© COPYRIGHT This drawing is the property of the SNS Architects–Engineers, PC. It is subject to copyright laws and shall not be used or copied without express written permission.

FIRE PROTECTION NOTES AND SPECIFICATIONS

GENERAL

1. CONTRACTOR SHALL PERFORM ALL WORK AS TO CONFORM TO LOCAL, STATE AND NATIONAL CODES AND THE REQUIREMENTS OF LOCAL AUTHORITIES HAVING JURISDICTION.
2. CONTRACTOR TO EXAMINE THE SITE TO DETERMINE THE EXACT CONDITIONS EFFECTING THE FIRE PROTECTION WORK.
3. DRAWINGS INDICATE THE GENERAL SCHEME OF THE INSTALLATION AND ARE DIAGRAMMATIC IN SCOPE. THE ENGINEER RESERVES THE RIGHT TO CHANGE THE LOCATION OF HEADS, VALVES, NOZZLES, APPARATUS, ETC. TO A REASONABLE EXTENT AS THE BUILDING CONDITIONS MAY DICTATE PRIOR TO THEIR INSTALLATION WITHOUT EXTRA COST TO THE OWNER.
4. DETAILS OF CONSTRUCTION AND OF WORKMANSHIP WHERE NOT SPECIFICALLY DESCRIBED HEREIN OR INDICATED ON THE DRAWINGS SHALL BE SUBJECT TO THE ENGINEER'S APPROVAL. IT IS THE INTENT OF THESE SPECIFICATIONS TO PROVIDE COMPLETE SYSTEMS, LEFT IN GOOD WORKING ORDER, READY FOR OPERATION.
5. SCRAP AND DEBRIS, EXCEPT AS OTHERWISE SPECIFIED, SHALL BE REMOVED FROM THE SITE AND DISPOSED OF BY THIS CONTRACTOR.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR START-UP OF THE SYSTEM.
7. ALL WORK SHALL BE DONE WITH A MINIMUM OF DUST AND DIRT. PROVIDE SUFFICIENT FIREPROOF TARPAULINS AND COVER ALL EQUIPMENT IN WORK AREA WITH SAME DURING WORK OPERATIONS.
8. CONTRACTOR SHALL FURNISH SHOP DRAWINGS AND EQUIPMENT CUTS TO THE ARCHITECT FOR APPROVAL (MINIMUM 5 COPIES).
9. COORDINATE CONNECTIONS TO STREET WITH LOCAL UTILITY COMPANY(S).
10. CONTRACTOR SHALL FILE, SECURE AND PAY FOR ALL NECESSARY APPROVALS, PERMITS AND INSPECTIONS.
11. ALL WORK SHALL BE GUARANTEED TO BE FREE FROM DEFECT FOR ONE YEAR AFTER ACCEPTANCE OF WORK.
12. ALL WORK SHALL BE IN STRICT CONFORMANCE WITH THE STATE OF NEW JERSEY UNIFORM FIRE CODE (NJAC #5-18) AND THE STATE OF NEW JERSEY "FIRE PREVENTION CODE".
13. FIRE PROTECTION SYSTEMS SHALL BE TESTED IN ACCORDANCE WITH THE STATE OF NEW JERSEY FIRE PREVENTION CODE AND APPLICABLE NFPA CODES. CONTRACTOR TO COORDINATE TESTS WITH LOCAL OFFICIALS.
14. WHERE DEVICES REQUIRING ACCESS (INSPECTOR'S TEST VALVES, ETC.) WOULD OTHERWISE BE RENDERED INACCESSIBLE BY BUILDING CONSTRUCTION, PROVIDE FRAMED ACCESS DOOR. ACCESS DOOR FINISHES SHALL BE COORDINATED WITH ARCHITECT. IN GENERAL, ACCESS DOORS SHALL BE PRIMED, PAINTABLE, STEEL WHEN LOCATED IN DRYWALL CONSTRUCTION. ACCESS DOORS IN TOILET ROOM TILE WAINSCOT SHALL BE STAINLESS STEEL. ACCESS DOORS IN EXTERIOR WALLS SHALL BE PROVIDED WITH INSULATED DOORS. ACCESS DOORS IN COLUMN ENCLOSURES OR FIRE RESISTIVE WALLS SHALL BE FIRE RATED IN ACCORDANCE WITH INTERNATIONAL BUILDING CODE.

SCOPE OF WORK

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE FURNISHING AND INSTALLATION OF ALL EQUIPMENT, MATERIALS AND COMPONENTS REQUIRED FOR A COMPLETE AND OPERATIONALLY FUNCTIONAL SYSTEM. SCOPE OF WORK SHALL INCLUDE, BUT NOT BE LIMITED TO:
   1. CUTTING OF PAVEMENT OR CONCRETE SURFACES AS REQUIRED.
   2. EXCAVATION.
   3. BACKFILLING.
   4. RESTORATION OF EXISTING SURFACES, INCLUDING PAVEMENT, CONCRETE, PLANTINGS, SEEDING, ETC.
   5. FURNISHING AND INSTALLATION OF PRIVATE FIRE SERVICE WATER MAIN, INCLUDING CURB VALVE AND CONNECTIONS TO EXISTING WATER MAIN IN STREET.
   6. FURNISHING AND INSTALLATION OF BACKFLOW PREVENTER(S), INCLUDING OS&Y TYPE ISOLATION VALVES.
   7. CONNECTIONS TO PRIVATE FIRE SERVICE MAIN.
   8. FURNISHING AND INSTALLATION OF WET ALARM VALVE, INCLUDING RETARDING CHAMBER, PRESSURE SWITCH AND ASSOCIATED VALVE TRIM.
   9. FURNISHING AND INSTALLATION OF FIRE DEPARTMENT CONNECTION AND CHECK VALVE.
   10. FURNISHING AND INSTALLATION OF ALL FIRE PROTECTION PIPING, FITTINGS, HANGERS, SUPPORTS, SWAY BRACING(S) AND APPURTENANCES.
   11. FURNISHING AND INSTALLATION OF SPRINKLER HEADS AS SPECIFIED, INCLUDING UPRIGHT, PENDENT, SIDEWALL AND DRY HEADS AS REQUIRED.
   12. FURNISHING AND INSTALLATION OF INSPECTOR'S TEST CONNECTION(S).
   13. WELDING AS REQUIRED.
   14. FURNISHING AND INSTALLATION OF FIRE PROTECTION SYSTEM SIGNS AS SPECIFIED AND REQUIRED.
   15. FURNISHING OF SHOP DRAWINGS AND HYDRAULIC CALCULATIONS.
   16. SYSTEM FLUSHING.
   17. HYDROSTATIC AND OPERATIONAL TESTING.
   18. CUTTING AND PATCHING AS REQUIRED.
   19. PERMITS, INSPECTIONS, APPROVALS AND CERTIFICATES, INCLUDING FEES.
   20. GUARANTEE.

