

FIRE PROTECTION SPECIFICATION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

- A. DRAWINGS AND GENERAL PROVISIONS OF CONTRACT, INCLUDING GENERAL AND SUPPLEMENTARY CONDITIONS AND DIVISION-1 SPECIFICATION SECTIONS, APPLY TO WORK OF THIS SECTION.
B. DIVISION-15 BASIC MECHANICAL AND METHODS SECTIONS APPLY TO WORK OF THIS SECTION, EXCEPT AS MODIFIED BY THIS SECTION.

1.02 SYSTEM DESCRIPTION

A. THE FIRE PROTECTION SUBCONTRACTOR IS RESPONSIBLE FOR CODE COMPLIANCE, RESEARCH, DESIGN, COORDINATION, AND INSTALLATION OF A COMPLETE AND FUNCTIONAL HYDRAULICALLY CALCULATED SPRINKLER SYSTEM (AND STANDPIPE SYSTEM, IF REQUIRED) THAT MEETS THE APPROVAL OF AND IS IN ACCORDANCE WITH ALL APPLICABLE REGULATIONS AND REQUIREMENTS OF THE FOLLOWING AND AS FURTHER SPECIFIED:

- 1. CURRENT EDITIONS OF NFPA 13, 14, 20, 25, AND 96.
2. FM GLOBAL <HTTP://WWW.FMGLOBAL.COM/> 2-8N, 3-7N AND 3-26.
3. APPLICABLE CODES.
4. AUTHORITIES HAVING JURISDICTION.

B. ALARM SYSTEM DEVICES INCLUDING ALARM VALVES, FLOW SWITCHES, PRESSURE SWITCHES, TAMPER SWITCHES AND COORDINATION WITH FIRE ALARM AND DETECTION SUBCONTRACTOR.

C. ACCESS PANELS FOR SERVICE AND ACCESS TO VALVES IN ENCLOSED CEILING AND WALLS.

D. OBTAINING ALL PERMITS AND APPROVALS OF THE FIRE PROTECTION SYSTEM.

1.03 DESCRIPTION OF WORK:

A. EXTENT OF FIRE PROTECTION WORK IS INDICATED ON DRAWINGS AND SCHEDULES AND BY THE REQUIREMENTS OF THIS SECTION. 1. DESIGN, FURNISH AND INSTALL SPRINKLER SYSTEMS FOR THE ENTIRE NEW FACILITY. EACH SYSTEM ZONE SHALL INCLUDE INDIVIDUAL CONTROL VALVES WITH TAMPER SWITCHES, WATER FLOW SWITCHES, GAUGES, AND TEST AND DRAIN CONNECTIONS, ETC.

B. IN GENERAL, THE WORK CONSISTS OF NEW SPRINKLER SYSTEMS SUPPLIED FROM A NEW UNDERGROUND MAIN. THE SYSTEMS SHALL PROVIDE COVERAGE FOR THE ENTIRE FACILITY.

C. REFER TO OTHER DIVISION 15 SECTIONS FOR FIRE PROTECTION PIPING AND APPURTENANCES EXTERIOR TO BUILDING; NOT WORK OF THIS SECTION.

D. PROVIDE ALL LABOR AND MATERIALS AND PERFORM ALL OPERATIONS REQUIRED IN CONNECTION WITH THE INSTALLATION OF THE FIRE SUPPRESSION SYSTEMS SHOWN ON THE DRAWINGS AND HEREIN SPECIFIED.

E. ATTEMPTS HAVE BEEN MADE TO SPECIFY ALL FIRE PROTECTION EQUIPMENT IN ACCORDANCE WITH APPLICABLE AND GOVERNING CODES AND REGULATIONS. EACH SUPPLIER AND CONTRACTOR SHALL ENDEAVOR TO FOLLOW SUCH REGULATIONS AND NOTIFY THE ARCHITECT/ENGINEER OF ANY DEVIATIONS FROM THESE REGULATIONS. CLARIFICATION WILL BE MADE BY ADDENDA.

1. THIS CONTRACTOR SHALL VERIFY THE ACCURACY OF THE BUILDING PLANS WITH THE ARCHITECT AND ACTUAL FIELD CONDITIONS, PRIOR TO BID. MODIFICATIONS REQUIRED TO THE BUILDING PLANS SHALL BE IDENTIFIED AND DISCUSSED WITH THE DESIGN TEAM AT LEAST SEVEN (7) DAYS PRIOR TO THE BID DUE DATE.

F. THE SYSTEMS SHALL INCLUDE FIRE DEPARTMENT SWAMSE CONNECTIONS, DISTRIBUTION PIPING, SPRINKLER PIPING, SPRINKLERS, PIPE SUPPORTS, ALARMS, DRAINS, TEST CONNECTIONS, CONTROL VALVES AND CHECK VALVES.

G. THE DESIGN OF THE SPRINKLER SYSTEM HAS BEEN DICTATED BY THE BUILDING CONSTRUCTION AND USAGE AND AS SPECIFIED HEREIN. PIPING SHALL BE CONCEALED ABOVE SUSPENDED CEILINGS.

