

Chapter 25 WATER SYSTEM DESIGN CRITERIA

INTRODUCTION

This chapter presents the criteria, standards and regulations related to the design of water distribution systems for general development service. It does not cover the criteria necessary for design of major transmission lines, wells, pumping facilities, or reservoirs. The material is directed to the competent design professional and is not intended to be a detailed design handbook. Criteria and standards presented are those determined to be the minimum acceptable values necessary to result in system designs having satisfactory functional characteristics, durability and operational suitability. It is expected that the designer will strive for the best design to suit the circumstances involved, and that designs will reflect sound professional judgment at all times.

Section 1. GOVERNING REGULATIONS

Ordinances and policies related to the design and operation of sanitary sewer systems include the following:

A. Regulations and Plans

City of Albuquerque Standard Specifications for Public Works Construction

This document contains the general conditions, material and construction specifications, and construction details required for City public works construction.

American Water Works Association (AWWA) Standards and Specifications

Subdivision Ordinance (R.O.A. 1994, Ch. 14, Art. 14)

This Ordinance primarily requires that water service be available to proposed developments before issuance of building permits. There are no specific design criteria included in this Ordinance. However, the provisions contained in the DPM have the same effect as those in the Subdivision Ordinance. (see R.O.A. 1994 § 14-14-1-10, Rulemaking)

Water and Sewer Rates (R.O.A. 1994, Ch. 6, Art. 4)

This ordinance relates to the revenue system for water and sewer service. This ordinance contains no specific design criteria.

Water and Sewer System Expansion Policies (Council Bill R-390, Enactment No. 20-1984), Adopted by the City Council on February 6, 1984.

These policies are generally to regulate and control the development, extension and expansion, including connection, of water and sewer facilities to serve development in the City and immediate environs. They include policies relating to the distribution of costs for such extensions and expansion.

Master Plan of Water Supply for City of Albuquerque, New Mexico and Environs

This plan establishes the elements of the major water supply, transmission and distribution systems for the City and environs. (Available for review at the Planning Department/Utility Development.)

Uniform Administrative Code (R.O.A. 1994, Ch. 14, Art. 1)

This code adopts, by reference, the New Mexico Uniform Building Code, all technical codes, and all of their amendments for use in the City of Albuquerque. The Uniform Building Code was adopted by the Construction Industries Division of the State of New Mexico on April 8, 1980, with an effective date of June 1, 1980.

Fire Code (R.O.A. 1994, Ch. 14, Art. 2)

This code contains the City adopted policies regulating fire protection.

Cross-Connection Prevention and Control Ordinance (R.O.A. 1994, Ch. 6, Art. 2)

This Ordinance establishes appropriate guidelines for preventing cross-connections with the municipal water system.

B. AVAILABILITY STATEMENTS

(Planning Department/Utility Development Section Administrative Procedure)

A Water and Sanitary Sewer Availability Statement issued by the Planning Department/Utility Development within the past 12 months is required for any proposed development, subdivision plat, or site plan within the City or for anyone contemplating service in Bernalillo County. Availability Statements will identify the water and sanitary sewer infrastructure needs (public/private; on/off site) to provide a proposed development with services and fire protection. In addition, any time constraints for development plans, or requirement for annexation to receive services, will be identified in the Statement. A request for an Availability Statement should be made as early as possible in the planning of a project to allow sufficient time for response and to enable the developer to include the necessary water and sanitary sewer infrastructure in the project plans.

Detailed procedures and submittal requirements for requesting a water and sewer Serviceability Letter or Availability Statement are provided in Section 1.B of Chapter 24 Sanitary Sewer Design Criteria, DPM Volume 2.

Section 2. WATER LINE DESIGN CRITERIA

A. General Requirements

1. The sizing and routing of Master Plan lines must be coordinated with and approved by the Public Works Department (PWD)/Water Utility Division (WUD) and the Planning Department/Utility Development. Specific requirements for providing water (and sewer) service to any parcel or development will be specifically defined in a "Water and Sewer Service Availability Statement" from the Planning Department/Utility Development. The procedure for obtaining an Availability Statement is outlined in Section 1.B, Chapter 24.

