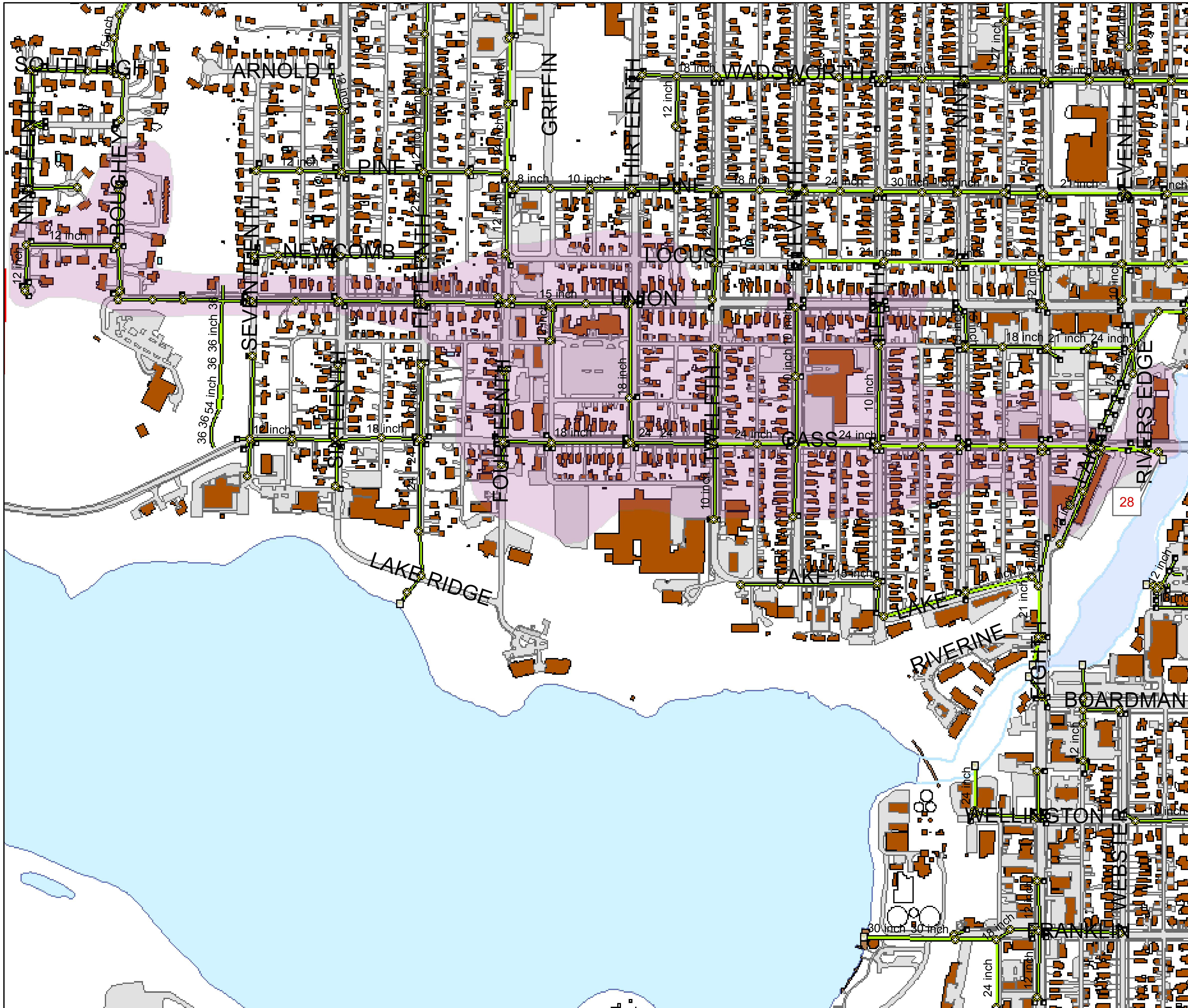

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5-11-06-007

Boundary D Outfall #28

Legend

- Storm Manholes
- Catchbasins
- Outfalls
- Storm Reach

1 inch equals 500 feet

0 380 760 1,140 1,520 Feet

City of Traverse City Engineering Department
2007 Storm Water Management Report

Stormwater System: 28

FromMH	From Elev. (FT)	ToMH	To Elevation (FT)	SLOPE (%)	Length (FT)	Material	Diameter (IN)	Max Flow (CFS)
028001	692.00	028002	691.94	0.03	239.50	CONCRETE	12 inch	0.56
028002	691.94	028003	689.10	0.60	474.62	CONCRETE	12 inch	2.75
028003	689.10	028004	687.50	0.70	230.17	CONCRETE	12 inch	2.97
028004	687.50	028005	686.39	2.24	49.48	CONCRETE	12 inch	5.33
028005	686.39	028006	681.00	2.97	181.26	CONCRETE	12 inch	6.14
028006	681.00	028007	663.29	11.24	157.52	CONCRETE	12 inch	11.94
028007	663.29	028008	619.09	12.46	354.75	CONCRETE	12 inch	12.57
028008	619.09	028009	614.97	1.80	229.37	CONCRETE	12 inch	4.77
028009	614.97	028010	613.15	0.79	230.14	CONCRETE	15 inch	5.74
028010	613.15	028011	611.78	0.32	427.73	CONCRETE	15 inch	3.65

Stormwater System: 28

FromMH	From Elev. (FT)	ToMH	To Elevation (FT)	SLOPE (%)	Length (FT)	Material	Diameter (IN)	Max Flow (CFS)
028011	611.78	028012	610.40	0.31	441.73	CONCRETE	15 inch	3.61
028012	610.40	028013	609.97	0.19	230.59	CONCRETE	15 inch	2.79
028013	609.97	028014	609.65	0.17	186.41	CONCRETE	15 inch	2.68
028014	609.65	Junction	609.23	0.18	209.08	VC	15 inch	2.78
Junction	609.65	028015	609.23	0.18	21.00	CONCRETE	15 inch	2.78
028015	609.00	Junction	608.42	0.12	36.00	CONCRETE	18 inch	3.60
Junction	609.00	028016	608.42	0.12	456.70	VC	18 inch	3.60
028016	608.42	028017	608.12	0.13	228.63	CONCRETE	18 inch	3.80
028017	607.77	028018	607.45	0.07	438.21	CONCRETE	24 inch	6.11
028018	607.45	028019	607.06	0.17	223.75	CONCRETE	24 inch	9.44
028019	607.06	Junction	606.70	0.22	165.40	CONCRETE	24 inch	10.55

Stormwater System: 28

FromMH	From Elev. (FT)	ToMH	To Elevation (FT)	SLOPE (%)	Length (FT)	Material	Diameter (IN)	Max Flow (CFS)
Junction	607.06	028020	606.70	1.00	35.97	CONCRETE	24 inch	22.62
028020	606.70	Junction	605.65	0.26	398.54	CONCRETE	24 inch	11.61
Junction	606.70	028021	605.65	3.82	27.46	CONCRETE	24 inch	44.22
028021	605.53	028022	604.95	0.25	230.11	CONCRETE	24 inch	11.35
028022	604.80	028023	602.97	0.90	203.59	CONCRETE	24 inch	21.44
028023	602.97	Junction	603.92	-4.31	22.06	CONCRETE	24 inch	#Error
Junction	602.97	Junction	603.92	-2.87	33.10	CONCRETE	24 inch	#Error
Junction	602.97	028024	603.92	-0.56	168.83	CONCRETE	24 inch	#Error
028024	603.92	028025	603.32	0.30	200.38	CONCRETE	24 inch	12.37
028025	603.32	Junction	602.10	0.52	236.35	CONCRETE	24 inch	16.25
Junction	603.32	028026	602.10	5.92	20.62	CONCRETE	24 inch	55.01

Stormwater System: 28

FromMH	From Elev. (FT)	ToMH	To Elevation (FT)	SLOPE (%)	Length (FT)	Material	Diameter (IN)	Max Flow (CFS)
028026	602.10	028027	603.11	-2.04	49.41	CONCRETE	24 inch	#Error
028027	601.89	Junction	598.85	1.83	166.23	CONCRETE	24 inch	30.58
Junction	601.89	028028	598.85	4.39	69.18	CONCRETE	24 inch	47.40
028028	598.66	028050	597.90	0.00	10.00	UNKNOWN	24 inch	0.00
028050	598.23	Treatment System 9	0.00	2.80	6.05	CONCRETE	15 inch	10.80
Treatment System	0.00	028051	596.75	2.80	12.02	CONCRETE	15 inch	10.80
028051	596.94	028029	596.45	0.00	44.02	UNKNOWN	24 inch	0.00
028029	596.57	Outfall 28	592.43	0.00	43.63	CONCRETE	24 inch	0.00

The City of Traverse City
Storm Outlet Evaluation

Project No. ____________ File: ____________

Description: ____________ Field Work by: LL + CB Date: 5/11/06

Drainage Systems: D Checked by: ____________ Date: ______

Available Information: #28

Plans: ☐ Yes ☐ No Year Built: ______

Plan Reference #: ______ Year Modified: ______

Easement: ☒ Yes Landscape easement ☐ No Pipe Size: ______

Outlet Water Course: Boardman River

Field Investigation: #28 South Cass St bridge

Outlet Pipe Size: 24 Pipe Type: ☐ Concrete ☒ CMP ☐ Plastic ☐ Other: ______

Outlet Submerged: ☐ Yes ☒ No ☐ Partial Depth: ______

Sediment Depth: ______

Deposits: ☒ Yes Type: sediment ☐ No

End Treatment: ☐ Yes Type: ______ ☒ No

Amount of Pipe Exposed: 2'

Slope Protection: ☐ Yes Type: ☐ Rip Rap ☐ Pave Spillway ☐ Armor Stone ☐ Cobble ☐ Other: ______ ☒ No

3' 10 Pipe wall 14"

Scour: ☒ Yes Depth: ______ ☐ No

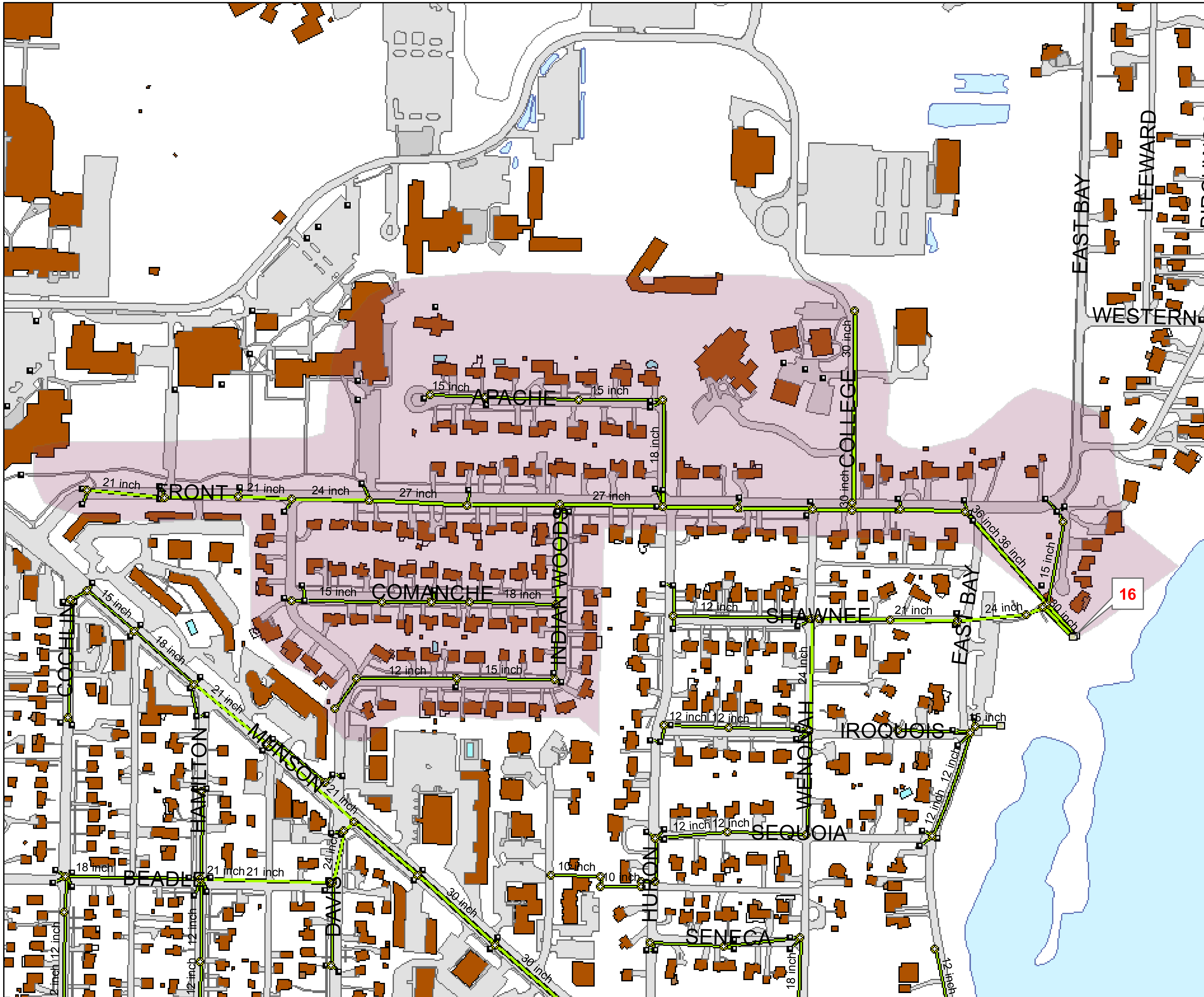
High Water Mark/Watercourse: 2'

