HYDRANT FLUSHING AND PRESSURE TESTING

WHAT DOES THIS MEAN?


NATIONAL GEOGRAPHIC
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TOP SHOTS, MARCH 2012
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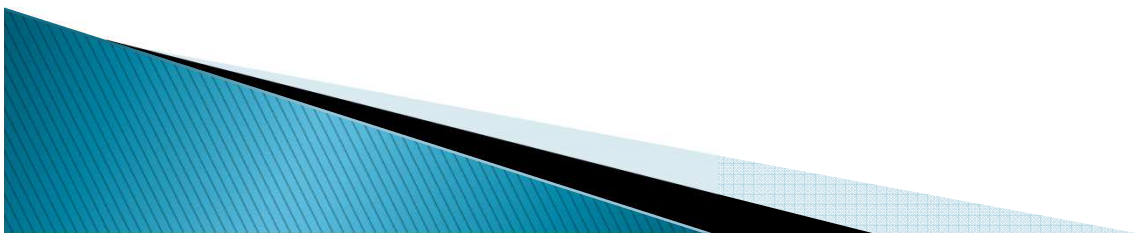
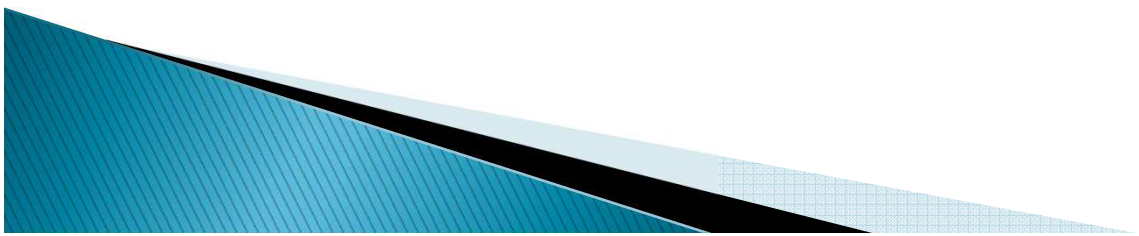
WHY FLUSH HYDRANTS?

- TO REMOVE SEDIMENT AND DEBRIS FROM THE WATER DISTRIBUTION SYSTEM
- REPLACE OLD WATER (STALE) WITH NEW
- CHLORINE REPLENTISHING
- EXERCISE FIRE HYDRANTS
- EXERCISE VALVES



RECOMMENDED APPROACH TO FIRE HYDRANT FLUSHING

- PUBLIC NOTIFICATION
- FLOOD CONTROL
- MANPOWER REQUIREMENTS



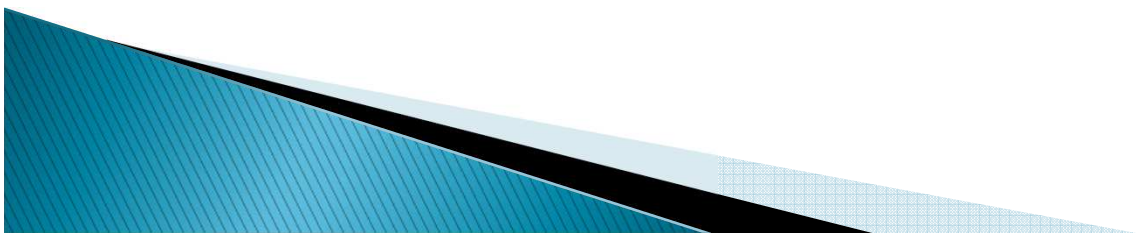
HOW TO DEVELOP AND PERFORM A FLUSHING PROGRAM

- YOU MAY WANT TO INCREASE THE CHLORINE DOSAGE BY .2-.5 PPM IN CASE BACKSIPHNAGE OCCURS IN THE DISTRIBUTION SYSTEM (it will happen)

