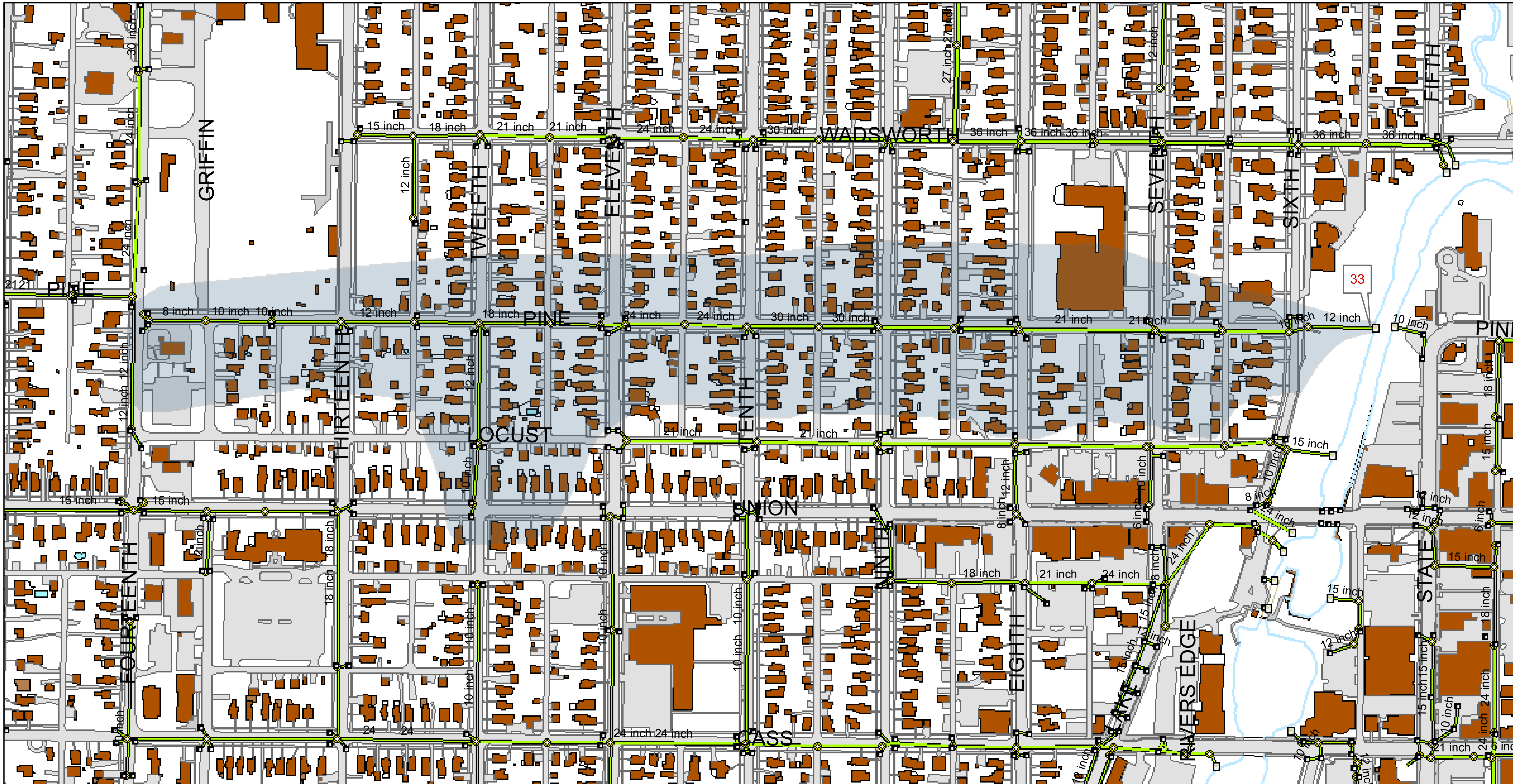

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Westerly

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Southerly

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Southerly

W S N E

1 inch equals 300 feet

0 210 420 630 840 Feet

Legend

- Storm Manholes
- Catchbasins
- Outfalls
- Storm Reach

Boundary A Outfall #33

City of Traverse City Engineering Department
2007 Storm Water Management Report

Stormwater System: 33

FromMH	From Elev. (FT)	ToMH	To Elevation (FT)	SLOPE (%)	Length (FT)	Material	Diameter (IN)	Max Flow (CFS)
033002	610.40	033003	609.80	0.34	178.59	UNKNOWN	8 inch	0.49
033003	609.80	033004	609.10	0.33	208.99	CONCRETE	10 inch	1.27
033004	609.10	033005	608.29	0.37	219.35	CONCRETE	10 inch	1.33
033005	608.29	033006	607.50	0.34	232.23	CONCRETE	12 inch	2.08
033006	607.50	033007	606.84	0.32	203.20	CONCRETE	12 inch	2.03
033007	608.84	033008	606.40	1.07	227.22	CONCRETE	18 inch	10.88
033008	606.43	033009	606.10	0.21	157.25	CONCRETE	18 inch	4.81
033009	606.10	033010	605.92	0.23	79.76	CONCRETE	24 inch	10.74
033010	605.92	033011	605.60	0.17	185.62	CONCRETE	24 inch	9.39
033011	605.60	033012	605.33	0.14	198.91	CONCRETE	24 inch	8.33

Stormwater System: 33

FromMH	From Elev. (FT)	ToMH	To Elevation (FT)	SLOPE (%)	Length (FT)	Material	Diameter (IN)	Max Flow (CFS)
033012	605.33	033013	605.00	0.15	226.98	CONCRETE	30 inch	15.63
033013	605.00	033014	604.68	0.17	185.77	CONCRETE	30 inch	17.01
033014	604.68	033015	604.32	0.15	243.05	CONCRETE	30 inch	15.78
033015	604.32	033016	603.96	0.18	202.68	CONCRETE	30 inch	17.28
033016	603.82	033017	602.83	0.23	430.53	CONCRETE	21 inch	7.59
033017	602.83	033018	602.12	0.33	213.89	CONCRETE	21 inch	9.12
033018	602.12	033019	600.99	0.61	212.97	CONCRETE	21 inch	12.33
033019	601.08	033020	597.77	5.44	61.26	CONCRETE	18 inch	24.48
033020	597.72	033023	595.22	6.41	39.00	UNKNOWN	Unknown	0.00
033023	0.00	Junction	595.38	28.00	10.85	ADS	15 inch	34.16
Junction	0.00	033024	593.85	28.00	15.06	ADS	15 inch	34.16

Stormwater System: 33

FromMH	From Elev. (FT)	ToMH	To Elevation (FT)	SLOPE (%)	Length (FT)	Material	Diameter (IN)	Max Flow (CFS)
033024	592.10	Outfall 33	581.00	7.05	157.52	UNKNOWN	24 inch	60.04

The City of Traverse City
Storm Outlet Evaluation

Project No. ______ File: ______
Description: ______ Field Work by: LL + CB + TL Date: 4/26/06
Drainage Systems: A Checked by: ______ Date: ______

Available Information: #33 (Pine)
Plans: X Yes ☐ No Year Built: 1941
Plan Reference #: Storm Plans 4-2 + Flat file Year Modified: ______
Easement: X Yes ☐ No City Park (Hannah)
Outlet Water Course: 18" to Boardman River at 4.2%

Field Investigation:
Outlet Pipe Size: 30" Pipe Type: ☐ Concrete X CMP ☐ Plastic ☐ Other: ______
Outlet Submerged: ☐ Yes X No ☐ Partial Depth: ______
End Treatment: ☐ Yes Type: ______ X No

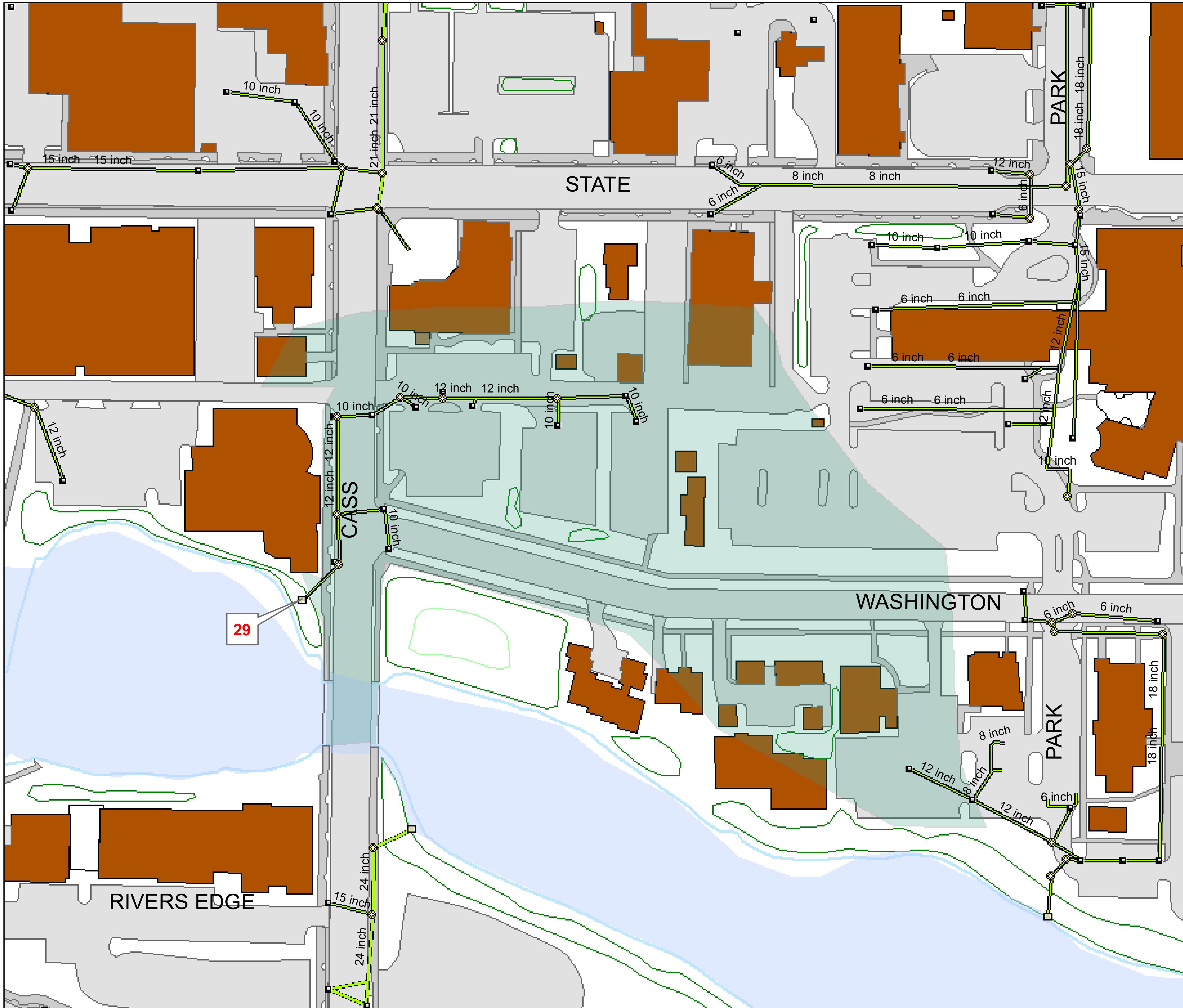
Slope Protection: ☐ Yes Type: ☐ Rip Rap ☐ Pave Spillway ☐ Armor Stone ☐ Cobble ☐ Other: ______ X No

Scour: ☐ Yes Depth: ______ X No
High Water Mark: on pipe for river 1/3 up pipe in pipe 3"
Depth from Invert: 3"

Evidence of Flooding: ☐ Yes X No
Photographs: X Yes ☐ No 5/11/06 #5 4/26/06 5-7
Comments: Pipe separated from concrete
bottom of pipe gone so ⟷ carved out under pipe
20' of pipe from concrete

5/11/06 Storm event – milky brown water flow

Boundary AA Outfall #29



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: 29

FromMH	From Elev. (FT)	ToMH	To Elevation (FT)	SLOPE (%)	Length (FT)	Material	Diameter (IN)	Max Flow (CFS)
Catchbasin 1957	597.48	029001	597.35	0.19	69.75	CONCRETE	12 inch	1.54
029001	597.35	Junction	597.14	0.25	85.37	CONCRETE	12 inch	1.77
Junction	597.35	029002	597.14	0.61	34.24	CONCRETE	12 inch	2.79
029002	597.14	029003	597.06	0.18	43.34	CONCRETE	12 inch	1.53
029003	597.06	Catchbasin 790	596.44	1.79	34.65	CONCRETE	12 inch	4.76
Catchbasin 790	596.44	029004	594.94	4.13	36.35	CONCRETE	10 inch	4.45
029004	594.82	029005	594.40	0.41	101.78	CONCRETE	12 inch	2.29
029005	594.40	029006	593.94	0.88	52.28	CONCRETE	12 inch	3.34
029006	593.94	Outfall 29	593.52	0.79	53.16	CONCRETE	12 inch	3.17

The City of Traverse City
Storm Outlet Evaluation

Project No. ______ File: ______

Description: ______ Field Work by: ______ Date: 5/16/06

Drainage Systems: AA Checked by: CB Date: ______

Available Information: #29

Plans: ☒ Yes ☐ No

Year Built: 1953

Plan Reference #: Storm #26-3

Year Modified: ______

Easement: ☐ Yes ☐ No

Pipe Size: 12"

Outlet Water Course: Boardman River

Field Investigation: #29

Outlet Pipe Size: 12"

Pipe Type: ☒ Concrete ☐ CMP ☐ Plastic ☐ Other: ______ ☐ Partial Depth: ______

Sediment Depth: ______

Outlet Submerged: ☐ Yes ☒ No

Deposits: ☒ Yes Type: Silt ☐ No

End Treatment: ☐ Yes Type: ______ ☒ No

Amount of Pipe Exposed: 14"

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

Scour: ☐ Yes Depth: ______ ☒ No

High Water Mark/Watercourse: 1'

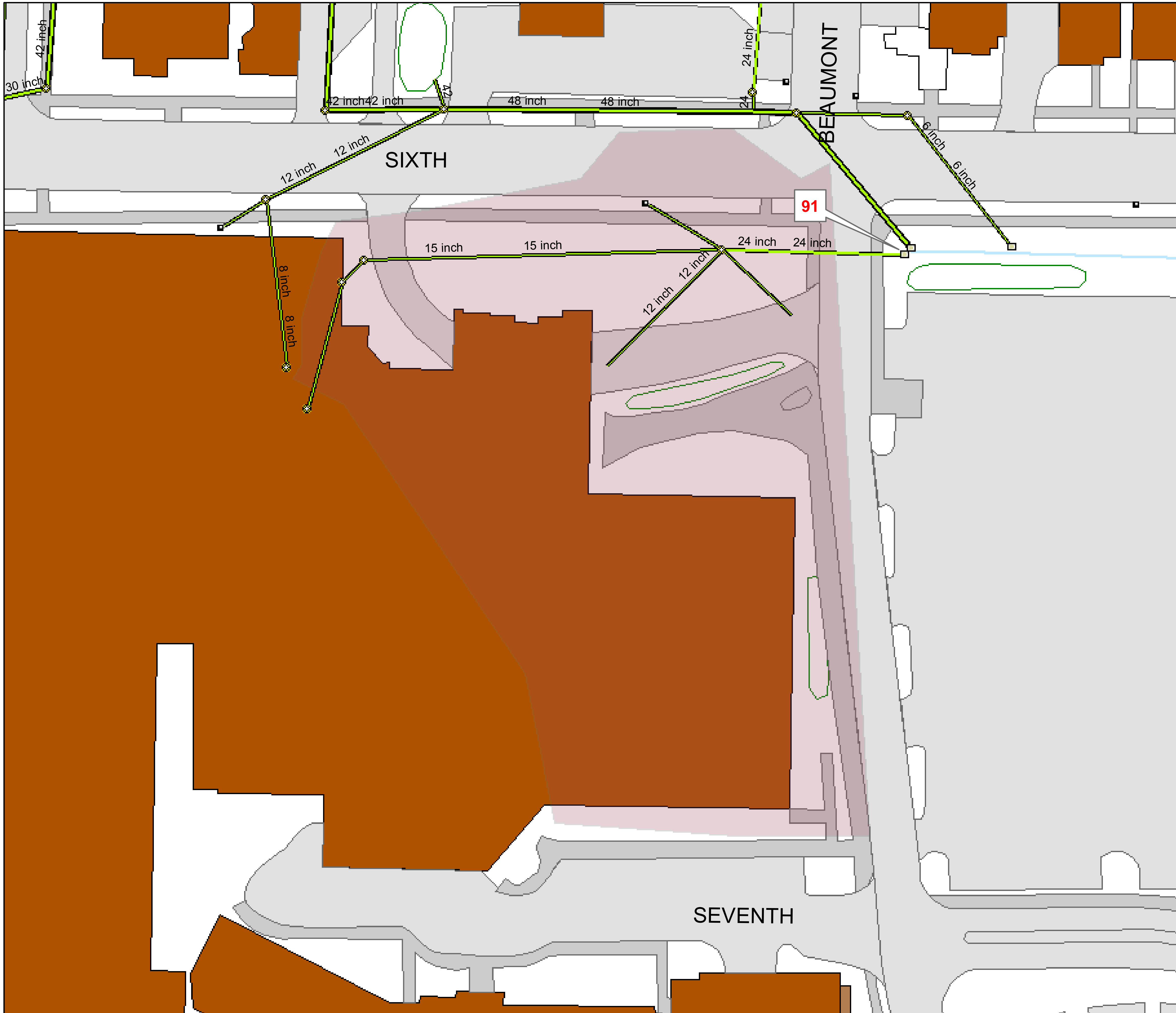
Depth from Invert: 10"

