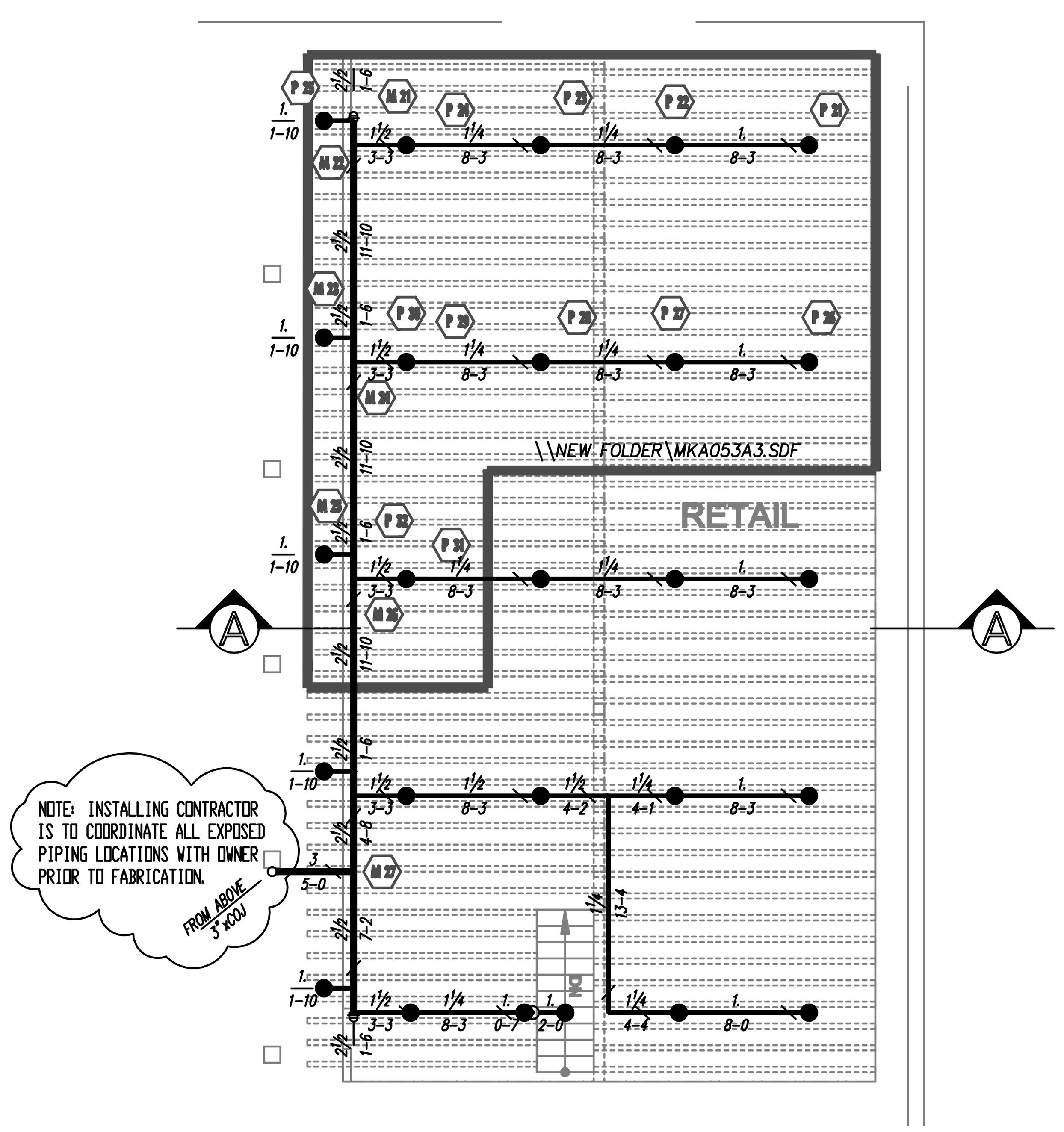
BUILDING SECTION A - A

SCALE: 1/8" = 1'-0"



FIRE SPRINKLER PIPING PLAN

BASEMENT

SCALE: 1/8" = 1'-0"

