bfgc transmittal

to STATE OF CALIFORNIA
OFFICE OF STATE ARCHITECT
107 S. Broadway, Room 3029
Los Angeles, CA 90012

from SCOTT WAYTASHEK

date OCTOBER 19, 1989

re BAKERSFIELD CITY SCHOOLS

remarks

Transmitting, herewith one (1) set of drawing prints dated January 1989 and February 1989 for your records.

Sierra Jr. High Modernization
File No.: F-15-6
Appl. No.: A-51512

Horace Mann Modernization
File No.: F-25-16
Appl. No.: A-51532

Roosevelt School Modernization
File No.: F-15-6
Appl. No.: A-51474

Mt. Vernon Modernization
File No.: F-15-6
Appl. No.: A-51530

BC8168WB.T01

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bfgc architects planners inc
p.o. box 9698 bakersfield california 93389-9698
31 south real road 93309 fax: 805 832 0243
805 832 8122

51474

BSK & Associates, Geotechnical Consultants, Inc.

September 15, 1987 Our Job 87541

Dr. K.E. Garland
District Representative
Bakersfield City School District
Education Center
1300 Baker Street
Bakersfield, California 93305

SUBJECT: Roosevelt Elementary School
Geologic/Seismic Hazards
Request for Exemption

Gentlemen:

Our investigation shows that the Roosevelt Elementary School is located in an area that has no known or inferred active faults which cross or approach the property. Further, this school property is not located in a designated Special Studies Zone established by the Alquist-Priolo Act (see attached Site Location Map, Figure 1). Maps prepared by the California Division of Mines and Geology show that the site does not lie within a Special Studies Zone.

In view of these findings and that the scope of the work program is restricted to interior nonstructural remodeling as reported by Bakersfield City School District, it is our opinion that a geologic/ seismic hazards report is not required for this site and thus we request the granting of an exemption under Section 39002.5 of the Education Code.

We trust this information meets your requirements. If you need more information or have any questions, please contact us.

Respectfully submitted,

BSK & Associates

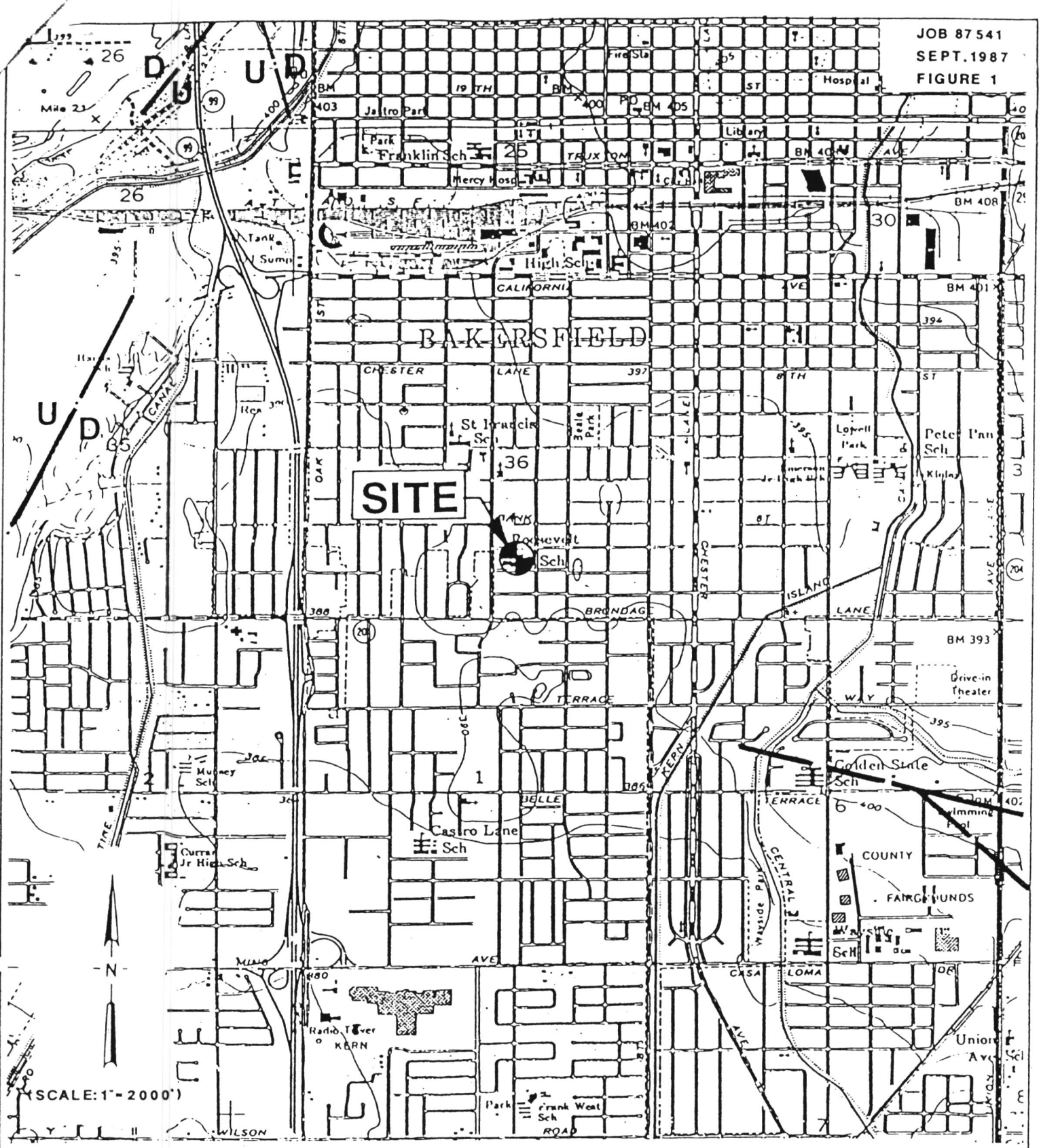
Theodore L. Smith

Theodore L. Smith
CEG 345

TLS:lk
Enclosure

cc: John Moore, BSK Bakersfield Office

JOB 87541
SEPT. 1987
FIGURE 1



LEGEND

——·—— SUBSURFACE FAULTS

——— SUBSURFACE FAULTS INFERRED - Exact Location Unknown

SITE LOCATION MAP

ROOSEVELT ELEMENTARY SCHOOL
BAKERSFIELD CITY SCHOOL DISTRICT

BSK & Associates GEOTECHNICAL CONSULTANTS

● TO Violeta

ROOM\STA. NO.

