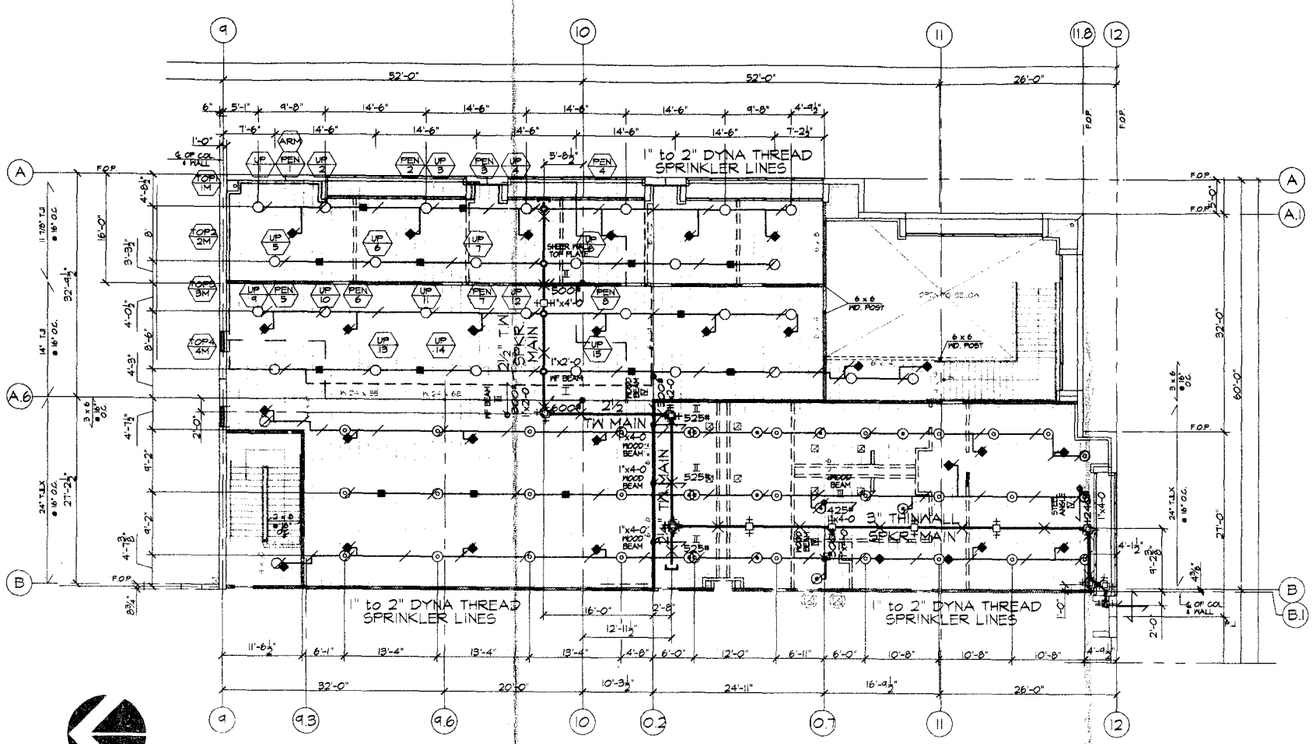


1/8" = 1'-0"
NORTH

UNDER MEZZANINE STRUCTURAL AND HYDRAULIC CALC PLAN

SCALE 1/8" = 1'-0"

LATERAL TYPE II - MAIN ONLY TO 6" WOOD BEAM
SEE DETAIL NO. 5 - THIS SHEET

PIPE SIZE	WEIGHT PER FOOT	PIPE LENGTH	WEIGHT
3" (SCH. 10)	7.94 lb. / ft.	40'-0"	317.60
SUB-TOTAL WEIGHT OF WATER FILLED PIPE		=	317.60
Allowance for Fittings & etc. 15%, per 2002 NFPA 13, Section 9.3.5.6.1	.15	x 317.60 =	47.64
TOTAL WEIGHT OF WATER FILLED PIPE		=	365.24
0.76 WEIGHT OF WATER FILLED PIPE		=	277.58

NFPA #13 (02) FIGURE 9.3.5.9.1
BRACING DIAGRAM= "H"
FASTENER ATTACHMENT= 1/2" THROUGH TAP BOLT
ALLOWABLE LOAD= 4749
LATERAL BRACE SPACING= 2½ / 3" T.W. SPRINKLER MAIN 40' max

