



# APPENDIX A

## Manhole Inspection Tabular Summary

## APPENDIX A: MANHOLE INSPECTION TABULAR SUMMARY

CITY OF SANDWICH, IL

Manhole ID#	Street	Subbasin	Severity	Rim to Invert (Feet)	Surface Type	Cover Material	Cover Type	Frame Material	Chimney Material 1	Cone Type	Cone Material	Wall Material	Bench Material	Channel Material	Channel Type	Channel Exposure
4003	322 E 3RD ST.	A	Severe	8.8	ASPHALT;	Cast Iron	SOLID;	Cast Iron	Concrete (precast)	Conical centered	Concrete (precast)	Concrete (precast)	Concrete (cast in place)	Concrete (cast in place)	Formed	Fully Opened
4005	421 N LAFAYETTE	A	Severe	12.96	ASPHALT;	Cast Iron	SOLID;	Cast Iron	Brick	Conical centered	Brick	Brick	Brick	Brick	Formed	Fully Opened
4006	405 6TH ST	A	Severe	10.34	ASPHALT;	Cast Iron	VENTED; LOCKING;	Cast Iron		Conical centered	Brick	Brick	Concrete (cast in place)	Concrete (cast in place)	Formed	Fully Opened
4013	333 E ARNOLD ST	A	Severe	7.78	GRAVEL;	Cast Iron	SOLID;	Cast Iron	Brick	Conical centered	Brick	Brick	Concrete (cast in place)	Vitrified Clay	Pipe	Fully Opened
4023	619 ELM ST	A	Severe	9.1	ASPHALT;	Cast Iron	SOLID;	Cast Iron	Brick	Conical centered	Brick	Brick	Concrete (cast in place)	Vitrified Clay	Pipe	Fully Opened
4034	604 E 4TH ST	A	Severe	8.9	ASPHALT;	Cast Iron	SOLID;	Cast Iron	Brick	Conical centered	Brick	Brick	Concrete (cast in place)	Brick	Other	Fully Opened
4036	516 CEDAR ST.	A	Severe	7.9	ASPHALT;	Cast Iron	SOLID;	Cast Iron	Concrete (precast)	Conical centered	Brick	Brick	Concrete (cast in place)	Vitrified Clay	Pipe	Fully Opened
4041	503 E 4TH ST	A	Severe	10.8	ASPHALT;	Cast Iron	SOLID;	Cast Iron	Brick	Conical centered	Brick	Brick	Brick	Brick	Other	Fully Opened
4049	322 E 3RD ST	A	Severe	8.8	ASPHALT;	Cast Iron	VENTED;	Cast Iron	Brick	Conical centered	Brick	Brick	Brick	Vitrified Clay	Pipe	Fully Opened
4056	124 E 2ND ST.	A	Severe	7.6	ASPHALT;	Cast Iron	SOLID;	Cast Iron		Conical centered	Brick	Brick	Brick	Vitrified Clay	Pipe	Fully Opened
4058	123 E 2ND ST	A	Severe	11.04	ASPHALT;	Cast Iron	SOLID;	Cast Iron	Concrete (precast)	Conical off centered	Concrete (precast)	Concrete (precast)	Concrete (cast in place)	Concrete (cast in place)	Formed	Fully Opened
4061	420 N EDDY ST	A	Severe	11.8	ASPHALT;	Cast Iron	SOLID;	Cast Iron	Brick, Concrete (precast)	Conical centered	Brick	Brick	Brick	Vitrified Clay	Pipe	Fully Opened
4062	520 N EDDY ST	A	Severe	11.04	ASPHALT;	Cast Iron	SOLID;	Cast Iron	Brick	Conical centered	Brick	Brick	Brick	Vitrified Clay	Pipe	Fully Opened
4074	118 E 2ND ST.	A	Severe	11.85	ASPHALT;	Cast Iron	SOLID;	Cast Iron	Concrete (precast)	Conical off centered	Concrete (precast)	Concrete (precast)	Concrete (cast in place)	Concrete (cast in place)	Formed	Fully Opened

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Manhole ID#	Street	Subbasin	Severity	Rim to Invert (Feet)	Surface Type	Cover Material	Cover Type	Frame Material	Chimney Material 1	Cone Type	Cone Material	Wall Material	Bench Material	Channel Material	Channel Type	Channel Exposure
4075	222 N EDDY ST	A	Severe	7.26	ASPHALT;	Cast Iron	SOLID;	Cast Iron	Concrete (precast)	Conical centered	Brick	Brick	Brick	Brick	Other	Fully Opened
4079	118 E 4TH ST	A	Severe	7.08	ASPHALT;	Cast Iron	SOLID;	Cast Iron	Concrete (precast), Brick	Conical centered	Brick	Brick	Concrete (cast in place)			
4088	420 E ARNOLD ST	A	Severe	6.2	ASPHALT;	Cast Iron	SOLID;	Cast Iron	Brick	Conical centered	Brick	Brick	Concrete (cast in place)	Vitrified Clay	Pipe	Fully Opened
4118	31 ARNOLD ST	E	Severe	6.76	GRASS/DIRT;	Cast Iron	SOLID;	Cast Iron	Concrete (precast)	Conical centered	Brick	Brick	Concrete (cast in place)	Clay Tile	Pipe	Fully Opened
4212	NEAR 344 BOULEVARD ST	E	Severe	6.6	ASPHALT;	Cast Iron	SOLID;GASKETED;	Cast Iron	Brick	Conical centered	Brick	Brick	Concrete (cast in place)	Clay Tile	Pipe	Fully Opened
4213	344 BOULEVARD ST	E	Severe	7.88	ASPHALT;	Cast Iron	SOLID;GASKETED;	Cast Iron	Concrete (precast)	Conical off centered	Concrete (precast)	Concrete (precast)	Concrete (cast in place)	Clay Tile	Pipe	Fully Opened
4224	311 W PLEASANT AVE	E	Severe	8.6	ASPHALT;	Cast Iron	SOLID;	Cast Iron	Brick	Conical centered	Concrete (precast)	Concrete (precast)	Concrete (cast in place)	Clay Tile	Pipe	Fully Opened
4226	111 W PLEASANT AVE	E	Severe	7.5	ASPHALT;	Cast Iron	SOLID;	Cast Iron		Conical centered	Concrete (precast)	Concrete (precast)	Concrete (cast in place)	Clay Tile	Pipe	Fully Opened
4227	15 W PLEASANT AVE	E	Severe	8	ASPHALT;	Cast Iron	SOLID;	Cast Iron		Conical off centered	Concrete (precast)	Concrete (precast)	Concrete (cast in place)	Concrete (cast in place)	Formed	Closed
4230	519 E PLEASANT AVE	E	Severe	6.94	CONCRETE PAVEMENT;GRASS/DIRT;	Cast Iron	SOLID;	Cast Iron		Conical centered	Concrete (precast)	Concrete (precast)	Concrete (cast in place)	Concrete (cast in place)	Formed	Fully Opened
4234	1302 N MAIN ST	E	Severe	6.9	ASPHALT;	Cast Iron	SOLID;GASKETED;	Cast Iron		Conical centered	Concrete (precast)	Concrete (precast)	Concrete (cast in place)	Clay Tile	Pipe	Partially Opened
4235	327 W KNIGHTS RD	E	Severe	11.86	ASPHALT;	Cast Iron	SOLID;GASKETED;	Cast Iron	Brick	Conical centered	Concrete (precast)	Concrete (precast)	Concrete (cast in place)	Clay Tile	Pipe	Fully Opened
4636	1006 BAYBERRY CT	E	Severe	13.06	GRASS/DIRT;	Cast Iron	SOLID;GASKETED;	Cast Iron	Concrete (precast)	Conical off centered	Concrete (precast)	Concrete (precast)	Concrete (cast in place)	Concrete (cast in place)	Formed	Fully Opened
4637	341 W PLEASANT AVE	E	Severe	12.9	GRASS/DIRT;	Cast Iron	SOLID;	Cast Iron	Concrete (precast)	Conical off centered	Concrete (precast)	Concrete (precast)	Concrete (cast in place)	Concrete (cast in place)	Formed	Fully Opened

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4007	405 6TH ST	A	High	11	ASPHALT;	Cast Iron	SOLID;	Cast Iron	Concrete (precast)	Conical centered	Brick	Brick	Brick	Concrete (cast in place)	Formed	Fully Opened
4008	614 N LAFAYETTE ST	A	High	8.7	GRASS/DIRT;	Cast Iron	SOLID;	Cast Iron	Brick, Unknown	Conical centered	Brick	Brick	Concrete (cast in place)	Concrete (cast in place)	Formed	Fully Opened
4009	800 N LAFAYETTE ST	A	High	7.22	GRASS/DIRT;	Cast Iron	SOLID;	Cast Iron		Conical centered	Brick	Brick	Concrete (cast in place)	Concrete (cast in place)	Formed	Fully Opened
4010	803 N LAFAYETTE ST	A	High	7.6	GRASS/DIRT;	Cast Iron	SOLID;	Cast Iron	Concrete (precast), Brick	Conical centered	Brick	Brick	Concrete (cast in place)	Concrete (cast in place)	Formed	Fully Opened
4011	841 N LAFAYETTE ST	A	High	7.1	GRASS/DIRT;	Cast Iron	SOLID;	Cast Iron	Concrete (precast), Brick	Conical centered	Brick	Brick	Concrete (cast in place)	Concrete (cast in place)	Formed	Fully Opened
4012	934 N LAFAYETTE ST	A	High	6.2	GRASS/DIRT;	Cast Iron	SOLID;	Cast Iron	Brick	Conical centered	Brick	Brick	Concrete (cast in place)		None	
4022	701 ELM ST	A	High	8.5	ASPHALT;	Cast Iron	SOLID;	Cast Iron	Concrete (precast)	Conical centered	Brick	Brick	Concrete (cast in place)	Vitrified Clay	Pipe	Fully Opened
4024	513 ELM ST	A	High	7.32	ASPHALT;	Cast Iron	SOLID;	Cast Iron	Brick	Conical centered	Brick	Brick	Concrete (cast in place)	Concrete (cast in place)	Formed	Fully Opened
4025	614 E 4TH ST	A	High	7.26	ASPHALT;	Cast Iron	SOLID;	Cast Iron	Concrete (precast)	Conical centered	Brick	Brick	Concrete (cast in place)	Vitrified Clay	Pipe	Fully Opened
4026	222 ELM ST	A	High	7.9	ASPHALT;	Cast Iron	SOLID;	Cast Iron	Brick	Conical centered	Brick	Brick	Concrete (cast in place)	Concrete (precast)	Formed	Fully Opened
4033	518 E 3RD ST	A	High	8.26	ASPHALT;	Cast Iron	SOLID;	Cast Iron	Concrete (precast), Brick	Conical centered	Brick	Brick	Brick	Brick	Other	Fully Opened
4035	515 E 4TH ST	A	High	9.16	ASPHALT;	Cast Iron	SOLID;	Cast Iron	Brick, Concrete (precast)	Conical centered	Brick	Brick	Concrete (cast in place)	Concrete (cast in place)	Formed	Fully Opened
4037	605 6TH ST	A	High	7.36	ASPHALT;	Cast Iron	SOLID;	Cast Iron	Brick	Conical centered	Brick	Brick	Concrete (cast in place)	Vitrified Clay	Pipe	Fully Opened
4038	502 6TH ST	A	High	8.4	ASPHALT;	Cast Iron	SOLID;	Cast Iron	Brick	Conical centered	Brick	Brick	Concrete (cast in place)	Concrete (cast in place)	None	Fully Opened

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4039	604 DE KALB ST	A	High	5	GRASS/DIRT;	Cast Iron	SOLID;	Cast Iron	Concrete (precast)	Conical off centered	Concrete (precast)	Concrete (precast)	Concrete (cast in place)	Vitrified Clay	Pipe	Partially Opened
4040	504 DE KALB ST	A	High	10.26	ASPHALT;	Cast Iron	SOLID;	Cast Iron	Brick	Conical centered	Brick	Brick	Brick	Vitrified Clay	Pipe	Fully Opened
4042	420 E 3RD ST	A	High	8.9	ASPHALT;	Cast Iron	SOLID;	Cast Iron	Brick	Conical centered	Brick	Brick	Brick	Brick	Other	Fully Opened
4044	106 DE KALB ST	A	High	11.58	ASPHALT;	Cast Iron	SOLID;	Cast Iron	Concrete (precast)	Conical centered	Brick	Brick	Concrete (cast in place)	Concrete (cast in place)	Formed	Fully Opened
4046	216 E 1ST ST.	A	High	11.38	ASPHALT;	Cast Iron	SOLID;	Cast Iron	Brick	Conical centered	Brick	Brick	Brick	Vitrified Clay	Pipe	Fully Opened
4047	216 WASHINGTON ST	A	High	8	ASPHALT;	Cast Iron	VENTED;	Cast Iron	Brick	Conical centered	Brick	Brick	Concrete (cast in place)	Concrete (cast in place)	Formed	Fully Opened
4050	304 E 4TH ST	A	High	10.46	ASPHALT;	Cast Iron	SOLID;	Cast Iron	Concrete (precast), Brick	Conical centered	Brick	Brick	Brick	Vitrified Clay	Pipe	Fully Opened
4051	204 E 1ST. ST.	A	High	11.28	ASPHALT;	Cast Iron	SOLID;GASKETED;	Cast Iron	Concrete (precast)	Conical centered	Brick	Brick	Brick	Vitrified Clay	Pipe	Fully Opened
4059	218 N EDDY ST	A	High	9.35	ASPHALT;	Cast Iron	SOLID;	Cast Iron		Conical centered	Brick	Brick	Brick	Brick	Other	Fully Opened
4060	329 N EDDY ST	A	High	12.12	ASPHALT;	Cast Iron	SOLID;	Cast Iron	Brick	Conical centered	Brick	Brick	Brick	Vitrified Clay	Pipe	Fully Opened
4063	701 N EDDY ST	A	High	10.6	ASPHALT;	Cast Iron	SOLID;	Cast Iron	Brick	Conical centered	Brick	Brick	Brick	Vitrified Clay	Pipe	Fully Opened
4064	708 N EDDY ST	A	High	9.45	ASPHALT;	Cast Iron	SOLID;	Cast Iron	Brick	Conical centered	Brick	Brick	Brick	Vitrified Clay	Pipe	Fully Opened
4068	802 N EDDY ST	A	High	8.3	ASPHALT;	Cast Iron	SOLID;	Cast Iron	Concrete (precast), Brick	Conical centered	Brick	Brick	Concrete (cast in place)	Vitrified Clay	Pipe	Fully Opened
4070	908 N EDDY ST	A	High	7.18	ASPHALT;	Cast Iron	SOLID;	Cast Iron	Concrete (precast)	Conical centered	Brick	Brick	Concrete (cast in place)	Vitrified Clay	Pipe	Partially Opened

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Manhole ID#	Street	Subbasin	Severity	Rim to Invert (Feet)	Surface Type	Cover Material	Cover Type	Frame Material	Chimney Material 1	Cone Type	Cone Material	Wall Material	Bench Material	Channel Material	Channel Type	Channel Exposure
4071	940 N EDDY ST	A	High	7.9	ASPHALT;	Cast Iron	SOLID;	Cast Iron	Concrete (precast)	Conical centered	Brick	Brick	Concrete (cast in place)	Vitrified Clay	Pipe	Fully Opened
4080	118 6TH ST	A	High	6.72	ASPHALT;	Cast Iron	SOLID;	Cast Iron		Conical centered	Brick	Brick	Concrete (cast in place)			
4081	308 6TH ST	A	High	7.8	ASPHALT;	Cast Iron	SOLID;	Cast Iron	Concrete (precast)	Conical centered	Brick	Brick	Brick	Vitrified Clay	Pipe	Fully Opened
4084	711 ALLEN ST	A	High	10.8	ASPHALT;	Cast Iron	SOLID;	Cast Iron	Brick	Conical off centered	Concrete (precast)	Concrete (precast)	Concrete (cast in place)	Vitrified Clay	Pipe	Partially Opened
4090	108 E ARNOLD ST	E	High	6.9	GRASS/DIRT;	Cast Iron	VENTED;	Cast Iron	Concrete (precast)	Conical centered	Brick	Brick	Concrete (cast in place)	Clay Tile	Pipe	Fully Opened
4091	123 E 9TH ST	A	High	6.59	GRASS/DIRT;	Cast Iron	VENTED;LOCKING;	Cast Iron	Brick	Conical centered	Brick	Brick	Concrete (cast in place)	Vitrified Clay	Pipe	Fully Opened
4094	924 WASHINGTON ST	A	High	4.3	GRASS/DIRT;	Cast Iron	SOLID;	Cast Iron		Conical centered	Concrete (precast)	Concrete (precast)	Concrete (cast in place)	Polyvinyl Chloride	Pipe	Fully Opened
4095	619 E ARNOLD ST	A	High	5.9	GRASS/DIRT;	Cast Iron	SOLID;	Cast Iron		Conical centered	Brick	Brick	Concrete (cast in place)	Vitrified Clay	Pipe	Fully Opened
4115	920 N MAIN ST	E	High	8.44	ASPHALT;	Cast Iron	SOLID;	Cast Iron	Brick, Concrete(precast)	Conical centered	Brick	Brick	Concrete (cast in place)	Clay Tile	Pipe	Fully Opened
4117	27 W ARNOLD ST	E	High	5.84	GRASS/DIRT;	Cast Iron	SOLID;	Cast Iron	Concrete (precast)	Conical off centered	Concrete (precast)	Concrete (precast)	Concrete (cast in place)	Polyvinyl Chloride	Pipe	Fully Opened
4120	307 W ARNOLD ST	E	High	2.9	GRASS/DIRT;GRAVEL;	Cast Iron	VENTED;	Cast Iron		Conical centered	Concrete (precast)	Concrete (precast)	Concrete (cast in place)	Polyvinyl Chloride	Pipe	Partially Opened
4122	15 E ARNOLD ST	E	High	7.56	GRASS/DIRT;	Cast Iron	SOLID;	Cast Iron	Brick	Conical centered	Brick	Brick	Concrete (cast in place)	Clay Tile	Pipe	Fully Opened
4123	927 N WOLFE ST	E	High	7.52	ASPHALT;	Cast Iron	SOLID;	Cast Iron	Brick	Conical centered	Brick	Brick	Concrete (cast in place)	Clay Tile	Pipe	Fully Opened
4124	19 BOULEVARD ST	E	High	8.6	ASPHALT;	Cast Iron	SOLID;GASKETED;	Cast Iron	Brick, Concrete(precast)	Conical centered	Brick	Brick	Concrete (cast in place)	Clay Tile	Pipe	Fully Opened

