

NOTES & LEGEND

THESE SHOP DRAWINGS ARE BASED ON THE OWNER'S ACCEPTANCE OF NFPA 25 AS THE OWNER'S STANDARD FOR THE INSPECTION, TESTING AND MAINTENANCE OF WATER-BASED FIRE PROTECTION SYSTEMS.

OWNER TO PROVIDE ADEQUATE HEAT THROUGHOUT THE ENTIRE BUILDING TO PREVENT ALL SPRINKLER PIPING FROM FREEZING.

ALL DESIGN, MATERIAL & INSTALLATION TO COMPLY WITH ALL LOCAL REQUIREMENTS AND APPLICABLE NFPA STANDARDS.

ENTIRE BUILD SPACE TO BE COMPLETELY FREE OF ANY COMBUSTIBLES TO AVOID THE NECESSITY OF SPRINKLER PROTECTION.

CENTRAL MONITORING OF SPRINKLER SYSTEM TO BE BY OTHERS.

ALL ELECTRICAL WIRING TO BE BY OTHERS.

ALL UNDERGROUND WORK TO BE BY OTHERS.

TOS - TOP OF STEEL BEAM ELEVATION ABOVE FIN. FLR.

EL. DIM. - CENTER LINE OF PIPE ELEVATION ABOVE FIN. FLR.

○ DIM. - FINISHED CEILING HEIGHT ABOVE FIN. FLR.

P.O.L. - PIPE-O-LET

D.N. - DOWN OR DROP NIPPLE

H.F. - TO BE HUNG IN FIELD

U.N.O. - UNLESS NOTED OTHERWISE

○ - APPROVED TYPE HANGER ON A PIPE

○ - HYDRAULIC REFERENCE POINT OR LINE NUMBER

S.M. - SHAPED NIPPLE

R.N. - RISER NIPPLE

C.O.A. - CUT ON JOB

N.T.S. - NOT TO SCALE

FLOW TEST INFORMATION

LOCATION: HYD 021-039PH EL. 99'4"

DATE: 11/14/2020

BY: KAW VALLEY ENGINEERING INC.

SIZE OF CITY MAIN: VARIES

STATIC PRESSURE: 93

RESIDUAL PRESSURE: 86

FLOW @ RESIDUAL: 1700

Block Two Lin & NW Lowenstein Dr.

SYMBOL	NOTES
VC300	ESCHCUTCHEN
VC300	FINISH
VC300	BRASS
VC300	QUICK
VC300	RECESSED
VC300	WHITE

APPROVALS

DATE: 5/9/20

BY: [Signature]

DATE: 5/9/20

BY: [Signature]

DESIGN CRITERIA:

PARKING AREA / RAMP:

PER NFPA-13, 2016 EDITION: ORDINARY HAZARD OR I OCCUPANCY

0.15 GPM / SQ. FT. FOR 125 SQ. FT. ALL HEADS TO BE QUICK RESPONSE, 130 SQ. FT. / HEAD MAXIMUM SPACING, TOTAL HOSE ALLOWANCE = 250 GPM(100 INSIDE / 150 OUTSIDE)

CONTRACT NO: 13613

TOTAL HEADS: 4107

HEADS THIS SHEET: 511

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

DESIGNED BY: B.K.P.

CHECKED BY:

DRAWING DATE: 1-10-2020

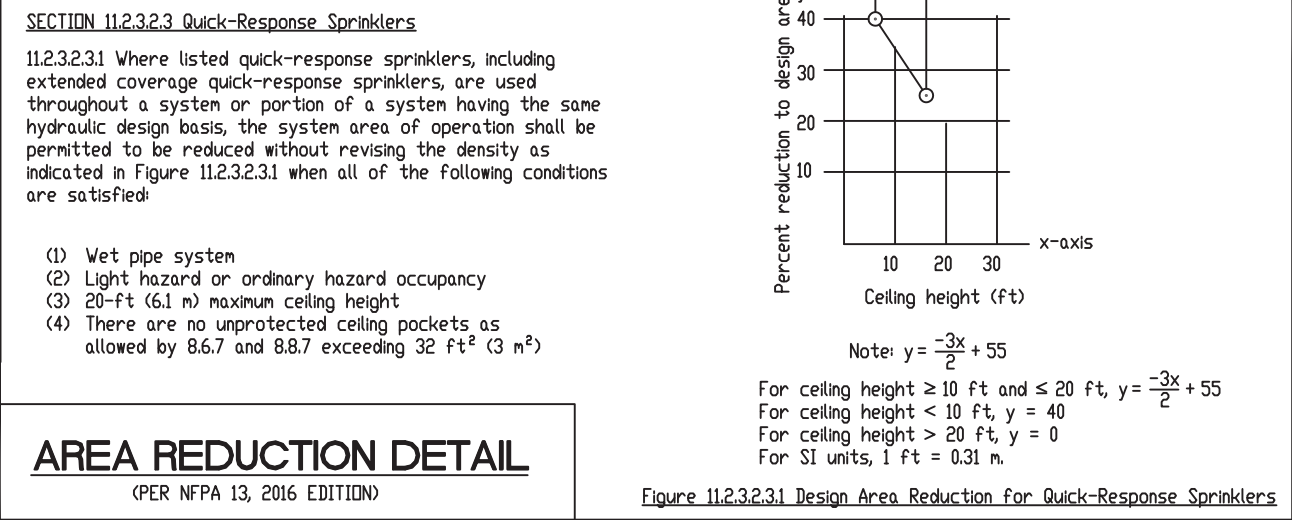
PLOT DATE:

DRAWING NO: 2 OF 16

KEY PLAN

SYSTEM #1

SYSTEM #2



GARAGE SYSTEM #1

GARAGE LEVEL ELEVATION 87'-4"

COMMERCIAL LEVEL ELEVATION 100'-0"

FIRST FLOOR ELEVATION 104'-0"

ALL BRANCH LINE HANGERS TO BE #6@1'-3" UNID

ALL HANGERS TO BE SPACED PER NFPA 13

HANGER SPACING TABLE	
HANGER SPACING FOR STEEL PIPE (SCH. 40)	
PIPE SIZE	HANGER SPACING
1", 1 1/4"	12'
1 1/2" & LARGER	15'
HANGER SPACING FOR STEEL PIPE (THINWALL)	
PIPE SIZE	HANGER SPACING
1" - 3"	12'
4" & LARGER	15'

TYP. HANGER #06

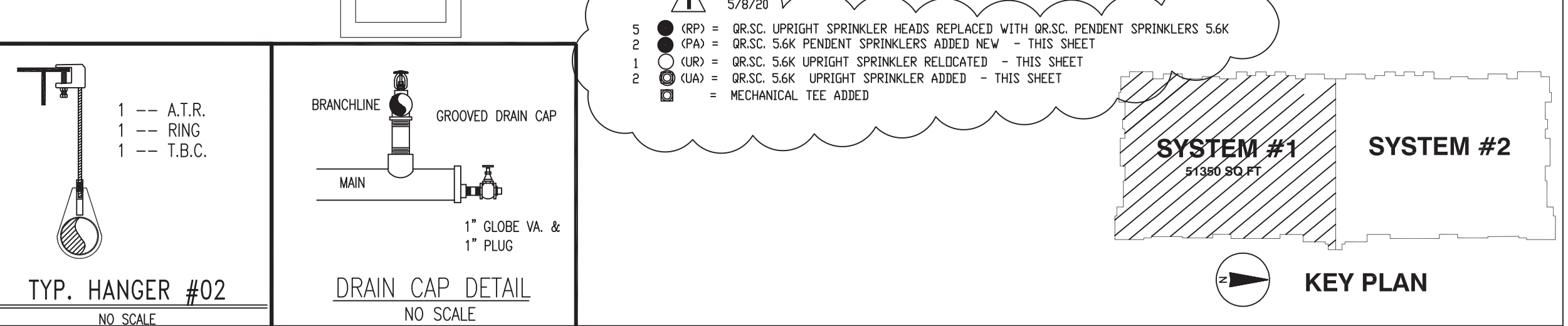
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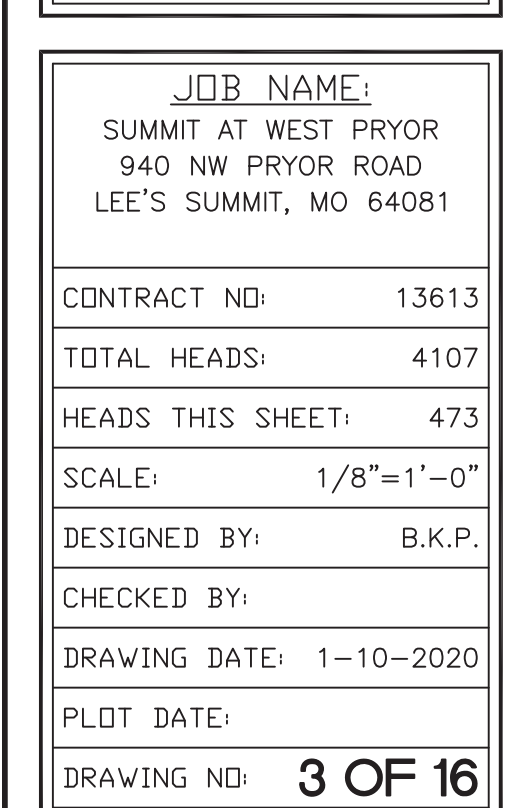
TYP. HANGER #02

NO SCALE

DRAIN CAP DETAIL

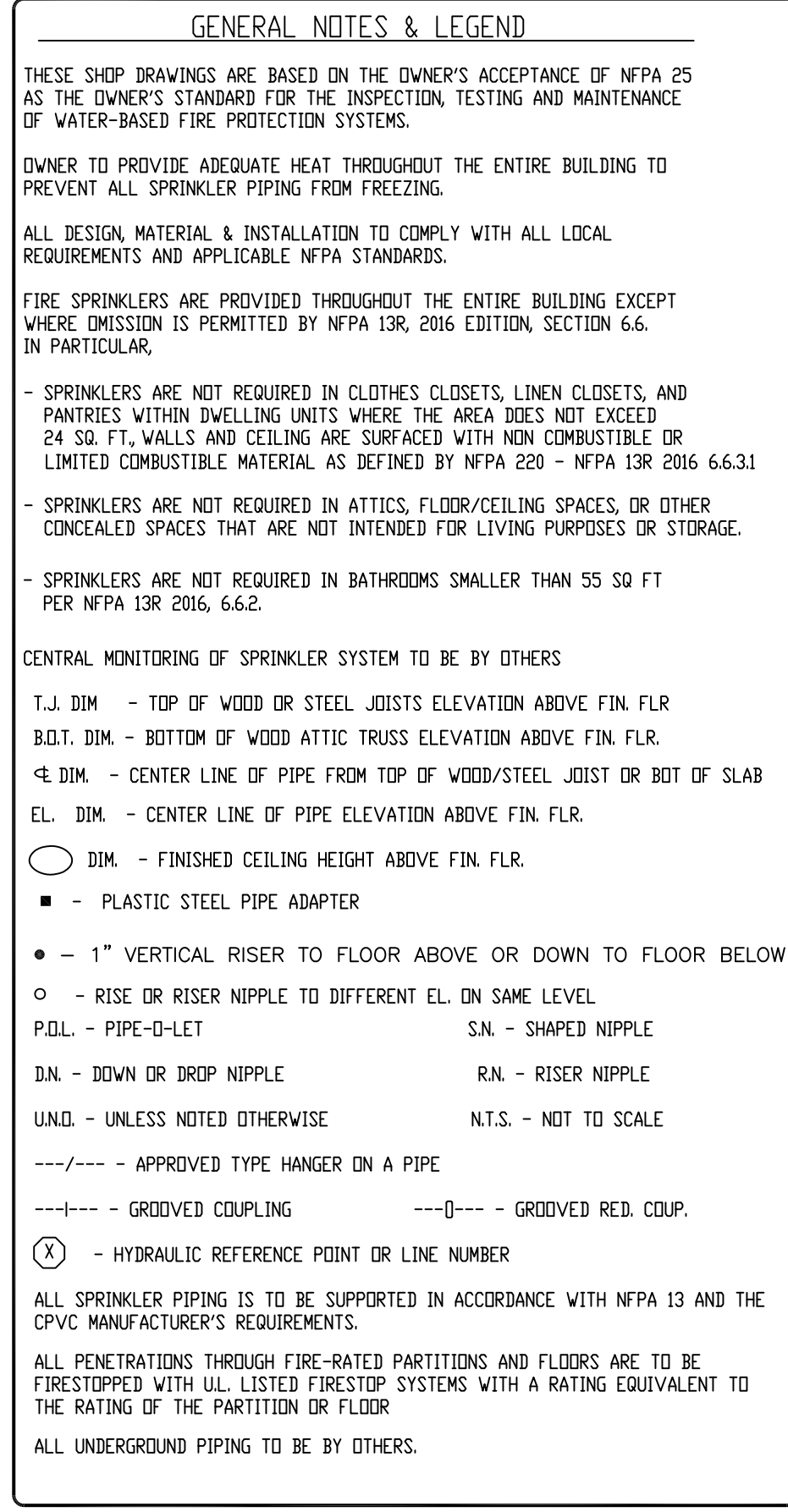
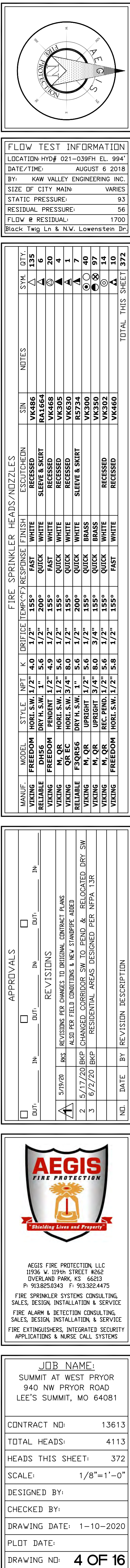
NO SCALE




