



ROLF JENSEN & ASSOCIATES, INC.

**WATER SUPPLY EVALUATION
NEW MEXICO PUBLIC SCHOOLS
DIRECTIONS TO PROPOSED ENGINEER OF RECORD
STATE OF NEW MEXICO
PUBLIC SCHOOLS FACILITIES AUTHORITY**

Prepared For:

Public Schools Facilities Authority
State of New Mexico
2019 Galisteo, Suite B
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September 13, 2006
Project H39317

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WATER SUPPLY EVALUATION
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1.0 GENERAL: INSTRUCTION TO THE DESIGN PROFESSIONAL

1.1 Purpose

- A. Prospective engineers of record (engineer) for the design of fire protection including automatic sprinkler, standpipe systems and fire hydrants in public schools shall evaluate and/or prepare the specifications and design documents that assure a proper water supply is available in accordance with the following design and installation criteria. Water supply systems that must be evaluated and/or designed include, but are not limited to the following:
 - 1. Municipal / Local Water Authority Service
 - 2. Dedicated Fire Protection Water Storage Tanks
 - 3. Fire pumps
 - 4. Hydrants
 - 5. Connection of Fire Service Hydrants and Building Suppression to tanks or municipal / local service
- B. These criteria have been developed in collaboration with the State Fire Marshall (State), Public Schools Facilities Authority (Authority) to provide a consistent level of life safety for the occupants of the Public Schools and effective use of the resources of the State to provide this level of life safety. The design professionals responsible for the fire protection systems (systems) shall consider and include all costs and activities described herein in their response to any requests for proposals for design services that include the installation, modification, replacement, or improvement to any system.

1.2 Authority Having Jurisdiction

RETYPE BASED UPON EXHIBIT ONE

- A. Final determination of compliance and acceptability of any system design shall be made by the Authority with advisement and approval from the New Mexico State Fire Marshal's Office (Fire Marshal). The Authority retains all rights reserved for the "Authority Having Jurisdiction" in the applicable codes. Authority policy is for the system installation to be coordinated with local responding fire departments or building code enforcement departments (local agencies).
- B. The intent of these criteria is that the engineer shall, upon commencement of design, become familiar with all specification and design document requirements and comply with these requirements.
- C. In the event of conflicts of either technical, design or format, the engineer shall contact the Authority for final resolution who will coordinate with the Fire Marshal.
- D. Should the engineer be a lower tier member of the project design team, it is not the intent of these criteria to supercede any communications routings or procedures. As is appropriate, the Authority shall communicate with the engineer of the system or the primary design professional for the project.

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- E. The Authority may, at its option, assign or delegate all its responsibilities for document review, inspection, testing and determination of system compliance to the Fire Marshal or local agencies.

1.3 Reference

- A. The applicable codes for systems in new construction shall be:
 - 1. Adopted New Mexico Building Code with local amendments.
 - 2. Adopted New Mexico Fire Code with local amendments.
 - 3. Installation of Sprinkler Systems (NFPA 13), Edition referenced in the fire code.
 - 4. Installation of Standpipe and Hose Systems (NFPA 14), Edition referenced in the fire code.
 - 5. Installation of Stationary Pumps for Fire Protection (NFPA 20), Edition referenced in the fire code.
 - 6. Standard for Water Tanks for Private Fire Protection (NFPA 22), Edition referenced in the fire code.
 - 7. Installation of Private Fire Service Mains and Their Appurtenances (NFPA 24), Edition referenced in the fire code.
 - 8. Standard for the Inspection, Testing and Maintenance of Water Based Fire Protection Systems (NFPA 25), Edition referenced in the fire code.
 - 9. American Water Works Association Standard C800-05 for Underground Service Line Valves and Fittings
 - 10. And all codes and standards referenced therein.
- B. The applicable codes for existing buildings water supply shall be:
 - 1. International Existing Building Code, 2003 Supplement with New Mexico Amendments (New Mexico Existing Building Code).
 - 2. And all codes and standards referenced therein.
- C. Where these design criteria specify conditions for specific exceptions to or additional requirements to the above referenced codes, the provisions of these criteria shall govern.

