

**GMP**  
FIRE PROTECTION DESIGN  
5617 QUAIL COVEY LN  
WENDELL, NC 27591  
OFF: (919) 625-9884  
FAX: (919) 217-2957

**sfl+a**  
ARCHITECTS  
214 Burgess St.  
Fayetteville, NC 28301  
Phone: 910.484.4989  
Fax: 910.484.1466  
[www.sfla.biz](http://www.sfla.biz)



CONSULTING ENGINEERS  
PROGRESSIVE DESIGN  
COLLABORATIVE, I.A.L.  
POST OFFICE BOX 61249  
RALEIGH, N. C. 27661-1249  
TELEPHONE 919-790-8888  
FDC# 06021

ADDITIONS  
**BLUE CREEK & NORTHWOODS ELEMENTARY SCHOOLS**  
Blue Creek Fire Protection Details

Project #: 005310007  
Drawn By: NLP  
Checked By: NLP  
Issue Date: 02/26/2007  
Revisions:

**FP-1**

System No. C-1044

August 23, 2004

(Formerly System No. 136)

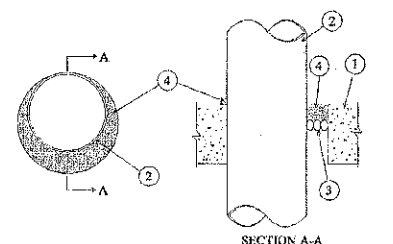
F Ratings — 2, 3, and 4 Hr (See Items 2k and 4)

T Rating — 0 Hr

L Rating At Ambient — 2 CFM/sq Ft

L Rating At 400 F — less than 1 CFM/sq Ft

W Rating — Class I (See Item 4)



SECTION A-A

1. Floor or Wall Assembly — Light weight or normal weight (100-150 pcf) concrete. Except as noted in table 1, min thickness of solid concrete floor or wall assembly is 4-1/2 in. Floor may also be smooth-cast of any min 5 in. thick U.L. Classified Hollow Core Precast Concrete Slab. When floor is constructed of hollow core precast concrete units, packing material (Item 3) and cast-in-place concrete (Item 4) is installed symmetrically on both sides of floor. Wall assembly may also be constructed of easy U.L. Classified Concrete Block. Max diam of opening in wall is 16 in. Max diam of opening in floor construction of hollow-core precast concrete walls is 7 ft.

See Concrete Blocks (CBZ) and Precast Concrete Units (PCU) categories in the Fire Resistance Directory for names of manufacturers.

1A. Steel Sleeve — (Cast-in, not shown) — Max 16 in. ID (or smaller) Schedule 10 (or heavier) steel sleeve cast or grouted into floor or wall assembly. Sleeve may extend a max of 2 in. above top of floor or beyond other surface of wall. Max 16 in. ID (or smaller) 60,000 psi yield strength steel sleeve cast or grouted into floor or wall assembly. Sleeve may extend a max of 2 in. beyond other surface of floor or wall.

2. Through Penetrations — One or more pipes, conduits or tubing installed vertically or horizontally within the firestop system. Max annular space between pipe, conduit or tubing and edge of through opening or sleeve is 1/8 in. Max diam of opening in floor or wall is 4 in. Min annular space between pipe or conduit and edge of through opening is 1/8 in. (tight contact). Pipe, conduit or tubing in floor or wall assembly. The following types and sizes of metal pipes, conduits or tubing may be used:

- A. Steel Pipe — Nom 3/4 in. diam (or smaller) Sch 40 (or heavier) steel pipe.
- B. Iron Pipe — Nom 3/4 in. diam (or smaller) cast or ductile iron pipe.
- C. Conduit — Nom 1/2 in. diam (or smaller) rigid steel conduit.
- D. Conduit — Nom 1/2 in. diam (or smaller) rigid electrical metallic tubing.
- E. Copper Tubing — Nom 1/2 in. diam (or smaller) Type L (or heavier) copper tubing.
- F. Copper Pipe — Nom 1/2 in. diam (or smaller) Regular (or heavier) copper pipe.

3. Packing Material — Polyethylene beaded mat or mat 1 in. thickness of tightly packed mineral wool or glass fiber insulation firmly packed into opening in permanent form. Packing material to be recessed from top surface of floor or from both surfaces of wall as required to accommodate the required thickness of cast-in-place concrete (Item 1).

