APPENDIX E

NOISE ANALYSIS

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Traffic Noise Impact Summary.....E-1

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E-1 TABLE E-1: TRAFFIC NOISE IMPACT SUMMARY

Table E-1: Traffic Noise Impact Summary

Receptor Location (see Exhibit E-1)	Number of Residences, Schools, etc., Typical of this Receptor Site	Noise Abatement Criteria (NAC)	Sound Levels Leq (dBA)		Impact Evaluation		
			Future Noise Level[1]	Existing Noise Level	Difference in Future and Existing Noise Levels (Column D minus Column E)[1]	Difference in Future Noise Levels and NAC (Column D minus Column C)[1]	Impact or No Impact[2]
(A)	(B)	(C)	(D)	(E)	(F)	(G)	
N1	Residence (3)	67	57	55	2	-10	N
N2	Residence (3)	67	62	58	4	-5	N
N3	Residence (3)	67	61	58	3	-6	N
N4	Residence (3)	67	61	59	2	-6	N
N5	Residence (3)	67	61	58	3	-6	N
N6	Residence (3)	67	61	59	2	-6	N
N7	Residence (3)	67	60	58	2	-7	N
N8	Residence (1)	67	57	56	1	-10	N
N9	Residence (3)	67	63	61	2	-4	N
N10	Residence (3)	67	62	59	3	-5	N
N11	Residence (3)	67	62	60	2	-5	N
N12	Residence (2)	67	61	59	2	-6	N
N13	Residence (5)	67	57	54	3	-10	N
N14	Residence (5)	67	57	54	3	-10	N
N15	Residence (6)	67	57	54	3	-10	N
N16	Residence (6)	67	56	54	2	-11	N
FS-1	Residence (1)	67	57	54	3	-10	N

Source: HNTB Corporation, August 2013

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			Future Noise Level[1]	Existing Noise Level	Difference in Future and Existing Noise Levels (Column D minus Column E)[1]	Difference in Future Noise Levels and NAC (Column D minus Column C)[1]	Impact or No Impact[2]
(A)	(B)	(C)	(D)	(E)	(F)	(G)	
N17	Residence (5)	67	57	55	2	-10	N
N18	Residence (4)	67	57	55	2	-10	N
N19	Residence (6)	67	57	55	2	-10	N
N20	Residence (5)	67	58	55	3	-9	N
N21	Park (1)	67	58	56	2	-9	N
N22		67	60	58	2	-7	
FS-2		67	63	59	4	-4	
N23	Residence (1)	67	72	72	0	5	I
N24	Residence (1)	67	65	65	0	-2	N
N25	Residence (1)	67	61	62	-1	-6	N
N26	Residence (1)	67	58	60	-2	-9	N
N27	Residence (1)	67	56	58	-2	-11	N
N28	Residence (1)	67	59	60	-1	-8	N
N29	Residence (1)	67	64	64	0	-3	N
N30	Residence (1)	67	69	69	0	2	I
N31	Residence (1)	67	69	70	-1	2	I
N32	Residence (1)	67	64	63	1	-3	N
N33	Residence (1)	67	62	60	2	-5	N

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			Future Noise Level[1]	Existing Noise Level	Difference in Future and Existing Noise Levels (Column D minus Column E)[1]	Difference in Future Noise Levels and NAC (Column D minus Column C)[1]	Impact or No Impact[2]
(A)	(B)	(C)	(D)	(E)	(F)	(G)	
N34	Residence (1)	67	58	56	2	-9	N
FS-3	Residence (1)	67	51	52	-1	-16	N
N35	Residence (1)	67	54	55	-1	-13	N
N36	Residence (1)	67	57	58	-1	-10	N
N37	Residence (1)	67	60	61	-1	-7	N
N38	Residence (1)	67	66	67	-1	-1	I
FS-4	Field Site (0)	-	65	66	-1	-	-
N39	Residence (1)	67	70	73	-3	3	I
N40	Residence (1)	67	66	71	-5	-1	I
N41	Residence (1)	67	63	65	-2	-4	N
N42	Residence (1)	67	60	61	-1	-7	N
N43	Residence (1)	67	59	59	0	-8	N
N44	Residence (1)	67	56	56	0	-11	N
N45	Residence (1)	67	50	53	-3	-17	N
N46	Residence (1)	67	54	59	-5	-13	N
N47	Residence (1)	67	57	61	-4	-10	N
N48	Residence (1)	67	59	63	-4	-8	N
N49	Residence (1)	67	63	68	-5	-4	N

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			Future Noise Level[1]	Existing Noise Level	Difference in Future and Existing Noise Levels (Column D minus Column E)[1]	Difference in Future Noise Levels and NAC (Column D minus Column C)[1]	Impact or No Impact[2]
(A)	(B)	(C)	(D)	(E)	(F)	(G)	
N50	Residence (1)	67	63	70	-7	-4	N
N51	Residence (1)	67	59	64	-5	-8	N
N52	Residence (1)	67	57	62	-5	-10	N
N53	Residence (1)	67	57	62	-5	-10	N
N54	Residence (1)	67	54	60	-6	-13	N
N55	Residence (1)	67	52	58	-6	-15	N
N56	Residence (1)	67	49	55	-6	-18	N
N57	Residence (1)	67	51	57	-6	-16	N
N58	Residence (1)	67	52	58	-6	-15	N
N59	Multifamily Residence Common Area (1)	67	47	50	-3	-20	N
N60	Multifamily Residence Common Area (1)	67	62	66	-4	-5	N
N61		67	54	59	-5	-13	
N62	Library (1)	67	56	59	-3	-11	N
N63	Day Care Center (1)	67	60	61	-1	-7	N
N64	Hospital (1)	67	59	59	0	-8	N

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(A)	(B)	(C)	(D)	(E)	(F)	(G)	
N65	School - Active Sports Area (1)	67	65	70	-5	-2	I
N66		67	64	66	-2	-3	
N67		67	63	64	-1	-4	
N68		67	68	72	-4	1	
N69		67	62	64	-2	-5	
N70		67	59	60	-1	-8	
N71	Residence (12)	67	64	61	3	-3	N
N72	Residence (10)	67	65	63	2	-2	N
N73	Residence (10)	67	67	64	3	0	I
N74	Residence (5)	67	64	61	3	-3	N
N75	Residence (3)	67	64	61	3	-3	N
N76	Residence (3)	67	60	58	2	-7	N
N77	Residence (3)	67	64	61	3	-3	N
N78	Residence (2)	67	64	61	3	-3	N
N79	Residence (2)	67	62	59	3	-5	N
N80	Residence (2)	67	63	61	2	-4	N
N81	Residence (4)	67	63	61	2	-4	N
N82	Residence (2)	67	62	60	2	-5	N

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			Future Noise Level[1]	Existing Noise Level	Difference in Future and Existing Noise Levels (Column D minus Column E)[1]	Difference in Future Noise Levels and NAC (Column D minus Column C)[1]	Impact or No Impact[2]
(A)	(B)	(C)	(D)	(E)	(F)	(G)	
N83	Residence (1)	67	62	60	2	-5	N
N84	Residence (2)	67	63	61	2	-4	N
N85	Residence (2)	67	61	59	2	-6	N
N86	Residence (1)	67	61	59	2	-6	N
N87	Residence (4)	67	60	58	2	-7	N
N88	Residence (2)	67	60	58	2	-7	N
N89	Residence (2)	67	60	58	2	-7	N
N90	Residence (2)	67	61	60	1	-6	N
N91	Multifamily Residence (1)	67	59	57	2	-8	N
N92	Residence (1)	67	72	73	-1	5	I
N93	Residence (1)	67	62	62	0	-5	N
N94	Residence (1)	67	58	58	0	-9	N
N95	Residence (1)	67	58	59	-1	-9	N
N96	Residence (1)	67	57	59	-2	-10	N
N97	Residence (1)	67	61	63	-2	-6	N
N98	Residence (1)	67	69	71	-2	2	I
N99	Residence (1)	67	69	63	6	2	I
N100	Residence (1)	67	62	61	1	-5	N

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(A)	(B)	(C)	(D)	(E)	(F)	(G)	
N101	Residence (1)	67	58	59	-1	-9	N
N102	Residence (1)	67	57	58	-1	-10	N
N103	Residence (1)	67	55	56	-1	-12	N
N104	Residence (1)	67	69	65	4	2	I
N105	Residence (1)	67	63	65	-2	-4	N
N106	Residence (1)	67	59	62	-3	-8	N
N107	Residence (1)	67	56	59	-3	-11	N
N108	Residence (1)	67	54	57	-3	-13	N
N109	Residence (1)	67	53	55	-2	-14	N
N110	Residence (1)	67	67	71	-4	0	I
N111	Residence (1)	67	61	67	-6	-6	N
N112	Residence (1)	67	57	60	-3	-10	N
N113	Residence (1)	67	54	57	-3	-13	N
N114	Residence (1)	67	52	56	-4	-15	N
N115	Residence (1)	67	52	54	-2	-15	N
FS-5	Field Site (0)	-	50	52	-2	-	-
FS-6	Field Site (0)	-	69	74	-5	-	-
N116	Residence (1)	67	61	65	-4	-6	N

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(A)	(B)	(C)	(D)	(E)	(F)	(G)	
N117	Residence (1)	67	56	61	-5	-11	N
N118	Residence (1)	67	53	58	-5	-14	N
N119	Residence (1)	67	53	57	-4	-14	N
N120	Residence (1)	67	53	56	-3	-14	N
N121	Residence (1)	67	52	55	-3	-15	N
N122	Residence (1)	67	68	72	-4	1	I
N123	Residence (1)	67	69	73	-4	2	I
N124	Residence (1)	67	59	61	-2	-8	N
N125	Residence (1)	67	56	58	-2	-11	N
N126	Residence (1)	67	55	56	-1	-12	N
N127	Residence (1)	67	54	55	-1	-13	N
FS-7	School (1)	67	58	59	-1	-9	N
N128		67	61	62	-1	-6	
N129	School - Active Sports Area (1)	67	65	67	-2	-2	N
N130		67	63	63	0	-4	
N131		67	60	60	0	-7	
N132		67	62	62	0	-5	
N133		67	59	59	0	-8	

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			Future Noise Level[1]	Existing Noise Level	Difference in Future and Existing Noise Levels (Column D minus Column E)[1]	Difference in Future Noise Levels and NAC (Column D minus Column C)[1]	Impact or No Impact[2]
(A)	(B)	(C)	(D)	(E)	(F)	(G)	
N134	Residence (3)	67	58	58	0	-9	N
N135	Residence (3)	67	57	57	0	-10	N
FS-8	Field Site (0)	-	55	56	-1	-	-
N136	Residence (2)	67	57	59	-2	-10	N
N137	Residence (3)	67	58	56	2	-9	N
N138	Residence (1)	67	62	61	1	-5	N
N139	Residence (1)	67	74	69	5	7	I
N140	Residence (1)	67	69	66	3	2	I
N141	Residence (1)	67	57	53	4	-10	N
N142	Residence (1)	67	55	55	0	-12	N
N143	Residence (1)	67	53	52	1	-14	N
N144	Residence (1)	67	55	55	0	-12	N
N145	Residence (1)	67	67	69	-2	0	I
N146	Residence (1)	67	59	58	1	-8	N
N147	Hotel (1)	72	61	65	-4	-11	N
N148	Multifamily Residence (2)	67	61	61	0	-6	N
N149	Residence (1)	67	61	66	-5	-6	N
N150	Residence (1)	67	65	68	-3	-2	N

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(A)	(B)	(C)	(D)	(E)	(F)	(G)	
N151	Residence (1)	67	70	71	-1	3	I
N152	Residence (1)	67	71	72	-1	4	I
N153	Residence (1)	67	72	73	-1	5	I
N154	Residence (1)	67	74	74	0	7	I
N155	Residence (1)	67	72	72	0	5	I
N156	Residence (1)	67	73	73	0	6	I
N157	Residence (1)	67	71	70	1	4	I
N158	Residence (1)	67	71	71	0	4	I
N159	Residence (1)	67	72	71	1	5	I
N160	Residence (1)	67	62	62	0	-5	N
N161	Residence (1)	67	62	62	0	-5	N
N162	Residence (1)	67	63	62	1	-4	N
N163	Residence (1)	67	64	63	1	-3	N
N164	Residence (1)	67	65	63	2	-2	N
N165	Residence (1)	67	65	63	2	-2	N
N166	Residence (1)	67	65	63	2	-2	N
N167	Residence (1)	67	65	63	2	-2	N
N168	Residence (1)	67	65	63	2	-2	N

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(A)	(B)	(C)	(D)	(E)	(F)	(G)	
N169	Residence (1)	67	64	62	2	-3	N
N170	Residence (1)	67	69	69	0	2	I
N171	Residence (1)	67	70	69	1	3	I
N172	Residence (1)	67	75	74	1	8	I
N173	Residence (1)	67	61	60	1	-6	N
N174	Residence (1)	67	76	75	1	9	I
N175	Residence (1)	67	68	67	1	1	I
N176	Residence (1)	67	63	61	2	-4	N
N177	Residence (1)	67	64	63	1	-3	N
FS-9	Field Site (0)	-	61	60	1	-	-
N178	Residence (1)	67	64	62	2	-3	N
N179	Residence (1)	67	68	67	1	1	I
N180	Residence (1)	67	74	73	1	7	I
FS-10	Field Site (0)	-	74	73	1	-	-
N181	Residence (1)	67	75	74	1	8	I
N182	Residence (1)	67	70	69	1	3	I
N183	Residence (1)	67	64	63	1	-3	N
N184	Residence (1)	67	64	62	2	-3	N

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(A)	(B)	(C)	(D)	(E)	(F)	(G)	
N185	Residence (1)	67	65	64	1	-2	N
N186	Residence (1)	67	66	64	2	-1	I
N187	Residence (1)	67	66	65	1	-1	I
N188	Residence (1)	67	67	65	2	0	I
N189	Residence (1)	67	66	63	3	-1	I
N190	Residence (1)	67	66	63	3	-1	I
N191	Residence (1)	67	74	72	2	7	I
N192	Residence (1)	67	72	71	1	5	I
N193	Residence (1)	67	62	61	1	-5	N
N194	Residence (1)	67	64	63	1	-3	N
N195	Residence (1)	67	74	73	1	7	I
N196	Residence (1)	67	71	69	2	4	I
N197	Residence (1)	67	66	63	3	-1	I
N198	Residence (1)	67	66	63	3	-1	I
N199	Residence (1)	67	68	65	3	1	I
N200	Residence (1)	67	67	64	3	0	I
N201	Residence (1)	67	66	63	3	-1	I
N202	Residence (1)	67	69	67	2	2	I

Source: HNTB Corporation, August 2013

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2. *Wisconsin Department of Transportation's* Facilities Development Manual, *Chapter 23: "Noise"*

Receptor Location (see Exhibit E-1)	Number of Residences, Schools, etc., Typical of this Receptor Site	Noise Abatement Criteria (NAC)	Sound Levels Leq (dBA)		Impact Evaluation		
			Future Noise Level[1]	Existing Noise Level	Difference in Future and Existing Noise Levels (Column D minus Column E)[1]	Difference in Future Noise Levels and NAC (Column D minus Column C)[1]	Impact or No Impact[2]
(A)	(B)	(C)	(D)	(E)	(F)	(G)	
N203	Residence (1)	67	76	75	1	9	I
N204	Residence (3)	67	60	59	1	-7	N
N205	Residence (2)	67	60	58	2	-7	N
N206	Residence (2)	67	58	57	1	-9	N
N207	Residence (2)	67	59	58	1	-8	N
N208	Residence (1)	67	58	57	1	-9	N
N209	Residence (2)	67	59	57	2	-8	N
N210	Residence (1)	67	58	57	1	-9	N
N211	Residence (2)	67	59	58	1	-8	N
N212	Residence (1)	67	64	61	3	-3	N
N213	Residence (1)	67	68	65	3	1	I
N214	Residence (1)	67	77	75	2	10	I
N215	Residence (1)	67	74	73	1	7	I
N216	Residence (1)	67	66	63	3	-1	I
N217	Residence (1)	67	63	61	2	-4	N
N218.1	Multifamily Residence – 1st Floor (2)	67	57	55	2	-10	N
N218.2	Multifamily Residence – 2nd Floor (2)	67	62	59	3	-5	N
N218.3	Multifamily Residence – 3rd Floor (2)	67	64	63	1	-3	N

Source: HNTB Corporation, August 2013

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Receptor Location (see Exhibit E-1)	Number of Residences, Schools, etc., Typical of this Receptor Site	Noise Abatement Criteria (NAC)	Sound Levels Leq (dBA)		Impact Evaluation		
			Future Noise Level[1]	Existing Noise Level	Difference in Future and Existing Noise Levels (Column D minus Column E)[1]	Difference in Future Noise Levels and NAC (Column D minus Column C)[1]	Impact or No Impact[2]
(A)	(B)	(C)	(D)	(E)	(F)	(G)	
N219.1	Multifamily Residence – 1st Floor (4)	67	61	57	4	-6	N
N219.2	Multifamily Residence – 2nd Floor (4)	67	64	63	1	-3	N
N219.3	Multifamily Residence – 3rd Floor (4)	67	67	65	2	0	I
N220.1	Multifamily Residence – 1st Floor (2)	67	63	60	3	-4	N
N220.2	Multifamily Residence – 2nd Floor (2)	67	69	67	2	2	I
N220.3	Multifamily Residence – 3rd Floor (2)	67	72	70	2	5	I
N221.1	Multifamily Residence – 1st Floor (2)	67	65	64	1	-2	N
N221.2	Multifamily Residence – 2nd Floor (2)	67	74	73	1	7	I
N221.3	Multifamily Residence – 3rd Floor (2)	67	75	73	2	8	I
N222.1	Multifamily Residence – 1st Floor (3)	67	59	56	3	-8	N
N222.2	Multifamily Residence – 2nd Floor (3)	67	74	72	2	7	I
N222.3	Multifamily Residence – 3rd Floor (3)	67	75	73	2	8	I
N223.1	Multifamily Residence – 1st Floor (3)	67	48	45	3	-19	N
N223.2	Multifamily Residence – 2nd Floor (3)	67	53	50	3	-14	N
N223.3	Multifamily Residence – 3rd Floor (3)	67	68	65	3	1	I
N224.1	Multifamily Residence – 1st Floor (4)	67	52	50	2	-15	N
N224.2	Multifamily Residence – 2nd Floor (4)	67	55	53	2	-12	N
N224.3	Multifamily Residence – 3rd Floor (4)	67	65	63	2	-2	N

Source: HNTB Corporation, August 2013

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Receptor Location (see Exhibit E-1)	Number of Residences, Schools, etc., Typical of this Receptor Site	Noise Abatement Criteria (NAC)	Sound Levels Leq (dBA)		Impact Evaluation		
			Future Noise Level[1]	Existing Noise Level	Difference in Future and Existing Noise Levels (Column D minus Column E)[1]	Difference in Future Noise Levels and NAC (Column D minus Column C)[1]	Impact or No Impact[2]
(A)	(B)	(C)	(D)	(E)	(F)	(G)	
N225.1	Multifamily Residence – 1st Floor (3)	67	51	49	2	-16	N
N225.2	Multifamily Residence – 2nd Floor (3)	67	55	53	2	-12	N
N225.3	Multifamily Residence – 3rd Floor (3)	67	63	62	1	-4	N
N226.1	Multifamily Residence – 1st Floor (5)	67	56	53	3	-11	N
N226.2	Multifamily Residence – 2nd Floor (5)	67	60	58	2	-7	N
N226.3	Multifamily Residence – 3rd Floor (5)	67	64	62	2	-3	N
N227	Multifamily Residential Complex Pool (1)	67	57	55	2	-10	N
N228.1	Multifamily Residence – 1st Floor (5)	67	56	53	3	-11	N
N228.2	Multifamily Residence – 2nd Floor (5)	67	60	58	2	-7	N
N228.3	Multifamily Residence – 3rd Floor (5)	67	64	62	2	-3	N
N229.1	Multifamily Residence – 1st Floor (3)	67	52	50	2	-15	N
N229.2	Multifamily Residence – 2nd Floor (3)	67	57	54	3	-10	N
N229.3	Multifamily Residence – 3rd Floor (3)	67	63	61	2	-4	N
N230.1	Multifamily Residence – 1st Floor (4)	67	53	51	2	-14	N
N230.2	Multifamily Residence – 2nd Floor (4)	67	58	56	2	-9	N
N230.3	Multifamily Residence – 3rd Floor (4)	67	65	62	3	-2	N
N231.1	Multifamily Residence – 1st Floor (3)	67	50	48	2	-17	N

Source: HNTB Corporation, August 2013

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Receptor Location (see Exhibit E-1)	Number of Residences, Schools, etc., Typical of this Receptor Site	Noise Abatement Criteria (NAC)	Sound Levels Leq (dBA)		Impact Evaluation		
			Future Noise Level[1]	Existing Noise Level	Difference in Future and Existing Noise Levels (Column D minus Column E)[1]	Difference in Future Noise Levels and NAC (Column D minus Column C)[1]	Impact or No Impact[2]
(A)	(B)	(C)	(D)	(E)	(F)	(G)	
N231.2	Multifamily Residence – 2nd Floor (3)	67	55	54	1	-12	N
N231.3	Multifamily Residence – 3rd Floor (3)	67	66	64	2	-1	I
N232.1	Multifamily Residence – 1st Floor (3)	67	60	58	2	-7	N
N232.2	Multifamily Residence – 2nd Floor (3)	67	74	71	3	7	I
N232.3	Multifamily Residence – 3rd Floor (3)	67	75	73	2	8	I
N233.1	Multifamily Residence – 1st Floor (2)	67	62	60	2	-5	N
N233.2	Multifamily Residence – 2nd Floor (2)	67	75	73	2	8	I
N233.3	Multifamily Residence – 3rd Floor (2)	67	75	73	2	8	I
N234.1	Multifamily Residence – 1st Floor (2)	67	62	59	3	-5	N
N234.2	Multifamily Residence – 2nd Floor (2)	67	67	64	3	0	I
N234.3	Multifamily Residence – 3rd Floor (2)	67	71	69	2	4	I
N235.1	Multifamily Residence – 1st Floor (4)	67	60	59	1	-7	N
N235.2	Multifamily Residence – 2nd Floor (4)	67	63	61	2	-4	N
N235.3	Multifamily Residence – 3rd Floor (4)	67	66	64	2	-1	I
N236.1	Multifamily Residence – 1st Floor (2)	67	57	57	0	-10	N
N236.2	Multifamily Residence – 2nd Floor (2)	67	61	59	2	-6	N
N236.3	Multifamily Residence – 3rd Floor (2)	67	63	61	2	-4	N
FS-13	Field Site (0)	-	64	62	2	-	-

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Receptor Location (see Exhibit E-1)	Number of Residences, Schools, etc., Typical of this Receptor Site	Noise Abatement Criteria (NAC)	Sound Levels Leq (dBA)		Impact Evaluation		
			Future Noise Level[1]	Existing Noise Level	Difference in Future and Existing Noise Levels (Column D minus Column E)[1]	Difference in Future Noise Levels and NAC (Column D minus Column C)[1]	Impact or No Impact[2]
(A)	(B)	(C)	(D)	(E)	(F)	(G)	
N237	Multifamily Residential Complex Tennis Court (1)	67	61	61	0	-6	I
N238		67	64	63	1	-3	
N239		67	66	65	1	-1	
N240	Place of Worship (1)	67	56	56	0	-11	N
N241	School - Active Sports Area (1)	67	64	63	1	-3	I
N242		67	64	64	0	-3	
N243		67	61	61	0	-6	
N244		67	69	66	3	2	
N245	Residence (1)	67	69	68	1	2	I
N246	Residence (1)	67	73	72	1	6	I
N247	Residence (1)	67	72	71	1	5	I
N248	Residence (1)	67	70	70	0	3	I
N249	Residence (1)	67	70	70	0	3	I
N250	Residence (1)	67	69	69	0	2	I
N251	Residence (1)	67	70	70	0	3	I
N252	Residence (1)	67	70	69	1	3	I
N253	Residence (1)	67	70	68	2	3	I
N254	Residence (2)	67	67	64	3	0	I

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Receptor Location (see Exhibit E-1)	Number of Residences, Schools, etc., Typical of this Receptor Site	Noise Abatement Criteria (NAC)	Sound Levels Leq (dBA)		Impact Evaluation		
			Future Noise Level[1]	Existing Noise Level	Difference in Future and Existing Noise Levels (Column D minus Column E)[1]	Difference in Future Noise Levels and NAC (Column D minus Column C)[1]	Impact or No Impact[2]
(A)	(B)	(C)	(D)	(E)	(F)	(G)	
N255	Residence (1)	67	73	70	3	6	I
FS-14	Field Site (0)	-	64	64	0	-	-
N257	Residence (1)	67	70	69	1	3	I
N258	Residence (1)	67	61	61	0	-6	N
N259	Residence (1)	67	63	62	1	-4	N
N260	Residence (1)	67	62	62	0	-5	N
N261	Residence (1)	67	58	57	1	-9	N
N262	Residence (1)	67	61	59	2	-6	N
N263	Residence (1)	67	62	61	1	-5	N
N264	Residence (1)	67	63	62	1	-4	N
N265	Residence (1)	67	63	62	1	-4	N
N266	Residence (1)	67	63	62	1	-4	N
N267	Residence (1)	67	62	62	0	-5	N
N268	Residence (1)	67	63	62	1	-4	N
N269	Residence (1)	67	63	62	1	-4	N
N270	Residence (1)	67	64	63	1	-3	N
N271	Residence (1)	67	63	63	0	-4	N
N272	Residence (1)	67	64	64	0	-3	N

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Receptor Location (see Exhibit E-1)	Number of Residences, Schools, etc., Typical of this Receptor Site	Noise Abatement Criteria (NAC)	Sound Levels Leq (dBA)		Impact Evaluation		
			Future Noise Level[1]	Existing Noise Level	Difference in Future and Existing Noise Levels (Column D minus Column E)[1]	Difference in Future Noise Levels and NAC (Column D minus Column C)[1]	Impact or No Impact[2]
(A)	(B)	(C)	(D)	(E)	(F)	(G)	
N273	Residence (1)	67	62	60	2	-5	N
N274	Residence (1)	67	59	57	2	-8	N
N275	Residence (1)	67	65	63	2	-2	N
N276	Residence (1)	67	63	60	3	-4	N
N277	Residence (1)	67	61	58	3	-6	N
N278	Residence (1)	67	63	60	3	-4	N
N279	Residence (1)	67	71	69	2	4	I
N280	Residence (1)	67	63	63	0	-4	N
N281	Park (1)	67	63	63	0	-4	N
FS-11	Residence (1)	67	53	52	1	-14	N
FS-12	Residence (1)	67	61	59	2	-6	N
N282	Residence (1)	67	63	61	2	-4	N
N283	Residence (1)	67	62	60	2	-5	N
N284	Residence (1)	67	57	55	2	-10	N
N285	Residence (1)	67	50	47	3	-17	N
N286	Residence (1)	67	62	61	1	-5	N
N287	Residence (1)	67	59	58	1	-8	N
N288	Residence (1)	67	58	56	2	-9	N