1. THE DESIGN AND METHOD OF INSTALLATION OF THE FIRE PROTECTION WORK SHALL BE IN ACCORDANCE WITH THE CONTRACT DOCUMENTS, CURRENT EDITION OF THE MINNESOTA STATE FIRE CODE, THE 2001 EDITION OF THE MINNESOTA STATE BUILDING CODE, THE 2000 EDITION OF THE INTERNATIONAL BUILDING CODE (IBC) AND IBC STANDARDS, AND NATIONAL FIRE PROTECTION ASSOCIATION STANDARDS THAT CONTAIN REFERENCE TO OR SUPPLEMENTARY MATERIAL ON SPRINKLER SYSTEMS ALONG WITH THE REQUIREMENTS OF THE OWNERS INSURANCE AUTHORITY, THE CITY, THE STATE, AND THE FIRE DEPARTMENT.

2. THE SPRINKLER SYSTEMS SHALL BE HYDRAULICALLY CALCULATED. CALCULATIONS SHALL CONFORM TO THE 2002 EDITION OF ANS/NFPA 13, CHAPTER 9 OF THE 2000 EDITION OF THE MINNESOTA STATE BUILDING CODE AND INTERNATIONAL BUILDING CODE (IBC) AND IBCS 9-1

3. WHERE REQUIREMENTS OF THIS SPECIFICATION FOR MATERIAL, EQUIPMENT, AND PROCEDURES EXCEED THOSE OF ANS/NFPA, IFC, UL, FM, IBC, AND FIRE MARSHAL REQUIREMENTS, THE REQUIREMENTS OF THIS SPECIFICATION SUPERSEDE THE REQUIREMENTS OF THESE AND ALL OTHER GOVERNING AND REGULATORY AGENCIES.

4. THE SYSTEMS SHALL HAVE SEPARATE CONTROL VALVES WITH TAMPER SWITCHES, FLOW SWITCHES, PRESSURE GAUGES, MAIN DRAINS, AND INSPECTORS TEST CONNECTIONS.

H. AREAS SUCH AS ENCLOSED ENTRANCES, ELEVATOR SHAFTS, STORAGE AREAS, LOADING DOCKS, VESTIBULES, ENTRYWAYS, ATTACHED EXTERIOR STORAGE ROOMS OR TRASH AREAS, ETC., AND AS INDICATED, SUBJECT TO FREEZING CONDITIONS, SHALL BE PROVIDED WITH A NON-FREEZE SYSTEM THAT MEETS ANS/NFPA STANDARDS AND ALL STATE AND LOCAL CODES. ALL AREAS REQUIRING MORE THAN FOUR (4) SPRINKLERS SHALL BE DESIGNED WITH COMPLETE DRY PIPE SPRINKLER SYSTEMS.

1. PIPING PASSING THROUGH ENTRY WAYS, ENCLOSED ENTRANCES, VESTIBULES AND SIMILAR ENCLOSED AREAS THAT MAY BE SUBJECT TO FREEZING SHALL BE AVOIDED.

I. ENTIRE BUILDING SHALL BE PROTECTED BY THE SPRINKLER SYSTEMS INCLUDING BATHROOMS, CLOSETS, COMBUSTIBLE CONCEALED BLIND SPACES, ETC.

1. KITCHEN HOODS AND EXHAUST DUCTS SHALL BE PROTECTED BY EQUIPMENT PROVIDED BY THE KITCHEN EQUIPMENT SUPPLIER, NOT BY THIS CONTRACTOR.

J. ATTEMPTS HAVE NOT BEEN MADE TO INDICATE A PROPOSED, COORDINATED ROUTING OF THE SPRINKLER SYSTEMS PIPING AND SPRINKLER HEAD LOCATIONS. THE SUCCESSFUL CONTRACTOR MUST COORDINATE WITH THE INSTALLATION CONDITIONS, ALL OTHER TRADES, THE BUILDING COMPONENTS, ALL NEW CONSTRUCTION, AND MAKE ALL NECESSARY MODIFICATIONS TO THE PIPE ROUTING BEFORE SUBMITTING FOR APPROVAL. PROVIDE HYDRAULIC CALCULATIONS FOR ALL AREAS OF THE BUILDING INCLUDING ALL NECESSARY HYDRAULIC CALCULATIONS TO PROVE THE REMOTE AREA AND ALL NON-TYPICAL PIPE SIZING.

1. ADDITIONAL COMPENSATION WILL NOT BE ALLOWED FOR MODIFICATIONS TO THE BID DOCUMENTS FOR ADDITIONAL SPRINKLERS, PIPE OFFSETS, COORDINATION, OR FOR ADDITIONAL HYDRAULIC CALCULATIONS.

BE 12. SPRINKLER HEAD LOCATIONS AND ALL PIPE ROUTING SHALL BE COORDINATED WITH ALL MECHANICAL AND ELECTRICAL EQUIPMENT AND ALL STRUCTURAL AND ARCHITECTURAL COMPONENTS TO AVOID OBSTRUCTIONS.

3. THIS CONTRACTOR SHALL CAREFULLY REVIEW ALL OF THE BID DOCUMENTS FROM ALL DISCIPLINES (ARCHITECTURAL, STRUCTURAL, CIVIL, KITCHEN EQUIPMENT, ELECTRICAL, AND MECHANICAL) AND DESIGN THE SPRINKLER SYSTEMS TO PROPERLY PROTECT ALL AREAS OF THE FACILITY.

4. THE SPRINKLER SYSTEMS SHALL BE INSTALLED IN A MANNER THAT IS AESTHETICALLY UNOBTRUSIVE, WITH ALL SPRINKLER HEADS SYMMETRICALLY ALIGNED, DOES NOT INTERFERE WITH EQUIPMENT AND BUILDING COMPONENTS (CLOCKS, SPEAKERS, EQUIPMENT ACCESS, LIGHTS, ACCESS PANELS, ETC.), AND IS NOT SUBJECT TO DAMAGE BY THE BUILDING OCCUPANTS.