High Watermark Pipe: 0

Evidence of Flooding: ☐ Yes ☒ No

Photographs: ☒ Yes ☐ No Numbers: 100-2445

Comments: tons of cigarette butts



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05-04-06\05-04-06003.jpg

Westerly

Boundary AB
Outfall #91

Legend

- Storm Manholes
- Catchbasins
- Outfalls
- Storm Reach

N
W E
S

1 inch equals 50 feet

0 30 60 90 120
Feet

City of Traverse City Engineering Department
2007 Storm Water Management Report

Stormwater System: 91

FromMH	From Elev. (FT)	ToMH	To Elevation (FT)	SLOPE (%)	Length (FT)	Material	Diameter (IN)	Max Flow (CFS)
091001	0.00	091002	0.00	0.00	67.28	CONCRETE	15 inch	0.00
091002	0.00	091003	0.00	0.00	16.69	CONCRETE	15 inch	0.00
091003	0.00	091004	0.00	0.00	184.46	CONCRETE	15 inch	0.00
091004	0.00	Outfall 91	0.00	0.00	93.82	UNKNOWN	24 inch	0.00

The City of Traverse City
Storm Outlet Evaluation

Page ____ of ______

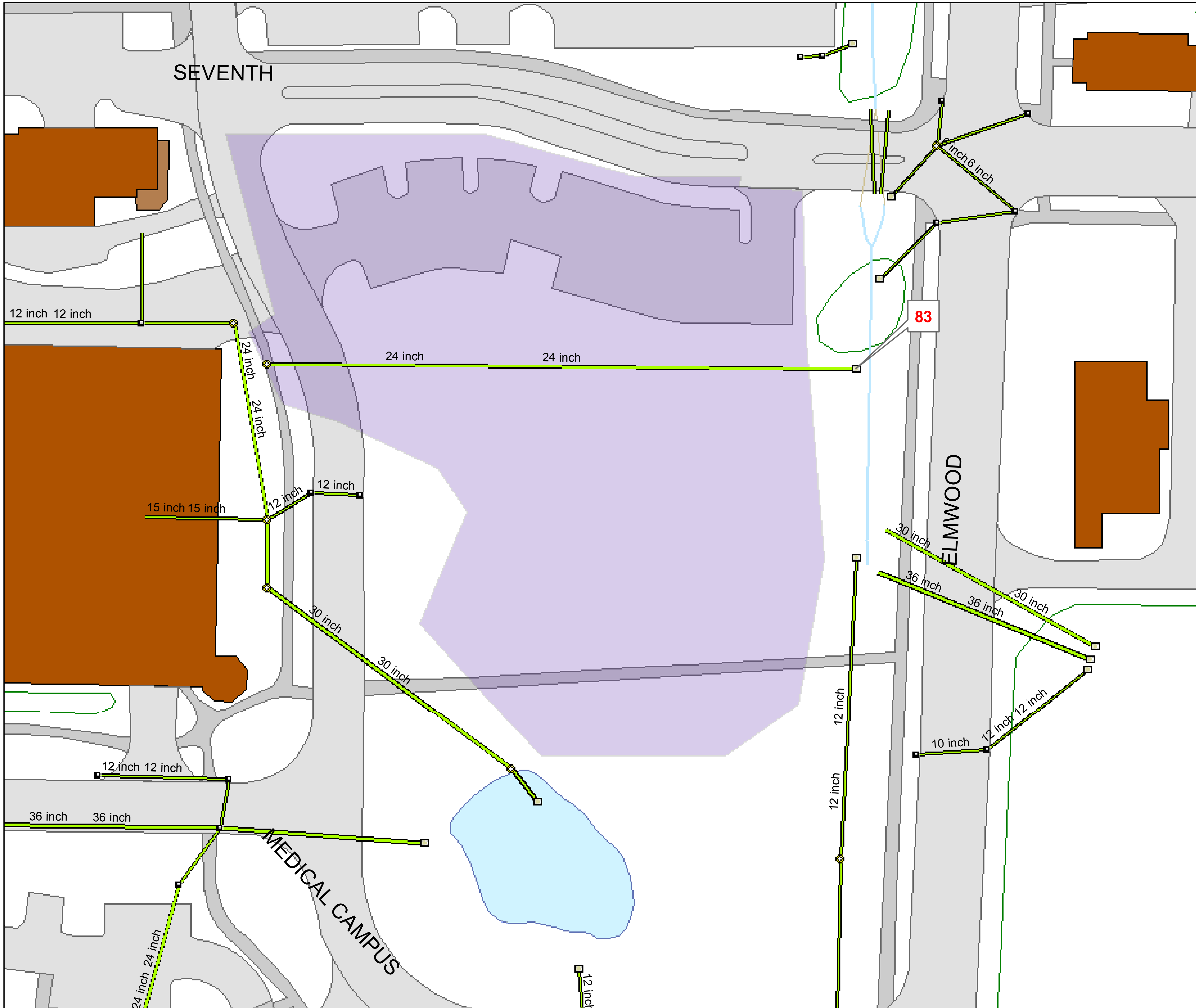
Project No. ____________ **File:** ____________
Description: ____________ **Field Work by:** LL + CB **Date:** 5/1/0?
Drainage Systems: AB **Checked by:** ____________ **Date:** ______

Available Information: #91

Plans: ☐ Yes ☐ No **Year Built:** ____________
Plan Reference #: ____________ **Year Modified:** ____________
Easement: ☒ Yes 6th St ☐ No **Pipe Size:** ____________
Outlet Water Course: Tributary B of Kids Creek

Field Investigation: #91 South pipe Munson SW of Beaumont
Outlet Pipe Size: 30" **Pipe Type:** ☒ Concrete ☐ CMP ☐ Plastic
☐ Other: ____________
Outlet Submerged: ☐ Yes ☐ No ☒ Partial Depth: 9"
Sediment Depth: 1"
Deposits: ☒ Yes Type: Sand + debris ☐ No
End Treatment: ☐ Yes Type: ____________ ☐ No
Amount of Pipe Exposed: ____________
Slope Protection: ☒ Yes Type: ☐ Rip Rap ☐ Pave Spillway ☐ No
☐ Armor Stone ☐ Cobble
☒ Other: concrete wall
Scour: ☒ Yes Depth: 3" ☐ No
High Water Mark/Watercourse: 2'
Depth from Invert: 16" **High Watermark Pipe:** 16"

Evidence of Flooding: ☒ Yes ☐ No
Photographs: ☒ Yes ☐ No Numbers: 3
Comments: ____________



Boundary AC Outfall #83

Legend

- Storm Manholes
- Catchbasins
- Outfalls
- Storm Reach

N W E S

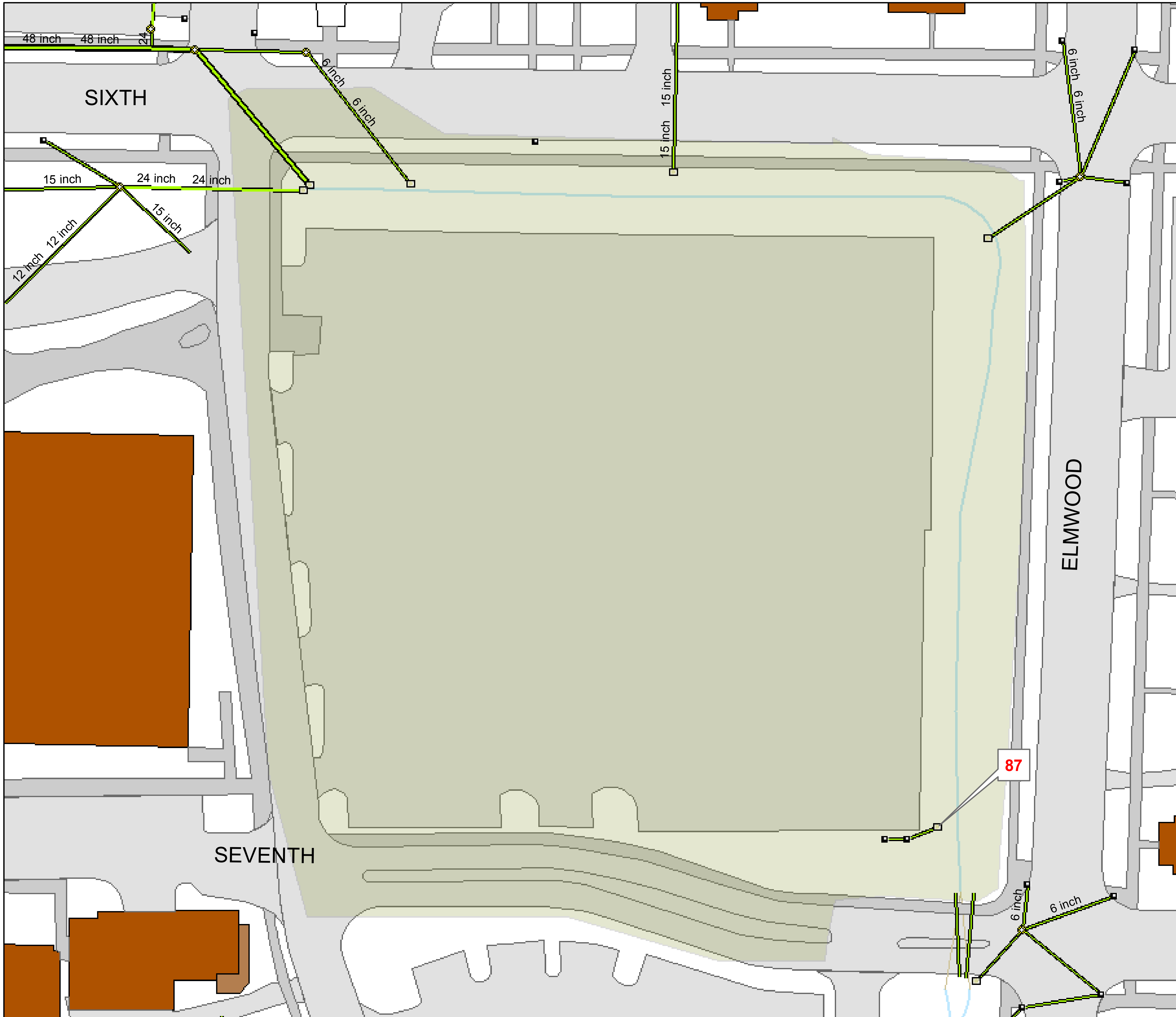
1 inch equals 50 feet

0 30 60 90 120 Feet

City of Traverse City Engineering Department
2007 Storm Water Management Report

Stormwater System: 83

FromMH	From Elev. (FT)	ToMH	To Elevation (FT)	SLOPE (%)	Length (FT)	Material	Diameter (IN)	Max Flow (CFS)
083001	0.00	Outfall 83	0.00	0.00	304.89	CONCRETE	24 inch	0.00



Boundary AD Outfall #87

Legend

- Storm Manholes
- Catchbasins
- Outfalls
- Storm Reach

N
W E
S

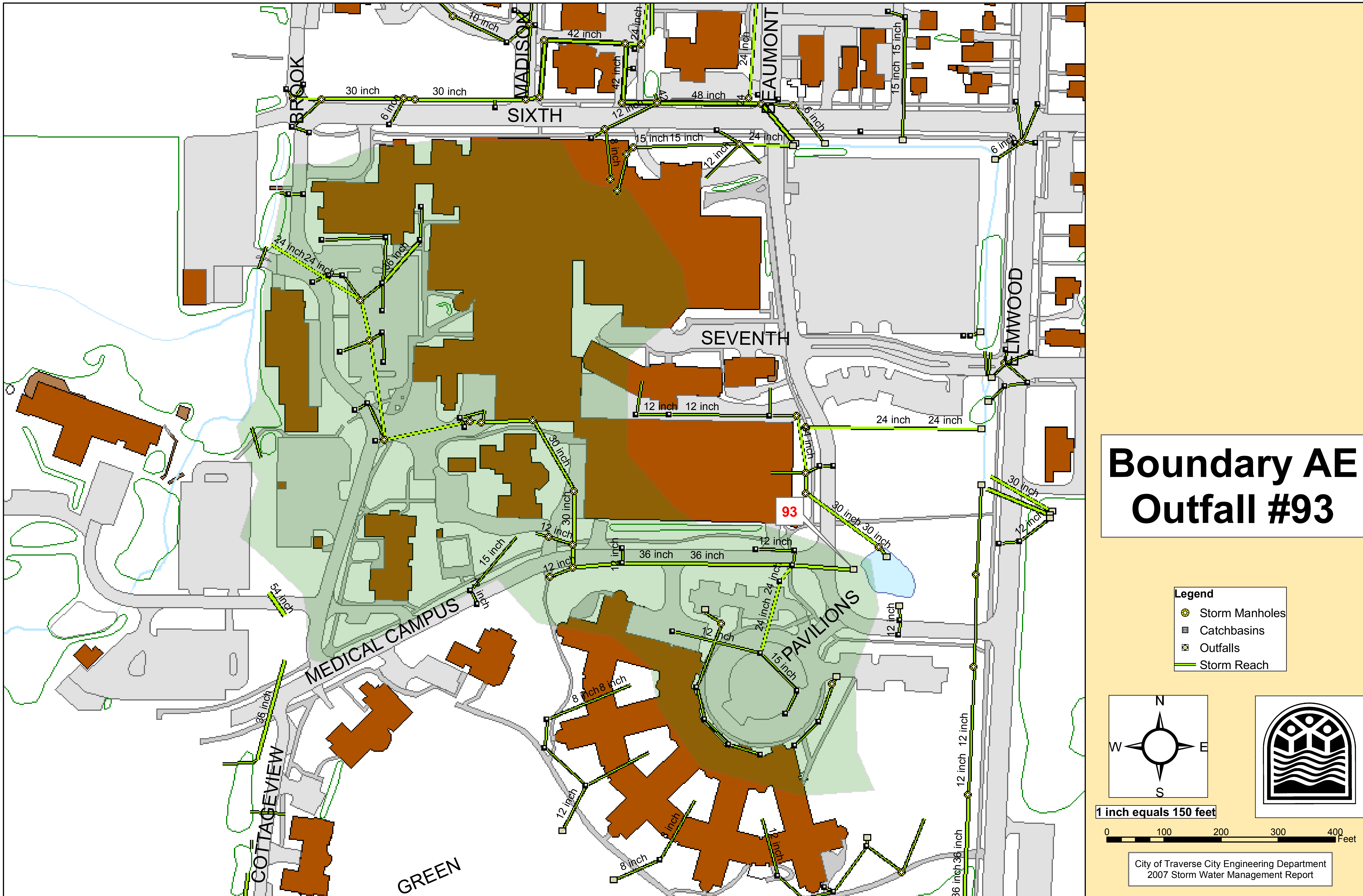
1 inch equals 50 feet

0 30 60 90 120 Feet

City of Traverse City Engineering Department
2007 Storm Water Management Report

Stormwater System: 87

FromMH	From Elev. (FT)	ToMH	To Elevation (FT)	SLOPE (%)	Length (FT)	Material	Diameter (IN)	Max Flow (CFS)
Catchbain 2118	0.00	Outfall 87	0.00	0.00	27.78	UNKNOWN	Unknown	0.00



Boundary AE
Outfall #93
93
SIXTH
SEVENTH
BROOK
MADISON
BEAUMONT
ELMWOOD
MEDICAL CAMPUS
PAVILIONS
COTTAGEVIEW
GREEN
Legend
Storm Manholes
Catchbasins
Outfalls
Storm Reach
N
W
E
S
1 inch equals 150 feet
0
100
200
300
400
Feet
City of Traverse City Engineering Department
2007 Storm Water Management Report