2.0 DOCUMENTS

2.1 Document Presentation

- A. Fire protection specifications shall be titled “Section 13900 – Fire Protection Systems”.
- B. If a water tank is necessary to meet supply demands, water tank specification shall be titled “Section - Water Tank for Fire Protection Service”.

2.2 Standards Applicable To The Installing Fire Protection Contractors

Specifications shall require that the installation contractor of record shall possess a “Certificate of Fitness” issued by the Fire Marshal.

2.3 Standards Applicable To Fire Alarm Contractor Submittals

- A. As a minimum, all submittals shall be in accordance with NFPA 13.
- B. Specifications shall require the following submittals be received by the Authority prior to the commencement of work by the fire protection contractor.
 - 1. One (1) copy of the transmittal of each appropriate permit application for the system.
 - 2. One (1) copy of the authorization that the installing contractor is a duly qualified representative of the fire protection equipment manufacturer.
 - 3. One (1) copy of the installing contractor’s Certificate of Fitness from the Fire Marshal.
- C. Specifications shall require the following submittals be received by the Authority prior to application for the initial payment for any work performed on the fire protection systems.
 - 1. Reproducible sets of installation drawings. Submittal must be comprehensive of the entire project, complete in all detail, and include, but not be limited to, the following:
 - a) All information and sheets required by the Fire Marshal’s published “Automatic Sprinkler Guidelines”.
 - b) Facility site plans showing water supply including tank and the location of all hydrants, piping, valves and drains. Drawings shall also show underground thrust blocking. Plans shall be AUTOCAD Release 14, 2000, 2002 or 2004 generated. Consult Authority for project specific allowance to omit electronic drawing requirement.
 - c) Calculations showing water supply for any automatic sprinkler systems present. Calculations shall include all piping to supply and all elevation changes.

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- d) Calculations showing hydrant fire-flow requirements for each building on campus to verify largest demand for water supply.
 - e) Include list of all material to be used for the systems. The manufacturer, trade name and catalog number shall be given for each item. Information shall include type of pipe, hydrants, valves, pipe fittings/joining methods, and signage.
 - f) For systems that include a fire pump, drawings shall show power supply connections and/or fuel system provisions for the fire pump, jockey pump, and controllers.
 - g) For systems that include dedicated water tank, drawings shall show details of water tank and interconnection to the system. When required by Authority, design tank with 15% spare capacity.
2. One (1) copy of an approved schedule of values to be the basis for all progress payment requests by the Contractor.
- D. Specifications shall require the following submittals be received by the Authority prior to the request for an inspection for a Fire Marshal Inspection:
1. One (1) copy each of all installation manuals in electronic document format.
 2. One (1) original of the Fire Marshal's "Public School Fire Protection Pre-inspection Checklist." in electronic document format.
 3. One (1) sample copy of the documentation format for recording the fire protection system acceptance test. Test document format shall, as a minimum, comply with the requirements of NFPA 13 and NFPA 25 including the "Contractor's Material and Test Certificate".
 4. Half scale (11 inches by 17 inches) contractor record drawings of the system showing all equipment, controls, piping, valves, drains, supports and tank if provided.
 5. Provide all information not specified as electronic format, in hardcopy and electronic format where possible.
- E. Specifications shall require the following submittals be received by the Authority prior to application for final payment:
1. Copies of all reports for tests and inspections.
 2. All permits and licenses required.

