SECTION 8

COLLECTION SYSTEM CONDITION ASSESSMENT

8-1 INTRODUCTION

The City of Manhattan Beach (City) established a program to begin CCTV inspections of its approximately 86 mile long sewer collection system. The scope of the Master Plan included inspections of 227,714 feet (43.1 miles) of pipe or 52.9 percent of the total system.

Condition assessment of the inspected gravity sewer pipes and manholes is presented in this section. The procedure followed to complete the assessment of the gravity sewers is as follows:

- a. Conduct CCTV Inspections.
- b. Review information provided by the CCTV contractor.
- c. Prepare a database summarizing the findings of the CCTV reports and recordings.
- d. Prioritize the CCTV recordings per the database summary to select a list of reaches with numerous or significant defects of representative types. Consider operation and maintenance issues separately and identify additional hotspots for the City's review.
- e. Select representative reaches of the system to review the CCTV recordings in detail to ensure compliance with CCTV standards and procedures and further prioritize the sewers for replacement and/or repair. Verify the completeness of the inspection reports and update the inspection database.
- f. Develop a rating system to identify and prioritize the condition deficiencies, therefore identifying the critical sewer mains in need of rehabilitation and/or repair. Focus on the sewer pipes that are at risk of collapse or prone to more frequent blockages.
- g. Develop an engineer's cost estimate for the rehabilitation/replacement of the sewer mains, including construction cost, design, inspection, administration, and contingencies.

8-2 CLOSED CIRCUIT TELEVISION (CCTV) INSPECTIONS OF GRAVITY PIPES

Empire Pipe Cleaning and Equipment, Inc. (Empire) performed video inspection work on approximately 222,714 feet of pipe between October 2008 and August 2009. Seventy-six (137) DVD's with inspection reports for 1,200 reaches of sewer were produced by Empire. Each inspection report lists the service connections and deficiencies by location in the inspected pipe. Photographs of the identified deficiencies are included in the inspection reports.

The locations of City sewers with completed CCTV inspections are shown on Figure 8-1. The CCTV inspected sewer pipes range in size from 6-inches to 15-inches in diameter. The majority of the pipes inspected is 8-inches in diameter and made of vitrified clay pipe (VCP).

National Association of Sewer Service Companies (NASSCO) Pipeline Assessment and Certification Program (PACP) coding procedures formed the basis of the inspection work and reports prepared by Empire.

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8-2.1 INSPECTION REPORT DATABASE SUMMARY

Initially, a database summary was developed utilizing the CCTV inspection written reports. This database summary contained a tabulation of the deficiencies identified in the written reports, including the following information:

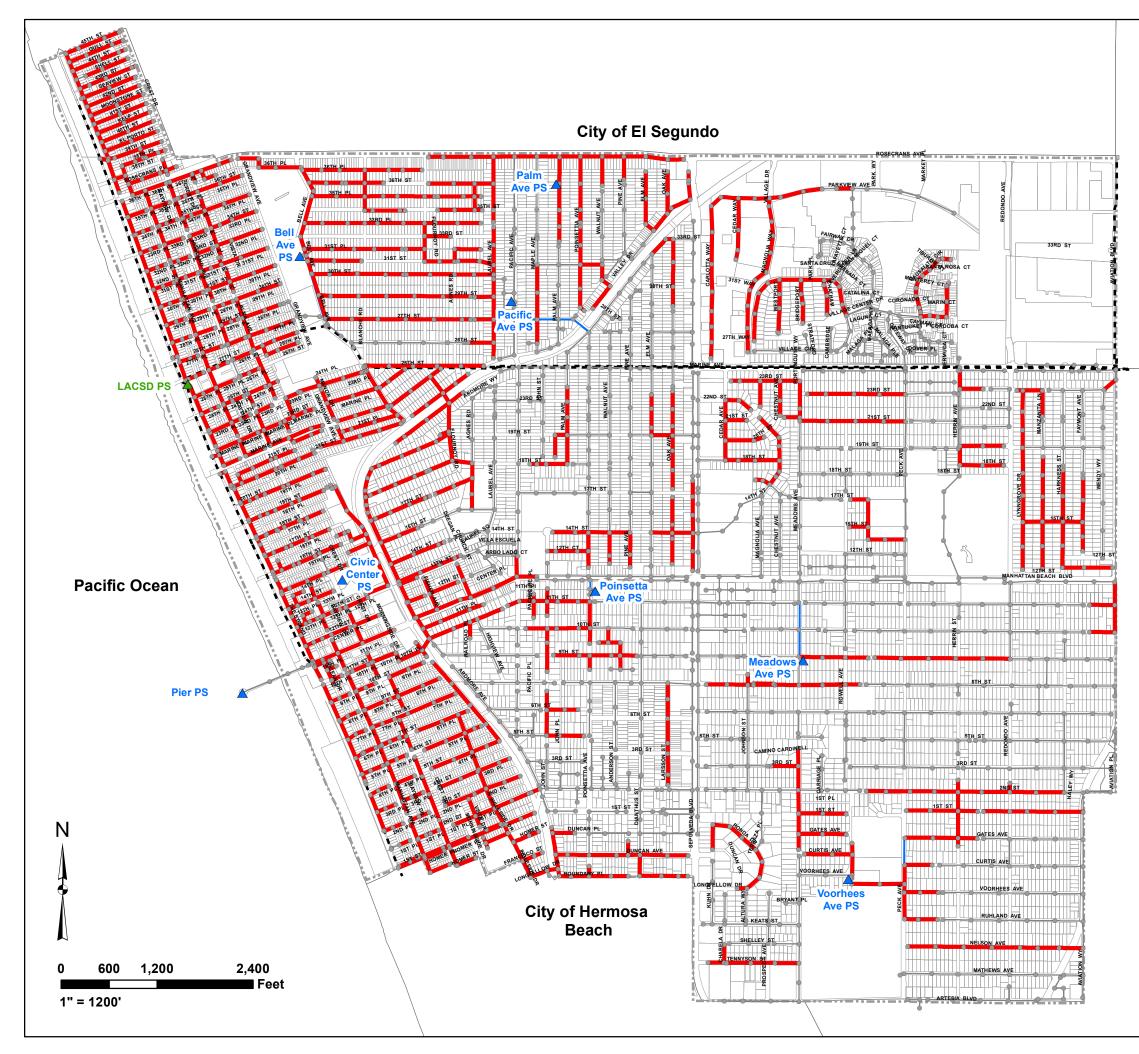
- > DVD Number
- Inspection (Run) Number
- Reversal DVD Number
- Reversal Inspection (Run) Number
- Location (Street Name)
- CCTV Inspection Date
- > Pipe Identification Number
- > Upstream Manhole and Downstream Manhole Identification Numbers
- Direction of Camera
- Pipe Size and Material
- > Atlas Length and CCTV Inspected Length of Pipe
- > Deficiency Tabulation from Written Reports using PACP codes

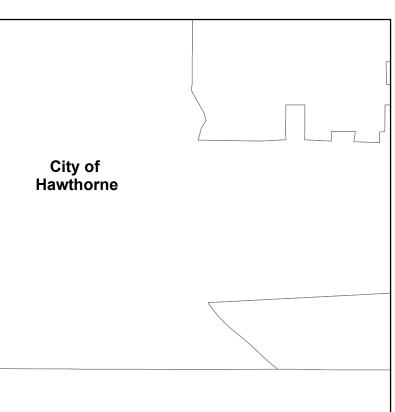
8-2.2 REVIEW OF REPRESENTATIVE CCTV RECORDINGS

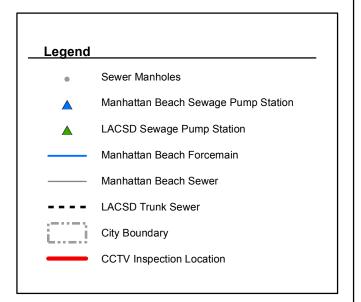
The inspection report database summary was used in selecting the recordings to be reviewed in detail. The pipe reaches selected for detailed review were those that showed the most severe structural problems and multiple deficiencies, as well as severe operation and maintenance issues.

First, the reaches that had listed deficiencies such as deformed pipe, hole in pipe, broken pipe, large offset joint, large obstacles, and ball roots were selected for review. These deficiencies can be a cause of sanitary sewer collapse, overflow or exfiltration into the surrounding soil and may need immediate attention. Next, reaches that had numerous or multiple deficiencies such as fractures, cracks, roots, deposits, obstructions, sags, camera underwater, and survey abandoned were selected. Finally, several reaches without listed deficiencies were selected in order to develop insight into the overall condition of the CCTV inspected system.

Recordings for 264 reaches and 53,789 feet of pipe (23.9% of total inspected) were selected and reviewed in detail. The assessment information of pipes reviewed in detail was incorporated into the original Inspection Report Database Summary. Seventy-two (72) reverse inspections were conducted and are included in the database summary. The reverse set-ups were conducted to complete runs when the camera was blocked for any reason. The length recorded for some of the reaches where reverse inspections were necessary may be shorter than actual due to blockages in the pipe, as sometimes the camera was not able to reach the same point in the pipe from two directions.











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CCTV Locations

8-2.3 CONDITION GRADING

The PACP condition grading system was used to assign a condition rating for structural defects and operation and maintenance defects for each reach of pipe. The rating provides the ability to quantitatively measure the difference in pipe condition between one inspection and subsequent inspections, and to prioritize among different pipe segments. A grade of 1 to 5 is assigned to each defect based on potential for further deterioration or pipe failure. Pipe failure is defined as when it can no longer convey the design capacity. The grades are as follows:

5 – Immediate Attention	Defects requiring immediate attention
4 – Poor	Severe defects that will become Grade 5 defects within the foreseeable future
3 – Fair	Moderate defects that will continue to deteriorate
2 – Good	Defects that have not begun to deteriorate
1 – Excellent	Minor defects

A truly continuous defect is defined as a defect that extends more than 3 feet. A repeated continuous defect is defined as a defect that occurs in a length of pipe in at least 75 percent of the joints (i.e. 3 out of 4 joints).

The equivalent number (quantity) of "truly" and "repeating" continuous defects is calculated by dividing the length of the continuous defect by 5, normalizing the defects for comparison to other reaches. Each unit in the number of defects represents an occurrence of defect or a joint length of defective pipe. This is a PACP standard.

The grade values for the most common defects are shown in Table 8-1. For defects with variable grade values dependent on the degree of deficiency of the defect, an estimated average value was used.

Figure 8-2 shows the number of reaches where an identified deficiency was found at least once within the reach. It provides a general sense of the magnitude of the problems that were found in the City's collection system. The problems identified most often were fine roots (835 reaches, 22% of total), cracks (563 reaches, 15% of total) and joint offset medium (437 reaches, 12% of total).

The structural defect score and O& M defect score is calculated by multiplying the number of occurrences of each defect by its assigned grade and summing them.

The structural defect index and the O&M defect index is calculated by dividing the defect score by the number of defects. It is an indicator of the distribution of defect severity.

Figure 8-3 is a plot of the number of reaches versus the highest deficiency grades found in each reach. For example, there were 218 reaches found with at least one structural deficiency grade of 5 and 4 reaches found with at least one operation and maintenance deficiency grade of 5.

Figures 8-4 through 8-6 illustrate the locations of the reaches with significant structural defects such as broken pipe, holes in pipe, and large joint offsets.

PACP		
Code	Structural Defect Coding	Grade
CL	Crack - longitudinal	2
CC	Crack - circumferential	1
CM	Crack - multiple	3
CS	Crack - spiral	2
FL	Fracture - longitudinal	3
FC	Fracture - circumferential	2
FM	Fracture - multiple	4
FS	Fracture - spiral	3
BSV	Broken - soil visible	5
BVV	Broken - void visible	5
HSV	Hole - soil visible	5
HVV	Hole - void visible	5
JOL	Joint Offset - large	5 ^b
JOM	Joint Offset - medium	3 ^a
JSL	Joint Separated - large	2
JSM	Joint Separated - medium	1
RPZ	Point Repair - other	1
MWLS	Miscellaneous - water level, sag.	2

Table 8-1Defect Codes and Condition Grades

^a PACP grade is 1. Grade was increased for this report, because defect is considered to be major. ^b PACP grade is 2. Grade was increased

for this report, because defect is considered to be severe.

