STORM DRAIN SYSTEM 001
STRUCTURE SUMMARY AND CONDITION ASSESSMENT - 2020

Storm Structure Number	Survey Point Number	Storm System Number	Structure Type					Condition Rating	Comments
			SDMH	CBMH	CB	OUTFALL	FIELD INLET		
101	5736	1				1		1	System outfall host pipe corroded away; riprap movement has deformed liner material; invert mostly blocked causing siltation
102	5669	1	1					3	Structure has many cracks in base; 4 of the 7 inverts abandoned; soil migration as surface deformation; deterioration of grade ring
103	5665	1		1				3	CBMH was cleaned in 2019; both pipe inverts have no grout and gravel is exposed with possible migration; infiltration at base; fractured grade ring gravel exposed; nth pipe 50% capacity
104	5670	1			1			3	CB has damaged grade rings with possible gravel migration; pipe penetration not grouted gravel exposed
105	5667	1	1					3	SDMH has sewer lid not storm; infiltration in base at grout; both north pipes abandoned; sump filled with sediment (silt)
106	5668	1		1				3	CBMH is non-standard style; sump filled with sediment; Sth pipe has severe sag with no capacity
107	5674	1		1				4	CBMH is non-standard style; had design for side access (swale); missing grout; lid was buried with gravel; pipes 50% capacity
108	5740	1		1				3	CBMH is non-standard style; lower south invert unknown length or if it ties into structure; north pipe may have crown failure
109	5692	1					1	4	Field inlet with sediment present in flow line; gravel swale upstream
110	5644	1	1					2	SDMH cone damaged, danger of collapse; base has significant sediment build up; east CMP heavily corroded with shear closer to 111
111	5642	1		1				2	CBMH has significant sediment build up in sump; east 36" CMP has severe pipe shear, pipe corrosion; west 36" CPEP has pipe joint separations
112	5643	1			1			3	CB missing grout at pipe penetration; pipe shows signs of poor compaction as it is crushed as it exits structure.
113	5641	1						3	SDMH has significant sediment build up extending into all pipes included perf; grout failure; east 36" has some shear at exit
114	5640	1	1					4	SDMH has minor grout failure; sump has sediment
115	5647	1	1					4	SDMH has grout failure; sump has sediment; both north and south pipe have significant sedimentation
116	5659	1			1			4	SDMH / CB, structure is at the end of a perf line, but has a solid lid, uncertain if surface drains to structure; sediment in sump
117	5588	1	1					4	SDMH has grout failure; sump has sediment; south pipe has severe shear causing sedimentation upstream
118	5605	1	1					4	SDMH has sediment in base
119	5585	1	1					4	SDMH has sediment in base; east invert abandoned, but still discharges ground water; full plug is approx. 15' east of invert
120	5584	1	1					4	SDMH has sediment in base; east invert has severe shear
121	5583	1					1	3	Field Inlet / CB is nonstandard with slotted casting over a 18" CPEP 90 elbow; severe shear at structure 120; gravel in flow line
122	5093	1					1	3	Field Inlet is partially blocked by gravel; pipe has gravel in flow line
123	5596	1	1					4	SDMH has minor infiltration at joint between base and cone; south pipe has full obstruction approx. 25' upstream
124	5578	1			1			4	CB has minor grout cracking; north pipe has full obstruction approx. 250' downstream
125	5591	1	1					4	SDMH east of rail tracks; base has circumferential cracking; infiltration
126	5082	1					1	4	Field Inlet east of rail tracks; inlet is partially blocked by organic material
127	5593	1	1					4	SDMH east of rail tracks; sump is full of sediment
128	5607	1	1					3	SDMH east of rail tracks; does not have access; sump full of sediment; storm pipes are surcharged
129	5075	1					1	5	Field Inlet east of rail tracks No access for maintenance
130	5590	1	1					5	SDMH east of rail tracks; does not have maintenance access
131	5582	1	1					5	SDMH east of rail tracks; does not have maintenance access
132	5096	1					1	5	Field Inlet east of rail tracks; No access for maintenance
133	5581	1	1					4	SDMH east of rail tracks; No access for maintenance
134	5579	1	1					4	SDMH east of rail tracks; does not have access; north storm pipe has severe sag fully surcharged
135	5112	1					1	3	Field Inlet east of rail tracks; inlet has gravel blocking invert
136	5576	1	1					4	SDMH east of rail tracks; No access for maintenance
137	5575	1	1					5	SDMH east of rail tracks; does not have access
138	5115	1					1	5	Field Inlet east of rail tracks; No access for maintenance
139	5619	1	1					4	No Comment
		Totals	**19**	**5**	**4**	**1**	**8**		

Abbreviations: SDMH = Storm Drain Manhole; CBMH = Catch Basin Manhole; CB = Catch Basin; FI = Field Inlet; CMP = Corrugated Metal Pipe; DIP = Ductile Iron Pipe; CPEP = Corrugated Polyethylene Pipe; OGS = Oil & Grit Separator; PVC = Polyvinyl Chloride; CMU = Concrete Masonry Unit; CIP = Cast-In-Place