SEISMIC PROTECTION

1. SEISMIC PROTECTION FOR FIRE PROTECTION SYSTEMS SHALL BE IN ACCORDANCE WITH NFPA #13.4-5.4.3.
2. PROVIDE U.L. LISTED, GROOVED END, FLEXIBLE COUPLINGS IN ALL LINES 3 1/2" AND LARGER AT THE FOLLOWING LOCATIONS:
   1. WITHIN 24" OF THE TOP AND BOTTOM OF ALL RISERS IN EXCESS OF 7'-0".
   2. CENTER OF ALL RISERS LONGER THAN 3'-0" BUT LESS THAN 7'0".
   3. WITHIN 12" ABOVE OR BELOW EACH FLOOR ELEVATION IN MULTI-STORY BUILDINGS.
   4. ON ONE SIDE OF EACH CONCRETE OR MASONRY WALL WITHIN 3'-0" OF WALL.
   5. AT BUILDING EXPANSION JOINTS.
3. PROVIDE U.L. LISTED, GROOVED END, FLEXIBLE COUPLINGS IN ALL LINES, REGARDLESS OF SIZE, AS FOLLOWS:
   1. WITHIN 2'-0" OF CEILING AT THE TOP OF DROPS TO HOSE LINKS, RACK SPRINKLERS, MEZZANINES, ETC.
   2. WITHIN 2'-0" OF CEILING AT THE TOP OF DROPS EXCEEDING 15'-0" TO MORE THAN ONE SPRINKLER.
4. SEISMIC SEPARATION ASSEMBLIES SHALL BE PROVIDED IN ACCORDANCE WITH NFPA #13, APPENDIX A, PARAGRAPH 4-5.4.3.3 WHERE SPRINKLER PIPING CROSSES A BUILDING SEISMIC SEPARATION JOINT ABOVE GRADE.
5. PROVIDE CLEARANCES AS FOLLOWS FOR PIPING PENETRATING CONCRETE, MASONRY OR STEEL CONSTRUCTION:
   1. PENETRATION DIAMETER SHALL BE 2" LARGER THAN NOMINAL PIPE SIZE FOR ALL PIPING 3 1/2" AND LESS IN DIAMETER.
   2. PENETRATION DIAMETER SHALL BE 4" LARGER THAN NOMINAL PIPE SIZE FOR ALL PIPING 4" AND LARGER.

   ANNULAR SPACE BETWEEN PIPING AND SLEEVES SHALL BE FILLED WITH A FLEXIBLE MASTIC.
6. PIPING CLEARANCES IN PENETRATIONS THRU NON-WATERPROOFED MASONRY, CONCRETE AND STEEL MAY BE ELIMINATED WHERE FLEXIBLE COUPLINGS ARE LOCATED WITHIN 12" OF EITHER SIDE OF THE PENETRATION.
7. FLEXIBLE COUPLINGS SHALL BE VICTAULIC STYLE #75 OR APPROVED EQUAL.
8. PROVIDE SWAY BRACING (SEISMIC RESTRAINT) FOR FIRE PROTECTION SYSTEMS IN ACCORDANCE WITH NFPA #13.4-5.4.3.5 AND BOCA #1113.10.
9. LONGITUDINAL SWAY BRACING SHALL BE PROVIDED FOR ALL FEED AND CROSS MAINS AT SPACINGS NOT EXCEEDING 80'-0".
10. LATERAL SWAY BRACING SHALL BE PROVIDED FOR ALL FEED MAINS, CROSS MAINS; BRANCH LINES 1 1/4" AND LARGER IN BOILER AND MECHANICAL ROOMS AND BRANCH LINES 2 1/2" AND LARGER IN ALL OTHER AREAS.
11. LATERAL SWAY BRACING SHALL BE SPACED AT INTERVALS NOT EXCEEDING 40'-0".
12. LATERAL SWAY BRACING MAY BE OMITTED WHEN LINES ARE SUPPORTED BY HANGERS OF 6" OR LESS IN LENGTH.
13. LONGITUDINAL SWAY BRACING MAY BE OMITTED WHEN LINES ARE SECURED DIRECTLY TO FRAMING.
14. "C" TYPE BEAM CLAMPS, WHERE USED TO ATTACH HANGERS TO THE BUILDING STRUCTURE SHALL BE PROVIDED WITH RESTRAINING STRAPS.
15. TOPS OF RISERS SHALL BE SECURED AGAINST DRIFTING USING FOUR-WAY SWAY BRACING.
16. PROVIDE LATERAL BRACING FOR THE LAST LENGTH OF PIPE AT THE END OF ALL FEED AND CROSS MAINS.
17. BEAM CLAMPS, WITH OR WITHOUT RESTRAINING STRAPS SHALL NOT BE PERMITTED FOR ANCHORING SWAY BRACING. USE LUG SCREWS OR THROUGH BOLTS IN WOOD FRAMING, EXPANSION SHIELD IN CONCRETE AND THROUGH BOLTS IN STEEL.
18. SWAY BRACING SHALL BE ATTACHED TO PIPING USING UL LISTED PIPE CLAMPS OR "U" BOLTS.