PACP	Operational & Maintenance and Construction	Grada
Code	Features	Grade
DAE	Deposits Attached - encrustation	2
DAGS	Deposits Attached - grease	2
DAR	Deposits Attached - ragging	2
DAZ	Deposits Attached - other	2
DSF	Deposits Settled - fine	2
DSC	Deposits Settled - hard/compacted	2
DSZ	Deposits Settled - other	2
DNF	Deposits Ingress - fine material (silt & sand)	2
RFB	Roots Fine - barrel	2
RFL	Roots Fine - lateral	1
RFC	Roots Fine - connection	1
RFJ	Roots Fine - joint	· ·
RMB	Roots Medium - barrel	4
RML	Roots Medium - lateral	3
RMC	Roots Medium - connection	3
RMJ	Roots Medium - joint	3
RBB	Roots Ball - barrel	5
RBL	Roots Ball - lateral	4
RBC	Roots Ball - connection	4
RBJ	Roots Ball - joint	4
RTB	Roots Tap - barrel	3
RTC	Roots Tap - connection	2
RTJ	Roots Tap - joint	2
IW	Infiltration - Weeper	2
ID	Infiltration - Dripper	3
IR	Infiltration - Runner	4
IG	Infiltration - Gusher	5
OBI	Obstacles - protruding through wall	4
OBJ	Obstacles - wedged in joint	4
OBC	Obstacles - through connection	4
OBP	Obstacles -external pipe cable	4
OBS	Obstacles - build into structure	4
OBN	Obstacles - construction debris	4
OBR	Obstacles - rocks	4
OBZ	Obstacles - other	4
VC	Vermin - cockroach	1
	Tap (Lateral) - factory made defective	2
TB	Tap (Lateral) - break in	3
TBI	Tap (Lateral) - intruding	3
TBA	Tap (Lateral) - active	3
TBB	Tap (Lateral) - abandoned	0
TBC	Tap (Lateral) - capped	2
ISSRH	Intruding Seal Material - ring hanging	4
	Line - left	2
LD	Line - Down	2
MCU	Miscellaneous - camera underwater	4
MSC	Miscellaneous - shape/size change	0
MMC MSA	Miscellaneous - material change	0
NOA	Miscellaneous - survey abandoned	0

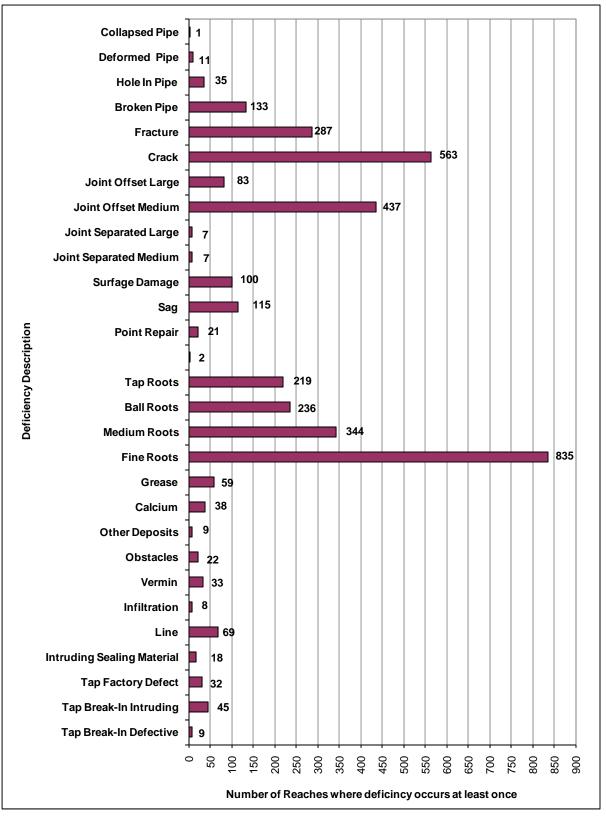


Figure 8-2 Sewer Reaches with Identified Deficiencies

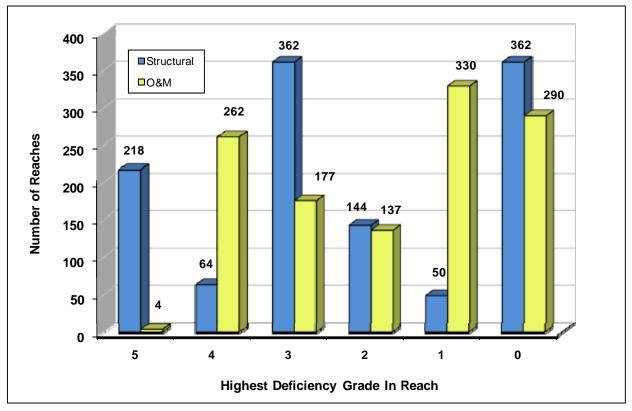
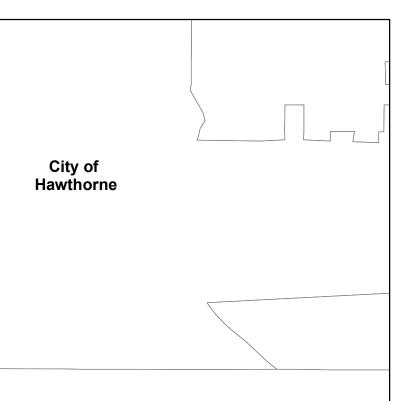
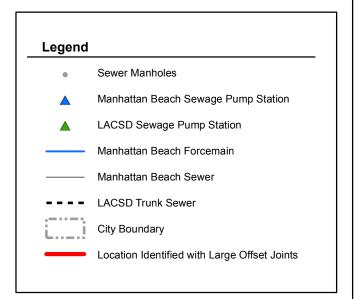


Figure 8-3 Deficiency Grades





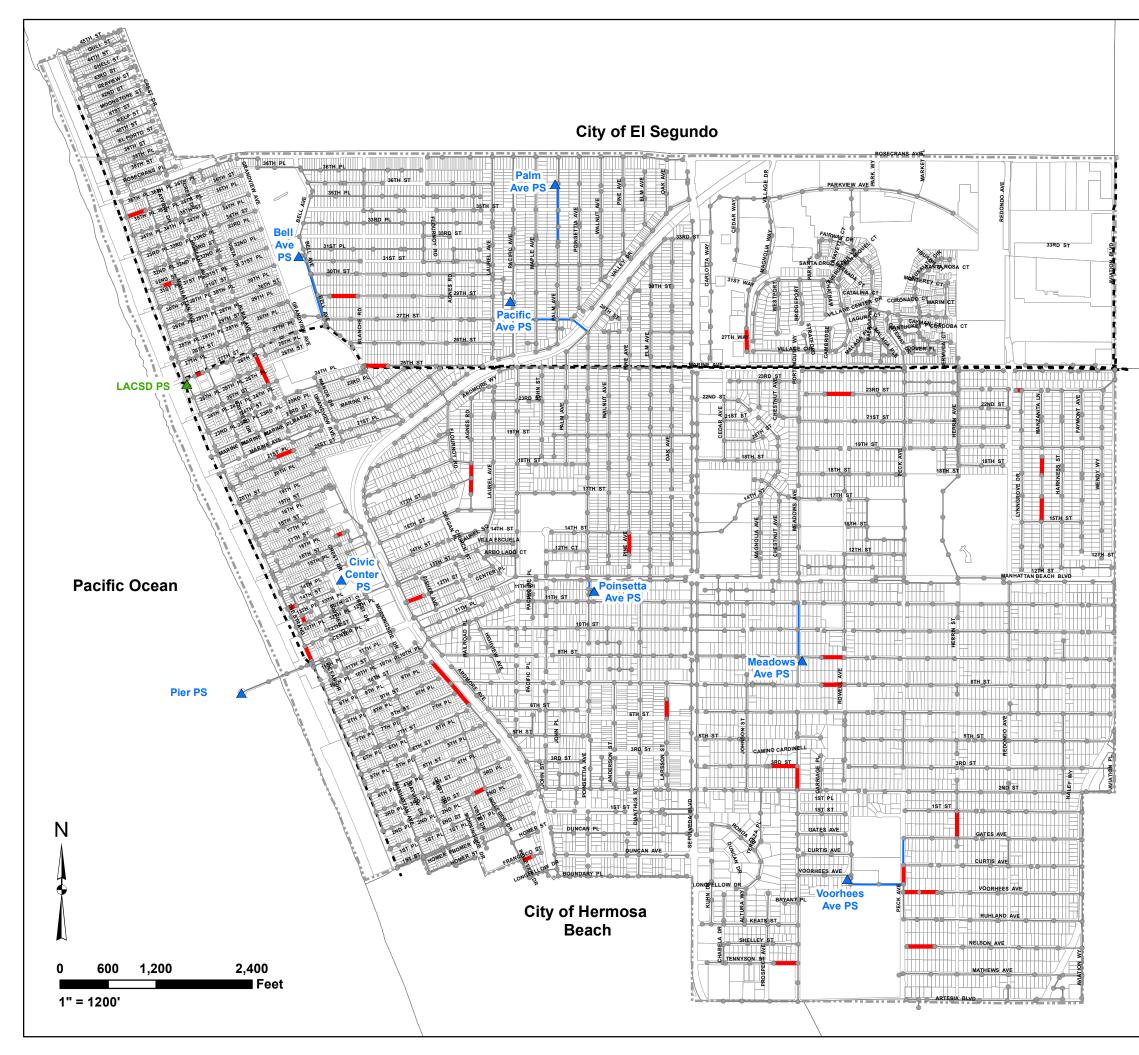


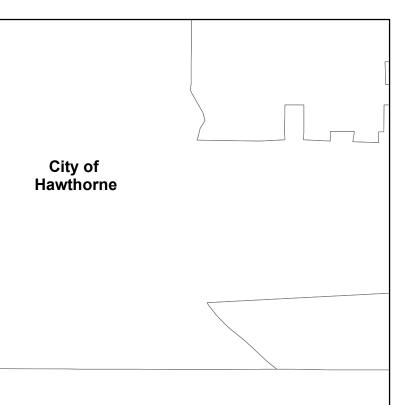


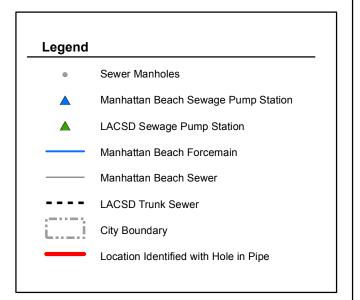


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Large Offset Joints







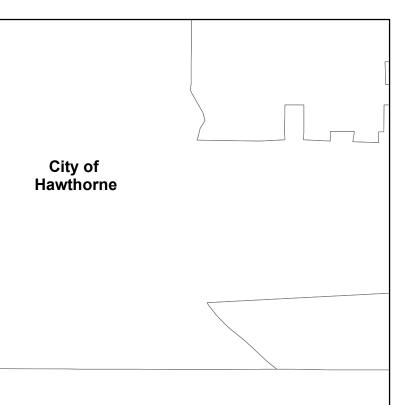


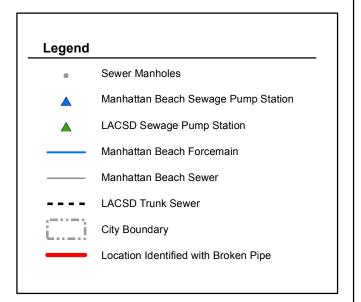


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Holes in Pipe











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Broken Pipe

8-2.4 REHABILITATION AND REPLACEMENT PRIORITIES

The purpose of CCTV inspections is to determine the condition of the City's existing gravity sewers, and formulate a rehabilitation plan for the defective sewers. The defect scores and indexes provide a good indication as to which pipes are in poor condition, but cannot be relied upon solely to prioritize improvement projects. The priorities are selected primarily with consideration of the health and safety of the public and protection of the environment by minimizing the possibility of sanitary sewer overflows and leakage. The pipe capacity, location of particular defects, and the tributary areas/wastewater flow rates are other considerations used in formulating the final capital improvement project priorities.

The initial priorities for improvements to the sewers are based on the severity of the pipe defects. The six (6) categories utilized in this report are as follows:

- a. <u>Severe Condition</u> This category primarily includes structural defects of deformed pipe, hole in pipe, broken pipe, and large joint offsets.
- b. <u>Major Condition</u> This category primarily includes structural defects of multiple fractures, medium joint offsets and major sags. Pipes with a large number of cracks are also included.
- c. <u>Moderate Condition</u> Pipes in this category have fractures, cracks, small and medium joint offsets, and sags.
- d. <u>Minor Condition</u> Pipes in this category have slight sags, cracks, and small joint offsets.
- e. <u>O&M</u> This condition is for operational and maintenance problems and construction feature defects. There are no structural defects.
- f. <u>No Defects</u> This condition is for the pipe with no structural, operation and maintenance or construction feature defects.

Figure 8-7 shows the distribution of the condition priorities assigned to the pipes with completed inspections. Figure 8-8 shows the CCTV locations, color coded by rehabilitation/replacement priority.

The gravity pipe condition inspection summary, sorted by priority is shown in Appendix 5, Gravity Pipe Condition Inspection Summary. Planning level recommendations are included and are based upon the pipe defects reported in the CCTV Inspection Reports and review of select recordings. Actual improvements must be designed based upon further detailed review of each recording, taking into consideration other factors such as location, age and flow capacity of the pipe, existing utilities, and concurrent infrastructure construction projects. The initial priorities are given to the reaches with severe and major structural defects.