4. Fill Void or Cavity Material — Cast, Grout or Mortar — Applied to fill the annular space flush with top surface of floor. In wall assemblies, required cast-in-place concrete shall be installed symmetrically on both sides of wall, flush with wall surface. At point contact between penetration and sleeve or between penetration and concrete, a min 1/4 in. diameter cast-in-place concrete shall be applied at top surface of floor and at both surfaces of wall. The local F Rating and the min required cast-in-place concrete are dependent upon a number of parameters, as shown in the following table:

Min Floor or Wall Thickness in.	Max Pipe or Conduit Diam in.	Max Annular Space in.	Min Cast-in-Place Thickness in.	F Rating Hr	T Rating Hr
2-1/2	10-1/2	1-3/8	1/2	2	0
2-1/2	10-1/2	3-3/4	1	2	0
4-1/2	10-6	1-3/8	1/2 (a)	2	0
4-1/2	10-12	1-1/4	1/2	2	0
4-1/2	10-20	2	1	2	0
4-1/2	10-30	2	1	2	0
4-1/2	10-12	3-1/4	1	2	0
4-1/2	20-31	2	2	2	0
6-1/2	10-6	1-3/8	1/2 (a)	4	0

(a) Max 2 in thickness of mineral wool beaded mat or mat 1 in. thickness of mineral wool insulation required in annular space on both sides of floor or wall assembly. Min 1 in. thickness of cast-in-place concrete shall be applied to top surface of floor or wall assembly.

3M COMPANY — CP 2500 or FB 3000 WT.

Note: W Rating applies only when FB 3000 WT is used.

Bearing the U.L. Classification Mark

Filename: X:\HEZ\C-1044  
Copyright August 23, 2004 Underwriters Laboratories, Inc.  
Reprinted from the U.L. Online Certification Directory with permission from Underwriters Laboratories, Inc.

System No. W-L-1001

September 17, 2004

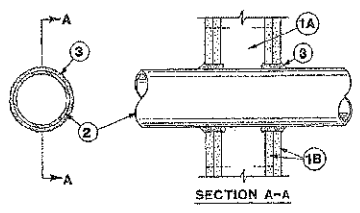
(Formerly System No. 140)

F Ratings — 1, 2, 3 and 4 Hr (See Items 2 and 3)

T Ratings — 0, 1, 2, 3, and 4 Hr (See Item 3)

L Rating At Ambient — less than 1 CFM/sq Ft

L Rating At 400 F — less than 1 CFM/sq Ft



SECTION A-A

1. Wall Assembly — The 1, 2, 3 or 4 hr fire-rated system with finished wall assembly shall be constructed of the materials and in the manner described in the individual U200 or J400 Series Wall or Partition Designs in the U.L. Fire Resistance Directory and shall include the following construction factors:

A. Studs — Wall framing may consist of either wood studs (max 2 hr fire rated assemblies) or steel channel studs. Wood studs to consist of nominal 2 by 4 in. lumber spaced 16 in. OC with a max 2 by 4 in. lumber end plate and cross braces. Steel studs to be min 3-5/8 in. wide by 1-3/8 in. deep channels spaced max 24 in. OC.

B. Gypsum Board — Nom 1/2 or 5/8 in. thick, 4 ft. wide with square or tapered edges. The gypsum wallboard type, thickness, number of layers, fastener type and fastener spacing shall be as specified in the individual U200 or J400 Series Design in the U.L. Fire Resistance Directory. Max diam of opening is 24 in.

2. Through Penetrations — One or more pipes, conduits or tubing installed vertically or horizontally within the firestop system. The annular space between pipe, conduit or tubing and edge of through opening shall be 1/8 in. (tight contact) to max 2 in. Pipe, conduit or tubing to be rigidly supported on both sides of wall assembly. The following types and sizes of metal pipes, conduits or tubing may be used:

- A. Steel Pipe — Nom 3/4 in. diam (or smaller) Schedule 40 (or heavier) steel pipe.
- B. Iron Pipe — Nom 3/4 in. diam (or smaller) cast iron pipe, nom 12 in. diam (or smaller) or Class 50 (or heavier) ductile iron pipe.
- C. Conduit — Nom 1/2 in. diam (or smaller) steel conduit or nom 1/2 in. diam (or smaller) steel electrical metallic tubing.
- D. Copper Tubing — Nom 1/2 in. diam (or smaller) Type L (or heavier) copper tubing.
- E. Copper Pipe — Nom 1/2 in. diam (or smaller) Regular (or heavier) copper pipe.
- F. Through Penetrating Product — Flexible Metal Piping The following types of steel flexible metal gas piping may be used:
  - 1. Nom 2 in. diam (or smaller) steel flexible metal gas piping. Plastic covering on piping may or may not be removed on both sides of floor or wall assembly. OREGA FLEX INC
  - 2. Nom 1 in. diam (or smaller) steel flexible metal gas piping. Plastic covering on piping may or may not be removed on both sides of floor or wall assembly. TIREFLX CORP
  - 3. Nom 1 in. diam (or smaller) steel flexible metal gas piping. Plastic covering on piping may or may not be removed on both sides of floor or wall assembly. BUNDY CO

WARD MFG INC

3. Fill Void or Cavity Material — Cast or Grout — Min 5/8, 1-1/4, 1-7/8 and 2-1/2 in. thickness of cast-in-place concrete, respectively, applied within annular space, flush with both surfaces of wall. Min 1/4 in. diam cast-in-place concrete applied to top surface of floor and at both surfaces of wall. The local F Rating and the min required cast-in-place concrete are dependent upon a number of parameters, as shown in the following table:

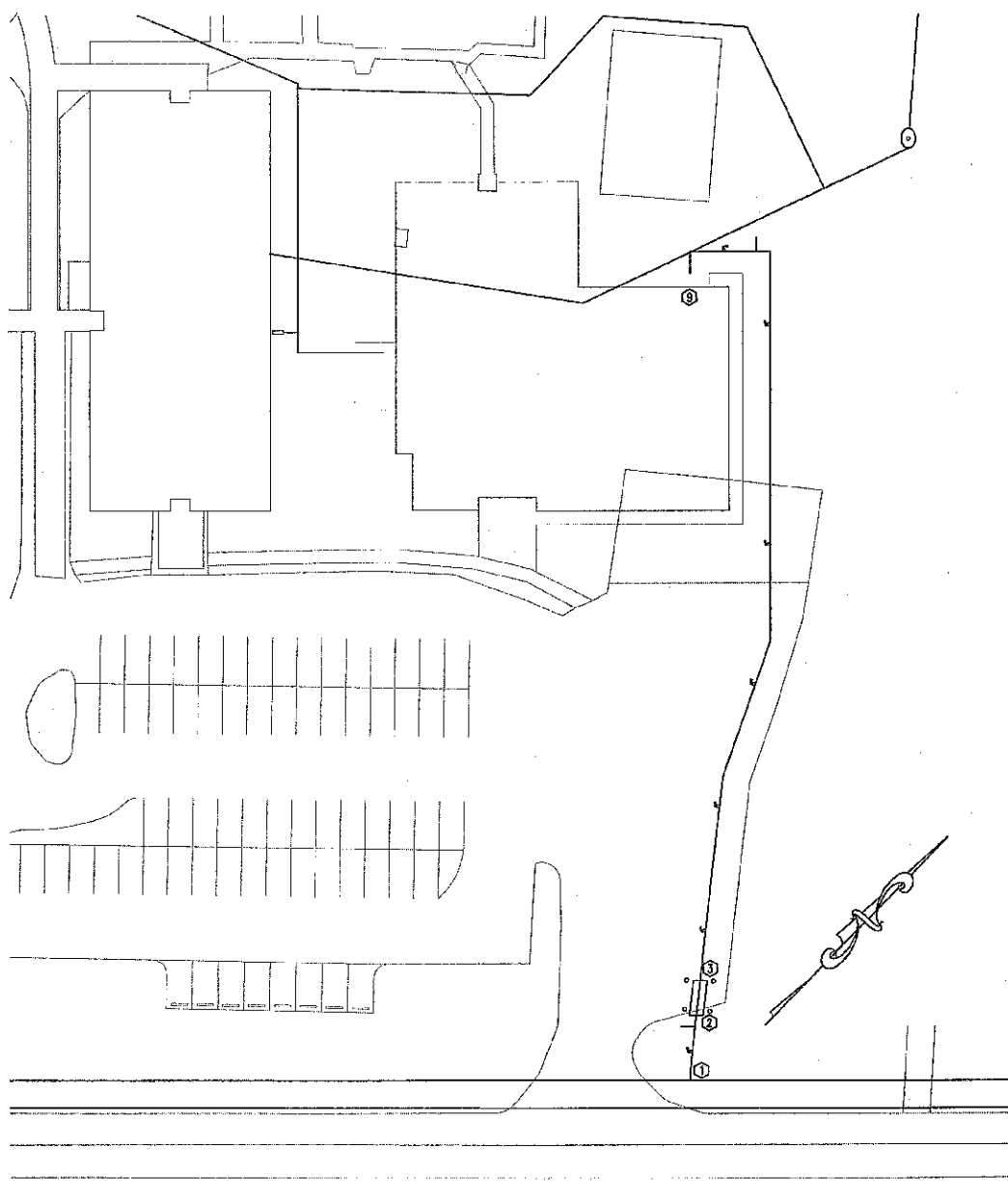
Max Pipe or Conduit Diam in.	F Rating Hr	T Rating Hr
1	1 or 2	0, 1 or 2
2	3 or 4	2 or 4
3	1 or 2	0
4	3 or 4	0
6	1 or 2	0
12	1 or 2	0