K. REFER TO DIVISION-16 SECTIONS FOR THE FOLLOWING WORK; NOT WORK OF THIS SECTION.

1. POWER SUPPLY WIRING FROM POWER SOURCE TO POWER CONNECTION ON REQUIRED ELECTRICAL DEVICES, EXCEPT WHERE SPECIFIED AS FURNISHED, OR FACTORY INSTALLED, BY MANUFACTURERS.

2. ALARM AND INDICATOR WIRING FROM DEVICES TO THE FIRE ALARM PANEL.

A. WIRING FOR ALL SUPERVISORY SWITCHES.

B. WIRING FOR ALL ALARMS AND INDICATORS.

C. WIRING AND MOUNTING OF EXTERIOR HORN AND LIGHT.

L. MAINTAIN THE INTEGRITY OF ALL FIRE WALLS AND SMOKE PARTITIONS.

1.04 SPRINKLER SYSTEMS DESCRIPTION

A. WET PIPE SPRINKLER SYSTEMS SHALL PROVIDE COVERAGE IN ACCORDANCE WITH THE CURRENT EDITION OF ANS/NFPA STANDARD 13, THE CURRENT EDITION OF THE MINNESOTA BUILDING AND FIRE CODES, THE IFC STANDARDS, THE IBC STANDARDS, AND THESE SPECIFICATIONS. SPRINKLER SPACING AND PIPE ROUTING SHALL BE AS INDICATED IN THE BID DOCUMENTS, EXCEPT FOR COORDINATION REQUIREMENTS.

1.05 QUALITY ASSURANCE

A. THE FIRE PROTECTION CONTRACTOR SHALL INSTITUTE A SYSTEM OF QUALITY ASSURANCE TO ASSURE THAT THE DESIGN, INSTALLATION, MATERIALS, INSPECTION, AND TESTING OF ALL COMPONENTS ARE IN ACCORDANCE WITH THE PROVISIONS OF THIS SPECIFICATION AND THE APPLICABLE CODES AND STANDARDS. THE QUALITY ASSURANCE PROGRAM SHALL REQUIRE THAT ALL DRAWINGS, CALCULATIONS, AND OTHER SUBMITTALS ARE CHECKED BY A SUPERVISOR POSSESSING A MINIMUM OF NICET LEVEL III CERTIFICATION, AND ALL SUBMITTALS SHALL BE SIGNED BY THE SUPERVISOR WHO CHECKED THE WORK.

B. CUTOFF DISKS CREATED BY CUTTING HOLES IN A PIPE FOR WELDED, SADDLE-TYPE FITTINGS, OR WATER FLOW SWITCHES, SHALL BE RECOVERED-AND WIRED TO THE PIPE NEAR THE POINT OF CUTTING. ALL DISKS SHALL BE ACCOUNTED FOR, TO ASSURE THAT NO BLOCKAGE OF THE PIPE WOULD OCCUR AS THE RESULT OF THE DISPLACEMENT OF THESE DISKS.

C. MANUFACTURERS: FIRMS REGULARLY ENGAGED IN MANUFACTURE OF FIRE PROTECTION PIPING SYSTEMS PRODUCTS, OF TYPES, MATERIALS, AND SIZES REQUIRED, WHOSE PRODUCTS HAVE BEEN IN SATISFACTORY USE IN SIMILAR SERVICE FOR NOT LESS THAN TEN (10) YEARS.

1. THE NAME OF THE MANUFACTURER, PART NUMBERS AND SERIAL NUMBERS SHALL APPEAR ON ALL MAJOR COMPONENTS.

2. ALL DEVICES, COMPONENTS AND EQUIPMENT SHALL BE THE PRODUCTS OF THE SAME MANUFACTURER.

3. ALL DEVICES, COMPONENTS AND EQUIPMENT SHALL BE NEW AND STANDARD PRODUCTS OF THE MANUFACTURERS LATEST DESIGN, SUITABLE TO PERFORM THE FUNCTIONS INTENDED.

D. INSTALLER: A MINNESOTA-LICENSED SPRINKLER CONTRACTOR WITH SUCCESSFUL INSTALLATION EXPERIENCE ON PROJECTS WITH FIRE PROTECTION PIPING SYSTEMS SIMILAR TO THAT REQUIRED FOR THE PROJECT.

1. INSTALLATION OF THE ENTIRE SPRINKLER SYSTEM IS TO BE PERFORMED BY A SPRINKLER CONTRACTOR WITH A MINIMUM OF FIVE (5) YEARS OF DESIGN AND INSTALLATION EXPERIENCE WITH SPRINKLER SYSTEMS SIMILAR TO THE ONE SPECIFIED UNDER THIS CONTRACT. EVIDENCE OF SUCH EXPERIENCE MUST BE SUBMITTED WITH THE BID FOR THIS PROJECT.

2. LAYOUT IS TO BE PERFORMED BY A PERSON WORKING UNDER THE DIRECT SUPERVISION OF A PERSON WITH A MINIMUM NICET III CERTIFICATION IN AUTOMATIC SPRINKLER SYSTEM LAYOUT. EVIDENCE OF SUCH EXPERIENCE MUST BE SUBMITTED WITH THE BID FOR THIS PROJECT.