Depth from Invert: ______ High Watermark Pipe: Ø

Evidence of Flooding: ☐ Yes ☒ No

Photographs: ☒ Yes ☐ No Numbers: 5/11/06 #6+7

Comments: 5/11/06 Storm event → 5" invert → water flow large brown plume, some water hitting behind metal breakwall. Very gross.
Cigarette butt pile underwater + major sediment deposit



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Westerly

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Easterly

Boundary E Outfall #16

Legend

- Storm Manholes
- Catchbasins
- Outfalls
- Storm Reach

N W E S

1 inch equals 300 feet

0 220 440 660 880 Feet

City of Traverse City Engineering Department
2007 Storm Water Management Report

Stormwater System: 16

FromMH	From Elev. (FT)	ToMH	To Elevation (FT)	SLOPE (%)	Length (FT)	Material	Diameter (IN)	Max Flow (CFS)
016001	604.30	016002	603.75	0.23	243.27	CONCRETE	21 inch	7.53
016002	603.75	016003	603.20	0.24	233.76	CONCRETE	21 inch	7.68
016003	603.20	016004	602.70	0.30	168.19	CONCRETE	21 inch	8.64
016004	602.70	016005	601.60	0.45	242.53	CONCRETE	24 inch	15.23
016005	601.60	016006	600.82	0.25	307.86	CONCRETE	27 inch	15.58
016006	600.72	016007	599.69	0.35	294.04	CONCRETE	27 inch	18.32
016007	598.69	016008	595.49	0.99	322.59	CONCRETE	27 inch	30.83
016008	594.79	016009	592.36	1.03	236.08	CONCRETE	30 inch	41.59
016009	592.26	016010	589.96	0.97	236.27	CONCRETE	30 inch	40.45
016010	589.86	016011	588.43	1.15	123.88	CONCRETE	30 inch	44.05

Stormwater System: 16

FromMH	From Elev. (FT)	ToMH	To Elevation (FT)	SLOPE (%)	Length (FT)	Material	Diameter (IN)	Max Flow (CFS)
016011	587.68	016012	586.25	0.93	153.53	CONCRETE	30 inch	39.57
016012	586.25	016013	583.73	1.23	205.06	CONCRETE	36 inch	73.90
016013	583.53	016050	581.94	0.00	118.16	CONCRETE	36 inch	0.00
016050	582.54	Treatment System	0.00	0.65	20.26	ADS	18 inch	8.46
Treatment System	0.00	016051	581.60	0.65	26.95	ADS	18 inch	8.46
016051	581.88	016014	579.04	0.00	244.72	CONCRETE	36 inch	0.00
016014	579.04	Outfall 16	578.68	0.21	131.66	CONCRETE	30 inch	18.56

The City of Traverse City
Storm Outlet Evaluation

Project No. ______ **File:** ______

Description: ______ **Field Work by:** LL / CB **Date:** 5/11/06

Drainage Systems: E **Checked by:** ______ **Date:** ______

Available Information: #16

- **Plans:** ☒ Yes ☐ No — **Year Built:** 1966
- **Plan Reference #:** Storm 122 — **Year Modified:** ______
- **Easement:** ☒ Yes East Bay Park ☐ No — **Pipe Size:** 30"
- **Outlet Water Course:** East Bay

Field Investigation: 2X #16 two 30"'s

(1) South pipe
(2) North pipe
Flow
(A) 2"
(B) 1"

- **Outlet Pipe Size:** 30" — **Pipe Type:** ☒ Concrete ☐ CMP ☐ Plastic ☐ Other: ______
- **Outlet Submerged:** ☐ Yes ☒ No — ☐ Partial **Depth:** ______ **Sediment Depth:** ______
- **Deposits:** ☒ Yes **Type:** (A) [illegible] (B) moss/smooth [illegible] ☐ No
- **End Treatment:** ☐ Yes **Type:** ______ ☒ No
- **Amount of Pipe Exposed:** 3'
- **Slope Protection:** ☒ Yes **Type:** ☐ Rip Rap ☐ Pave Spillway ☐ Armor Stone ☒ Cobble wall ☐ Other: ______ ☐ No
- **Scour:** ☐ Yes **Depth:** ______ ☐ No
- **High Water Mark/Watercourse:** Bay 1"
- **Depth from Invert:** (A) 11" (B) 14" 0 — **High Watermark Pipe:** (A) 11" (B) 18"
- **Evidence of Flooding:** ☐ Yes ☒ No
- **Photographs:** ☒ Yes ☐ No **Numbers:** 14

5/11/06 Storm event

Comments: Sewer/gas smell coming out grass inbetween pipes

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Westerly

Boundary F Outfall #18

Legend

- Storm Manholes
- Catchbasins
- Outfalls
- Storm Reach

N
W E
S

1 inch equals 400 feet

0 290 580 870 1,160 Feet

City of Traverse City Engineering Department
2007 Storm Water Management Report

Stormwater System: 18

FromMH	From Elev. (FT)	ToMH	To Elevation (FT)	SLOPE (%)	Length (FT)	Material	Diameter (IN)	Max Flow (CFS)
018003	605.06	018004	604.29	0.40	192.95	CONCRETE	15 inch	4.08
018004	604.28	018005	603.58	0.28	252.88	CONCRETE	18 inch	5.52
018005	603.58	018006	602.98	0.20	295.65	CONCRETE	21 inch	7.13
018006	602.98	018007	602.18	0.22	366.72	CONCRETE	21 inch	7.40
018007	601.75	018008	601.22	0.20	263.13	CONCRETE	30 inch	18.40
018008	601.22	018009	600.60	0.19	327.02	CONCRETE	30 inch	17.85
018009	600.60	018010	599.50	0.20	539.53	CONCRETE	30 inch	18.51
018010	599.50	018011	593.09	1.36	470.47	UNKNOWN	24 inch	26.39
018011	593.09	018012	591.42	1.47	113.71	CONCRETE	24 inch	27.40
018012	591.42	018013	584.73	1.61	414.59	CONCRETE	24 inch	28.72

Stormwater System: 18

FromMH	From Elev. (FT)	ToMH	To Elevation (FT)	SLOPE (%)	Length (FT)	Material	Diameter (IN)	Max Flow (CFS)
018013	584.73	018014	579.80	1.55	318.17	CONCRETE	24 inch	28.15
018014	577.60	018058	579.13	39.52	7.00	UNKNOWN	30 inch	257.71
018058	579.33	Treatment System	0.00	15.00	10.00	ADS	18 inch	40.66
Treatment System	0.00	Treatment System	0.00	7.00	4.00	ADS	18 inch	27.78
Treatment System	0.00	Treatment System	0.00	0.00	20.95	OTHER	18 inch	0.00
Treatment System	0.00	018059	579.11	2.10	8.00	ADS	18 inch	15.21
018059	579.01	Outfall 18	578.97	0.00	9.50	CONCRETE	30 inch	0.00

The City of Traverse City
Storm Outlet Evaluation

Project No. ______ **File:** ______
Description: ______ **Field Work by:** LL + CB **Date:** 5/11/06
Drainage Systems: F **Checked by:** ______ **Date:** ______

Available Information: #18

Plans: ☒ Yes ☐ No
Plan Reference #: Storm # 107A
Easement: ☒ Yes 8th St ROW ☐ No
Outlet Water Course: East Bay
Year Built: 1975
Year Modified: ______
Pipe Size: 30"

Field Investigation: #18

Outlet Pipe Size: 36"
14" of water flowing
Pipe Type: ☒ Concrete ☐ CMP ☐ Plastic
☐ Other: ______
Outlet Submerged: ☐ Yes ☒ No
☐ Partial Depth: ______
flare outlet w/concrete pad
Sediment Depth: ______
Deposits: ☐ Yes Type: ______ ☐ No
End Treatment: ☐ Yes Type: ______ ☒ No
Amount of Pipe Exposed: ______
Slope Protection: ☐ Yes Type: ☒ Rip Rap ☒ Pave Spillway ☐ No
☐ Armor Stone ☐ Cobble
☐ Other: ______
Scour: ☐ Yes Depth: ______ ☒ No
High Water Mark/Watercourse: 1"
Depth from Invert: 14"
High Watermark Pipe: ______

5/11/06 Storm event

Evidence of Flooding: ☒ Yes ☐ No
Photographs: ☒ Yes ☐ No Numbers: 17
Comments: water looks clear