Stormwater System: 93

FromMH	From Elev. (FT)	ToMH	To Elevation (FT)	SLOPE (%)	Length (FT)	Material	Diameter (IN)	Max Flow (CFS)
Open Channel	0.00	093001	0.00	0.00	185.21	CONCRETE	24 inch	0.00
093001	0.00	093002	0.00	0.00	71.12	CONCRETE	24 inch	0.00
093002	0.00	093003	0.00	0.00	175.84	CONCRETE	24 inch	0.00
093003	0.00	093004	0.00	0.00	153.87	CONCRETE	24 inch	0.00
093004	0.00	093005	0.00	0.00	19.20	CONCRETE	24 inch	0.00
093005	0.00	093006	0.00	0.00	90.29	CONCRETE	30 inch	0.00
093006	0.00	093007	0.00	0.00	143.78	CONCRETE	30 inch	0.00
093007	0.00	093008	0.00	0.00	95.12	CONCRETE	30 inch	0.00
093008	608.50	093009	608.40	0.25	40.02	CONCRETE	30 inch	20.49
093009	608.40	Catchbasin 2536	608.25	0.17	87.06	CONCRETE	36 inch	27.67

Stormwater System: 93

FromMH	From Elev. (FT)	ToMH	To Elevation (FT)	SLOPE (%)	Length (FT)	Material	Diameter (IN)	Max Flow (CFS)
Catchbasin 2536	608.25	Catchbasin 1135	607.30	0.32	297.43	CONCRETE	36 inch	37.68
Catchbasin 1135	607.30	Outfall 93	607.00	0.28	106.17	CONCRETE	36 inch	35.44

Boundary AF Outfall #92

Legend

- Storm Manholes
- Catchbasins
- Outfalls
- Storm Reach

N
W
E
S

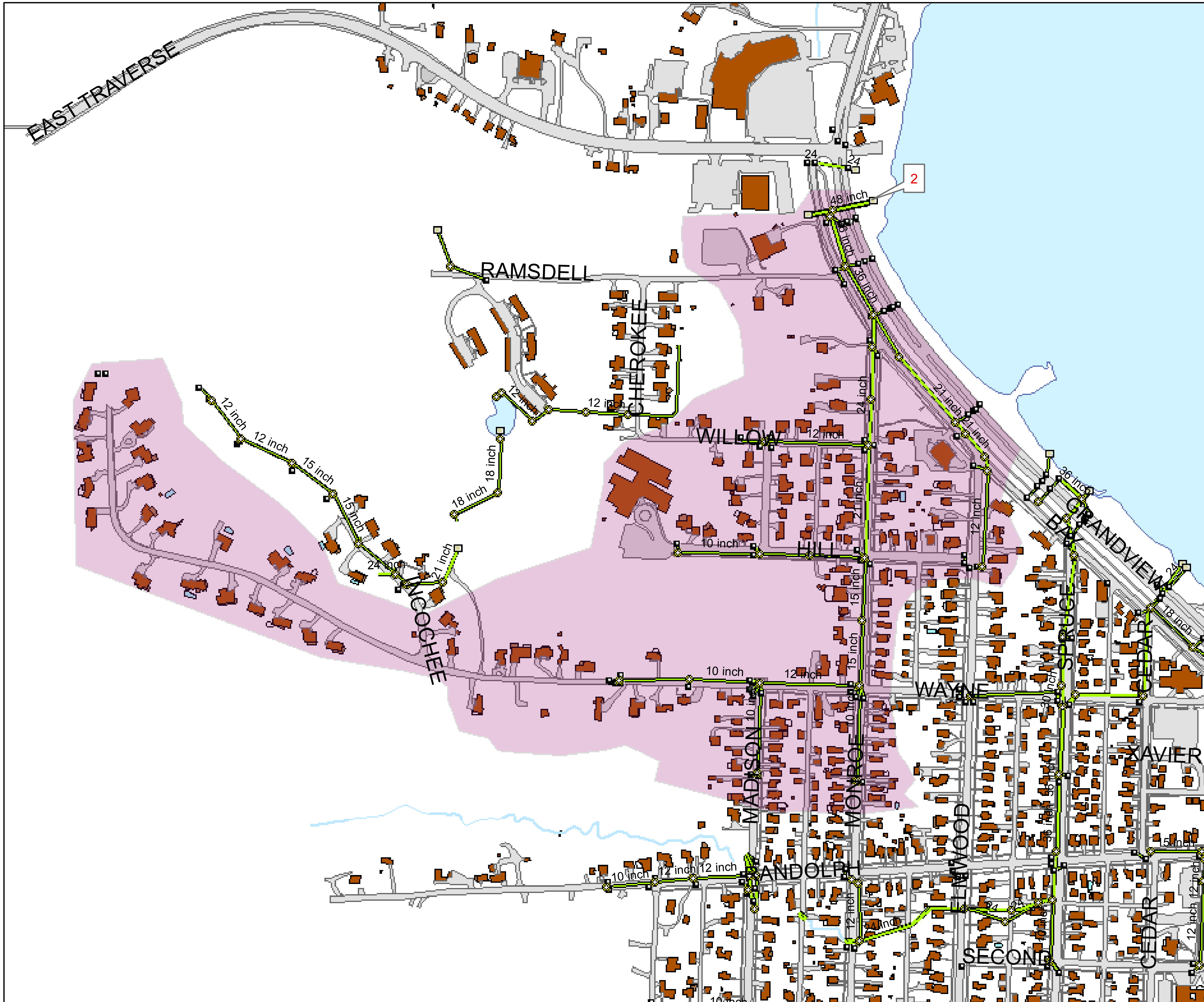
1 inch equals 50 feet

0 30 60 90 120 Feet

City of Traverse City Engineering Department
2007 Storm Water Management Report

Stormwater System: 92

FromMH	From Elev. (FT)	ToMH	To Elevation (FT)	SLOPE (%)	Length (FT)	Material	Diameter (IN)	Max Flow (CFS)
Catchbasin 1757	0.00	Catchbasin 1578	0.00	0.00	58.00	HD POLY	12 inch	0.00
Catchbasin 1578	0.00	Catchbasin 1577	0.00	0.00	175.00	HD POLY	12 inch	0.00
Catchbasin 1577	0.00	092001	0.00	0.00	48.00	HD POLY	Unknown	0.00
092001	0.00	092002	0.00	0.00	103.03	CONCRETE	24 inch	0.00
092002	0.00	092003	0.00	0.00	35.41	CONCRETE	30 inch	0.00
092003	607.50	092004	606.80	0.44	157.67	CONCRETE	30 inch	27.32
092004	0.00	Outfall 92	0.00	0.00	21.80	CONCRETE	30 inch	0.00



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Northwesterly

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Southeasterly

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Southerly

Boundary AG Outfall #2

Legend

- Storm Manholes
- Catchbasins
- Outfalls
- Storm Reach

N W E S

1 inch equals 400 feet

0 275 550 825 1,100 Feet

City of Traverse City Engineering Department
2007 Storm Water Management Report

Stormwater System: 2

FromMH	From Elev. (FT)	ToMH	To Elevation (FT)	SLOPE (%)	Length (FT)	Material	Diameter (IN)	Max Flow (CFS)
002001	646.50	002002	623.55	8.80	289.20	CONCRETE	10 inch	6.50
002002	623.55	002003	613.35	3.40	296.28	CONCRETE	10 inch	4.04
002003	612.52	002004	602.40	2.45	413.41	CONCRETE	12 inch	5.57
002004	599.57	002005	594.93	1.70	273.31	CONCRETE	15 inch	8.41
002005	594.93	002006	591.15	1.44	263.21	CONCRETE	15 inch	7.74
002006	590.18	002007	586.73	0.74	470.22	CONCRETE	21 inch	13.64
002007	585.60	002008	583.86	1.12	191.91	CONCRETE	24 inch	23.93
002008	583.86	002009	581.52	1.07	217.73	CONCRETE	24 inch	23.44
002009	580.73	002010	580.36	0.54	132.88	CONCRETE	36 inch	49.07
002010	580.08	002011	579.52	0.24	233.06	CONCRETE	36 inch	32.68

Stormwater System: 2

FromMH	From Elev. (FT)	ToMH	To Elevation (FT)	SLOPE (%)	Length (FT)	Material	Diameter (IN)	Max Flow (CFS)
002011	579.52	002012	579.00	0.24	216.22	CONCRETE	36 inch	32.69
002012	579.00	002013	578.87	0.41	31.44	CONCRETE	36 inch	42.86
002013	578.30	Junction	577.82	0.32	151.01	CM	48 inch	80.95
Junction	578.04	Outfall 2	578.02	0.00	14.61	CONCRETE	Unknown	0.00

The City of Traverse City
Storm Outlet Evaluation

Project No. ______ **File:** ______

Description: ______ **Field Work by:** LL + CB **Date:** 5/9/06

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

Available Information: #2 AG

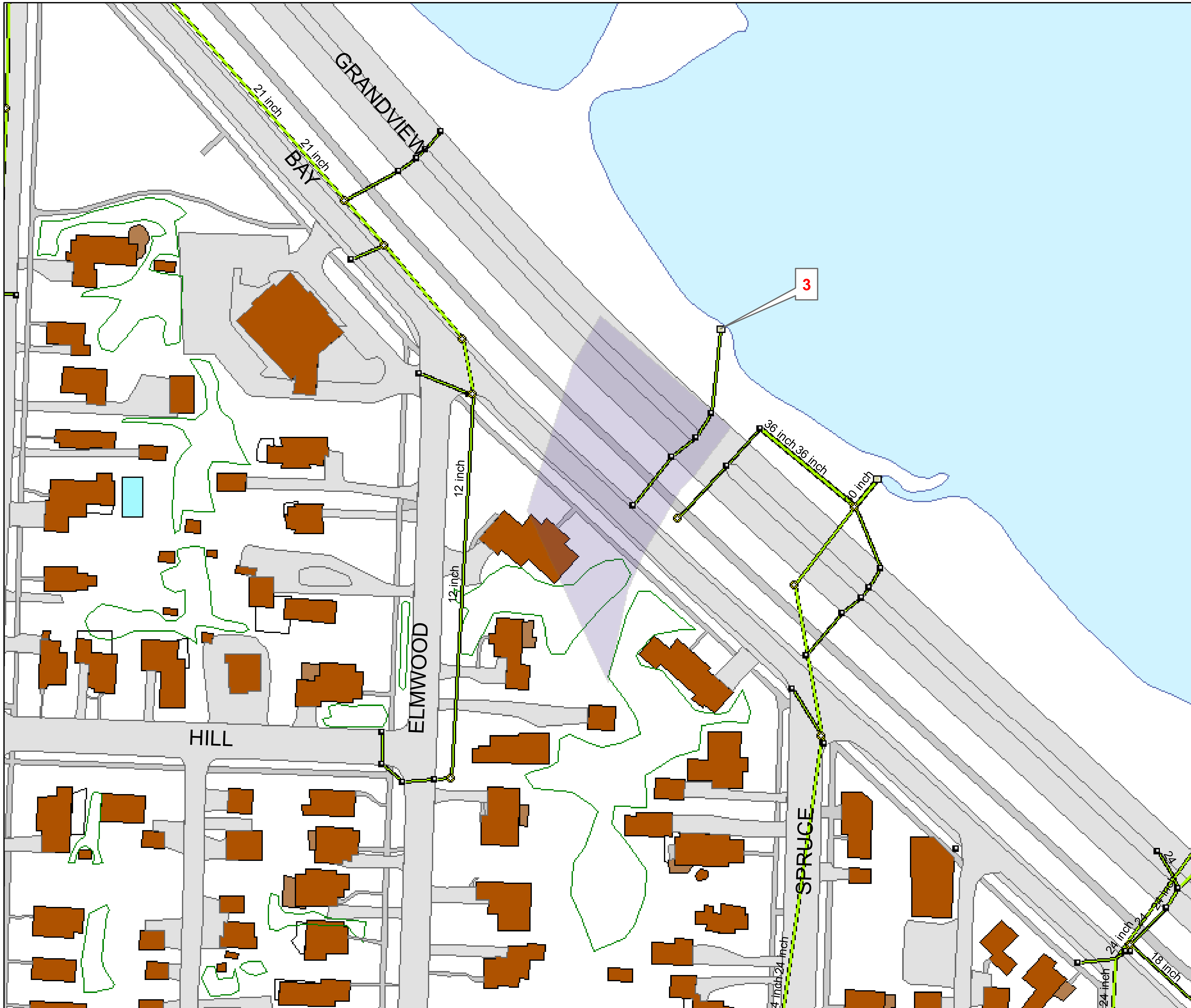
- **Plans:** ☒ Yes ☐ No
- **Plan Reference #:** Storm # 15-1
- **Easement:** ☒ Yes ☐ No
- **Outlet Water Course:** Bay
- **Year Built:** 1949
- **Year Modified:** ______
- **Pipe Size:** 48"

Field Investigation: #2

- **Outlet Pipe Size:** 48"
- **Pipe Type:** ☐ Concrete ☒ CMP ☐ Plastic ☐ Other: ______
- **Outlet Submerged:** ☐ Yes ☐ No ☒ Partial **Depth:** 4"
- **Sediment Depth:** ______
- **Deposits:** ☒ Yes **Type:** sand salt + rust ☐ No
- **End Treatment:** ☐ Yes **Type:** ______ ☒ No
- **Amount of Pipe Exposed:** 29'
- **Slope Protection:** ☒ Yes **Type:** ☒ Rip Rap ☐ Pave Spillway ☐ Armor Stone ☐ Cobble ☐ Other: ______ ☐ No
- **Scour:** ☒ Yes **Depth:** 3' ☐ No
- **High Water Mark/Watercourse:** 12"
- **Depth from Invert:** 30"
- **High Watermark Pipe:** 30"

- **Evidence of Flooding:** ☐ Yes ☒ No
- **Photographs:** ☒ Yes ☐ No **Numbers:** 3 + 4 + 7 5/11/06 #11
- **Comments:** Sand bar

5/11/06 Storm event → 8" invert water flow, water is very brown



Boundary AH Outfall #3

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: 3

FromMH	From Elev. (FT)	ToMH	To Elevation (FT)	SLOPE (%)	Length (FT)	Material	Diameter (IN)	Max Flow (CFS)
Catchbasin 511	582.00	Catchbasin 512	581.41	0.91	64.48	CONCRETE	Unknown	0.00
Catchbasin 512	581.41	Catchbasin 513	581.12	0.91	31.80	CONCRETE	Unknown	0.00
Catchbasin 513	581.12	Catchbasin 514	580.83	0.92	31.47	CONCRETE	Unknown	0.00
Catchbasin 514	580.83	Outfall 3	580.03	0.93	85.83	CONCRETE	Unknown	0.00

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Boundary AI Outfalls #4

Legend

- Storm Manholes
- Catchbasins
- Outfalls
- Storm Reach

N
W E
S

1 inch equals 300 feet

0 210 420 630 840 Feet

City of Traverse City Engineering Department
2007 Storm Water Management Report

Stormwater System: 4

FromMH	From Elev. (FT)	ToMH	To Elevation (FT)	SLOPE (%)	Length (FT)	Material	Diameter (IN)	Max Flow (CFS)
Open Channel	616.17	004004	615.03	1.32	86.33	CM	30 inch	47.11
004004	615.03	004005	614.15	1.44	61.15	CM	30 inch	49.18
004005	614.15	004006	612.99	1.39	83.70	CM	30 inch	48.26
004006	612.99	Open Channel	612.69	0.00	9.77	UNKNOWN	30 inch	0.00
Open Channel	612.00	Open Channel	611.11	0.00	41.72	CM	30 inch	0.00
Open Channel	0.00	004007	0.00	0.00	64.21	CM	24 inch	0.00
004007	0.00	004008	601.86	0.00	477.06	CM	24 inch	0.00
004007	0.00	004008	601.86	0.00	477.10	CONCRETE	24 inch	0.00
004007	0.00	004008	0.00	0.00	212.57	CONCRETE	24 inch	0.00
004008	601.86	004023	0.00	0.00	196.75	CM	24 inch	0.00

Stormwater System: 4

FromMH	From Elev. (FT)	ToMH	To Elevation (FT)	SLOPE (%)	Length (FT)	Material	Diameter (IN)	Max Flow (CFS)
004008	601.86	004009	0.00	0.00	177.39	CM	24 inch	0.00
004009	0.00	004010	597.31	0.00	158.00	CM	24 inch	0.00
004023	0.00	004010	597.16	0.00	123.83	CM	24 inch	0.00
004010	597.16	004011	596.33	1.42	58.65	CM	24 inch	26.90
004010	597.31	004011	596.33	1.67	58.17	CM	24 inch	29.24
004011	0.00	Catchbasin 390	593.53	0.00	121.57	CM	18 inch	0.00
004011	0.00	Catchbasin 390	593.53	1.25	119.19	CM	24 inch	25.28
Catchbasin 390	593.53	004012	593.33	1.25	85.19	CM	24 inch	25.28
Catchbasin 390	593.53	004012	593.33	0.00	87.20	CM	18 inch	0.00
004012	592.43	004013	589.83	1.25	318.68	CM	36 inch	74.53
004013	589.83	004014	587.44	0.84	284.71	CM	36 inch	61.08

Stormwater System: 4

FromMH	From Elev. (FT)	ToMH	To Elevation (FT)	SLOPE (%)	Length (FT)	Material	Diameter (IN)	Max Flow (CFS)
004014	587.44	004015	587.14	0.34	88.45	CM	24 inch	13.17
004015	587.14	004016	0.00	0.00	203.05	CM	24 inch	0.00
004016	0.00	004017	0.00	0.00	343.56	CM	24 inch	0.00
004017	0.00	004018	0.00	0.00	159.68	CM	24 inch	0.00
004018	0.00	004019	0.00	0.00	102.74	CM	24 inch	0.00
004019	0.00	Outfall 4	0.00	0.00	37.27	CM	36 inch	0.00

The City of Traverse City
Storm Outlet Evaluation

Project No. ____________ **File:** ____________

Description: ____________ **Field Work by:** LL + CB **Date:** 5/9/06

Drainage Systems: AI **Checked by:** ____________ **Date:** ____________

Available Information: #4 AI

Plans: ☐ Yes ☐ No

Plan Reference #: ____________

Easement: ☒ Yes 38 m ☐ No

Outlet Water Course: Bay

Year Built: ____________

Year Modified: ____________

Pipe Size: ____________

Field Investigation: #4

Outlet Pipe Size: 36"

Pipe Type: ☐ Concrete ☒ CMP ☐ Plastic ☐ Other: ____________

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

Sediment Depth: ____________

Deposits: ☒ Yes Type: rust, salt ☐ No

End Treatment: ☐ Yes Type: ____________ ☒ No

Amount of Pipe Exposed: 5'

Slope Protection: ☒ Yes Type: ☒ Rip Rap (2'-16") ☐ Pave Spillway ☐ Armor Stone ☐ Cobble ☐ Other: ____________ ☐ No

Scour: ☐ Yes Depth: ____________ ☒ No

High Water Mark/Watercourse: 1'

Depth from Invert: 10"

High Watermark Pipe: 9"

Evidence of Flooding: ☐ Yes ☒ No

Photographs: ☒ Yes ☐ No Numbers: 7+8+9

Comments: Pipe is buried w/ ≈10" of cover (rip-rap) 41' back
Some sort of oilly looking substance + rust looking stuff.