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Receptor Location (see Exhibit E-1)	Number of Residences, Schools, etc., Typical of this Receptor Site	Noise Abatement Criteria (NAC)	Sound Levels Leq (dBA)		Impact Evaluation		
			Future Noise Level[1]	Existing Noise Level	Difference in Future and Existing Noise Levels (Column D minus Column E)[1]	Difference in Future Noise Levels and NAC (Column D minus Column C)[1]	Impact or No Impact[2]
(A)	(B)	(C)	(D)	(E)	(F)	(G)	
N289	Residence (1)	67	72	70	2	5	I
N290	Residence (1)	67	68	64	4	1	I
N291	Residence (1)	67	59	58	1	-8	N
N292	Residence (1)	67	60	58	2	-7	N
N293	Residence (1)	67	62	60	2	-5	N
N294	School (1)	67	55	53	2	-12	N
N295.1	Multifamily Residence – 1st Floor (2)	67	61	59	2	-6	N
N295.2	Multifamily Residence – 2nd Floor (2)	67	66	63	3	-1	I
N296.1	Multifamily Residence – 1st Floor (2)	67	63	62	1	-4	N
N296.2	Multifamily Residence – 2nd Floor (2)	67	68	65	3	1	I
N297.1	Multifamily Residence – 1st Floor (2)	67	67	65	2	0	I
N297.2	Multifamily Residence – 2nd Floor (2)	67	70	67	3	3	I
N298.1	Multifamily Residence – 1st Floor (2)	67	70	68	2	3	I
N298.2	Multifamily Residence – 2nd Floor (2)	67	72	69	3	5	I
N299.1	Multifamily Residence – 1st Floor (2)	67	74	71	3	7	I
N299.2	Multifamily Residence – 2nd Floor (2)	67	75	72	3	8	I
N300.1	Multifamily Residence – 1st Floor (2)	67	74	72	2	7	I
N300.2	Multifamily Residence – 2nd Floor (2)	67	76	72	4	9	I

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			Future Noise Level[1]	Existing Noise Level	Difference in Future and Existing Noise Levels (Column D minus Column E)[1]	Difference in Future Noise Levels and NAC (Column D minus Column C)[1]	Impact or No Impact[2]
(A)	(B)	(C)	(D)	(E)	(F)	(G)	
N301.1	Multifamily Residence – 1st Floor (2)	67	75	72	3	8	I
N301.2	Multifamily Residence – 2nd Floor (2)	67	76	72	4	9	I
N302.1	Multifamily Residence – 1st Floor (2)	67	75	72	3	8	I
N302.2	Multifamily Residence – 2nd Floor (2)	67	76	72	4	9	I
N303.1	Multifamily Residence – 1st Floor (2)	67	63	58	5	-4	N
N303.2	Multifamily Residence – 2nd Floor (2)	67	64	62	2	-3	N
N304.1	Multifamily Residence – 1st Floor (1)	67	65	61	4	-2	N
N304.2	Multifamily Residence – 2nd Floor (1)	67	66	64	2	-1	I
N305.1	Multifamily Residence – 1st Floor (3)	67	67	64	3	0	I
N305.2	Multifamily Residence – 2nd Floor (3)	67	68	66	2	1	I
N306.1	Multifamily Residence – 1st Floor (2)	67	71	68	3	4	I
N306.2	Multifamily Residence – 2nd Floor (2)	67	72	69	3	5	I
N307.1	Multifamily Residence – 1st Floor (3)	67	73	70	3	6	I
N307.2	Multifamily Residence – 2nd Floor (3)	67	74	71	3	7	I
N308.1	Multifamily Residence – 1st Floor (3)	67	65	63	2	-2	N
N308.2	Multifamily Residence – 2nd Floor (3)	67	66	64	2	-1	I
N309.1	Multifamily Residence – 1st Floor (2)	67	61	59	2	-6	N
N309.2	Multifamily Residence – 2nd Floor (2)	67	63	61	2	-4	N

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Receptor Location (see Exhibit E-1)	Number of Residences, Schools, etc., Typical of this Receptor Site	Noise Abatement Criteria (NAC)	Sound Levels Leq (dBA)		Impact Evaluation		
			Future Noise Level[1]	Existing Noise Level	Difference in Future and Existing Noise Levels (Column D minus Column E)[1]	Difference in Future Noise Levels and NAC (Column D minus Column C)[1]	Impact or No Impact[2]
(A)	(B)	(C)	(D)	(E)	(F)	(G)	
N310.1	Multifamily Residence – 1st Floor (4)	67	59	58	1	-8	N
N310.2	Multifamily Residence – 2nd Floor (4)	67	62	60	2	-5	N
N311.1	Multifamily Residence – 1st Floor (4)	67	55	55	0	-12	N
N311.2	Multifamily Residence – 2nd Floor (4)	67	60	58	2	-7	N
N312	Multifamily Residence (2)	67	53	50	3	-14	N
N313	Multifamily Residence (2)	67	46	44	2	-21	N
N314	Multifamily Residence (2)	67	52	51	1	-15	N
N315	Multifamily Residence (2)	67	63	62	1	-4	N
N316	Multifamily Residence (2)	67	71	69	2	4	I
N317	Multifamily Residence (2)	67	70	68	2	3	I
N318	Multifamily Residence (2)	67	63	62	1	-4	N
N319	Multifamily Residence (2)	67	56	55	1	-11	N
N320	Multifamily Residence (2)	67	52	48	4	-15	N
N321	Multifamily Residence (2)	67	59	58	1	-8	N
N322	Multifamily Residence (2)	67	62	61	1	-5	N
N323	Multifamily Residence (2)	67	50	48	2	-17	N
N324	Multifamily Residence (2)	67	51	49	2	-16	N
N325	Multifamily Residence (2)	67	52	51	1	-15	N

Source: HNTB Corporation, August 2013

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Receptor Location (see Exhibit E-1)	Number of Residences, Schools, etc., Typical of this Receptor Site	Noise Abatement Criteria (NAC)	Sound Levels Leq (dBA)		Impact Evaluation		
			Future Noise Level[1]	Existing Noise Level	Difference in Future and Existing Noise Levels (Column D minus Column E)[1]	Difference in Future Noise Levels and NAC (Column D minus Column C)[1]	Impact or No Impact[2]
(A)	(B)	(C)	(D)	(E)	(F)	(G)	
N326	Multifamily Residence (2)	67	55	55	0	-12	N
N327.1	Multifamily Residence – 1st Floor (1)	67	65	64	1	-2	N
N327.2	Multifamily Residence – 2nd Floor (1)	67	68	66	2	1	I
N328.1	Multifamily Residence – 1st Floor (1)	67	67	65	2	0	I
N328.2	Multifamily Residence – 2nd Floor (1)	67	69	67	2	2	I
N329.1	Multifamily Residence – 1st Floor (1)	67	67	66	1	0	I
N329.2	Multifamily Residence – 2nd Floor (1)	67	73	69	4	6	I
N330.1	Multifamily Residence – 1st Floor (1)	67	66	64	2	-1	I
N330.2	Multifamily Residence – 2nd Floor (1)	67	71	67	4	4	I
N331.1	Multifamily Residence – 1st Floor (1)	67	65	62	3	-2	N
N331.2	Multifamily Residence – 2nd Floor (1)	67	67	65	2	0	I
N332.1	Multifamily Residence – 1st Floor (1)	67	66	63	3	-1	I
N332.2	Multifamily Residence – 2nd Floor (1)	67	68	66	2	1	I
N333.1	Multifamily Residence – 1st Floor (1)	67	61	59	2	-6	N
N333.2	Multifamily Residence – 2nd Floor (1)	67	64	63	1	-3	N
FS-16	Field Site (0)	-	68	66	2	-	-
N334	Multifamily Residence Common Area (1)	67	68	66	2	1	I

Source: HNTB Corporation, August 2013

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2. *Wisconsin Department of Transportation's* Facilities Development Manual, *Chapter 23: "Noise"*

Receptor Location (see Exhibit E-1)	Number of Residences, Schools, etc., Typical of this Receptor Site	Noise Abatement Criteria (NAC)	Sound Levels Leq (dBA)		Impact Evaluation		
			Future Noise Level[1]	Existing Noise Level	Difference in Future and Existing Noise Levels (Column D minus Column E)[1]	Difference in Future Noise Levels and NAC (Column D minus Column C)[1]	Impact or No Impact[2]
(A)	(B)	(C)	(D)	(E)	(F)	(G)	
N335	Multifamily Residence Common Area (1)	67	40	38	2	-27	N
N336	Multifamily Residence Common Area (1)	67	60	59	1	-7	N
N337	Residence (1)	67	53	53	0	-14	N
N338	Residence (1)	67	54	54	0	-13	N
N339	Residence (1)	67	55	55	0	-12	N
N340	Residence (1)	67	57	57	0	-10	N
N341	Residence (1)	67	54	55	-1	-13	N
N342	Residence (1)	67	56	55	1	-11	N
N343	Residence (1)	67	57	57	0	-10	N
N344	Residence (1)	67	59	58	1	-8	N
N345	Residence (1)	67	65	64	1	-2	N
N346	Residence (1)	67	65	64	1	-2	N
N347	Residence (1)	67	65	64	1	-2	N
N348	Residence (1)	67	63	62	1	-4	N
N349	Residence (1)	67	59	58	1	-8	N
N350	Residence (1)	67	59	58	1	-8	N

Source: HNTB Corporation, August 2013

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Receptor Location (see Exhibit E-1)	Number of Residences, Schools, etc., Typical of this Receptor Site	Noise Abatement Criteria (NAC)	Sound Levels Leq (dBA)		Impact Evaluation		
			Future Noise Level[1]	Existing Noise Level	Difference in Future and Existing Noise Levels (Column D minus Column E)[1]	Difference in Future Noise Levels and NAC (Column D minus Column C)[1]	Impact or No Impact[2]
(A)	(B)	(C)	(D)	(E)	(F)	(G)	
N351	Residence (1)	67	63	62	1	-4	N
N352	Residence (1)	67	68	67	1	1	I
N353	Residence (1)	67	70	68	2	3	I
N354	Residence (1)	67	57	56	1	-10	N
N355	Residence (1)	67	59	58	1	-8	N
N356	Residence (1)	67	63	62	1	-4	N
N357	Residence (1)	67	66	65	1	-1	I
N358	Residence (1)	67	71	70	1	4	I
N359	Residence (1)	67	70	69	1	3	I
N360	Residence (1)	67	65	64	1	-2	N
N361	Residence (1)	67	56	55	1	-11	N
N362	Residence (1)	67	59	58	1	-8	N
N363	Residence (1)	67	60	59	1	-7	N
N364	Residence (1)	67	60	59	1	-7	N
N365	Residence (1)	67	59	58	1	-8	N
N366	Residence (1)	67	55	55	0	-12	N
N367	Residence (1)	67	56	55	1	-11	N
N368	Residence (1)	67	55	54	1	-12	N

Source: HNTB Corporation, August 2013

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Receptor Location (see Exhibit E-1)	Number of Residences, Schools, etc., Typical of this Receptor Site	Noise Abatement Criteria (NAC)	Sound Levels Leq (dBA)		Impact Evaluation		
			Future Noise Level[1]	Existing Noise Level	Difference in Future and Existing Noise Levels (Column D minus Column E)[1]	Difference in Future Noise Levels and NAC (Column D minus Column C)[1]	Impact or No Impact[2]
(A)	(B)	(C)	(D)	(E)	(F)	(G)	
N369	Residence (1)	67	70	69	1	3	I
N370	Residence (1)	67	64	63	1	-3	N
N371	Residence (1)	67	64	62	2	-3	N
N372	Residence (1)	67	68	68	0	1	I
N373	Residence (1)	67	63	62	1	-4	N
N374	Residence (1)	67	57	57	0	-10	N
N375	Residence (1)	67	55	55	0	-12	N
N376	Residence (1)	67	54	53	1	-13	N
N377	Residence (1)	67	53	53	0	-14	N
N378	Residence (1)	67	55	54	1	-12	N
N379	Residence (1)	67	57	56	1	-10	N
N380	Residence (1)	67	59	58	1	-8	N
N381	Residence (1)	67	62	62	0	-5	N
N382	Residence (1)	67	51	50	1	-16	N
N383	Residence (1)	67	53	52	1	-14	N
N384	Residence (1)	67	53	51	2	-14	N
N385	Residence (1)	67	53	51	2	-14	N
N386	Residence (1)	67	53	52	1	-14	N

Source: HNTB Corporation, August 2013

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Receptor Location (see Exhibit E-1)	Number of Residences, Schools, etc., Typical of this Receptor Site	Noise Abatement Criteria (NAC)	Sound Levels Leq (dBA)		Impact Evaluation		
			Future Noise Level[1]	Existing Noise Level	Difference in Future and Existing Noise Levels (Column D minus Column E)[1]	Difference in Future Noise Levels and NAC (Column D minus Column C)[1]	Impact or No Impact[2]
(A)	(B)	(C)	(D)	(E)	(F)	(G)	
N387	Residence (1)	67	56	54	2	-11	N
FS-15	Field Site (0)	-	55	53	2	-	-
N388	Residence (1)	67	53	52	1	-14	N
N389	Residence (1)	67	54	53	1	-13	N
N390	Residence (1)	67	54	53	1	-13	N
N391	Residence (1)	67	51	50	1	-16	N
N392	Residence (1)	67	52	50	2	-15	N
N393	Residence (1)	67	52	50	2	-15	N
N394	Residence (1)	67	51	49	2	-16	N
N395	Residence (1)	67	53	52	1	-14	N
N396	Residence (1)	67	52	50	2	-15	N
N397	Residence (1)	67	54	51	3	-13	N
N398	Residence (1)	67	58	55	3	-9	N
N399	Residence (1)	67	68	65	3	1	I
N400	Residence (1)	67	63	60	3	-4	N
N401	Residence (1)	67	60	57	3	-7	N
N402	Residence (1)	67	69	67	2	2	I
N403	Residence (1)	67	64	62	2	-3	N

Source: HNTB Corporation, August 2013

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Receptor Location (see Exhibit E-1)	Number of Residences, Schools, etc., Typical of this Receptor Site	Noise Abatement Criteria (NAC)	Sound Levels Leq (dBA)		Impact Evaluation		
			Future Noise Level[1]	Existing Noise Level	Difference in Future and Existing Noise Levels (Column D minus Column E)[1]	Difference in Future Noise Levels and NAC (Column D minus Column C)[1]	Impact or No Impact[2]
(A)	(B)	(C)	(D)	(E)	(F)	(G)	
N404	Residence (1)	67	61	60	1	-6	N
N405	Residence (1)	67	58	55	3	-9	N
N406	Residence (1)	67	58	57	1	-9	N
FS-28	Field Site (0)	-	73	71	2	-	-
N407	Residence (1)	67	61	59	2	-6	N
N408	Residence (1)	67	64	62	2	-3	N
N409	Residence (1)	67	62	60	2	-5	N
N410	Residence (1)	67	62	60	2	-5	N
N411	Residence (1)	67	71	70	1	4	I
N412	Residence (1)	67	67	67	0	0	I
N413	Residence (1)	67	69	68	1	2	I
N414	Residence (1)	67	70	69	1	3	I
N415	Residence (1)	67	59	57	2	-8	N
N416	Residence (1)	67	60	58	2	-7	N
N417	Residence (1)	67	59	58	1	-8	N
N418	Residence (1)	67	58	57	1	-9	N
N419	Residence (1)	67	58	56	2	-9	N
N420	Residence (1)	67	56	54	2	-11	N

Source: HNTB Corporation, August 2013

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Receptor Location (see Exhibit E-1)	Number of Residences, Schools, etc., Typical of this Receptor Site	Noise Abatement Criteria (NAC)	Sound Levels Leq (dBA)		Impact Evaluation		
			Future Noise Level[1]	Existing Noise Level	Difference in Future and Existing Noise Levels (Column D minus Column E)[1]	Difference in Future Noise Levels and NAC (Column D minus Column C)[1]	Impact or No Impact[2]
(A)	(B)	(C)	(D)	(E)	(F)	(G)	
N421	Residence (1)	67	59	58	1	-8	N
N422	Residence (1)	67	61	59	2	-6	N
N423	Residence (1)	67	58	57	1	-9	N
N424	Residence (1)	67	65	63	2	-2	N
N425	Multifamily Residence (2)	67	58 / 58 / 59 / 59	58	0 / 0 / 1 / 1	-9 / -9 / -8 / -8	N / N / N / N
N426	Multifamily Residence (2)	67	57 / 58 / 58 / 58	57	0 / 1 / 1 / 1	-10 / -9 / -9 / -9	N / N / N / N
N427	Multifamily Residence (2)	67	57 / 59 / 59 / 59	57	0 / 2 / 2 / 2	-10 / -8 / -8 / -8	N / N / N / N
N428	Multifamily Residence (2)	67	55 / 55 / 56 / 56	54	1 / 1 / 2 / 2	-12 / -12 / -11 / -11	N / N / N / N
N429	Multifamily Residence (2)	67	54 / 55 / 55 / 55	53	1 / 2 / 2 / 2	-13 / -12 / -12 / -12	N / N / N / N
N430	Multifamily Residence (2)	67	49 / 50 / 50 / 50	49	0 / 1 / 1 / 1	-18 / -17 / -17 / -17	N / N / N / N
N431	Multifamily Residence (2)	67	51 / 52 / 52 / 52	51	0 / 1 / 1 / 1	-16 / -15 / -15 / -15	N / N / N / N
N432	Multifamily Residence (2)	67	53 / 53 / 53 / 53	53	0 / 0 / 0 / 0	-14 / -14 / -14 / -14	N / N / N / N
N433	Multifamily Residence (2)	67	50 / 50 / 50 / 50	49	1 / 1 / 1 / 1	-17 / -17 / -17 / -17	N / N / N / N
N434	Multifamily Residence (2)	67	45 / 46 / 46 / 46	45	0 / 1 / 1 / 1	-22 / -21 / -21 / -21	N / N / N / N
N435	Multifamily Residence (2)	67	49 / 49 / 49 / 49	49	0 / 0 / 0 / 0	-18 / -18 / -18 / -18	N / N / N / N
N436	Multifamily Residence (2)	67	48 / 49 / 49 / 49	50	-2 / -1 / -1 / -1	-19 / -18 / -18 / -18	N / N / N / N
N437	Multifamily Residence (2)	67	50 / 50 / 51 / 51	51	-1 / -1 / 0 / 0	-17 / -17 / -16 / -16	N / N / N / N
N438.1	Multifamily Residence – 1st Floor (2)	67	48 / 49 / 49 / 49	51	-3 / -2 / -2 / -2	-19 / -18 / -18 / -18	N / N / N / N

Source: HNTB Corporation, August 2013

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Receptor Location (see Exhibit E-1)	Number of Residences, Schools, etc., Typical of this Receptor Site	Noise Abatement Criteria (NAC)	Sound Levels Leq (dBA)		Impact Evaluation		
			Future Noise Level[1]	Existing Noise Level	Difference in Future and Existing Noise Levels (Column D minus Column E)[1]	Difference in Future Noise Levels and NAC (Column D minus Column C)[1]	Impact or No Impact[2]
(A)	(B)	(C)	(D)	(E)	(F)	(G)	
N438.2	Multifamily Residence – 2nd Floor (2)	67	52 / 53 / 54 / 54	55	-3 / -2 / -1 / -1	-15 / -14 / -13 / -13	N / N / N / N
N439.1	Multifamily Residence – 1st Floor (2)	67	47 / 48 / 48 / 48	50	-3 / -2 / -2 / -2	-20 / -19 / -19 / -19	N / N / N / N
N439.2	Multifamily Residence – 2nd Floor (2)	67	50 / 51 / 51 / 51	53	-3 / -2 / -2 / -2	-17 / -16 / -16 / -16	N / N / N / N
N440.1	Multifamily Residence – 1st Floor (2)	67	52 / 54 / 53 / 53	52	0 / 2 / 1 / 1	-15 / -13 / -14 / -14	N / N / N / N
N440.2	Multifamily Residence – 2nd Floor (2)	67	56 / 58 / 58 / 58	57	-1 / 1 / 1 / 1	-11 / -9 / -9 / -9	N / N / N / N
N441.1	Multifamily Residence – 1st Floor (2)	67	49 / 51 / 51 / 51	51	-2 / 0 / 0 / 0	-18 / -16 / -16 / -16	N / N / N / N
N441.2	Multifamily Residence – 2nd Floor (2)	67	52 / 54 / 54 / 53	54	-2 / 0 / 0 / -1	-15 / -13 / -13 / -14	N / N / N / N
N442.1	Multifamily Residence – 1st Floor (2)	67	48 / 50 / 50 / 50	53	-5 / -3 / -3 / -3	-19 / -17 / -17 / -17	N / N / N / N
N442.2	Multifamily Residence – 2nd Floor (2)	67	52 / 53 / 53 / 53	56	-4 / -3 / -3 / -3	-15 / -14 / -14 / -14	N / N / N / N
N443.1	Multifamily Residence – 1st Floor (2)	67	46 / 48 / 48 / 48	51	-5 / -3 / -3 / -3	-21 / -19 / -19 / -19	N / N / N / N
N443.2	Multifamily Residence – 2nd Floor (2)	67	49 / 50 / 50 / 50	53	-4 / -3 / -3 / -3	-18 / -17 / -17 / -17	N / N / N / N
N444.1	Multifamily Residence – 1st Floor (2)	67	53 / 55 / 55 / 54	54	-1 / 1 / 1 / 0	-14 / -12 / -12 / -13	N / N / N / N
N444.2	Multifamily Residence – 2nd Floor (2)	67	57 / 59 / 58 / 58	57	0 / 2 / 1 / 1	-10 / -8 / -9 / -9	N / N / N / N
N445.1	Multifamily Residence – 1st Floor (2)	67	51 / 53 / 53 / 52	51	0 / 2 / 2 / 1	-16 / -14 / -14 / -15	N / N / N / N
N445.2	Multifamily Residence – 2nd Floor (2)	67	54 / 56 / 55 / 55	54	0 / 2 / 1 / 1	-13 / -11 / -12 / -12	N / N / N / N
N446	Residence (2)	67	57 / 59 / 59 / 58	57	0 / 2 / 2 / 1	-10 / -8 / -8 / -9	N / N / N / N
N447	Residence (2)	67	57 / 59 / 58 / 58	56	1 / 3 / 2 / 2	-10 / -8 / -9 / -9	N / N / N / N
N448	Residence (2)	67	58 / 59 / 58 / 58	57	1 / 2 / 1 / 1	-9 / -8 / -9 / -9	N / N / N / N

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Receptor Location (see Exhibit E-1)	Number of Residences, Schools, etc., Typical of this Receptor Site	Noise Abatement Criteria (NAC)	Sound Levels Leq (dBA)		Impact Evaluation		
			Future Noise Level[1]	Existing Noise Level	Difference in Future and Existing Noise Levels (Column D minus Column E)[1]	Difference in Future Noise Levels and NAC (Column D minus Column C)[1]	Impact or No Impact[2]
(A)	(B)	(C)	(D)	(E)	(F)	(G)	
FS-26	Field Site (0)	-	57 / 59 / 58 / 58	56	1 / 3 / 2 / 2	-	-
N449	Residence (2)	67	58 / 59 / 57 / 58	56	2 / 3 / 1 / 2	-9 / -8 / -10 / -9	N / N / N / N
N450	Residence (2)	67	57 / 59 / 57 / 58	56	1 / 3 / 1 / 2	-10 / -8 / -10 / -9	N / N / N / N
N451	Residence (2)	67	58 / 60 / 58 / 59	57	1 / 3 / 1 / 2	-9 / -7 / -9 / -8	N / N / N / N
N452	Park (1)	67	65 / 65 / 63 / 64	63	2 / 2 / 0 / 1	-2 / -2 / -4 / -3	N / N / N / N
N453		67	61 / 62 / 61 / 62	60	1 / 2 / 1 / 2	-6 / -5 / -6 / -5	
N454		67	59 / 60 / 59 / 59	58	1 / 2 / 1 / 1	-8 / -7 / -8 / -8	
N455		67	58 / 59 / 59 / 58	56	2 / 3 / 3 / 2	-9 / -8 / -8 / -9	
N456		67	56 / 57 / 57 / 57	55	1 / 2 / 2 / 2	-11 / -10 / -10 / -10	
N457		67	55 / 56 / 56 / 56	54	1 / 2 / 2 / 2	-12 / -11 / -11 / -11	
N458		67	54 / 55 / 55 / 55	53	1 / 2 / 2 / 2	-13 / -12 / -12 / -12	
N459	Residence (1)	67	69 / 69 / 71 / 70	67	2 / 2 / 4 / 3	2 / 2 / 4 / 3	I / I / I / I
N460	Residence (1)	67	63 / 64 / 65 / 65	62	1 / 2 / 3 / 3	-4 / -3 / -2 / -2	N / N / N / N
N461	Residence (1)	67	60 / 61 / 61 / 61	59	1 / 2 / 2 / 2	-7 / -6 / -6 / -6	N / N / N / N
N462	Residence (1)	67	58 / 59 / 59 / 59	56	2 / 3 / 3 / 3	-9 / -8 / -8 / -8	N / N / N / N
N463	Residence (1)	67	68 / 69 / 69 / 69	67	1 / 2 / 2 / 2	1 / 2 / 2 / 2	I / I / I / I
N464	Residence (1)	67	63 / 64 / 64 / 64	62	1 / 2 / 2 / 2	-4 / -3 / -3 / -3	N / N / N / N
N465	Residence (1)	67	60 / 61 / 61 / 61	59	1 / 2 / 2 / 2	-7 / -6 / -6 / -6	N / N / N / N