SPRINKLER SYSTEM(S)

1. SPRINKLER SYSTEM SHALL BE INSTALLED IN STRICT CONFORMANCE WITH NFPA #13 FOR RETAIL, GARAGE AND RESIDENTIAL CORE AREAS. SPRINKLER SYSTEM WITHIN RESIDENTIAL UNITS SHALL BE INSTALLED IN STRICT CONFORMANCE WITH NFPA 13R.
2. ALL SPRINKLER SYSTEM COMPONENTS, INCLUDING HEADS, FITTINGS, PIPING, VALVES, HANGERS, ETC. SHALL BE U.L./FACTORY MUTUAL LISTED FOR FIRE PROTECTION SERVICE AND FOR THE SPECIFIC USE.
3. ALL SPRINKLER SYSTEM COMPONENTS SHALL BE NEW AND SHALL BE DESIGNED FOR A WORKING PRESSURE OF NOT LESS THAN 175 PSI.
4. PROVIDE A 1" INSPECTOR'S TEST CONNECTION FROM THE END OF THE MOST REMOTE BRANCH LINE SERVED FROM THE ALARM VALVE. TEST CONNECTION SHALL DISCHARGE TO OUTDOORS THROUGH A SMOOTH BORE CORROSION RESISTANT TEST ORIFICE AND SHALL BE IN ACCORDANCE WITH NFPA #13.4-6.4.
5. PROVIDE A 1" INSPECTOR'S TEST CONNECTION FROM THE TOP OF THE MOST REMOTE BRANCH LINE IN THE HIGHEST STORY. PROVIDE INSPECTOR'S TEST VALVE WITH BRASS PIPE PLUG IN OUTLET. TEST CONNECTION SHALL DISCHARGE TO OUTDOORS VIA A REMOVABLE 1" NIPPLE WITH UNION AND A SMOOTH BORE CORROSION RESISTANT TEST ORIFICE AND SHALL BE IN ACCORDANCE WITH #13.9.2.
6. ALL VALVES IN WATER SUPPLIES TO SPRINKLERS SHALL BE OUTSIDE SCREW AND YOKE (OS&Y) TYPE, GAT E VALVE WITH MINIMUM 175# WORKING PRESSURE. VALVES SHALL BE MARKED "U.L./FM APPROVED" AND SHALL NOT CLOSE IN LESS THAN 5 SECONDS WHEN OPERATED AT MAXIMUM FIGURE #B-133 THROUGH 2" SIZE AND IRON BODY, STOCKHAM FIGURE #G-634 IN 2 1/2" SIZE AND LARGER.
7. DRAIN AND TEST VALVES MAY BE BALL OR GLOBE TYPE WITH MINIMUM 175# WORKING PRESSURE.
8. CHECK VALVES SHALL BE U.L. LISTED/FM APPROVED AND SHALL BE INSTALLED (HORIZONTALLY OR VERTICALLY) IN ACCORDANCE WITH THEIR LISTING.
9. ALL VALVES IN WATER SUPPLIES TO SPRINKLERS SHALL BE SUPERVISED FOR "OPEN POSITION" BY THE FIRE ALARM SYSTEM. PROVIDE TAMPER SWITCHES ON ALL VALVES. SWITCHES TO BE POTTER ROEMER #6220. WIRING BETWEEN TAMPER SWITCHES AND THE FIRE ALARM SYSTEM SHALL BE FURNISHED AND INSTALLED BY THE ELECTRICAL CONTRACTOR.
10. FURNISH AND INSTALL A CHECK VALVE IN THE WATER SUPPLY TO FIRE PROTECTION SYSTEM. CHECK VALVE SHALL BE U.L. LISTED AND FM APPROVED AND SHALL BE STOCKHAM FIGURE #G-940.

SPRINKLER HEADS

1. SPRINKLER HEADS SHALL BE 1/2" ORIFICE, AUTOMATIC TYPE AND, UNLESS OTHERWISE NOTED AND SHALL BE AS MANUFACTURED BY RELIABLE, VIKING, OR APPROVED EQUAL. LOCATIONS, TYPE, FINISH AND MODELS SHALL BE AS FOLLOWS:

LOCATION	TYPE	FINISH	MFR/MODEL
EXPOSED, NO CEILING	UPRIGHT	BRONZE	VIKING MODEL "VK310"
CONCEALED, WALL MOUNTED	CONCEALED SIDEWALL	CHROME PLATED	VIKING MODEL "VK481"
CONCEALED, CEILING MOUNTED	CONCEALED PENDENT	WHITE	VIKING MODEL MODEL "VK463"

