

## Section 9

### PLUMBING & FIRE PROTECTION SYSTEMS CONSIDERATIONS

It is highly possible the collections and equipment housed within the new Searcy Public Library building will be more valuable than the building itself. Therefore, the building should be provided with a sprinkler system designed for discharged water density and spacing, as prescribed by the National Fire Protection Association (NFPA) Code 13. All code requirements for the State of Arkansas and/or White County and/or the City of Searcy **must** also be met. Provision of a sprinkler system that incorporates safeguards to minimize water damage is imperative.

Plumbing systems should be designed and provided in accordance with the requirements of the International Plumbing and Building Codes and other applicable laws, rules, regulations, codes, and authorities having jurisdiction over the project.

#### PLUMBING FIXTURES

All fixtures should be in compliance with International Plumbing Code, Americans with Disabilities Act (ADA) where required, and good library design criteria. Handicapped accessible fixtures should be provided where required. Tamperproof and vandal resistant hardware should be used throughout. Confer with the library or city staff for detailed information regarding any City of Searcy plumbing fixture preferences.

**Restrooms.** Plumbing fixtures for the public and staff restrooms should include a combination of barrier free and standard wall-mounted flush valve-type vitreous china water closets, counter mounted oval and wall mounted vitreous china lavatories with wrist blade type faucets, and wall-mounted flush valve-type vitreous china urinals. Consider automatic flush-o-meter systems as an option to ADA lever-type handles and flush valve operator. Floor drains should be provided in all restrooms. Depending on LEED implementation, additional water reducing methods of low consumption water closets and urinals should be employed.

**Water Closets & Urinals.** Water closets should be vitreous china, elongated bowl, siphon jet, wall hung on chair carrier with low flow flush valve, and open front solid plastic white seats, less cover. Water closets for use by the physically challenged should be installed a distance above the finished floor to meet ADA and code requirements. Urinals should be vitreous china, wall hung products as described in the *Library Program Building Standard Guidelines* in more detail, mounted the required distance above the finished floor. Fixtures that promote water conservation should be installed.

**Lavatories, Sinks & Mop Basins.** Lavatories should be vitreous china type, recessed in a counter, with a faucet providing 0.5 gallons per minute (GPM) flow restricting aerator and open grid waste. All lavatories should be installed at a constant height above the finished floor to accommodate both the physically challenged and non-handicapped customers. All faucets should accommodate use by people with disabilities. Stainless steel self-rimming counter-mounted sinks should be deployed in the staff work and break rooms. Janitor's closets should be a minimum size of 55 net square feet and include a floor-mounted 24-inch by 24-inch molded stone mop sink basin and a medium duty floor drain with a cast iron grate.

**Drinking Fountains.** Electric water coolers should be wall-mounted, ADA-compliant, bi-level water coolers capable of providing an approximate 9.6 gallons per hour of refrigerated and filtered cold water. Locate drinking fountains adjacent to public and staff restrooms. Push plate operation is suggested. Consider a unit that directs water back into the fountain housing mounted on the wall to prevent overspill.

## **DOMESTIC WATER SUPPLY & DISTRIBUTION**

A complete domestic water system of cold and hot water circulation to all fixtures and equipment requiring such should be provided. A metered water service should be supplied from the municipal water main.

**Domestic Water System.** The domestic water system should extend from the meter to a room within the building. A City-approved reduced pressure backflow preventer device should be installed at any location where domestic water enters the building. No domestic water piping or equipment should be located in the same room as Electrical equipment. A dedicated room shall be provided for Electrical equipment. Exterior water hose connections should be frost-free design, at locations acceptable with a minimum spacing not to exceed 75 feet. The domestic water (potable water) should extend to all plumbing fixtures. All domestic water piping within the facility should be copper and insulated with fiberglass pipe insulation.

**Domestic Water Heaters.** The domestic hot water system should include a centrally located, wall-mounted, gas-fired, low NOx, tankless domestic water heater. The heated domestic water should pass through a thermostatic type water-tempering valve to provide tempered water as required per the City and applicable Codes. The domestic hot water distribution system should include a hot water recirculation system to minimize the amount of time the plumbing fixture user will have to wait for domestic hot water. The domestic hot water recirculation system should include an in-line pump with calibrated balancing valves to adjust water flow through the system when domestic hot water is not being used.