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3. Record drawings of the complete installation to include, but not be limited to information required on the installation drawing submittal. All information shall accurately show the completed installation. Record drawings shall be AUTOCAD Release 14, 2000, 2002 or 2004 generated. Consult Authority for project, specific allowance to omit electronic drawing requirement.
 4. Original warranty documents including, but not limited to, those of the fire protection equipment manufacturer and installing contractor(s). Warranty documents shall reference and be binding to the warranty provisions specified.
 5. Copies of all site hydraulic calculations. Hydraulic calculations shall show a 10 psi safety factor and include all piping to supply and account for changes in elevation.
 6. Service directory which includes the main 24-hour emergency service number and at least three alternate numbers which are monitored on a 24-hour basis.
 7. Three (3) sets of equipment warranties and three (3) sets of operations and maintenance manuals to the Owner.
- F. Specifications shall require that the engineer receive, in writing from the contractor, any proposed substitutions and comments from the local agencies within five (5) working days after the receipt of their comments. Engineer will determine the appropriate actions for response to the comments. The Engineer will involve the Authority if necessary. The appropriate action and response shall be documented in writing.
- G. All substitutions and alternates will have separate documentation including individual review and approval in accordance with the Authority guidelines.
- H. For renovations and additions to existing buildings, Engineer shall receive from the Architect the designated "Level" (per the IEBC existing building code) of renovation for design purposes. Where no architect is involved in the project, the Engineer shall consult the Authority for determination of the appropriate "Level" of renovation.
- I. Engineer shall review for accuracy all submittals required to be received prior to equipment release or installation. The Owner or the Authority shall not be responsible for any additional costs resulting from placement of equipment or materials not reviewed prior to installation.

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3.0 DESIGN

- 3.1 New Construction – New Schools, excluding those designated as “Rural/Small Community Schools”.
 - A. Design for all New School building construction, excluding those designated as “Rural/Small Community Schools”, all fire protection systems shall be as required by the applicable codes adopted by the State of New Mexico and the specifications published by the PSFA. The “Engineer of Record must contact and confirm with the municipal or local water authority that the system well pumps and/or gravity feed capacity can provide the following:

TABLE 3.1

System Type	Minimum PSI on Maximum Flow	Flow in GPM		Duration of Flow in Minutes		Volume of Flow in Gallons	
		Light Hazard	Ordinary Hazard	Light Hazard	Ordinary Hazard	Light Hazard	Ordinary Hazard
Automatic Sprinkler	20	300	450	30	90	9,000	40,500
Stand-Pipe Unsprinklered Building	20	100	250	30	90	3,000	22,500
Stand-Pipe Sprinklered Building	20	100	250	10	30	1,000	7,500
Three or Less Hydrants Unsprinklered Building	20	1,000	1,000	120	120	120,000	120,000
Three or Less Hydrants Sprinklered Building	20	1,000	1,000	40	40	40,000	40,000
Four or More Hydrants Unsprinklered Building	20	2,000	2,000	120	120	240,000	240,000
Four or More Hydrants Sprinklered Building	20	2,000	2,000	40	40	80,000	80,000

- B. Water supply information obtained by the “Engineer of Record” shall be current and satisfactory to the Authority.
- C. For designs for New School, excluding those designated as “Rural/Small Community Schools”, building construction that is unsprinklered, only the requirements for the applicable systems of Table 3.1 shall apply.
- D. In the absence of the “Total Volume” capacities of Table 3.1, engineer shall provide a design for above ground dedicated fire protection service tank(s). Design requirements shall include, but not be limited to the following:

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1. Design and specify water tank installation in accordance with NFPA 22.
2. Design and specify water tank for private fire protection use by school only. The tank shall not be designed to supplement the city or county water supply. Specify backflow prevention device on the filling line for the tank. Unless specifically permitted by the Authority, the tank shall not serve any domestic purpose.
3. Design Tanks with the capacity required by the systems listed in Table 3.1 plus and additional 20%.
4. Maximum tank size shall be limited to 300,000 gallons per campus.
5. Design and specify all supply piping to the building in accordance with NFPA 24.
6. Have documentation provided for the joint inspection of the tank.
7. Acceptance testing shall be in accordance with NFPA 13 and NFPA 25.

