FIRE PROTECTION NOTES

1. INSTALL ALL WORK IN ACCORDANCE WITH THE PLUMBING CODE, LATEST APPROVED EDITION NFPA FIRE CODES, LOCAL PLUMBING CODES, AND APPLICABLE OSHA AND EPA REGULATIONS AND GUIDELINES. WHERE CONFLICTS BETWEEN CODE AND CONSTRUCTION DOCUMENT OCCUR, THE MOST RESTRICTIVE REQUIREMENTS SHALL GOVERN.
2. COORDINATE EXACT LOCATION OF ALL SPRINKLERS WITH THE CEILING AND LIGHTING LAYOUT.
3. LIGHT FIXTURES AND HVAC DIFFUSERS TAKE PRECEDENCE. ADD ADDITIONAL SPRINKLERS AS REQUIRED TO MEET "COVERAGE REQUIREMENTS".
4. PLACE SPRINKLERS IN CENTER OF CEILING TILES. PROVIDE RETURN BENDS AT ALL SPRINKLER LOCATIONS TO ALLOW FIELD ADJUSTMENT. PREFABRICATION OF PIPING TO LOCATE SPRINKLER IN CENTER OR TILE IS PROHIBITED.
5. IN MECHANICAL ROOMS FINAL LOCATION OF SPRINKLERS SHALL BE DETERMINED AFTER EQUIPMENT AND DUCTWORK ARE IN PLACE. CONTRACTOR SHALL PROVIDE ADDITIONAL SPRINKLERS, IF NECESSARY, TO PROVIDE ADEQUATE COVERAGE IN ACCORDANCE WITH NFPA 13.
6. PROVIDE A LISTED GUARD FOR SPRINKLERS IN LOCATIONS SUBJECT TO MECHANICAL INJURY. THESE AREAS SHALL INCLUDE MECHANICAL ROOMS, ELECTRICAL ROOMS, UNDER STAIRWELL LANDING, AND IN ELEVATOR SHAFTS.
7. CLEARANCES SHALL BE MAINTAINED OF SEVEN AND ONE HALF FEET (7'-6") IN FRONT OF AND TO THE SIDES OF FIRE DEPARTMENT CONNECTION.
8. FIRE DEPARTMENT CONNECTIONS SHALL BE IDENTIFIED BY A SIGN THAT STATES "NO PARKING, FIRE DEPARTMENT CONNECTION".
9. EACH FIRE DEPARTMENT CONNECTION SHALL BE IDENTIFIED WITH A SIGN INDICATING THE BUILDING OR BUILDINGS SERVED.
10. AN EXTERNAL AUDIBLE ALARM SHALL BE PROVIDED WHEN THE WATER FLOW SWITCH IS ACTIVATED. THE EXTERNAL ALARM SHALL BE PROVIDED WITH APPROPRIATE SIGNAGE. THE SIGN SHOULD BE LOCATED NEAR THE DEVICE IN A CONSPICUOUS POSITION AND SHOULD BE WORDED AS FOLLOWS: "SPRINKLER FIRE ALARM - WHEN BELL RINGS CALL FIRE DEPT.".
11. THE CONTRACTOR SHALL SUBMIT A PERMIT APPLICATION AND PLANS FOR REVIEW PER NFPA 1, 1.14.2, IBC 2015 EDITION.

FIRE SPRINKLER CONTRACTOR CALCULATIONS REQUIREMENTS

1. THESE DRAWINGS REPRESENT THE DESIGN INTENT FOR THE FIRE SPRINKLER SYSTEM. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING A FIRE SPRINKLER SYSTEM FOR THE BUILDING, APPROVED BY NFPA AND THE AUTHORITY HAVING JURISDICTION. PROVIDE FIRE SPRINKLER SHOP DRAWINGS AND HYDRAULIC CALCULATIONS, SUBMITTED THROUGH THE ENGINEER. SIZE PIPING TO PROVIDE AN ADDITIONAL 10% RESIDUAL PRESSURE AT THE HYDRAULICALLY MOST DEMANDING POINT AT SYSTEM DESIGN FLOW.