   ALL SIDEWALL AND PENDENT HEADS SHALL BE FURNISHED COMPLETE WITH ADJUSTABLE ESCUTCHEON. ESCUTCHEON FINISH SHALL MATCH HEAD FINISH.
2. UNLESS OTHERWISE NOTED, SPRINKLER HEADS SHALL BE "ORDINARY" TEMPERATURE RATING. WHERE REQUIRED BY CEILING TEMPERATURES, INSTALL HEADS WITH GREATER TEMPERATURE RATINGS AS REQUIRED.
3. SPRINKLER HEADS LOCATED LESS THAN 2'-6" ABOVE OR LESS THAN 1'-0" TO THE SIDE OR BELOW A HEATING DUCT SHALL BE "INTERMEDIATE" TEMPERATURE RATING.
4. SPRINKLER HEADS LOCATED WITHIN 1'-0" HORIZONTALLY OF DOWNWARD DISCHARGE DIFFUSER, FROM 1'-0" BELOW TO 2'-6" ABOVE DIFFUSER SHALL BE "INTERMEDIATE" TEMPERATURE RATING.
5. SPRINKLER HEADS LOCATED WITHIN 2'-6" RADIALLY OF A HORIZONTAL DISCHARGE DIFFUSER, FROM 1'-0" TO 2'-6" ABOVE DIFFUSER SHALL BE "INTERMEDIATE" TEMPERATURE RATING.
6. SPRINKLERS LOCATED WITHIN 7'-0" RADIALLY OF A HORIZONTAL DISCHARGE UNIT HEATER, FROM 2'-0" BELOW TO 7'-0" ABOVE UNIT HEATER SHALL BE "HIGH" TEMPERATURE RATING. SPRINKLERS MORE THAN 7'-0" ABOVE THE 7'-0" RADIAL ZONE SHALL BE "INTERMEDIATE" TEMPERATURE RATING.
7. SPRINKLERS LOCATED FROM 7'-0" TO 20'-0" IN FRONT OF A HORIZONTAL DISCHARGE UNIT HEATER AND WITHIN A PIE SHAPED ZONE FORMED BY A 30 DEGREE ANGLE INTERSECTING EACH SIDE OF THE HEATER, FROM 2'-0" BELOW TO 7'-0" ABOVE THE UNIT HEATER SHALL BE "INTERMEDIATE" TEMPERATURE RATING.
8. POSITION OF UPRIGHT, PENDENT AND SIDEWALL HEADS WITH RESPECT TO CONSTRUCTION AND CONTENTS SHALL BE IN ACCORDANCE WITH NFPA #13.4-4.3.
9. COORDINATE SPRINKLER HEAD LOCATIONS WITH ELECTRICAL AND HVAC WORK.
10. SPRINKLER HEADS SHALL NOT BE FIELD PAINTED.
11. PROVIDE STOCK OF SPARE SPRINKLER HEADS AND SPRINKLER WRENCHES IN ACCORDANCE WITH NFPA 13. QUANTITIES OF SPARES FOR EACH HEAD TYPE AND TEMPERATURE RATING SHALL BE IN ACCORDANCE WITH NFPA 13.2-2.7. PROVIDE APPROVED CABINET IN SPRINKLER ROOM FOR SPARE HEADS AND WRENCHES.

SPRINKLER PIPING & FITTINGS

1. PIPING FOR SPRINKLER SYSTEMS SHALL BE WELDED OR SEAMLESS STEEL PIPE IN ACCORDANCE WITH ASTM#A120 OR ASTM#A795 AND DESIGNED FOR A WORKING PRESSURE OF 175 PSI.

   SPRINKLER PIPING AND FITTINGS CONSISTING OF CHLORINATED POLYVINYL CHLORIDE (CPVC) SHALL BE ACCEPTABLE WHEN INSTALLED IN ACCORDANCE WITH NFPA 13 SECTION 6.3.6 AND WITH PORTIONS OF THE ASTM STANDARDS SPECIFIED IN TABLE 6.3.6.1 THAT APPLY TO FIRE PROTECTION SERVICE.
2. STEEL PIPE SHALL BE MINIMUM SCHEDULE 10 WALL THICKNESS FOR PRESSURES UP TO 300# WHEN JOINED BY WELDING OR ROLLED GROOVE CONNECTION.
3. STEEL PIPE JOINED BY THREADED FITTINGS OR CUT GROOVE CONNECTIONS FOR PRESSURE UP TO 300# SHALL BE MINIMUM SCHEDULE 30 WALL THICKNESS IN PIPE SIZES 8" AND LARGER AND SCHEDULE 40 FOR PIPE SIZES SMALLER THAN 8".
4. FITTINGS FOR FIRE PROTECTION PIPING SHALL BE CAST IRON OR MALLEABLE IRON, THREADED OR FLANGED FITTINGS, OR STEEL, FLANGED OR WELDED FITTINGS, IN ACCORDANCE WITH ANSI STANDARDS AS FOLLOWS:

FITTING	STANDARD
CAST IRON - THREADED	ANSI#B16.4
CAST IRON - FLANGED	ANSI#B16.1
MALLEABLE IRON - THREADED	ANSI#B16.3
STEEL - FLANGED	ANSI#B16.5
STEEL - WELDED	ANSI#B16.9