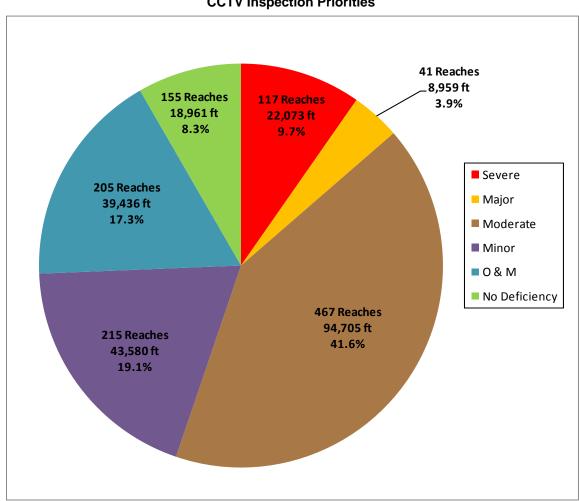
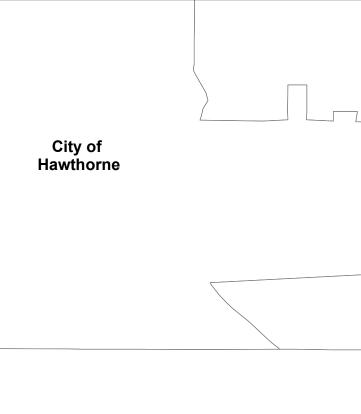
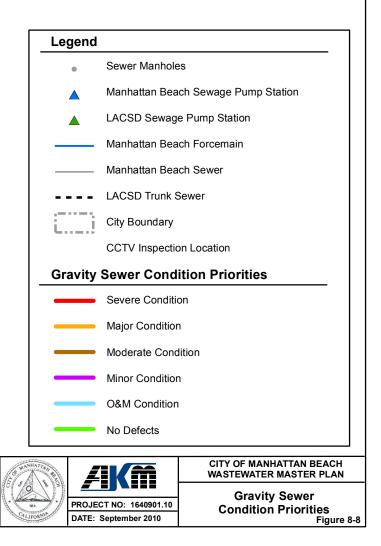


Figure 8-7 CCTV Inspection Priorities

The City of Manhattan Beach will address the "Severe" and "Major" collection system deficiencies. Table 8-2 lists the project priorities assigned to the 87 reaches of collection system identified as in "Severe" or "Major" condition, as well as planning level implementation costs based upon August 2010 dollars. The collection system construction estimates are based upon replacement at \$45 per diameter inch per foot of pipe. Implementation cost is determined by adding 35 percent of construction cost to cover engineering, inspection, and administration. The total estimated cost of upgrading the sewers with severe or major condition priorities is \$15,330,000. This is based on the assessment of 43.1 miles of pipe or 52.9 percent of the total gravity sewer system. Assuming that similar deficiencies will be identified when the remainder of the system is CCTV inspected, the total cost for rehabilitation and replacement of the remaining gravity sewer pipes is estimated at approximately \$13,600,000.







			General Information									Structura	Defect	Cadiaa		5	Severe ar		ible 8-2 or Condi	tion Prio		erationai ar	od Maint					<u> </u>	nstruction	Festures				1	······································	i
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DVD No. Inspectio Reversa	Reversa DVD Wa	Street Name	CCTV Date Pipe ID	Start En	Direction	Size (in) Mat	Length L (ft)	(ft)	CML	CMSV	VV SV	H J VV O M L I 5 3 5	S V ML	D X H P 5 5		C Sags Total Str	Total Str Structur	AGS AE				BLJC	Ball (1 BLJ	3) 1 C G D R 4 5 3 4	OB W Other C Z % 2 4 4	C R	Total O8 Total O8 O&M De	<u> </u>			GT Z SA C		Condition	2 Comments	Minimum Recommendations	Project Replacement Cost (\$)
G312-011 Ph 2 11 G312-011 Ph 2		1ST ST	7/21/09 12025A-12025	12-025A 12-0	025 D/S	6 12 VCP	70	80		1		1		1			3 13 4.5	3		7			1				8 12 2				2	Sev	vere 1	64' Collapsed Pipe & 64.8' BPSV. MSA 64.2' (16.2' from D/S MH) BPV Inspection complete.	V. Spot repair	58,466
G312-003 Ph 2 8	Y	THE STRAND	7/9/09 14070-14071	14-070 14-(071 U/S	6 VCP	181	5			1				1		2 6 3.(0							1 30		1 4 4.0				1	Sev	vere 2	3' BPVV & 5' BPSV. 5' MSA (OBZ=OBI, Another Utility Pipe). Camera blocked by obstacle thru wat RP=RPP.	Replace pipe	65,975
G312-004 Ph 2 2	Y	MANHATTAN BEACH BLVD	7/10/09 14059-14060	14-059 14-(060 U/S	6 VCP	70	144	1	3 1	1	3					9 34 3.1	8 1	1	1					1 30		4 9 2.3					Sev	vere 3	55.4' BPSV (Another sewer line or sewer lateral in the main sewer pipe) & 108.4' BPVV. Inspection report sho Repair Patch at 104.8'. But looks like BPVV. OBZ=OBI	ws Spot repair or Replace pipe	52,634
G312-056 8	Y	26TH PL	1/13/09 20008-20009	20-008 20-0	009 D/S	5 8 VCP	152	161	2		2	2		1			7 27 3.5	9		t 18 1		2 1 3					26 40 1.5					Sev	vere 4	144.2' to 146.6' & 157.1' BPVV. 144. to 146.7' Deformed Pipe Horizontal.	Spot repair 144' to 148 'BPVV & 2' Deformed Pipe. Also Spot repai 157.1' BPVV. Root Treat and Cut.	
G312-006 4 G312-006	06 6 Y	HARKNESS ST	10/27/08 02006-02007	02-006 02-0	007 U/S	5 8 VCP	323	326 1		2	3			3			9 40 4.4	4	1	2 8	1 1	1	1				15 24 1.6	1			2	Sev	vere 5	306.7' to 316' Deformed Pipe (Also BPVV & Continuous Fracture Multipl MSA 311.1' (14.8' from U/S MH) BPV	Pipe V.	ed 158,387
G312-033 5 G312-033	33 6 Y	этн ст	12/5/08 11093-11094	11-093 11-0	094 D/S	6 VCP	271	278	19	3 1		20	1		11		55 161 2.9	9		12	1	1			1 15	5	15 21 1.4				2	Sev	vere 6	55' to 61.5' Deformed Pipe Vertical 8 BPSV 57.8' from DS MH. MSA 137. (140.3' from D/S MH) Obstacle. SAV OBJ		& 101,367
G312-002 7	Y	2ND ST	10/21/08 01082-01083	01-082 01-0	083 D/S	5 8 VCP	296	303 2	2 7 2	1 10	3	3	2			4 :	36 117 3.3	3 100		2						1	102 202 2.0		1			Sev	vere 7	124.5' & 142.8' Deformed Pipe Vertical. 124.5', 142.8' & 150.8' BPV 120' to153.9' Continuous Fractures.	pipe, brvv, a tractures.	147,404
G312-008 Ph 2 1	Y	8TH ST	7/16/09 11099-11100	11-099 11-	100 D/S	8 8 VCP	190	164 2	2 11	2 5	2		1		5	:	30 88 2.9	9	1	18	1	1	2				14 24 1.7	2	2			Sev	vere 8	99' BPVV. 156.3' BPVV & Deformed Horizontal Pipe. S=SAVZ	99' Spot repair & Replace pipe 150' to159'	79,461
G312-008 Ph 2 2	Y	8ТН ST	7/16/09 11100-11101	11-100 11-	101 D/S	8 8 VCP	120	131	11		2		1	1	6	1	21 65 3.1	1		28	1 1						12 15 1.3					Sev	vere 9	124.9 Deformed Pipe Horizontal & BPVV. 126.8' Deformed Pipe Vertica & BPVV. S=SAVZ	I Replace pipe 124.9' to 127'	63,423
G312-021 3	Y	ROSECRANS AVE	11/17/08 07001-07002	07-001 07-0	002 U/S	S 8 VCP	198	185		2				1			3 13 4.5	3		2							2 2 1.0		1			Sev	vere 10		I. Spot repair 148' to 151' to Deformed H. Pipe	90,007
G312-035 1	Y	3RD ST	12/9/08 12031-12032	12-031 12-0	032 U/S	6 VCP	138	16 1	1	2	1			2	1		8 26 3.5	3		1		1					2 4 2.0				1	Sev	vere 11	15' to 15.8' Deformed Pipe Horizonta x BPVV. 15.8' MSA (BPVV). U/S MH is possible C/O. SAVZ	A Spot repair or Replace pipe 8' to 17'	50,122
G312-036 6	Y	18TH ST	12/10/08 15035-15036	15-035 15-0	036 D/S	5 8 VCP	302	307		1	1	11		1			5 20 4.(0		2 12 1	1		1				17 22 1.3					Sev	vere 12	303.7 to 304.6' Broken Pipe & Deformed Pipe Horizontal. 304.6' Ju (D/SH).	DL Spot repair 301' to 305' Deformed Horizontal & BPVV	149,396
G312-060 1	Y	MARINE AVE	1/19/09 21012-21016	21-012 21-0	016 D/S	6 VCP	303	310	4 9	1 3	1	83				:	29 89 3.4	1		48			2				50 56 1.1	1				Sev	vere 13	139.1' JOL (D/SL). 140.7' JOL (D/SH & 150.4 JOL (D/SL). 175.1' BPVV.	I) Spot repair 139.1'10 150.4' & 175.1'	112,959
G312-013 5 G312-013	13 3 Y	ROWELL AVE	11/5/08 05054-05055	05-054 05-0	055 D/S	6 VCP	144	151				3					3 15 5.(0									0 0 0.0				2	Sev	vere 14	120.9' JOL (D/SL). 123' JOL (D/SH) 148.9' JOL (D/SL). MSA 121.1' (JOL	& Spot repair 120.9', 123' & 148.9' to JOL	55,003
G312-072 8 G312-060	50 2 Y	20TH ST	2/11/09 22030-22031	22-030 22-0	031 D/S	6 VCP	342	357 1	1 13	2 2	2	10 2			41		/4 186 2.5	5	1	5 24	4	3 1 1	1 6				45 78 1.7				2	1 Sev	vere 15	Surface Damage= SSSZ	Spot repair. Root Treat & Cut	130,090
G312-057 10 G312-05	58 1 Y	VISTA DR	1/14/09 21002-21005	21-002 21-0	005 U/S	6 VCP	256	247 1	1	1	1	9 2					15 51 3.4	4		2 13		2 1	5				23 44 1.9				2	Sev	vere 16	BPVV. MSA 240' (6.5' from U/S MF RMJ.	2' Spot repair 101.2' BPVV& & 205.8 to 208' for JOL. Root Trea & Cut	at 89,849
G312-017 -1 2	Y	3RD ST	8/3/09 10139-10142	10-139 10-	142 D/S	5 6 VCP	140	166 2	3 5	1 2		2 2 1			2	2	22 59 2.7	7	1	5 15		2					23 28 1.2				1	Sev	vere 17	RP=RPR		60,361
G312-017 -1 3 G312-005		6ТН ST	8/3/09 11120A-11122				↓	131 2	2 2 6	1	1		1		4		17 46 2.7			19		3 1	1 1			┼┼╂	24 35 1.5	1	┼┼┼┼				vere 18	Horizontal. S=SSSZ	Replace pipe after 129'	47,859
Ph 3 ⁵		EASEMENT 8TH ST	8/14/09 17023-17024 11/4/08 04059-04060	17-023 17-0 04-059 04-0		+		278	1			3					18 49 2.7		+	1 2	++++	┝┝┝	┼┼┼	┝┼┼┼┥		┼┼╂	3 3 1.0		1				vere 19 vere 20		Spot repair 248' to 251' JOL	54,626 202,370
G312-012 1 G312-003 10 G312-003		NELSON AVE	10/22/08 01031-01032			+		307	1 7			2				10	12 30 2.5		5	13		2		┝┼┼┼┤		$\left \right $	35 61 1 7		┼┼┼┽				vere 20	225.9' JOL (D/SL). 238.9' JOL (D/Sł	I). Spot repair JOL (D/SL) 225.9' &	
		HIGHVIEW AVE	12/3/08 11040-11041			5 6 VCP		239 3	3 4	1		10 2					20 60 3.0	.0		9 1	1	1	1				13 19 1.5				2		vere 22			87,261
G312-055 6	۲ ۲	25TH ST	1/12/09 20053-20054	20-053 20-1	054 U/S	5 6 VCP	95	109 1	1 1			1 2					6 19 3.2	2	1 1	2 13 1	1 1	1					21 27 1.3					Ser	vere 23	from D/S MH) JOL. 106.1' JOL (D/SH). 108' JOL (D/SL). Both JOL looks like size change. Not clear. DSZ = DNF	Spot repair 106' to 108' to JOL	39,876
G312-059 7	T Y	MARINE AVE	1/16/09 21014-21015	21-014 21-	-015 U/S	6 VCP	235	260	1			17 2					21 68 3.2	2		19	1					╎╎╏	20 21 1.1			$\left \right $		2 Ser	vere 24	142.7' JOL (D/SH). 205.5 JOL (D/SL		94,806
G312-063 11	Y	18TH ST	1/27/09 22014-22015	22-014 22-	015 U/S	6 VCP	218	66			2	6 2					10 38 3.8	.8	1	3		2					6 11 1.8		1		1	Sev	vere 25		7' to 9.1' & 64.6' to 66.2' Spot repair	79,282
G312-052 2	T Y	17TH ST	1/7/09 15025-15026	15-025 15-	026 D/S	3 8 VCP	247	250				52				+	7 25 3.6	.6		1 23 1		3		╞┾┼┼┤		┼┼╂	31 42 1.4	+ +				Sev	vere 26	is a CO. 123.7'JOL (D/SL). 245.5' JOL (D/SL		121,354
G312-071 3	Y	17TH ST	2/10/09 22008-22009	22-008 22-1	009 U/S	6 VCP	226	194	1 4		1	23 1			6		37 109 2.9	9		3 6		1	3				14 26 1.9				1	Sev	vere 27	Climb). U/S MH is a CO. Surface	Spot repair 1.2' to 8.5'	82,413
A315-015 1	Y	19TH ST	5/29/09 22025-22026	22-025 22-	-026 D/S	5 6 VCP	200	227 2	2 15	2	1						21 33 1.6	.6	+	4 31		5 2 1	1 1		-+++-	┼┼╂	44 63 1.4				1	Sev	vere 28	1007 IOL (D/CLI) & DDV/V. Clease to a	^{1d} Spot repair	82,742
A315-019 8 A315-02	21 2	17TH ST	6/4/09 22011-22012	22-011 22-0	012 D/S	5 6 VCP	112	77 1	2 1	1		2 1					8 23 2.5	9				1					1 3 3.0				2	Se	vere 29	74.3' MSA (JOL (D/SH) & BPSV)'.	Spot repair	40,824
G312-003 Ph 2 1	Y	MANHATTAN AVE	7/9/09 14052-14053	14-052 14-1	053 D/S	S 8 VCP	223	224				1 2	1				4 14 3.5	5 1'	9								19 38 2.0					Se	vere 30	36.6' (JOL D/SL). 38.4' (JOL D/SH).	Spot repair	108,621
G312-006 9 Ph 2 9	Y	4TH ST	7/14/09 10135-10136	10-135 10-	136 U/S	6 VCP	130	3		1		1					2 10 5.0	0	1	1							2 3 1.5				1	Ser	vere 31	× 3' JOL (D/SH). 3.3' BPSV. MSA (JO U/S MH is a C/O	-). Spot repair	47,385