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Southeasterly

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Southwesterly

Boundary G Outfall #36

Legend

- Storm Manholes
- Catchbasins
- Outfalls
- Storm Reach

N
W E
S

1 inch equals 300 feet

0 220 440 660 880 Feet

City of Traverse City Engineering Department
2007 Storm Water Management Report

Stormwater System: 36

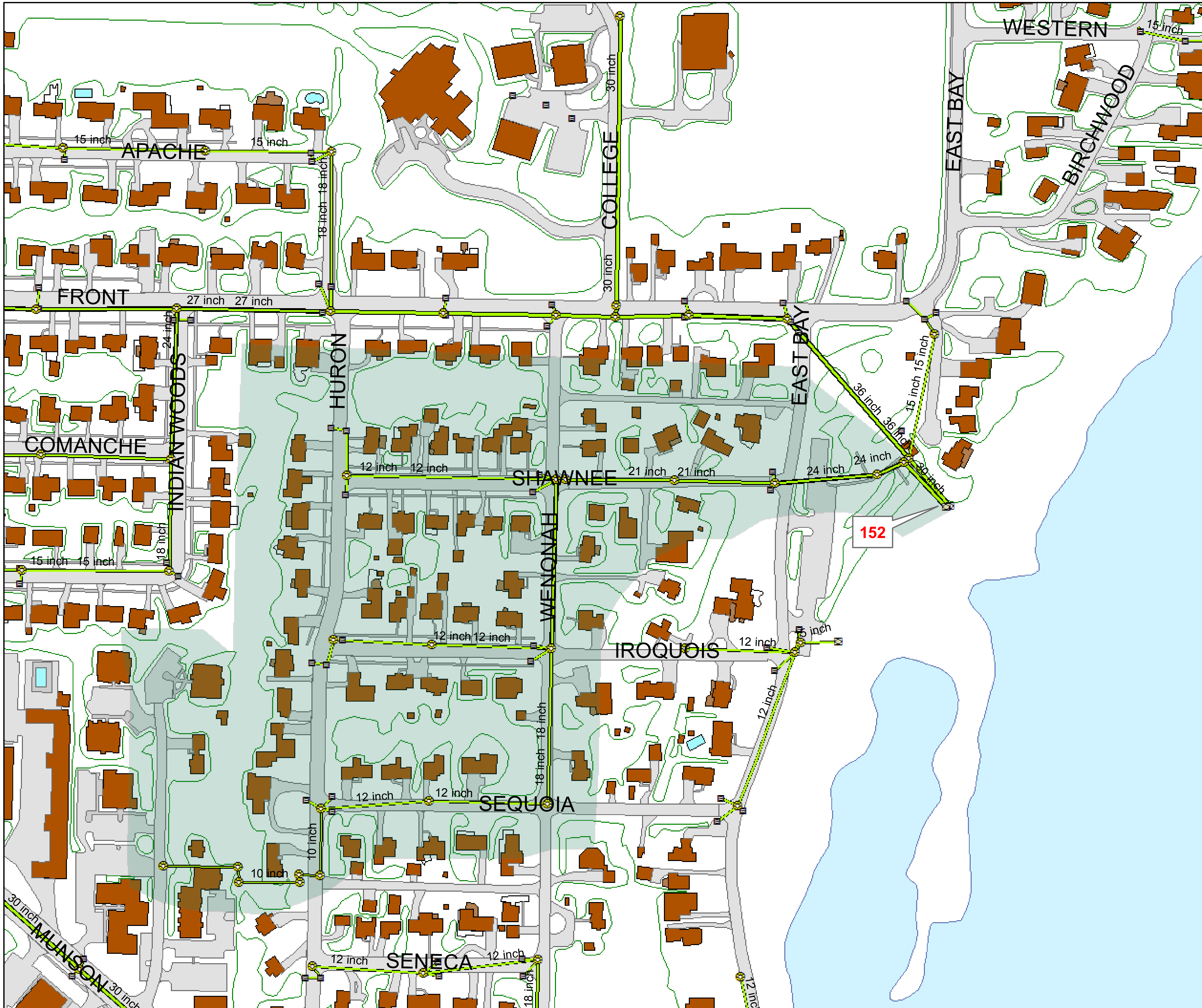
FromMH	From Elev. (FT)	ToMH	To Elevation (FT)	SLOPE (%)	Length (FT)	Material	Diameter (IN)	Max Flow (CFS)
036001	0.00	Catchbasin 2609	596.56	0.00	209.77	CONCRETE	15 inch	0.00
Catchbasin 2609	596.40	036003	594.30	0.50	418.93	CONCRETE	12 inch	2.52
036003	594.22	Catchbasin 1478	594.52	-1.05	28.45	CONCRETE	12 inch	#Error
Catchbasin 1478	594.60	Catchbasin 1480	593.71	2.70	32.95	CONCRETE	15 inch	10.61
Catchbasin 1480	593.46	036004	591.85	0.72	223.84	CONCRETE	15 inch	5.48
036004	591.80	036002	590.61	0.59	167.81	CONCRETE	15 inch	4.96
036002	590.57	036005	590.45	0.35	34.19	CONCRETE	15 inch	3.82
036005	587.76	036006	587.23	0.99	274.22	CONCRETE	15 inch	6.43
036006	587.23	036007	585.05	1.05	216.93	CONCRETE	15 inch	6.60
036008	585.50	036007	585.05	0.47	96.21	UNKNOWN	15 inch	4.42

Stormwater System: 36

FromMH	From Elev. (FT)	ToMH	To Elevation (FT)	SLOPE (%)	Length (FT)	Material	Diameter (IN)	Max Flow (CFS)
036008	584.90	036009	584.32	2.03	27.09	UNKNOWN	15 inch	9.20
036009	584.32	036010	582.80	2.40	63.21	CONCRETE	15 inch	10.01
036010	582.80	036011	582.03	11.36	6.78	CONCRETE	15 inch	21.76
036011	582.03	036012	581.48	0.68	81.18	CONCRETE	15 inch	5.31
036012	581.48	036019	580.68	0.40	174.10	CONCRETE	24 inch	14.28
036019	580.87	Junction	0.00	0.00	21.00	CONCRETE	24 inch	0.00
Junction	0.00	036020	580.45	0.00	3.00	ADS	24 inch	0.00
036020	580.87	Treatment System 1	0.00	15.00	10.00	ADS	10 inch	8.48
Treatment System	0.00	Treatment System 1	0.00	8.00	5.00	ADS	18 inch	29.70
Treatment System	0.00	Outfall 36	579.95	1.70	32.00	ADS	18 inch	13.69

Stormwater System: 36

FromMH	*From Elev. (FT)*	*ToMH*	*To Elevation (FT)*	*SLOPE (%)*	*Length (FT)*	*Material*	*Diameter (IN)*	*Max Flow (CFS)*



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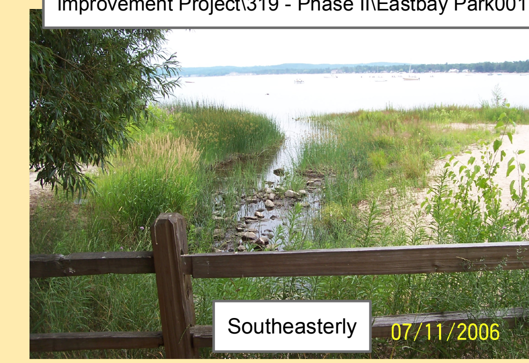
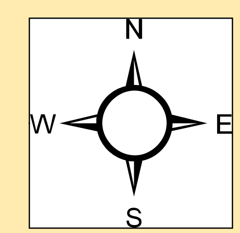


Boundary H Outfall #152

Legend

- Storm Manholes
- Catchbasins
- Outfalls
- Storm Reach



1 inch equals 200 feet

0 150 300 450 600 Feet

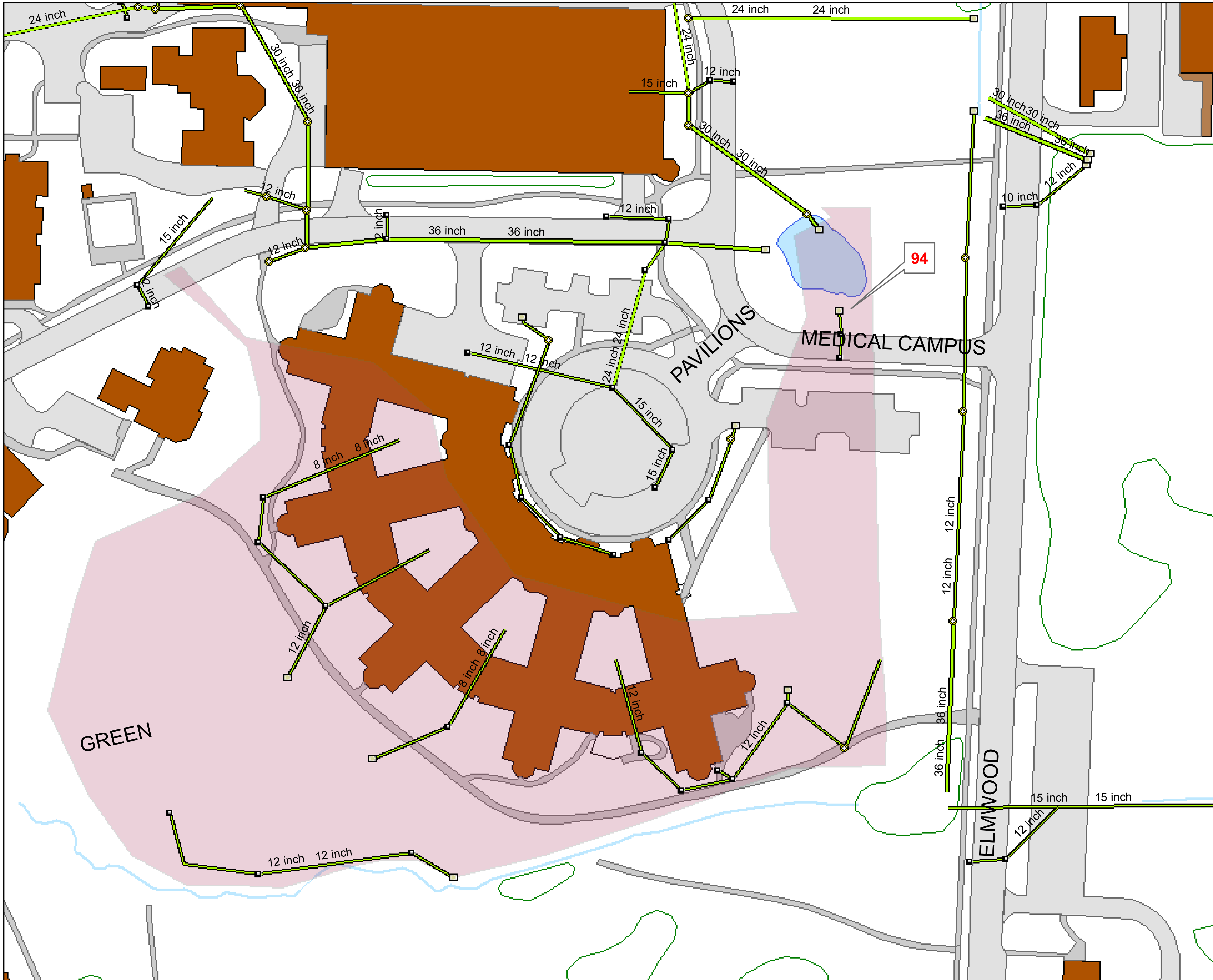
City of Traverse City Engineering Department
2007 Storm Water Management Report

Stormwater System: 152

FromMH	From Elev. (FT)	ToMH	To Elevation (FT)	SLOPE (%)	Length (FT)	Material	Diameter (IN)	Max Flow (CFS)
16020	601.42	16021	600.69	0.47	156.03	CONCRETE	10 inch	1.50
16021	600.69	16022	597.61	9.99	30.82	CONCRETE	10 inch	6.92
16022	597.61	16023	594.38	2.52	128.13	CONCRETE	10 inch	3.48
16023	594.38	16024	594.04	2.23	15.24	CONCRETE	10 inch	3.27
16024	594.04	16025	594.04	0.00	43.06	CONCRETE	10 inch	0.00
16025	594.04	16026	592.38	1.19	139.53	CONCRETE	10 inch	2.39
16026	592.38	16027	591.56	0.36	227.65	CONCRETE	12 inch	2.14
16027	591.37	16028	589.84	0.62	247.40	CONCRETE	12 inch	2.80
16028	589.84	16029	588.81	0.31	327.35	CONCRETE	18 inch	5.89
16029	588.81	16030	588.10	0.20	353.47	CONCRETE	24 inch	10.13

Stormwater System: 152

FromMH	From Elev. (FT)	ToMH	To Elevation (FT)	SLOPE (%)	Length (FT)	Material	Diameter (IN)	Max Flow (CFS)
16030	585.10	16031	585.10	0.00	20.43	CONCRETE	21 inch	0.00
16031	587.75	16032	584.18	1.57	227.26	CONCRETE	21 inch	19.85
16032	584.08	16033	581.09	1.41	211.33	CONCRETE	21 inch	18.84
16033	580.89	16034	579.81	0.50	214.76	CONCRETE	24 inch	16.03
16034	579.71	16035	579.26	0.74	61.18	CONCRETE	24 inch	19.39
16035	579.26	Outfall 152	578.68	0.38	130.28	CONCRETE	30 inch	25.14



