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|----------------|--|---|--|
| | HYDRANT FLOW TEST DATA | PIPING SYMBOLS | FIRE PUMP GENERAL NOTES |
| | DATE: MARCH 27, 2024 STATIC PRESSURE: 52 PSI | ELBOW UP ELBOW DOWN | A. THE CONTRACTOR SHALL PROVIDE A PREMANUFACTURED FIRE PUMP HOUSE INCLUDING BUT NOT LIMIITED TO A 1,500 GPM, 150 PSI ELECTRIC FIRE PUMP, JOCKEY PUMP, FIRE PUMP CONTROLLERS, FIRE PUMP TEST LOOP, AND ALL ASSOCIATED VALVES AND COMPONENTS. |
| | RESIDUAL PRESSURE: 32 PSI | | ALL SYSTEMS ALL SYSTEMS MUST BE DESIGNED IN ACCORDANCE WITH APPLICABLE CODES AND STANDARDS, INCLUDING, BUT NOT LIMITED TO THE FOLLOWING: |
| П | FIRE PUMP & WATER STORAGE TANK DESIGN | VALVE IN CENTER DROP | ARKANSAS FIRE PROTECTION CODE, VOLUME I FIRE (2021 INTERNATIONAL FIRE CODE WITH ARKANSAS AMENDMENTS) ARKANSAS FIRE PROTECTION CODE, VOLUME II BUILDING (2021 INTERNATIONAL BUILDING CODE WITH ARKANSAS AMENDMENTS) NFPA 13, STANDARD FOR THE INSTALLATION OF SPRINKLER SYSTEMS (2019) NFPA 20, STANDARD FOR THE INSTALLATION OF STATIONARY PUMPS FOR FIRE PROTECTION (2022) NFPA 72, NATIONAL FIRE ALARM SIGNALING CODE (2022) NFPA 72, NATIONAL FIRE ALARM SIGNALING CODE (2022) |
| U | THE EXISTING WATER SUPPLY ON SITE IS NOT SUFFICIENT TO SUPPLY THE REQUIRED | DIRECTION OF FLOW | FM LPDS 3-0, HYDRAULICS OF FIRE PROTECTION SYSTEMS (2010) FM LPDS 3-7, FIRE PROTECTION PUMPS (2012) SPEC SECTION 213110, FIRE PUMP SYSTEM |
| | WATER DEMANDS TO ALL THE BUILDINGS ON SITE. A FIRE WATER STORAGE TANK AND FIRE PUMP/PUMP HOUSE ARE REQUIRED TO MEET THESE DEMANDS. THE INTENT OF THESE DRAWINGS ARE TO PROVIDE MINIMUM REQUIREMENTS FOR THE NEW FIRE WATER SYSTEM. CONTRACTOR TO COMPLETE FULL DETAILED DESIGN OF THE WATER TANK PUMP PUMP HOUSE AND ALL ASSOCIATED COMPONENTS. THE FIRE PUMP HOUSE | DIRECTION OF SLOPE DOWN | B. ALL MATERIALS, MEANS AND METHODS SHALL COMPLY WITH APPLICABLE CODES, ORDINANCES, REGULATIONS, AND STANDARDS. C. IN THE EVENT OF CONFLICTING REQUIREMENTS BETWEEN ICC, NFPA, AND FM GLOBAL, AND/OR OTHER CODES AND STANDARDS THE MORE STRINGENT REQUIREMENT SHALL BE USED. |
| | AND WATER TANKS MAY BE PREFABRICATED STRUCTURES. ALL ELEMENTS OF THESE SYSTEMS AND EQUIPMENT MUST BE COMPLIANT WITH NFPA 20, NFPA 22, FM LPDS 3-7, | | D. THE FIRE PROTECTION CONTRACTOR SHALL BE CERTIFIED AND LICENSED TO PERFORM THE ENGINEERING, DESIGN, INSTALLATION, AI TENTING OF FIRE PROTECTION OVOTEMS IN ARKANGAGE |
