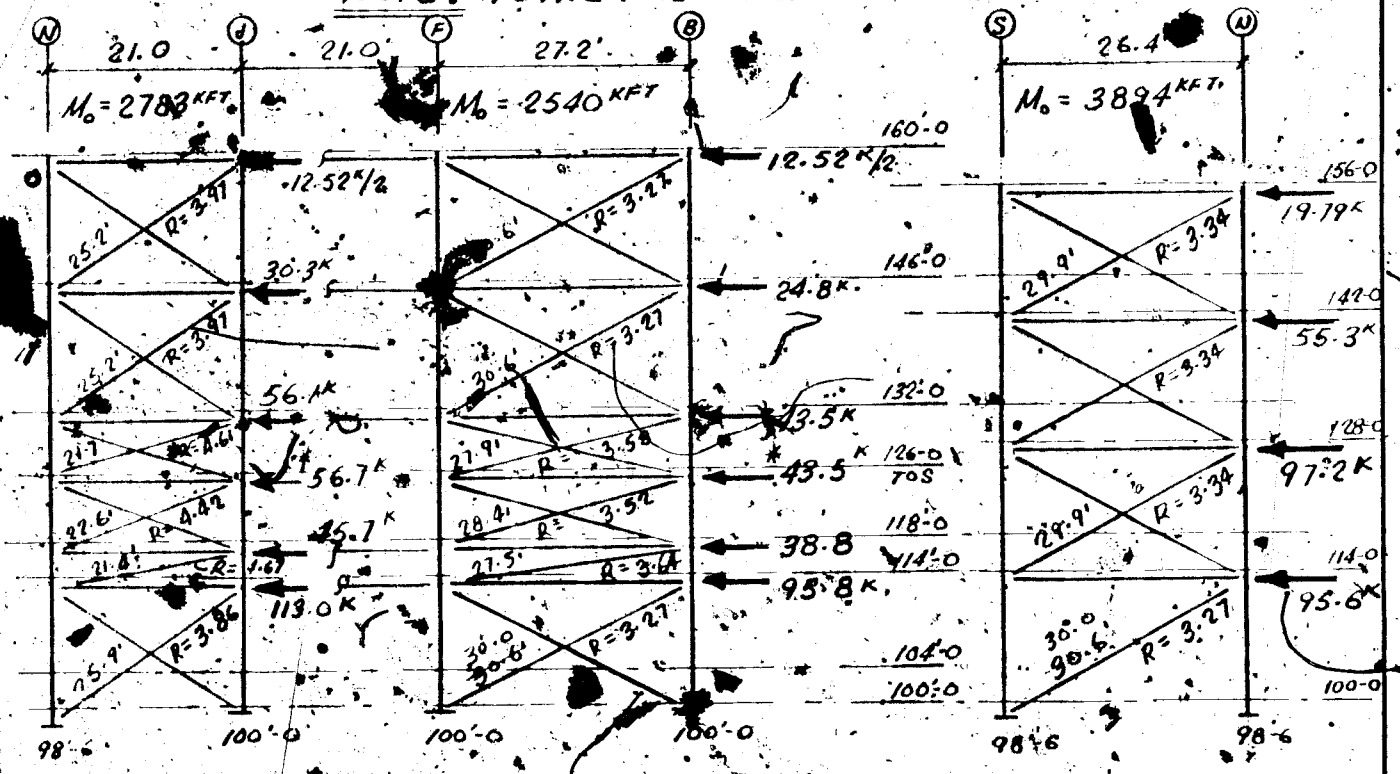
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BRACED FRMS

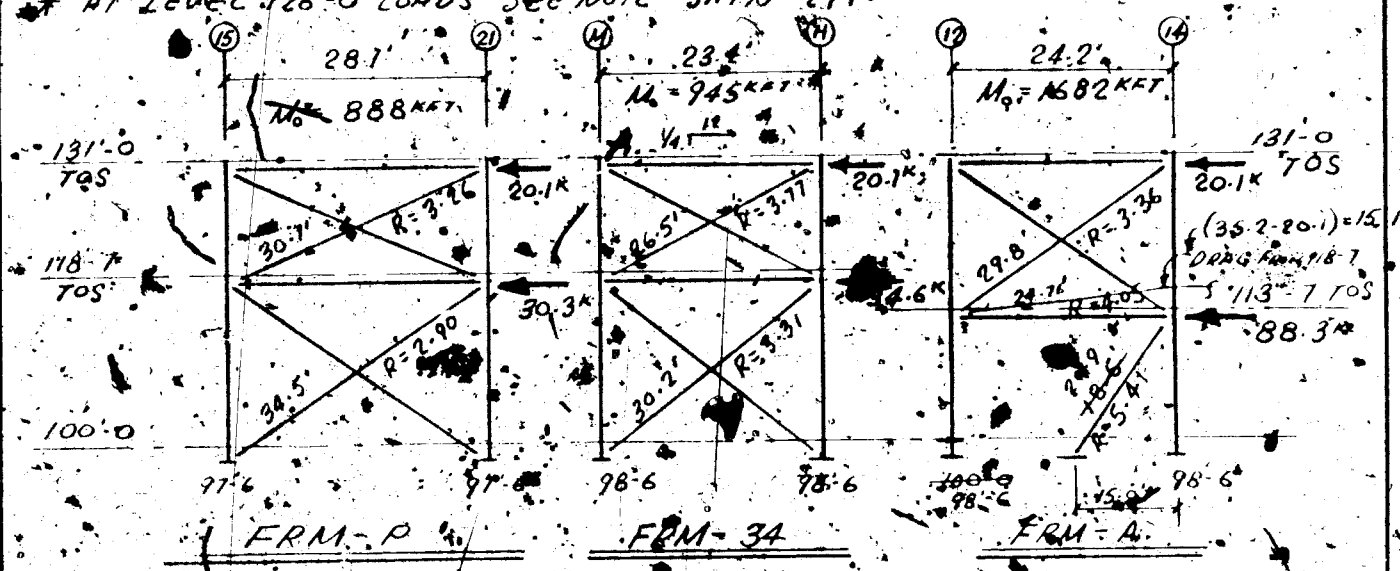
NOTE: TOTAL ACCUM SHEAR AT EA LEVEL IS SHOWN



FRMS - 12 J & 12 B

FRM - 12 S

* AT LEVEL 126'-0 LOADS - SEE NOTE SHT N° 294



FRM - P

FRM - 34

FRM - A

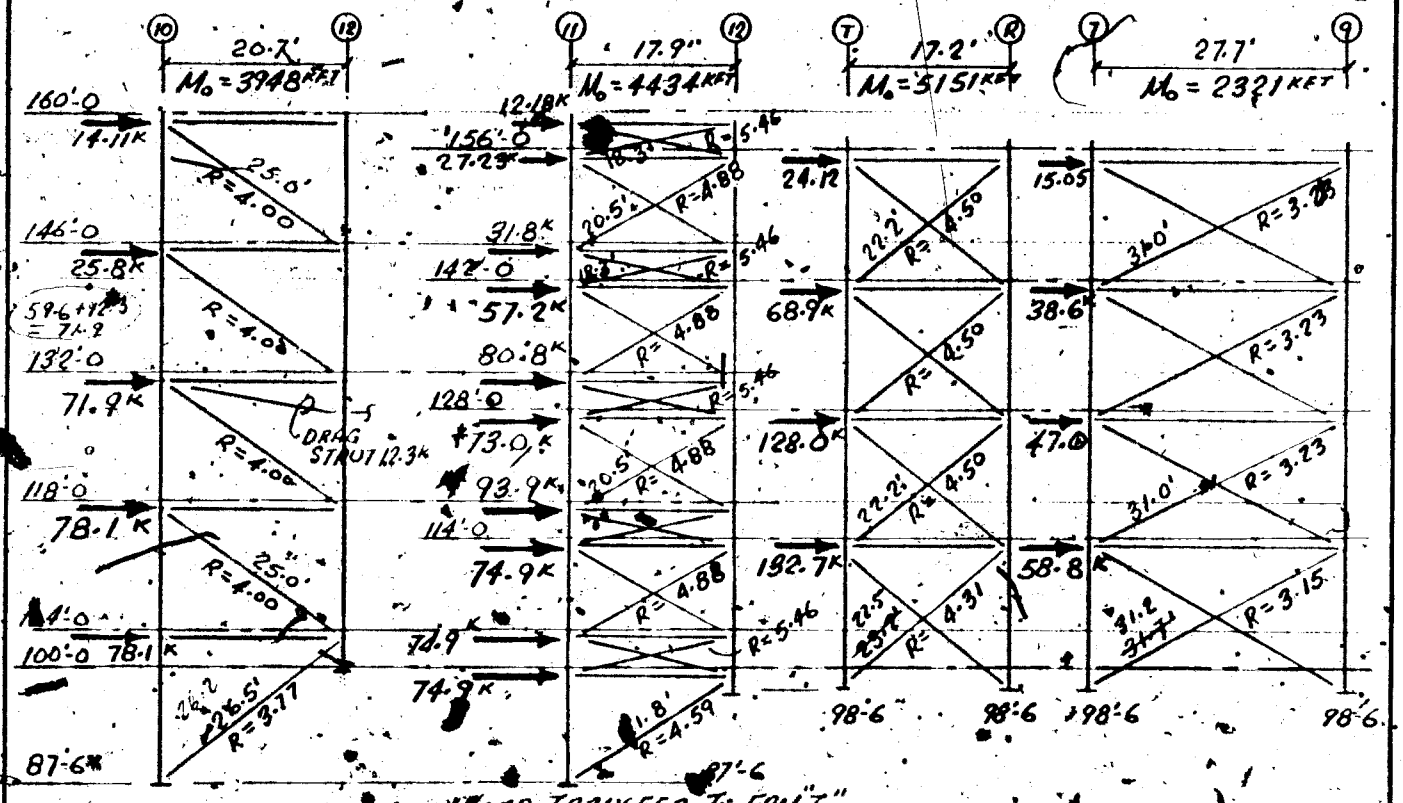
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BRACED FRMS

NOTE: TOTAL ACCUM SHEAR AT EA LEVEL IS SHOWN



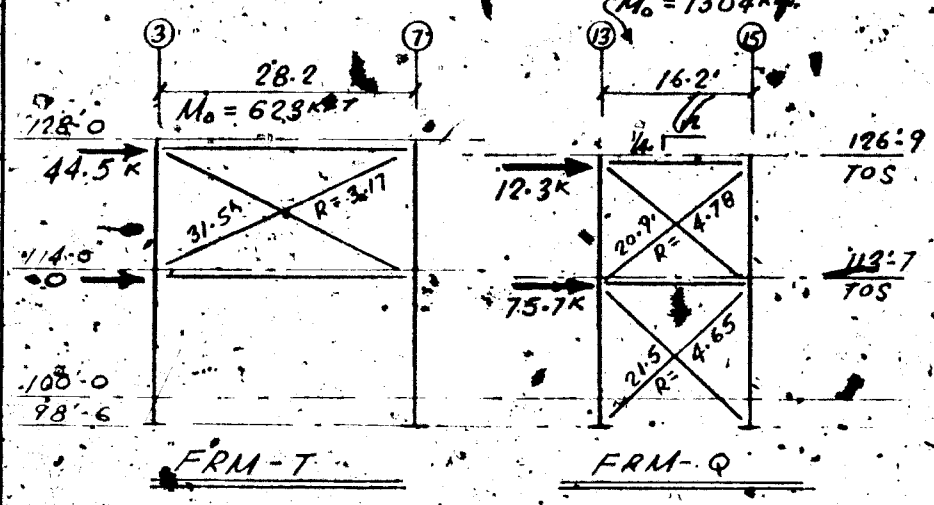
*LOAD TRANSFER TO FRM "T" ∴ REDUC.

FRM-B

FRM-N

FRM-3

FRM-U



FRM-T

FRM-Q

FRM RIGIDITY BASED ON Δ OF DIAGONAL

$\Delta = \frac{PL_D}{AE}$

w/ $\frac{P}{A}$ RELATIVELY CONST. & E. CONST

$\Delta = KL_D$

& $R = 1/\Delta = 1/KL_D$

K USED HERE = 1/100 FOR RELATIVE RIGIDITY R

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CENTER OF RIGIDITY C.R. & CENTER OF GRAVITY C.G.

4TH LEVEL EL 146-0

FRM	R	X	R(x)
12-B	3.27	0	0
12-J	3.97	0	0
8	3.92	42.0	164.64
	ER = 11.16		ER(x) = 164.64

C.R. N-S EM_{12}

$\bar{x} = ER(x)/ER = 14.7'$ SOUTH OF GRID 12

	R	Y	R(y)
B	4.00	8.80	35.20
N	5.46	78.00	425.88
	ER = 9.46		ER(y) = 461.08

C.R. E-W EM_A

$\bar{y} = ER(y)/ER = 48.7'$ EAST OF GRID A

	Y	P(y)
1.58	0	0
14.11K	8.8	124.2
28.88K	78.0	2252.6
41.96K	39.0	1636.4
86.53K		4013.2 KFT

C.G. E-W EM_A

$\bar{y} = EP(y)/EP = 46.4'$ EAST OF GRID A

	X	P(x)
15.46K	0	0
2.94K	42.0	123.5
39.23K	21.0	823.8
57.63K		947.3 KFT

C.G. N-S EM_{12}

$\bar{x} = EP(x)/EP = 16.4'$ SOUTH OF GRID 12

$e_x = (16.4' - 14.7') = 1.7'$
$e_y = (48.7' - 46.4') = 2.3'$

4TH LEVEL EL 142-0

FRM	R	X	R(x)
12-5	3.34	0	0
3	4.50	79.2	356.40
	7.84		356.40

$\bar{x} = 45.5'$

	R	Y	R(y)
N	4.88	78.0	380.64
U	3.23	125.8	406.33
	8.11		786.97

$\bar{y} = 97.0'$

C.R. $\bar{x} = 45.5'$ SOUTH OF GRID 12
$\bar{y} = 97.0'$ EAST OF GRID A

P	X	P(x)
21.34	0	0
31.4	42.0'	1318.8
24.12	79.2'	1910.3
1.55	88.4'	137.0
45.79	44.2'	2023.9
124.20		5390.0

$\bar{x} = 43.4'$

	Y	P(y)
34.67	78.0'	2704.3
17.92	125.8'	2254.3
43.16	101.9'	4398.0
95.75		9356.6

$\bar{y} = 97.7$

$e_x = (45.5 - 43.4') = 2.1'$
$e_y = (97.7 - 97.0) = 0.7'$

C.G. $\bar{x} = 43.4'$ S. OF GRID 12.
$\bar{y} = 97.7'$ E. OF GRID A

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4TH LEVEL RIGID DIAPHRAGMS

EL 146'-0"

N-S { $P = 57.6^K$; $M = P(e_y) = P(2.3') = 132.5^{KFT}$; $M_T = P(0.05 \times 78') = 224.6^{KFT}$

E-W { $P = 86.5^K$; $M = P(e_x) = P(1.7') = 147.1^{KFT}$; $M_T = P(0.05 \times 78') = 337.4^{KFT}$

FRM	R	d	Rd	Rd^2	$P_{N-S}\frac{R}{ER}$	$M\frac{Rd}{ERd^2}$	$M_T\frac{Rd}{ERd^2}$	F'	V_{DIA}	$P_{E-W}\frac{R}{ER}$	$M\frac{Rd}{ERd^2}$	$M_T\frac{Rd}{ERd^2}$	F'	V_{DIA}
B	4.00	39.9	160	6368	24.4	± 1.4	± 2.3	26.7	25.8	—	± 1.5	± 3.5	LESS CRITICAL THAN N-S LOAD'G	
N	5.46	(29.3)	160	4687	33.2	- 1.4	± 2.3	35.5	31.8	—	- 1.5	± 3.5		
ER = 9.46					57.6		—	62.2	57.6					
12-B	3.27	14.7	48	707	—	- 0.4	± 0.7	LESS CRITICAL THAN E-W LOAD'G		25.3	- 0.5	± 1.0	26.3	24.8
12-J	3.97	14.7	59	858	—	- 0.5	± 0.8			30.8	- 0.5	± 1.3	32.1	30.3
8	3.92	(27.3)	107	2922	—	+ 0.9	± 1.5			30.4	+ 1.0	± 2.3	32.7	31.4
ER = 11.76			ERd² = 15542							86.5			91	86.5

EL 142'-0"

N-S { $R = 95.8^K$; $M = P(e_y) = P(0.7') = 67.1^{KFT}$; $M_T = P(0.05 \times 88.4') = 423.5^{KFT}$

E-W { $P = 124.2^K$; $M = P(e_x) = P(2.1') = 260.9^{KFT}$; $M_T = P(0.05 \times 88.4') =$ [illegible]

FRM	R	d	Rd	Rd^2	PR/ER_x	MRd/ERd^2	M_TRd/ERd^2	F	V_{DIA}	PR/ER	MRd/ERd^2	M_TRd/ERd^2	F	V_{DIA}
N	4.88	(19.0)	93	1762	57.6	- 0.4	± 2.4	60.0	57.2	—	- 1.5	± 3.1	LESS CRITICAL THAN N-S LOAD'G	
U	3.23	28.8	93	2679	38.2	+ 0.4	± 2.4	40.6	38.6	—	[illegible]	± 3.1		
ER = 8.11					95.8			100.6	95.8					
12-S	3.34	45.5	152	6915	—	+ 0.6	± 3.9	LESS CRITICAL THAN E-W LOAD'G		52.9	+ 2.4	± 5.1	58.0	55.3
3	4.50	(33.7)	152	5111	—	- 0.6	± 3.9			71.3	- 2.4	± 5.1	76.4	68.9
ER = 7.84			ERd² = 16,467							124.2			134.4	124.2