Boundary I Outfall #94,

Legend
- Storm Manholes
- Catchbasins
- Outfalls
- Storm Reach

N
W E
S

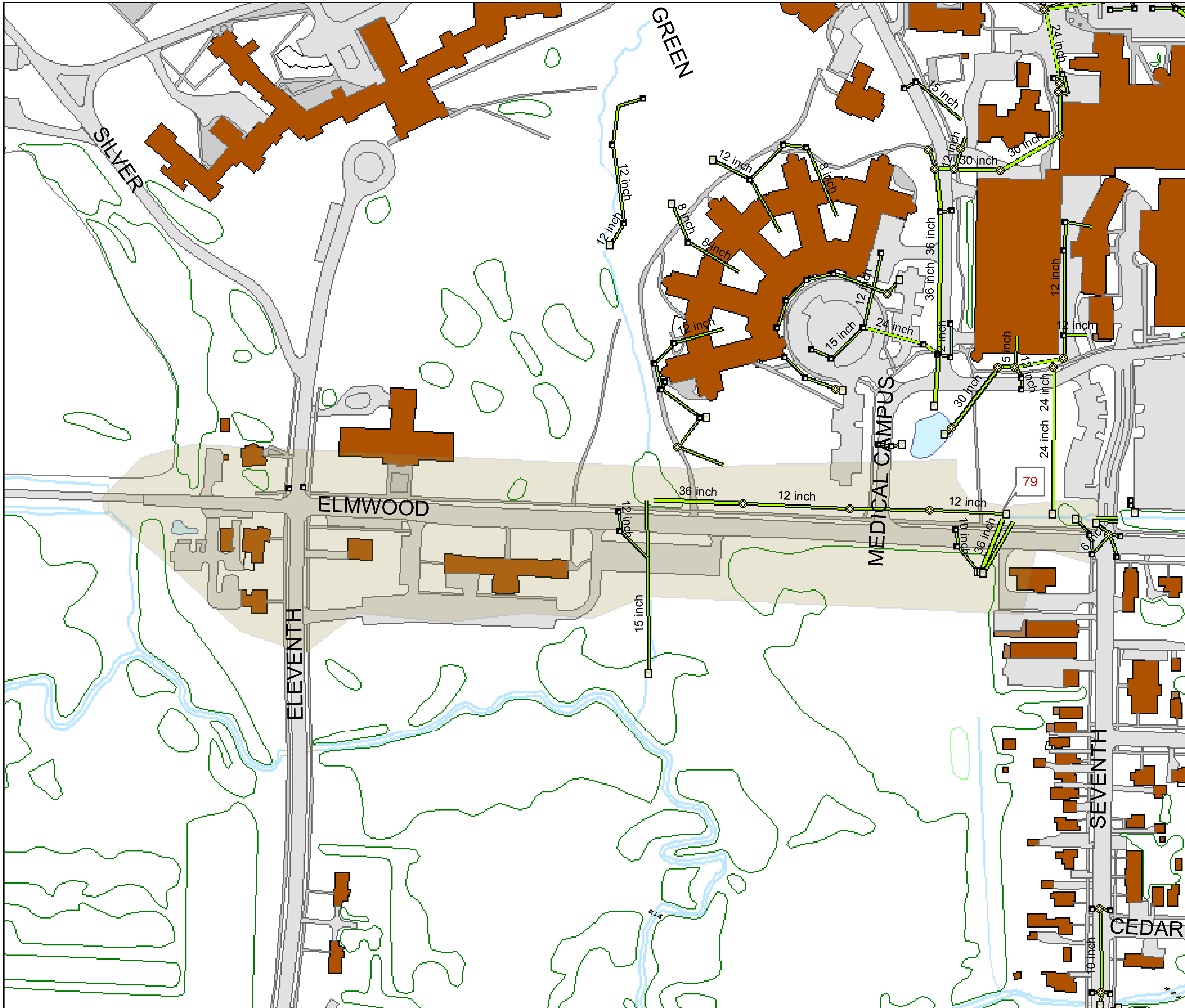
1 inch equals 100 feet

0 70 140 210 280 Feet

City of Traverse City Engineering Department
2007 Storm Water Management Report

Stormwater System: 94

FromMH	*From Elev. (FT)*	*ToMH*	*To Elevation (FT)*	*SLOPE (%)*	*Length (FT)*	*Material*	*Diameter (IN)*	*Max Flow (CFS)*
Catchbasin 1776	0.00	Catchbasin 1777	0.00	0.00	26.05	CONCRETE	12 inch	0.00
Catchbasin 1777	0.00	Outfall 94	0.00	0.00	23.41	CONCRETE	12 inch	0.00



Boundary J Outfall #79

Legend
- Storm Manholes
- Catchbasins
- Outfalls
- Storm Reach

W
S
N
E

1 inch equals 200 feet

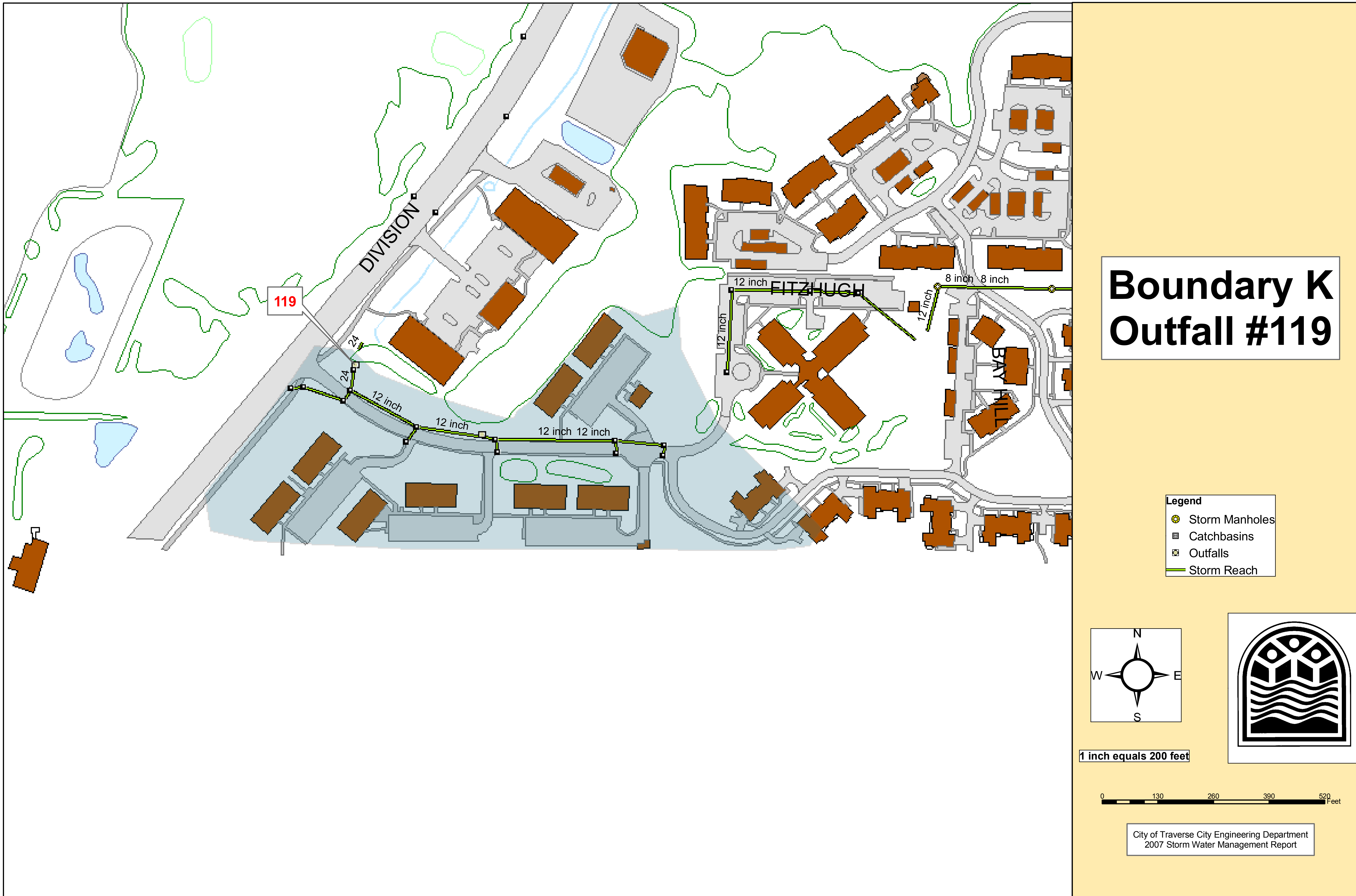
0 160 320 480 640 Feet

City of Traverse City Engineering Department
2007 Storm Water Management Report

Stormwater System: 79

FromMH	From Elev. (FT)	ToMH	To Elevation (FT)	SLOPE (%)	Length (FT)	Material	Diameter (IN)	Max Flow (CFS)
Open Channel	0.00	079001	0.00	0.00	192.42	VC	36 inch	0.00
079001	0.00	079002	0.00	0.00	223.89	VC	12 inch	0.00
079002	0.00	079003	0.00	0.00	164.26	VC	12 inch	0.00
079003	0.00	Outfall 79	0.00	0.00	156.15	VC	12 inch	0.00

Boundary K Outfall #119



City of Traverse City Engineering Department
2007 Storm Water Management Report

Stormwater System: 119

FromMH	From Elev. (FT)	ToMH	To Elevation (FT)	SLOPE (%)	Length (FT)	Material	Diameter (IN)	Max Flow (CFS)
Catchbasin 1891	679.20	Catchbasin 1722	673.40	5.01	115.66	CONCRETE	12 inch	7.97
Catchbasin 1722	673.40	Catchbasin 1889	652.20	7.56	280.25	CONCRETE	12 inch	9.79
Catchbasin 1889	0.00	Junction	0.00	0.00	23.59	CONCRETE	Unknown	0.00
Junction	652.20	Catchbasin 1887	635.50	10.39	160.70	CONCRETE	12 inch	11.48
Catchbasin 1887	635.50	Catchbasin 969	622.00	7.60	177.55	CONCRETE	12 inch	9.82
Catchbasin 969	0.00	Catchbasin 1721	0.00	0.00	48.93	CM	24 inch	0.00
Catchbasin 1721	0.00	Outfall 119	0.00	0.00	11.60	CM	24 inch	0.00