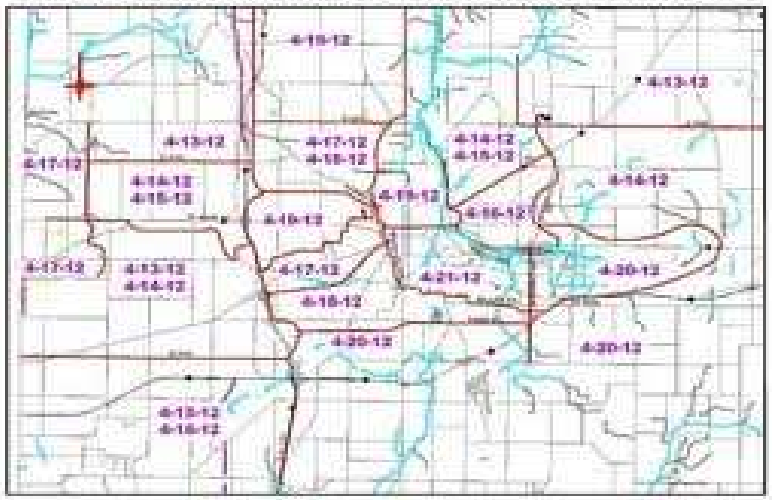
- RECORD THE BEGINNING MASTER WATER METER READINGS

- PURPOSELY OVERFLOW THE STORAGE TANK (to remove debris that has collected in the top layer of the tank)

- UTILIZING YOUR WATER DISTRIBUTION MAP:
- WORK YOUR WAY OUT FROM EITHER PRODUCTION OR STORAGE BY FLUSHING THE LARGER WATERMAINS FIRST
- ISOLATE AREAS AND BACKFEED FROM SMALLER WATERMAINS BY CLOSING DISTRIBUTION SYSTEM GATE VALVES
- AFTER THE LARGER MAINS ARE FLUSHED, BEGIN FLUSHING THE LATERALS AND FINISH THE DEADENDS LAST



SPRING 2012 WATER SYSTEM FLUSHING SCHEDULE

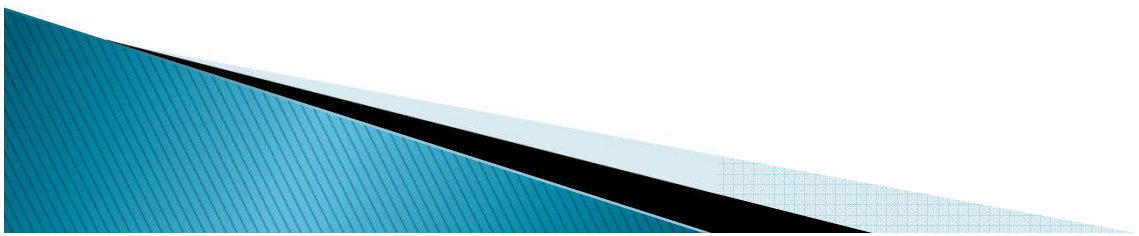


- FLUSH FROM FIRE HYDRANT TO FIRE HYDRANT, THIS WILL CREATE MORE SCOURING POWER IN THE WATERMAIN AND WILL PROVIDE A MORE EFFICIENT CLEANING

- BY CLOSING VALVES, YOU ARE NOW MOVING WATER IN A CERTAIN DIRECTION TO ASSIST IN THE CLEANING ACTION.

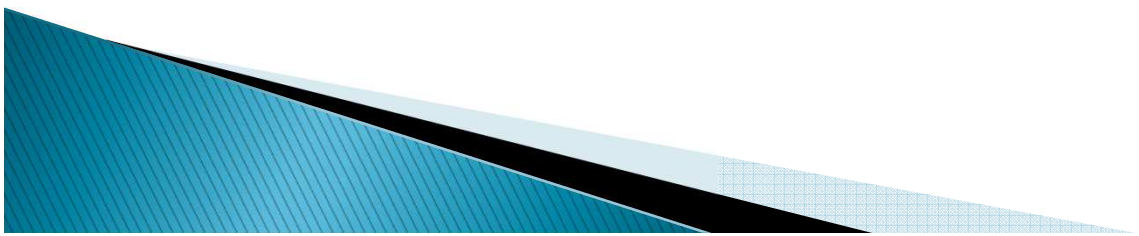
- THIS IS CALLED DIRECTIONAL FLUSHING!

