

### Sprinkler Design Data

Project Name:	HIGHLAND ELEMENTARY ADDITION AND RENOVATION	System:	WET
Project Street Address:	1915 BUFFALO LAKE RD, SANFORD, NC 27332	Sys. Sq. Ft.:	16,311 +/-
Suite:	-	Floor#:	1
Colling Height:	VARIABLES	Total Bldg. Hgt.:	24'-2 +/-
Designed By:	J&D SPRINKLER CO., INC.	Phone:	919-553-2356
Occupancy:	SCHOOL	Hazard:	LIGHT HAZARD

### Design Summary

	System #1	System #2	System #3	System #4	System #5
Design Method	CALCULATED	CALCULATED	CALCULATED	CALCULATED	-
Design Area #	A	B	C	C	-
Location	COLLABORATION	CLASSROOM 11	CLASSROOM 8	MEZZANINE	-
Type of System	WET	WET	WET	WET	-
Hazard Class	LIGHT	LIGHT	LIGHT	OH GRP I	-
Criteria From	NFPA 13 (2013)	NFPA 13 (2013)	NFPA 13 (2013)	NFPA 13 (2013)	-
Design Area	1383 SF (ENTIRE AREA)	1500 SF	1500 SF	5 HEADS	-
Sprinkler Spacing	130 MAX	324 MAX	324 MAX	130 MAX	-
Density	0.10	.10	.10	.15	-
K-factor	8	8	8	5.6	-
Hose Allowance	100	100	100	250	-
# Design Sprinklers	8	9	8	5	-
Special Application Spk	-	-	-	-	-
Requirement @ TEST					
G.P.M. Req'd	261.54	410.22	385.19	348.05	-
P.S.I. Req'd	61.151	49.509	53.901	36.465	-
Requirement @ BASE					
GPM Required	161.54	310.22	285.19	96.05	-
PSI Required	38.306	36.483	40.912	23.667	-
Safety factor @ Test	16.317	15.968	11.963	29.936	-
Dry Sys. Volume (gall)	-	-	-	-	-

### Water Supply Information

Tested by	LKC ENGINEERING	Date/Time	07.29.2022/9:30AM	Pressure Hydrant	-
Hydrant Elevation	-	Flow Hydrant # 1	-	Flow Hydrant #2	-
Static (PSI)	69	Residual (PSI)	50	Flow (gpm)	1020

Copy of Water Test Data Included with Calculation is required

### Fire Pump Data

Rated G.P.M.	---	Rated Pressure	---	Horsepower	---
Diesel/Electric	---	Churn Pressure	---	Style of pump	---
Combined Discharge	---	150%/1% Flow (suction)	---	150%/1% Flow (gpm)	---

Certified pump curve required

### If Storage is Greater than 12 Feet Complete Commodity Storage Design Information

Commodity Description	Storage Height	Storage Type (Kick Bin/Pile)	Clearance
Commodity Class	Open/Close	Wet/Dry	System
Stable/Unstable	Area		

Figure #	Curve #	Density	Height	Clear	Array	Dry	Design	Minimum	Final
		Area	Factor	Factor	Factor	Penalty	Design	Design	Design
-	-	Initial	-	-	-	-	-	-	-
-	-	Seco	-	-	-	-	-	-	-
-	-	Jary	-	-	-	-	-	-	-

Is system compliant with Chapter 23 (FPC)  Is storage area layout, rack, and pile plan included?

### HANGER INSTALLATION REQUIREMENTS

NOMINAL PIPE SIZE	MAXIMUM DISTANCE BETWEEN HANGERS									
	3/4"	1"	1-1/4"	1-1/2"	2"	2-1/2"	3"	4"	6"	
BLAZEMASTER CPVC	5' 6"	6' 0"	6' 6"	7' 0"	8' 0"	9' 0"	10' 0"	N/A	N/A	
THREADABLE LIGHTWALL	N/A	12' 0"	12' 0"	12' 0"	12' 0"	12' 0"	12' 0"	N/A	N/A	
STEEL PIPE (10/40)	N/A	12' 0"	12' 0"	15' 0"	15' 0"	15' 0"	15' 0"	15' 0"	15' 0"	

100 PSI STATIC PRESSURE ON SYSTEM REQUIRES UP-LIFT RESTRAINT WITHIN 12 INCHES HORIZONTALLY OF HEAD FOR ARM-OVERS AND END OF BRANCH LINE  
 THE UNSUPPORTED LENGTH BETWEEN THE END SPRINKLER AND THE LAST HANGER ON THE LINE SHALL NOT EXCEED 36" FOR 1" PIPE, 48" FOR 1 1/4" PIPE AND 60" FOR 1 1/2" PIPE OR LARGER  
 THE CUMULATIVE HORIZONTAL LENGTH OF AN UNSUPPORTED ARM OVER TO A SPRINKLER, SPRINKLER DROP, OR SPRING-UP SHALL NOT EXCEED 24"

