

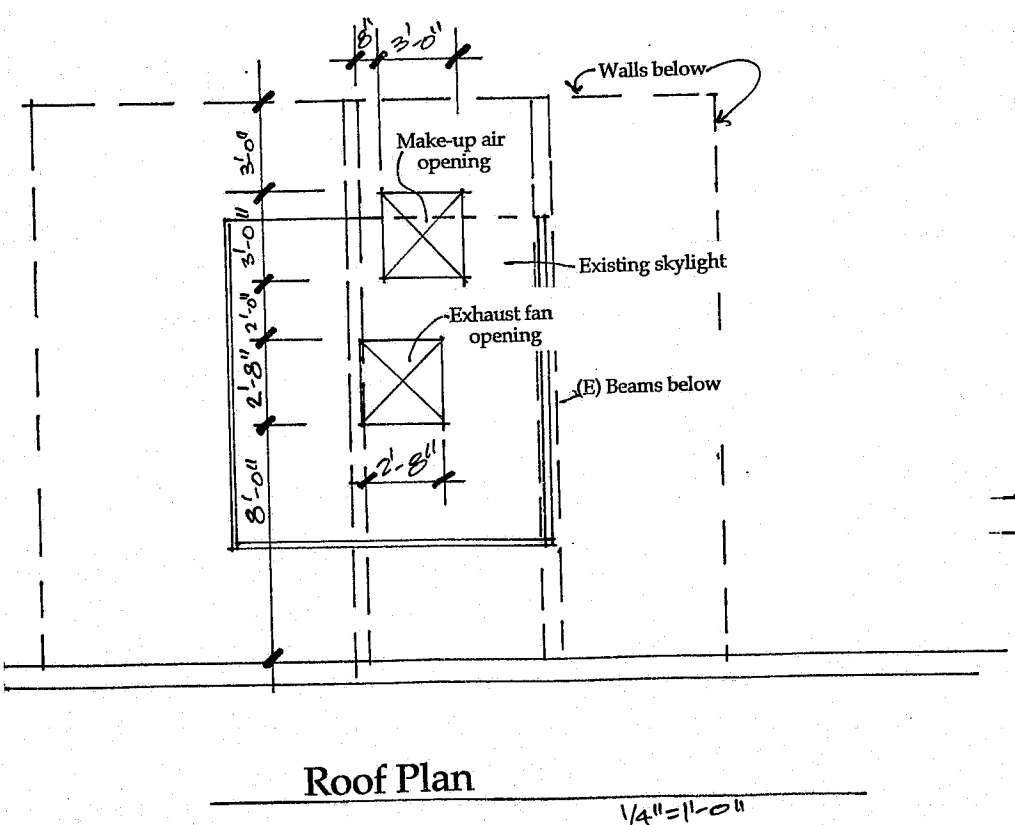
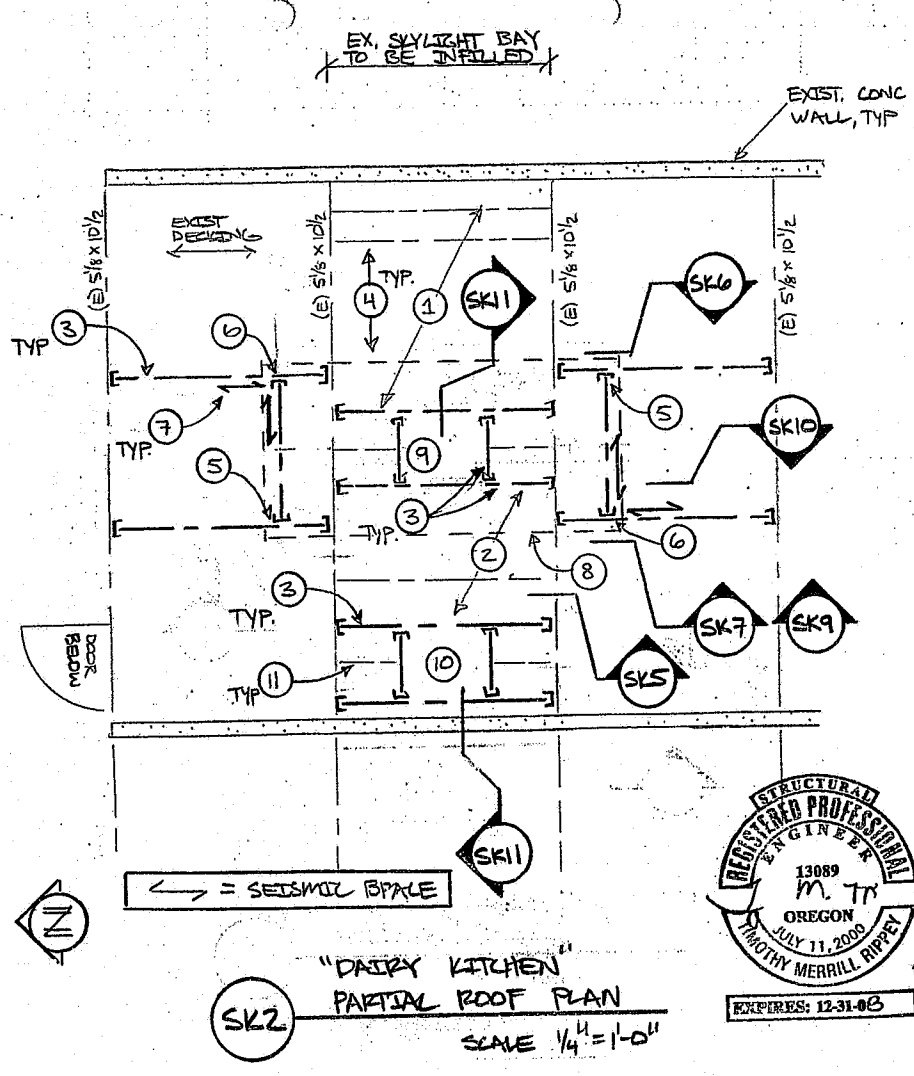
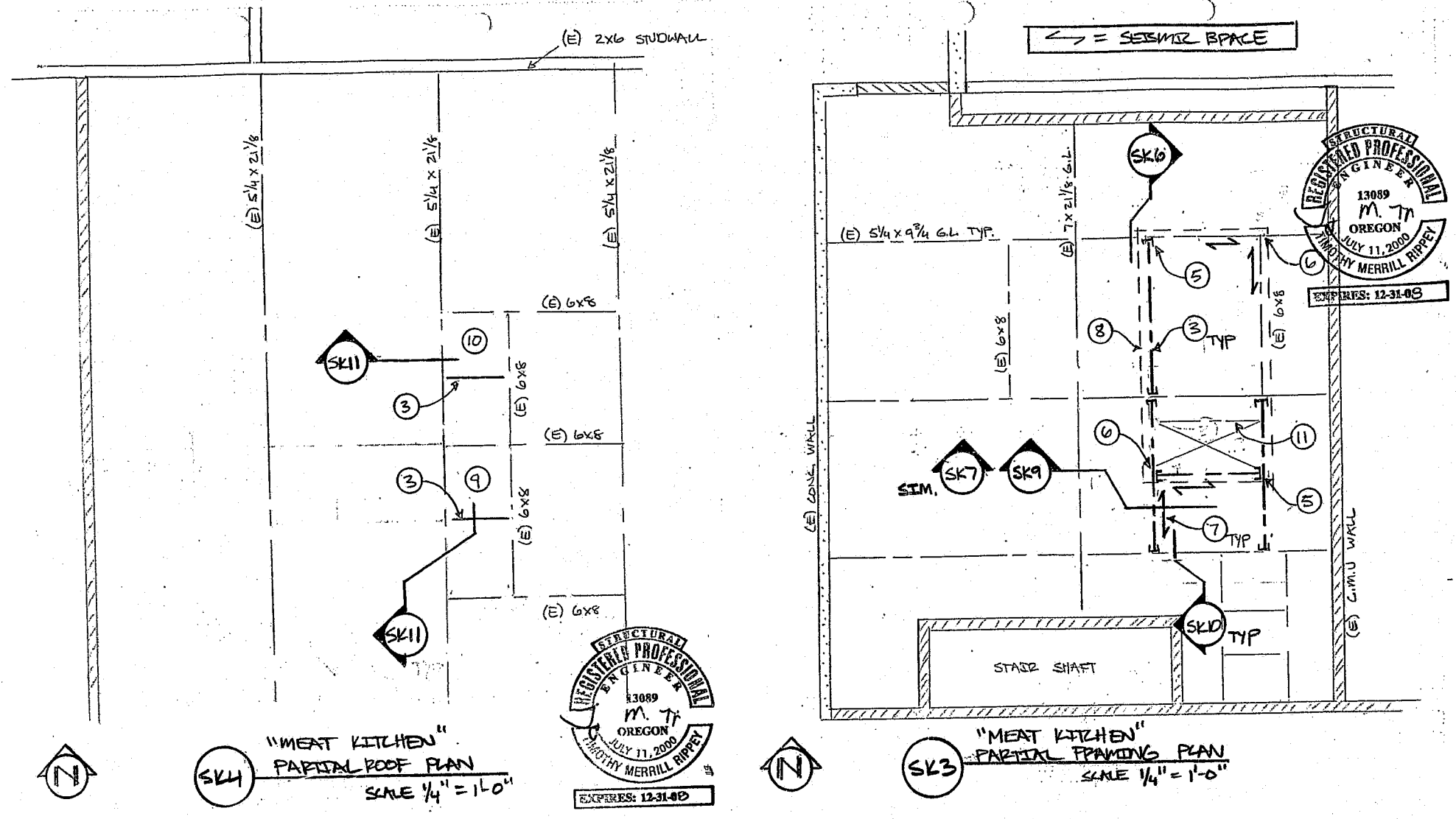
6651 SW CAPITOL HWY REV-01 FA06-176088 1.