Table 8-2

Norm Norm Norm Norm N					Table 8- Severe and Major Con	dition Priorities		
Image: Second in the	VD No.	cation	Size Length Length	Crack Fracture Broken Hole Joint C F B H J	Deformed Deformed Surface Damage Point Repair Fallure Tructural Defects Structural Defect Score data Defect Score Tallure Defect Score	Roots (R) Fine (F) Tap (T) Medium [Bail (B)]	Obstaci Factor Factor </th <th>Replacement</th>	Replacement
Control Contro Contro Contro			PACP Grade	2 1 3 3 2 4 5 5 5 5 3 5 1 1 1 1 1 1 1 1 1	2 5 5 5 2 1 2 2 2 2 6 20 3.3	2 1 1 1 3 2 2 2 4 3 3 5 4 4 1 19 1 1 1 1 1	Source 23 284.4 JOL (D/SH) & BPVV. Same Foot reseit	139,482
Abs Abs Abs Abs Abs <td></td> <td>1/8/09 19031-19053</td> <td></td> <td>1 5 1 3 1</td> <td>11 35 3.2 1</td> <td></td> <td>17.3' Small BPVV & 134.2' JOL (D/SH). Spot repair 17.3' BPVV & 134.2'</td> <td>50,775</td>		1/8/09 19031-19053		1 5 1 3 1	11 35 3.2 1		17.3' Small BPVV & 134.2' JOL (D/SH). Spot repair 17.3' BPVV & 134.2'	50,775
Solution	G312-011 Ph 2 7 Y 1ST ST	7/21/09 12025-12026	6 12-025 12-026 D/S 8 VCP 100 107	5 1 4 1 1	1 13 45 3.5	2 10 1		51,953
Success State Success State Success State Success St	G312-054 3 Y ALMA A	'E 1/9/09 20019-20021		4 2 9 1	┝┼╴┼╶┼╼┼╼┼╶┼┈╂┈╂┈┼╌┼╶╉╾┾╼┾╼╼	3 6 1		
NIME V V V V V V V V V V V V V <th< td=""><td></td><td></td><td></td><td>5 1 10 1</td><td>┟╶┟╌╞╌┝╌┝┈┝┈╞┈┫┈╍┟┈┟┈┫╴┥╾┝</td><td>29 1 9 1</td><td>┝┼┼┾┼┾┼┽╉╴┼╶┥┫┼╎╴┼┼┼┾┼┼┼┼┨┥┽╶┫╍╍╴┤╴┥┼┼╴╴╴╴╴╴╴╴╴╴╴╴╴╴╴╴╴╴╴╴╴</td><td></td></th<>				5 1 10 1	┟╶┟╌╞╌┝╌┝┈┝┈╞┈┫┈╍┟┈┟┈┫╴┥╾┝	29 1 9 1	┝┼┼┾┼┾┼┽╉╴┼╶┥┫┼╎╴┼┼┼┾┼┼┼┼┨┥┽╶┫╍╍╴┤╴┥┼┼╴╴╴╴╴╴╴╴╴╴╴╴╴╴╴╴╴╴╴╴╴	
					┝┽╾┾╍┾╍┼╍┼╍┼╶╆╶╉╺┼╴╆╶╂╶┾┼╌╸			
</td <td></td> <td></td> <td></td> <td>21</td> <td></td> <td></td> <td></td> <td></td>				21				
	G312-008 11 G312-012 4 V 15T 5T			1 1	2 9 4.5	1 1	2 4 2.0 1 2 Severe 40 From D/S MH) JOL (D/SH). No inspection 4' to 16'. Pipe ID was 10056 Spot repair	7,290
min min <td>G312-027 11 Y BOUND</td> <td>RY PL 11/25/08 10013-10014</td> <td>4 10-013 10-014 D/S 8 VCP 274 278</td> <td>1 1</td> <td>2 8 4.0 2</td> <td>7</td> <td></td> <td>134,962</td>	G312-027 11 Y BOUND	RY PL 11/25/08 10013-10014	4 10-013 10-014 D/S 8 VCP 274 278	1 1	2 8 4.0 2	7		134,962
Norma Norma <th< td=""><td>A315-013 3 Y MARINE</td><td>AVE 5/27/09 21024-21025</td><td>5 21-024 21-025 U/S 6 VCP 270 3</td><td>1</td><td>1 5 5.0</td><td></td><td>0 0 0.0 1 1 Severe 42 x 2.5' JOL (D/SH). MSA (JOL). 336.1' Spot repair</td><td>98,415</td></th<>	A315-013 3 Y MARINE	AVE 5/27/09 21024-21025	5 21-024 21-025 U/S 6 VCP 270 3	1	1 5 5.0		0 0 0.0 1 1 Severe 42 x 2.5' JOL (D/SH). MSA (JOL). 336.1' Spot repair	98,415
Origin bit is a	G312-012 Ph 2 3 Y 1ST ST	7/22/09 14100-10058	3 14-100 10-058 D/S 15 VCP 50 35		1 5 5.0 2		2 42 0 4 5 Contraction of the sectron of the sectro	31,985
No. 1 No. 2000000000000000000000000000000000000	G312-007 1 G312-007 2 Y VALLEY	DR 7/15/09 10118-10119	9 10-118 10-119 D/S 6 VCP 280 192	15 1 2 1	19 64 3.4	1 31 1	33 33 1.0 2 Severe 44 187.7' MSA (JOL D/SL). 275.9' (4.1' from U/S MH) BPSV. 168.6' BPVV. Spot repair	102,060
Normal Normal<		IT AVE 10/24/08 02001-02002	2 02-001 02-002 D/S 8 VCP 265 273	1 1 1	3 13 4.3	3 44	48 50 1.0 Savara 45 244.4' JOL (D/SL). 270.3' BPVV (End Spot repair 244.4' IOL (D/SL).	t32,484
A V Axad Coto Axad Book	G312-053 2 G312-053 3 Y MANHA	TAN AVE 1/8/09 18039-18040) 18-039 18-040 D/S 6 VCP 239 190	1 8 1 3 1	14 42 3.0 14	1 1 19 1 1 5 1	43 72 1.7 2 Severe 46 MSA (JOL) & 236.04' (Camera does not fit). 186.7' JOL (D/SH). 187.4' (MSA (JOL). No Inspection 187.4' to 186.7' Spot repair to JOL (D/SH). 187.4' (MSA (JOL). No Inspection M311.001 #	ł) 87,130
Current Current <t< td=""><td>G312-019 -1 1 Y FRANC</td><td>SCO ST 8/5/09 10045-10046</td><td>3 10-045 10-046 D/S 8 VCP 164 165</td><td>4 4 2 2 t 2 1</td><td>1 2 19 47 2.5</td><td>11 1 1 2 2</td><td>17 26 1.5 1 Severe 47 Severe 47 Severe Severe 47 Severe Severe 47 Severe Severe 47 Severe Severe 10 Severe 10 Severe Severe 10 Severe Severe 10 Severe Severe 10 Severe 10 Severe Severe 10 Severe Severe 10 Severe Sev</td><td>ot 80,141</td></t<>	G312-019 -1 1 Y FRANC	SCO ST 8/5/09 10045-10046	3 10-045 10-046 D/S 8 VCP 164 165	4 4 2 2 t 2 1	1 2 19 47 2.5	11 1 1 2 2	17 26 1.5 1 Severe 47 Severe 47 Severe Severe 47 Severe Severe 47 Severe Severe 47 Severe Severe 10 Severe 10 Severe Severe 10 Severe Severe 10 Severe Severe 10 Severe 10 Severe Severe 10 Severe Severe 10 Severe Sev	ot 80,141
Selection	G312-001 7 Y HERRIN	ST 10/20/08 01076-01080	0 01-076 01-080 D/S 8 VCP 338 347	2 3 t 1 1	8 20 2.5 92	1	93 185 2.0 Severe 48 241.1' JOL (D/SL). 274.4' HSV. Spot repair 241.1' JOL (D/SL). 8 274.4' HSV.	168,399
Line display Line display<	G312-051 2 G312-053 1 Y HIGHLA	ND AVE 1/6/09 19015-19017	7 19-015 19-017 D/S 6 VCP 241 74	4 1 2 1	8 28 3.5	1 6	8 11 1.4 2 Severe 49 169.48' MSA (71.3 ' from U/S MH) JOL (70.8' from U/S	10 87,764
A D C D C D C D C D C D C D C D C D C D	G312-039 5 Y MARINE	AVE 12/15/08 15054-15055	5 15-054 15-055 D/S 8 VCP 302 307	1 1 1	3 12 4.0	1 2	36Vele 50 20.3 JOL (D/SL) & 23.9 BEVV	6' 149,105
1 V 0 <th0< th=""> 0 0 0 0 0 0<</th0<>	G312-036 2 Y NO STF	EET NAME 12/10/08 15023-15024	4 15-023 15-024 D/S 8 VCP 198 202	1 4 3 3 3 2	35 51 124 2.4	2	2 2 1.0 1 1 1 1 2 2 Severe 51 to 199.7 MCU. Could not see any repair69 to 84' & 104' to 107' fc	
Value Value <th< td=""><td>G312-047 6 Y ROSEC</td><td>ANS AVE 12/29/08 18023-18024</td><td>4 18-023 18-024 U/S 6 VCP 163 181</td><td>1 1 1 1</td><td>4 14 3.5</td><td>1</td><td>1 1 1 1.0 1 1 1 1 1 1 Severe 52 x 180.7' JOL (D/SL) & BPVV. MSA Spot repair 178' 10 181' 10 BPV 180.7' (JOL). MH 18-023 is a C/O & JOL</td><td>V 66,084</td></th<>	G312-047 6 Y ROSEC	ANS AVE 12/29/08 18023-18024	4 18-023 18-024 U/S 6 VCP 163 181	1 1 1 1	4 14 3.5	1	1 1 1 1.0 1 1 1 1 1 1 Severe 52 x 180.7' JOL (D/SL) & BPVV. MSA Spot repair 178' 10 181' 10 BPV 180.7' (JOL). MH 18-023 is a C/O & JOL	V 66,084
1 1 1 1 1 1 <	G312-056 5 Y 29TH S	t/13/09 20005-20006	6 20-005 20-006 D/S 6 VCP 293 292	17 1 1 10 2	4 35 105 3.0	5 42 2 1	Severe 53 SAVZ Sportepail 37.4 & 100.4 to 30	DL 106,361
max n max		ST 7/16/09 10048-10049	9 10-048 10-049 D/S 8 VCP 250 206	1 1 1 1 1	5 16 3.2	10 1		121,500
Alt Gold I I Alt Gold I Alt Gold I Alt Gold		AND 7/9/09 14068-14069	9 t4-068 14-069 D/S 8 VCP 207 211	4 2 5 1 2 1	15 41 2.7	2 28 1 1	32 34 1.1 2 1 1 Severe 55 6.5' HSV. 209.2' JOL (D/SL). Spot repair for HSV, Spot repair for JOL (D/SL).	ir 102,643
m 2 4 V NUMPTIS 0 1000 1100000000000000000000000000000000000		6/29/09 11049-11050	0 11-049 11-050 D/S 6 VCP 250 105	3 1 2	6 15 2.5	7	8 11 1.4 2 Severe 56 (Reversal 46.5') JOL D/SL. No Spot repair Reversal video between 56.3' to 200.9'.	
A 315 01 9 Y 2TH ST 52289 20.048 20.049 20.049 2		6/10/09 11024-11025	5 11-024 11-025 D/S 8 VCP 305 307	2 1 2 4 1	10 37 3.7 6		Severe 57 306.2' BVVV (Channel of D/S MH). repair Jol & BPVV 306.2'	ot 149,056
Ph 3 I P 315 PL 81200 P 017 PL/22 S 8 V 2 50 S 0 I I I I I		5/22/09 20048-20049	9 20-048 20-049 D/S 6 VCP 125 29	1 1	1 3 12 4.0		0 0 0 0 1 2 Severe 58 JOL & 121.5 (Due to angle of the pipe/incline). No inspection 25.7' to Spot repair	45,563
Ph 3	Ph 3 1 1 1 3151 Pl				┟┟ <u>╷┥╶┧╸┥╺┧╺┨╺</u> ┨╸┥╴┥	6 58 2 4 2 3 6 1		
G312-017-1 1 V 3HOS 1 01/03 1/13 1/1 1/1 3/1 1/1	Ph 3 7 Y 2914 S				<u>┤╶┨──┤──┤──┤──┤──┤──┨──┼──┼──</u> ┫━─┼╍┼╼╍╼		61 72 1 2 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	
G312-049 1 Y 33RD ST 12/31/08 18001-18002 18-001 18-002 U/S 6 V/C 408 57 8 2 2 2 2 3 2 2 1 1 2 2 2 2 1 1	G312-002 6 Y 29TH S			4 1 1 1	┼┼╍┼╍┼╍┼╶╂╴╂╴╂╸╂╸╂		S=SSSZ 301.8 JOL (D/SL). 356.7' HVV (End of the Pipe Line). Also three Repair Patch in poor condition (164.2', 167.2' & Replace pipe 163' to 169' for Patch in poor condition (164.2', 167.2' & Replace pipe 163' to 169' for	4
A315-001 13 A315-004 9 Y PARKVIEW AVE 5/6/09 25027-25028 25-027 25-028 L/2 4 2 1 1 1 1	- - - - -	12/31/08 18001-18002	2 18-001 18-002 U/S 6 VCP 408 357	8 2 29 2	27 68 179 2 6 3	6 18 2 2 3 2 2		148.785
A 315-012 13 A 315-013 2 28TH ST 5/26/09 19039-19045 19-039 19-045 D/S 6 VCP 130 109 2 1 1 1 1 4 4 12 3.0 1 1 1 10 4 12 3.0 1 10 12 12 13 1.1 1 10 1 12 13 1.1 1 10 11 12 13 1.1 1 10 11 12 13 1.1 1 10 11 12 13 1.1 11 10 11 12 13 1.1 11 11 11 11 11 11 11 11 11 11 11 11				2 4 2 1 1 1 2 1			143.4' to 153.1' BPVV. 201.3' BPSV. 17 34[2.0] 1 2 5 Severe 64 203' MSA (BPVV). 133' to 163.8 Severe 64 203' MSA (BPVV). 133' to 163.8 Severe 64 203' MSA (BPVV).	91
	A315-012 13 A315-013 2 28TH S	5/26/09 19039-19045	5 19-039 19-045 D/S 6 VCP 130 109	2 1 1 1	4 12 3.0	1 1 10	12 12 13 1.1 2 13 1.1 2 2 Severe 65 (DS/L). MSA 105.9' (BPSV). There is Spot repair	47,385
	G312-061 4 Y MARINI	AVE 1/23/09 21016-21017	7 21-016 21-017 D/S 6 VCP 250 256	6 6 2 4 1 9 1	1 30 83 2.8		12.8' JOL (D/SL). 161.6' JSL. 235.4' Sect appointer (D). 151.8 BD	/V 93,348