2. Pressure zone boundaries must be considered in the design of all systems.
3. A distribution line must be provided in all streets.
4. Location of lines must be according to Primary Utility Locations, Chapter 24, Figures 24.1 - 24.5. Deviations will require approval of the Design Review Committee (DRC).
6. No dead end lines will be allowed, except by City Engineer approval. All lines must be looped.
5. No property may develop or take service in such a manner that leaves adjacent outlying undeveloped or developed unserved properties without means to obtain service. Line extensions are required to cover all frontage of the property requesting service unless all adjacent properties have other means of being served.
6. No dead end lines will be allowed, except by City Engineer approval. All lines must be looped.

B. Single-Family and Duplex Developments

Sizing requirements are as follows:

1. Typical 6" minimum.
2. A minimum 8" line is required where the system's 6" lines are not interconnected to an 8" at intervals of 1200' or less.
3. Minimum 6" line to any fire hydrant.
4. May allow 4" line into cul-de-sac with a maximum of eight (8) units if there are no fire hydrants on the line.
5. Fire protection may require larger sizing. Determination is made by Planning Department/Utility Development and Albuquerque Fire Department (AFD). (See Sections 7 and 8 for additional information.)

C. Industrial/Commercial and Multi-Family Developments

Sizing requirements are as follows:

1. Typical 8" minimum.
2. Fire protection may require larger sizing. Determination is made by Utility Development and AFD. (See Sections 7 and 8.)

D. Material Requirements

Materials must be in accordance with the current City of Albuquerque Standard Specifications and the Standard Details.

E. Waterline Designations

Designations relate to the function intended for the lines, as described below:

1. Transmission lines are generally lines conveying water from pumping facilities to reservoirs or lines conveying water directly between pumping facilities or directly between reservoirs. Such lines generally may not be tapped for any purpose without specific PWD/Water Utility Division (WUD) approval.

2. Master Plan lines are generally major network distribution lines. They are termed Master Plan because they are designated as specific elements of facilities Master Plans. These lines provide service to local distribution lines and generally may not be tapped for individual service without specific PWD/Water Utility Division (WUD) approval.

3. Distribution lines are generally lines providing local distribution of water and from which individual user service taps are made. Distribution lines stem from Master Plan lines or from other local distribution lines. Both Master Plan and distribution lines are sometimes referred to as "main lines" or "mains."

4. Service lines are lines providing service from the local distribution line directly to the individual user's meter.

5. Collector or Well Collector lines are lines that gather water directly from wells and convey to pumping or other facilities. These lines shall not be tapped for any purpose.

F. Minimum Waterline Depths

Depth to the top of waterlines shall be as follows:

1. Transmission lines shall have 4' minimum cover from top of grade to top of water line.

2. Distribution lines shall have 3' minimum cover from top of grade to top of water line.

3. Channel and ditch crossing depths and details must be reviewed and approved by City Hydrology Division, PWD/Water Utility Division (WUD), Middle Rio Grande Conservancy District (MRGCD) and/or the Albuquerque Metropolitan Area Flood Control Authority (AMAFCA), depending upon jurisdiction for the affected waterway.

G. Thrust Restraints

Thrust restraint design shall conform to the following:

1. Water line tees, bends, valves and fittings must be restrained against thrust forces to prevent movement or failure of the water line.

2. Thrust restraint shall be in accordance with the City of Albuquerque Standard Specifications for Public Works Construction. The designer is responsible for providing, on the construction drawings, an adequate restraining system design for the water line, including minimum length of restrained pipe required in each direction.

H. Water Valve Shut Off Plans

1. Construction plans that specify modifying or adding to, the municipal water system must include a water valve shut off plan, if a shut off is needed to complete the work. Prior to submittal of the proposed shut-off plan, the designer shall field verify the existence and

accessibility of the valves involved in the plan. If any valve(s) is found to be inoperable, the construction plans shall include replacement of the valve(s).

2. At a minimum, the shut off plan will include the following:

a. Schematic showing valve numbers and locations, water line sizes and types, and streets in the shut off area.

b. City valve numbers of all valves that must be closed to accomplish the shut off plan.

c. The following notes:

- "Notify City of Albuquerque, Water Utility Division (WUD) seven (7) working days in advance of needing execution of the water shut off plan. Submit the completed Shutoff Request Form found in the City of Albuquerque Standard Specifications for Public Works Construction.

- Only authorized personnel designated by Water Utility Division are permitted to operate municipal water system valves."