MAR 07 2008
MICROFILMED
EN

24X

19

A



FRAMING KEYNOTES

1. NEW 2X6 D.F. #2 JOISTS AT 1'-4" O.C. WITH SIMPSON "LUS26" HANGERS. (8) 10D NAILS PER HANGER TYP. SPACE FIRST JOIST 8" +/- FROM EXISTING CONCRETE WALL.
2. NEW 2X6 D.F. #2 JOISTS AT 2'-0" O.C. WITH SIMPSON "LUS26" HANGERS. (8) 10D NAILS PER HANGER TYP.
3. NEW 4X6 D.F. #2 BEAM WITH SIMPSON "LUS46" HANGERS. (8) 16D NAILS PER HANGER TYP.
4. 19/32" PLYWOOD OR OSB ROOF SHEATHING WITH 8D NAILS AT 6" O.C. AT SUPPORTED PANEL EDGES AND 8D NAILS AT 12" O.C. AT INTERMEDIATE SUPPORTS. DIRECTION OF STRONG AXIS OF PLYWOOD SHOWN.
5. 1/2" DIAMETER ALL-THREAD HANGER. VERIFY CONNECTION TO NEW HOOD WITH MANUFACTURER.
6. 1/2" DIAMETER ALL-THREAD HANGER WITH UNISTRUT CHANNEL STIFFENER. VERIFY CONNECTION TO NEW HOOD WITH MANUFACTURER.
7. P1000 UNISTRUT SEISMIC BRACE. 45 DEGREE MAXIMUM ANGLE. (MEASURED FROM HORIZONTAL)
8. EXHAUST HOOD OUTLINE SHOWN BELOW ROOF LEVEL. OPERATING WEIGHT 520 LB. (INCLUDES CURB WEIGHT). VERIFY MINIMUM DISTANCE FROM FAN UNIT.
9. NEW FAN UNIT. OPERATING WEIGHT 520 LB. (INCLUDES CURB WEIGHT)
10. NEW MAKE-UP AIR UNIT. OPERATING WEIGHT 625 LB. (INCLUDES CURB WEIGHT). VERIFY MINIMUM DISTANCE FROM FAN UNIT.
11. 2X6 D.F. #2 INFILL FRAMING OR FRAMING AROUND DUCTWORK OPENING AS REQUIRED. HANGERS SIMILAR TO KEYNOTE 1.

GENERAL STRUCTURAL NOTES

DESIGN CRITERIA:
DESIGN WAS BASED ON THE STRENGTH AND DEFLECTION CRITERIA OF THE 2003 INTERNATIONAL BUILDING CODE.

DESIGN OF THE VERTICAL AND LATERAL LOAD CARRYING MEMBERS WAS DETERMINED BASED ON WEIGHT OF 50 LB. DESIGN OF THE HOOD ASSEMBLY AND ITS CONNECTIONS TO THE BRACES IS BY OTHERS AND SHALL BE VERIFIED PRIOR TO INSTALLING.

CODE REQUIREMENTS:
CONFORM TO THE 2003 INTERNATIONAL BUILDING CODE AND THE SEISMIC PROVISIONS FROM THE ASCE 7-02, MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES.

EXISTING CONDITIONS:
THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS, DIMENSIONS AND ELEVATIONS. THE CONTRACTOR SHALL NOTIFY THE ARCHITECT/ENGINEER OF ANY DISCREPANCIES FROM CONDITIONS SHOWN ON THE DRAWINGS PRIOR TO THE START OF THE WORK.

TEMPORARY CONDITIONS:
THE CONTRACTOR SHALL BE RESPONSIBLE FOR STRUCTURAL STABILITY OF THE NEW AND EXISTING STRUCTURES AND WALLS DURING CONSTRUCTION. THE STRUCTURE SHOWN ON THE DRAWINGS HAS BEEN DESIGNED FOR STABILITY UNDER THE FINAL CONFIGURATION ONLY.

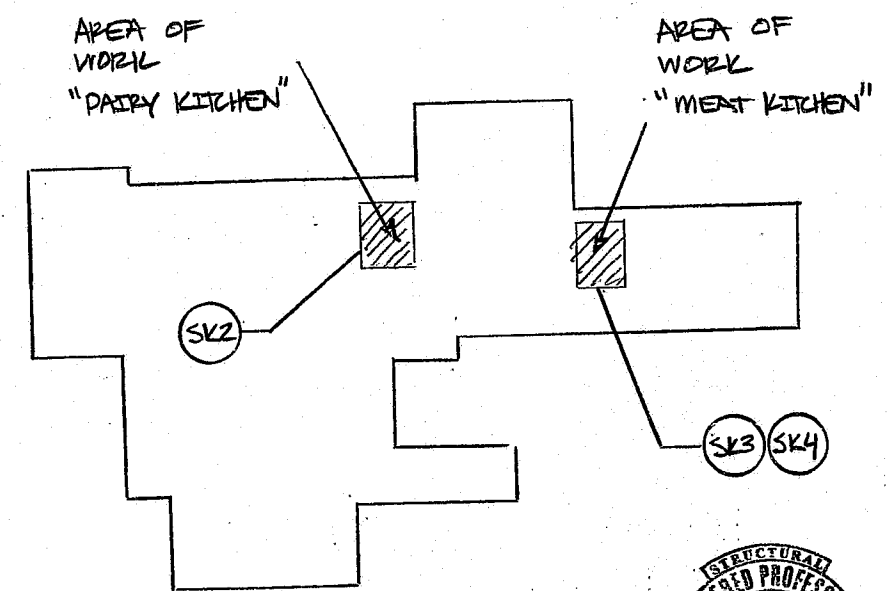
CARPENTRY:
SAWN LUMBER DESIGN IS BASED ON THE NATIONAL DESIGN SPECIFICATION, LATEST EDITION. SAWN LUMBER SHALL CONFORM TO WEST COAST LUMBER INSPECTION BUREAU OR WESTERN WOOD PRODUCTS ASSOCIATION GRADING RULES. ALL LUMBER NOT SPECIFICALLY NOTED TO BE D.F. #2 OR BETTER. ALL WOOD IN PERMANENT CONTACT WITH CONCRETE OR CMU SHALL BE PRESSURE TREATED UNLESS AN APPROVED BARRIER IS PROVIDED. FRAMING ACCESSORIES AND STRUCTURAL FASTENERS SHALL BE MANUFACTURED BY SIMPSON STRONG-TIE COMPANY (OR ENGINEER APPROVED EQUAL) AND OF THE SIZE AND TYPE SHOWN ON THE DRAWINGS AND ATTACHED PER MANUFACTURER'S REQUIREMENTS AND RECOMMENDATIONS UNLESS NOTED OTHERWISE. HANGERS NOT SHOWN SHALL BE SIMPSON HJ OF SIZE RECOMMENDED FOR MEMBER. ALL FRAMING NAILS SHALL BE COMMON NAILS AS SHOWN BELOW UNLESS OTHERWISE NOTED.

NAIL TYPE	LENGTH	DIAMETER
8d	2-1/2"	0.131"
10d	3"	0.148"
16d	3-1/2"	0.162"

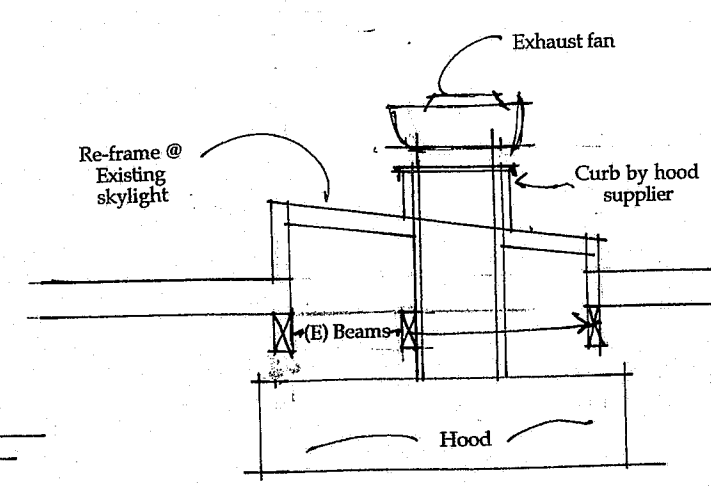
METALS:
ALL MISCELLANEOUS STEEL: ASTM A36 (FY=46,000 PSI, OR AS NOTED ASTM A572 (FY=50 KSI).
THREADED RODS: ASTM A36 UNLESS NOTED OTHERWISE.
CHANNEL BRACES: ALL BRACES SHALL BE UNISTRUT "P1000" ASTM A653 GR. 33 OR ENGINEER APPROVED EQUAL.

CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL UNISTRUT HARDWARE USED FOR BRACES PRIOR TO CONSTRUCTION. CHANNEL BRACES SHALL BE FREE-GALVANIZED (FG) CONFORMING TO ASTM A653 G90. WELDING: NO WELDING OF CHANNEL BRACES PERMITTED.

FLASHING AND WATERPROOFING:
ALL FLASHING AND WATERPROOFING SHALL BE BY OTHERS UNLESS NOTED OTHERWISE ON THE PLANS.



SK1 OVERALL PLAN N.T.S.



Section

FIRE PROTECTION SYSTEM SHALL BE MAINTAINED TO ORIGINAL BUILDING STANDARDS. ALTERATIONS TO BUILDING MAY REQUIRE FIRE PROTECTION SYSTEMS UPGRADE. FIRE ALARM SYSTEMS SHALL COMPLY WITH ADA REQUIREMENTS (HORNSTROUB). SEPARATE FIRE PERMITS MAY BE REQUIRED. CONTACT YOUR FIRE MARSHAL FOR DETAILS.

REVISIONS	BY
2	

MJCC Deli

Portland, Or

06 176088

Case Design Group

Date 12/12/06

Scale

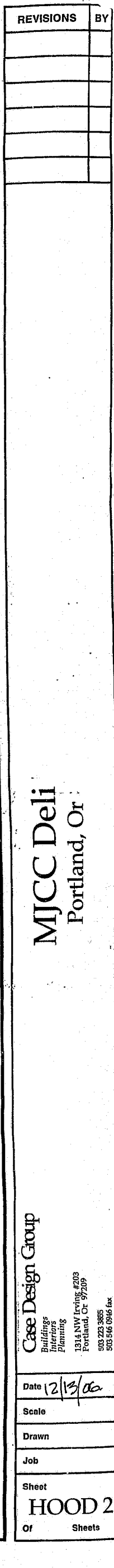
Drawn

Job

HOOD

A

A



FA.06.176088 REV.01.

A

MAR 11 2008
MICROFILMED

19

ATTN: Tom Keogan



CITY OF PORTLAND, OREGON - BUREAU OF DEVELOPMENT SERVICES

1900 SW Fourth Avenue • Portland, Oregon 97201 • www.portlandonline.com/bds • 503-823-0652 • FAX 503-823-7425



Facilities Permit Plan Intake Form

FOR INTAKE, STAFF USE ONLY

Date Received _____ Building/IV 503-823-0637 Tom Keogan / 66
 Building Registration # _____ Electrical 503-823-3447 John-Riser
 Fixed Bid _____ Plumbing 503-823-2343 Wes-Cooke
 Bin # _____ Fire 503-823-4402 Ken McGraw/goo
 Building Permit # 06-122955 Planning _____
 Mechanical # _____ BES _____
 Plumbing Permit # _____ PDOT _____
 Electrical Permit # _____ Structural _____
 Other _____

APPLICANT: Complete all sections below that apply to the project. Please print legibly.