														Seve	re and N	Table 8-: lajor Conc	2 dition Priori														
/D No. spection No. versal DVD No.	Votrsal Inspec. No. Matched? (Y) soon	General Information	Manhole	fi		ias CCTV – Igth Length –	C	acture Bro F E C M SV	в н	v o s	A Deformed	× Coilapsed Pipe & Surface Damage	경 Point Repair ning Faiture	igs Ital Structural Defects Ital Structural Defect Score		Deposits D S AE Other	Fine (F) B L J C B	Roots (Tap (T)	Medium I	inf Bali (B)	ilitration I DRWC			Tap (Lateral)	Line	inti dir Se Mat ia	er Wisco	151 tority	o Reverse Set-up Completed		Project Replacement
	x G Street	Vame CCTV Date Pipe ID	Start E	nd 🛱 i	(in) Mat (f	ft) (ft) PACP Grade	2 1 3 3	245	55	M L M 5 3 5 1		52	1	8 P P 2	ي ت 2	2 2	21113	2 2 2 4	4 3 3 3 5	4445		Z %						<u> </u>		Minimum Recommendations	Cost (\$)
G312-019 -1 3	Y 5TH ST	8/5/09 10131-10132		132 U/S		258 255	2 3	2 1		91		2	2	22 5 35 9	7 2.6		1 15 2	+	1	3		┝┼╌┼┼	22 33 1	.5				Severe 6	7 39.3' JOL (D/SL). Same G312-042 (deleted). S=SSSZ. RP=RPR 272' JOL (D/SL). SAVZ. MSA 272' (Spot repair	93,093
G312-031 6 G312-031 7 R311-002 10 R311-002 1	7 Y BEACH BL					278 305 284 319	1 11	2		61		13		35 9 19 5			3 42 3			6		┝┼╌┼┼	55 75 1	.2			2	Severe 6 Severe 6	from D/S MH) JOL 8.1' JOL (D/SL). MSA 262.3' (56.8'	(D/SL) Spot repair 8.1' to JOL	111,173 116,312
G312-006 G312-006	4 Y 4TH ST	7/14/09 10136-10137		137 D/S		250 254	1 11			5 1				19 5	8 3 1		2 26 4			2		╞┼╌┼┼	42 56 1	3			2	Severe 7	from D/S MH) TBI 226.3' JOL (D/SL). MSA 237' (17.1'	Spot repair	123,493
Ph 2 Ph 2 G312-001- 7	Y ARDMORE					310 306	1 15 1					┨┨┣-		22 6	0 0.1	-	2 20 7	+	++++	2		┞┼╌┠┼	21 44 1				-	Severe 7	from D/S MH) LR. Inspection complet 1 5' JOL (D/SL).	Spot repair	148,910
Ph 2 / G312-003 10	11TH ST	AVE 6/10/09 11018-11021 7/9/09 14055-14056			<u>+</u>	131 97	4 2	1		8 1		+		16 4		3	3 20		┥┥┥╵	2	++++		0 00	.0		++-	1	Severe 7	35.7' JOM (D/SL). U/S MH is a C/O.		47.750
Ph 2 10 G312-035 13	Y 10TH ST	12/9/08 11130-11131		131 U/S		139 143	1 3			5 1		8		18 4	+		1 3		┼┼┼┼				4 4 1	.0			-	Severe 7	2 X 96.6' MSA (Camera flips over at JOI 3 112.2' JOL (D/SL). SAVZ	Spot repair 112.2' to JOL (D/SL)	
G312-004 10	Y 18TH ST	10/23/08 01221-01222	01-221 01-	222 U/S	8 VCP	278 282	3 1 7	1		2 1				15 4	1 2.7	4	4 2				4		14 22 1	.6				Severe 7	4 194.7' JOL (D/SH).	Spot repair 194.7' to JOL (D/SL)) 136,955
G312-006 Ph 2 10	Y 3RD ST	7/ t4/09 10140-10141	10-140 10-	141 U/S	6 VCP	250 t11	2	1		4 1				8 2	25 3.1		2 11 1		2				16 20 1	.3			1	Severe 7	5 x 111.1' MSA (JOM).29.2' JOL (D/SL) U/S MH is a C/O	Spot repair	91,125
G312-004 1 G312-002	Y 9TH ST	10/23/08 01161-01162			8 VCP	342 346	2	1		31		1		8 2	+ +		56	2	++++	1			14 19 1	.4	1			Severe 7	6 95.3' JOL (D/SL). SAVZ	Spot repair 95.3' JOL (D/SL) & Line Down	168,253
B12 5 Ph2 5 G312-001	Y HIGHLAND		-+		12 VCP 8 VCP	245 242 230 230				3 1 1					5 3.0 3 2.6	2	2 27						2 4 2	.0					7 207.8' JOL (D/SL). 8 83.1' JOL (D/SL).	Spot repair Spot repair	176,637
Ph 3 1 G312-003 7	Y THE STRA				8 VCP	32 31	1 4			4 1		+			9 2.8		2			2		$\left \right $	2 2 1	.0				Severe 7	9 16.5' JOL (D/SL).	Spot repair	15,017
Ph 2 / G312-045 3	Y 30TH ST	12/23/08 17016-17017				347 359	1	1		2 1		+++			5 3.0		2 1		4			╏╎╴╎╴╎	7 t5 2	.1	╊╋╋╋				0 320.3' JOL (D/SL) .	Spot repair 318' to 320.3' to JOL	
G312-066 3	Y SAUSALIT	CIR 2/3/09 24093-24094	24-093 24-	094 D/S	8 VCP	135 144				2 1				3 1	1 3.7	8							8 16 2	.0				Severe 8	1 51.2' JOL (D/SL).	Spot repair	70,178
G312-070 3	Y 33RD PL	2/9/09 17065-17066	i 17-065 17-	066 D/S	8 VCP	161 167				2 1				3 1	t 3.7		5	1	1	1			8 14 1	.8				Severe 8	2 164.9' JOL (D/SL).	Spot repair	81,113
A315-012 11	Y 27TH ST	5/26/09 19037-19037				120 125	1 1			1 1					2 3.0		9						9 9 1	.0	1		1		3 x 124.7' JOL(D/SL). MSA 124.' (JOL). 7' JOL (D/SL). Pipe ID was 08001-	Spot repair	45,453
G312-022 4	Y SEPULVED					142 112		1		1 1			_	3 1	0 3.3	8						$\left \right $	10 18 1	.8				Severe 8	4 08001A.	Spot repair 7' JOL (D/SL)	54,626
G312-010 2 G312-028 2	Y LONGFELL Y 6TH ST	OW DR 10/31/08 04025-04026 11/26/08 10073-10075				210 212 225 230				11		1		3 1	0 3.3		2 23		+	┼┼┼┼			25 25 1	.0		+			5 121.5' JOL (D/SL). SAVZ 6 34.1' JOL (D/SL).	Spot repair 121.5' to JOL (D/SL) Spot repair34' to 36' to JOL	103,032 111,537
0312-020 2	1 017131	11/20/08 100/3-100/3	10-073 10-	013 0/3		223 230	┼┼┼					+				+ +				╆╋╋╋	+++				┼┼┼┼┼				64.1' JOL (D/SL). 64.5' MSA (JOL).		111,307
G312-055 7 G312-055	8 Y 25TH ST	1/12/09 20054-20063	20-054 20-	063 D/S	6 VCP	133 67	1			1				2	8 4.0		16						16 16 1	.0			2	Severe 8	7 130.85' (2' from U/S MH) MSA (Camera does not fit). No inspection 64.5' to 130.85'	Spot repair	48,424
G312-024 12	Y 29TH ST	11/20/08 08061-08062	08-061 08-	062 D/S	8 VCP	235 241	1			1				2	8 4.0		4			1			5 8 1	.6	1 1	1		Severe 8	8 238.2' JOL (D/SL). Close to End MH	. Spot repair 238.2' JOL (D/SL)	117,223
G312-013 10	Y SHORES F	ARKING 11/5/08 05009-05010	05-009 05-	010 D/S	8 VCP	300 316		1 1		1				3 1	1 3.7		56 1						57 57 1	.0				Severe 8	9 5' JOL (D/SL).	Spot repair 5' JOL (D/SL)	153,673
A315-021 3	Y 13TH PL	6/9/09 14025-14026		026 U/S	·	168 79	2			1				3	7 2.3		2	_		1			3 6 2	.0			1	-	0 × 78.8' MSA (JOL D/SL). U/S MH is a possible C/O 167.5' (JOL D/SL). 167.5' (85.8' fro	Spot repair	61,236
	10 Y 23RD ST	5/27/09 15071-15072		072 D/S		270 253				1		╉╌┼╍┼	_		5 5.0		3 46	+++	2	5		┼┼┼┼	56 75 1	.3	┼┼┼┼┼		2	Severe S	D/S MH) JOL.	Spot repair	t31,220
G312-039 4 G312-033 7	Y MARINE A	/E 12/15/08 15053-15054 12/5/08 12015-12016		054 D/S		314 316 61 94		$\left \right $	$\left - \right $			┼┼┼			5 5.0		1 1 2		┼┼┼┼					0 1		1			2 60.7' JOL (D/SL). 3 17' JOL (D/SL).	Spot repair 60.7' to JOL Spot repair 17' JOL (D/SL)	t53,333 45,490
A315-016 12	Y 19TH ST	6/1/09 22028-22055				143 4				1				1	5 5.0								0 00	.0			1		4 x 3.5' MSA (JOL).	Spot repair	52,124
G312-009 Ph 2 4	Y 1ST ST	7/17/09 10148-14100) 10-148 14-	100 D/S	6 VCP	20 8				1				1	5 5.0								0 0 0	.0	1		1	Severe S	5 x 2' JOL (D/SL). 7.5' MSA (LD). Pipe was 10148-10058B.	ID Spot repair	7,290
A315-024 8	Y 36TH ST	7/15/09 19046-19048	8 19-046 19-	-048 U/S	6 VCP	285 140	2 6 1			1				12 2	23 1.9	7							7 14 2	.0			1	Severe S	6 x pipes segments seem to have a JOI	After 140.1', Replace or Spot	103,883
A315-012 12	Y 28TH ST	5/26/09 19038-19039	19-038 19-	-039 U/S	6 VCP	175 3	+++	1		+++		+ $+$ $+$		1	5 5.0				++++	++++		$\left \right $	0 00	.0	╋╋		1	Severe 9	MH 19-046 is possible CO 7 × 2.5' BPSV (Missing Pipe). 2.5' MSA (BP SV). U/S MH is a CO		63,788
											$\left \right $	+++				++			++-++			$\left \right $			╁╂╁╂┼				Continuous Cracks (Multiple), 278' to	Deline er Deplere sine (779) te	
A315-018 3	Y 13TH ST	6/3/09 14013-14016	5 14-013 14-	-016 D/S	8 VCP	296 300	1 62	1		2				66 19	95 3.0		2 43		2				49 61 1	.2				Severe 9	8 284' possible abandoned MH (MH14 035). Bottom part is in poor condition	004	145,606
G312-056 9	Y VISTA DR	1/13/09 20009-20012	20-009 20-	012 D/S	8 VCP	130 129	1 2	2 1 2	1					9 3	30 3.3	3	6	1					10 14 1	.4				Severe 9	9 2' BPVV. 121.5' & 122.5' BPSV.	Spot repair 2' to 4' BPVV & 119' to 128' BPSV and Fractures	62,840
G312-004 7	Y AVIATION	BLVD 10/23/08 01187-01189	01-187 01-	-189 D/S	8 VCP	340 343	1	2 2		1			1	7 2	23 3.3							╞┼╌┾┽	0 00	.0 1				Severe 1	223.8' & 226.8 ' (two sides) BPSV. Pipe ID was 01187-01089.	220' to 229' Fractures Multiple & Broken Pipes. Spot repair 220' to	5 166,601
G312-072 7	Y 20TH ST	2/11/09 22029-22030	22-029 22-	-030 U/S	6 VCP	161 3			1					2	7 3.5								0 00	.0			1	Severe 1	2.5' BPSV (Missing Pipe). 2.5' MSA 0t x (BPSV). U/S MH is a CO. Surface	Replace pipe or Spot repair	58,612
G312-067 5	Y 19TH ST	2/4/09 22023-22024	22-023 22-	-024 U/S	6 VCP	330 4	+++					+		1	5 5.0					┼┼┼┼┤		2 15	3 12 4	.0	┼┼┼┼			Severe 1	Damage = SAMZ D2 X 4.2' BPSV. 4.2' MSA (OBM). OBM - OBN. U/S MH is a CO.	Spot repair 2 to 4.2'	120,278
G312-037 7	Y 16TH PL	t2/11/08 14003-14004		-004 U/S		105 68	62	2 1		4		+		16 4	19 3.1		4		4	┼┼┼┤			8 16 2		╏╎╎╎			Severe 1	 OBN. U/S MH is a CO. 26.9' HSV. Large Fractures. 68' MS (Roots). U/S MH Possible C/O. 	A Spot repair 21' to 27' for HSV & fractures	
G312-005 4	Y 19TH ST	10/24/08 01224-01225	6 01-224 01-	-225 U/S	8 VCP	278 285	1 2 3	2 4	2			$\uparrow \uparrow \uparrow$		14 4	13 3. t		1 2 2		++++			††††	6 10 1	.7 3		++-		Severe 1	17.4' & 144.1' BPVV with continuous fractures.		138,413
G312-052 5	Y 38TH PL	1/7/09 18050-18051	18-050 18-	-051 U/S	6 VCP	140 6			2					2 1	0 5.0								0 00	.0			1	Severe 1	5 x 6' MSA (BPVV). 4' to 6' BPVV (Miss Pipe). U/S MH is a possible C/O		51,132
G312-057 7	Y MANHATT	NAVE 1/14/09 20044-2004	5 20-044 20-	-046 D/S	6 VCP	245 256	2 10	4		4		┼┼┼		21 6	5 3.1		1 3		╉╋	┼┼┼┼┤		┼┼┼┼	4 4 1	.0	┼┼┼┼	++-		Severe 1	06 157.9' Vertical Deformed Pipe.	Spot repair 157.9' to vertical deformed pipe	93,421
G312-051 3	Y 33RD ST	t/6/09 19016-19017				219 4	$\uparrow\uparrow\uparrow$	2	2						8 4.5								0 0 0	.0					07 x 4' MSA (BPVV). U/S MH is Poinse Pump Station.	tia Spot repair 0' to 6' BPVV	79,785
G312-054 1	Y ALMA AVE	1/9/09 20018-2002	20-018 20-	-021 U/S	6 VCP	408 407	1 6	4	2 1	t3				27 9	90 3.3	1	4 62	2	3	2			74 89 1	.2			1	Severe 1	08 97' & 110.1' BPVV. 186.1' HSV. U/ MH is a possible C/O.		148,169