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4125	103 BOULEVARD ST	E	High	9.2	ASPHALT;	Cast Iron	SOLID;	Cast Iron	Brick	Conical centered	Brick	Brick	Concrete (cast in place)	Clay Tile	Pipe	Fully Opened
4126	209 BOULEVARD ST	E	High	9.02	ASPHALT;	Cast Iron	SOLID;	Cast Iron	Brick, Concrete (precast)	Conical centered	Brick	Brick	Concrete (cast in place)	Clay Tile	Pipe	Fully Opened
4128	318 BOULEVARD ST	E	High	6.96	ASPHALT;	Cast Iron	SOLID;	Cast Iron	Brick	Conical centered	Brick	Brick	Concrete (cast in place)	Clay Tile	Pipe	Fully Opened
4210	1008 CASTLE ST	E	High	11.8	ASPHALT;	Cast Iron	SOLID;	Cast Iron	Brick	Conical centered	Concrete (precast)	Concrete (precast)	Concrete (cast in place)	Clay Tile	Pipe	Fully Opened
4211	344 BOULEVARD ST	E	High	10.38	ASPHALT;	Cast Iron	SOLID;	Cast Iron	Concrete (precast)	Conical off centered	Brick	Concrete (precast)	Concrete (cast in place)	Polyvinyl Chloride	Pipe	Fully Opened
4223	317 W PLEASANT AVE	E	High	9.1	ASPHALT;	Cast Iron	SOLID;	Cast Iron	Concrete (precast)	Conical centered	Concrete (precast)	Concrete (precast)	Concrete (cast in place)	Clay Tile	Pipe	Fully Opened
4225	211 W PLEASANT AVE	E	High	8.5	ASPHALT;	Cast Iron	SOLID;	Cast Iron		Conical centered	Concrete (precast)	Concrete (precast)	Concrete (cast in place)	Clay Tile	Pipe	Fully Opened
4231	521 E PLEASANT AVE	E	High	6	CONCRETE PAVEMENT;	Cast Iron	SOLID;	Cast Iron		Conical centered	Concrete (precast)	Concrete (precast)	Concrete (cast in place)	Vitrified Clay	Pipe	Partially Opened
4237	127 W KNIGHTS RD	E	High	6.72	ASPHALT;	Cast Iron	SOLID;	Cast Iron	Brick	Conical centered	Concrete (precast)	Concrete (precast)	Concrete (cast in place)	Clay Tile	Pipe	Fully Opened
4277	1302 N MAIN ST	E	High	6.28	GRASS/DIRT;	Cast Iron	VENTED;	Cast Iron	Concrete (precast), Brick	Conical centered	Concrete (precast)	Concrete (precast)	Concrete (cast in place)	Clay Tile	Pipe	Partially Opened
4001	312 E 1ST. ST.	A	Moderate	13.09	ASPHALT;	Cast Iron	SOLID;	Cast Iron	Concrete (precast)	Conical off centered	Concrete (precast)	Concrete (precast)	Concrete (cast in place)	Concrete (cast in place)	Formed	Fully Opened
4043	207 DE KALB ST.	A	Moderate	7.1	ASPHALT;	Cast Iron	SOLID;	Cast Iron	Concrete (precast)	Conical off centered	Concrete (precast)	Concrete (precast)	Concrete (cast in place)	Polyvinyl Chloride	Pipe	Fully Opened
4065	205 MILLER CT	A	Moderate	6.54	CONCRETE PAVEMENT;	Cast Iron	SOLID;	Cast Iron	Concrete (precast)	Conical off centered	Concrete (precast)	Concrete (precast)	Concrete (cast in place)	Concrete (precast)	Precast	Fully Opened
4066	208 MILLER CT	A	Moderate	5.06	GRASS/DIRT;	Cast Iron	SOLID;	Cast Iron		Conical off centered	Concrete (precast)	Concrete (precast)	Concrete (cast in place)	Concrete (precast)	Precast	Fully Opened
4067	730 N EDDY ST	A	Moderate	8.7	ASPHALT;	Cast Iron	SOLID;	Cast Iron	Concrete (precast)	Conical centered	Brick	Brick	Concrete (cast in place)	Concrete (cast in place)	Formed	Fully Opened

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4069	909 N EDDY ST	A	Moderate	7.9	ASPHALT;	Cast Iron	SOLID;	Cast Iron		Conical off centered	Concrete (precast)	Concrete (precast)	Concrete (cast in place)	Polyvinyl Chloride	Pipe	Fully Opened
4089	216 E ARNOLD ST	A	Moderate	7.1	GRASS/DIRT;	Cast Iron	SOLID;	Cast Iron	Brick	Conical centered	Brick	Brick	Concrete (cast in place)	Concrete (cast in place)	Formed	Fully Opened
4093	923 WASHINGTON ST	A	Moderate	5.14	ASPHALT;	Cast Iron	SOLID;	Cast Iron	Concrete (precast)	Conical off centered	Concrete (precast)	Concrete (precast)	Concrete (cast in place)	Polyvinyl Chloride	Pipe	Partially Opened
4101	307 E CROFOOT ST	A	Moderate	6.52	ASPHALT;	Cast Iron	SOLID;	Cast Iron	Concrete (precast)	Conical centered	Concrete (precast)	Concrete (precast)	Concrete (cast in place)	Vitrified Clay	Pipe	Fully Opened
4102	305 E CROFOOT ST	A	Moderate	5.7	ASPHALT;	Cast Iron	SOLID;	Cast Iron		Conical centered	Concrete (precast)	Concrete (precast)	Concrete (cast in place)	Concrete (cast in place)	Formed	Fully Opened
4103	729 SUZANNE DR	A	Moderate	4.56	ASPHALT;	Cast Iron	SOLID;	Cast Iron		Conical centered	Concrete (precast)	Concrete (precast)	Concrete (cast in place)	Concrete (cast in place)	Formed	Fully Opened
4113	811 N MAIN ST	E	Moderate	6.4	GRASS/DIRT;	Cast Iron	SOLID;GASKETED;	Cast Iron	Concrete (precast)	Conical off centered	Concrete (precast)	Concrete (precast)	Concrete (cast in place)	Concrete (precast)	Precast	Fully Opened
4119	111 W ARNOLD ST	E	Moderate	6.48	GRASS/DIRT;	Cast Iron	SOLID;	Cast Iron		Conical centered	Concrete (precast)	Concrete (precast)	Concrete (cast in place)	Clay Tile	Pipe	Partially Opened
4127	221 BOULEVARD ST	E	Moderate	7.9	ASPHALT;	Cast Iron	SOLID;	Cast Iron	Brick, Concrete (precast)	Conical centered	Brick	Brick	Concrete (cast in place)	Clay Tile	Pipe	Fully Opened
4222	339 W PLEASANT AVE	E	Moderate	7.7	ASPHALT;	Cast Iron	SOLID;	Cast Iron	Concrete (precast)	Conical centered	Concrete (precast)	Concrete (precast)	Concrete (cast in place)	Clay Tile	Pipe	Fully Opened
4228	205 E PLEASANT AVE	E	Moderate	5.57	CONCRETE PAVEMENT;	Cast Iron	SOLID;	Cast Iron	Brick	Conical centered	Concrete (precast)	Concrete (precast)	Concrete (cast in place)	Clay Tile	Pipe	Partially Opened
4236	305 W KNIGHTS RD	E	Moderate	9.5	ASPHALT;	Cast Iron	SOLID;GASKETED;	Cast Iron	Concrete (precast)	Conical centered	Concrete (precast)	Concrete (precast)	Concrete (cast in place)	Clay Tile	Pipe	Fully Opened
4239	1302 N S MAIN ST	E	Moderate	6.26	GRASS/DIRT;GRAVEL;	Cast Iron	SOLID;GASKETED;	Cast Iron	Concrete (precast)	Conical off centered	Concrete (precast)	Concrete (precast)	Concrete (cast in place)	Concrete (cast in place)	Formed	Fully Opened
4240	1302 N S MAIN ST	E	Moderate	5.86	GRASS/DIRT;	Cast Iron	SOLID;GASKETED;	Cast Iron	Concrete (precast)	Conical off centered	Concrete (precast)	Concrete (precast)	Concrete (cast in place)			



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CITY OF SANDWICH, IL

Manhole ID#	Street	Subbasin	Severity	Rim to Invert (Feet)	Surface Type	Cover Material	Cover Type	Frame Material	Chimney Material 1	Cone Type	Cone Material	Wall Material	Bench Material	Channel Material	Channel Type	Channel Exposure
4242	1015 N MAIN ST	E	Moderate	8.66	ASPHALT;	Cast Iron	SOLID;	Cast Iron		Conical centered	Concrete (precast)	Concrete (precast)	Concrete (cast in place)	Clay Tile	Pipe	Partially Opened
4243	1012 SPRUCE ST	E	Moderate	4.38	ASPHALT;	Cast Iron	SOLID;	Cast Iron		Conical centered	Concrete (precast)	Concrete (precast)	Concrete (cast in place)			
4635	1006 BAYBERRY CT	E	Moderate	12.14	GRASS/DIRT;	Cast Iron	SOLID;	Cast Iron		Conical off centered	Concrete (precast)	Concrete (precast)	Concrete (cast in place)	Concrete (cast in place)	Formed	Fully Opened
4638	340 W PLEASANT AVE	E	Moderate	13.26	ASPHALT;	Cast Iron	SOLID;GASKETED;	Cast Iron	Concrete (precast)	Conical off centered	Concrete (precast)	Concrete (precast)	Concrete (cast in place)	Concrete (cast in place)	Formed	Fully Opened
4639	341 W PLEASANT AVE	E	Moderate	12.66	GRASS/DIRT;	Cast Iron	SOLID;	Cast Iron	Concrete (precast)	Conical centered	Concrete (precast)	Concrete (precast)	Concrete (cast in place)	Clay Tile	Pipe	Fully Opened
4640	406 W KNIGHTS RD	E	Moderate	13.5	ASPHALT;	Cast Iron	SOLID;	Cast Iron		Conical centered	Concrete (precast)	Concrete (precast)	Concrete (cast in place)	Clay Tile	Pipe	Fully Opened
4642	955 CASTLE ST	E	Moderate	6.8	GRASS/DIRT;	Cast Iron	SOLID;	Cast Iron	Not Known	Conical off centered	Not Known	Not Known	Concrete (cast in place)	Concrete (cast in place)	Formed	Fully Opened
4002	123 N LAFAYETTE ST.	A	Good	10.6	ASPHALT;	Cast Iron	SOLID;	Cast Iron		Conical off centered	Concrete (precast)	Concrete (precast)	Concrete (cast in place)	Concrete (cast in place)	Formed	Fully Opened
4004	319 N LAFAYETTE ST	A	Good	11.9	ASPHALT;	Cast Iron	SOLID;	Cast Iron	Concrete (precast)	Conical centered	Concrete (precast)	Concrete (precast)	Concrete (cast in place)	Brick	Formed	Fully Opened
4021	717 ELM ST	A	Good	6.5	CONCRETE PAVEMENT;	Cast Iron	SOLID;	Cast Iron	Concrete (precast)	Conical off centered	Concrete (precast)	Concrete (precast)	Concrete (cast in place)	Polyvinyl Chloride	Pipe	Fully Opened
4048	211 E 2ND ST	A	Good	10.48	ASPHALT;	Cast Iron	SOLID;	Cast Iron	Concrete (precast)	Conical off centered	Concrete (precast)	Concrete (precast)	Concrete (cast in place)	Concrete (cast in place)	Formed	Fully Opened
4055	60548 E. 1ST ST.	A	Good	10.3	ASPHALT;	Cast Iron	SOLID;GASKETED;	Cast Iron		Conical off centered	Concrete (precast)	Concrete (precast)	Concrete (cast in place)	Polyvinyl Chloride	Insert	Fully Opened
4057	124 E 2ND ST	A	Good	12.2	ASPHALT;	Cast Iron	SOLID;	Cast Iron		Conical off centered	Concrete (precast)	Concrete (precast)	Concrete (cast in place)	Concrete (cast in place)	Formed	Fully Opened
4078	404 ELM ST	A	Good	8.6	ASPHALT;	Cast Iron	SOLID;	Cast Iron	Concrete (precast)	Conical off centered	Concrete (precast)	Concrete (precast)	Concrete (cast in place)	Polyvinyl Chloride	Pipe	Fully Opened

## APPENDIX A: MANHOLE INSPECTION TABULAR SUMMARY

CITY OF SANDWICH, IL

Manhole ID#	Street	Subbasin	Severity	Rim to Invert (Feet)	Surface Type	Cover Material	Cover Type	Frame Material	Chimney Material 1	Cone Type	Cone Material	Wall Material	Bench Material	Channel Material	Channel Type	Channel Exposure
4092	908 WASHINGTON ST	A	Good	5	ASPHALT;	Cast Iron	SOLID;	Cast Iron		Conical off centered	Concrete (precast)	Concrete (precast)	Concrete (cast in place)	Polyvinyl Chloride	Pipe	Fully Opened
4114	830 N MAIN ST	E	Good	8	ASPHALT;	Cast Iron	SOLID;	Cast Iron		Conical centered	Brick	Brick	Concrete (cast in place)	Clay Tile	Pipe	Fully Opened
4116	3 E ARNOLD ST	E	Good	8.8	ASPHALT;	Cast Iron	SOLID;	Cast Iron	Concrete (precast)	Conical off centered	Concrete (precast)	Concrete (precast)	Concrete (cast in place)	Polyvinyl Chloride	Pipe	Fully Opened
4121	1007 SPRUCE ST	E	Good	5.5	GRASS/DIRT;	Cast Iron	SOLID;	Cast Iron	Concrete (precast)	Conical off centered	Concrete (precast)	Concrete (precast)	Concrete (cast in place)	Clay Tile	Pipe	Fully Opened
4229	303 E PLEASANT AVE	E	Good	5.38	CONCRETE PAVEMENT;	Cast Iron	SOLID;GASKETED;	Cast Iron		Conical off centered	Concrete (precast)	Concrete (precast)	Concrete (cast in place)	Clay Tile	Pipe	Fully Opened
4238	27 W KNIGHTS RD	E	Good	7	GRASS/DIRT;	Cast Iron	SOLID;GASKETED;	Cast Iron		Conical off centered	Concrete (precast)	Concrete (precast)	Concrete (cast in place)	Concrete (cast in place)	Formed	Fully Opened
4241	1302 N S MAIN ST	E	Good	7.58	GRASS/DIRT;	Cast Iron	SOLID;GASKETED;	Cast Iron		Conical off centered	Concrete (precast)	Concrete (precast)	Concrete (cast in place)	Concrete (cast in place)	Formed	Fully Opened
4276	1302 N MAIN ST	E	Good	6	GRASS/DIRT;	Cast Iron	SOLID;GASKETED;	Cast Iron	Concrete (precast)	Conical off centered	Concrete (precast)	Concrete (precast)	Concrete (cast in place)	Clay Tile	Pipe	Fully Opened
4632	608 W PLEASANT AVE	E	Good	8.1	GRASS/DIRT;	Cast Iron	SOLID;GASKETED;	Cast Iron	Concrete (precast)	Conical off centered	Concrete (precast)	Concrete (precast)	Concrete (cast in place)	Concrete (cast in place)	Formed	Fully Opened
4633	1002 BAYBERRY CT	E	Good	9.2	GRASS/DIRT;	Cast Iron	SOLID;GASKETED;	Cast Iron	Concrete (precast)	Conical off centered	Concrete (precast)	Concrete (precast)	Concrete (cast in place)	Concrete (precast)	Formed	Fully Opened
4634	1006 BAYBERRY CT	E	Good	11.84	CONCRETE PAVEMENT;	Cast Iron	SOLID;GASKETED;	Cast Iron		Conical off centered	Concrete (precast)	Concrete (precast)	Concrete (cast in place)	Concrete (cast in place)	Formed	Fully Opened
4641	1006 BAYBERRY CT	E	Good	12.46	GRASS/DIRT;	Cast Iron	SOLID;GASKETED;	Cast Iron	Concrete (precast)	Conical off centered	Concrete (precast)	Concrete (precast)	Concrete (cast in place)	Concrete (precast)	Precast	Fully Opened
4688	619 E ARNOLD ST	E	Good	5.18	GRAVEL;	Cast Iron	SOLID;	Cast Iron		Conical off centered	Concrete (precast)	Concrete (precast)	Concrete (cast in place)	Polyvinyl Chloride	Pipe	Partially Opened

**Note:**

*Blank cells denote attribute do not exist*



## **APPENDIX B**

### **SSES Communication Documentation**

#### **Appendix B.1**

Letter of Notice of Manhole Inspections

#### **Appendix B.2**

Letter Notice of Smoke Testing

#### **Appendix B.3**

Door Hanger Notice of Smoke Testing

#### **Appendix B.4**

Smoke Testing Standard Operating Procedure

#### **Appendix B.5**

Hurco's LiquiSmoke MSDS



June 24, 2019

Dear Resident,

Beginning next week, representatives from RMS Utility Services of Crystal Lake, IL. will be in your area to evaluate the condition of the sanitary sewer manholes. They will be using a camera with 360-degree imaging used to televise and catalog structural features, piping arrangements, depth and deficiencies within the manholes. This process will not impact sanitary sewer flows and there will be no interruption to your sanitary sewer service.

Representatives from RMS will need to access manholes in the right-of-way and/or utility easements, including those on private property. In addition to access to the property, RMS may also request the temporary use of your driveway, as it may aid in the optimal positioning of their camera truck. The televising process should last less than 15 minutes per manhole. The representatives from RMS who will be working in our area are:

- Gary Hallaert
- Mike Freye
- Jason Harrod
- Richard Peter
- Colin Murphy

Manhole inspection is the first phase of a two-part assessment of the sanitary sewers in your area. The second phase includes smoke testing of the system. The assessment locates leaks in the system that may allow water from rain storms or large snow melts, for example, to enter. If the leaks add a significant amount of water into the system, sanitary sewer backups can sometimes result. More information about the sanitary sewer inspection and assessment project is on the City of Sandwich website at <https://www.sandwich.il.us/a&e.html/>.

We appreciate your cooperation during this project. Please feel free to contact Public Works at (815)786-8802 if you have any questions.

Thank you for your cooperation.



# City of Sandwich

Public Works Department

## **NOTICE OF SMOKE TESTING**

**Please be advised that the City of Sandwich will be smoke testing the sanitary sewer lines in your area. Work will occur 7/22/19 through 7/29/19 between the hours of 8 am and 5 pm.**

The City of Sandwich will be conducting smoke testing on the sanitary sewer lines from Center Street to Knights Road, generally between Castle Street and N. Latham Street. **The tentative date that this work will start is July 22, 2019. It is anticipated that the work could be completed by July 29, 2019 if all goes well.**

These tests involve blowing harmless smoke into the sewer system to find damage, illegal connections, and where unwanted rainfall or groundwater may be entering the City's sanitary sewer system. As a result, smoke may be seen coming from roof vents, building foundations, catch basins, clean-outs, down spouts, sewer laterals, or manhole covers. The smoke will not enter your home or business if it is properly plumbed, vented, and the water traps contain water.

### **Recommendation for Residents:**

**If you have a bathroom or plumbing fixture that is not used or is seldom used, traps should be filled by running water in the fixtures the day before scheduled smoke testing. Water can evaporate from unused plumbing fixtures and sewer gases can enter the home. Water should be added on a monthly basis thereafter in order to prevent sewer gas from entering the home or office. As a precaution, open the bathroom windows for ventilation and close the door, in case smoke does enter the bathroom.**

The smoke used is a non-toxic substance that is harmless to humans, pets, food, and material items. If smoke does enter the building, it will clear in a few minutes with proper ventilation. Please advise a representative of the smoke testing crew if any leakage occurs in your home or business. Additionally, if you have any questions about the test, health issues, or any other concerns, feel free to ask a crew member, or contact the Public Works Department at (815) 786-8802.

Your presence is not required during the tests, and all public safety authorities (Sandwich Police Department and Sandwich Community Fire Protection District) have been notified of this event. **We would appreciate it if you would mention this notice to your neighbors in case they have not received it.**

You can learn more about sewer smoke testing on the City's website at <http://www.sandwich.il.us/a&e.html/>. Refer to the back of this notice for *Frequently Asked Questions* concerning sewer smoke testing.

Thank you for your cooperation.

## **Sanitary Sewer Smoke Testing - Frequently Asked Questions**

### **How does smoke testing work?**

Field crews blow air and smoke into the sanitary sewer system in the street and monitor where smoke escapes the system. The smoke under pressure will fill the main line as well as any connections and then follow the path of any leak to the ground surface, quickly revealing the source of the problem.