Print Name GREG VICKERS Sign Name Greg Vickers
 Street Address 1420 NW LOVEJOY #416
 City PORTLAND State OR Zip Code _____
 Day Phone (503) 709-8801 FAX (503) 233-4909 email GVVNA@EASYSTREET.COM

Plans / permits available for pick up at 1900 SW 4th Avenue, 5th floor between 8:00 am to 5:00 pm

Contact Name for plan/permit pick up GREG VICKERS

Day Phone (503) 709-8801 email GVVNA@EASYSTREET.COM

Project Building Name / # MIDDLEMAN JEWISH COMMUNITY CENTER
 Project Address or Location 6651 SW CAPITOL HWY. PORTLAND, OR
 Project Name and Description STRUCTURAL AT MAIN AND DELI KITCHENS

Total Project Value \$100,000 Project Reference # _____
 Building Contractor HOWARD S. WRIGHT C.C. CCB # 164711
 Mechanical Contractor _____ CCB # _____
 Electrical Contractor _____ CCB# _____ License # _____
 Plumbing Contractor _____ CCB# _____ License # _____

☒ Building Permit
 No. of Stories 2
 Const. Type SA
☒ [M] Alarms Required
☒ [M] [N] Smoke Det. Req'd
☒ [M] [N] Sprinklers Req'd
☒ [M] [N] Struct. Eng / Calcs Submitted

☐ Electrical Permit
 Please provide a completed standard electrical permit application form. You may mail or deliver it to 1900 SW 4th Avenue, Portland, Oregon 97201 or FAX to 503-823-7425.

☐ Mechanical Permit
 Mechanical Valuation _____
 Description _____

☐ Plumbing Permit
 Number of Fixtures _____
 Back Flow Devices _____
 Water Service (# of Feet) _____
 Medical Gas _____
 Other _____

GENERAL STRUCTURAL NOTES

DESIGN CRITERIA:

DESIGN WAS BASED ON THE STRENGTH AND DEFLECTION CRITERIA OF THE 2003 INTERNATIONAL BUILDING CODE.

DESIGN OF THE VERTICAL AND LATERAL LOAD CARRYING MEMBERS WAS DETERMINED BASED ON WEIGHT OF 521 LB. DESIGN OF THE HOOD ASSEMBLIES AND ITS CONNECTIONS TO THE BRACES IS BY OTHERS AND SHALL BE VERIFIED PRIOR TO INSTALLING.

CODE REQUIREMENTS:

CONFORM TO THE 2003 INTERNATIONAL BUILDING CODE AND THE SEISMIC PROVISIONS FROM THE ASCE 7-02, MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES.

EXISTING CONDITIONS:

THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS, DIMENSIONS AND ELEVATIONS. THE CONTRACTOR SHALL NOTIFY THE ARCHITECT/ENGINEER OF ANY DISCREPANCIES FROM CONDITIONS SHOWN ON THE DRAWINGS PRIOR TO THE START OF THE WORK

TEMPORARY CONDITIONS:

THE CONTRACTOR SHALL BE RESPONSIBLE FOR STRUCTURAL STABILITY OF THE NEW AND EXISTING STRUCTURES AND WALLS DURING CONSTRUCTION. THE STRUCTURE SHOWN ON THE DRAWINGS HAS BEEN DESIGNED FOR STABILITY UNDER THE FINAL CONFIGURATION ONLY.

CARPENTRY:

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<u>NAIL TYPE</u>	<u>LENGTH</u>	<u>DIAMETER</u>
8d	2-1/2"	0.131"
10d	3"	0.148"
16d	3-1/2"	0.162"

METALS:

ALL MISCELLANEOUS STEEL: ASTM A36 (FY=36,000 PSI), OR AS NOTED ASTM A572 (FY=50 KSI).
THREADED RODS: ASTM A36 UNLESS NOTED OTHERWISE
CHANNEL BRACES: ALL BRACES SHALL BE UNISTRUT 'P1000' ASTM A653 GR. 33 OR ENGINEER APPROVED EQUAL.

CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL UNISTRUT HARDWARE USED FOR BRACES PRIOR TO CONSTRUCTION. CHANNEL BRACES SHALL BE PRE-GALVANIZED (PG) CONFORMING TO ASTM A653 G90. WELDING: NO WELDING OF CHANNEL BRACES PERMITTED.

FLASHING AND WATERPROOFING:

ALL FLASHING AND WATERPROOFING SHALL BE BY OTHERS UNLESS NOTED OTHERWISE ON THE PLANS.

TMR TM RIPPEY
CONSULTING ENGINEERS

7650 S.W. Beveland St., Suite 100
Tigard, Oregon 97223
Phone: (503) 443-3900

JEWISH COMMUNITY CENTER

10651 SE CAPITOL HWY

PORTLAND, OR 97219

BY BWH DATE 12/9/06

CHECK BY DATE

JOHN 12/13/01

SHEET 1 OF 13

MOC
10.1

176088 Rev 1 FA 06

FRAMING KEYNOTES

1. NEW 2X6 D.F. #2 JOISTS AT 1-4" O.C. WITH SIMPSON "LUS26" HANGERS. (8) 10D NAILS PER HANGER TYP. SPACE FIRST JOIST 8" +/- FROM EXISTING CONCRETE WALL.
2. NEW 2X6 D.F. #2 JOISTS AT 2-0" O.C. WITH SIMPSON "LUS26" HANGERS. (8) 10D NAILS PER HANGER TYP.
3. NEW 4X6 D.F. #2 BEAM WITH SIMPSON "LUS46" HANGERS. (8) 16D NAILS PER HANGER TYP.
4. 19/32" PLYWOOD OR OSB ROOF SHEATHING WITH 8D NAILS AT 6" O.C. AT SUPPORTED PANEL EDGES AND 8D NAILS AT 12" O.C. AT INTERMEDIATE SUPPORTS. DIRECTION OF STRONG AXIS OF PLYWOOD SHOWN.
5. 1/2" DIAMETER ALL-THREAD HANGER. VERIFY CONNECTION TO NEW HOOD WITH MANUFACTURER.
6. 1/2" DIAMETER ALL-THREAD HANGER WITH UNISTRUT CHANNEL STIFFENER. VERIFY CONNECTION TO NEW HOOD WITH MANUFACTURER.
7. P1000 UNISTRUT SEISMIC BRACE. 45 DEGREE MAXIMUM ANGLE. (MEASURED FROM HORIZONTAL)
8. EXHAUST HOOD OUTLINE SHOWN BELOW ROOF LEVEL. OPERATING WEIGHT 521 LB. (INCLUDES 100 LB ALLOWANCE FOR FIRE SUPPRESSION SYSTEM HARDWARE - BY OTHERS.)
9. NEW FAN UNIT. OPERATING WEIGHT 320 LB. (INCLUDES CURB WEIGHT)
10. NEW MAKE-UP AIR UNIT. OPERATING WEIGHT 625 LB (INCLUDES CURB WEIGHT). VERIFY MINIMUM DISTANCE FROM FAN UNIT.
11. 2X6 D.F. #2 INFILL FRAMING OR FRAMING AROUND DUCTWORK OPENING AS REQUIRED. HANGERS SIMILAR TO KEYNOTE 1.

TM RIPPEY
CONSULTING ENGINEERS

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Tigard, Oregon 97223
Phone: (503) 443-3900

JEVISH COMMUNITY CENTER

6651 SE CAPITOL HWY

PORTLAND, OR 97219

BY BH DATE 2/9/06

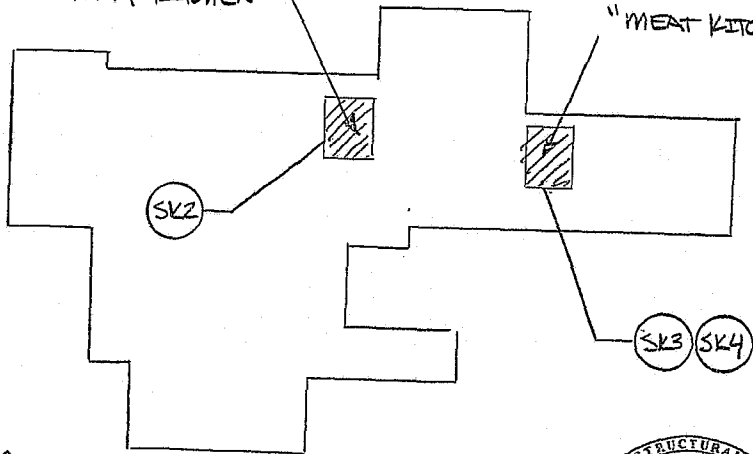
CHK BY _____ DATE _____

JOB NO 6343.01

SHEET 2 OF 13

AREA OF
WORK
"DAIRY KITCHEN"

AREA OF
WORK
"MEAT KITCHEN"



OVERALL PLAN

N.T.S.



TMR **TMRIPPY**
CONSULTING ENGINEERS

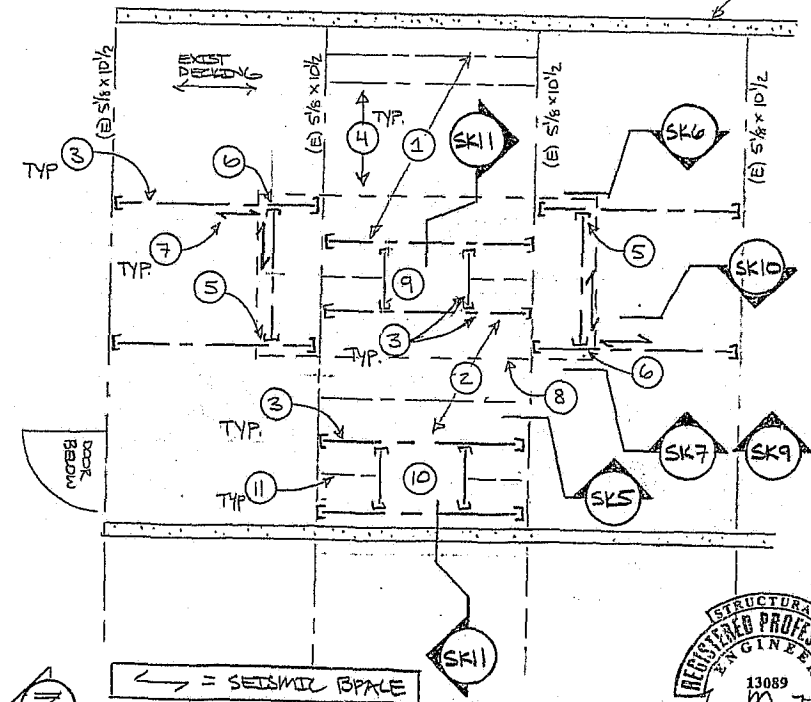
7650 S.W. Beveland St, Suite 100
Tigard, Oregon 97223
Phone (503) 443-3900