KEY PLAN

NO SCALE

NO SCALE



<u>HANGER SPACING TABLE</u>			
HANGER SPACING FOR PLASTIC PIPE		HANGER SPACING FOR STEEL PIPE (SCH. 40)	
<u>PIPE SIZE</u>	<u>HANGER SPACING</u>	<u>PIPE SIZE</u>	<u>HANGER SPACING</u>
1"	6'	1", 1 1/4"	12'
1 1/4"	6 1/2'	1 1/2" & LARGER	15'
1 1/2"	7'		
2"	8'		
HANGER SPACING FOR STEEL PIPE (THINWALL)			
<u>PIPE SIZE</u>	<u>HANGER SPACING</u>	<u>PIPE SIZE</u>	<u>HANGER SPACING</u>
1" - 3"	12'		
4" & LARGER	15'		

<p><u>PIPE TYPE</u></p> <p>2 1/2" AND LARGER: TO BE SCH. 10 W/ GROOVED FITTINGS</p> <p>2" AND SMALLER CONCEALED PIPING: CPVC PLASTIC W/ PLASTIC FITTINGS</p> <p>ALL EXPOSED PIPING TO BE STEEL SCH. 40 W/ THREADED FITTINGS</p> <p>ALL GR. FITTINGS TO BE FIRELOCK U.N.O.</p>
<p><u>PIPE TYPE RETAIL AREA</u></p> <p>ALL WELDED MAIN & LINE PIPING TO BE STEEL SCH. 10.</p> <p>ALL THREADED LINE PIPING TO BE STEEL SCH. 40.</p> <p>ALL GR. FITTINGS TO BE FIRELOCK U.N.O.</p> <p>ALL GR. COUPLINGS TO BE 009 EZ FIRELOCK</p>

5/6/20

9 (RP) = DR.SC. UPRIGHT SPRINKLER HEADS REPLACED WITH DR.SC. PENDENT SPRINKLER HEADS - THIS SHEET

0 (PA) = DR.SC. 5.6K PENDENT SPRINKLERS ADDED NEW - THIS SHEET

6 (UR) = DR.SC. 8.0K UPRIGHT SPRINKLER RELOCATED - THIS SHEET

17 (UA) = DR.SC. 8.0K UPRIGHT SPRINKLER ADDED - THIS SHEET

5 (P) = PLUG EXISTING OUTLET - THIS SHEET

DESIGN CRITERIA:

SYSTEM DESIGN FOR DWELLING UNITS IS IN ACCORDANCE WITH
NFPA 13B, 2016 EDITION, PARAGRAPH 7.1.1.3 AND PRODUCT LISTING SPECIFICATION
AREA TO INCLUDE ALL SPRINKLERS WITHIN A COMPARTMENT, UP TO A MAXIMUM OF
SQR. THIS DESIGN INCLUDES A 100 GPM ALLOWANCE FOR HOSE STREAMS.

OTHER LIGHT HAZARD AREAS
 OTHER NFPA 13 (2016 EDITION) LIGHT HAZ OCCUPANCY, 0.10 GPM/SQ. FT. FOR 900 SQ. FT. TOTAL ALLOWANCE FOR HOSES IS 100 GPM. QUICK RESPONSE HEADS. 225 SQ FT/ H. SPACING WITH STANDARD COVERAGE HEADS.

NR NFPA 13 (2016 EDITION) ORD HAZ GR 1, 0.15 GPM/SQ. FT. FOR 900 SQ. FT.
TAL ALLOWANCE FOR HOSES IS 250 GPM. QUICK RESPONSE HEADS. 130 SQ FT/ H
PACING WITH QR STANDARD COVERAGE HEADS.

UNIVERSITY OF MICHIGAN

MAHENDRA H. SHETH



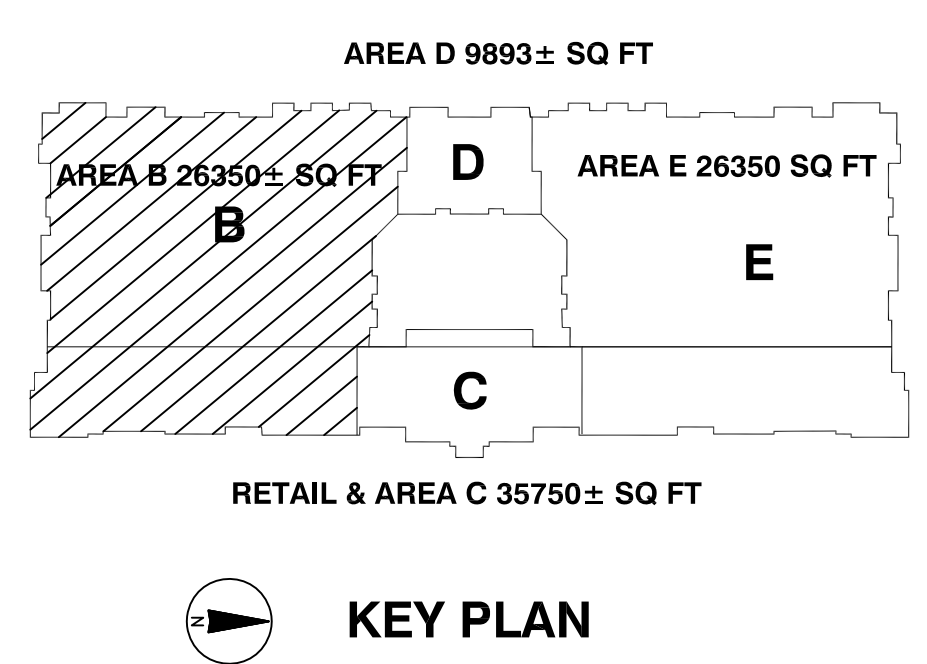
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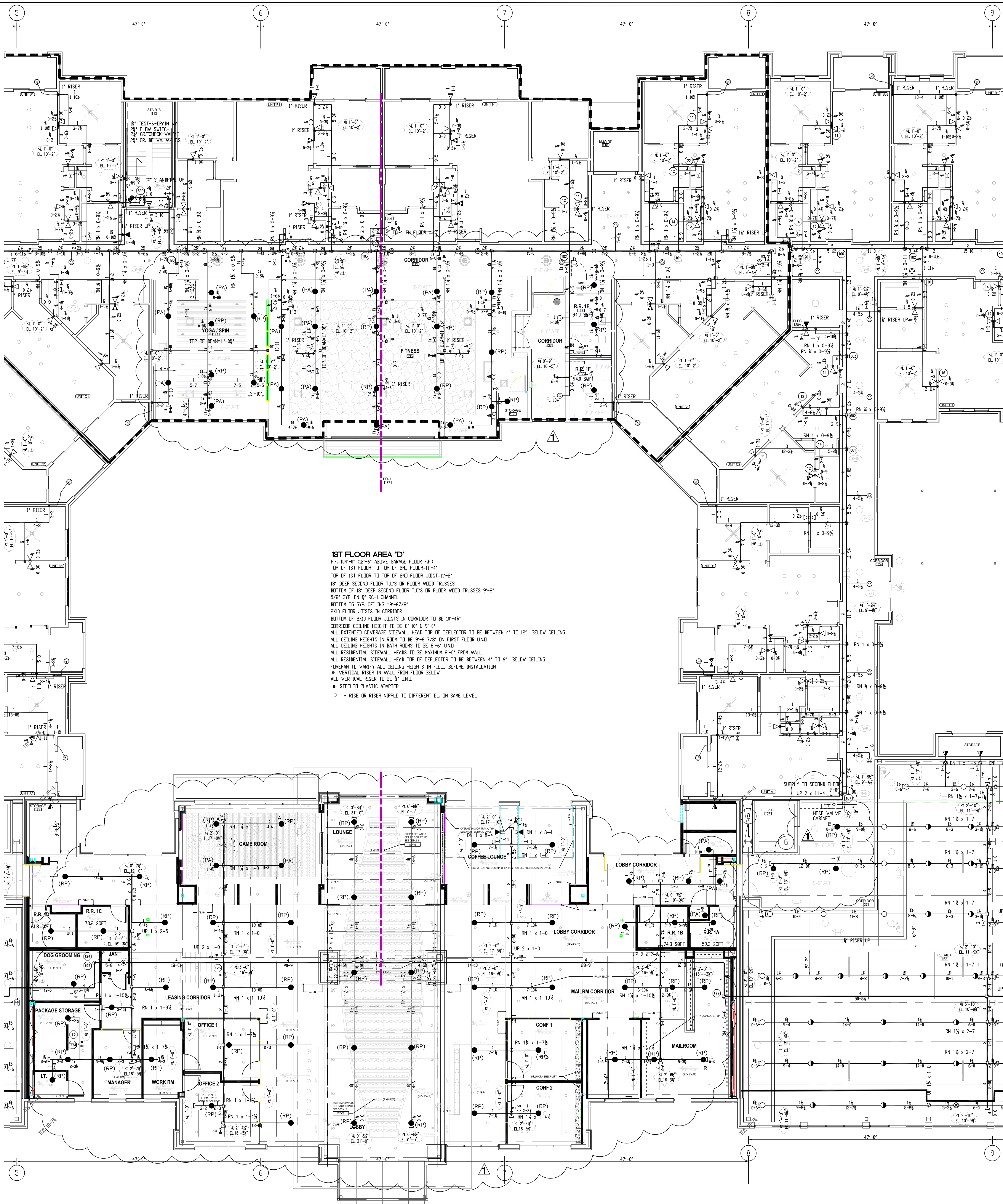
AREA D 9893+ SQ FT

AREA B 26350± SQ FT **D** AREA E 26350 S

DETAIL & AREA C 25750+ SQ. FT.