2. CONTRACTOR SHALL PROVIDE TO THE FIRE MARSHALL, ENGINEER, AND OWNER. THE FOLLOWING AS APPLICABLE, BUT NOT LIMITED TO:
   1) SPRINKLER SYSTEM SHOP DRAWINGS, INCLUDING SPRINKLER SYSTEM LAYOUT, NODE IDENTIFICATION AND NODE SPOT ELEVATIONS,
   2) WATER SUPPLY INFORMATION,
   3) SPRINKLER SYSTEM DESIGN AND HYDRAULIC CALCULATIONS, INCLUDING DETAILED WORKSHEETS AND GRAPH OF WATER SUPPLY CURVE AND SPRINKLER SYSTEM DEMAND,
   4) SPRINKLER HEAD DATA/CUT SHEETS WITH SPECIFIC SYSTEM COMPONENTS IDENTIFIED, AND
   5) ADDITIONAL SPRINKLER SYSTEM SPECIFICATIONS AS REQUIRED IN COMPLIANCE WITH NFPA 13, STANDARD FOR THE INSTALLATION OF SPRINKLER SYSTEMS CHAPTER 8, PLANS AND CALCULATIONS, PRIOR TO AUTOMATIC SPRINKLER SYSTEMS INSTALLATION.

3. THE SYSTEM SHALL BE HYDRAULICALLY DESIGNED WITH A HOSE STREAM ALLOWANCE OF 100 GPM FOR LIGHT HAZARD AND 250 GPM FOR ORDINARY HAZARD AND DENSITY VALUES AS FOLLOWS:

   LIGHT HAZARD DENSITY = 0.10 GPM/SF OVER THE MOST DEMANDING 1500 SQ. FT. WITH 225 SQ. FT. MAX SPACING BETWEEN SPRINKLERS.

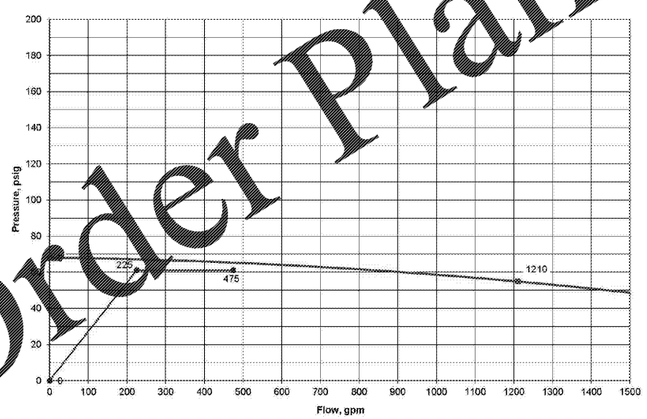
   ORDINARY HAZARD GROUP 1 DENSITY = 0.15 GPM/SF OVER THE MOST DEMANDING 1500 SQ. FT. WITH 130 SF MAX SPACING BETWEEN SPRINKLERS.

THE DESIGN OF THE SPRINKLER SYSTEM SHALL BE BASED UPON WATER SUPPLY INFORMATION OBTAINED BY THE SPRINKLER CONTRACTOR AND WITNESSED BY THE AUHORITY HAVING JURISDICTION. WATER SUPPLY SHALL BE PRESUMED AVAILABLE AT THE POINT OF CONNECTION OF THE FIRE MAIN TO CITY WATER SUPPLY.

APPLICABLE CODES

NFPA 1	UNIFORM FIRE CODE
NFPA 13	INSTALLATION OF SPRINKLER SYSTEMS
NFPA 14	INSTALLATION OF STANDPIPE AND HOSE SYSTEMS
NFPA 25	WATER BASED FIRE PROTECTION SYSTEMS
NFPA 70	NATIONAL ELECTRICAL CODE
NFPA 72	NATIONAL FIRE ALARM CODE
NFPA 101	LIFE SAFETY CODE
NFPA 1963	SCREW THREADS AND GASKETS FOR FIRE HOSE CONNECTIONS
IBC 2009	INTERNATIONAL BUILDING CODE 2009
IBC 2009	INTERNATIONAL FIRE PREVENTION CODE 2009