3. The shut off plan must be submitted as part of the construction plan set during the design review process.

Section 3. ALIGNMENT AND EASEMENTS

A. The main lines are to be located within public right-of-way, except as noted below, and aligned in accordance with the Primary Utility Locations Chapter 24, Section 3, Figures 1-5. Water lines must be located so that they can be maintained without disturbing any sidewalk, curb, gutter, structure, or any other utility. For lines within streets, the construction trench is required to be contained totally within the paved roadway.

B. If circumstances require location of water lines in other than the location established by the Primary Utility Locations, written approval of both the DRC and the utilities normally expected to occupy the revised location must be obtained.

Main lines may be located outside public right-of-way only with prior written approval of the PWD, Development Review Board (DRB), or Development Review Committee (DRC) Utility Development representative and only within appropriate easements.

C. If not in public right-of-way, the distribution line must be located as follows:

1. In a paved, permanent access easement, including an easement for the water line, or

2. In a planned, landscaped area with access suitable for maintenance equipment and within an appropriate easement. Trees shall NOT be planted within 10' of the centerline of the water line.

3. If 1 or 2 above are impossible because of prior platting, the location will be handled as a special case.

4. In private streets, Primary Utility Locations apply where possible.

D. Easement Requirements and Restrictions:

1. A permanent easement must be granted for the exclusive use of water and sanitary sewer, unless shared use with other utilities is coordinated and approved in advance by the DRC Utility Development representative. A minimum width easement of 20' is required for a single utility and 25' for water and sewer both within the same easement. Appropriate forms of easement language may be obtained from the Planning Department/Utility Development.

2. A public water and/or sanitary sewer easement granted across private land cannot be split by a lot line. The easement must be contained entirely within a single lot.

3. The following structures and obstructions are prohibited within City water / sewer easements:

a. Buildings

b. Walls and fences that run parallel to, and are contained within, the easement

c. Trees

d. Curb, gutter, and/or sidewalks that run parallel to, and are contained within, the easement

e. Any other structure that would be damaged or destroyed if the utility lines needed to be exposed for maintenance or repair.

E. Where the Primary Utility Locations do not apply, lines shall be located in accordance with the New Mexico Environment Department policy on the proximity of water and sewer lines with City amendments as follows:

a. Sewer lines should be laid at least 10 feet horizontally from any existing or proposed water main. In situations where it is not feasible to maintain a 10 foot separation, the distance may be reduced on a case-by-case basis, if supported by information by the Design Engineer. The water main must be in a separate trench or on an undisturbed earth shelf located on one side of the sewer line and at an elevation such that the bottom of the water main is at least 18 inches above the top of the sewer line.

b. Sewer lines crossing water mains should be laid to provide a minimum vertical separation of 18 inches between the outside of the water main and the outside of the sewer line. This separation should be maintained where the water main is either above or below the sewer line. The crossing should be arranged so that the sewer line joints will be equidistant and as far as possible from the water main (~10 feet).

c. When it is impractical to obtain proper horizontal and vertical separation, the sewer line should be designed and constructed of pressure rated (125 psi), plastic pipe, and should be pressure tested similar to a water line to assure water tightness. When pressure rated pipe is required for a sewer crossing, it shall be installed the entire distance between the adjacent manholes.

d. If local constraints dictate that the water line must be installed near existing sanitary sewer facilities, use concrete encasement in accordance with NMED requirements.

F. The minimum radius of water line curvature is:

Pipe Type	Pipe Diameter	Joint Length (NOM)	Minimum Radius
DIP	4" - 12"	20'	300'
PVC	4"	20'	135'
PVC	6"	20'	190'
PVC	8"	20'	250'
PVC	10"	20'	310'
PVC	12"	20'	370'

Section 4. VALVING

The design of valving within the water system shall conform to the following criteria:

A. Valve Spacing:

- 2600' maximum between in-line valves for Master Plan lines 16" and larger.
- 1200' maximum between in-line valves for lines 14" and smaller.

B. Near the intersection of a branch line connection to a Master Plan line, the branch line must be valved. Near the intersection of non-master plan main lines, all lines but one (1) must be valved.

C. Fire hydrant legs from mains 10" and larger must be valved.

D. The system valving must be arranged so that lines may be shut down with a minimum number of valves and affecting the minimum service area. Valving of the ultimate system looping must be such that no break will disrupt service beyond the next valve location. System valving design should assure that only the immediate area where the break occurs will suffer disruption of water supply and that only one (1) hydrant will be placed out of service.