KEY PLAN





HANGER SPACING TABLE

HANGER SPACING FOR PLASTIC PIPE		HANGER SPACING FOR STEEL PIPE (SCH. 40)	
PIPE SIZE	HANGER SPACING	PIPE SIZE	HANGER SPACING
1"	6"	1", 1 1/4"	12"
1 1/4"	6"	1 1/2" & LARGER	15"
1 1/2"	7"		
2"	8"	HANGER SPACING FOR STEEL PIPE (THINWALL)	
		PIPE SIZE	HANGER SPACING
		1" - 3"	12"
		4" & LARGER	15"

PIPE TYPE RESIDENTIAL AREA

- 2 1/2" & LARGER: TO BE SCHED. 10 W/ GROOVED FITTINGS
- 2" & SMALLER CONCEALED PIPING: CPVC PLASTIC W/ PLASTIC FITTINGS
- ALL EXPOSED PIPING TO BE STEEL SCH. 40 W/ THREADED FITTINGS
- ALL GR. FITTINGS TO BE FIRELOCK UNO.

PIPE TYPE RETAIL AREA

- ALL WELDED MAIN & LINE PIPING TO BE STEEL SCH. 10.
- ALL THREADED LINE PIPING TO BE STEEL SCH. 40.
- ALL GR. FITTINGS TO BE FIRELOCK UNO.
- ALL GR. COUPLING TO BE 009 EZ FIRELOCK

GENERAL NOTES & LEGEND

THESE SHOP DRAWINGS ARE BASED ON THE OWNER'S ACCEPTANCE OF NFPA 25 AS THE OWNER'S STANDARD FOR THE INSPECTION, TESTING AND MAINTENANCE OF WATER-BASED FIRE PROTECTION SYSTEMS.

OWNER TO PROVIDE ADEQUATE HEAT THROUGHOUT THE ENTIRE BUILDING TO PREVENT ALL SPRINKLER PIPING FROM FREEZING.

ALL DESIGN, MATERIAL & INSTALLATION TO COMPLY WITH ALL LOCAL REQUIREMENTS AND APPLICABLE NFPA STANDARDS.

FIRE SPRINKLERS ARE PROVIDED THROUGHOUT THE ENTIRE BUILDING EXCEPT WHERE EXEMPTION IS PERMITTED BY NFPA 13R, 2016 EDITION, SECTION 4.6. IN PARTICULAR,

- SPRINKLERS ARE NOT REQUIRED IN CLOTHES CLOSETS, LINEN CLOSETS, AND PANTRIES WITHIN DWELLING UNITS WHERE THE AREA DOES NOT EXCEED 24 SQ. FT. WALLS AND CEILING ARE SURFACED WITH NON COMBUSTIBLE OR LIMITED COMBUSTIBLE MATERIAL, AS DEFINED BY NFPA 220 - NFPA 13R 2016 6.6.3.1
- SPRINKLERS ARE NOT REQUIRED IN ATTICS, FLOOR/CEILING SPACES, OR OTHER CONCEALED SPACES THAT ARE NOT INTENDED FOR LIVING PURPOSES OR STORAGE.
- SPRINKLERS ARE NOT REQUIRED IN BATHROOMS SMALLER THAN 55 SQ. FT. PER NFPA 13R 2016, 6.6.2.

CENTRAL MONITORING OF SPRINKLER SYSTEMS TO BE BY OTHERS

T.J. DIM - TOP OF WOOD OR STEEL JOISTS ELEVATION ABOVE FIN. FLR

B.D.T. DIM - BOTTOM OF WOOD ATTIC TRUSS ELEVATION ABOVE FIN. FLR

± DIM - CENTER LINE OF PIPE FROM TOP OF WOOD/STEEL JOIST OR BOT. OF SLAB

EL. DIM - CENTER LINE OF PIPE ELEVATION ABOVE FIN. FLR

○ DIM - FINISHED CEILING HEIGHT ABOVE FIN. FLR

● - PLASTIC STEEL PIPE ADAPTER

● - 1" VERTICAL RISER TO FLOOR ABOVE OR DOWN TO FLOOR BELOW

○ - RISE OR RISER NIPPLE TO DIFFERENT EL. ON SAME LEVEL

P.D.L. - PIPE-D-LET S.N. - SHAPED NIPPLE

D.N. - DOWN OR DROP NIPPLE R.N. - RISER NIPPLE

UNO. - UNLESS NOTED OTHERWISE N.T.S. - NOT TO SCALE

---/--- APPROVED TYPE HANGER ON A PIPE

---+--- GROOVED COUPLING ---0--- GROOVED RED. COUP.

⑧ - HYDRAULIC REFERENCE POINT OR LINE NUMBER

ALL SPRINKLER PIPING IS TO BE SUPPORTED IN ACCORDANCE WITH NFPA 13 AND THE CPVC MANUFACTURER'S REQUIREMENTS.

ALL PENETRATIONS THROUGH FIRE-RATED PARTITIONS AND FLOORS ARE TO BE FIRESTOPPED WITH U.L. LISTED FIRESTOP SYSTEMS WITH A RATING EQUIVALENT TO THE RATING OF THE PARTITION OR FLOOR

ALL UNDERGROUND PIPING TO BE BY OTHERS

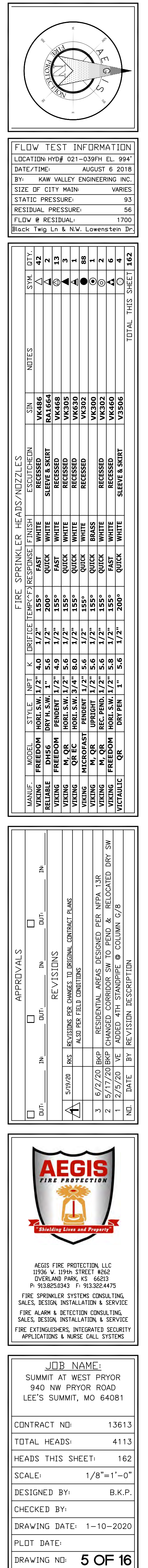
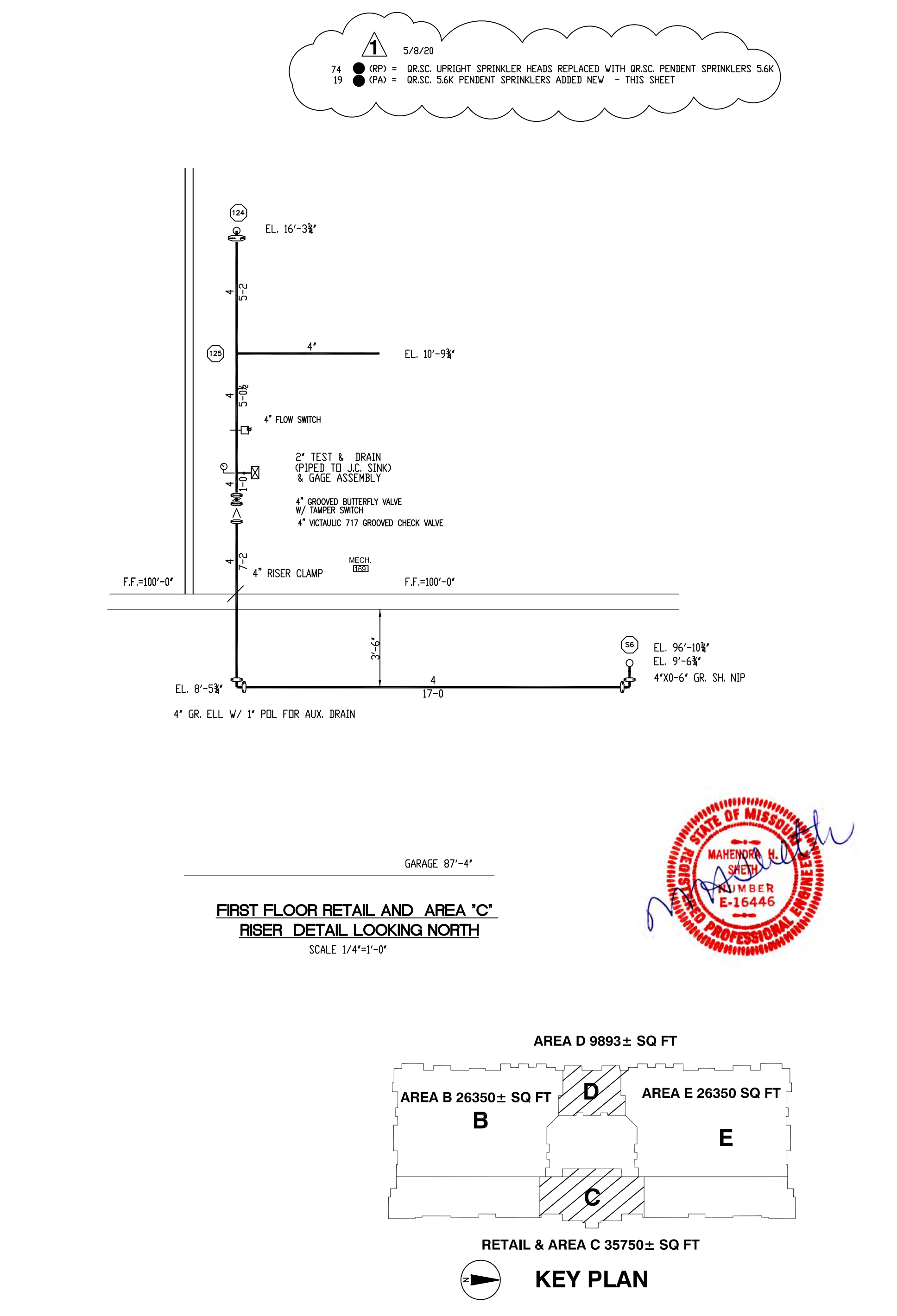
DESIGN CRITERIA:

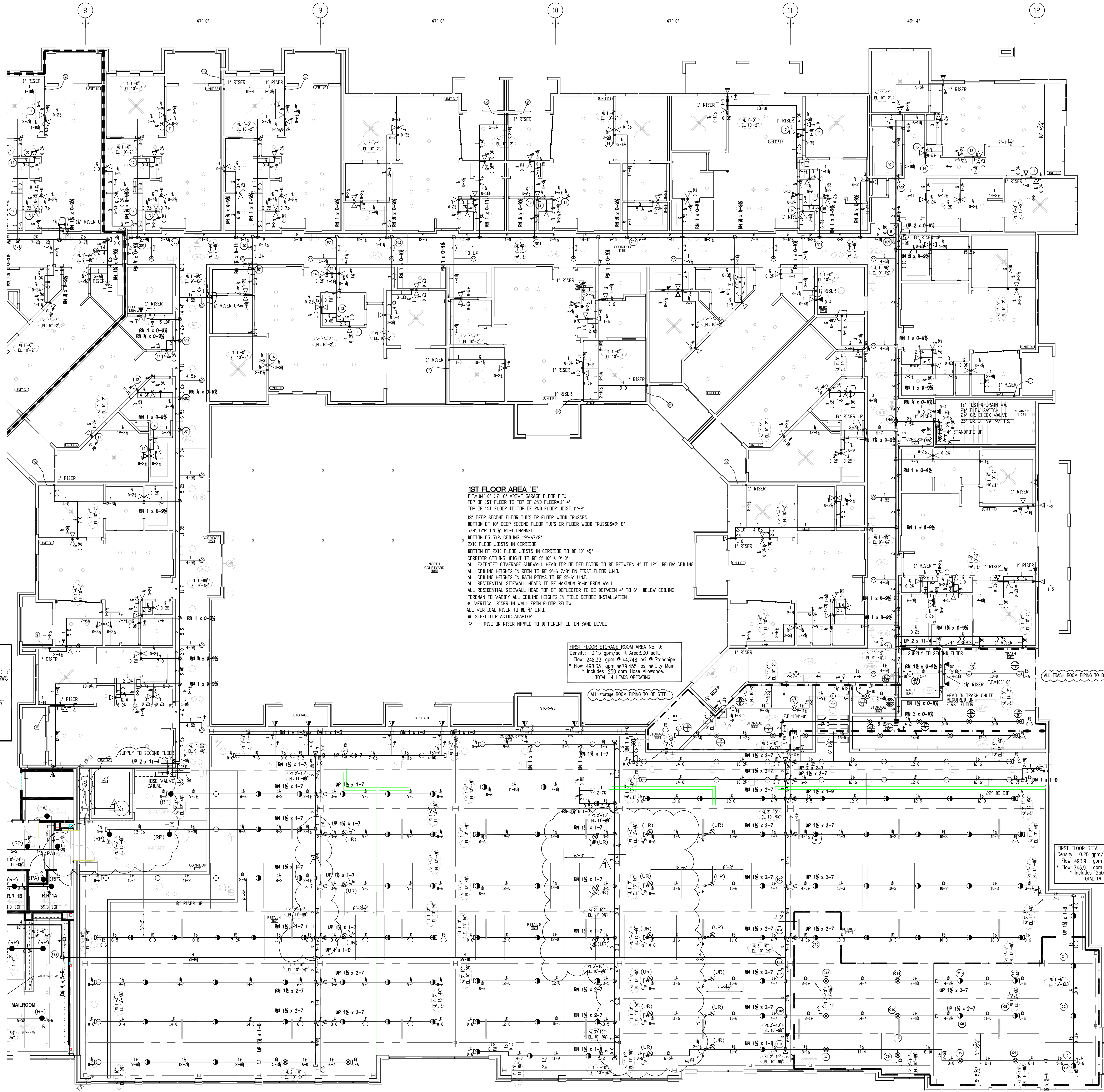
SYSTEM DESIGN FOR DWELLING UNITS IS IN ACCORDANCE WITH NFPA 13R, 2016 EDITION, PARAGRAPH 7.1.1.3 AND PRODUCT LISTING SPECIFICATIONS. DESIGN AREA TO INCLUDE ALL SPRINKLERS WITHIN A COMPARTMENT, UP TO A MAXIMUM OF FOUR. DESIGN DISCHARGE IS IN ACCORDANCE WITH PRODUCT LISTING. THOUGH NOT REQUIRED BY NFPA 13R, THIS DESIGN INCLUDES A 100 GPM ALLOWANCE FOR HOSE STREAMS.