● FROM Pat Goodrich

● REPRESENTING

DATE	TIME	PHONE	☐ CALNET
		836-4300	

☐ TELEPHONED ☐ PLEASE CALL ☐ WAS IN

☐ RETURNED CALL ☐ WILL CALL AGAIN ☐ WANTS TO SEE YOU

☐ INFORMATION NOTE AND REPLY

☐ COMMENT ☐ RE-ROUTE ☐ MY SIGNATURE

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● MESSAGE/REMARKS

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STD. 7 (REV. 12-92)

92 64128

STATE OF CALIFORNIA

Pat: (805)
836-4811

Office of the State Architect

107 S. Broadway, Rm. 3029
Los Angeles, CA 90012

Please deliver the following document(s) to:

NAME: Pat Goodrich

OFFICE: BFGC

DATE: 10-25-93

TIME: 3:07

The number of pages being delivered including this cover sheet are: 4

If you do not receive all pages, please call

Violeta Amurao (name of sender)

as soon as possible at (213) 897-3995

CALNET _____.

FOR YOUR RECORDS, THE DIVISION OF THE STATE ARCHITECT, OFFICE OF REGULATION SERVICES,STRUCTURAL SAFETY SECTION, LOS ANGELES TELEFAX NUMBER IS (213) 897-3159 AND TELEPHONE NUMBER IS (213) 897-3995.

51474

STRUCTURAL CALCULATIONS

PROJECT DESCRIPTION:

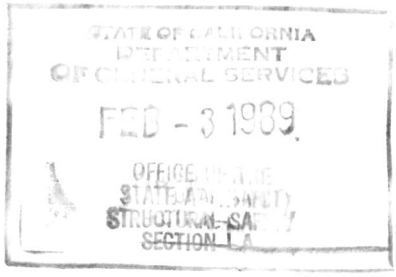
JOB NO. : 88107
NAME : ROOSEVELT SCHOOL
MODERNIZATION
ADDRESS : BAKERSFIELD, CA

CLIENT:

BFGC, INC.
31 SOUTH REAL ROAD
P.O. BOX 9698
BAKERSFIELD, CA. 93389-9698

STRUCTURAL ENGINEER:

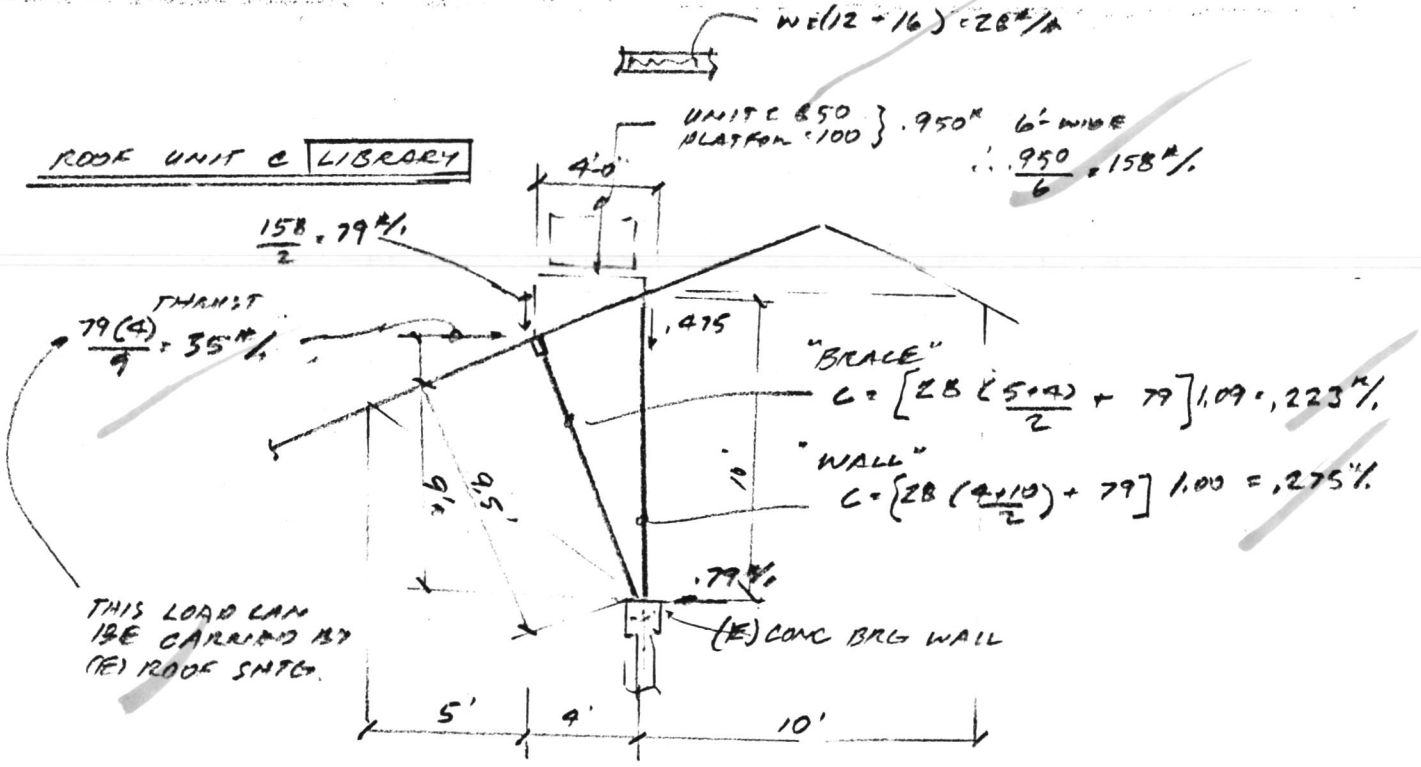
JOHN Q. FORESTELLE
STRUCTURAL ENGINEER
920 WIBLE ROAD
BAKERSFIELD, CA 93304
(805) 397-7800



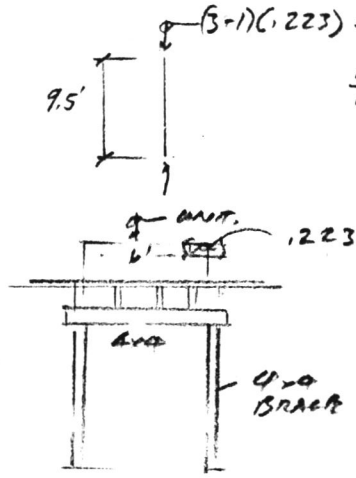
JOHN Q. FORESTELLE
STRUCTURAL ENGINEER
920 WIBLE ROAD BAKERSFIELD
CALIFORNIA 93304 (805) 397-7800

Subject .....

Job No. 88107
Sheet No. 1
Date 1-9-89
By JQF



"BRACE" 2-4x4 BRACES.



$\frac{KL}{d} = \frac{1(9.5\times12)}{3.5} = 32$

$\therefore P_{all} = (3.5\times3.5)\left(\frac{.3(1,600,000)}{(32)^2}\right) = 5.74^{\#} >> .892^{\#}$

TRY 4x4

S = 7.14
A = 12.25
I = 12.50

$M = .223(3)^2/8 = .25$

$f_b = \frac{.25(12)}{7.14} = .42 < 1.25$ OK

$Area = \frac{.669(1.5)}{.095(1.15)} = 9.18 < 12.25$ ∴ OK

BOTT CONN. "HUC44"

$P_{all} = .555(.80) = .428^{\#}$

THRUST $P_{act} = .79(3) = .237^{\#} < .428^{\#}$ OK

USE 4x4 BRACE @ EA END OF 4-0 BM. W/ "HUC40" @ EA END.
INCREASE SIZES TO 4-6 TO ACCOMMODATE NON-NOM. FROM 2x4 STUD WALL LATERAL SHEARS.