| | THE CONTRACTOR MUST EMPLOY OR RETAIN A NICET LEVEL III OR IV TECHNICIAN OR | | E. FIRE PROTECTION SYSTEM MATERIALS AND COMPONENTS SHALL BE FM APPROVED. |
| | PROFESSIONAL ENGINEER LICENSED IN ARKANSAS TO DESIGN AND DETAIL DELEGATED DESIGN ITEMS TO MEET THE PERFORMANCE AND DESIGN CRITERIA ESTABLISHED IN THE CONTRACT DOCUMENTS INCLUDING BUT NOT LIMITED TO: | | F. COORDINATE THE DESIGN, LAYOUT, AND INSTALLATION OF FIRE PROTECTION PIPING AND EQUIPMENT WITH ALL TRADES AND DRAWIN PRIOR TO COMMENCING INSTALLATION. |
| | 1. TANK SIZE, TYPE, AND LAYOUT INCLUDING LOCATION OF PIPING TO AND FROM THE | | G. CONTRACTOR TO DETERMINE AND PROVIDE MEANS OF FREEZE PROTECTION FOR ALL PIPING WITH POTENTIAL FOR FREEZING. |
| | METHOD TO PREVENT FREEZING OF PIPES AND TANK. FIRE WATER PUMPS AND ASSOCIATED PUMP HOUSE. | | H. REFER TO CIVIL DRAWINGS FOR LOCATION OF ELECTRICAL UTILITIES TO THE SERVE THE FIRE PUMP HOUSE AND TANK COMPONENTS. |
| | 4. FOUNDATION SUPPORT OF TANK AND PUMP HOUSE. THE FIRE PUMP WILL BE LOCATED IN AN EXTERIOR PUMP HOUSE AND BE RATED AT 1,500 GPM AND 150 PSI TO MEET THE HIGHEST FIRE WATER DEMAND. THE HIGHEST FIRE FLOW | BLOWDOWN VALVE | CONTRACTOR SHALL OBTAIN ALL REQUIRED PERMITS. BEFORE ANY WORK STARTS, SUBMIT AND OBTAIN APPROVAL FROM THE AHJ AN FM GLOBAL. AT A MINIMUM, APPROVAL IS REQUIRED FOR PRODUCT DATA, CALCULATIONS, AND DRAWINGS AS REQUIRED BY NFPA 13, LDPS 2-0, AND OTHER REQUIREMENTS PROMULGATED BY THE AHJ. |
| | REQUIRED FOR ALL BUILDINGS IS 1,500 GPM PER IFC 2021 APPENDIX B, TABLE B105.1(2) THE HIGHEST FIRE FLOW EXCEEDES THE HYDRAULICALLY CALCULATED SPRINKLER DEMANDS FOR EACH BUILDING ON SITE. | | K. WATER DEMAND FOR THE FIRE PROTECTION SYSTEMS SHALL BE SUPPLIED BY A NEW FIRE WATER STORAGE TANK AND FIRE PUMP. THE NEW FIRE WATER STORAGE TANK SHALL BE SUPPLIED BY THE EXISTING SITE FIRE WATER DISTRIBUTION SYSTEM. CONTRACTOR TO PERFORM A FIRE HYDRANT FLOW TEST IN ACCORDANCE WITH NFPA 291 WITHIN 6 MONTHS OF SHOP DRAWING SUBMITTAL TO ENSURE |