WATER FLOW TEST CHART



GENERAL NOTES

1. IT IS NOTED THAT SOME AREAS SHALL BE REQUIRED TO BE SPRINKLED AS ORDINARY HAZARD (I.E. MECHANICAL ROOMS, ETC.) THESE AREAS HAVE BEEN IDENTIFIED BY A DIFFERENT HATCHING PATTERN THAN THE LIGHT HAZARD AREAS ON THE PLANS.
2. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN CURRENT WATER FLOW DATA AND DESIGN SPRINKLER SYSTEMS ACCORDINGLY.
3. THE BUILDING SHALL BE FULLY SPRINKLER IN ACCORDANCE WITH THE MOST RECENT EDITION OF NFPA 13 AND LOCAL CODES.
4. MAINTAIN THE INTEGRITY OF ALL FIRE RATED ASSEMBLIES AND ACOUSTICAL ASSEMBLIES.
5. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING SYSTEM DESIGN WITH ALL APPLICABLE TRADES.
6. CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING INSPECTOR'S TEST LOCATION IN ACCORDANCE WITH NFPA 13 AND THE AUTHORITY HAVING JURISDICTION.
7. SPRINKLER HEADS SHALL BE OF THE ORDINARY TEMPERATURE RATINGS FOR ALL LIGHT HAZARD AREAS AND OF THE INTERMEDIATE TEMPERATURE RATINGS FOR ALL ORDINARY HAZARD AREAS. PROVIDE SEMI-RECESSED TYPE SPRINKLER HEADS IN ALL CEILINGS, EXCEPT IN BATHROOMS. ALL BATHROOMS SHALL HAVE CONCEALED HEADS.
8. ALL PIPING SHALL OBSERVE PROPER PITCH. LOW POINTS SHALL HAVE DRAINS AS REQUIRED.
9. THE SPRINKLER SYSTEM SHALL BE ARRANGED FOR FLUSHING. READILY REMOVABLE FITTINGS SHALL BE PROBIDED AT THE END OF ALL CROSS MAINS.
10. MICROBIAL INDUCED CORROSION IS NOT ANTICIPATED ON THIS PROJECT.
11. ALL SPRINKLER HEADS INSTALLED IN LAY-IN CEILINGS SHALL BE INSTALLED CENTER OF TILE. THE LOCATION OF SPRINKLER HEADS INSTALLED IN GYPSUM BOARD CEILINGS SHALL BE GUIDED BY ARCHITECTURAL ELEMENTS.
12. PIPE HANGERS SHALL BE INSTALLED AS REQUIRED BY NFPA FOR SUPPORTING SPRINKLER PIPING. NO OTHER PIPING AND/OR DEVICES ARE TO BE ATTACHED TO THE SPRINKLER PIPE HANGER SYSTEM UNLESS THE HANGER HAS BEEN SPECIFICALLY DESIGNED FOR THE ADDITIONAL LOADING.
13. THE CONSTRUCTION OF THE SYSTEM SHALL CONFORM TO: NFPA 13, 14 20 AND 72, AND 2015 INTERNATIONAL BUILDING CODE.
14. CONTRACTOR SHALL PAINT ALL EXPOSED PIPING RED
15. THE MAXIMUM FLOOR AREA ON ANY ONE FLOOR PROTECTED BY ONE SPRINKLER SYSTEM RISER IS 52,000 SF PER NFPA 13. THE FLOOR AREA OF THE BUILDING TO BE PROTECTED BY A WET PIPE SPRINKLER SYSTEMS IN THIS CONTRACT IS APPROXIMATELY:
    - 12,350 SF FOR THE FIRST FLOOR
    - 12,350 SF FOR THE SECOND FLOOR
    - 12,350 SF FOR THE THIRD FLOOR

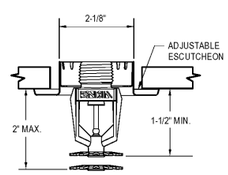
FOR A TOTAL OF APPROXIMATELY 37,050 SF. THE CONTRACTOR SHALL PROVIDE WET PIPE SPRINKLER ZONE RISERS AS REQUIRED IN THE RISER ROOM TO PROTECT THE REQUIRED DESIGN AREA. PROVIDE DRY PIPE SYSTEMS FOR ALL LOCATIONS SUBJECT TO FREEZING CONDITIONS.

HYDRAULIC CALCULATIONS

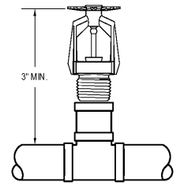
FLOW TEST DATA
DATE: SEPTEMBER 15, 2017 AT 9:00 AM
STATIC PRESSURE: 68.00 PSI
RESIDUAL PRESSURE: 55 PSI
WATER FLOW: 1210.4 GPM
PERFORMED BY: MECHANICAL FIRE PROTECTION INC.