\*When copper pipe is used, T Rating is 0 hr.

3M COMPANY — CP 2500 or FB 3000 WT

Bearing the U.L. Classification Mark

Filename: X:\HEZ\W-L-1001  
Copyright September 17, 2004 Underwriters Laboratories, Inc.  
Reprinted from the U.L. Online Certification Directory with permission from Underwriters Laboratories, Inc.

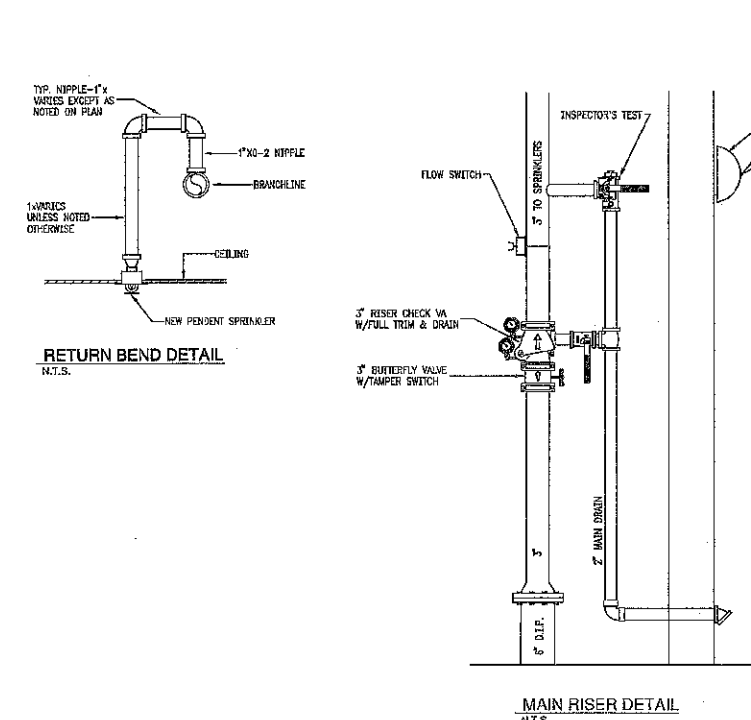
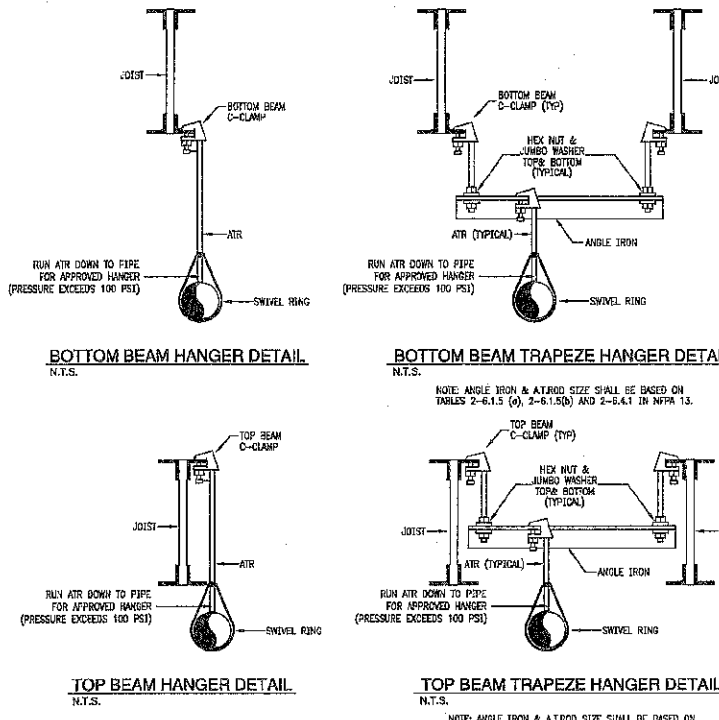