| • | THE MINIMUM CAPACITY OF FIRE WATER REQUIRED IN THE WATER STORAGE TANK IS 200,000 GALLONS. THE WATER STORAGE TANK MUST BE LOCATED UPSTREAM OF THE | | SIZE OF THE FILL LINE TO THE WATER STORAGE TANK IS SUFFICIENT TO MEET THE TANK REFILL REQUIREMENTS PER NEPA 22. L. THE MATERIALS OF CONSTRUCTION FOR THE NEW UNDERGROUND SYSTEM WILL UTILIZE FM CLASS 200 (DR11) HIGH DENSITY POLYETHYLENE PIPE (HDPE). THE MATERIALS OF CONSTRUCTION FOR THE ABOVEGROUND PORTIONS OF THE FIRE WATER MAIN WILL |
| C | NEW FIRE PUMP. THE SIZE OF THE TANK WAS DETERMINED USING A MAXIMUM FIRE FLOW ON SITE OF 1,500 GPM X 2 HR = 180,000 GALLONS PER IFC 2021 APPENDIX B, TABLE B105.1(2) AND AN INCREASE TO 200,000 GALLONS AS A SAFETY FACTOR AND TO ACCOUNT FOR ANY FUTURE EXPANSIONS TO THE SITE. THE WATER STORAGE TANK | RELIEF VALVE | UTILIZE CARBON STEEL PIPE THAT IS INTERNALLY AND EXTERNALLY COATED. THE ABOVE GROUND CARBON STEEL PIPE WILL BE SCHEDULE 40 FOR FIRE SPRINKLER SYSTEM PIPING LESS THAN 2 INCHES AND SCHEDULE 10 FOR FIRE SPRINKLER SYSTEM PIPING GREATER THAN 2 INCHES. |
| | WILL HAVE A DEDICATED FIRE REFILL LINE THAT CONNECTS BACK TO THE EXISTING SITE WATER SUPPLY. THIS FILL LINE MUST BE SIZED TO ENSURE THAT THE WATER STORAGE | PRESSURE GAUGE | M. THE FIRE PUMP HOUSE FACP SHALL BE CONNECTED TO THE MAIN DISTRIBUTION POINT LOCATED AT THE M142 COMPUTER ROOM AND COMMUNICATE WITH CENTRAL NETWORK VIA THE FIBER OPTIC NETWORK. THE BUILDING FACP SHALL BE COMPATIBLE WITH THE |
| | CALCULATIONS SHOW THAT A MINIMUM 6" HDPE FM CLASS 200 PIPE IS SUFFICIENT BASED ON THE EXISTING HYDRANT FLOW TEST DATA. | | EXISTING SITE FIRE ALARM NETWORK. COORDINATE WITH TELECOMMUNICATION FOR LOCATION OF FIBER OPTIC PATHWAY INTO FIRE PUMP HOUSE. |
| | THE TANK WILL BE PROVIDED WITH A 12" OVERFLOW PIPE IN ACCORDANCE WITH NFPA 22 SECTION 14. AN AIR GAP IN THE FILL LINE TO THE TANK WILL BE USED AS A METHOD | | N. THESE DOCUMENTS DEPICT PERFORMANCE LEVEL ENGINEERING DESIGN CRITERIA TO BE UTILIZED AS GUIDANCE FOR THE PLANNING OF THE FIRE SPRINKLER SYSTEM BY THE CONTRACTOR. PROVIDE COMPLETE DOCUMENTS FOR REVIEW AND APPROVAL FROM A |
| | OF BACKFLOW PREVENTION. THE OVERFLOW LINE INVERT MUST BE ABOVE THE NORMAL TANK WATER SURFACE ELEVATION THAT CORRESPONDS TO THE MINIMUM REQUIRED USABLE CAPACITY. THERE MUST BE A MINIMUM OF 12 INCHES BETWEEN THE TOP OF THE OVERFLOW LINE AND THE FILL LINE DISCHARGE POINT. | MISCELLNEOUS | DRAWINGS, CALCULATIONS, AND ANY ADDITIONAL EQUIPMENT NECESSARY TO PROVIDE A COMPLETE INSTALLATION AND COMPLY WIT LOCAL CODES AMENDMENTS, AND STANDARDS. |