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3RD LEVEL DIAPHRAGMS

SEISMIC LOAD'G = (F_x/ω_x) (100% G LOADS)

3RD LEVEL EL 132-0 = (109.0/1257.4) (do).
3RD LEVEL EL 128-0 = 33.8/443.5) (do)

FLEXIBLE DIAPHRAGM PORTION OF ROOF

(109.0/1257.4) (334.7K + 37.8K + 90.5)/94' = 0.427 K/' E-W LOAD'G

(do) (do)/79.8' = 0.503 K/' N-S LOAD'G

E-W LOAD'G:

R = (0.427 K/')(94'/2) = 20.07K
M = (do)(94)²/8 = 471.6 K-FT
$v_{D/A}$ = (20.07K x 10³)/79.8' = 252 #/'
CHORD = 471.6 K-FT/79.8' = 5.9K

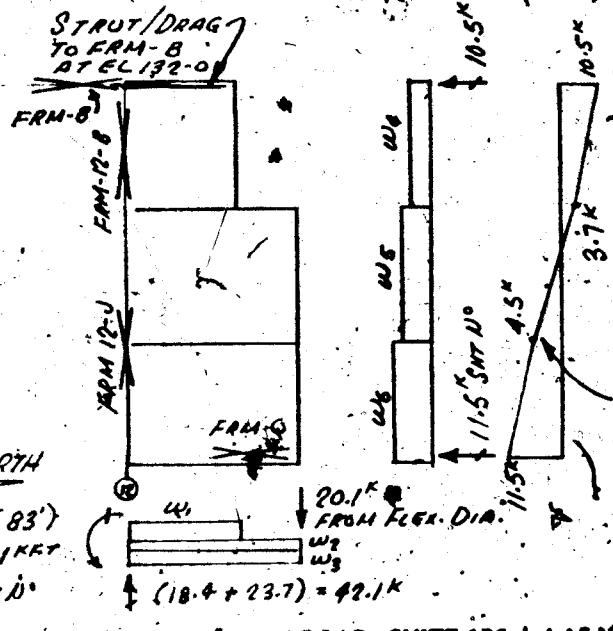
N-S LOAD'G:

R = (0.503 K/')(79.8')/2 = 20.07K
M = (do)(79.8')²/8 = 400.4 K-FT
$v_{D/A}$ = (20.07 x 10³)/94.0 = 214 #/'
CHORD = 400.4 K-FT/94.0 = 4.3K

F = 14.26 + 40.1(1/3) = 28 → SEMI-FLEX.
1½" B-DECK
20 GA
36" WIDTH
7-WELD PAT.
BUTTON PUNCH,
FMARG. WELDS @ 24" o.c.
330 #/' ALW

CHORD FORCE < 6K MIN CONN.

RIGID PORTION OF ROOF NORTH OF GRID 12



(109.0/1257.4)(78.0K)/21.3 = 0.28 K/' = ω_1
(do)(94.5K)/35.9' = 0.228 K/' = ω_2
(do)(81.0K)/35.9' = 0.196 K/' = ω_3
(do)(78.0K)/31.3' = 0.816 K/' = ω_4
(do)(94.5K)/29.3' = 0.280 K/' = ω_5
(do)(81.0K)/22.6' = 0.311 K/' = ω_6

SHEAR TRANSFER BTWN HIGH ROOF & LOW ROOF PORTION NORTH OF GRID 12 EQUALS 4.5K MAX.
*DRAG STRUT TO FRM-B AT EL 132-0 REQUIRES 12.3K CAPACITY. (E-W LOAD'G TORSION)

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3RD LEVEL DIAPHRAGMS continued

SEISMIC LOAD'G

RIGID PORTION OF ROOF EL 132-0 & SOUTH OF GRID 12

E-W { (109.0/1257.4)(281.8K + 24.7K/2)/42' = 0.633K/l.
(do)(45.9/2) = 2.0K
(do)(148.4K + 40.1K) = 16.3K

N-S { (109.0/1257.4)(281.8K + 45.9)/78' = 0.364K/l
(do)(148.4K + 40.1K) = 16.3K
(do)(24.7K/2) = 1.1K

} REFER TO SKETCH SHT N°

RIGID PORTION OF ROOF EL 128-0

E-W { (33.8/443.5)(363.4K + 52.0)/88.4' = 0.358K/l
(do)(28.1K/2) = 1.1K

N-S { (33.8/443.5)(363.4 + 28.1)/47.8' = 0.624K/l
(do)(52.0/2) = 2.0K

} REFER TO SKETCH SHT N°

C.G. & C.R AT 3RD LEVEL EL 128-0

FRM	R	Y	R(Y)
N	4.88	78.0	380.6
T	3.17	113.8	360.7
U	3.23	125.8	406.3
	11.28		1147.6
	$\bar{y}$ = 101.7'		
		X	R(x)
12-S	3.34	0	0
3	4.50	79.2	356.4
	7.84		356.4
	$\bar{x}$ = 45.5'		

C.R. $\bar{x}$ = 45.5' SOUTH OF GRID 12
$\bar{y}$ = 101.7' EAST OF GRID A

P	Y	P(Y)
29.8	101.9	3036.6
82.8	78.0	6458.4
40.6	125.8	5107.5
153.2		14602.5
$\bar{y}$ = 95.3'		

P	x	P(x)
31.6	44.2	1396.7
56.4	0	0
50.8	42.0	2133.6
68.9	79.2	5456.9
1.1	88.4	97.2
208.8		9084.4
$\bar{x}$ = 43.5'		

C.G. $\bar{x}$ = 43.5' SOUTH OF GRID 12
$\bar{y}$ = 95.3' EAST OF GRID A

$e_x = (45.5 - 43.5) = 2.0'$
$e_y = (101.7 - 95.3) = 6.4'$

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3RD LEVEL EL 127-0± TO EL 131-0±

RIGID PORTION OF ROOF DIAPHRAGM NORTH OF GRID 12

NOTE: THE MASS AT THIS PORTION IS CONSERVATELY ASSUMED TO IMPART LOADS UP TO THE HIGHER OF THE TWO LEVELS OF BRC'G BTWN. EL 132-0 & 126-0 ALONG GRID 12 DUE TO THE CONTINUITY OF DIAPHRAGM CROSSING THESE LEVELS.

FRM	R	Y	R(Y)
B	4.00	8.8	35.2
Q	4.78	91.8	438.8
	8.78		474.0

$\bar{Y} = 54.0'$

	R	X	R(X)
12-B	3.58	0	0
12-J	4.61	0	0
	8.19		0

$\bar{X} = 0$

C.R. $\bar{X} = 0$ :: ON GRID 12
$\bar{Y} = 54.0'$ EAST OF GRID A

P	Y	P(Y)
6.76K	24.45'	165.3
8.19K	50.65'	414.8
7.02K	80.50'	565.1
21.97K		1145.2

	X	P(X)
6.76K	-12.10'	-18.9
8.19K	-17.95'	-147.0
7.02K	-17.95'	-126.0
20.10K	-35.90'	-721.6
42.07K		-1013.5

$e_x = (24.1-0) = 24.1'$
$e_y = (54.0-52.1) = 1.9'$

C.G. $\bar{X} = -24.1'$ :: NORTH OF GRID 12
$\bar{Y} = 52.1'$ EAST OF GRID A.

3RD LEVEL EL 132-0

RIGID PORTION SOUTH OF GRID 12

FRM	R	Y	R(Y)
B	4.00	8.8	35.2
N	5.46	78.0	425.9
	9.46		461.1

$\bar{Y} = 48.7'$

	R	X	R(X)
12-B	3.58	0	0
12-J	4.61	0	0
B	3.92	42.0	164.6
	12.11		164.6

$\bar{X} = 13.6'$

C.R. $\bar{X} = 13.6'$ SOUTH OF GRID 12
$\bar{Y} = 48.7'$ EAST OF GRID A

P	Y	P(Y)
28.4K	39.0'	1107.6
16.3K	52.0'	847.6
1.1K	0	0
36.3K	8.8	319.4
58.3K	78.0	4547.4
140.4K		6822.0

$\bar{Y} = 48.6'$

P	X_1	P(X)
25.6	21.0'	537.6
2.0	42.0	84.0
99.2	0	0
16.3	57.5'	937.3
143.1K		1558.9

$\bar{X} = 10.9'$

C.G. $\bar{X} = 10.9'$ SOUTH OF GRID 12
$\bar{Y} = 48.6'$ EAST OF GRID A

$e_x = (13.6-10.9) = 2.7'$
$e_y = (48.7-48.6) = 0.1'$

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3RD LEVEL RIGID DIAPHRAGMS

EL 727-0± TO 131-0± PORTION N. OF GRID 12

N-S { P = 22.0^K ; M = P(e_y) = P(1.9') = 42^KFT ; M_T = P(.05 x 83') = 92^KFT

E-W { P = 22.1' ; M = P(e_x) = P(24.1') = 1015^KFT ; M_T = P(.05 x 83') = 175^KFT

FRM	R	d	Rd	Rd²	PR/ΣR	MRd/ΣRd²	M_T Rd/ΣRd²	F	V_DIA	PR/ΣR	MRd/ΣRd²	M_T Rd/ΣRd²	F	
B	4.00	45.2	181	8172	10.0	+0.5	±1.1	11.1	10.5	—	+12.3	±2.1	12.3	
Q	4.78	(37.8)	181	6830	12.0	-0.5	±1.1	13.1	11.5	—	12.3	±2.1	12.3	12.3
ΣR =	8.78				22.0			24.2	22.0				24.6	24.6
12-B	3.58	0	0	0	—	0	0	0	0	18.4	0	0	18.4	18.4
12-J	4.61	0	0	0	—	0	0	0	0	23.7	0	0	23.7	23.7
ΣR =	8.19		ΣRd² = 1500²							42.1			42.1	42.1

EL 132-0 PORTION S. OF GRID 12

N-S { P = 140.4^K ; M = P(e_y) = P(0.1') = 14.0^KFT ; M_T = P(.05 x 88.4') = 621^KFT

E-W { P = 143.1 ; M = P(e_x) = P(2.7') = 387^KFT ; M_T = P(.05 x 88.4') = 633^KFT

FRM	R	d	Rd	Rd²	PR/ΣR	MRd/ΣRd²	M_T Rd/ΣRd²	F	V_DIA	PR/ΣR	MRd/ΣRd²	M_T Rd/ΣRd²	F	V_DIA
B	4.00	39.9	160	6368	59.4	+0.2	±6.3	65.7	59.6	—	+3.9	±6.4	LESS CRITICAL	
N	5.46	(29.3)	160	4687	81.0	-0.2	±6.3	87.3	80.8	—	-3.9	±6.4	THAN N-S	
ΣR =	9.46				140.4			153.0	140.4				LOAD'G	
12-B	3.58	13.6	49	662	—	+0.1	±1.9	LESS CRITICAL		42.3	+1.2	±2.0	44.3	43.5
12-J	4.61	13.6	63	853	—	+0.1	±2.5	THAN E-W		54.5	+1.6	±2.5	57.0	56.1
B	3.92	28.4	112	3162	—	-0.1	±4.4	LOAD'G		46.3	-2.8	±4.5	50.8	43.5
ΣR =	12.11		ΣRd² = 15732							143.1			152.1	143.1

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3rd LEVEL RIGID DIAPHRAGMS Continued

EL 122-0

N-S { P = 153.2k, M = P(e_y) = P(6.4') = 981 KFT, M_T = P(.05 x 88.4') = 677 KFT }

FRM	R	d	Rd	ΣRd²	PR/ΣR	MRd/ΣRd²	M_T Rd/ΣRd²	F	V_DIA
N	4.88	23.7	116	2741	66.3	± 6.7	± 4.6	73.0	73.0
T	3.17	(19.7)	38	464	43.0	- 2.2	± 1.5	44.5	40.8
U	3.23	(24.1)	78	1876	43.9	- 4.5	± 3.1	47.0	39.4
	ΣR = 11.28				153.2			164.5	153.2
1-2-S	3.34	45.5	152	6915	—	+ 8.7	± 6.0	LESS CRITICAL	
3	4.50	(33.7)	152	5111	—	- 8.7	± 6.0	THAN E-W	89.0
ΣR = 7.84				ΣRd² = 17107				LOAD'G	119.8

E-W { P = 153.2k, M = P(e_x) = P(2.0') = 418 KFT, M_T = P(.05 x 88.4') = 923 KFT }

FRM	R	d	Rd	ΣRd²	PR/ΣR	MRd/ΣRd²	M_T Rd/ΣRd²	F	V_DIA
A	4.05	(33.3)	135	4491	33.6	- 6.2	± 1.6	LESS CRITICAL	
P	2.90	46.5	135	6271	24.1	+ 6.2	± 1.6	THAN N-S	
	ΣR = 6.95				57.7			LOAD'G	
1-5	3.56	(45.3)	161	7305	—	- 7.3	± 1.9	LESS CRITICAL	29.9
34	3.31	48.7	161	7850	—	+ 7.3	± 1.9	THAN E-W	27.8
	ΣR = 6.87			ΣRd² = 25917				LOAD'G	57.7

E-W { P = 57.7k, M = P(e_x) = P(19.1') = 1102 KFT, M_T = P(.05 x 105.7) = 305 KFT }

PR/ΣR	MRd/ΣRd²	F	V_DIA
—	- 5.7	LESS CRITICAL	
—	+ 5.7	THAN N-S	
		LOAD'G	
29.9	- 6.8		
27.8	+ 6.8		
57.7			

2ND LEVEL RIGID DIAPHRAGMS

EL 119-0

N-S { P = 57.7k, M = P(e_y) = P(20.5') = 1183 KFT, M_T = P(.05 x 105.7) = 305 KFT }

FRM	R	d	Rd	ΣRd²	PR/ΣR	MRd/ΣRd²	M_T Rd/ΣRd²	F	V_DIA
A	4.05	(33.3)	135	4491	33.6	- 6.2	± 1.6	35.2	27.4
P	2.90	46.5	135	6271	24.1	+ 6.2	± 1.6	30.3	30.3
	ΣR = 6.95				57.7			65.5	57.7
1-5	3.56	(45.3)	161	7305	—	- 7.3	± 1.9	LESS CRITICAL	
34	3.31	48.7	161	7850	—	+ 7.3	± 1.9	THAN E-W	
	ΣR = 6.87			ΣRd² = 25917				LOAD'G	

E-W { P = 57.7k, M = P(e_x) = P(19.1') = 1102 KFT, M_T = P(.05 x 105.7) = 305 KFT }

PR/ΣR	MRd/ΣRd²	F	V_DIA
—	- 5.7	LESS CRITICAL	
—	+ 5.7	THAN N-S	
		LOAD'G	
29.9	- 6.8		
27.8	+ 6.8		
57.7			

1600 EAST DESERT INN ROAD SUITE 106 | LAS VEGAS, NEVADA 89109-2594 (702) 731-6226

Done Hand, 12/31/87

STRAUSS & LOFTFIELD
STRUCTURAL ENGINEERS

CLIENT/
PROJECT/
SHEET/ 297 OF 317
PROJECT # 82017
DATE/ OCT '82
ENGINEER/ HS

CENTER OF RIGIDITY C.R. & CENTER OF GRAVITY C.G.