### **What are the benefits of smoke testing?**

Smoke testing is the most efficient and cost effective way to locate and identify where unauthorized water is entering the public portion of the sewer system and find areas of the sewer system that need improvement. Smoke testing is becoming a requirement nationwide for locating unauthorized water problems that are threatening the ability to properly treat wastewater.

### **How long will it take?**

While crews might be in your area for a few hours, each actual smoke test setup takes approximately 15 minutes to complete. Most houses will only be within the testing area for one or two tests.

### **What should I do if smoke gets into the house?**

Do Not Become Alarmed. Open windows to allow ventilation and note the location of the smoke emission. Smoke will clear within a few minutes. Exit the building and notify smoke testing personnel in the area. **If you have any doubt as to the source of the smoke in your home or yard, phone 911 immediately.**

### **If the smoke is not harmful, why do you recommend evacuating the structure?**

Evacuating is a precautionary measure in case the smoke is due to a real fire rather than a test, and also since smoke in your house from this test indicates other sewer gases may also be entering the building.

### **What should I do if I have emphysema or respiratory problems? Is the smoke harmful?**

Although the smoke is considered to have no adverse health effects, individuals with respiratory conditions should take special precautions. Smoke rarely enters a home, but you could sit outside for the duration of the smoke test (20 min). If you cannot sit outside, open the windows and shut your bathroom doors. Also, tell the crew member who knocks on your door that you have a respiratory condition.

### **I am a pet owner and I will not be at home during the testing. Should I be concerned?**

The smoke is not harmful to pets. As long as windows are left open, any smoke that enters the building will dissipate in a few minutes.

### **What does it mean if smoke enters my house?**

If smoke enters your home during the test, it may indicate there are deficiencies in the plumbing that may allow potentially dangerous sewer gases to enter. Plumbing fixtures in your home or business are connected to the sanitary sewer, therefore there is potential for smoke to enter if the drains are not connected properly. This happens particularly under the following circumstances:

- The vents connected to your building's sewer pipes are inadequate, defective, or improperly installed.
- The traps under sinks, tubs, basins, etc. are dry, defective, or improperly installed.
- The pipes, connections, or seals in the waste water drain system in and/or under your building are damaged, defective, have plugs missing, or are improperly installed.

Simply run water down the drain for a minute to ensure that the trap is not dry. It is important to locate dry traps as they could allow sewer gases to enter the home.

### **Can the smoke testing activate the smoke alarms?**

Yes, smoke alarms may activate during smoke testing. If possible, open windows and/or doors for ventilation. **If you have any doubts about the origin of the smoke, please call 911.**

# NOTICE

## SMOKE TESTING SEWER

**SO: Evaluación de la Redde Alcantarillado  
(Prueba de Humo)**

Work crews will be conducting smoke tests of sanitary sewers in your area on:  
*Estamos conduciendo pruebas de humo en la red de alcantarillado en su área el día:*

7123 - 7125

These tests will assist us in locating breaks and leaks in the public utility sewer system. During the test, **YOU MAY SEE SMOKE COMING FROM STACKS ON BUILDINGS OR FROM HOLES IN THE GROUND.** Don't be alarmed. The smoke has no odor, is non-toxic, non-staining, does not pose a fire hazard, and will dissipate in a few minutes. Your local fire and police departments have been notified of this test.

### Preparing for the Test

When we conduct the smoke test, please pour (3) gallons of water on receipt of this notice into your basement floor drains and into any unused sinks. This will seal the drain traps so that smoke will not enter your building through the drain.

If you won't be home during the test, open bathroom and laundry room windows and close the doors before you leave. Any smoke that enters the building will be contained and dissipate in a few minutes.

Smoke is not harmful to humans or pets. But if you or a pet will be home at the time of the test who may be irritated by the smoke or has a respiratory condition, please call the number at the bottom of the back of this notice.

### Smoke Enters Your Home

If smoke does enter your building during the test, it means there are defects in the plumbing that allow sewer gas to enter. Note the location of the smoke and call the number on the back of this notice. Open doors and windows to ventilate any smoke that enters the building.

(Continued on reverse side / Leer el reverso de este aviso)

*Estas pruebas ayudaran a localizar fugas y defectos en la red de alcantarillado. Durante el periodo de pruebas, puede ser visible la presencia de HUMO proveniente de la ventilación de la cañería de edificios o también de huecos en la tierra. No se alarme. Este humo no tiene color, no es tóxico, no causa manchas, no crea ningún peligro de incendio, y normalmente desaparece en pocos minutos.*

*Antes de empezar las pruebas, por favor llenar con agua los drenajes de su sótano y también lavabos / fregaderos que no son usados diariamente. Esta medida es necesaria para que los drenajes permanezcan bloqueados y el humo no entre a su residencia*

*Si usted detecta la presencia de humo dentro de su edificio durante las pruebas, significa que hay defectos y fugas en las cañerías que puede permitir el ingreso de GASES PELIGROSOS PROCEDIENTES DEL ALCANTARILLADO dentro de su edificio. Por favor hacer nota del sitio exacto donde aparece el humo y llamar a nuestra oficina para hacer una cita con un inspector. Abrir puertas y ventanas para ventilar el humo fuera del edificio. Si usted tiene perros, aves u otras mascotas que se confinará solo en el edificio durante la prueba, se recomienda abrir o ventilar una ventana en caso de que el humo entre en su hogar a través de un defecto de plomería.*

*Por favor llamar a nuestra oficina antes de conducir las pruebas si existe alguna de las siguientes situaciones:*

- *Existe una persona que vive solo(a) y además es minusválido(a) o esta reposando durante las pruebas.*
- *Existe una persona(s) con problemas respiratorios dentro del edificio.*
- *Existe una persona(s) de mayor edad que vive solo(a) y puede ser afectado(a) por este tipo de pruebas.*

**If you have any of these situations, or have questions regarding the smoke test, call:**

***Si existe alguna de las situaciones arriba mencionadas, o si tiene preguntas acerca de estas pruebas, por favor llamar al teléfono:***

**RMS**  
UTILITY SERVICES

Call our Office at:  
(888) 655-4085

For more information on smoke testing  
visit: [www.rms4service.com](http://www.rms4service.com)



## **SMOKE TESTING STANDARD OPERATING PROCEDURE**

The City of Sandwich is utilizing a three-phase approach to reduce excessive inflow and infiltration (I/I) from entering the City's sanitary sewer system. The first phase of the approach is to complete flow monitoring which can determine if a sub-basin has inflow or infiltration. The second phase of the approach is to complete smoke testing, dye testing, or other sanitary sewer evaluation survey (SSES) work to find the exact locations of the inflow or infiltration sources. The final phase is the remediation of the inflow or infiltration source.

This standard operating procedure outlines the actions regarding smoke testing which is part of the second phase of the three-phase I/I reduction plan. Smoke testing can be used to find areas where groundwater or stormwater are leaking into the sanitary sewer, thus causing surcharging or backups during periods of high groundwater or heavy rains. Smoke testing is useful and necessary to find defects such as connected roof leaders, broken or missing cleanout covers, connected storm sewer inlets, cracked sanitary sewer service lines, drain tile connections, and other issues.

Smoke testing is a valuable tool for finding I/I sources. The smoke testing may affect residents; therefore, steps should be taken to alert residents and other stakeholders of the smoke testing timelines what to expect during smoke testing.

### **AREA SELECTION AND PROJECT TIMING**

As part of the City's Capacity, Management, Operations, and Maintenance (CMOM) plan the City has outlined a plan to reduce I/I throughout the City. Over the course of the plan, all portions of the City's collection system will be flow monitored as part of Phase I of the I/I reduction goal. Problem areas identified during Phase I will undergo SSES work such as smoke testing. A map delineating the boundaries of the subbasin(s) that will be tested during any given year will be created and disseminated as necessary.

Project timing is also significant. Smoke will not be evident in areas that are saturated with groundwater. The optimal scheduling for smoke testing is during the periods of prolonged dry weather (June – September). The purpose of testing is to locate surface features such as illegal connections and broken cleanouts, as well as issues in the sanitary sewer main, laterals, and manholes.

### **NOTIFICATIONS AND COORDINATION**

Notifications and coordination are a critical function of the testing program. Those connected to the City of Sandwich's sanitary sewer network, City Council, 911 Dispatch, Police Department, Fire Department, Homeowners Associations (HOAs), School Districts (if applicable), apartment complex managers, adjacent communities, and the general public need to know the purpose, location, dates, procedure and status reports of smoke testing.

The overall communication process shall follow the following recurrence. The project manager shall ensure all communication and other work is completed in a timely and professional fashion.

1.  City Council approval of smoke testing contract for a specified area.



2.  City GIS Department or the City's Engineering Consultant prepares a map or maps of the area to be smoke tested.
3.  City Staff Project Manager updates City's Infiltration/Inflow Remediation Program (IIRP) website with location and tentative schedule for smoke testing.
4.  Two weeks prior to smoke testing City Staff contacts, via phone and email, the following agencies to inform them of the upcoming smoke testing.
  - a.  911 Dispatch
  - b.  Police Department
  - c.  Fire Department
  - d.  School District (If a school is located in the smoke testing area)
  - e.  Apartment Complex Managers
  - f.  Homeowners Associations (HOAs)
5.  Two weeks prior to smoke testing, City sends direct mailer to residents and business owners in study area.
6.  Two to four days prior to smoke testing, contractor hangs door hangers on all residential doors and businesses.
7.  Two to four days in advance, City posts notifications on City's Facebook page and tweets upcoming schedule and locations for smoke testing.
8.  One day in advance, contractor sets up signs through study area.
9.  Throughout testing, City Staff shall provide weekly updates to:
  - a.  911 Dispatch
  - b.  Police Department
  - c.  Fire Department
  - d.  School District (If a school is located in the smoke testing area)
  - e.  Apartment Complex Managers
  - f.  Homeowners Associations (HOAs)
10.  Within the week following the completion of the smoke testing field work, all parties shall be informed that testing is complete.
11.  One week after testing is complete, City staff or Contractor shall remove all remaining door hangers.

**A MORE DETAILED DESCRIPTION OF EACH ACTIVITIES IS AS FOLLOWS:**

1. As stated at the beginning of this document, the City of Sandwich utilizes a three-phase system to decrease the amount of I/I in their sanitary sewer system. Smoke testing is part of the second phase of the plan. Prior to the initiation of smoke testing, flow monitoring should be completed in order to determine areas with large amounts of inflow and infiltration. Once flow monitoring of an area has been completed, city staff or engineering consultants will recommend areas which are candidates for smoke testing or other SSES work to the City Council.
2. A map or maps of the testing area shall be created. It may be useful to create two or more maps to utilize during smoke testing. One map shall be provided to residents and should highlight the smoke testing area, along with any major streets or notable information for residents. Another more detailed map shall be

used by those conducting smoke testing and shall highlight the locations and sizes of the mains to be tested. The map shall also highlight the locations of all manholes. An example of the more detailed map can be found here: \_\_\_\_\_.

3. The web page, which shall be accessible from a link off the landing page of the City's website, shall serve as the main communication device between the City and those affected by smoke testing. Throughout the smoke testing, it is imperative that the website be kept up to date and that the website serves as the 'first go-to' for information. The website shall include the following pieces of information:
  - a. Map of area to be smoke tested
  - b. Tentative dates and times of smoke testing.
  - c. MSDS of the smoke being used
  - d. FAQ regarding smoke testing
  - e. Pictures of smoke testing
  - f. Contact information for relevant City staff
  - g. A place for those who have special health or other concerns, such as those with asthma or young children, may directly contact the City to discuss concerns.
4. Two weeks prior to smoke testing, entities listed in point four should be contacted via phone call and all necessary follow up should be made. City staff should ensure that the contacts are familiar with the procedure and that any pertinent questions have been answered.
5. Two weeks prior to smoke testing, a direct mailer should be sent out to those who are in the smoke testing area. A copy of the mailer can be found here: \_\_\_\_\_. The direct mailer should include the following information:
  - a. A summary of what smoke testing is and why the smoke testing is being completed
  - b. A summary of when and where smoke testing is going to be completed
  - c. A reference to the smoke testing website, which will be used during the duration of the smoke testing to provide real-time updates
  - d. A summary of the FAQs regarding smoke testing
6. Two to four days prior to smoke testing, door hangers shall be placed on all buildings that may be affected by smoke testing. A copy of the door hangers can be found here: \_\_\_\_\_. The door hanger should outline the dates and times when smoke testing is expected to be completed. The door hanger should also direct the residents to access the website for additional information.
7. Two to four days prior to smoke testing, the City should begin to utilize their social media accounts, such as Facebook and Twitter, to remind residents of the upcoming smoke testing. These social media updates should be completed by the City and should refer residents to the website for additional information.
8. One day prior to smoke testing, the City or the Contractor should set up signs strategically placed in the smoke testing area alerting residents of the upcoming activities. Signs should be placed throughout the testing area including on major streets and any entrances into subdivisions.
9. All entities listed in section four should receive weekly updates from the City for the duration of the smoke testing. These updates should include the dates and times of the upcoming smoke testing, along with any other relevant information. The City shall ensure that any questions from the entities are answered and any concerns are addressed appropriately.

10. Once smoke testing is completed, all parties listed in section four should be notified directly that smoke testing is complete. The City website and all social media accounts should also note the fact that smoke testing has been completed.
11. One week after smoke testing has been completed, the door hangers left prior to smoke testing should be removed if they have not been removed already. A door hanger which has not been removed may serve as an indication that a resident has not been to their residence for an extended period of time, and therefore the residence may serve as a target for malicious actions. The door hangers should be removed by representatives from the City or by the Contractor.



## MSDS AND TEST DATA EXPLANATION

Enclosed with this cover letter is a copy of our Safety Data Sheet for the liquid form of LiquiSmoke, and a summary of the Maxim Technologies and Wisconsin Occupational Health Laboratory reports on the smoke generated by Hurco's LiquiSmoke.

**Please note that only people who are using the "raw" LiquiSmoke (the liquid form) will be concerned with the SDS sheet. People who are exposed to the "smoke" LiquiSmoke only need to be concerned with the Maxim Technologies and WOHL reports.** What is important to note on the SDS sheet is Section 11 - Toxicological Information - it is not a potential carcinogen. The "raw" LiquiSmoke does not require any hazardous transportation documentation.

Since there is not an SDS for products in smoke form, we hired a private, nationally recognized laboratory, Maxim Technologies, Inc. of Sioux Falls, South Dakota, to sample the smoke generated by LiquiSmoke. The samples were sent to the Wisconsin Occupational Health Laboratory where a GC Solvent Scan was performed. Of the 107 items listed in a GC Solvent Scan, only .01 parts per million (PPM) petroleum distillates was found. The OSHA Permissible Exposure Limit (PEL) is 500 ppm. Carbon Monoxide and Carbon Dioxide levels all tested within the OSHA PEL. This information is important to persons being exposed to the "smoke". Even though these test don't identify any harmful quantities of toxic compounds, you will need to warn your customers of dangerous sewer gases that may be traveling with the smoke. They should always be warned to evacuate the premise when smoke is detected.

Finally, we had Maxim Technologies test the smoke generated by our LiquiSmoke for staining and residue. The tests showed that there was no staining or residue caused by LiquiSmoke. Your customers can rest assured that LiquiSmoke will not ruin their furniture or drapery. More information is included in the following document, "Scientific Evaluation of LiquiSmoke".

If you have any questions or concerns about Hurco's LiquiSmoke, please contact me at 1-800-888-1436.

Sincerely,

Beckie Hurley  
Vice President

# **Scientific Evaluation of LiquiSmoke™**

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## **A Summary of the Scientific Evaluation Reports Produced by Maxim Technologies of Sioux Falls, South Dakota**

During testing conducted by Maxim Technologies, the following facts concerning the smoke generated by LiquiSmoke were determined, under the guidelines set by The National Institute of Occupational Safety and Health (NIOSH), and the Occupational Safety and Health Administration (OSHA).

During the tests, Maxim Technologies collected a sample of the smoke generated by LiquiSmoke in a charcoal tube. The sample was sent to the Wisconsin Occupational Health Laboratory. A GC Solvent Scan was conducted to determine if the smoke generated by LiquiSmoke formed any hazardous compounds or conditions. The GC Solvent Scan searched for 107 different hazardous organic compounds. Of the 107 items listed, only .01 parts per million (ppm) petroleum distillates was found. The OSHA permissible Exposure Limit is 500 ppm.

Further testing by Maxim Technologies found that the ambient carbon monoxide levels were found to be zero. NIOSH regulations have determined that the “8 hour time weighted average” (TWA) for carbon monoxide to be 35 ppm. During the duration of the test, measurable TWA levels of LiquiSmoke ranged from 4.6 to 7.8 ppm – within the OSHA Permissible Exposure Limit (PEL) set by OSHA.

Maxim Technologies also tested for carbon dioxide levels. Ambient levels were found to be at 330 ppm. The level of carbon dioxide during the entire LiquiSmoke test was determined to be 500 ppm. The OSHA Permissible Exposure Limit (PEL) is 5,000 ppm.

In addition, testing by Maxim Technologies was also performed to determine if usage of the product left any staining or odor. Residual staining and odor tests were conducted in a closed facility filled with LiquiSmoke. Time interval testing of filter paper samples exposed to LiquiSmoke were examined under a microscope at 40X magnification. In all cases, no visible staining was present, along with no odor on any of the filter papers exposed to the smoke.

This summary is based on complete reports from Maxim Technologies of Sioux Falls, South Dakota. Copies of these tests, as well as the findings of the Wisconsin Occupational Health Laboratory, are available from Hurco Technologies, Inc.



PLEASE NOTE: This information is for Hurco LiquiSmoke in LIQUID form ONLY. This does not pertain to the SMOKE form. Contact Hurco for that information.

### SECTION 1 IDENTIFICATION

Product Identifier	Hydrotreated Middle Distillate
Trade Name	Hurco LiquiSmoke™
Chemical Formula	Proprietary
Use	This product is intended for use in Hurco Smoke Testing Equipment.
Manufacturer/Distributor	Hurco Technologies, Inc. 409 Enterprise Street Harrisburg, SD57032 605-743-2466 info@hurcotech.com
Emergency Phone	CHEMTREC - 800-424-9300

### SECTION 2 HAZARD IDENTIFICATION

GHS Classification	Aspiration Hazard Category 1
Signal Word	DANGER!
Pictogram	
Hazard Statement	May be fatal if swallowed and enters airways.
Response	IF SWALLOWED: Immediately call a POISON CENTER/doctor. Do NOT induce vomiting.

This product is considered hazardous under 29 CFR 1919.1200

# SAFETY DATA SHEET

### SECTION 3 COMPOSITION/INFORMATION ON INGREDIENTS

Ingredient	Hydrotreated Middle Distillate
CAS #	64742-46-7
Percent	100

### SECTION 4 FIRST AID MEASURES

**Eye Contact:** Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses. Get medical attention if irritation occurs.

**Skin Contact:** Remove contaminated clothing and shoes. Wash skin immediately and thoroughly with soap and water. Get medical attention if irritation develops. Wash clothing and shoes before reuse.

**Inhalation:** Move affected person to fresh air. Loosen tight clothing. If breathing is difficult, provide oxygen. If not breathing, provide artificial respiration. Get medical attention if adverse health symptoms persist or are severe.

**Ingestion:** Consult poison center/doctor immediately. Rinse mouth thoroughly if conscious. Do not induce vomiting. If vomiting occurs, keep head low so the vomit does not enter lungs.