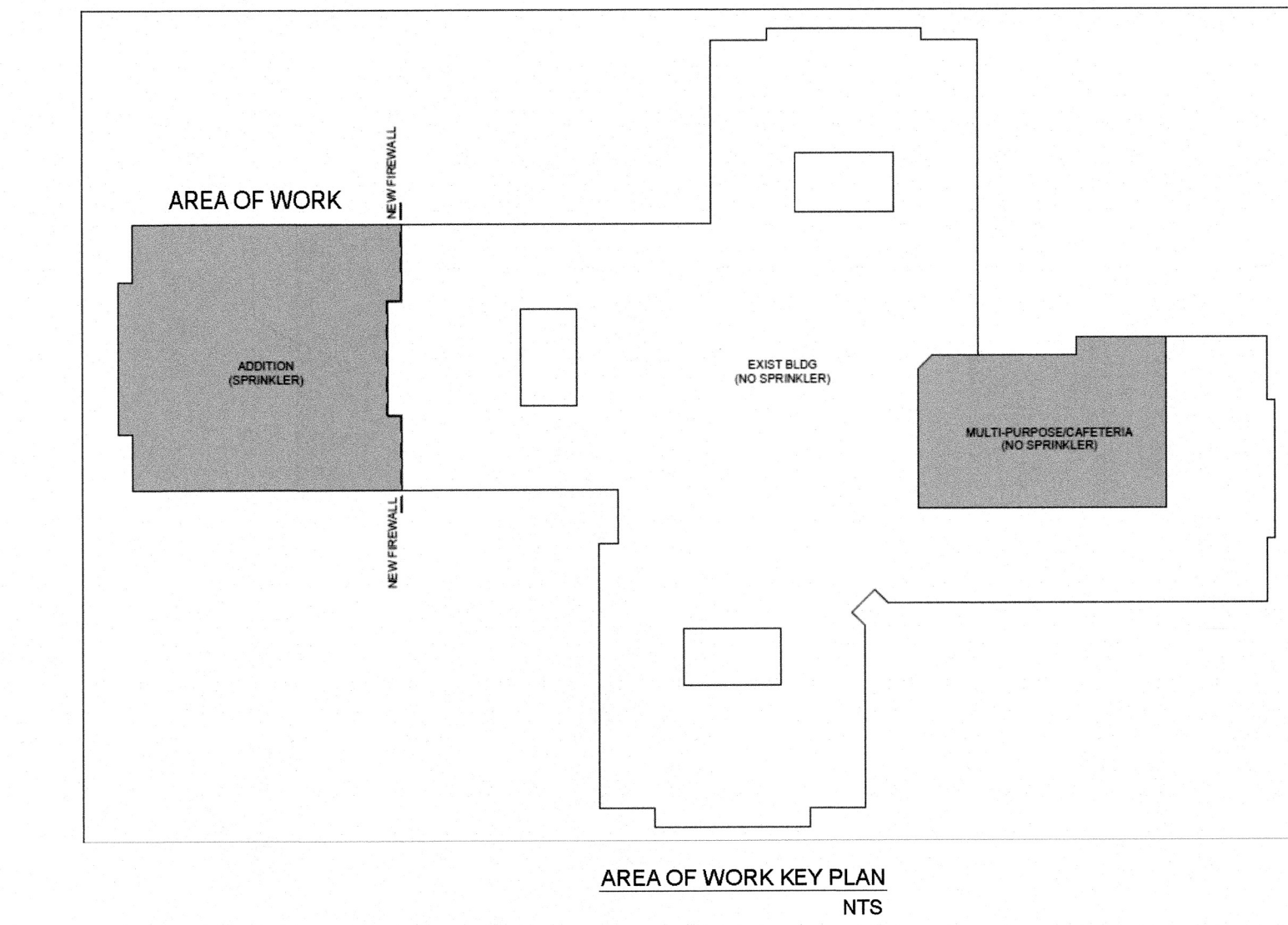
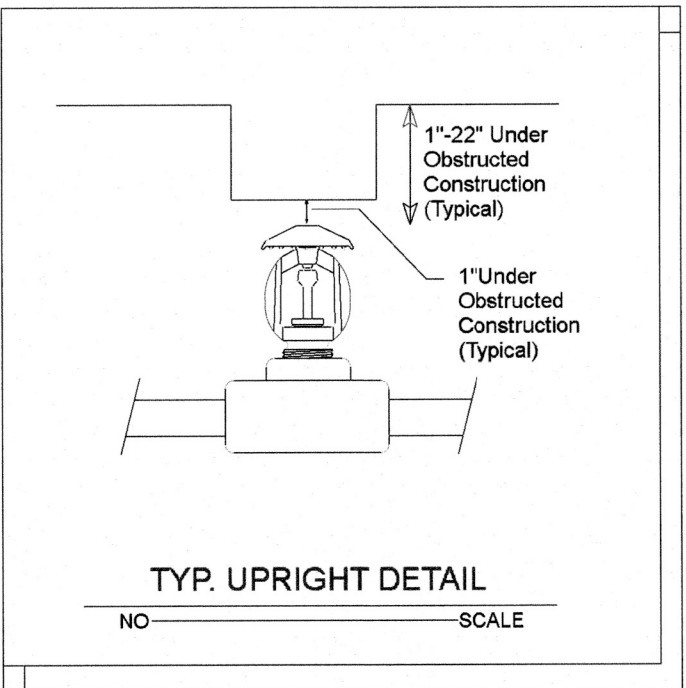
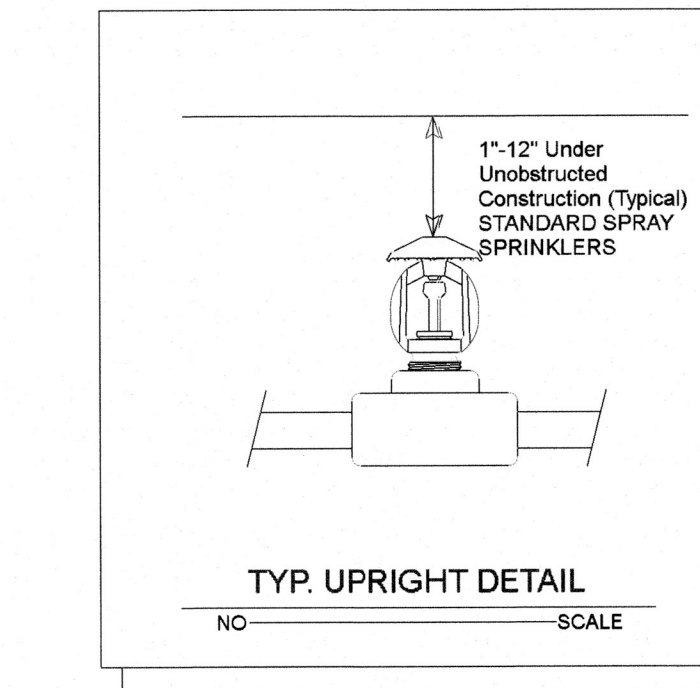
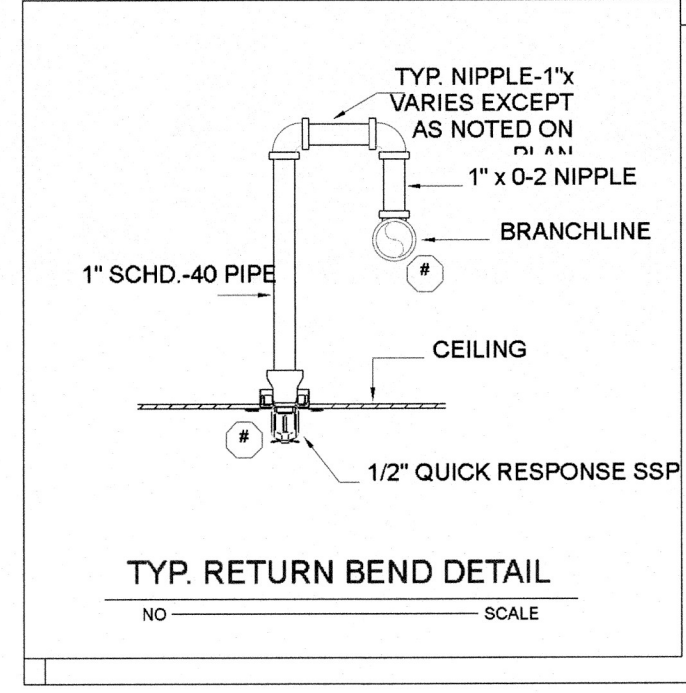
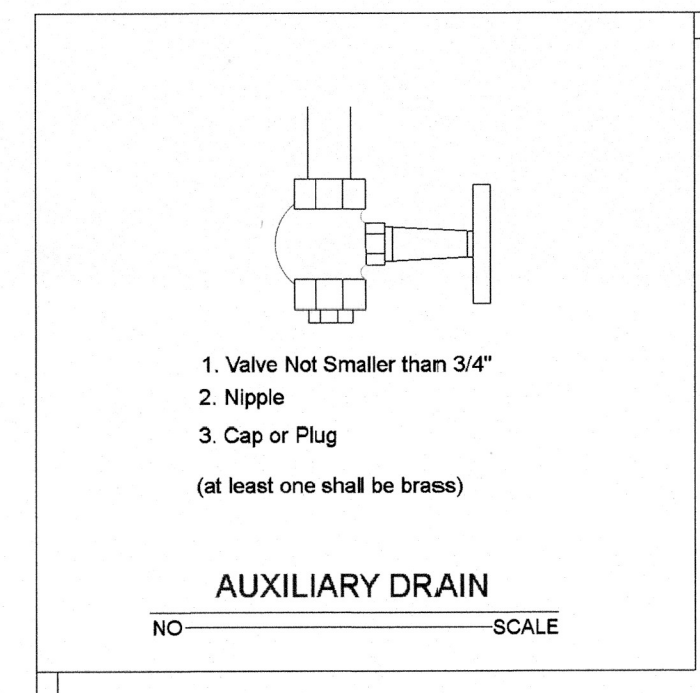
### TRAPEZE INSTALLATION REQUIREMENTS