Subject .....

JOHN Q. FORESTELLE
STRUCTURAL ENGINEER

920 WIBLE ROAD BAKERSFIELD
CALIFORNIA 93304 (805) 397-7800

Job No. BB107
Sheet No. 2
Date 1-9-89
By JQF

ROOF UNIT @ LIBRARY (CONT)

"WALL"

$\therefore \frac{KL}{d} = \frac{1(10\times12)}{3.5} = 34$

$\frac{KL}{d} = \frac{1(3.5\times18)}{1.5} = 28$ } = 34

$\therefore P_{all} = (1.5\times3.5)\frac{(.3)(1,600,000)}{(34)^2} = 2,180\#$

$P_{act} = .550\# < 2.18\#$ ∴ OK

USE (E) 2-4@24" w/ BRACE @ 3'-6" O.C. MAX TIE BACK TO ∅ BRACE INCREASE BRACE TO ∅ 6 TO PICK UP NOM. MOMENT CAUSED BY THESE WALL SUPPORTS

CLG

NEW: T-BAR CLG 1.0
INSULATION .5
MISC. 1.0
} 2.5

(E) CLG. PLASTER & LATH - 5 TO 8 #/ft² > 2.5# BY 2½ TO 5½ #/ft²
∟ FRAMING.

NO ANALYSIS ON STABILITY FRAMING OF ROOF/CLG FRAMING IS REQ SINCE RECONSTRUCTION WILL LIGHTEN ROOF/CLG FRAMING BY 2½ TO 5½ #/ft²

JOHN Q. FORESTELLE
STRUCTURAL ENGINEER
920 WIBLE ROAD BAKERSFIELD
CALIFORNIA 93304 (805) 397-7800

Subject .....

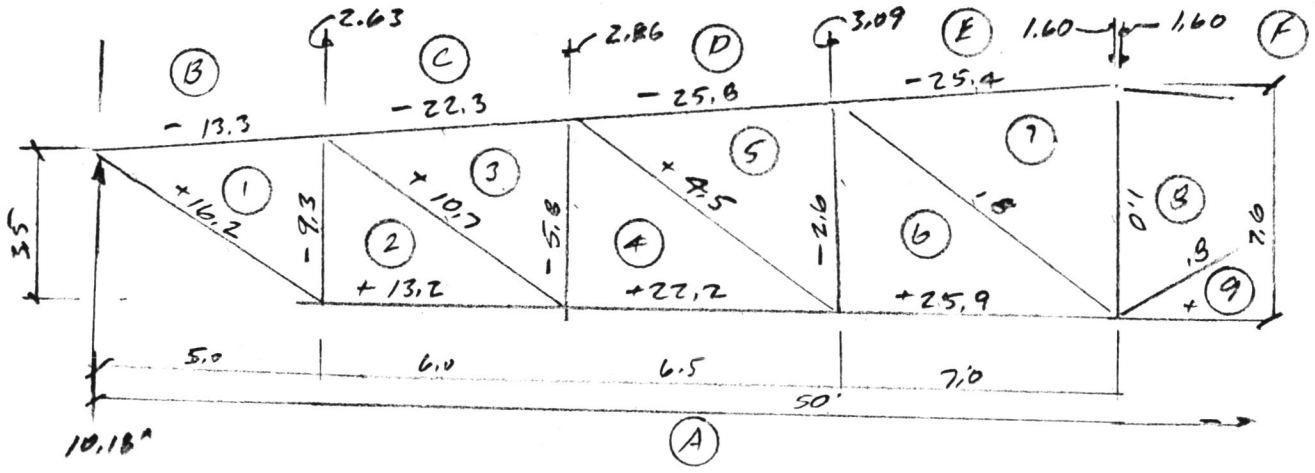
Job No. 88107
Sheet No. 3
Date 1-9-89
By JQF

CLG @ MULTI PURPOSE ROOM

D.L
(E) BUR = 6.0 = 6.0
10 SHTG = 2.2
2×10 @ 24" = 1.9
CLG = 5
MISC = 1.5
19.6 ≈ 20#
(N) T-BAR INSUL. = 2.0 → 2.0
(F) TRUSS @ BRACE = 2.0 → 2.0
20 + 2 = 22#/ft
22 + 2 = 24#/ft

LL T.A. = 14.3 × 24.5 (2)
700 #
∴ LL = 12

W_D+L = 14.3 (12 + 20) = .458 K/ft



Subject .....

JOHN Q. FORESTELLE
STRUCTURAL ENGINEER

920 WIBLE ROAD BAKERSFIELD
CALIFORNIA 93304 (805) 397-7800

Job No. 88107
Sheet No. 4
Date 1-9-89
By JQF

CLG @ MULTI PURPOSE ROOM (CONT)

MEMBER		LOAD	MEMBER	LENGTH	PAN CAP
BOTT. CHORD	A-6	+25.9	JL 5½×3×5/16 LLV	7.0	3.87 (15) = 58ᴷ ✓
	A-4	+22.2	"	6.5	
	A-2	+13.2	"	6.0	
TOP CHORD	13-1	-13.3	JL 5×3½×3/8 LLV	5.0	
	C-3	-22.3	"	6.0	
	D-5	-25.8	"	6.5	
	E-7	-25.4	"	7.0	105ᴷ ✓
DIAG WEB	1-A	+16.2	JL 3×2½×¼ LLB-D	7.0	
	2-3	+10.2	JL 2½×2×¼	7.3	2.13 (15) = 32ᴷ ✓
	4-5	+4.5	"	8.1	
	6-7	+1.8	"	8.8	
VERT WEB	1-2	-9.3	JL 2½×2×¼	4.0	37.0
	3-4	-5.8	"	4.5	35.5
	5-6	-2.6	"	5.0	34.0 ✓
	7-8	+1.0	JL 2½×2½×¼	5.5	35.0 ✓