3. QUALITY ASSURANCE CHECKING OF THE COMPLETED INSTALLATION, PERFORMED IN ACCORDANCE WITH THIS SPECIFICATION, BY THE PERSON WHO PERFORMED THE QUALITY ASSURANCE REVIEW OF THE COMPLETED LAYOUT, SHALL POSSESS A MINIMUM NICET III IN AUTOMATIC SPRINKLER SYSTEM LAYOUT. EVIDENCE OF SUCH EXPERIENCE MUST BE SUBMITTED WITH THE BID FOR THIS PROJECT. THE COMPLETED INSTALLATION IS TO BE COMPARED TO THE COMPLETED DESIGN FOR COMPLETENESS AND CORRECTNESS. ANY DEVIATIONS FROM THE DESIGN ARE TO BE CORRECTED, AND THE INDIVIDUAL CERTIFYING THE SYSTEM SHALL SIGN THE CONTRACTOR'S MATERIAL AND TEST CERTIFICATE.

E. THE CONTRACTOR SHALL INSTITUTE A SYSTEM OF QUALITY ASSURANCE TO ENSURE THAT THE DESIGN, INSTALLATION, MATERIALS, INSPECTIONS, AND TESTING OF ALL COMPONENTS ARE IN ACCORDANCE WITH THIS SPECIFICATION AND THE APPLICABLE CODES AND STANDARDS. THE QUALITY ASSURANCE PROGRAM SHALL REQUIRE THAT ALL DRAWINGS, CALCULATIONS, AND OTHER SUBMITTALS AREA CHECKED BY A SUPERVISOR POSSESSING A MINIMUM OF NICET LEVEL III CERTIFICATION, AND ALL SUBMITTALS SHALL BE SIGNED BY THE SUPERVISOR WHO CHECKED THE WORK.

F. CODES AND STANDARDS:

1. ANS/NFPA COMPLIANCE: INSTALL FIRE PROTECTION SYSTEMS IN ACCORDANCE WITH THE CURRENT EDITIONS OF ANS/NFPA 13 "STANDARD FOR THE INSTALLATION OF SPRINKLER SYSTEMS".

2. UL COMPLIANCE: PROVIDE FIRE PROTECTION PRODUCTS IN ACCORDANCE WITH UL STANDARDS; PROVIDE UL LABEL ON EACH PRODUCT.

3. UL/FM COMPLIANCE: PROVIDE FIRE PROTECTION PRODUCTS IN ACCORDANCE WITH UL STANDARDS; PROVIDE UL OR FM LABEL ON EACH PRODUCT.

4. FIRE DEPARTMENT/MARSHAL COMPLIANCE: INSTALL FIRE PROTECTION SYSTEMS IN ACCORDANCE WITH LOCAL REGULATIONS OF FIRE DEPARTMENT OR FIRE MARSHAL.

5. SCREW THREAD CONNECTIONS: COMPLY WITH LOCAL FIRE DEPARTMENT/MARSHAL REGULATIONS FOR SIZES, THREADING AND ARRANGEMENT OF CONNECTIONS FOR FIRE DEPARTMENT EQUIPMENT TO SPRINKLER AND STANDPIPE SYSTEMS. COMPLY WITH ANS/NFPA 1963, "STANDARD FOR SCREW THREADS AND GASKETS FOR FIRE HOSE CONNECTIONS," PERTAINING TO THREADED CONNECTIONS.

6. THE WATER SERVICE CONNECTION AND SPRINKLER SYSTEM VALVE ASSEMBLY SHALL COMPLY WITH THE LOCAL MUNICIPALITY WATER DEPARTMENT REQUIREMENTS.

G. OBTAIN ALL REQUIRED APPROVALS AND PERMITS. PERMITS SHALL BE OBTAINED FROM THE CITY OR MUNICIPALITY IN WHICH THE SYSTEM WILL BE INSTALLED. IF PERMITS ARE NOT ISSUED BY THE CITY OR MUNICIPALITY, A PERMIT SHALL BE OBTAINED FROM THE APPLICABLE STATE FIRE MARSHAL OR STATE BUILDING CODES DIVISION.

1.05 COORDINATION

A. GENERAL: THE CONTRACTOR SHALL COORDINATE FIRE PROTECTION WITH OTHER TRADES.

1. COORDINATE WITH OTHER WORK, INCLUDING PLUMBING PIPING, DUCT WORK, AND ELECTRICAL PIPING AND EQUIPMENT, AS NECESSARY TO INTERFACE COMPONENTS OF FIRE SPRINKLER PIPING PROPERLY WITH OTHER WORK.

2. COORDINATE WITH ALL NEW CONDITIONS. COORDINATE WITH THE ARCHITECT ALL EXPOSED PIPING LOCATIONS, PRIOR TO DESIGN SUBMITTAL AND FABRICATION. PIPING SHALL BE INSTALLED IN SOFFITS OR ALONG STRUCTURAL MEMBERS WHEN DIRECTED BY THE ARCHITECT.

1.06 SUBMITTALS AND APPROVALS

A. GENERAL: THE FOLLOWING PROCEDURES SHALL BE FOLLOWED FOR ALL SUBMITTALS:

1. REFER TO ARTICLE IN THE SECTION ENTITLED, "COORDINATION", THE CONTRACTOR SHALL COORDINATE FIRE PROTECTION WORK PRIOR TO SUBMITTING SHOP DRAWINGS FOR REVIEW.