2ND LEVEL EL 118-0

FRM	R	Y	R(Y)
B	4.00	8.8	35.2
N	4.88	78.0	380.6
	8.88		415.8
$\bar{y}$ = 46.8			
		X	R(x)
12-B	3.27	0	0
12-J	3.86	0	0
8	3.79	42.0	159.2
	10.92		159.2
$\bar{x}$ = 14.6'			

C.R. $\bar{x}$ = 14.6' SOUTH OF GRID 1
$\bar{y}$ = 46.8' EAST OF GRID A

P	Y	P(Y)
0.5	0	0
71.9	8.8	632.7
14.1	39.0	549.9
73.5	78.0	5733.0
160.0		6915.6
$\bar{y}$ = 43.2'		

P	X	P(x)
100.6	0	0
13.2	21.0	277.2
1.0	42.0	42.0
114.8		319.2
$\bar{x}$ = 2.8		

EG $\bar{x}$ = 2.8' SOUTH OF GRID 12
$\bar{y}$ = 43.2' EAST OF GRID A

$e_x = (14.6 - 2.8) = 11.8'$
$e_y = (46.8 - 43.2) = 3.6'$

2ND LEVEL EL 119-0

FRM	R	Y	R(Y)
A ORIG	4.05	0	0
P	2.90	79.8	231.4
	6.95		231.4
$\bar{y}$ = 33.3' E. OF A			
		X	R(x)
15 ORIG	3.56	-35.9	-127.8
34	3.31	-129.9	-430.0
	6.87		-557.8
$\bar{x}$ = -81.2' N. OF 12			

P	Y	P(Y)
34.6	39.9	1380.5
1.5	0	0
21.6	79.8	1723.7
57.7		3104.2
$\bar{y}$ = 53.8' E. OF A		

P	X	P(x)
36.4	-82.9	-3017.6
21.3	-129.9	-2766.9
57.7		-5784.5
$\bar{x}$ = -100.3' N. OF 12		

$e_x = (100.3 - 81.2) = 19.1'$
$e_y = (53.8 - 33.9) = 20.5'$

2ND LEVEL EL 114-0

FRM	R	Y	R(Y)	X	R(x)
J	3.15	125.8	396.3	—	—
Q	4.65	91.8	426.9	—	—
R	4.88	78.0	380.6	—	—
	5.41	0	0		
	18.09		1203.8		
$\bar{y}$ = 66.5' & $\bar{x}$ = 25.9'					
3	4.31	—	—	88.4	381.0
12-B	3.27	—	—	0	0
12-J	3.86	—	—	0	0
12-S	3.27	—	—	0	0
	14.71				381.0

$e_x = (27.4 - 25.9) = 1.5'$
$e_y = (83.0 - 66.5) = 16.5'$

$\bar{y}$ = 83.0'
$\bar{x}$ = 27.4'

P	Y	P(Y)
35.6	0	0
94.9	78.0	7402.2
12.7	91.8	1165.9
44.5	113.8	5064.1
48.0	125.8	6038.4
9.8	45.9	449.8
2.1	65.9	138.4
15.5	101.9	1579.5
263.1		21838.3

P	X	P(x)
32.8	-35.9	-1177.5
182.8	0	0
42.9	42.0	1801.8
128.6	-79.2	10131.6
0.6	-88.4	-53.0
2.1	-38.1	-63.2
9.0	-12.1	-108.9
16.4	44.2	724.9
414.6		11367.7

1600 EAST DESERT INN ROAD SUITE 106 | LAS VEGAS, NEVADA 89109-2594 (702) 731-6226

2ND LEVEL RIGID DIAPHRAGMS continued

EL 118.0

N-S { P = 160.0K ; M = P(e_y) = P(3.6') = 576 K-FT ; M_T = P(.05 x 78') = 624 K-FT

E-W { P = 114.8 ; M = P(e_x) = P(11.8') = 1355 K-FT ; M_T = P(.05 x 78') = 448 K-FT

FRM	R	d	Rd	Rd²	PR/ER	MRd/ERd²	M_TRd/ERd²	F	V_DIA
B	4.00	38.0	152	5776	72.1	+ 5.9	± 6.0	78.1	78.0
N	4.88	(31.2)	152	4750	87.9	- 5.9	± 6.0	93.9	82.0
ER=	8.88							172.0	160.0
12-B	3.27	14.6	48	697	—	+ 1.9	± 2.0	LESS CRITICAL	
12-J	3.86	14.6	56	823	—	+ 2.2	± 2.3	THAN E-W	
B	3.79	(27.4)	104	2845	—	- 4.1	± 4.3	LOAD'G	
ER=	10.92		ERd² =	14891					

PR/ER	MRd/ERd²	M_TRd/ERd²	F	V_DIA
—	+ 13.8	± 4.6	LESS CRITICAL	
—	- 13.8	± 4.6	THAN N-S	
			LOAD'G	
34.4	+ 4.4	± 1.4	38.8	38.8
40.6	+ 5.1	± 1.7	45.7	45.7
39.8	- 9.5	± 3.1	42.9	30.3
114.8			127.4	114.8

EL 114-0

N-S { P = 263.1K ; M = P(e_y) = P(16.5') = 1342 K-FT ; M_T = P(.05 x 125.8') = 1655 K-FT

E-W { P = 414.6 ; M = P(e_x) = P(1.5') = 622 K-FT ; M_T = P(.05 x 125.8) = 2608 K-FT

FRM	R	d	Rd	Rd²	PR/ER	MRd/ERd²	M_TRd/ERd²	F	V_DIA
U	3.15	59.8	187	11077	45.8	+ 13.0	± 5.0	58.8	58.8
Q	4.65	25.3	117	2976	67.6	+ 8.1	± 3.1	75.7	75.7
N	4.88	11.5	56	645	71.0	+ 3.9	± 1.5	74.9	74.9
A	5.41	(66.5)	360	23924	78.7	- 25.0	± 9.6	88.3	53.7
ER	18.09				263.1			297.7	263.1
3	4.31	62.5	269	16836	—	+ 18.7	± 7.1	LESS CRITICAL	
12-B	3.27	(25.9)	85	2194	—	- 5.9	± 2.2	THAN E-W	
12-J	3.86	(25.9)	100	2589	—	+ 7.0	± 2.7	LOAD'G	
12-S	3.27	(25.9)	84	2194	—	- 5.8	± 2.2		
ER=	14.71		ERd² =	62435					

PR/ER	MRd/ERd²	M_TRd/ERd²	F	V_DIA
—	+ 1.9	± 7.8	LESS CRITICAL	
—	+ 1.2	± 4.9	THAN N-S	
—	+ 0.5	± 2.3	LOAD'G	
—	- 3.6	± 15.0		
121.5	+ 2.7	± 11.2	138.7	124.2
92.2	- 0.9	± 3.6	95.8	91.3
108.8	- 1.0	± 4.2	113.0	107.8
92.1	- 0.8	± 3.5	95.6	91.3
414.6			437.1	414.6

STRAUSS & LOFFREED
STRUCTURAL ENGINEERS

CLIENT/
PROJECT/
PROJECT # 82017
DATE/ 12/31/87
ENGINEER M/S
SHEET 298 OF 317
JOB # 7782

Work Sheet

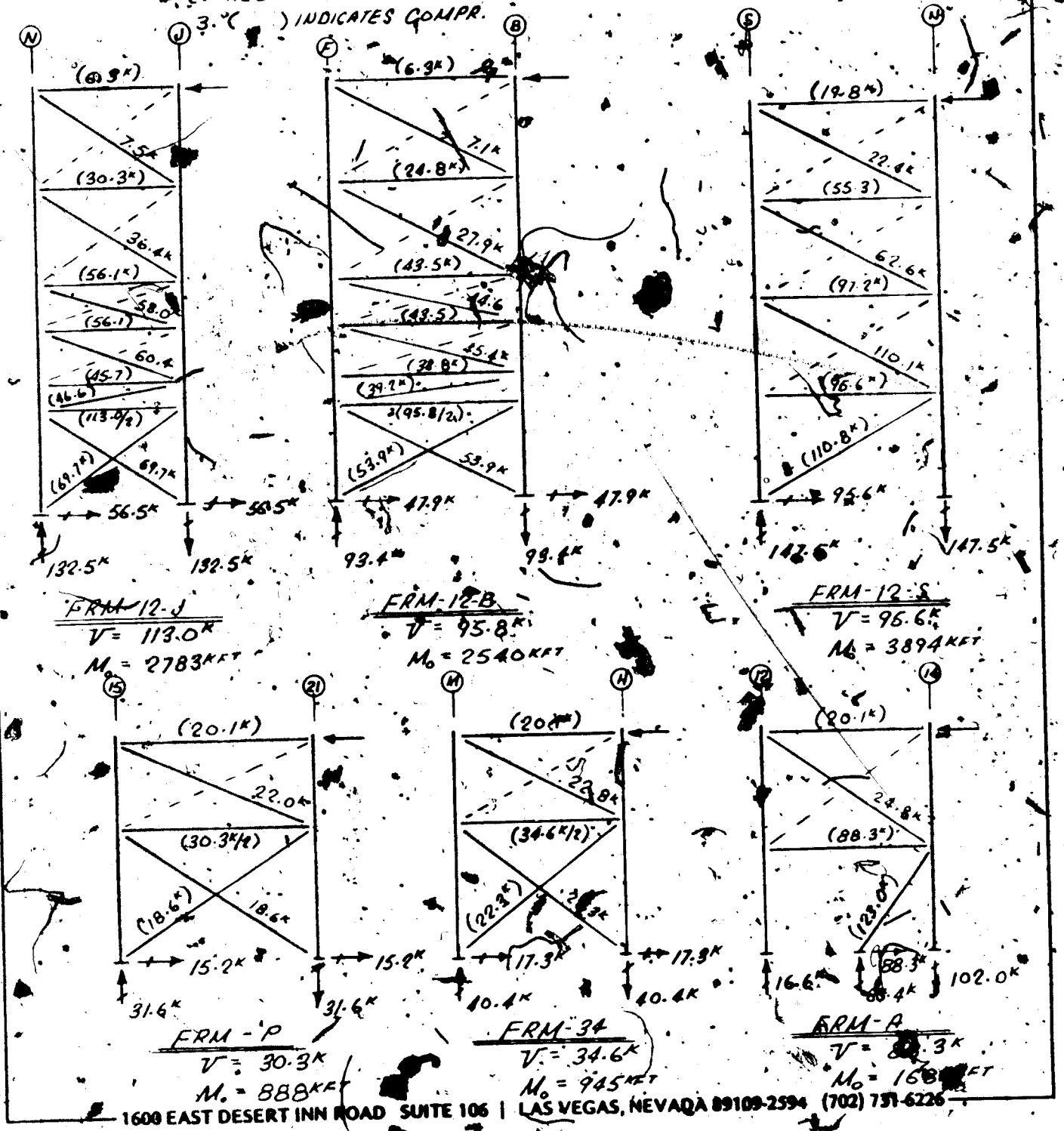
Dora Hasel 12/31/87

STRAUSS & LOFTFIELD
STRUCTURAL ENGINEERS

CLIENT/
PROJECT/
SHEET/ 299 OF 317
PROJECT # 8207
DATE/ OCT 82
ENGINEER/ HS

BRACED FRMS

NOTE: 1. SEE SNT N°288 & N°289 FOR SHEAR LOADING & GEOMETRY.
2. REDUNDANT DIAGONALS ARE SHOWN DASHED.
3. ( ) INDICATES COMPR.



501 N. CASINO CTR

3-8-84

MAYOR BILL BRIARE

COUNCILMEN
RON LURIE
PAUL J. CHRISTENSEN
AL LEVY
BOB NOLEN

CITY ATTORNEY
GEORGE F. OGILVIE

CITY MANAGER
ASHLEY HALL



CITY of LAS VEGAS

84

February 3, 1984
and
Hand Delivered
Rec'd by: Brian K. Furlong
12:24 PM 2/7/84

S. J. Amoroso Construction Co.
3380 Wynn Road
Las Vegas, Nevada 89102

Attn: Mr. Brian K. Furlong

RE: Central Fire Station Complex

Gentlemen:

The City as owner of this project must channel its communication through Architectural Services and the architect. However, the City as Building Official has a direct relationship with any contractor building within the City limits. Therefore, we are writing you directly about several problems which the architect brought to our attention in their January 31, 1984 letter to you and our meeting with them yesterday.

1. Your January 31, 1984 letter indicates that you will be ... "proceeding with the completion of the previously red tagged areas..." Let me explain the problems you would face should you do so. Violation of any Stop Order is a misdemeanor. If you do so, it will be necessary for us to issue a citation to appear in court. While it passes out of my hands at that point, a restraining order and/or fines are among the possible outcomes. I would not want to see this happen to you, and advise you not to treat a "red tag" lightly.

2. Recent tests, requested and conducted by you and observed by the owner and architect, demonstrate that the veneer has not been installed in conformance with either of the two criteria in Chapter 30 of the U.B.C.

Copy

CITY OF LAS VEGAS NEVADA

3-1-84

A. Section 3004(b) requires a minimum shear strength of 50 psi or 28,800 pounds for the 24" x 24" veneer being installed. Two of the three "dry, pull-off" tests demonstrated that the veneer could be easily removed with a simple hammer by one man. Since the tiles had been cured a minimum of 16 days, and in some cases 28 days, it is clear that this required strength has not developed. Furthermore, particles of the Mer-Krete tile setting adhesive can be easily removed from sample tiles without any effort indicating that the material itself is not developing adequate strength.

B. Section 3005(d) 2 requires that the veneer be pressed and tapped into place to provide complete coverage between the mortar bed and veneer unit. However, all of the observed tests, and all of the "core tests" you have also made for your own purposes, revealed hollow cavities in the adhesive. The furrows left by the notched trowel are remaining separated instead of blending together for "complete coverage". In two of the three tests only 50%+ contact is accomplished; in the third, only 65%+. Clearly, the application is not satisfying the code.

C. The I.C.B.O., which produces the code and is independent of this Department is the final authority and has been consulted on each of the above issues. They agree and are forwarding some additional data.

In conclusion, the defective method of installation must be immediately remedied to the satisfaction of this Department and the architect before proceeding with new areas of veneer work; and all existing areas must be brought into conformance with the Code to the satisfaction of this Department and the Architect before a Certificate of Occupancy can be issued.

If you continue to work in violation of the Code and this Correction Notice, then another Stop Order will be issued, etc. Please keep me advised of your actions to the foregoing order through my authorized representative Ted Rexing.

Sincerely,

CLAY HYMER, DIRECTOR
Building and Safety Department

CH:TR:bjl
cc: Harris Sharp & Associates
File: Building & Safety
Thomas B. Graham
David C. Walliser
Ted Rexing
File: OAS WH1353

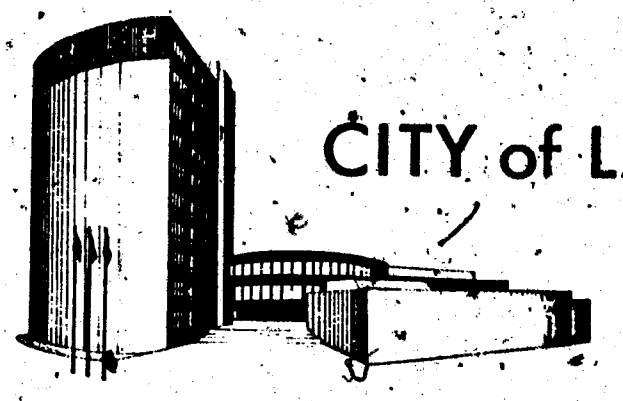
Con. Hrdg. 3-9-84

MAYOR BILL BRIARE

COUNCILMEN
RON LURIE
PAUL J. CHRISTENSEN
AL LEVY
BOB NOLEN

CITY ATTORNEY
GEORGE F. OGILVIE

CITY MANAGER
ASHLEY HALL



CITY of LAS VEGAS

February 3, 1984

Harris Sharp & Associates Incorporated
2915 West Charleston Boulevard
Las Vegas, Nevada 89102

Attn: Mr. Ned Cole

RE: Central Fire Station Complex

Gentlemen:

I have written S. J. Amoroso concerning the Code and adhered veneer after our meeting last week; a copy of the letter is attached. Upon further consideration there is one aspect of this problem which must be addressed to you. Namely, that the Mer-Krete tile setting adhesive, approved by you on January 24, 1983, is a deviation from U.B.C. Section 3005(d)2 which has not been approved by this Department or by I.C.B.O. Therefore, in accordance with Sections 105 and 107, we request that all information concerning that product be submitted to our Plans Check Division for review prior to continuance of any veneer work. Furthermore, we request that a recognized testing laboratory certify that the existing installations meet the requirements of Section 3004.

Sincerely,

Clay Hymer

CLAY HYMER, DIRECTOR
Building and Safety Department

CH:TR:bjl
cc: Thomas B. Graham
David C. Walliser
Ted Rexing
File: Bldg. & Safety
File: OAS: WH1353

CITY OF LAS VEGAS NEVADA

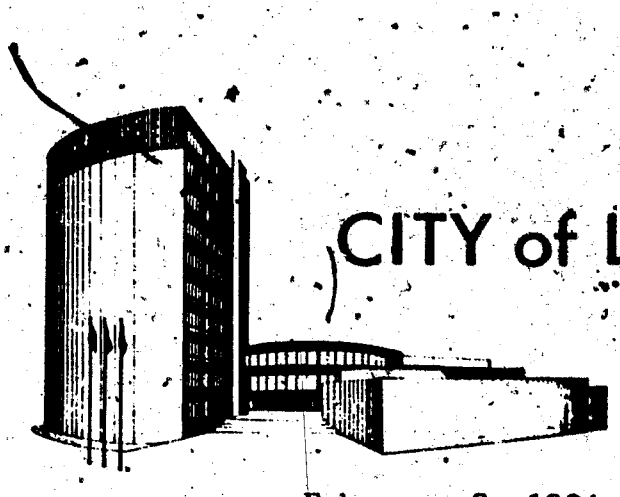
Handed 3-9-84

MAYOR BILL BRIARE

COUNCILMEN
RON LURIE
PAUL I. CHRISTENSEN
AL LEVY
BOB NOLEN

CITY ATTORNEY
GEORGE F. OGILVIE

CITY MANAGER
ASHLEY HALL



CITY of LAS VEGAS

February 3, 1984
and

Hand Delivered _____

Rec'd by: _____

S. J. Amoroso Construction Co.
3380 Wynn Road
Las Vegas, Nevada 89102

Attn: Mr. Brian K. Furlong

RE: Central Fire Station Complex

Gentlemen:

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2. Recent tests, requested and conducted by you and observed by the owner and architect, demonstrate that the veneer has not been installed in conformance with either of the two criteria in Chapter 30 of the U.B.C.