   IN ADDITION TO THE ABOVE, VICTAULIC CO., STYLE 77 AND FULL FLOW FITTINGS SHALL BE PERMITTED.
5. ALL THREADED PIPE SHALL BE REAMED SMOOTH BEFORE BEING INSTALLED. PIPE SHALL NOT BE SPLIT, BENT, FLATTENED NOR OTHERWISE INJURED EITHER BEFORE OR DURING THE INSTALLATION.
6. ALL THREADED FITTINGS AND PIPE SHALL BE THREADED IN ACCORDANCE WITH ANSI/ASME #B1.20.1. CARE SHOULD BE TAKEN TO INSURE THAT THE THREADED CONNECTION DOES NOT EXTEND INTO THE FITTING SUFFICIENTLY TO REDUCE THE WATERWAY.
7. APPLY JOINT COMPOUND OR TAPE TO ALL PIPE THREADS PRIOR TO MAKING UP THREADED JOINTS.
8. WHERE MECHANICALLY GROOVED FITTINGS OR JOINTS ARE EMPLOYED (EITHER ROLL GROOVED OR CUT GROOVED), THE OVERALL ASSEMBLY OF THE FITTING, GASKET, GROOVES, ETC. SHALL BE A LISTED COMBINATION. GROOVES SHALL BE MADE BY USING EQUIPMENT AND PROCEDURES AS PROVIDED BY THE MANUFACTURER AND SHALL BE DIMENSIONALLY CONSISTENT WITH THE FITTING.
9. WHERE DRY SYSTEM SPRINKLER PIPING CANNOT BE PITCHED TO MAIN SYSTEM DRAIN, PROVIDE AUXILIARY DRAIN VALVES TO ALLOW COMPLETE DRAINING OF SYSTEM.
10. UNLESS OTHERWISE INDICATED, ALL PIPING SHALL BE CONCEALED IN SUSPENDED CEILINGS, WALLS AND SHAFTS. PIPING IN THE SPRINKLER VALVE ROOM SHALL BE INSTALLED EXPOSED. EXPOSED INSTALLATIONS ARE ALSO PERMITTED IN ATTICS, MECHANICAL ROOMS AND SPACES WITHOUT FINISHED CEILINGS.

SPRINKLER HANGERS & SUPPORTS

1. HANGERS AND INSTALLATION METHODS SHALL BE IN ACCORDANCE WITH NFPA #13.2-6 AND #13.4-5.2.
2. HANGERS SHALL BE FABRICATED OF FERROUS MATERIALS. COMPONENTS OF HANGER SYSTEMS ATTACHING DIRECTLY TO THE PIPE OR TO THE BUILDING STRUCTURE SHALL BE LISTED.
3. HANGER ASSEMBLIES SHALL BE RATED FOR THE WEIGHT OF WATER FILLED PIPING PLUS 250# APPLIED AT THE POINT OF HANGER ATTACHMENT.
4. WHERE TRAPEZE HANGERS ARE EMPLOYED TO SPAN BELOW DUCTS OR BETWEEN JOISTS OR PURLINS, ETC., STEEL ANGLES SHALL BE SIZED IN ACCORDANCE WITH NFPA #13.2-6.1.4.
5. HANGER THREADED RODS SHALL BE THE SAME SIZE AS THAT APPROVED FOR THE ASSEMBLY BUT NOT LESS THAN 3/8" FOR LINES UP TO AND INCLUDING 4", 1/2" FOR 5", 6" AND 8" LINES AND 5/8" FOR 10", & 12" LINES.
6. MAXIMUM DISTANCE BETWEEN HANGERS FOR HEAVY WALL PIPES SHALL NOT EXCEED 12' FOR LINES SMALLER THAN 1 1/2" AND 15' FOR LINES 1 1/2" AND LARGER.
7. MAXIMUM DISTANCE BETWEEN HANGERS FOR THREADED, LIGHT WEIGHT STEEL PIPE SHALL NOT EXCEED 12' FOR LINES 3" AND SMALLER.
8. PROVIDE A MINIMUM OF ONE HANGER FOR EACH LENGTH OF BRANCH LINE PIPING.
9. HANGERS SHALL NOT BE LOCATED WITHIN 3" OF THE CENTERLINE OF AN UPRIGHT SPRINKLER.
10. THE MAXIMUM UNSUPPORTED LENGTH AT THE END OF A BRANCH LINE SHALL BE 36" FOR UPRIGHT HEADS AND 12" FOR PENDENT HEADS.
11. HANGERS AT THE END OF BRANCH LINES SERVING PENDENT HEADS SHALL BE OF THE TYPE WHICH RESTRICT UPWARD MOVEMENT OF PIPING SUCH AS "ADJUSTABLE CLIP TYPE", ETC.
12. THE LENGTH OF AN UNSUPPORTED ARMOVER TO A SPRINKLER SHALL NOT EXCEED 24" FOR STEEL PIPE OR 12" FOR COPPER TUBE.
13. MAINS SHALL BE SUPPORTED BY AT LEAST ONE HANGER BETWEEN EACH TWO BRANCH LIES.
14. FIRE PROTECTION PIPING SHALL NOT BE SUPPORTED FROM DUCTWORK OR THE PIPING OF OTHER TRADES.
15. THE CONTRACTOR MAY COORDINATE WITH CONTRACTORS OF OTHER TRADES TO USE COMMON MEANS OF SUPPORT. SUBMIT FOR APPROVAL ALL PERTINENT DESIGN DATA RELATING TO THE SUPPORT AS WELL AS VERIFICATION OF THE RESPONSIBILITY FOR THE SUPPORT.
16. SUPPORT HANGERS FROM APPROVED CONCRETE INSERTS WHERE SLABS ARE AVAILABLE.
17. WHERE PIPING IS REQUIRED TO BE HUNG FROM OTHER THAN CONCRETE SLABS, SUCH AS PRECAST OR METAL DECKING, SUBMIT PROPOSED METHOD OF SUPPORT TO THE STRUCTURAL ENGINEER FOR APPROVAL PRIOR TO INSTALLATION.