Acute Exposure Effects	Ingestion may cause nausea, vomiting and diarrhea. May be fatal if swallowed and enters airway. May cause skin dryness or irritation.
Chronic Exposure Effects	Ingestion may cause nausea, vomiting and diarrhea. May cause skin dryness or irritation.
Physician Treatment	Treat symptomatically.

## SECTION 5 FIRE FIGHTING MEASURES

<b>Extinguishing Media</b>	CO2, Dry Chemical, Foam.
<b>Unsuitable Extinguishing Media</b>	Avoid solid water stream/jet which may spread fire.
<b>Fire Fighting Procedures</b>	Isolate scene. Wear appropriate protective equipment. SCBA may be required.

## SECTION 6 ACCIDENTAL RELEASE MEASURES

<b>Personal Precautions</b>	Eliminate all sources of ignition. Avoid walking through spilled product. Remove unnecessary personnel. Wear appropriate protective equipment when required.
<b>Environmental Precautions</b>	Prevent spilled material from entering sewers, drainage systems, waterways and soil. Contact proper authorities regarding possible contamination if necessary.
<b>Containment and Cleanup</b>	Contain with earthen like or petroleum absorbent material. Remove all contaminated materials to salvage container. Dispose of in accordance with local regulations. Smaller amounts of product may be diluted with water and mopped up.

## SECTION 7 HANDLING AND STORAGE

<b>Handling</b>	Do not eat, drink or smoke while handling product or in product storage areas.
<b>Storage</b>	Keep away from ignition sources. Store in original container or a properly labeled approved alternative. Keep container upright and tightly closed.

## SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

<b>Ingredient</b>	Hydrotreated Middle Distillate
<b>Exposure Limits</b>	OSHA PEL: TWA 5 mg/m3 (8 hours) ACGIH TLV: TWA 5 mg/m3 (8 hours); STEL 10 mg/m3 (15 minutes)
<b>Appropriate Engineering Controls</b>	General ventilation. Local exhaust to control vapors. Mechanical ventilation for confined spaces.
<b>Personal Protective Equipment</b>	<b>Eye protection</b> - Chemical goggles or face shield. <b>Skin protection</b> - PVC/equivalent glove. PVC/equivalent apron where splash potential exists.
<b>Hygienic Practices</b>	Minimize body contact. Wash body contact areas promptly. Wash contaminated clothing.

## SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

<b>Appearance</b>	Clear to light yellow liquid
<b>Odor</b>	Negligible
<b>Odor Threshold</b>	Not available
<b>pH</b>	Not available
<b>Melting Point</b>	30 °F
<b>Freezing Point</b>	Not available
<b>Boiling Point</b>	470 °F
<b>Flash Point</b>	252 °F
<b>Evaporation Rate</b>	Not available
<b>Flammability (Solid, Gas)</b>	Not available
<b>Upper/Lower Explosive Limits</b>	Not available
<b>Vapor Pressure</b>	<0.1
<b>Vapor Density</b>	Not available
<b>Relative Density</b>	0.85
<b>Solubility in Water</b>	Insoluble
<b>Partition Coefficient</b>	Not available
<b>Auto-ignition Temperature</b>	Not available
<b>Decomposition Temperature</b>	Not available
<b>Viscosity</b>	3.6

## SECTION 10 STABILITY AND REACTIVITY

<b>Reactivity</b>	Not known to be reactive under normal conditions.
<b>Stability</b>	Stable under normal conditions.
<b>Hazardous Reactions</b>	No hazardous reactions under normal conditions.
<b>Materials to Avoid</b>	Heat and flame
<b>Incompatible Materials</b>	Oxidizers and acids
<b>Hazardous Decomposition</b>	Carbon Monoxide and other petroleum decomposition products.

## SECTION 11 TOXICOLOGICAL INFORMATION

<b>Route of Exposure</b>	<b>Inhalation</b>
Related Symptoms	None known
Acute and Chronic Effects	None known
<b>Route of Exposure</b>	<b>Ingestion</b>
Related Symptoms	Nausea or vomiting
Acute and Chronic Effects	May be fatal if swallowed and enters airway
<b>Route of Exposure</b>	<b>Skin</b>
Related Symptoms	May cause irritation or dryness
Acute and Chronic Effects	May cause irritation or dryness
<b>Route of Exposure</b>	<b>Eye</b>
Related Symptoms	None known
Acute and Chronic Effects	None known
<b>Numerical measures of toxicity</b>	Oral LD Rat - >5000 mg/kg. Dermal LD50 - >2000 mg/kg
<b>Potential Carcinogen</b>	No

## SECTION 12 ECOLOGICAL INFORMATION

<b>Ecotoxicity</b>	Not Available
<b>Persistence and Degradability</b>	Not Available
<b>Bioaccumulative Potential</b>	Not Available
<b>Mobility in Soil</b>	Not Available
<b>Other Adverse Effects</b>	Not Available

## SECTION 13 DISPOSAL CONSIDERATIONS

<b>Waste Management</b>	Dispose of per Federal, State and local laws. Avoid generation of waste wherever possible.
-------------------------	--

## SECTION 14 TRANSPORT INFORMATION

<b>Proper Shipping Name</b>	Not a DOT regulated material
<b>UN/NA Number</b>	N/A
<b>Hazard Class</b>	N/A
<b>Packaging Group</b>	N/A
<b>Environmental Hazards</b>	No
<b>Transport in Bulk</b>	Packaging in excess of 3500 gal require an OIL SPILL perversion and response plan per 49 CFR1
<b>Special Precautions</b>	Transport upright in closed containers.



## SECTION 15 REGULATORY INFORMATION

SARA Section 311	This product is may be subject to regulations under Section 311 of the Clean water Act and Oil Pollution Act. Release of this product into United States waters or adjoining shorelines must be reported to the National Response Center: 800-424-8802.
SARA Section 313	No components are listed
Fire Hazard	No
Sudden Release	No
Immediate	No
Reactive Hazard	No

## SECTION 16 OTHER INFORMATION

Issue Date	06/01/15
NFPA 704M Rating	
Flammability	1
Health	1
Instability	0
Special Hazards	Blank



**This SDS is for the unburnt LiquiSmoke ONLY.  
Test data is available for LiquiSmoke "smoke"  
by contacting Hurco Technologies.**

Hurco Technologies, Inc.  
409 Enterprise Street  
Harrisburg, SD 57032  
605-743-2466  
info@hurcotech.com  
**HURCO**TECH.COM

The information contained in this SDS is believed to be accurate, but is not warranted to be, whether originated with Hurco Technologies or not. Recipients are advised to confirm in advance of need that the information is current, applicable, and suitable to the circumstances. All hazard precautions given in this SDS must be observed.

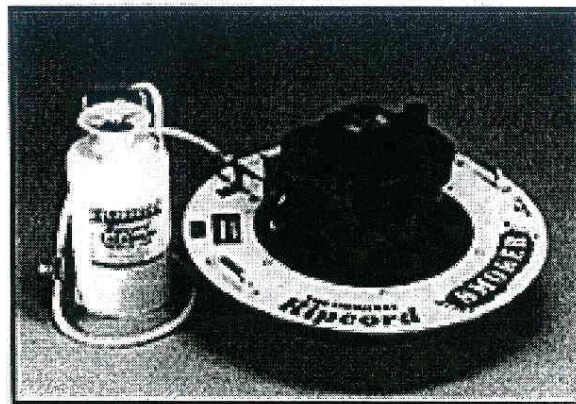
Wisconsin Occupational Health Laboratory recently conducted a GC Solvent Scan looking for volatile organic compounds in Hurco's LiquiSmoke-

**NONE OF THE COMPOUNDS LISTED BELOW WERE DETECTED**

Acetone  
 Allyl Alcohol  
 Amyl Acetate (n)  
 Amyl Alcohol  
 Benzaldehyde  
 Benzene  
 Butanone (2)  
 Butyl Acetate (n)  
 Butyl Acrylate  
 Butyl Alcohol (n)  
 Butyl Alcohol (Sec)  
 Butyl Alcohol (Tert)  
 Butyl Glycidyl Ether  
 Butyl Methacrylate  
 Carbon Tetrachloride  
 Chlorobenzene  
 Chloroform  
 Chloroprene  
 Chlorostyrene  
 Chlorotoluene (o)  
 Cumene  
 Cyclohexanol  
 Cyclohexanone  
 Decamethyl Cyclopentasiloxane  
 Dichloroethane (1,1)  
 Dichloroethane (1,2)  
 Diisobutyl Ketone  
 Dioxane (Diethylene Dioxide)  
 Dioxolane- 1,3  
 Epichlorohydrin  
 Epoxybutane (1,2)  
 Ethyl Alcohol  
 Ethoxyethyl Acetate (2)  
 Ethyl Acetate  
 Ethyl Acrylate  
 Ethyl Benzene  
 Ethyl Butyl Ketone

Ethyl Butyrate  
 Ethyl Ether  
 Ethyl Methacrylate  
 Ethyl Toluene  
 Heptanone-2 (MBK)  
 Hexane (n)  
 Hexone (MIBK)  
 Hexyl Acetate  
 Isoamyl Acetate  
 Isoamyl Alcohol  
 Isobutyl Alcohol  
 Isobutyl Isobutrate  
 Isopropyl Acetate  
 Isopropyl Alcohol  
 Isopropyl Ether  
 Mesityl Oxide  
 Methyl Acetate  
 Methyl Acrylate  
 Methyl Chloroform  
 Methyl Isoamyl Ketone  
 Methyl Methacrylate  
 Methyl Styrene

Naphtha (Coal Tar)  
 Nonane  
 Octamethylcyclotetrasiloxane  
 Octanol  
 P-Dichlorobenzene  
 Pentane  
 Pentanone (2)  
 Perchloroethylene  
 Petroleum Distillates (Naphtha)  
 Pinene-Alpha  
 Pinene-Beta  
 Propanol  
 Propyl Acetate (n)  
 Styrene  
 Tetrahydrofuran  
 Toluene  
 Trichloro-Benzene (1,2,4)  
 Trichloro-Ethane (1,1,2)  
 Trichloroethylene  
 Vinyl Acetate  
 Xylene (o, m & p)



**HURCO**  
 TECHNOLOGIES, INC.



## APPENDIX C

### Manhole Rehabilitation/Investigation Cost Summary

## Appendix C: Subbasins A and E Manhole Rehabilitation/Investigation Cost Summary

City of Sandwich, IL

Subbasin	Subbasin-A	Subbasin-B	Total
<b>Rating=3 (Severe)</b>			
Manhole Lining Costs	\$46,183	\$20,602	\$66,785
Manhole Root Treatment Costs	\$580	\$0	\$580
Frame and Cover Modification Costs	\$4,800	\$7,450	\$12,250
Bench/Channel Modification Costs	\$16,425	\$8,640	\$25,065
Installation of Chimney Seal Costs	\$1,150	\$575	\$1,725
Joint Repair Costs	\$0	\$750	\$750
Curtain Grout Costs	\$1,400	\$175	\$1,575
Non I/I Issue or Speciality Work Costs	\$2,400	\$7,200	\$9,600
<b>Totals-Manholes</b>	<b>\$72,938</b>	<b>\$45,392</b>	<b>\$118,330</b>
<b>Rating=2 (High)</b>			
Manhole Lining Costs	\$87,798	\$43,068	\$130,866
Manhole Root Treatment Costs	\$290	\$0	\$290
Frame and Cover Modification Costs	\$21,440	\$15,560	\$37,000
Bench/Channel Modification Costs	\$32,880	\$6,060	\$38,940
Installation of Chimney Seal Costs	\$1,725	\$5,175	\$6,900
Joint Repair Costs	\$750	\$1,500	\$2,250
Curtain Grout Costs	\$3,150	\$175	\$3,325
Non I/I Issue or Speciality Work Costs	\$7,200	\$1,200	\$8,400
<b>Totals-Manholes</b>	<b>\$155,233</b>	<b>\$72,738</b>	<b>\$227,971</b>
<b>Rating=1 (Moderate)</b>			
Manhole Lining Costs	\$22,449	\$33,017	\$55,466
Manhole Root Treatment Costs	\$0	\$290	\$290
Frame and Cover Modification Costs	\$5,760	\$1,725	\$7,485
Bench/Channel Modification Costs	\$870	\$3,465	\$4,335
Installation of Chimney Seal Costs	\$2,300	\$2,300	\$4,600
Joint Repair Costs	\$2,250	\$3,000	\$5,250
Curtain Grout Costs	\$175	\$0	\$175
Non I/I Issue or Speciality Work Costs	\$0	\$2,400	\$2,400
<b>Totals-Manholes</b>	<b>\$33,804</b>	<b>\$46,197</b>	<b>\$80,001</b>
<b>Rating=0 (Low)</b>			
Manhole Lining Costs	\$0	\$0	\$0
Manhole Root Treatment Costs	\$0	\$0	\$0
Frame and Cover Modification Costs	\$0	\$0	\$0
Bench/Channel Modification Costs	\$0	\$0	\$0
Installation of Chimney Seal Costs	\$0	\$0	\$0
Joint Repair Costs	\$0	\$0	\$0
Curtain Grout Costs	\$0	\$0	\$0
Non I/I Issue or Speciality Work Costs	\$0	\$1,200	\$1,200
<b>Totals-Manholes</b>	<b>\$0</b>	<b>\$1,200</b>	<b>\$1,200</b>
<b>Total Manhole Repair Costs</b>	<b>\$261,975</b>	<b>\$165,527</b>	<b>\$427,502</b>

G:\Public\Sandwich\2019\SA1901 Subbasins A & E Phase 2 SSES\Eng\[A & E SSES Tables.xlsx]table 4-1 cost estimate



## **APPENDIX D**

### **Subbasin Manhole Repair Recommendations**

#### **Appendix D.1.a-d**

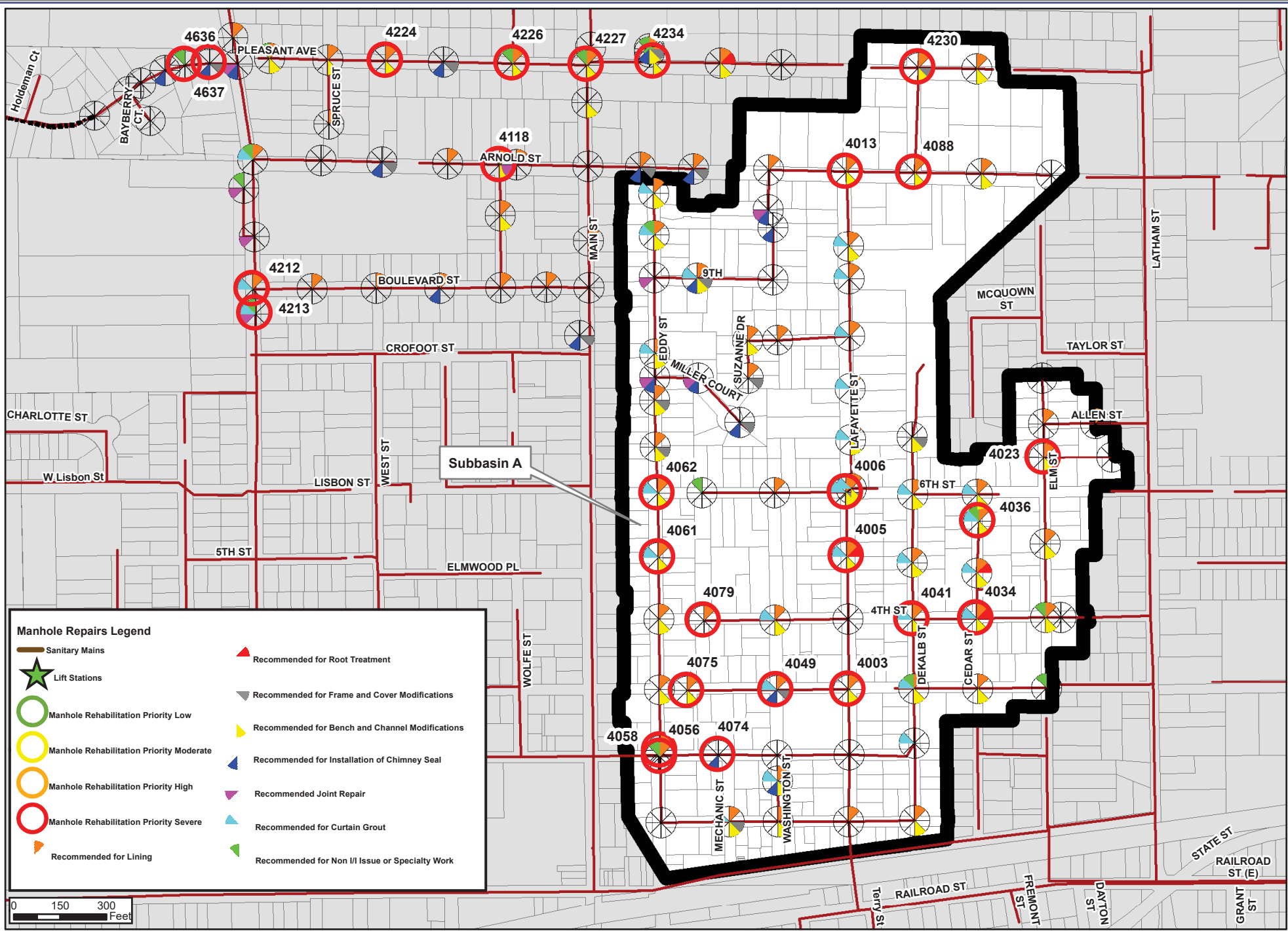
Subbasin A Manhole Inspection Severity Summaries