**BLUE CREEK SITE UTILITY HYDRAULIC REFERENCE PLAN**

SCALE: NONE  
NOTE: THIS PLAN IS FOR HYDRAULIC REFERENCE ONLY. IT IS NOT TO BE USED FOR CONSTRUCTION. REFER TO CIVIL PLANS FOR CONSTRUCTION.

**GENERAL NOTES**

1. ALL WORK SHALL BE IN FULL COMPLIANCE WITH NFPA 13 AND THE NORTH CAROLINA STATE BUILDING CODE. THE GENERAL CONDITIONS OF THE CONTRACT APPLY.
2. THE FP CONTRACTOR SHALL PROVIDE ALL LABOR AND MATERIALS REQUIRED FOR A COMPLETE WORKING SYSTEM WHICH MEETS ALL REQUIREMENTS OF THE STATE BUILDING CODE, NFPA 13, AND LOCAL AUTHORITY.
3. ALL MATERIALS AND EQUIPMENT SHALL BE NEW, UL LISTED FOR THE INTENDED USE AND SHALL BE INSTALLED IN FULL COMPLIANCE WITH MANUFACTURE'S RECOMMENDATIONS.
4. SPRINKLER HEADS ARE SPACED FOR LIGHT HAZARD PER NFPA 13. QUICK RESPONSE HEADS SHALL BE USED.
5. ALL PIPE 2 1/2" AND LARGER SHALL BE BLACK STEEL SCH. 10 WITH GROOVED ENDS JOINED BY GROOVE FITTINGS. PIPE THAT IS TO BE THREADED SHALL BE SCH. 40 ONLY.
6. ALL PIPE 2" AND SMALLER SHALL BE BLACK STEEL SCH. 40 WITH THREADED ENDS JOINED BY THREADED FITTINGS.
7. SPRINKLER SYSTEM IS WET PIPE TYPE FOR ALL FLOORS.
8. ALL ARMORS SHALL BE 1", ARMORS EXCEEDING 1"x2'-0" SHALL BE SUPPORTED WITH A HANGER PER NFPA #13.
9. ALL FIREWALL PIPE PENETRATIONS SHALL BE PROTECTED AND SEALED WITH APPROVED FIRE-STOP MATERIAL.
10. LOCATIONS OF PIPING AS SHOWN ON THE DRAWINGS ARE APPROXIMATE AND SUBJECT TO MINOR ADJUSTMENTS IN THE FIELD.
11. ANY PIPE SUPPLYING A DRY SYSTEM SHALL BE GALVANIZED.



