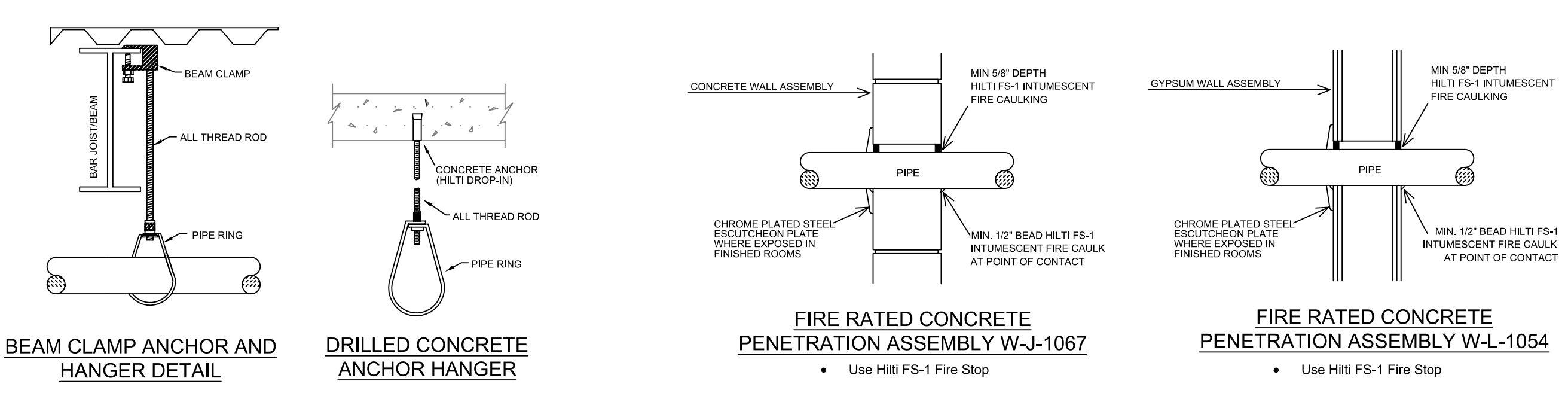


**SECTION A-A**  
SCALE: 1/8" = 1'-0"



**HANGER DETAILS**

**FIRE PROOFING DETAILS**

**MAXIMUM DISTANCE BETWEEN HANGERS (FT.-IN.)**

	NOMINAL PIPE SIZE (IN.)										
	3/4"	1"	1 1/2"	1 3/4"	2"	2 1/2"	3"	4"	6"	8"	
STEEL PIPE EXCEPT THREADED LIGHTWALL	NA	12-0	12-0	15-0	15-0	15-0	15-0	15-0	15-0	15-0	
THREADED LIGHTWALL STEEL PIPE	NA	12-0	12-0	12-0	12-0	NA	NA	NA	NA	NA	
COPPER TUBE	8-0	8-0	10-0	10-0	12-0	12-0	12-0	NA	NA	NA	
BLAZEMASTER CPVC	5-6	6-0	6-6	7-0	8-0	9-0	10-0	NA	NA	NA	

NFPA 13 HANGER SPACING

**PIPE LEGEND**

- BLK STEEL WET SYSTEM PIPING
- BLK STEEL DRY SYSTEM PIPING
- CPVC BLAZEMASTER WET SYSTEM PIPING
- GALV STEEL WET SYSTEM PIPING
- FIRE SPRINKLER STANDPIPE PIPING
- 1 HOUR FIRE RATED WALL (FIRE CAULK PIPE PENETRATIONS)
- 2 HOUR FIRE RATED WALL (FIRE CAULK PIPE PENETRATIONS)

**SYMBOL LEGEND**

SYM	CNT	POSITION	FINISH	TEMP	K	NPY	SIN	MFG.	MODEL#	ESCUTCHEON
103	PEND	WHITE	155	5.60	1/2"	TY323	Tyco	TY-FRB	SEM-RECESS	
10	PEND	WHITE	200	5.60	1/2"	TY223	Tyco	TY-FRB	SEM-RECESS	
12	PEND	LET BLACK	200	11.20	1"	TY228	Tyco	DS-ECC	CONCEALED	
68	PEND	WHITE	155	11.20	3/4"	TY227	Tyco	EC-11	SEM-RECESS	
58	PEND	WHITE	155	5.60	1/2"	RA5814	Reliable	LT58	SEM-RECESS	
325	PEND	WHITE	180	4.20	1/2"	TY224	Tyco	LFI	SEM-RECESS	
3	UPR	WHITE	200	8.00	3/4"	TY4131	Tyco	TY-FRB	N/A	
4	UPR	BRASS	155	8.00	3/4"	TY4131	Tyco	TY-FRB	N/A	
46	UPR	BRASS	200	8.00	3/4"	TY4131	Tyco	TY-FRB	N/A	
9	UPR	BRASS	288	8.00	3/4"	TY4131	Tyco	TY-FRB	N/A	
274	UPR	BRASS	155	14.00	3/4"	TY6137	Tyco	EC-14	N/A	
13	UPR	BRASS	200	14.00	3/4"	TY6137	Tyco	EC-14	N/A	
11	UPR	BRASS	288	14.00	3/4"	TY6137	Tyco	EC-14	N/A	
8	SIDE	CHROME	155	5.60	1/2"	TY331	Tyco	TY-FRB	SEM-RECESS	
4	SIDE	CHROME	155	8.00	3/4"	TY4332	Tyco	TY-FRB	SEM-RECESS	
380	SIDE	WHITE	155	4.20	1/2"	TY1334	Tyco	LFI	SEM-RECESS	
4	SIDE	WHITE	200	5.60	1"	TY3355	Tyco	DS-1	STANDARD	
2	SIDE	BLACK POLY	200	5.60	1"	GL5641	Globe	GL5641	RECESSED	
1369	TOTAL									* SPRINKLER HEADS WITH WHITE COLOR ARE COATED IN WHITE POLYESTER AND ARE LISTED AS CORROSION RESISTANT SPRINKLERS.