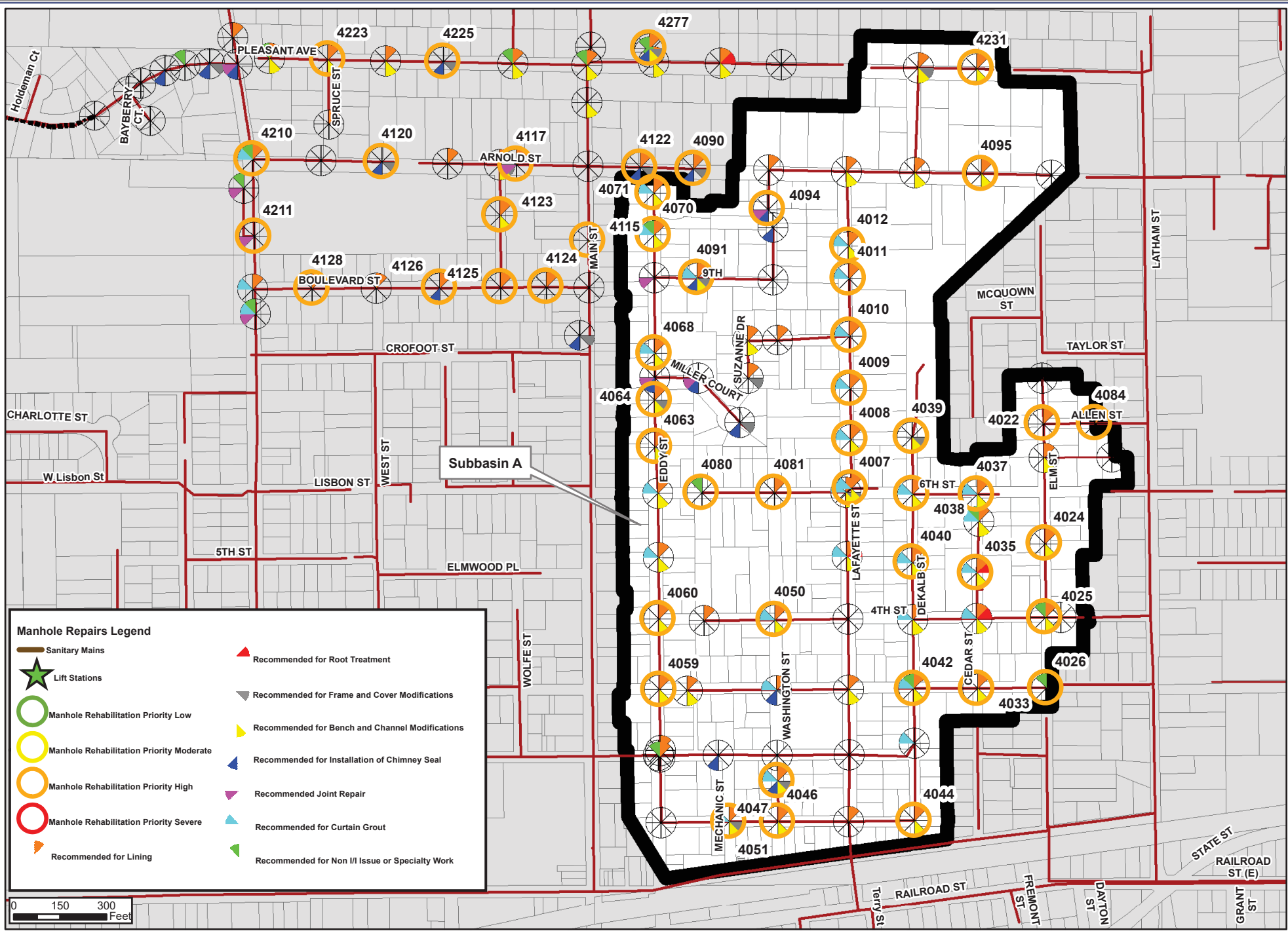
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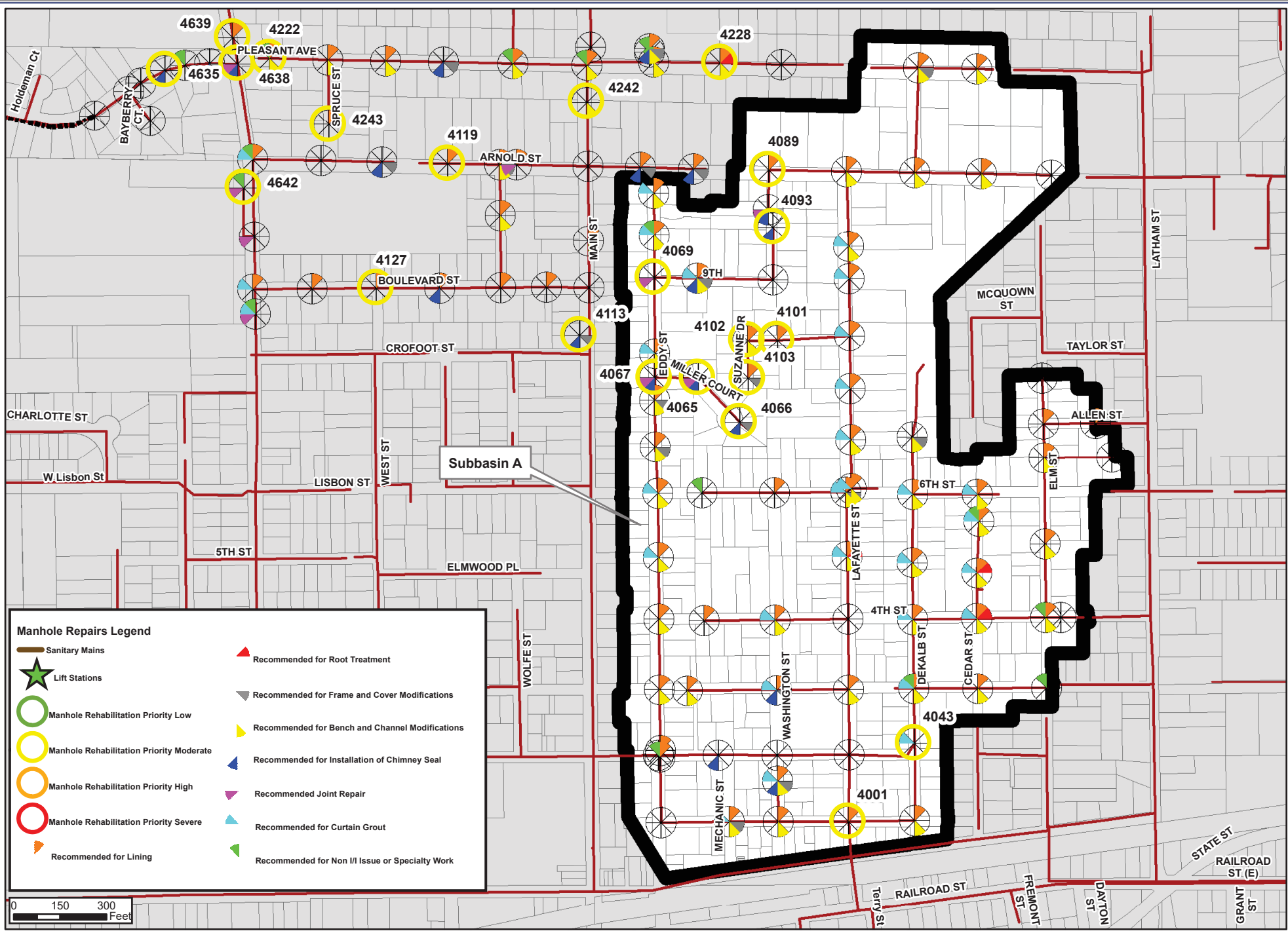
Subbasin E Manhole Inspection Severity Summaries

#### **Appendix D.3**

Manhole Rehabilitation Tabular Review







**Manhole Repairs Legend**

Sanitary Mains	Recommended for Root Treatment
Lift Stations	Recommended for Frame and Cover Modifications
Manhole Rehabilitation Priority Low	Recommended for Bench and Channel Modifications
Manhole Rehabilitation Priority Moderate	Recommended for Installation of Chimney Seal
Manhole Rehabilitation Priority High	Recommended Joint Repair
Manhole Rehabilitation Priority Severe	Recommended for Curtain Grout
Recommended for Lining	Recommended for Non I/I Issue or Specialty Work



**Engineering Enterprises, Inc.**  
 52 Wheeler Road  
 Sugar Grove, Illinois 60554  
 (630) 466-6700  
 www.eeiweb.com

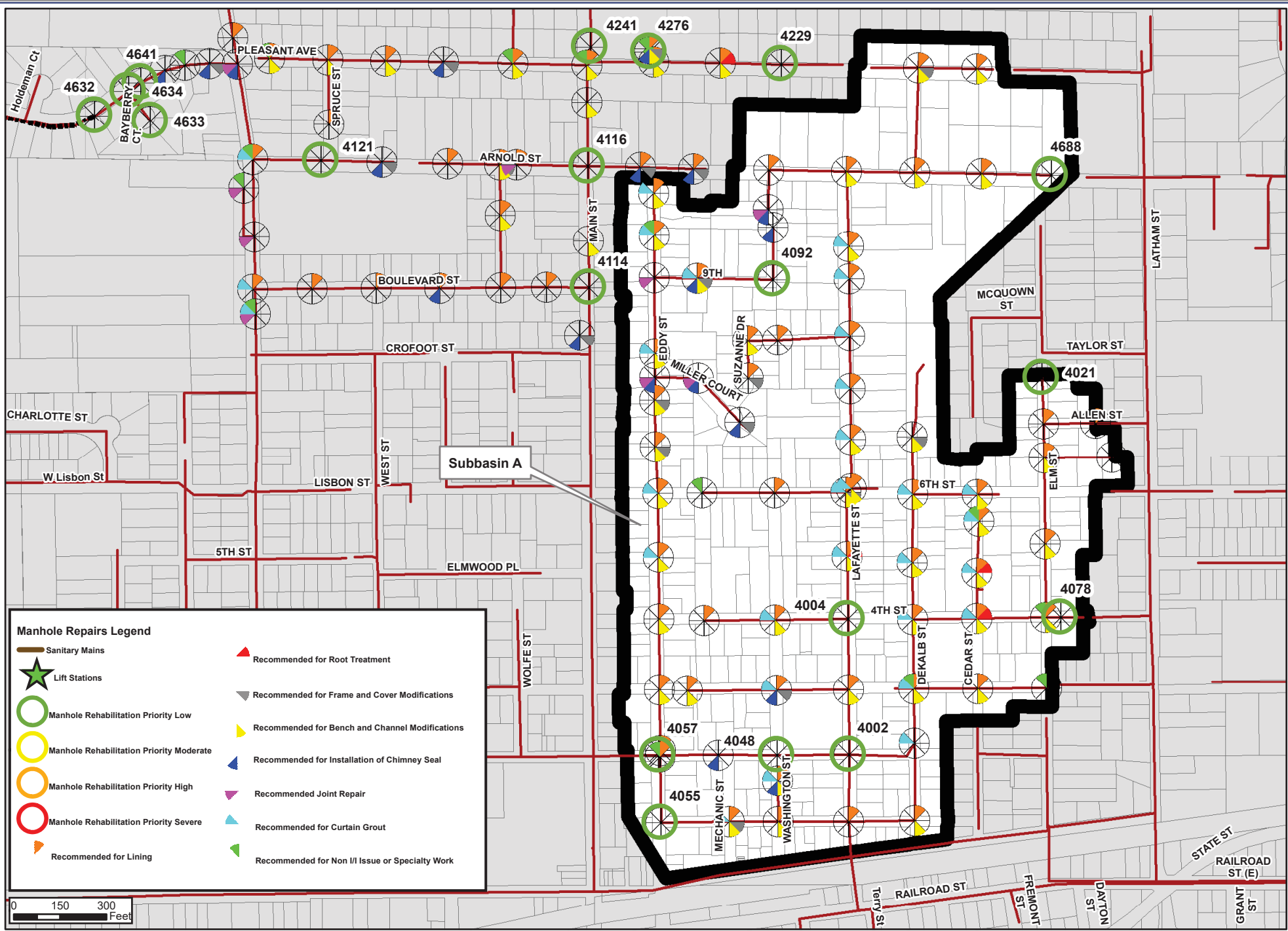
**City of Sandwich**  
 144 E. Railroad Street,  
 Sandwich, IL 60548

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 FILE: SA1901 Appendix D-1c Inspection Summary Moderate

**INFLOW & INFILTRATION  
 REDUCTION PROGRAM - PHASE 2 SSES**

**Appendix D: D-1c  
 Subbasin A  
 Manhole Inspections  
 Defect Summary Moderate**

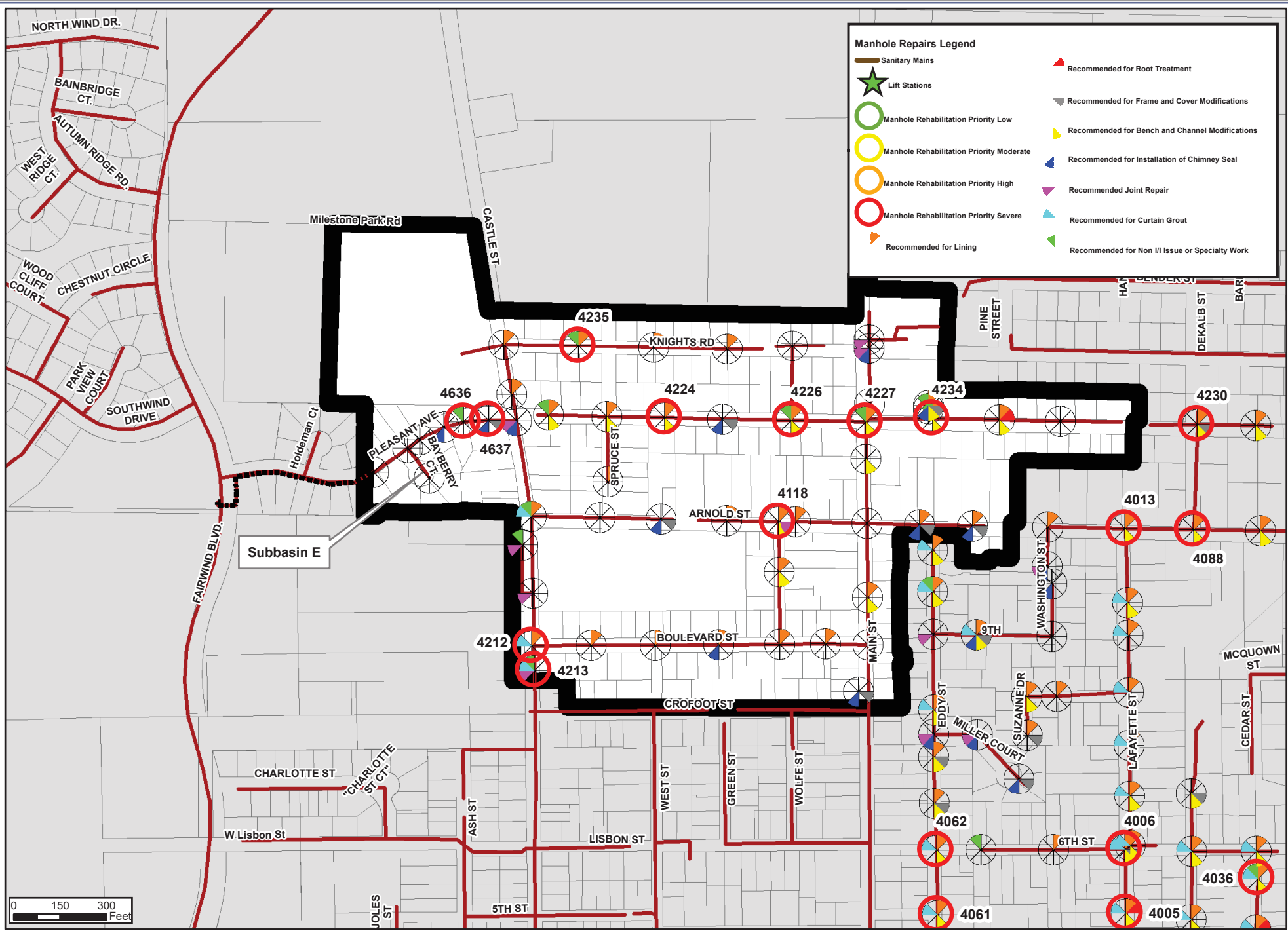


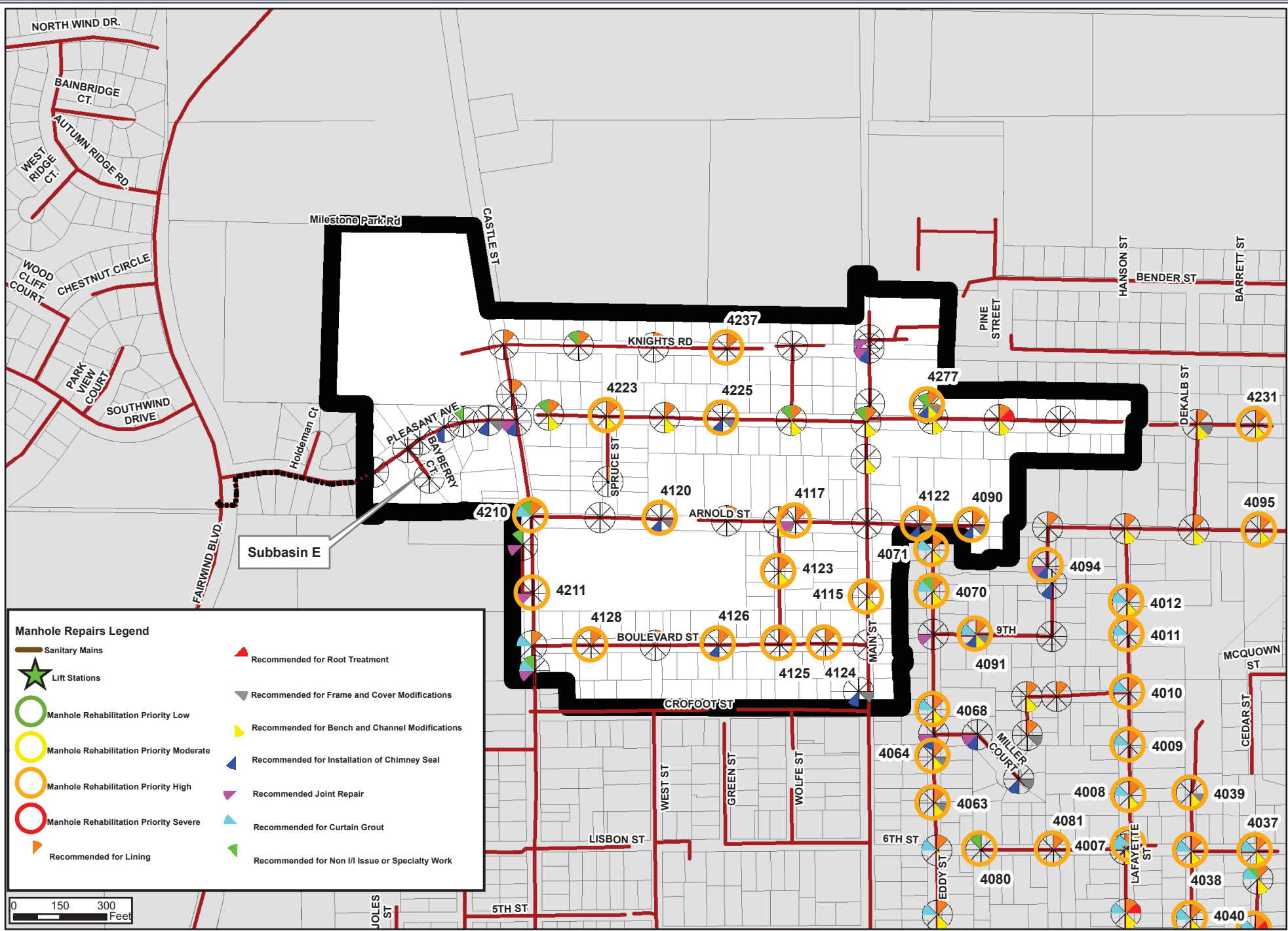


**Manhole Repairs Legend**

Sanitary Mains	Recommended for Root Treatment
Lift Stations	Recommended for Frame and Cover Modifications
Manhole Rehabilitation Priority Low	Recommended for Bench and Channel Modifications
Manhole Rehabilitation Priority Moderate	Recommended for Installation of Chimney Seal
Manhole Rehabilitation Priority High	Recommended Joint Repair
Manhole Rehabilitation Priority Severe	Recommended for Curtain Grout
Recommended for Lining	Recommended for Non I/I Issue or Specialty Work

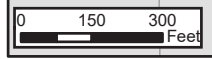






**Manhole Repairs Legend**

- Sanitary Mains
- Lift Stations
- Manhole Rehabilitation Priority Low
- Manhole Rehabilitation Priority Moderate
- Manhole Rehabilitation Priority High
- Manhole Rehabilitation Priority Severe
- Recommended for Lining
- Recommended for Root Treatment
- Recommended for Frame and Cover Modifications
- Recommended for Bench and Channel Modifications
- Recommended for Installation of Chimney Seal
- Recommended Joint Repair
- Recommended for Curtain Grout
- Recommended for Non I/I Issue or Specialty Work