E. Valve location: Standard location for valves is at the PC/PT of the curb return. Valves for pressure connections of branches to existing water lines at intersections will be dismantled/removed and buried. Avoid locating valves under parking spaces and in intersections.

NOTE: Unmetered fire lines must be valved for PWD use within the street right-of-way with a separate private valve located on private property for use of owner.

F. Valve Types:

- Valves 12" and smaller must be gate valves.
- Valves 14" and larger must be butterfly valves.

G. Valve Sizing:

- All valves shall be the same size as the main lines.

H. Air Relief Valves

No air relief valves or air relief hydrants are required on lines 8" or smaller where there are services on the line. On Master Plan lines and distribution lines greater than 8", sizing and location of air relief hydrants and valves must be coordinated with the Planning Department/Utility Development.

I. Pressure Reducing Valve Stations

The PWD determines the need for pressure reducing valve stations and their locations. The size of the PRV shall be coordinated with the PWD. Station design will generally be in conformance with the Standard Details.

Section 5. SERVICE LINES AND METERS

The following criteria is provided for service lines/meters designs:

- A. The metered service line is public through connection with the outlet of the meter or meter setter.
- B. Sizing of the service line and meter is the responsibility of the requestor or his agent. The Public Works Department (PWD) will, upon request, provide information relative to the flow characteristics of the various available metered sizes. Every meter shall be supplied by its own service line. Any meters larger than 5/8" × 3/4" shall require supporting calculations.
- C. The public portion of the service line including the meter and box may be installed by either of two methods:
 1. The PWD will make the installations subsequent to formal application and payment of all appropriate charges. If so desired, and appropriate, the PWD will also install the meter at this time. This method is most often used for taps to an existing main in a previously developed area where service lines were not stubbed out.
 2. An approved licensed and bonded New Mexico contractor may install the service line and/or meter box under a construction agreement via procedures described in Chapter 5, DPM Volume 1. This method is most often used in new subdivisions where construction of the main line is accomplished under such an Agreement. This method requires an approved set of construction plans.

The design of the entire service line installation must follow the Standard Details for the desired size of meter and line combination. The water mains and service lines must be completed, including flushing and disinfection, and accepted formally in writing before the PWD will install meters. In addition, unless special agreements for phasing have been made, the entire subdivision included in the Construction Agreement has to be formally accepted in writing by the City Engineer before the PWD will install a meter. Upon completion and acceptance of the project, the PWD will install the meter subsequent to formal application and payment of all appropriate charges.

D. Typically meters 2" and smaller are located within the public right-of-way, behind the street curb as shown in the Standard Details.

E. Meters 3" and larger require a permanent easement on the landowner's property.

1. The easement locations and sizes will be determined on an individual basis to suit the circumstances.

2. The easement must be outside areas occupied or possibly occupied in the future by underground or above ground utility systems or street fixtures.

3. The landowner must provide the PWD with three (3) copies of the recorded easement, legal description and certificate of survey before installation begins.

F. Mains larger than 16" are not to be tapped for service connections except as approved by the PWD/Water Utility Division.

1. Generally, only factory-fabricated taps are allowed on concrete cylinder pipes.

2. Taps on existing concrete cylinder pipes will only be allowed for special circumstances and must be approved in writing by Utility Development. The request for approval must include justification for tap; plans for additional valves, if required; and date tap required.

3. Taps to existing concrete cylinder pipes will be made in strict accordance with procedures defined in the Standard Specifications and Standard Details.

G. Meters for any installation may only be installed by PWD subsequent to formal application and payment of all appropriate charges.

Section 6. PRIVATE DISTRIBUTION SYSTEMS

The following guidelines and requirements apply to private distribution design:

A. The private line is that portion past the meter yoke/copper setter for metered service, and on private property for unmetered service.

B. Design, construction and inspection of private distribution systems are coordinated through the Code Administration Division, Planning Department, according to current plumbing codes.

C. Private lines will be inspected by the Code Administration Division within the city limits and by the State Mechanical Board outside the city limits.

D. Private systems must not "loop," that is, connect the same line to the public system at more than one point. When both private domestic distribution systems and fire protection lines are approved for the same developments, the fire protection system may be independent from the private domestic system connection.