R:\Rpts\Manhattan Beach\Wastewater Master Plan

																	Se	/ere and	Table I I Major Co										a					. . .		
D No. pection No. versal DVD No.	versal Inspec. No. D Watched? (Y)	Location		Information	Manh	ection of Camera	Size	Pipe Atias Length	ссти	Crack Fra C C C M		в н	J	Deformed	× Collapsed Pipe v Surface Damage	권 Point Repair Ing Fallure	gs tal Structural Defects	tal Structural Defect Score uctural Defect Index	Deposits D AGS AE Oth		Ro Tap (T	Operational pots (R)) Medium C B L J	Baii (B	Infiltratio	ОВ	<mark>고</mark> < Vermin 코 < Vermin tai O&M Defects	tal O&M Defect Score M Defect Index	Tap (Laterai) T	Line Line	intro ding Sea Mate iai	Misce	ortty	ndition Ranking	Reverse Set-up Completed		Project Replacement
Re Ins	\$ <u></u>	Street Name	CCTV Date	Pipe ID	Start	End 🖻	(in) Ma	ut (ft)	(ft) PGrade 2	1 3 3	245	55	M L 1		552	1	8 P 2	St 1	2 2 2	2 1 1	1322	2433	3544	4534	CZ% 244	1 1	08 08					Ē	ů	2 Comments	Minimum Recommendations	Cost (\$)
A315-001 4	Y	MAGNOLIA WAY	5/6/09	25015-25016	25-015	25-016 U/S	6 8 VC	P 303	303							_	1	5 5.0	26				++++	1		27	56 2.1					Severe	e 109	same point. ISZ=ISSRH	Spot repair	147,258
A315-005 8 A315-0	05 9 Y	ROSECRANS PL	5/12/09	18048-18049	18-048	18-049 D/S	6 VC	P 200	16	1	1						2	8 4.0		1						1	1 1.0				2	Severe	e 110	(BPSV) There is no inspection 15.8' to	Spot repair	72,900
G312-005 Ph 2 1	Y	VALLEY DR	7/13/09	10115-10116	10-115	10-116 U/S	5 6 VC	P 275	347 1	1 1 8		1	6				17	50 2.9	8	2 28	2					40	48 1.2					1 Severe	e 111	103.7' HSV (Missing Pipe).	Spot repair	126,627
G312-054 4	Y	25TH ST	1/9/09	20021-20022	20-021	20-022 D/S	5 6 VC	P 109	51	4	t	1					6	21 3.5		7		2				9	13 1.4					Severe	e 112	34.7 BPVV (Missing Pipe).	Spot repair 34' to 38' for BPVV & Fracture	18,480
G312-055 5	Y	24TH ST	1/12/09	20059-20061	20-059	20-061 D/S	6 VC	P 297	301	4 23	2 3	2	13				47	138 2.9		12		4	1			17	27 1.6					Severe	e 113	70.1' & 76.6' BPVV.	Spot repair 70' to 78' for BPVV & Fractures	109,642
G312-040 8		THE STRAND		11132-11133	++	11-133 D/S			256		2 1	1	1	1			6	18 3.0	4 1	1			++++			6	11 1.8	1			1	Sever		74.8' Small BPVV. 253.7' Joint Separated Large. ISSR	Spot repair 74.8' BPVV & 253.7' JSL	124,319
A315-001 10		MAGNOLIA WAY	5/6/09	25024-25025	25-024	25-025 D/S	s 8 vc	P 97	95		1 1	$\left \right $			_		2 5	12 2.4	12		+++-		++++			2 14	26 1.9	_		+ + +		Severe	e 115	39' BPSV. ISZ=ISSRH 5' MSA (Camera doesn't fit due to	Spot repair	46,170
G312-010 Ph 2 4 Ph 2		EASEMENT	7/20/09	10052-10053	10-052	10-053 D/S	5 6 VC	P 350	19		1						2	7 3.5		2						2	2 1.0				2	Sever		channel at U/S MH). 336' JSL & BPSV No Inspection 5' to 336'		127,575
Various 2 (G312-015) 9	Y	27TH ST		19037 A- 19044	++		++		15		1		11				3	12 4.0		1			╉				1 1.0		1 1		1	Sever			Spot Repair	5,285
A315-019 9	Y	/ 17TH ST		22013-22050	+ +	22-050 D/S	+		114		1	1					2	7 3.5		1 7						9	11 1.2					Major			Spot repair	41,553
A315-021 4	- Y	OCEAN DR	6/9/09			14-027 D/S	+ $+$		107 2	2 6 2				+++			11	21 1.9			+++-		+++			1	11.0					Major		17.9' HSV. 63.2' BPVV.	Spot repair	51,856 24,130
G312-061 6 G312-002 3	+	1ST ST	1/23/09	21023-21026 01060-01061		21-026 D/S 01-061 D/S	+		252	+++	1			++-+		+	2	13 3.3			+++		╉╫╫				615	-			+++	Major Major		348.9' BPSV & FC.	Spot repair Replace pipe 347' to 350' BPVV	17 t,461
A315-012 10		27TH ST	5/26/09			19-037 U/S	+		42	11	-					+	4	14 3.5		2	+++		+++			3	517					Major	_	7' Small HVV, 42.4' MSA (RMJ). U/S	Spot repair	63,788
A315-016 6		15TH ST		14034-14062		14-062 D/S	+		116	3 2	2 1	1					9	22 2.4		2 4	+++-		╉╋			6	61.0					Major		MH is a possible C/O 3' BPVV.	Spot repair	42,391
G312-005		VALLEY DR		10117-10118	++	10-118 D/S	+	++	318	1 7	2 1	1					12	35 2.9		1 34	1	1	╋╋			37	391.1					Major		171.8' BPVV.	Spot repair 169.6' to 173.7'	115,911
Ph 2 3 G312-008 9 Ph 2 9		1ST ST	7/16/09	10054-10055	10-054	10-055 D/S	5 6 VC	P 200	192	6	2 1		3			+-+-	12	36 3.0		1 24		3				28	34 1.2		1	╋		Major		27' BPSV.	Spot repair	70,020
A315-024 11	Y	12TH ST	7/15/09	11033-11034	11-033	11-034 U/S	s 6 VC	P 247	222	1 2 1		1					5	12 2.4	3	1 1 7		1 2				15	6 26 1.7			+++		Major	r 126		Spot repair	81,065
A315-005 t6 A315-0	05 17 Y	ROSECRANS	5/12/09	18025-18027	18-025	18-027 U/S	5 6 VC	P 150	122	1 1 3 1	1					1	8	22 2.8		1 1						2	3 1.5				2	Major	r 127	6.5' BPSV . MSA 6.5' ' (BPSV). Close to End MH	Spot repair	54,675
A315-007 5	Y	33RD ST	5/18/09	19032-19033	19-032	19-033 U/S	s 6 VC	P 110	3	1		1					2	6 3.0								0	0.0 0				1	Major	r 128	x 2.5' BPVV. MSA 2.5' (BPVV). U/S MH is a possible C/O	Spot repair	40,095
G312-005 2 Ph 2 2	Y	VALLEY DR	7/13/09	10116-10117	10-116	10-117 D/S	5 6 VC	P 345	368 2	2 6 16	1 1	1					27	69 2.6		1 32		3				36	6 42 1.2	1				Major	r 129		Spot repair	133,954
A315-001 3	Y	MAGNOLIA WAY	5/6/09	25018-25019	25-018	25-019 D/S	S 8 VC	P 155	t57	1 1	1	1					26	17 2.8	29	1						30	59 2.0		1 1 1	1 1		Major	r 130	65.4' BPSV. 106.8' BPVV.	Spot repair	76,108
G312-004 Ph 3 2	Y	BELL AVE	8/13/09	17013-17018	17-013	17-018 D/S	s 10 VC	P 300	276	1 11	2	1	2				17	50 2.9		1 32		2				35	39 1.1					Major	r 131		Spot repair 264' 1o 267'	t67,792
G312-008 12 G312-0	08 13 Y	(21ST ST	10/29/08	03059-03060	03-059	03-060 D/S	s 8 VC	P 188	198	4		1					5	17 3.4		1 9		2				12	2 16 1.3	1			2	Major	r 132	111.7' 10 113.4' BPVV. MSA 113.4' (84.9' from D/S MH) BPVV.	Spot repair 110' to 113' to BPVV	96,374
G312-071 4	Y	18TH ST	2/10/09	22015-22016	22-015	22-016 U/S	s 6 VC	P 84	135	1 2	2	1	10			 	16	51 3.2		1 16	1		1 1			20	27 1.4					Major	r 133		Spot repair 100' to 103.2'	49,135
G312-050 5	Y	1 31ST ST	1/5/09		-+	19-007 D/S			291 5	5 3 16	1 2	1	5		1	1		113 2.6		6	1	1 3	+++			11	19 1.7	1				Major	r 134		215.6' Spot repair to BP VV	106,179
G312-057 4	Y	1 30TH ST	1/14/09	20041-20042	20-041	20-042 U/S	5 6 VC	P 252	51	3		1	3	+++			7	23 3.3		10	1		2			13	3 20 1.5				1	Major	r 135	× 3.5' BPVV. 51.1' MSA (RTJ). U/S MH is CO.	Spot repair 3.5' to BP VV 90' to 93' Replace pipe for	91,807
G312-002 8	Y	2ND ST	10/21/08	01083-01085	01-083	01-085 D/S	s 8 VC	P 350	355 2	2 9 13 1	34	3	4			1	7 47	120 2.6	115 30							145	290 2.0				2	Major	r 136	90' & 92.8' Continuous BPVV. 199.9' Small BPVV. SAVZ	BPVV.199.9' Spot repair for Small BPVV	172,287
G312-040 3	Y	7 27TH ST	12/16/08	3 16015-16016	16-015	16-016 D/S	5 8 VC	P 350	359	1	1 1		2				5	15 3.0		6 38		4				48	3 56 1.2					Major	r 137		Spot repair 23.3' to BPSV	174,474
G312-03t 11 G312-0	31 12 Y	7 3RD ST	12/3/08	3 12012-12013	12-012	12-013 U/S	S 6 VC	P 122	122	1 5		1	4			Ð	20	52 2.6	3	4						7	/ 10 1.4				2	Major	r 138	U/S MH) JOM.	Spot repair 2' to 3' for BPVV	44,287
G312-057 3 G312-0	57 2 Y	ALMA AVE	1/14/09	20013-20016	20-013	20-016 U/S	5 6 VC	P 177	182	1 3 5 1	1	2	7			1	21	58 2.8		5						5	5 5 1.0	1			2	Major	r 139	8.3' & 90' Small BPVV. 179.5' MSA (Camera does not fit). SCP (lateral)	Spot repair 8.9' & 90' to BP VV	66,339
A315-007 8	Y	THE STRAND	5/18/09	19047-19048		19-048 U/S			206 3	3 1	1 1	\square					6	16 2.7		1 12	2	2				18	3 25 1.4					Major	r 140	2' BPSV.	Spot repair	100,067
A315-002 2	Y	HOMER ST	5/7/09	23027-23028		23-028 D/S			357		1			$\downarrow \downarrow \downarrow$		<u> </u>	2	7 3.5		1 2			1			5	5 9 1.8					Major	r 141	352.9' BPVV .	Spot repair	173,453
G312-037 10	_ Y	14TH ST		3 14041-14064	++	14-064 D/S			116	4	1		1 3	<u> _</u>				33 3.3		9			+++			9	9 1.0					Major	_	261 C RRVV MUID 000 segrented to	Spot repair 103' to 106' for HVV & BPVV	42,100
G312-030 2	_ [×]	HIGHLAND AVE		12007-12008		12-008 D/S			268	15	2 1					 	+ + + + + + + + + + + + + + + + + + +	95 2.9	10	39			1 2			53	/ / - 1.4	$\left - + - \right $		++	+++	Major	_	MH12-008	Spot repair 261' to 264' BPVV. Root Treat & Cut Spot repair 89.2' BPVV & Spot	130,345
G312-0t0 13	_ _ [×]	7 3RD ST	10/31/08	3 04008-04011	04-008	04-011 D/S	S 8 VC	P 332	350 2	2 2 1			2	+++		┨	3 12	31 2.6		2 40			4	┝┼┼┼┼		48	64 1.3			+		Major	r 144	 69.2 BPVV, 346.1 HVV, (End of the sewer line). 196.8' BPVV. Also invert of the Start & End MH has severe Surface Damane. 	ropair 249 11 HV/V	169,906
G312-012 6		TENNYSON ST		3 05020-05021		05-021 D/S			306			1				2										47	94 2.0					Major	r 145	SAMZ	Spot repair 196.8' BPVV, Spot repair to Surface Damage	148,619
G312-058 6		23RD ST		21008-21018					230 2	2 10	1 2	1	1			<u> -</u>		52 3.1		2 13						17	7 22 1.3					Major			Spot repair 160' to 162'	83,944
G312-059 3 G312-0		21ST PL		22042-22043		22-043 D/S			261	2 6			5			1		44 2.9	2	7			1			10) 14 1.4			++	2	Major			Spot repair	95,244
G312-059 1 G312-004		21ST PL		22040-22041		22-041 U/S			257	1 2 8			1 8		_			57 2.9	1	1 5	+++			┝╫╟╟╢		9	9 15 1.7		┝┽┼┼┼			Major		x 48.8' HVV. 257.1 MSA (JOM). U/S MH is a possible C/O.	Spot repair	93,713
B312-004 5 Ph 2 5 G312-010 1		19TH ST		14001-14002		14-002 D/S			237	2 6				+++	+	╄╋	┝─┠─┤	31 3.1					+++	┝┽┼┼┦		0	0.0			+	+++	Major			Spot repair	115,085
Ph 2 1 G312-001-		10TH ST		11083-11084		11-084 D/S			t28	2 5	3			+++		+		37 3.1		14				+ + + +		15	5 17 1.1			+++		Major	_		Spot repair	46,729
Ph 2 3 G312-001-		Y 14TH ST	_	11023-11024	++	11-024 D/S			336	1 2			3	+++			╎╌┠┈┤	21 3.0		1 16	3			┝┽┼┼┤		21	24 1.1		┝┼┼┼┼	+ $+$ $+$	+	Major	_		Spot repair 335.6'	163,247
Ph 2 1	Y	15TH ST	6/10/09	11019-11020	11-019	11-020 D/S	s 8 VC	P 255	260	<u>' </u>			3				5	16 3.2		2 3	4		' ²			11	21 1.9					Major	r 152	257.7' BPSV.	Spot repair 257.7'	126,263