SPAN OF TRAPEZE (Schedule 10)	NOMINAL PIPE SIZE SUPPORTED							
	1"	1-1/4"	1-1/2"	2"	2-1/2"	3"	4"	6"
1 FT. 6 IN.	1"	1"	1"	1"	1"	1"	1-1/4"	1-1/4"
2 FT. 0 IN.	1"	1"	1"	1-1/4"	1-1/4"	1-1/4"	1-1/4"	1-1/2"
2 FT. 6 IN.	1-1/4"	1-1/4"	1-1/4"	1-1/4"	1-1/4"	1-1/4"	1-1/2"	2"
3 FT. 0 IN.	1-1/4"	1-1/4"	1-1/4"	1-1/4"	1-1/2"	1-1/2"	1-1/2"	2"
4 FT. 0 IN.	1-1/2"	1-1/2"	1-1/2"	1-1/2"	2"	2"	2"	2-1/2"
5 FT. 0 IN.	2"	2"	2"	2"	2"	2"	2-1/2"	2-1/2"
6 FT. 0 IN.	2"	2"	2"	2"	2"	2-1/2"	2-1/2"	3"
7 FT. 0 IN.	2"	2"	2"	2-1/2"	2-1/2"	2-1/2"	2-1/2"	3"
8 FT. 0 IN.	2-1/2"	2-1/2"	2-1/2"	2-1/2"	2-1/2"	2-1/2"	2-1/2"	3"
9 FT. 0 IN.	2-1/2"	2-1/2"	2-1/2"	2-1/2"	2-1/2"	2-1/2"	3"	4"
10 FT. 0 IN.	2-1/2"	2-1/2"	2-1/2"	2-1/2"	2-1/2"	3"	3"	4"