MAX COMP = A-6
(A-4) +16.2ᴷ
(A-6) +25.9ᴷ

6-¾" RIVETS D.S.
6 (7.03) = 42.2ᴷ > 25.9ᴷ OK

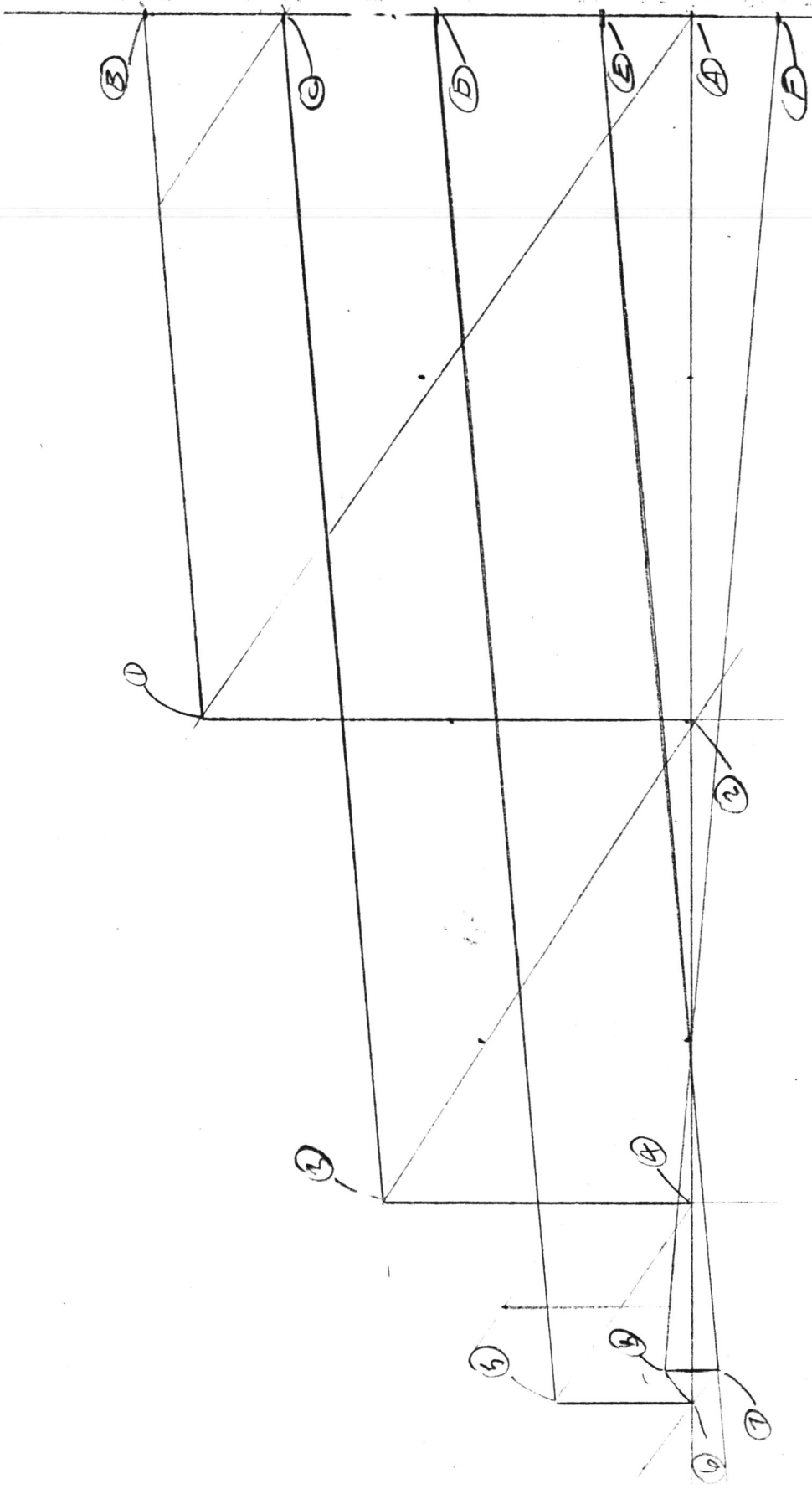
ALL (E) MEMBERS & CONN. ARE OK W/O STRENGTHEN
2. ADD NEW CLG. W/(E) CLG. REMAINING

Subject .....

JOHN Q. FORESTELLE
STRUCTURAL ENGINEER

920 WIBLE ROAD BAKERSFIELD
CALIFORNIA 93304 (805) 397-7800

Job No. BB107
Sheet No. 5
Date 1-9-89
By JQF



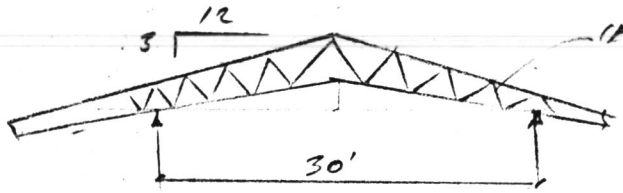
Subject .....

JOHN Q. FORESTELLE
STRUCTURAL ENGINEER

920 WIBLE ROAD BAKERSFIELD
CALIFORNIA 93304 (805) 397-7800

Job No. 88107
Sheet No. 10
Date 1.9.89
By JQF

NEW CLGS & BLDGS 200, 300, 400 & 500



DL

(E) D.L ROOF	RFG =	= 3.5	11.0 #/ft
	1/2 SHTG	= 2.5	
	2x4 @ 24"	= 1.0	
	TRUSSES @ 4'	= 3.0	
	MISC	= 1.0	
(N) DL CLGS	2x3 @ 24"	= .5	2.0 #/ft
	1"x3 @ 12"	= .5	
	A.C. TILE	= 1.0	

13.0 #

LL 20 #/ft

∴ Σ DL = 13 #/ft
LL = 20
} 33 #/ft

RECONSTRUCTION

CLGS
(E) ROOF LOAD = 11.0
(E) 2x3 @ 24" .5
(N) 1"x4 @ 12" .5
T-BAR (N) = 1.0
INSUL. (N) = .5
REMOVE (E) A.C. TILE = 0
} 2.5
} 13.5 #

INCREASE IN D.L ONLY = $\frac{13.5}{13} = 1.038 \rightarrow 3.8\% < 5\%$

INCREASE IN DL+LL = $\frac{33.5}{33} = 1.015 \rightarrow 1\frac{1}{2}\% < 5\%$

- INCREASE IN VERT LOADS IS VERY SMALL (ABOUT 1/2% OF D+L)
- ESTIMATED LOADS CAN NOT BE DETERMINED TO AN ACCURACY OF LESS THAN 5%
- ∴ REMOVE (E) A.C. TILE ADD NEW T-BAR & INSUL. REANALYSIS OF ROOF FRAME IS NOT WARRANTED

JOHN Q. FORESTELLE
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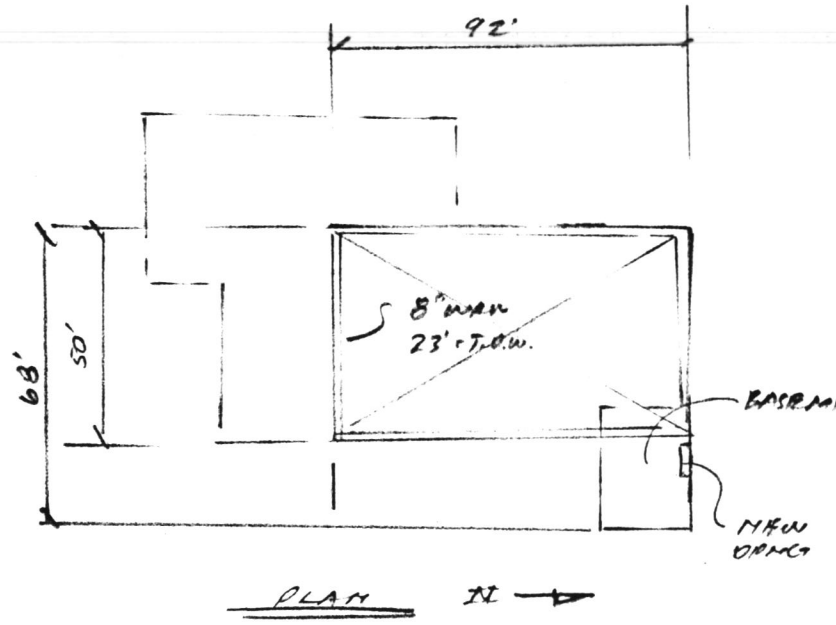
920 WIBLE ROAD BAKERSFIELD
CALIFORNIA 93304 (805) 397-7800

Subject .....