Notes:
1. Structure totals encompass all of Storm Drain System 001; which includes structures outside project limits.
2. Pictures and Videos from the 2020 Structure and Pipe Condition Assessment can be found at: https://aro36587742.sharepoint.com/:f:/s/FileShare/Ep-xDJOqqDBLvjsRGpMsmUoBv7WAu5oMjn4ssIYyuSak0w?e=JFhBZA

Condition Rating Criteria:

1	Critical	Very advanced deterioration, Replacement / Rehabilitation recommended, Safety issues are present if no action is taken, Infrastructure failure will result adjacent to structure if failure occurs
2	Serious	Advanced deterioration present, Schedule maintenance ASAP, Safety issues may be present
3	Poor	Deterioration / Damage present, Scheduled maintenance is needed, No safety issues present
4	Fair	No Defects or Damage present, No safety issues present, Structure requires maintenance
5	Good	No Defects or Damage present, No safety issues present, Maintain as normal
		Indicates a specific storm structure or pipe that requires maintenance and could be a future safety concern.

STORM DRAIN SYSTEM 001
PIPE SUMMARY AND CONDITION ASSESSMENT - 2020

Storm Structure Start	Storm Structure End	Storm System Number	Pipe Size (Inch)	Pipe Type & Length (Feet)						Condition Rating	Comments
				CPEP	CPEP (SUBDRAIN)	CMP	HDPE	DIP	CIPP		
101	102	1	36						424		Host CMP pipe completely corroded at outfall
102	103	1	18	30							
102	105	1	36						69	4	Nothing in notes about this pipe, appears to be in good condition in video
103	104	1	18	207							
103	105	1	36						69		
105	106	1	12				45			3	Looking South: Second and third sections of pipe are heaved; 2/10' channelized sediment in pipe; sixth section of pipe begins to drop down; Looking North: HDPE pipe, half full channelized sediment, infiltration at 1st and 2nd joints, sag in roof at 5th joint
105	110	1	36						101	3	Looking East: a lot of sediment on both sides up to 45 degrees; Looking West: possible deformation, 1.5' channelized sediment sloped up walls
106	107	1	18			329				3	Looking South: Over 1/2 full of sediment, at 4' pipe angles down and is completely full of sediment; Looking North: Severe sag with no capacity, over half-full of sediment; infiltration present on roof and joint btwn 2nd and 3rd section looking north; deflects down
107	108	1	18			407				3	Looking South: 1/2 full of sediment, infiltration present at 1st joint, invert rusted out; Looking North: infiltration at first 5 joints
108	unk-south	1	12			50				3	Looking South: Pipe is half filled with water; cannot confirm end of pipe
108	109	1	18			90				3	Looking South: Ovaling at beginning, 4th section bulging on Eastside, 0.1' gravel in pipe; Looking North: joint btwn. 2nd and 3rd section is disconnected, slight deflection after third section
110	111	1	36			356				2	Severe pipe shear / joint separation; soil migration; Looking East: infiltration present btwn. 2nd and 3rd sections of pipe, separation/shear btwn. 3rd and 4th sections of pipe, 4th section drops down
111	112	1	18		362					3	Looking North: tear present after structure; Looking South: pipe drop exiting structure, settlement in downstream section, 10th section ovaled, 11th section has westward deflection
111	113	1	36	211						2	Looking East: 4/10' channelized sediment, infiltration at 1st joint, 2nd and 3rd joints separated, infiltration at 5th section, almost every joint is damaged or separated, 12th section deflects to South
111	527	1	18		338					4	Pipe is capped at structure 527
113	114	1	12		321					2	Looking North: Ovaling present in 2nd Section, 3rd section deflects south; Looking South: 2nd joint is separated, third section deflects to east, 5th section slopes down dramatically, potential collapse
113	115	1	12		380					3	Looking South: 2/10' sediment on west side, some separation at 1st joint, ovaling present in 5th and 6th sections, extreme ovaling in 7th section; Looking North: 4/10' sediment, Ovaling present in 2nd section
113	117	1	36	233						3	Looking East: 1' channelized sediment present, slight separation at 1st joint, some ovaling at 5th section, some bulging at 5th section on south side; Looking West: No field notes, no visible defects in limited video, sediment build-up, needs cleaning
114	139	1	12		300					3	Looking North: Pipe torn, ovaling present, slightly separated at 1st joint, 3rd section half-full of sediment; Looking South: tear in pipe, slight separation in 1st and 2nd joints, 4th section bulging on west side, 6th section deflects to west; pipe designed to flow south, flows north due to collected sediment
115	116	1	12		385					3	Looking South: 4/10' sediment, ovaling present in 1st and 4th sections; Looking North: 2-10' sediment, ovaling in 1st and 5th sections, large sinking depression in section 5.