- FLUSH THE FIRE HYDRANT A MINIMUM OF 20 MINUTES TO ASSURE PROPER CLEANING OF THE WATERMAIN
- USE A WHITE CONTAINER TO PERIODICALLY VIEW THE WATER BEING FLUSHED FROM THE FIRE HDYRANT FOR CLARITY AND SEDIMENT
- CHECK THE CHLORINE RESIDUALS TO SEE IF YOU ARE PULLING IN A HIGHER RESIDUAL, THAT WILL INDICATE WATER TURNOVER



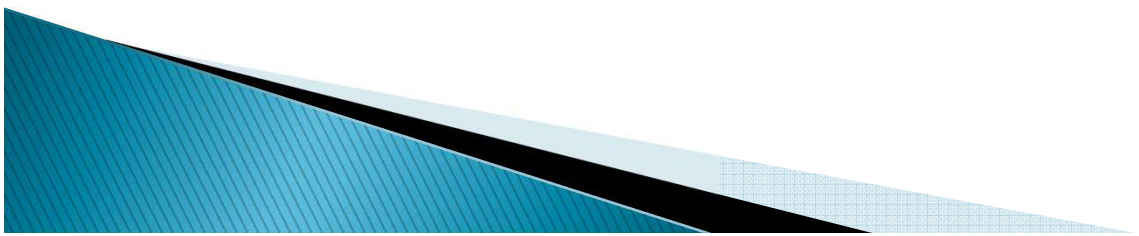
- MAKE SURE THE STORM DRAINS ARE KEPT CLEAR OF LEAVES AND STICKS TO PREVENT ROAD, DRIVEWAY AND GARAGE FLOODING

- USE TRAFFIC CONTROL DEVICES AND WEAR PROPER SAFETY EQUIPEMENT



- WHEN THE FLUSHING IS COMPLETED, RECORD THE MASTER WATER METER READINGS AND SUBTRACT THE BEGINNING READING.

- This will tell us that water produced was used for maintenance and can be subtracted from the unaccounted for water during the annual water audit.

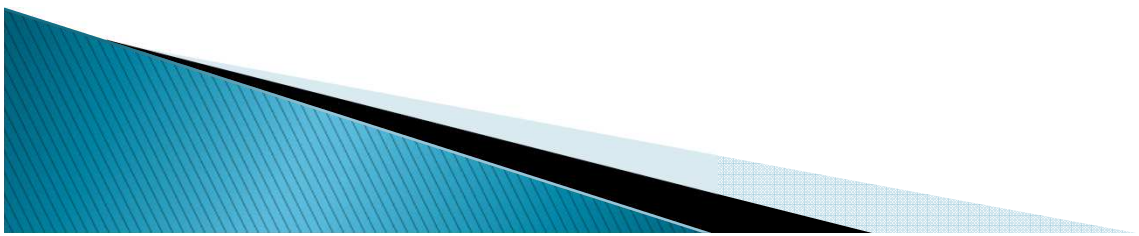


PRESSURE AND FLOW TESTING FIRE HYDRANTS

WHY?

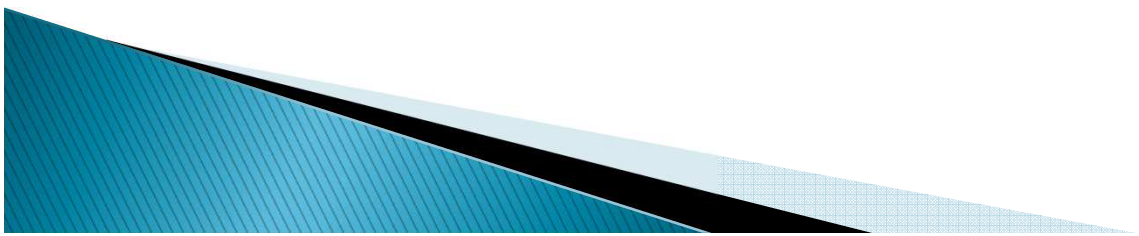
INSURANCE SERVICE ORGANIZATION (ISO)