Boundary L Outfall #126

Legend

- Storm Manholes
- Catchbasins
- Outfalls
- Storm Reach

N
W E
S

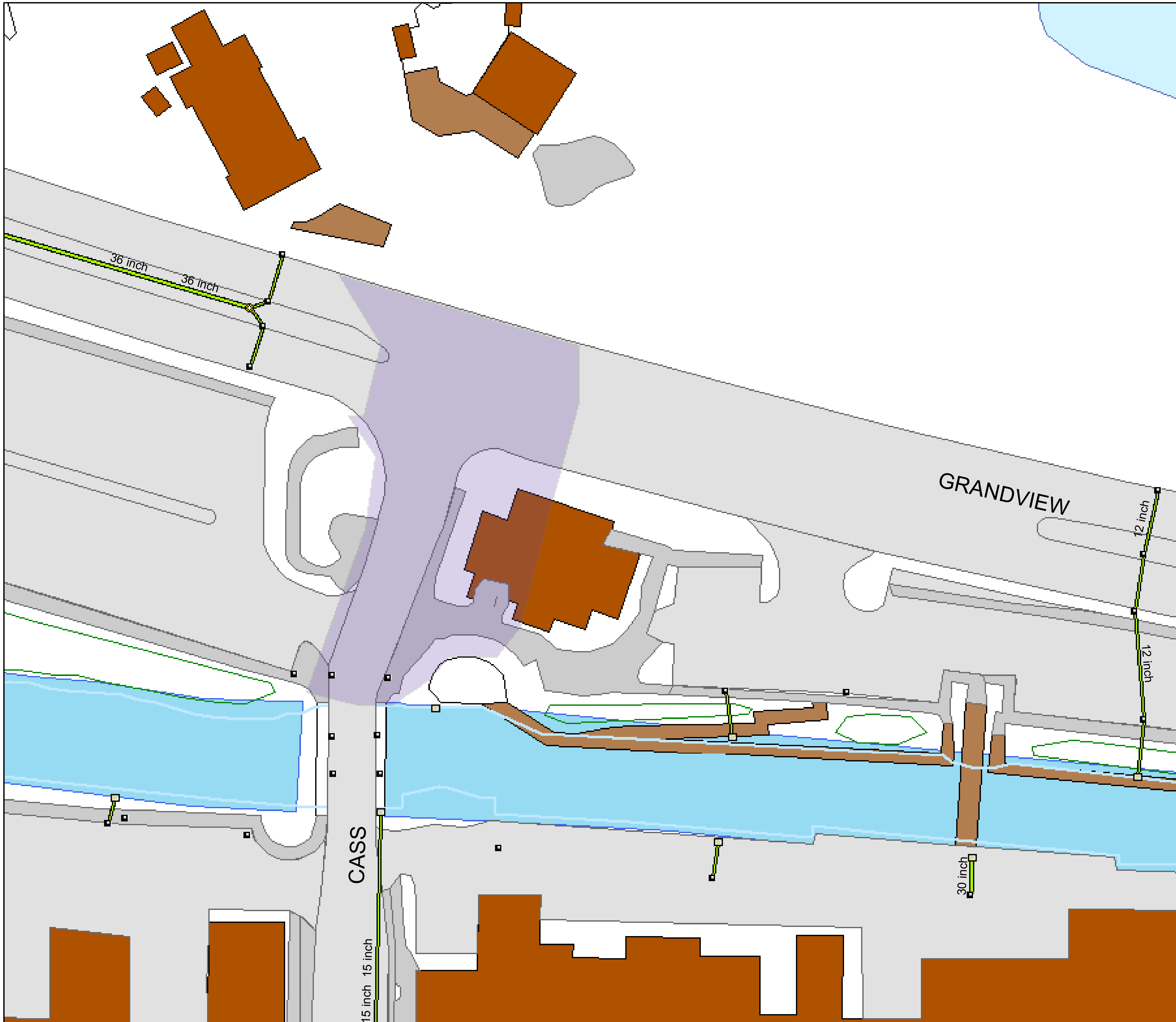
1 inch equals 100 feet

0 60 120 180 240 Feet

City of Traverse City Engineering Department
2007 Storm Water Management Report

Stormwater System: 126

FromMH	From Elev. (FT)	ToMH	To Elevation (FT)	SLOPE (%)	Length (FT)	Material	Diameter (IN)	Max Flow (CFS)
Catchbasin 1659	0.00	Outfall 126	0.00	0.00	57.43	UNKNOWN	Unknown	0.00



Boundary M Outfall #NONE

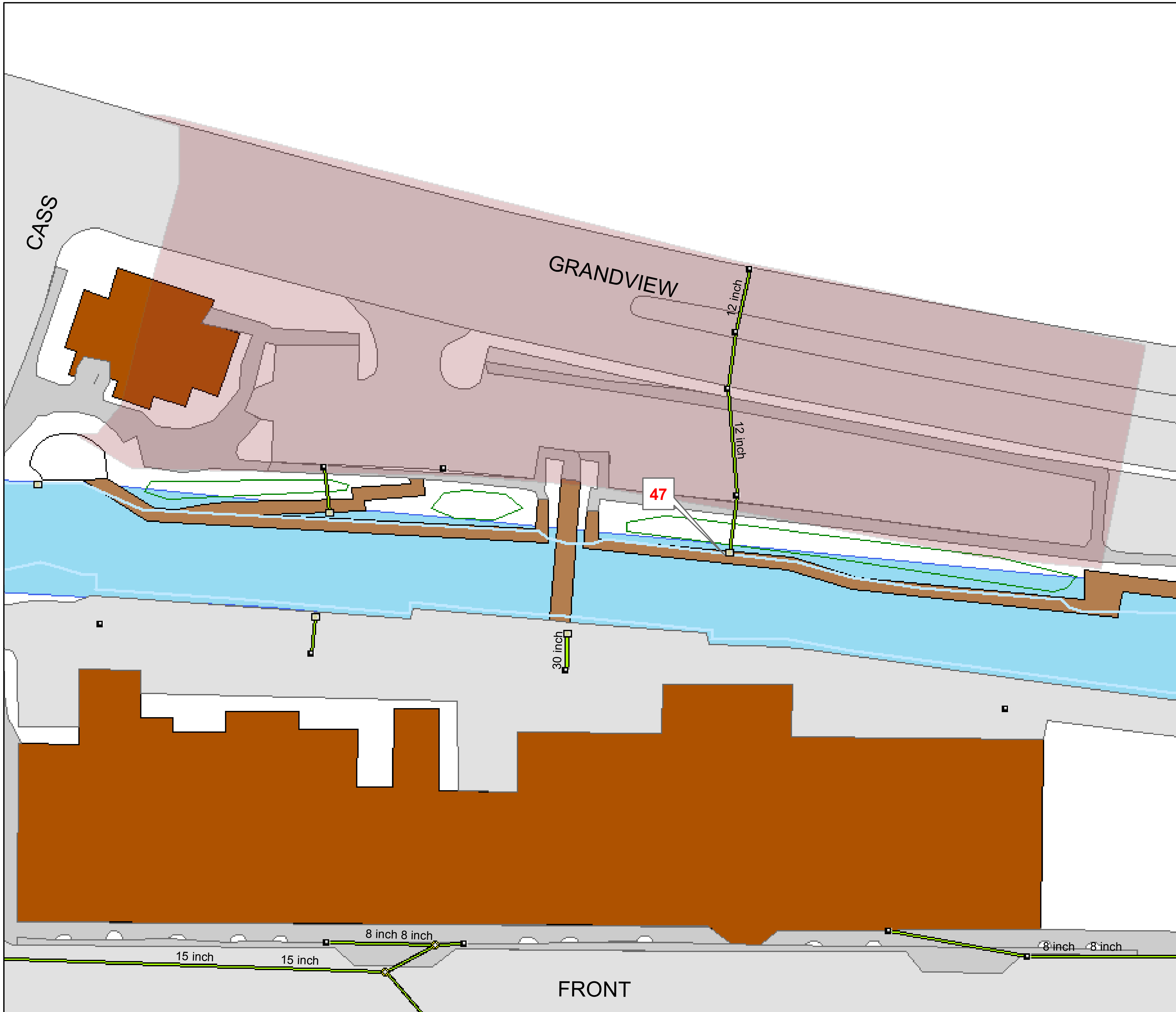
Legend
- Storm Manholes
- Catchbasins
- Outfalls
- Storm Reach

N
W E
S

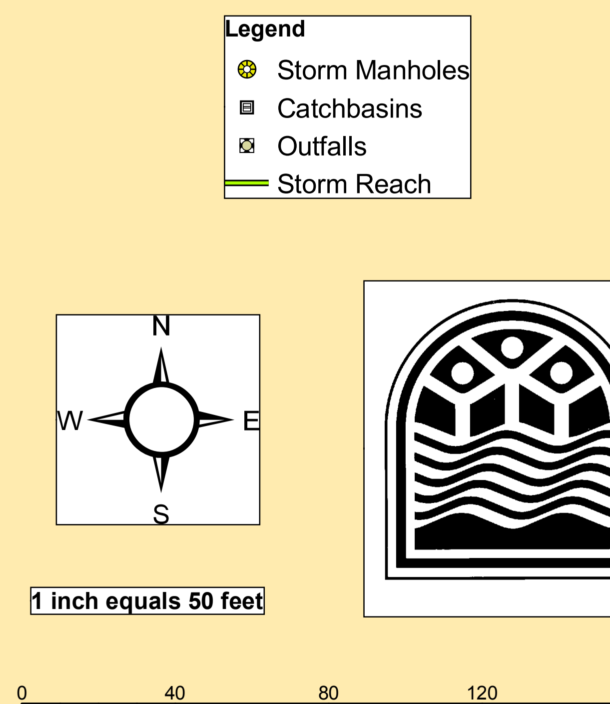
1 inch equals 50 feet

0 40 80 120 160 Feet

City of Traverse City Engineering Department
2007 Storm Water Management Report



Boundary N Outfall #47



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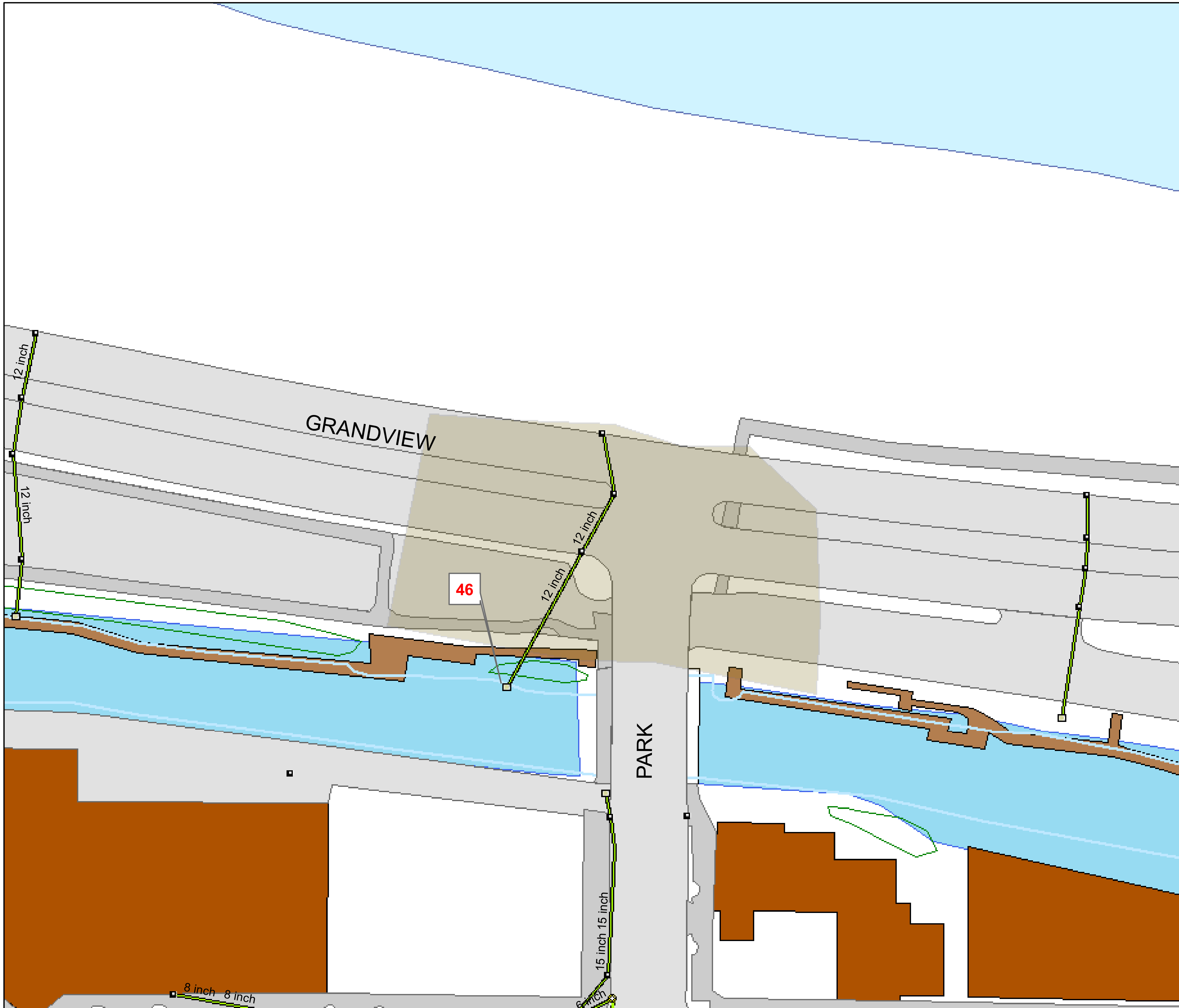
2007 Storm Water Management Report