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Receptor Location (see Exhibit E-1)	Number of Residences, Schools, etc., Typical of this Receptor Site	Noise Abatement Criteria (NAC)	Sound Levels Leq (dBA)		Impact Evaluation		
			Future Noise Level[1]	Existing Noise Level	Difference in Future and Existing Noise Levels (Column D minus Column E)[1]	Difference in Future Noise Levels and NAC (Column D minus Column C)[1]	Impact or No Impact[2]
(A)	(B)	(C)	(D)	(E)	(F)	(G)	
N466	Residence (1)	67	58 / 59 / 58 / 59	57	1 / 2 / 1 / 2	-9 / -8 / -9 / -8	N / N / N / N
N467	Residence (1)	67	56 / 57 / 57 / 57	55	1 / 2 / 2 / 2	-11 / -10 / -10 / -10	N / N / N / N
FS-17	Field Site (0)	-	72 / 72 / 72 / 72	71	1 / 1 / 1 / 1	-	-
N468	Residence (1)	67	67 / 68 / 68 / 68	67	0 / 1 / 1 / 1	0 / 1 / 1 / 1	I / I / I / I
N469	Residence (1)	67	61 / 62 / 62 / 62	60	1 / 2 / 2 / 2	-6 / -5 / -5 / -5	N / N / N / N
N470	Residence (1)	67	59 / 60 / 60 / 60	58	1 / 2 / 2 / 2	-8 / -7 / -7 / -7	N / N / N / N
N471	Residence (1)	67	56 / 57 / 57 / 57	55	1 / 2 / 2 / 2	-11 / -10 / -10 / -10	N / N / N / N
N472	Residence (1)	67	54 / 55 / 55 / 55	53	1 / 2 / 2 / 2	-13 / -12 / -12 / -12	N / N / N / N
N473	Residence (1)	67	71 / 72 / 72 / 70	71	0 / 1 / 1 / -1	4 / 5 / 5 / 3	I / I / I / I
N474	Residence (1)	67	64 / 65 / 65 / 65	63	1 / 2 / 2 / 2	-3 / -2 / -2 / -2	N / N / N / N
N475	Residence (1)	67	59 / 60 / 60 / 61	58	1 / 2 / 2 / 3	-8 / -7 / -7 / -6	N / N / N / N
N476	Residence (1)	67	57 / 58 / 58 / 58	56	1 / 2 / 2 / 2	-10 / -9 / -9 / -9	N / N / N / N
N477	Residence (1)	67	55 / 56 / 56 / 57	54	1 / 2 / 2 / 3	-12 / -11 / -11 / -10	N / N / N / N
N478	Residence (1)	67	54 / 55 / 55 / 55	53	1 / 2 / 2 / 2	-13 / -12 / -12 / -12	N / N / N / N
N479	Residence (1)	67	64 / 65 / 66 / 65	64	0 / 1 / 2 / 1	-3 / -2 / -1 / -2	N / N / N / N
N480	Residence (1)	67	60 / 61 / 61 / 61	59	1 / 2 / 2 / 2	-7 / -6 / -6 / -6	N / N / N / N
N481	Residence (1)	67	58 / 59 / 59 / 59	57	1 / 2 / 2 / 2	-9 / -8 / -8 / -8	N / N / N / N
N482	Residence (1)	67	56 / 57 / 58 / 57	55	1 / 2 / 3 / 2	-11 / -10 / -9 / -10	N / N / N / N

Source: HNTB Corporation, August 2013

1. *Single entries are presented for the County Line Partial Diamond and the Highland Road Tight Diamond Alternative. Quadruplicate entries are presented for the County Line No Access / County Line Partial Diamond, Split Diamond Hybrid Alternative (Grade Separation) / County Line Split Diamond Hybrid (Without Grade Separation) Alternative. Dual entries are represented for both the Highland Road Tight Diamond Alternative / Highland Road No Access Alternative.*
2. *Wisconsin Department of Transportation's* Facilities Development Manual, *Chapter 23: "Noise"*

Receptor Location (see Exhibit E-1)	Number of Residences, Schools, etc., Typical of this Receptor Site	Noise Abatement Criteria (NAC)	Sound Levels Leq (dBA)		Impact Evaluation		
			Future Noise Level[1]	Existing Noise Level	Difference in Future and Existing Noise Levels (Column D minus Column E)[1]	Difference in Future Noise Levels and NAC (Column D minus Column C)[1]	Impact or No Impact[2]
(A)	(B)	(C)	(D)	(E)	(F)	(G)	
N483	Residence (1)	67	56 / 57 / 57 / 57	55	1 / 2 / 2 / 2	-11 / -10 / -10 / -10	N / N / N / N
N484	Residence (1)	67	59 / 60 / 60 / 60	58	1 / 2 / 2 / 2	-8 / -7 / -7 / -7	N / N / N / N
N485	Residence (1)	67	66 / 67 / 68 / 66	65	1 / 2 / 3 / 1	-1 / 0 / 1 / -1	N / I / I / N
N486	Residence (1)	67	71 / 71 / 71 / 71	71	0 / 0 / 0 / 0	4 / 4 / 4 / 4	I / I / I / I
N487	Residence (1)	67	64 / 65 / 65 / 65	62	2 / 3 / 3 / 3	-3 / -2 / -2 / -2	N / N / N / N
N488	Residence (1)	67	61 / 62 / 62 / 62	58	3 / 4 / 4 / 4	-6 / -5 / -5 / -5	N / N / N / N
N489	Residence (1)	67	58 / 59 / 59 / 59	55	3 / 4 / 4 / 4	-9 / -8 / -8 / -8	N / N / N / N
N490	Residence (1)	67	68 / 69 / 69 / 69	62	6 / 7 / 7 / 7	1 / 2 / 2 / 2	I / I / I / I
N491	Residence (2)	67	54 / 55 / 55 / 55	52	2 / 3 / 3 / 3	-13 / -12 / -12 / -12	N / N / N / N
N492	Residence (2)	67	55 / 56 / 56 / 56	53	2 / 3 / 3 / 3	-12 / -11 / -11 / -11	N / N / N / N
N493	Residence (2)	67	57 / 58 / 58 / 58	55	2 / 3 / 3 / 3	-10 / -9 / -9 / -9	N / N / N / N
N494	Residence (1)	67	54 / 55 / 55 / 55	52	2 / 3 / 3 / 3	-13 / -12 / -12 / -12	N / N / N / N
N495	Residence (2)	67	57 / 57 / 57 / 57	54	3 / 3 / 3 / 3	-10 / -10 / -10 / -10	N / N / N / N
N496	Residence (3)	67	58 / 58 / 58 / 58	56	2 / 2 / 2 / 2	-9 / -9 / -9 / -9	N / N / N / N
N497	Residence (3)	67	57 / 57 / 57 / 57	55	2 / 2 / 2 / 2	-10 / -10 / -10 / -10	N / N / N / N
N498	Residence (3)	67	55 / 56 / 56 / 56	54	1 / 2 / 2 / 2	-12 / -11 / -11 / -11	N / N / N / N
FS-18	Residence (1)	67	53 / 54 / 54 / 54	51	2 / 3 / 3 / 3	-14 / -13 / -13 / -13	N / N / N / N
N499	Residence (3)	67	55 / 55 / 56 / 56	54	1 / 1 / 2 / 2	-12 / -12 / -11 / -11	N / N / N / N

Source: HNTB Corporation, August 2013

1. *Single entries are presented for the County Line Partial Diamond and the Highland Road Tight Diamond Alternative. Quadruplicate entries are presented for the County Line No Access / County Line Partial Diamond, Split Diamond Hybrid Alternative (Grade Separation) / County Line Split Diamond Hybrid (Without Grade Separation) Alternative. Dual entries are represented for both the Highland Road Tight Diamond Alternative / Highland Road No Access Alternative.*
2. *Wisconsin Department of Transportation's* Facilities Development Manual, *Chapter 23: "Noise"*

Receptor Location (see Exhibit E-1)	Number of Residences, Schools, etc., Typical of this Receptor Site	Noise Abatement Criteria (NAC)	Sound Levels Leq (dBA)		Impact Evaluation		
			Future Noise Level[1]	Existing Noise Level	Difference in Future and Existing Noise Levels (Column D minus Column E)[1]	Difference in Future Noise Levels and NAC (Column D minus Column C)[1]	Impact or No Impact[2]
(A)	(B)	(C)	(D)	(E)	(F)	(G)	
N500	Residence (3)	67	59 / 60 / 59 / 59	57	2 / 3 / 2 / 2	-8 / -7 / -8 / -8	N / N / N / N
N501	Residence (3)	67	59 / 60 / 60 / 60	59	0 / 1 / 1 / 1	-8 / -7 / -7 / -7	N / N / N / N
N502	Residence (3)	67	60 / 61 / 61 / 61	59	1 / 2 / 2 / 2	-7 / -6 / -6 / -6	N / N / N / N
N503	Residence (3)	67	59 / 60 / 60 / 60	58	1 / 2 / 2 / 2	-8 / -7 / -7 / -7	N / N / N / N
N504	Residence (3)	67	60 / 60 / 60 / 60	57	3 / 3 / 3 / 3	-7 / -7 / -7 / -7	N / N / N / N
N505	Residence (2)	67	60 / 60 / 60 / 60	57	3 / 3 / 3 / 3	-7 / -7 / -7 / -7	N / N / N / N
N506	Residence (3)	67	60 / 60 / 60 / 60	57	3 / 3 / 3 / 3	-7 / -7 / -7 / -7	N / N / N / N
N507	Residence (1)	67	63 / 63 / 63 / 63	59	4 / 4 / 4 / 4	-4 / -4 / -4 / -4	N / N / N / N
N508	Residence (1)	67	58 / 59 / 59 / 59	57	1 / 2 / 2 / 2	-9 / -8 / -8 / -8	N / N / N / N
N509	Residence (1)	67	59 / 60 / 60 / 60	59	0 / 1 / 1 / 1	-8 / -7 / -7 / -7	N / N / N / N
N510	Residence (1)	67	65 / 65 / 65 / 65	64	1 / 1 / 1 / 1	-2 / -2 / -2 / -2	N / N / N / N
N511	Residence (1)	67	68 / 69 / 69 / 69	66	2 / 3 / 3 / 3	1 / 2 / 2 / 2	I / I / I / I
N512	Residence (1)	67	61 / 62 / 62 / 62	60	1 / 2 / 2 / 2	-6 / -5 / -5 / -5	N / N / N / N
N513	Residence (1)	67	58 / 58 / 58 / 58	56	2 / 2 / 2 / 2	-9 / -9 / -9 / -9	N / N / N / N
FS-27	Residence (1)	67	65 / 66 / 66 / 66	64	1 / 2 / 2 / 2	-2 / -1 / -1 / -1	N / N / N / N
N514	Residence (1)	67	57 / 58 / 58 / 58	55	2 / 3 / 3 / 3	-10 / -9 / -9 / -9	N / N / N / N
N515	Residence (1)	67	61 / 62 / 62 / 62	59	2 / 3 / 3 / 3	-6 / -5 / -5 / -5	N / N / N / N
N516	Residence (1)	67	65 / 66 / 66 / 66	63	2 / 3 / 3 / 3	-2 / -1 / -1 / -1	N / N / N / N

Source: HNTB Corporation, August 2013

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2. *Wisconsin Department of Transportation's* Facilities Development Manual, *Chapter 23: "Noise"*

Receptor Location (see Exhibit E-1)	Number of Residences, Schools, etc., Typical of this Receptor Site	Noise Abatement Criteria (NAC)	Sound Levels Leq (dBA)		Impact Evaluation		
			Future Noise Level[1]	Existing Noise Level	Difference in Future and Existing Noise Levels (Column D minus Column E)[1]	Difference in Future Noise Levels and NAC (Column D minus Column C)[1]	Impact or No Impact[2]
(A)	(B)	(C)	(D)	(E)	(F)	(G)	
N517	Residence (1)	67	63 / 64 / 64 / 64	61	2 / 3 / 3 / 3	-4 / -3 / -3 / -3	N / N / N / N
N518	Residence (1)	67	64 / 64 / 64 / 64	61	3 / 3 / 3 / 3	-3 / -3 / -3 / -3	N / N / N / N
N519	Residence (1)	67	56 / 56 / 56 / 56	54	2 / 2 / 2 / 2	-11 / -11 / -11 / -11	N / N / N / N
N520	Residence (1)	67	58 / 58 / 58 / 58	56	2 / 2 / 2 / 2	-9 / -9 / -9 / -9	N / N / N / N
N521	Residence (1)	67	64 / 65 / 65 / 65	61	3 / 4 / 4 / 4	-3 / -2 / -2 / -2	N / N / N / N
N522	Residence (1)	67	62 / 62 / 62 / 62	60	2 / 2 / 2 / 2	-5 / -5 / -5 / -5	N / N / N / N
N523	Residence (1)	67	57 / 57 / 57 / 57	56	1 / 1 / 1 / 1	-10 / -10 / -10 / -10	N / N / N / N
N524	Residence (1)	67	56 / 56 / 56 / 56	54	2 / 2 / 2 / 2	-11 / -11 / -11 / -11	N / N / N / N
N525	Residence (1)	67	62 / 62 / 62 / 62	60	2 / 2 / 2 / 2	-5 / -5 / -5 / -5	N / N / N / N
N526	Residence (1)	67	62 / 63 / 63 / 63	61	1 / 2 / 2 / 2	-5 / -4 / -4 / -4	N / N / N / N
N527	Residence (1)	67	56 / 56 / 56 / 56	55	1 / 1 / 1 / 1	-11 / -11 / -11 / -11	N / N / N / N
N528	Residence (1)	67	58 / 58 / 58 / 58	57	1 / 1 / 1 / 1	-9 / -9 / -9 / -9	N / N / N / N
N529	Residence (1)	67	63 / 63 / 63 / 63	62	1 / 1 / 1 / 1	-4 / -4 / -4 / -4	N / N / N / N
N530	Day Care Center (1)	67	72 / 64 / 64 / 64	71	1 / -7 / -7 / -7	5 / -3 / -3 / -3	I / N / N / N
N531	Hospital (1)	72	60 / 62 / 62 / 62	60	0 / 2 / 2 / 2	-12 / -10 / -10 / -10	N / N / N / N
N532	Hotel (1)	67	58 / 61 / 61 / 61	59	-1 / 2 / 2 / 2	-9 / -6 / -6 / -6	N / N / N / N
N533.1	Multifamily Residence – 1st Floor (0)	67	53 / 54 / 54 / 54	52	1 / 2 / 2 / 2	-14 / -13 / -13 / -13	N / N / N / N
N533.2	Multifamily Residence – 2nd Floor (1)	67	57 / 58 / 58 / 58	56	1 / 2 / 2 / 2	-10 / -9 / -9 / -9	N / N / N / N

Source: HNTB Corporation, August 2013

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2. *Wisconsin Department of Transportation's* Facilities Development Manual, *Chapter 23: "Noise"*

Receptor Location (see Exhibit E-1)	Number of Residences, Schools, etc., Typical of this Receptor Site	Noise Abatement Criteria (NAC)	Sound Levels Leq (dBA)		Impact Evaluation		
			Future Noise Level[1]	Existing Noise Level	Difference in Future and Existing Noise Levels (Column D minus Column E)[1]	Difference in Future Noise Levels and NAC (Column D minus Column C)[1]	Impact or No Impact[2]
(A)	(B)	(C)	(D)	(E)	(F)	(G)	
N534.1	Multifamily Residence – 1st Floor (0)	67	45 / 47 / 47 / 47	43	2 / 4 / 4 / 4	-22 / -20 / -20 / -20	N / N / N / N
N534.2	Multifamily Residence – 2nd Floor (2)	67	49 / 51 / 51 / 51	47	2 / 4 / 4 / 4	-18 / -16 / -16 / -16	N / N / N / N
N535.1	Multifamily Residence – 1st Floor (0)	67	49 / 50 / 50 / 50	46	3 / 4 / 4 / 4	-18 / -17 / -17 / -17	N / N / N / N
N535.2	Multifamily Residence – 2nd Floor (2)	67	52 / 53 / 53 / 53	49	3 / 4 / 4 / 4	-15 / -14 / -14 / -14	N / N / N / N
N536.1	Multifamily Residence – 1st Floor (0)	67	45 / 46 / 46 / 46	43	2 / 3 / 3 / 3	-22 / -21 / -21 / -21	N / N / N / N
N536.2	Multifamily Residence – 2nd Floor (2)	67	48 / 49 / 49 / 49	46	2 / 3 / 3 / 3	-19 / -18 / -18 / -18	N / N / N / N
N537.1	Multifamily Residence – 1st Floor (0)	67	53 / 54 / 54 / 54	49	4 / 5 / 5 / 5	-14 / -13 / -13 / -13	N / N / N / N
N537.2	Multifamily Residence – 2nd Floor (1)	67	55 / 56 / 56 / 56	53	2 / 3 / 3 / 3	-12 / -11 / -11 / -11	N / N / N / N
N538.1	Multifamily Residence – 1st Floor (0)	67	48 / 49 / 49 / 49	46	2 / 3 / 3 / 3	-19 / -18 / -18 / -18	N / N / N / N
N538.2	Multifamily Residence – 2nd Floor (1)	67	51 / 52 / 52 / 52	48	3 / 4 / 4 / 4	-16 / -15 / -15 / -15	N / N / N / N
N539.1	Multifamily Residence – 1st Floor (0)	67	46 / 47 / 47 / 47	44	2 / 3 / 3 / 3	-21 / -20 / -20 / -20	N / N / N / N
N539.2	Multifamily Residence – 2nd Floor (1)	67	50 / 51 / 51 / 51	48	2 / 3 / 3 / 3	-17 / -16 / -16 / -16	N / N / N / N
N540.1	Multifamily Residence – 1st Floor (0)	67	45 / 46 / 46 / 46	43	2 / 3 / 3 / 3	-22 / -21 / -21 / -21	N / N / N / N
N540.2	Multifamily Residence – 2nd Floor (2)	67	49 / 50 / 50 / 50	47	2 / 3 / 3 / 3	-18 / -17 / -17 / -17	N / N / N / N
N541.1	Multifamily Residence – 1st Floor (0)	67	67 / 67 / 67 / 67	64	3 / 3 / 3 / 3	0 / 0 / 0 / 0	I / I / I / I
N541.2	Multifamily Residence – 2nd Floor (1)	67	68 / 68 / 68 / 68	65	3 / 3 / 3 / 3	1 / 1 / 1 / 1	I / I / I / I
N542.1	Multifamily Residence – 1st Floor (0)	67	75 / 76 / 76 / 76	72	3 / 4 / 4 / 4	8 / 9 / 9 / 9	I / I / I / I
N542.2	Multifamily Residence – 2nd Floor (1)	67	75 / 76 / 76 / 76	73	2 / 3 / 3 / 3	8 / 9 / 9 / 9	I / I / I / I

Source: HNTB Corporation, August 2013

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2. *Wisconsin Department of Transportation's* Facilities Development Manual, *Chapter 23: "Noise"*

Receptor Location (see Exhibit E-1)	Number of Residences, Schools, etc., Typical of this Receptor Site	Noise Abatement Criteria (NAC)	Sound Levels Leq (dBA)		Impact Evaluation		
			Future Noise Level[1]	Existing Noise Level	Difference in Future and Existing Noise Levels (Column D minus Column E)[1]	Difference in Future Noise Levels and NAC (Column D minus Column C)[1]	Impact or No Impact[2]
(A)	(B)	(C)	(D)	(E)	(F)	(G)	
N543.1	Multifamily Residence – 1st Floor (0)	67	47 / 48 / 48 / 48	44	3 / 4 / 4 / 4	-20 / -19 / -19 / -19	N / N / N / N
N543.2	Multifamily Residence – 2nd Floor (2)	67	49 / 50 / 50 / 50	47	2 / 3 / 3 / 3	-18 / -17 / -17 / -17	N / N / N / N
N544.1	Multifamily Residence – 1st Floor (0)	67	49 / 50 / 50 / 50	47	2 / 3 / 3 / 3	-18 / -17 / -17 / -17	N / N / N / N
N544.2	Multifamily Residence – 2nd Floor (2)	67	51 / 52 / 52 / 52	48	3 / 4 / 4 / 4	-16 / -15 / -15 / -15	N / N / N / N
N545.1	Multifamily Residence – 1st Floor (0)	67	45 / 47 / 47 / 47	45	0 / 2 / 2 / 2	-22 / -20 / -20 / -20	N / N / N / N
N545.2	Multifamily Residence – 2nd Floor (1)	67	48 / 50 / 50 / 50	47	1 / 3 / 3 / 3	-19 / -17 / -17 / -17	N / N / N / N
N546.1	Multifamily Residence – 1st Floor (0)	67	59 / 60 / 60 / 60	55	4 / 5 / 5 / 5	-8 / -7 / -7 / -7	N / N / N / N
N546.2	Multifamily Residence – 2nd Floor (1)	67	61 / 62 / 62 / 62	59	2 / 3 / 3 / 3	-6 / -5 / -5 / -5	N / N / N / N
N547.1	Multifamily Residence – 1st Floor (0)	67	54 / 55 / 55 / 55	50	4 / 5 / 5 / 5	-13 / -12 / -12 / -12	N / N / N / N
N547.2	Multifamily Residence – 2nd Floor (2)	67	57 / 58 / 58 / 58	55	2 / 3 / 3 / 3	-10 / -9 / -9 / -9	N / N / N / N
N548.1	Multifamily Residence – 1st Floor (0)	67	55 / 56 / 56 / 56	52	3 / 4 / 4 / 4	-12 / -11 / -11 / -11	N / N / N / N
N548.2	Multifamily Residence – 2nd Floor (1)	67	58 / 59 / 59 / 59	56	2 / 3 / 3 / 3	-9 / -8 / -8 / -8	N / N / N / N
N549	Multifamily Residence Complex Pool (1)	67	57 / 59 / 59 / 59	55	2 / 4 / 4 / 4	-10 / -8 / -8 / -8	N / N / N / N
N550.1	Multifamily Residence – 1st Floor (0)	67	60 / 61 / 61 / 61	59	1 / 2 / 2 / 2	-7 / -6 / -6 / -6	N / N / N / N
N550.2	Multifamily Residence – 2nd Floor (4)	67	64 / 65 / 65 / 65	63	1 / 2 / 2 / 2	-3 / -2 / -2 / -2	N / N / N / N
N551.1	Multifamily Residence – 1st Floor (0)	67	57 / 58 / 58 / 58	56	1 / 2 / 2 / 2	-10 / -9 / -9 / -9	N / N / N / N
N551.2	Multifamily Residence – 2nd Floor (4)	67	61 / 62 / 62 / 62	60	1 / 2 / 2 / 2	-6 / -5 / -5 / -5	N / N / N / N

Source: HNTB Corporation, August 2013

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Receptor Location (see Exhibit E-1)	Number of Residences, Schools, etc., Typical of this Receptor Site	Noise Abatement Criteria (NAC)	Sound Levels Leq (dBA)		Impact Evaluation		
			Future Noise Level[1]	Existing Noise Level	Difference in Future and Existing Noise Levels (Column D minus Column E)[1]	Difference in Future Noise Levels and NAC (Column D minus Column C)[1]	Impact or No Impact[2]
(A)	(B)	(C)	(D)	(E)	(F)	(G)	
N552.1	Multifamily Residence – 1st Floor (0)	67	62 / 63 / 63 / 63	54	8 / 9 / 9 / 9	-5 / -4 / -4 / -4	N / N / N / N
N552.2	Multifamily Residence – 2nd Floor (1)	67	62 / 63 / 63 / 63	60	2 / 3 / 3 / 3	-5 / -4 / -4 / -4	N / N / N / N
N553.1	Multifamily Residence – 1st Floor (0)	67	61 / 61 / 61 / 61	54	7 / 7 / 7 / 7	-6 / -6 / -6 / -6	N / N / N / N
N553.2	Multifamily Residence – 2nd Floor (1)	67	63 / 63 / 63 / 63	59	4 / 4 / 4 / 4	-4 / -4 / -4 / -4	N / N / N / N
N554.1	Multifamily Residence – 1st Floor (0)	67	60 / 61 / 61 / 61	61	-1 / 0 / 0 / 0	-7 / -6 / -6 / -6	N / N / N / N
N554.2	Multifamily Residence – 2nd Floor (1)	67	64 / 64 / 64 / 64	62	2 / 2 / 2 / 2	-3 / -3 / -3 / -3	N / N / N / N
N555.1	Multifamily Residence – 1st Floor (0)	67	56 / 57 / 57 / 57	57	-1 / 0 / 0 / 0	-11 / -10 / -10 / -10	N / N / N / N
N555.2	Multifamily Residence – 2nd Floor (1)	67	59 / 59 / 59 / 59	61	-2 / -2 / -2 / -2	-8 / -8 / -8 / -8	N / N / N / N
N556.1	Multifamily Residence – 1st Floor (0)	67	60 / 61 / 61 / 61	55	5 / 6 / 6 / 6	-7 / -6 / -6 / -6	N / N / N / N
N556.2	Multifamily Residence – 2nd Floor (1)	67	62 / 62 / 62 / 62	60	2 / 2 / 2 / 2	-5 / -5 / -5 / -5	N / N / N / N
N557.1	Multifamily Residence – 1st Floor (0)	67	46 / 47 / 47 / 47	44	2 / 3 / 3 / 3	-21 / -20 / -20 / -20	N / N / N / N
N557.2	Multifamily Residence – 2nd Floor (1)	67	48 / 49 / 49 / 49	47	1 / 2 / 2 / 2	-19 / -18 / -18 / -18	N / N / N / N
N558.1	Multifamily Residence – 1st Floor (0)	67	69 / 70 / 70 / 70	67	2 / 3 / 3 / 3	2 / 3 / 3 / 3	I / I / I / I
N558.2	Multifamily Residence – 2nd Floor (1)	67	70 / 70 / 70 / 70	68	2 / 2 / 2 / 2	3 / 3 / 3 / 3	I / I / I / I
N559.1	Multifamily Residence – 1st Floor (0)	67	66 / 67 / 67 / 67	65	1 / 2 / 2 / 2	-1 / 0 / 0 / 0	N / I / I / I
N559.2	Multifamily Residence – 2nd Floor (1)	67	69 / 69 / 69 / 69	67	2 / 2 / 2 / 2	2 / 2 / 2 / 2	I / I / I / I
N560	Residence (2)	67	58 / 58	55	3 / 3	-9 / -9	N / N
N561	Residence (3)	67	59 / 59	55	4 / 4	-8 / -8	N / N

Source: HNTB Corporation, August 2013

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Receptor Location (see Exhibit E-1)	Number of Residences, Schools, etc., Typical of this Receptor Site	Noise Abatement Criteria (NAC)	Sound Levels Leq (dBA)		Impact Evaluation		
			Future Noise Level[1]	Existing Noise Level	Difference in Future and Existing Noise Levels (Column D minus Column E)[1]	Difference in Future Noise Levels and NAC (Column D minus Column C)[1]	Impact or No Impact[2]
(A)	(B)	(C)	(D)	(E)	(F)	(G)	
N562	Residence (3)	67	59 / 59	55	4 / 4	-8 / -8	N / N
N563	Residence (3)	67	55 / 55	52	3 / 3	-12 / -12	N / N
N564	Residence (3)	67	54 / 54	51	3 / 3	-13 / -13	N / N
FS-19	Residence (1)	67	53 / 53	48	5 / 5	-14 / -14	N / N
FS-21	Field Site (0)	-	53 / 53	48	5 / 5	-	-
N565	Residence (1)	67	64 / 64	57	7 / 7	-3 / -3	N / N
N566	Residence (1)	67	61 / 61	55	6 / 6	-6 / -6	N / N
N567	Residence (1)	67	62 / 62	56	6 / 6	-5 / -5	N / N
N568	Residence (1)	67	64 / 64	58	6 / 6	-3 / -3	N / N
N569	Residence (1)	67	64 / 64	58	6 / 6	-3 / -3	N / N
N570	Residence (1)	67	63 / 63	57	6 / 6	-4 / -4	N / N
N571	Residence (1)	67	62 / 62	55	7 / 7	-5 / -5	N / N
N572	Residence (1)	67	61 / 61	55	6 / 6	-6 / -6	N / N
N573	Residence (1)	67	60 / 61	56	4 / 5	-7 / -6	N / N
N574	Residence (1)	67	61 / 62	57	4 / 5	-6 / -5	N / N
N575	Residence (1)	67	61 / 62	57	4 / 5	-6 / -5	N / N
N576	Residence (1)	67	64 / 64	60	4 / 4	-3 / -3	N / N
FS-20	Field Site (0)	-	64 / 64	59	5 / 5	-	-