2. SUBMIT ALL REQUIRED PRODUCT DATA, SAMPLES, DRAWINGS, AND CALCULATIONS TOGETHER IN A SINGLE PACKAGE. SUBMITTALS SHALL BE NEATLY INDEXED AND BOUND. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SCHEDULING THE COORDINATION, PREPARATION, AND REVIEW OF THE FIRE PROTECTION SUBMITTAL PACKAGE IN A TIMELY MANNER SO THAT PIECEMEAL SUBMITTALS ARE NOT NECESSARY. PRELIMINARY AND PARTIAL SUBMITTALS WILL BE REJECTED BY THE ARCHITECT/ENGINEER.

3. SUBMIT PRODUCT DATA/SAMPLES/DRAWINGS/CALCULATIONS PACKAGE TO THE ARCHITECT/ENGINEER SIMULTANEOUSLY WITH THE SUBMITTAL TO THE AUTHORITY HAVING JURISDICTION (AHJ).

A. SUBMIT A MINIMUM OF ONE (1) SAMPLE OF EACH SPRINKLER TYPE TO THE ARCHITECT/ENGINEER.

4. ALL SUBMITTALS SHALL BE COMPLETE AND IN COMPLIANCE WITH THE BID DOCUMENTS AND THE REQUIREMENTS OF THE CODES AND STANDARDS THAT APPLY.

5. SUBMIT SIX (6) COPIES OF THE REVIEW LETTER FROM THE AHJ, ALONG WITH SIX (6) COPIES OF THE PLANS AND HYDRAULIC CALCULATIONS INDICATING THE AHJ REVIEW TO THE ARCHITECT/ENGINEER.

6. PURCHASING, FABRICATION, OR INSTALLATION SHALL NOT BEGIN UNTIL ALL SUBMITTALS ARE ACCEPTABLE TO THE AHJ AND THE ARCHITECT/ENGINEER.

7. FINAL PAYMENT WILL NOT BE AUTHORIZED UNTIL ACCURATE AND COMPLETE RECORD DRAWINGS, MAINTENANCE MANUALS, AND HYDRAULIC CALCULATIONS HAVE BEEN RECEIVED AND VERIFIED BY THE ARCHITECT/ENGINEER.

B. APPROVAL DRAWINGS: PREPARE APPROVAL DRAWINGS OF FIRE PROTECTION SYSTEMS INDICATING ALL OF THE REQUIREMENTS OF ANS/NFPA 13, PARAGRAPHS 8-1, 8-2, 8-3, AND 8-4, INCLUDING, BUT NOT LIMITED TO ROOM OCCUPANCY, PIPE SIZES, PIPE LENGTHS, PIPE LOCATIONS, FITTINGS, CONTROL VALVES, EQUIPMENT, FIRE DEPARTMENT CONNECTIONS, HANGER TYPES AND LOCATIONS, ETC. INDICATE ELEVATIONS, SLOPES, FLOOR AND WALL PENETRATIONS, DRAINS, ETC.

1. ALL SUBMITTALS SHALL BE REVIEWED AND SIGNED IN ACCORDANCE WITH SECTION 1.04.

2. SUBMIT ALL REQUIRED PRODUCT DATA, SAMPLES, DRAWINGS, AND CALCULATIONS TOGETHER IN A SINGLE PACKAGE. SUBMITTALS SHALL BE NEATLY INDEXED AND BOUND. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SCHEDULING THE COORDINATION, PREPARATION, AND REVIEW OF THE FIRE PROTECTION SUBMITTAL PACKAGE IN A TIMELY MANNER SO THAT PIECEMEAL SUBMITTALS ARE NOT NECESSARY. PRELIMINARY AND PARTIAL SUBMITTALS WILL BE REJECTED BY THE ARCHITECT/ENGINEER, UNLESS IT IS SOLELY FOR COORDINATION OF EXPOSED PIPING SYSTEM COMPONENTS.

3. SUBMIT PRODUCT DATA/SAMPLES/DRAWINGS/CALCULATIONS PACKAGE TO THE ARCHITECT/ENGINEER SIMULTANEOUSLY WITH THE SUBMITTAL TO THE AUTHORITY HAVING JURISDICTION (AHJ).

4. AGENCY REFERS TO THE INSURANCE AUTHORITY AND THE LOCAL OR STATE FIRE MARSHAL. IN ADDITION, THE STATE OF MINNESOTA SHALL APPROVE ALL BUILDING PLANS INVOLVING STATE OWNED OR FINANCED BUILDING WORK.

5. ALL SUBMITTALS SHALL BE COMPLETE AND IN COMPLIANCE WITH THE BID DOCUMENTS AND THE REQUIREMENTS OF THE CODES AND STANDARDS THAT APPLY.

6. SUBMIT SIX (6) COPIES OF THE REVIEW LETTER FROM THE AUTHORITY HAVING JURISDICTION (AHJ), ALONG WITH SIX (6) COPIES OF THE PLANS AND HYDRAULIC CALCULATIONS INDICATING THE AHJ REVIEW TO THE ARCHITECT/ENGINEER.