JEWISH COMMUNITY CENTER
6051 SE CAPITOL HWY.
PORTLAND, OR 97219

BY B.M.H. DATE 12/9/06
CHK BY DATE
JOB NO. 60343.01
SHEET 3 OF 13

EX. SKYLIGHT BAY
TO BE INFILLED

EXIST. CONC
WALL, TYP



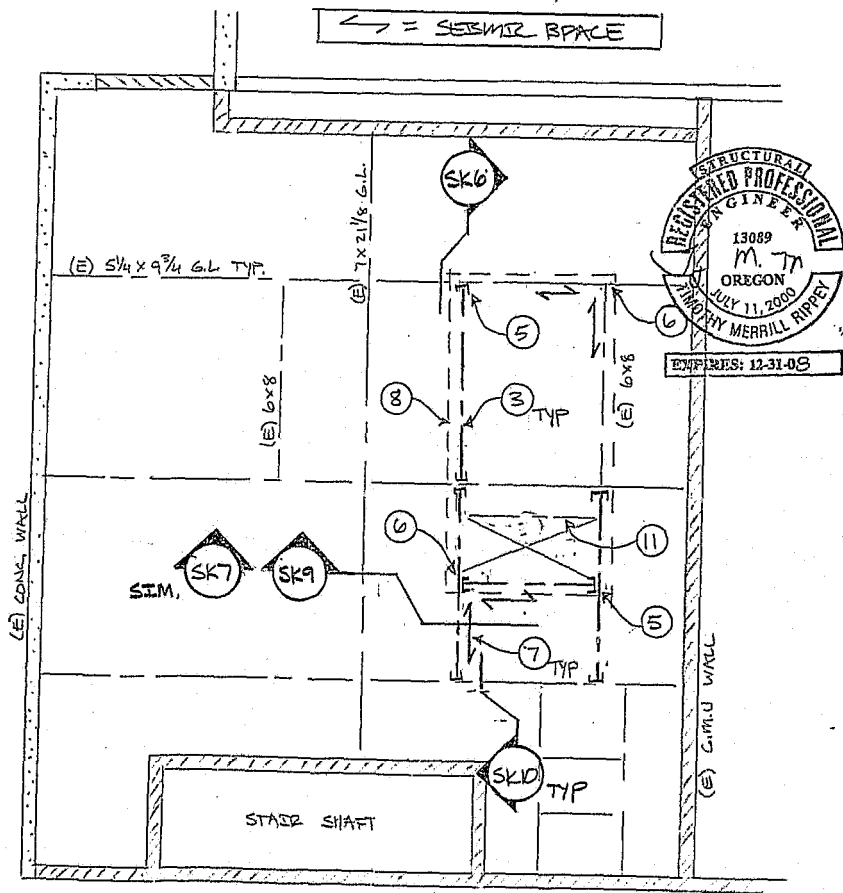
SK2 "DAIRY KITCHEN"
PARTIAL ROOF PLAN
SCALE $\frac{1}{4}'' = 1'-0''$



TMR TM RIPPEY
CONSULTING ENGINEERS

7650 S.W. Beveland St, Suite 100
Tigard, Oregon 97223
Phone (503) 443-3900

BY _____ DATE _____
CHK BY _____ DATE _____
JOB NO. 0343.01
SHEET 4 OF 13



SV3

"MEAT KITCHEN"
PARTIAL FRAMING PLAN
SCALE $\frac{1}{4}" = 1'-0"$

TMR TM RIPPEY
CONSULTING ENGINEERS

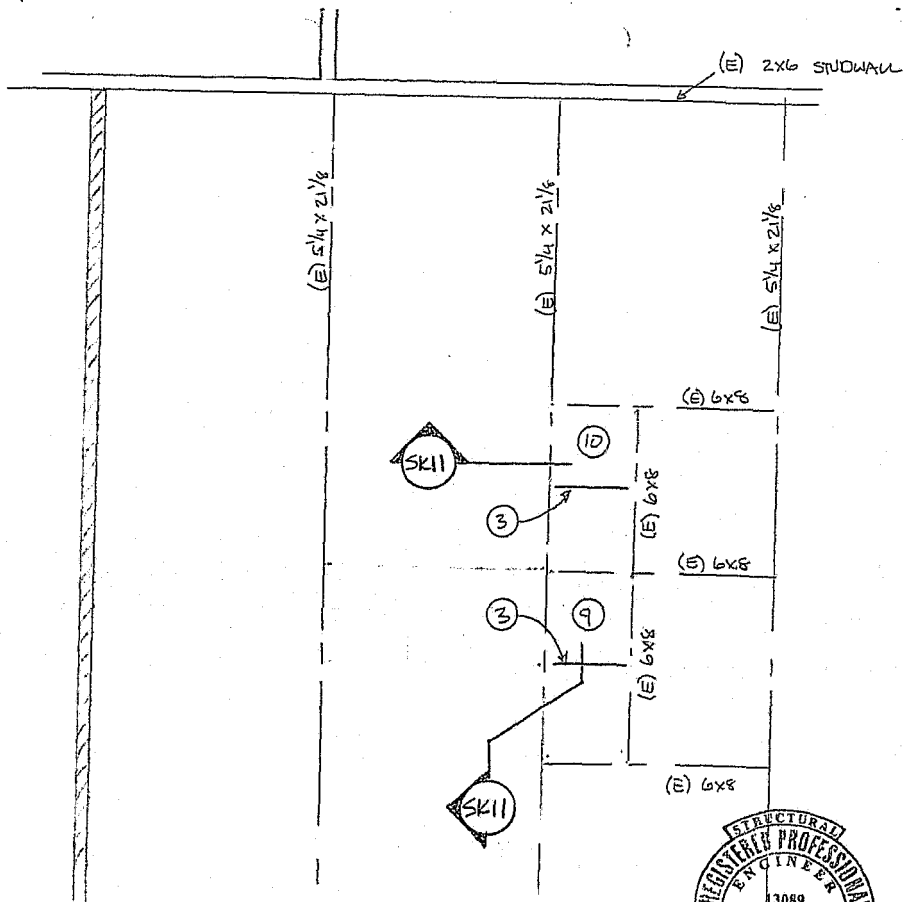
7650 S.W. Beveland St, Suite 100
Tigard, Oregon 97223
Phone (503) 443-3900

BY _____ DATE _____

CHK BY _____ DATE _____

108 NO 6343.01

SHEET 5 OF 13



SK4

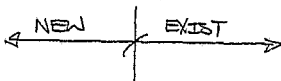
"MEAT KITCHEN"
PARTIAL ROOF PLAN
SCALE 1/4" = 1'-0"



T.M.R. **TM RIPPEY**
CONSULTING ENGINEERS

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BY _____ DATE _____
CHK BY _____ DATE _____
JOB NO. 0343.01
SHEET 6 OF 13



NEW ROOF
SHEATHING

EXIST 2X BEAMING

NEW 2X ROOF
EXIST SEE
PLAN

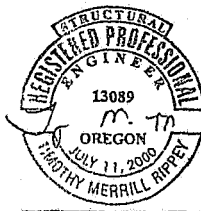
SIMPSON 'LUS26'
FACE MOUNT
HANGER

EXIST GULAM
FURLIN



SECTION

SCALE 1 1/2" = 1'-0"



EXPIRES: 12-31-08

TMR **TM RIPPEY**
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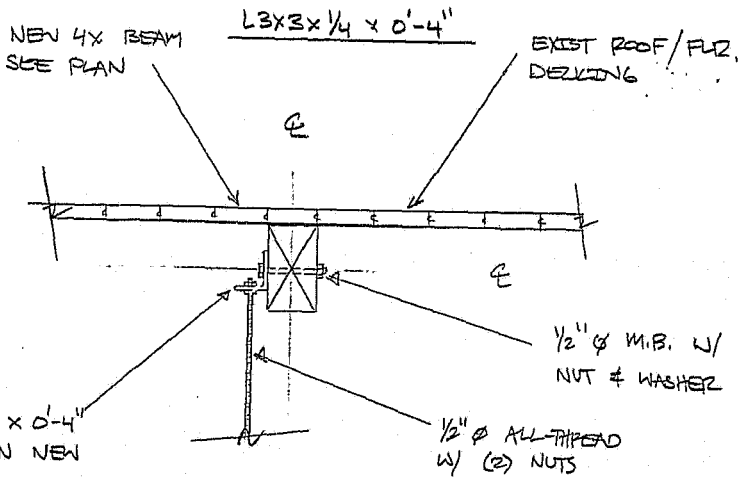
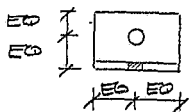
JEWISH COMMUNITY CENTER

BY _____ DATE _____

CHK BY _____ DATE _____

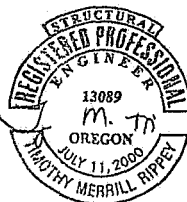
JOB NO. 6343.01

SHEET 7 OF 13



TYPICAL
HANGER DETAIL

SCALE 1/2" = 1'-0"



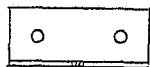
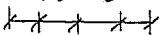
EXPIRES: 12-31-08

T.M.R. **TM RIPPEY**
CONSULTING ENGINEERS

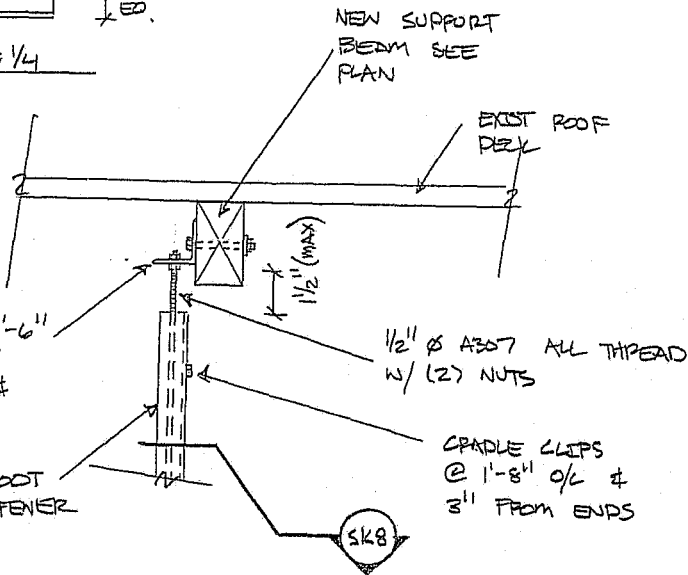
7650 S.W. Beveland St, Suite 100
Tigard, Oregon 97223
Phone (503) 443-3900