ALL FUTURE SHELL AREAS & FLEX RETAIL AREAS
PER NFPA 13 (2016 EDITION) ORD HAZ GR 2 OCCUPANCY, 0.20 GPM/SQ. FT. FOR 1500 SQ. FT. TOTAL ALLOWANCE FOR HOSES IS 250 GPM. QUICK RESPONSE HEADS, 130 SQ FT/ HEAD MAXIMUM SPACING WITH STANDARD COVERAGE HEADS.

ALL OTHER LIGHT HAZ/GR AREAS
PER NFPA 13 (2016 EDITION) LIGHT HAZ OCCUPANCY, 0.10 GPM/SQ. FT. FOR 900 SQ. FT. TOTAL ALLOWANCE FOR HOSES IS 100 GPM. QUICK RESPONSE HEADS, 225 SQ FT/ HEAD MAXIMUM SPACING WITH STANDARD COVERAGE HEADS.

ALL SMALL STORAGE ROOMS & MECH. AREAS
PER NFPA 13 (2016 EDITION) ORD HAZ GR 1, 0.15 GPM/SQ. FT. FOR 900 SQ. FT. TOTAL ALLOWANCE FOR HOSES IS 250 GPM. QUICK RESPONSE HEADS, 130 SQ FT/ HEAD MAXIMUM SPACING WITH OR STANDARD COVERAGE HEADS.





PIPE TYPE RESIDENTIAL AREA

2 1/2" AND LARGER: TO BE SCHED. 10 W/ GROOVED FITTINGS
2" AND SMALLER CONCEALED PIPING: CPVC PLASTIC W/ PLASTIC FITTINGS
ALL EXPOSED PIPING TO BE STEEL SCH. 40 W/ THREADED FITTINGS
ALL GR. FITTINGS TO BE FIRELOCK U.N.O.

PIPE TYPE RETAIL AREA

ALL WELDED MAIN & LINE PIPING TO BE STEEL SCH. 10.
ALL THREADED LINE PIPING TO BE STEEL SCH. 40.
ALL GR. FITTINGS TO BE FIRELOCK U.N.O.
ALL GR. COUPLING TO BE 009 EZ FIRELOCK

[illegible]

1 --- A.T.R.
1 --- RING
1 --- EYE SOCKET
1 --- WASHER
1 --- LAG BOLT

TYP. HANGER #05

NO SCALE

1 --- A.T.R.
1 --- RING
1 --- EYE SOCKET
1 --- WASHER
1 --- LAG BOLT

TYP. HANGER #05A

NO SCALE

1 --- 2x4 TRAPEZE
1 --- 3/4" A.T.R.
1 --- RING
1 --- "SIDEWINDER"
MODEL SWG 20

TYP. HANGER #15A

NO SCALE

1 --- NIBCO/TOLCO FIG. 23 HANGER
FOR CPVC PIPE WITH
SUPPLIED WOOD SCREWS

TYP. HANGER #23

NO SCALE

1 --- WOOD JOIST
OR BEAM

TYP. HANGER #24

NO SCALE

1 --- NIBCO/TOLCO FIG. 23 HANGER
FOR CPVC PIPE WITH
SUPPLIED WOOD SCREWS

TYP. HANGER #24

NO SCALE

1 --- WOOD JOIST
1 --- 3/4" A.T.R.
1 --- RING
1 --- MODEL GST 30
SAMMY SUPER SCREW

TYP. HANGER #17

NO SCALE

1 --- FIN. CEILING
1 --- 1" ARM OVER
1 --- MAIN OR LINE
1 --- WALL / SOFFIT

SIDEWALL DETAIL

NO SCALE

1 --- A.T.R.
1 --- RING
1 --- "SIDEWINDER"
MODEL SWG
2" LONG

HANGER DETAIL #52

NO SCALE

1 --- A.T.R.
1 --- RING
1 --- T.B.C.

TYP. HANGER #02

NO SCALE

1 --- 3/8" SHORT INSERT
1 --- HD-P DROP-IN ANCHOR
MECHANICAL ANCHORING SYSTEMS
1 --- A.T.R.
1 --- RING

TYP. HANGER #06

NO SCALE

1 --- TYP. HANGER #100

NO SCALE

TYCO "SHB1"
CPVC PIPE
HANGER

TYP. HANGER #24X

NO SCALE

GENERAL NOTES & LEGEND

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OWNER TO PROVIDE ADEQUATE HEAT THROUGHOUT THE ENTIRE BUILDING TO PREVENT ALL SPRINKLER PIPING FROM FREEZING.

ALL DESIGN MATERIAL & INSTALLATION TO COMPLY WITH ALL LOCAL REQUIREMENTS AND APPLICABLE NFPA STANDARDS.

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IN PARTICULAR:

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- SPRINKLERS ARE NOT REQUIRED IN ATTICS, FLOOR/CEILING SPACES, OR OTHER CONCEALED SPACES THAT ARE NOT INTENDED FOR LIVING PURPOSES OR STORAGE.

- SPRINKLERS ARE NOT REQUIRED IN BATHROOMS SMALLER THAN 55 SQ. FT. PER NFPA 13R 2016 6.6.2.

CENTRAL MONITORING OF SPRINKLER SYSTEM TO BE BY OTHERS

T.B. DIM - TOP OF WOOD OR STEEL JOISTS ELEVATION ABOVE FIN. FLR.

B.O. DIM - BOTTOM OF WOOD ATTIC TRUSS ELEVATION ABOVE FIN. FLR.

CL DIM - CENTER LINE OF PIPE FROM TOP OF WOOD JOIST

EL. DIM - CENTER LINE OF PIPE ELEVATION ABOVE FIN. FLR.

○ DIM - FINISHED CEILING HEIGHT ABOVE FIN. FLR.

■ - PLASTIC STEEL PIPE ADAPTER

● - 1" VERTICAL RISER TO FLOOR ABOVE OR DOWN TO FLOOR BELOW

○ - RISE OR RISER NIPPLE TO DIFFERENT EL. ON SAME LEVEL

PLD. - PIPE-D-LET

SN - SHAPED NIPPLE

DN - DOWN OR DROP NIPPLE

RN - RISER NIPPLE

UND. - UNLESS NOTED OTHERWISE

N.T.S. - NOT TO SCALE

--- APPROVED TYPE HANGER ON A PIPE

--- GROOVED COUPLING

○ - GROOVED RED. COUP.

③ - HYDRAULIC RESISTANCE POINT OR LINE NUMBER

ALL SPRINKLER PIPING IS TO BE SUPPORTED IN ACCORDANCE WITH NFPA 13 AND THE CPVC MANUFACTURER'S REQUIREMENTS.

ALL PENETRATIONS THROUGH FIRE-RATED PARTITIONS AND FLOORS ARE TO BE FIRESTOPPED WITH U.L. LISTED FIRESTOP SYSTEMS WITH A RATING EQUIVALENT TO THE RATING OF THE PARTITION OR FLOOR.

ALL UNDERGROUND PIPING TO BE BY OTHERS.

ALL SPRINKLER PIPING TO BE SUPPORTED IN ACCORDANCE WITH NFPA 13 AND THE CPVC MANUFACTURER'S REQUIREMENTS.

HANGER SPACING TABLE

HANGER SPACING FOR PLASTIC PIPE

PIPE SIZE HANGER SPACING

1/2" 6"

3/4" 7"

1" 8"

1 1/2" 12"

2" 15"

HANGER SPACING FOR STEEL PIPE (SCH. 40)

PIPE SIZE HANGER SPACING

1/2" 12"

3/4" 15"

1" 15"

1 1/2" 15"

2" 15"

HANGER SPACING FOR STEEL PIPE (THINWALL)

PIPE SIZE HANGER SPACING

1/2" 12"

3/4" 15"

1" 15"

1 1/2" 15"

2" 15"

PIPE TYPE

2 1/2" AND LARGER: TO BE SCHED. 10 W/ GROOVED FITTINGS

2" AND SMALLER CONCEALED PIPING: CPVC PLASTIC W/ PLASTIC FITTINGS

ALL EXPOSED PIPING TO BE STEEL SCH. 40 W/ THREADED FITTINGS

ALL GR. FITTINGS TO BE FIRELOCK UNDO.

DESIGN CRITERIA:

SYSTEM DESIGN FOR DWELLING UNITS IS IN ACCORDANCE WITH NFPA 13R, 2016 EDITION, PARAGRAPH 7.1.1.3 AND PRODUCT LISTING SPECIFICATIONS. DESIGN AREA TO INCLUDE ALL SPRINKLERS WITHIN A COMPARTMENT, UP TO A MAXIMUM OF FOUR DESIGN DISCHARGE IN ACCORDANCE WITH PRODUCT LISTING. THOUGH NOT REQUIRED BY NFPA 13R, THIS DESIGN INCLUDES A 100 GPM ALLOWANCE FOR HOSE STREAMS.

2ND FLOOR AREA 'B'

17'-110" x 47'-01" ABOVE 1ST FLOOR (F.F.)

TOP OF 2ND FLOOR TO TOP OF 3RD FLOOR-10'-8"

TOP OF 2ND FLOOR TO TOP OF 1ST FLOOR-10'-4"

18" DEEP THIRD FLOOR T.J.'S OR FLOOR WOOD TRUSSES

BOTTOM OF 18" DEEP THIRD FLOOR T.J.'S OR FLOOR WOOD TRUSSES-9'-0"

5/8" GYP. ON 1/2" RC-1 CHANNEL

BOTTOM OF GYP. CEILING-8'-10" 7/8"

2ND FLOOR JOISTS IN CORRIDOR

BOTTOM OF 2ND FLOOR JOISTS IN CORRIDOR TO BE 9'-8"

CORRIDOR CEILING HEIGHT TO BE 8'-10"

ALL EXTENDED COVERAGE SIDEWALL HEAD TOP OF DEFLECTOR TO BE BETWEEN 4" TO 12" BELOW CEILING

ALL CEILING HEIGHTS IN ROOM TO BE 9'-10" 7/8" ON SECOND FLOOR UNDO.

ALL CEILING HEIGHTS IN BATH ROOMS TO BE 8'-4" UNDO.