The City of Traverse City
Storm Outlet Evaluation

Page 1 of 1

Project No. ______ **File:** ______

Description: ______ **Field Work by:** LL + CB **Date:** 5/3/06

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

Available Information: #112 on Madison South of Randolph

Plans: ☒ Yes ☐ No **Year Built:** 1946

Plan Reference #: Street #15 **Year Modified:** ______

Easement: ☒ Yes Madison St ☐ No **Pipe Size:** ______

Outlet Water Course: Foots Creek ?

#112 **Field Investigation:** 2 pipes North pipe

Outlet Pipe Size: 18" **Pipe Type:** ☒ Concrete ☐ CMP ☐ Plastic ☐ Other: ______

Outlet Submerged: ☐ Yes ☐ No ☒ Partial Depth: 17"

Sediment Depth: 3"

Deposits: ☒ Yes Type: sediment ☐ No

End Treatment: ☐ Yes Type: ______ ☒ No

Amount of Pipe Exposed: 1'

Slope Protection: ☒ Yes Type: ☐ Rip Rap ☐ Pave Spillway ☐ No

☐ Armor Stone ☒ Cobble +

☒ Other: Concrete wall

Scour: ☒ Yes Depth: 1' ☐ No

High Water Mark/Watercourse: 1'

Depth from Invert: ______ **High Watermark Pipe:** full pipe size.

Evidence of Flooding: ☐ Yes ☒ No

Photographs: ☒ Yes ☐ No, Numbers: 5

Comments: bar of deposits (pebbles, sediment) <2"

The City of Traverse City
Storm Outlet Evaluation

Project No. ______ **File:** ______

Description: ______ **Field Work by:** LL+CB **Date:** 5/3/06

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

Available Information: #112 on Madison S. of Randolph

Plans: ☒ Yes ☐ No **Year Built:** 1946

Plan Reference #: Streets #15 **Year Modified:** ______

Easement: ☒ Yes Madison St ☐ No **Pipe Size:** ______

Outlet Water Course: Foots Creek?

Field Investigation: #112 South Pipe

Outlet Pipe Size: 30" **Pipe Type:** ☐ Concrete ☒ CMP ☐ Plastic ☐ Other: ______

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

Sediment Depth: 16"

Deposits: ☒ Yes Type: sediment ☐ No

End Treatment: ☐ Yes Type: ______ ☒ No

Amount of Pipe Exposed: 8"

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

Scour: ☒ Yes Depth: 1' ☐ No

High Water Mark/Watercourse: 12"

Depth from Invert: full **High Watermark Pipe:** full

Evidence of Flooding: ☐ Yes ☒ No

Photographs: ☒ Yes ☐ No Numbers: 5

Comments: sand/bar in deposits (sediment + pebbles <2")
HD at 224 N. Madison says they have had flooding the last 2 years into their basements but never historically. She says the sand bar is a new thing in the last 2 years she has been here over 18 years.

The City of Traverse City
Storm Outlet Evaluation

Project No. ______________________ **File:** ______________________

Description: ______________________ **Field Work by:** LL + CB **Date:** 5/3/06

Drainage Systems: AI **Checked by:** ______________________ **Date:** ______

Available Information: #112.1 on Madison N. of Randolph

Plans: ☒ Yes ☐ No **Year Built:** 1946 ?

Plan Reference #: Streets #15 **Year Modified:** ______________________

Easement: ☒ Yes Madison St ☐ No **Pipe Size:** ______________________

Outlet Water Course: Foots Creek?

Field Investigation: #112.1

Outlet Pipe Size: 24" **Pipe Type:** ☒ Concrete ☐ CMP ☐ Plastic ☐ Other: ______________________

Outlet Submerged: ☐ Yes ☐ No ☒ Partial Depth: 23" Sediment Depth: 10"

Deposits: ☒ Yes Type: sediment, rocks 22" ☐ No

End Treatment: ☐ Yes Type: ______________________ ☒ No

Amount of Pipe Exposed: 3'

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

Scour: ☐ Yes Depth: ______________________ ☒ No

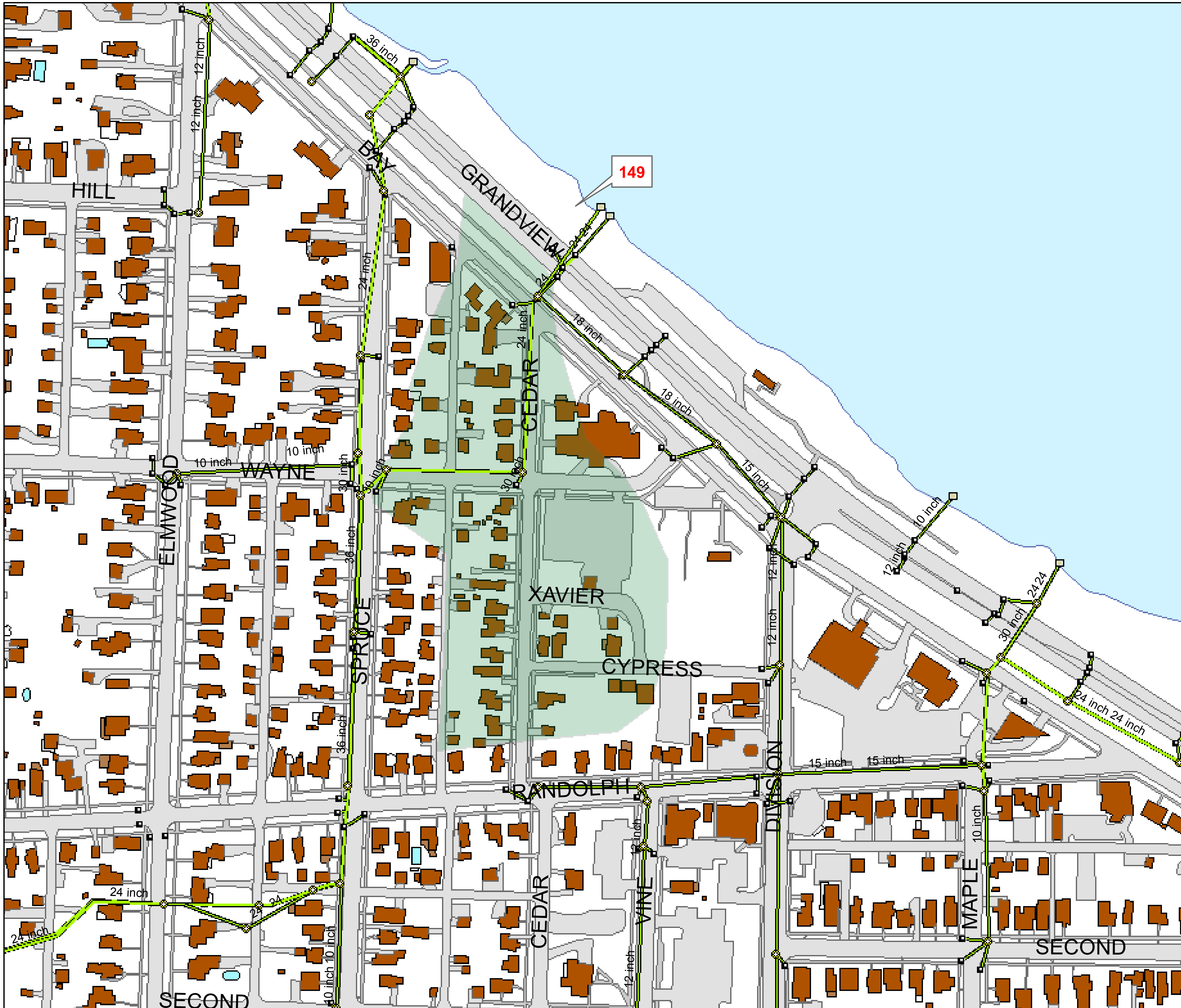
High Water Mark/Watercourse: 1'

Depth from Invert: 10" **High Watermark Pipe:** 10"

Evidence of Flooding: ☐ Yes ☒ No

Photographs: ☒ Yes ☐ No Numbers: 4

Comments: Cage over pipes, debris in cage (leaves, twigs)



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Boundary AJ Outfall #149

Legend

- Storm Manholes
- Catchbasins
- Outfalls
- Storm Reach

N
W E
S

1 inch equals 200 feet

0 150 300 450 600 Feet

City of Traverse City Engineering Department
2007 Storm Water Management Report

Stormwater System: 149

FromMH	From Elev. (FT)	ToMH	To Elevation (FT)	SLOPE (%)	Length (FT)	Material	Diameter (IN)	Max Flow (CFS)
Catchbasin 2636	0.00	Treatment System 4	0.00	0.00	20.00	UNKNOWN	Unknown	0.00
Treatment System	0.00	Outfall 149	0.00	0.00	59.51	UNKNOWN	15 inch	0.00

The City of Traverse City
Storm Outlet Evaluation

Project No. ____ **File:** ____

Description: ____ **Field Work by:** LL & CB **Date:** 5/9/06

Drainage Systems: AJ **Checked by:** ____ **Date:** ____

Available Information: #4.1

Plans: ☐ Yes ☐ No **Year Built:** ____

Plan Reference #: ____ **Year Modified:** ____

Easement: ☒ Yes 38ROW ☐ No **Pipe Size:** ____

Outlet Water Course: Bay

Field Investigation: #4.1

Outlet Pipe Size: 30" **Pipe Type:** ☐ Concrete ☒ CMP ☐ Plastic ☐ Other: ____

Outlet Submerged: ☐ Yes ☐ No ☒ Partial Depth: 4"

Sediment Depth: ____

Deposits: ☐ Yes Type: alge ☐ No

End Treatment: ☐ Yes Type: ____ ☒ No

Amount of Pipe Exposed: 34'

Slope Protection: ☒ Yes Type: ☒ Rip Rap 14"-20" ☐ Pave Spillway ☐ No ☐ Armor Stone ☐ Cobble ☐ Other: ____

Scour: ☒ Yes Depth: 6" ☐ No

High Water Mark/Watercourse: Bay

Depth from Invert: 14" **High Watermark Pipe:** 10"

Evidence of Flooding: ☐ Yes ☒ No

Photographs: ☒ Yes ☐ No Numbers: 11

Comments: 19" suspended over water damaged / Boat hit?

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Southeasterly

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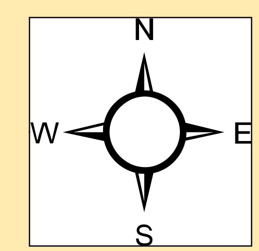
Southerly

Boundary AK Outfall #5

Legend

- Storm Manholes
- Catchbasins
- Outfalls
- Storm Reach



1 inch equals 200 feet

0 140 280 420 560 Feet

City of Traverse City Engineering Department
2007 Storm Water Management Report

Stormwater System: 5

FromMH	*From Elev. (FT)*	*ToMH*	*To Elevation (FT)*	*SLOPE (%)*	*Length (FT)*	*Material*	*Diameter (IN)*	*Max Flow (CFS)*
005009	591.98	005010	588.50	1.00	351.28	CONCRETE	12 inch	3.56
005010	588.50	005011	587.96	0.64	93.19	CONCRETE	12 inch	2.85
005011	587.46	005012	587.14	0.64	31.32	CONCRETE	12 inch	2.85
005012	586.91	005003	584.24	0.89	287.34	VC	15 inch	6.09
005003	584.71	005004	584.04	0.24	226.30	CONCRETE	12 inch	1.74
005004	584.04	005005	582.84	0.32	306.45	CONCRETE	12 inch	2.01
005005	582.20	005006	582.13	0.24	203.05	CONCRETE	15 inch	3.16
005006	582.13	005007	581.58	0.24	240.31	CONCRETE	18 inch	5.14
005007	581.58	005008	581.00	0.24	240.94	CONCRETE	18 inch	5.14
005008	581.00	Catchbasin 1557	579.56	3.20	54.86	UNKNOWN	24 inch	40.45

Stormwater System: 5

FromMH	From Elev. (FT)	ToMH	To Elevation (FT)	SLOPE (%)	Length (FT)	Material	Diameter (IN)	Max Flow (CFS)
Catchbasin 1557	0.00	Catchbasin 1558	0.00	0.00	23.02	CM	24 inch	0.00
Catchbasin 1558	0.00	Catchbasin 1560	0.00	0.00	36.15	CM	24 inch	0.00
Catchbasin 1560	0.00	Outfall 5	0.00	0.00	105.73	CM	36 inch	0.00

The City of Traverse City
Storm Outlet Evaluation

Project No. ____________ **File:** ____________

Description: ____________ **Field Work by:** LL + CB **Date:** 5/9/06

Drainage Systems: AK **Checked by:** ____________ **Date:** ____________

Available Information: #5

Plans: ☐ Yes ☐ No **Year Built:** ____________

Plan Reference #: ____________ **Year Modified:** ____________

Easement: ☒ Yes 38N ☐ No **Pipe Size:** ____________

Outlet Water Course: Bay

Field Investigation: #5

Outlet Pipe Size: 30" **Pipe Type:** ☐ Concrete ☒ CMP ☐ Plastic ☐ Other: ____________

Outlet Submerged: ☐ Yes ☐ No ☒ Partial Depth: 1"

Sediment Depth: 1"

Deposits: ☒ Yes Type: sand + Black algae? ☐ No

End Treatment: ☒ Yes Type: Collar + rip rap ☐ No

Amount of Pipe Exposed: 4.5'