7. NO WORK INCLUDING PURCHASING OF EQUIPMENT AND MATERIALS, FABRICATION, OR INSTALLATION SHALL PROCEED ON THIS PROJECT PRIOR TO REVIEW AND ACCEPTANCE IN WRITING OF THE CONTRACTOR'S PLANS, PRODUCT SUBMITTALS AND HYDRAULIC CALCULATIONS, BY BOTH THE ARCHITECT, ENGINEER AND THE AUTHORITIES HAVING JURISDICTION. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN REQUIRED PERMITS AND APPROVALS IN A TIMELY MANNER AS TO NOT DELAY THE WORK OF ANY OTHER TRADES.

C. HYDRAULIC CALCULATIONS: PREPARE HYDRAULIC CALCULATIONS FOR THE FIRE PROTECTION SYSTEMS. SUBMIT TO AGENCY HAVING JURISDICTION AND THE ENGINEER FOR APPROVAL. HYDRAULIC CALCULATIONS MUST PROVE THE REMOTE AREA. SUBMIT SUPPLEMENTAL CALCULATIONS FOR ALL NON-TYPICAL AREAS TO VERIFY REMOTE AREA.

1. HYDRAULIC CALCULATIONS SHALL INCLUDE ALL INFORMATION REQUIRED BY ANS/NFPA 13 PARAGRAPH 8.2.

2. THE HYDRAULIC DESIGN SHALL BE BASED ON A LIGHT HAZARD OCCUPANCY THROUGHOUT THE BUILDING, EXCEPT AS REQUIRED BY ANS/NFPA 13 FOR ORDINARY HAZARD AREAS, SUCH AS ALL STORAGE AREAS, EQUIPMENT ROOMS, UTILITY ROOMS, JANITOR, MECHANICAL ROOMS, AND ANY OTHER SPACES AS DEFINED IN THE UBCS AS ORDINARY HAZARD.

3. HYDRAULIC DESIGN DENSITIES SHALL BE IN ACCORDANCE WITH THE 1999 EDITION OF ANS/NFPA 13 FOR LIGHT HAZARD AND ORDINARY HAZARD.

D. FLOW TEST

1. THE CONTRACTOR SHALL CONDUCT A NEW FLOW TEST FOR THIS SITE, FOR COMPARISON TO THE PROJECTED SUPPLY. THE TEST SHALL BE WITNESSED BY CITY WATER AND FIRE DEPARTMENT REPRESENTATIVES AND THE PROJECT ENGINEERS' REPRESENTATIVES.

2. THE CONTRACTOR MUST ALLOW A MINIMUM OF 5 PSIG CUSHION BETWEEN THE SYSTEM DEMAND AND THE PROJECTED AVAILABLE WATER SUPPLY FOR ALL CALCULATIONS.

3. HYDRAULIC CALCULATIONS SHALL BE COMPLETED WITH THE PIPE LENGTH AND FITTINGS TO THE FLOW TEST LOCATION INCLUDING ALL EXISTING CONDITIONS, AND HOSE STREAMS FLOWING FROM THE HYDRANT NEAREST THE SPRINKLER SYSTEM RISER.

E. CERTIFICATE OF INSTALLATION: SUBMIT CERTIFICATE UPON COMPLETION OF FIRE PROTECTION PIPING WORK WHICH INDICATES THAT WORK HAS BEEN TESTED IN ACCORDANCE WITH ANS/NFPA 13 AND ALSO THAT THE SYSTEMS ARE OPERATIONAL, COMPLETE, AND HAVE NO DEFECTS.

1. OBTAIN THE COMPLETED UNDERGROUND TEST CERTIFICATE BEFORE CONNECTING TO THE UNDERGROUND MAIN AND SUBMIT A COPY TO THE ARCHITECT/ENGINEER.

2. INSTALLING FOREMAN SHALL RECORD THEIR STATE SPRINKLER LICENSE NUMBER ON ALL TEST PAPERS.

3. SUBMIT A CERTIFICATE CONFIRMING COMPLIANCE WITH SECTION 01.04 FOR QUALITY ASSURANCE.

4. SUBMIT A CERTIFICATE CONFIRMING COMPLIANCE WITH SECTION 01.04 FOR EXPERIENCE QUALIFICATIONS.

5. SUBMIT COPY OF THE NICET III CERTIFICATE FOR THE SUPERVISOR OF THE LAYOUT TECHNICIAN IN SECTION 01.04.

6. SUBMIT A COPY OF THE NICET II CERTIFICATE FOR THE PERSON CHECKING THE DESIGN WORK IN SECTION 01.04.

7. A COPY OF THE NICET III CERTIFICATE FOR THE PERSON CHECKING THE COMPLETED INSTALLATION IN SECTION 01.04.

F. RECORD DRAWINGS: AT PROJECT CLOSE-OUT, SUBMIT RECORD DRAWINGS OF INSTALLED FIRE PROTECTION PIPING IN ACCORDANCE WITH REQUIREMENTS OF DIVISION 1 AND SPECIFIED HEREIN.

1. SUBMIT RECORD DRAWINGS AND AS-BUILT HYDRAULIC CALCULATIONS TO THE ENGINEER PRIOR TO SUBSTANTIAL COMPLETION OF THE PROJECT. THESE CALCULATIONS SHALL REFLECT ALL FIELD CHANGES MADE TO THE SYSTEMS.

2. RECORD DRAWINGS SHALL CLEARLY INDICATE ALL SPRINKLER HEAD TYPES AND LOCATIONS, VALVE LOCATIONS, DRAIN LOCATIONS, TEST CONNECTIONS, FLOW SWITCHES, PRESSURE SWITCHES, TAMPER SWITCHES, NEW PIPING, ETC.