**SPRINKLER LEGEND**

**NOTE:**

**PIPE SCHEDULE ~**

- WET- 1" = THREADED LIGHTWALL
- 1 1/4" & LARGER = GRVD LIGHTWALL
- 1" THROUGH 3" = BLAZEMASTER CPVC
- DRY- 1" = THREADED SCH 40
- 1 1/4" & LARGER = GRVD SCH 40

**DESIGN CRITERIA ~**

**LIGHT HAZARD AREAS ~**  
DESIGNED TO DELIVER 0.10 GPM/S.F. OVER THE MOST DEMANDING 1500 S.F.

**ORDINARY HAZARD GROUP 1 AREAS ~**  
DESIGNED TO DELIVER 0.15 GPM/S.F. OVER THE MOST DEMANDING 1500 S.F.

REMOTE AREA REDUCTIONS HAVE BEEN TAKEN WHERE APPLICABLE PER NFPA 13 SEC. 11.2.3.2.3

**FIRE CAULKING ~**  
ALL FIRE RATED WALLS TO BE CAULKED w/ HLTI FS-ONE FIRE CAULKING AS PER U.L. LISTING FOR WALL TYPE & RATING

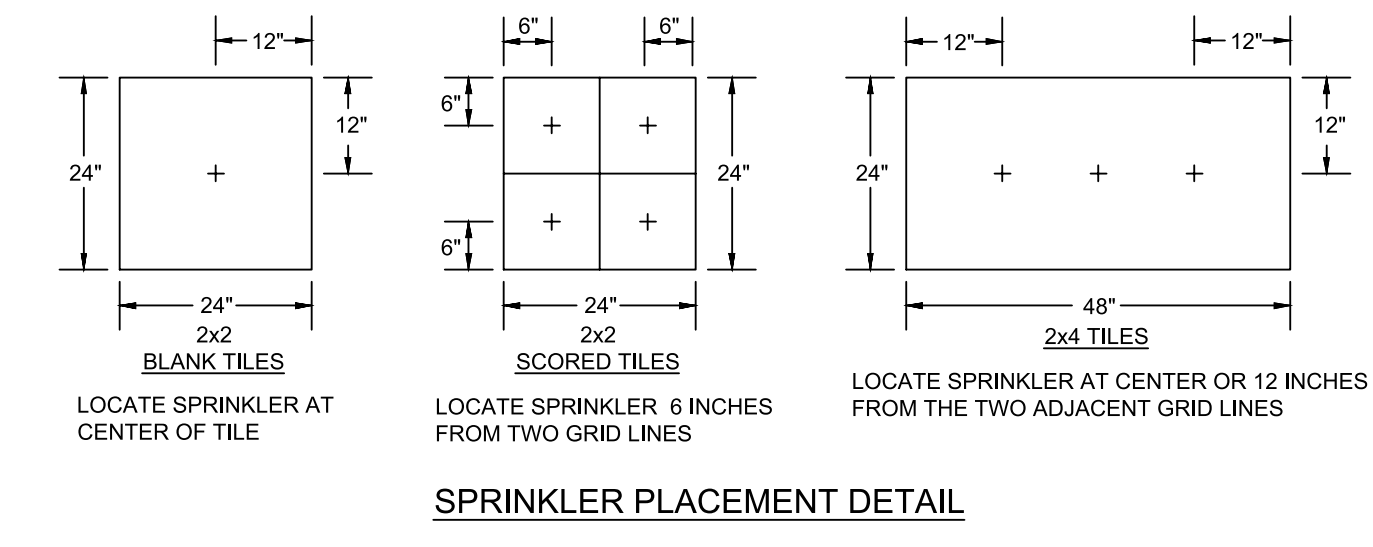
**AUX. DRAINS ~**  
SHALL BE PROVIDED WHERE A CHANGE IN PIPING DIRECTION PREVENTS DRAINAGE OF SYSTEM PIPING THROUGH THE MAIN DRAIN VAL.

**OBSTRUCTIONS ~**  
ALL SPRINKLER LOCATIONS TO BE SPACED IN ACCORDANCE w/ OBSTRUCTIONS TO MAINTAIN CLEARANCES - PER NFPA-13 (EXIT SIGNS & SECURITY EQUIPMENT SHALL NOT BE OBSCURED BY FIRE PROTECTION SYSTEM)

**ELEC. EQUIP ~**  
PROVIDE SHIELDS OR Baffles WHERE WATER DAMAGE MAY RESULT FROM HEADS TO USED TO ELEC. PANELS

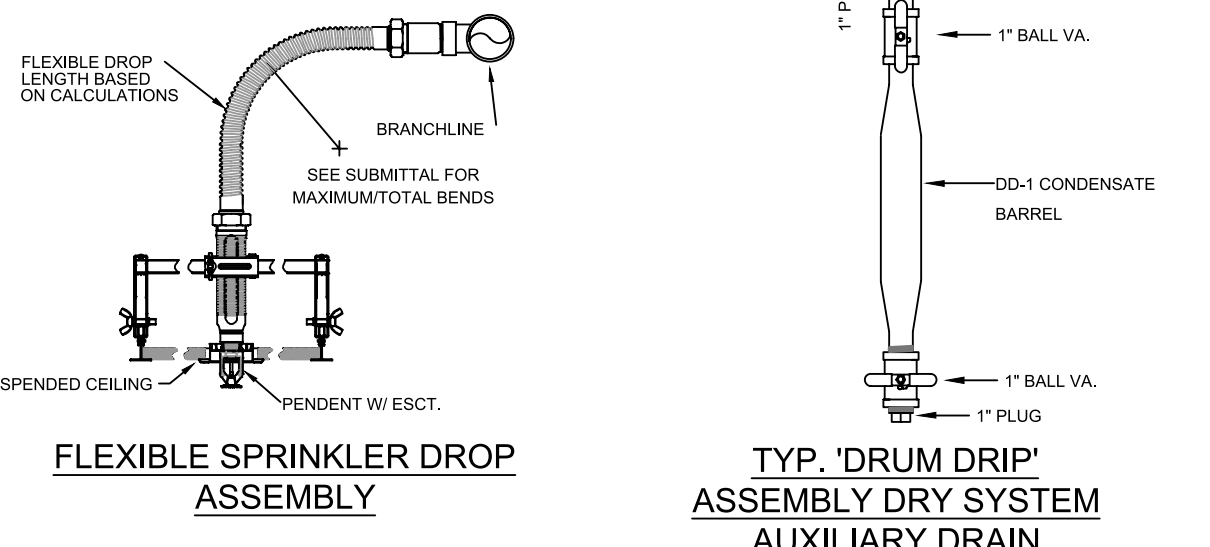
**SYMBOLS USED ON DRAWING**

- PIPE ELEVATION A.F.F.
- PIPE ELEVATION BELOW B.O.D.
- ROOM HAZARD CLASSIFICATION (ALL ROOMS ARE CONSIDERED LIGHT HAZARD UNLESS NOTED)
- HYDRAULIC CALCULATION JUNCTION POINT
- CEILING HEIGHT

