MAIN SIZING JUSTIFICATION FORM
FOR 6-INCH MAIN EXTENSION/ REPLACEMENT

(Follow Procedures on page 2)

Project: _____

Location: _____

Design Engineer/Firm: _____

Project Description: _____

Expected Type of Customer Served: ☐ Residential ☐ Commercial ☐ Industrial

Main Extension Information

Length of Proposed 6-inch Main: _____ ft

Number of Lots/ Customers Served by Proposed 6-Inch Main: _____

1. Size of Existing Main(s) at Point of Connection(s): _____ inch
2. Number of Connections to Existing Main(s): _____ Dead-End Main: ☐ Yes ☐ No
3. Static Pressure at Point of Connection(s): _____ psi
4. Anticipated Turn-Over rate within 6-inch Main: _____ times
   Multiply Number of Customers by 190 gpcd divided by the Sum of the Length of Main multiplied by 1.4687 gallons.
5. Required Fire Flow for Proposed Main: _____ gpm
6. Residual Pressure at Point of Connection(s): _____ psi during required fire flow.
7. Available Fire Flow at Point of Connection(s): _____ gpm at 35 psi.
8. Pressure Drop at End/ Middle of Proposed Main: _____ (psi) at required fire flow.
   Utilize Hydraulic Model or Multiply Length of Main by coefficient developed from procedures on back page.
9. Residual Pressure at End/ Middle of Proposed Main: _____ (psi) at required fire flow.
   Should be greater than 35 psi
10. Engineers Statement of Justification:

Signature: _____ Title: _____
Engineer

Note: Attach Sketch of Main Extension

MAIN SIZING JUSTIFICATION FORM
FOR 6-INCH MAIN EXTENSION/ REPLACEMENT
(Procedures for 6-Inch Water Main Extension/ Replacement)

1. Determine size of existing main at each point of connection(s) the new main makes with the existing distribution system.

2. Determine the number of connections the new main will make to the existing distribution system.

3. Determine Static Pressure at point of new connection(s) using field data or hydraulic model information.

4. Determine the anticipated turn over rate within the proposed 6-inch main by using the following equation:

   Turn Over = (Number of Customers * 190 gpcd) / (Length of Main * 1.4687 gallons)

   (*Note: 1.4678 gallons is calculated from the Volume of 1 ft of the 6-inch main times 7.48 gallons)*

5. Determine Required Fire Flow for the main extension using information provided by the applicant/developer or use Table A

6. Determine Residual Pressure at point of new connection(s) assuming required flow as determined in Step 3. *(Information should be taken from Hydraulic Model or Field Tests.)*

7. Determine Available Fire Flow at point of new connection(s) at a residual pressure of 35 psi. Use field fire flow tests, if unavailable utilize the Table B for flow rates of existing mains based on main sizes and a velocity of 7 fps.

8. *Determine the pressure drop during fire flow conditions within the proposed 6-inch main by using the hydraulic model or by multiplying the length of the proposed main by the Coefficient listed in Table C. (*If main is served by more than one connection then use the mid-point of the proposed main to determine the length of proposed main.)

9. Calculate Available Residual Pressure at end (or middle of main if more than one connection) of proposed main by using the hydraulic model or by subtracting the Residual Pressure at the point of connection by the calculated pressure drop in Step 6. (*Verify that Available Residual Pressure of proposed main is greater than 35 psi.)*

10. Provide justification for the use of the 6-inch main within the text box. This justification should include references to the information provided within the form.

TABLE A – Required Fire Flow				
Residential Development			Commercial	Industrial/ School
Distance between buildings			2,000 gpm	3,500 gpm
31’ to 100’	11’ to 30’	10’ or less		
750 gpm	1,000 gpm	1,500 gpm		

TABLE B – Available Flow (assuming main velocity of 7 fps)					
Main Size	6-Inch	8-Inch	10-Inch	12-Inch	16-Inch
Available Flow	625 gpm	1,100 gpm	1,700 gpm	3,125 gpm	5,500 gpm

TABLE C – Pressure Drop Coefficients on 6-inch Main					
Required Flow	750 gpm	1,000 gpm	1,500 gpm	2,000 gpm	3,500 gpm
Coefficient *(psi/ft main)*	0.0196	0.0264	0.068	-	-