BY _____ DATE _____
CHK BY _____ DATE _____
JOB NO. 6243.01
SHEET 8 OF 13

(4) @ $1\frac{1}{2}" = 6"$



L3x3x1/4



SECTION

SCALE $1\frac{1}{2}" = 1'-0"$



TMR **TM RIPPEY**
CONSULTING ENGINEERS

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Phone (503) 443-3900

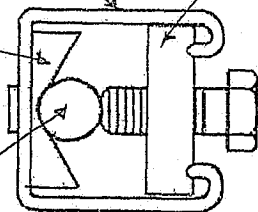
_____	BY _____ DATE _____
_____	CHK BY _____ DATE _____
_____	JOB NO. <u>6343.01</u>
_____	SHEET <u>9</u> OF <u>13</u>

UNISTRUT
P1000 T
CHANNEL
STIFFENER
(P.25)

UNISTRUT
P2008 NUT
(P.79)

UNISTRUT
P2485 CRADLE
CLIP
(P.84)

THREADED ROD
VERIFY CRADLE
CLIP SIZE



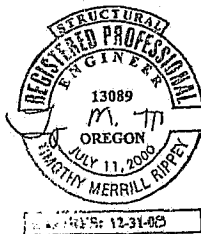
$\frac{3}{8}$ " x 1" HEX
HEAD CAP
SCREW
(P.81)

NOTE:

PAGE NUMBERS REFERENCE UNISTRUT No.14
GENERAL ENGINEERING CATALOG. U.N.O.

SK8 SECTION

N.T.S.



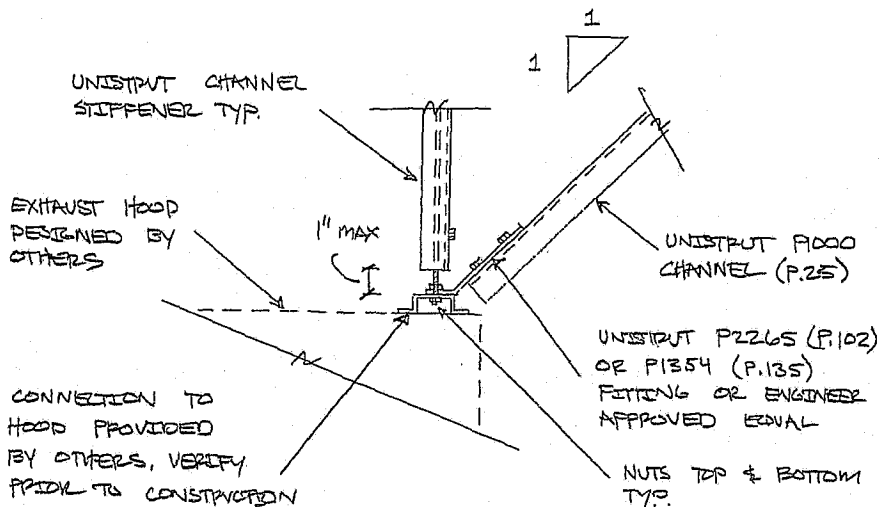
T.M.R. **TM RIPPEY**
CONSULTING ENGINEERS

7650 S.W. Beveland St, Suite 100
Tigard, Oregon 97223
Phone (503) 443-3900

BY _____ DATE _____
CHK BY _____ DATE _____
JOB NO. 6343.01
SHEET 10 OF 13

NOTE:

PAGE NUMBERS REFERENCE UNISTRUT NO. 14 GENERAL
ENGINEERING CATALOG U.N.G.



SK9 BRACE DETAIL
SCALE $1\frac{1}{2}'' = 1'-0''$

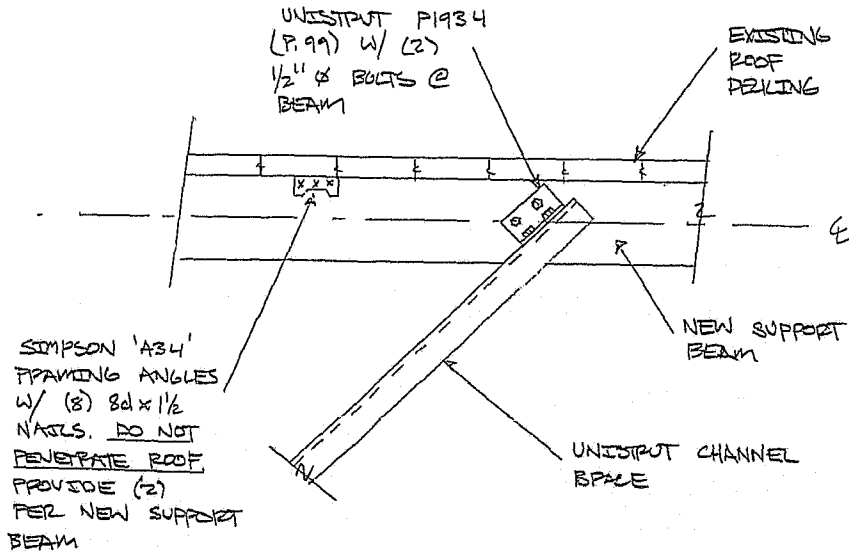


EXPIRES: 12-31-05

TMR **TM RIPPEY**
CONSULTING ENGINEERS

7650 S.W. Beveland St, Suite 100
Tigard, Oregon 97223
Phone (503) 443-3900

BY _____ DATE _____
CHK BY _____ DATE _____
JOB NO. 0343.01
SHEET 11 OF 13



SKID SPACE DETAIL
SLOPE: 1 1/2" = 1'-0"

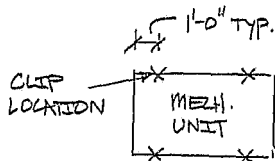


TMR **TM RIPPEY**
CONSULTING ENGINEERS

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Tigard, Oregon 97223
Phone (503) 443-3900

JEWSH COMMUNITY CENTER
6651 SE CAPITAL HWY
PORTLAND, OR 97219

BY BW DATE 12/9/06
CHK BY DATE
JOB NO. 6343.01
SHEET 12 OF 13



DETAIL 'A'

16 GA CLIPS W/
(8) # 10 TEL
SCREWS PER CLIP,
(4) CLIPS REQ'D
SEE DETAIL "A"
FOR LOCATION

FLASHING & INSULATION
NOT SHOWN FOR
CLARITY

WOOD BLOCKING
REQ'D.

PROVIDE #12
SCREWS @ 24" O/C
AND AT 6" FROM
ENDS W/ MIN. 1 1/2"
EMBED. INTO STRUCTURAL
MEMBER, TYP.

CENTER CURB
ON NEW OR EXIST
STRUCTURAL MEMBER



SECTION AT CURB

SCALE 1 1/2" = 1'-0"



EXPIRES: 12-31-08

TMA **TM RIPPEY**
CONSULTING ENGINEERS

7650 S.W. Beveland St, Suite 100
Tigard, Oregon 97223
Phone (503) 443-3900

JEWISH COMMUNITY CENTER
61051 SE CAPITOL HWY
PORTLAND, OR 97219

BY BWH DATE 12/19/06

CHK BY _____ DATE _____

JOB NO. 10343.01

SHEET 13 OF 13

Structural Calculations

Skylight & Kitchen Modifications Mittleman Jewish Community Center 6651 SE Capitol Highway Portland, OR 97219



EXPIRES: 12-31-08

TMA **TM RIPPEY**
CONSULTING ENGINEERS

7650 S.W. Beveland St, Suite 100
Tigard, Oregon 97223
Phone: (503) 443-3900

BY BWH DATE 12/9/06

CHK BY _____ DATE _____

JOB NO. 10243.01

SHEET 1 OF 19

SUNLIGHT FRAMING @ PERT

MAKE-UP AIR UNIT = 525 lb
UNIT CURB = 100 lb (ASSUMED)
TOTAL 625 lb

EXHAUST FAN = 270 lb
UNIT CURB = 50 lb (ASSUMED)
TOTAL 320 lb

ROOF DEAD LOAD = 15 psf
" " SNOW LOAD = 25 psf

GLULAM BEAM SPACING ~ 7'-6"

EX. SPAN = 17'-8" - (2)(2 1/2") - (2)(1") = 17.08'

EXIST GL 5 1/4 x 9 5/8 Fb = 2200 psi (PER PLANS - SS)

SPACING = 6'-7 1/4" = 6.58'

$W_D = (15)(6.58) = 99$ plf } 0'-17.25'

$W_S = (25)(6.58) = 165$ plf }

DLIFT = (31)(6.58) = 204 plf (0'-7.5' LINEAR RESPONSE)

$P_D = 1/2(625) = 313$ lb @ 14' FROM END

$P_D = 1/2(320) = 160$ lb @ MIDSPAN (ROOF TOP)

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JOB NO. _____

SHEET 2 OF 19

Snow Drift Load

Worksheet calculates the snow drift load based on the ASCE 7-02 snow load provisions. Drift loads are superimposed on the balanced snow load. Additional modified drift and length based on min roof load.

Snow load

$P_g := 20 \cdot \text{psf}$

(Ground snow load at site)

$P_{min} := 25 \cdot \text{psf}$

(Minimum roof snow load per local code requirement)

Roof parameters

Height := 15 · ft

(Height of roof projection)

Length := 113 · ft

(Upwind length contributing to snow drift)

Slope := "0:12"

(Roof slope enter as decimal degrees or "H:12". Ex. "1/4:12" or "35 deg")

Roof := "normal"

(Roof surface type "slippery" or "normal")

Building and terrain

Category := "II"

(Building category "I", "II", "III", or "IV")

Terrain := "B"

(Terrain category, "A", "B", "C", "D" or "mountain")

Exposure := "partial"

(Exposure category, "full", "partial", or "sheltered")

Thermal := "normal"

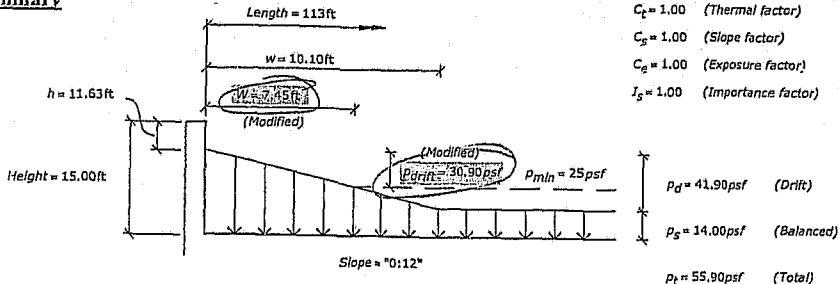
(Thermal condition "normal", "cold", "unheated" or "greenhouse")

Drift := "windward"

(Drift type "windward" or "leeward")

D

Summary



Coefficient summary

$C_t = 1.00$ (Thermal factor)

$C_s = 1.00$ (Slope factor)

$C_e = 1.00$ (Exposure factor)

$I_s = 1.00$ (Importance factor)

Notes:

1. Drift load is superimposed on the balanced snow load.
2. Modified drift load and width are based on the minimum roof snow load.