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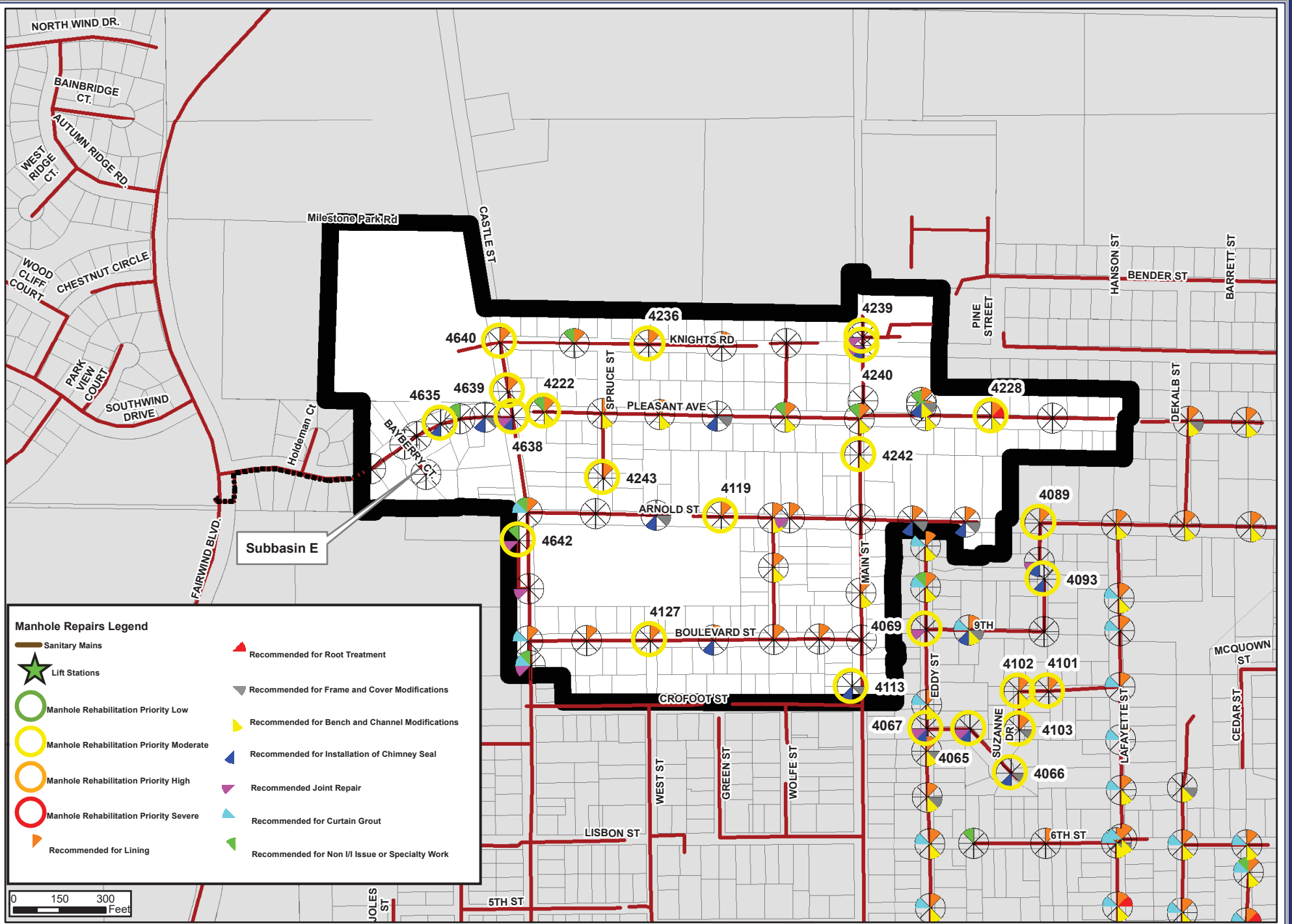
**City of Sandwich**  
 144 E. Railroad Street,  
 Sandwich, IL 60548

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 FILE: SA1901\_Appendix D-2b Inspection Summary High

**INFLOW & INFILTRATION  
 REDUCTION PROGRAM - PHASE 2 SSES**

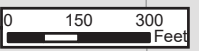
**Appendix D-2b  
 Subbasin E  
 Manhole Inspections  
 Defect Summary High**





**Manhole Repairs Legend**

- |  |   |
|--|---|
| Sanitary Mains                           | Recommended for Root Treatment                  |
| Lift Stations                            | Recommended for Frame and Cover Modifications   |
| Manhole Rehabilitation Priority Low      | Recommended for Bench and Channel Modifications |
| Manhole Rehabilitation Priority Moderate | Recommended for Installation of Chimney Seal    |
| Manhole Rehabilitation Priority High     | Recommended Joint Repair                        |
| Manhole Rehabilitation Priority Severe   | Recommended for Curtain Grout                   |
| Recommended for Lining                   | Recommended for Non I/I Issue or Specialty Work |



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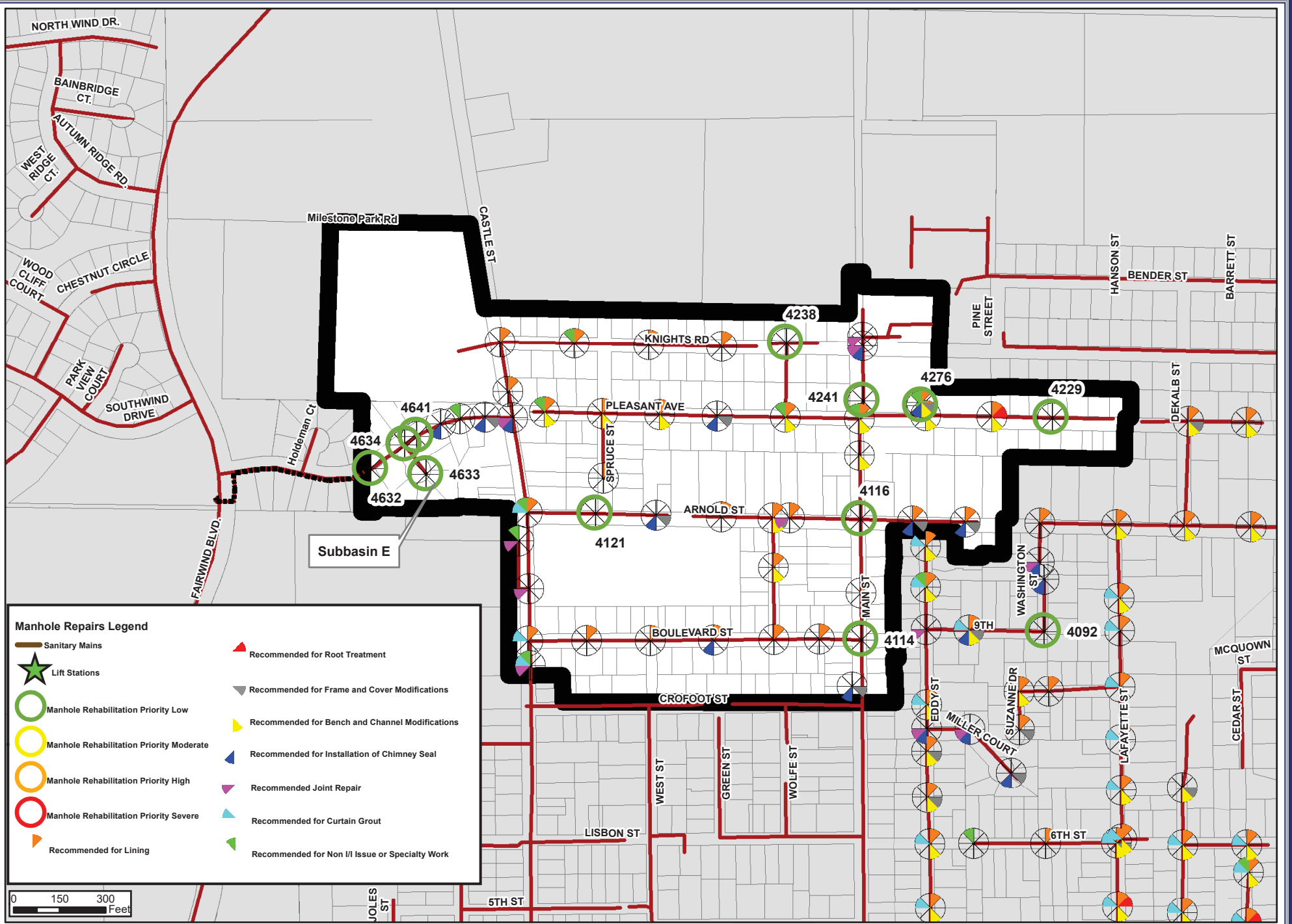
**City of Sandwich**  
 144 E. Railroad Street,  
 Sandwich, IL 60548

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 FILE: SA1901\_Appendix D-2c Inspection Summary Moderate

**INFLOW & INFILTRATION  
 REDUCTION PROGRAM - PHASE 2 SSES**

**Appendix D: D-2c  
 Subbasin E  
 Manhole Inspections  
 Defect Summary Moderate**





**Manhole Repairs Legend**

- Sanitary Mains
- Lift Stations
- Manhole Rehabilitation Priority Low
- Manhole Rehabilitation Priority Moderate
- Manhole Rehabilitation Priority High
- Manhole Rehabilitation Priority Severe
- Recommended for Lining
- Recommended for Root Treatment
- Recommended for Frame and Cover Modifications
- Recommended for Bench and Channel Modifications
- Recommended for Installation of Chimney Seal
- Recommended Joint Repair
- Recommended for Curtain Grout
- Recommended for Non I/I Issue or Specialty Work



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**INFLOW & INFILTRATION  
 REDUCTION PROGRAM - PHASE 2 SSES**

**Appendix D: D-2d  
 Subbasin E  
 Manhole Inspections  
 Defect Summary Low**

APPENDIX D3: MANHOLE REPAIR TABULAR REVIEW

CITY OF SANDWICH, IL

Manhole ID	Surface Type	Address	Subbasin	Severity	Note	Replace Cover	Replace Frame & Cover	Raise or Reset Frame	External Chim. Seal	Internal Chim. Seal	Lining	Install Drop	Grout & Wipe Joints	Wipe Joints (no grout)	Curtain Grout	Curtain Grout Lower 4'	Repair Bench/Channel	Replace Bench/Channel	Roots Present/Treat	Vac	Heavy Cleaning	Special Obsv or Repair	Replace Structure
4003	ASPHALT;	322 E 3RD ST.	A	Severe	broken pipes, break out and rebuild bench						x							x					
4005	ASPHALT;	421 N LAFAYETTE	A	Severe							x				x			x	x				
4006	ASPHALT;	405 6TH ST	A	Severe	missing mortar throughout	x					x						x						
4013	GRAVEL;	333 E ARNOLD ST	A	Severe							x							x					
4023	ASPHALT;	619 ELM ST	A	Severe	missing mortar throughout						x							x					
4034	ASPHALT;	604 E 4TH ST	A	Severe							x				x		x		x				
4036	ASPHALT;	516 CEDAR ST.	A	Severe	debris in invert						x				x		x			x			
4041	ASPHALT;	503 E 4TH ST	A	Severe							x				x		x						
4049	ASPHALT;	322 E 3RD ST	A	Severe		x	x			x	x				x								
4056	ASPHALT;	124 E 2ND ST.	A	Severe	heavy debris in invert						x									x			
4058	ASPHALT;	123 E 2ND ST	A	Severe	vertical stress crack in barrel section						x												
4061	ASPHALT;	420 N EDDY ST	A	Severe							x				x			x					
4062	ASPHALT;	520 N EDDY ST	A	Severe	active leaking in wall						x				x			x					
4074	ASPHALT;	118 E 2ND ST.	A	Severe						x													
4075	ASPHALT;	222 N EDDY ST	A	Severe	heavy patching in chimney required before lining						x							x					
4079	ASPHALT;	118 E 4TH ST	A	Severe							x												
4088	ASPHALT;	420 E ARNOLD ST	A	Severe							x							x					
4118	GRASS/DIRT;	31 ARNOLD ST	E	Severe				x			x							x					
4212	ASPHALT;	NEAR 344 BOULEVARD ST	E	Severe							x				x								
4213	ASPHALT;	344 BOULEVARD ST	E	Severe	gusher leak at pipe								x			x							x
4224	ASPHALT;	311 W PLEASANT AVE	E	Severe							x							x					
4226	ASPHALT;	111 W PLEASANT AVE	E	Severe	large debris in invert						x							x		x			
4227	ASPHALT;	15 W PLEASANT AVE	E	Severe	flow obstruction						x							x		x			x
4230	CONCRETE PAVEMENT,GRASS/DIRT;	519 E PLEASANT AVE	E	Severe			x				x							x					
4234	ASPHALT;	1302 N MAIN ST	E	Severe	debris in bench						x							x		x			
4235	ASPHALT;	327 W KNIGHTS RD	E	Severe							x									x			
4636	GRASS/DIRT;	1006 BAYBERRY CT	E	Severe																			x
4637	GRASS/DIRT;	341 W PLEASANT AVE	E	Severe	eccentric cone -4" seal			x	x														
4007	ASPHALT;	405 6TH ST	A	High							x				x			x					
4008	GRASS/DIRT;	614 N LAFAYETTE ST	A	High							x				x								
4009	GRASS/DIRT;	800 N LAFAYETTE ST	A	High							x				x			x					
4010	GRASS/DIRT;	803 N LAFAYETTE ST	A	High							x				x								
4011	GRASS/DIRT;	841 N LAFAYETTE ST	A	High							x				x								
4012	GRASS/DIRT;	934 N LAFAYETTE ST	A	High							x				x			x					
4022	ASPHALT;	701 ELM ST	A	High							x												
4024	ASPHALT;	513 ELM ST	A	High							x							x					
4025	ASPHALT;	614 E 4TH ST	A	High							x							x					
4026	ASPHALT;	222 ELM ST	A	High	specialty structure - needs engineering to estimate																		x
4033	ASPHALT;	518 E 3RD ST	A	High							x							x					
4035	ASPHALT;	515 E 4TH ST	A	High							x				x			x		x			
4037	ASPHALT;	605 6TH ST	A	High							x				x			x					
4038	ASPHALT;	502 6TH ST	A	High	missing mortar throughout						x				x			x					
4039	GRASS/DIRT;	604 DE KALB ST	A	High				x										x					
4040	ASPHALT;	504 DE KALB ST	A	High							x				x			x					
4042	ASPHALT;	420 E 3RD ST	A	High							x	x			x			x					
4044	ASPHALT;	106 DE KALB ST	A	High							x							x					
4046	ASPHALT;	216 E 1ST ST.	A	High							x							x					
4047	ASPHALT;	216 WASHINGTON ST	A	High		x	x			x	x				x			x					
4050	ASPHALT;	304 E 4TH ST	A	High							x				x			x					
4051	ASPHALT;	204 E 1ST ST.	A	High			x				x				x			x					
4059	ASPHALT;	218 N EDDY ST	A	High							x							x					
4060	ASPHALT;	329 N EDDY ST	A	High							x							x					
4063	ASPHALT;	701 N EDDY ST	A	High	offset; replace with rubber riser rings and reline				x		x							x					
4064	ASPHALT;	708 N EDDY ST	A	High	offset; replace with rubber riser rings and reline				x		x							x					
4068	ASPHALT;	802 N EDDY ST	A	High							x				x			x					

APPENDIX D3: MANHOLE REPAIR TABULAR REVIEW

CITY OF SANDWICH, IL

Manhole ID	Surface Type	Address	Subbasin	Severity	Note	Replace Cover	Replace Frame & Cover	Raise or Reset Frame	External Chim. Seal	Internal Chim. Seal	Lining	Install Drop	Grout & Wipe Joints	Wipe Joints (no grout)	Curtain Grout	Curtain Grout Lower 4'	Repair Bench/Channel	Replace Bench/Channel	Roots Present/Treat	Vac	Heavy Cleaning	Special Obsv or Repair	Replace Structure
4070	ASPHALT;	908 N EDDY ST	A	High							x				x			x					
4071	ASPHALT;	940 N EDDY ST	A	High							x				x			x					
4080	ASPHALT;	118 6TH ST	A	High	specialty structure - needs engineering to estimate																	x	x
4081	ASPHALT;	308 6TH ST	A	High							x												
4084	ASPHALT;	711 ALLEN ST	A	High	bricks in chimney need patching; more cost effective to line entire structure						x												
4090	GRASS/DIRT;	108 E ARNOLD S	E	High		x	x			x	x												
4091	GRASS/DIRT;	123 E 9TH ST	A	High		x	x			x	x				x			x					
4094	GRASS/DIRT;	924 WASHINGTON ST	A	High						x				x									
4095	GRASS/DIRT;	619 E ARNOLD ST	A	High							x							x					
4115	ASPHALT;	920 N MAIN ST	E	High							x							x					
4117	GRASS/DIRT;	27 W ARNOLD ST	E	High							x			x				x					
4120	GRASS/DIRT;GRAVEL;	307 W ARNOLD ST	E	High		x	x		x														
4122	GRASS/DIRT;	15 E ARNOLD ST	E	High			x				x												
4123	ASPHALT;	927 N WOLFE ST	E	High						x	x							x					
4124	ASPHALT;	19 BOULEVARD ST	E	High							x												
4125	ASPHALT;	103 BOULEVARD ST	E	High							x												
4126	ASPHALT;	209 BOULEVARD ST	E	High							x												
4128	ASPHALT;	318 BOULEVARD ST	E	High	heavy patching in chimney required before lining						x												
4210	ASPHALT;	1008 CASTLE ST	E	High							x	x				x							
4211	ASPHALT;	344 BOULEVARD ST	E	High							x												
4223	ASPHALT;	317 W PLEASANT AVE	E	High							x							x					
4225	ASPHALT;	211 W PLEASANT AVE	E	High			x		x														
4231	CONCRETE PAVEMENT;	521 E PLEASANT AVE	E	High	replace invert						x							x					
4237	ASPHALT;	127 W KNIGHTS RD	E	High							x												
4277	GRASS/DIRT;	1302 N MAIN ST	E	High		x	x			x	x							x					
4001	ASPHALT;	312 E 1ST. ST.	A	Moderate	minor rebar visible bottom of manhole						x												
4043	ASPHALT;	207 DE KALB ST.	A	Moderate													x						
4065	CONCRETE PAVEMENT;	205 MILLER CT	A	Moderate						x				x									
4066	GRASS/DIRT;	208 MILLER CT	A	Moderate	flattop - need internal seal			x			x												
4067	ASPHALT;	730 N EDDY ST	A	Moderate							x												
4069	ASPHALT;	909 N EDDY ST	A	Moderate	determine if invert configuration is correct									x									
4089	GRASS/DIRT;	216 E ARNOLD ST	A	Moderate							x												
4093	ASPHALT;	923 WASHINGTON ST	A	Moderate							x												
4101	ASPHALT;	307 E CROFOOT ST	A	Moderate							x												
4102	ASPHALT;	305 E CROFOOT ST	A	Moderate							x							x					
4103	ASPHALT;	729 SUZANNE DR	A	Moderate	This is a very short structure. Could also replace since excavating to reset frame			x			x												
4113	GRASS/DIRT;	811 N MAIN ST	E	Moderate				x			x												
4119	GRASS/DIRT;	111 W ARNOLD ST	E	Moderate							x												
4127	ASPHALT;	221 BOULEVARD ST	E	Moderate							x												
4222	ASPHALT;	339 W PLEASANT AVE	E	Moderate							x							x					
4228	CONCRETE PAVEMENT;	205 E PLEASANT AVE	E	Moderate							x							x					
4236	ASPHALT;	305 W KNIGHTS RD	E	Moderate							x												
4239	GRASS/DIRT;GRAVEL;	1302 N S MAIN ST	E	Moderate										x									
4240	GRASS/DIRT;	1302 N S MAIN ST	E	Moderate							x			x									
4242	ASPHALT;	1015 N MAIN ST	E	Moderate	replace bench to prevent debris from collection and blocking drop pipe																		
4243	ASPHALT;	1012 SPRUCE ST	E	Moderate	heavy chimney patching required to line						x												
4635	GRASS/DIRT;	1006 BAYBERRY CT	E	Moderate						x													
4638	ASPHALT;	340 W PLEASANT AVE	E	Moderate							x												
4639	GRASS/DIRT;	341 W PLEASANT AVE	E	Moderate							x												
4640	ASPHALT;	406 W KNIGHTS RD	E	Moderate							x												
4642	GRASS/DIRT;	955 CASTLE ST	E	Moderate	previously lined									x									x
4002	ASPHALT;	123 N LAFAYETTE ST.	A	Low																			
4004	ASPHALT;	319 N LAFAYETTE ST	A	Low																			
4021	CONCRETE PAVEMENT;	717 ELM ST	A	Low																			
4048	ASPHALT;	211 E 2ND ST	A	Low																			