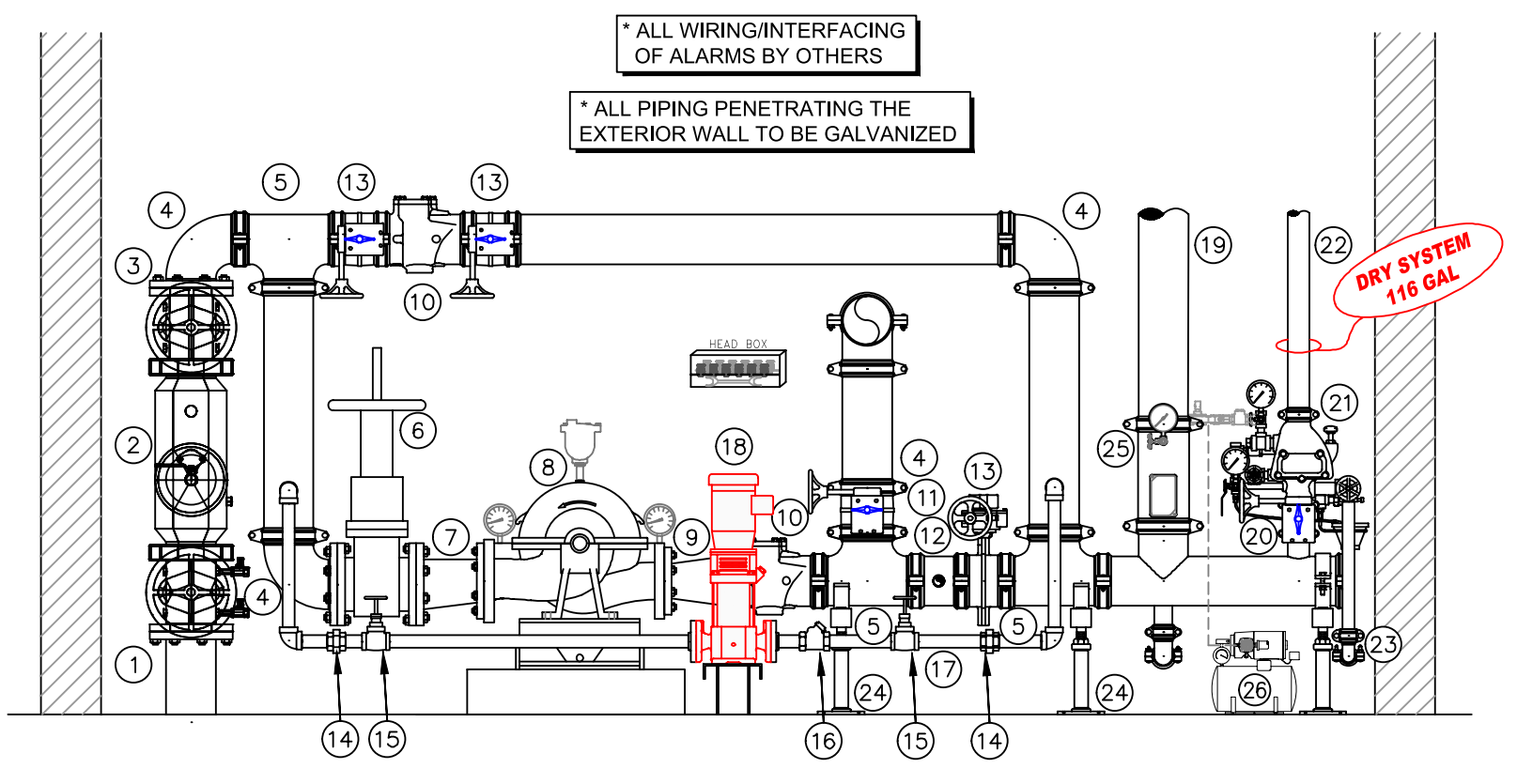


**SPRINKLER PLACEMENT DETAIL**

**INSTALLATION DETAILS**

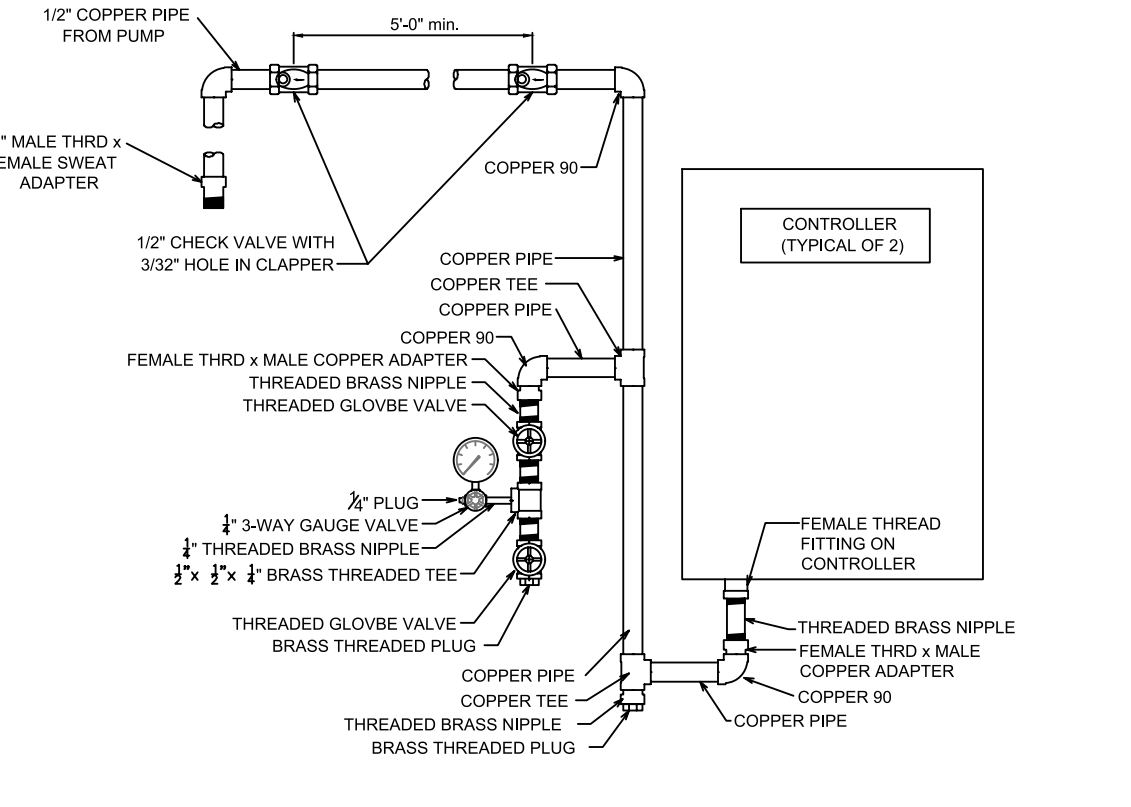


**TYP. RETURN BEND ASSEMBLY**  
**FLEXIBLE SPRINKLER DROP ASSEMBLY**

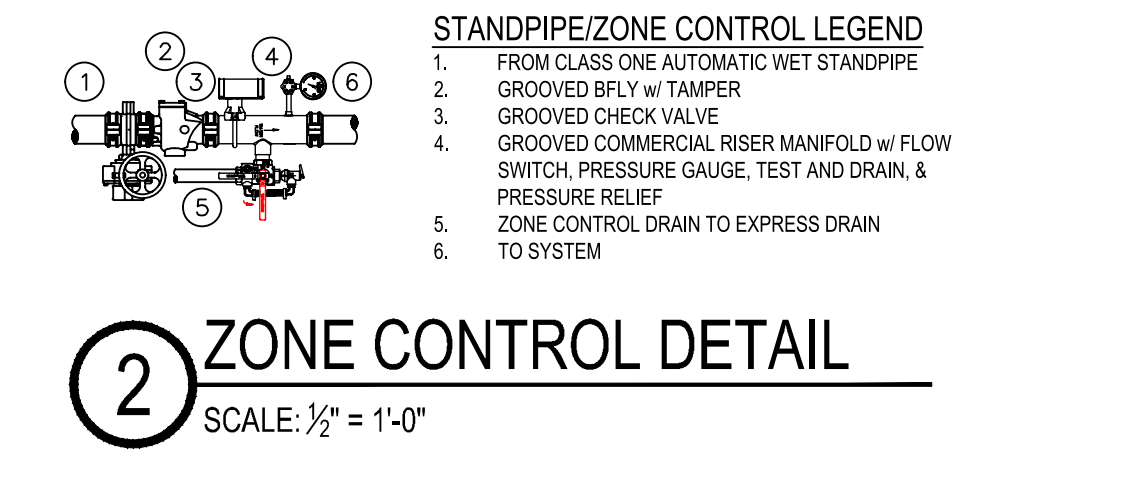


**1 VALVE ASSEMBLY DETAIL**  
SCALE: 1/2" = 1'-0"

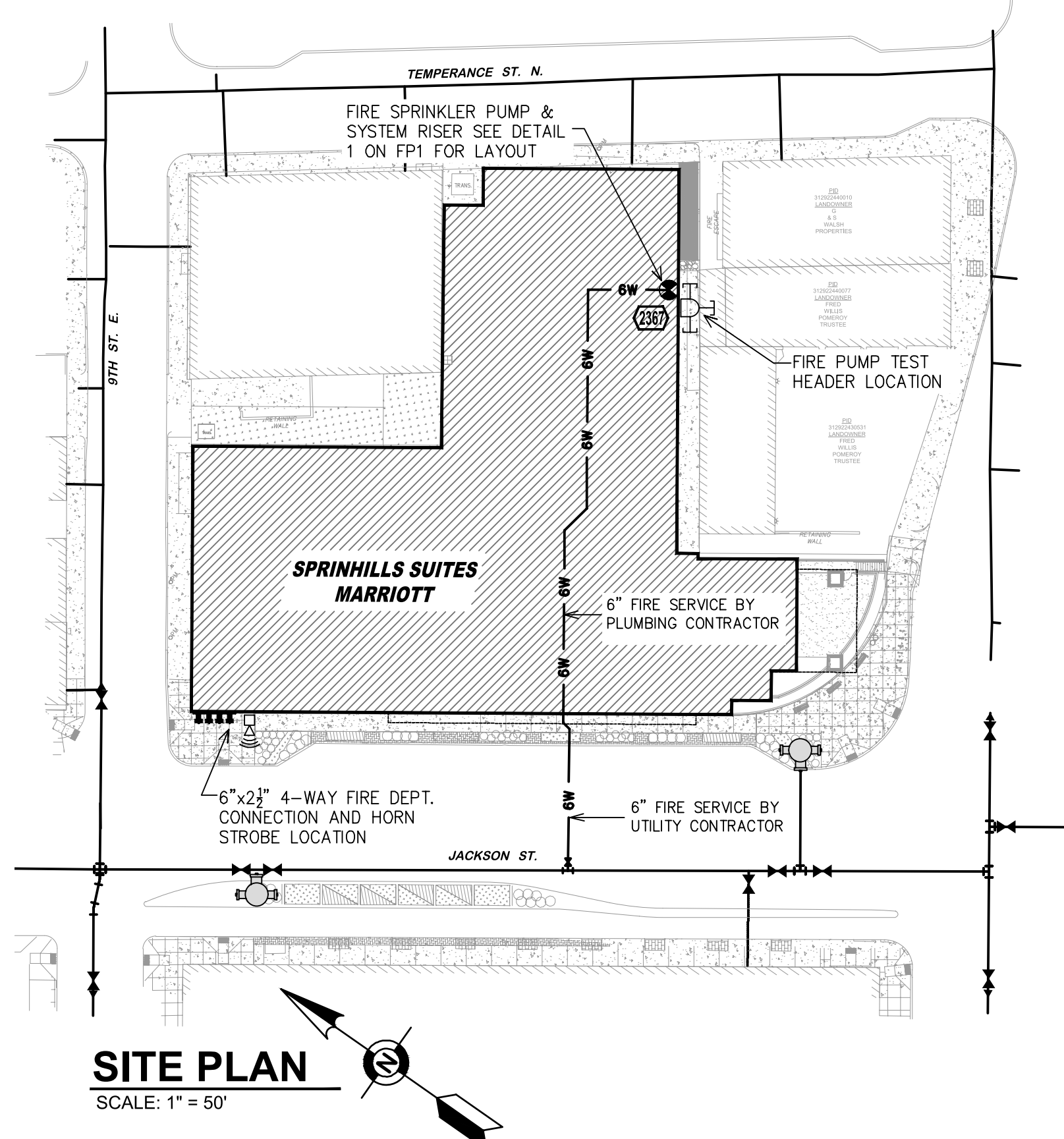
- FIRE PUMP & RISER LEGEND**
- 1" UNDERGROUND WATER SERVICE (BY OTHERS)
  - 6" APOLLO DCLP 4" FLANGED BACKFLOW w/ FxG GATES & TAMPER
  - 6" FLANGED X GROOVED ADAPTER
  - 6" GROOVED 90 ELBOW
  - 6" GROOVED TEE
  - 6" FLANGED GATE VALVE w/ TAMPER
  - 6"x6" FLANGED ECCENTRIC REDUCER
  - AURORA 14881-110 100psi @ 750gpm FIRE PUMP (60hp)
  - 4"x6" FLANGED CONCENTRIC INCREASER