																				s	ievere :	and N	Table I Najor Co		Prioriti	ies																	
				General	Information										Struct	turai Defe	ct Codir	ng								Opera	ationai a	und Mainte	enance					Cons	truction I	Features					_		
VD No. Ispection No.	teversal DVD No.	leversal inspec. No. VD Watched? (Y)	Location				lanhole	arection of Camera	Pipe Atia Leng	as CCT		C	racture Bi F . C M S	в	н	Joint J S	 < □ Deformed 	v Collapsed Plpe v Surface Damage	Ining Failure	ags otal Structural Defects	otal Structural Defect Score	structural Defect Index	Deposits D S AE Oth	Fine er BL	(F) Ta J C B L	Roots (ap (T)		Bail (E C B L J	infiltra b) 1 C G D 1	ation a	taci s B Wher C F	otal O&M Defects otal O&M Defect Score	la a a b a b a b a b a b a b a b a b a b	Tap aterai) T Bi BD		ne	Intru ding Seal Mater Iai IS GT Z S/	→ → Miscellaneous	riority	Condition Ranking	salad Galage di-tass sessare S	Minimum Recommendations	Project Replacem Cost (\$)
	<u> </u>		Street Name	CCTV Dat	e Pipe iD	Star	End	- (in)	mail fre	PACP Gr	ade 2	1 3 3	2 4 5	5 5	5 3	5 1 2	5 5	5 2		2		2	2 2	2 1 1	1 1 3 2	2 2 4	3 3	3 5 4 4	4 5 3	4 2 4 4	1 1			┝╍┼╍╌┼					<u> </u>		Z Comments	Minimum Recommendations	Cost (a)
Various 1 (G312-015) 7	Various 1 (G312- 015)		THE STRAND	7/30/0	9 12037-12038	8 12-03	7 12-038 D	o/s 8	VCP 2	35	259 2	3 11	1 1	1						2 2	1 55 2	2.6		2								2 4	2.0	1 1				2	Major	153	63.1' BPSV. Major Defect. DAZ=DAZ	Spot Repair	f25,i
G312-007 4 Ph 3 4		Y	BELL AVE	8/18/0	9 17032-80133	3 17-03	2 17-033 D	0/S 8	VCP 1	50	95			1	1						2 8 4	4.0			3	TTT						3 3	3 1.0		TIT				Major	154	0' BPVV (Beginning of fhe sewer line)	Spof repair	46,
G312-005 Ph 3 2		Y	36TH PL	8/14/0	9 17028-17029	9 f7-02	8 17-029 D	0/S 8	VCP 2	35	243	1		1							2 8 4	4.0		3	4		1	2				10 18	3 1.8						Major	155	243.2' BPVV (End of the sewer line)	Spof repair	118,
G312-003 1		Y	NELSON AVE	10/22/0	8 01025-01026	6 01-02	5 01-026 🛙)/S 8	VCP 3	150	357				1 3						5 f9 3	3.8		5	4		5					14 24	1.7	1	TIT				Major	156	248.6' HSV & 354.1' HVV (End of the sewer line).	Spof repair 248.6' HSV & 354.1' HVV	173,
G312-005 3		Y	18TH ST	10/24/0	8 01222-01223	3 01-22	2 01-223 🛙	0/S 8	VCP 2	278	284	48	2		3			1			4 159 2	2.9 2	5 52				1			51		129 259	2.0						Major	157	Mosf joints have DAE, IW & CM. SAVZ.	Reline	137,
G312-030 5		Y	1ST ST	f2/2/0	8 12010-12023	3 12-01	0 12-023 🗆	D/S 6	VCP 2	259	263 2	57	1		2			33		5	15 251 2	2.6	2	11	5 1		1	1				21 25	9 1.4				1		Major	f58	Continuous Crack Multiple & Surface Damage, SAVZ, ISSRH	Reline	95,7
				•					Tota	ift 31,																																······································	15,329,

Total miles 5.9

8-2.5 FOLLOW-UP CCTV INSPECTION AND CONDITION ASSESSMENT PROGRAM

- a. Portions of the system rated to be in **Severe Structural Deficiency** condition will be inspected **annually** and evaluated to determine if immediate corrective action is needed.
- b. Portions of the system rated to be in **Major Structural Deficiency** condition will be CCTV inspected and evaluated once every **three (3) years**
- c. Portions of the system rated to be in **Moderate Structural Deficiency** condition will be CCTV inspected and evaluated once every **five (5) years**
- d. Portions of the system rated to be in **Minor Structural Deficiency** condition will be CCTV inspected and evaluated once every **ten (10) years**
- e. Portions of the system with **no structural deficiencies** will be CCTV inspected and evaluated once every **ten (10) years**
- f. Portions of the system with **Operational and Maintenance** deficiencies, except the **Hot Spots**, will be CCTV inspected and evaluated once every **four (4) years**.
- g. **Hot Spots**, except siphons, will be CCTV inspected and evaluated **before and after each maintenance activity and cleaning for one year** to establish the appropriateness of the method, and then **annually**.

As structural deficiency mitigation projects are implemented, their condition will be reclassified, and they will be included in the appropriate category for follow up CCTV inspection and condition assessment work.

8-3 MANHOLE INSPECTIONS AND ASSESSMENTS

The condition of the manholes associated with the 52.9 miles of gravity pipes inspected was also assessed. A total of 1,075 manholes were inspected and assessed. Photos were taken of each element of the manholes and inspection reports were prepared.

The manhole inspections included general evaluations of the following elements:

- Manhole Cover
- Frame
- Cone
- Barrel
- Rungs
- Bench
- Channel

Each element was rated as good, fair, poor, or failing. Signs of debris, grease, vermin, and odors were also noted in the inspection reports. The results of the inspections are summarized in Table 8-3.