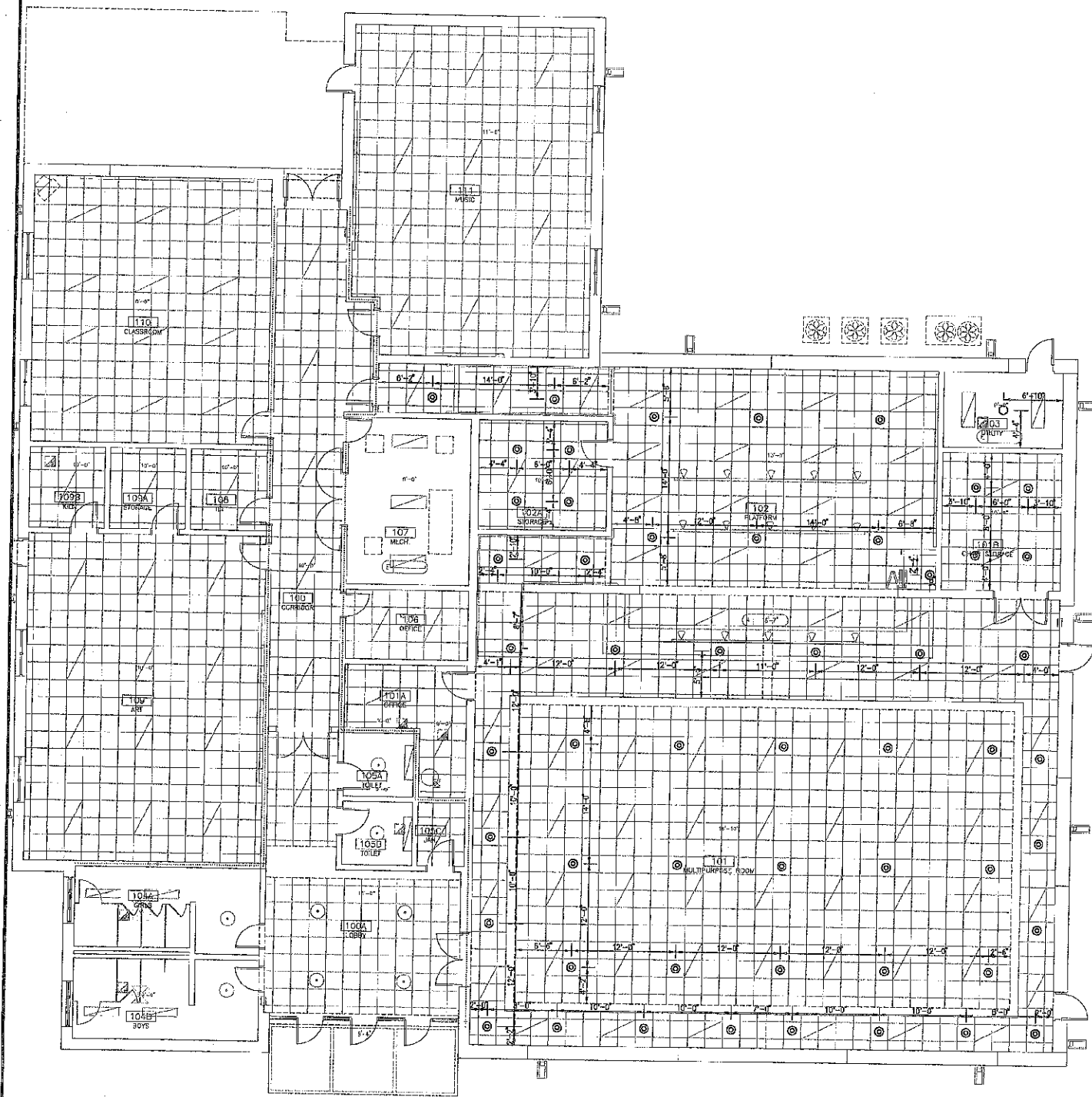
**GNP**  
FIRE PROTECTION DESIGN  
6617 QUAIL COVEY LN  
WENDELL, NC 27691  
OFF: (919) 625-9864  
FAX: (919) 217-2957