WELDING

1. WELDING METHODS FOR FIRE PROTECTION PIPING SHALL BE IN ACCORDANCE WITH AMERICAN WELDING SOCIETY (AWS) STANDARD #D10.9, LEVEL AR-3.
2. WELDING INSIDE NEW BUILDINGS UNDER CONSTRUCTION SHALL BE PERMITTED ONLY WHEN THE STRUCTURE AND CONTENTS ARE NON-COMBUSTIBLE AND WHEN PROCEDURES COMPLY WITH NFPA #51B.
3. WELDING IS PERMITTED AT THE CONTRACTOR'S SHOP OR IN DESIGNATED AREAS ON SITE.
4. WELDING IS NOT PERMITTED WITHIN EXISTING BUILDINGS.
5. ALL WELDED FITTINGS, EXCEPT PIPE BUTT JOINTS, SHALL BE U.L. LISTED.
6. WELDING SHALL NOT BE PERMITTED IF THERE IS IMPINGEMENT OF RAIN, SNOW, SLEET OR HIGH WINDS ON THE WELD AREA.
7. LIMITATIONS ON WELDING PROCEDURES LISTED IN NFPA #13.2-5.2.5 AND APPENDIX "A" SHALL APPLY.
8. WELDING SHALL BE PERFORMED ONLY BY WELDERS QUALIFIED IN ACCORDANCE WITH AWS #D10.9. WRITTEN WELDING PROCEDURES AND QUALITY ASSURANCE PROCEDURE SHALL BE QUALIFIED IN ACCORDANCE WITH AWS #D10.9 AND SHALL BE MAINTAINED ON SITE, AVAILABLE TO THE AUTHORITY HAVING JURISDICTION.
9. EACH WELD SHALL BE IMPRINTED ON THE PIPE, ADJACENT TO THE WELD WITH THE WELDERS IDENTIFICATION STAMP.
10. MAINTAIN JOBSITE WELDING RECORDS IN ACCORDANCE WITH NFPA #13.2-5.2.9 AVAILABLE FOR INSPECTION BY AUTHORITIES HAVING JURISDICTION.

FLUSHING AND TESTING

1. FLUSHING OF INSIDE SPRINKLERS SHALL NOT BE PERFORMED PRIOR TO INDEPENDENT FLUSHING OF THE PRIVATE FIRE SERVICE MAIN AND LEAD-IN PIPING.
2. WHERE AN EXISTING PRIVATE FIRE SERVICE MAIN SUPPLIES NEW OR MODIFIED SPRINKLER SYSTEMS, FLUSH MAIN VIA THE FIRE DEPARTMENT CONNECTION PRIOR TO FLUSHING THE SPRINKLER SYSTEM. REMOVE ALARM VALVE, CHECK VALVE AND SIAMESE CLAPPERS AND INSTALL INDICATING TEST BLANKS AS REQUIRED FOR FLUSHING. REMOVE TEST BLANKS AND REINSTALL CLAPPERS UPON COMPLETION OF FLUSHING.
3. SPRINKLER RISERS, FEED MAINS, CROSS MAINS AND BRANCH CIRCUITS SHALL BE HYDRAULICALLY FLUSHED (IN THAT ORDER) IN THE DIRECTION OF NORMAL FLOW.
4. WHERE SIZE REDUCTIONS IN CROSS MAINS PROHIBIT OBTAINING SUFFICIENT FLOW FOR SCOURING OF LARGER PIPE SIZES, OPEN CROSS MAIN AND FLUSH FROM THE END OF LARGER SIZE PIPING.
5. INSTALL TEMPORARY HOSES TO PERMIT REMOVAL OF FLUSHING WATER TO A LOCATION WHICH WILL NOT RESULT IN PROPERTY DAMAGE.
6. WHERE INSPECTION OF PIPING REVEALS SCALE OR OTHER MATERIALS NOT REMOVABLE BY HYDRAULIC FLUSHING, OR WHERE WATER PRESSURES ARE INADEQUATE FOR HYDRAULIC FLUSHING, PIPING SHALL BE FLUSHED BY THE HYDRO-PNEUMATIC METHOD. CONTRACTOR SHALL TAKE APPROPRIATE PRECAUTIONS TO PREVENT FLUSHING OF THE SPRINKLER SYSTEM INTO THE PRIVATE FIRE SERVICE MAIN.
7. WHERE FLUSHING REVEALS THAT A LINE SECTION IS SEVERELY OBSTRUCTED WITH PACKED MATERIALS, OPEN PIPING AND CLEAN BY RODDING OR OTHER POSITIVE MEANS.
8. WATER SHOULD BE ADMITTED TO DRY SPRINKLER SYSTEM SEVERAL DAYS BEFORE FLUSHING TO SOFTEN SCALE, ETC. PRECAUTIONS SHOULD BE TAKEN TO PREVENT FREEZING.
9. ALL NEW WET AND DRY SPRINKLER SYSTEMS OR MODIFIED PORTIONS OF EXISTING SYSTEMS SHALL BE HYDROSTATICALLY TESTED AT NOT LESS THAN 200# OR MAXIMUM WORKING PRESSURE PLUS 50#, WHICHEVER IS GREATER. TEST DURATION SHALL BE 2 HOURS. PROVIDE TEST GAUGES AS REQUIRED.
10. NO VISIBLE LEAKAGE SHALL BE PERMITTED DURING HYDROSTATIC TEST PERIOD OTHER THAN "MINOR" BEADING WHICH DOES NOT RESULT IN DRIPPING.
11. ALL HYDROSTATIC TESTS SHALL BE WITNESSED BY THE LOCAL AUTHORITY HAVING JURISDICTION.
12. ADDITIVES AND CORROSIVE CHEMICALS, SODIUM SILICATE, OR DERIVATIVES OF SODIUM SILICATE, BRINE OR OTHER CHEMICALS SHALL NOT BE USED FOR TESTING SYSTEMS OR SEALING LEAKS.
13. WHERE TEST BLANKS ARE UTILIZED TO SEAL PIPE OPENINGS, THEY SHALL BE OF THE SELF-INDICATING TYPE WITH A PAINTED RED LUG PROTRUDING BEYOND THE FLANGE.
14. DRY PIPE VALVE CLAPPERS SHALL BE REMOVED OR LIFTED FROM ITS SEAT DURING ALL TESTS INVOLVING PRESSURES OVER 50#.
15. DRY SPRINKLER SYSTEMS SHALL BE SUBJECTED TO A PNEUMATIC TEST AT 40 PSI OVER A 24 HOUR PERIOD. LEAKAGE SHALL NOT EXCEED 1 1/2 PSI OVER THE 24 HOUR PERIOD. PROVIDE TEST GAUGES AS REQUIRED.
16. DRY SPRINKLER SYSTEMS SHALL BE OPERATIONALLY TESTED BY OPENING OF THE INSPECTOR'S TEST CONNECTION AND MEASURING THE TRIP AND WATER DELIVERY TIMES.
17. WET SYSTEMS SHALL BE OPERATIONALLY TESTED BY OPENING THE INSPECTOR'S TEST CONNECTION AND MEASURING THE TRIP TIME.
18. MAIN DRAIN SHALL BE TESTED BY FULLY OPENING THE MAIN DRAIN VALVE AND FLOWING WATER UNTIL SYSTEM PRESSURE STABILIZES. RECORD NORMAL PRESSURE AND FLOWING PRESSURE. PROVIDE TEST GAUGES AS REQUIRED.
19. CONTRACTOR SHALL COMPLETE "CONTRACTOR'S MATERIAL AND TEST CERTIFICATE FOR ABOVE GROUND PIPING" IN ACCORDANCE WITH NFPA #13 AND SUBMIT TO AUTHORITY HAVING JURISDICTION.
20. ALL FLUSHING AND TESTING OPERATIONS SHALL BE IN ACCORDANCE WITH NFPA #13 AND NFPA #13A.