NORTH

0' 1' 4' 8' 16'

SPRINKLER SYSTEM HYDRAULIC ANALYSIS
\\MKA_MICHAEL KELLY ARC\MKA043A3.SDF
JOB TITLE: TRUE VALUE

WATER SUPPLY DATA

SOURCE NODE TAG	STATIC PRESS. (PSI)	RESID. PRESS. (PSI)	@ FLOW (GPM)	AVAIL. PRESS. (PSI)	@ TOTAL DEMAND (GPM)	REQ'D PRESS. (PSI)
S	54.0	39.0	1186.0	50.0	576.6	46.1

AGGREGATE FLOW ANALYSIS:

TOTAL FLOW AT SOURCE	576.6 GPM
TOTAL HOSE STREAM ALLOWANCE AT SOURCE	0.0 GPM
OTHER HOSE STREAM ALLOWANCES	250.0 GPM
TOTAL DISCHARGE FROM ACTIVE SPRINKLERS	326.6 GPM

NODE ANALYSIS DATA

NODE TAG	ELEVATION (FT)	NODE TYPE	PRESSURE (PSI)	DISCHARGE (GPM)
P21	0.0	K= 8.00	7.6	22.0
P22	0.0	K= 8.00	8.7	23.6
P23	0.0	K= 8.00	9.8	25.1
P24	0.0	K= 8.00	12.5	28.3
P25	0.0	K= 8.00	14.1	30.1
P26	0.0	K= 8.00	7.8	22.4
P27	0.0	K= 8.00	9.0	24.0
P28	0.0	K= 8.00	10.2	25.6
P29	0.0	K= 8.00	12.9	28.8
P30	0.0	K= 8.00	14.6	30.6
P31	0.0	K= 8.00	18.0	34.0
P32	0.0	K= 8.00	16.2	32.2
M21	0.0	- - - -	15.9	- - -
M22	0.0	- - - -	15.9	- - -
M23	0.0	- - - -	16.4	- - -
M24	0.0	- - - -	16.5	- - -
M25	0.0	- - - -	18.2	- - -
M26	0.0	- - - -	18.5	- - -
M27	0.0	- - - -	26.4	- - -
M8	14.5	- - - -	24.1	- - -
M9	14.5	- - - -	27.6	- - -
M10	13.7	- - - -	32.0	- - -
TOR	13.7	- - - -	33.5	- - -
BOR	4.0	- - - -	38.0	- - -
BF1	4.0	- - - -	43.0	- - -
BF2	0.0	- - - -	44.8	- - -
UG	0.5	HOSE STREAM	44.7	250.0
S	0.0	SOURCE	46.1	576.6