ALL RESIDENTIAL SIDEWALL HEADS TO BE MAXIMUM 8'-0" FROM WALL

ALL RESIDENTIAL SIDEWALL HEAD TOP OF DEFLECTOR TO BE BETWEEN 4" TO 6" BELOW CEILING

FOREMAN TO VERIFY ALL CEILING HEIGHTS IN FIELD BEFORE INSTALLATION

● VERTICAL RISER IN WALL FROM FLOOR BELOW

ALL VERTICAL RISER TO BE 1" UNDO.

■ STEEL TO PLASTIC ADAPTER

○ - RISE OR RISER NIPPLE TO DIFFERENT EL. ON SAME LEVEL

APPROVALS

DATE: 5/8/20

1 (SVA) - RESIDENTIAL HSX SPRINKLERS ADDED NEW - THIS SHEET

KEY PLAN

AREA D 9893± SQ FT

AREA B 35200± SQ FT

AREA E 35200 SQ FT

FLOW TEST INFORMATION

LOCATION: 1100 021-0300 EL. 984'

DATE/TIME: AUGUST 6, 2018

BY: KAM VALLEY ENGINEERING INC.

SIZE OF CITY MAIN: VARIES

STATIC PRESSURE: 93

RESIDUAL PRESSURE: 96

FLOW @ RESIDUAL: 1700

Black Tag Lm & N.W. Lowenstein Dr.

FIRE SPRINKLER HEADS/NOZZLES

MANUF. MODEL STYLE NPT K ORIFICE TEMP. °F RESPONSE FINISH

TABLE

1. VIKING FREEDOM 1/2" 4.0 172° 250° WHITE

2. VIKING FREEDOM 1/2" 4.0 172° 250° WHITE

3. VIKING FREEDOM 1/2" 4.0 172° 250° WHITE

4. VIKING FREEDOM 1/2" 4.0 172° 250° WHITE

5. VIKING FREEDOM 1/2" 4.0 172° 250° WHITE

6. VIKING FREEDOM 1/2" 4.0 172° 250° WHITE

7. VIKING FREEDOM 1/2" 4.0 172° 250° WHITE

8. VIKING FREEDOM 1/2" 4.0 172° 250° WHITE

9. VIKING FREEDOM 1/2" 4.0 172° 250° WHITE

10. VIKING FREEDOM 1/2" 4.0 172° 250° WHITE

11. VIKING FREEDOM 1/2" 4.0 172° 250° WHITE

12. VIKING FREEDOM 1/2" 4.0 172° 250° WHITE

13. VIKING FREEDOM 1/2" 4.0 172° 250° WHITE

14. VIKING FREEDOM 1/2" 4.0 172° 250° WHITE

15. VIKING FREEDOM 1/2" 4.0 172° 250° WHITE

16. VIKING FREEDOM 1/2" 4.0 172° 250° WHITE

17. VIKING FREEDOM 1/2" 4.0 172° 250° WHITE

18. VIKING FREEDOM 1/2" 4.0 172° 250° WHITE

19. VIKING FREEDOM 1/2" 4.0 172° 250° WHITE

20. VIKING FREEDOM 1/2" 4.0 172° 250° WHITE

21. VIKING FREEDOM 1/2" 4.0 172° 250° WHITE

22. VIKING FREEDOM 1/2" 4.0 172° 250° WHITE

23. VIKING FREEDOM 1/2" 4.0 172° 250° WHITE

24. VIKING FREEDOM 1/2" 4.0 172° 250° WHITE

25. VIKING FREEDOM 1/2" 4.0 172° 250° WHITE

26. VIKING FREEDOM 1/2" 4.0 172° 250° WHITE

27. VIKING FREEDOM 1/2" 4.0 172° 250° WHITE

28. VIKING FREEDOM 1/2" 4.0 172° 250° WHITE

29. VIKING FREEDOM 1/2" 4.0 172° 250° WHITE

30. VIKING FREEDOM 1/2" 4.0 172° 250° WHITE

31. VIKING FREEDOM 1/2" 4.0 172° 250° WHITE

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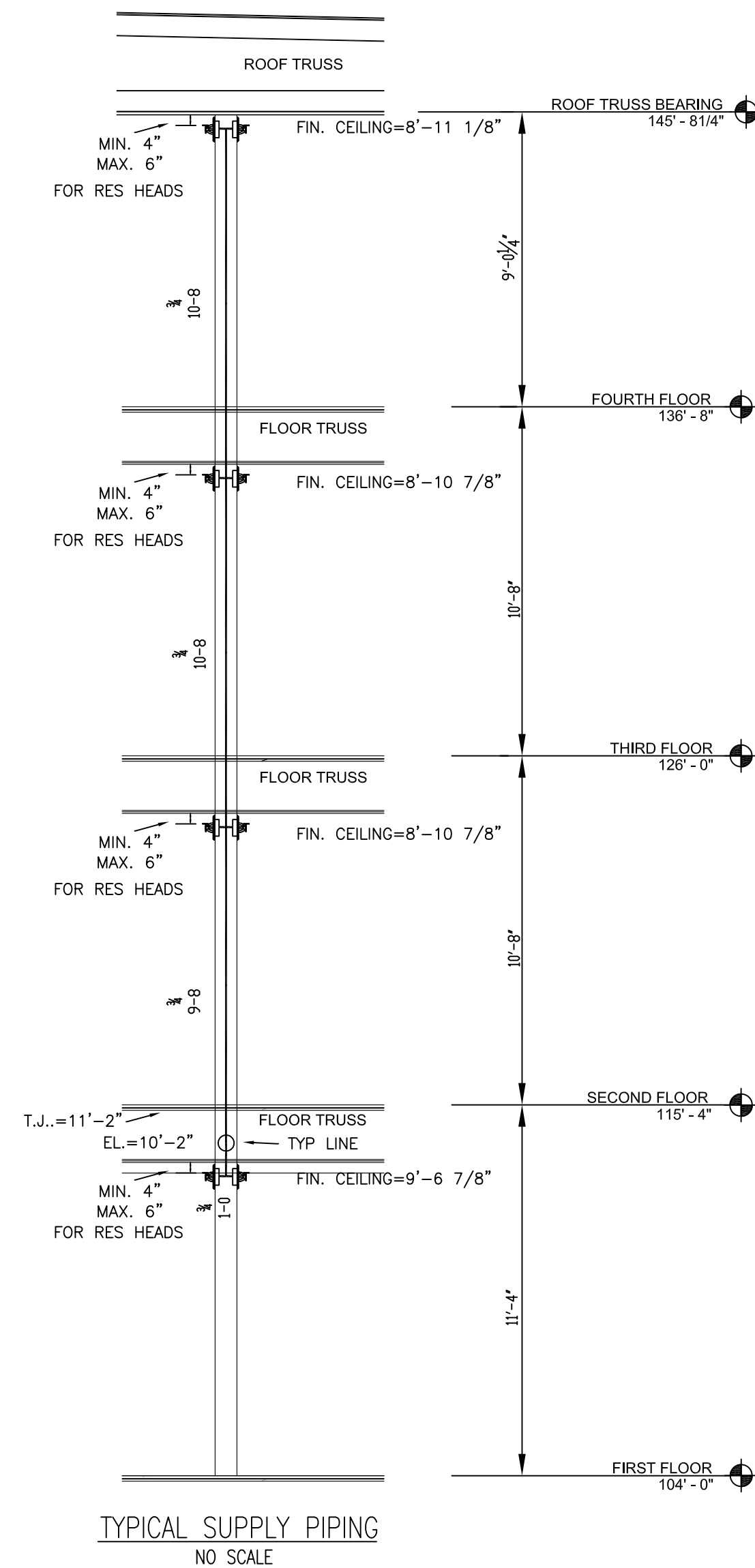
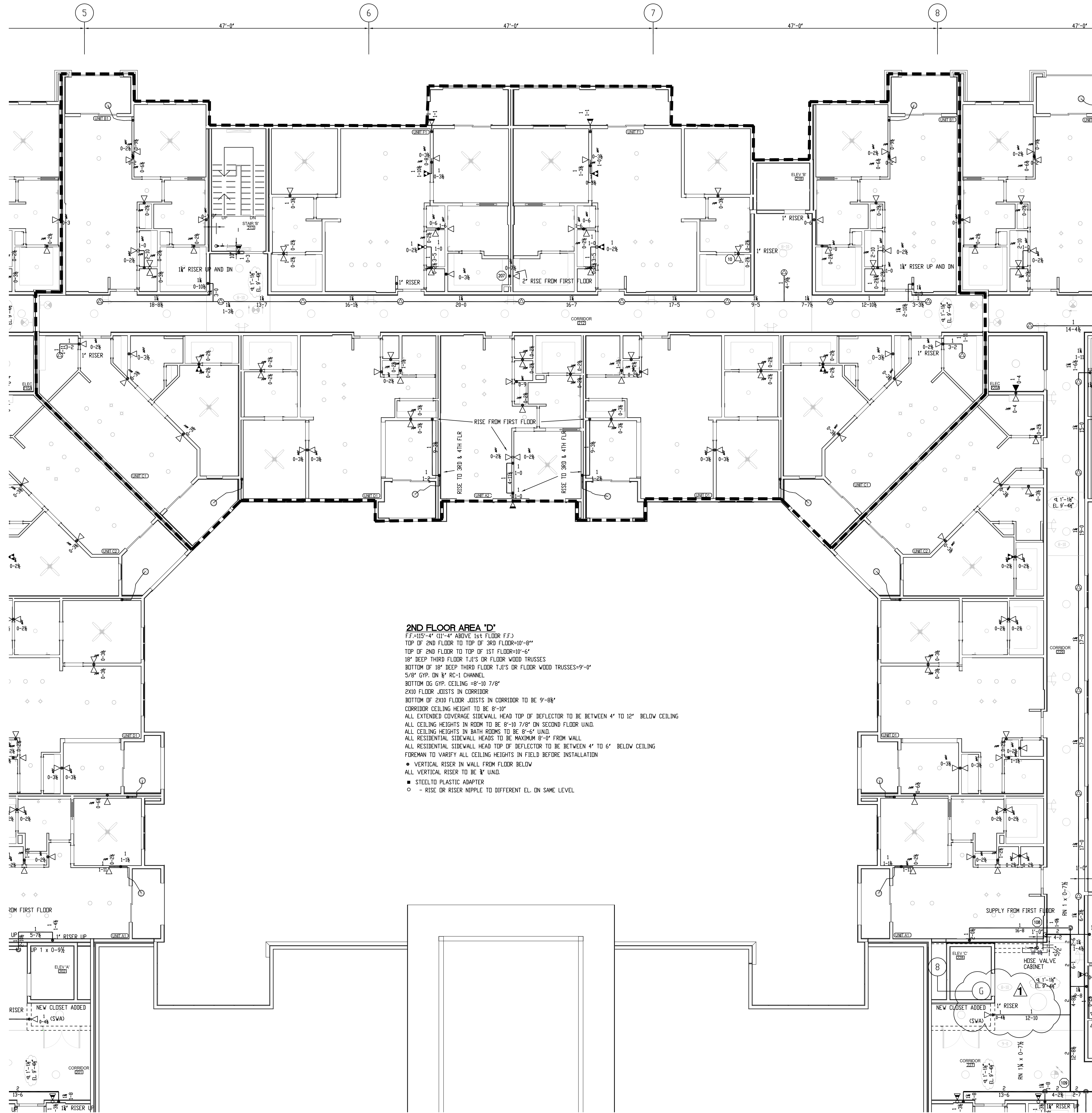
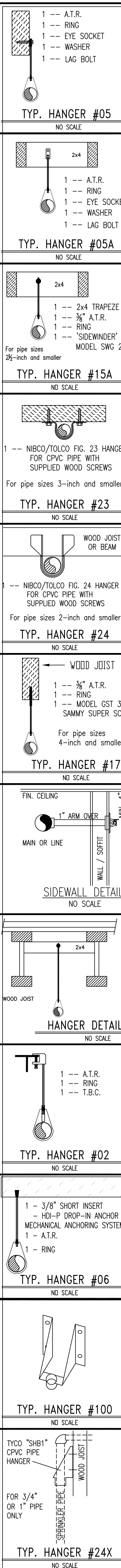
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GENERAL NOTES & LEGEND

THESE SHOP DRAWINGS ARE BASED ON THE OWNER'S ACCEPTANCE OF NFPA 25 AS THE OWNER'S STANDARD FOR THE INSPECTION, TESTING AND MAINTENANCE OF WATER-BASED FIRE PROTECTION SYSTEMS.

OWNER TO PROVIDE ADEQUATE HEAT THROUGHOUT THE ENTIRE BUILDING TO PREVENT ALL GAS FURNELER PIPING FROM FREEZING.

ALL DESIGN MATERIAL & INSTALLATION TO COMPLY WITH ALL LOCAL REQUIREMENTS AND APPLICABLE NFPA STANDARDS.

ALL FIREPROOFERS ARE PROVIDED THROUGHOUT THE ENTIRE BUILDING EXCEPT WHERE OMISSION IS PERMITTED BY NFPA 13A, 2016 EDITION, SECTION 6.6. IN PARTICULAR,

- SPRINKLERS ARE NOT REQUIRED IN CLOTHES CLOSETS, LINEN CLOSETS, AND PAINTING AND WALL DRILLING UNITS WHERE THE AREA DOES NOT EXCEED 24 SQ. FT. WALLS AND CEILING ARE SURFACED WITH NON COMBUSTIBLE OR LIMITED COMBUSTIBLE MATERIAL AS DETICED BY NFPA 220 - NFPA 13B 2016 6.6.3.1
- SPRINKLERS ARE NOT REQUIRED IN ATTIC/FLOOR/CLOSET SPACES, OR OTHER CONCEALED SPACES THAT ARE NOT INTENDED FOR LIVING PURPOSES OR STORAGE.
- SPRINKLERS ARE NOT REQUIRED IN BATHROOMS SMALLER THAN 55 SQ. FT PER NFPA 13B 2016 6.6.2.

CENTRAL MOUNTING OF SPRINKLER SYSTEM TO BE BY OTHERS

B.T. DIM - TOP OF WOOD OR STEEL JOISTS ELEVATION ABOVE FIN FLOOR
 B.O.T. DIM - TOP OF WOOD ATTIC TRUSS ELEVATION ABOVE FIN FLOOR
 9. DIM - CENTER LINE OF PIPE FROM TOP OF WOOD JOIST
 EL. DIM - CENTER LINE OF PIPE ELEVATION ABOVE FIN FLOOR
 ○ DIM - FINISHED CEILING HEIGHT ABOVE FIN FLOOR

- - PLASTIC STEEL PIPE AMPLIFIER
- - 1" VERTICAL RISER TO FLOOR ABOVE OR DOWN TO FLOOR BELOW
 - - RISE OR RISE NIPPLE TO DIFFERENT EL. ON SAME LEVEL
- P.D.L. - PIPE-D-LET S.N. - SHAPED NIPPLE
- LD. - DOWN DR. NIPPLE R.N. - RISER NIPPLE
- UND. - UNDER BUMPED OTHERWISE N.T.S. - NOT TO SCALE
- /--- APPROVED TYPE WAGON IN A PIPE
- /--- GROOVED CUPLING ---/--- GROOVED RED. COUP.

① - HYDRAULIC REFERENCE POINT OR LINE NUMBER

ALL SPRINKLER PIPING IS TO BE SUPPORTED IN ACCORDANCE WITH NFPA 13 AND THE CPVC MANUFACTURER'S REQUIREMENTS.

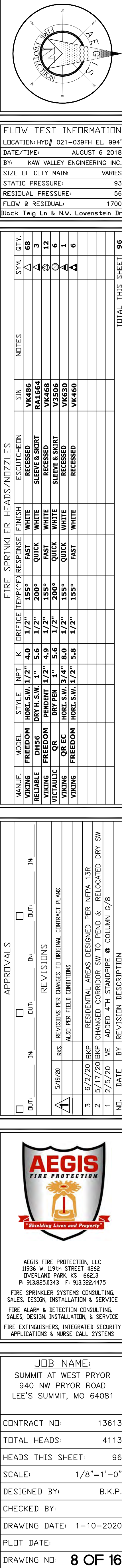
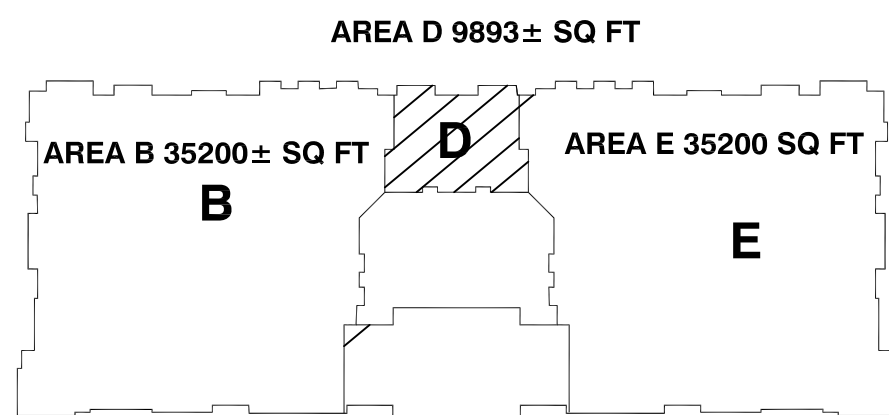
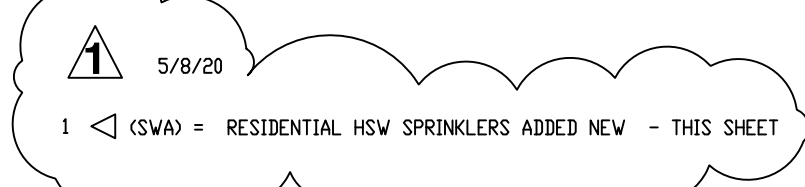
ALL PENETRATIONS THROUGH FIRE-RATED PARTITIONS AND FLOORS ARE TO BE FIRESTOPPED WITH UL LISTED FIRESTOP SYSTEMS WITH A RATING EQUIVALENT TO THE RATING OF THE PARTITION OR FLOOR

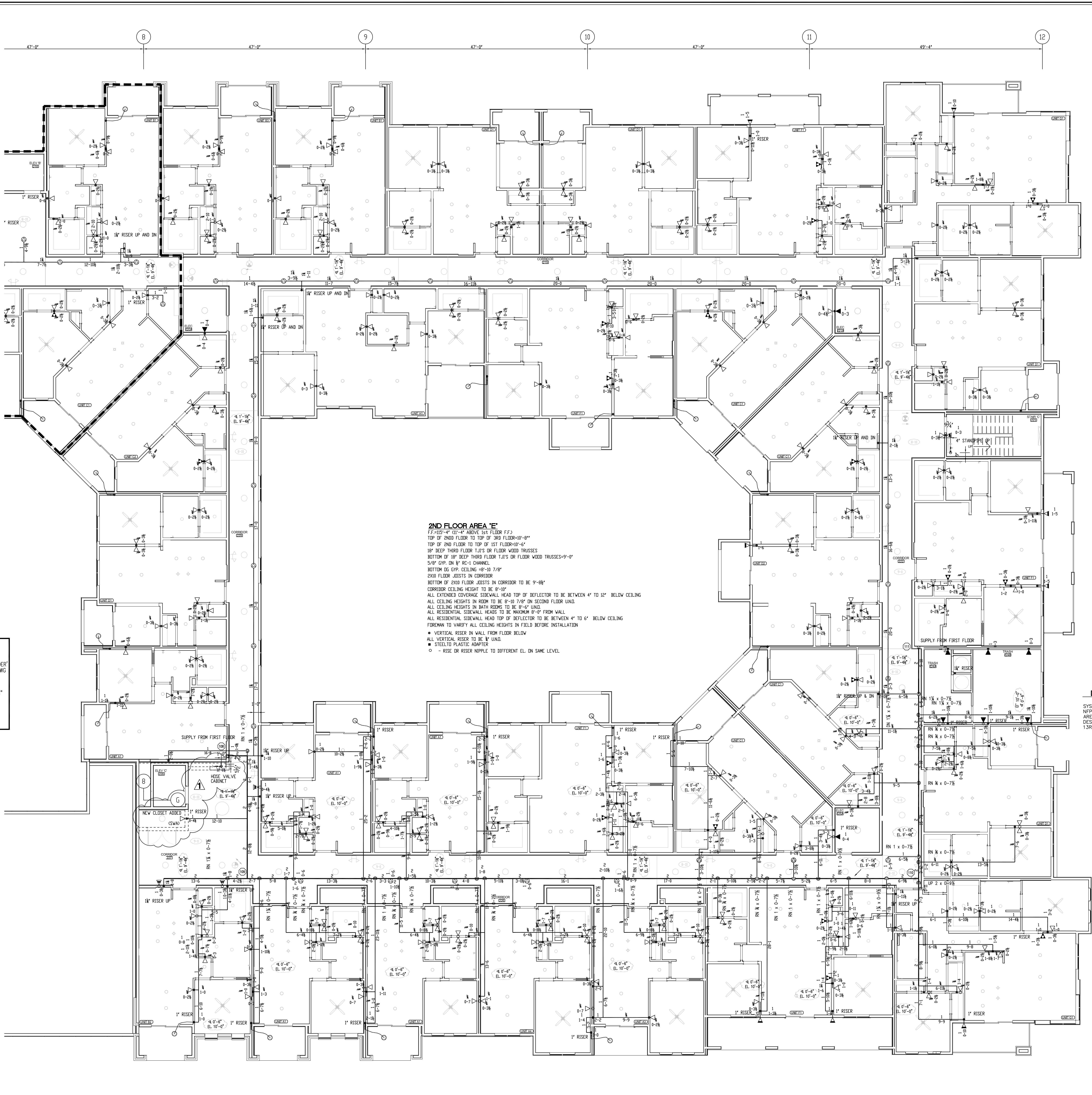
ALL UNDERGROUND PIPING TO BE BY OTHERS.

<u>HANGER SPACING TABLE</u>			
HANGER SPACING FOR PLASTIC PIPE		HANGER SPACING FOR STEEL PIPE (SCH. 40)	
PIPE SIZE	HANGER SPACING	PIPE SIZE	HANGER SPACING
1"	6'	1", 1 1/4"	12'
1 1/4"	6'	1 1/2" & LARGER	15'
2"	8'		
		PIPE SIZE	HANGER SPACING
		1" - 3"	12'
		4" & LARGER	15'

DESIGN CRITERIA:

SYSTEM DESIGN FOR DWELLING UNITS IS IN ACCORDANCE WITH NFPA 13R, 2016 EDITION, PARAGRAPH 7.1.1.3 AND PRODUCT LISTING SPECIFICATIONS. DESIGN AREA TO INCLUDE ALL SPRINKLERS WITHIN A COMPARTMENT, UP TO A MAXIMUM OF FOUR. DESIGN DISCHARGE IN ACCORDANCE WITH PRODUCT LISTING. THOUGH NOT REQUIRED BY NFPA 13R, THIS DESIGN INCLUDES A 100 GPM ALLOWANCE FOR HOSE STREAMS.