1. Backflow prevention from private systems is required in accordance with the Cross-Connection Prevention and Control Ordinance as adopted by the City of Albuquerque.

2. The unmetered fire line is typically public within the street right-of-way to the right-of-way line.

E. Backflow prevention must be provided as follows:

1. Backflow prevention devices are required to prevent cross-connections to the municipal water system or within premises.
2. Requirements for cross-connection prevention are outlined in the "Cross-Connection Prevention and Control Ordinance." The ordinance should be referred to for specific cross-connection prevention requirements.
3. At a minimum, cross-connection prevention is required in the following instances:
 - a. At the service connection to any premise which has an auxiliary water supply or private well.
 - b. At the service connection to any premise on which contaminants or pollutants are handled in such a fashion as to permit their backflow into the consumer's water system.
 - c. At the service connection to any premise where it is physically or economically infeasible to find and eliminate or control all actual or potential cross connections.

Section 7. FIRE HYDRANT CRITERIA

A. General Information

1. Albuquerque Fire Department (AFD) experience, National Fire Codes, Fire Insurance Regulations (Insurance Services Office) and ~~Public Works/Water Utility Division-ABCWUA standards/practices~~ provide the hydrant criteria which is used to determine required protection.

2. Albuquerque's fire prevention policies are required to:
 - a. Attain appropriate fire protection of life and property.
 - b. Achieve orderly development of the fire hydrant protection system.
 - c. Set forth guidelines and rules for development of a fire hydrant system.

These policies are a joint effort of the ~~Planning Department, PWD,~~ and AFD Fire Marshal's Office.

3. Fire hydrants are to be generally installed on mains when water lines are extended, according to spacing criteria that varies according to proposed land use adjacent to the water line. These hydrants may have to be supplemented with additional hydrants when actual development takes place.

Cases also exist where water lines have been extended through undeveloped areas or unplatted land, and hydrants were not installed at the time of water line extension. Necessary hydrants must be installed at the time of adjacent development.

4. Fire hydrants are located within public right-of-way where possible. The type, layout and size of development may dictate location of fire hydrants on private property.

5. Each development must be analyzed for fire hydrant needs. Fire hydrant requirements vary with the size and layout of the buildings, building design and construction materials, and access from and proximity to the public right-of-way.

6. Where private developments require fire hydrants on private property, which benefit no other development, such hydrants shall be privately owned and maintained. Private fire hydrants are typically installed on unmetered, private fire line connections to the ABCWUACity main line. A monthly charge is assessed for private fire lines, per the Water and Sewer Rate Ordinance.

B. General Fire Hydrant Requirements for Fire Protection

1. Definitions:

Residential: single family and two family dwellings, duplexes, triplexes, and mobile homes.

~~Light use Commercial: All buildings not defined above as residential light industrial and shopping centers under 18,000 square feet, and apartments over four (4) units (includes townhouses).~~

~~Heavy use Commercial: large industrial complexes, major shopping centers, and apartment complexes over 18,000 square feet and high rise buildings.~~

2. Hydrant Spacing Requirements

a. Development Areas (Street Measurement, Bonnet to Bonnet)

~~Residential * 950' maximum between hydrants~~

~~Light Commercial 450' to the farthest portion of the building~~
~~Hydrant spacing for commercial developments shall be as required by IFC Appendix C600' maximum between hydrants~~

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~~Heavy Commercial 300' maximum between hydrants~~

* In residential areas and mobile home parks, there shall be one (1) hydrant at each street intersection with intermediate hydrants so that no one home is more than 500' (as the fire equipment travels) from a hydrant.

b. New and Existing Individual Buildings

Distance is measured as the fire equipment travels from the fire hydrant to the structure. All distances given are maximums:

Residential 500'

~~Light Commercial 450' to the farthest portion of the building~~

~~Heavy Commercial 300' to the farthest portion of the building~~
~~Hydrant spacing for commercial buildings shall be as required by IFC Appendix C~~

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3. All Required Fire Hydrants

See ~~pages 25-16 in~~ Section 7.C.3.

C. New Buildings, Building Additions or Building Reconstruction

This portion of the policies applies to buildings for which a City building permit is required, including new construction, additional construction, or reconstruction.