  - 6" GROOVED CHECK VALVE
  - 6" GROOVED BUTTERFLY VALVE w/ TAMPER (CLOSED)
  - 6"x6" w/ OUTLET FOR CASING RELIEF VALVE & FIRE PUMP CONTROLLER FEED LINE
  - 6" GROOVED BUTTERFLY VALVE w/ TAMPER
  - 1" THREADED UNION
  - 1" THREADED GATE VALVE
  - 1" THREADED CHECK VALVE
  - 1" JOCKEY PUMP SUPPLY
  - 1" JOCKEY PUMP
  - 6" MAIN TO FEED AUTOMATIC STANDPIPES & FIRE DEPARTMENT CONNECTION (SEE PIPING PLAN FOR CONTINUATION)
  - 6" GROOVED BUTTERFLY VALVE w/ TAMPER
  - 2" GROOVED DRY VALVE w/ GALV TRIM
  - 2" MAIN TO DRY SYSTEM (SEE PIPING PLAN FOR CONTINUATION)
  - 12" MAIN DRAIN PIPED TO OUTSIDE
  - PIPE STAND
  - 6" GROOVED COMMERCIAL RISER MANIFOLD w/ FLOW SWITCH, TEST & DRAIN, PRESSURE RELIEF, & PRESSURE GAUGE
  - AIR COMPRESSOR