CITY OF LAS VEGAS NEVADA

Nona Hasley 3-9-84

A. Section 3004(b) requires a minimum shear strength of 50 psi or 28,800 pounds for the 24" x 24" veneer being installed. Two of the three "dry, pull-off" tests demonstrated that the veneer could be easily removed with a simple hammer by one man. Since the tiles had been cured a minimum of 16 days, and in some cases 28 days, it is clear that this required strength has not developed. Furthermore, particles of the Mer-Krete tile setting adhesive can be easily removed from sample tiles without any effort indicating that the material itself is not developing adequate strength.

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C. The I.C.B.O., which produces the code and is independent of this Department is the final authority and has been consulted on each of the above issues. They agree and are forwarding some additional data.

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If you continue to work in violation of the Code and this Correction Notice, then another Stop Order will be issued, etc. Please keep me advised of your actions to the foregoing order through my authorized representative Ted Rexing.

Sincerely,

CLAY HYMER, DIRECTOR
Building and Safety Department

CH:TR:bjl
cc: Harris Sharp & Associates
File: Building & Safety
Thomas B. Graham
David C. Walliser
Ted Rexing
File: OAS WH1353

Don Hosley 3-9-84.

MAYOR
COUNCILMEN
RON LURIE
PAUL J. CHRISTENSEN
AL LEVY
BOB NOLEN
CITY ATTORNEY
GEORGE F. OGILVIE
CITY MANAGER
ASHLEY HALL



CITY of LAS VEGAS

February 23, 1984

Brian Furlong
S.J. Amoroso Construction Company
3380 Wynn Road
Las Vegas, Nevada 89102

Gentlemen:

This is written to document our meeting on February 13, 1984. The purpose was to review your proposal for correcting the Code violation addressed in our February 3, 1984, letter. The meeting was requested by you through Harris Sharp Associates; it was held in my office; and the following were present: Brian Furlong, C. Catello, David Daileda, Ned Cole, Thomas Graham, David Walliser, Ted Rexing, and I.

The conclusions and major points of discussion were as follows:

1. Your proposal to test (9) 24" x 24" "cut-out" samples is acceptable if, the tests by an independent lab satisfy UBC 3004.

2. At that point S.J. Amoroso would have to request in writing a waiver to the 3005 criteria since "complete coverage" has not been satisfied regardless of shear strength.

3. Our having to issue Stop Orders on portions of the installation does not entitle you to an extension of Contract Time. This is a problem with application, not with design, and the General Contractor is exclusively responsible for delays caused by his incorrect installation. You will recall that Carmine Catello acknowledged this in the meeting.

4. Similarly, you are responsible for the costs of such testing. The application is your responsibility and the method of correction has been your proposal.

CITY OF LAS VEGAS
NEVADA

Dan Healy 3-9-84

5. The City's architect may assist you in selecting the nine samples as you've requested, but it is understood that you are proposing and conducting the tests.

6. The Stop Orders were issued because the architects rejected certain areas of the mortar bed, not because of the 3004 and 3005 Code violations. The architects must advise when their specifications are satisfied regarding plaster strength before we can lift the Stop Orders.

7. Time is of the essence. Your proposal must be carried out quickly so as not to further delay the March 2, 1984, deadline.

Please notify this department in writing within fourteen days if you wish to add anything to the conference notes.

Sincerely,

DEPARTMENT OF BUILDING AND SAFETY

Clay Hymer

CLAY HYMER, DIRECTOR

CH:TR:sf
cc: C. Catello
Harris Sharp Associates
Architectural Services

Orig Hold - 3-9-84

Harris Sharp Associates Incorporated
Architecture, Planning, Interiors

2915 West Charleston Boulevard Las Vegas Nevada 89102 (702) 877 0126

February 22, 1984

TO: CITY OF LAS VEGAS
BUILDING & SAFETY DEPARTMENT

ATTN: CLAY HYMER

RE: CENTRAL FIRE STATION

Dear Clay;

In response to your letter of February 3rd, regarding the approval of the "Mer-Krete" tile setting adhesive, I am enclosing the following information for your review:

1) ICBO research report indicating that GTI is an approved quality control agency,

2) CTI standards for thin-set Portland cement mortar,

3) CTI tested materials report on thin-set mortars

We hope a review of this information will confirm our understand that the Mer-Krete is indeed in conformance with UBC Section 3005(d)2.

If you need any further information or have any questions, please do not hesitate to call.

Sincerely,

HARRIS SHARP ASSOCIATES, INC.

David A. Dalleda, A.I.A.

DAD/lm
Enclosures

cc: Dave Walliser
Ted Rexing

David A Dalleda AIA Ned [illegible]ole AIA Patrick J Klenk AIA Thomas M Silva AIA Harris P Sharp AIA (Retired)

3-9-84

International Conference of Building Officials

RESEARCH REPORT

Report No. AA-519
December, 1982

Filing Category: QUALITY CONTROL AGENCIES

QUALITY CONTROL AGENCY FOR THE CERTIFICATION OF CERAMIC TILE, BONDING AGENTS AND GROUTS
CERAMIC TILE INSTITUTE OF AMERICA
700 N. VIRGIL AVENUE
LOS ANGELES, CALIFORNIA 90005

I. Subject: Quality control agency for the certification of ceramic tile, bonding agents and grouts.

II. Description: The Ceramic Tile Institute provides testing services and listing services for ceramic tile, organic adhesives and thin-set portland cements for bonding ceramic tile and grout for use in grouting ceramic tile. Ceramic tile must meet the requirements of the American National Standards Institute, ANSI A137.1-1980.

Ceramic Tile Institute Standards CTI-64-1 and CTI-64-2 are followed respectively for thin-set portland cement mortar and organic adhesives. Wet and dry portland cement grout is evaluated under Ceramic Tile Institute Standard CTI-64-3.

Identification: Products inspected by the Ceramic Title Institute will be identified by the appearance of the logo depicted in Figure No. 1 on bags or packages of material.

III. Evidence Submitted: A description of the activities of Ceramic Tile Institute acting in the capacity of a quality control agency is furnished along with copies of the standards employed.

Findings

IV. Findings: That the Ceramic Tile Institute of America located at 700 N. Virgil Avenue, Los Angeles, California, be recognized as a quality control agency for the testing and certification of ceramic tile, bonding agents and grouts under the 1982 Uniform Building Code.

This report is subject to re-examination in two years.

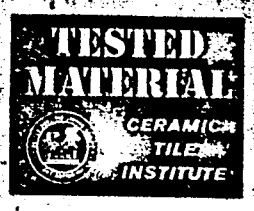


FIGURE NO. 1

ICBO research reports are issued solely to provide information to Class A members of the organization utilizing the code upon which the report is based. Research reports are not to be construed as representing aesthetics or any other attributes not specifically addressed nor as an endorsement or recommendation for use of the subject report.

This report is based upon information concerning organization and procedures submitted by the applicant. The ICBO technical staff has reviewed the material, but does not, as a matter of routine, make an independent verification.

Done Floors 3-9-84

STANDARD FOR THIN-SET PORTLAND CEMENT MORTARS

CTI-64-1

CERAMIC TILE INSTITUTE • 700 North Virgil Ave., Los Angeles, California 90029 • (213) 660-1911

Hand 3-2-84

5

CERAMIC TILE INSTITUTE CTI-64-1

STANDARD FOR THIN-SET PORTLAND CEMENT MORTARS

A1. Portland cement in mortars submitted for tests shall comply with ASTM C-150, latest revision, for type used: I, II, III, low in alkali (not over 0.6%). Portland cement manufacturers shall furnish certification of compliance.

A2. Thin-set portland cement mortar for setting tile shall have mixing instructions printed on all bags and containers. Water to mortar, expressed in gallons per sack ratio, shall be specifically stated thereon.

A3. Printed instructions on containers shall be followed for mixing all test specimens unless otherwise specified.

A4. The smooth front faces of bisque 4-1/4 x 4-1/4 x 5/16 wall tile shall be used for all shear tests. These bisque shall have a water absorption range of between 12% and 18%.

A5. All tile to be bonded shall be clean and dry.

A6. Any individual specimen outside of the mean average shall be rejected and if two or more specimens show wide variation the test shall be reconducted.

A7. All specimens for shear tests shall have lugs removed from pressure surfaces prior to being assembled.

A8. Shear shall be tested in a vertical position by compression loading at a rate of 0.05 inch per minute.

A9. Specimens to be shear tested are to be bonded with 1/8" thickness of mortar. Tile to be offset 1/4" each way to maintain approximately 16 square inches of bonding surface. Cylindrical metal spacers approximately one inch long, or other suitable spacers, shall be placed between the tile to insure a proper and uniform thickness of the mortar. A second tile shall be covered with a generous supply of the mortar and pressed slowly until the tiles rest firmly on the spacers. The excess mortar shall be scraped from the exposed edges and the spacers removed. Each assembly shall immediately be placed where it will not be disturbed.

A10. Air curing temperature shall be 70 plus or minus 3 degrees F. with 50% plus or minus 5% relative humidity.

A11. Tests B4.a, b, and c will be performed first. If results of B4.c average is lower than 100 P.S.I. no further tests will be made.

B1. Chemical tests shall be made of minus 270 mesh screened samples of the thin-set mortar. The procedure followed will be ASTM C-150 for the type II portland cement. Material retained on 270 mesh screen shall be reported and expressed on percent retained.

Revised 3-9-64

B2. Three specimens shall be placed in an autoclave and results recorded and average noted. ASTM C-151 procedure shall be followed using the mortar as directed in A3 of this Standard.

B3. Skinning and Open Time will be established at air temperature with mortar as directed in A3 and using apparatus CTI-1, in Diagram 1, and apparatus CTI-2, in Diagram 2.

This will be a three-phase procedure:

1. First phase will establish a time bracket, reported to the nearest five minutes, in which a tile falls off the mortar. Using suitable gauge a 1/8" thickness of mortar will be placed on the horizontal piece of gypsum wallboard. A bisque tile, as per paragraph A4 of the Standard, will be placed on the solid bed of mortar. The specimen will then be placed in apparatus CTI-2 and the weight lifted full height and dropped on the tile eight (8) times. All excess mortar will be scraped away from the edges of the tile and the specimen secured to the mortar frame of apparatus CTI-1. Mortar frame will be lifted to ten degrees past the vertical and left for one minute to see if tile falls off mortar. The mortar will be left for the following number of minutes before the bisque tile is placed on the mortar: ten, twenty, thirty, forty and forty-five.

2. Second, at the time bracket established where the tile falls off, three additional samples will be set and lifted. Procedure for the second phase will be the same as for the first. Open Time will be reported to the nearest five minutes.

3. Mortar will be placed 1/8" thick and allowed to stand for thirty (30) minutes on the horizontal piece of gypsum wallboard. Mortar will then be combed with a 1/4" x 1/4" notched trowel to full depth of mortar. A bisque tile, as per paragraph A4 of the Standard will be placed on the combed mortar immediately. The specimen will then be placed in apparatus CTI-2 and the weight lifted full height and dropped on the tile eight (8) times. The mortar frame will be lifted to ten degrees past the vertical to see if tile falls off. This will be repeated with three tiles.

B4. a. Specimens, prepared as outlined (A9) in this Standard, shall be air-cured (A10) for 24 hours. Five specimens will be tested in shear and the results recorded and average noted.

b. Specimens, prepared as outlined (A9) in this Standard, shall be air-cured (A10) for 48 hours. Five specimens will be tested in shear and the results recorded and average noted.

Ina Hasle 3-9-84

c. Specimens, prepared as outlined (A9) in this Standard, shall be air-cured (A10) for 72 hours. Five specimens will be tested in shear and the results recorded and average noted.

B5. Specimens, prepared as outlined (A9) in this Standard, shall be air-cured (A10) for 7 days. Five specimens will be tested in shear and the results recorded and average noted.

B6. Specimens, prepared as outlined (A9) in this Standard, shall be air-cured (A10) for 7 days. Ten specimens will be immersed in a fresh 3% solution of Ivory Soap Flakes for a seven and fourteen day test. At the end of 7 days, five specimens will be removed and tested in shear with results recorded and average noted. At the end of 14 days the five remaining specimens will be removed and tested in shear with results recorded and average noted. The 14 day test shall not show loss in excess of 15% of the 7 day test.

B7. Five specimens, prepared as outlined (A9) in this Standard, shall be air-cured (A10) for 7 days and then placed in a hot air oven maintained at 175 plus or minus 5 degrees F. and left for a period of two hours: Remove specimens from oven and arrange so that air can circulate around them. Allow specimens to air-cure (A10) for four hours and then test in shear with results recorded and average noted.

B8. Five specimens, prepared as outlined (A9) in this Standard, shall be air-cured (A10) for 7 days and then cooled to minus 20 plus or minus 5 degrees F. and left for a period of two hours. Remove specimens from freezer and arrange so that air can circulate around them. Allow specimens to air-cure (A10) for four hours then test in shear with results recorded and average noted.

B9. Five specimens, prepared as outlined (A9) in this Standard, shall be air-cured (A10) for 7 days and then immersed in clean, potable water for 7 days. Water to be maintained at 70 plus or minus 5 degrees F. Remove specimens from water, wipe dry and test in shear within 30 seconds after removal from water with results recorded and average noted.

Omx : Hardy 3-4-84

CERAMIC TILE INSTITUTE CTI-64-1

STANDARD FOR THIN-SET PORTLAND CEMENT MORTARS

		TEST REQUIREMENTS
B2.	Autoclave	Shall not exceed plus or minus 0.5 percent.
B3.	Skinning Time Phase 1 and 2	Not less than fifteen minutes. Not to exceed forty minutes.
	Open Time Phase 3	All three tile must remain one minute on raised frame.
B4. a)	30 P.S.I. Average	
b)	175 P.S.I. Average	
c)	100 P.S.I. Average	
B5.	175 P.S.I. Average	
B6. a)	Average shall not show a loss in excess of 15% of B5 requirement at 7 days in order to pass this test.	
b)	If the loss is in excess of 15% of B5 requirement at 7 days but does not show a loss greater than 25%, then the fourteen day results shall be observed as an alternative to passing at 7 days. If this fourteen day PSI average result does not show a loss in excess of 15% of the B5 requirement (148.75 PSI) at 7 days, the material will have passed this portion of the test.	
B7.	Average shall not show loss in excess of 15% of B5 at 7 days.	
B8.	Average shall not show loss in excess of 15% of B5 at 7 days.	
B9.	Average shall not show loss in excess of 15% of B5 at 7 days.	

CHECK TEST

Quarterly check tests shall be made on materials as they come from the containers, using paragraphs B4. a); B4. b); B4. c); of the Standard.

