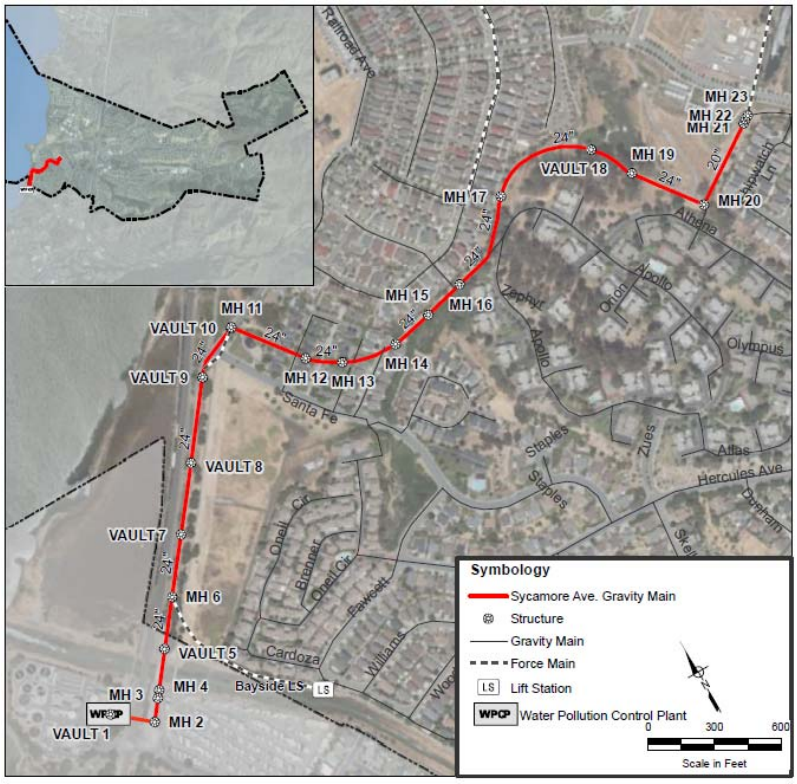
PROJECT:	**Sycamore Avenue Trunk Sewer Replacement Project**
Risk Factors:	**Likelihood of failure:** Medium-high due to potential asbestos concrete pipe (ACP) deterioration, corrosion, and under-sized capacity. **Consequence of failure:** High due to large potential overflow volume, waterway and railroad crossings adjacent to Bay, and lack of trunk sewer redundancy for single sewer serving entire City.
Project Purpose:	Increase capacity of trunk sewer and address structural defects.
Project Location:	Easement at Duck Pond Park to WPCP at 11 Tennent Ave., Pinole, CA.
Existing Pipe Description:	Approximately 5,500 LF of 20-inch and 24-inch diameter sewer.
Ultimate PWWF:	8.73 mgd (2008 Collection System Master Plan)
Recommendations:	Replace existing 20” and 24” trunk sewer with 27” PVC sewer and install new manholes. Bridge crossing over Pinole Creek and bore and jack under railroad, both near the corners of Railroad and Tennent Ave., just upstream of the WPCP.
Estimated Project Cost:	$8.5 Million (see page 2 for details)

DEFECT PHOTOS

MH 2 to Vault 1 at 0 feet - Corrosion and grease, typical throughout project area.

Vault 8 to Vault 7 at 270 feet – Grease/blockage in flow and corrosion/spalling from 9 to 3 o’clock.