**APPENDIX D3: MANHOLE REPAIR TABULAR REVIEW**

CITY OF SANDWICH, IL

Manhole ID	Surface Type	Address	Subbasin	Severity	Note	Replace Cover	Replace Frame & Cover	Raise or Reset Frame	External Chim. Seal	Internal Chim. Seal	Lining	Install Drop	Grout & Wipe Joints	Wipe Joints (no grout)	Curtain Grout	Curtain Grout Lower 4'	Repair Bench/Channel	Replace Bench/Channel	Roots Present/Treat	Vac	Heavy Cleaning	Special Obsv or Repair	Replace Structure
4055	ASPHALT;	60548 E. 1ST ST.	A	Low																			
4057	ASPHALT;	124 E 2ND ST	A	Low																			
4078	ASPHALT;	404 ELM ST	A	Low																			
4092	ASPHALT;	908 WASHINGTON ST	A	Low																			
4114	ASPHALT;	830 N MAIN ST	E	Low																			
4116	ASPHALT;	3 E ARNOLD ST	E	Low																			
4121	GRASS/DIRT;	1007 SPRUCE ST	E	Low																			
4229	CONCRETE PAVEMENT;	303 E PLEASANT AVE	E	Low																			
4238	GRASS/DIRT;	27 W KNIGHTS RD	E	Low																			
4241	GRASS/DIRT;	1302 N S MAIN ST	E	Low																			
4276	GRASS/DIRT;	1302 N MAIN ST	E	Low	special structure - flow monitor																		
4632	GRASS/DIRT;	608 W PLEASANT AVE	E	Low																			
4633	GRASS/DIRT;	1002 BAYBERRY CT	E	Low																			
4634	CONCRETE PAVEMENT;	1006 BAYBERRY CT	E	Low																			
4641	GRASS/DIRT;	1006 BAYBERRY CT	E	Low																			
4688	GRAVEL;	619 E ARNOLD ST	E	Low																			





## **APPENDIX E**

### **Manhole Repair Recommendations**

#### **Appendix E.1**

Subbasins A & E Manholes Recommended for Lining

#### **Appendix E.2**

Subbasins A & E Manholes Recommended for Root Treatment

#### **Appendix E.3**

Subbasins A & E Manholes Recommended for Frame and Cover Modifications

#### **Appendix E.4**

Subbasins A & E Manholes Recommended for Bench and Channel Modifications

#### **Appendix E.5**

Subbasins A & E Manholes Recommended for Installation of Chimney Seal

#### **Appendix E.6**

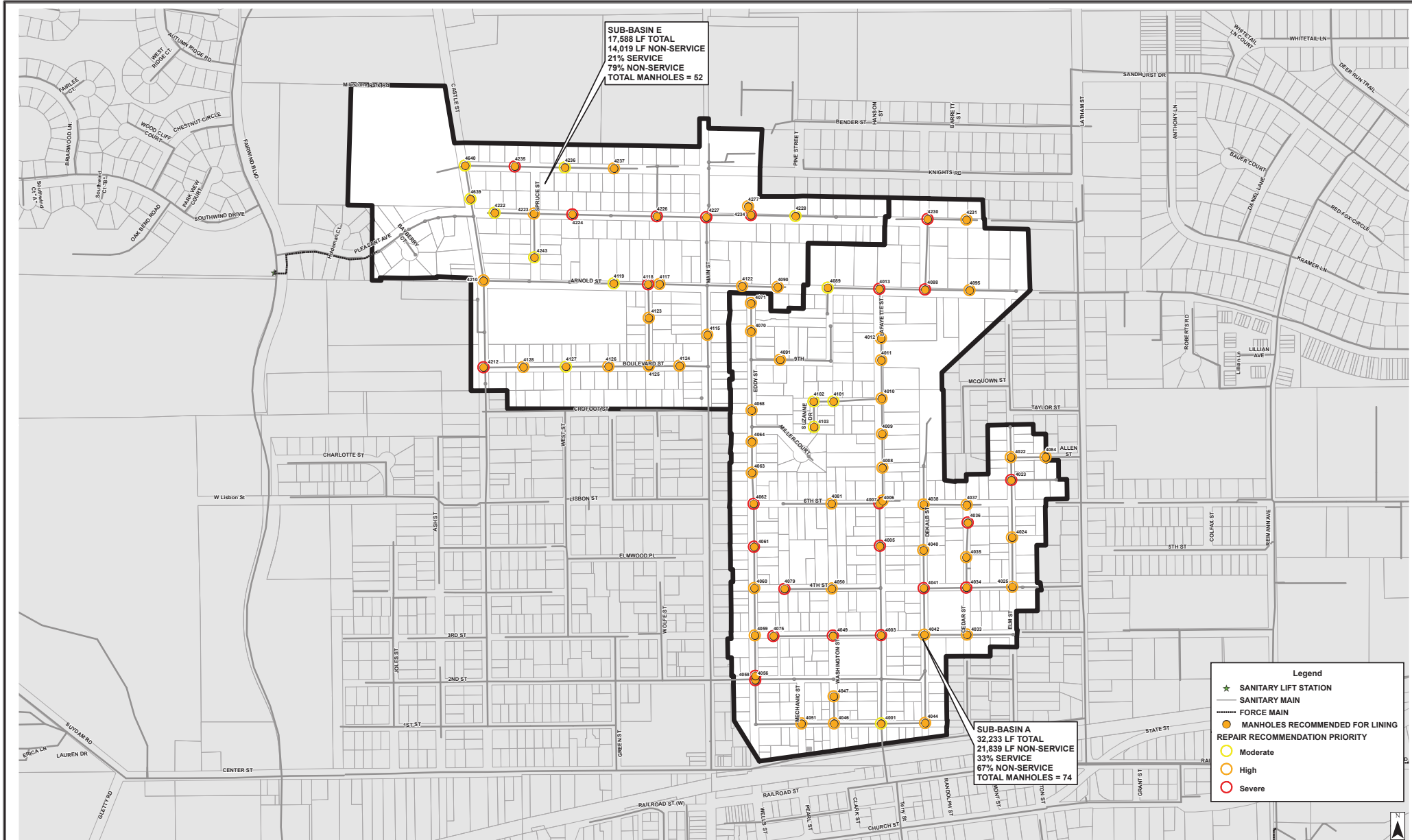
Subbasins A & E Manholes Recommended for Joint Repair

#### **Appendix E.7**

Subbasins A & E Manholes Recommended for Curtain Grout

#### **Appendix E.8**

Subbasins A & E Manholes Recommended for Non-I/I Issue or Specialty Work



**SUB-BASIN E**  
 17,588 LF TOTAL  
 14,019 LF NON-SERVICE  
 21% SERVICE  
 79% NON-SERVICE  
 TOTAL MANHOLES = 52

**SUB-BASIN A**  
 32,233 LF TOTAL  
 21,839 LF NON-SERVICE  
 33% SERVICE  
 67% NON-SERVICE  
 TOTAL MANHOLES = 74

**Legend**

- ★ SANITARY LIFT STATION
- SANITARY MAIN
- ..... FORCE MAIN
- MANHOLES RECOMMENDED FOR LINING
- REPAIR RECOMMENDATION PRIORITY
- Moderate
- High
- Severe

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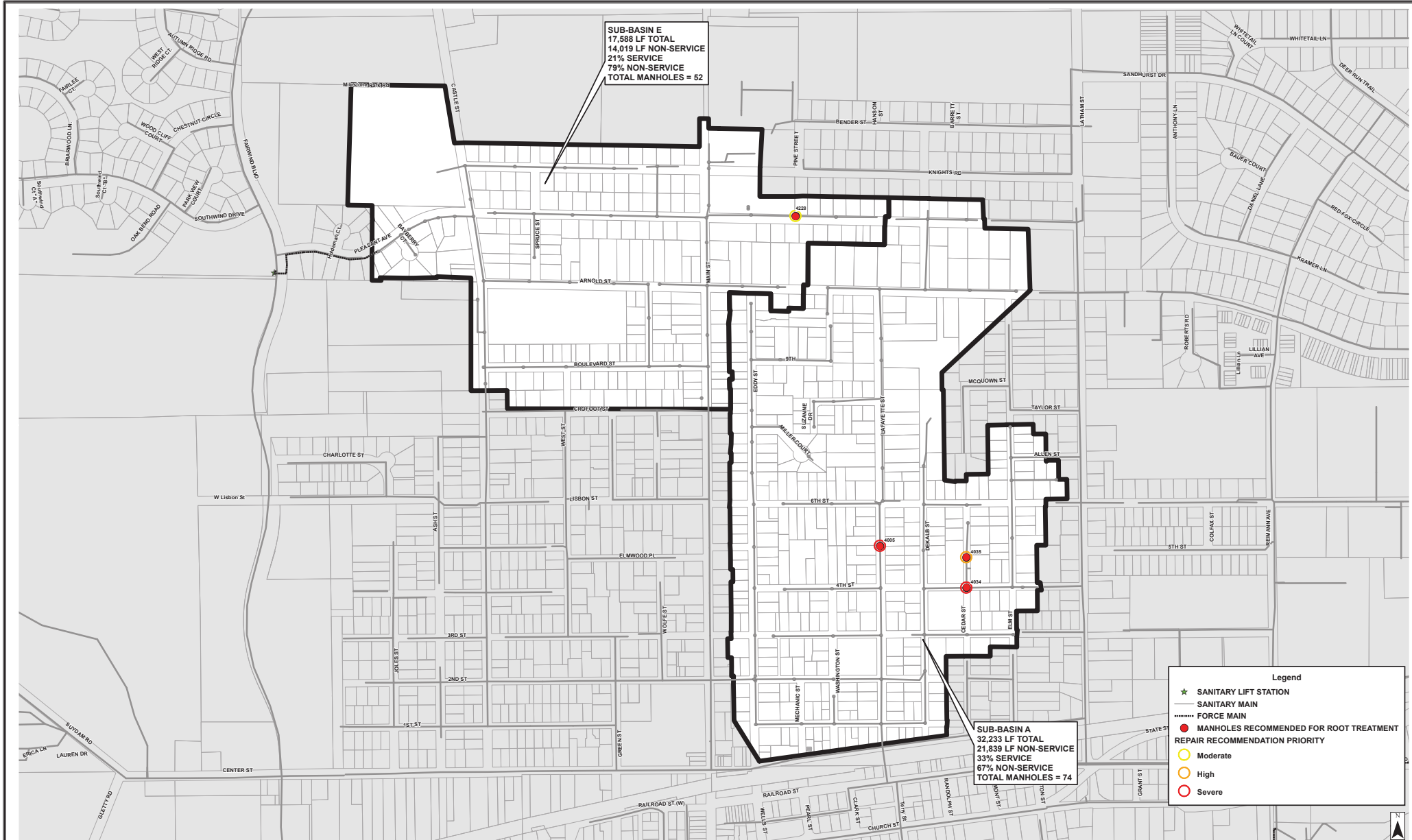
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**INFLOW & INFILTRATION  
 REDUCTION PROGRAM - PHASE 2 SSES**  
 SANDWICH, ILLINOIS

**APPENDIX E-1  
 SUBBASIN A&E MANHOLES  
 RECOMMENDED FOR LINING**



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 TOTAL MANHOLES = 52

**SUB-BASIN A**  
 32,233 LF TOTAL  
 21,839 LF NON-SERVICE  
 33% SERVICE  
 67% NON-SERVICE  
 TOTAL MANHOLES = 74

**Legend**

- ★ SANITARY LIFT STATION
- SANITARY MAIN
- ..... FORCE MAIN
- MANHOLES RECOMMENDED FOR ROOT TREATMENT

**REPAIR RECOMMENDATION PRIORITY**

- Moderate
- High
- Severe

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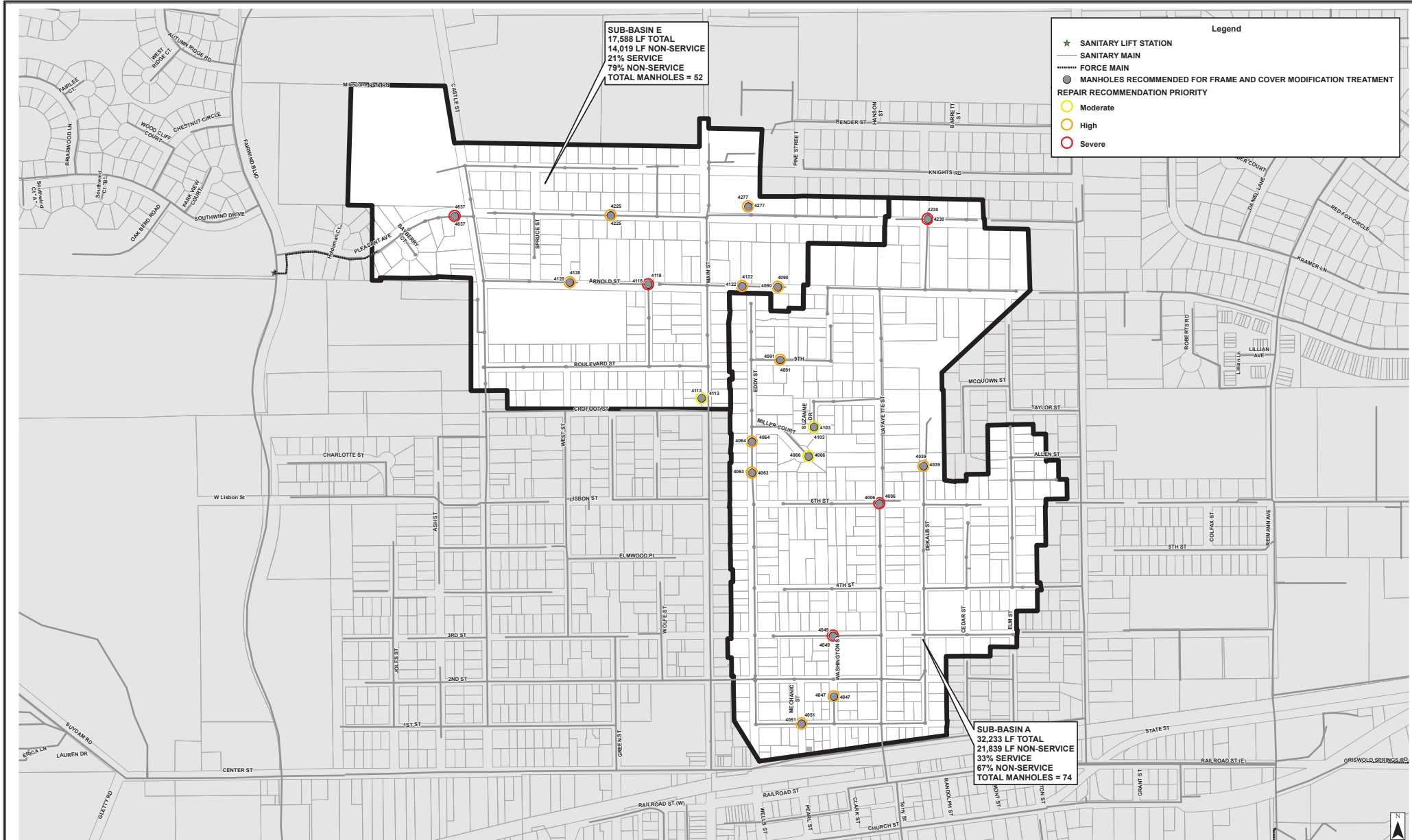
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**INFLOW & INFILTRATION  
 REDUCTION PROGRAM - PHASE 2 SSES**  
 SANDWICH, ILLINOIS

**APPENDIX E-2  
 SUBBASIN A&E MANHOLES  
 RECOMMENDED FOR ROOT TREATMENT**



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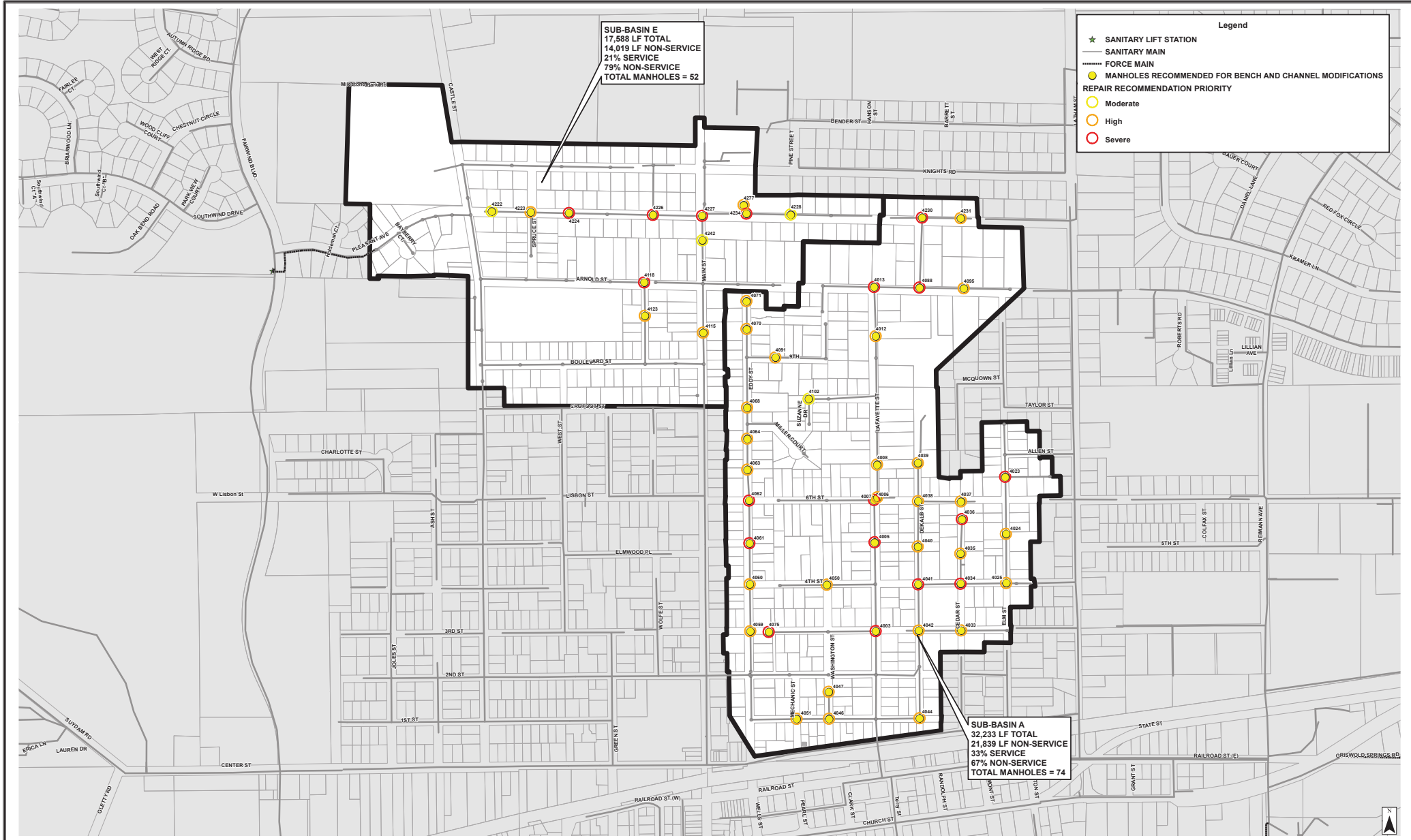
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 SA1901 APPENDIX E.3 RECOMM FOR FRAME AND COVER.MXD