Source: HNTB Corporation, August 2013

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2. *Wisconsin Department of Transportation's* Facilities Development Manual, *Chapter 23: "Noise"*

Receptor Location (see Exhibit E-1)	Number of Residences, Schools, etc., Typical of this Receptor Site	Noise Abatement Criteria (NAC)	Sound Levels Leq (dBA)		Impact Evaluation		
			Future Noise Level[1]	Existing Noise Level	Difference in Future and Existing Noise Levels (Column D minus Column E)[1]	Difference in Future Noise Levels and NAC (Column D minus Column C)[1]	Impact or No Impact[2]
(A)	(B)	(C)	(D)	(E)	(F)	(G)	
N577	Residence (1)	67	65 / 65	61	4 / 4	-2 / -2	N / N
N578	Residence (1)	67	63 / 63	58	5 / 5	-4 / -4	N / N
N579	Residence (1)	67	66 / 66	59	7 / 7	-1 / -1	I / I
N580	Residence (1)	67	68 / 68	61	7 / 7	1 / 1	I / I
N581	Residence (1)	67	68 / 68	61	7 / 7	1 / 1	I / I
N582	Residence (1)	67	70 / 70	63	7 / 7	3 / 3	I / I
N583	Residence (1)	67	71 / 71	66	5 / 5	4 / 4	I / I
N584	School (1)	67	54 / 54	51	3 / 3	-13 / -13	N / N
N585	School (1)	67	61 / 61	57	4 / 4	-6 / -6	N / N
N586	Residence (1)	67	57 / 57	52	5 / 5	-10 / -10	N / N
FS-23	Field Site (0)	-	62 / 62	58	4 / 4	-	-
N587	Residence (1)	67	65 / 65	60	5 / 5	-2 / -2	N / N
N588	Residence (1)	67	68 / 68	63	5 / 5	1 / 1	I / I
N589	Residence (1)	67	62 / 62	56	6 / 6	-5 / -5	N / N
N590	Residence (1)	67	63 / 63	59	4 / 4	-4 / -4	N / N
N591	Residence (1)	67	63 / 63	58	5 / 5	-4 / -4	N / N
N592	Residence (1)	67	66 / 66	62	4 / 4	-1 / -1	I / I
N593	Residence (1)	67	65 / 65	61	4 / 4	-2 / -2	N / N

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			Future Noise Level[1]	Existing Noise Level	Difference in Future and Existing Noise Levels (Column D minus Column E)[1]	Difference in Future Noise Levels and NAC (Column D minus Column C)[1]	Impact or No Impact[2]
(A)	(B)	(C)	(D)	(E)	(F)	(G)	
N594	Residence (1)	67	62 / 62	56	6 / 6	-5 / -5	N / N
N595	Residence (1)	67	55 / 55	51	4 / 4	-12 / -12	N / N
N596	Active Sports Area – Pool (1)	67	49 / 49	45	4 / 4	-18 / -18	N / N
N597	Day Care Center (1)	67	75 / 74	70	5 / 4	8 / 7	I / I
N598	Residence (1)	67	76 / 76	72	4 / 4	9 / 9	I / I
N599	Residence (1)	67	76 / 77	73	3 / 4	9 / 10	I / I
N600	Residence (1)	67	76 / 76	73	3 / 3	9 / 9	I / I
N601	Residence (1)	67	74 / 74	70	4 / 4	7 / 7	I / I
N602	Residence (1)	67	70 / 70	66	4 / 4	3 / 3	I / I
N603	Residence (1)	67	66 / 66	62	4 / 4	-1 / -1	I / I
N604	Residence (1)	67	60 / 61	56	4 / 5	-7 / -6	N / N
N605	Residence (1)	67	61 / 61	56	5 / 5	-6 / -6	N / N
N606	Residence (1)	67	59 / 59	55	4 / 4	-8 / -8	N / N
N607	Residence (1)	67	57 / 58	54	3 / 4	-10 / -9	N / N
N608	Residence (1)	67	58 / 59	56	2 / 3	-9 / -8	N / N
N609	Residence (2)	67	67 / 67	63	4 / 4	0 / 0	I / I
N610	Residence (1)	67	61 / 61	57	4 / 4	-6 / -6	N / N
N611	Residence (1)	67	62 / 62	59	3 / 3	-5 / -5	N / N

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			Future Noise Level[1]	Existing Noise Level	Difference in Future and Existing Noise Levels (Column D minus Column E)[1]	Difference in Future Noise Levels and NAC (Column D minus Column C)[1]	Impact or No Impact[2]
(A)	(B)	(C)	(D)	(E)	(F)	(G)	
N612.1	Multifamily Residence – 1st Floor (2)	67	56 / 55	51	5 / 4	-11 / -12	N / N
N612.2	Multifamily Residence – 2nd Floor (2)	67	60 / 60	55	5 / 5	-7 / -7	N / N
N612.3	Multifamily Residence – 3rd Floor (2)	67	63 / 63	59	4 / 4	-4 / -4	N / N
N613.1	Multifamily Residence – 1st Floor (1)	67	59 / 59	56	3 / 3	-8 / -8	N / N
N613.2	Multifamily Residence – 2nd Floor (1)	67	64 / 64	60	4 / 4	-3 / -3	N / N
N613.3	Multifamily Residence – 3rd Floor (1)	67	66 / 66	62	4 / 4	-1 / -1	I / I
N614.1	Multifamily Residence – 1st Floor (1)	67	59 / 59	55	4 / 4	-8 / -8	N / N
N614.2	Multifamily Residence – 2nd Floor (1)	67	65 / 65	61	4 / 4	-2 / -2	N / N
N615.1	Multifamily Residence – 1st Floor (1)	67	58 / 58	54	4 / 4	-9 / -9	N / N
N615.2	Multifamily Residence – 2nd Floor (1)	67	65 / 65	60	5 / 5	-2 / -2	N / N
N616.1	Multifamily Residence – 1st Floor (2)	67	69 / 69	65	4 / 4	2 / 2	I / I
N616.2	Multifamily Residence – 2nd Floor (2)	67	72 / 72	68	4 / 4	5 / 5	I / I
N616.3	Multifamily Residence – 3rd Floor (2)	67	72 / 73	69	3 / 4	5 / 6	I / I
N617.1	Multifamily Residence – 1st Floor (1)	67	74 / 74	71	3 / 3	7 / 7	I / I
N617.2	Multifamily Residence – 2nd Floor (1)	67	75 / 75	72	3 / 3	8 / 8	I / I
N617.3	Multifamily Residence – 3rd Floor (1)	67	75 / 76	72	3 / 4	8 / 9	I / I
N618.1	Multifamily Residence – 1st Floor (1)	67	74 / 75	71	3 / 4	7 / 8	I / I
N618.2	Multifamily Residence – 2nd Floor (1)	67	75 / 76	72	3 / 4	8 / 9	I / I

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Receptor Location (see Exhibit E-1)	Number of Residences, Schools, etc., Typical of this Receptor Site	Noise Abatement Criteria (NAC)	Sound Levels Leq (dBA)		Impact Evaluation		
			Future Noise Level[1]	Existing Noise Level	Difference in Future and Existing Noise Levels (Column D minus Column E)[1]	Difference in Future Noise Levels and NAC (Column D minus Column C)[1]	Impact or No Impact[2]
(A)	(B)	(C)	(D)	(E)	(F)	(G)	
N618.3	Multifamily Residence – 3rd Floor (1)	67	76 / 76	73	3 / 3	9 / 9	I / I
N619.1	Multifamily Residence – 1st Floor (1)	67	67 / 67	64	3 / 3	0 / 0	I / I
N619.2	Multifamily Residence – 2nd Floor (1)	67	70 / 70	67	3 / 3	3 / 3	I / I
N619.3	Multifamily Residence – 3rd Floor (1)	67	70 / 71	67	3 / 4	3 / 4	I / I
N620.1	Multifamily Residence – 1st Floor (2)	67	65 / 65	62	3 / 3	-2 / -2	N / N
N620.2	Multifamily Residence – 2nd Floor (2)	67	68 / 69	65	3 / 4	1 / 2	I / I
N620.3	Multifamily Residence – 3rd Floor (2)	67	68 / 69	65	3 / 4	1 / 2	I / I
N621.1	Multifamily Residence – 1st Floor (3)	67	64 / 63	60	4 / 3	-3 / -4	N / N
N621.2	Multifamily Residence – 2nd Floor (3)	67	67 / 68	65	2 / 3	0 / 1	I / I
N622.1	Multifamily Residence – 1st Floor (1)	67	62 / 61	57	5 / 4	-5 / -6	N / N
N622.2	Multifamily Residence – 2nd Floor (1)	67	65 / 66	63	2 / 3	-2 / -1	N / I
N622.3	Multifamily Residence – 3rd Floor (1)	67	66 / 67	63	3 / 4	-1 / 0	I / I
N623.1	Multifamily Residence – 1st Floor (2)	67	61 / 61	57	4 / 4	-6 / -6	N / N
N623.2	Multifamily Residence – 2nd Floor (2)	67	65 / 65	62	3 / 3	-2 / -2	N / N
N623.3	Multifamily Residence – 3rd Floor (2)	67	66 / 67	63	3 / 4	-1 / 0	I / I
N624.1	Multifamily Residence – 1st Floor (1)	67	52 / 52	48	4 / 4	-15 / -15	N / N
N624.2	Multifamily Residence – 2nd Floor (1)	67	56 / 57	54	2 / 3	-11 / -10	N / N
N624.3	Multifamily Residence – 3rd Floor (1)	67	58 / 59	56	2 / 3	-9 / -8	N / N

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Receptor Location (see Exhibit E-1)	Number of Residences, Schools, etc., Typical of this Receptor Site	Noise Abatement Criteria (NAC)	Sound Levels Leq (dBA)		Impact Evaluation		
			Future Noise Level[1]	Existing Noise Level	Difference in Future and Existing Noise Levels (Column D minus Column E)[1]	Difference in Future Noise Levels and NAC (Column D minus Column C)[1]	Impact or No Impact[2]
(A)	(B)	(C)	(D)	(E)	(F)	(G)	
N625.1	Multifamily Residence – 1st Floor (2)	67	37 / 37	35	2 / 2	-30 / -30	N / N
N625.2	Multifamily Residence – 2nd Floor (2)	67	39 / 39	36	3 / 3	-28 / -28	N / N
N625.3	Multifamily Residence – 3rd Floor (2)	67	39 / 39	37	2 / 2	-28 / -28	N / N
N626.1	Multifamily Residence – 1st Floor (2)	67	59 / 58	53	6 / 5	-8 / -9	N / N
N626.2	Multifamily Residence – 2nd Floor (2)	67	61 / 62	58	3 / 4	-6 / -5	N / N
N626.3	Multifamily Residence – 3rd Floor (2)	67	63 / 64	60	3 / 4	-4 / -3	N / N
N627.1	Multifamily Residence – 1st Floor (2)	67	61 / 61	56	5 / 5	-6 / -6	N / N
N627.2	Multifamily Residence – 2nd Floor (2)	67	65 / 65	62	3 / 3	-2 / -2	N / N
N627.3	Multifamily Residence – 3rd Floor (2)	67	66 / 66	63	3 / 3	-1 / -1	I / I
N628.1	Multifamily Residence – 1st Floor (1)	67	59 / 58	54	5 / 4	-8 / -9	N / N
N628.2	Multifamily Residence – 2nd Floor (1)	67	63 / 63	60	3 / 3	-4 / -4	N / N
N628.3	Multifamily Residence – 3rd Floor (1)	67	64 / 64	61	3 / 3	-3 / -3	N / N
N629.1	Multifamily Residence – 1st Floor (5)	67	38 / 38	36	2 / 2	-29 / -29	N / N
N629.2	Multifamily Residence – 2nd Floor (5)	67	40 / 40	38	2 / 2	-27 / -27	N / N
N629.3	Multifamily Residence – 3rd Floor (5)	67	42 / 42	40	2 / 2	-25 / -25	N / N
N630.1	Multifamily Residence – 1st Floor (2)	67	66 / 66	63	3 / 3	-1 / -1	I / I
N630.2	Multifamily Residence – 2nd Floor (2)	67	69 / 70	66	3 / 4	2 / 3	I / I
N630.3	Multifamily Residence – 3rd Floor (2)	67	69 / 70	66	3 / 4	2 / 3	I / I

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			Future Noise Level[1]	Existing Noise Level	Difference in Future and Existing Noise Levels (Column D minus Column E)[1]	Difference in Future Noise Levels and NAC (Column D minus Column C)[1]	Impact or No Impact[2]
(A)	(B)	(C)	(D)	(E)	(F)	(G)	
N631.1	Multifamily Residence – 1st Floor (3)	67	70 / 70	67	3 / 3	3 / 3	I / I
N631.2	Multifamily Residence – 2nd Floor (3)	67	72 / 73	70	2 / 3	5 / 6	I / I
N631.3	Multifamily Residence – 3rd Floor (3)	67	72 / 73	70	2 / 3	5 / 6	I / I
FS-22	Field Site (0)	-	70 / 70	67	3 / 3	-	--
N632.1	Multifamily Residence – 1st Floor (1)	67	68 / 68	65	3 / 3	1 / 1	I / I
N632.2	Multifamily Residence – 2nd Floor (1)	67	70 / 72	68	2 / 4	3 / 5	I / I
N632.3	Multifamily Residence – 3rd Floor (1)	67	71 / 72	68	3 / 4	4 / 5	I / I
N633.1	Multifamily Residence – 1st Floor (2)	67	66 / 67	64	2 / 3	-1 / 0	I / I
N633.2	Multifamily Residence – 2nd Floor (2)	67	70 / 71	68	2 / 3	3 / 4	I / I
N633.3	Multifamily Residence – 3rd Floor (2)	67	70 / 71	68	2 / 3	3 / 4	I / I
N634	Multifamily Residence Common Area (1)	67	56 / 55	51	5 / 4	-11 / -12	N / N
N635	Multifamily Residence Common Area (1)	67	49 / 50	47	2 / 3	-18 / -17	N / N
N636	Multifamily Residence Common Area (1)	67	65 / 66	63	2 / 3	-2 / -1	N / I
N637	Multifamily Residence Common Area (1)	67	39 / 39	36	3 / 3	-28 / -28	N / N

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			Future Noise Level[1]	Existing Noise Level	Difference in Future and Existing Noise Levels (Column D minus Column E)[1]	Difference in Future Noise Levels and NAC (Column D minus Column C)[1]	Impact or No Impact[2]
(A)	(B)	(C)	(D)	(E)	(F)	(G)	
N638	Multifamily Residence Common Area (1)	67	51 / 50	47	4 / 3	-16 / -17	N / N
N639	Multifamily Residence Common Area (1)	67	60 / 65	61	-1 / 4	-7 / -2	N / N
N640	Multifamily Residence (2)	67	60 / 66	63	-3 / 3	-7 / -1	N / I
N641	Place of Worship (1)	67	61	56	5	-6	N
N642	Place of Worship (1)	67	62	56	6	-5	N
N643	Residence (1)	67	57	58	-1	-10	N
FS-24	Field Site (0)	-	59	55	4	-	-
N644	Residence (1)	67	57	53	4	-10	N
N645	Residence (1)	67	57	53	4	-10	N
N646	Residence (1)	67	55	51	4	-12	N
N647	Residence (1)	67	55	51	4	-12	N
N648	Residence (1)	67	56	50	6	-11	N
N649	Residence (1)	67	54	49	5	-13	N
N650	Residence (1)	67	55	50	5	-12	N
N651	Residence (1)	67	63	59	4	-4	N
N652	Residence (1)	67	59	56	3	-8	N

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			Future Noise Level[1]	Existing Noise Level	Difference in Future and Existing Noise Levels (Column D minus Column E)[1]	Difference in Future Noise Levels and NAC (Column D minus Column C)[1]	Impact or No Impact[2]
(A)	(B)	(C)	(D)	(E)	(F)	(G)	
N653	Residence (1)	67	58	54	4	-9	N
N654	Residence (1)	67	58	54	4	-9	N
N655	Residence (1)	67	58	53	5	-9	N
N656	Residence (1)	67	59	52	7	-8	N
N657	Residence (1)	67	59	51	8	-8	N
N658	Residence (1)	67	59	52	7	-8	N
N659	Residence (1)	67	54	49	5	-13	N
N660	Residence (1)	67	54	50	4	-13	N
N661	Residence (1)	67	57	51	6	-10	N
N662	Residence (1)	67	66	66	0	-1	I
N664	Residence (1)	67	62	58	4	-5	N
N665	Residence (1)	67	62	57	5	-5	N
N666	Place of Worship (1)	67	62	57	5	-5	N
N667	Residence (1)	67	69	66	3	2	I
FS-25	Field Site (0)	-	70	67	3	-	-
N668	Residence (1)	67	70	67	3	3	I
N669	Place of Worship (1)	67	66	63	3	-1	I
N670	Residence (1)	67	63	59	4	-4	N

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			Future Noise Level[1]	Existing Noise Level	Difference in Future and Existing Noise Levels (Column D minus Column E)[1]	Difference in Future Noise Levels and NAC (Column D minus Column C)[1]	Impact or No Impact[2]
(A)	(B)	(C)	(D)	(E)	(F)	(G)	
N671	Residence (1)	67	64	61	3	-3	N
N672	Residence (1)	67	67	62	5	0	I
N673	Residence (1)	67	60	55	5	-7	N
N674	Place of Worship (1)	67	60	55	5	-7	N

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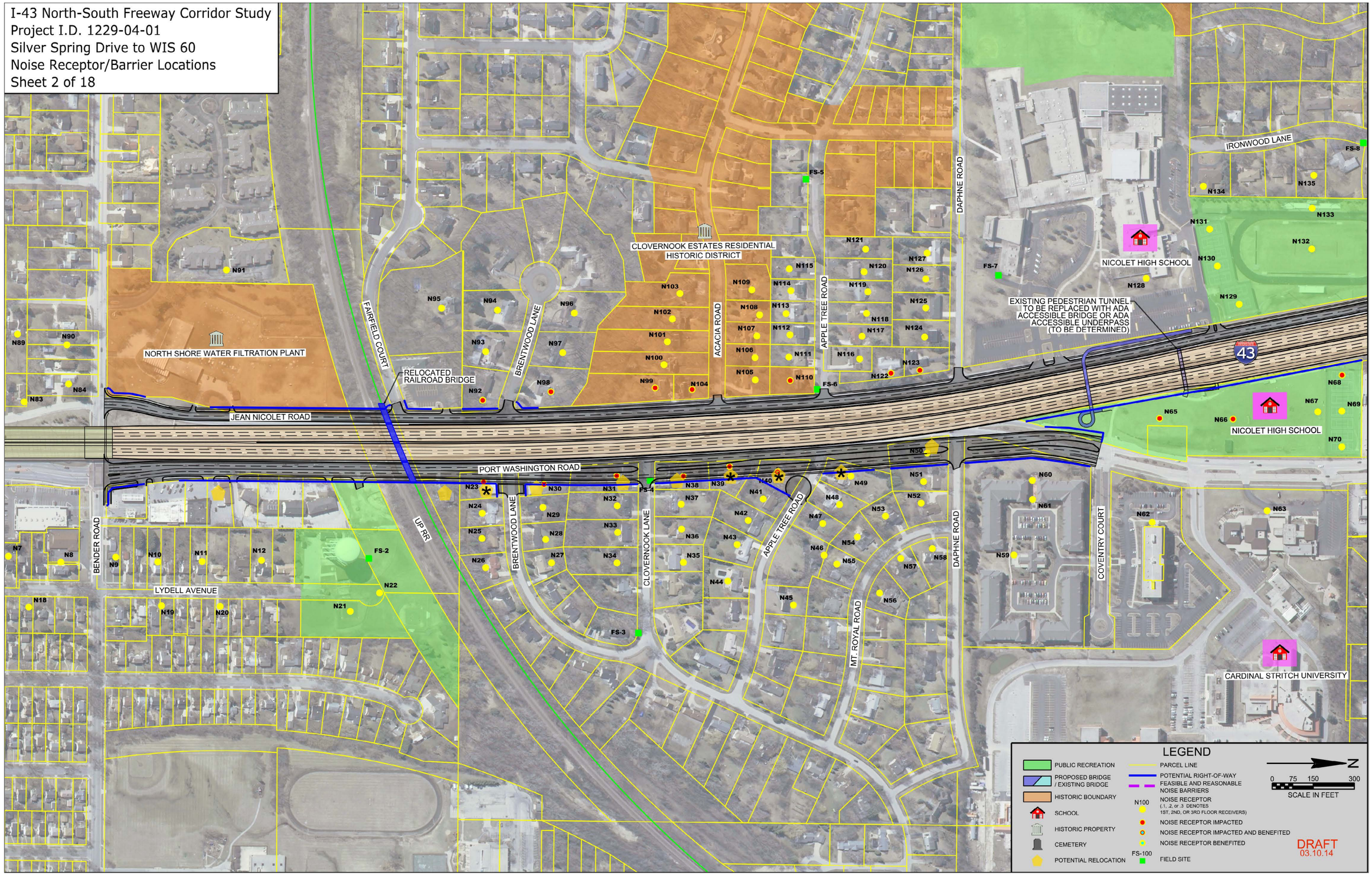
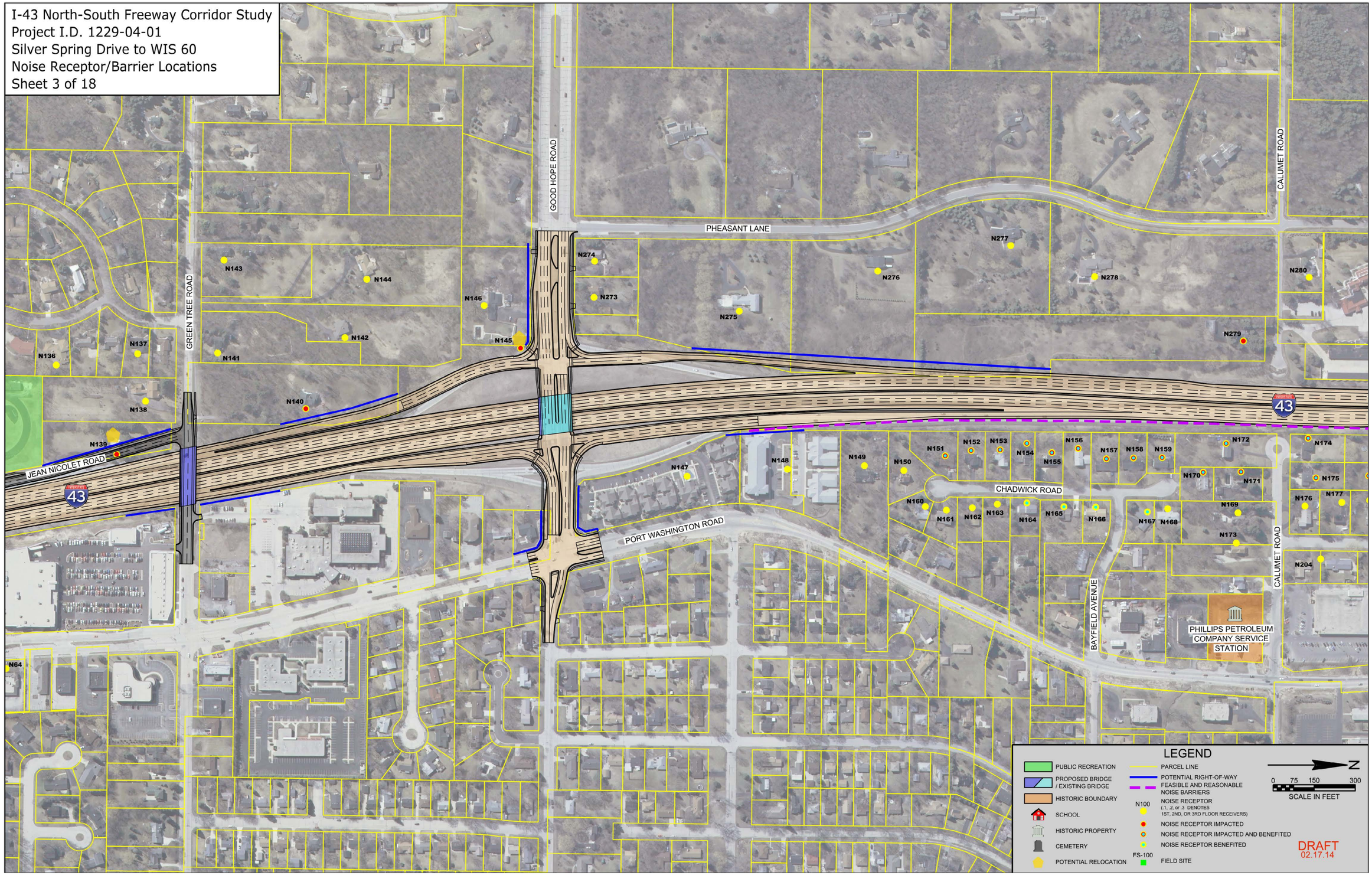
E-2 EXHIBIT E-1: NOISE RECEPTOR/ BARRIER LOCATIONS

Exhibit E-1: Noise Receptor/Barrier Locations

I-43 North-South Freeway Corridor Study
Project I.D. 1229-04-01
Silver Spring Drive to WIS 60
Noise Receptor/Barrier Locations
Sheet 2 of 18



I-43 North-South Freeway Corridor Study
Project I.D. 1229-04-01
Silver Spring Drive to WIS 60
Noise Receptor/Barrier Locations
Sheet 3 of 18