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

Scour: ☐ Yes Depth: ____________ ☒ No

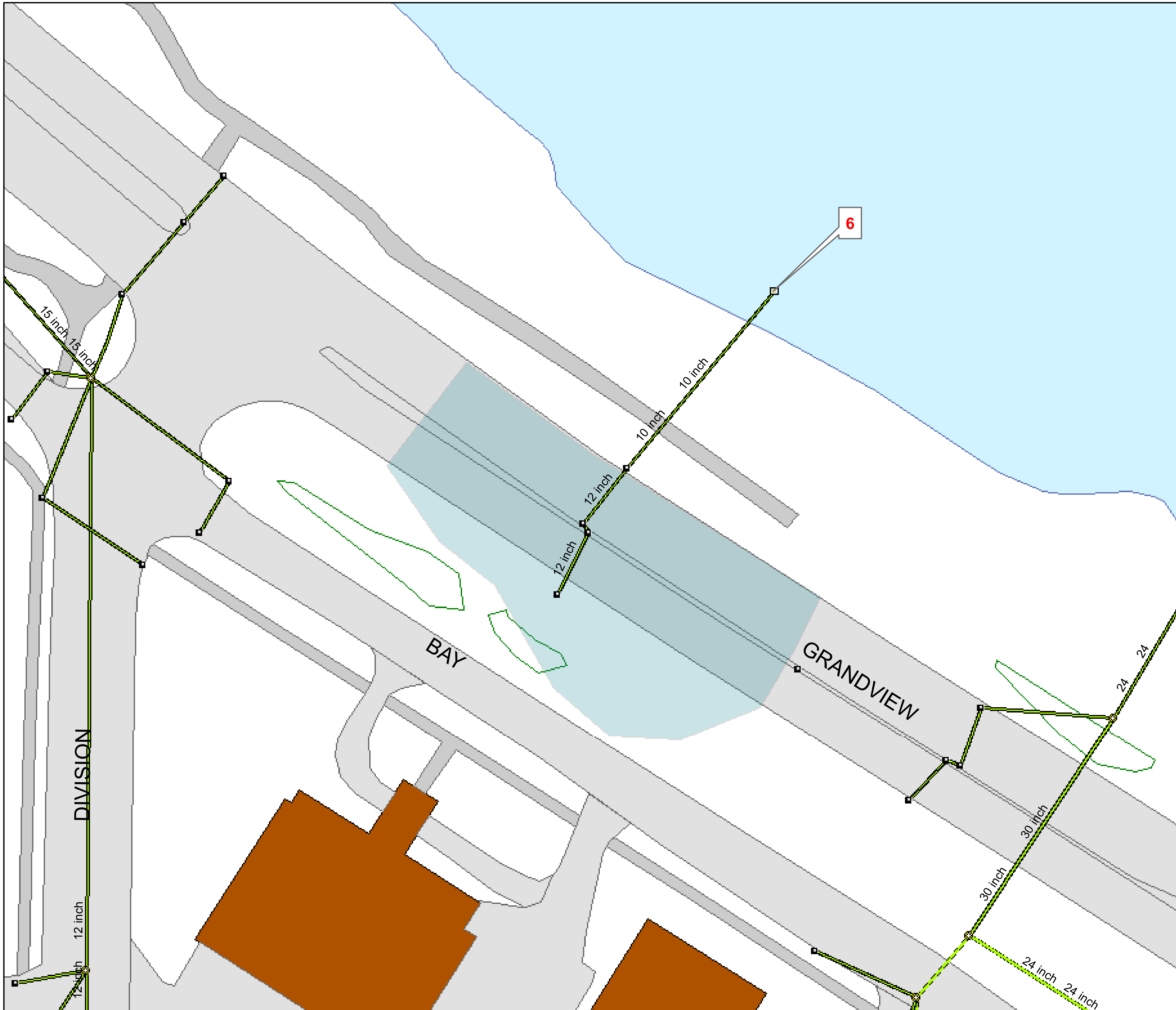
High Water Mark/Watercourse: Bay

Depth from Invert: 10" **High Watermark Pipe:** 10"

Evidence of Flooding: ☐ Yes ☒ No

Photographs: ☒ Yes ☐ No Numbers: 12 + 13

Comments: hole in top



Boundary AL Outfall #6

Legend
- Storm Manholes
- Catchbasins
- Outfalls
- Storm Reach

N
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1 inch equals 50 feet

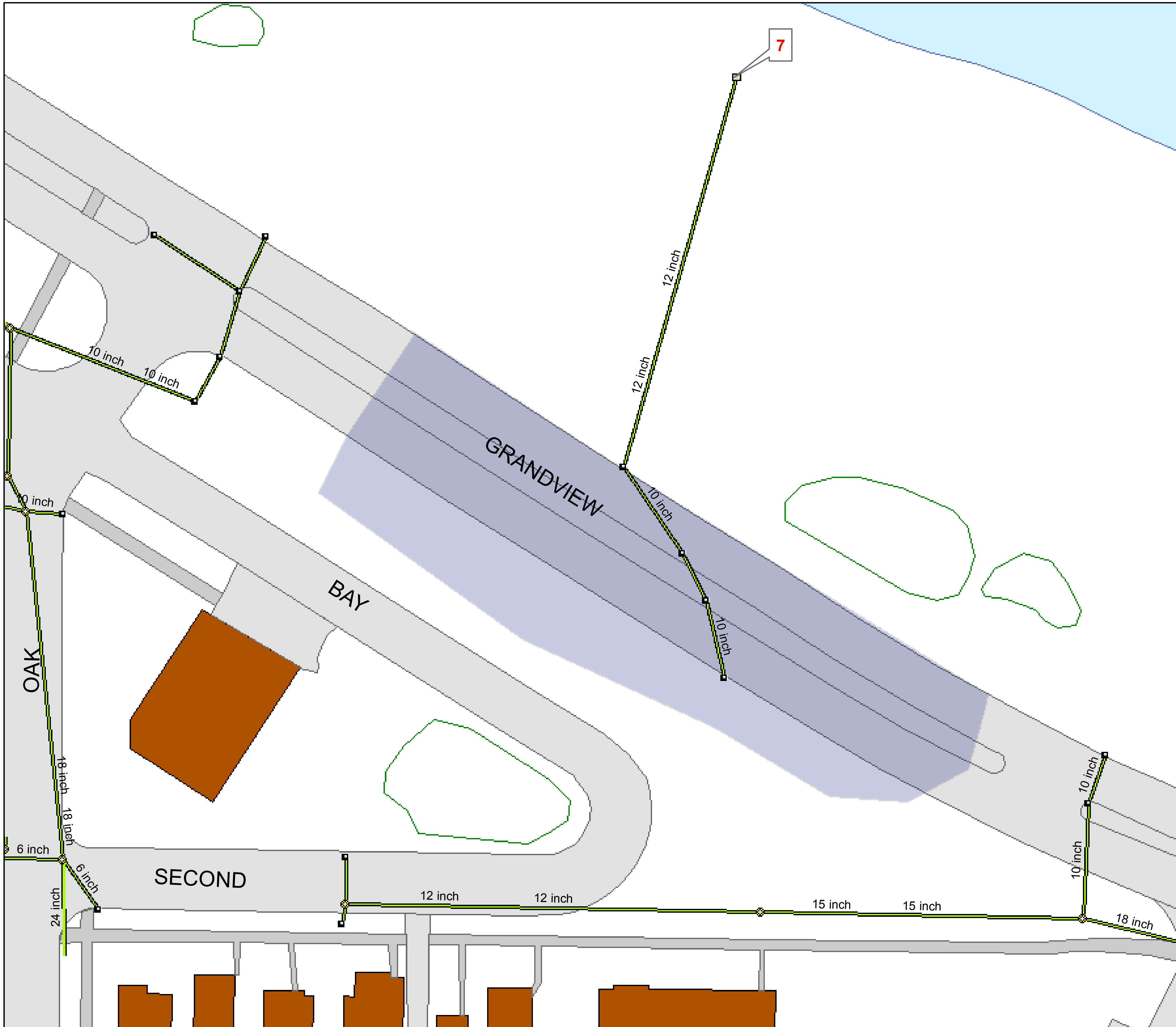
0 40 80 120 160 Feet

City of Traverse City Engineering Department
2007 Storm Water Management Report

Stormwater System: 6

FromMH	From Elev. (FT)	ToMH	To Elevation (FT)	SLOPE (%)	Length (FT)	Material	Diameter (IN)	Max Flow (CFS)
Catchbasin 1546	582.83	Catchbasin 1547	581.58	1.19	26.54	CONCRETE	12 inch	3.88
Catchbasin 1547	581.58	Catchbasin 1548	581.51	1.22	5.72	CONCRETE	12 inch	3.94
Catchbasin 1548	581.51	Catchbasin 1549	581.08	1.19	36.24	CONCRETE	12 inch	3.88
Catchbasin 1549	581.08	Outfall 6	0.00	0.00	118.94	PVC	10 inch	0.00

Boundary AM Outfall #7



Legend

- Storm Manholes
- Catchbasins
- Outfalls
- Storm Reach

N
W E
S

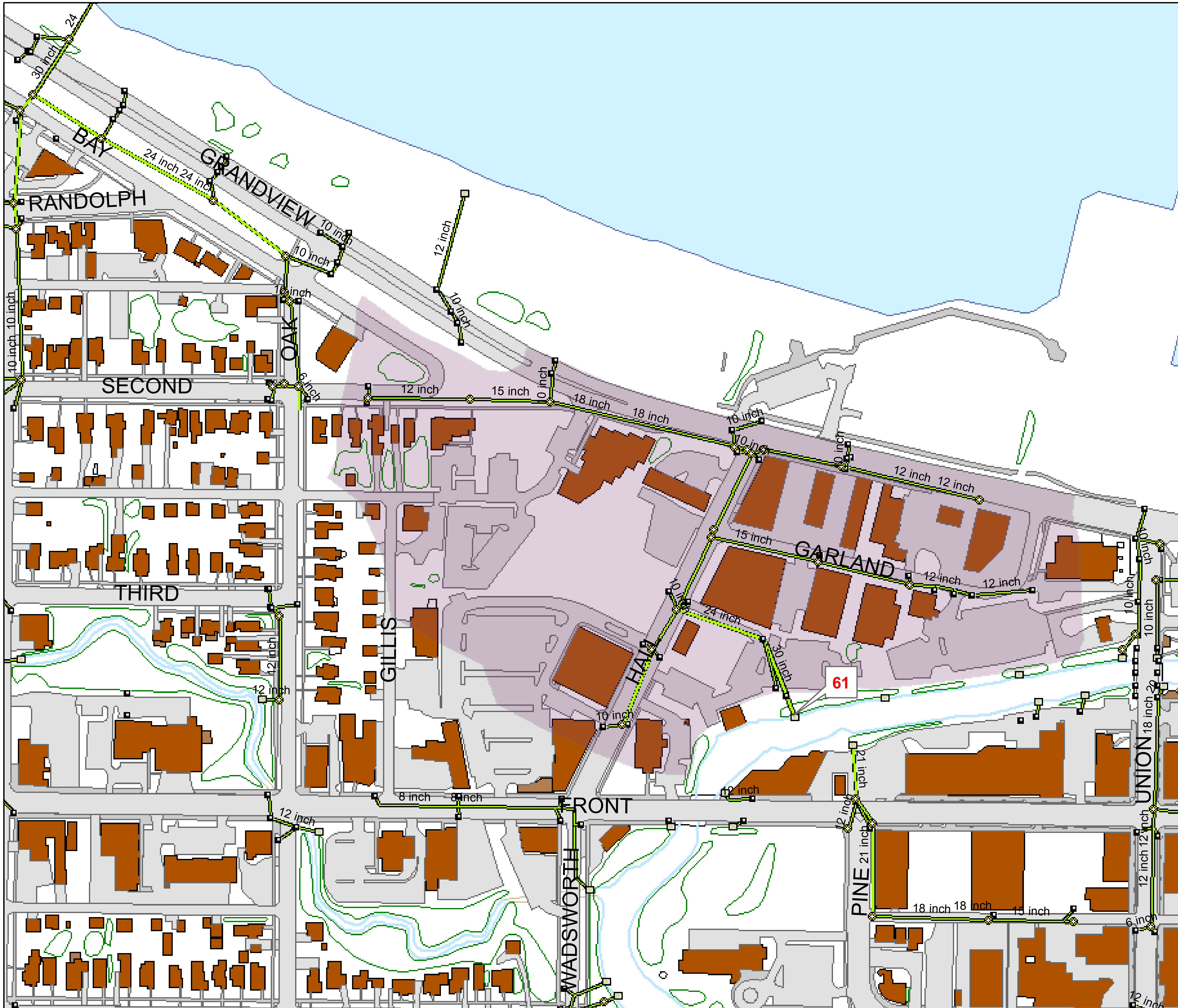
1 inch equals 50 feet

0 40 80 120 160 Feet

City of Traverse City Engineering Department
2007 Storm Water Management Report

Stormwater System: 7

FromMH	From Elev. (FT)	ToMH	To Elevation (FT)	SLOPE (%)	Length (FT)	Material	Diameter (IN)	Max Flow (CFS)
Catchbasin 1527	0.00	Catchbasin 1526	0.00	0.00	40.65	CONCRETE	10 inch	0.00
Catchbasin 1526	0.00	Catchbasin 1525	0.00	0.00	27.18	CONCRETE	10 inch	0.00
Catchbasin 1525	0.00	Catchbasin 1524	0.00	0.00	53.13	CONCRETE	10 inch	0.00
Catchbasin 1524	0.00	Outfall 7	0.00	0.00	206.04	CONCRETE	12 inch	0.00



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North Westerly

Boundary AN Outfall #61

Legend

- Storm Manholes
- Catchbasins
- Outfalls
- Storm Reach

N
W E
S

1 inch equals 200 feet

0 150 300 450 600 Feet

City of Traverse City Engineering Department
2007 Storm Water Management Report

Stormwater System: 61

FromMH	From Elev. (FT)	ToMH	To Elevation (FT)	SLOPE (%)	Length (FT)	Material	Diameter (IN)	Max Flow (CFS)
061001	0.00	061002	0.00	0.00	211.64	CONCRETE	12 inch	0.00
061002	583.89	061003	583.44	0.27	163.70	CONCRETE	15 inch	3.39
061003	583.44	061004	582.49	0.23	421.39	CONCRETE	18 inch	4.99
061004	582.49	061005	582.47	0.17	11.92	CONCRETE	15 inch	2.64
061005	582.47	061006	582.05	0.24	175.30	CONCRETE	24 inch	11.07
061006	0.00	061007	0.00	0.00	15.06	CONCRETE	24 inch	0.00
061007	582.10	061008	581.40	0.42	165.61	CONCRETE	24 inch	14.70
061008	581.40	Catchbasin 858	579.75	0.87	190.59	CONCRETE	24 inch	21.04
Catchbasin 858	579.35	Catchbasin 859	578.65	0.56	125.86	CONCRETE	30 inch	30.57
Catchbasin 859	578.65	Outfall 61	0.00	0.00	47.37	CONCRETE	30 inch	0.00

Stormwater System: 61

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

The City of Traverse City
Storm Outlet Evaluation

Project No. ______________ **File:** ______________

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

Drainage Systems: AN **Checked by:** ______________ **Date:** ______

Available Information: #61

Plans: ☒ Yes ☐ No Storm #5 **Year Built:** 1965 57?

Plan Reference #: Streets # 110-112 **Year Modified:** ______

Easement: ☒ Yes 26V-2 ☐ No **Pipe Size:** ______

Outlet Water Course: Boardman River

Field Investigation: #61

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

Outlet Submerged: ☐ Yes ☐ No ☒ Partial Depth: 16"

Sediment Depth: Ø

Deposits: ☒ Yes Type: rust ☐ No

End Treatment: ☐ Yes Type: ______ ☒ No

Amount of Pipe Exposed: 13

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

Scour: ☐ Yes Depth: ______ ☒ No

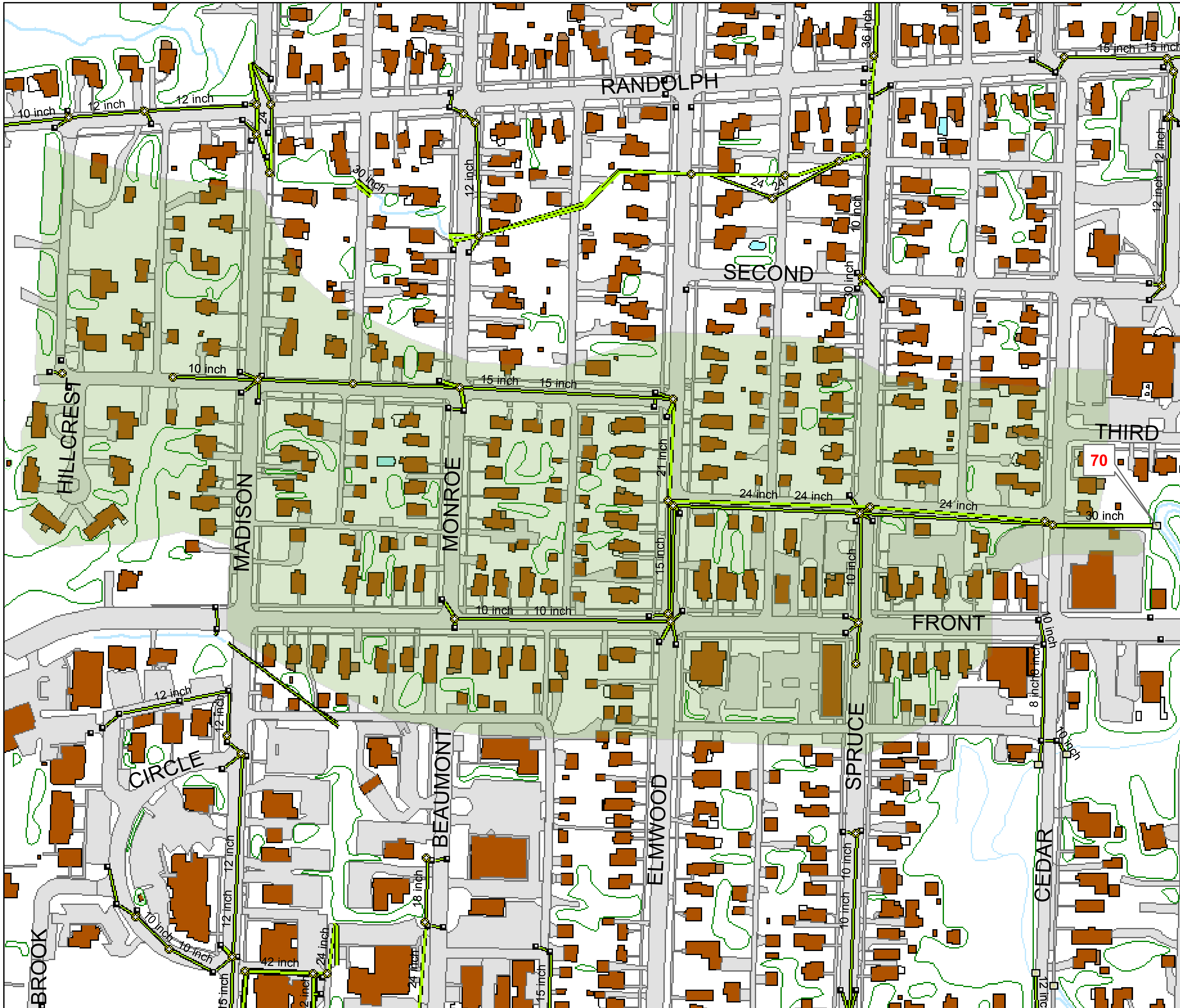
High Water Mark/Watercourse: 2'