- COMMUNITY FIRE INSURANCE PREMIUMS ARE BASED ON A ISO RATING
- THE ISO RATING TAKES INTO ACCOUNT THE WATER SYSTEM PRODUCTION, STORAGE AND FIRE HYDRANT FLOWS THAT HELP DETERMINE THE FIRE INSURANCE RATING FOR THE COMMUNITY
- NO FIRE PROTECTION = 10
- RURAL SYSTEMS WITH WATER COLLECTION POINTS WITHIN 1000 FEET OF A DWELLING = 9



ISO CONTINUED

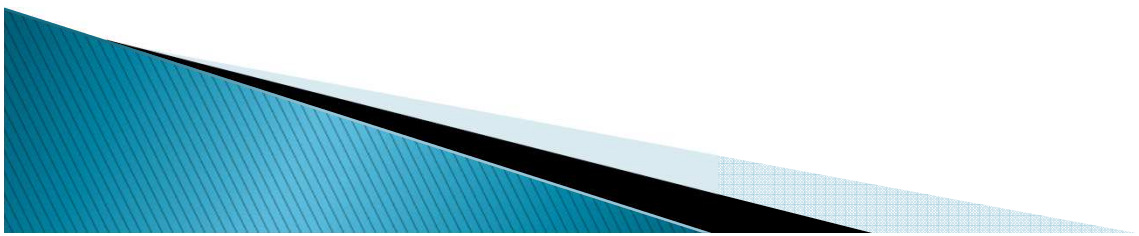
- ISO RECOMMENDS A COMMERCIAL FIRE FLOW OF 2,500 GALLONS PER MINUTE FOR FOUR HOURS AND….
- 1,500 GALLONS PER MINUTE FOR FOUR HOURS FOR RESIDENTIAL AREAS
- CAN YOUR WATER SUPPLY DO THAT?!?



DEQ REQUIREMENTS

- NORMAL MINIMUM WATER PRESSURE IN A DISTRIBUTION SYSTEM CANNOT BE BELOW 35 PSI

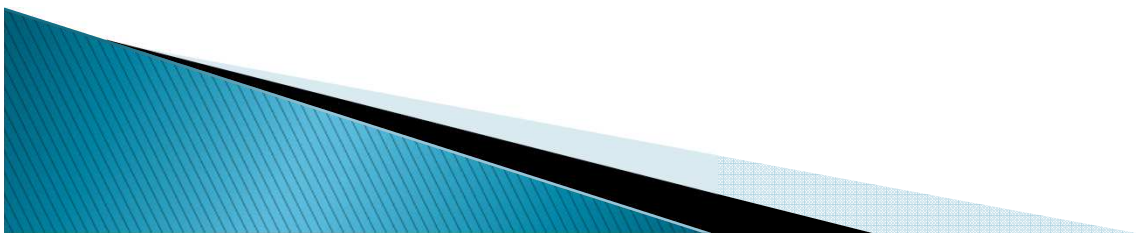
- WHEN A FIRE HYDRANT IS OPENED, THE MINIMUM WATER PRESSURE (RESIDUAL PSI) CANNOT BE BELOW 20 PSI



FIRE PROTECTION

Fire Protection

- 2 Types of fire protection; Public, and Private
- Public: protection available directly from hydrants supplied by the public distribution system.
- Private: protection provided through fire service connections to sprinkler, standpipe, or other special extinguishing systems, or to private yard distribution systems supplying hydrants.