LONGITUDINAL TYPE III - MAIN ONLY TO 6" WOOD BEAM
SEE DETAIL NO. 6 - THIS SHEET

PIPE SIZE	WEIGHT PER FOOT	PIPE LENGTH	WEIGHT
3" (SCH. 10)	7.94 lb. / ft.	60'-0"	476.40
SUB-TOTAL WEIGHT OF WATER FILLED PIPE		=	476.40
Allowance for Fittings & etc. 15%, per 2002 NFPA 13, Section 9.3.5.6.1	.15	x 476.40 =	71.46
TOTAL WEIGHT OF WATER FILLED PIPE		=	547.86
0.76 WEIGHT OF WATER FILLED PIPE		=	416.37

NFPA #13 (02) FIGURE 9.3.5.9.1
BRACING DIAGRAM= "E"
FASTENER ATTACHMENT= 1/2" THROUGH TAP BOLT
ALLOWABLE LOAD= 680 lbs
3" T.W. SPRINKLER MAIN - LONGITUDINAL BRACE SPACING= 80'-0" MAXIMUM

LATERAL TYPE II - MAIN AND LINES TO 6" WOOD BEAM
SEE DETAIL NO. 7 - THIS SHEET

PIPE SIZE	WEIGHT PER FOOT	PIPE LENGTH	WEIGHT
1" (DYNA THREAD) (LINES AND ARMS)	1.75 lb. / ft.	37'-10"	66.21
1¼" (DYNA THREAD)	2.54 lb. / ft.	21'-4"	54.19
1½" (DYNA THREAD)	3.22 lb. / ft.	26'-4"	84.78
2" (DYNA THREAD)	4.57 lb. / ft.	54'-0"	246.78
1" (DYNA THREAD) (SPRIGS AND DROPS)	1.75 lb. / ft.	45'-2"	79.04
2½" (SCH. 10)	5.84 lb. / ft.	16'-2"	93.99
SUB-TOTAL WEIGHT OF WATER FILLED PIPE		=	565.00
Allowance for Fittings & etc. 15%, per 2002 NFPA 13, Section 9.3.5.6.1	.15	x 565.00 =	87.75
TOTAL WEIGHT OF WATER FILLED PIPE		=	652.75
0.76 WEIGHT OF WATER FILLED PIPE		=	511.24

NFPA #13 (02) FIGURE 9.3.5.9.1
BRACING DIAGRAM= "E"
FASTENER ATTACHMENT= 1/2" THROUGH BOLT
ALLOWABLE LOAD= 680#
LATERAL BRACE SPACING= 10' max (1 brace for 1 line)

LONGITUDINAL TYPE III - 2½" MAIN ONLY TO WF STEEL BEAM
SEE DETAIL NO. 8 - THIS SHEET

PIPE SIZE	WEIGHT PER FOOT	PIPE LENGTH	WEIGHT
2½" (SCH. 10)	5.84 lb. / ft.	40'-0"	233.60
SUB-TOTAL WEIGHT OF WATER FILLED PIPE		=	233.60
Allowance for Fittings & etc. 15%, per 2002 NFPA 13, Section 9.3.5.6.1	.15	x 233.60 =	35.04
TOTAL WEIGHT OF WATER FILLED PIPE		=	270.64
0.76 WEIGHT OF WATER FILLED PIPE		=	205.91

NFPA #13 (02) FIGURE 9.3.5.9.1
BRACING DIAGRAM= "C"
FASTENER ATTACHMENT= TOLCO FIG. 800 (1/2" STEEL BOLT)
ALLOWABLE LOAD= 1749# PER TOLCO
2½" T.W. SPRINKLER MAIN - LONGITUDINAL BRACE SPACING= 80'-0" MAXIMUM