**CONTROLLER SENSING LINE DETAIL**  
SCALE: NONE



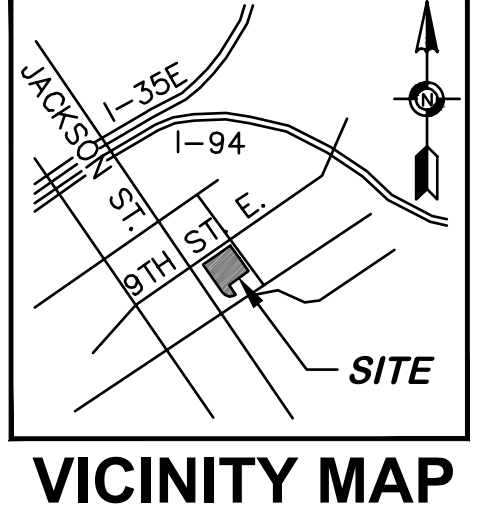
**2 ZONE CONTROL DETAIL**  
SCALE: 3/8" = 1'-0"



**SITE PLAN**  
SCALE: 1" = 50'

**FLOW TEST INFO:**  
STATIC: 58 PSI  
RESID: 54 PSI  
FLOW: 2745 GPM  
DATE: 07/03/17

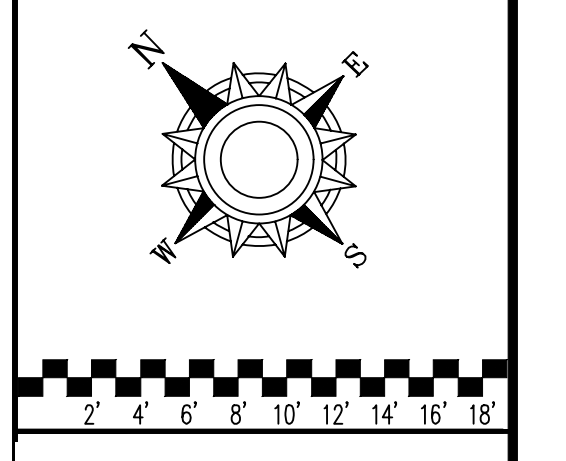
\* FLOW TEST INFORMATION PROVIDED BY CITY OF SAINT PAUL, MN. STATIC HYDRANT IS AT THE CORNER OF JACKSON STREET AND 10TH STREET E. 15' HIGHER THAN F.F.E.



**VICINITY MAP**

**APPROVAL STAMP**

General Notes:  
 1. System shall be installed in accordance with NFPA 13 and State Fire Marshal.  
 2. All equipment for this system shall be U.L. listed.  
 3. Minimum pipe size shall be 1" nominal pipe.  
 4. All welding per NFPA-10 (B-9.3) has welded outlets & grooved fittings.  
 5. All installation or fabrication shall be done in accordance with NFPA-13 and State Fire Marshal.  
 6. All piping shall be installed in accordance with NFPA-13 and State Fire Marshal.  
 7. All piping shall be installed in accordance with NFPA-13 and State Fire Marshal.  
 8. All piping shall be installed in accordance with NFPA-13 and State Fire Marshal.  
 9. Provide one spare head cabinet w/ 6 hds. & one id wrench.  
 10. Hangers are to be U.L. listed and F&I Approved.  
 11. Provide adequate heating to prevent wet system piping from freezing.  
 12. Owner's responsibility to provide adequate heating to prevent wet system piping from freezing.