$W = 7.5'$

$W_b = 31 \text{ psf}$

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SHEET 3 OF _____

ASSUME $\frac{1}{2}$ WT OF HOOD @ MIDPOINT

$$\text{HOOD} = 421 \text{ lb}$$

$$\text{ADD } 100 \text{ lb} \quad (\text{PIPE SUPPRESSION SYSTEM})$$

$$\text{TOTAL } \underline{521 \text{ lb}}$$

$$\frac{1}{2}(521) = 261 \text{ lb} \quad (\text{MIDSPAN})$$

$$M = 12,865 \text{ ft}\cdot\text{lb}$$

$$V = 3176 \text{ lb}$$

- SEE ENERCALL FOR
MEMBER CAPACITY -

$$M_a = 17.1 \text{ ft}\cdot\text{k} > 12.9 \text{ ft}\cdot\text{k} \quad (\text{O.K.}) \quad (0.754)$$

$$V_a = 13.9 \text{ k} > 11.5(3.1) = 4.7 \text{ k} \quad (\text{O.K.}) \quad (0.338)$$

$\therefore$ DESIGN ADEQUATE

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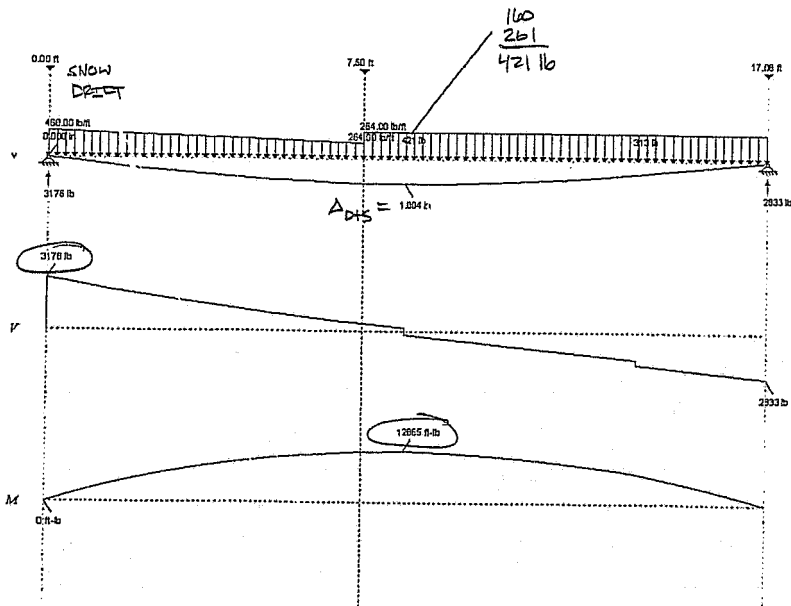
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JOB NO. _____

SHEET 4 OF _____



$$E = 1.7 \times 10^6 \text{ psi}$$

$$I = 390.1 \text{ in}^4$$

TOTAL LOAD EXIST
5'4" x 9 5/8 G.L. (W/ DRIFT)

$$A_{D+S} = 1.00 \quad \left(\frac{L}{205} \right)$$

$$A_S = 0.560 \quad \left(\frac{L}{366} \right)$$

DEFLECTIONS O.K.

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BY _____ DATE _____
 CHK BY _____ DATE _____
 JOB NO. _____
 SHEET 5 OF _____

Title :
Dsgnr :
Description :

Job # 71@
Date: 11:47AM, 9 DEC 05

Scope :

Rev: 580000
User: RW-2002562, V4 (2001, 1-Dec-2003)
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General Timber Beam

Page 1
pcadsl.com/Calculators

Description Existing Purlin Allow load only

SEE V&M

General Information

Code Ref: 1997 NDS, 2003 IBC, 2003 NFPA 5000. Base allowables are user defined

Section Name	5.25x9.625	Center Span	1.00 ft	Lu	0.00 ft
Beam Width	5.250 in	Left Cantilever	ft	Lu	0.00 ft
Beam Depth	9.625 in	Right Cantilever	ft	Lu	0.00 ft
Member Type	Glulam	Douglas Fir, 22F - V8			
Load Dur. Factor	1.150	Fb Base Allow	2,300.0 psi		
Beam End Fixity	Pin-Pin	Fv Allow	240.0 psi		
		Fc Allow	580.0 psi		
		E	1,700.0 ksi		

BEAM
FULLY
SUPPORTED

Summary

Span = 1.00ft, Beam Width = 5.250in x Depth = 9.625in, Ends are Pin-Pin

Max Stress Ratio
Maximum Moment Allowable

0.000
0.0 k-ft
17.1 k-ft

Maximum Shear * 1.5 Allowable

0.0 k

Max. Positive Moment	0.00 k-ft	at	1.000 ft
Max. Negative Moment	0.00 k-ft	at	1.000 ft
Max @ Left Support	0.00 k-ft		
Max @ Right Support	0.00 k-ft		
Max. M allow	17.09		

Reactions...

fb	0.00 psi	Fv	0.00 psi
Fb	2,530.00 psi	Fv	276.00 psi

Shear:	@ Left	0.00 k
	@ Right	0.00 k
Camber:	@ Left	0.000 in
	@ Center	0.000 in
	@ Right	0.000 in

Left DL	0.00 k	Max	0.00 k
Right DL	0.00 k	Max	0.00 k

Deflections

Center Span...	Dead Load	Total Load	Left Cantilever...	Dead Load	Total Load
Deflection	0.000 in	0.000 in	Deflection	0.000 in	0.000 in
...Location	1.000 ft	1.000 ft	...Length/Defl	0.0	0.0
...Length/Defl	0.0	0.00			
Camber { using 1.5 * D.L. Defl } ...			Right Cantilever...		
@ Center	0.000 in		Deflection	0.000 in	0.000 in
@ Left	0.000 in		...Length/Defl	0.0	0.0
@ Right	0.000 in				

Stress Calcs

Bending Analysis					
Ck	21.023	Le	0.000 ft	Sxx	81,051 in3
Cv	1.000	Rb	0.000	CI	0.000
				Area	50,531 in2
		Max Moment		Sxx Req'd	
@ Center		0.00 k-ft		Allowable fb	
@ Left Support		0.00 k-ft			2,530.00 psi
@ Right Support		0.00 k-ft			2,530.00 psi
					2,530.00 psi
Shear Analysis					
Design Shear	@ Left Support		@ Right Support		
Area Required	0.00 k		0.00 k		
Fv Allowable	276.00 psi		0.000 in2		
			276.00 psi		
Bearing @ Supports					
Max. Left Reaction	0.00 k		Bearing Length Req'd	0.000 in	
Max. Right Reaction	0.00 k		Bearing Length Req'd	0.000 in	

* SEE V&M FOR ACTUAL SHEAR & MOMENT
THIS SHEET CALLS CAPACITY ONLY!

NEW ROOF JOIST

$$D = 15 \text{ pft}$$

$$S = 25 \text{ pft}$$

$$\text{DRAFT} = 31 \text{ pft}$$

$$\text{SLOPE} = 31/7.5 = 4.13 \text{ pft/ft}$$

@ 24" o/c

$$\text{AVE DRAFT} = (31 + 22.74)(1/2) = 26.9 \text{ pft}$$

$$D = 30 \text{ pft}$$

$$S = (2)(25 + 26.9) = 103.8 \text{ pft} \rightarrow 104 \text{ pft}$$

2x8 (O.K.)
2x6 (N.G.)

@ 16" o/c

$$\text{AVE DRAFT} = (31 + 25.5)(1/2) = 28.2 \text{ pft}$$

$$W_D = 20 \text{ pft}$$

$$W_S = (16/12)(25 + 28.2) = 70.9 \text{ pft}$$

2x6 (O.K.) (85% STRESSED)

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BY _____ DATE _____
CHK BY _____ DATE _____
JOB NO _____
SHEET 7 OF _____

Title :
 Dsgnr:
 Description :
 Scope :

Job #
 Date: 4:53PM, 8 DEC 05

Rev: 50000
 User: KIV-000562, Ver 5.8.0, 1-Dec-2003
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General Timber Beam

Page 1

Description Roof Joist

General Information

Code Ref: 1997 NDS, 2003 IBC, 2003 NFPA 5000. Base allowables are user defined

Section Name	2x5	Center Span	7.50 ft	Lu	0.00 ft
Beam Width	1,500 in	Left Cantilever	ft	Lu	0.00 ft
Beam Depth	5,500 in	Right Cantilever	ft	Lu	0.00 ft
Member Type	Sawn	Douglas Fir - Larch, No.2			
		Fb Base Allow	900.0 psi		
Load Dur. Factor	1.150	Fv Allow	180.0 psi		
Beam End Fixity	Pin-Pin	Fc Allow	625.0 psi		
		E	1,600.0 ksi		

Repetitive Member

Full Length Uniform Loads

Center	DL	20.00 #/ft	LL	70.90 #/ft
Left Cantilever	DL	#/ft	LL	#/ft
Right Cantilever	DL	#/ft	LL	#/ft

Summary

Beam Design OK

Span= 7.50 ft, Beam Width = 1,500 in x Depth = 5.5 in, Ends are Pin-Pin					
Max Stress Ratio	0.852 ; 1				
Maximum Moment Allowable	0.6 k-ft				
	0.8 k-ft				
Max. Positive Moment	0.64 k-ft	at	3,750 ft	Maximum Shear * 1.5	0.4 k
Max. Negative Moment	0.00 k-ft	at	7,500 ft	Allowable	1.7 k
Max @ Left Support	0.00 k-ft			Shear:	@ Left 0.34 k
Max @ Right Support	0.00 k-ft				@ Right 0.34 k
Max. Allow	0.75			Camber:	@ Left 0.000 in
					@ Center 0.064 in
					@ Right 0.000 in
Fb	1,014.17 psi	Fv	54.54 psi	Reactions...	
Fb	1,180.25 psi	Fv	207.00 psi	Left DL	0.07 k
				Right DL	0.07 k
				Max	0.34 k