LATERAL TYPE II - MAIN AND LINES TO WF STEEL BEAM
SEE DETAIL NO. 9 - THIS SHEET

PIPE SIZE	WEIGHT PER FOOT	PIPE LENGTH	WEIGHT
1" (DYNA THREAD) (LINES AND ARMS)	1.75 lb. / ft.	73'-8"	128.92
1¼" (DYNA THREAD)	2.54 lb. / ft.	55'-4"	140.55
1½" (DYNA THREAD)	3.22 lb. / ft.	67'-10"	218.42
2" (DYNA THREAD)	4.57 lb. / ft.	6'-6"	29.71
1" (DYNA THREAD) (DROPS)	1.75 lb. / ft.	20'-0"	35.0
2½" (SCH. 10)	5.84 lb. / ft.	21'-0"	122.64
SUB-TOTAL WEIGHT OF WATER FILLED PIPE		=	676.24
Allowance for Fittings & etc. 15%, per 2002 NFPA 13, Section 9.3.5.6.1	.15	x 676.24 =	101.44
TOTAL WEIGHT OF WATER FILLED PIPE		=	777.73
0.76 WEIGHT OF WATER FILLED PIPE		=	591.07

NFPA #13 (02) FIGURE 9.3.5.9.1
BRACING DIAGRAM= "C"
FASTENER ATTACHMENT= TOLCO FIG. 800 (1/2" STEEL BOLT)
ALLOWABLE LOAD= 1749# PER TOLCO
LATERAL BRACE SPACING= 20' max (1 brace for 2 lines)

LATERAL TYPE II - MAIN AND LINES TO TOP PLATE @ SHEER WALL
SEE DETAIL NO. 5 (SIMILAR) - THIS SHEET

PIPE SIZE	WEIGHT PER FOOT	PIPE LENGTH	WEIGHT
1" (DYNA THREAD) (LINES AND ARMS)	1.75 lb. / ft.	74'-7"	134.27
1¼" (DYNA THREAD)	2.54 lb. / ft.	58'-0"	147.32
1½" (DYNA THREAD)	3.22 lb. / ft.	40'-10¼"	131.62
2" (DYNA THREAD)	4.57 lb. / ft.	2'-7½"	12.0
1" (DYNA THREAD) (DROPS)	1.75 lb. / ft.	15'-0"	26.25
2½" (SCH. 10)	5.84 lb. / ft.	12'-0"	70.08
SUB-TOTAL WEIGHT OF WATER FILLED PIPE		=	527.14
Allowance for Fittings & etc. 15%, per 2002 NFPA 13, Section 9.3.5.6.1	.15	x 527.14 =	79.07
TOTAL WEIGHT OF WATER FILLED PIPE		=	606.21
0.76 WEIGHT OF WATER FILLED PIPE		=	460.72

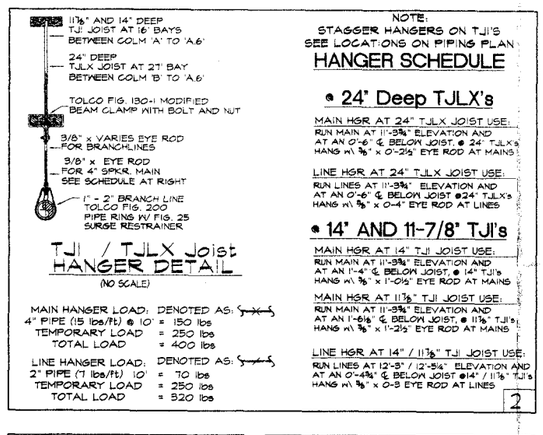
NFPA #13 (02) FIGURE 9.3.5.9.1
BRACING DIAGRAM= "H"
FASTENER ATTACHMENT= 1/2" THROUGH BOLT
ALLOWABLE LOAD= 4749
LATERAL BRACE SPACING= 12' max (1 brace for 2 lines)

LATERAL TYPE II - MAIN ONLY TO TJLX OPEN WEB JOIST (ANGLE IRON)
SEE DETAIL NO. 11 - THIS SHEET

PIPE SIZE	WEIGHT PER FOOT	PIPE LENGTH	WEIGHT
3" (SCH. 10)	7.94 lb. / ft.	30'-0"	238.20
SUB-TOTAL WEIGHT OF WATER FILLED PIPE		=	238.20
Allowance for Fittings & etc. 15%, per 2002 NFPA 13, Section 9.3.5.6.1	.15	x 238.20 =	35.73
TOTAL WEIGHT OF WATER FILLED PIPE		=	273.93
0.76 WEIGHT OF WATER FILLED PIPE		=	208.14

NFPA #13 (02) FIGURE 9.3.5.9.1
BRACING DIAGRAM= "B"
FASTENER ATTACHMENT= 1/2" MACHINE BOLT THROUGH STEEL ANGLE IRON
ALLOWABLE LOAD= 240# PER TRUS JOIST
LATERAL BRACE SPACING= 3'-T.W. SPRINKLER MAIN 30' max