	M	anhol	e Eler	nents	Conc	lition	Sumn	nary			
Condition	Manhole Cover	Frame	Cone	Barrel / Wall	Rungs	Bench	Channel	Debris	Grease	Vermin	Odor
Good	1070	1068	1030	1048	612	1022	960				
Fair		7	37	22	155	38	95				
Poor			7	4	150	15	20				
Failing			1	1	67						
Broken	2										
Cracked	3										
Not Applicable					91						
Yes								15		55	3
No								1060	1075	1020	1072

Table 8-3

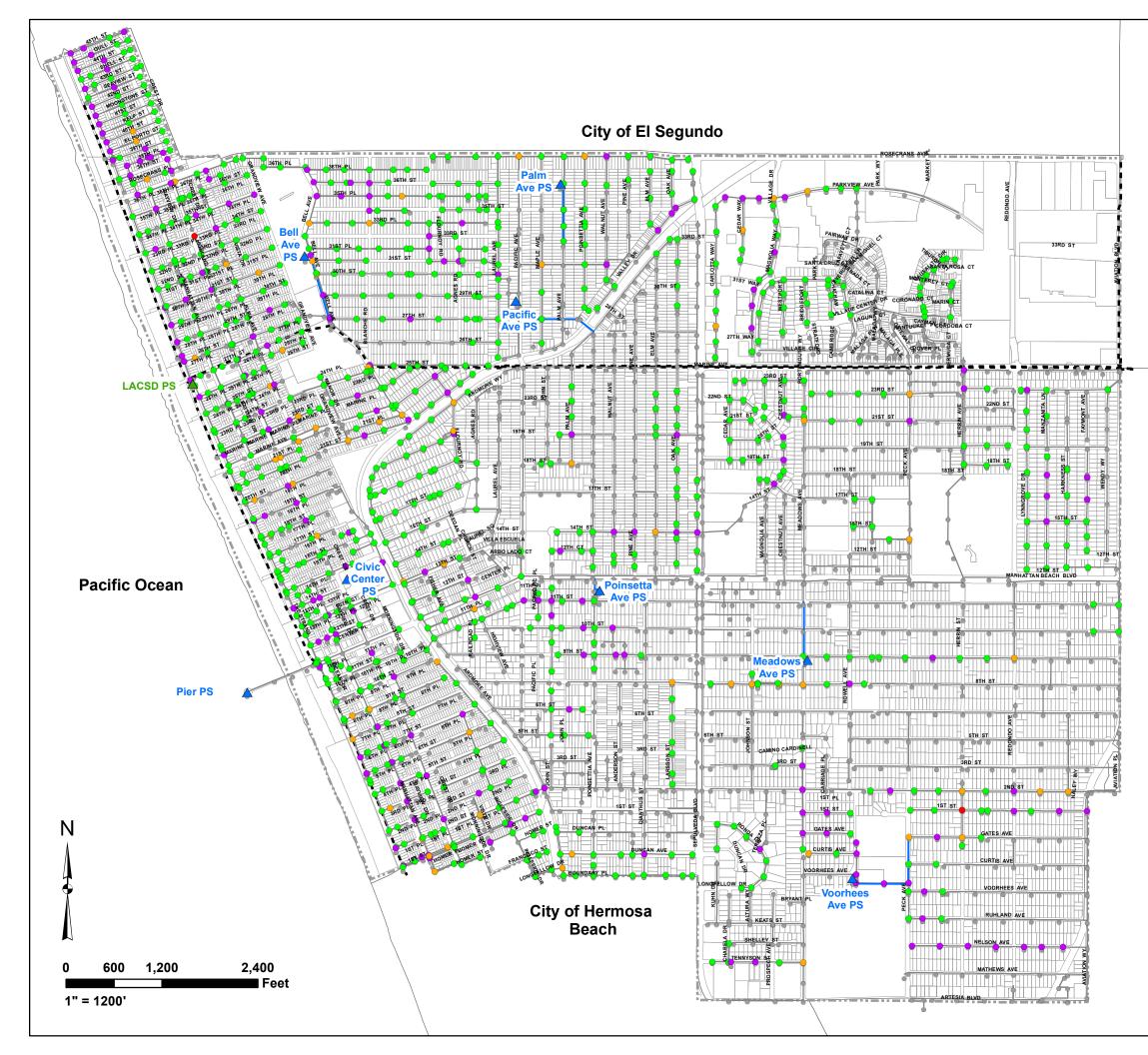
8-3.1 **Rehabilitation Priorities**

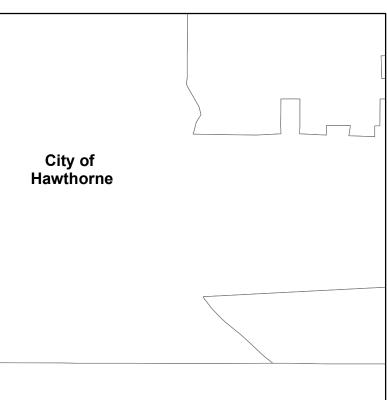
Point values were assigned to each condition rating in order to prioritize the manholes for rehabilitation. The assigned point values are as follows:

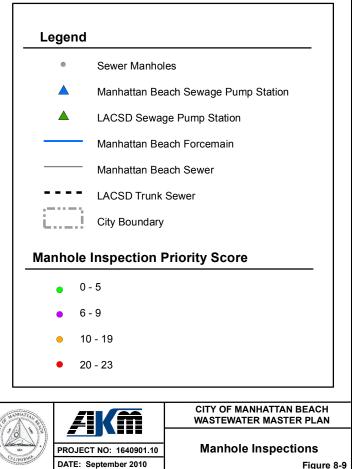
Condition Rating	Point Value
Good	0
Fair	1
Poor	5*
Failing	10*
Broken	10
Crack	8
Yes	1
No	0

*For Rungs, Failing is given a point value of 3 and Poor is given a point value of 2

Rungs are not considered as urgent a problem since the City no longer uses them to access manholes. If City staff must enter a sewer manhole, tripods are utilized. The detailed manhole condition inspection summary, sorted by priority can be found in Appendix 6, Manhole Condition Inspection Summary. Manhole locations colored by total point value are shown on Figure 8-9.







8-3.2 Manhole Improvements

A total of thirty-two (32) manholes were identified to have poor conditions in the manhole cover, cone, barrel, bench, and/or channel. Preliminary recommendations are shown in Table 8-4.

The manhole rehabilitation cost estimates are based on the following:

Replacement	\$30,000
Line Manhole	\$10,000
Repair Mortar	\$ 6,000
Replace Frame and Cover	\$ 3,500

The total estimated cost of upgrading the manholes with poor conditions is \$316,000. This is based on the assessment 1,075 manholes or 53 percent of all the manholes. The total number of manholes in the sewer system is estimated at 2,031. Assuming that similar deficiencies will be identified when the remainder of the system is CCTV inspected, the total remaining cost for rehabilitation and replacement of the manholes in poor condition is estimated at approximately \$280,000.

										Estima	ates									
nspection Phase	Session ID	Street	Manhole	Inspection Date	Surface Condition	Manhole Cover	Frame	Cone	Barrel / Wall	Rungs	Bench	Channel	Debris	Grease	Vermin	Odor	Priority Score Condition Ranking	Comment	Recommendation	Project Cost (\$)
																		Fractures in cone and barrel. Fracture seen in		1
1	25	Highland Ave	19-015	1/12/09	Pavement - Concrete Collar	Good	Good	Failing	Failing	Good	Good	Good	No	No	No	No	24 1	street pavement surrounding manhole cover.	Replace	30,000
1	28	1st St	01-080	11/21/08	Pavement - Concrete Collar	Good	Good	Poor	Poor	Failing	Poor	Poor	No	No	0	No	22 2	Missing mortar. Corrosion at bench and channel.	Line manhole	10,000
1	74	Duncan Ave	10-039	12/19/08	Pavement - Concrete Collar	Good	Good	Good	Good	Failing		Poor	No	No	No	No	18 3	Corrosion at bench and channel.	Line manhole	10,000
1	90	Gates Ave	01-072	11/20/08	Pavement - Concrete Collar	Good	Good	Poor	Fair	Poor	Poor	Poor	No	Yes	0	Yes	15 4	Corrosion at bench and channel.	Line manhole	10,000
																		Broken manhole cover. Corrosion at bench and	Replace manhole	
1	51	Curtis Ave	05-052	12/2/08	Pavement - Concrete Collar	Broken	Good	Good	Good	Poor	Poor	Poor	No	No	No	No	14 5	channel.	cover and line	13,500
1	36	2nd St	01-086	11/24/08	Pavement - Concrete Collar	Good	Good	Good				Poor	Yes	No	0	No	11 6	Corrosion at bench and channel.	Line manhole	10,000
1	109	18th St	06-244	12/5/08	Pavement - Concrete Collar	Good	Good	Good	Good	Poor	Poor	Poor	No	No	No	No	10 7	Corrosion at bench and channel.	Line manhole	10,000
1	23	8th St	04-054	12/1/08	Pavement - Concrete Collar	Good	Good	Good	Good	Poor	Poor	Poor	No	No	No	No	10 8	Corrosion at bench and channel.	Line manhole	10,000
																		Corrosion at bench and channel. Not a smooth		
1	50	Meadows Ave	05-023	12/2/08	Pavement - Concrete Collar	Good	Good	Good	Good	Poor	Poor	Poor	No	No	No	No	10 9	transition.	Line manhole	10,000
1	130	14th St	06-191	12/8/08	Pavement - Concrete Collar	Good	Good	Good		Poor		Poor	No	No	No	No	10 10	Corrosion at bench and channel.	Line manhole	10,000
1	291	Cedar Way	25-012	1/22/09	Pavement - Concrete Collar	Good	Good	Poor	_	Poor	Good	Good	No	No	No	No	10 11	Corrosion and cracking in cone and wall	Line manhole	10,000
1		Village Dr	25-025	1/22/09	Pavement - Concrete Collar	Good		Poor		Poor	Good		No	No	No	No	10 12		Line manhole	10,000
																			Replace manhole	
1	53	Rowell Ave	05-055	12/2/08	Pavement - Concrete Collar	Broken	Good	Good	Good	Fair	Good	Good	No	No	No	No	9 13	Broken manhole cover.	cover	3,500
1	47	Tennyson St	05-020	12/2/08	Pavement - Concrete Collar	Good	Good	Good				Poor	No	No	No	No	9 14	Corrosion at channel.	Line manhole	10,000
1	60	Voorhees Ave	05-005	12/2/08	Pavement - Concrete Collar	Good	Good	Good	Good			Poor	No	No	No	No	9 15	Corrosion at channel.	Line manhole	10,000
1	181	Flournoy Rd	17-057	1/8/09	Pavement - Concrete Collar	Good	Good	Good	Good			Poor	No	No	No	No	9 16	Corrosion at bench and channel.	Line manhole	10,000
1	46	11th St	09-028	12/18/08	Pavement - Concrete Collar	Good	Good	Good	Good	Good	Poor	Poor	No	No	Yes	No	9 17	Corrosion at bench and channel.	Line manhole	10,000
2	235	The Strand	12-030A	7/20/09	Pavement - Concrete Collar	Good	Good	Good	Poor	Poor	Good	Fair	No	No	No	No	9 18	Missing mortar.	Repair mortar	6,000
1	80	14th St	06-050	12/4/08	Pavement - Concrete Collar	Good	Good	Good	Good	Good		Poor	No	No	No	No	8 19		Line manhole	10,000
1	131	14th St	06-077	12/8/08	Pavement - Concrete Collar	Good	Good	Good				Poor	No	No	No	No	8 20	Corrosion at bench and channel.	Line manhole	10,000
1	178	31st St	17-053	1/8/09	Pavement - Concrete Collar	Good	Good	Good	Good	Good	Poor	Poor	No	No	No	No	8 21	Corrosion at channel.	Line manhole	10,000
1	99	Manhattan Ave	11-116A	12/22/08	Pavement - Concrete Collar	Good	Good	Poor	Good	Poor	Good	Good	No	No	No	No	8 22	Cracks in cone.	Line manhole	10,000
3	25	35th Pl	17-049	8/11/09	Pavement - Concrete Collar	Good	Good	Good	Good			Poor	No	No	0	No	8 23	Corrosion at bench and channel.	Line manhole	10,000
																			Replace manhole	
1	284	The Strand	14-064	1/21/09	Pavement - Concrete Collar	Cracked	Good	Good	Good	N/A	Good	Good	No	No	No	No	7 24	Cracked manhole cover.	cover	3,500
1		19th St	06-030	12/5/08	Pavement - Concrete Collar	Good	-		Good		Fair		No		No			Corrosion at channel.	Line manhole	10,000
1		Blanche Rd	17-040	1/9/09	Pavement - Concrete Collar	Good			Good		Good		No		No			Corrosion at channel.	Line manhole	10,000
1		1st St	01-061	11/21/08	Pavement - Concrete Collar	Good			Good		Good		No			No		Corrosion at channel.	Line manhole	10,000
1		Marine Ave	15-053	1/7/09	Pavement - Concrete Collar	Good	Good		Good		Good		No		No		7 28		Repair mortar	6,000
1		Highview Ave	11-040	12/22/08	Pavement - Concrete Collar	Good			Good		Good		Yes		No		7 29		Line manhole	10,000
2		1st St	12-026	7/16/09	Pavement - Concrete Collar	Good			Good			Fair	No		No		7 30	Corrosion at bench and channel.	Line manhole	10,000
t						1				1		1	1						Replace manhole	<u> </u>
2	278	3rd St	10-139	7/22/09	Pavement - Concrete Collar	Cracked	Good	Good	Good	Good	Good	Good	No	No	No	No	7 31	Cracked manhole cover.	cover	3,500
	100	Manhattan Ave	11-117	12/22/08	Pavement - Concrete Collar	Good	Good		Good		Good		No		No			Cracks in cone.	Line manhole	10,000

 Table 8-4

 Manhole Rehabilitation and Replacement Recommendations and Cost

 Fstimates