Job No. BB107
Sheet No. 11
Date 1.9.89
By JQF

DUCT PENNITRATION @ BASEMENT (BLDG 100)



APPROX DL TO ROOF

NAILS = $\frac{23}{2}\left(\frac{8}{12}\right)(150)(284') = 327^{\#}$

ROOF = 25(50×92) = 115#

MISC = ALLOW 10% = 50#

492

SAY 500#

$V = \frac{.186(500)}{2} = 46.5^{\#}$/FOOT WALL

(F) 8" WALL

$V_u = 1.43(46.5) = 66.5^{K}$

$N_u = \frac{66.5}{.85(8)(12\times50')(.8)} = .020^{K/in^2}$

$N_a = 2\sqrt{f_c} = 2\sqrt{2000} = .089^{K/in^2}$

$N_u < \frac{N_a}{2} = \frac{.089}{2} = .045^{K/in^2}$

∴ REMAINING CONC WALL IS ADEQUATE W/ DUCT HOLE FOR CURRENT CODE EQ LOADING V = .186 WL BY TWICE

Subject .....

JOHN Q. FORESTELLE
STRUCTURAL ENGINEER

920 WIBLE ROAD BAKERSFIELD
CALIFORNIA 93304 (805) 397-7800

Job No. 88107
Sheet No. 12
Date 1-9-89
By JQF

REF: T24 - 2-2312 g
TABLE 2-23J PART B

HC/1

DATA

EQUIP MODEL =

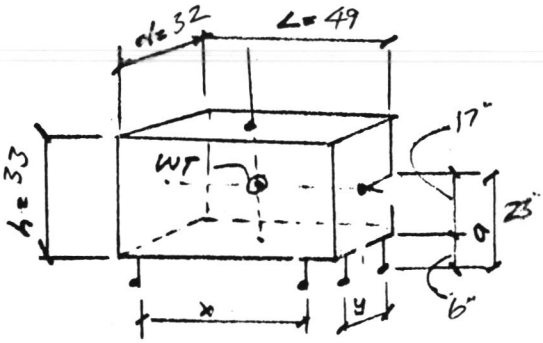
OPERATING WT. = 400 #

TYPE OF ANCHORAGE = LAG BOLTS

LOADS

C_{PH} = .33 ( ) ( ) = .33

(2 = IF ISOLATORS)
(2/3 IF ON GROUND)



$C_{PV} = \frac{C_{PH}}{3} = (.33)/3 = .11$

LET $y < x$

N = NUMBER OF LAGS = 4 MIN.

VERT ANCHORAGE

VERT PULLOUT (UPLIFT) / LEG = $(C_{PV})(WT)/N = .11(400)/4$ ↑ = 11

VERT PULLOUT (OTM) / LEG = $(C_{PH})(WT)(a)/y(N) = \frac{.33(400)(23)}{32(2)}$ ↑ = 47

VERT DEAD LOAD / LEG = $WT/(N) = \frac{400}{4}$ ↓ = 100

ALLOW. VERT. UPLIFT / LEG =
3/8" x 3" LAG BOLT → T_{ALL} = .834# > NO UPLIFT > = 42

∴ NO NET UPLIFT

HORIZ ANCHORAGE

SHEAR / LEG = $(C_{PH})(WT)/(N) = \frac{.33(400)}{4} = 33$

ALLOW. SHEAR / LEG.
3/8" x 3" LAG BOLT → V_{ALL} = .260

COMBINED HORIZ & VERT

$\frac{\text{VERT ACT.}}{\text{VERT ALL.}} + \frac{\text{HORIZ ACT.}}{\text{VERT ALL.}} = \frac{0}{834} + \frac{.033}{.260} = .13 \leq 1.0$

USE 4 - 3/8" x 3" LAG BOLTS BETWEEN UNIT & PLATFORM
6-LAG BOLTS CALLED FOR

Subject .....

JOHN Q. FORESTELLE
STRUCTURAL ENGINEER

920 WIBLE ROAD BAKERSFIELD
CALIFORNIA 93304 (805) 397-7800

Job No. 88107
Sheet No. 13
Date 1.9.89
By JQF

REF: T24 - 2-2312 g
TABLA 2-23J PART B

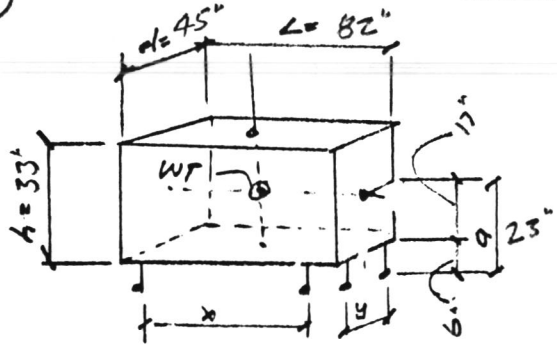
HC/2 & HC/3 (ACTUAL WT = 630 & 650)
⊥ OR

DATA

EQUIP MODEL =

OPERATING WT. = 850#

TYPE OF ANCHORAGE = LAG BOLTS



LOADS

$C_{PH} = .33(1)(1) = .33$
(2 = IF ISOLATORS)
(⅔ IF ON GROUND)

$C_{PV} = \frac{C_{PH}}{3} = (.33)/3 = .11$

LET y < x

N = NUMBER OF LAGS = 4 MIN.