ZONES OF INFLUENCE | 12



TJI / TJLX Joist HANGER DETAIL
(NO SCALE)

MAIN HANGER LOAD:	DENOTED AS:	
4" PIPE (15 lbs/ft) @ 10'	=	150 lbs
TEMPORARY LOAD	=	250 lbs
TOTAL LOAD	=	400 lbs
LINE HANGER LOAD:	DENOTED AS:	
2" PIPE (7 lbs/ft) 10'	=	70 lbs
TEMPORARY LOAD	=	250 lbs
TOTAL LOAD	=	320 lbs

2

NOTE:
STAGGER HANGERS ON TJI'S
SEE LOCATIONS ON PIPING PLAN

HANGER SCHEDULE

@ 24" Deep TJLX's

MAIN HGR AT 24" TJLX JOIST USE:
RUN MAIN AT 11'-3⅜" ELEVATION AND AT AN 0'-6" ℄ BELOW JOIST, @ 24" TJLX's HANG w\ ⅜" x 0'-2½" EYE ROD AT MAINS

LINE HGR AT 24" TJLX JOIST USE:
RUN LINES AT 11'-3⅜" ELEVATION AND AT AN 0'-6" ℄ BELOW JOIST @24" TJLX's HANG w\ ⅜" x 0'-4" EYE ROD AT LINES

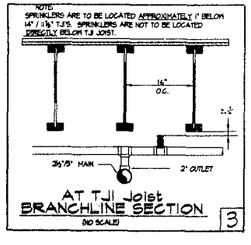
@ 14" AND 11-7/8" TJI's

MAIN HGR AT 14" TJI JOIST USE:
RUN MAIN AT 11'-3⅜" ELEVATION AND AT AN 1'-4" ℄ BELOW JOIST, @ 14" TJI's HANG w\ ⅜" x 1'-0½" EYE ROD AT MAINS

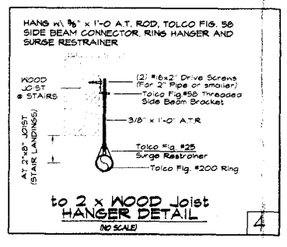
MAIN HGR AT 11⅞" TJI JOIST USE:
RUN MAIN AT 11'-3⅜" ELEVATION AND AT AN 1'-6⅛" ℄ BELOW JOIST, @ 11⅞" TJI's HANG w\ ⅜" x 1'-2½" EYE ROD AT MAINS

LINE HGR AT 14" / 11⅞" TJI JOIST USE:
RUN LINES AT 12'-3" / 12'-5¼" ELEVATION AND AT AN 0'-4⅜" ℄ BELOW JOIST @14" / 11⅞" TJI's HANG w\ ⅜" x 0'-8 EYE ROD AT LINES

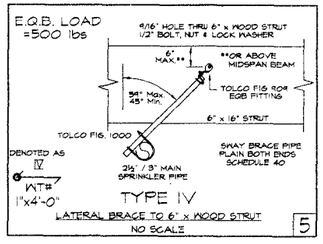
2



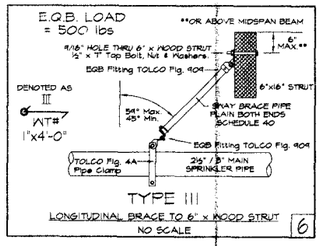
AT TJI Joist BRANCHLINE SECTION
(NO SCALE)
3



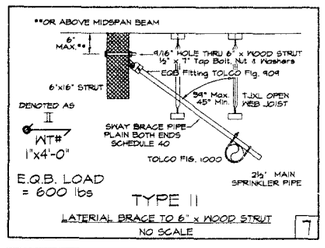
to 2 x WOOD Joist HANGER DETAIL
(NO SCALE)
4



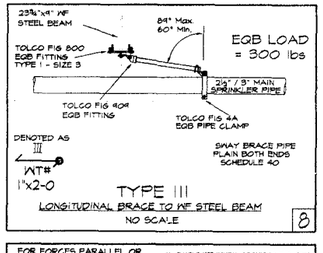
TYPE IV
LATERAL BRACE TO 6" x WOOD STRUT
NO SCALE
5