I-43 North-South Freeway Corridor Study
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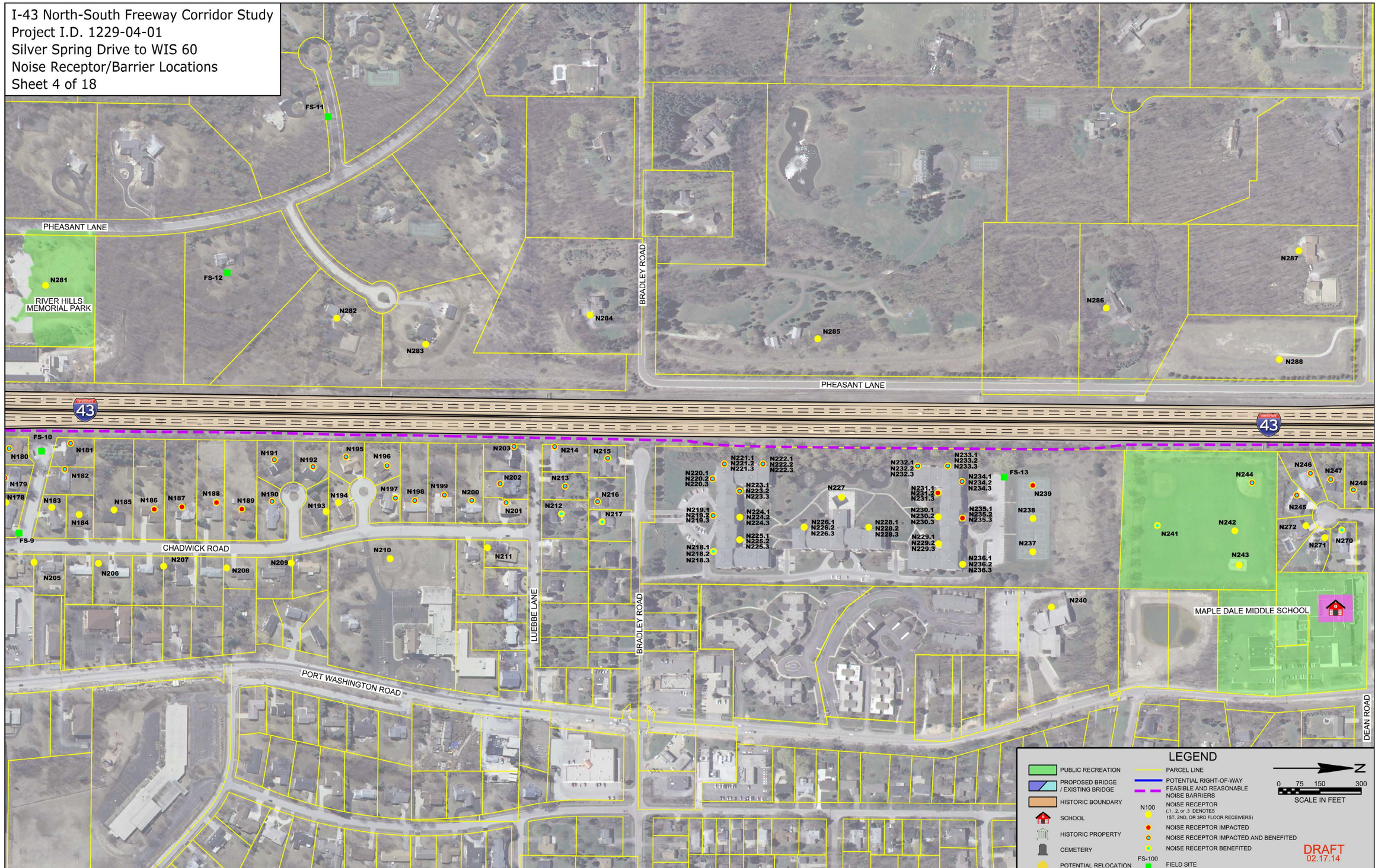

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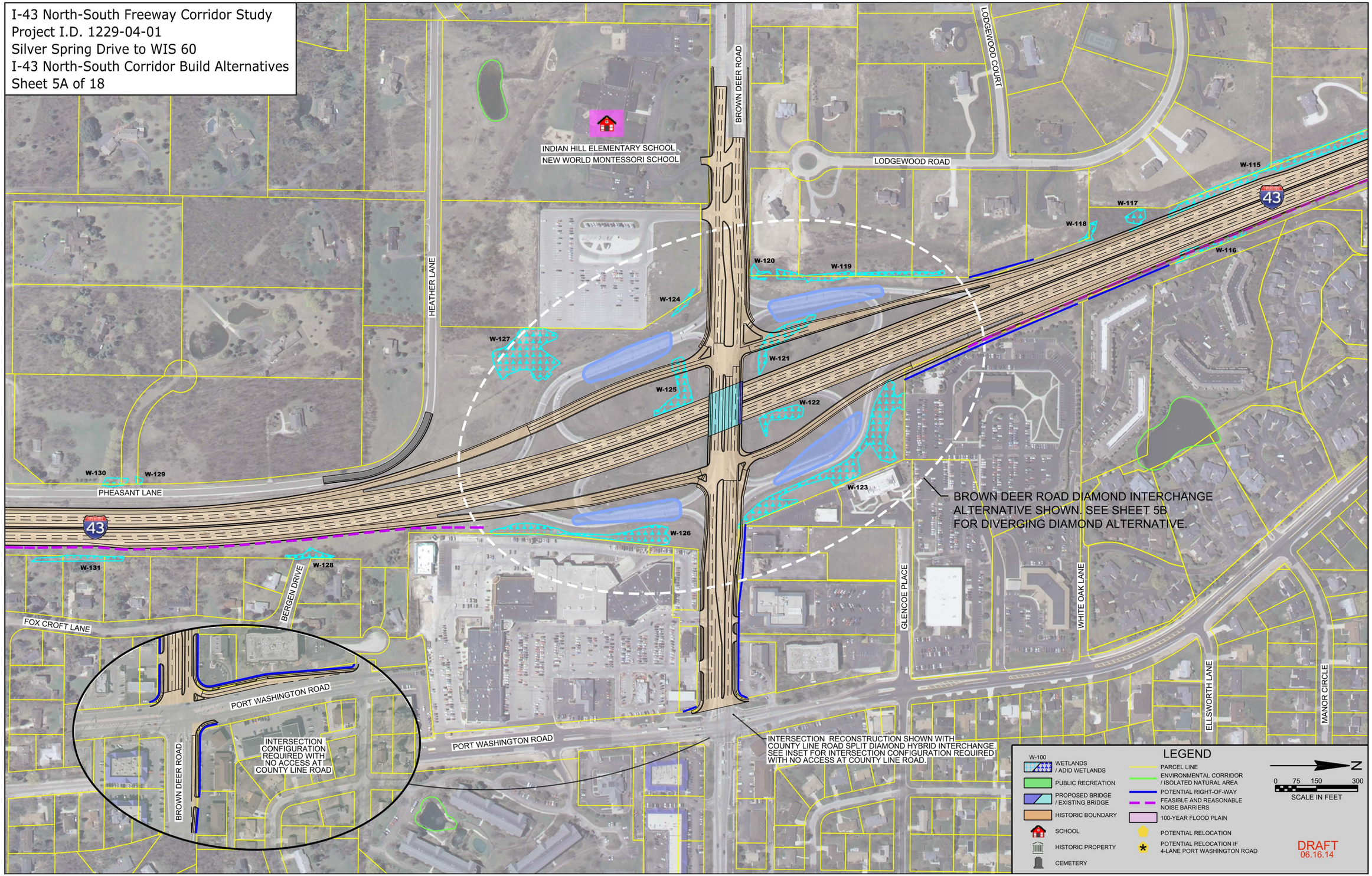

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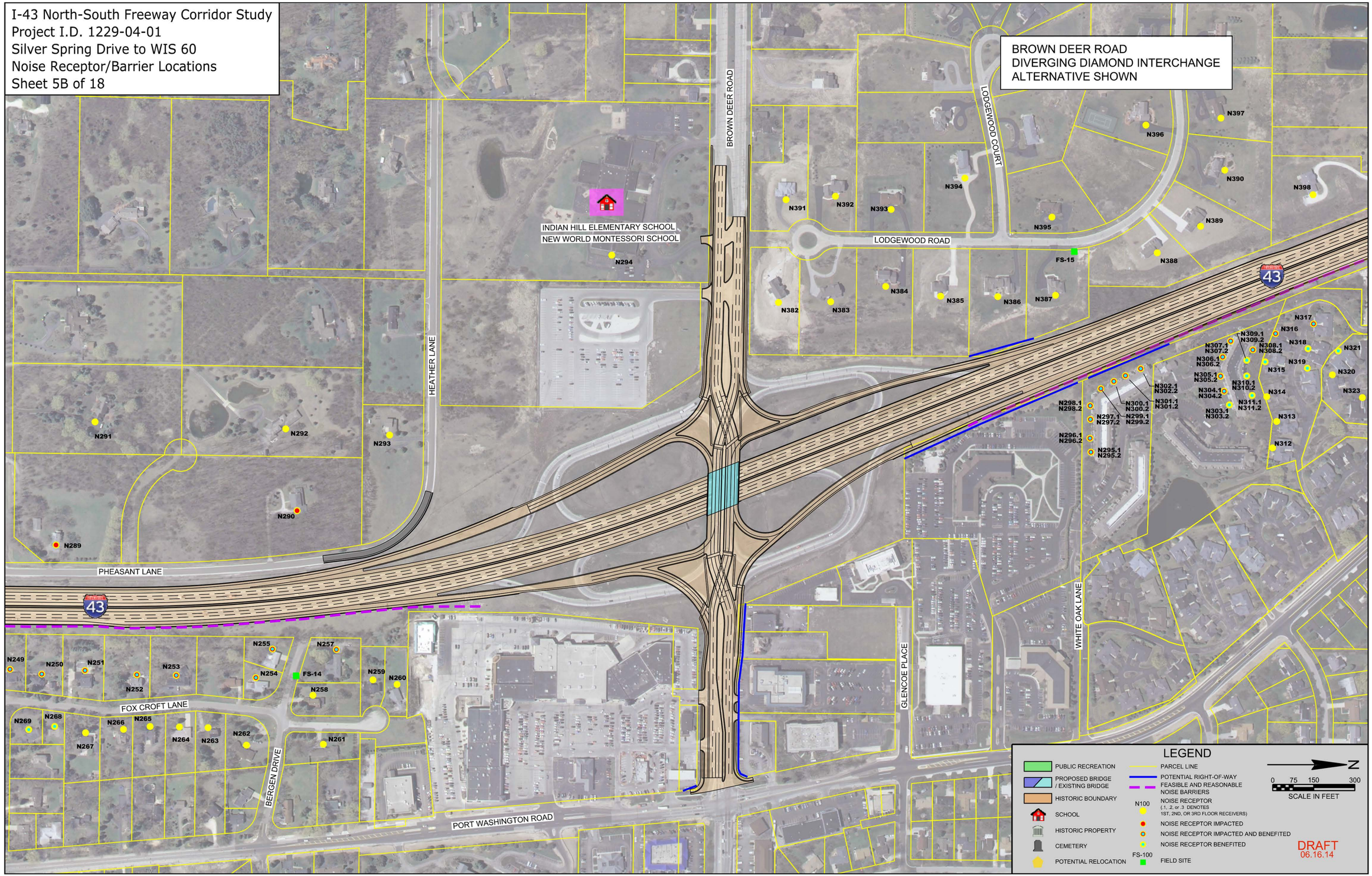

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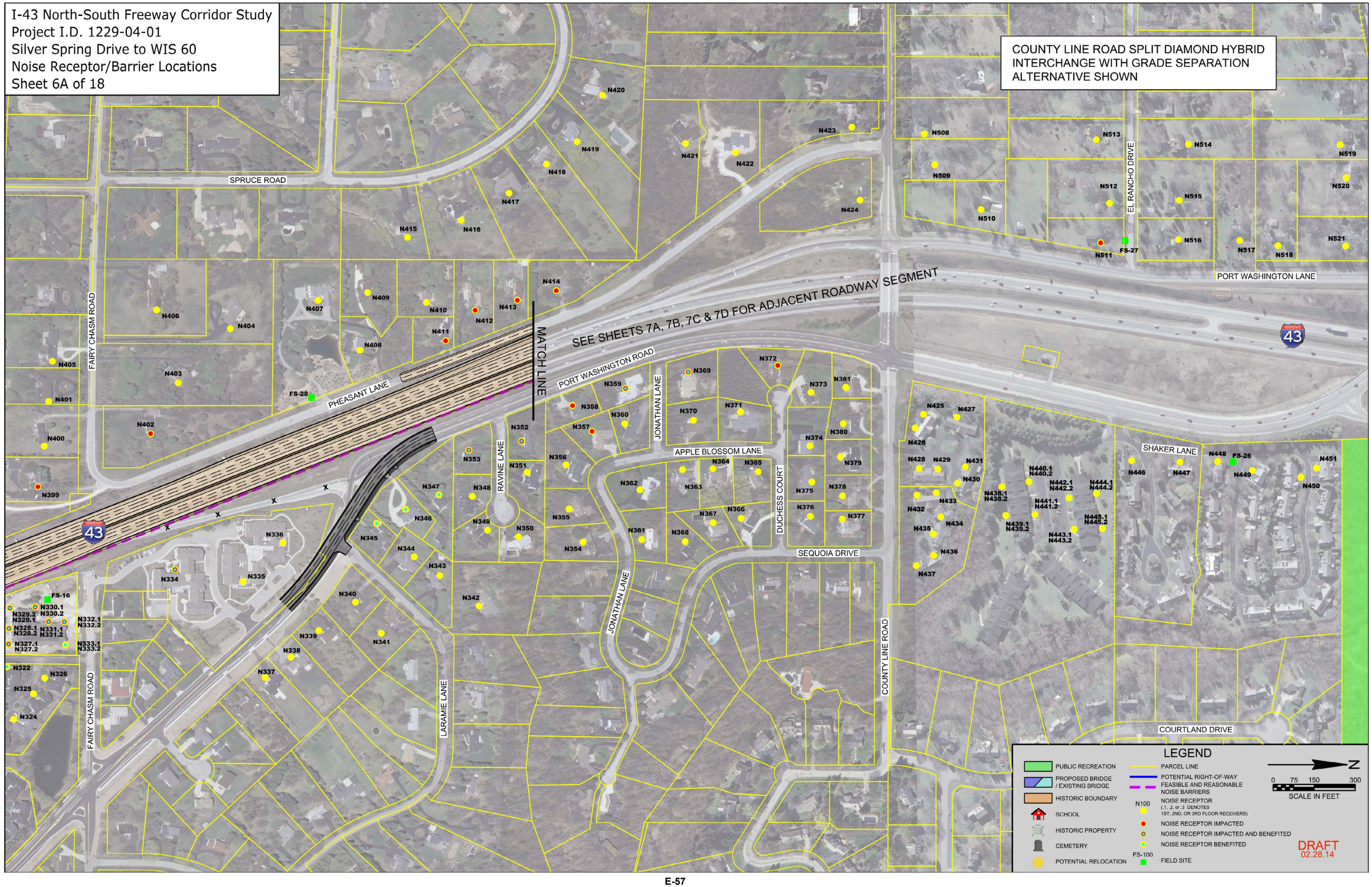
COUNTY LINE ROAD SPLIT DIAMOND HYBRID INTERCHANGE WITH GRADE SEPARATION ALTERNATIVE SHOWN



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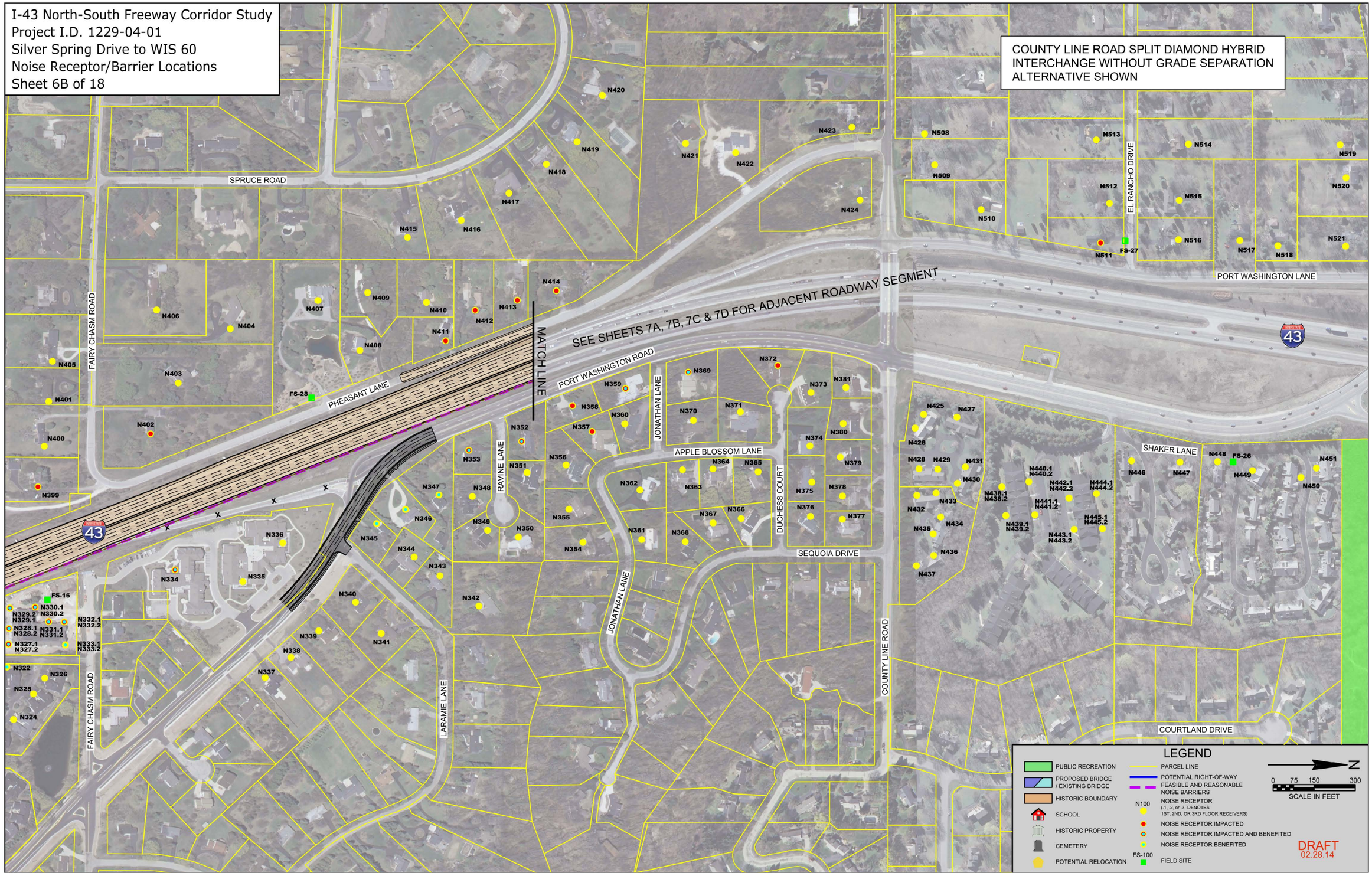
COUNTY LINE ROAD SPLIT DIAMOND HYBRID INTERCHANGE WITHOUT GRADE SEPARATION ALTERNATIVE SHOWN



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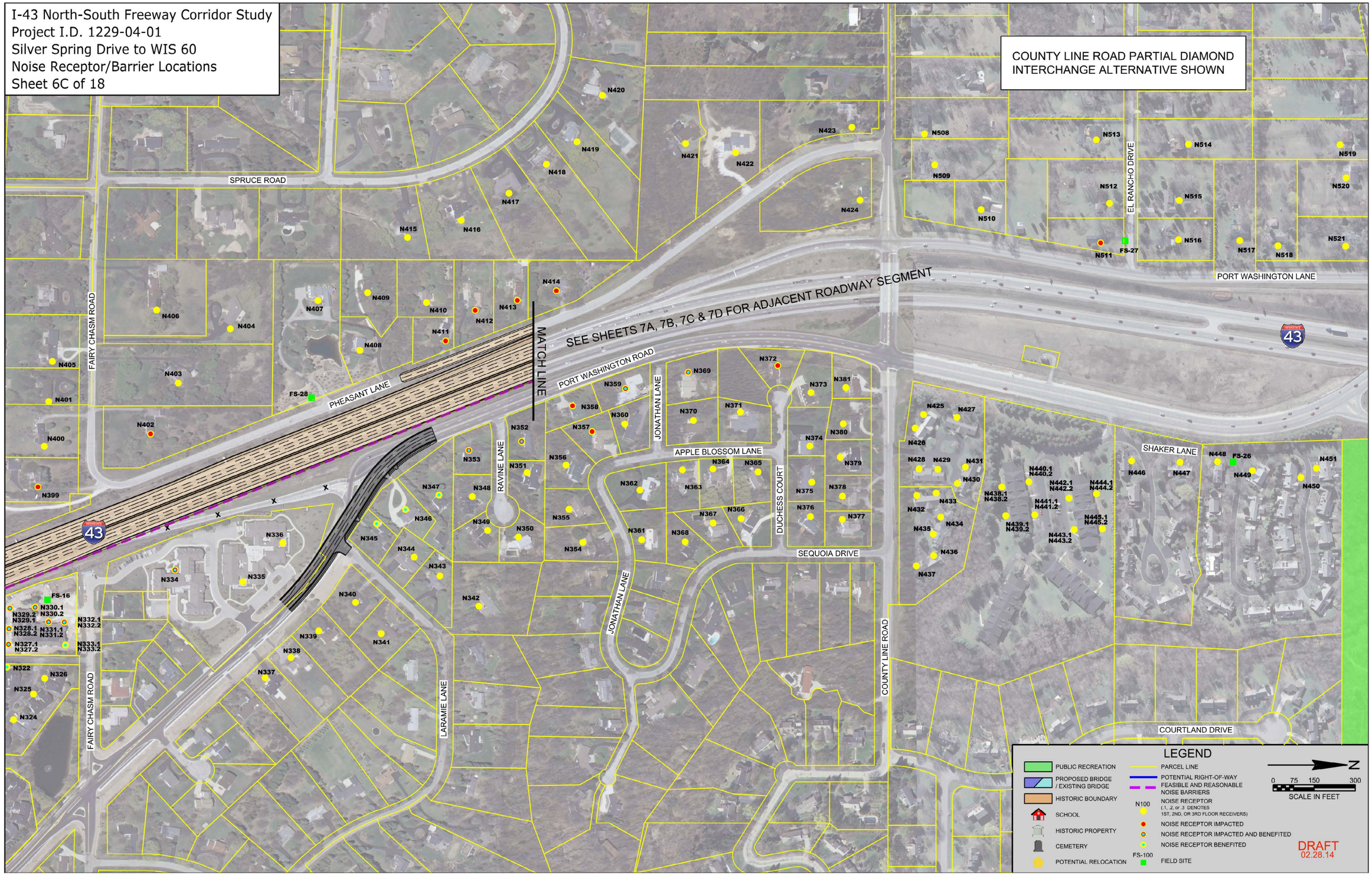

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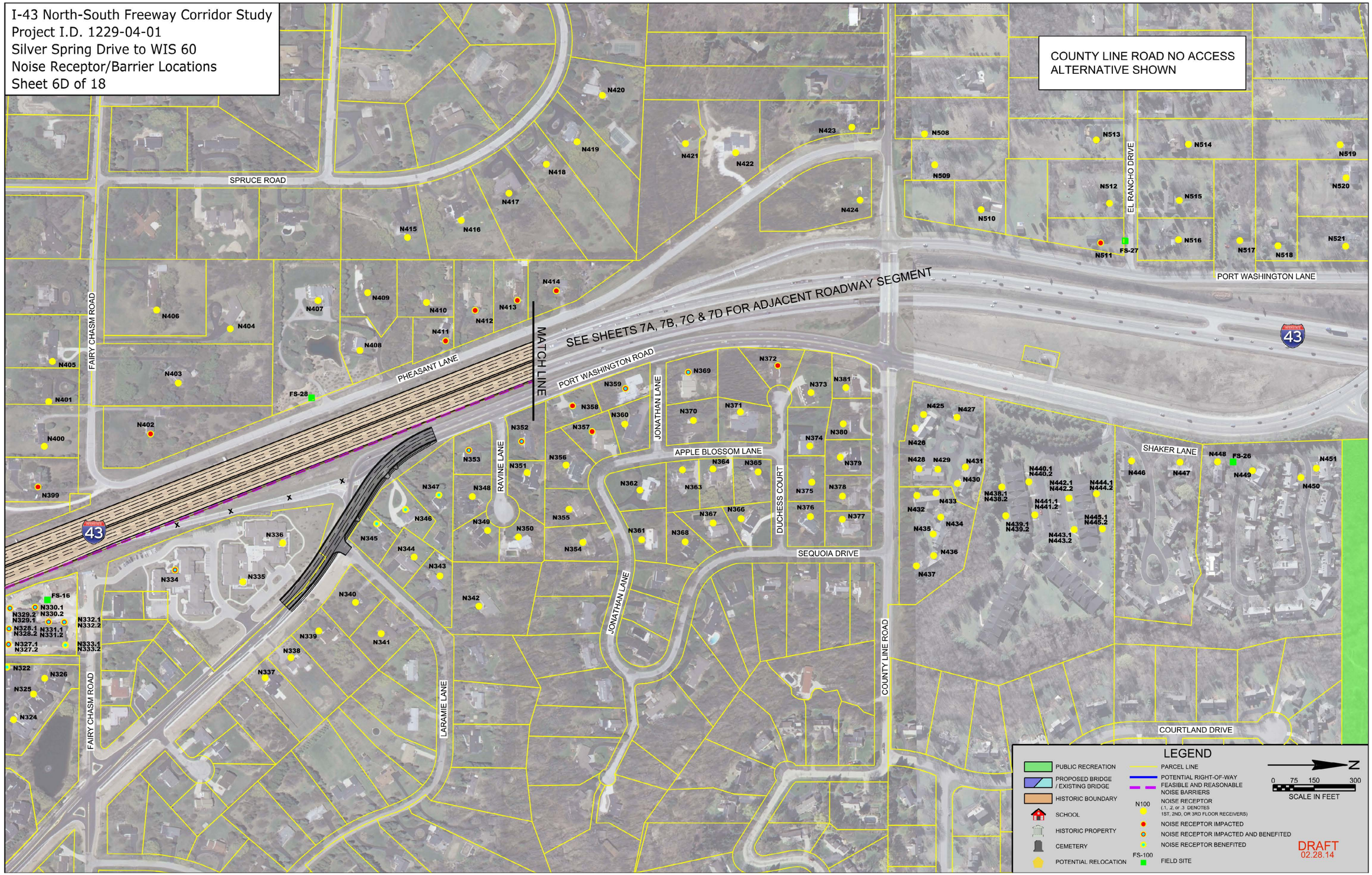