Depth from Invert: 30" **High Watermark Pipe:** 24"

Evidence of Flooding: ☐ Yes ☒ No

Photographs: ☒ Yes ☐ No Numbers: 4

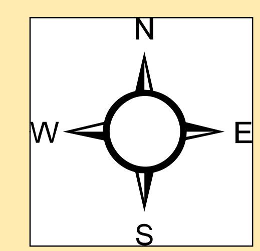
Comments: 4' back from end pipe is suspended in water



Boundary AO Outfall #70

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: 70

FromMH	From Elev. (FT)	ToMH	To Elevation (FT)	SLOPE (%)	Length (FT)	Material	Diameter (IN)	Max Flow (CFS)
070001	0.00	070002	0.00	0.00	50.00	CONCRETE	Unknown	0.00
070002	0.00	070003	0.00	0.00	137.30	CONCRETE	Unknown	0.00
070003	618.98	070004	614.66	2.45	217.00	CONCRETE	10 inch	3.43
070004	614.32	070005	611.00	1.68	197.53	CONCRETE	15 inch	8.37
070005	611.00	070006	609.23	0.80	221.04	CONCRETE	15 inch	5.78
070006	609.23	070007	603.51	1.29	443.93	CONCRETE	15 inch	7.33
070007	603.51	070008	603.08	0.20	210.28	CONCRETE	21 inch	7.16
070008	602.88	070017	601.22	0.39	420.37	CONCRETE	24 inch	14.21
070017	601.22	070018	599.20	0.56	363.47	OTHER	24 inch	16.86
070018	599.20	070011	598.60	3.33	18.03	OTHER	24 inch	41.25

Stormwater System: 70

FromMH	From Elev. (FT)	ToMH	To Elevation (FT)	SLOPE (%)	Length (FT)	Material	Diameter (IN)	Max Flow (CFS)
070011	598.60	Outfall 70	594.20	2.07	212.82	CONCRETE	30 inch	58.95

The City of Traverse City
Storm Outlet Evaluation

Project No. ____________ **File:** ____________

Description: ____________ **Field Work by:** LL + CB **Date:** 5/3/06

Drainage Systems: AO **Checked by:** ____________ **Date:** ____________

Available Information: #70

Plans: ☒ Yes ☐ No **Year Built:** 1952

Plan Reference #: Storm #21 **Year Modified:** ____________

Easement: ☒ Yes 220' easement ☐ No **Pipe Size:** 30"

Outlet Water Course: Kids Creek

Field Investigation: #70

Outlet Pipe Size: 30" **Pipe Type:** ☒ Concrete ☐ CMP ☐ Plastic ☐ Other: ____________

Outlet Submerged: ☐ Yes ☒ No ☐ Partial **Depth:** ____________

Sediment Depth: 16"

Deposits: ☒ Yes **Type:** ? Sediment ☐ No

End Treatment: ☐ Yes **Type:** ____________ ☒ No

Amount of Pipe Exposed: Ø

Slope Protection: ☒ Yes vegetation **Type:** ☐ Rip Rap ☐ Pave Spillway ☐ No ☐ Armor Stone ☐ Cobble ☒ Other: bulkhead / concrete box

Scour: ☐ Yes **Depth:** ____________ ☒ No

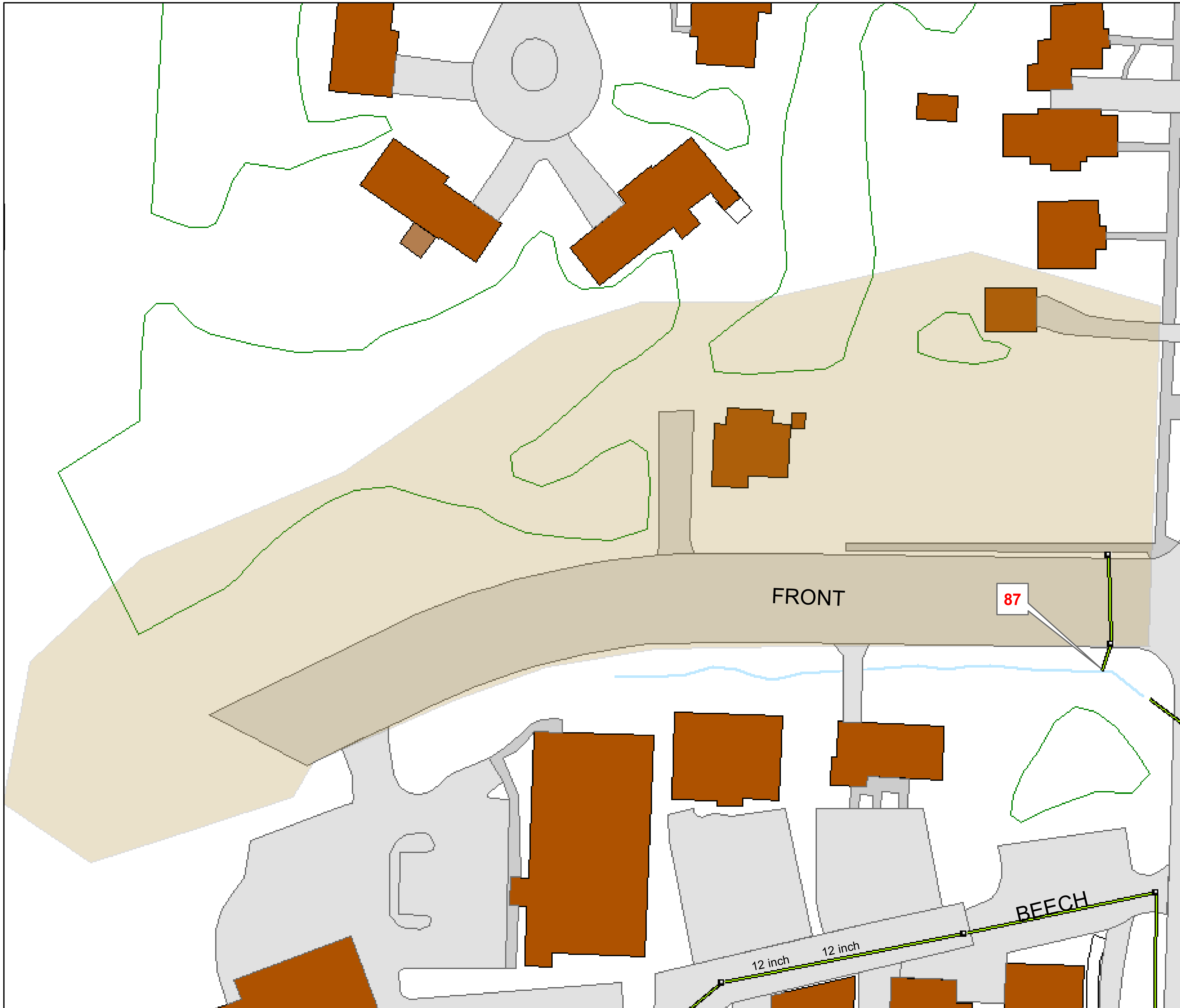
High Water Mark/Watercourse: 2'

Depth from Invert: 16" **High Watermark Pipe:** 22"

Evidence of Flooding: ☐ Yes ☐ No

Photographs: ☒ Yes ☐ No **Numbers:** 6, 7, 8 5/11/06 8, 9, 10

Comments: green moss ? growing on deposits
bar of deposits upstream + in front
really nasty
water cloudy [illegible], eddy in front, constant water flow
5/11/06 Storm event → 21" invert ⇒ water flow
very cloudy, brown water
lots of flooding



Boundary AP Outfall #87

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: 87

FromMH	From Elev. (FT)	ToMH	To Elevation (FT)	SLOPE (%)	Length (FT)	Material	Diameter (IN)	Max Flow (CFS)
Catchbain 2118	0.00	Outfall 87	0.00	0.00	27.78	UNKNOWN	Unknown	0.00

The City of Traverse City
Storm Outlet Evaluation

Project No. ____________ **File:** ____________

Description: ____________ **Field Work by:** LL + CB **Date:** 5/4/06

Drainage Systems: AP **Checked by:** ____________ **Date:** ______

Available Information: #141 / 90.2

Plans: ☐ Yes ☐ No **Year Built:** ____________

Plan Reference #: ____________ **Year Modified:** ____________

Easement: [X] Yes Front + Madison ☐ No **Pipe Size:** ____________

Outlet Water Course: Tributary A of Kids Creek

Field Investigation: #141 / 90.2

Outlet Pipe Size: 12" **Pipe Type:** [X] Concrete ☐ CMP ☐ Plastic ☐ Other: ______

Outlet Submerged: ☐ Yes [X] No ☐ Partial Depth: ______

Sediment Depth: ______

Deposits: ☐ Yes Type: ______ [X] No

End Treatment: ☐ Yes Type: ______ [X] No

Amount of Pipe Exposed: ______

Slope Protection: [X] Yes Type: ☐ Rip Rap ☐ Pave Spillway ☐ Armor Stone ☐ Cobble [X] Other: grass ☐ No

Scour: ☐ Yes Depth: 4" [X] No

High Water Mark/Watercourse: 6"

Depth from Invert: 1" **High Watermark Pipe:** 1"

from invert ⇒ water level – 5"

Evidence of Flooding: ☐ Yes [X] No

Photographs: [X] Yes ☐ No Numbers: 1

Comments: 4" under pipe of dirt gone.

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Outlet 90.1 Westerly

Boundary AQ
Outfall #90

Legend

- Storm Manholes
- Catchbasins
- Outfalls
- Storm Reach

N
W E
S

1 inch equals 100 feet

0 75 150 225 300 Feet

City of Traverse City Engineering Department
2007 Storm Water Management Report

Stormwater System: 90

FromMH	From Elev. (FT)	ToMH	To Elevation (FT)	SLOPE (%)	Length (FT)	Material	Diameter (IN)	Max Flow (CFS)
Open Channel	0.00	Open Channel	0.00	0.00	98.34	CONCRETE	36 inch	0.00
Open Channel	0.00	Open Channel	0.00	0.00	14.55	CONCRETE	Unknown	0.00
Open Channel	0.00	Open Channel	0.00	0.00	179.44	CONCRETE	36 inch	0.00
Open Channel	0.00	Open Channel	0.00	0.00	50.07	CONCRETE	54 inch	0.00
Open Channel	0.00	Open Channel	0.00	0.00	55.68	CONCRETE	Unknown	0.00
Open Channel	0.00	Open Channel	0.00	0.00	39.62	CONCRETE	Unknown	0.00
Open Channel	0.00	090002	0.00	0.00	71.66	UNKNOWN	24 inch	0.00
090002	620.88	090003	618.00	1.98	145.11	CONCRETE	30 inch	57.75
090003	618.00	090004	617.20	4.11	19.49	CONCRETE	30 inch	83.06
090004	617.20	Junction	613.60	2.59	139.26	CONCRETE	30 inch	65.92

Stormwater System: 90

FromMH	From Elev. (FT)	ToMH	To Elevation (FT)	SLOPE (%)	Length (FT)	Material	Diameter (IN)	Max Flow (CFS)
Junction	0.00	090005	613.60	2.00	55.29	CONCRETE	30 inch	57.98
090005	613.60	090006	613.14	1.88	24.52	CONCRETE	30 inch	56.16
090006	413.14	090007	612.09	-201.16	98.90	CONCRETE	42 inch	#Error
090007	612.09	090008	610.70	0.98	141.46	CONCRETE	42 inch	99.68
090008	610.40	Junction	609.38	2.30	44.28	CONCRETE	42 inch	152.62
Junction	610.40	090009	609.38	1.69	60.42	CONCRETE	42 inch	130.66
090009	609.38	090010	608.79	0.97	60.74	CONCRETE	42 inch	99.11
090010	608.31	Junction	607.41	0.56	159.56	CONCRETE	48 inch	107.82
Junction	608.31	090011	607.41	3.95	22.79	CONCRETE	48 inch	285.34
090011	607.39	090012	606.79	1.06	56.78	CM	6 inch	0.58
090012	0.00	Outfall 90	0.00	0.00	86.63	CM	6 inch	0.00

Stormwater System: 90

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

Stormwater System: 90.1

FromMH	From Elev. (FT)	ToMH	To Elevation (FT)	SLOPE (%)	Length (FT)	Material	Diameter (IN)	Max Flow (CFS)
090011	0.00	Outfall 90.1	0.00	0.00	91.41	CM	48 inch	0.00

The City of Traverse City
Storm Outlet Evaluation

Project No. ______ **File:** ______

Description: ______ **Field Work by:** LL + CB **Date:** 5/4/06

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

Available Information: #90

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

Plan Reference #: Streets #236 **Year Modified:** ______

Easement: ☒ Yes 6th St. ☐ No **Pipe Size:** 36"

Outlet Water Course: Tributary A of Kids Creek

Field Investigation: #90 Munson SE of Beaumont

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

Outlet Submerged: ☒ Yes ☐ No ☒ Partial **Depth:** 2'

Sediment Depth: 10"

Deposits: ☐ Yes **Type:** 12"-16" rocks + sediment rust + ☐ No

End Treatment: ☐ Yes **Type:** ______ ☒ No

Amount of Pipe Exposed: 12"

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

Scour: ☒ Yes **Depth:** 2" ☐ No

High Water Mark/Watercourse: 2'

Depth from Invert: 30" **High Watermark Pipe:** 27"

Evidence of Flooding: ☒ Yes ☐ No

Photographs: ☒ Yes ☐ No **Numbers:** 4

Comments: ______

The City of Traverse City
Storm Outlet Evaluation

Project No. ____________ **File:** ____________

Description: ____________ **Field Work by:** LL + CB **Date:** 5/4/06

Drainage Systems: AQ **Checked by:** ____________ **Date:** ______

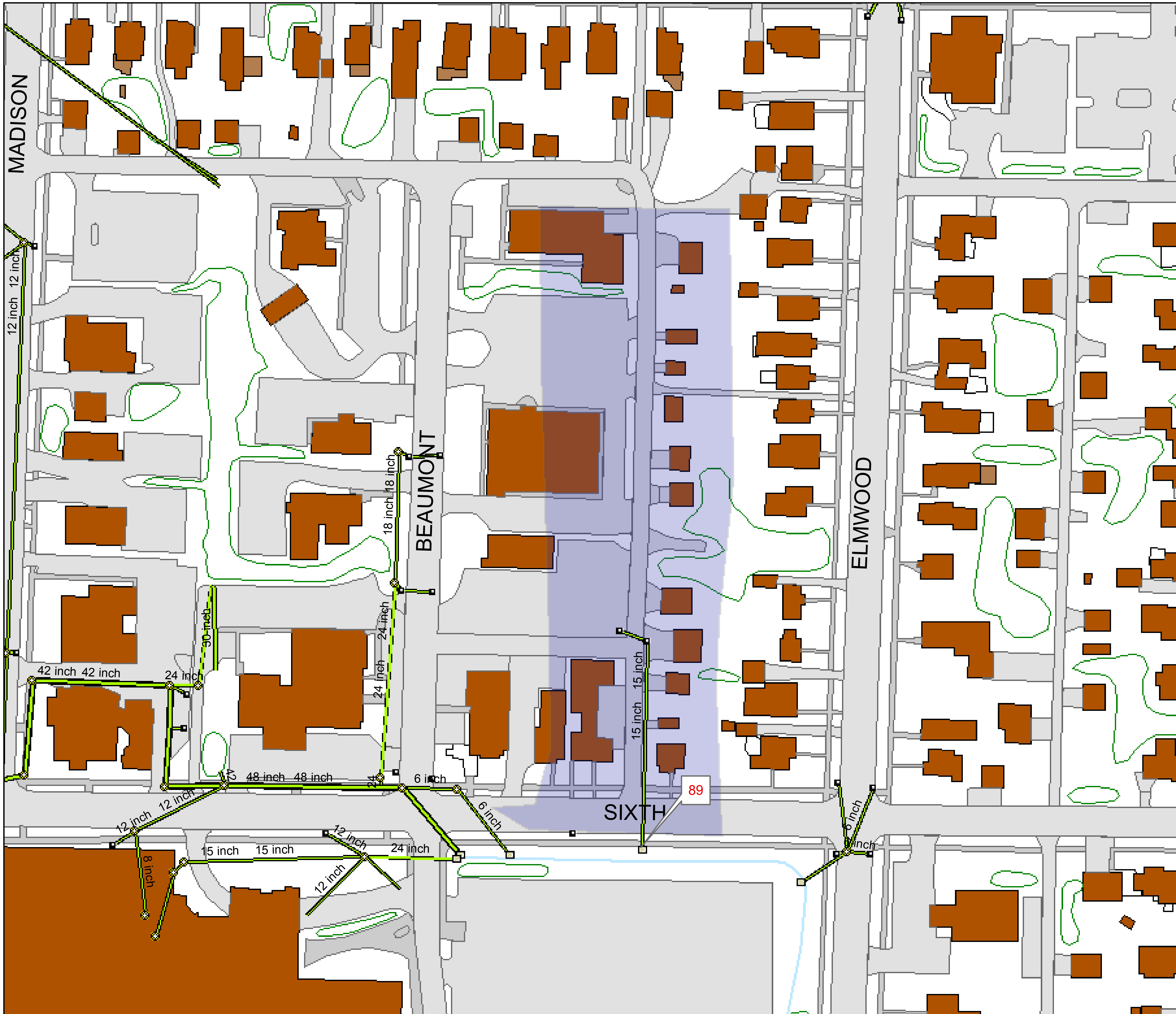
Available Information: #90.1

- **Plans:** ☒ Yes ☐ No — **Year Built:** ______
- **Plan Reference #:** Streets #2310 — **Year Modified:** ______
- **Easement:** ☒ Yes 6th St ☐ No — **Pipe Size:** 36"
- **Outlet Water Course:** Tributary A of Kids Creek