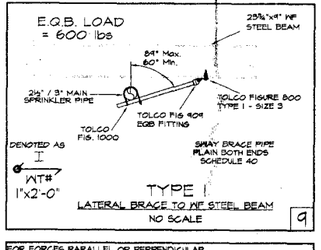
TYPE III
LONGITUDINAL BRACE TO 6" x WOOD STRUT
NO SCALE
6



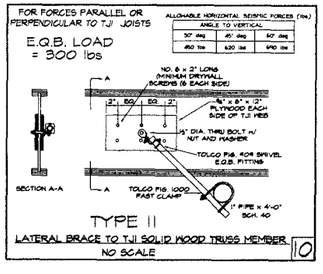
TYPE II
LATERAL BRACE TO 6" x WOOD STRUT
NO SCALE
7



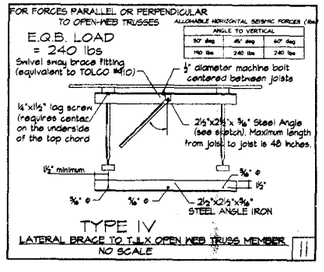
TYPE III
LONGITUDINAL BRACE TO WF STEEL BEAM
NO SCALE
8



TYPE I
LATERAL BRACE TO WF STEEL BEAM
NO SCALE
9



TYPE II
LATERAL BRACE TO TJI SOLID WOOD TRUSS MEMBER
NO SCALE
10



TYPE IV
LATERAL BRACE TO TJLX OPEN WEB TRUSS MEMBER
NO SCALE
11

MEZZANINE ATTIC

HYDRAULIC CALCULATIONS

This system has been hydraulically designed to provide .15 gpm per square foot over the most remote 1500 sqaure feet in accordance with NFPA #13 FIG. 7-2.3.1.2 ORDINARY GP. 1 (CALCULATED 15 SSU)
Hose stream allonance: 100 inside (BASE RISER) and 150 outside (U.G.) also, 0 gpm Conveyor water (REMOTE AREA) and 0 In-rack (BSR)
Sprinkler Orifice ½", K-Factor 5.6 Temp. 212° RELIABLE MODEL 'G'
Demand at base of riser 428.59 GPM with 71.176 PSI
WATER TEST - SUPPLY 84 PSI Static, 80 PSI Res. with 2815 GPM
FIRE PUMP = 75 psi FIRE PUMP AT 2500 gpm

1st FLOOR OFFICE CEILING

HYDRAULIC CALCULATIONS

This system has been hydraulically designed to provide .10 gpm per square foot over the most remote 1500 sqaure feet in accordance with NFPA #13 FIG. 7-2.3.1.2 LIGHT HAZARD (CALCULATED 8 EC PEND)
Hose stream allonance: 0 inside (BASE RISER) and 100 outside (U.G.), also, 0 gpm Conveyor water (REMOTE AREA) and 0 In-rack (BSR)
Sprinkler Orifice 17/32", K-Factor 8.0, Temp. 135°
RELIABLE MODEL FIFR Quick Response, Extended Coverage Sprinklers
USED: 20' x 20' COVERAGE AREA (40 gpm) AT 25 psi MINIMUM PT.
Demand at base of riser 352.86 GPM with 109.497 PSI
WATER TEST - SUPPLY 84 PSI Static, 80 PSI Res. with 2815 GPM
FIRE PUMP = 75 psi FIRE PUMP AT 2500 gpm

HYDRAULIC CALCULATION INFO | 13

THE FIRE SPRINKLER ROOF PLANS FOR BUILDING MEZZANINE WERE GENERATED FROM AJIT RANDHAVA'S STRUCTURAL DRAWINGS UNDER MEZZANINE FRAMING PLAN 8-11, DATED 9-29-04 (BID SET) REC'D 10-04-04 VIA E-MAIL FROM AJIT RANDHAVA AND ASSOCIATES

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UNDER MEZZANINE STRUCTURAL / HYDRAULIC PLAN
SCALE 1/8" = 1'-0"

ALLAN AUTOMATIC SPRINKLER CORPORATION OF SO. CAL.
3233 ENTERPRISE ST. / BREA, CA. 92821 / (714) 993-9500
CALIFORNIA STATE LICENSE C-16 # 1617-82

HARBOR GATEWAY
1451 KNOX STREET
CITY OF LOS ANGELES, CALIFORNIA

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DATE 9-23-04		FILE #	HARBOR
DATE PRINTED NOV 01 2004		SHEET	FP-14S

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