SIGNS

1. PROVIDE A SIGN AT SPRINKLER AND/OR STANDPIPE VALVE ROOM DOOR INDICATING "SPRINKLER CONTROL VALVES" AND/OR "STANDPIPE CONTROL VALVES" AS APPROPRIATE IN ACCORDANCE WITH BOCA #1000.5. LETTERS SHALL BE OF A CONSPICUOUS COLOR AND BE AT LEAST 4" HIGH.
2. WHEN CONTROL VALVES FOR A COMBINED STANDPIPE/SPRINKLER SYSTEM ARE LOCATED IN A SEPARATE ROOM, PROVIDE A DOOR SIGN INDICATING "STANDPIPE CONTROL VALVES". OTHERWISE PROVIDE A 2" X 6", CHAIN HUNG SIGN AT CONTROL VALVE (POTTER ROEMER #6316 & 6345 OR APPROVED EQUAL).
3. SEE "FIRE DEPARTMENT CONNECTIONS" FOR ESCUTCHEON REQUIREMENTS.
4. PROVIDE A FRAMED NAMEPLATE ADJACENT TO VALVE HEADER FOR HYDRAULICALLY DESIGNED SYSTEMS. NAMEPLATE SHALL BE IN ACCORDANCE WITH NFPA #13.8-5.
5. ALL VALVES SHALL BE TAGGED IN ACCORDANCE WITH NFPA #26-2.8 AND BOCA #1004.6.

SHOP DRAWINGS

1. CONTRACTOR SHALL BE RESPONSIBLE FOR PREPARATION OF SHOP DRAWINGS FOR APPROVAL PRIOR TO PURCHASE OR FABRICATION OF MATERIALS, EQUIPMENT, ETC.
2. SHOP DRAWINGS FOR HYDRAULICALLY DESIGNED SYSTEMS SHALL BE PREPARED IN ACCORDANCE WITH NFPA #13, CHAPTER #6. AS A MINIMUM, SHOP DRAWINGS SHALL INCLUDE:
   - A. HAZARD CLASSIFICATION.
   - B. SPRINKLER SYSTEM WATER REQUIREMENTS, INCLUDING INSIDE HOSE AND OUTSIDE HYDRANT ALLOWANCES.
   - C. WATER SUPPLY CHARACTERISTICS.
   - D. SPRINKLER PLAN WITH HYDRAULIC REFERENCE POINTS, PIPING SIZES AND LENGTHS, ETC.
   - E. DESCRIPTION OF SPRINKLERS USED.
   - F. ELEVATION INFORMATION.
   - G. HYDRAULIC CALCULATIONS.
   - H. SUMMARY SHEET.
   - I. VALVE AND EQUIPMENT CUT SHEETS.
   - J. PIPING SPECIFICATION.
3. THE FOLLOWING SYSTEMS SHALL BE HYDRAULICALLY DESIGNED:
   - A. SYSTEMS HAVING STANDPIPES IN BUILDINGS WHICH ARE NOT COMPLETELY SPRINKLERED.
   - B. SYSTEMS WITH OPEN SPRINKLERS OR DELUGE SYSTEMS.
   - C. SYSTEMS WITH COINCIDENT SPRINKLER AND HOSE STREAM OR HYDRANT ALLOWANCES.
   - D. SPRINKLER SYSTEMS UTILIZING OTHER THAN 1/2" ORIFICE SPRINKLERS.
   - E. SYSTEMS HAVING UNUSUAL PIPING REQUIREMENTS.