HANGER SPACING TABLE			
HANGER SPACING FOR PLASTIC PIPE		HANGER SPACING FOR STEEL PIPE (SCH. 40)	
PIPE SIZE	HANGER SPACING	PIPE SIZE	HANGER SPACING
1"	6'	1", 1 1/4"	12'
1 1/4"	6 1/2'	1 1/2" & LARGER	15'
1 1/2"	7'		
2"	8'	PIPE SIZE	HANGER SPACING
		1" - 3"	12'
		4" & LARGER	15'

PIPE TYPE

2" 1/2" AND LARGER: TO BE SCHED. 10 W/ GROUVED FITTINGS

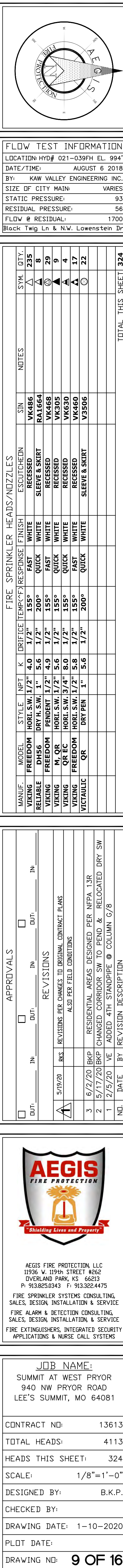
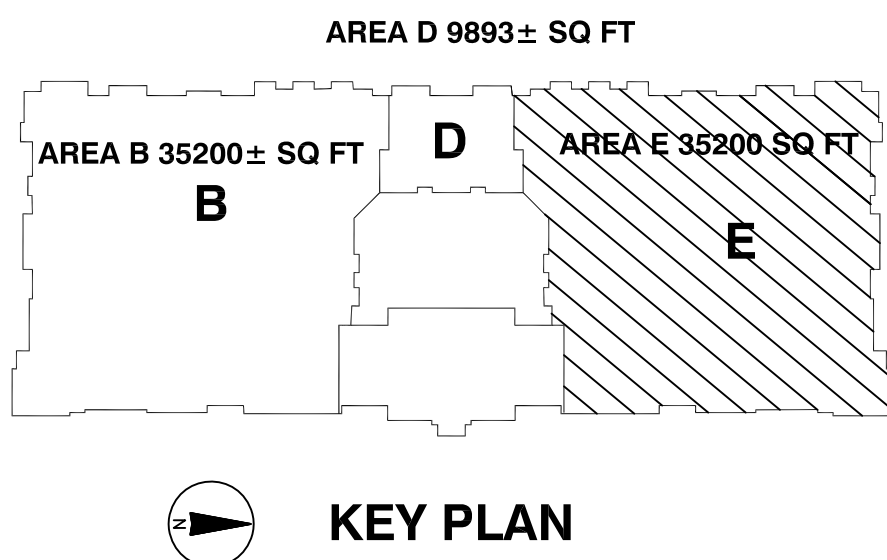
2" AND SMALLER CONCEALED PIPING: CPVC PLASTIC W/ PLASTIC FITTINGS

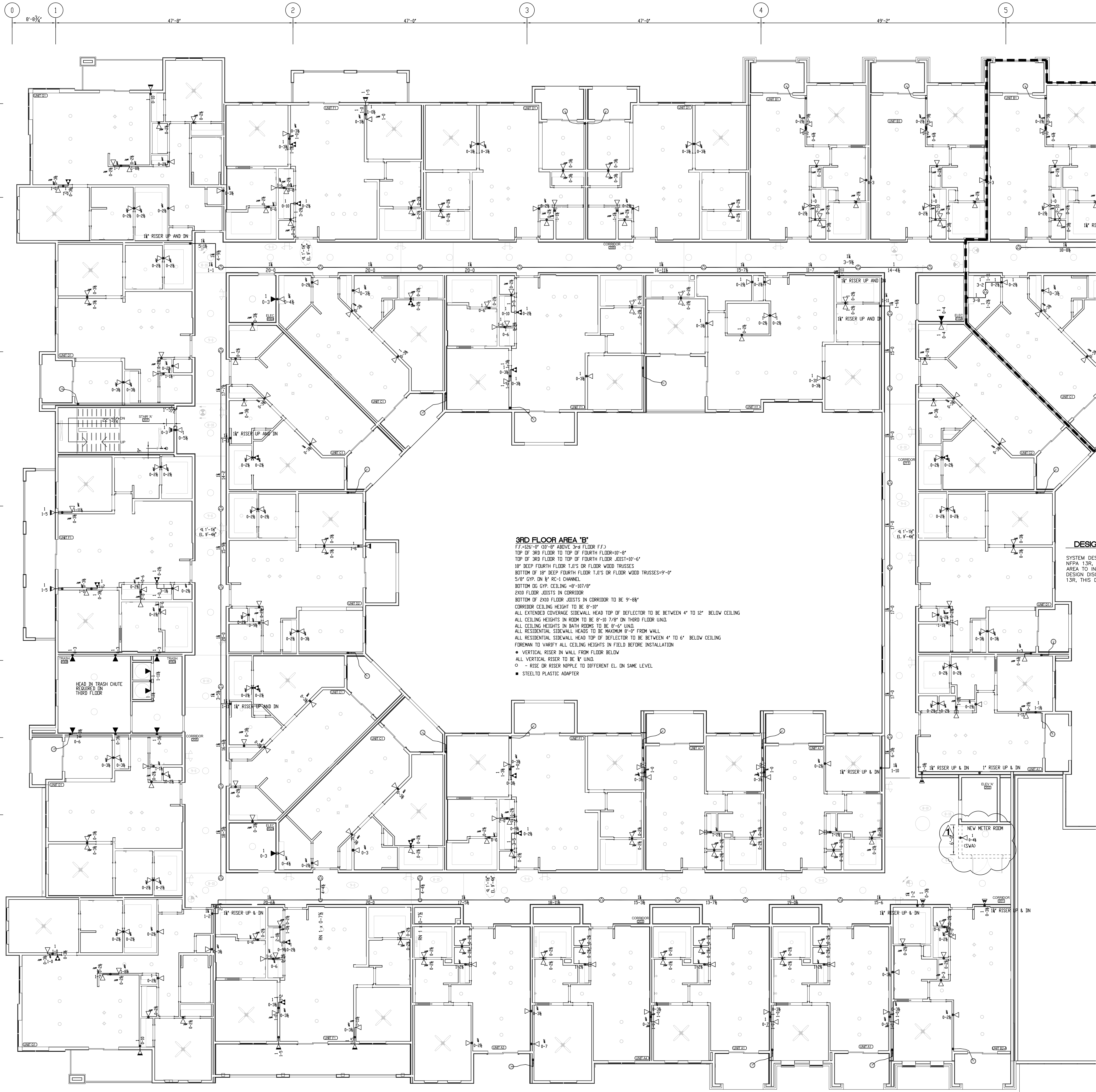
ALL EXPOSED PIPING TO BE STEEL SCH. 40 W/ THREADED FITTINGS

ALL GR. FITTINGS TO BE FIRELOCK U.N.O.

AREA 'E'

DESIGN CRITERIA:

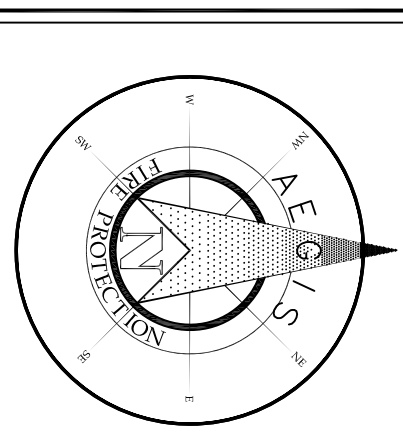
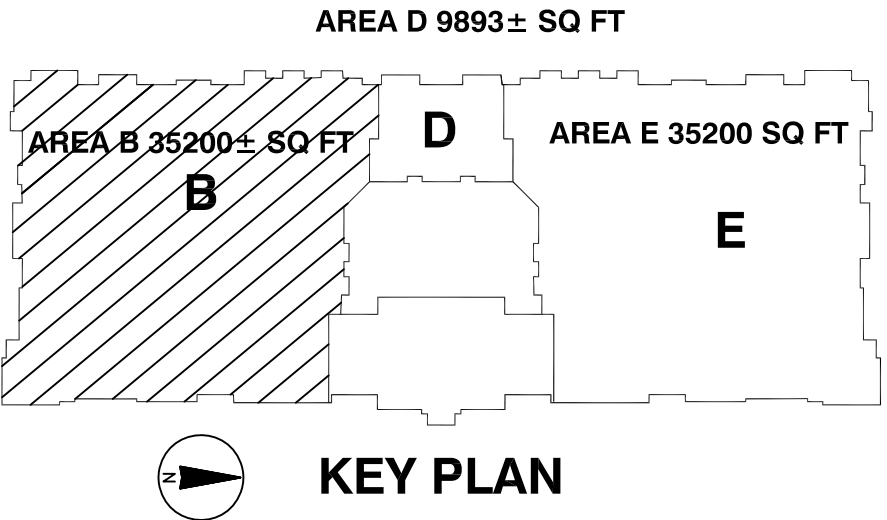


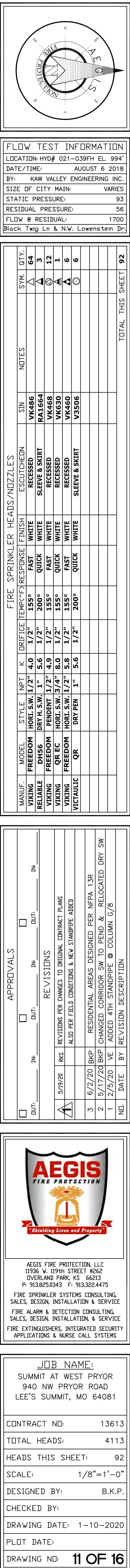


<u>HANGER SPACING TABLE</u>	
HANGER SPACING FOR PLASTIC PIPE	HANGER SPACING FOR STEEL PIPE (SCH. 40)
<u>PIPE SIZE</u>	<u>PIPE SIZE</u>
1"	1", 1 1/4"
1 1/4"	12"
1 1/2"	1 1/2" & LARGER
2"	15"
	HANGER SPACING FOR STEEL PIPE (THINWALL)
	<u>PIPE SIZE</u>
	1" - 3"
	12"
	4" & LARGER
	15"
<u>PIPE TYPE</u>	
2 1/2" & LARGER: TO BE SCHED. 10 W/ GROOVED FITTINGS	
2" & SMALLER CONCEALED PIPING: CPVC, PLASTIC W/ PLASTIC FITTINGS	
ALL EXPOSED PIPING TO BE STEEL, SCH. 40 W/ THREADED FITTINGS	
ALL GR. FITTINGS TO BE FIRELOCK U.N.O.	

DESIGN CRITERIA:

SYSTEM DESIGN FOR DWELLING UNITS IS IN ACCORDANCE WITH NFPA 13R, 2016 EDITION, PARAGRAPH 7.1.1.3 AND PRODUCT LISTING SPECIFICATIONS. DESIGN AREA TO INCLUDE ALL SPRINKLERS WITHIN A COMPARTMENT, UP TO A MAXIMUM OF FOUR. DESIGN DISCHARGE IN ACCORDANCE WITH PRODUCT LISTING. THOUGH NOT REQUIRED BY NFPA 13R, THIS DESIGN INCLUDES A 100 GPM ALLOWANCE FOR HOSE STREAMS.





1 --- A.T.R.
1 --- RING
1 --- EYE SOCKET
1 --- WASHER
1 --- LAG BOLT

TYP. HANGER #05

NO SCALE

1 --- 2x4
1 --- A.T.R.
1 --- RING
1 --- EYE SOCKET
1 --- WASHER
1 --- LAG BOLT

TYP. HANGER #05A

NO SCALE

1 --- 2x4
1 --- 3/8" A.T.R.
1 --- RING
1 --- "SIDEWINDER"
MODEL SWG 20

TYP. HANGER #15A

NO SCALE

1 --- NIBCO/TOLCO FIG. 23 HANGER
FOR CPVC PIPE WITH
SUPPLIED WOOD SCREWS

TYP. HANGER #23

NO SCALE

WOOD JOIST
OR BEAM

--- NIBCO/TOLCO FIG. 24 HANGER
FOR CPVC PIPE WITH
SUPPLIED WOOD SCREWS

TYP. HANGER #24

NO SCALE

WOOD JOIST

1 --- 3/8" A.T.R.
1 --- RING
1 --- MODEL GST 30
SAMMY SUPER SCREW

TYP. HANGER #17

NO SCALE

FIN. CEILING

1 --- 1" ARM OVER
MIN. 4"
MAX. 12"

SIDEWALL DETAIL

NO SCALE

WOOD JOIST

1 --- A.T.R.
1 --- RING
1 --- "SIDEWINDER"
MODEL SWG
2" LONG

HANGER DETAIL #52

NO SCALE

1 --- A.T.R.
1 --- RING
1 --- T.B.C.