Stormwater System: 47

FromMH	From Elev. (FT)	ToMH	To Elevation (FT)	SLOPE (%)	Length (FT)	Material	Diameter (IN)	Max Flow (CFS)
Catchbasin 1509	0.00	Catchbasin 1510	0.00	0.00	37.75	CONCRETE	12 inch	0.00
Catchbasin 1510	0.00	Catchbasin 1511	0.00	0.00	24.69	CONCRETE	12 inch	0.00
Catchbasin 1511	0.00	Catchbasin 2570	0.00	0.00	12.61	CONCRETE	12 inch	0.00
Catchbasin 2570	0.00	047001	0.00	0.00	32.15	CONCRETE	12 inch	0.00
047001	0.00	047002	0.00	0.00	13.41	CONCRETE	12 inch	0.00
047002	0.00	Outfall 47	0.00	0.00	30.02	CONCRETE	12 inch	0.00



Boundary P
Outfall #46

Legend
- Storm Manholes
- Catchbasins
- Outfalls
- Storm Reach

N
W E
S

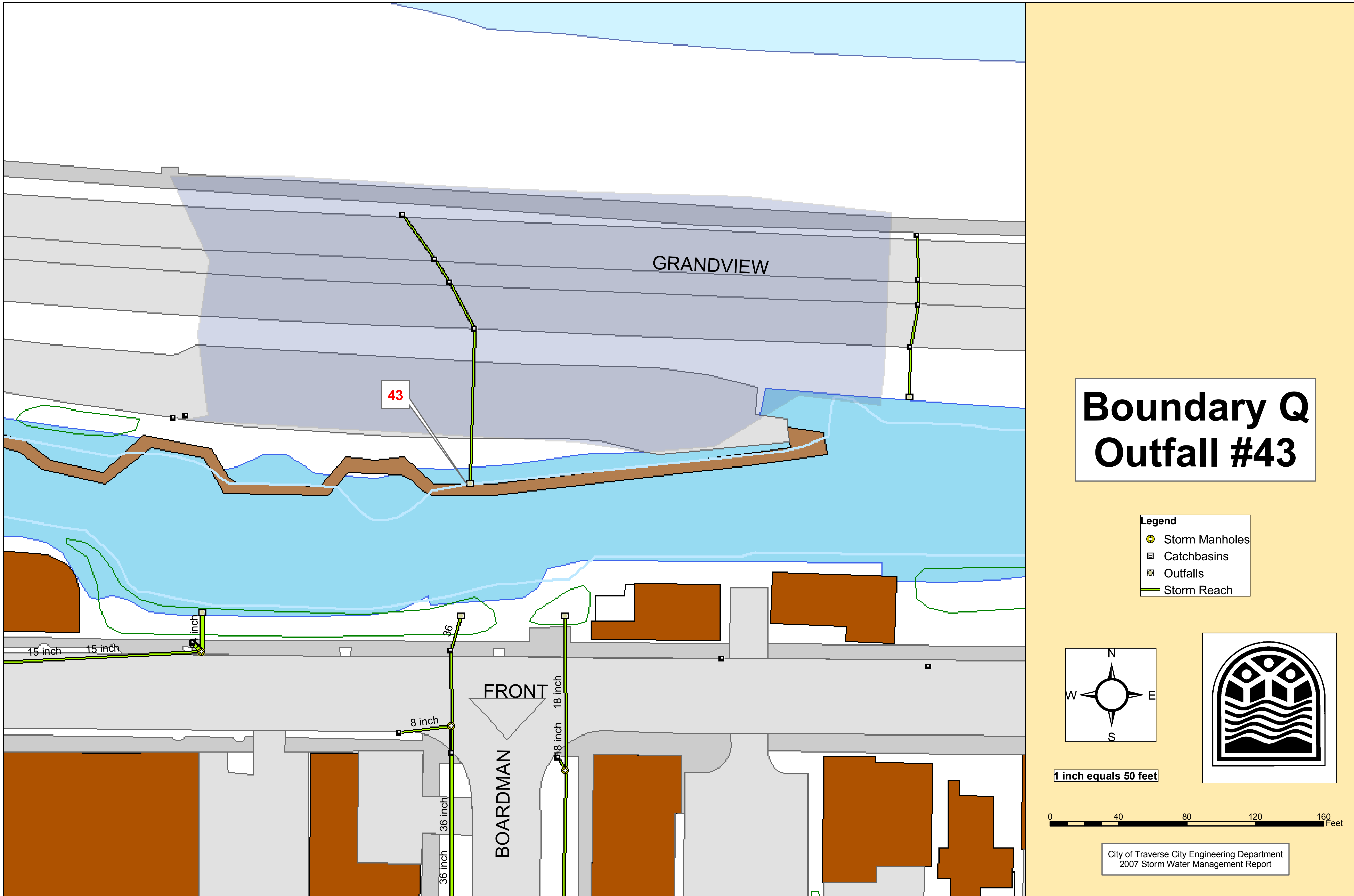
1 inch equals 50 feet

0 40 80 120 160 Feet

City of Traverse City Engineering Department
2007 Storm Water Management Report

Stormwater System: 46

FromMH	*From Elev. (FT)*	*ToMH*	*To Elevation (FT)*	*SLOPE (%)*	*Length (FT)*	*Material*	*Diameter (IN)*	*Max Flow (CFS)*
Catchbasin 1506	0.00	Catchbasin 1507	0.00	0.00	31.40	CONCRETE	12 inch	0.00
Catchbasin 1507	0.00	Catchbasin 1508	0.00	0.00	34.34	CONCRETE	12 inch	0.00
Catchbasin 1508	0.00	Outfall 46	0.00	0.00	81.00	CONCRETE	12 inch	0.00



Boundary Q
Outfall #43

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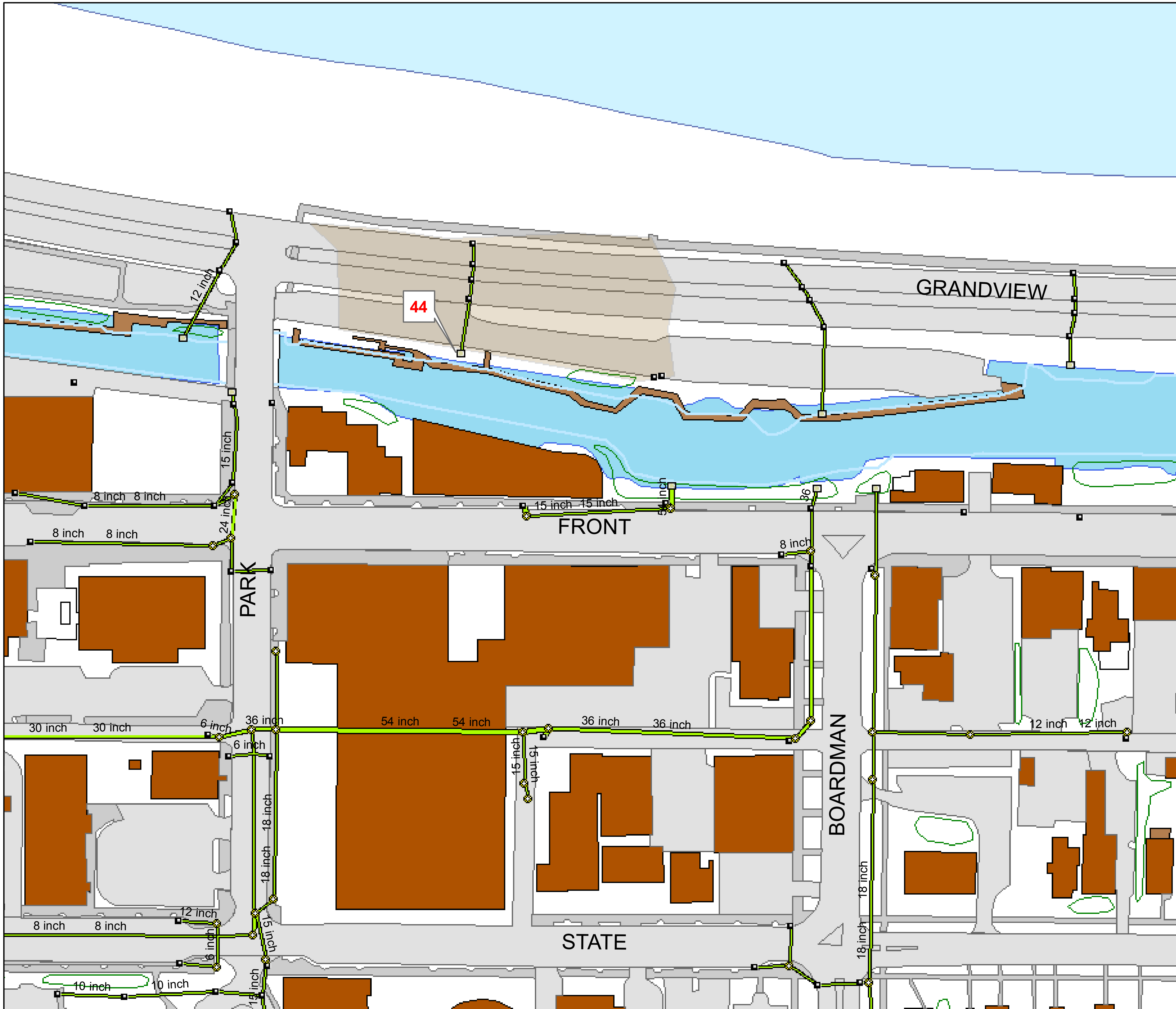
2007 Storm Water Management Report

Stormwater System: 43

FromMH	*From Elev. (FT)*	*ToMH*	*To Elevation (FT)*	*SLOPE (%)*	*Length (FT)*	*Material*	*Diameter (IN)*	*Max Flow (CFS)*
Catchbasin 1498	0.00	Catchbasin 1499	0.00	0.00	32.33	CONCRETE	Unknown	0.00
Catchbasin 1499	0.00	Catchbasin 1500	0.00	0.00	15.80	CONCRETE	Unknown	0.00
Catchbasin 1500	0.00	Catchbasin 1501	0.00	0.00	30.58	CONCRETE	Unknown	0.00
Catchbasin 1501	0.00	Outfall 43	0.00	0.00	91.05	CONCRETE	Unknown	0.00



