

The field analysis of restoration on water network for emergency

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Abstract. We have been doing research about the restoration manual for emergency situations and application plan of result data which is obtained from restoration works.

Keywords: Waterworks, water pipe networks, restoration work

1 Introduction

Recently some damage of infrastructure are increasing. These situations are mostly caused by careless of workers or abnormal climate exchange such as earthquake, heavy snow. It could be classified into natural disaster and man-made disaster. It is possible to reduce the amount of damage through the construction activities and systematic maintenance management. But if unexpected disasters which are more powerful than ever occur, the damage will become worse.[4]

So it is essential to developing inspection standard of facilities and emergency restoration system for the above-mentioned emergency situations. We have been doing research about the restoration manual for emergency situations and application plan of result data which is obtained from restoration works.

For the study, there was some contact with several local governments and request for some data about diagnose work of water pipe network. After collecting materials, a work proceeded to gather some result data for the analysis of the physical features and to examine some data of advanced countries in waterworks field and studied about national application plan. Lastly Investigation was made for some equipment which is necessary for the restoration work.

The study is not finished. This is still very much a work in progress. Therefore, it is expected that we could get better results.

2 Contents of research

Table 1. is about the basic information of some kinds of pipes. In the table, there is KS. KS is Korean Industrial Standards about all kinds of products made in Korea.[1] It is possible to find out some information by reading KS. And Fig. 1. is a part of excel files which are made by using gathering data.[2],[3]

Table 1. some kinds of pipes used in Korea.

KS	Pipe	Characteristic
D 3537	Galvanized steel pipe	Carbon steel pipe for pipelines are plated by zinc, use hydrostatic is under the 100mm and it uses mainly water pipe for water supply
D 3623	Corrosion resistance steel pipe	Generally, it uses a waterworks pipe coated white by corrosion resistance welded steel in water supply
D 3565	Wrapped steel pipe	Generally, it uses a steel pipe using hydrostatic under the 100mm waterworks piping
D 3608	Steel pipe coated by an epoxy resin	It is steel pipe coated epoxy resin that used maximum use pressure under 1.0Mpa in waterworks
D 3619	Polyethylene lining Steel pipe	-

지역명	계류(사입)소명	구역 분류명	관위(호)	관세명	기본세명							
					형상(호)	관경(mm)	관종	실내내경(mm)	외관과두께(mm)	외관두께(두께)(mm)	외관부식깊이(mm)	외관부식률(%)
광주광역시	충원	-	31647	1	1986	100	DCIP	99.84	6.2	3.07	0.57	0
광주광역시	지현	-	36915	2	1984	100	DCIP	100.86	7.7	5.84	1	0
광주광역시	지현	-	51985	3	1984	100	DCIP	99.27	4.8	5.72	4	0
광주광역시	지현	-	36935	4	1988	100	DCIP	101.42	6.7	6.74	1.91	0
광주광역시	지현	-	51991	5	1984	100	DCIP	100.5	4.9	5.11	4	0
광주광역시	지현	-	41927	6	1988	100	DCIP	100.83	5.8	5.19	2	0
광주광역시	지현	-	36886	7	1988	100	DCIP	100.39	6.4	3.2	1	0
광주광역시	지현	-	36846	8	1988	100	HI-SP					
광주광역시	충원	-	20290	9	1985	100	DCIP	100.48	9.2	5.12	5	0
광주광역시	충원	-	40637	10	1999	100	HI-SP					
광주광역시	충원	-	40638	11	1999	100	HI-SP					
광주광역시	지현	-	34178	12	2000	150	HI-SP					
광주광역시	지현	-	34187	13	1992	100	DCIP	101.31	6.4	3.04	1.2	0
광주광역시	지현	-	44715	14	2001	180	HI-SP					
광주광역시	충원	-	86834	15	2004	80	HI-SP					
광주광역시	충원	-	53190	16	1985	75	GSP	78.55	6.93	0	5	4
광주광역시	지현	-	39019	17	1984	150	DCIP	154.09	7.5	4.88	2	0
광주광역시	지현	-	39074	18	1984	150	DCIP	154.15	7.54	4	2	0
광주광역시	지현	-	39825	19	1984	150	DCIP	153.3	7	4.1	2	0
광주광역시	지현	-	44799	20	1981	100	DCIP	101.51	6.45	3.12	1	0
광주광역시	지현	-	50411	21	1989	100	DCIP	108.74	8.85	4.85	2	0
광주광역시	충원	-	17114	22	1985	200	ZIP	202.69	8.7	1.85	2	1
광주광역시	지현	-	51371	23	1988	100	DCIP	100.4	7.04	3.79	2	0
광주광역시	지현	-	51406	24	1985	100	DCIP	106.89	7.29	3.88	2	0
광주광역시	덕남	-	15931	25	1994	100	DCIP	100.18	6.69	4.32	1	0
광주광역시	덕남	-	58504	26	1992	100	DCIP	100.05	6.6	3.21	1	0
광주광역시	지현	-	19078	27	1985	100	DCIP	101.3	6.59	2.9	1	0
광주광역시	충원	-	95651	28	1984	100	DCIP	101.26	9.21	5.34	3	0
광주광역시	충원	-	23771	29	1993	100	DCIP	98.64	7.41	3.24	1	0

Fig. 1. An excel file made by using gathered data from local government. All local governments do research for waterworks. After research they make a report for maintenance work.

2.1 Rapid restoration manual for water pipe networks

Rapid restoration manual for water pipe networks is a guideline divided into two types which are type of disaster and strength. The type of disaster is divided into

natural disaster and man-made disaster. Additionally natural disaster is separated into three groups. And man-made disaster is separated into two groups. The strength of disaster is divided into 3 levels. But if it is impossible to divide into 3 levels, using 2 levels is suitable. Fig. 2. is rapid restoration manual programmed effectively.

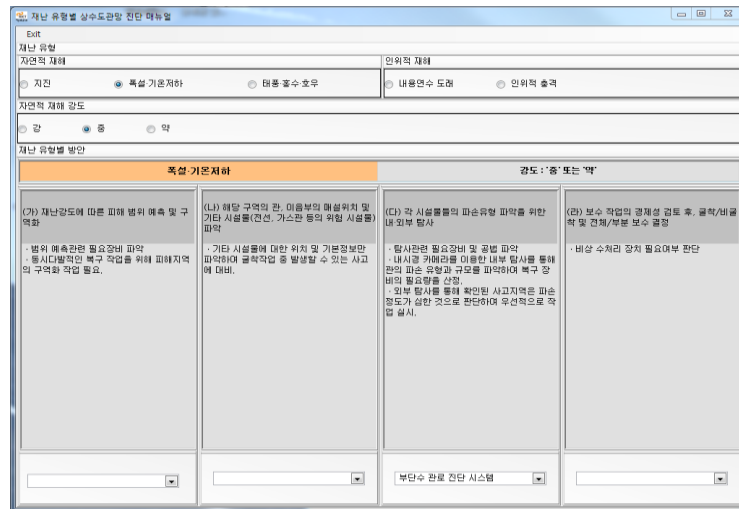


Fig. 2. Rapid restoration manual for water pipe networks. The program is made by using gathering data.

2.1 Date-Base for feedback of restoration work results

The Data-Base is developed to utilize reference materials. This data-base has many kinds of contents about situation of restoration. So it could be possible to search related work results in case of necessity.

3 Conclusion

These manual program and data-base need management consistently. So it is necessary to come into wide use. But before that, it is required to do field test additionally for reliability development about the manual program and data-base.

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