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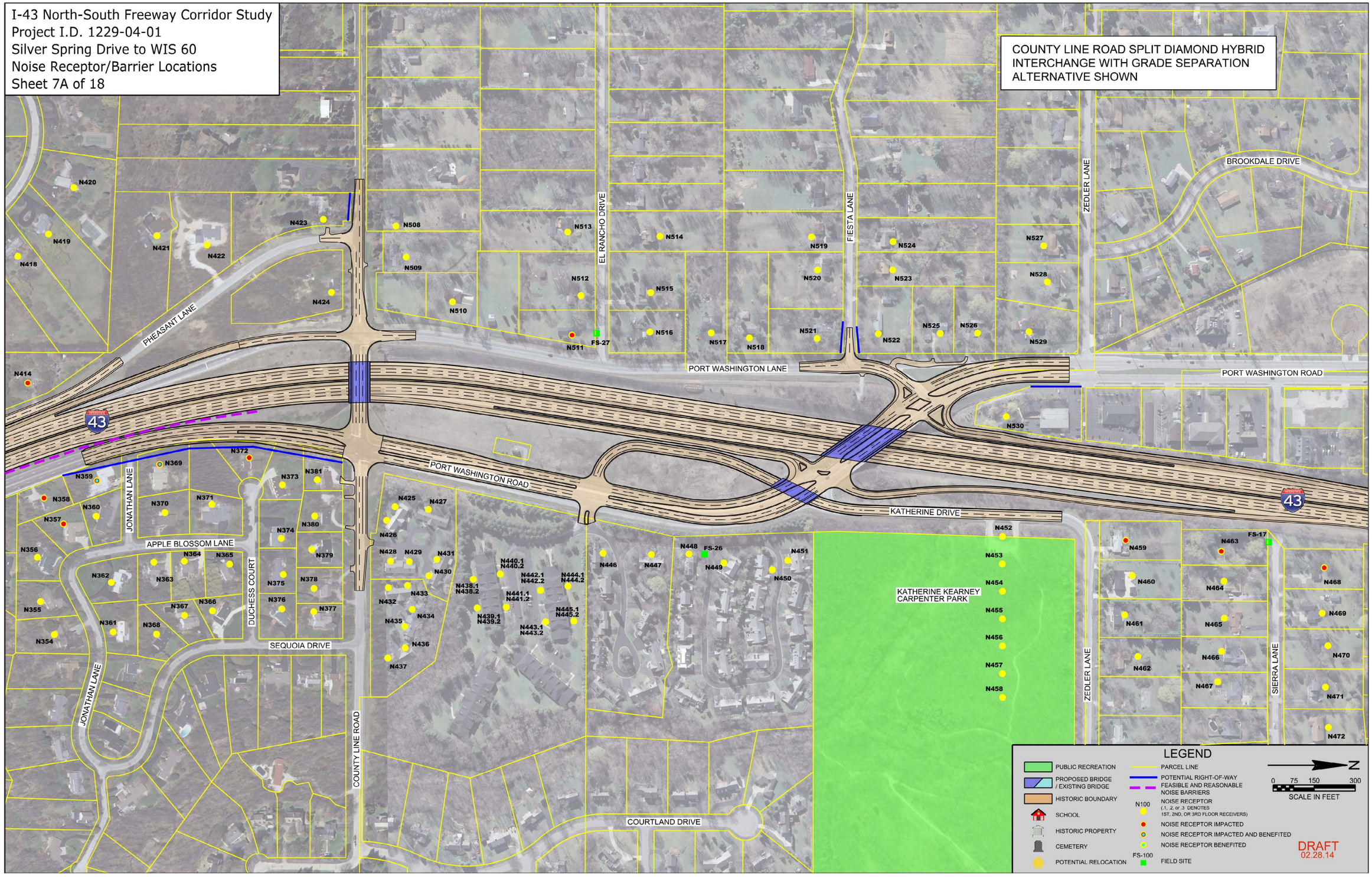
COUNTY LINE ROAD SPLIT DIAMOND HYBRID INTERCHANGE WITH GRADE SEPARATION ALTERNATIVE SHOWN



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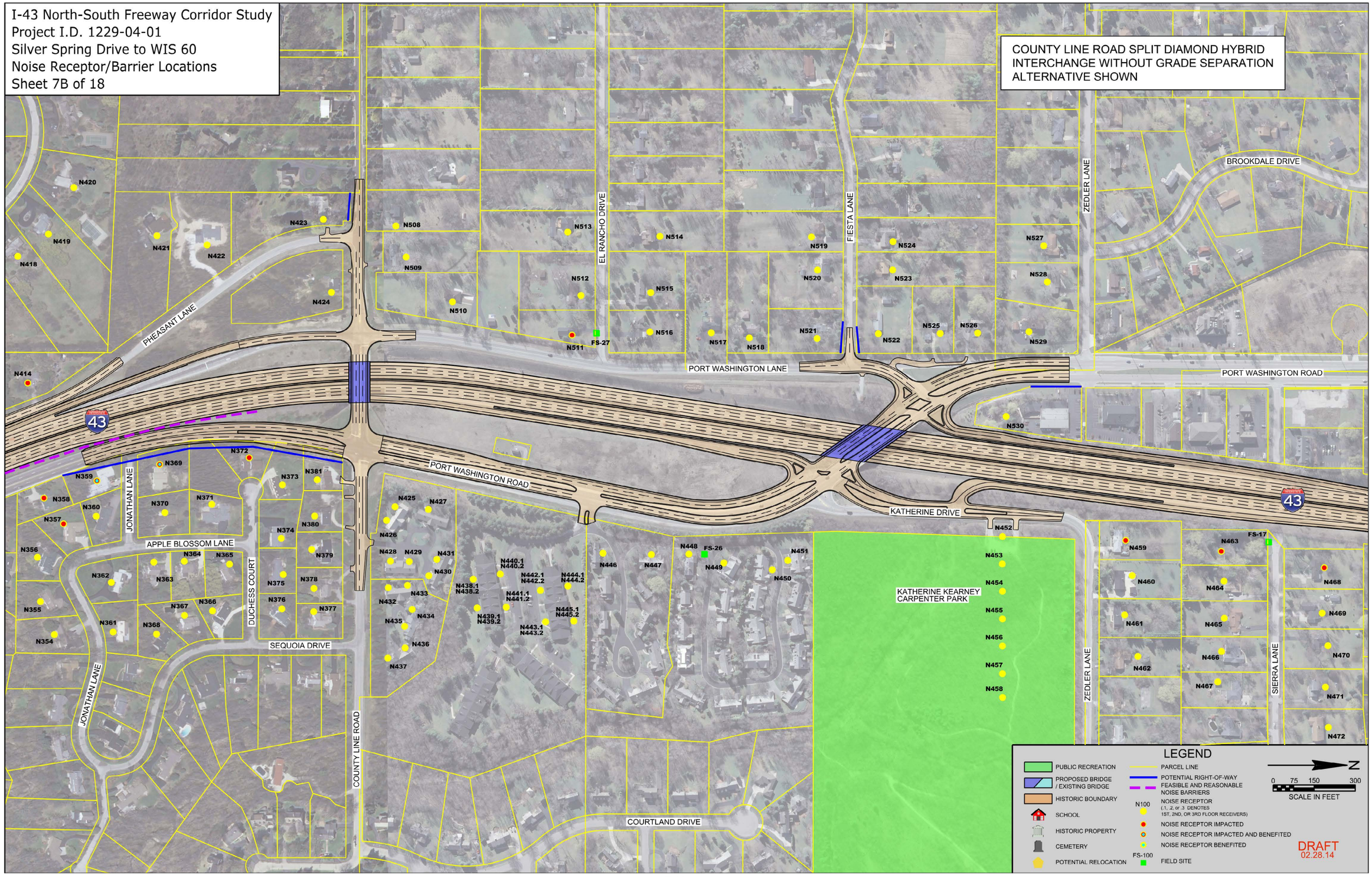
COUNTY LINE ROAD SPLIT DIAMOND HYBRID INTERCHANGE WITHOUT GRADE SEPARATION ALTERNATIVE SHOWN



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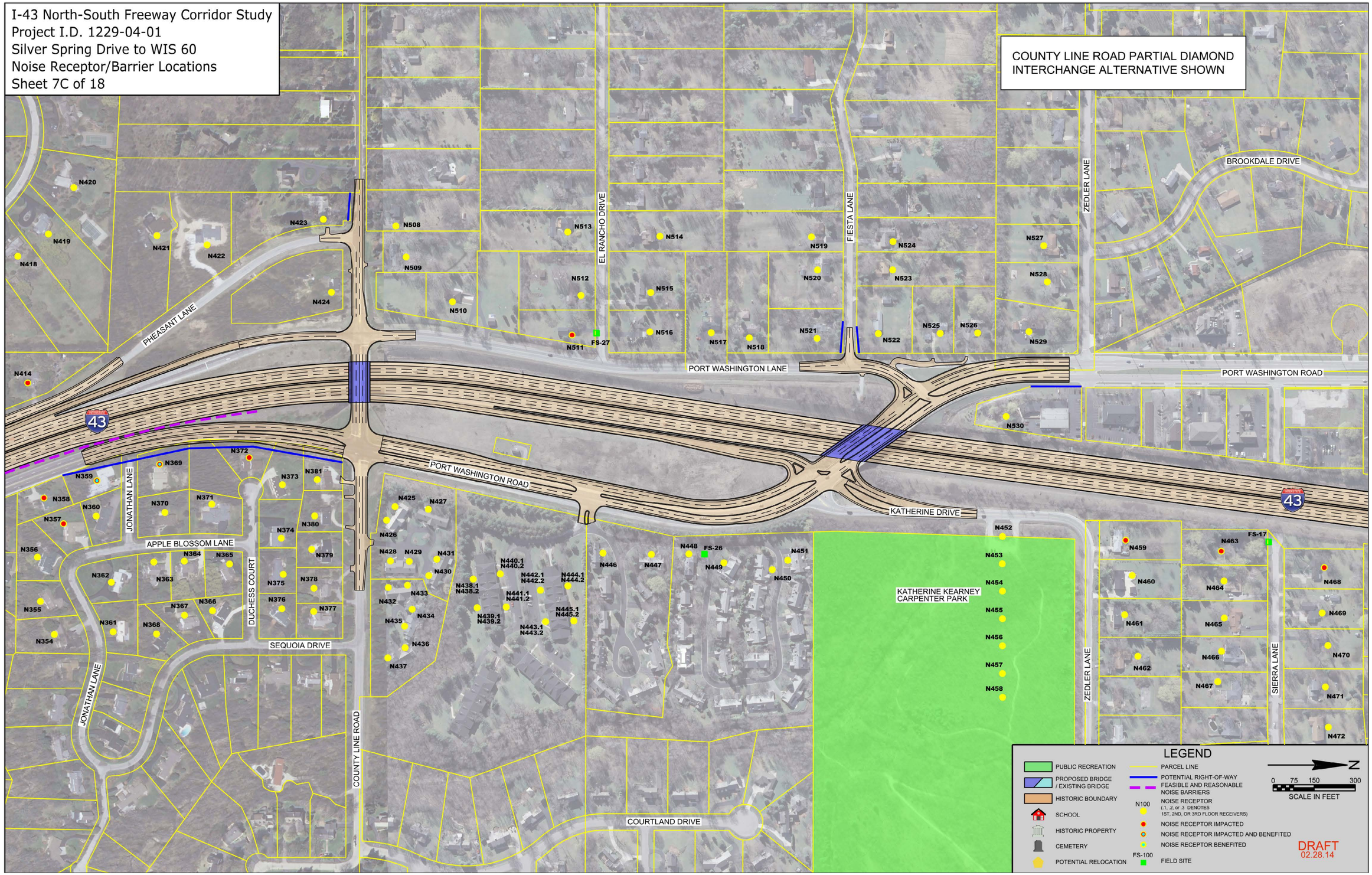
COUNTY LINE ROAD PARTIAL DIAMOND INTERCHANGE ALTERNATIVE SHOWN



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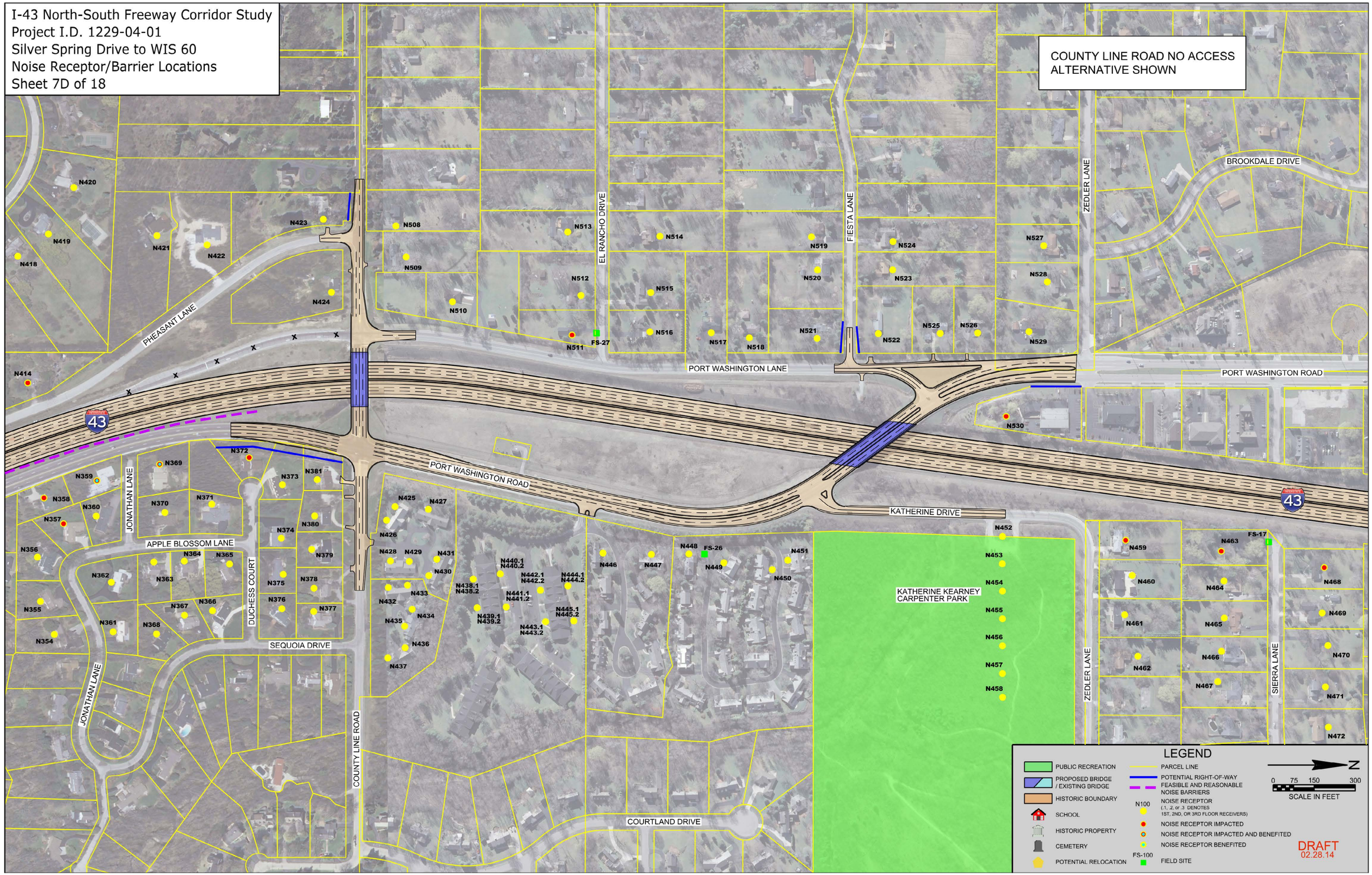

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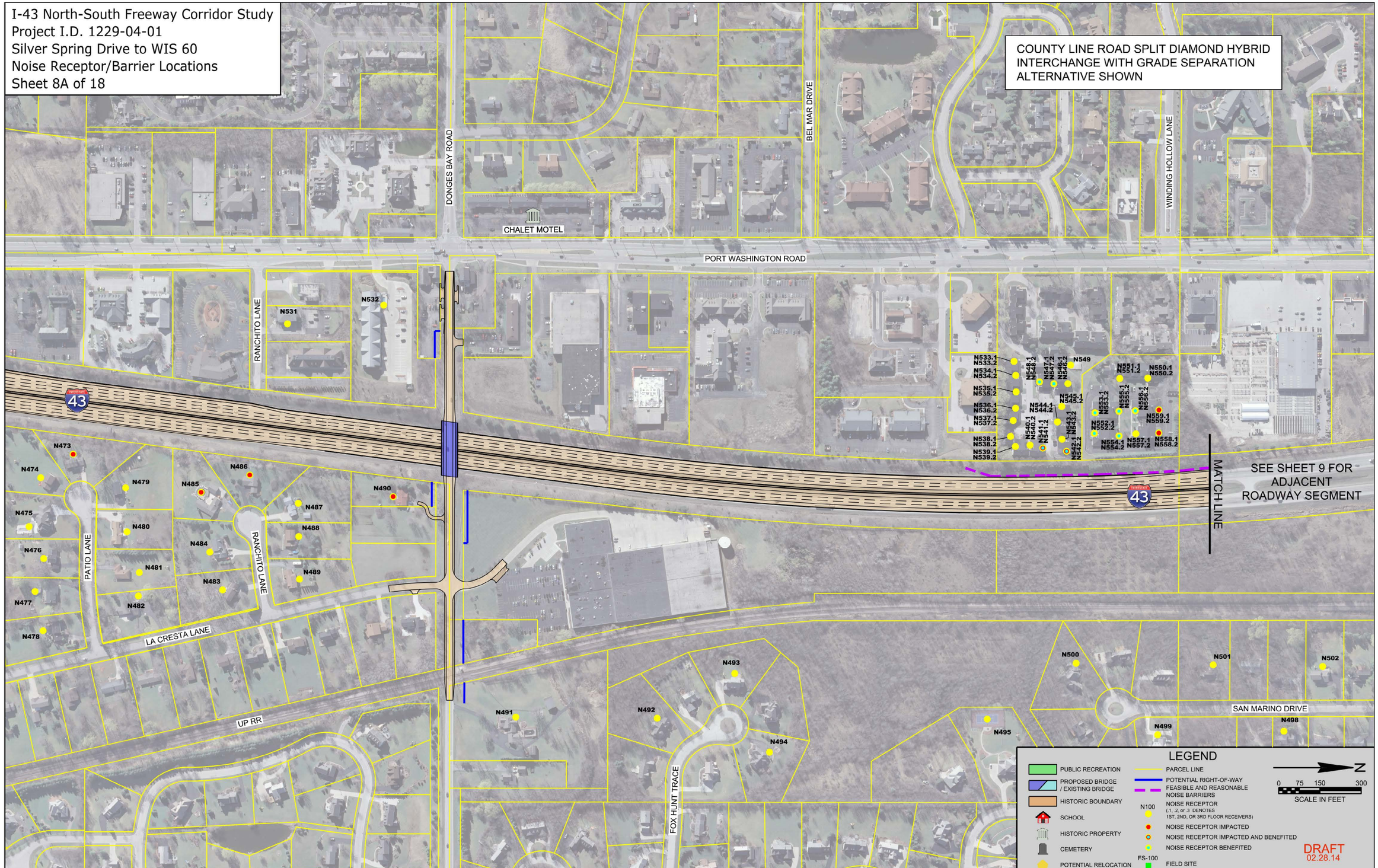

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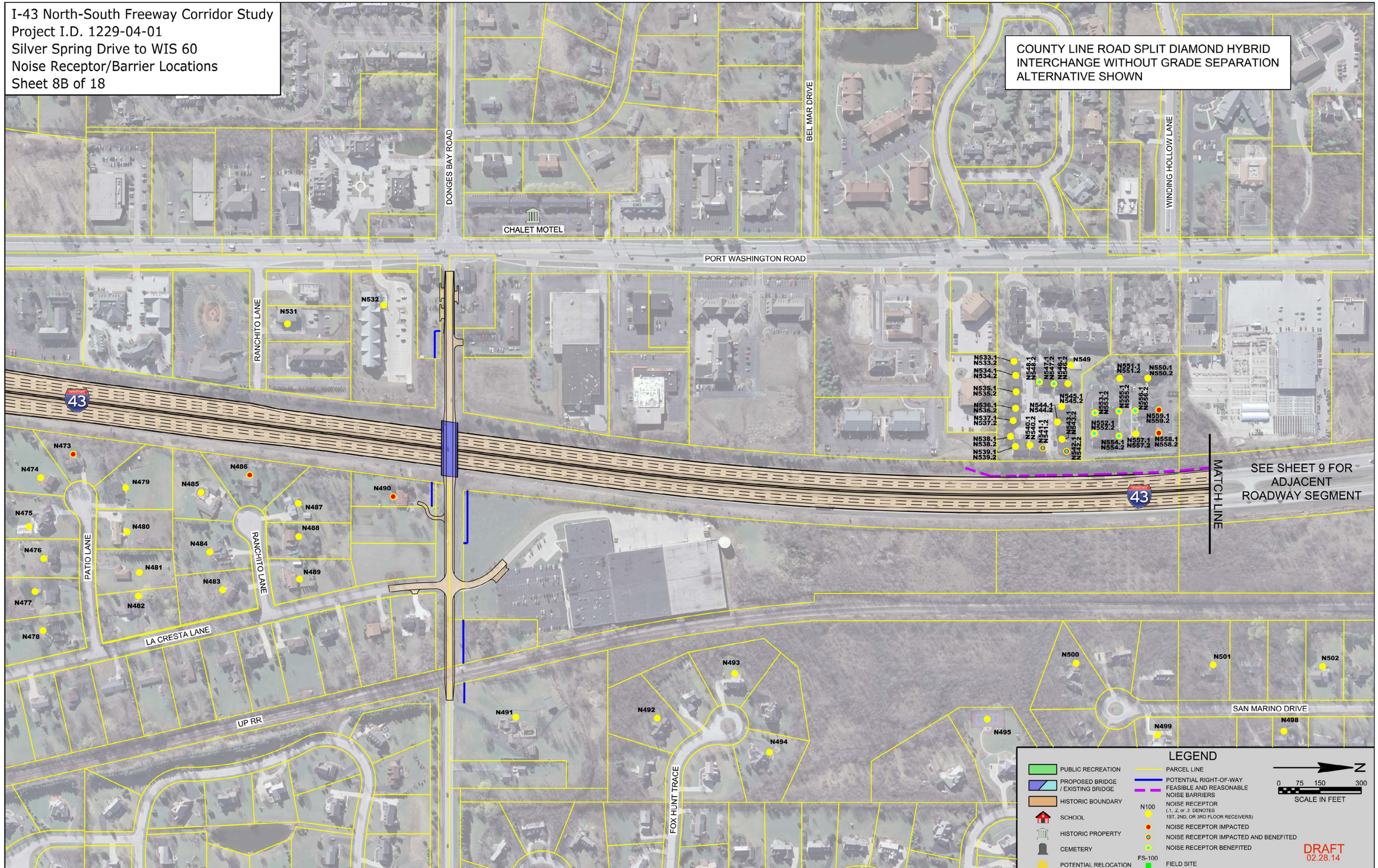

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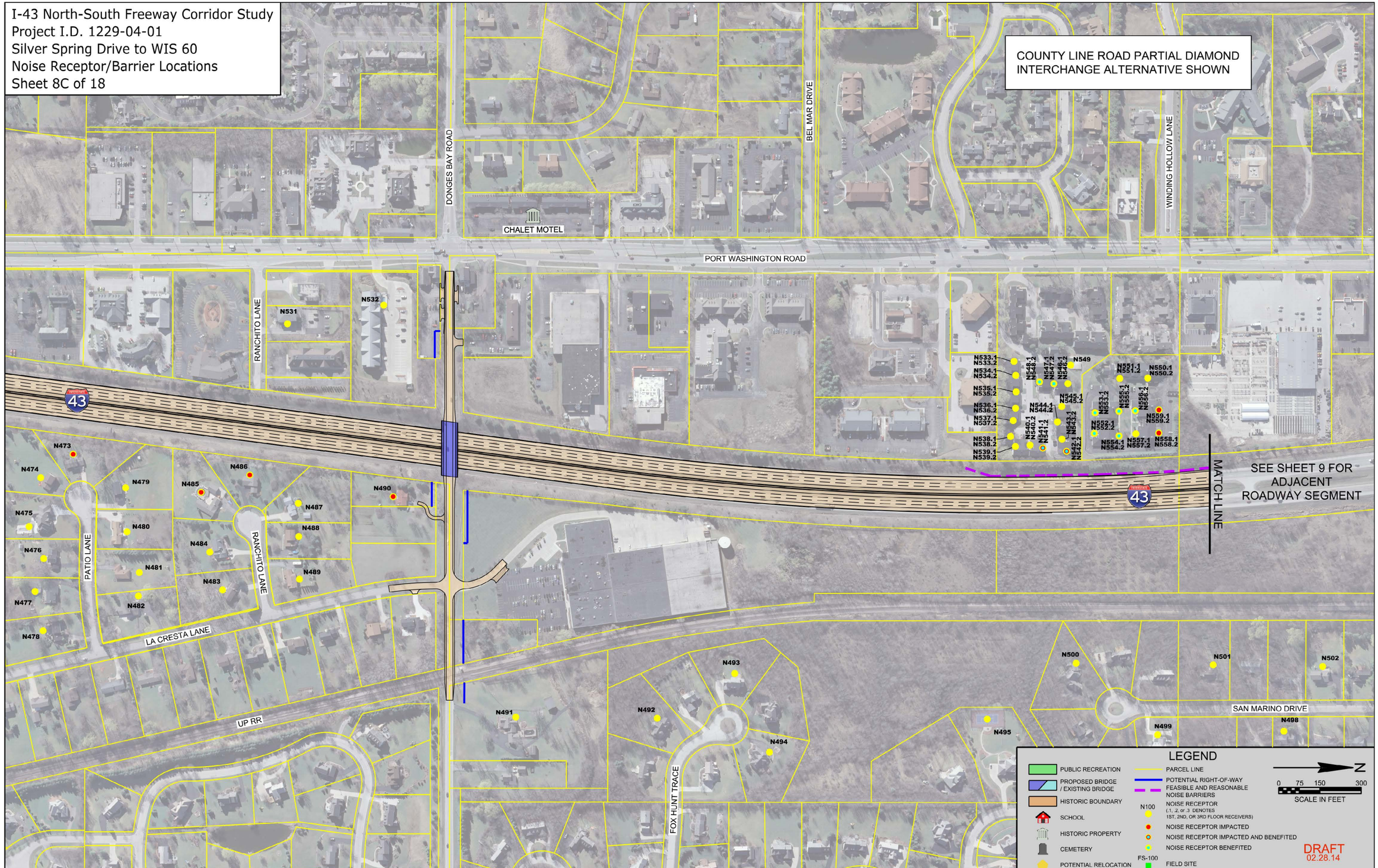
COUNTY LINE ROAD PARTIAL DIAMOND INTERCHANGE ALTERNATIVE SHOWN