Boundary R Outfall #44

Legend

- Storm Manholes
- Catchbasins
- Outfalls
- Storm Reach

N
W E
S

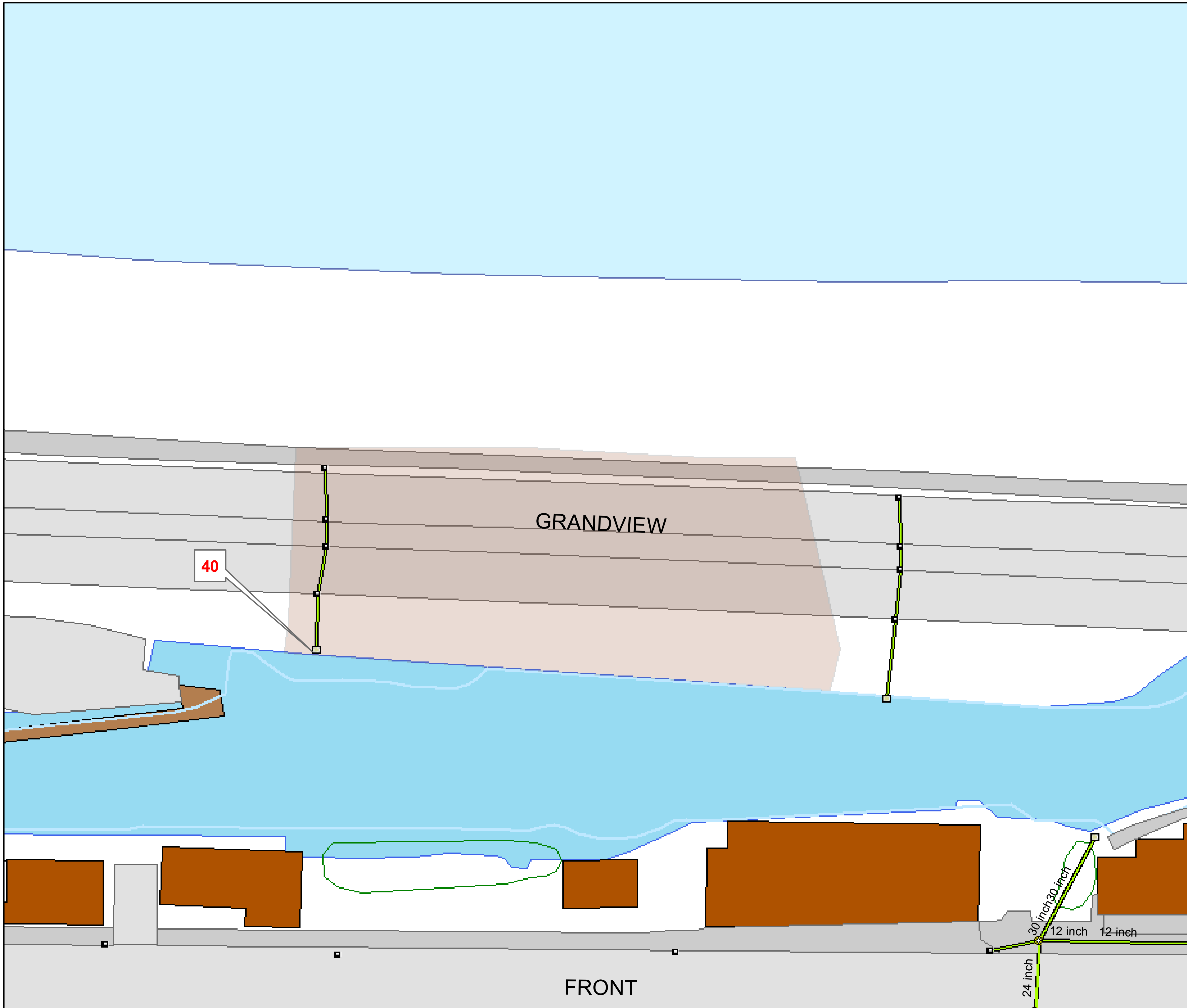
1 inch equals 100 feet

0 80 160 240 320 Feet

City of Traverse City Engineering Department
2007 Storm Water Management Report

Stormwater System: 44

FromMH	From Elev. (FT)	ToMH	To Elevation (FT)	SLOPE (%)	Length (FT)	Material	Diameter (IN)	Max Flow (CFS)
Catchbasin 1502	0.00	Catchbasin 1503	0.00	0.00	21.75	CONCRETE	Unknown	0.00
Catchbasin 1503	0.00	Catchbasin 1504	0.00	0.00	15.83	CONCRETE	Unknown	0.00
Catchbasin 1504	0.00	Catchbasin 1505	0.00	0.00	20.66	CONCRETE	Unknown	0.00
Catchbasin 1505	0.00	Outfall 44	0.00	0.00	58.55	CONCRETE	Unknown	0.00



Boundary S Outfall #40

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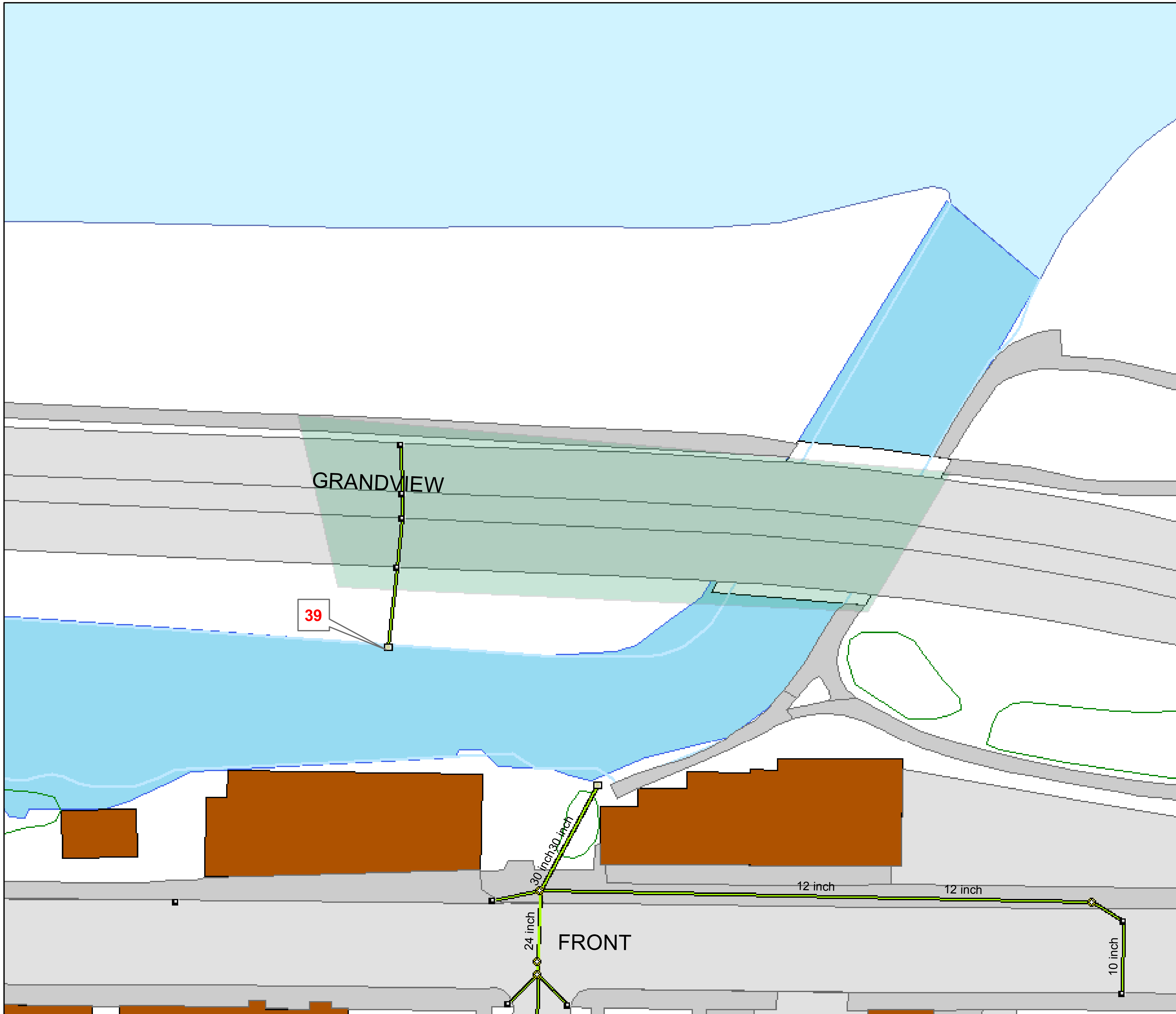
2007 Storm Water Management Report

Stormwater System: 40

FromMH	From Elev. (FT)	ToMH	To Elevation (FT)	SLOPE (%)	Length (FT)	Material	Diameter (IN)	Max Flow (CFS)
Catchbasin 1494	0.00	Catchbasin 1495	0.00	0.00	26.51	CONCRETE	Unknown	0.00
Catchbasin 1495	0.00	Catchbasin 1496	0.00	0.00	14.28	CONCRETE	Unknown	0.00
Catchbasin 1496	0.00	Catchbasin 1497	0.00	0.00	24.95	CONCRETE	Unknown	0.00
Catchbasin 1497	0.00	Outfall 40	0.00	0.00	29.49	CONCRETE	Unknown	0.00



Boundary T Outfall #39

Legend
- Storm Manholes
- Catchbasins
- Outfalls
- Storm Reach

N
W E
S

1 inch equals 50 feet

0 40 80 120 160 Feet

City of Traverse City Engineering Department
2007 Storm Water Management Report

Stormwater System: 39

FromMH	From Elev. (FT)	ToMH	To Elevation (FT)	SLOPE (%)	Length (FT)	Material	Diameter (IN)	Max Flow (CFS)
Catchbasin 1490	0.00	Catchbasin 1491	0.00	0.00	25.60	CONCRETE	Unknown	0.00
Catchbasin 1491	0.00	Catchbasin 1492	0.00	0.00	12.37	UNKNOWN	Unknown	0.00
Catchbasin 1492	0.00	Catchbasin 1493	0.00	0.00	25.49	CONCRETE	Unknown	0.00
Catchbasin 1493	0.00	Outfall 39	0.00	0.00	41.89	CONCRETE	Unknown	0.00

Boundary V Outfall #67, 68

Legend
- Storm Manholes
- Catchbasins
- Outfalls
- Storm Reach

N
W
E
S

1 inch equals 50 feet

0 40 80 120 160 Feet

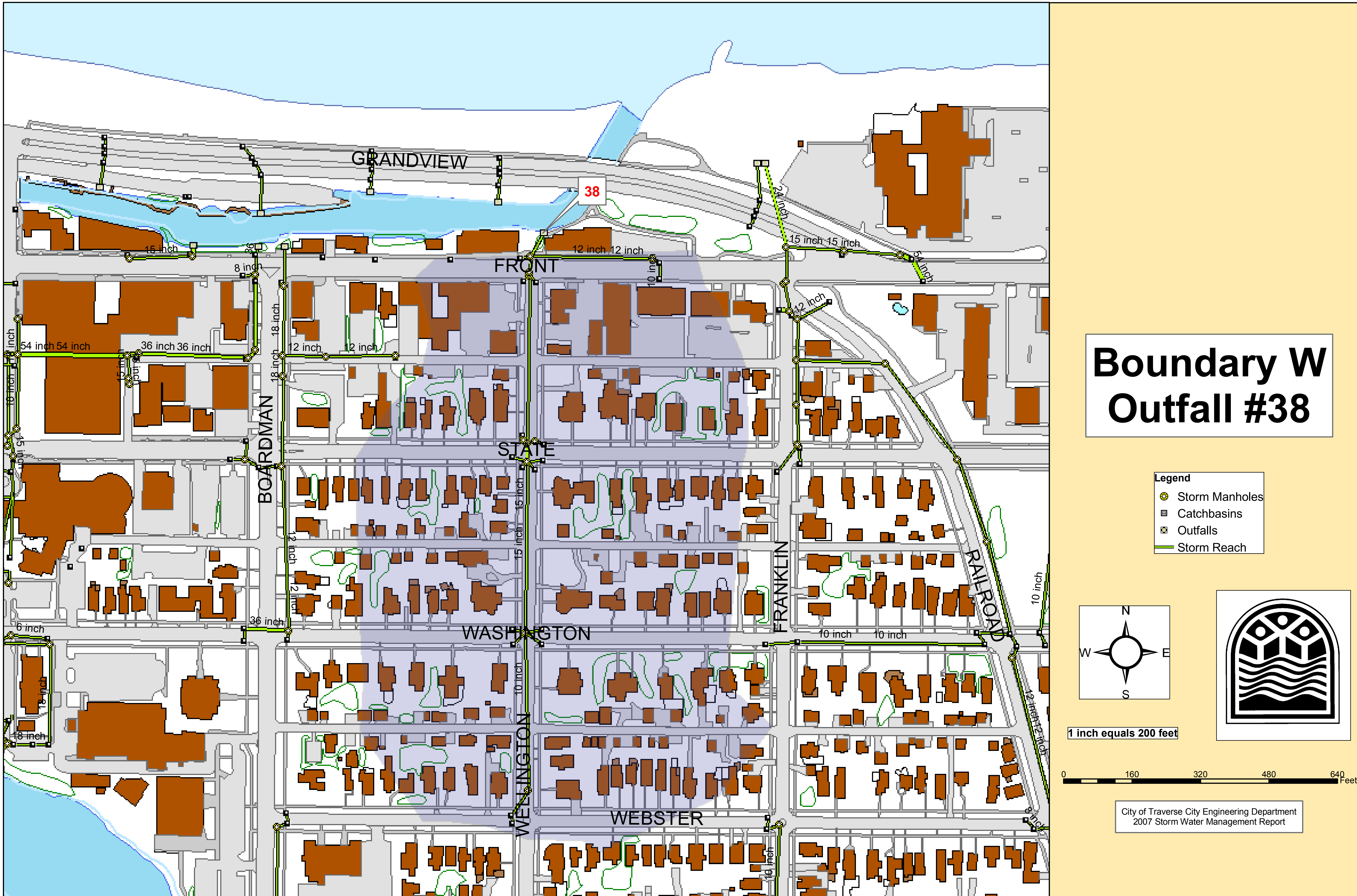
City of Traverse City Engineering Department
2007 Storm Water Management Report