Field Investigation: #90.1 North pipe Munson SW of Beaumont

- **Outlet Pipe Size:** 30" — **Pipe Type:** ☒ Concrete ☐ CMP ☐ Plastic ☐ Other: ______
- **Outlet Submerged:** ☐ Yes ☐ No ☒ Partial Depth: 25" Sediment Depth: 15"
- **Deposits:** ☒ Yes Type: sediment ☐ No
- **End Treatment:** ☐ Yes Type: ______ ☒ No
- **Amount of Pipe Exposed:** Ø
- **Slope Protection:** ☒ Yes Type: ☐ Rip Rap ☐ Pave Spillway ☐ Armor Stone ☐ Cobble ☒ Other: concrete wall ☐ No
- **Scour:** ☐ Yes Depth: ______ ☒ No
- **High Water Mark/Watercourse:** 2'
- **Depth from Invert:** ______ **High Watermark Pipe:** 30"

- **Evidence of Flooding:** ☒ Yes ☐ No
- **Photographs:** ☒ Yes ☐ No Numbers: 3
- **Comments:** sediment bar



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319\05-04-06\05-04-06006.jpg

Easterly

Boundary AR Outfall #89

Legend

- Storm Manholes
- Catchbasins
- Outfalls
- Storm Reach

N
W E
S

1 inch equals 100 feet

0 75 150 225 300 Feet

City of Traverse City Engineering Department
2007 Storm Water Management Report

Stormwater System: 89

FromMH	*From Elev. (FT)*	*ToMH*	*To Elevation (FT)*	*SLOPE (%)*	*Length (FT)*	*Material*	*Diameter (IN)*	*Max Flow (CFS)*
Catchbasin 421	608.60	Outfall 89	608.16	0.20	214.74	CONCRETE	15 inch	2.92

The City of Traverse City
Storm Outlet Evaluation

Project No. ______ **File:** ______

Description: ______ **Field Work by:** LL + CB **Date:** 5/4/06

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

Available Information: #89

Plans: ☒ Yes ☐ No **Year Built:** 1994

Plan Reference #: Storm #157 **Year Modified:** ______

Easement: ☒ Yes 6th St. ☐ No **Pipe Size:** 15"

Outlet Water Course: Tributary A of Kids Creek

Field Investigation: #89 munson

Outlet Pipe Size: 15" **Pipe Type:** ☒ Concrete ☐ CMP ☐ Plastic ☐ Other: ______

Outlet Submerged: ☐ Yes ☐ No ☒ Partial Depth: 4"

Sediment Depth: 1/4 inch

Deposits: ☒ Yes Type: sediment ☐ No

End Treatment: ☐ Yes Type: ______ ☒ No

Amount of Pipe Exposed: 2'

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: 7" **High Watermark Pipe:** 5"

Evidence of Flooding: ☒ Yes ☐ No

Photographs: ☒ Yes ☐ No Numbers: 6

Comments: ______

The City of Traverse City
Storm Outlet Evaluation

Project No. ______ **File:** ______

Description: ______ **Field Work by:** LL + CB **Date:** 5/4/06

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

Available Information: #89

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

Plan Reference #: Storm #157 **Year Modified:** 1994

Easement: ☒ Yes 6th St. ☐ No **Pipe Size:** 8"

Outlet Water Course: Tributary A of Kids Creek

Field Investigation: #89 South of Alley between Elmwood + Beaumont

Outlet Pipe Size: 8" Munson **Pipe Type:** ☒ Concrete ☐ CMP ☐ Plastic ☐ Other: ______

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

Deposits: ☐ Yes Type: ______ ☒ No

End Treatment: ☐ Yes Type: ______ ☒ No

Amount of Pipe Exposed: 20"

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

Scour: ☒ Yes Depth: 1' dry ☐ No

High Water Mark/Watercourse: 1'

Depth from Invert: 1" **High Watermark Pipe:** ∅

Evidence of Flooding: ☒ Yes ☐ No

Photographs: ☒ Yes ☐ No Numbers: 5

Comments: Pipe up on side of hill

Boundary AS Outfall #88

Legend

- Storm Manholes
- Catchbasins
- Outfalls
- Storm Reach

1 inch equals 100 feet

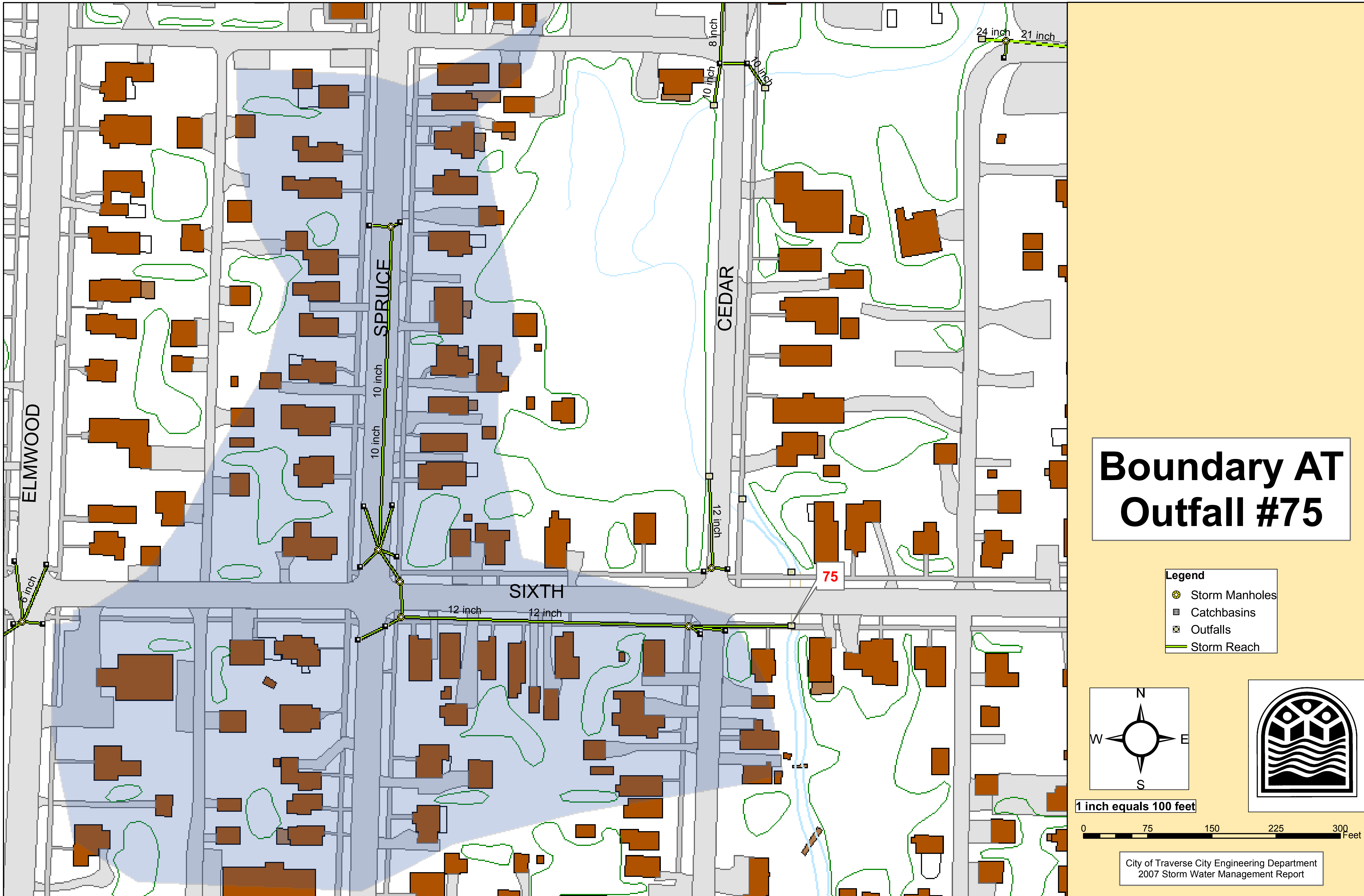
0 80 160 240 320 Feet

City of Traverse City Engineering Department
2007 Storm Water Management Report

Stormwater System: 88

FromMH	From Elev. (FT)	ToMH	To Elevation (FT)	SLOPE (%)	Length (FT)	Material	Diameter (IN)	Max Flow (CFS)
088001	0.00	Outfall 88	0.00	0.00	57.84	CONCRETE	6 inch	0.00

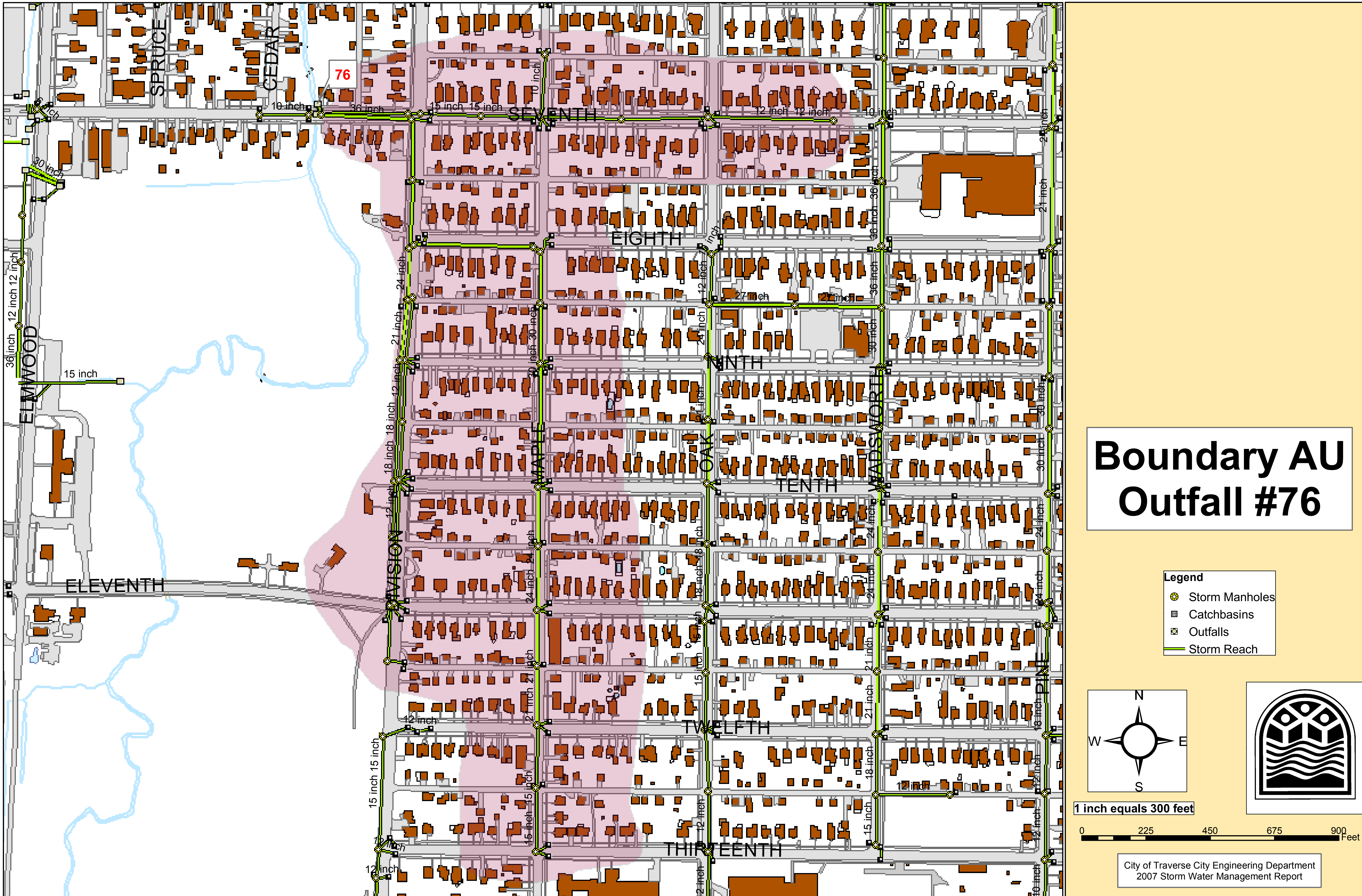
Boundary AT Outfall #75



City of Traverse City Engineering Department
2007 Storm Water Management Report

Stormwater System: 75

FromMH	From Elev. (FT)	ToMH	To Elevation (FT)	SLOPE (%)	Length (FT)	Material	Diameter (IN)	Max Flow (CFS)
075001	604.20	075002	603.06	0.30	377.12	CONCRETE	10 inch	1.20
075002	602.92	075003	602.72	0.44	45.45	CONCRETE	12 inch	2.36
075003	602.72	075004	602.55	0.42	40.63	CONCRETE	12 inch	2.30
075004	602.55	075005	597.00	1.65	335.98	CONCRETE	12 inch	4.58
075005	597.00	Outfall 75	596.40	0.50	119.44	CONCRETE	12 inch	2.52