FIRE PROTECTION SYMBOLS

PIPING

- PIPING ABOVE GRADE (EXPOSED OR CONCEALED)
- PIPING BELOW GRADE
- PIPE TURNING DOWN
- PIPE TURNING UP
- C — LOW VOLTAGE ELEC. CONTROL
- CA — COMPRESSED AIR
- E — LINE VOLTAGE ELECTRICAL
- FA — FIRE ALARM (LOW VOLTAGE ELEC.)
- FD — FIRE DETECTION (MECHANICAL OR LOW VOLTAGE ELECTRIC)
- TEE
- 90° ELBOW
- 45° ELBOW
- CROSS
- RN — RISER NIPPLE
- UNION
- NIPPLE & CAP (FLUSHING OR DRAIN CONNECTION)
- FLANGED CONNECTION

VALVES

- OS & Y GATE VALVE
- GATE VALVE (NORMALLY OPEN)
- GATE VALVE (NORMALLY CLOSED)
- CHECK VALVE
- BALL VALVE
- GAUGE PETCOCK
- AUXILIARY DRAIN CONNECTION

ALARM VALVES

- WET ALARM VALVE
- DRY VALVE

SPRINKLER HEADS/NOZZLES

(SEE SPECS. FOR TEMP. RATINGS)

- PENDANT SPRINKLER HEAD
- UPRIGHT SPRINKLER HEAD
- PENDANT & UPRIGHT FOR PROTECTION ABOVE & BELOW CLG.
- DRY PENDANT SPRINKLER HEAD(LENGTH AS REQ'D.)
- SIDEWALL SPRINKLER HEAD
- DRY SIDEWALL SPRINKLER HEAD

BACKFLOW PREVENTERS (UL/FM APPROVED)

- DOUBLE CHECK VALVE ASSEMBLY

FIRE DEPARTMENT CONNECTIONS

- WALL MTD. SIAMESE CONNECTION W/ESCUTCHEON CAPS & CHAINS (SURFACE MTD. OR FLUSH-SEE SPEC.)
- R — RED LIGHT @ FIRE DEPT. CONNECTION (WEATHERPROOF)

ALARM DEVICES

- WATER MOTOR GONG
- PS — PRESSURE SWITCH
- FS — FLOW SWITCH
- TS — TAMPER SWITCH

MISCELLANEOUS

- MTR — UTILITY WATER METER
- PRESSURE GAUGE (0-300#)
- FILL CUP OR DRIP CUP
- AC — AIR COMPRESSOR W/PRESSURE RELIEF VALVE FOR DRY PIPE VALVE
- FP-1 / FP-2 — FIRE PROTECTION RISER TAG FOR LINES CONTINUED ON FLOOR ABOVE AND/OR BELOW (SEE DESCRIPTION)
- FP-A / FP-2 — FIRE PROTECTION RISER TAG FOR LINES CONTINUED ON OTHER DRAWINGS (SEE DESCRIPTION)

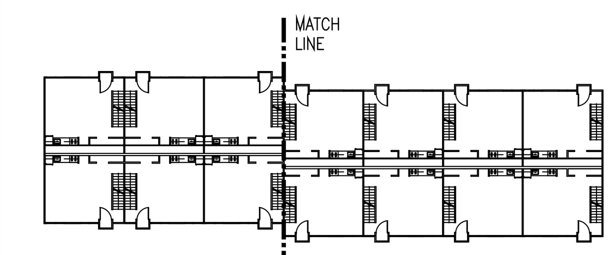
ABBREVIATIONS

AFF	ABOVE FINISHED FLOOR	T	TEE
CLG	CEILING	VIF	VERIFY IN FIELD
CU	COPPER	VLV	VALVE
CU.FT.	CUBIC FEET	W/	WITH
CV	CURB VALVE	WTR	WATER
DN	DOWN		
EL	ELBOW		
ELEC	ELECTRIC		
ELEV	ELEVATION		
FPS	FEET PER SECOND		
FT.	FEET		
GAL	GALLONS		
GPH	GALLONS PER HOUR		
GPM	GALLONS PER MINUTE		
HD	HEAD		
HP	HORSEPOWER		
ID	INSIDE DIAMETER		
IN.	INCHES		
IPS	INTERNATIONAL PIPE SIZE		
LF	LINEAR FEET		
MTD.	MOUNTED		
NTS	NOT TO SCALE		
OD	OUTSIDE DIAMETER		
OS&Y	OUTSIDE STEM & YOKE		
PIV	POST INDICATOR VALVE		
PSI	POUNDS PER SQUARE INCH		
RN	RISER NIPPLE		

Revisions

Date	Issue	Description
06-03-15	1	ISSUE FOR CONSTRUCTION

Key Plan



Consultants

LINWOOD ENGINEERING ASSOCIATES, P.A.

CONSULTING MECHANICAL & ELECTRICAL ENGINEERS

LEA

955 Lincoln Ave.
Glen Rock, New Jersey
07452
t: 201.857.3998
f: 201.857.3994

2301 Dupont Drive-Suite 150
Irvine, California
92612
t: 714.424.0001
f: 714.424.0004

www.linwoodengineering.com

Michael T. Davina, P.E.
NJ #48654
CT #0025779

Robert J. Hatch, P.E.
AR #13868
CA #E16118
CT #13318
FL #69560
MA #48516
NJ #30419
NV #019975
NY #56608
PA #036014–E

Project

INTERIOR RENOVATIONS
AT THE
TAMARACK - N RESIDENCE

RAMAPO COLLEGE OF NEW JERSEY
505 Ramapo Valley Road
Mahwah, New Jersey 07430-1680

Client

RAMAPO COLLEGE OF NEW JERSEY
505 Ramapo Valley Road
Mahwah, New Jersey 07430-1680

SNS Architects & Engineers, PC
1 PARAGON DRIVE . MONTVALE . NEW JERSEY . 07645
tel: 201.573.1767 fax: 201.573.0808 www.sns–arch–eng.com

Fay W. Logan, AIA
John M. Lignos, AIA
Lorin J. Sonenshine, AIA
Steven Napolitano, PE

Cert./Lic. No.

Date	04-10-15	Scale	AS NOTED
Drawn By	MD	Checked By	SG

Dwg. Title

FIRE PROTECTION NOTES & SYMBOLS

Work Order No. 4698N

Dwg. No. FP001