## **SANITARY DRAINAGE SYSTEM**

A complete and minimal maintenance sanitary drainage system to convey soil and waste from fixtures and equipment should be provided. The sanitary stacks should connect to the sanitary house sewers exiting the building and should discharge into the municipal sewer.

**Sanitary Waste & Vent Piping.** Sanitary waste piping should extend from plumbing fixtures located throughout the facility to connections with the utility sanitary sewer systems. Sanitary waste piping located under the ground floor level and above the floor should be standard weight cast iron piping with drainage waste and vent fittings. Cast iron should be used above floor for compliance with smoke development and fire spread rating requirements in plenum spaces designated for use as a return air plenum and for reduced noise generated from piping system use. Any sanitary waste from fixtures below the gravity house drain should be evacuated by duplex sewage ejector pumps discharging into the sanitary house drain.

Vent piping should extend from fixtures, drains, equipment, and sanitary stacks to a point of termination above the roof. All vent piping penetrating the roof should be insulated with fiberglass insulation from the penetration out 10 feet to avoid possible condensation.

## **STORM DRAINAGE SYSTEM**

As the building design requires, a complete storm system conveying storm water from roof drains and/or gutters and downspouts should be provided. Consider water harvesting and/or green roof technologies for the new Search Public Library building.

**Storm Water System.** At flat roof areas exposed to standard roof conditions, storm water roof drainage systems should be internally collected from cast iron dome type roof drains. Additional overflow roof drains, when required, should be piped independently of the primary roof drainage system and should discharge at grade in a visible location with an exterior downspout nozzle. Roof and overflow drainage piping above floor should be standard weight cast iron piping with drainage waste and vent fittings. Cast iron should be used above floor for compliance with smoke and fire development rating requirements in plenum spaces designated for use as a return air plenum and for reduced noise from use of the piping systems. All roof drainage piping should be insulated with fiberglass type pipe insulation with a vapor barrier.

Sump pumps, if required, should discharge to the storm drainage system. Duplex sump pumps should be provided to convey clear storm waste from drains located below the gravity storm drainage elevation. Storm water **must** be managed in accordance with local Watershed Management Requirements, as applicable.

**HVAC Condensate System.** Condensate drain piping from package units should extend to points of indirect discharge into the sanitary sewer systems. Condensate p-traps should be provided at each air-handling unit to reduce losses in air pressure through drain connections at the cooling coils and to accommodate gravity drainage from each air-handling unit. Condensate drain piping should be copper with pipe insulation and a vapor barrier.

**Natural Gas Piping.** Natural gas distribution systems should extend into the facility from a natural gas meter provided and installed by the local natural gas utility company. Each gas-fired appliance or equipment should be provided with a gas shutoff valve and minimum of 6-inch sediment trap prior to connection to the appliance or equipment.

## **FIRE PROTECTION SYSTEM**

The facility should be protected with a dry-pipe fire sprinkler system capable of suppressing potential fire spread throughout the facility. A minimum of 6-inch fire service main should be extended from the utility water main to a dedicated Fire Sprinkler Riser Room within the building. Fire department connections and hose stream demand factors should be in accordance with NFPA 13 and City requirements.

The fire sprinkler distribution system should be designed and hydraulically calculated by a Fire Protection Consultant based on flow and pressure available at the facility and the distribution system routing determined by the Consultant. All fire sprinkler piping downstream of dry-type valves should be black steel, with iron fittings – a minimum of Schedule 10 for the sprinkler mains and Schedule 40 for all branch lines. All Library Materials Return/Drop-Off Areas should be provided with dedicated clean-agent fire suppression system.

The entire system should be installed as a hydraulically designed system. Sprinkler head coverage should be based on Ordinary Hazard Groups 1 or 2, as described in NFPA 13. The architect should specify sprinkler head types as follows:

- Finished areas with hung ceilings may require concealed type heads; and
- Unfinished areas or areas without hung ceilings may be able to utilize upright or pendent type heads, as required by code.

**Fire Standpipe & Fire Pump System.** If required, fire standpipe risers and associated drain risers should be located in stairwells. A complete floor control assembly should be provided at each floor for the sprinkler system. An electric automatic fire pump, jockey pump, and associated controllers and transfer switch designed to deliver the necessary gallons per minute (gpm) should also be provided. Confer with the City of Searcy Fire Marshall for specific requirements.

A separate water service to the fire pump should be provided. This service should be connected to the existing municipal main with an approved back-flow prevention device. A fire pump test header and required fire department connections should also be provided.