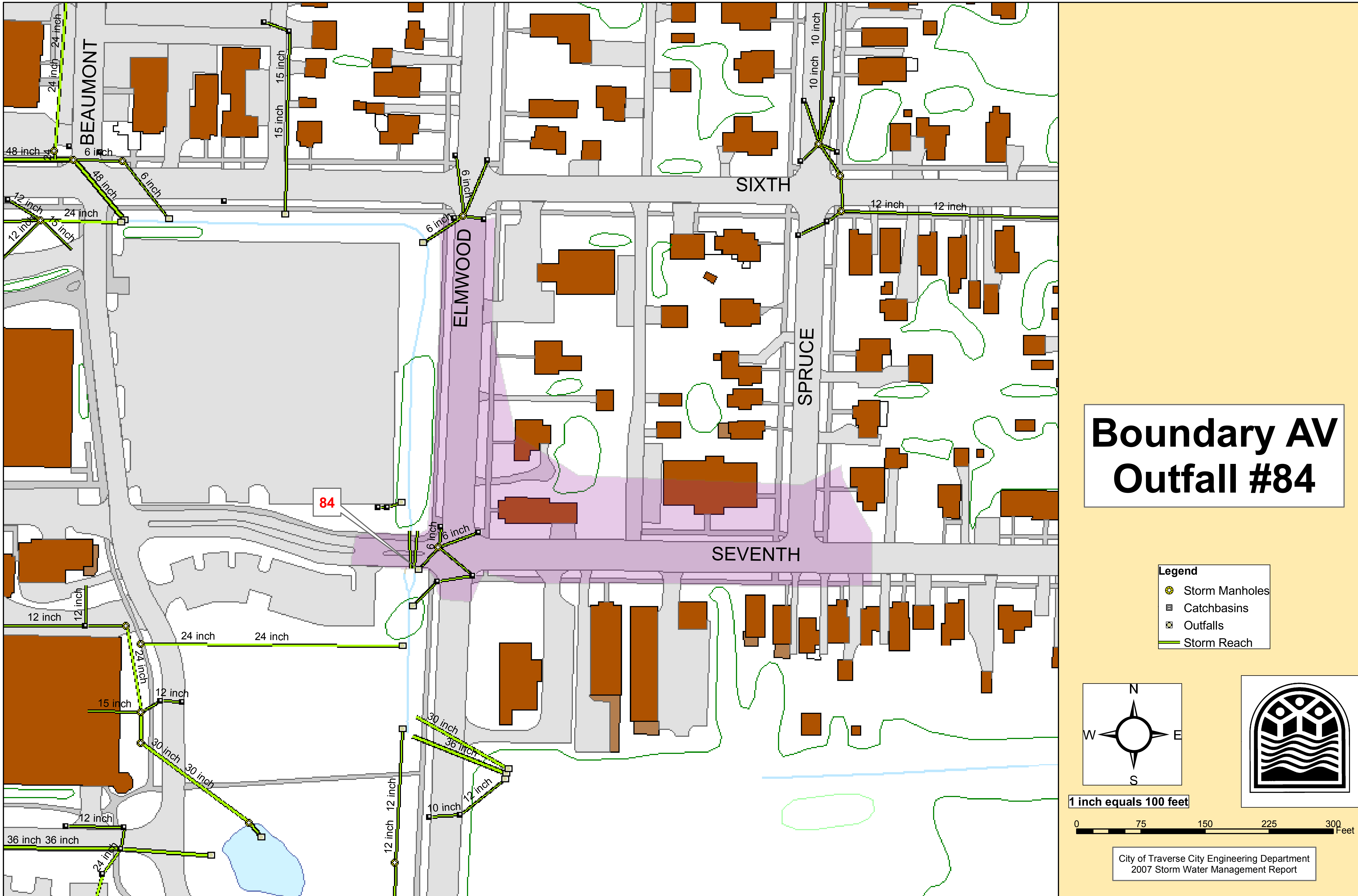
76
SPRUCE
CEDAR
SEVENTH
EIGHTH
NINTH
TENTH
ELEVENTH
TWELFTH
THIRTEENTH
ELMWOOD
DIVISION
MAPLE
OAK
WADSWORTH
PINE
Boundary AU
Outfall #76
Legend
Storm Manholes
Catchbasins
Outfalls
Storm Reach
N
W
E
S
1 inch equals 300 feet
0
225
450
675
900
Feet
City of Traverse City Engineering Department
2007 Storm Water Management Report

Stormwater System: 76

FromMH	From Elev. (FT)	ToMH	To Elevation (FT)	SLOPE (%)	Length (FT)	Material	Diameter (IN)	Max Flow (CFS)
076001	607.28	076002	606.72	0.25	226.36	CONCRETE	15 inch	3.21
076002	606.72	076003	606.23	0.23	217.25	CONCRETE	15 inch	3.07
076003	606.23	076004	605.81	0.20	210.83	CONCRETE	21 inch	7.07
076004	606.23	076005	605.40	0.42	197.37	CONCRETE	21 inch	10.27
076005	605.40	076006	604.93	0.21	223.28	CONCRETE	24 inch	10.37
076006	604.93	076007	604.71	0.11	206.71	CONCRETE	24 inch	7.38
076007	604.47	076008	603.78	0.16	431.20	CONCRETE	30 inch	16.40
076008	602.73	076009	602.37	0.17	211.64	CONCRETE	30 inch	16.91
076009	602.37	076010	602.10	0.15	181.49	CONCRETE	30 inch	15.81
076010	602.10	076011	602.05	0.18	28.29	CONCRETE	30 inch	17.24

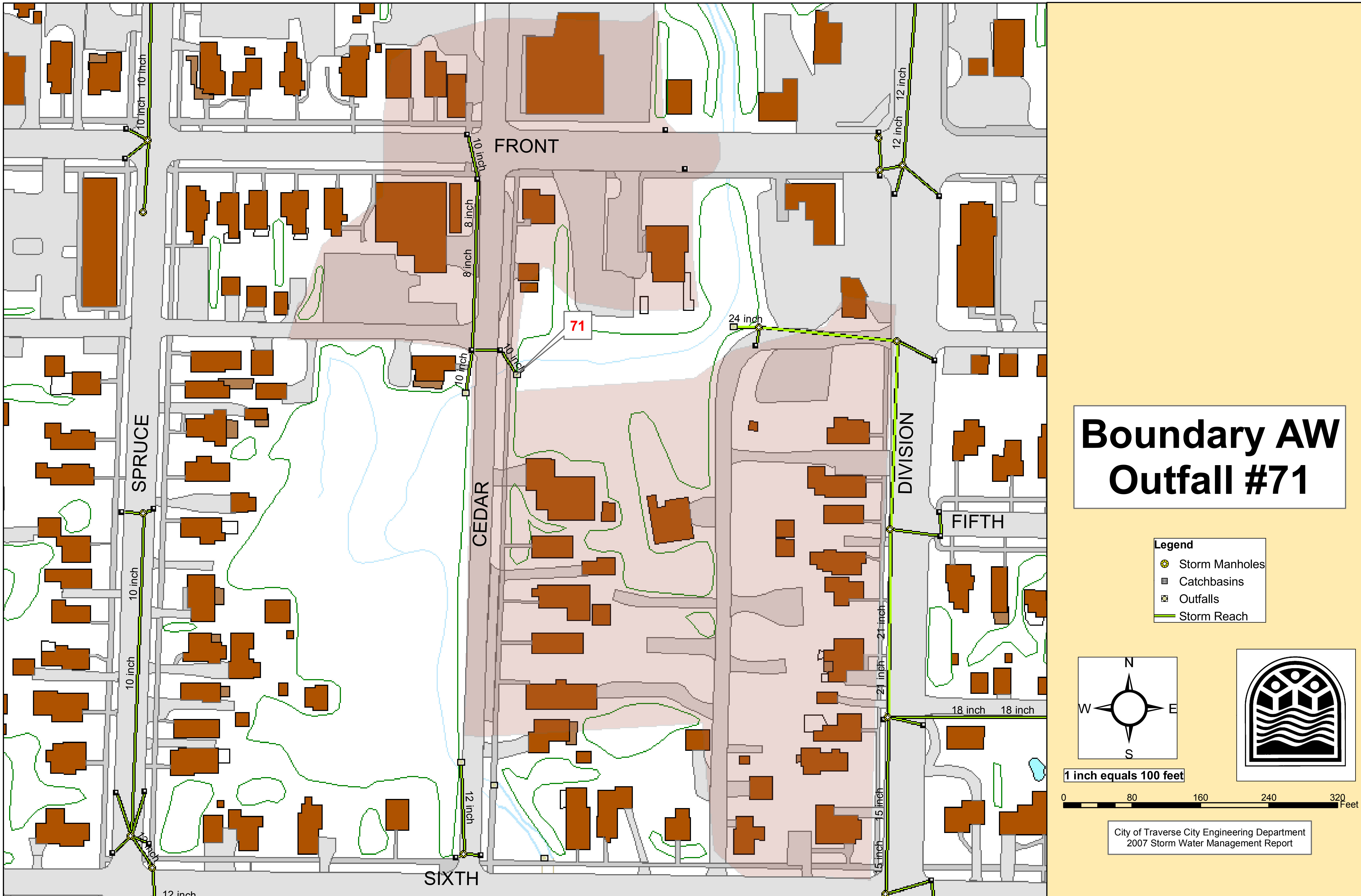
Stormwater System: 76

FromMH	From Elev. (FT)	ToMH	To Elevation (FT)	SLOPE (%)	Length (FT)	Material	Diameter (IN)	Max Flow (CFS)
076011	602.05	Catchbasin 1613	601.34	0.19	382.37	CONCRETE	30 inch	17.67
Catchbasin 1613	601.34	076012	601.25	0.25	35.53	CONCRETE	30 inch	20.63
076012	601.25	076013	600.35	4.74	18.98	CONCRETE	30 inch	89.27
076013	600.35	076014	598.64	0.71	240.16	CONCRETE	30 inch	34.59
076014	598.64	076015	596.80	0.88	210.11	CONCRETE	30 inch	38.36
076015	596.80	076016	595.07	0.54	317.98	CONCRETE	36 inch	49.17
076016	595.07	Outfall 76	0.00	0.00	38.48	CONCRETE	36 inch	0.00


Boundary AV
Outfall #84
BEAUMONT
ELMWOOD
SPRUCE
SIXTH
SEVENTH
84
Legend
Storm Manholes
Catchbasins
Outfalls
Storm Reach
N
S
W
E
1 inch equals 100 feet
0
75
150
225
300
Feet
City of Traverse City Engineering Department
2007 Storm Water Management Report

Stormwater System: 84

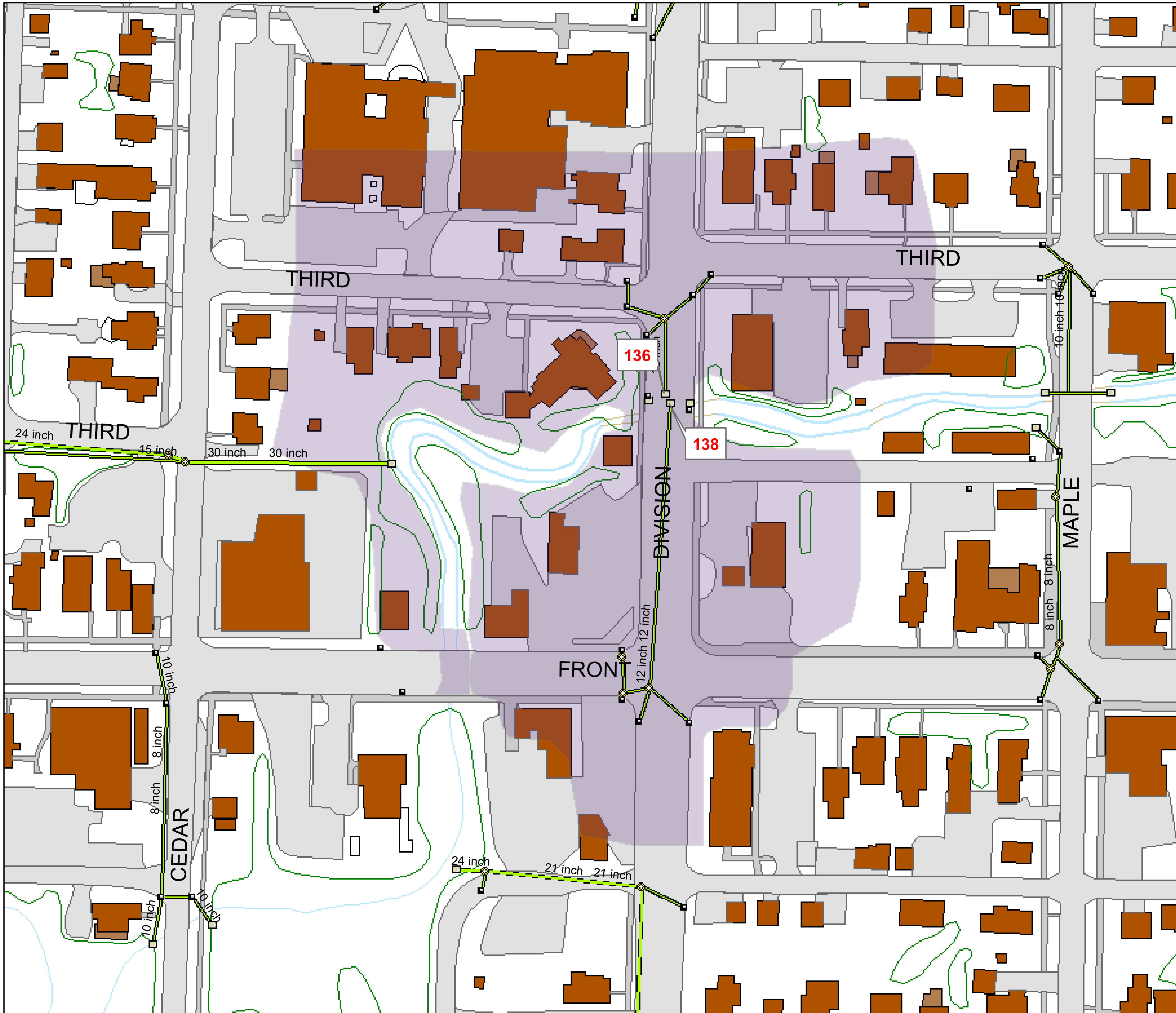
FromMH	From Elev. (FT)	ToMH	To Elevation (FT)	SLOPE (%)	Length (FT)	Material	Diameter (IN)	Max Flow (CFS)
084001	0.00	Outfall 84	0.00	0.00	27.09	CONCRETE	6 inch	0.00



Boundary AW
Outfall #71
FRONT
SPRUCE
CEDAR
DIVISION
FIFTH
SIXTH
71
10 inch
8 inch
24 inch
12 inch
21 inch
18 inch
15 inch
Legend
Storm Manholes
Catchbasins
Outfalls
Storm Reach
N
S
E
W
1 inch equals 100 feet
0
80
160
240
320
Feet
City of Traverse City Engineering Department
2007 Storm Water Management Report

Stormwater System: 71

FromMH	From Elev. (FT)	ToMH	To Elevation (FT)	SLOPE (%)	Length (FT)	Material	Diameter (IN)	Max Flow (CFS)
Catchbasin 439	0.00	Catchbasin 438	0.00	0.00	52.47	CONCRETE	10 inch	0.00
Catchbasin 438	0.00	Junction	598.50	-1.15	56.00	CONCRETE	10 inch	#Error
Junction	598.50	Catchbasin 422	596.20	1.79	144.16	HD POLY	8 inch	1.13
Catchbasin 422	596.20	Outfall 71	596.00	0.00	41.72	HD POLY	10 inch	0.00



Boundary AX Outfall #136 And #138

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: 136

FromMH	From Elev. (FT)	ToMH	To Elevation (FT)	SLOPE (%)	Length (FT)	Material	Diameter (IN)	Max Flow (CFS)
136001	595.00	Outfall 136	0.00	0.80	97.09	CONCRETE	12 inch	3.19

Stormwater System: 138

FromMH	From Elev. (FT)	ToMH	To Elevation (FT)	SLOPE (%)	Length (FT)	Material	Diameter (IN)	Max Flow (CFS)
138001	0.00	138002	0.00	0.00	36.34	CONCRETE	Unknown	0.00
138002	0.00	138003	0.00	0.00	25.39	CONCRETE	Unknown	0.00
138003	599.60	Outfall 138	596.18	1.16	274.04	CONCRETE	12 inch	3.84

Boundary AY Outfall #69

Legend
- Storm Manholes
- Catchbasins
- Outfalls
- Storm Reach

N
W E
S

1 inch equals 200 feet

0 125 250 375 500 Feet

City of Traverse City Engineering Department
2007 Storm Water Management Report

Stormwater System: 69

FromMH	From Elev. (FT)	ToMH	To Elevation (FT)	SLOPE (%)	Length (FT)	Material	Diameter (IN)	Max Flow (CFS)
069001	604.22	069002	603.40	0.46	179.76	CONCRETE	10 inch	1.48
069002	603.38	069003	602.21	0.38	310.08	CONCRETE	15 inch	3.97
069003	602.21	069004	601.05	0.41	277.79	CONCRETE	15 inch	4.15
069003	602.21	069004	601.05	0.41	7.07	CONCRETE	15 inch	4.15
069004	600.99	Catchbasin 2672	599.55	0.40	18.19	CONCRETE	18 inch	6.64
Catchbasin 2672	600.99	Junction	599.55	0.40	337.78	CONCRETE	18 inch	6.64
Junction	599.55	069005	598.91	0.64	98.15	CONCRETE	18 inch	8.42
069005	595.88	069006	595.45	0.20	218.76	CONCRETE	21 inch	7.00
069006	595.45	069007	595.02	0.20	219.90	CONCRETE	21 inch	7.00
069007	595.02	069008	593.34	1.04	152.89	CONCRETE	21 inch	16.12

Stormwater System: 69

FromMH	From Elev. (FT)	ToMH	To Elevation (FT)	SLOPE (%)	Length (FT)	Material	Diameter (IN)	Max Flow (CFS)
069008	0.00	Outfall 69	0.00	0.00	38.03	CONCRETE	24 inch	0.00

FIFTH
SPRUCE
CEDAR
SIXTH
DIVISION
SEVENTH
72
10 inch
12 inch
15 inch
18 inch
21 inch
30 inch
36 inch
Boundary AZ
Outfall #72
Legend
Storm Manholes
Catchbasins
Outfalls
Storm Reach
N
S
E
W
1 inch equals 100 feet
City of Traverse City Engineering Department
2007 Storm Water Management Report

Stormwater System: 72

FromMH	From Elev. (FT)	ToMH	To Elevation (FT)	SLOPE (%)	Length (FT)	Material	Diameter (IN)	Max Flow (CFS)
072001	595.46	Outfall 72	595.09	0.35	107.01	CONCRETE	12 inch	2.09