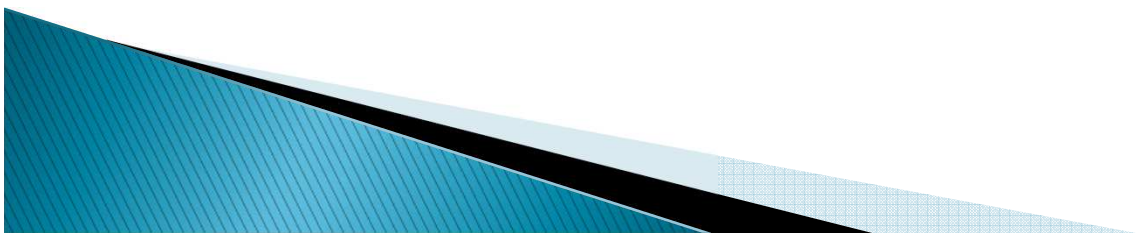


Municipal fire protection

- (1889) National Board of Fire Underwriters (NBFU) initiates municipal fire protection surveys to assist cities with their fire protection problems.
- (1904) The survey work is stepped up after a series of disastrous events occurred in several large cities
- * The results of each survey were reported to the municipal officials and insurance companies that comprised the membership of the NBFU

The Changing NBFU

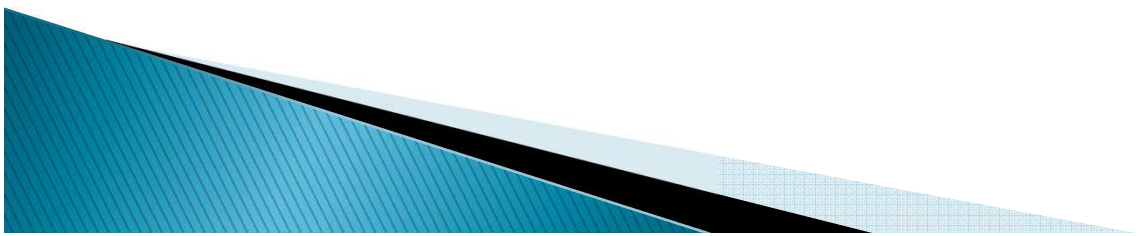
- (1916) NBFU publishes the " Standard Schedule for grading cities and towns of the U.S.
- Applications of this schedule enabled municipalities to be placed in one of ten relative fire protection classes, to be used for insurance purposes.
- This schedule was revised several times from 1922-1956 with amendments in 1963 and 1964



The Changing NBFU

- Shortly after the publication of the last amendment , the NBFU joined two other insurance organizations to form the American Insurance Association (AIA) in 1965.

- (1971) Municipal Survey Division of AIA is transferred to Insurance Services Office (ISO).




FEAR ON TAP
NATURAL GAS LEAK MAKES
HOME'S TAP WATER FLAMMABLE
5:55 MT
MSNBC

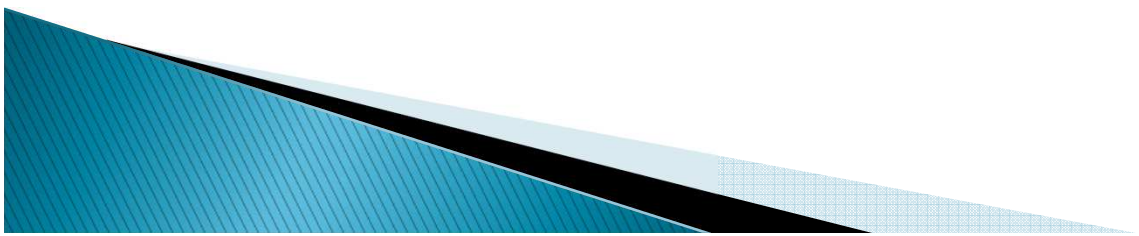
Public Fire Protection

- ISO publishes Grading Schedule for Municipal Fire Protection, to determine relative class deficiency points are assigned for each feature of fire protection in which the municipality fails to meet the established standards.

Fire Flow Requirements

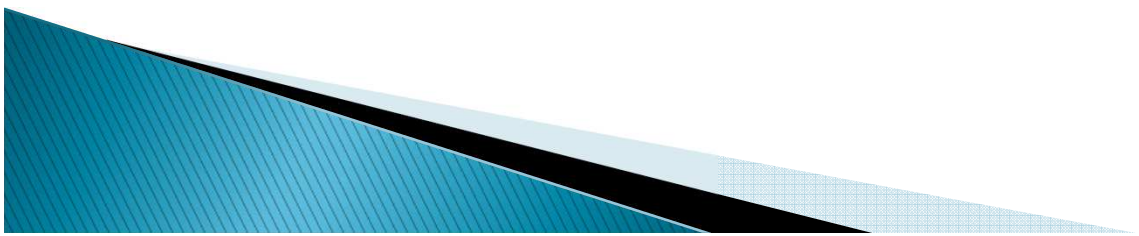
- (1972) ISO publishes Guide for Determination of required fire flow, which can be used for estimating fire flow requirements in any portion of a municipality. Introduced by the AWWA