TYP. HANGER #02

NO SCALE

1 --- 3/8" SHORT INSERT
--- HDI-P DROP-IN ANCHOR
MECHANICAL ANCHORING SYSTEMS
1 --- A.T.R.
1 --- RING

TYP. HANGER #06

NO SCALE

TYP. HANGER #100

NO SCALE

TYCO "SHB1"
CPVC PIPE
HANGER

FOR 3/4"
OR 1" PIPE
ONLY

TYP. HANGER #24X

NO SCALE

4TH FLOOR AREA 'B'
F.F. 102'-0" UP OF ABOVE 3rd FLOOR F.F.
ROOF TRUSS BEARING EL. 145'-8"
TOP OF 4TH FLOOR TO BOTTOM OF ROOF TRUSS EL. 9'-0"
2ND ROOF JOISTS IN CORRIDOR
BOTTOM OF 2ND ROOF JOISTS IN CORRIDOR VARIES
CORRIDOR CEILING HEIGHT TO BE 8'-10"
ALL EXTENDED COVERAGE SIDEWALL HEAD TOP OF REFLECTOR TO BE BETWEEN 4" TO 12" BELOW CEILING
ALL CEILING HEIGHTS IN ROOM TO BE 8'-0" 1/8" ON FOURTH FLOOR UNID
ALL CEILING HEIGHTS IN BATH ROOMS TO BE 8'-6" UNID
ALL RESIDENTIAL SIDEWALL HEADS TO BE MAXIMUM 8'-0" FROM WALL
ALL RESIDENTIAL SIDEWALL HEAD TOP OF REFLECTOR TO BE BETWEEN 4" TO 6" BELOW CEILING
FOREMAN TO VERIFY ALL CEILING HEIGHTS IN FIELD BEFORE INSTALLATION
• VERTICAL RISER IN WALL FROM FLOOR BELOW
ALL PIPING IN ATTIC TO BE PROTECTED FROM FREEZING BY OTHERS

GENERAL NOTES & LEGEND

THESE SHOP DRAWINGS ARE BASED ON THE OWNER'S ACCEPTANCE OF NFPA 20 AS THE OWNER'S STANDARD FOR THE INSPECTION, TESTING AND MAINTENANCE OF WATER-BASED FIRE PROTECTION SYSTEMS.

OWNER TO PROVIDE ADEQUATE HEAT THROUGHOUT THE ENTIRE BUILDING TO PREVENT ALL SPRINKLER PIPING FROM FREEZING.

ALL DESIGN MATERIAL & INSTALLATION TO COMPLY WITH ALL LOCAL REQUIREMENTS AND APPLICABLE NFPA STANDARDS.

FIRE SPRINKLERS ARE PROVIDED THROUGHOUT THE ENTIRE BUILDING EXCEPT WHERE EXEMPTION IS PERMITTED BY NFPA 13R, 2016 EDITION, SECTION 6.6 IN PARTICULAR:

- SPRINKLERS ARE NOT REQUIRED IN CLOTHES CLOSETS, LINEN CLOSETS, AND PANTRIES WITHIN DWELLING UNITS WHERE THE AREA DOES NOT EXCEED 24 SQ. FT. WALLS AND CEILING ARE SURFACED WITH NON COMBUSTIBLE OR LIMITED COMBUSTIBLE MATERIAL AS DEFINED BY NFPA 220 - NFPA 1206 6.6.3.1
- SPRINKLERS ARE NOT REQUIRED IN ATTICS, FLOOR/CEILING SPACES, OR OTHER CONCEALED SPACES THAT ARE NOT INTENDED FOR LIVING PURPOSES OR STORAGE.
- SPRINKLERS ARE NOT REQUIRED IN BATHROOMS SMALLER THAN 55 SQ. FT. PER NFPA 13R 2016 6.6.2

CENTRAL MONITORING OF SPRINKLER SYSTEM TO BE BY OTHERS

T.J. DIM - TOP OF WOOD OR STEEL JOISTS ELEVATION ABOVE FIN. FLR.
B.O.T. DIM - BOTTOM OF WOOD ATTIC TRUSS ELEVATION ABOVE FIN. FLR.
CL. DIM - CENTER LINE OF PIPE FROM TOP OF WOOD JOIST
EL. DIM - CENTER LINE OF PIPE ELEVATION ABOVE FIN. FLR.
O. DIM - FINISHED CEILING HEIGHT ABOVE FIN. FLR.

- - PLASTIC STEEL PIPE ADAPTER
- - 1" VERTICAL RISER TO FLOOR ABOVE OR DOWN TO FLOOR BELOW
- - RISE OR RISER NIPPLE TO DIFFERENT EL. ON SAME LEVEL
- P.D.L. - PIPE-D-LET
- DN - DOWN OR DROP NIPPLE
- UNID - UNLESS NOTED OTHERWISE
- /--- - APPROVED TYPE HANGER ON A PIPE
- - GROOVED COUPLING
- - HYDRAULIC REFERENCE POINT OR LINE NUMBER

ALL SPRINKLER PIPING IS TO BE SUPPORTED IN ACCORDANCE WITH NFPA 13 AND THE CPVC MANUFACTURER'S REQUIREMENTS.

ALL PENETRATIONS THROUGH FIRE-RATED PARTITIONS AND FLOORS ARE TO BE FIRESTOPPED WITH UL LISTED FIRESTOP SYSTEMS WITH A RATING EQUIVALENT TO THE RATING OF THE PARTITION OR FLOOR

ALL UNDERGROUND PIPING TO BE BY OTHERS.

HANGER SPACING TABLE

HANGER SPACING FOR PLASTIC PIPE		HANGER SPACING FOR STEEL PIPE (SCH. 40)	
PIPE SIZE	HANGER SPACING	PIPE SIZE	HANGER SPACING
1"	6'	1", 1 1/4"	12'
1 1/4"	6'	1 1/2" & LARGER	15'
1 1/2"	7'		
2"	8'		

HANGER SPACING FOR STEEL PIPE (THINWALL)	
PIPE SIZE	HANGER SPACING
1" - 3"	12'
4" & LARGER	15'

PIPE TYPE

2 1/2" & LARGER TO BE SCHED. 10 W/ GROOVED FITTINGS
2" & SMALLER CONCEALED PIPING: CPVC, PLASTIC W/ PLASTIC FITTINGS
ALL EXPOSED PIPING TO BE STEEL SCH. 40 W/ THREADED FITTINGS
ALL OR. FITTINGS TO BE FIRELOCK UNID.

DESIGN CRITERIA:

SYSTEM DESIGN FOR DWELLING UNITS IS IN ACCORDANCE WITH NFPA 13R, 2016 EDITION, PARAGRAPH 7.1.1.3 AND PRODUCT LISTING SPECIFICATIONS. DESIGN AREA TO INCLUDE ALL SPRINKLERS WITHIN A COMPARTMENT, UP TO A MAXIMUM OF FOUR DESIGN DISCHARGE IN ACCORDANCE WITH PRODUCT LISTING, THOUGH NOT REQUIRED BY NFPA 13R, THIS DESIGN INCLUDES A 100 GPM ALLOWANCE FOR HOSE STREAMS.

KEY PLAN

FLOW TEST INFORMATION

LOCATION: HYD 021-039FL EL. 994'

DATE/TIME: AUGUST 6, 2018

BY: KAM VALLEY ENGINEERING INC.

SIZE OF CITY MAIN: VARIES

STATIC PRESSURE: 93

RESIDUAL PRESSURE: 56

FLOW @ RESIDUAL: 1700

Black Twig Ln. & N.W. Lowenstein Dr.

FIRE SPRINKLER HEADS/NOZZLES	
SYN. QTY.	NOTES
28	ESCHUCHEN
32	ESCHUCHEN
11	ESCHUCHEN
1	ESCHUCHEN
18	ESCHUCHEN
22	ESCHUCHEN

TOTAL THIS SHEET: 328

APPROVALS

DESIGNED BY: [Signature]

CHECKED BY: [Signature]

DATE: 5/17/2018

JOB NAME:

SUMMIT AT WEST PRYOR

940 NW PRYOR ROAD

LEE'S SUMMIT, MO 64081

CONTRACT NO: 13613

TOTAL HEADS: 4113

HEADS THIS SHEET: 328

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

DESIGNED BY: B.K.P.

CHECKED BY:

DRAWING DATE: 1-10-2020

PLOT DATE:

DRAWING NO: 13 OF 16

AEGIS FIRE PROTECTION

AGS FIRE PROTECTION, LLC

11936 W. 13th STREET MOSE

OVERLAND PARK, KS 66203

P. 913.852.6443 F. 913.852.4475

FIRE SPRINKLER SYSTEM CONSULTING

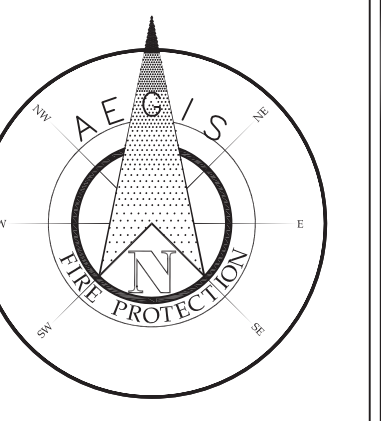
SALES, DESIGN, INSTALLATION & SERVICE

FIRE ALARM & DETECTION CONSULTING

SALES, DESIGN, INSTALLATION & SERVICE

FIRE EXTINGUISHERS, INTEGRATED SECURITY

APPLICATIONS & NURSE CALL SYSTEMS



FLOW TEST INFORMATION	
LOCATION HYD	021-03PH EL. 984'
DATE/TIME	AUGUST 6 2018
BY	KAM VALLEY ENGINEERING INC.
SIZE OF CITY MAIN	VARIABLES
STATIC PRESSURE	93
RESIDUAL PRESSURE	56
FLOW @ RESIDUAL	1700
Black Twig Ln & N.W. Lowenstein Dr	

BRAND :	MODEL :	QTY	UNIT :	QTY	UNIT PRICE :	QTY	UNIT PRICE :	QTY	UNIT PRICE :	QTY	UNIT PRICE :	QTY	UNIT PRICE :	QTY	UNIT PRICE :	QTY	UNIT PRICE :	QTY	UNIT PRICE :	QTY	UNIT PRICE :	QTY	UNIT PRICE :	QTY	UNIT PRICE :	QTY	UNIT PRICE :	QTY	UNIT PRICE :	QTY	UNIT PRICE :	QTY	UNIT PRICE :	QTY	UNIT PRICE :	QTY	UNIT PRICE :	QTY	UNIT PRICE :	QTY	UNIT PRICE :	QTY	UNIT PRICE :	QTY	UNIT PRICE :	QTY	UNIT PRICE :	QTY	UNIT PRICE :	QTY	UNIT PRICE :	QTY	UNIT PRICE :	QTY	UNIT PRICE :	QTY	UNIT PRICE :	QTY	UNIT PRICE :	QTY	UNIT PRICE :	QTY	UNIT PRICE :	QTY	UNIT PRICE :	QTY	UNIT PRICE :	QTY	UNIT PRICE :	QTY	UNIT PRICE :	QTY	UNIT PRICE :	QTY	UNIT PRICE :	QTY	UNIT PRICE :	QTY	UNIT PRICE :	QTY	UNIT PRICE :	QTY	UNIT PRICE :	QTY	UNIT PRICE :	QTY	UNIT PRICE :	QTY	UNIT PRICE :	QTY	UNIT PRICE :	QTY	UNIT PRICE :	QTY	UNIT PRICE :	QTY	UNIT PRICE :	QTY	UNIT PRICE :	QTY	UNIT PRICE :	QTY	UNIT PRICE :	QTY	UNIT PRICE :	QTY	UNIT PRICE :	QTY	UNIT PRICE :	QTY	UNIT PRICE :	QTY	UNIT PRICE :	QTY	UNIT PRICE :	QTY	UNIT PRICE 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