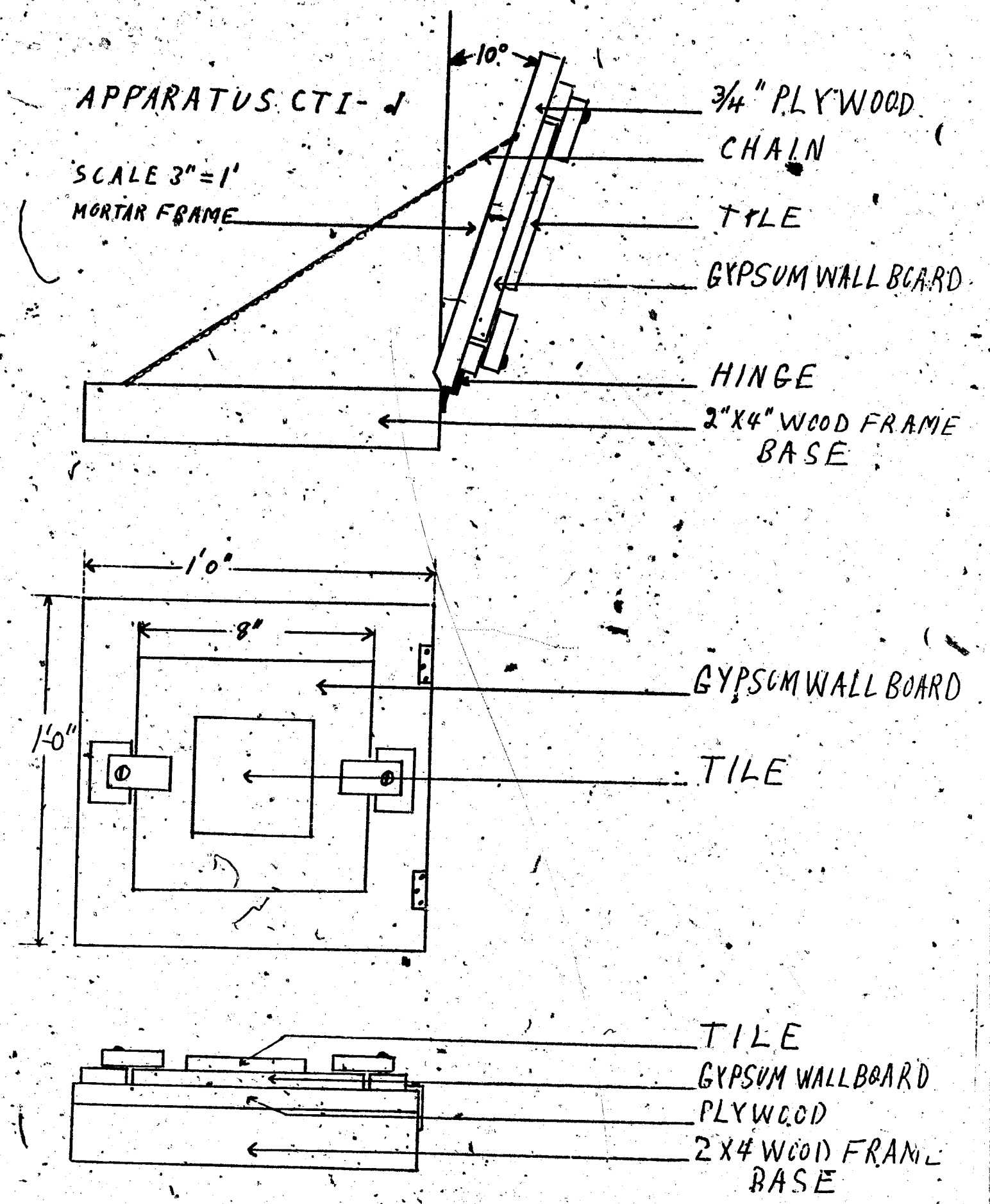
November, 1967

Revised March, 1981

Dina Hsieh 3-4-84

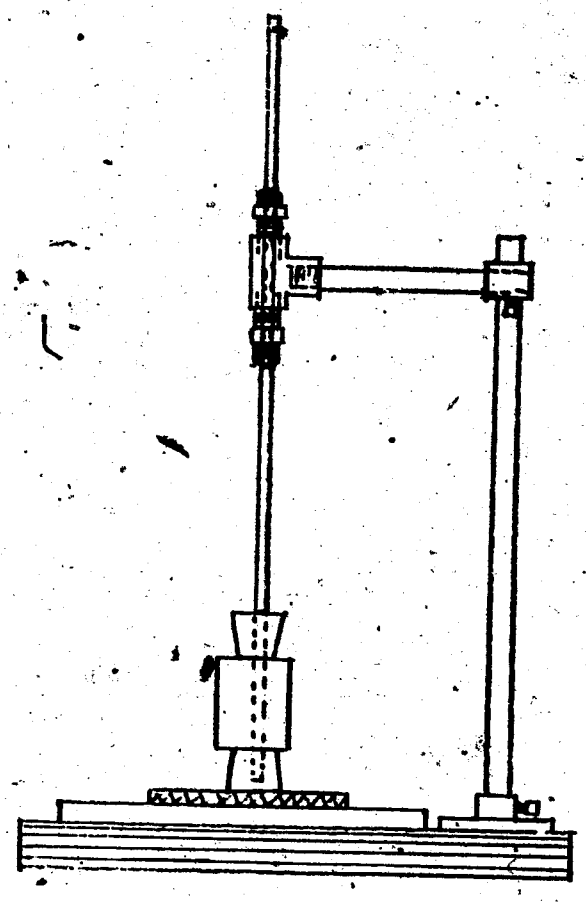
APPARATUS CTI-1

SCALE 3"=1'

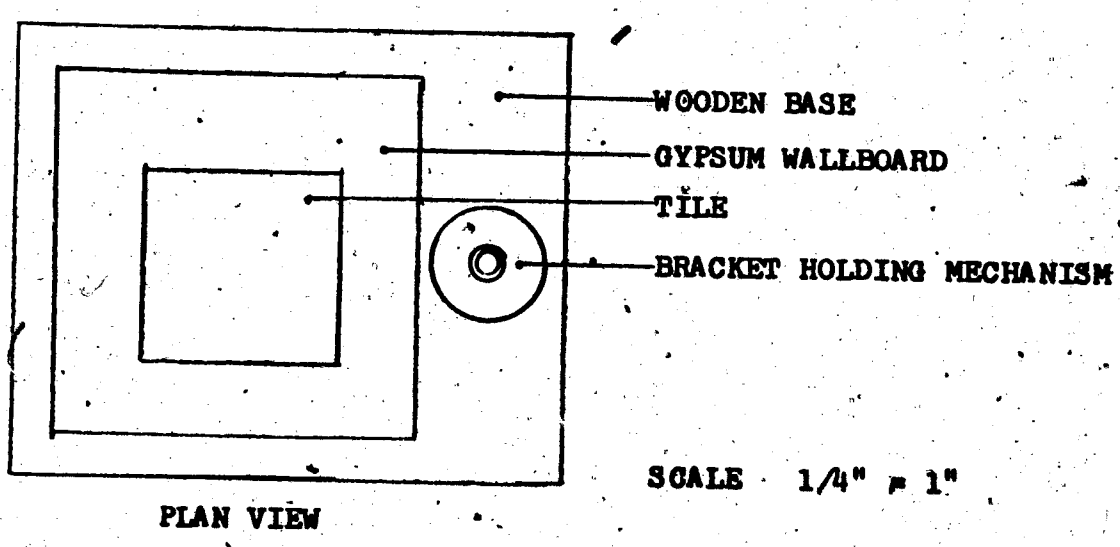


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APPARATUS CTI-2



ELEVATION



PLAN VIEW

SCALE 1/4" = 1"

This apparatus is to provide tapping of tile similar to job conditions.

The portion of the mechanism contacting the tile is a rubber cork forced onto one quarter inch drill rod. The total dropping weight of the rod and attachments is two hundred grams. A weight is positioned on the bottom rubber cork and another rubber cork is positioned on the rod above the weight to regulate the height of the drop to six inches. The inside diameter of the top bracket must be sufficiently larger than the outside diameter of the drill rod to allow a free fall of the weighted rod.

Dave Hasley - 3-9-84

TESTED MATERIALS 1984

The Ceramic Tile Institute established the program of testing materials for performance at the request of many tile contractors who wanted to be sure they were using quality products.

The materials listed below have passed the designated tests. We feel you will be protecting yourself, your customer and your Industry by using quality materials, by installing them correctly, and by using them where they are intended to be used. Manufacturers often advocate the use of their materials on surfaces not recommended by the Ceramic Tile Institute, an example is wood. Ceramic Tile Institute does not recommend bonding directly to wood with any products. We have tried to give you complete information on this sheet. However, whenever you are in doubt about materials you are using, feel free to call the Ceramic Tile Institute office.

1. THIN-SET PORTLAND CEMENT MORTAR - TEST CTI-64-1

The following mortars are classified Dry-Set portland cement bonding mortars. They require water only to be added to a dry premixed material.

DRY-SET BONDING MORTAR

American Admixtures and Chemical Corp.

*PCL FT-RAPID-SET TILE ADHESIVE
FT NON-SAG THIN-SET MORTAR
FLEX MORTAR

American Olean Tile Company

AMERICAN OLEAN THIN-SET MORTAR, GREY
AMERICAN OLEAN THIN-SET MORTAR, WHITE
AMERICAN OLEAN MULTI-PURPOSE THIN-SET MORTAR

W. R. Bonsal Company

BONSAL THIN-SET MORTAR, GREY
BONSAL THIN-SET MORTAR, WHITE
BONSAL MULTI-PURPOSE THIN-SET MORTAR

Custom Building Products, Inc.

CUSTOM THIN-SET TILE MORTAR, WHITE
CUSTOM THIN-SET TILE MORTAR, GREY
CUSTOM TILE-SET WHITE, THIN-SET MORTAR
CUSTOM TILE-SET GREY, THIN-SET MORTAR

C-Cure Chemical Co., Inc. (C-Cure Chemical of Nevada)

PERMABOND GREY SANDED THIN-SET MORTAR
PERMABOND WHITE SANDED THIN-SET MORTAR
MULTI-PURPOSE DRY SET
C-CURE THIN-SET MORTAR, GREY
C-CURE THIN-SET MORTAR, WHITE.

CERAMIC TILE INSTITUTE • 700 North Virgil Ave., Los Angeles, Califor a 90029 • (213) 660-1911

Dina Hanley 3-9-84

H. B. Fuller Company, Technical Adhesives Division

TEC CEMENT-SET, WHITE
TEC CEMENT-SET, GREY

L & M Surco Mfg., Inc.

L & M WALL MIX, WHITE
L & M FLOOR MIX, GREY

Laticrete International, Inc.

LATICRETE DRYBOND FLOOR 'n WALL THIN-SET MORTAR, GREY

Les-K Products, Inc.

ULTRABOND WHITE MORTAR
ULTRABOND GREY MORTAR

Omega Products Corp.

OMEGA GREY THIN-SET MORTAR

USM Corporation, Upco Chemical Division

TILE MATE THIN-SET MORTAR FOR FLOOR, GREY
TILE MATE THIN-SET MORTAR ALL CLIMATE FORMULA FOR WALL TILE, WHITE
TILE MATE THIN=SET MORTAR ALL CLIMATE FORMULA FOR WALL TILE, GREY

*When used in accordance with manufacturer's directions, taking into consideration that this is a fast setting material with short open time.

2. LATEX BONDING MORTARS - TEST CTI-64-1

The following mortars are classified Latex portland cement bonding mortars, to which portland cement and fine graded sand is added in accordance with manufacturer's directions.

Custom Building Products, Inc.

CUSTOM-CRETE, LATEX MORTAR

C-Cure Chemical Co., Inc. (C-Cure Chemical of Nevada)

DESERT-CRETE, LATEX THIN-SET ADMIXTURE
C-CURE-CRETE, LATEX THIN-SET ADMIXTURE

H. B. Fuller Company, Technical Adhesives Division

TEC-CRETE LIQUID RUBBER PORTLAND CEMENT MORTAR

Sona Hosalig 3-9-84

L & M Surco Mfg., Inc.

L & M POLYCRETE PLUS

Laticrete International, Inc.

LATICRETE TILE SETTING LIQUID 4237

TOP Building Products, USA

TOP 400 ACRYLIC (Formerly known as LIP 400 ACRYLIC)

Mer-Kote Products, Inc.

MER-KRETE TILE SETTING ADHESIVE
MER-KRETE ACRYLIC

USM Corporation, Upco Chemical Division

TILE MATE LATEX ADDITIVE FOR TILE MATE THIN-SET MIX

3. EPOXY BONDING MORTARS - TEST CTI-64-1

The following mortars are classified Epoxy Bonding Mortars, and are recommended to be used in accordance with the manufacturer's instructions.

Laticrete International, Inc.

LATAPOXY 210 EPOXY ADHESIVE

4. ORGANIC ADHESIVE - TEST CTI-64-2

We do not recommend these adhesives for use under excessive heat conditions of service, such as on building exteriors or on walls behind cooking grills, unless the adhesive manufacturer assumes full responsibility for the unlimited performance of their product under such conditions.

We recommend using the Ceramic Tile Institute CTI-R3-101-62 Standard Specification for installing tile with this material.

Semco Sales, Inc.

SEMCO WATERPROOF TILE ADHESIVE

5. PORTLAND CEMENT GROUT FOR 1/8" OR LESS JOINT WIDTH - TEST CTI-64-3

American Olean Tile Company

AMERICAN OLEAN DRY-WALL GROUT

W. R. Bonsal Company

BONSAL DRY WALL GROUT

Dona Hasley 3-9-84

TESTED MATERIALS Continued

C-Cure Chemical Company

AR COLORED GROUT

Custom Building Products, Inc.

CUSTOM'S WHITE TILE GROUT, DRY

H. B. Fuller Company, Technical Adhesives Division

TEC DRY GROUT

L & M Surco Mfg., Inc.

L & M DRY CURE NON SANDED GROUT, WHITE

Les-K Products, Inc.

WHITE MAGIC DRY GROUT

Omega Products Corp.

OMEGA TILE GROUT - UNSANDED WHITE

6. UNDERLAYMENTS FOR SOUND-RATED FLOORS:

The following materials were tested and should be installed according to the publication CTI-R-3-113-79.

American Enka Company

ENKASONIC

Dow Chemical U.S.A.

ETHAFOAM #222

Modulars, Inc.

WONDERBOARD

7. SEALERS AND MEMBRANES

Aqua Mix Products Manufacturing Company

AQUA BOND PENETRATING SEALER

One Hearing 3-9-84

LAW OFFICES
John J. McCune
241 RIDGE STREET
SUITE 400
RENO, NEVADA 89501
(702) 786-0697

JOHN J. McCUNE
MICHAEL B. SPRINGER
TIMOTHY E. ROWE

February 29, 1984

City of Las Vegas
Department of Building & Safety
400 East Stewart
Las Vegas, Nevada 89101

Attention: Mr. Clay Hymer

Subject: Request For Copies Of Public Records And Inspection Of Documents Pursuant To NRS 239.010, 239.030

Dear Mr. Hymer:

Pursuant to Nevada Revised Statutes above referenced, this letter shall serve as a request for copies of the following described documents and public records in the possession and/or control of the Las Vegas Department of Building & Safety, a department of a statutorily constituted public entity within the scope of the aforementioned statutes. This request requires the production of the following documents and copies thereof:

> All contracts, agreements, grants, financial statements, loan documents, financial records, plans, specifications, building permits, daily reports, daily logs, reports, inspection reports, memorandums, job progress memoranda, correspondence between the Building & Safety Department and any Architect or other third person pertaining to, generated or prepared in connection with the construction project known as the Las Vegas City Central Fire Station, notes, record of telephone conversations, diaries, notes of meetings, agendas, notes of conversations, tapes, transcripts of tapes of any and all meetings, and records of communications of any type or character between employees of the Building & Safety Department and any other Department person or entity within the City of Las Vegas or under contract with the City of Las Vegas pertaining to the project known as the City of Las Vegas Central Fire Station.

In the event it is determined by you that any portion of any document requested herein is exempt from production under the above referenced statutes, request is herewith made for a detailed statement

Dina Healy 3-1-84

of the reasons for such non production and an index or similar statement of the nature of the document withheld for purposes of identification in order that upon petition to the court proper identification of such withheld documentation can be made in order to seek and compel such documents production.

Under the statutes above referenced, case law and Attorney General opinions, the documents and copies thereof are available to me and other members of the public. They are not exempted from the Act and it is believed that the District Attorney's office for Clark County would concur that the information requested herein must be released under the terms of the statutes.

I herewith promise to pay your prepublished charges for the copies requested herein and if no such reasonable rate has heretofore been established by your office, in writing, and ratified by the City Council, then in that event I promise to pay reasonable rate for such copies, transcripts and tapes upon presentation of an invoice along with the furnished copies. If for any reason the fees for such production of the documents requested herein exceed the sum of $150.00, you are required to telephone me in advance at my expense for agreement to such additional charge. My phone number in Reno is 786-0697.

You are required under this request, to respond within ten (10) days of the date of service hereof setting forth the time and place that the aforedescribed copies of documents will be ready for production and delivery to me.

Sincerely yours,

Michael B. Springer

MBS:tr
copy: District Attorney
Clark County

Dina,
Check w/ Ted Rex. on daily report forms - w/ Joe Silvestri on phlg - meek w/ notify Wagner on Elect. notices
Citi

One Hourly 3-9-84

CITY OF LAS VEGAS

INTER-OFFICE MEMORANDUM

Date: MARCH 6, 1984

TO:
GEORGE OGILVIE
CITY ATTORNEY

FROM:
THOMAS B. GRAHAM, AIEP, ELA, DIRECTOR
OFFICE OF ARCHITECTURAL SERVICES AND
PROJECT CONTROL

SUBJECT:
CENTRAL FIRE STATION
LETTER DATED FEBRUARY 29, 1984
FROM MICHAEL B. SPRINGER TO
THOMAS B. GRAHAM

COPIES TO:
ASHLEY HALL, CITY MANAGER
DON J. SAYLOR, DEPUTY CITY MANAGER
CLAY HYMER, BUILDING & SAFETY
DAN PILKINGTON, GENERAL SERVICES

Please advise as to the extent of compliance required of my office in response to the "Request For Copies Of Public Records And Inspection Of Documents" made by S. J. Amoroso Construction Company's attorney. (Please see copy of letter dated February 29 1984, received by my office March 5, 1984.)

A requirement of a ten day response period is alleged.

Your immediate advice on this issue is desirable.

TBG:DCW:bjl
attachment

As discussed yesterday, this office is handling the request in question on behalf of all departments that received a copy, and that there was no need for you to write this memo.

RECEIVED
MAR - 6 1984
CITY ATTORNEYS OFFICE

MAR 8 1984

Loria Hoeal 3-16-84

CITY OF LAS VEGAS, NEVADA

LOG NO. & AREA _____ CONST. VAL. $ _____

FORWARD ONE COPY TO THE FIRE DEPARTMENT

DEPARTMENT OF BUILDING AND SAFETY
PHONE 386-6251

PLUMBING PERMIT

ADDRESS OF CONSTRUCTION 501 N. Casino Ctr. OWNER Fire Dept.

CONTRACTOR American Fire & Safety STATE LICENSE NO. 911 CITY LICENSE NO. C11 01912

LOT(s) _____ BLOCK _____ SUBDIVISION _____ ZONE _____

PROPOSED CONSTRUCTION: _____ USE: _____

PLUMBING PERMIT NO. 1948-3

Approval for the work under this permit will be given only after refuse and debris have been removed from job site and public right of way

UNITS	DESCRIPTION		FEE	TOTAL
	PERMIT ISSUANCE			
1	For Issuing Each Permit		10.00	
	For Issuing Each Supplemental Permit		4.50	
	FIXTURE CHARGE			
	Bathtub, Shower, Lavatory, Toilet, Urinal	EA.	2.00	
	Floor Drain, Floor Sink, Wash Tray, Sink	EA.	2.00	
	Garbage Disposal, Clothes Washer, Dishwasher (residential)	EA.	2.00	
	Garbage Disposal (commercial)	EA.	8.00	
	Clothes Washer, Dishwasher (commercial)	EA.	2.00	
	Clothes Dryer (gas) (venting)		2.00	
	Dental Unit		8.00	
	Drinking Fountain		2.00	
	Refrigerator - Ice Maker, Water Dispenser		2.00	
	Any other water using equipment, Attached Coffee Makers, Ice Makers		2.00	
	Hot Water Heater (Gas or Electric)	EA.	2.00	
	SEWER SYSTEM			
	New, Replacement, Modification, or Any Drainage Work		10.00	
	Grease or Sand Trap or Interceptor		2.00	
	Trailer Trap (rental parks)		5.00	
	WATER SOFTENERS			
	Non Permanent Type (rental)		2.00	
	Permanent Type (connected to drain)		3.00	
	SWIMMING POOLS			
	Private or Wading Pool (including spa)		20.00	
	Public or Semi-Public		30.00	
	Spas - Preformed (private)		10.00	
	Spas - Preformed (commercial)		20.00	
	WATER DISTRIBUTION SYSTEM			
	Single Family Dwelling		6.00	
	Multi-Family Dwelling		6.00	
	Plus Each Dwelling Unit		3.00	
	Commercial Building per floor		3.00	
	Plus Each Unit (leased space or office)		2.00	
	Hotel or Motel		8.00	
	Plus Each Unit		3.00	
	Trailer Park		30.00	
	Plus Each Space		2.00	
	Irrigation		8.00	
	FUEL PIPING SYSTEM			
	Single Family Dwelling		6.00	
	Multi-Family Dwelling		10.00	
	Plus Each Unit		2.00	
	Commercial Building (per floor)		6.00	
	Plus Each Unit (leased space or office)		6.00	

UNITS	DESCRIPTION	FEE	TOTAL
	Medium Pressure Gas System (plan check)	12.00	
	Each Gas Appliance (any type)	2.00	
	Standby Emergency (generating engines)	5.00	
	Steam Boilers	5.00	
	Service Station Fuel Tank and Piping System	10.00	
	Fuel Tanks (ea)	5.00	
	AUTOMATIC FIRE EXTINGUISHING SYSTEM		
	Underground Piping	20.00	
	Distribution Piping (per foot)	.05	
	Sprinkler Head (each)	.20	
1	In Range Hood and Vent	10.00	10.00
	Dry Standpipe System		
	Piping	75.00	
	Each Outlet	2.00	
	Wet Strandpipe System		
	Piping	10.00	
	Fire Hose Cabinet	2.00	
	SOLAR ENERGY SYSTEMS		
	Collectors (including piping) (per collector)	5.00	
	Storage Tanks (each)	5.00	
	PIPELINE CONTRACT		
	For Onsite Sewer, Gas or Water Contract Value Fee based on Building Code Permit Valuation Chart.		
	OTHER INSPECTIONS AND FEES		
	Inspections outside of normal business hours (minimum charge— three hours)	25.00 per hour	
	Reinspection fee assessed under provisions of TABLE 3-A of the Uniform Building Code = $15.00 EACH	15.00 each	
	Inspections for which no fee is specifically indicated (minimum charge — one-half hour)	15.00 per hour	
	Additional plan review required by changes, additions or revisions to approved plans (minimum charge two hours)	15.00 per hour	

Plumbing permit fees may be computed the same as building permit fees by using the cost of installation for valuation amount when such work is not included in the above schedule.

I hereby certify that I have carefully examined and read the above application that the same is true and correct; and that the work herein described is to be done in accordance with all the provisions of the applicable Ordinances of the City of Las Vegas, Nevada and the State Laws, whether herein specified or not.

2310-2403

SIGNED Yeal Insurance CONTRACTOR MASTER CARD NO.

BY Gordon Mark Registered Master Plumber, Spec. Contr. or Owner

BUILDING DEPT. P Alfano DATE 3-13-84

SEWER # 7114-3654
CONNECTION

FIXTURES _____ X _____

FEE 12

PERMIT FEE 20.00

TOTAL FEES _____

RECEIPT

MUST BE MACHINE VALIDATED

3/83 Permit Expires 180 Days After Abandonment of Work

Civic Center 3-29-84

STOP WORK ORDER

PLACED ON JOB AT: 501 N. Casion Ctr.

CONTRACTOR/OWNER: S.J.Amoroso Const. Co./City of Las Vegas

DATE 2-3-84 TIME 10:00am

REASON for concealing rejected work noted in:
HSA 12-30-83 Ltr re exposed lath & scratch coat;
~~HSA 1-9-84 Ltr re same; HSA 1-10-84 Site Mtg re same;~~ CLV 1-11-84 Correct'n Notice & HSA 1-14-84 Ltr re covering deficiencies.

INSPECTOR: Ted Rexing & Stu Cornelius

Hooley 3-27-84

501 N. Casino Ctr

MAYOR BILL BRIARE

COUNCILMEN
RON LURIE
PAUL J. CHRISTENSEN
AL LEVY
BOB NOLEN

CITY ATTORNEY
GEORGE F. OGILVIE

CITY MANAGER
ASHLEY HALL



CITY of LAS VEGAS

March 21, 1984

Mr. J. Patrick Henderson
S.J. Amarosa Construction Company
3380 Wynn Road
Las Vegas, Nevada 89102

Reference: Las Vegas Central Fire Station

Dear Mr. Henderson:

In conjunction with the letter of March 20, 1984, written by City Attorney, George Ogilvie, to Michael Springer Esq., of which you received a copy, and in consideration that you have requested a waiver of non-conformance to section 3005 paragraph (d) of the Uniform Building Code with respect to the tile which has already been installed, since the Building Department has on file an agreement from Harris Sharp Associates to allow the remaining portion of the exterior tile veneer to be installed, this Department will remove the red tag and allow the remaining portion of the tile to be installed in accordance to the Building Code and approved plans and specifications. However, we will require that tests be conducted in quantities and specific areas recommended by the architect on the balance of tile work.

The foregoing waiver is granted solely for the purpose of facilitating the completion of this project and should not be regarded as an admission on the part of the City of Las Vegas or the architect that the plans and specifications or the applicable provisions of Uniform Building Code have been complied with. As stated in Mr. Ogilvie's letter to Mr. Springer neither the request for this waiver nor the granting thereof shall prejudice the right of either party, in any subsequent proceeding, to argue the adequacy, or lack thereof, of the installation of the tile.

If you have any questions, please feel free to call me at 386-6251.

Yours sincerely,

Clay Hymer

Clay Hymer, Director
Department of Building and Safety

CH:at
cc: Dave Daileda, Harris Sharp Assoc.
Tom Graham
George Ogilvie, City Attorney

JH 3/21/84
Hand delivered to
S.J. Amarosa Construction Co.
Received by [illegible]

CITY OF LAS VEGAS

Done Hosby 4-25-84

FILE ON MICRO FILM

BUILDING DEPARTMENT
CITY OF LAS VEGAS

CORRECTION NOTICE

FOR INFORMATION ONLY

Job Located at 501 N Casino Center

I have this day inspected this structure and these premises and have found the following violations of City and/or State laws governing same:

This notice documents the understanding that you are proceeding at your own risk by not conserving the original shipment of Cermaic Veneer for the face of the building as suggested in HSA's 1-14-84 Letter, see the item dealing with the north side of Stair #8.

are hereby notified to correct and call for re-inspection.

Ted Rexing
Inspector

move this tag!

Marianne Francis 6-14-84

BUILDING AND FIRE INSPECTION COMPLETION FORM

1. Address of Inspection 501 Casino Center Blvd. North New Station #1
2. Inspection Date 6/11/84
3. Reinspection Date
4. Inspection Time 2 hrs
5. Inspection Type Final on Bldg.
6. Person Contacted Ted Rexing
7. Building Inspector: (A) D W — subject to punch list
8. Fire Inspector: (A) D W — subject to punch list

FIRE INSP. SIGNATURE Ree Spring

BLDG. INSP. SIGNATURE Stuart Cornelius

A - Approved D - Disapproved W - Witnessed

The Department of Building and Safety requests a joint inspection from your department at:

1. Address of Inspection 501 Casino Center North Fire Station
2. Inspection Date June 4-1984
3. Inspection Time 8:30 AM
4. Inspection Type Final Bldg Cancelled
5. Person Contacted and the Assigned Inspector

Stu Cornelius

Confirmation of scheduled inspection for your records.

F-2584

501 N. Casino Center

Certificate of Occupancy

City of Las Vegas, Nevada
Department of Building & Safety

This Certificate issued pursuant to the requirements of the Uniform Building Code certifying that at the time of issuance this structure was in compliance with the various ordinances of the City regulating building construction or use. For the following:

Use Classification: Fire Station B-2 Bldg. Permit No. 6065

Building Address: 501 N. Casino Center Floor, Suite or Room

Owner of Building: City of Las Vegas Address: Same

By: Clay Hymer

Clay Hymer
Building Official

Date: July 12, 1984

POST IN CONSPICUOUS PLACE

Lula Collins 12-19-84

OWNER 501 N. Casino Ctr. ADDRESS City Of L.V.

DATE 12-23-82 GEN. CONT. Amoroso Const.

TYPE OF STRUCTURE Demolition PERMIT NO. 5851 FINAL INSPECTION

LEGAL DESCRIPTION See app. LOG # C-197 AREA #

APPROVED FOR OCCUPANCY & METER

BUILDING		MECHANICAL	
Investigation		Plumbing Cont.	
Location & Footing		Permit No.	Date
Concrete Slab Floor		Heat & Vent. A/C Cont.	
Vert. Steel Reinf.		Permit No.	Date
Horiz. Steel Reinf.		Sewer Cont.	
Framing		Permit No.	Date
Ext. Lath		Rough Soil	
Ext. Brown		Rough Water	
Final Building	12-28-84	Top-Out	
Appr. for Occ.		Rough Gas	
		A/C Rough Duct	
		Final Plumbing	
		Final Gas	
ELECTRICAL		Final Air Cond.	
Temp. pole cont.		Final Sewer	
Permit No.	Date		
Inspection	Date		
Electrical Cont.	Date		
Permit No.	Date	PLEASE NOTE REMARKS ON REVERSE SIDE	
Rough		DIV. OF BLDG. & SAFETY CITY OF LAS VEGAS REV. 10-78	
Final Rough			
Final Electrical		2-1-32	
Temporary Service		E-Z-WAY SYSTEMS NEWARK OH 43055 LITHO IN U.S.A.	

ELEC. ONLY PLBG. ONLY, A.C. ONLY

OWNER Colt Fire Station DATE 12-28

ADDRESS 501 N. Casino Ctr

CONTRACTOR	PERMIT NO.	FINAL INSPECTION

LOT	BLOCK	SUBDIVISION

LOG NO. AREA 140 (Downtown)

ELECTRIC ONLY	PLUMBING ONLY
Contractor	Contractor Nevada Pipe
Permit No.	Permit No 8927
Rough Elec.	Rough Soil
Final Rough	Rough Water
Final Elec.	Top Out
Temp. Service	Rough Gas
HEAT & VENT. A/C ONLY	Final Plbg. 12-17-84
Contractor	Final Gas
Permit No.	Sewer Final
A/C Rough Duct	
Rough Gas	
Final A/C	
Final Gas	

79-3-13 (811-81) DEPT. OF BLDG. & SAFETY CITY OF LAS VEGAS

Debbie Ingham 3-11-85

Xerox copy for
Bob Sylvain city atty (
Ted King + Tom Graham
Place on or Master File under
Res. Central Fire Stations

501 So. Casino Center

nce of Building Officials

WHITTIER, CALIFORNIA 90601 • (213) 699-0541

March 5, 1985

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TECHNICAL DIRECTOR
DONALD R. WATSON, P.E.

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JOHN E. MAULDING, P.E.
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DIVISION OF CODE ADMINISTRATION
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STANLEY WHEELER
CHIEF BUILDING INSPECTOR
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SUPERINTENDENT, BUILDING
AND SAFETY
LONG BEACH, CALIFORNIA

Clay Hymer
Director Building and Safety
Department
City of Las Vegas
400 East Stewart Avenue
Las Vegas, Nevada 89104

Dear Mr. Hymer:

The following description of the procedures used by the International Conference of Building Officials in the preparation of written responses to letters, requesting an interpretation of the code, is furnished as requested in your telephone call, on March 4, 1985.

The individual to whom the letter is addressed prepares a draft. This draft is then circulated to the code/plan check and the education departments, as well as being reviewed by myself and Don Watson, the Technical Director. At the present time this involves a review by as many as twelve separate individuals in addition to the preparer. Each person reviewing the letter indicates any questions or differences of opinion with the response. These comments are resolved before preparation of the final letter.

The purpose behind this procedure is to insure uniformity of response and to keep all of the staff, who deal with the public, knowledgeable of the various interpretations that have been made.

We hope this response adaquately describes the procedures we use in preparing written responses to requests for code interpretations. Please feel free to contact us if we can be of any further assistance.

Sincerely,

Frank M. Drake, P.E.
Assistant Technical Director/Codes

FMD/cb

Rec'd 3/7/85

Regional Offices: 6738 N.W. Tower Drive • Kansas City, Missouri 64151 • (816) 741-2241
17544 Midvale Avenue N., Suite 304 • Seattle, Washington 98133 • (206) 542-9421
603 West 13th Street, Suite 2-F • Austin, Texas 78701 • (512) 479-8278

JACKIE B. 1-29-86

OWNER City of Las Vegas ADDRESS 501 N Casino Cen
DATE 12/30/82 GEN. CONT. Amoroso Const
TYPE OF STRUCTURE Fire Station PERMIT NO. 6065 FINAL INSPECTION
LEGAL DESCRIPTION See App. LOG # C197-2 AREA #
APPROVED FOR OCCUPANCY & METER

BUILDING	MECHANICAL
Investigation	Plumbing Cont.
Location & Footing SC 5-6-83	Permit No. Date
Concrete Slab Floor SC 5-28-83	Heat & Vent. A/C Cont.
Vert. Steel Reinf. SC 5-28-83	Permit No. Date
Horiz. Steel Reinf. SC 5-28-83	Sewer Cont.
Framing	Permit No. Date
Ext. Lath	Rough Soil
Ext. Brown	Rough Water
Final Building	Top-Out
Appr. for Occu.	Rough Gas
Exam-2nd bvd SC 12-23-83	A/C Rough Duct
	Final Plumbing
ELECTRICAL	Final Gas
	Final Air Cond.
Temp. pole cont.	Final Sewer
Permit No. Date	
Inspection RP Date 1-4-83	
Electrical Cont. Date	
Permit No. Date	PLEASE NOTE REMARKS ON REVERSE SIDE
Rough RP 10-28-83	DIV. OF BLDG. & SAFETY CITY OF LAS VEGAS REV 10-78
Final Rough	
Final Electrical RP 6-1-84	2-1-32
Temporary Service 90 da. RP 10-11-83	

© E-Z-WAY SYSTEMS NEWARK OH 43055 LITHO IN U.S.A.

JACKIE B. 1-29-86

2" PVC [illegible] RP2-16-85

RP3-30-85

#248 [illegible] RP5-27-85

Concrete slab S.E. Corner [illegible] 3C6-10-3

[illegible] RP6-11-85

Concrete slab 2nd level [illegible] 3C6-15-5

elec. slab 2nd level [illegible] 3C6-17-85

[illegible] RP6-17-85

PC concrete slab 3C6-24-85

RP6-28-85

UG [illegible] RP5-22-85

Rebecca L. Ruiz 5-30-90

DEPARTMENT OF BUILDING & SAFETY CITY OF LAS VEGAS

JOB ADDRESS: 501 Cargo			PERMIT NO.
LOT NO.	MAP NO.	INSPECTOR: 55	DATE
SUBDIVISION NAME			PHONE
INSPECTOR: Earl Russell			INSPECTION DATE: 5.17.90

Investigation

Cited for work w/out permit

☐ PARTIAL INSPECTION - DESCRIPTION:

☒ APPROVED ☐ PERMIT REQUIRED ☐ STOP WORK

☐ REJECTED - CORRECTION NOTICE - REINSPECTION REQUIRED CALL 799-2071

INSPECT	DESCRIPTION	INSPECT	DESCRIPTION	INSPECT	DESCRIPTION
☐ B-1	FOOTING, LAYOUT, REBAR, ZONING	☐ P-1	ON SITE SEWER	☐ X-2	UNDERGROUND HYDRO*
☐ B-2	STEM WALL — FORMS & REBAR	☐ P-2	ON SITE WATER	☐ X-3	UNDERGROUND FINAL/FLOW
☐ B-3	PRE-SLAB	☐ P-3	BUILDING SEWER (YARD LINES)	☐ X-4	SPRINKLER SYSTEM HYDRO
☐ B-4	ROOF SHEATHING	☐ P-4	UNDERSLAB PLUMBING	☐ X-5	FIRE ALARM
☐ B-5	FRAMING	☐ P-5	TOP OUT-WATER, GAS, WASTE	☐ X-6	OTHER:
☐ B-6	INSULATION	☐ P-6	FINAL GAS TEST	☐ X-7	FINAL FIRE
☐ B-7	DRYWALL NAILING	☐ P-7	FINAL PLUMBING		
☐ B-8	EXTERIOR LATH/STUCCO			☐ E-1	UNDERGROUND ELETRICAL
☐ B-9	WALL GROUT & STEEL	☐ M-1	ROUGH VENT	☐ E-2	ROUGH ELECTRICAL
☐ B-10	POOL PRE-GUNITE	☐ M-2	HOOD	☐ E-3	LOW VOLTAGE ELECTRICAL
☐ B-11	POOL PRE-PLASTER / FINAL	☐ M-3	FINAL MECHANICAL	☐ E-4	SIGN INSPECTION
☐ B-12	BUILDING FINAL			☐ E-5	FINAL ELECTRICAL
☐ B-13	CERT. OF OCC.	☐ X-1	KICKER / FLUSH	☐ E-6	TEMP POWER

☐ **FINAL INSPECTION** — BRING HARD CARD WITH FIRE, QUALITY CONTROL & PLANNING APPROVALS SIGNED OFF TO BLDG & SAFETY FOR C. of O. ISSUANCE (Commercial Only)

FOR ASSISTANCE -CALL: 386-6251

501 N. CASINO CENTER
SPECIAL INSPECTOR REPORT
(Ted Rexing)

C. of L.V.
FIRE STATION

Marianne Francis 7-27-84

City of Las Vegas

Office of Architectural Services and Project Control

TRANSMITTAL

date 7-26-84

to Mr. Sal Cornelius

from Thomas B. Graham; AICP, RLA, Director

subject CENTRAL FIRE STA.

copies

File # WU 6023 REXING

We transmit herewith the following:

Description		
CONTRACTORS PERMIT CARD & ITO ATTACHMENTS	ORIGINAL	C

Action Codes:

A - Information only no action required
B - Review and forward comments by:
C - I HAVE REQUESTED ALL DEPTS TO SIGN, BUT AS THIS IS A RESPONSIBILITY OF BLDG. & SAFETY, WOULD YOU ① PLEASE MAKE COPIES OF IT ALL FOR YOUR MICRO-FILES ② RETURN ORIGINALS DIRECTLY TO MR. BOB TIGHE OF CLARK CO. INT. & ③ NOTIFY MR. T. WHEN THE CERT. OF OCCUPANCY WILL BE READY FOR P.U.

Marianne Francis 7-27-84

S. J. AMOROSO CONSTRUCTION COMPANY
P.O. Box 11146
Las Vegas, Nevada 89111-1146
(702) 739 - 5188

LETTER OF TRANSMITTAL

TO City of Las Vegas
Building Department

TO: HARRIS SHARP & ASSOCIATES

DATE	JOB NO.
July 17, 1984	#244

ATTENTION

RE: CENTRAL FIRE STATION
501 N. Casino Crt.

WE ARE SENDING YOU ☒ Attached ☐ Under separate cover via _____ the following items:

☐ Shop drawings ☐ Prints ☐ Plans ☒ Samples ☐ Specifications

☐ Copy of letter ☐ Change order ☒ As below

COPIES	DATE	NO.	DESCRIPTION
1 each sheet			Original Department of Building & Safety card, as executed by inspectors for the above referenced project, with attachments (5 shts.)

THESE ARE TRANSMITTED as checked below:

☐ For approval ☐ Approved as submitted ☒ Resubmit _____ copies for approval

☒ For your use ☐ Approved as noted ☐ Submit _____ copies for distribution

☐ As requested ☒ Returned for corrections ☐ Return _____ corrected prints

☐ For review and comment ☐ _____

☐ FOR BIDS DUE _____ 19 ____ ☐ PRINTS RETURNED AFTER LOAN TO US

REMARKS

Close-out file

COPY TO [redacted]/Project Manager/File SIGNED: JEANNIE BACA

If enclosures are not as noted, kindly notify us at once.

Marianne Francis 7-2784

Arnytek

① permission for kitchen
② mini dwgs showed chilled water back up
③ Kim Gibson @ Hansen
E. Bittenbender

Marianne Francis 7-2784

Digital

① permission for kickers
② mid dwg showed chilled water back up
③ Kim Grigsby @ Hawaiian
Ed Hatten

Marianne Francis 7-27-84

DEPARTMENT OF BUILDING & SAFETY

Phone 386-6251

CITY OF LAS VEGAS, NEVADA

APPROVED BUILDING PLANS No. C-1952

Approved Plans must be on Job Site During Const.

OWNER City of L.V.

STREET NO. 574 N. Pecos Cir

TYPE OF STRUCTURE: Fire Station

CONTRACTOR Universal Const Co

DATE ISSUED: 12/20/83

Location & Footing
Stem Wall

Pour No Concrete Until Above is Signed

Conc. Slab (Reinf.)
Electrical Slab
Plumbing (groundwork) SEE ATTACHMENT
Gas Piping (groundwork)

Fireplace Footing
Chimney Steel
Fireplace Final

Conc. Block Building
Vert. Steel 1st 2nd
Horiz. Steel 1st 2nd

Pour No Concrete Until Above is Signed

Rough Electrical 2nd #5
Topout MMM 02-22-84
Rough Gas Piping MMM 02-22-84
Rough Htg. & Vent. MMM 02-22-84
Sheathing
Framing BLDG. INSP. 55 CLV 5/17/84
Insulation

PERMITS ISSUED

Building Permit No. 6065
Electric Permit No.
Plumbing Permit No.
Air Cond. Permit No.
Sewer Connection No.

POST THIS CARD ON FRONT OF BUILDING

Drywall BLDG. INSP. 55 CLV
Ext. Lath
Ext. Scratch
Ext. Brown

Miscellaneous
Roofing
Sewer 02-04-83 MMM

Basement Cert 4-17-84 #15-223

Final Electrical #15 - 6-1-84 Subject to punch list
Final Plumbing MECH. INSP. 81 CLV Per punch list 06-01-84
Final Gas MECH. INSP. 81 CLV Per punch list 6-1-84
Final Heating & Vent MECH. INSP. 81 CLV Per punch list 6-1-84
Final Building BLDG. INSP. 55 CLV Per punch list 6/1/84
On-Site Paving

NOTE: All of the following equipment shall be approved by the Las Vegas Fire Department before the Building Department will final the structure. Sprinkler systems; alarm and communications systems; standpipes; underground flammable liquid tanks; fire pumps; emergency generator; hood extinguishment systems; non-flammable medical gas systems.

Call Fire Prevention Bureau at 386-6361 for inspection

Fire Pump NA
Emerg. Generator Rex Swing 4/9/84
Alarm System NA
Sprinkler System Stone Plumb 3-12-84 subject to correction
Smoke Detector

Occupancy Approval

Planning Dept. XXX 7/24/84
Quality Cont.
Fire Dept. Rex Swing 7/26/84
Bldg. Dept. SR. BLDG. INSP. 44 CLV 7/26/84

Temp. Occupancy Approval
Not To Exceed 60 Days
Bldg. Dept.

Marianne Francis 7-27-84

DEPARTMENT OF BUILDING & SAFETY

Phone 386-6251

CITY OF LAS VEGAS, NEVADA

APPROVED BUILDING PLANS No. C-1952

Approved Plans must be on Job Site During Const.

OWNER City of L.V.

STREET NO. 521 N. Casino Ctr

TYPE OF STRUCTURE: Fire Station

CONTRACTOR Lindsay Const Co

DATE ISSUED: 12/30/83

Location & Footing
Stem Wall

Pour No Concrete Until Above is Signed

Conc. Slab (Reinf.)
Electrical Slab
Plumbing (groundwork) SEE ATTACHMENT
Gas Piping (groundwork)

Fireplace Footing
Chimney Steel
Fireplace Final

Conc. Block Building
Vert. Steel 1st 2nd
Horiz. Steel 1st 2nd

Pour No Concrete Until Above is Signed

Rough Electrical RBV #5
Topout MMM 02-22-84
Rough Gas Piping MMM 02-22-84
Rough Htg. & Vent. MMM 02-22-84
Sheathing
Framing BLDG. INSP. 55 CLV 5/17/84
Insulation

REVISION 5851

Building Permit No. 6265
Electric Permit No.
Plumbing Permit No.
Air Cond. Permit No.
Sewer Connection No.

POST THIS CARD ON FRONT OF BUILDING

Drywall BLDG. INSP. 55 CLV
Ext. Lath
Ext. Scratch
Ext. Brown

Miscellaneous
Roofing
Sewer 02-04-83 MMM

Basement Cut 4,434 F.S. 223

Final Electrical #15 - 6-1-84 Subject to punch list
Final Plumbing MECH. INSP. 81 CLV Per punch list 06-01-84
Final Gas MECH. INSP. 81 CLV Per punch list 06-01-84
Final Heating & Vent MECH. INSP. 81 CLV Per punch list 6-1-84
Final Building BLDG. INSP. 55 CLV Per punch list 6/1/84
On-Site Paving

NOTE: All of the following equipment shall be approved by the Las Vegas Fire Department before the Building Department will final the structure. Sprinkler systems; alarm and communications systems; standpipes; underground flammable liquid tanks; fire pumps; emergency generator; hood extinguishment systems; non-flammable medical gas systems.

Call Fire Prevention Bureau at 386-6361 for inspection

Fire Pump NA
Emerg. Generator Lee Swing 4/10/84
Alarm System NA
Sprinkler System Steve Ottmich 3-12-84 subject to connection
Smoke Detector

Occupancy Approval

Planning Dept. [illegible] 7/26/84
Quality Cont.
Fire Dept. Lee Swing 7/26/84
Bldg. Dept. SR. BLDG. INSP. 44 CLV 7/26/84

Temp. Occupancy Approval
Not To Exceed 60 Days
Bldg. Dept.

N. Louise Francis 7-20-84

ATTACHMENT 2 BUILDING PERMIT 501 N. CAMINO CTR.

PG 1 OF

10" A.C.P. WATER LINE METER VAULT-S.		1-11-83	mnm 01-11-83
N. RET. WALL FOOTING	SUBJECT TO ① MIX ② REMOVE RVC @ E. ② 5' CLR.	1-12-83	BLDG. INSP. 53 CLV 1-12-83
N. RET. WALL (HIGH)	SUBJECT TO POSSIBLE INCREASE IN STL. @ TOP	1-17-83	BLDG. INSP. 53 CLV 1-17-83
N. RET. WALL AT EAST LOW	SUBJECT TO STL. REINF. @ STEP DOWN, COMPLETE TIES, & NORTH END	1-20-83	~~mnm 01-20-83~~ ~~#81~~ BLDG. INSP. 53 CLV 1-20-83
10" A.C.P. WATER LINE * METER VAULT → N + WET TAP		1-20-83	mnm 01-20-83
8" & 10" P.V.C. SEWER LINE *		1-20-83	mnm 01-20-83 #81
MANHOLES		1-24-83	mnm 01-24-83 #81
8" RVC W/ ENCASEMENT	SUBJECT TO FHA MECHANICAL ACT	1-26-83	mnm 01-26-83 #81
4" RVC SEWER * FROM G.O. NEAR ENTRANCE, EAST		1-20-83	~~mnm 01-18-83 #81~~ mnm 01-26-83 #81
* PRESSURE & LEAK TEST - 8" (WET TAP TO HTD.)		2-2-83	MECH. INSP. 81 CLV 02-02-83
Leak Test 10" - Sewer		2-4-83	MECH. INSP. 81 CLV 02-04-83
Leak Test 4" - Sewer		2-4-83	MECH. INSP. 81 CLV 02-04-83
18" RCP (MANHOLE, N-TO-GRATE)		2-[illegible]-83	
FTG. F-39 & WALL		1-31-83	BLDG. INSP. 53 CLV
FTG. F-25	SUBJECT TO FINAL FLOOR CUT AT 7 IN.	2-1-83	BLDG. INSP. 53 CLV
SUMP PUMP LINE IN FTG. F-25		2-1-83	MECH. INSP. 81 CLV
FTG. F-40 + F-24	PROVIDE OR ORIENT HOOKS PER DTLS. 5-5 & 4-4. ALSO ROTATE COL. B-8 AT 90°. ALSO PROVIDE CONT. #4 PER DTL. 5-5	2-1-83	BLDG. INSP. 53 CLV
FTG. F-26 & F-23 (J-12)		2-2-83	BLDG. INSP. 53 CLV
* PRESSURE & LEAK TEST - 8" (VAULT NORTH)			
FTGS. A-18, A-24, A-30, H-34, P-32, P-21, P-27 + WALL FTG @ N. & NW.		2-4-83	BLDG. INSP. 53 CLV BLDG. INSP. 53 CLV BLDG. INSP. 53 CLV
FTGS. A-33, D-33, G-19, G-32, H-34, F-8, & J-8		2-10-83	BLDG. INSP. 53 CLV
ELEC. IN N. BASEMENT WALL		2-14-83	ELEC. INSP. NO. 75 C' SUBJECT TO LITE AT STAIR NO. 6
REBAR IN N. BASEMENT WALL		2-14-83	BLDG. INSP. 53 CLV SUBJECT TO CORNER BARS; EMBEDS; T.O.W. HK 4-13; GRADE BM.
[redacted] PLUMBING IN N. EAST WALL		2-11-83	mnm 02-11-83 #81
AC IN N. EAST WALL		2-16-83	mnm 02-16-83 #81
FTG @ S. WALL, BASEMENT & UFRG		2-16-83	ELEC. INSP. NO. 75 C'
REBAR @ FTG. 4/S2, S. WALL BASEMENT PLUS FTGS. D/S2 @ INT. OF BASEMENT		2-16-83	BLDG. INSP. 53 CLV SUBJECT TO 4 OCH/DIODES A. CARDBOARD
PLUMBING @ ELECTER (PER P-2)		2-16-83	mnm 02-16-83
PLUMBING @ PLAZA (PER P-2) BEFORE SOIL INTERGER.		2-16-83	mnm 02-16-83
TELEPHONE SERVICE (PER E-1)		2-16-83	ELEC. INSP. NO. 75 C'

Marianne Francis 7-27-84

PG. 2

Encasement of Exist. 8" Sewer @ Bonanza	TR 2-24-83	mnm 02-23-83 3-7-83 BLDG. INSP. 53 CLV
W.F.G. Basement Walls - Rebar	TR 3-5-83	
W.F.G. Basement Walls - Elec.	TR 3-5-83	RP. 3-7-83
W.F.G. Basement Walls - HVAC+P.	TR 3-5-83	mnm #81 03/10/83
18" R.C.P. FR. S.S.M.H. #2 → Drop Inlet		
Basement Ret. Wall at Retail Flr (G-2)	TR 3-8-83	BLDG. INSP. 53 CLV 3-7-83
Tunnel Slab T-7, U-7, GB-5, G-17	TR 3-8-83	BLDG. INSP. 53 CLV
Plaza Ftgs P-15, GB-3, Q-15, GB-4	TR 3-11-83 SUBJECT TO: GB-4 BOT. REINF. W/IN STRUCTURAL FTG. DIM. CLR AT GB-5 & CLEAR"	BLDG. INSP. 53 CLV
Tunnel Walls - Rebar	TR 3-11-83	BLDG. INSP. 53 CLV
Tunnell Walls - Elec	TR 3-15-83	ELEC. INSP. NO. 75 C' 3-15-83
East Slab @ Communications - Plumb.	TR 3-15-83	mnm 03-15-83 #81
East Slab " - Elec	TR 3-16-85	ELEC. INSP. NO. 75 C' 3-16-83
East Slab " - Rebar	TR 3-17-83	BLDG. INSP. 53 CLV
Tunnel Ceiling - Plumbing	TR 3-17-83	mnm 03-17-83 #81
Basement Slab: S. ½ - Plumbing (Incl. wall east of Elev. #1)	TR 3-23-83	
Basement Slab: S. ½ - Elec.	TR 3-24-83	ELEC. INSP. NO. 75 C' 3-24-83
Basement Slab: S ½ - Rebar	TR 3-24-83	BLDG. INSP. 53 CLV
Plaza Lumb. under slab Col. 14→15, A→P	TR 3-29-83	mnm 03-29-83
Plaza Slab - Elec (Apparatus Bot)	TR 3-31-83 SUBJECT TO SLEEVES	ELEC. INSP. NO. 75 C' 3-31-83
Plaza Slab - Rebar (Apparatus Bot)	SUBJECT TO COL. 150. JT. PER Q-2 3-31-83	BLDG. INSP. 53 CLV
Basement Ftg: N-2 - Rebar (Grade Bal. 5/5-2)	SUBJECT TO 1 OF U.F.R.GO.	BLDG. INSP. 53 CLV
Basement Wall East Betn. N-2 & N-6 - Rebar	TR 4-13-83	BLDG. INSP. 53 CLV
Plaza Footings A-14, M-13, Q-13, - Rebar	TR 4-22-83 SUBJECT TO GRADE BM #1	BLDG. INSP. 53 CLV
Sand Trap Installation P-2 Waste over P-2 Tunnel	TR 4-05-83	mnm 04-21-83 #81 MECH. INSP. 55 CLV
Basement: Men + Woman bathroom (Per Q-3 Rough Plumbing)	TR 4-27-83	mnm 04-27-83 #81
Footings (B. 5-2) at Elev. 1 on Grade Beam R→N on line 12	TR 4-28-83	BLDG. INSP. 55 CLV
Partial Wall: Elec. Section at Elev. #1	TR 5-2-83 SUBJECT TO INV. SLEEVES & TOP HOOKS	BLDG. INSP. 55 CLV
Plaza Footing: A-12 +	TR 4-27-83	BLDG. INSP. 55 CLV
Basement Slab R-T-U-3, R-5, Plaza Ftgs R-7 & U-9	TR 5-10-83 SUBJECT TO ENDERS AT R-T-U-3	ELEC. INSP. NO. 75 C' 5/6/83 BLDG. INSP. 55 CLV 5/6/83
Plaza Plumbing: Under Slab Rough-in Δ→N 12→15	TR 5-6-83	mnm #81 05/6/83

Marianne Francis 7-2784

PG. 2

Encasement of Exist. 8" Sewer @ Bonanza TR 2-24-83 mnm 02-23-83
W.P.S. Basement Walls - Rebar TR 3-5-83 3-7-83 BLDG. INSP. 53 CLV
W.P.S. Basement Walls - Elec. TR 3-5-83 #75 RP. -3-7-83
W.P.S. Basement Walls - HVAC+P. TR 3-5-83 mnm #81 03/04/83
18" R.C.P. FR. S.S.M.H. #2 → Drop Inlet
BASEMENT RET. WALL AT PEDESTAL FTR (E-2) TR 3-8-83 BLDG. INSP. 53 CLV 3-7-83
TUNNEL SLAB T-7, U-7, GB-5, G-17 TR 3-8-83 BLDG. INSP. 53 CLV
PLAZA FTGS P-15, GB-3, Q-15, GB-4 TR 3-11-83 SUBJECT TO: G6-4 BOT. REINF. W/N STRUCTURAL FTG. DIM. & LR AT GB-5 & CLEAR BLDG. INSP. 53 CLV
TUNNEL WALLS - REBAR TR 3-11-83 BLDG. INSP. 53 CLV
TUNNEL WALLS - ELEC TR 3-15-83 ELEC. INSP. NO. 75 C' 3-15-83
EAST SLAB @ Communications - PLUMB. TR 3-15-83 mnm 03-15-83 #81
EAST SLAB " - ELEC TR 3-16-83 ELEC. INSP. NO. 75 C' 3-16-83
EAST SLAB " - REBAR TR 3-17-83 BLDG. INSP. 53 CLV
TUNNEL CEILING - PLUMBING TR 3-17-83 mnm 03-17-83 #81

INCL. WALL EAST OF ELEV. #1
BASEMENT SLAB: S. 1/2 - PLUMBING TR 3-23-83
BASEMENT SLAB: S. 1/2 - ELEC. TR 3-24-83 ELEC. INSP. NO. 75 C' 3-24-83
BASEMENT SLAB: S. 1/2 - REBAR TR 3-24-83 BLDG. INSP. 53 CLV
PLAZA LITE. UNDER SLAB Col. 14→15, A→P TR 3-29-83 mnm 03-29-83
PLAZA SLAB - ELEC (APPARATUS EQT) TR 3-31-83 SUBJECT TO ALLEGIES ELEC. INSP. NO. 75 C' 3-31-83
PLAZA SLAB - REBAR (APPARATUS EQT) SUBJECT TO COL. 150. JT. PER Q-2 BLDG. INSP. 53 CLV
BASEMENT FTG: N-2 (END SLAB 5/5-2) - REBAR TR 3-31-83 SUBJECT TO 5 OF U.F.R. GIO. BLDG. INSP. 53 CLV

BASEMENT WALL EAST BERM. N-2 & N-6 - REBAR TR 4-13-83 BLDG. INSP. 53 CLV

PLAZA FOOTINGS A-14, M-13, Q-13 - REBAR TR 4-22-83 SUBJECT TO GRADE BM # BLDG. INSP. 53 CLV

Sand Trap Installation mnm 04-21-83 #81
P-2 WASTE OVER TUNNEL TR 4-27-83 MECH. INSP. 55 CLV
BASEMENT: Men + woman bathroom (PER Q-3 Rough Plumbing) mnm 04-27-83 #81
FOOTING (E-5.2) AT LINE 1/5 GRADE BEAM R→N ON LINE 12 OVER ELEV TR 4-28-83 BLDG. INSP. 55 CLV
PARTITION WALL: ELEV. PIT SECTION AT TR 5-2-83 SUBJECT TO INV. & TOP HOOKS BLDG. INSP. 55 CLV
PLAZA FOOTING: A-12+ TR 4-27-83 BLDG. INSP. 55 CLV

BASEMENT SLAB
PLAZA FTGS R-7 & U-9 R-T-U-3, R-5, UNDER SLAB TR 5-10-83 SUBJECT TO REBARS AT R-T-U-3 BLDG. INSP. 55 CLV 5/6/83 ELEC. INSP. NO. 75 C' 5/6/83
PLAZA PLUMBING: ROUGH-IN Δ→N 12→15 TR 5-6-83 mnm #81 05/6/83

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OKS SUBJECT TO TEST APPR.

Plaza Slab 12→15 A→N : ELEC. ELEC. INSP. NO. 75 C' TR 5-13-83
Basement Slab : J± → 12 J → N : REBAR TR 5-10-83
Plaza Slab : 12→15 A→N : REBAR TR 5-10-83
Plaza Slab : (H) → EAST : REBAR ALSO SUBJECT TO VOLCAY CORRECTION + (21) BLDG. INSP. 55 CLV 5/27/83 TR 5-27-83 SUBJECT TO SAWCUT REBAR
Plaza Slab : (H) → EAST : ELEC SUBJECT TO BRINGING (21) TO FIN. GRADE ELEC. INSP. NO. 75 C' TR 5-27-83
Plaza Slab : (H) → EAST : PLUMBING SUBJECT TO SLEEVES mnm 05-31-83 #81 TR 5-27-83
2nd Level : (15) → NORTH : STRUCTURAL STL + REBAR BLDG. INSP. 55 CLV 6/13/83 TR 6-14-83 SUBJECT TO MISC. CORRECTN
2nd Level : : ELEC ELEC. INSP. NO. 75 C' 6/16/83 TR 6-14-83
2nd Level : : PLUMBING SUBJECT TO ~~mech~~ mnm 06-13-83 #81 TR 6-13-83
Basement Slab : Room 120 : rebar BLDG. INSP. 55 CLV 6/10/83. TR 6-10-83 SUBJECT TO EXP. JOINT

POUR #9
2nd Level Slab : (12) → (15) P+HVAC : mnm 06-17-83 #81 TR 6-17-83 SUBJECT TO SUPERFLOW
2nd Level Slab : (12) → (15) ELEC : ELEC. INSP. NO. 75 C' TR 6-17-83
2nd Level Slab : (12) → (15) REBAR/STRUCTURE BLDG. INSP. 55 CLV 6/17/83 TR 6-17-83 SUBJECT TO HEAT ELEC PENETRATNS

POUR #7
2nd Level Slab : (N) → EAST : STRUCTURE REBAR BLDG. INSP. 55 CLV 6/21/83 TR 6-23-83 SUBJECT TO POUR #7 PATCH.
2nd Level Slab : (H) → EAST : MECH + PLUMB mnm 06-21-83 #81 TR 6-21-83 SUBJECT TO HEAT
2nd Level Slab : (N) → EAST : ELEC ELEC. INSP. NO. 75 C' 6/21/83 TR 6-21-83

POUR #5
Plaza Level Slab : (10) → (12) A → N± : STRUCTURE + REBAR BLDG. INSP. 55 CLV 6/24/83 TR 6-27-83 SUBJECT TO FINAL
Plaza Level Slab : SAME : HVAC "B" mnm #81 06-23-83 TR 6-23-83 SUBJECT TO DF.
Plaza Level Slab : SAME : "E" ELEC. INSP. NO. 75 C' 6/24/83 TR 6-24-83

POUR #2
Plaza Level Slab : (1) → (6)± A → N : STRUCTURE REBAR BLDG. INSP. 55 CLV TR 6-29-83
Plaza Level Slab : SAME : HVAC B TR 6-27-83
Plaza Level Slab : SAME : E ELEC. INSP. NO. 75 C' 6/28/83 TR 6-28-83

POUR #10
Roof : (N) → (4) STRUCTURE REBAR BLDG. INSP. 55 CLV 6/28/83. TR 6-29-83
Roof : SAME : HVAC + P mnm #81 06-28-83 TR 6-29-83
Roof : SAME : E ELEC. INSP. NO. 75 C' 6/28/83 TR 6-28-83

POUR #8
2nd Level Slab : (8) → (12) A → N : STRUCTURE + REBAR BLDG. INSP. 55 CLV 6/29/83 TR 6-30-83
2nd Level : SAME : HVAC + P mnm #81 06-29-83 TR 6-30-83
2nd Level : SAME : E ELEC. INSP. NO. 75 C' TR 6-30-83

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SUBJECT TO TEST APPR.

Plaza Slab A→N 12→15 : ELEC. — ELEC. INSP. NO. 75 C' — R 5-13-83
Basement Slab : J→N J±→12 : REBAR — R 5-10-83
Plaza Slab : A→N 12→15 : REBAR — R 5-10-83
Plaza Slab : (H)→EAST : REBAR — ALSO SUBJECT TO VOUCHER CORRECTION + (B) (31) BLDG. INSP. 55 CLV 5/27/83 — R 5-17-83 SUBJECT TO POST-TENSIONING REBAR
Plaza Slab : (N)→EAST : ELEC — SUBJECT TO BRINGING @ TO FIN. GRADE — ELEC. INSP. NO. 75 C' — R 5-27-83
Plaza Slab : (N)→EAST : PLUMBING — SUBJECT TO SLEEVES — mnm 05-31-83 #81 — R 5-[illegible]-83
2nd Level : (15)→NORTH : STRUCTURAL STL + REBAR — BLDG. INSP. 55 CLV 6/13/83 — R 6-14-83 SUBJECT TO [illegible] CORRECTN
2nd Level : : ELEC — ELEC. INSP. NO. 75 C' 6/13/83 — R 6-14-83
2nd Level : : PLUMBG SUBJECT TO ~~PRIOR~~ Mech — mnm 06-13-83 #81 — R 6-13-83
Basement Slab : Room 126 : rebar — BLDG. INSP. 55 CLV 6/10/83 — R 6-10-83 SUBJECT TO EXP. JOINT
POUR #9
2nd Level Slab : (12)→(15) P+HVAC : mnm 06-17-83 #81 — R 6-17-83 SUBJECT TO [illegible] OVERPOUR
2nd Level Slab : (12)→(15) ELEC : ELEC. INSP. NO. 75 C' — R 6-17-83
2nd Level Slab : (12)→(15) REBAR/STRUCTURE — BLDG. INSP. 55 CLV 6/17/83 — R 6-17-83 SUBJECT TO HEAT ELEC PENETRATNS
POUR #7
2nd Level Slab : (N)→EAST : STRUCTURE REBAR — BLDG. INSP. 55 CLV 6/21/83 — R 6-23-83 SUBJECT TO POUR #7 PATCH.
2nd Level Slab : (H)→EAST : MECH + PLUMB — mnm 06-21-83 #81 — R 6-21-83 SUBJECT TO [illegible] ATTEN
2nd Level Slab : (N)→EAST : ELEC — ELEC. INSP. NO. 75 C' 6/21/83 — R 6-21-83
POUR #5
Plaza Level Slab : (10)→(12) (A)→(N) ± : STRUCTURE REBAR — BLDG. INSP. 55 CLV 6/24/83 — R 6-27-83 SUBJECT TO [illegible] 6-28-83 SUBJECT TO [illegible]
Plaza Level Slab : SAME : HVAC "P" — mnm #81 06-23-83
Plaza Level Slab : SAME : "E" — ELEC. INSP. NO. 75 C' 6/24/83 — R 6-24-83
POUR #2
Plaza Level Slab : (1)→(10) (A)→(N) ± : STRUCTURE REBAR — BLDG. INSP. 55 CLV — R 6-29-83
Plaza Level Slab : SAME : HVAC P — R 6-29-83
Plaza Level Slab : SAME : E — ELEC. INSP. NO. 75 C' 6/28/83 — R 6-28-83
POUR #10
Roof : (N)→(4) : STRUCTURE REBAR — BLDG. INSP. 55 CLV 6/28/83 — R 6-29-83
Roof : SAME : HVAC + P — mnm #81 06-28-83 — R 6-29-83
Roof : SAME : E — ELEC. INSP. NO. 75 C' 6/28/83 — R 6-28-83
POUR #8
2nd Level Slab : (8)→(12) (A)→(N) : STRUCTURE + REBAR — BLDG. INSP. 55 CLV 6/29/83 — R 6-30-83
2nd Level : SAME : HVAC + P — mnm #81 06-29-83 — R 6-30-83
2nd Level : SAME : E — ELEC. INSP. NO. 75 C' — R 6-30-83

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POUR #11B
- Roof: B→A→12→N : REBAR + STRUCT. — BLDG. INSP. 55 CLV 7/12/83 — R 7-13-83
- Roof: SAME : HVAC + P — mnm #81 07-12-83 — R 7-13-83
- Roof: SAME : E — R 7-13-83

POUR #11A
- Roof: 12→15 : REBAR + STRUCT — BLDG. INSP. 55 CLV 7/14/83 — R 7-15-83
- Roof: SAME : HVAC + P — R 7-15-83
- Roof: SAME : ELEC. — R 7-15-83

- Sewer Connection from ejector pump. P — Subject to mnm Water Test mnm 07-21-83 #81 (Water test OK) — R 7-22-83 SUBJECT TO P.L.
- Sewer Connection from ejector pump — mnm 07-22-83 #81 — R 7-22-83
- Storm drains connection at east — mnm 07-22-83 — R 7-22-83 SUBJECT TO P.L.
- Overhead Copper H_2O Lines — 8/2/83 MECH. INSP. 55 CLV — R 8-2-83 SUBJECT TO MECH. INSP. 55 CLV
- Coil Line Leak Test: 2nd Level: Combat Dorms + Mach. Rms — mnm 08-16-83 #81 — R 8-16-83
- Hot Water Supply + Return (Pressure test) Apparatus Bay + Dorm Area / VAV Terminal units Rough Test — mnm 08-19-83 #81
- Hot water Supply + Return (Pressure test) VAV Terminal units Rough Test Basement — mnm 08-22-83 #81
- Rough Gas Inspection + Pressure test 120 PSI Test OK — mnm 08-26-83 #81
- Pressure test Hot + Cold copper water lines 150 PSI Test OK — mnm 09-20-83 #81
- BAIT: ROUGH HVAC/P
- BAIT: FRAMING — SEE P-LIST
- Re Elect. Basement — BLDG. INSP. 55 CLV. 9/22/83 — ELEC. INSP. NO. 75 C 9/22/83
- Installation + water test on deck drain on south side of bowling plaza level. Test at no leaks noted mnm 09-23-83 #81

PLAZA LEVEL: 12→NORTH: FRAMING — BLDG. INSP. 55 CLV 6/1/84 but punch list — R FREE P-LIST 6-1-84
PLAZA LEVEL: 12→NORTH: ROUGH HVAC/P — mnm 10-6-83 — R 10-6-83 SUBJECT TO PUNCH LIST
PLAZA LEVEL: 12→NORTH: ROUGH E — R " " 6-1-84

2ND LEVEL: 12→NORTH*: FRAMING — SUBJECT TO PUNCH LIST BLDG. INSP. 55 CLV 11/8/83 — R FREE P-LIST 6-1-84
2ND LEVEL 12→NORTH*: ROUGH HVAC/P — R SUBJECT TO 6-1-84
2ND LEVEL: 12→NORTH*: ROUGH E — ELEC. INSP. NO. 75 C — R 11-2
* EXCEPT 326 327 328

Mpls Inspections Division — Property Information Card

Property Address: [redacted]

Johnnie Francis 7-2784

Plaza Level: (12) → south: Framing	SUBJECT TO BLDG. INSP. 55 CLV 11/9/83	TR	SUBJECT TO PUNCHLIST
" " " : HVAC/P	mnm 11-10-83 #81	TR	
" " " : Elec.	ELEC. INSP. NO. 75 CL 11/9/83	TR	"
2nd Level: (12) → south: Framing	BLDG. INSP. 55 CLV 12/23/83	TR	SUBJECT TO PUNCHLIST
" " " : HVAC/P	mnm 12-23-83 #81	TR	"
" " " : Electrical	ELEC. INSP. NO. 75 CL 12/22/83	TR	"
Basement: Building Final	SUBJECT TO PUNCHLIST BLDG. INSP. 55 CLV 4/10/84	TR	4-5-84
Basement: Electrical Final	SUBJECT TO PUNCHLIST ELEC. INSP. NO. 75-4-17-84	TR	4-5-84
Basement: Mech+Plumb. Final	SUBJECT TO PUNCHLIST mnm 04-10-84 #81	TR	4-5-84
Basement: Fire Dept. Final	SUBJECT TO PUNCHLIST Ree Swing 4/10/84	TR	4-5-84
Balance of Building: Building Final	SEE ACTUAL PERMIT CARD		
Balance of Building: Mech+Plumb. Final			
Balance of Building: Elec Final			
Balance of Building: Fire Final			