The AFD Fire Marshal's Office shall review development plans at (or prior to) the time of building plan review to determine the fire protection requirements for the development, for the purpose of determining conformity with adopted City codes and criteria for fire flow quantity, and number of hydrants, location and spacing. (Development plans shall include new development, building additions and/or redevelopment.) Once fire hydrant protection requirement(s) are established in writing by the AFD Fire Marshal's Office (via "Fire Hydrant and Instantaneous Fire Flow Requirements" form), ~~Utility Development~~ABCWUA will check these requirements against the ability of the water system to provide these requirements. If the water system can meet the requirements, then the hydrant(s) may be designed and constructed per the appropriate chapter in Volume 1, either Public Infrastructure Improvements, Chapter 5 or Private Infrastructure Improvements, Chapter 6. If the water system cannot meet the requirements, then analysis will be made by the Planning Department/~~ABCWUA~~Utility ~~Development Section~~ to determine what is necessary to rectify the situation (including developer's responsibilities if water system improvements are necessary).

Comment [JC1]: This form is not a part of the DPM, but it would need to be revised to make reference to IFC Appendix B Table B 105.1

2. Hydrants shall be installed in accordance with the ~~ABCWUA~~City Standard Specifications, Standard Details, and policies, and shall be available for use prior to the beginning of development building construction.

3. Hydrants and fire sprinkler lines shall be installed at the developer's expense, including:

- a. Extension of ~~ABCWUA~~City-owned water lines in accordance with ~~ABCWUA~~City Water and Sewer System Extension and Expansion Policies.
- b. Addition of public fire hydrants to existing water lines.
- c. Construction of Private fire lines and private, on-site hydrants.
- d. All costs of incidental items (e.g., removal and replacement of existing improvements).

D. Existing Development Fire Hydrant Deficiencies

This portion of the policies applies to existing developments and buildings.

1. The City shall determine deficiencies in fire hydrant protection located in public right-of-way.
2. Where existing development poses a danger to life and property due to fire hydrant deficiencies existing on private property, the AFD may require deficiency correction. The cost of this type of fire hydrant protection shall be borne by the property owner.

E. Public Fire Hydrant Installation Procedure (City Service Area)

The following procedure has been established to expedite the installation of fire hydrants required as a result of a subdivision or a service request and to insure proper record keeping.

This procedure eliminates the need for a design by a licensed professional engineer, the processing of a SIA, and the need for a formal DRC and Work Order Process. It is intended for use only when no other construction of public infrastructure is required and the City

Engineer/~~Utility Development~~ABCWUA determines that the normal design, review, and Work Order Process is not required. ~~This procedure is for construction within or adjacent to local streets and shall not apply to Arterial or Collector streets unless approved by the City Engineer.~~

1. The owner or contractor must submit plans using the ~~City~~ standard forms to the ABCWUA ~~City Engineer/Utility Development at Development and Building Services~~ for review and approval. Forms may be obtained at Development and Building Services, Plaza del Sol, 600 2nd St. NW. Plans must include: Zone Atlas page number, legal description, and location of fire hydrant(s) relative to nearest property corner or street centerline intersection. Submitter must provide:

- One set of original mylar forms.
- 4 copies of the original forms.
- Engineering fee established for EACH fire hydrant or fire line.
- Names and phone numbers of the project Contractor, Designer/Engineer, and Owner.
- Shut-Off Plan.

2. The DRC Master Scheduler shall assign a project number to the proposed installation.

3. Upon receipt of the Engineering Fee and approval of the proposed installation, the ~~ABCWUA Development Review Engineer~~ ~~City Engineer/Utility Development~~ will forward the approved plan to the Construction Division for review and to assign a city inspector to the project.

4. The Construction Division will forward a copy of the approved plan to the owner or owner's contractor. Prior to construction, the contractor must obtain the necessary permits from the City, County and/or Village. A copy of the approved design must accompany the request for a permit. The contractor must be properly licensed and bonded to do work on the ~~ABCWUA~~ ~~City~~ Water System. This must be verified through the ~~City's~~ Permits office.

Comment [JC2]: May need to be updated.

5. Any soil compaction, asphalt, concrete, or any material testing required by the standard specifications shall be done by the contractor at no expense to the City ~~or ABCWUA.~~

6. Upon construction of the fire hydrant the contractor will obtain the city inspector's approval of the construction, the Inspector will sign the original which will then be forwarded to the Maps and Records Division for As-Built processing.