VERT ANCHORAGE

VERT PULLOUT (UPLIFT) / LEG = $(C_{PV})(WT)/N$ = .11 (850)/4 ↑ = 47

VERT PULLOUT (OTM) / LEG = $(C_{PH})(WT)(a)/y(N)$ = $\frac{.33(850)(23)}{45(2)}$ ↑ = 72

VERT DEAD LOAD / LEG = $WT/(N) = \frac{850}{4}$ ↓ = 212

ALLOW. VERT UPLIFT / LEG =
3/8" x 3" LAG BOLT
$T_{ALL} = (2"\text{ EMBED})(.313)(F_3) = .834^{\#} > \text{NO LOAD}$ → > ↓ = 93
∴ NO NET UPLIFT

HORIZ ANCHORAGE

SHEAR / LEG = $(C_{PH})(WT)/(N) = \frac{.33(850)}{4}$ = 70

ALLOW. SHEAR / LEG.
3/8" x 3" LAG BOLT ⊥ GRAIN
$V_{ALL} = .195(F_3) = .260^{\#}/\text{BOLT} > .070^{\#}$

COMBINED HORIZ & VERT

$\frac{\text{VERT ACT}}{\text{VERT ALL.}} + \frac{\text{HORIZ ACT.}}{\text{VERT ALL.}} = \frac{0}{834} + \frac{.070}{.260} = .27 \leq 1.0$

USE 4 - 3/8" x 3" LAG BOLTS
BETWN UNIT & PLATFORM
6 - LAG BOLTS CALLED FOR

Subject .....

JOHN Q. FORESTELLE
STRUCTURAL ENGINEER

920 WIBLE ROAD BAKERSFIELD
CALIFORNIA 93304 (805) 397-7800

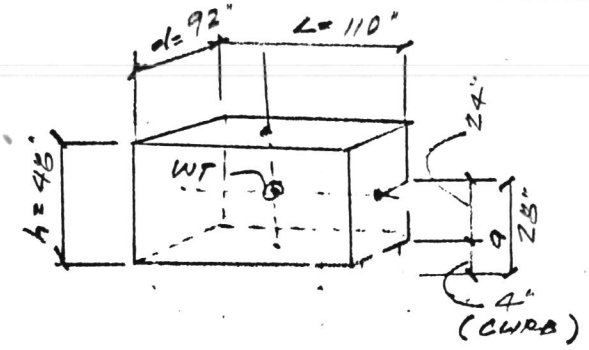
Job No. 88107
Sheet No. 14
Date 1.9.89
By V.O.F.

REF: T24 - 2-2312 g
TABLA 2-23J PART B

HC-4

DATA

EQUIP MODEL = DISS240
OPERATING WT. = 2660
TYPE OF ANCHORAGE = BOLTED



LOADS

$C_{pH} = .33(\frac{2}{3})(1) = .22$
(2 = IF ISOLATORS)
($\frac{2}{3}$ IF ON GROUND)

$C_{pV} = \frac{C_{pH}}{3} = (.22)/3 = .073$

LAT $d < L$

N = NUMBER OF LEGS = 4

VERT ANCHORAGE

VERT PULLOUT (UPLIFT)/LEG = $(C_{pV})(WT)/N = .073(2660)/4$ ↑ = 49
VERT PULLOUT (OTM)/LEG = $(C_{pH})(WT)(a)/d(N) = \frac{.22(2660)(28)}{92(2)}$ ↑ = 89
VERT DEAD LOAD/LEG = $WT/(N) = \frac{2660}{4}$ ↓ = 665
ALLOW. VERT. UPLIFT/LEG = ~~3/8"x3" LAG BOLT EMBED 2" MIN.~~ $\therefore T_{up} = (313)(2")(\frac{4}{3}) = 835$ > ↓ = 527 NO NET UPLIFT
1/2" WEDGE ANCHOR = 1,380# >

HORIZ ANCHORAGE

SHEAR/LEG = $(C_{pH})(WT)/(N) = .22(2660)/4 = 146$
ALLOW. SHEAR/LEG. = ~~3/8"x3" LAG BOLT w/ MIN EDGE & = (195)(4/3) = 260~~
1/2" WEDGE ANCHOR = 1.42 K
EMBED 2½"

COMBINED HORIZ & VERT

$\frac{\text{VERT ACT}}{\text{VERT ALL.}} + \frac{\text{HORIZ ACT.}}{\text{HORIZ ALL.}} = \frac{-0-}{~~856~~\ 1,380} + \frac{.106}{~~260~~\ 1.42} = .10 \leq 1.0$

USE 1/2"ϕ WEDGE ANCHOR
RED HEAD - ICBO 1372
WS 1236 4 TOTAL
1 EA CORNER

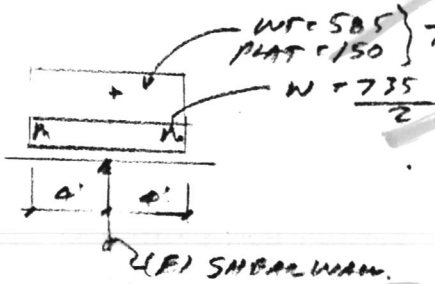
Subject .....

JOHN Q. FORESTELLE
STRUCTURAL ENGINEER

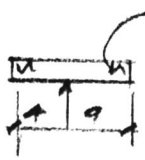
920 WIBLE ROAD BAKERSFIELD
CALIFORNIA 93304 (805) 397-7800

Job No. 88107
Sheet No. 14.1
Date 1.19.89
By JQF

ROOF MTD. FURNACE



4x8 TAPERED SUPPORTED BY (E) 2x S.P. WALL BELOW



$M = .046(4)^2/2 = .370$

$S_{REQ} = \frac{.370(12)}{1,250} = 3.55^{in^3}$ $\quad S = \frac{bd^2}{6}$

$d_{min} = \sqrt{\frac{3.55(6)}{3.5}} = 6.08 < 7.25 - .375 = 6.38'$
SLOPE 3
OR

NOT ALL VERT LOAD IS GOING DIRECTLY THRU 4x6 FLAT BLOCK OVER (E) S.P. 2. NO LOAD IS BEING TRANSFED TO THE (E) ROOF TRUSSES EXCEPT THE REACTIONS TO THE DTM. CAUSED BY LATERAL LOADS IN THE LONGITUDINAL DIRECTION. THESE LOADS ARE MUCH LESS THAN NORMAL ROOF LIVE LOADS THAT THE TRUSS WAS DESIGNED FOR.

USE 4x8 TAPERED (x9'0") @ EA LONGITUDINAL EDGE.

JOHN Q. FORESTELLE
STRUCTURAL ENGINEER
920 WIBLE ROAD BAKERSFIELD
CALIFORNIA 93304 (805) 397-7800

Subject .....