| | | CALCULATION NODE POINT (2 NODES) | |
| | | CALCULATION NODE POINT (1 NODE) | |
| | | NOTE BY SYMBOL REFERENCE | |
| | FILL LINE CALCULATIONS | | |
| В | THE FLOW RATE (Q) REQUIRED TO REFILL THE MINIMUM REQUIRED FIRE PROTECTION WATER VOLUME WITHIN THE TANK IN 8 HOURS PER NFPA 22 SECTION 4.2.1.4 IS DETERMINED BY DIVING THE TOTAL GALLONS OF THE TANK BY THE TIME REQUIRED TO REFILL. Q = [180 000 GAL / (8 HR X 60 MINS/HR)] = 375 GPM | DRAWING REFERENCE | |
| | HAZEN WILLIAMS FORMULA IS USED TO FIND PRESSURE LOSS THROUGH PIPE DUE TO FRICTION (| | |
| | $\Delta P_{\text{FRICTION}} = [4.52 \text{ (L) } (Q^{1.85})] [(C^{1.85}) (D^{4.8655})]$ $\Delta P_{\text{FRICTION}} = HFAD OSS IN PS $ | REFER TO | |
| | L = LENGTH OF PIPE IN FEET = 850 FT + 1,500 FT (EQUIVALENT LENGTH OF FITTINGS) = 2,350 FT C = FRICTION COEFFICIENT = 150 Q = GALLONS PER MINUTE = 375 GPM D = INSIDE DIAMETER OF THE PIPE = 5.349" * I.D. OF 6" FM CLASS 200 HDPE | NUMBER/ RE:A1/F-001 | |
| | $ \Delta P_{\text{FRICTION}} = 16.56 \text{ PSI} \Delta P_{\text{ELEVATION}} = 0.433 (H) \rightarrow H = \text{LENGTH OF PIPE} (ELEVATION CHANGE) \Delta P_{\text{ELEVATION}} = 0.433 (30 \text{ FT}) = 12.99 \text{ PSI} * THE ASSUMED ELEVATION OF THE FILL LINE ENTRY TO THE WATER TANK IS 30 FT. CONTRACTOR TO DETERMINE FINAL LOCATION OF FILL LINE AND DETERMINE FINAL PROPERTY FILL FILL FILL FILL FILL FILL FILL FIL$ | SHEET NUMBER ON WHICH CONDITION IS SHOWN | |
| Grinder_FP.rvt | TOTAL PRESSURE LOSS = 16.56 PSI + 12.99 PSI = 29.55 PSI THE SYSTEM DEMAND AT THE FILL LINE @ 375 GPM = 29.55 PSI THE AVAILABLE SUPPLY BASED ON THE HYDRANT FLOW TEST RESULTS @ 375 GPM = 44 PSI | | |
| _CMDN_OSD_ | THE AVAILABLE WATER PRESSURE FROM THE SUPPLY AT THE REQUIRED FLOW RATE OF 375 GPM IS GREATER THAN THE WATER PRESSURE DEMAND REQUIRED AT THE FILL LINE TO THE TANK. THIS SHOWS THAT THERE IS ADEQUATE PRESSURE AND FLOW TO REFILL THE TANK IN | | |
| 37545N0 | THESE TANK FILLING CALCULATIONS SHALL BE CONFIRMED BY THE CONTRACTOR BASED ON | | |
| (etdyne/D | TINAL DESIGN AND LOCATION OF THE FIRE WATER STURAGE TANK. | | |
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| Autode | | | |