PIPE DATA

PIPE TAG / END	ELEV.	NOZ.	PT	DISC.	Q(GPM) / VEL(FPS)	DIA(IN) / HW(C)		LENGTH (FT)		PRESS. SUM.
Pipe: 1					-22.0	1.080	PL	8.25	PF	1.1
P21	0.0	8.0	7.6	22.0	7.7	120	FTG	----	PE	0.0
P22	0.0	8.0	8.7	23.6		0.135	TL	8.25	PV	
Pipe: 2					-45.6	1.408	PL	8.25	PF	1.2
P22	0.0	8.0	8.7	23.6	9.4	120	FTG	----	PE	0.0
P23	0.0	8.0	9.8	25.1		0.142	TL	8.25	PV	
Pipe: 3					-70.7	1.408	PL	8.25	PF	2.6
P23	0.0	8.0	9.8	25.1	14.6	120	FTG	----	PE	0.0
P24	0.0	8.0	12.5	28.3		0.321	TL	8.25	PV	
Pipe: 4					-98.9	1.639	PL	3.25	PF	3.4
P24	0.0	8.0	12.5	28.3	15.0	120	FTG	T	PE	0.0
M22	0.0	0.0	15.9	0.0		0.285	TL	11.95	PV	
Pipe: 5					-30.1	1.080	PL	1.50	PF	1.8
P25	0.0	8.0	14.1	30.1	10.5	120	FTG	T	PE	0.0
M21	0.0	0.0	15.9	0.0		0.240	TL	7.30	PV	
Pipe: 6					-22.4	1.080	PL	8.25	PF	1.1
P26	0.0	8.0	7.8	22.4	7.8	120	FTG	----	PE	0.0
P27	0.0	8.0	9.0	24.0		0.139	TL	8.25	PV	
Pipe: 7					-46.4	1.408	PL	8.25	PF	1.2
P27	0.0	8.0	9.0	24.0	9.6	120	FTG	----	PE	0.0
P28	0.0	8.0	10.2	25.6		0.147	TL	8.25	PV	
Pipe: 8					-72.0	1.408	PL	8.25	PF	2.7
P28	0.0	8.0	10.2	25.6	14.8	120	FTG	----	PE	0.0
P29	0.0	8.0	12.9	28.8		0.332	TL	8.25	PV	
Pipe: 9					-100.8	1.639	PL	3.25	PF	3.5
P29	0.0	8.0	12.9	28.8	15.3	120	FTG	T	PE	0.0
M24	0.0	0.0	16.5	0.0		0.295	TL	11.95	PV	
Pipe: 10					-30.6	1.080	PL	1.25	PF	1.7
P30	0.0	8.0	14.6	30.6	10.7	120	FTG	T	PE	0.0
M23	0.0	0.0	16.4	0.0		0.248	TL	7.05	PV	
Pipe: 11					-34.0	1.639	PL	3.25	PF	0.5
P31	0.0	8.0	18.0	34.0	5.2	120	FTG	T	PE	0.0
M26	0.0	0.0	18.5	0.0		0.039	TL	11.95	PV	
Pipe: 12					-32.2	1.080	PL	1.50	PF	2.0
P32	0.0	8.0	16.2	32.2	11.3	120	FTG	T	PE	0.0
M25	0.0	0.0	18.2	0.0		0.273	TL	7.30	PV	
Pipe: 13					-30.1	2.703	PL	1.50	PF	0.0
M21	0.0	0.0	15.9	0.0	1.7	120	FTG	----	PE	0.0
M22	0.0	0.0	15.9	0.0		0.003	TL	1.50	PV	
Pipe: 14					-129.0	2.703	PL	11.83	PF	0.5
M22	0.0	0.0	15.9	0.0	7.2	120	FTG	----	PE	0.0
M23	0.0	0.0	16.4	0.0		0.041	TL	11.83	PV	
Pipe: 15					-159.6	2.703	PL	1.50	PF	0.1
M23	0.0	0.0	16.4	0.0	8.9	120	FTG	----	PE	0.0
M24	0.0	0.0	16.5	0.0		0.060	TL	1.50	PV	
Pipe: 16					-260.4	2.703	PL	11.83	PF	1.8
M24	0.0	0.0	16.5	0.0	14.6	120	FTG	----	PE	0.0
M25	0.0	0.0	18.2	0.0		0.149	TL	11.83	PV	
Pipe: 17					-292.6	2.703	PL	1.50	PF	0.3
M25	0.0	0.0	18.2	0.0	16.4	120	FTG	----	PE	0.0
M26	0.0	0.0	18.5	0.0		0.185	TL	1.50	PV	
Pipe: 18					-326.6	2.703	PL	18.00	PF	7.9
M26	0.0	0.0	18.5	0.0	18.3	120	FTG	T	PE	0.0
M27	0.0	0.0	26.4	0.0		0.227	TL	34.71	PV	
Pipe: 19					-326.6	3.314	PL	21.00	PF	4.0
M27	0.0	0.0	26.4	0.0	12.1	120	FTG	ET	PE	-6.3
M8	14.5	0.0	24.1	0.0		0.084	TL	47.21	PV	
Pipe: 20					-326.6	3.314	PL	14.83	PF	3.5
M8	14.5	0.0	24.1	0.0	12.1	120	FTG	ET	PE	0.0
M9	14.5	0.0	27.6	0.0		0.084	TL	41.04	PV	
Pipe: 21					-326.6	3.314	PL	33.50	PF	4.0
M9	14.5	0.0	27.6	0.0	12.1	120	FTG	2E	PE	0.4
M10	13.7	0.0	32.0	0.0		0.084	TL	48.06	PV	
Pipe: 22					-326.6	4.310	PL	58.00	PF	1.6
M10	13.7	0.0	32.0	0.0	7.2	120	FTG	E	PE	0.0
TOR	13.7	0.0	33.5	0.0		0.023	TL	67.48	PV	
Pipe: 23					-326.6	4.310	PL	9.67	PF	0.2
TOR	13.7	0.0	33.5	0.0	7.2	120	FTG	----	PE	4.2
BOR	4.0	0.0	38.0	0.0		0.023	TL	9.67	PV	
Pipe: 24					FIXED PRESSURE LOSS DEVICE					
BF1	4.0	0.0	43.0	0.0	5.0 psi, 326.6 gpm					
BOR	4.0	0.0	38.0	0.0						
Pipe: 25					-326.6	4.310	PL	3.50	PF	0.1
BF1	4.0	0.0	43.0	0.0	7.2	120	FTG	----	PE	1.7
BF2	0.0	0.0	44.8	0.0		0.023	TL	3.50	PV	
Pipe: 26					-326.6	4.220	PL	9.00	PF	0.2
BF2	0.0	0.0	44.8	0.0	7.5	140	FTG	----	PE	-0.2
UG	0.5	H.S.	44.7	250.0		0.020	TL	9.00	PV	
Pipe: 27					-576.6	8.390	PL	400.00	PF	1.1
UG	0.5	H.S.	44.7	250.0	3.3	140	FTG	2E2TG	PE	0.2
S	0.0	SRCE	46.1	(N/A)		0.002	TL	562.70	PV	