PROJECT LOCATION MAP



TRUNK SEWER REPAIR AND CAPACITY PLAN

SYCAMORE AVENUE TRUNK SEWER REPLACEMENT PROJECT SHEET

WEST YOST ASSOCIATES

SUMMARY OF PIPE DEFECTS AND RECOMMENDATIONS

PPS CCTV Inspection, 7/20/16 - 07/21/16									City of Hercules GIS			West Yost Assessment	
Upstream Manhole (MH)	Downstream Manhole (MH)	Diam.	PPS Length Inspected (LF, *abandoned inspection lengths in italics*)	Length between PPS Inspection Structures shown in GIS [a] (LF)	Material	Struct PACP	O&M PACP	Overall PACP	Herc ID From MH	Herc ID To MH	Diam.	CCTV Observations	Existing Full-Pipe Capacity[b], mgd
MH 23	MH 22	24	9.2	20	RCP	5200	0	5200	2728	3634	20	Surface corrosion/scaling/build up throughout, water level 50%.	22.71
MH 22	MH 21	24	22.3	20	RCP	5400	0	5400	3634	4728	20	Surface corrosion/scaling/build up throughout, water level 40%.	-
MH 21	MH 20	24	403.7	408	RCP	5000	0	5000	4728	3598	20	Surface corrosion/scaling/build up throughout, water level 45%, "pipe wall missing" recorded in report, but not seen in CCTV.	6.44
MH 20	MH 19	-	-	356	-	-	-	-	3598	3599	24	No CCTV available	-
MH 19	VAULT 18	-	-	215	-	-	-	-	3599	-	24	No CCTV available	-
VAULT 18	MH 17	24	512.2	512	RCP	5SOO	0	5SOO	-	-	24	Surface corrosion/scaling/build up throughout, water level 55%.	7.24
MH 17	MH 16	24	455.0	458	RCP	5000	0	5000	-	4136	24	Surface corrosion/scaling/build up throughout, water level 55%.	5.75
MH 16	MH 15	24	202.1	199	RCP	5GOO	4100	5G41	4136	-	24	Surface corrosion/scaling/build up throughout, water level 50%.	6.77
MH 15	MH 14	24	196.7	197	RCP	5FOO	0	5FOO	-	-	24	Surface corrosion/scaling/build up throughout, water level 50%.	8.58
MH 14	MH 13	24	257.2	258	RCP	5100	0	5100	-	-	24	Surface corrosion/scaling/build up throughout, water level 55%.	8.58
MH 13	MH 12	24	167.7	167	RCP	5EOO	0	5EOO	-	4354	24	Surface corrosion throughout.	7.18
MH 12	MH 11	24	364.2	364	RCP	5MOO	1100	5M11	4354	4459	24	Surface corrosion throughout, water level 45%.	14.95
MH 11	VAULT 10	24	4.6	5	RCP	0	0	0	4459	-	24	Water level 40%.	6.51
VAULT 10	VAULT 9	24	260.7	261	RCP	5100	5121	5121	-	-	24	Surface corrosion throughout, water level 25% to 40%, deposits attached, rubber seal at joint hanging down halfway from cracked joint.	6.51
VAULT 9	VAULT 8	-	-	389	-	-	-	-	-	-	24	No CCTV available	6.11
VAULT 8	VAULT 7	24	***272.7***	***328***	RCP	5J3F	5126	5J3F	-	-	24	Surface corrosion throughout, water level 40% to 70%, deposits attached, sag 160-215 ft, obstruction in joint to abandonment, neither Exhiit A observation seen at 240 ft or 270 ft.	6.17
VAULT 7	MH 6	24	***248.1***	***285***	RCP	5130	0	5130	-	4707	24	Surface corrosion throughout, water level 55% throughout majority, sags 50% to 75% to inspection abandonment at 248 ft.	6.17
MH 6	VAULT 5	-	-	236	-	-	-	-	4707	-	24	No CCTV available	6.01
VAULT 5	MH 4	24	185.7	188	RCP	5FOO	1100	5F11	-	-	24	Surface corrosion throughout, water level 45%.	6.01
MH 4	MH 3	-	-	35	-	-	-	-	-	-	-	No CCTV available	6.01
MH 3	MH 2	-	-	108	-	-	-	-	-	-	-	No CCTV available	6.01
MH 2	VAULT 1	24	231.8	213	RCP	5JOO	0	5JOO	-	-	-	Surface corrosion throughout, water level 40% (to 25%), minor cracks, no signs of spot repair.	6.01
Total:			**3,794**	**5,222**									

(a) PPS inspection lengths and sewer layout features were used to place the 'Structure' in GIS as shown on Project Sheet and to indicate the location of noted MH or Vault. The City's GIS data for MHs along trunk sewer is not accurate, but the 'PPS Structure' locations are based on actual inspection data. The total length from MH 1 at the WPCP to MH 23 at Sycamore Avenue at Duck Pond Park was used for cost estimates, rounded to 5,500 LF total length for estimating purposes and to account for partial missing segments of data.

(b) Existing and PWWF Capacity based on hydraulic model from 2008 Collection System Master Plan. Design Flows account for 1,400 units of new development tributary to the Sycamore Avenue Trunk Sewer.

ESTIMATED PROJECT COSTS

Item	Description	Quantity	Units	Unit Cost	Extension
1	Traffic Control	1	LS	$75,000	$75,000
2	Temporary Bypass Pumping	1	LS	$550,000	$550,000
3	Remove & Replace Existing 20" and 24" with 27" PVC Sewer	5,500	LF	$600	$3,300,000
4	Remove & Replace Manholes	23	EA	$10,000	$230,000
5	Bridge Aerial Crossing - 39" Casing and Installation [c]	80	LF	$858	$68,640
6	Bore and Jack Pits at Railroad	2	EA	$20,000	$40,000
7	39" Casing for Bore and Jack under Railroad to WPCP	65	LF	$1,170	$76,050
				Subtotal	$4,340,000
				Estimator's Contingency	35% $1,520,000
				ENGINEER'S PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST	$5,860,000
				Construction Contingency	10% $590,000
				Engineering Design, Environmental Planning and Studies, Construction Management, ESDC, Public Outreach, and Legal and Admin Costs	35% $2,050,000
				ENGINEER'S PRELIMINARY OPINION OF PROBABLE TOTAL CAPITAL COST	$8,500,000

(c) Cost estimate assumes that the bridge structure can be re-utilized for an aerial crossing between MH 4 and Vault 5 with the casing upsized to 30" for the new 27" sewer.

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