BASELINE HYDRAULIC CRITERIA	ORDINARY I HAZARD	
REMOTE AREA	1,500	FT2
DESIGN DENSITY	0.15	GPM/FT2
	225	GPM
ADDITIONAL 30% FOR SLOPED CEILINGS (PITCH>1 in 6) OR DRY PIPE SYSTEM IF APPLICABLE		
CEILING MULTIPLIER	100.0%	(130% for sloped ceilings)
DRY PIPE MULTIPLIER	100.0%	(130% for dry pipe/preaction)
ADJUSTED FLOW REQUIREMENT	225	GPM
HOSE STREAM ALLOWANCE	250	GPM
TOTAL WATER DEMAND	475	GPM
STANDPIPE DEMAND	0	GPM

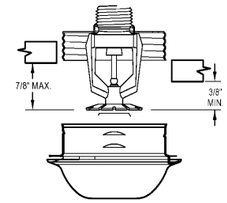
WATER PRESSURE CALCULATIONS		
SPRINKLER HEAD COVERAGE	130.0	FT2
STAND PIPE PRESSURE	0.0	PSI
PIPING ELEVATION RISE	55.0	PSI
ELEVATION LOSS	23.8	PSI
INSIDE FRICTION LOSS	15.0	PSI
BFP LOSS	15.0	PSI
OUTSIDE FRICTION LOSS	1.7	PSI
TOTAL LOSS	55.0	PSI
SAFETY	5.6	PSI
	61.1	PSI



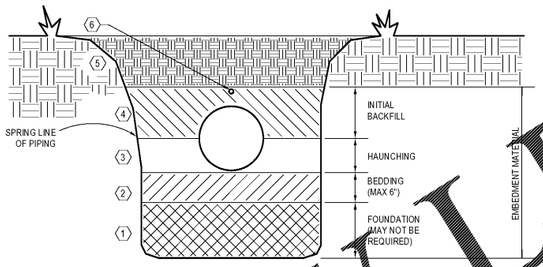
1 SPRINKLER HEAD DETAIL
NOT TO SCALE

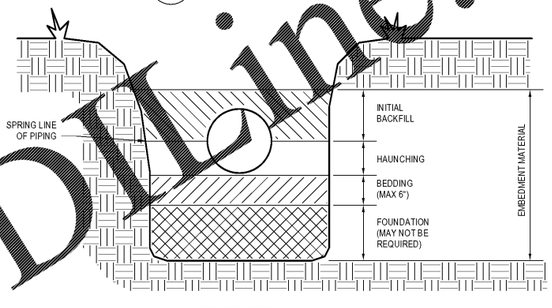


2 UPRIGHT SPRINKLER HEAD DETAIL
NOT TO SCALE



7 CONCEALED SPRINKLER HEAD DETAIL
NOT TO SCALE





EMBEDMENT MATERIALS

CLASS I: ANGULAR, 1/4"-1-1/2", GRADED STONE, INCLUDING A NUMBER OF FILL MATERIALS THAT HAVE REGIONAL SIGNIFICANCE SUCH AS CORAL, SLAG, CINDERS, CRUSHED STONE AND CRUSHED SHELLS.

CLASS II: COARSE SANDS AND GRAVELS WITH MAXIMUM PARTICLE SIZE OF 1-1/2" INCLUDING VARIOUS GRADED SANDS AND GRAVELS CONTAINING SMALL PERCENTAGES OF FINES, GENERALLY GRANULAR AND NON-COHESIVE, EITHER WET OR DRY. SOIL TYPES GW, GP, SW, AND SP ARE INCLUDED IN THIS CLASS.

CLASS III: FINE SAND AND CLAY GRAVELS, INCLUDING FINE SANDS, SANDCLAY MIXTURES AND GRAVEL-CLAY MIXTURES. SOIL TYPES GM, GC, SM, AND SC ARE INCLUDED IN THIS CLASS.

CLASS IV: SILT, SILTY CLAYS, AND CLAYS, INCLUDING INORGANIC CLAYS AND SILT OF MEDIUM TO HIGH PLASTICITY AND LIQUID LIMITS. SOIL TYPES MH, ML, CH, AND CL ARE INCLUDED IN THIS CLASS. THESE MATERIALS ARE NOT TO BE USED FOR BEDDING, HAUNCHING, OR INITIAL BACKFILL.

CLASS V: THIS CLASS INCLUDES THE ORGANIC SOILS, AS WELL AS SOILS CONTAINING FROZEN EARTH, DEBRIS, ROCKS LARGER THAN 1-1/2" IN DIAMETER AND OTHER FOREIGN MATERIALS. THESE MATERIALS ARE NOT TO BE USED FOR BEDDING, HAUNCHING, OR INITIAL BACKFILL.