7. The Construction Engineer will provide the ~~ABCWUA Development Review Engineer~~ ~~City Engineer/Utility Development~~ and DRC Master Scheduler written certification that the construction has been completed and accepted.

8. If the construction does not pass inspection and a revised design is required, then steps 1. through 5. must be reinstated. No plat will be signed or meter released until Construction Division has accepted the construction.

~~(Forms)~~

**Click to view:
Public Fire Hydrant Installation**

Comment [JC3]: Delete these forms from the DPM since the forms change from time to time and there is no need to update the DPM each time one of these forms is revised.

Public Fire Hydrant Instructions—Site Detail
Public Fire Hydrant Instructions—Standard Drawing 2437-A
Public Fire Hydrant Instructions—Standard Drawing 2430-A
(Adobe Reader required to view this image)

Section 8. FIRE FLOW REQUIREMENTS

~~1.A. General~~

~~1. An estimate of the fire flow required for a given fire area may be determined by the formula:~~

$$~~F = 18 C (A)^{0.5}~~$$

~~where A = the total floor area (including all stories, but excluding basements) in the building being considered.~~

~~F = the required fire flow in gpm~~

~~C = coefficient related to the type of construction:~~

~~0.6 for fire resistive construction*~~

~~0.8 for non-combustible construction*~~

~~1.0 for ordinary construction*~~

~~1.5 for wood frame construction*~~

~~* See Subsection B for definitions~~

~~The procedure for determining required fire flow shall be as prescribed in Appendix B of the IFC.~~

~~2. Fire Flow Requirement Tables based on the above formula for several common types of construction have been included in this Section for the convenience of the designer in estimating fire flow requirements.~~

~~3. All required fire hydrants shall provide proper fire flow (minimum of 1000 gpm at minimum 20 p.s.i. residual pressure from the 4-1/2 " outlet).~~

~~4. Fire hydrants are normally attached to ABCWUACity-owned water lines, which are paid for by the developers in accordance with ABCWUACity Water and Sewer System Extension and Expansion Policies. These hydrants are maintained by the ABCWUACity.~~

~~5. Private fire lines, with fire hydrants located on private property, are paid for by the property owner and are maintained by the property owner. A monthly fee is charged for private connections, per the Water and Sewer Rate Ordinance.~~

~~6. The property owner is also responsible for the cost of additional hydrants required because of new development, additional development, or redevelopment. In the event of additional development or redevelopment, the existing development is also included in the fire~~

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hydrant protection analysis, and deficiencies for both existing and new development are required to be corrected.

B. Definitions

~~For the specific purpose of using the fire flow requirement tables which follow, the following definitions apply:~~

~~**WOOD FRAME CONSTRUCTION:** Any structure in which the structural members are wholly or partly of wood or other combustible material and the construction does not qualify as ordinary construction. (Building Types V Non-Rated and V 1-hour)~~

~~**ORDINARY CONSTRUCTION:** Any structure having exterior walls of masonry or other non-combustible materials in which the other structural members, including but not limited to columns, floors, roofs, beams, girders, and joists, are wholly or partly of wood or other combustible material. (Building Types III Non-Rated and III 1-hour)~~

~~**NON-COMBUSTIBLE CONSTRUCTION:** Any structure having all structural members including walls, columns, piers, beams, girders, trusses, floors, and roofs of non-combustible material and not qualifying as fire-resistive construction. (Building Types I and II Non-Combustible)~~

~~**FIRE RESISTIVE CONSTRUCTION:** Any structure that is considered fire-resistive as defined by the Building Code of the City of Albuquerque. (Building Types I, II Fire-Resistive, and II 1-hour)~~

~~NOTE: Heavy timber type buildings (Building Types IV and IV 1-hour) are required to satisfy a number of specific provisions. (See Building Code of the City of Albuquerque.)~~

C. Fire Flow Requirement Tables

~~NOTE: *The following tables are for estimating only; final requirements must be verified in writing by the Fire Prevention Bureau.*~~

~~Click to view:
Wood Frame Construction
Ordinary Construction
Non-Combustible Construction
Fire Resistive Construction
(Adobe Reader required to view this image)~~

~~These charts are designed for quick reference ONLY. Any questions that you might encounter in calculating fire flow requirements should be directed to the Fire Prevention Bureau, Plans Examination Section.~~