## GENERAL NOTES:

- MATERIALS AND INSTALLATION SHALL COMPLY WITH APPLICABLE NFPA CODES (2013), STATE BUILDING CODE, LOCAL AUTHORITY HAVING JURISDICTION, AND INSURANCE UNDERWRITER'S REQUIREMENTS.
- ALL MATERIALS AND EQUIPMENT SHALL BE NEW, UL LISTED FOR THE INTENDED USE AND SHALL BE INSTALLED IN FULL COMPLIANCE WITH MANUFACTURER'S RECOMMENDATIONS.
- ALL NEW SPRINKLER PIPE 1 1/2" AND SMALLER IS SCHEDULE-40 BLACK STEEL WITH THREADED ENDS AND FITTINGS. ALL NEW SPRINKLER PIPE 1 1/2" AND LARGER IS SCHEDULE-10 BLACK STEEL WITH GROOVED ENDS AND FITTINGS.
- SPRINKLER HEAD SPACING IS BASED ON THE NFPA 13 2013 STANDARDS FOR LIGHT HAZARD OCCUPANCIES UTILIZING EXTENDED COVERAGE HEADS ALLOWING A MAXIMUM HEAD SPACING OF 324 S.F. PER HEAD. SPRINKLER HEAD SPACING IN MECHANICAL MEZZANINE AREA IS BASED ON NFPA 13 2013 STANDARDS FOR ORDINARY HAZARD GROUP I OCCUPANCIES ALLOWING A MAXIMUM HEAD SPACING OF 130 S.F.
- LOCATIONS OF PIPING AS SHOWN ON THE DRAWINGS ARE APPROXIMATE AND SUBJECT TO MINOR ADJUSTMENTS IN THE FIELD.
- THE WATER TEST INFORMATION HAS BEEN PROVIDED BY LKC ENGINEERING DATED 07.29.2022 INDICATES THE FOLLOWING...

STATIC: 69 PSI  
 RESIDUAL: 50 PSI  
 FLOW: 1020 GPM



System No. W-L-1054

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Rating - 1 and 2 Hr (See Items 1 and 3)	F Rating - 1 and 2 Hr (See Items 1 and 3)
FT Rating - 0 Hr	FT Rating - 0 Hr
L Rating at Ambient - Less Than 1 CFM/sq ft	FH Rating - 1 and 2 Hr (See Items 1 and 3)
L Rating at 400 F - Less Than 1 CFM/sq ft	FTH Rating - 0 Hr
	L Rating at Ambient - Less Than 1 CFM/sq ft
	L Rating at 400 F - Less Than 1 CFM/sq ft

1. Wall Assembly - The 1 or 2 hr fire-rated gypsum wallboard/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300 or U400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:  
 A. Studs - Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. (51 by 102 mm) lumber spaced 16 in. (406 mm) OC. Steel studs to be min 2-1/2 in. (64 mm) wide and spaced max 24 in. (610 mm) OC. When steel studs are used and the diam of opening exceeds the width of stud cavity, the opening shall be framed on all sides using lengths of steel stud installed between the vertical studs and screw-attached to the steel studs at each end. The framed opening in the wall shall be 4 to 6 in. (102 to 152 mm) wider and 4 to 6 in. (102 to 152 mm) higher than the diam of the penetrating item such that, when the penetrating item is installed in the opening, a 2 to 3 in. (51 to 76 mm) clearance is present between the penetrating item and the framing on all four sides.  
 B. Gypsum Board - 5/8 in. (16 mm) thick, 4 ft (122 cm) wide with square or tapered edges. The gypsum board type, thickness, number of layers, fastener type and sheet orientation shall be as specified in the individual U300 or U400 Series Design in the UL Fire Resistance Directory. Max diam of opening is 32-1/4 in. (819 mm) for steel stud walls. Max diam of opening is 14-1/2 in. (368 mm) for wood stud walls. The F and FH Ratings of the firestop system are equal to the fire rating of the wall assembly.  
 2. Through-Penetrants - One metallic pipe, conduit or tubing to be installed either concentrically or eccentrically within the firestop system. The annular space shall be min 0 in. to max 2-1/4 in. (57 mm). Pipe may be installed with continuous point contact. Pipe, conduit or tubing to be rigidly supported on both sides of wall assembly. The following types and sizes of metallic pipes, conduits or tubing may be used:  
 A. Steel Pipe - Nom 30 in. (762 mm) diam (or smaller) Schedule 10 (or heavier) steel pipe.  
 B. Iron Pipe - Nom 30 in. (762 mm) diam (or smaller) cast or ductile iron pipe.  
 C. Conduit - Nom 4 in. (102 mm) diam (or smaller) steel electrical metallic tubing or 6 in. (152 mm) diam steel conduit.  
 D. Copper Tubing - Nom 6 in. (152 mm) diam (or smaller) Type L (or heavier) copper tubing.  
 E. Copper Pipe - Nom 6 in. (152 mm) diam (or smaller) regular (or heavier) copper pipe.  
 3. Fill, Void or Cavity Material - Sealant - Min 5/16 in. (16 mm) thickness of fill material applied within the annulus, flush with both surfaces of wall. At the point or continuous contact locations between pipe and wall, a min 1/2 in. (13 mm) diam bead of fill material shall be applied at the pipe wall interface on both surfaces of wall.  
 HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC - FS-ONE Sealant or FS-ONE MAX Intumescent Sealant  
 \* Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.