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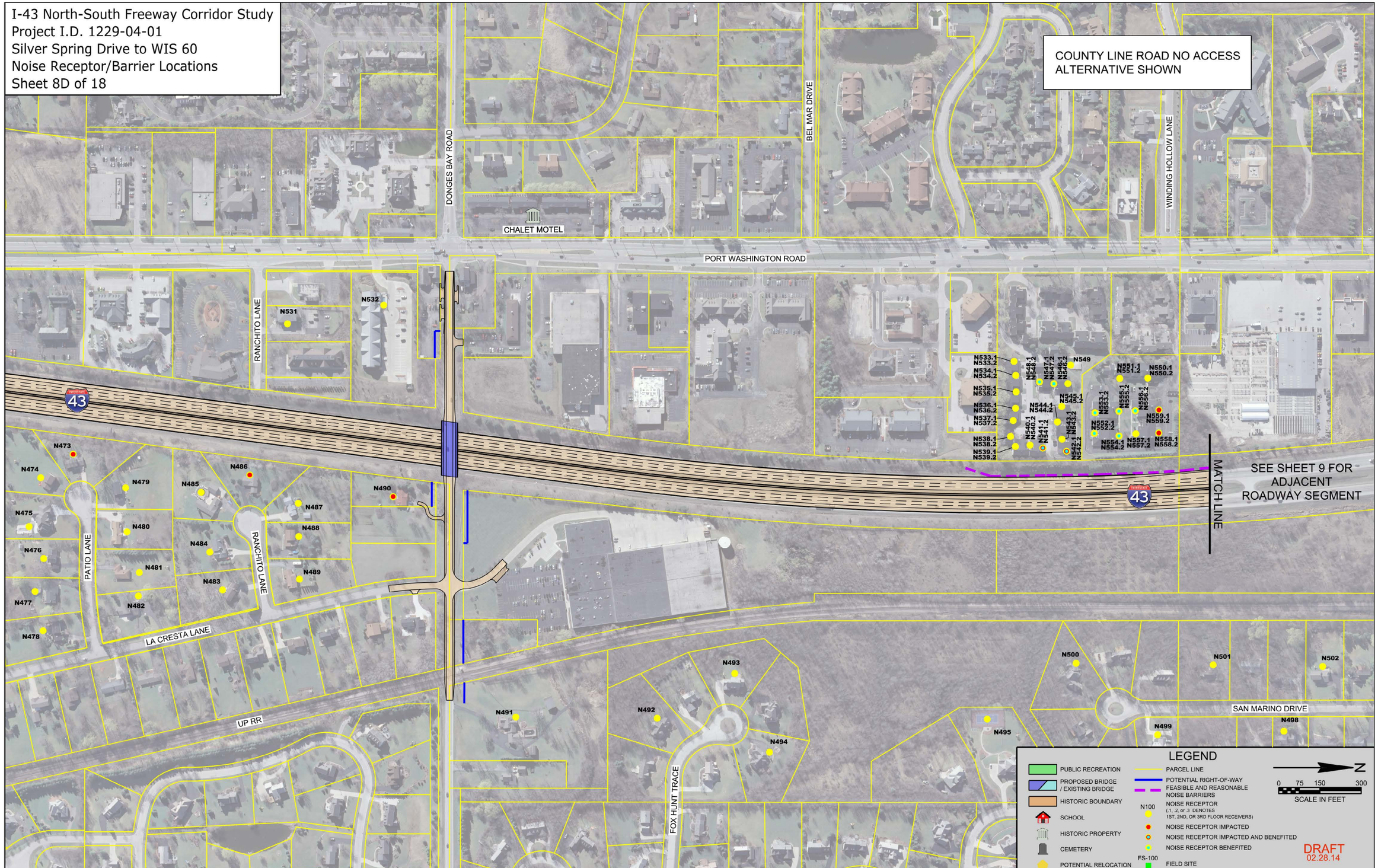

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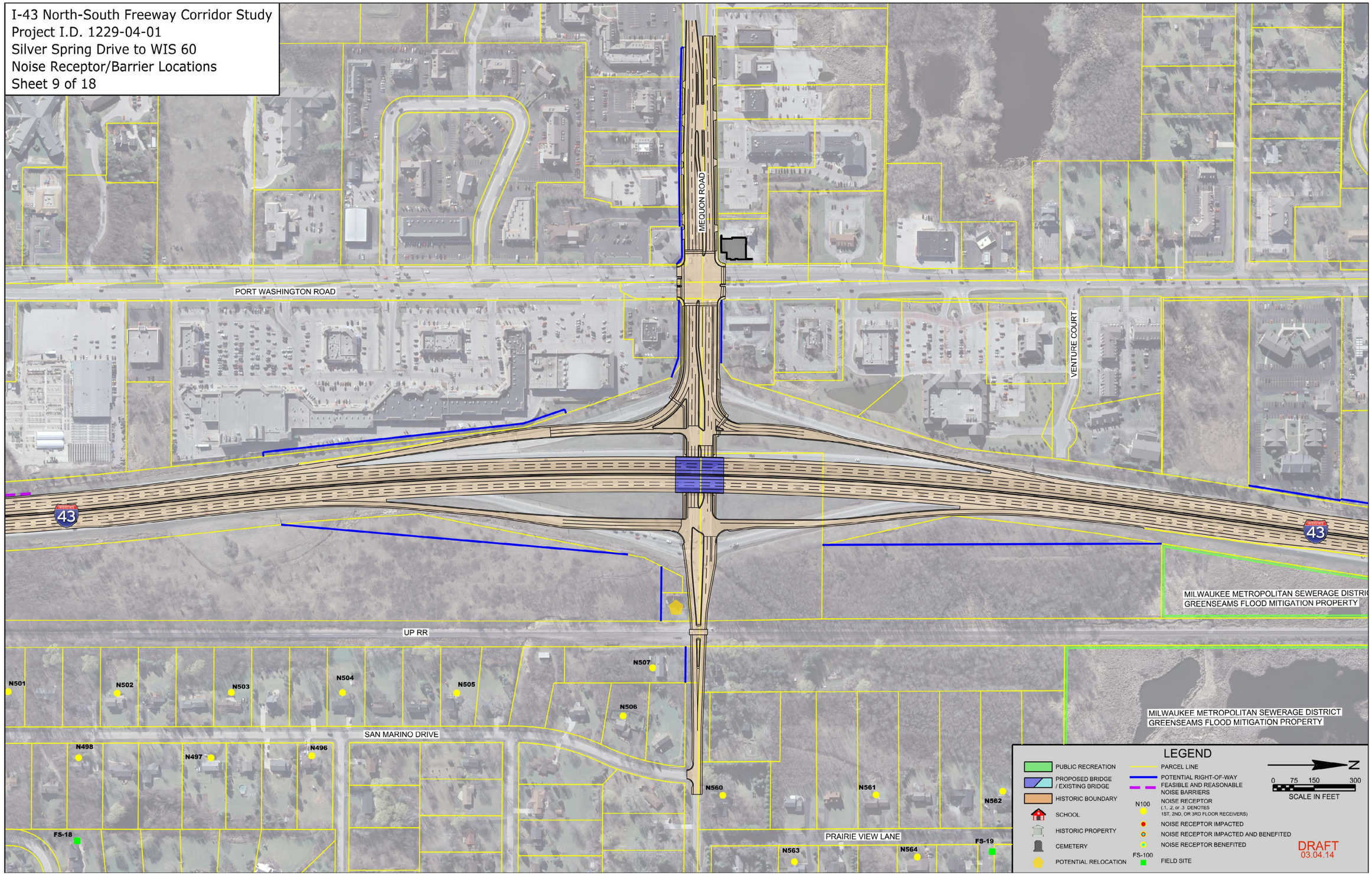

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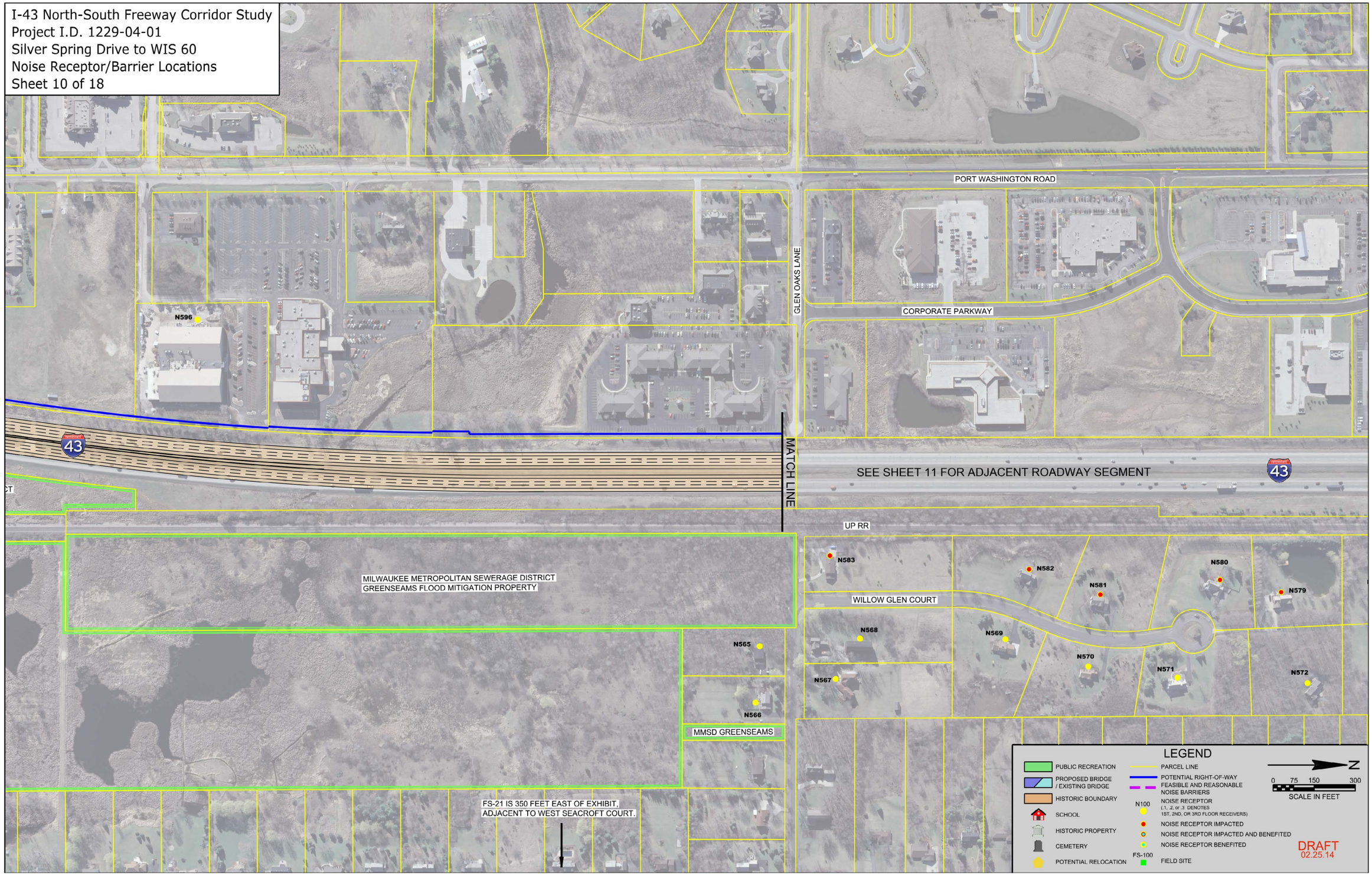

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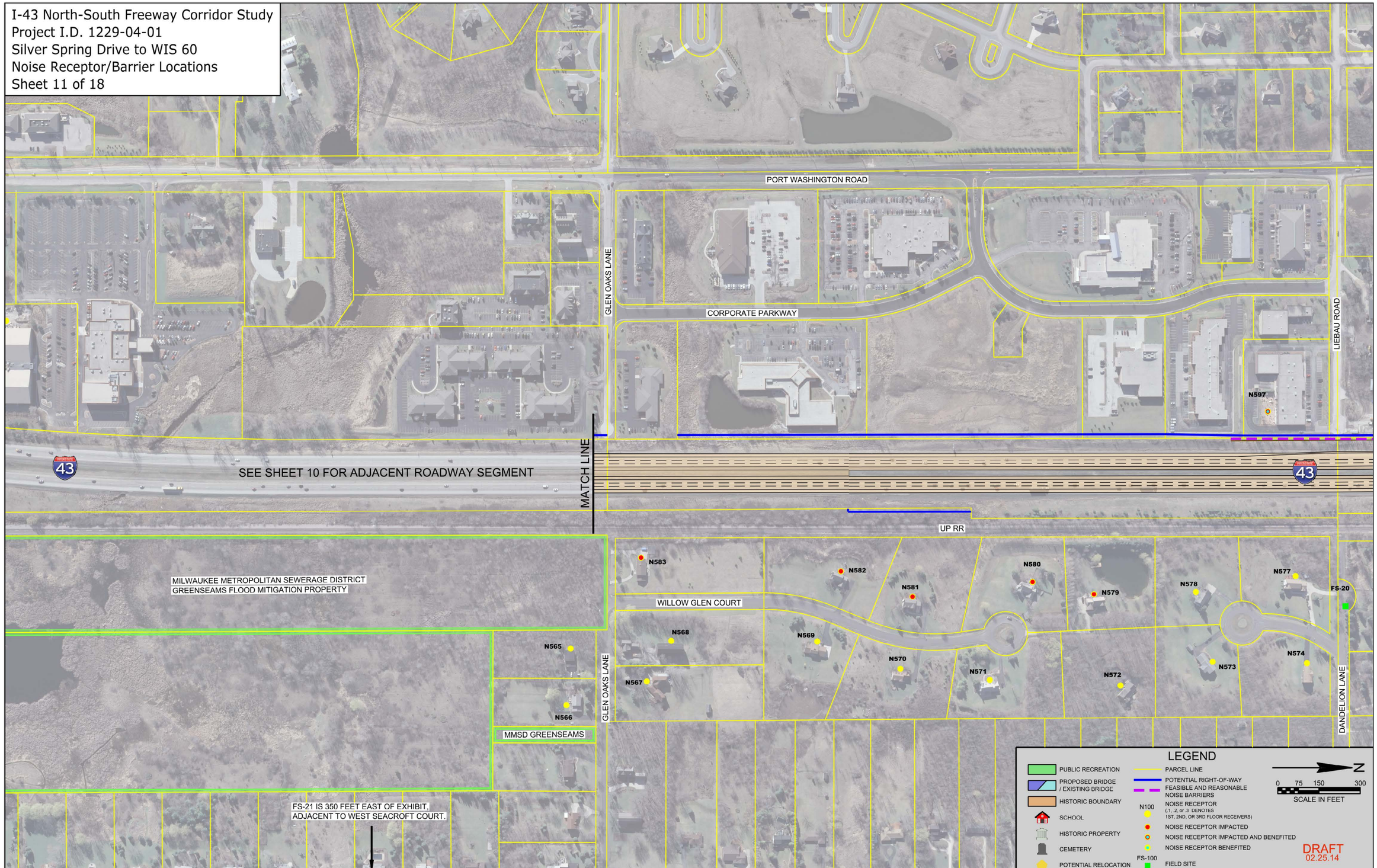

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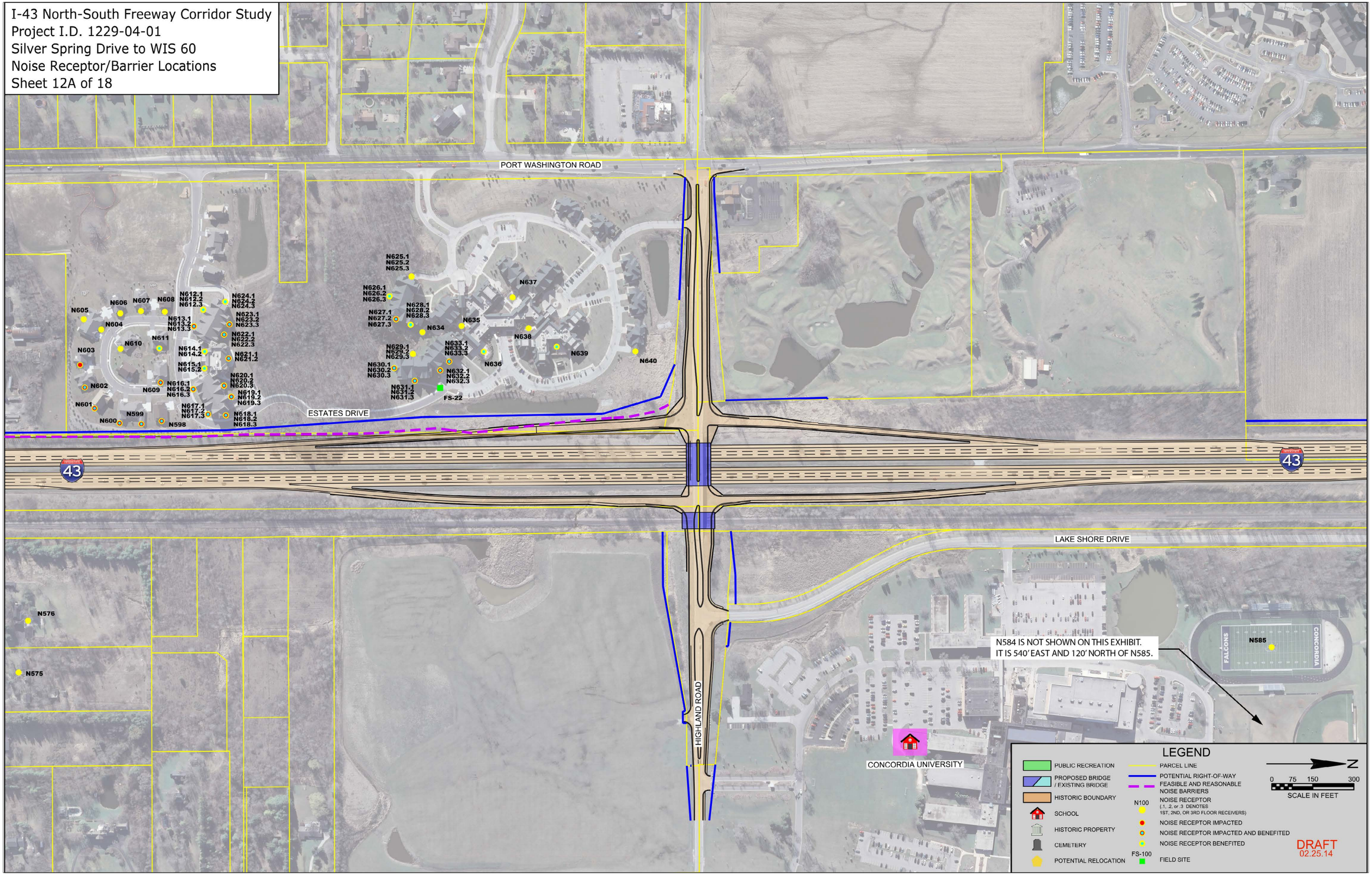

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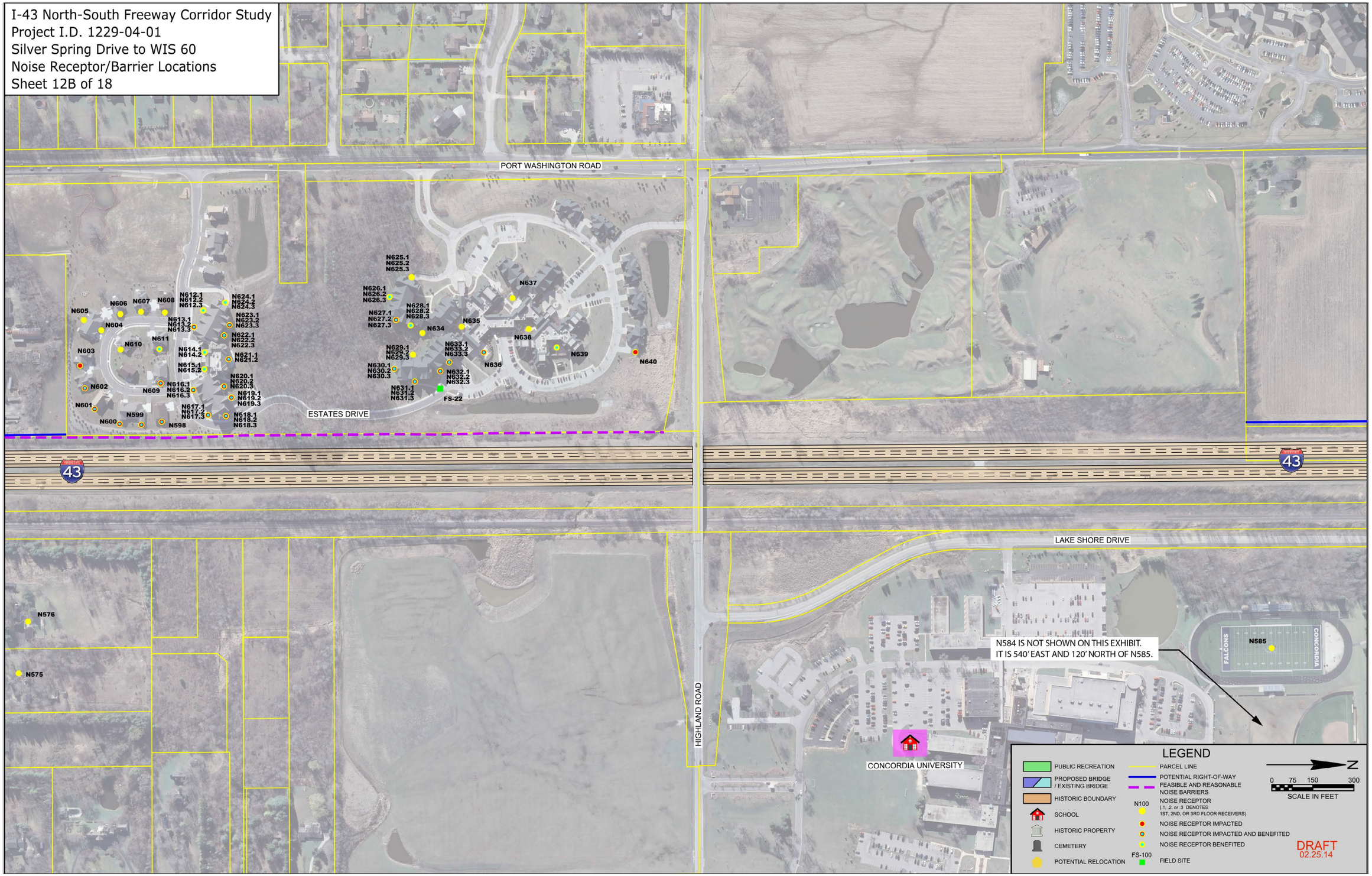

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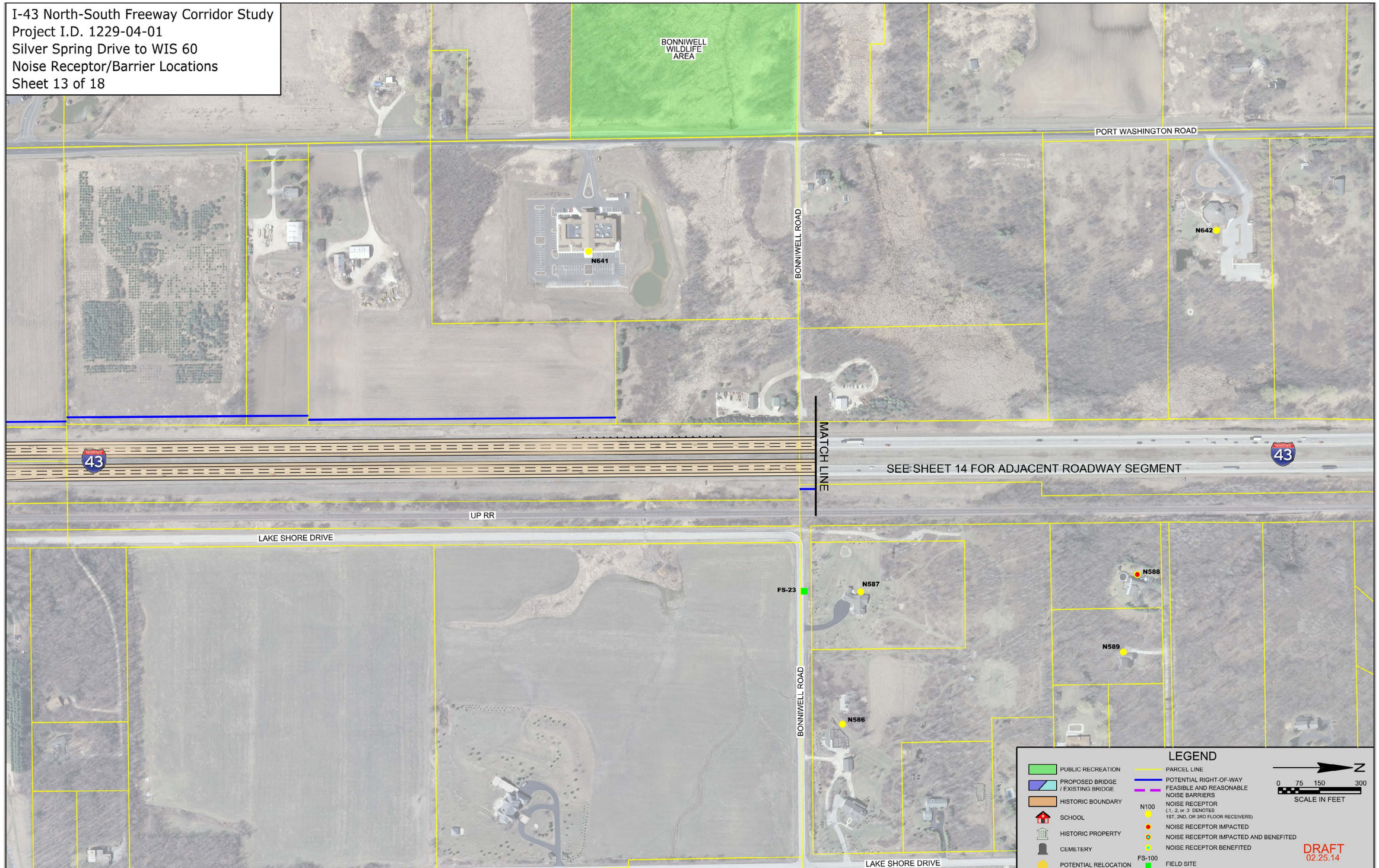

