CURRENT MAIN REPLACEMENT STATUS

Distribution Main Replacement Projects Completed During 1993 -- 2001

Prior to the consolidation on February 1, 2002, the former Arcade Water District had already begun a limited program to replace aging backyard water mains. The water mains in several neighborhoods were replaced as part of Arcade's $62 million capital improvement and replacement program that began in 1996 and continued through 2001. The areas that were selected for main replacement were those that included backyard water mains and main lines that experienced the highest frequency of leaks.

From 1993 through 2001, a total of 13.5 miles of backyard mains were abandoned and replaced with new mains located in the street fronting customer's homes. Main replacement projects completed from 1993 through 2001 are summarized in Table 1.

Distribution Main Replacement Projects Completed During 2004 -- 2007

Following a brief period after the consolidation of the Arcade and Northridge Water Districts in 2002 where there was no construction, a more aggressive program was initiated to replace aging backyard water mains. Starting in 2004 and through the end of 2007, a total of 12.3 miles of backyard water mains were abandoned and replaced with new mains located in the street fronting customer's homes. The projects completed during this time period include the majority of the projects identified as the "twelve (12) problem areas" that were included in *the Capital Improvement Plan, Multi-Year Financial Plan and Water Rate Study*, adopted by the Board in January 2004. This group of projects represented areas in the District with the highest incidences of failing mains and maintenance responses. Leak history and field staff input, regarding leak and maintenance repairs were the primary sources used to identify these problem areas. These were areas that required immediate attention and repair due to deteriorating pipe conditions. The twelve identified problem areas represented the planned replacement of approximately 74,500 feet (14.3 miles) of new water mains.

Distribution Main Replacement Projects Completed During 2008 -- 2011

During this period, the District made the most progress in replacing old back yard water mains and installing new front yard water mains. Starting in 2008 and through the end of 2011, the District abandoned 29.0 miles of deteriorating backyard water mains and successfully installed 33.4 miles of

front yard water mains. The District has also upgraded many old hydrants with new hydrants, contributing to improved fire flows which ensure safer communities.

Distribution Main Replacement Projects Completed During 2011 -- 2014

The District has continued with its progress in replacing primarily old ODS back yard water mains and installing new front yard water mains using DIP. Starting in 2011 and through the end of 2014 the District has abandoned 21.4 miles of deteriorating backyard water mains and successfully installed 24.7 miles of front yard water mains. In the process of main replacement, approximately 2,100 flat rate services have been updated to metered services. These mains continue to improve fire flows throughout the District with the added bonus of new steamer fire hydrants replacing many old wharf hydrants.

Main replacement projects completed from 1993 through 2014 are summarized below in Table 1.

Table 1. Completed Distribution Main Replacement Projects (1993-2014)

Time Period	Miles of Water Main Installed	Average Miles of Water Main Replaced Per Year	Number of Customer Services Switched to New Mains
1993 – 2001	13.5	1.5	1,140
2004 – 2007	12.3	3.08	1,183
2008 – 2011	33.4	8.34	2,344
2012 – 2014	24.7	8.23	2,110
TOTALS	**83.9**	**--**	**6,777**

In addition to these main replacement projects, in the late-1990's a total of 12.1 miles of new distribution mains (8-inch) were installed parallel to new transmission mains (24 inch) in various streets. In many cases the distribution main was installed at the same elevation of the transmission main, making service line connections very difficult and expensive. The current plan is to connect homes to these parallel distribution mains when main replacement projects are completed in the same neighborhoods in the future.

Inventory of Existing Distribution Mains in District

Currently there are approximately 625 miles of water distribution mains (14-inches in diameter and smaller)in the District. A breakdown of the water main type, length in miles and percentage of pipeline material in service in the District is shown in Table 2.

Table 2. Quantity of Distribution Mains in District by Type

Main Type	Quantity (Miles)	% of System
Asbestos Cement Pipe (ACP)	331.6	53%
Ductile Iron Pipe (DIP)	107.8	17%
Galvanized Steel (Galv.)	2.6	1%
Mortar Lined Steel (MLS)	48.8	8%
Outside Diameter Steel (ODS)	27.0	4%
Poly Vinyl Chloride (PVC)	86.0	14%
Miscellaneous (cast iron, alum.,& PEP)	21.6	3%
Total	**625.4**	**100**

Note: The previous Distribution Assets Management Plan showed 649-miles of distribution mains sized at 14-inches in diameter and smaller. These values show the most current up to date mainline totals in the District.