Job No. 88107
Sheet No. 14.2
Date 1.19.89
By JQF

REF: T24 - 2-2312 g
TABLA 2-23J PART B

FURNACE @ BLDG 400 & 500

DATA

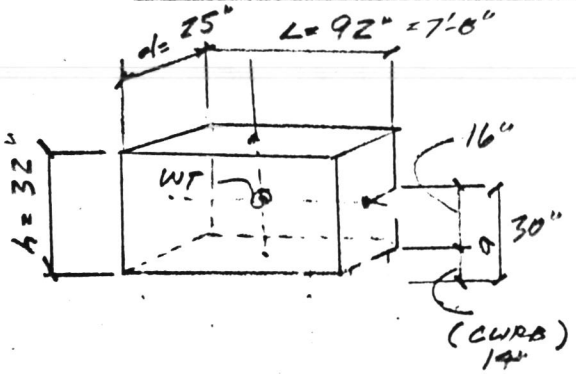
	FURNACE
EQUIP MODEL	MODEL 75
OPERATING WT.	585
TYPE OF ANCHORAGE	LAG BOLTED

LOADS

C_{pH} = .33 (1)(1) = .33
(2 = IF ISOLATORS)
(⅔ IF ON GROUND)

$C_{pV} = \frac{C_{pH}}{3} + (.33)/3 = .11$

N = NUMBER OF LAGS = 4



LAT d < L

VERT ANCHORAGE

VERT PULLOUT (UPLIFT)/LAG = $(C_{pV})(WT)/N = .11(585)/4$ ↑ = 16

VERT PULLOUT (OTM)/LAG = $(C_{pH})(WT)(a)/d(N) = \frac{.33(585)(30)}{25(2)}$ ↑ = 116

VERT DEAD LOAD/LAG = WT/(N) = 585/4 ↓ = 146

ALLOW. VERT UPLIFT/LAG = ⅜"×3" LAG BOLT EMBED 2" MIN.
$\therefore T_{up} = (313)(2")(4_3) = 835 >$ ↓ = 14
NO NET UPLIFT

HORIZ ANCHORAGE

SHEAR/LAG = $(C_{pL})(WT)/(N) = .33(585)/4 = 48$

ALLOW. SHEAR/LAG. = ⅜"×3" LAG BOLT W/ MTL SIDE PL = $(195)(4_3) = 260 > 48$ OK

COMBINED HORIZ & VERT

$$\frac{\text{VERT ACT.}}{\text{VERT ALL.}} + \frac{\text{HORIZ ACT.}}{\text{HORIZ ALL.}} = \frac{-0-}{835} + \frac{48}{260} = .19 \leq 1.0$$

USE 4 - ⅜"×3" LAG BOLTS TOTAL BTWN UNIT & PLATFORM
6 - LAG BOLTS CALLED FOR.

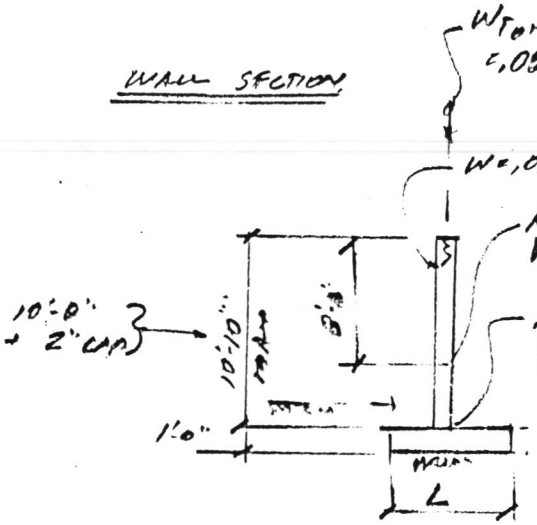
Subject ..... CHILLER YARD.

JOHN Q. FORESTELLE
STRUCTURAL ENGINEER

920 WIBLE ROAD BAKERSFIELD
CALIFORNIA 93304 (805) 397-7800

Job No. 88107
Sheet No. 15
Date 1.9.89
By JQF

WALL SECTION



WALL = 8"C.B = 77
PLASTER = 10
87 #/#

h/t – NOT APPLICABLE SINCE A FRAME & NOT PART OF A BLDG.

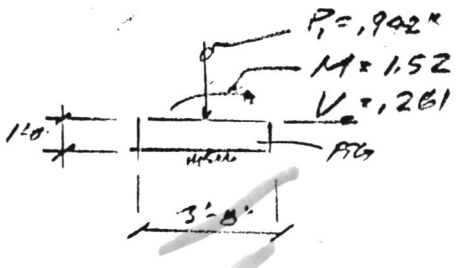
LAT
WL = 15 #/#

FW = Fp = ZICp W
Z = 1.0
I = 1.0
Cp = .3
Fp = .3 WT
.3(.057) = .026 #/#
.026 #/#

REINF @ 16" O.C. MAX
GROUT ALL CELLS.

Pb = 1200 PSF - SANDY LOAM.
OSA INSPECTION f'm = 1,500
f'c = 20 M'
N = 20

FOOTING



WT = .992 + FTG = 1.992 K
MAT = 2.73
MOT = 1.80
SF = 1.52 > 1.50
X̄ = .626'
Pb = 1.59
= 0
< 1.20 (4/3) = 1.60 KSF OK

USE 1'-0" THICK x 3'-8" WIDE CONT FTG CENTERED BELOW WALL W/ NOMINAL REINF.

Subject .....
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.....
.....

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STRUCTURAL ENGINEER

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Job No. 88107
Sheet No. 16
Date 1.9.89
By VDF

C.B WALL

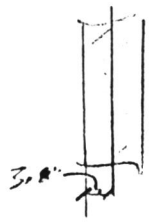
CONC. / MASONRY FLEXURAL CALCULATION

```
FLEXURAL DURATION FACTOR     = 1.333
BAR AREA (SQ INCHES)         =  .2
BAR SPACING (INCHES)         =  16
WIDTH OF MEMBER (INCHES)     = 12
DEPTH OF BAR (INCHES)        =  5.3
ALLOW STL STRESS (FLEX)      =  20
ALLOW CONC STRESS (FLEX)     = .5
ULT. CONC/MAS STRESS (FLEX)=  1.5
MODULAR RATIO                = 20
MOD OF ELAST (STEEL)  KSI    = 29000
MOD OF ELAST (MASON)  KSI    = 1500
MOD OF ELAST (CONC)   KSI    = 2207.60051
MOMENT FOR MAS/CONC   (MC)   = 2.25057692 > 1.52
  RATIO = .675382382
MOMENT FOR STEEL      (MS)   = 1.61104526 > 1.52
  RATIO = .943486839
PN    = .0471698113
J     = .912140446
2/JK = 8.31874923
```

USE 8" CONC BLOCK
FILL ALL CELLS W/ GROUT
#4@16" EF VERT
d=5.3'
#4@16" HORIZ. o/c

CONC. / MASONRY FLEXURAL CALCULATION

```
FLEXURAL DURATION FACTOR     = 1.333
BAR AREA (SQ INCHES)         =  .2
BAR SPACING (INCHES)         =  16
WIDTH OF MEMBER (INCHES)     = 12
DEPTH OF BAR (INCHES)        =  3.8
ALLOW STL STRESS (FLEX)      =  20
ALLOW CONC STRESS (FLEX)     = .5
ULT. CONC/MAS STRESS (FLEX)=  1.5
MODULAR RATIO                = 20
MOD OF ELAST (STEEL)  KSI    = 29000
MOD OF ELAST (MASON)  KSI    = 1500
MOD OF ELAST (CONC)   KSI    = 2207.60051
MOMENT FOR MAS/CONC   (MC)   = 1.31029697 > .978
  RATIO = .746395683
MOMENT FOR STEEL      (MS)   = 1.13850502 > .978
  RATIO = .859021248
PN    = .0657894737
J     = .899044511
2/JK = 7.34509828
```



USE 8" CONC BLOCK
FILL ALL CELLS W/ GROUT
#4@16" VERT d=3.8'
#4@16" HORIZ.
@ 8'-8" FROM TOP.