System No. C-AJ-1154

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Rating - 3 Hr	F Rating - 3 Hr
T Rating - 1/4 Hr	FT Rating - 1/4 Hr
L Rating At Ambient - Less Than 1 CFM/sq ft	FH Rating - 3 Hr
L Rating At 400 F - 4 CFM/sq ft	FTH Rating - 1/4 Hr
	L Rating At Ambient - Less Than 1 CFM/sq ft
	L Rating At 400 F - 4 CFM/sq ft

1. Floor or Wall Assembly - Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete. Wall may also be constructed of any UL Classified Concrete Blocker. Max diam of opening is 14 in. (356 mm).  
 2. Through-Penetrants - One metallic pipe, conduit or tubing to be installed either concentrically or eccentrically within the firestop system. The annular space shall be min 0 in. to max 3-1/4 in. (83 mm). Pipe, conduit or tubing to be rigidly supported on both sides of wall assembly. The following types and sizes of metallic pipes, conduits or tubing may be used:  
 A. Steel Pipe - Nom 10 in. (254 mm) diam (or smaller) Schedule 10 (or heavier) steel pipe.  
 B. Conduit - Nom 4 in. (254 mm) diam (or smaller) steel electrical metallic tubing or steel conduit.  
 C. Copper Tubing - Nom 4 in. (102 mm) diam (or smaller) Type L (or heavier) copper tubing.  
 D. Copper Pipe - Nom 4 in. (102 mm) diam (or smaller) regular (or heavier) copper pipe.  
 3. Firestop System - The firestop system shall consist of the following:  
 A. Packing Material - Mineral wool batt insulation firmly packed into opening as a permanent form. Packing material to be recessed from top surface of floor or from both surfaces of wall to accommodate the required thickness of fill material. As an option to the above, backer rod and/or foamed plastic backer material may be used.  
 B. Fill, Void or Cavity Material - Sealant - Min 1/2 in. (13 mm) thickness of fill material applied within the annulus, flush with top surface of floor or with both surfaces of wall. At the point contact location between pipe and concrete, a min 1/2 in. (13 mm) diam bead of fill material shall be applied at the concrete/pipe interface on the top surface of floor and on both surfaces of wall.  
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Hanger No. 18S STEEL SAMMY SIDEWINDER AND ROD

Hanger No. 03T Pipe/Top Beam C-Clamps

Riser Parts Legend

Key Note	Size	Description
1	2	Valve, T-T Angle
2	6 x 2	Waterflow Detector
3	6	Valve, G-G Butterfly
4	6	Valve, G-G Riser Check (Viking Easy Riser)
5	4	Valve, G-G Check
6	6	Valve, F-F Backflow Ames Colt C500

RISER DETAIL  
 NO SCALE

HIGHLAND ELEMENTARY  
 HARNETT CO SCHOOLS  
 1915 BUFFALO LAKE ROAD  
 SANFORD, NC 27332

J & D SPRINKLER CO. INC.  
 315 W. MAIN ST., CLAYTON, NC 27520  
 PHONE: (919)553-2356 FAX: (919) 359-0622

SHEET TITLE:  
 NOTES AND DETAILS

This fire sprinkler planning and design drawing has been prepared by J & D Sprinkler Co. as a licensed fire sprinkler contractor under Article 2 or Chapter 67 of the North Carolina State Board of Fire Protection and must be used in accordance with the rules and regulations of the State Board of Fire Protection and must be performed in reliance on this drawing pursuant to G.S. § 55B-15(e)(2). Installation work or any other work performed by any other person or entity in reliance on this drawing or any copy thereof is strictly prohibited.  
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 NICET LEVEL III  
 JASON GRAHAM  
 NC # 16869FS CERT # 121842  
 NICET LEVEL III