117	118	1	18		401					3	Looking North: Some deflection to west, some sediment buildup, flow is in opposite direction of design; Looking South: Pipe almost half full of water, infiltration present in 5th and 6th sections of pipe, flow is in opposite direction of design
117	119	1	18		299					4	Severe shear (not sure why that note is here, it's not in the field notes); Looking South: Separation as pipe leaves structure, 3/10' channelized sedimentation, bows up after 3rd section, bellying present in 3rd section; Looking North: 3rd section deflects to west, 4th section deflects to east, ovaling at 5th and 6th sections
117	125	1	24	71						3	Looking East: 3/10' channelized sediment, separation at first joint; Looking West: 4/10' channelized sediment, separation at last joint.
119	120	1	18		285					3	Looking South: 4/10" channelized sediment present, 2nd section heaved, 3rd section deflects west, ovaling present in 4th section; Looking North: Separation at Structure
120	121	1	18	14						4	Looking East: Separation after leaving structure and at 1st section, bellied btwn. structures
120	122	1	12	46						4	Looking West: Separation after structure and 1st joint, 2nd section deflects south and up; Looking East: no delineator or flared section at pipe end, 2" of gravel in flow line at inlet, inlet partially blocked by gravel.
120	123	1	18		361					3	
123	124	1	18		401					2	Looking South: Pipe torn after structure, 3/10' gravel present, rock or cap present at 23.3'; Looking North: 1/10' sediment and gravel present in 1st section, 250' to rock obstruction
125	126	1	18		9					4	Looking West: no delineator or flared end section, small amount of rock inlet protection, 1" of gravel in flow line, inlet partially blocked by organic material
125	127	1	18		219					3	Looking North: Bellying after structure, roots penetrating seams; Looking South: 0.1' sediment, 0.2' sediment on sidewalls, 3rd section has ovaling
125	130	1	18		9					3	Looking South: 3/10' channelized sediment, root penetration at seams; Looking North: 2/10' channelized sediment
127	128	1	18		11					3	Looking North: 0.1' sediment, blockage at 217', 1/3 pipe full of sediment, gradually fills up more; Looking South: Too full of sediment to video
128	129	1	18		11					5	Looking East: Delineator with no flared end section at pipe end, inlet is free from obstructions and has rock inlet protection
130	131	1	18		302					3	Looking South: 1/10' channelized sediment, some defletion pretty far in; Looking North: bellying/sag present after structure, infiltration present at 1st joint
131	132	1	18		11					5	Looking East: 2/10' rocks, gravel and leaves present; Looking West: delineator at pipe end with no flared end section, rock inlet protection
131	133	1	18		300					3	Looking South: ovaling present, bulge present in 1st section, 4th section has bulging to the east and may be disconnected; Looking North: Bellying/sag present after structure, 2/10' water in pipe, bulge in lower part of pipe near structure 131
133	134	1	18		300					2	Looking South: deflection to west at end of 1st section, 2/10' sediment, raises up at 1st joint, significant deflection back to east; Looking North: no flow, should flow north, pipe dips and is blocked at 14.5'
134	135	1	18		11					3	Looking East: Sags after structure, piece of wood at structure entrance, significant rock debris at 135 inlet; Looking West: Delineator at pipe end with no flared section, significant amount of rocks at pipe entrance
134	136	1	18		199					3	Looking South: Deflects to east at 1.5', pipe half full of standing water, no flow; Looking North: some sediment and leaf debris present, ovaling after 1st section, deflection to east after 2nd section, deflects back to west shortly after, pipe bows down after deflecting down, 2/3 full of water
136	137	1	18		151					3	Looking South: Ovaling present at end of 1st section, infiltration present in ovaled section; Looking North: Bellying present after structure and in 2nd section, pipe rises at 1st joint, ovaling and slight deflection to east and back to west
137	138	1	18		10					4	Looking East: Pipe looks good; Looking West: Delineator with no flared end section at pipe end, mostly free of debris, little to no vegetation or rock inlet protection

Storm Drain Pipe Totals

	Pipe Size (Inch)	Pipe Type & Length (Feet)						Totals (LF)
		CPEP	CPEP, Perf (SUBDRAIN)	CMP	HDPE	DIP	CIPP	
Storm Drain Pipe Type Totals (LF)		**812**	**5,376**	**1,232**	**45**	**0**	**663**	**8,128**
	2	0	0	0	0	0	0	**0**
	4	0	0	0	0	0	0	**0**
	6	0	0	0	0	0	0	**0**
	10	0	0	0	0	0	0	**0**
	12	46	1,386	50	45	0	0	**1,527**
	15	0	0	0	0	0	0	**0**
	18	372	3,990	826	0	0	0	**5,188**
	24	71	0	0	0	0	0	**71**
	30	0	0	0	0	0	0	**0**
	36	444	0	396	0	0	663	**1,513**
	42	0	0	0	0	0	0	**0**
	48	27	0	0	0	0	0	**27**

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