PUMP GENERAL NOTES

- NFPA 13, STANDARD FOR THE INSTALLATION OF SPRINKLER SYSTEMS (2019)
- NFPA 20, STANDARD FOR THE INSTALLATION OF STATIONARY PUMPS FOR FIRE PROTECTION (2022) NFPA 72, NATIONAL FIRE ALARM SIGNALING CODE (2022)
- FM LPDS 3-0, HYDRAULICS OF FIRE PROTECTION SYSTEMS (2010)
- FM LPDS 3-7, FIRE PROTECTION PUMPS (2012)
- SPEC SECTION 213110, FIRE PUMP SYSTEM

FIRE TANK GENERAL NOTES

FOUNDATION PAD.

FOLLOWING:

- -NFPA 22, STANDARD FOR WATER TANKS FOR PRIVATE FIRE PROTECTION (2023) - FM LPDS 3-2, WATER TANKS FOR FIRE PROTECTION (2015) - SPEC SECTION 221216, FIRE WATER STORAGE TANKS
- MORE STRINGENT REQUIREMENT SHALL BE USED.
- D ALARM SYSTEMS IN ARKANSAS.
- E. THE WATER TANK SYSTEM MATERIALS AND COMPONENTS SHALL BE FM APPROVED.
- COMMENCING INSTALLATION.
- FOR FREEZING.
- AND OTHER REQUIREMENTS PROMULGATED BY THE AHJ.

A. THE CONTRACTOR SHALL PROVIDE A 200,00 GALLON WATER STORAGE TANK FOR FIRE-SUPPRESSION WATER AND CONCRETE

ALL SYSTEMS MUST BE DESIGNED IN ACCORDANCE WITH APPLICABLE CODES AND STANDARDS, INCLUDING, BUT NOT LIMITED TO THE

- ARKANSAS FIRE PROTECTION CODE, VOLUME I FIRE (2021 INTERNATIONAL FIRE CODE WITH ARKANSAS AMENDMENTS) - ARKANSAS FIRE PROTECTION CODE, VOLUME II BUILDING (2021 INTERNATIONAL BUILDING CODE WITH ARKANSAS AMENDMENTS

ALL MATERIALS, MEANS AND METHODS SHALL COMPLY WITH APPLICABLE CODES, ORDINANCES, REGULATIONS, AND STANDARDS.

C. IN THE EVENT OF CONFLICTING REQUIREMENTS BETWEEN ICC, NFPA, AND FM GLOBAL, AND/OR OTHER CODES AND STANDARDS THE

THE CONTRACTOR SHALL BE CERTIFIED AND LICENSED TO PERFORM THE ENGINEERING, DESIGN, INSTALLATION, AND TESTING OF FIRE

COORDINATE THE DESIGN, LAYOUT, AND INSTALLATION OF WATER TANK COMPONENTS WITH ALL TRADES AND DRAWINGS PRIOR TO

CONTRACTOR TO DETERMINE AND PROVIDE MEANS OF FREEZE PROTECTION FOR TANK AND ALL ASSOCIATED PIPING WITH POTENTIAL

CONTRACTOR SHALL OBTAIN ALL REQUIRED PERMITS. BEFORE ANY WORK STARTS, SUBMIT AND OBTAIN APPROVAL FROM THE AHJ AND FM GLOBAL. AT A MINIMUM, APPROVAL IS REQUIRED FOR PRODUCT DATA, CALCULATIONS, AND DRAWINGS AS REQUIRED BY NFPA 72

THE LOCATIONS AND POINTS SHOWN ON THE PLANS ARE DIAGRAMMATICAL AND FOR REFERENCE ONLY. THE CONTRACTOR SHALL SHOW THE FINAL INFORMATION ON THE SHOP DRAWINGS AND INSTALLATION SHALL NOT BEGIN UNTIL THESE PLANS ARE APPROVED.

THESE DOCUMENTS DEPICT A PERFORMANCE LEVEL ENGINEERING DESIGN LAYOUT TO BE UTILIZED AS GUIDANCE FOR THE PLANNING OF THE FIRE ALARM SYSTEM BY THE CONTRACTOR. PROVIDE COMPLETE DOCUMENTS FOR REVIEW AND APPROVAL FROM A REGISTERED FIRE PROTECTION ENGINEER AND THE AUTHORITY HAVING JURISDICTION PRIOR TO INSTALLATION. INCLUDE IN THE SHOP DRAWINGS AND CALCULATIONS ANY ADDITIONAL EQUIPMENT NECESSARY, INCLUDING INITIATING DEVICES AND NOTIFICATION APPLIANCES, TO PROVIDE A COMPLETE INSTALLATION AND COMPLY WITH LOCAL CODES, AMENDMENTS AND STANDARDS.