**INFLOW & INFILTRATION  
 REDUCTION PROGRAM - PHASE 2 SSES**  
 SANDWICH, ILLINOIS

**APPENDIX E-3  
 SUBBASIN A&E MANHOLES  
 RECOMMENDED FOR FRAME  
 AND COVER MODIFICATION**



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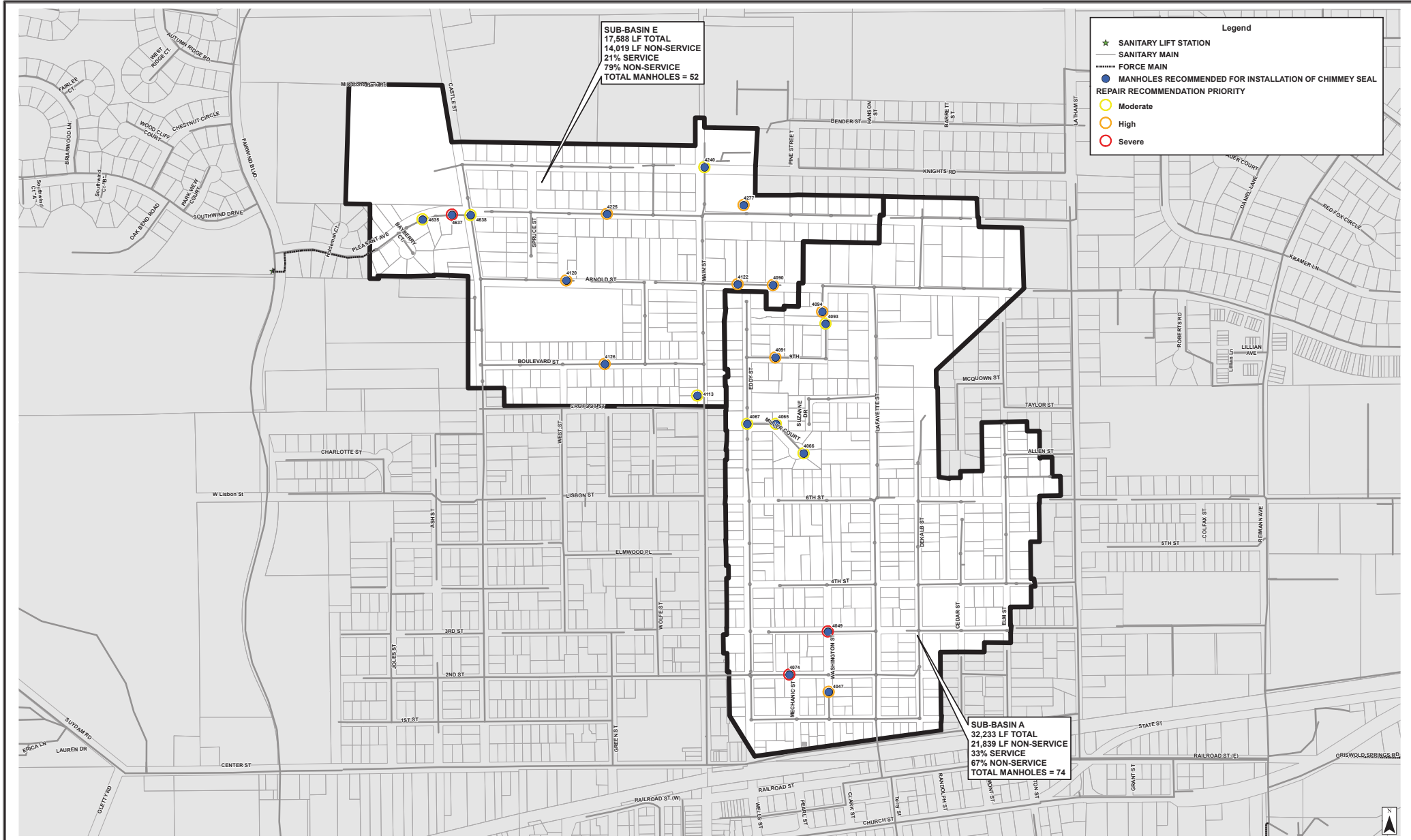
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**INFLOW & INFILTRATION  
 REDUCTION PROGRAM - PHASE 2 SSES**  
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**APPENDIX E-4  
 SUBBASIN A&E MANHOLES  
 RECOMMENDED FOR BENCH  
 AND CHANNEL MODIFICATION**



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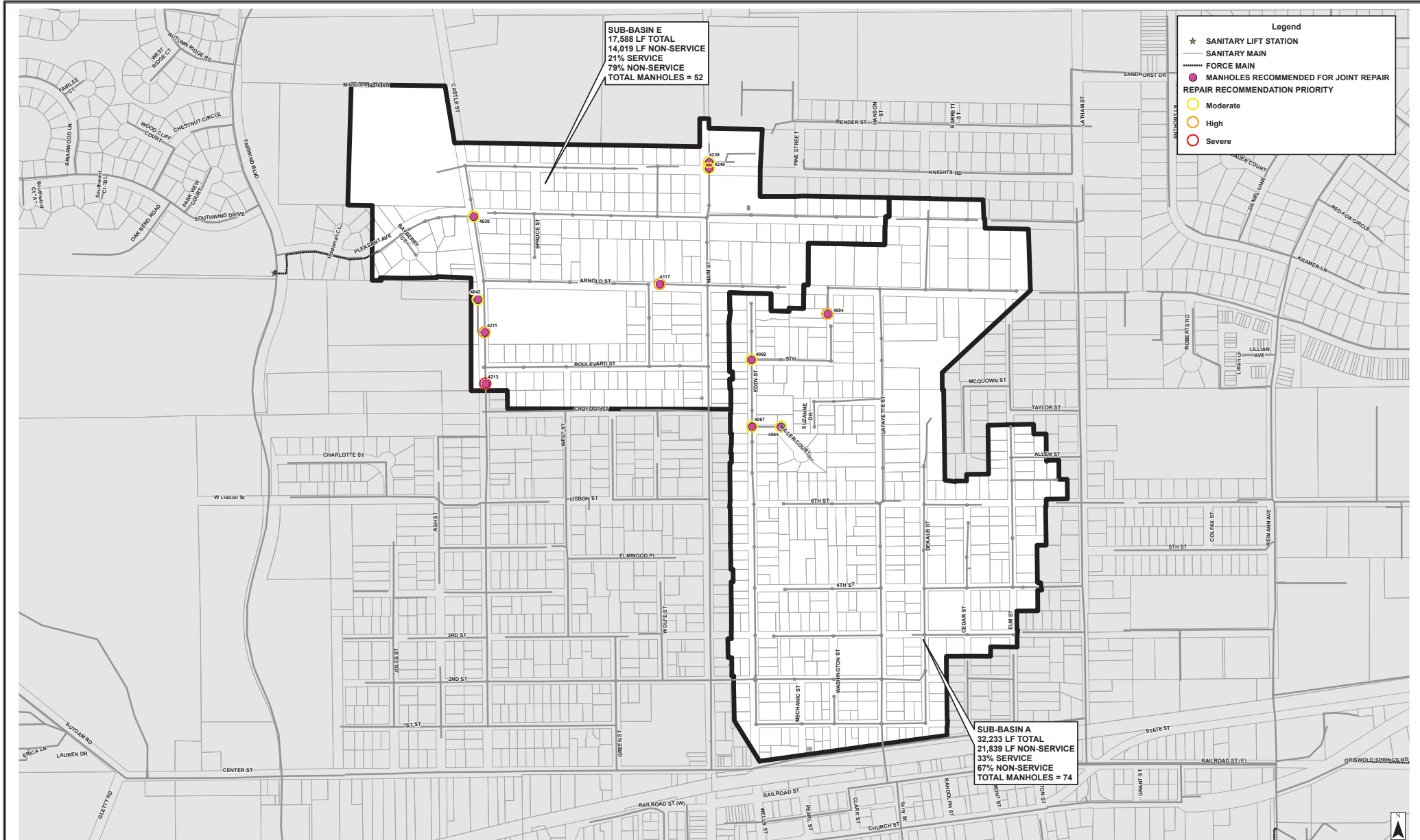
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 FILE: SA1901\_APPENDIX E-5 MANHOLE REPAIR CHIMNEY SEAL.MXD

**INFLOW & INFILTRATION  
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 SANDWICH, ILLINOIS

**APPENDIX E-5  
 SUBBASIN A&E MANHOLES  
 RECOMMENDED FOR INSTALLATION  
 OF CHIMNEY SEAL**



**SUB-BASIN E**  
 17,588 LF TOTAL  
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 79% NON-SERVICE  
 TOTAL MANHOLES = 52

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 32,233 LF TOTAL  
 21,839 LF NON-SERVICE  
 33% SERVICE  
 67% NON-SERVICE  
 TOTAL MANHOLES = 74

**Legend**

- ★ SANITARY LIFT STATION
- SANITARY MAIN
- FORCE MAIN
- MANHOLES RECOMMENDED FOR JOINT REPAIR
- REPAIR RECOMMENDATION PRIORITY
- Moderate
- High
- Severe

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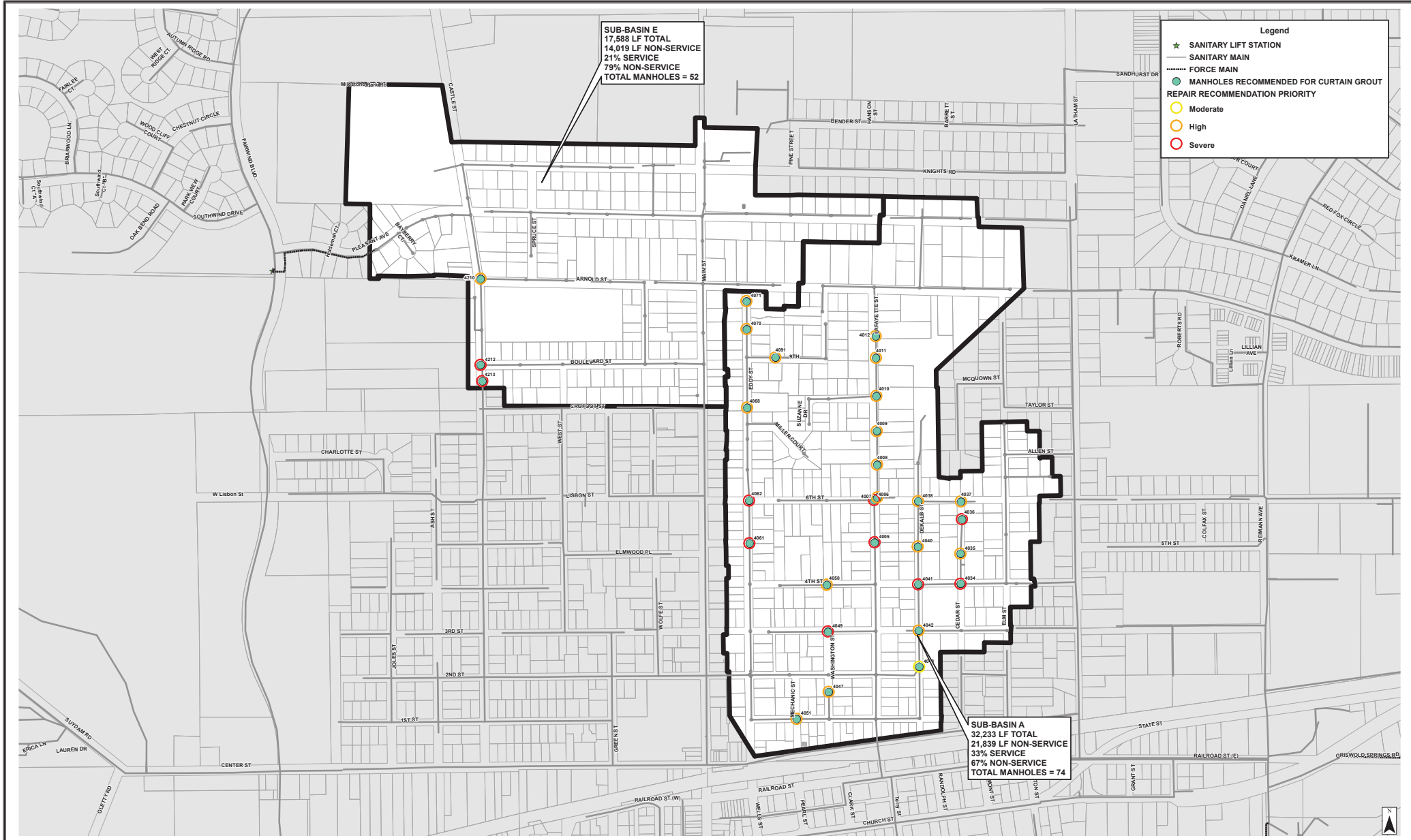
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 PCON: HGIS/PUBLIC/SANDWICH  
 FILE: SA1901\_APPENDIX E-6 RECOMMEND FOR JOINT REPAIR.MXD

**INFLOW & INFILTRATION  
 REDUCTION PROGRAM - PHASE 2 SSES**  
 SANDWICH, ILLINOIS

**APPENDIX E-6  
 SUBBASIN A&E MANHOLES  
 RECOMMENDED FOR JOINT REPAIR**



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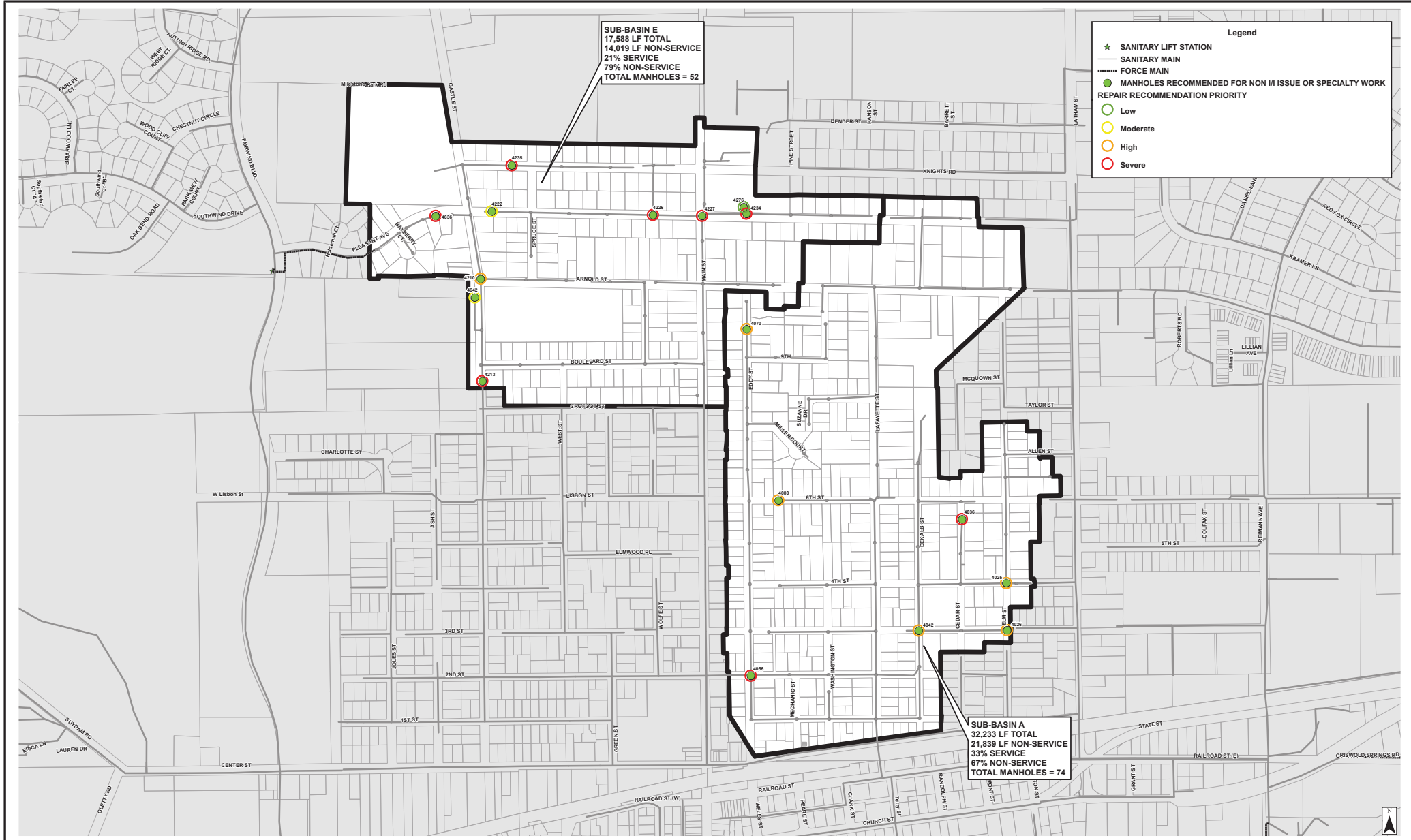
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DATE: SEPTEMBER 2019  
 PROJECT NO.: SA1901  
 P20#: HIGISPUBLIC/SANDWICH  
 FILE: SA1901\_APPENDIX E-7 RECOMMEND FOR CURTAIN GROUT.MXD

**INFLOW & INFILTRATION  
 REDUCTION PROGRAM - PHASE 2 SSES**  
 SANDWICH, ILLINOIS

**APPENDIX E-7  
 SUBBASIN A&E MANHOLES  
 RECOMMENDED FOR CURTAIN GROUT**





**SUB-BASIN E**  
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 79% NON-SERVICE  
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**SUB-BASIN A**  
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 21,839 LF NON-SERVICE  
 33% SERVICE  
 67% NON-SERVICE  
 TOTAL MANHOLES = 74

**Legend**

- ★ SANITARY LIFT STATION
- SANITARY MAIN
- FORCE MAIN
- MANHOLES RECOMMENDED FOR NON I/I ISSUE OR SPECIALTY WORK

**REPAIR RECOMMENDATION PRIORITY**

- Low
- Moderate
- High
- Severe

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 FILE: SA1901 APPENDIX E-8 RECOMMEND FOR SPECIALTY WORK.MXD

**INFLOW & INFILTRATION  
 REDUCTION PROGRAM - PHASE 2 SSES**  
 SANDWICH, ILLINOIS

**APPENDIX E-8  
 SUBBASIN A&E MANHOLES  
 RECOMMENDED FOR NON I/I  
 ISSUE OR SPECIALTY WORK**