- (1956) The schedule with a duration of 10 hours is specified for all fire flows of 2500 gpm or more. The duration required decreased progressively to 4 hours for al fire flows of 1200 gpm or less, it is later changed to 10 hours for 10000gpm or more and 2 hours for 2500 gpm or less.



Pressures

- 20 psi is normally specified as the minimum residual pressure. If the pumps in the water distribution system are working
- 75 psi is required for larger cities
- 50 psi is required for smaller cities.



Adequacy of Supply Works

- To be considered adequate under the schedule, a system should be capable of delivering the required fire flow with consumption at the maximum daily rate. (this means water used for drinking, bathing and other uses.)

- Because all water systems are different the specific methods employed to meet these requirements differ considerably.


Ford
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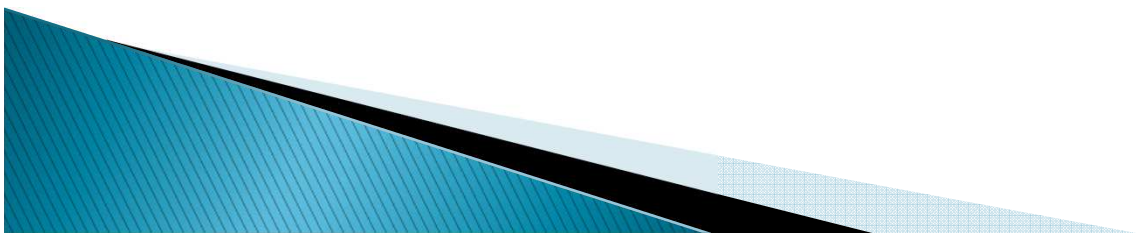
QUE DU SOLEIL

- 1. Provide supply works capacity to meet the total requirements
- 2. Provide supply works capacity equal to the maximum daily consumption rate, with storage on the distribution system capable of meeting the required fire flow for the specified duration.
- 3. Provide supply works capacity in excess of the maximum daily consumption rate. Storage on the distribution system should be capable of supplying, for the specified duration, the difference between the total required rate and the capacity of the supply works.