NOTES (HASS):
(1) Calculations were performed by the HASS 8.2 computer program under license no. 16121527 granted by
HRS Systems, Inc.
208 South Public Square
Petersburg, TN 37144
(931) 659-9760
(2) The system has been calculated to provide an average imbalance at each node of 0.002 gpm and a maximum imbalance at any node of 0.061 gpm.
(3) Total pressure at each node is used in balancing the system. Maximum water velocity is 18.3 ft/sec at pipe 18.
(4) Items listed in bold print on the cover sheet are automatically transferred from the calculation report.

(in)	E Ell	T Tee	L LngEll	C ChkVlv	B BfyVlv	G GatVlv
4.220	14.60	29.20	8.80	32.10	17.50	2.90
8.390	26.60	51.80	19.20	66.60	17.80	5.90

PAGE: F MATERIAL: DynaTHREAD HWC: 120
Diameter Equivalent Fitting Lengths in Feet

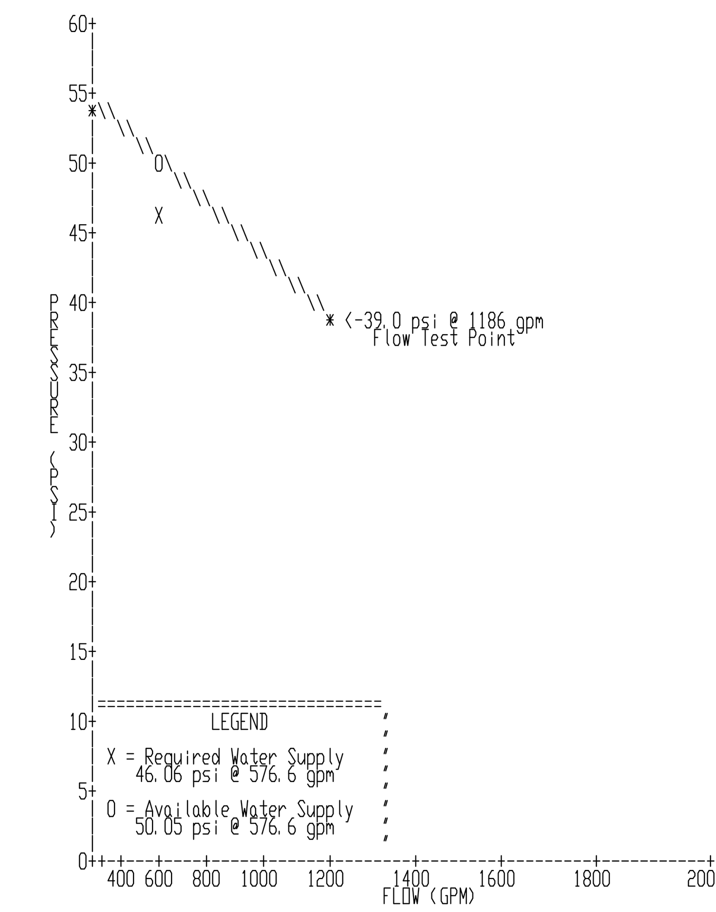
Diameter (in)	E Ell	T Tee	L lngell	C chkva	B bfly	G gate	A almva	D drychk
1.080	2.30	5.80	2.30	5.80	5.80	1.00	10.00	10.00
1.408	3.30	6.60	2.20	7.00	7.70	1.00	10.00	10.00
1.639	4.40	8.70	2.20	9.00	9.80	1.00	10.00	10.00

SPRINKLER SYSTEM HYDRAULIC ANALYSIS Page 5
DATE: 10/17/2011 Z:\HASSDATA\MKA_MICHAEL KELLY ARC\MKA043A3.SDF
JOB TITLE: TRUE VALUE

PAGE: I MATERIAL: DynaFLOW HWC: 120
Diameter Equivalent Fitting Lengths in Feet

Diameter (in)	E Ell	T Tee	L LNGELB	C CHKVA	B BFLYVA	G GATEVA	A ALMVA	D DRYVA
2.703	6.61	16.71	6.20	21.80	10.90	1.60	15.50	15.50
3.314	7.28	18.93	7.70	24.50	15.30	1.50	19.90	19.90
4.310	9.48	22.30	8.40	30.70	16.70	2.80	27.90	27.90

WATER SUPPLY CURVE



CALCULATION DESIGN INFORMATION

TOTAL AREA OF SYSTEM	16,500 S.F.
OCCUPANCY	MERCANTILE
HAZARD	ORD HAZ II
DENSITY	.20
AREA OF OPERATION	1060 S.F.
AREA PER DEMANDING HEAD	108 S.F.
NO. OF FLOWING SPRINKLERS	12
HOSE WATER ALLOWANCE:	
INSIDE 250.0 OUTSIDE 0.0	

SYSTEM DEMAND

REQUIRED	@BASE OF RISER	@SOURCE
PSI	38.0	46.1
GPM	326.6	576.6

PSI AVAILABLE	50.0
GPM AVAILABLE	576.6
% SAFETY FACTOR	10%+8.46% = 18.46%

SYSTEM: \\MKA_MICHAEL KELLY ARC\MKA043A3.SDF

These plans were prepared by:
FIRE PROTECTION ENGINEERING SERVICES
4242 W. Topeka Dr., Glendale, AZ 85308
(623) 587-1844 Fax. (623) 587-7992

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APPROVAL STAMP

SPRINKLER LEGEND

SYMBOL	MODEL	K-FAC	THREAD	RATING	DESCRIPTION	FINISH	QTY.
●	VIKING SIN VK352	8.0	3/4"	155°	QR PENDENT w/ 2 PC. REC. ESC.	BRASS	26
					TOTAL THIS SHEET =		26

MWKARCH
Architecture
Planning
Interiors
History
Arts
Michael Wilson Kelly - Architects, Ltd. -
21 East 6th Street / Unit 518
Tempe, Arizona 85281 (480) 829-7667

Revisions:

Registered Professional Engineer (Fire Protection) CERTIFICATE NO. 26512 DONALD K. NEAL Date Signed 11-2-11 ARIZONA, U.S.A.
EXPIRES 9/30/13

TRUE VALUE HARDWARE

Florence Commercial Rehabilitation– Fire Sprinkler Improvement
290 North Main Street, Florence, Arizona 85132

Drawn by: JRM	Checked by: MWK
Project No. 2010.05	Date: 09-14-11

BASEMENT PIPING

FP4.0