Deflections

Center Span...	Dead Load	Total Load	Left Cantilever...	Dead Load	Total Load
Deflection	-0.043 in	-0.194 in	Deflection	0.000 in	0.000 in
...Location	3,750 ft	3,750 ft	...Length/Defl	0.0	0.0
...Length/Defl	2,103.4	462.79			
Camber (using 1.5 * D.L. Defl) ...			Right Cantilever...		
@ Center	0.064 in		Deflection	0.000 in	0.000 in
@ Left	0.000 in		...Length/Defl	0.0	0.0
@ Right	0.000 in				

Stress Calcs

Bending Analysis					
Ck	31.887	Le	0.000 ft	Sxx	7,563 in3
Cf	1,000	Rb	0.000	Cf	0.000
				Area	8,250 in2
@ Center	0.64 k-ft	Max Moment		Sxx Req'd	1,190.25 psi
@ Left Support	0.00 k-ft				1,190.25 psi
@ Right Support	0.00 k-ft				1,190.25 psi
Shear Analysis					
Design Shear	0.45 k	@ Left Support		@ Right Support	
Area Required	2,174 in2				
Fv Allowable	207.00 psi				
Bearing @ Supports					
Max. Left Reaction	0.34 k			Bearing Length Req'd	0.364 in
Max. Right Reaction	0.34 k			Bearing Length Req'd	0.364 in

MEAT KITCHEN

BEAMS :	MB-55	7 x 17 7/8 G.L.	$F_b = 2600 \text{ psi}$
	MP-54	5 1/4 x 9 3/4 G.L.	" "

PER GEN NOTES

LIVE LOADS

FLOORS = 100 psf

PLATFORMS/CATWALK = 25 psf

ROOFS = 25 psf

ASSUME D $\approx$ 10 psf

MAIN BEAM 7 x 17 7/8 G.L. (MB-55)

SPAN $\approx$ 21'

TRIB = 12'

$W_D = (12)(10) = 120 \text{ plf}$

$W_L = (100)(10) = 1000 \text{ plf}$

NEW HOOD = 625 lb (ASSUME @ MIDSPAN)

$\therefore$ EX. G.L. O.K.

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BY _____ DATE _____

CHECK BY _____ DATE _____

JOB NO. _____

SHEET 9 OF _____

Sign: Description:

Job # 71@
Date: 1:24PM, 9 DEC 06

Scope:

Rev: 50000
User: JAW-200502, Ver 5.0.0, 1-Dec-2003
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General Timber Beam

Page 1

Jcc defl,acw/Calculations

Description MB-55 Meat Kitchen

General Information

Code Ref: 1997 NDS, 2003 IBC, 2003 NFPA 5000, Base allowables are user defined

Section Name	7x17.875	Center Span	21.00 ft	Lx	0.00 ft
Beam Width	7.000 in	Left Cantilever	ft	Lx	0.00 ft
Beam Depth	17.875 in	Right Cantilever	ft	Lx	0.00 ft
Member Type	GlULam	Southern Pine, 26F - V4			
Load Dur. Factor	1.000	Fb Base Allow	2,600.0 psi		
Beam End Fixity	Pin-Pin	Fv Allow	270.0 psi		
		Fc Allow	740.0 psi		
		E	1,900.0 ksi		

$F_b = 2600 \text{ psi}$
PER PLAN

Full Length Uniform Loads

Center	DL	120.00 #/ft	LL	1,000.00 #/ft
Left Cantilever	DL	#/ft	LL	#/ft
Right Cantilever	DL	#/ft	LL	#/ft

Point Loads

NEW HOOD

Dead Load	625.0 lbs	lbs	lbs	lbs	lbs	lbs	lbs
Live Load	0.000 ft	0.000 ft	0.000 ft	0.000 ft	0.000 ft	0.000 ft	0.000 ft
...distance	10.500 ft						

Summary

Beam Design OK

Span= 21.00ft, Beam Width = 7.000in x Depth= 17.875in, Ends are Pin-Pin

Max Stress Ratio 0.854

Maximum Moment Allowable 65.0 k-ft
75.2 k-ft

Maximum Shear * 1.5 Allowable 15.7 k
33.8 k

Max. Positive Moment 65.02 k-ft at 10.500 ft

Max. Negative Moment 0.00 k-ft at 21.000 ft

Max @ Left Support 0.00 k-ft

Max @ Right Support 0.00 k-ft

Max. Moment 75.23

Reactions...
Left DL 1.57 k
Right DL 1.57 k

Shear: @ Left 12.07 k
@ Right 12.07 k

Camber: @ Left 0.000in
@ Center 0.174in
@ Right 0.000in

fb 2,093.14 psi fv 125.55 psi
Fb 2,421.73 psi Fv 270.00 psi

Max 12.07 k
Max 12.07 k

Deflections

Center Span...	Dead Load	Total Load	Left Cantilever...	Dead Load	Total Load
Deflection	-0.116 in	-0.807 in	Deflection	0.000 in	0.000 in
...Location	10.500 ft	10.500 ft	...Length/Defl	0.0	0.0
...Length/Defl	2,174.9	312.22	Right Cantilever...	0.000 in	0.000 in
Camber (using 1.5 * D.L. Defl) ...			Deflection	0.0	0.0
@ Center	0.174 in		...Length/Defl		
@ Left	0.000 in				
@ Right	0.000 in				

PURLINS $5\frac{1}{4} \times 9\frac{3}{4}$ G.L. (MP-S4)

SPAN $\approx 11'-8'' - (2 \times 1) = 11.5'$

TRIB = 7.16'

$W_D = (7.16)(10) = 72 \text{ plf}$

$W_L = (7.16)(100) = 716 \text{ plf}$

NEW LOAD

$P_D = \frac{1}{4}(625) = 156 \text{ lb @ MIDPOINT}$

$\therefore$ EX. PURLIN (O.K.)

PURLIN HANGERS SIMPSON 'HARBESZS' (CONST. 1969)

$\hookrightarrow$ SIMILAR HARBESZS $\approx 4.2 \text{ k}$ (FOR SOLID SAWN 200S CMT.)

NEW REACTION = 4.61 k

CHECK 90 INCREASE

EXIST REACTION 4.58 k

NOTE:

EX. LOAD TO BE
REMOVED REPLACED
W/ SIM. ACTUAL
CHANGE IN LOAD
INSIGNIFICANT

ONLY 1.7% INCREASE TO
HANGER AT FULL LL.

RESUME ADEQUATE

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BY _____ DATE _____
CHK BY _____ DATE _____
JOB NO. _____
SHEET 11 OF _____

Title :
Dsgnr :
Description :

Job # 71@
Date: 1:30PM, 9 DEC 06

Scope :

Rev: 580000
User: KW-2002552 Ver 5.8.0, 1-Dec-2003
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General Timber Beam

Page 1

Description MP-54 Meat kitchen

for deflection calculations

General Information

Code Ref: 1997 NDS, 2003 IBC, 2003 NFPA 5000. Base allowables are user defined

Saction Name	5.25x9.75	Center Span	12.00 ft	Lu	0.00 ft
Beam Width	5.250 in	Left Cantilever	ft	Lu	0.00 ft
Beam Depth	9.750 in	Right Cantilever	ft	Lu	0.00 ft
Member Type	GluLam	Southern Pine, 26F - V4			
Load Dur. Factor	1.000	Fb Base Allow	2,500.0 psi		
Beam End Fixity	Pin-Pin	Fv Allow	270.0 psi		
		Fe Allow	740.0 psi		
		E	1,900.0 ksi		

Full Length Uniform Loads

Center	DL	72.00 #/ft	LL	715.00 #/ft
Left Cantilever	DL	#/ft	LL	#/ft
Right Cantilever	DL	#/ft	LL	#/ft

Point Loads

Dead Load	156.0 lbs	lbs	lbs	lbs	lbs	lbs	lbs	lbs
Live Load	lbs	lbs	lbs	lbs	lbs	lbs	lbs	lbs
...distance	6.000 ft	0.000 ft	0.000 ft	0.000 ft	0.000 ft	0.000 ft	0.000 ft	0.000 ft

Summary

Span= 12.00ft, Beam Width = 5.250in x Depth = 9.75in, Ends r = Pin-Pin

Beam Design OK

Max Stress Ratio	0.013 ; 1	Maximum Shear * 1.5	6.3 k
Maximum Moment Allowable	14.7 k-ft	Allowable	13.8 k
Max. Positive Moment	14.65 k-ft	at	6.000 ft
Max. Negative Moment	0.30 k-ft	at	0.000 ft
Max @ Left Support	0.00 k-ft	Shear:	@ Left 4.81 k
Max @ Right Support	0.00 k-ft	Camber:	@ Right 4.81 k
Max. Allow	18.02		@ Left 0.000in
fb	2,113.78 psi	Reactions...	@ Center 0.084in
Fb	2,500.00 psi	Left DL	@ Right 0.000in
		Right DL	Max 4.81 k
			Max 4.81 k

Deflections

Center Span...	Dead Load	Total Load	Left Cantilever...	Dead Load	Total Load
Deflection	-0.058 in	-0.490 in	Deflection	0.000 in	0.000 in
...Location	6.000 ft	6.000 ft	...Length/Defl	0.0	0.0
...Length/Defl	2,562.5	294.02	Right Cantilever...		
Camber (using 1.5 * D.L. Defl) ...			Deflection	0.000 in	0.000 in
@ Center	0.084 in		...Length/Defl	0.0	0.0
@ Left	0.000 in				
@ Right	0.000 in				

CHEEK ROOF BEAMS @ MEAT KITCHEN

$$(RB-11) \ 5\frac{1}{4} \times 2\frac{1}{8} \quad F_b = 2200 \text{ psi}$$

$$SPAN = 34'$$

$$TPCB = 8.25'$$

$$W_D = (15)(8.25) = 124 \text{ plf}$$

$$W_L = (25)(8.25) = 206 \text{ plf}$$

NEW MAKE-UP AIR UNIT

$$P_D = \frac{1}{2}(625) = 313 \text{ lb @ MIDSPAN}$$

$\therefore$ BEAM O.K.