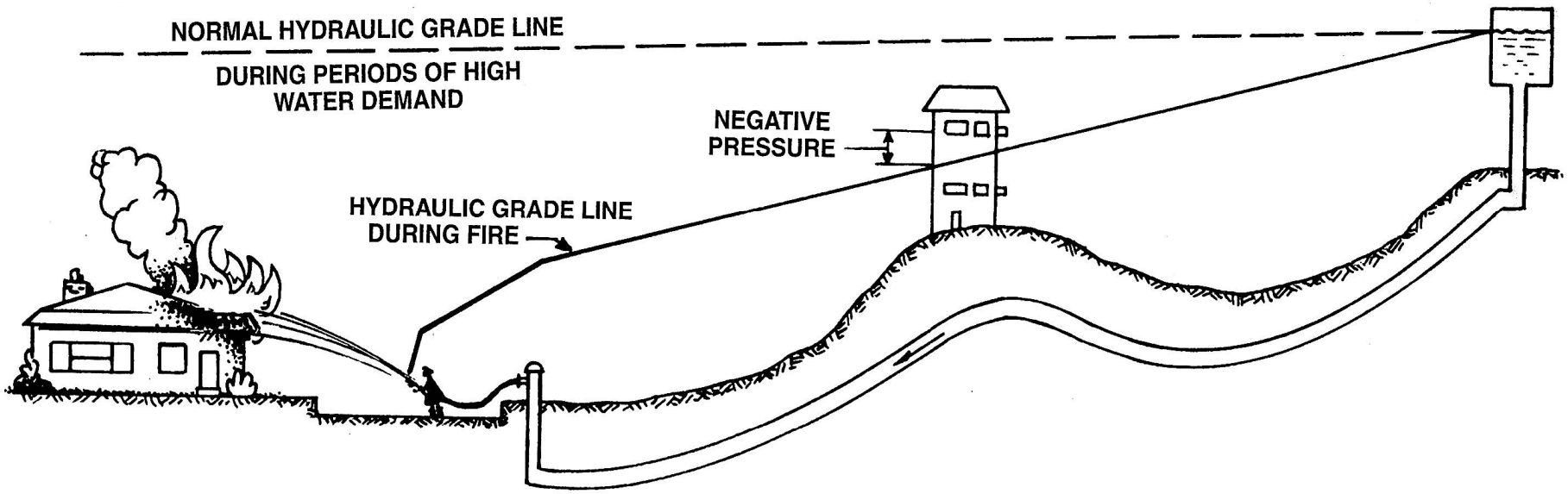


Reliability of Supply Works

- To comply with ISO standards the supply works should be able to meet the requirements not only under normal conditions but also under emergency or unusual conditions.

- To evaluate the reliability of the source of supply consideration is given to such factors as 1. The frequency and duration of droughts, 2. Physical conditions of dams and intakes,3. Danger from earthquakes, floods, forest fires, ice formations,4. Silting and 5. Clogging or increased salinity of wells

Negative Pressure



NOTE: Any fixture or faucet above the hydraulic grade line will be exposed to a negative pressure