3. THE ENGINEER MAY RECOMMEND WITHHOLDING PAYMENT IF RECORD DRAWINGS ARE NOT BEING MAINTAINED.

G. MAINTENANCE DATA: SUBMIT MAINTENANCE DATA AND PARTS LISTS FOR FIRE PROTECTION MATERIALS AND PRODUCTS. INCLUDE THIS DATA, PRODUCT DATA, SHOP DRAWINGS, APPROVAL DRAWINGS, APPROVAL CALCULATIONS, CERTIFICATE OF INSTALLATION, AND RECORD DRAWINGS IN A MAINTENANCE MANUAL, IN ACCORDANCE WITH REQUIREMENTS OF DIVISION 1 AND AS SPECIFIED HEREIN.

1. THE MAINTENANCE SUBMITTAL (TWO COPIES REQUIRED) SHALL BE NEATLY BOUND AND INDEXED IN AN APPROPRIATELY SIZED THREE-RING BINDER.

2. INCLUDE ALL COMPONENTS FOR THE SYSTEM, ACCURATE AS-BUILT HYDRAULIC CALCULATIONS, AND A COPY OF ANS/NFPA 25 IN EACH BINDER.

3. INCLUDE ALL MAINTENANCE AND TESTING EQUIPMENT FROM THE MANUFACTURER, ON EVERY PRODUCT.

H. OWNER ORIENTATION: PROVIDE THE OWNER AND THE OWNER'S DESIGNATED REPRESENTATIVES WITH A MINIMUM OF FOUR - (2)HOURS OF PROCEDURE AND MAINTENANCE TRAINING.

PART 2 - PRODUCTS

2.01 MATERIALS AND PRODUCTS

A. GENERAL: PROVIDE PIPING MATERIALS AND FACTORY-FABRICATED PIPING PRODUCTS OF SIZES, TYPES, PRESSURE RATINGS, TEMPERATURE RATINGS, AND CAPACITIES AS INDICATED, WHERE NOT INDICATED, PROVIDE PROPER SELECTION AS DETERMINED BY INSTALLER TO COMPLY WITH INSTALLATION REQUIREMENTS. PROVIDE SIZES AND TYPES MATCHING PIPING AND EQUIPMENT CONNECTIONS; PROVIDE FITTINGS OF MATERIALS THAT MATCH PIPE MATERIALS USED IN FIRE PROTECTION SYSTEMS, WHERE MORE THAN ONE (1) TYPE OF MATERIAL OR PRODUCTS IS INDICATED, SELECTION IS INSTALLER'S OPTION.

2.02 BASIC IDENTIFICATION

A. GENERAL: PROVIDE IDENTIFICATION COMPLYING WITH DIVISION-15 BASIC MECHANICAL MATERIALS AND METHODS SECTION "MECHANICAL IDENTIFICATION," ANS/NFPA STANDARDS AND IN ACCORDANCE WITH THE FOLLOWING LISTING:

1. PROTECTION PIPING: PLASTIC PIPE MARKERS.

2. PROTECTION VALVES: BRASS VALVE TAGS.

3. FIRE PROTECTION SIGNS: PROVIDE THE FOLLOWING SIGNS.

A. PROVIDE CUSTOM, PERMANENT, RED, PLASTIC, ENGRAVED SIGNAGE AT THE MAIN VALVE ASSEMBLY TO INDICATE THE ZONING OF THE SYSTEM. ALL CONTROL VALVES IN THE BUILDING SHALL HAVE CUSTOM, PERMANENT, RED, PLASTIC, ENGRAVED SIGNAGE INDICATING THE AREA IT CONTROLS. ALL INSPECTOR TEST VALVES SHALL HAVE CUSTOM, PERMANENT, RED, PLASTIC, ENGRAVED SIGNAGE INDICATING THE PROPER AREA.

B. SIGNAGE MUST BE APPROVED BY THE ARCHITECT/ENGINEER BEFORE FABRICATION. SUBMIT DETAILED SAMPLES WITH THE PRODUCT SUBMITTAL FOR APPROVAL.

C. PROVIDE A PERMANENT, UNDER GLASS BUILDING DIAGRAM, INDICATING THE ZONES OF THE SPRINKLER SYSTEM AND THE VALVES THAT CONTROL EACH ZONE. CLEARLY LABEL ALL ZONES, VALVES, FLOW AND PRESSURE SWITCHES, AND INSPECTOR TEST CONNECTIONS. SUBMIT SAMPLES TO THE ARCHITECT/ENGINEER PRIOR TO FABRICATION. MOUNT THE DIAGRAM PERMANENTLY WHERE DIRECTED BY THE ARCHITECT.

D. AT EACH OUTSIDE ALARM DEVICE, PROVIDE A SIGN INDICATING WHAT AUTHORITY TO CALL IF DEVICE IS ACTIVATED.

2.03 BASIC PIPES AND PIPE FITTINGS

A. GENERAL: PROVIDE PIPES AND PIPE FITTINGS COMPLYING WITH DIVISION-15 BASIC MECHANICAL MATERIALS AND METHODS SECTION "PIPES AND PIPE FITTINGS," ANS/NFPA 13, AND UBC CHAPTER 9 AND IN ACCORDANCE WITH THE FOLLOWING.