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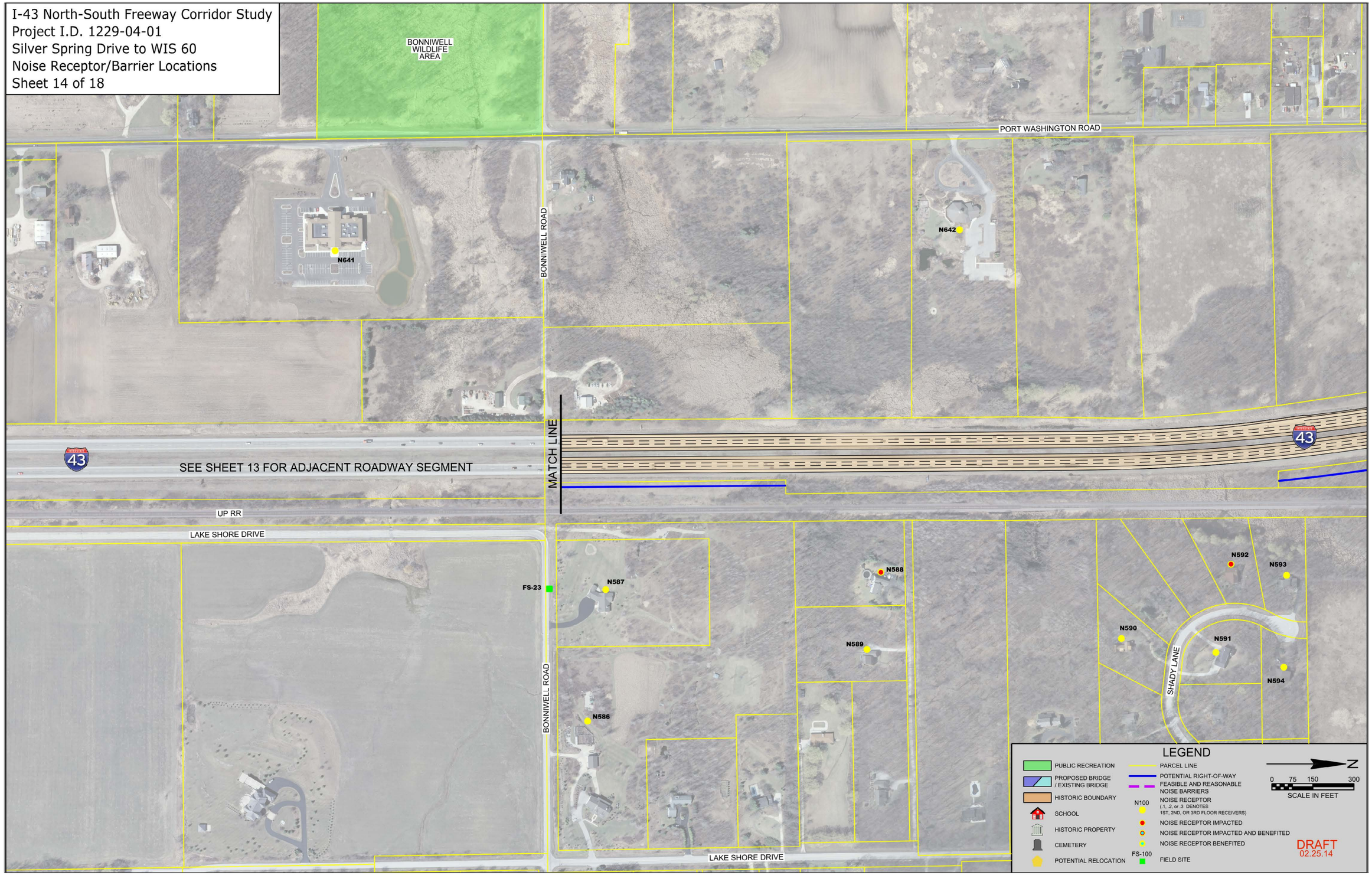

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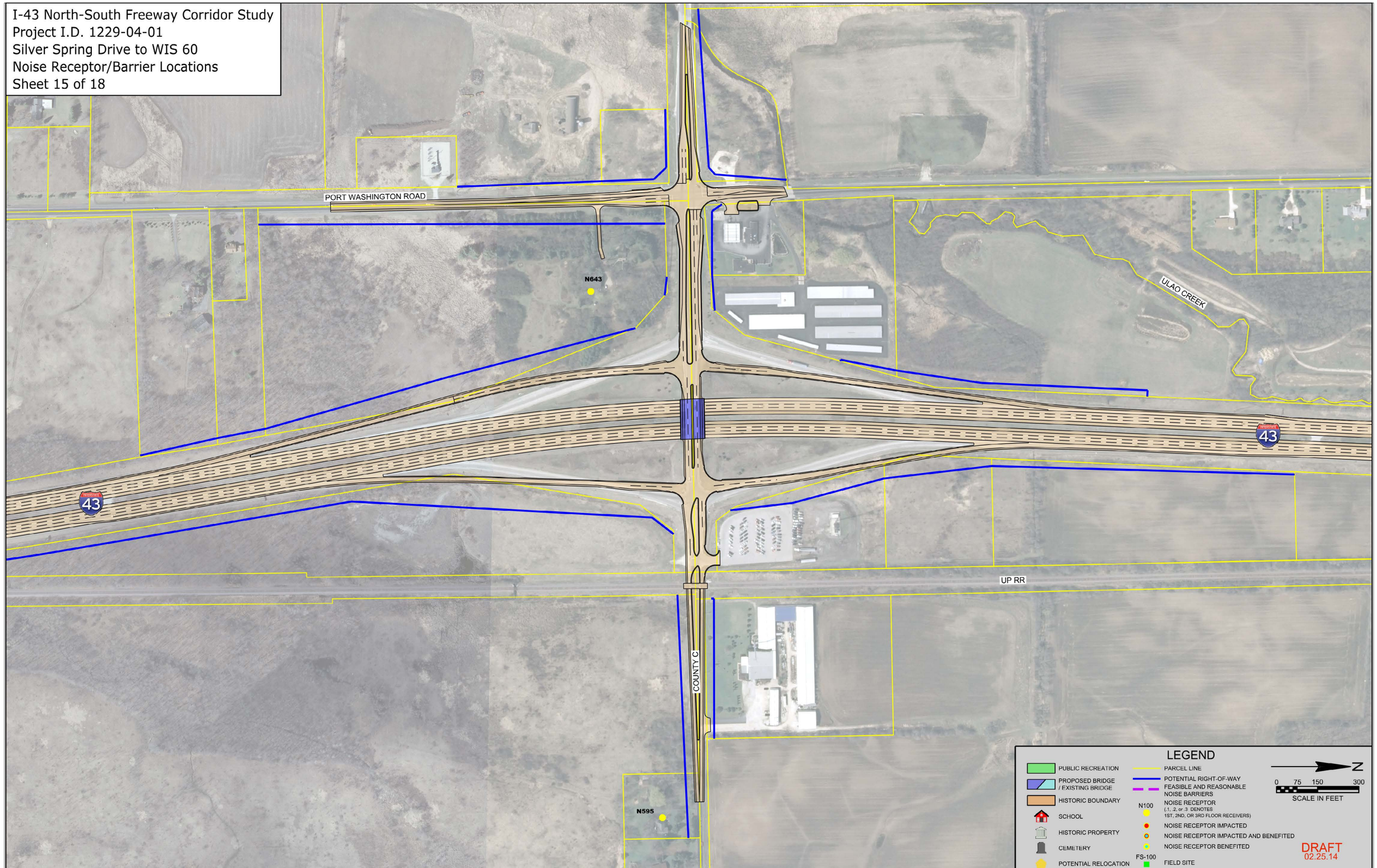

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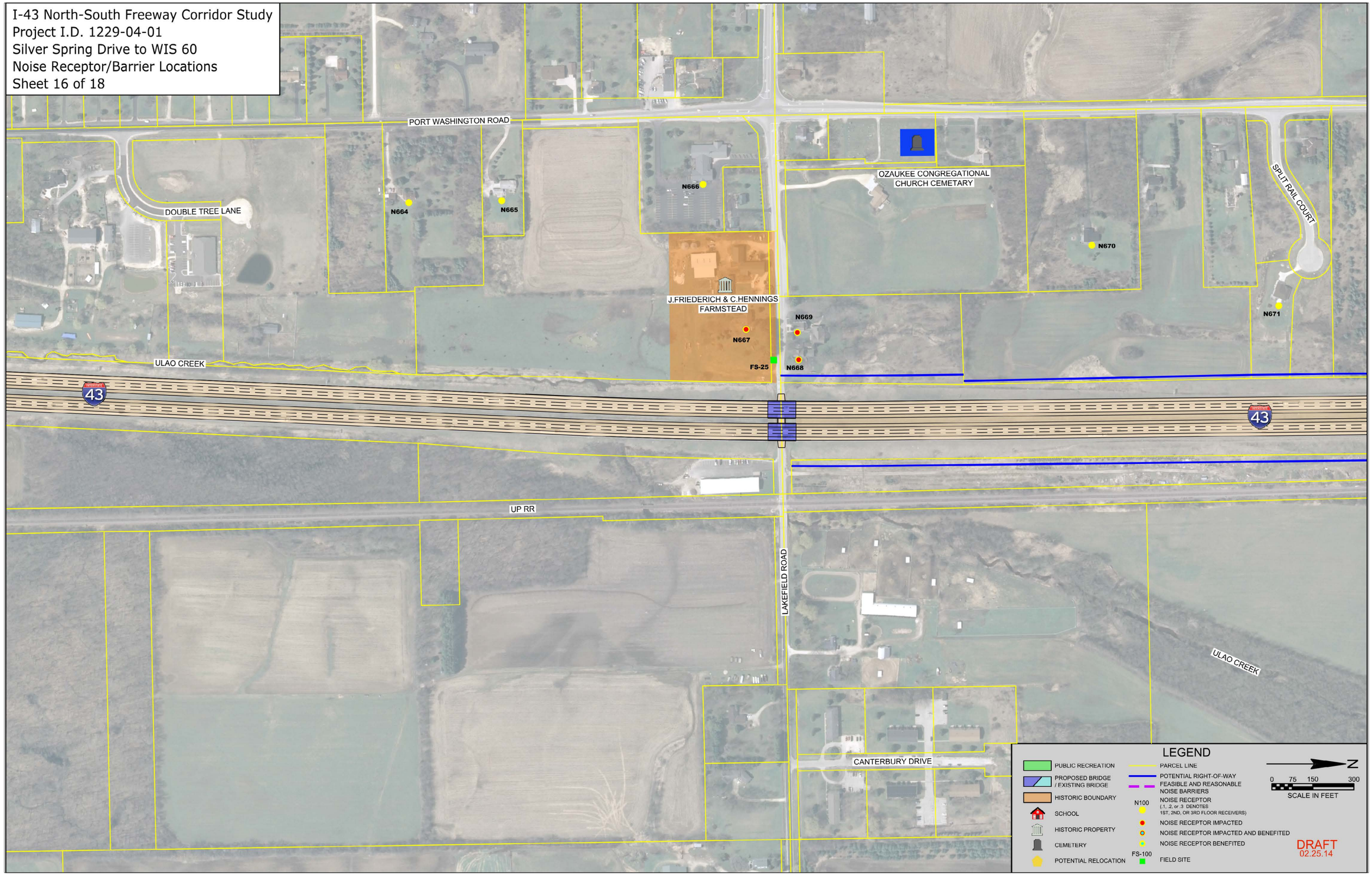

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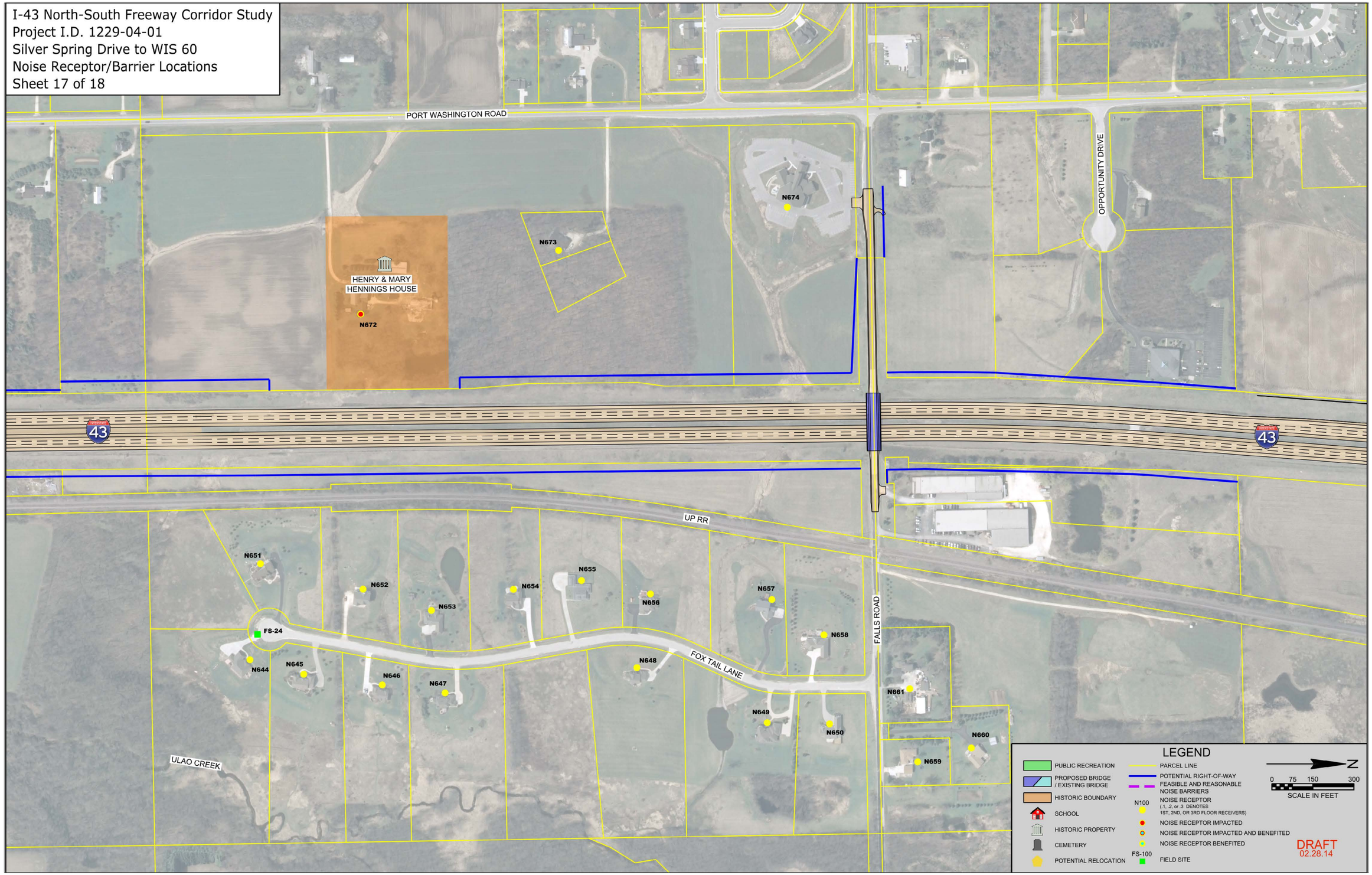

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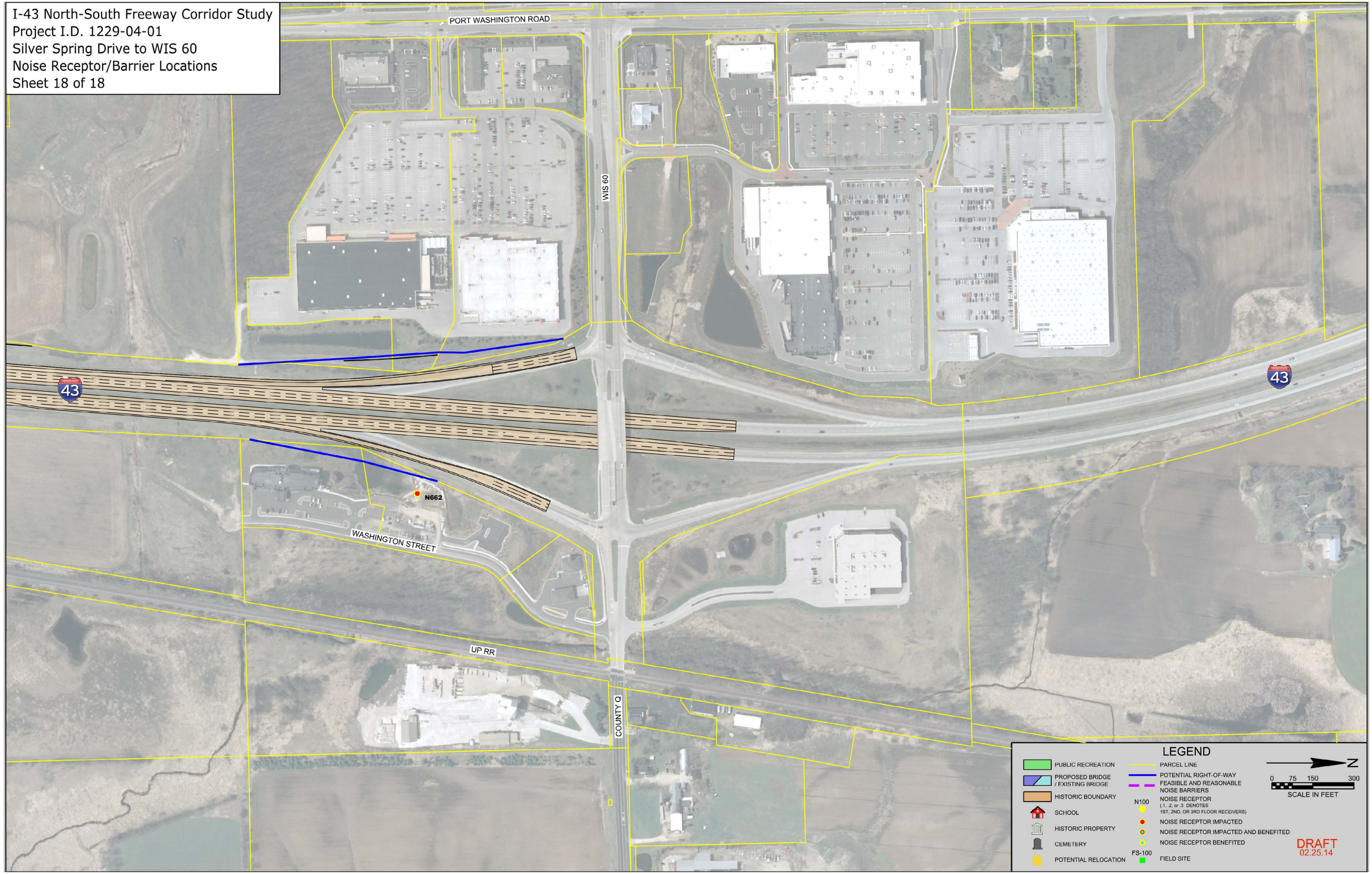


E-3 FTA NOISE AND VIBRATION CRITERIA

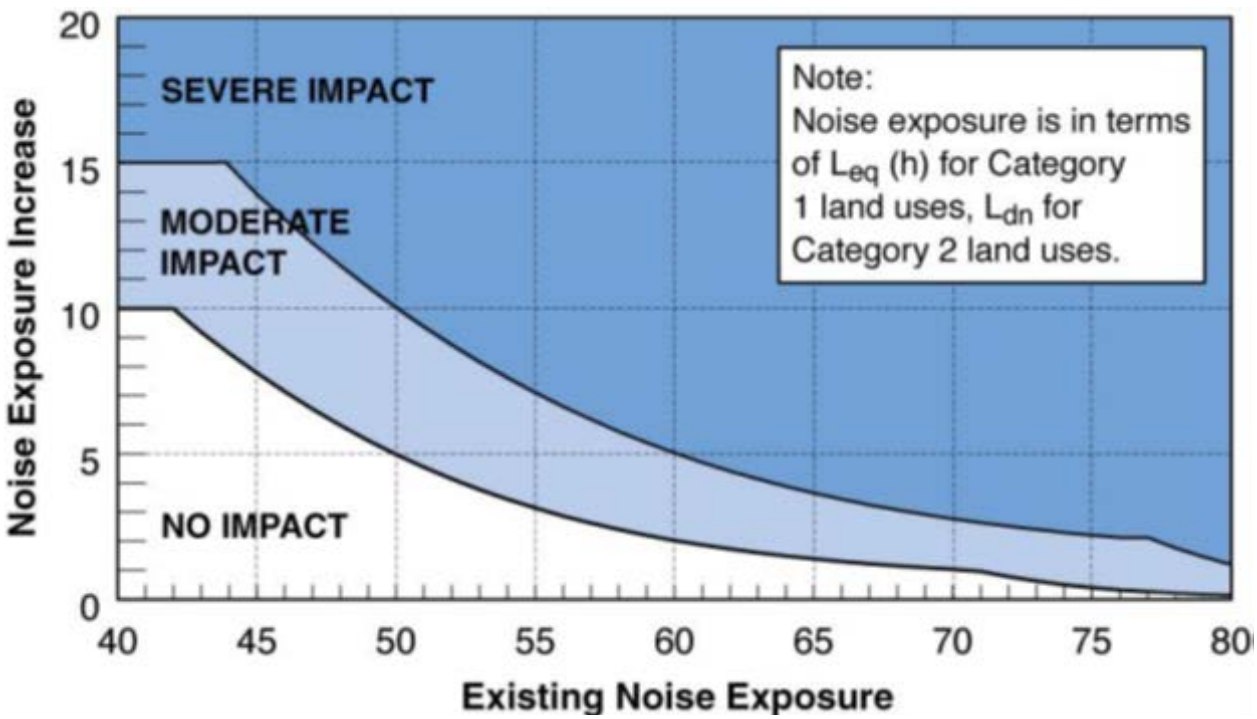
NOISE

The FTA noise impact criteria are based on a comparison of existing and future outdoor noise levels. In areas were existing rail noise is present, the criteria is the allowable increase in noise exposure when the increase in project noise is compared to the existing noise. The criteria were developed to address potential annoyance in a residential environment using Ldn as the noise descriptor. The Ldn noise level descriptor is defined as the 24-hour Leq where the nighttime noise, 10:00 pm to 7:00 am, is increased by 10 decibels prior to including the noise levels in the 24-hour calculation. The FTA criteria were established for three land use categories, identified as Category 1, 2, and 3:

1. "Tracts of land where quiet is an essential element in their intended purpose,
2. Residences and buildings were people normally sleep, and
3. Institutional land uses with primarily daytime and evening use."

The allowable increase in noise exposure for land use Categories 1 and 2 are graphically represented in **Exhibit 1**.

Exhibit 1: FTA Noise Impact Criteria



VIBRATION

Ground-borne vibration and noise are caused by vibrations originating at the wheel/rail interface and propagating from the rails through the intervening soil and rock to nearby buildings. The resulting vibration may be perceptible as mechanical motion (windows rattling, dishes on shelves rattling, etc.) and the acoustic radiation by the building components may cause an audible low-frequency rumble.

Ground-borne vibration and noise inside buildings are often near the threshold of human sensitivity. In this range, a small increase in vibration or noise levels can cause increases in human response.

Vibration can be described in terms of the displacement, velocity or acceleration of a vibrating surface. The peak velocity of a vibration is used to assess building damage. However, it is not appropriate for human response to vibration. One single number descriptor, VdB, is used to assess transit vibration. Vibration velocity in decibels is ratio of the rms velocity amplitude to the reference velocity amplitude of 1x10-6 in./sec.

Ground-borne noise is the rumbling sound created by the vibration of a room's surfaces. The descriptor used is the A-weighted sound level, dBA. Ground-borne noise from rail facilities has a significant low frequency component. Therefore, the rumbling noise created ground-borne noise sounds louder than broadband noise with the same dBA level.

Ground-borne vibration and noise are typically not every day experiences to most people. However, in the study area freight trains are the source of most perceptible outdoor ground-borne vibration velocity levels. Typical background vibration velocity levels in residential neighborhoods not exposed to rail traffic are usually 50 VdB or lower. The human threshold is around 65 VdB.

Ground-borne noise is the rumbling sound created by the vibration of a room's surfaces. The descriptor used is the A-weighted sound level, dBA. Ground-borne noise from rail facilities has a significant low frequency component. Therefore, the rumbling noise created ground-borne noise sounds louder than broadband noise with the same dBA level. The FTA criteria for ground-borne vibration and noise are presented in Table 1.

The criteria presented in Table 1 are for new rail alignments or when existing freight lines are moved closer to receptors. More appropriate to this project assessment are the FTA guidelines on how to account for improved rail operations in a rail corridor that has existing operations. When the project induced vibration levels exceed the existing vibration levels by5 VdB, the existing operations can be excluded and the future operations should be compared to the criteria in Table 1. Following are some representative scenarios for addressing vibration impact in an existing corridor:

1. Infrequently used rail corridor (fewer than five trains per day): Use the general vibration criteria, Table 1.

2. Moderately used rail corridor (5 to 12 trains per day): If the existing train vibration exceeds the impact criteria given in Table 1, there will be no impact from the project vibration if the levels estimated using FTA procedures are at least 5 VdB less than the existing train vibration. Otherwise, the vibration criteria in Table 1 apply to the project.

3. Heavily used rail corridor (more than 12 trains per day): If the existing train vibration exceeds the impact criteria given in Table 1, the project will cause additional impact if the project significantly increases the number of vibration events. Approximately doubling the number of

trains is required for a significant increase.

If there is not a significant increase in vibration events, there will be additional impact only if the project vibration, estimated using FTA procedures, will be 3 VdB or more than the existing vibration.

Table 1: Ground Borne Vibration and Noise Impact Criteria for General Assessment

	Ground-Borne Vibration Impact Levels, VdB			Ground-Borne Noise Impact Levels, dBA		
Land Use Category	**Frequent Events[1]**	**Occasional Events[2]**	**Infrequent Events[3]**	**Frequent Events[1]**	**Occasional Events[2]**	**Infrequent Events[3]**
Category 1: Buildings where low ambient vibration is essential for interior operations	65 VdB[4]	65 VdB[4]	65 VdB[4]	N/A[5]	N/A[5]	N/A[5]
Category 2: Residences and buildings where people normally sleep	72 VdB	75 VdB	80 VdB	35 dBA	38 dBA	43 dBA
Category 3: Institutional land uses with primarily daytime use	75 VdB	78 VdB	83 VdB	40 dBA	43 dBA	48 dBA

Notes:

[1] "Frequent Events" is defined as more than 70 vibration events per day.

[2] "Occasional Events" is defined as between 30 and 70 vibration events per day.

[3] "Infrequent Events" is defined at fewer than 30 vibration events per day.

[4] This criterion limit is based on levels that are acceptable for most moderately sensitive equipment such as optical microscopes.

[5] Vibration-sensitive equipment is not sensitive to ground-borne noise.