**DRIVEN**  
FIRE CONSULTANTS

910 N. SYCAMORE AVENUE, SIOUX FALLS, SD 57110. PHONE: (605)-444-9200

**SPRINGHILLS SUITES MARRIOTT**  
472 JACKSON STREET  
SAINT PAUL, MN 55101

**FIRE PROTECTION PLAN**

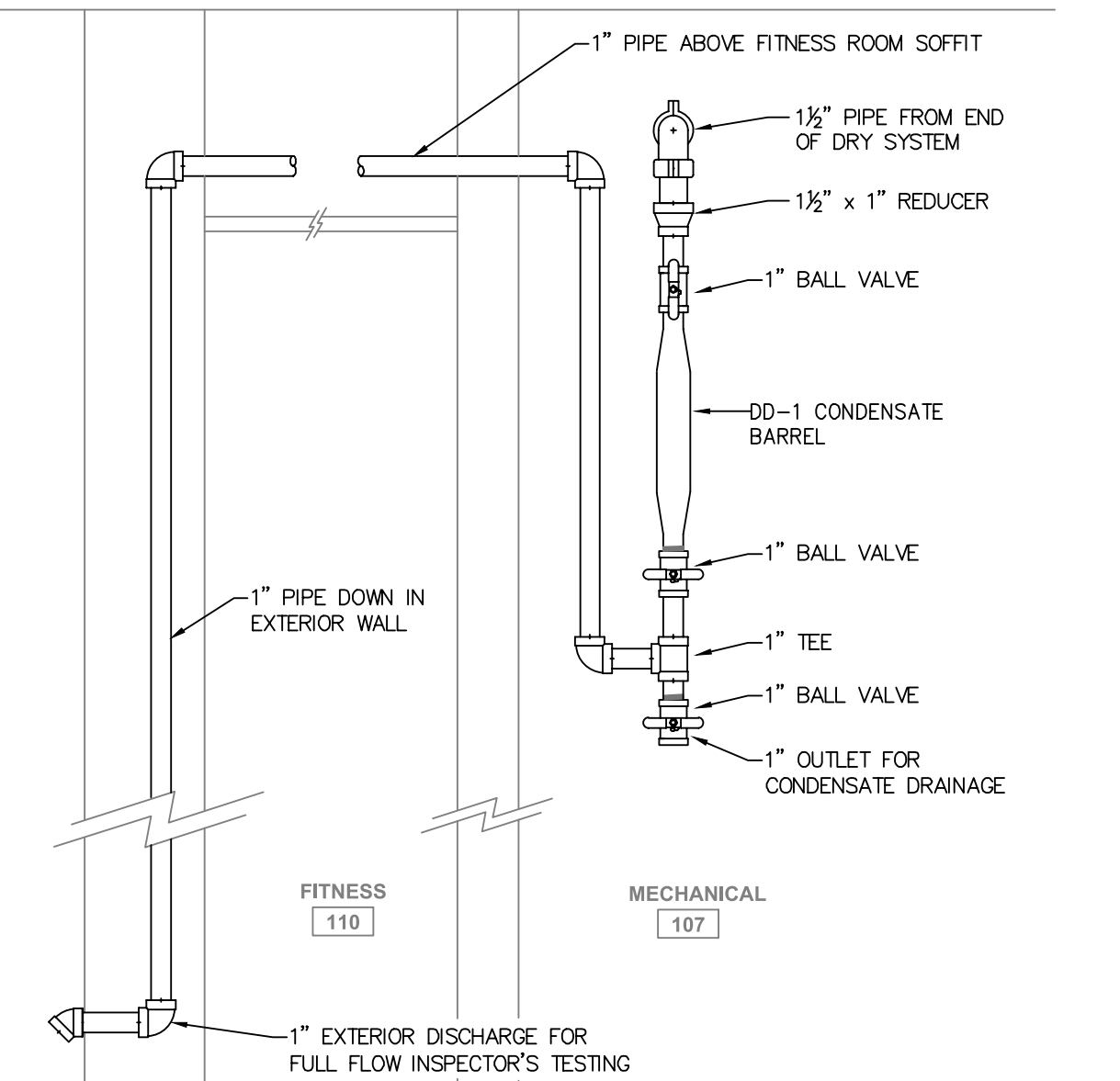
Contract No. **C18-51**

Drawing Date: 4/15/2018  
Scale: 1/8" = 1'-0"  
Drawn By:  
Approval By: STATE FIRE MARSHAL DIV.  
Sheet No. **1 of 8**

SYM	ENT	POSITION	FINISH	TEMP	K	HPT	BN	MFD.	MODEL#	ESCU/CHCON	
103	PEND	WHITE	155	5.60	1/2"	TY2323	Typo	TY-FRB	SEMIRECESS		
18	PEND	WHITE	200	5.60	1/2"	TY2323	Typo	TY-FRB	SEMIRECESS		
12	PEND	JET BLACK	200	11.20	1"	TY5238	Typo	DS-ECC	CONCEALED		
68	PEND	WHITE	155	11.20	3/4"	TY5237	Typo	ED-11	SEMIRECESS		
58	PEND	WHITE	155	5.60	1/2"	RA5914	Relebar	LT-76	SEMIRECESS		
325	PEND	WHITE	160	4.20	1/2"	TY2324	Typo	LFB	SEMIRECESS		
3	UPR	WHITE	200	8.00	3/4"	TY4131	Typo	TY-FRB	N/A		
4	UPR	BRASS	155	8.00	3/4"	TY4131	Typo	TY-FRB	N/A		
90	UPR	BRASS	200	8.00	3/4"	TY4131	Typo	TY-FRB	N/A		
9	UPR	BRASS	286	8.00	3/4"	TY4131	Typo	TY-FRB	N/A		
274	UPR	BRASS	155	14.00	3/4"	TY1337	Typo	ED-14	N/A		
13	UPR	BRASS	200	14.00	3/4"	TY1337	Typo	ED-14	N/A		
11	UPR	BRASS	286	14.00	3/4"	TY1337	Typo	ED-14	N/A		
4	8	SIDE	CHROME	155	5.60	1/2"	TY3331	Typo	TY-FRB	SEMIRECESS	
7	4	7	SIDE	CHROME	155	8.00	3/4"	TY4332	Typo	TY-FRB	SEMIRECESS
390	4	390	SIDE	WHITE	155	4.20	1/2"	TY1334	Typo	LFB	SEMIRECESS
2	4	2	SIDE	WHITE	200	5.60	1"	TY3335	Typo	DS-1	STANDARD
7	2	7	SIDE	BLACK POLY	200	5.60	1"	GL5641	Okawa	GL5641	RECESSED
1369	TOTAL										

\*SPRINKLER HEADS WITH WHITE COLOR ARE COATED IN WHITE PLYESTER AND ARE LISTED AS CORROSION RESISTANT SPRINKLERS.

### SPRINKLER LEGEND



### DRUM DRIP, INSPECTOR'S TEST DETAIL FOR DRIVE ENTRY DRY SYSTEM

### SECTION -B-

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

### SOFFIT DETAIL

SCALE= 1/2" = 1'-0"

### SECTION -E-

SCALE= 1/2" = 1'-0"

**CALC PLACARD**

Design Area # 8 HAZARD: LIGHT  
 Zone: 2 System Type: DRY  
 Location: PARKING ENTRY

Flowing Outlets: 6 Remote Area: ALL  
 Density: 0.10 Flow 386.1 gpm @ 39.6 psi  
 Calculation Safety: 18.2 psi  
 Includes 100 gpm Hose allowance

**CALC PLACARD**

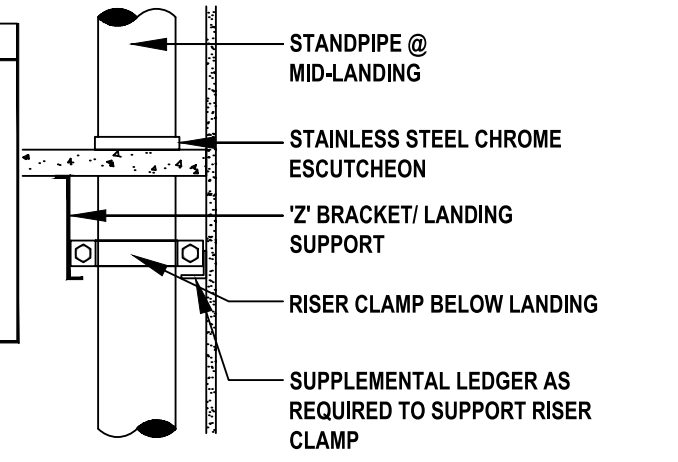
Design Area # 9 HAZARD: LIGHT  
 Zone: 4 System Type: WET  
 Location: 1ST FL DRIVING 121