B. ABOVE GROUND PIPING SHALL BE ASTM 53, ASTM 135, OR ASTM 795.

1. STEEL PIPE: MATERIALS LISTED IN ANS/NFPA STANDARDS.

2. GALVANIZED STEEL PIPE: MATERIALS LISTED IN ANS/NFPA STANDARDS - SCHEDULE 10 AND 40 ONLY.

3. PVC PIPE: MATERIALS LISTED IN ANS/NFPA 13 STANDARDS.

4. ALL PIPING MATERIALS PER ANS/NFPA 13 STANDARDS.

C. USE OF COPPER, PLASTIC, OR SCHEDULES 5, 7, 25, ETC., STEEL PIPE OR TUBE IS NOT ALLOWED.

D. GALVANIZED PIPE: GALVANIZED PIPE SHALL BE INSTALLED SHALL BE INSTALLED IN ALL AREAS EXPOSED TO THE WEATHER, SHOWER OR LOCKER AREAS AND AREAS OF HIGH HUMIDITY.

E. FITTINGS: SHALL BE STANDARD WEIGHT MATERIALS LISTED IN ANS/NFPA STANDARDS, EXCEPT WHERE PRESSURES EXCEED 175 PSIG. EXTRA HEAVY FITTINGS OR FITTINGS WITH MATERIALS LISTED IN ANS/NFPA STANDARDS SHALL BE USED.

1. PLAIN-END FITTINGS FOR STEEL PIPE SHALL NOT BE USED.

2. VICTAULIC "PRESS-FIT" FITTINGS SHALL NOT BE USED.

3. ALL SCREWED FITTINGS SHALL BE MALLEABLE OR CAST IRON.

4. 1" THROUGH 2" FITTINGS SHALL BE SCREWED.

5. ALL GROOVED FITTINGS SHALL BE FORGED STEEL, DUCTILE IRON, OR MALLEABLE IRON.

6. PLAIN-END, "SNAP-LOCK", OR "HOOKER" TYPE FITTINGS ARE NOT ALLOWED.

7. GALVANIZED PIPE AND FITTINGS SHALL BE INSTALLED IN ALL AREAS EXPOSED TO THE WEATHER, SHOWER OR LOCKER AREAS AND AREAS OF HIGH HUMIDITY.

8. 1/2" EXTENSION COUPLINGS SHALL NOT BE USED.

2.04 BASIC PIPING SPECIALTIES

A. GENERAL: PROVIDE PIPING SPECIALTIES COMPLYING WITH DIVISION-15 BASIC MECHANICAL MATERIALS AND METHODS IN ACCORDANCE WITH THE FOLLOWING LISTING:

PIPE ESCUTCHEONS
PIPE SLEEVES
SLEEVE SEALS
FIRE BARRIER PENETRATION SEALS

1. ALL PIPE PENETRATIONS THROUGH ALL WALLS, FLOORS, CEILINGS, AND PARTITIONS SHALL BE SLEEVED.

2. ALL PIPE PENETRATIONS THROUGH ALL WALLS, FLOORS, CEILINGS, AND PARTITIONS SHALL BE SLEEVED WITH STEEL PIPE SLEEVES, AT LEAST 2 PIPE DIAMETERS LARGER THAN THE PIPING PASSING THROUGH THE SLEEVE.

2.05 BASIC SUPPORTS AND ANCHORS

A. GENERAL: PROVIDE SUPPORTS AND ANCHORS COMPLYING WITH ANS/NFPA STANDARDS EXCEPT AS INDICATED IN THIS SECTION. POWDER DRIVEN STUDS SHALL NOT BE USED.

1. "HILTI" TYPE HDI-P DROP-IN ANCHORS ARE NOT ALLOWED.

2. ALL VALVE ASSEMBLIES SHALL HAVE FLOOR MOUNTED PIPE-STANDS NOT EXCEEDING 3"-0" ON CENTER.

3. CADMIUM OR ZINC PLATED COMPONENTS SHALL BE INSTALLED IN ALL AREAS EXPOSED TO THE WEATHER, SHOWER OR LOCKER AREAS AND AREAS OF HIGH HUMIDITY.

2.06 BASIC VALVES

A. GENERAL: PROVIDE VALVES IN ACCORDANCE WITH ANS/NFPA 13 AND WITH THE FOLLOWING LISTING:

1. GATE VALVES: VALVES SHALL BE FM/UL APPROVED FOR SPRINKLER SYSTEMS. THEY SHALL BE OF THE O.S. & Y. INDICATING TYPE.

A. VALVES SHALL BE RATED FOR WORKING PRESSURES NOT LESS THAN THE MAXIMUM TO BE DEVELOPED AT THEIR LOCATION IN THE SYSTEM. VALVES 2" AND SMALLER SHALL BE SCREWED, VALVES 2-1/2" AND LARGER SHALL BE FLANGED OR GROOVED.

2. CHECK VALVE: CHECK VALVES SHALL BE FM/UL APPROVED FOR FIRE SERVICE WITH BRONZE MOUNTING AND FLANGED CONNECTIONS. PRESSURE RATING TO BE AS DESCRIBED FOR GATE VALVES.

3. SLOW CLOSE CONTROL VALVES: BUTTERFLY OR BUTTERBALL VALVES SHALL BE UL OR FM APPROVED FOR SPRINKLER SYSTEMS AND SHALL BE SCREWED OR GROOVED.

B. AVAILABLE MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, MANUFACTURERS OFFERING VALVES WHICH MAY BE INCORPORATED IN THE WORK INCLUDE; BUT ARE NOT LIMITED TO, THE FOLLOWING:</