B. In the absence of the “Minimum PSI” at the most remote location of the fire protection system, design shall be provide for fire pumps. Pumps design shall be in accordance the applicable codes adopted by the State of New Mexico and the specifications published by the PSFA. Pump design requirements shall include, but not limited to the following:

1. Design and specify fire pump installation in accordance with NFPA 20.
2. Specify electric driven pump in accordance with preference of Authority and Fire Marshal.
3. Provide fire pump in separate independent room separated by 1-hour construction.
4. Design and specify the fire pump test header to be located along an exterior wall to permit water flow directly to the outside at grade. Do not specify the fire pump test header within the building.
5. Design and specify a pressure maintenance pump (jockey pump) in accordance with NFPA 20.
6. Acceptance testing shall be in accordance with NFPA 20. Testing shall be conducted by personnel licensed for fire pump testing. Authorized manufacturer representatives of each fire pump system component shall be present for testing.

3.2 New Construction – New Schools, designated as “Rural/Small Community Schools”.

A. A school shall be designated as a “Rural/Small Community School” for the purposes of this document if it complies with the following:

1. The school maintains a separation of at least 60 feet from any adjacent building structure.

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2. Water service to the building is provided by water source, private, local or city of less than 1000 gallons per minute flow.
 - B. For a fully sprinklered Rural/Small Community School the total water tanks capacity shall be sized to 30,000 gallons for every 100,000 square feet or part thereof.
 - C. For an Unsprinklered Rural/Small Community School the total water tank capacity shall be sized to 60,000 gallons for every 100,000 square feet or part thereof..
 - D. The community or water authority shall make every effort to provide water capacity to meet table 3.1. When capacity exists in a water main adjacent Rural/Small Community School's property, the school shall connect to that system
- 3.3 School Repairs and Alterations – Level 1
- A. If the building or area of repair and alteration does not include the addition of new automatic sprinklers, stand-pipes, hydrants or water based fire suppression then, no water supply evaluation, corrections or additions are required.
 - B. If the area of repair and alteration includes modifications or additions to automatic sprinklers, stand-pipes, hydrants or other water-based fire suppression, then the "Engineer-of-Record" shall provide to the Owner and assessment of the suitability for the water supply servicing the area of the repair or alteration.
- 3.4 School Alterations – Level 2
- A. If the building or area of repair and alteration does not include the addition of new automatic sprinklers, stand-pipes, hydrants or water based fire suppression then, no water supply evaluation, corrections or additions are required.
 - B. If the building or area of repair and alteration includes modifications or additions to automatic sprinklers, stand-pipes, hydrants or other waster-based fire suppression, then the "Engineer-of-Record" shall perform all water supply requirements specified in Section 3.1 or 3.2 as applicable.
- 3.5 School Alterations – Level 3 and Change of Occupancy
- A. If the building or area of repair and alteration does not include the addition of new automatic sprinklers, stand-pipes, hydrants or water based fire suppression then, not water supply evaluation, corrections or additions are required.
 1. If the building or area of repair and alteration includes modifications or additions to automatic sprinklers, stand-pipes, hydrants or other water-based fire suppression, then the "Engineer-of-Record" shall perform all water supply requirements specified in Section 3.1 or 3.2 as applicable.
- 3.6 School Additions

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- A. If the building or area of repair and alteration does not include the addition of new automatic sprinklers, stand-pipes, hydrants or water based fire suppression then, no water supply evaluation, corrections or additions are required.
- B. If the building or area of repair and alteration includes modifications or additions to automatic sprinklers, stand-pipes, hydrants or other water-based fire suppression, then the “Engineer-of-Record” shall perform all water supply requirements specified in Section 3.1.or 3.2 as applicable.

END OF DOCUMENT

DSM/KLG/dsm/smm/alf
H39317 – DESIGN CRITERIA FOR WATER SUPPLY 6-8-06 with PSFA changes.