Stormwater System: 67

FromMH	From Elev. (FT)	ToMH	To Elevation (FT)	SLOPE (%)	Length (FT)	Material	Diameter (IN)	Max Flow (CFS)
Junction	591.48	Outfall 67	0.00	0.00	43.81	CONCRETE	10 inch	0.00
Junction	592.00	067001	591.48	0.40	130.92	CONCRETE	10 inch	1.38

Stormwater System: 68

FromMH	From Elev. (FT)	ToMH	To Elevation (FT)	SLOPE (%)	Length (FT)	Material	Diameter (IN)	Max Flow (CFS)
068001	0.00	Junction	0.00	0.00	14.12	CONCRETE	8 inch	0.00
Junction	0.00	068002	0.00	0.00	13.08	CONCRETE	8 inch	0.00
068002	599.71	068003	594.57	3.39	151.75	VC	8 inch	1.56
068003	594.57	Catchbasin 1991	594.40	0.36	45.30	CONCRETE	8 inch	0.50
Catchbasin 1991	594.57	Outfall 68	590.34	12.07	55.47	CONCRETE	8 inch	2.94


Boundary W
Outfall #38
GRANDVIEW
FRONT
STATE
WASHINGTON
WEBSTER
BOARDMAN
WELLINGTON
FRANKLIN
RAILROAD
38
15 inch
12 inch 12 inch
10 inch
24 inch
15 inch 15 inch
54 inch
12 inch
8 inch
54 inch 54 inch
36 inch 36 inch
18 inch
12 inch
15 inch
6 inch
36 inch
10 inch 10 inch
12 inch 12 inch
8 inch
Legend
Storm Manholes
Catchbasins
Outfalls
Storm Reach
N
W
E
S
1 inch equals 200 feet
0
160
320
480
640
Feet
City of Traverse City Engineering Department
2007 Storm Water Management Report

Stormwater System: 38

FromMH	From Elev. (FT)	ToMH	To Elevation (FT)	SLOPE (%)	Length (FT)	Material	Diameter (IN)	Max Flow (CFS)
038001	0.00	Junction	0.00	0.00	297.05	CONCRETE	10 inch	0.00
Junction	0.00	Junction	0.00	0.00	15.00	PVC	10 inch	0.00
Junction	0.00	038002	0.00	0.00	56.41	CONCRETE	10 inch	0.00
038002	0.00	038003	0.00	0.00	400.82	CONCRETE	15 inch	0.00
038003	0.00	038004	0.00	0.00	42.13	CONCRETE	21 inch	0.00
038004	594.73	038005	593.00	0.44	392.48	CONCRETE	Unknown	0.00
038005	584.65	038006	584.61	0.59	6.80	CONCRETE	24 inch	17.35
038006	582.08	038007	0.00	0.00	36.81	UNKNOWN	24 inch	0.00
038007	0.00	Outfall 38	0.00	0.00	60.71	UNKNOWN	30 inch	0.00

Boundary X
Outfall #55

Legend
- Storm Manholes
- Catchbasins
- Outfalls
- Storm Reach

N
W E
S

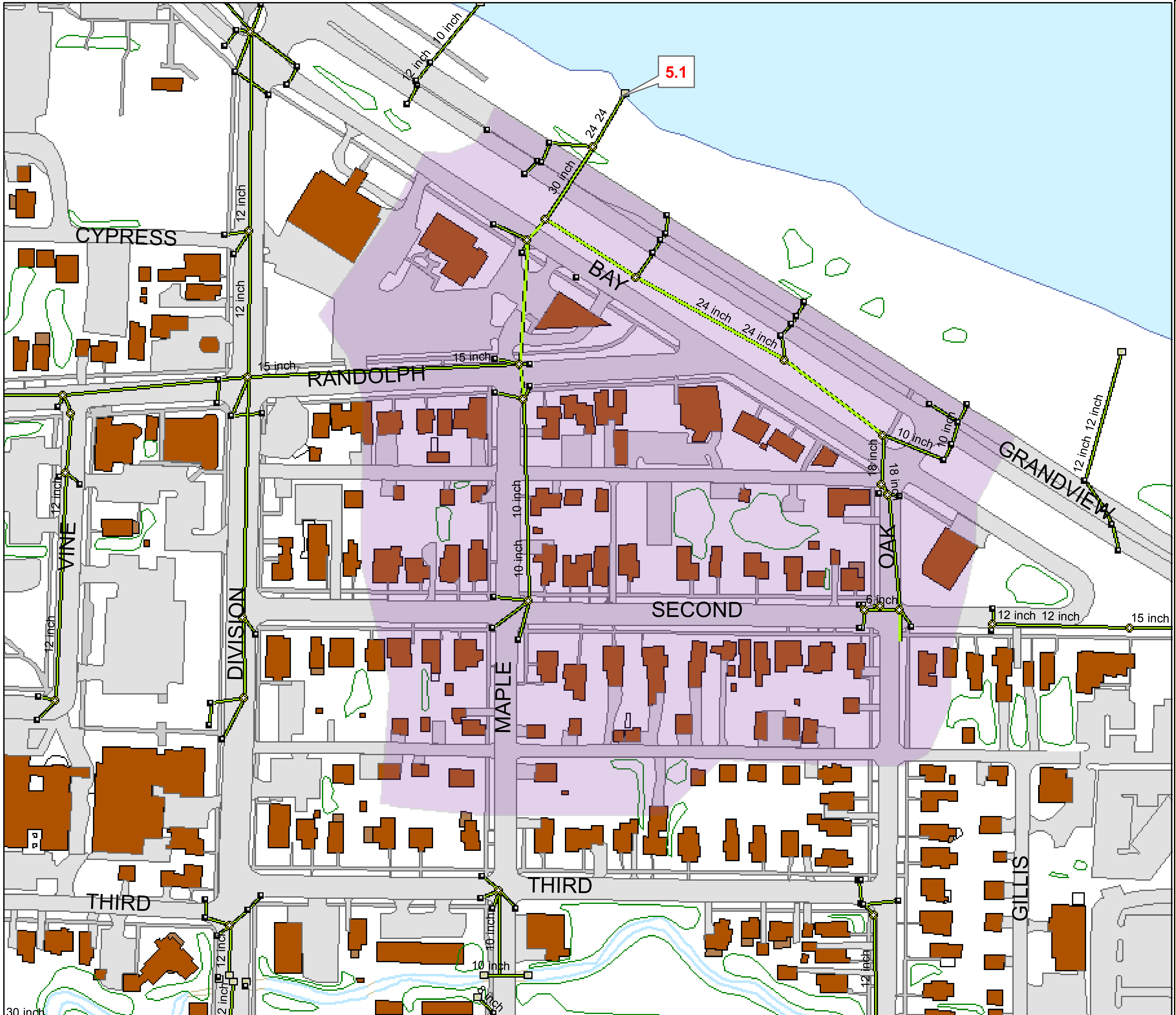
1 inch equals 50 feet

0 40 80 120 160 Feet

City of Traverse City Engineering Department
2007 Storm Water Management Report

Stormwater System: 55

FromMH	From Elev. (FT)	ToMH	To Elevation (FT)	SLOPE (%)	Length (FT)	Material	Diameter (IN)	Max Flow (CFS)
055001	587.90	Catchbasin 103	0.00	0.00	52.86	CONCRETE	Unknown	0.00
Catchbasin 103	0.00	Catchbasin 104	586.02	0.00	44.98	CONCRETE	10 inch	0.00
Catchbasin 104	585.52	Catchbasin 1484	585.26	0.30	87.34	CONCRETE	10 inch	1.19
Catchbasin 1484	584.76	Catchbasin 1766	584.55	0.31	68.66	CONCRETE	10 inch	1.21
Catchbasin 1766	0.00	055002	0.00	0.00	5.76	CONCRETE	10 inch	0.00
055002	584.55	055003	582.52	4.84	41.95	CONCRETE	10 inch	4.82
055003	582.52	Outfall 55	580.84	9.50	17.68	CONCRETE	10 inch	6.75



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Southwesterly

Boundary Z Outfall #5.1

Legend
- Storm Manholes
- Catchbasins
- Outfalls
- Storm Reach

N
W E
S

1 inch equals 150 feet

0 120 240 360 480 Feet

City of Traverse City Engineering Department
2007 Storm Water Management Report

Stormwater System: 5.1

FromMH	From Elev. (FT)	ToMH	To Elevation (FT)	SLOPE (%)	Length (FT)	Material	Diameter (IN)	Max Flow (CFS)
005003	584.18	005016	583.10	0.25	419.48	VC	15 inch	3.23
005016	583.10	005017	581.39	0.92	192.96	CM	24 inch	21.69
005017	581.59	005018	580.65	2.08	42.47	CM	24 inch	32.61
005018	580.65	005019	579.03	1.20	135.06	CM	30 inch	44.91
005019	0.00	Outfall 5.1	0.00	0.00	93.17	CM	24 inch	0.00

The City of Traverse City
Storm Outlet Evaluation

Project No. ______________________ **File:** ______________________

Description: ______________________ **Field Work by:** LL + CB **Date:** 5/?/06

Drainage Systems: Z **Checked by:** ______________ **Date:** ________

Available Information: #51

Plans: ☒ Yes ☐ No **Year Built:** ______________

Plan Reference #: Flat File C-D **Year Modified:** ______________

Easement: ☒ Yes 35C 23D ☐ No **Pipe Size:** 36"

Outlet Water Course: Bay

Field Investigation: #51

Outlet Pipe Size: 36" **Pipe Type:** ☐ Concrete ☒ CMP ☐ Plastic ☐ Other: ______________

Outlet Submerged: ☐ Yes ☐ No ☒ Partial Depth: 14" Sediment Depth: 7"

Deposits: ☒ Yes Type: rust/sand ☐ No

End Treatment: ☒ Yes Type: large rock ☐ No

Amount of Pipe Exposed: 4'

Slope Protection: ☒ Yes Type: ☒ Rip Rap ☐ Pave Spillway ☐ No ☐ Armor Stone ☐ Cobble ☐ Other: ______________

Scour: ☐ Yes Depth: ______________ ☒ No

High Water Mark/Watercourse: Bay

Depth from Invert: 30" **High Watermark Pipe:** 30"

Evidence of Flooding: ☐ Yes ☒ No

Photographs: ☒ Yes ☐ No Numbers: 14

Comments: pipe not circular any more + rust out w/ holes and/ rip rap covering 56' of pipe