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BY _____ DATE _____
CHK BY _____ DATE _____
JOB NO _____
SHEET 13 OF _____

Title :
 Dsgnr:
 Description :

Job # 71@
 Date: 2:10PM, 9 DEC 06

Scope :

Rev: 550000
 User: RW/06022502, Ver 5.9.0, 1-Dec-2003
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General Timber Beam

Page 1

(c) dellrevr Calculations

Description RB-11 Meat Kitchen -roof

General Information

Code Ref: 1997 NDS, 2003 IBC, 2003 NFPA 5000. Base allowables are user defined

Section Name	2x6	Center Span	34.00 ft	Lu	0.00 ft
Beam Width	5.250 in	Left Cantilever	ft	Lu	0.00 ft
Beam Depth	21.125 in	Right Cantilever	ft	Lu	0.00 ft
Member Type	GluLam	Douglas Fir, 22F - V8			
Load Dur. Factor	1.150	Fb Base Allow	2,200.0 psi		
Beam End Fixity	Pin-Pin	Fv Allow	240.0 psi		
		Pc Allow	590.0 psi		
		E	1,700.0 ksi		

Full Length Uniform Loads

Center	DL	124.00 #/ft	LL	208.00 #/ft
Left Cantilever	DL	#/ft	LL	#/ft
Right Cantilever	DL	#/ft	LL	#/ft

Point Loads

Dead Load	313.0 lbs	lbs	lbs	lbs	lbs	lbs	lbs
Live Load	17,000 ft	0.000 ft	0.000 ft	0.000 ft	0.000 ft	0.000 ft	0.000 ft

Summary

Beam Design OK

Span= 34.00ft, Beam Width = 5.250in x Depth = 21.125in, Ends are Pin-Pin

Max Stress Ratio

0.681 : 1

Maximum Moment Allowable

50.3 k-ft
74.0 k-ft

Maximum Shear * 1.5

7.8 k

Allowable

30.6 k

Max. Positive Moment

50.35 k-ft at 17,000 ft
0.00 k-ft at 34,000 ft

Max. Negative Moment

Shear:

@ Left 5.77 k
@ Right 5.77 k

Max @ Left Support

0.00 k-ft

Camber:

@ Left 0.000 in
@ Center 0.892 in
@ Right 0.000 in

Max @ Right Support

0.00 k-ft

Max. M allow

73.95

Reactions...

Fb 1,547.16 psi

Fv 70.71 psi

Left DL

2.26 k

Max 5.77 k

Fb 2,272.93 psi

Fv 276.00 psi

Right DL

2.26 k

Max 5.77 k

Deflections

Center Span...	Dead Load	Total Load	Left Cantilever...	Dead Load	Total Load
Deflection	-0.585 in	-1.478 in	Deflection	0.000 in	0.000 in
...Location	17,000 ft	17,000 ft	...Length/Defl	0.0	0.0
...Length/Defl	685.8	276.0	Right Cantilever...		
Camber (using 1.5 * D.L. Coef) ...			Deflection	0.000 in	0.000 in
@ Center	0.892 in		...Length/Defl	0.0	0.0
@ Left	0.000 in				
@ Right	0.000 in				

SEISMIC DATA

6651 SE CAPITOL HIGHWAY
PORTLAND, OR 97219

$$S_{MS} = (1.08)(1.056) = 1.143$$

$$S_{DS} = 2/3(1.143) = 0.762$$

ASCE 7-02

HVAC SYSTEMS NON-VIBRATION ISOLATED

$$q_p = 1.0 \quad r_p = 2.5$$

CONSERVATIVELY ASSUME ROOF MOUNTED $Z/H = 1.0$

HOOD CONTAINS A FIRE SUPPRESSION SYSTEM

$$\therefore I_p = 1.5$$

$$F_p = \frac{(0.4)(1.0)(0.762) W_p}{2.5/1.5} [1 + 2(1.0)] = 0.549 W_p$$

$$(F_p)_{\max} = (1.6)(0.762)(1.5) W_p = 1.829 W_p$$

$$(F_p)_{\min} = (0.3)(0.762)(1.5) W_p = 0.343 W_p$$

$$\therefore 0.7E = 0.7(0.549 W_p) = 0.384 W_p$$

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BY _____ DATE _____
CHK BY _____ DATE _____
JOB NO. _____
SHEET 15 OF _____

Wind And Seismic Loads On Mechanical Unit

Worksheet calculates the the wind and seismic forces for a rooftop mounted mechanical unit based on the ASCE 7-02. Holdown forces are calculated based on $0.6D + (W \text{ or } 0.7E)$ load cases.

Wind parameters

Wind speed := 100 mph (Wind speed - 3 second gust or fastest mile in mph)
Exposure := "B" (Exposure "B", "C", or "D")
Convert := "no" (Convert fastest mile to 3 second gust, "yes" or "no")

Seismic parameters

$S_D = 0.762$ (Design spectral response acceleration)
 $a_p = 1.0$ (Mechanical electrical seismic coefficient)
 $R_p = 2.5$ (Mechanical electrical seismic coefficient)
 $I_E = 1.0$ (Seismic Importance factor)

Mechanical unit dimensions

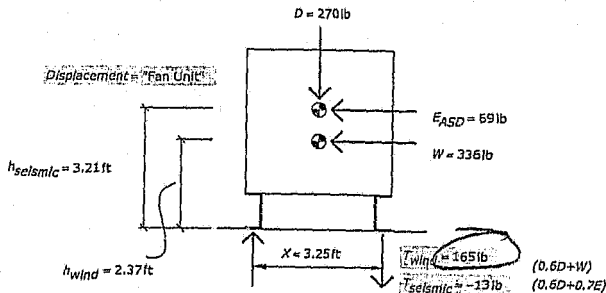
Displacement := "Fan Unit" (Unit displacement, e.g. "10 Ton")
Weight := 270 lb (Total mechanical weight in lb)
Height := 37 in (Unit height in feet or inches)
Width := 43 in (Unit width in feet or inches)
Length := 43 in (Unit length in feet or inches)
Curb := 20 in (Curb height in feet or inches)

Building parameters

Category := "I" (Building category, "I", "II", "III", "IV")
Roof_elevation := 10 ft (Elevation of roof in feet)

☐

Summary



Notes:

1. Positive sign convention shown, Negative values indicate opposite direction.
2. X equal the width of the unit minus 3"

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BY BWH DATE _____

CHEK BY _____ DATE _____

JOB NO. _____

SHEET 1 OF _____

Wind And Seismic Loads On Mechanical Unit

Worksheet calculates the the wind and seismic forces for a rooftop mounted mechanical unit based on the ASCE 7-02. Holdown forces are calculated based on $0.6D + (W \text{ or } 0.7E)$ load cases,

Wind parameters

Wind speed $\approx 100 \cdot \text{mph}$ (Wind speed - 3 second gust or fastest mile in mph)
Exposure $\approx "B"$ (Exposure "B", "C", or "D")
Convert $\approx "no"$ (Convert fastest mile to 3 second gust, "yes" or "no")

Seismic parameters

$S_D \approx 0.762$ (Design spectral response acceleration)
 $a_p \approx 1.0$ (Mechanical electrical seismic coefficient)
 $R_p \approx 2.5$ (Mechanical electrical seismic coefficient)
 $I_p \approx 1.0$ (Seismic Importance factor)

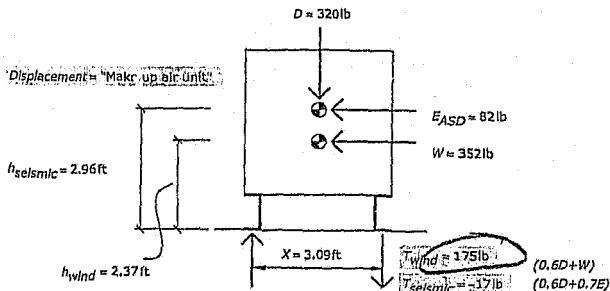
Mechanical unit dimensions

Displacement $\approx$ "Make up air unit" (Unit displacement, e.g. "10 Ton")
Weight $\approx 320 \cdot \text{lb}$ (Total mechanical weight in lb)
Height $\approx 43 \cdot \text{in}$ (Unit height in feet or inches)
Width $\approx 41 \cdot \text{in}$ (Unit width in feet or inches)
Length $\approx 45 \cdot \text{in}$ (Unit length in feet or inches)
Curb $\approx 14 \cdot \text{in}$ (Curb height in feet or inches)

Building parameters

Category $\approx "II"$ (Building category, "I", "II", "III", "IV")
Roof elevation $\approx 40 \cdot \text{ft}$ (Elevation of roof in feet)

Summary



Notes:

1. Positive sign convention shown. Negative values indicate opposite direction.
2. X equal the width of the unit minus 3"

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ASD FORCES FOR EQUIP. HOOD $W = 521 \text{ lb}$

$$\text{HORIZ.} = 0.384(521) = 200 \text{ lb}$$

$$\text{VERT.} = (0.7)[(0.20)(0.762)(521)] = 56 \text{ lb}$$

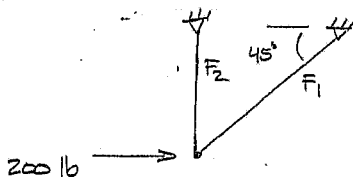
VERTICAL DESIGN (SUPPORTS @ EA. CORNER)

$$\text{CORNER WT.} = \frac{1}{4}(521 + 56) = 144 \text{ lb.}$$

$\therefore \frac{1}{2}'' \text{ } \phi \text{ ALL THREAD}$

SPACE FORCE ASSUME 45° ANGLE

FLOOD UNISTRUT SPACE
FLOOD CHANNEL STEFFENER



$$F_1 = \frac{200}{\cos 45^\circ} = 283 \text{ lb} \quad (\text{c})$$

$$F_2 = 283 \sin 45^\circ = 200 \text{ lb} \quad (\text{t})$$

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BRACES

TOP OF HOOD TO CEILING $\approx 4'-0"$

BRACE LENGTH $\approx 5.66' = 68"$

FORCE ≈ 283 lb (TOTAL)

UNISTRUT CATALOG P.26

$P_a = 2940$ lb @ $72"$ (CONCENTRICALLY LOADED)

PROVIDE (2) BRACES EA. DIRECTION (142 lb EA)

* DISREGARD ECCENTRIC LOADING CAUSED BY CONNECTION
FORCE INSIGNIFICANT.

BENDING ON ANGLE (COMP. FORCE)

ASSUME (2) BOLTS PREVENT TWISTING

MIN LENGTH $1.5 + 3 + 1.5 = 6"$

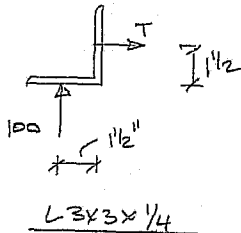
$$S_x = \frac{(4)(0.25)^2}{6} = 0.625 \text{ in}^3$$

$M = 150$ in. lb

$$f_b = \frac{150}{0.625} = 240 \text{ psi}$$

BOLT TENSION

$T = 100$ lb



$\therefore$ FORCES INSIGNIFICANT

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