Subject .....

JOHN Q. FORESTELLE
STRUCTURAL ENGINEER

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Job No. 88107
Sheet No. 17
Date 1-9-89
By J.Q.F.

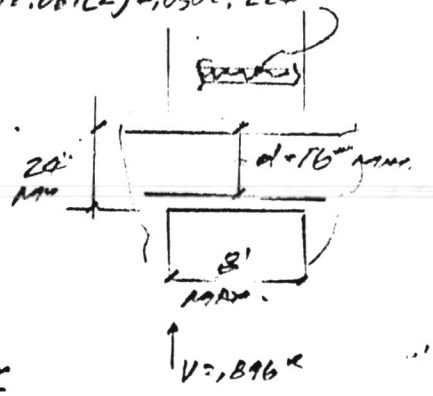
C.B. LINTEL

CONC. / MASONRY FLEXURAL CALCULATION

FLEXURAL DURATION FACTOR	=	1
BAR AREA (SQ INCHES)	=	.2
BAR SPACING (INCHES)	=	7.63
WIDTH OF MEMBER (INCHES)	=	7.63
DEPTH OF BAR (INCHES)	=	16
ALLOW STL STRESS (FLEX)	=	20
ALLOW CONC STRESS (FLEX)	=	.5
ULT. CONC/MAS STRESS (FLEX)	=	1.5
MODULAR RATIO	=	20
MOD OF ELAST (STEEL) KSI	=	29000
MOD OF ELAST (MASON) KSI	=	1500
MOD OF ELAST (CONC) KSI	=	2207.60051
MOMENT FOR MAS/CONC (MC)	=	8.48011914 > 1.43
~~RATIO = .168629706~~		
MOMENT FOR STEEL (MS)	=	4.9327772 > 1.43
~~RATIO = .289697545~~		
PN	=	.0327653997
J	=	.924895725
2/JK	=	9.59734945

OR

MISC
W = .087(2) + .050 = .224 K/L



FLEX

- 8' -

$M_{TOP} = .224(8)^2/10 = 1.43^{K'}$
MAX

SHEAR

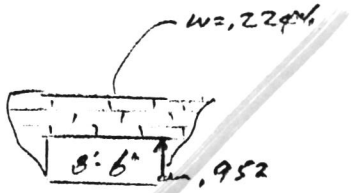
$V = .896^K$

$v = \frac{.896}{7.625(16).9} = .0082^{KSI}$

$v_{AM\ w/o\ WEB\ REINF} = .025^{KSI} > .0082$
$\therefore$ OK
NO WEB REINF NEEDED

ALTERNATE

8'-6" OPNG.



FLEX: $M = .224(8.5)^2/8 = 2.02^{K'} < 4.93^{K'}$ OK

SHEAR $v = \frac{.952}{7.625(16).9} = .0087^{KSI} < .025^{KSI}$
OR
(NO WEB STL REQ'D)

USE 8" C.B LINTEL
24" DEEP (16" d MIN.)
#4 @ 16" VERT
#4 @ TOP & BOTT
#16" HORIZ.
SPAN ≤ 8.5' OR LESS

Subject .....

JOHN Q. FORESTELLE
STRUCTURAL ENGINEER

920 WIBLE ROAD BAKERSFIELD
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Job No. 88107
Sheet No. 15
Date 1.9.89
By JQF

METAL DECK

PERM. LOADS

$W_{DL} = 2$
$LL = 20$ } 22

$M = .022(15.3)^2/8 = .644''/'$

CONSTRUCTION LOADS

$M = .200(15.3)/4 = .765''/'$

$M_{MAX} = .765''/'$

IF UNTESTED $\therefore F_y = 25^{KSI}$

$\therefore S_{REQ} = .765(12)/.60(25) = .612''^3 < .735''^3$

18GA → 3" → $S = .735$, $I = 1.222$

$\Delta = .765(15.3)^2/161(1.222) = .91'' \rightarrow L/201 < L/180$ AK

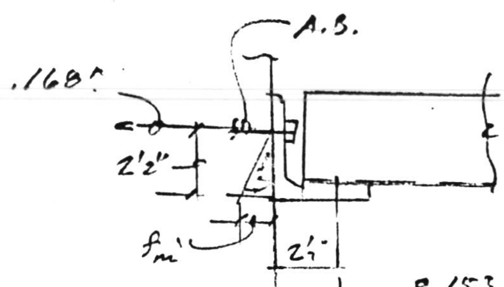
USE 3" x 18GA MTL. DECK F_y DESIGN = 25 KSI
$\therefore$ NO TESTING.

JOHN Q. FORESTELLE
STRUCTURAL ENGINEER
920 WIBLE ROAD BAKERSFIELD
CALIFORNIA 93304 (805) 397-7800

Subject ....

Job No. 88107
Sheet No. 19 of 19
Date 1-9-89
By JQF

METAL DECK LEDGERS



$P = \frac{15.3}{2}(20+2) = .168^{k}/'$

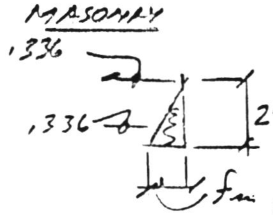
A.B @ 24"

SHEAR → $V = \frac{24}{12}(.168) = .336^{k}$

TEN → $T = \frac{24}{12}(.168) = .336^{k}$

COMBINED $= \frac{.336}{.750} + \frac{.336}{.750} = .896 > 1.0$ OK

MASONRY



f_m $(12) f_m \frac{(2.5)}{2} = P$ ∴ $f_m = \frac{2(.336)}{2.5(12)} = .0224 < .125(1.5) = .188^{ksi}$ OK

ASSUME 12" TRIB WIDTH DISTRIBUTION FROM ANGLE

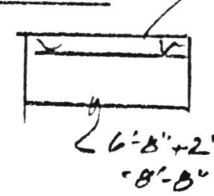
ANGLE $M = .168(2.5) = .42^{"k}$

$t = \sqrt{\frac{.42(6)}{.75(25)(12)}} = .105" < .188 \rightarrow 3/16"$

> USE L 3×3×3/16 CONT.
> W/ 5/8"φ×6" A.B @ 24"

LINTEL (IF USED)

$W = \frac{15.3}{2}(22) = .168^{k}/'$



$S_{REQ} = \frac{.168(8.67)^2(12)}{8(.6 \times 25)} = 1.27^{in^3} < 1.60 \rightarrow L6\times4\times$ LLH.

> USE L 6×4×3/8" LLH. @ OPNGS
>
> USE NOMINAL SEAT PL OR ANGLE WHERE NO OPNGS OCCUR