**sfl+a**  
ARCHITECTS

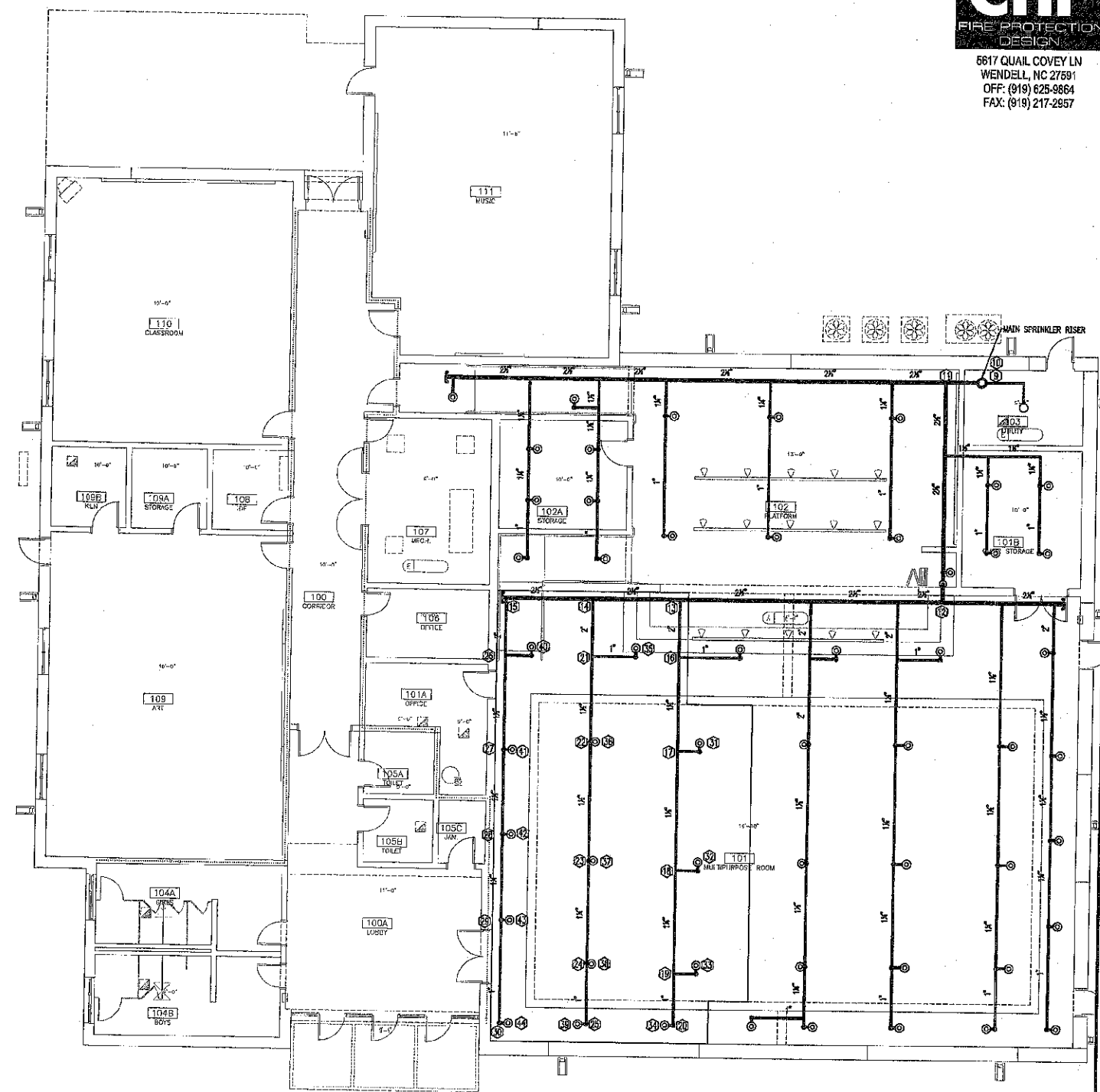
214 Burgess St.  
Fayetteville, NC 28301  
Phone: 910.484.4989  
Fax: 910.484.1456  
[www.sfla.biz](http://www.sfla.biz)



CONSULTING ENGINEERS  
PROGRESSIVE DESIGN  
CORPORATIVE, LLC  
POST OFFICE BOX 61249  
RALEIGH, N. C. 27661-1249  
TELEPHONE 919-790-9969  
PDC# C6021



**BLUE CREEK  
SPRINKLER PLAN**  
SCALE: 1" = 8'-0"



**BLUE CREEK  
PIPING PLAN**  
SCALE: 1" = 8'-0"

**ADDITIONS  
BLUE CREEK & NORTHWOODS ELEMENTARY SCHOOLS**

**Blue Creek Fire Protection Plan**

Project #: 00231000/  
00595000  
Drawn By: GNP  
Checked By: NLP  
Issue Date: 02/28/2001  
Revisions:

- LEGEND**
- ⊙ NEW QUICK RESPONSE RECESSED PENDENT SPRINKLER, 5.0 K-FACTOR, 155F, 3" ORIFICE, CHROME 2-PIECE ESCUTCHEON AND FINISH.
  - NEW SPRINKLER PIPING SIZE AS INDICATED
  - ⊙ HYDRAULIC CALCULATION NODE POINT.