REVISION:  
 NO. DATE

Date:  
 04.05.2023

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

Job Number:  
 B22243

Drawn By:  
 BKB

Sheet Number  
 FP1 OF 4



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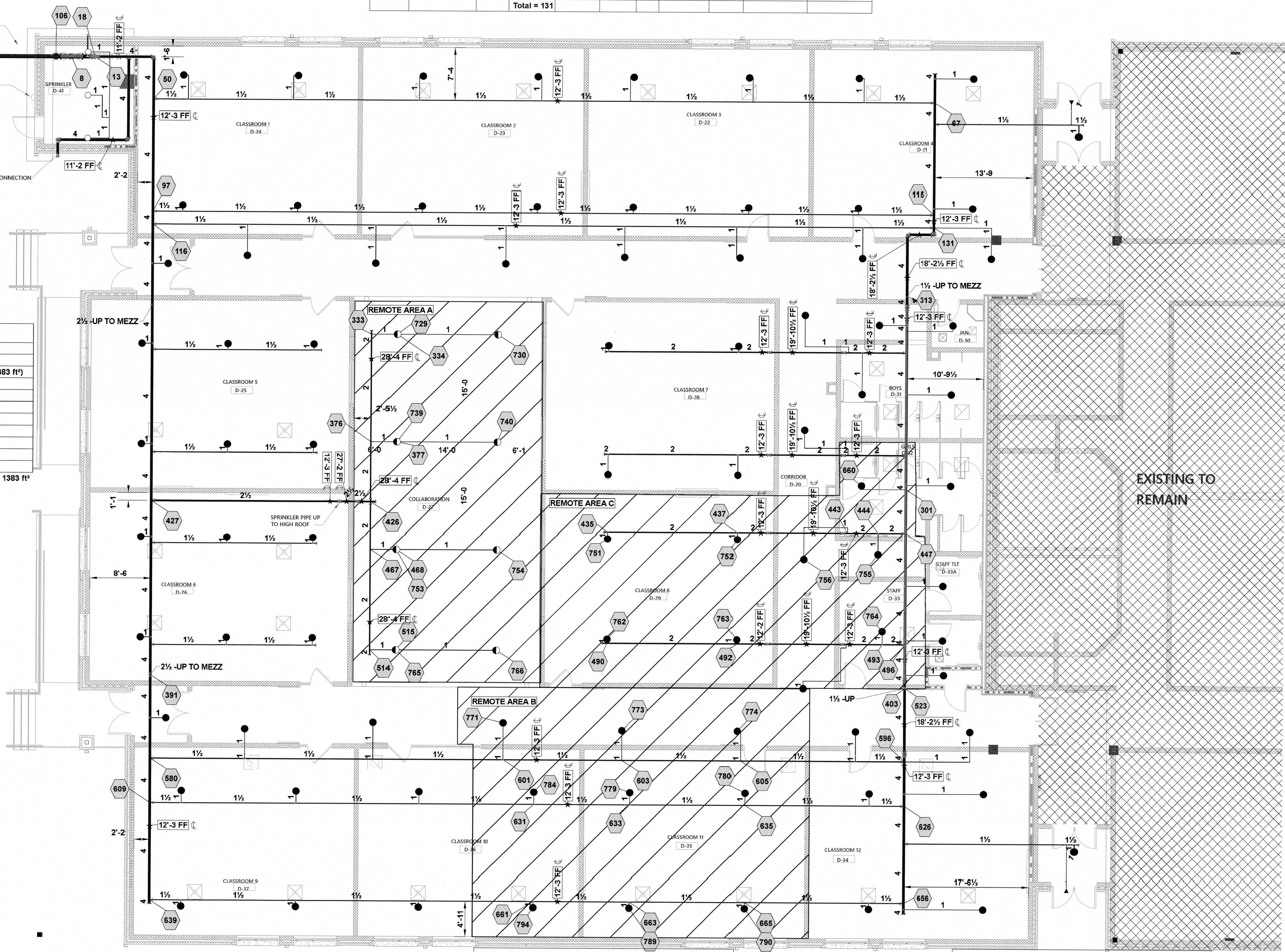
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FP2 OF 4

Sprinkler Legend										
Symbol	Manufacturer	SIN	Quantity	K-Factor	Type	Size	Response	Finish	Temperature	Note
●	Viking	VK634	85	8	Pendent	3/4"	Quick	Brass	155 °F	EC 18x18
●	Reliable	RA3415	8	5.6	Pendent	1/2"	Quick	Brass	165 °F	
●	Reliable	R5734	2	5.6	Sidewall	3/4"	Quick	Chrome	155 °F	DRY SIDEWALL
○	Reliable	RA1425	36	5.6	Upright	1/2"	Quick	Brass	200 °F	
			<b>Total = 131</b>							

TEST:  
STATIC - 69 PSI  
RESIDUAL - 50 PSI  
FLOW - 1020 GPM

Hydraulic Information	
Remote Area A	
OCCUPANCY CLASSIFICATION	Light Hazard
DENSITY (gpm/ft²)	0.10 for 1500 ft² (Actual 1383 ft²)
TOTAL HOSE STREAMS	100.00
TOTAL HEADS FLOWING	8
K-FACTOR	5.6
TOTAL WATER REQUIRED	261.54
TOTAL PRESSURE REQUIRED	51.151
BASE OF RISER (gpm)	161.54
BASE OF RISER (psi)	38.306
SAFETY MARGIN (psi)	+16.317 (24.2%)
Light Hazard-0.10 gpm/ft² for 1383 ft²	



Hydraulic Information	
Remote Area B	
OCCUPANCY CLASSIFICATION	Light Hazard
DENSITY (gpm/ft²)	0.10 for 1500 ft² (Actual 1639 ft²)
TOTAL HOSE STREAMS	100.00
DRY CAPACITY	0.00 gal
TOTAL HEADS FLOWING	9
K-FACTOR	8
TOTAL WATER REQUIRED	410.22
TOTAL PRESSURE REQUIRED	49.509
BASE OF RISER (gpm)	310.22
BASE OF RISER (psi)	36.483
SAFETY MARGIN (psi)	+15.968 (24.4%)
Light Hazard-0.10 gpm/ft² for 1639 ft²	

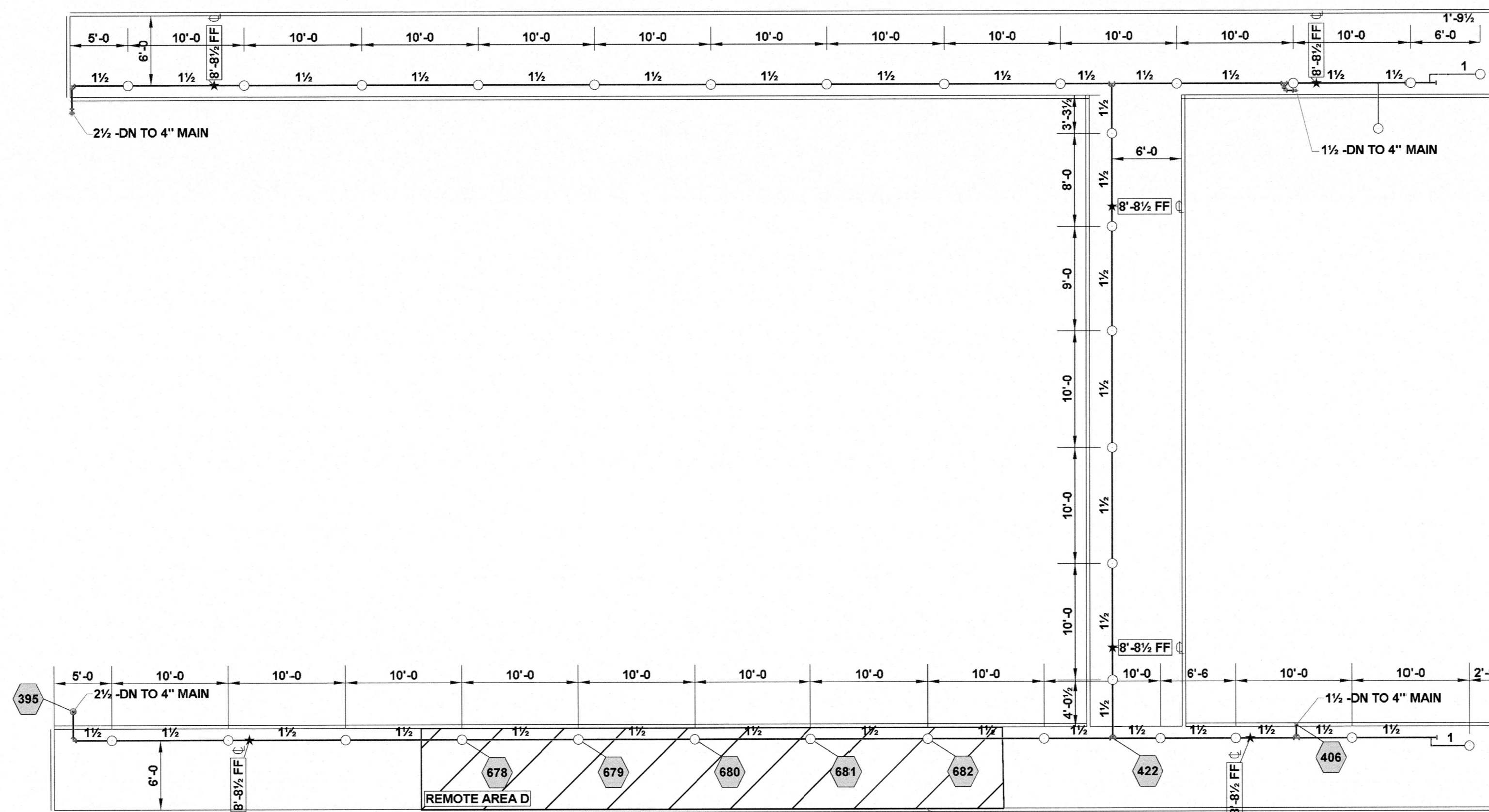
Hydraulic Information	
Remote Area C	
OCCUPANCY CLASSIFICATION	Light Hazard
DENSITY (gpm/ft²)	0.10 for 1500 ft² (Actual 1514 ft²)
TOTAL HOSE STREAMS	100.00
DRY CAPACITY	0.00 gal
TOTAL HEADS FLOWING	8
K-FACTOR	8
TOTAL WATER REQUIRED	385.19
TOTAL PRESSURE REQUIRED	53.901
BASE OF RISER (gpm)	285.19
BASE OF RISER (psi)	40.912
SAFETY MARGIN (psi)	+11.963 (18.2%)
Light Hazard-0.10 gpm/ft² for 1514 ft²	

Plan North  
**PIPING PLAN**  
1/8"=1'-0"

EXISTING TO REMAIN



Sprinkler Legend										
Symbol	Manufacturer	SIN	Quantity	K-Factor	Type	Size	Response	Finish	Temperature	Note
●	Viking	VK634	85	8	Pendent	3/4	Quick	Brass	155 °F	EC 18x18
●	Reliable	RA3415	8	5.6	Pendent	1/2	Quick	Brass	165 °F	
▲	Reliable	R5734	2	5.6	Sidewall	3/4	Quick	Chrome	155 °F	DRY SIDEWALL
○	Reliable	RA1425	36	5.6	Upright	1/2	Quick	Brass	200 °F	
			Total = 131							



Hydraulic Information	
Remote Area D	
OCCUPANCY CLASSIFICATION	Ordinary Group I
DENSITY (gpm/ft²)	0.15 for 1500 ft² (Actual 349 ft²)
TOTAL HOSE STREAMS	250.00
DRY CAPACITY	0.00 gal
TOTAL HEADS FLOWING	5
K-FACTOR	5.6
TOTAL WATER REQUIRED	348.05
TOTAL PRESSURE REQUIRED	36.465
BASE of RISER (gpm)	98.05
BASE of RISER (psi)	23.667
SAFETY MARGIN (psi)	+29.936 (45.1%)
Ordinary Group I-0.15 gpm/ft² for 349 ft²	

Plan North  MEZZANINE PIPING AND CEILING PLAN  
1/8"=1'-0"

HIGHLAND ELEMENTARY  
HARNETT CO SCHOOLS  
1915 BUFFALO LAKE ROAD  
SANFORD, NC 27332

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SHEET TITLE:  
MEZZANINE PIPING AND CEILING PLAN

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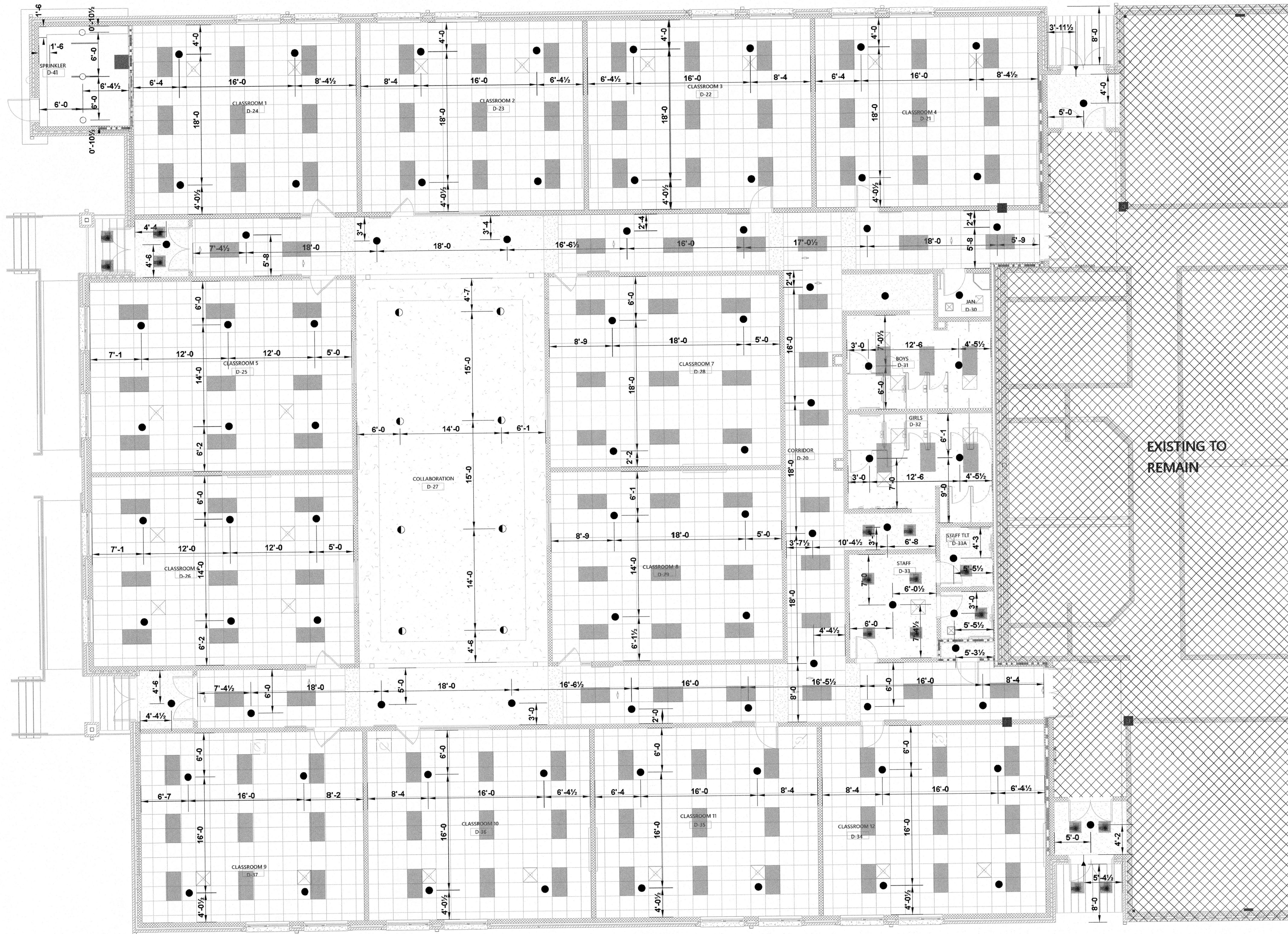
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FP3 OF 4



Sprinkler Legend										
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●	Viking	VK634	85	8	Pendent	3/4"	Quick	Brass	155°F	EC 18x18
○	Reliable	RA3415	8	5.6	Pendent	1/2"	Quick	Brass	165°F	
○	Reliable	R5734	2	5.6	Sidewall	3/4"	Quick	Chrome	155°F	DRY SIDEWALL
○	Reliable	RA1425	36	5.6	Upright	1/2"	Quick	Brass	200°F	
			Total = 131							



Plan North  
CEILING PLAN  
1/8"=1'-0"

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HARNETT CO SCHOOLS  
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SHEET  
TITLE:  
CEILING PLAN

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NICET LEVEL III

JASON GRAHAM

NC # 16229FS CERT # 121842  
NICET LEVEL III

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FP4 OF 4