Flowing Outlets: 8 Remote Area: 996  
 Density: 0.10 Flow 350.0 gpm @ 29.9 psi  
 Calculation Safety: 28.0 psi  
 Includes 100 gpm Hose allowance

**CALC PLACARD**

Design Area # 7 HAZARD: LIGHT  
 Zone: 2 System Type: DRY  
 Location: PATIO 139

Flowing Outlets: 6 Remote Area: ALL  
 Density: 0.10 Flow 200.6 gpm @ 1.3 psi  
 Calculation Safety: 59.2 psi  
 Includes 100 gpm Hose allowance



### STANDPIPE SUPPORT

SCALE= NONE

PIPE LEGEND	
	BLK STEEL WET SYSTEM PIPING
	BLK STEEL DRY SYSTEM PIPING
	CPVC GLAZEMASTER WET SYSTEM PIPING
	GALV STEEL WET SYSTEM PIPING
	FIRE SPRINKLER STANDPIPE PIPING
	1 HOUR FIRE RATED WALL (FIRE CALK PIPE PENETRATIONS)
	2 HOUR FIRE RATED WALL (FIRE CALK PIPE PENETRATIONS)

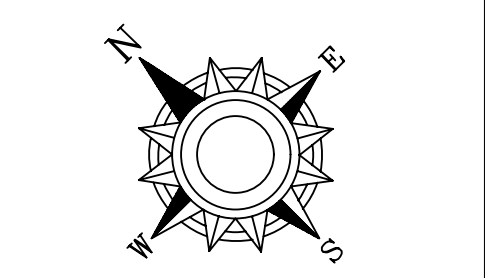
### 1ST FLOOR FIRE SPRINKLER PIPING PLAN

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

APPROVAL STAMP

**General Notes**

- System installed per NFPA-13 (2010 Edition) and State Fire Marshal.
- Minimum pipe size shall be 1" nominal pipe.
- All welding per NFPA-514 (2010 Edition) shall be welded outlets & grooved fittings.
- No installation or fabrication to begin without approved shop drawings.
- All dimensions shown are center to center.
- Installation by Sprinkler Contractor.
- Provide one spare head cabinet w/ 6 bid. & one bid wrench.
- Hangars are to be U.L. Listed and E.M. Approved.
- Owner's responsibility to provide adequate heating to prevent wet system piping from freezing.



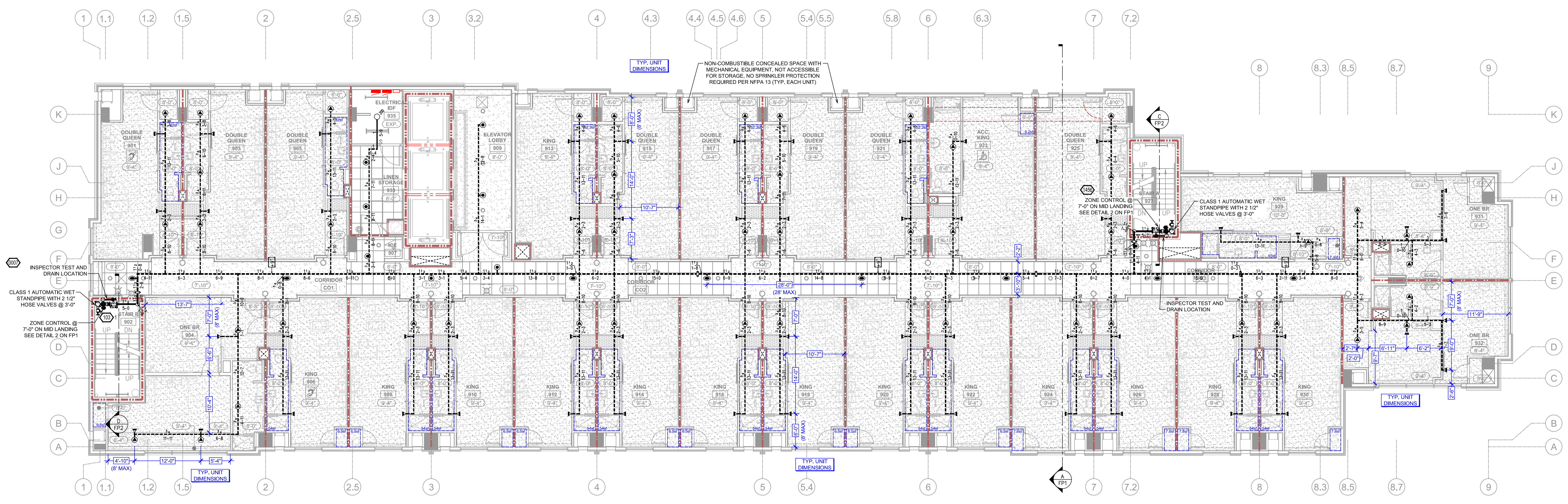
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18



**FIRE PROTECTION PLAN**

**SPRINGHILL SUITES**  
**MARRIOTT**  
 472 JACKSON STREET  
 SAINT PAUL, MN 55101

Contract No. **C18-51**  
 Drawing Date: 4/15/2018  
 Scale: 1/8" = 1'-0"  
 Drawn By: STATE FIRE MARSHAL DIV.  
 Approval By: STATE FIRE MARSHAL DIV.  
 SHEET NO. **2 of 8**



**9TH FLOOR FIRE SPRINKLER PIPING PLAN**  
SCALE= 1/8" = 1'-0"

**FLOOR CONTROL ASSEMBLY NOTES:**  
PER WARRIOTT MODULE 14, HIGH RISE BUILDINGS ARE TO BE ZONED PER FLOOR. FLOOR ZONES ARE TO HAVE DUAL FEEDS, ONE FROM EACH STANDPIPE. FOR HYDRAULIC CALCULATIONS, ONLY ONE OF THE DUAL CONTROL VALVES IS ASSUMED TO BE OPEN AND ALL SPRINKLER FLOW IS COMING FROM THE REMOTE REMOTE STANDPIPE ONLY.

SYM	CONT	POSITION	FINISH	TEMP	K	NPT	SN	MFG.	MODEL#	EXECUTIVE
103	PEND	WHITE	155	5.00	1/2"	TY223	Typo	TY-FRB	SEMI-RECESS	
58	PEND	WHITE	155	5.00	1/2"	RA5814	RELIABL	LT96	SEMI-RECESS	
325	PEND	WHITE	160	4.20	1/2"	TY2596	Typo	LFPI	SEMI-RECESS	
4	UPR	BRASS	155	6.00	3/4"	TY4131	Typo	TY-FRB	NA	
390	SIDE	WHITE	155	4.20	1/2"	TY1334	Typo	LFPI	SEMI-RECESS	
4	SIDE	BRASS	200	5.00	1"	TY3335	Typo	DS-1	STANDARD	

**PIPE LEGEND**

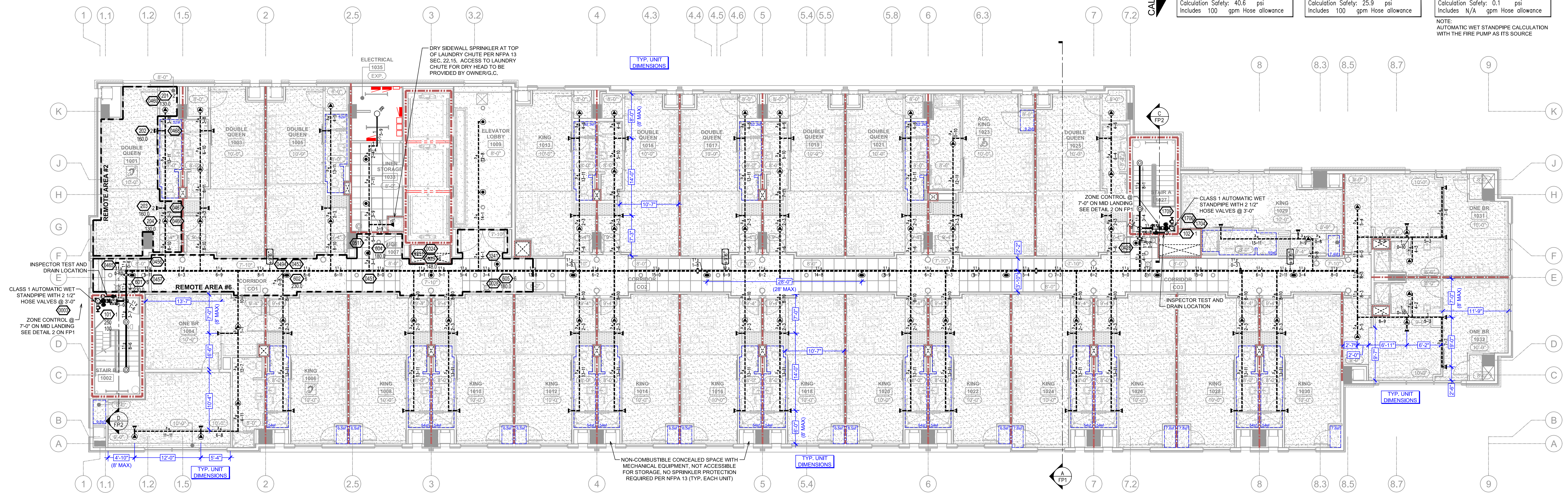
- BLK STEEL WET SYSTEM PIPING
- BLK STEEL DRY SYSTEM PIPING
- CPIC BLAZEMASTER WET SYSTEM PIPING
- GALV STEEL WET SYSTEM PIPING
- FIRE SPRINKLER STANDPIPE PIPING
- 1 HOUR FIRE RATED WALL (FIRE CAULK PIPE PENETRATIONS)
- 2 HOUR FIRE RATED WALL (FIRE CAULK PIPE PENETRATIONS)

**SPRINKLER LEGEND**

**CALC PLACARD**

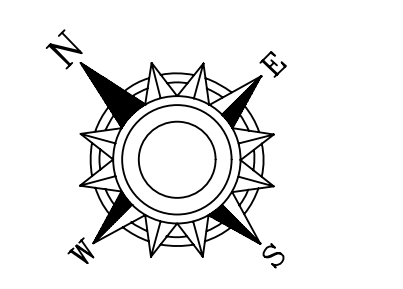
Design Area #:	HAZARD:
Design Area #6	HAZARD: LIGHT
Zone: 13	System Type: WET
Location: 10TH FL CORRIDOR	
Flowing Outlets: 5	
Density: 0.10	Remote Area: 900
Flow 221.3 gpm @ 17.3 psi	
Calculation Safety: 40.6 psi	
Includes 100 gpm Hose allowance	
Design Area #2	HAZARD: LIGHT
Zone: 13	System Type: WET
Location: 10TH FL DOUBLE QUEEN 1001	
Flowing Outlets: 4	
Density: 0.10	Remote Area: 4 A.S.
Flow 180.8 gpm @ 32.0 psi	
Calculation Safety: 0.1 psi	
Includes N/A gpm Hose allowance	
Design Area #1	HAZARD: STANDPIPE
Zone: 1	System Type: WET
Location: STANDPIPES STAIR A & B	
Flowing Outlets: 3	
Density: 1.0	Remote Area: N/A
Flow 750 gpm @ 57.6 psi	
Calculation Safety: 0.1 psi	
Includes N/A gpm Hose allowance	

NOTE: AUTOMATIC WET STANDPIPE CALCULATION WITH THE FIRE PUMP AS ITS SOURCE



**10TH FLOOR FIRE SPRINKLER PIPING PLAN**  
SCALE= 1/8" = 1'-0"

- General Notes**
- System shall be installed in accordance with State Fire Marshal.
  - All equipment for this system shall be U.L. listed.
  - Minimum pipe size shall be 1" nominal pipe.
  - All welding shall be in accordance with NFPA 51B.
  - All installation of fabrication shall be without approved shop drawings.
  - All piping shall be installed in accordance with NFPA 13.
  - Installation shall be in accordance with NFPA 13.
  - Dimensional Shop are Center to Grid Located Where Required.
  - Provide one spare head cabinet w/ 6 hds. & one hd wrench.
  - Wrenches are to be U.L. listed and F.M. approved.
  - Provide one spare head cabinet w/ 6 hds. & one hd wrench.
  - Owner's responsibility to provide adequate heating to prevent wet system piping from freezing.



**DRIVEN**  
FIRE CONSULTANTS  
510 N. SYDNORE AVENUE, STOUK FALLS, SD 57110 PHONE: (605) 444-9280

**SPRINGHILL SUITES MARRIOTT**  
472 JACKSON STREET  
SAINT PAUL, MN 55101

**FIRE PROTECTION PLAN**

Contract No. **C18-51**

Drawing Date: 4/15/2018  
Scale: 1/8" = 1'-0"  
Drawn By:  
Approval By: STATE FIRE MARSHAL DIV.  
SHEET NO. **8 of 8**