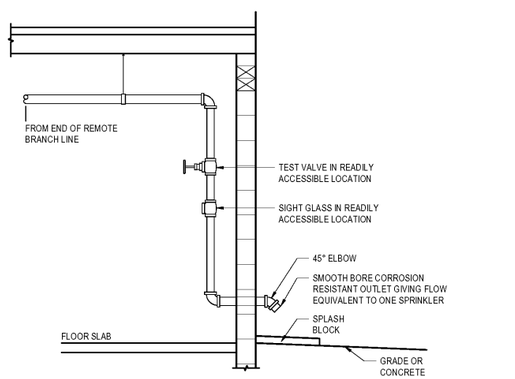
1. A FOUNDATION MAY BE REQUIRED IN VERY POOR SOIL CONDITIONS.
2. BEDDING IS REQUIRED PRIMARILY TO BRING THE TRENCH BOTTOM UP TO GRADE. BEDDING MATERIALS SHALL PROVIDE A UNIFORM AND ADEQUATE LONGITUDINAL SUPPORT UNDER THE PIPE. IN DRY SOIL CONDITIONS, CLASS II OR III MATERIAL SHALL BE PLACED 4-6" COMPACTED UNIFORM AND NOT FINER THAN THE FOUNDATION MATERIAL. IN WET CONDITIONS, CLASS I, II OR III MATERIAL SHALL BE HAND PLACED, 4-6", UNIFORM AND NOT FINER THAN THE FOUNDATION MATERIAL. WHEN UTILIZING CLASS I MATERIAL, SUFFICIENT AMOUNTS OF CLASS II OR III MATERIAL SHALL BE ADDED TO FILL ALL VOIDS CREATED BY THE USE OF CLASS I MATERIAL.
3. HAUNCHING MATERIAL SHALL BE HAND PLACED TO THE SPRINGLINE OF THE PIPE. CLASS II OR III MATERIAL SHALL BE CONSCIENTIOUSLY WORKED UNDER THE PIPE AND HAND TAMPED TO PROVIDE ADEQUATE SIDE SUPPORT.
4. INITIAL BACKFILL MATERIAL SHALL BE CLASS II OR III. IT SHALL BE PLACED WITHIN 24-30" ABOVE THE TOP OF THE PIPE AND TAMPED BY A PORTABLE VIBRATOR.
5. FINAL BACKFILL MATERIAL MAY BE MACHINE PLACED. THE MATERIAL SHALL BE CLASS II OR III MATERIAL. CLASS IV MATERIAL MAY BE INSTALLED OUTSIDE OF ROADWAY. FINAL BACKFILL UNDER ROADWAYS MAY REQUIRE SPECIAL COMPACTION AND DENSITY TESTS. A MINIMUM OF 30" OF COVER OVER THE TOP OF THE PIPE SHALL BE PROVIDED BEFORE THE TRENCH IS WHEEL-LOADED.

ALL EMBEDMENT MATERIALS SHALL BE NO LESS THAN 95% OF MAXIMUM DENSITY. LABORATORY TESTING (PAIDBY OWNER) OF THE SOIL WILL BE REQUIRED. THIS PROCEDURE SHALL BE REQUIRED ON ALL INSTALLATIONS.

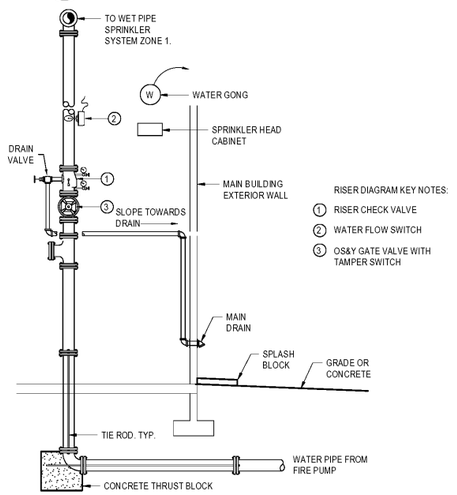
6. PROVIDE TRACKER WIRE

3 GENERAL DATA BACKFILLING REQ.
NOT TO SCALE

4 GENERAL DATA SOIL CLASSIFICATION DETAIL
NOT TO SCALE



5 INSPECTOR'S TEST CONNECTION DETAIL - WET PIPE
NOT TO SCALE



6 WET PIPE FIRE RISER DETAIL
NOT TO SCALE

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ALABAMA LICENSED 25171 PROFESSIONAL ENGINEER WILLIAM JOSEPH JONES

FIRE PROTECTION LEGEND

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