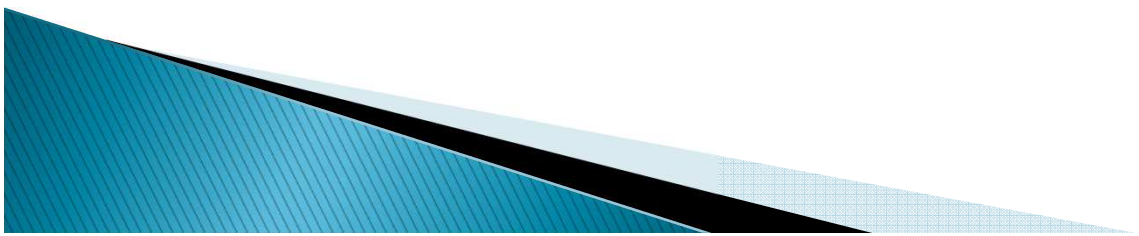
CONDUCTING FLOW AND PRESSURE TESTING

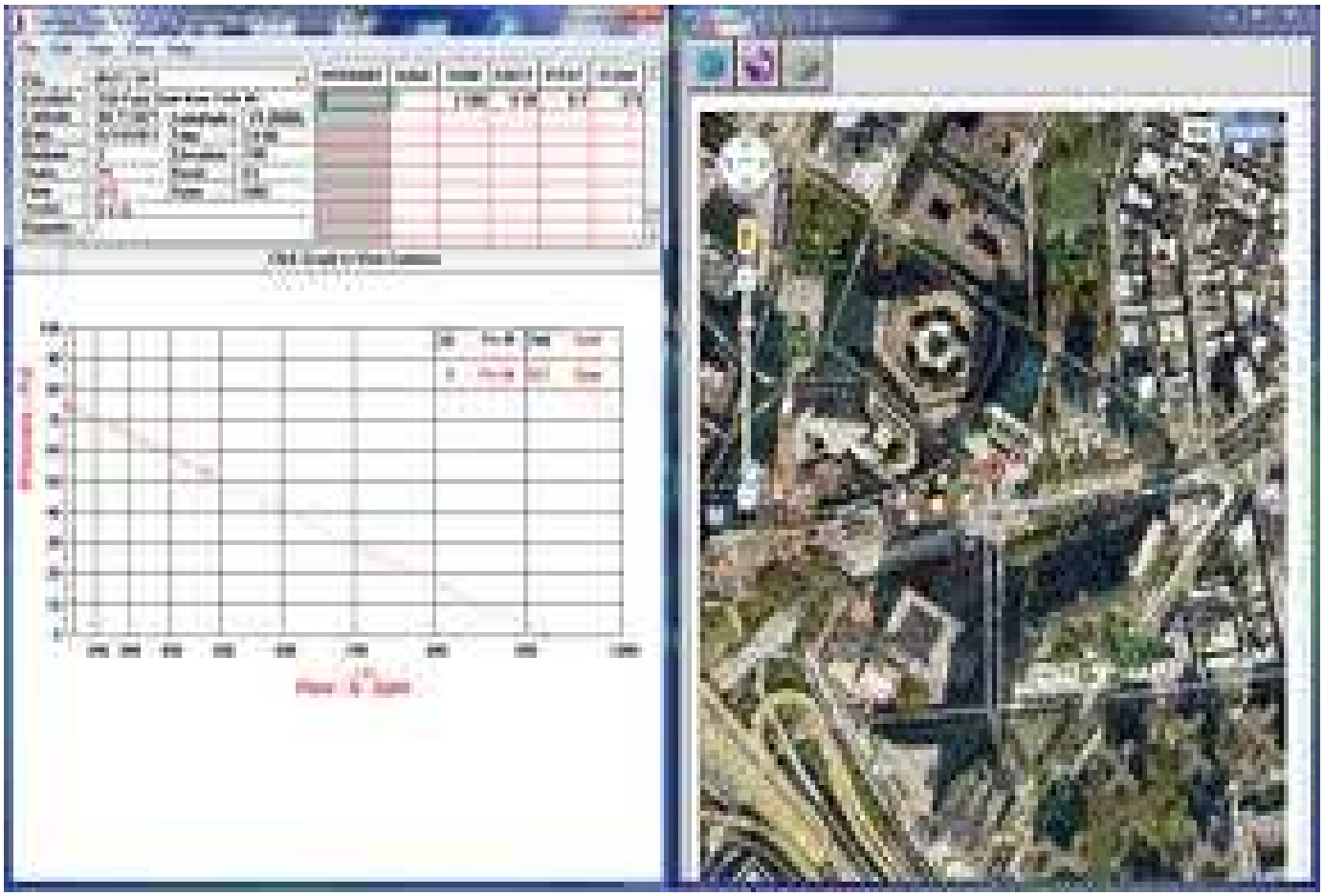
- YOU NEED A PITOT GAUGE AND A FIRE HYDRANT CAP GAUGE

- USING A PITOT GAUGE ON THE FIRE HYDRANT THAT IS FLOWING, THE WATER PRESSURE IS MEASURED
- THE FIRE HYDRANT UPSTREAM OF THE FLOWING HYDRANT MEASURES THE “STATIC WATER PSI” (BEFORE THE DOWNSTREAM HYDRANT IS OPENED)
- AFTER THE DOWNSTREAM HYDRANT IS OPENED COMPLETELY, THE “RESIDUAL PSI” IS TAKEN FROM THE UPSTREAM HYDRANT

- THIS INFORMATION IS ENTERED ONTO EITHER A SOFTWARE PROGRAM OR S SPREAD SHEET THAT CALCULATES HYDRANT FLOW USING THE STATIC AND RESIDUAL PSI

- THE HYDRANT NOZZLE SIZE AND COEFFICIENT (ORIFICE SMOOTHNESS) HAS TO BE TAKEN INTO ACCOUNT TOO





HYDRANT #	H7							
LOCATION:	Harbor Drive West (last Hydt.)							
DATE	9/20/2012							
TEST BY:	Mike smith							
			DATA					
FLOW HYDRANT(S)			Hydrant # 1		Hydrant # 2		Hydrant # 3	
	SIZE OPENING:		2.5					
	COEFFICIENT:		0.9					
	PITOT READING:		18					
	GPM:		**712**					
TOTAL FLOW DURING TEST:			**712**	GPM				
STATIC READING:		78	PSI		RESIDUAL:	28	PSI	
RESULTS:	AT 20 PSI RESIDUAL		**771**	GPM		AT 0 PSI	**905**	GPM
REMARKS: