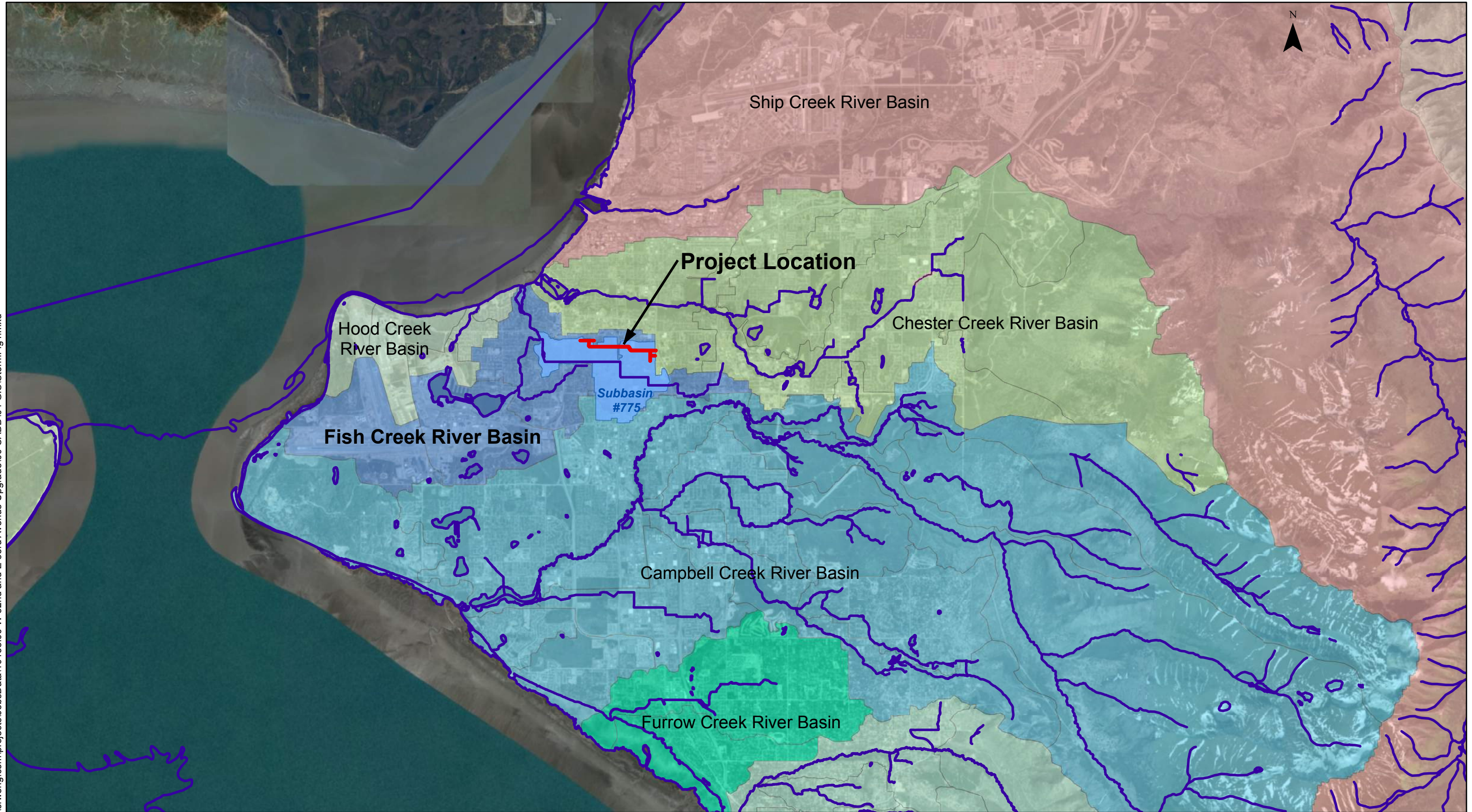


Storm Drain Modeling Data

Appendix E

\\csweng.com\projects\JobsData\10138.00 W 32nd and E 33rd Avenue Upgrade\00 CADD\04 GIS\StormFig1.mxd



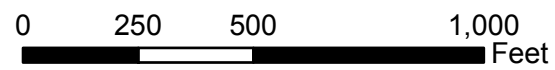
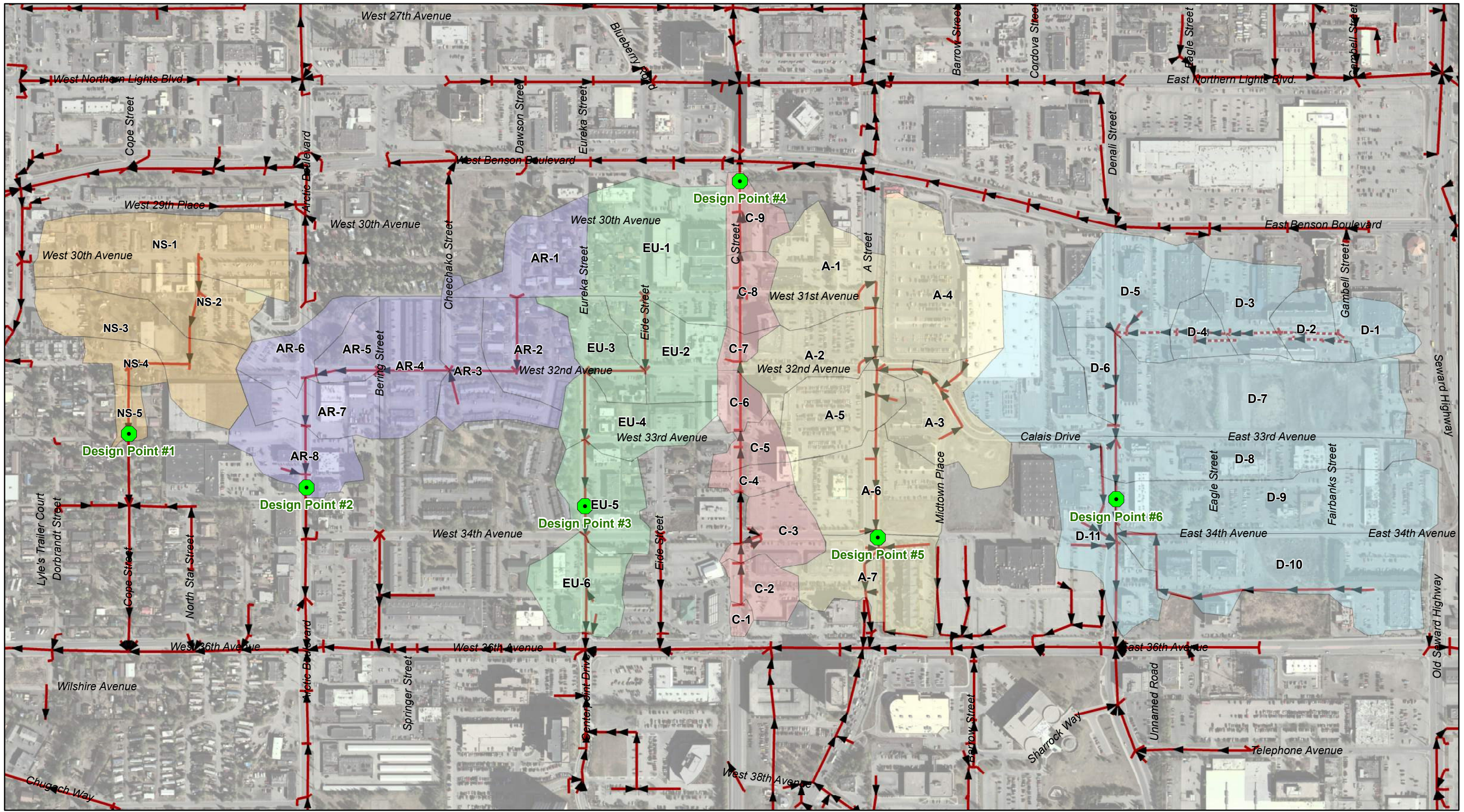
0 1 2 4 6 8 Miles

Project Location and Subbasin
W. 32nd Avenue and E. 33rd Avenue
Design Study Report

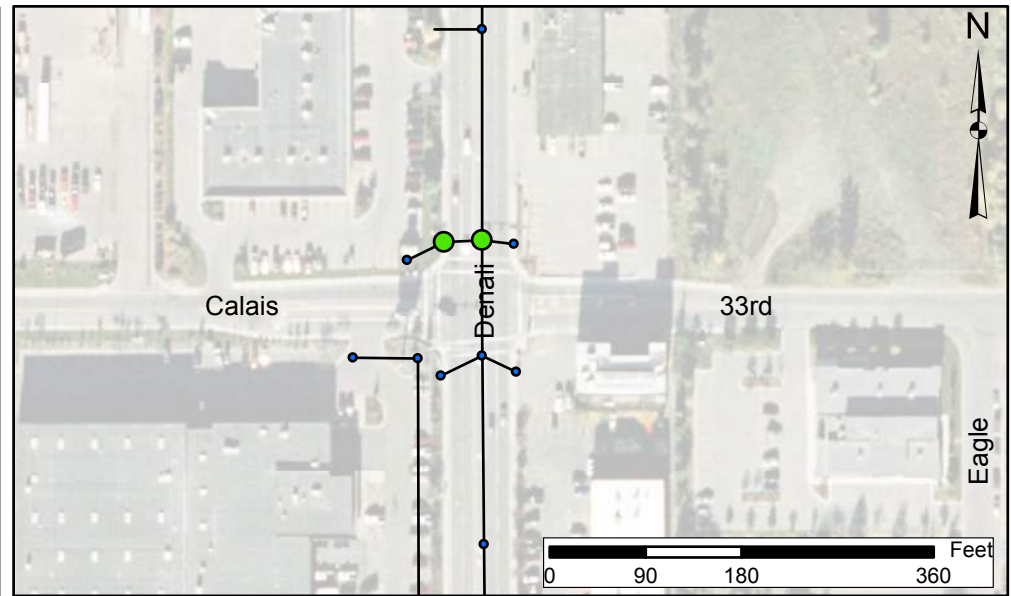
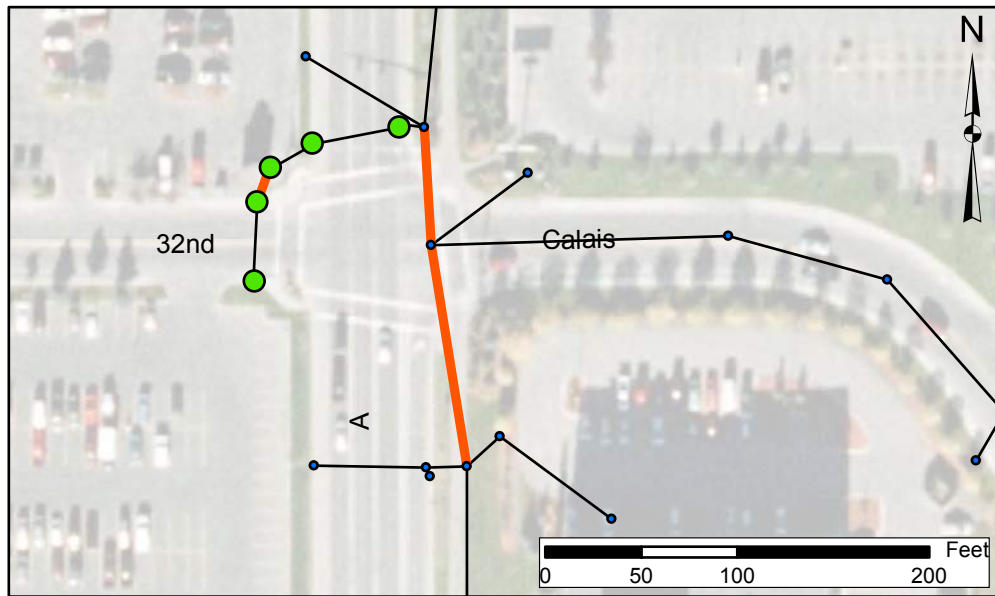
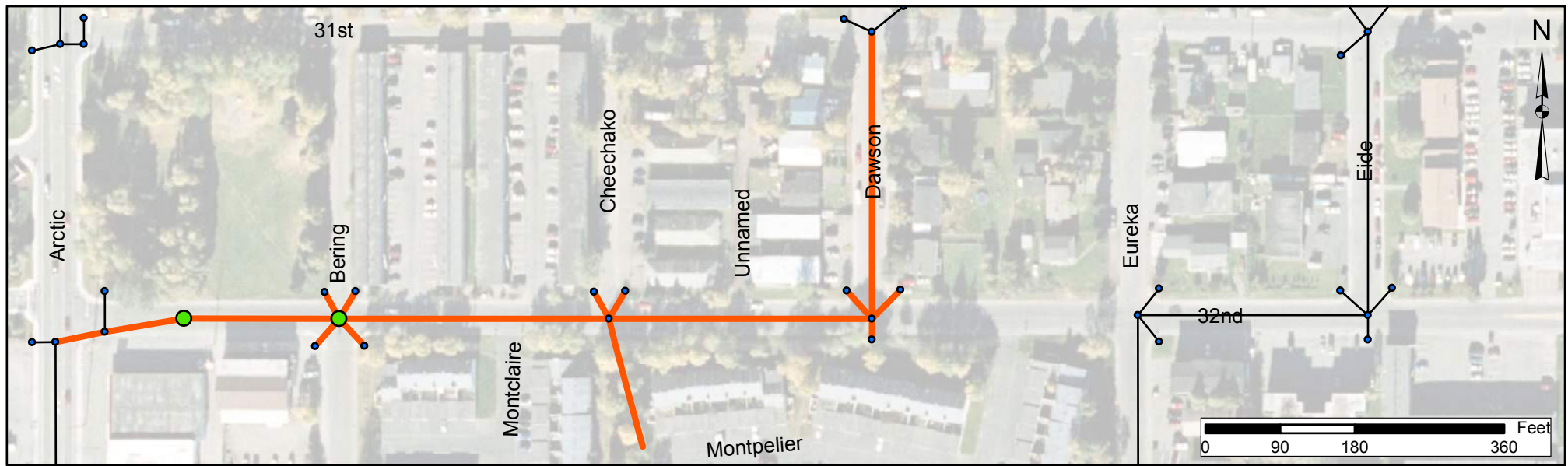
Date: MAR 2019

Figure: 1

\\crweng.com\projects\JobsData\10138.00 W 32nd and E 33rd Avenue Upgrade\00 CADD\04 GIS\StormFig2_Existing_expanded.mxd



Existing Project Catchment Areas and Storm System W. 32nd Avenue and E. 33rd Avenue Upgrade Project	Date: MAR 2019
	Figure: 2



Legend

- Existing Manholes - Acceptable Condition
- Existing Manholes - Deteriorated
- Existing Storm Pipe - Acceptable Condition
- Existing Storm Pipe - Deteriorated

Storm Drain Condition Assessment Results

CCTV and Analysis by StephI Engineering

Date: MAR 2019

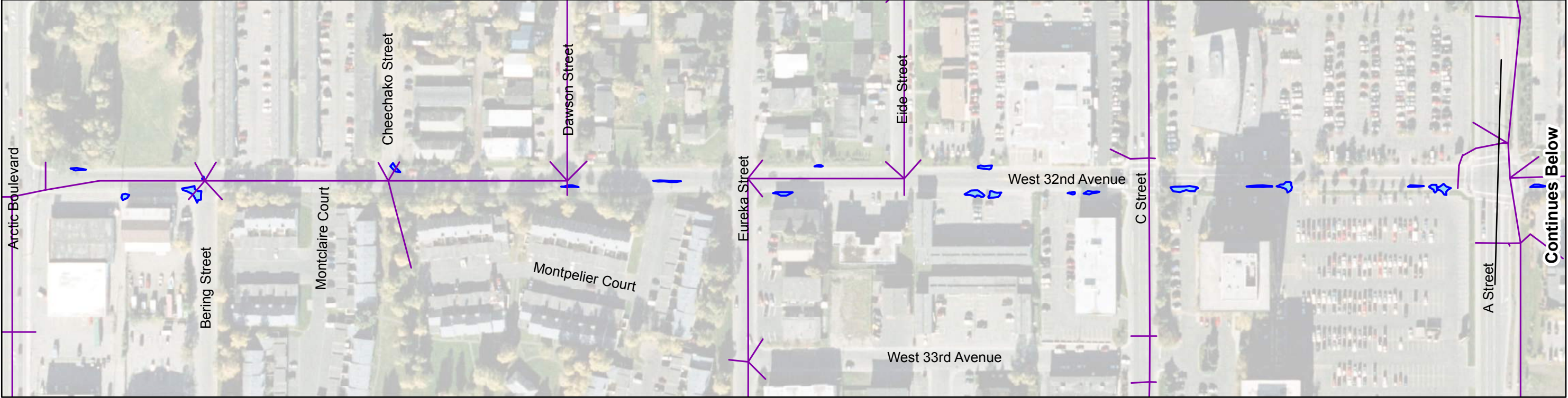
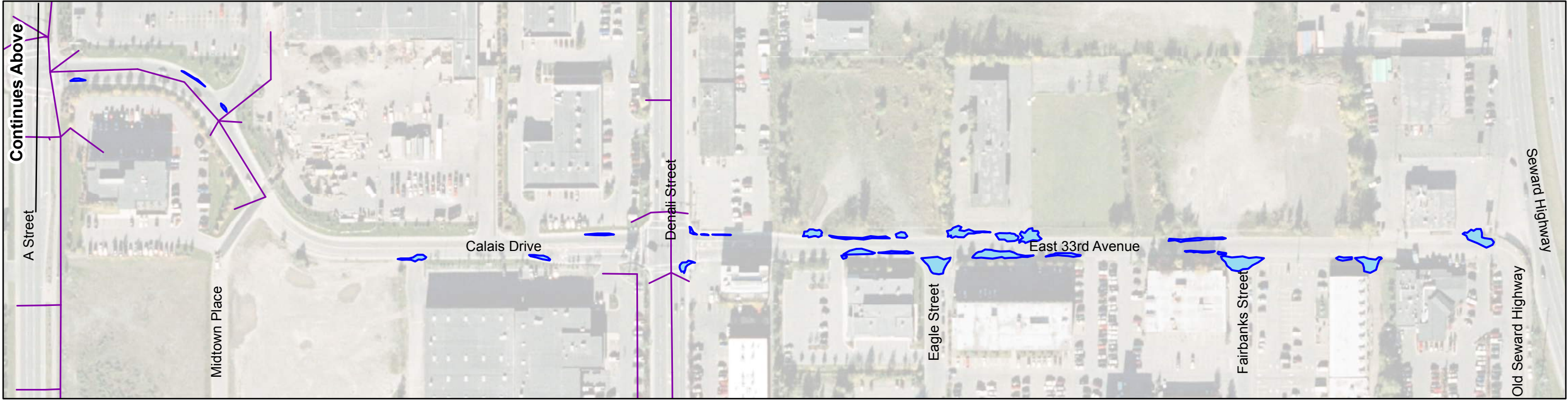
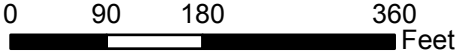
Figure: 3

\\crweng.com\projects\JobsData\10138.00 W 32nd and E 33rd Avenue Upgrade\00 CADD\04 GIS\10138.00 Figure 4 Ponding.mxd

Legend

Existing Storm Pipe

Puddles

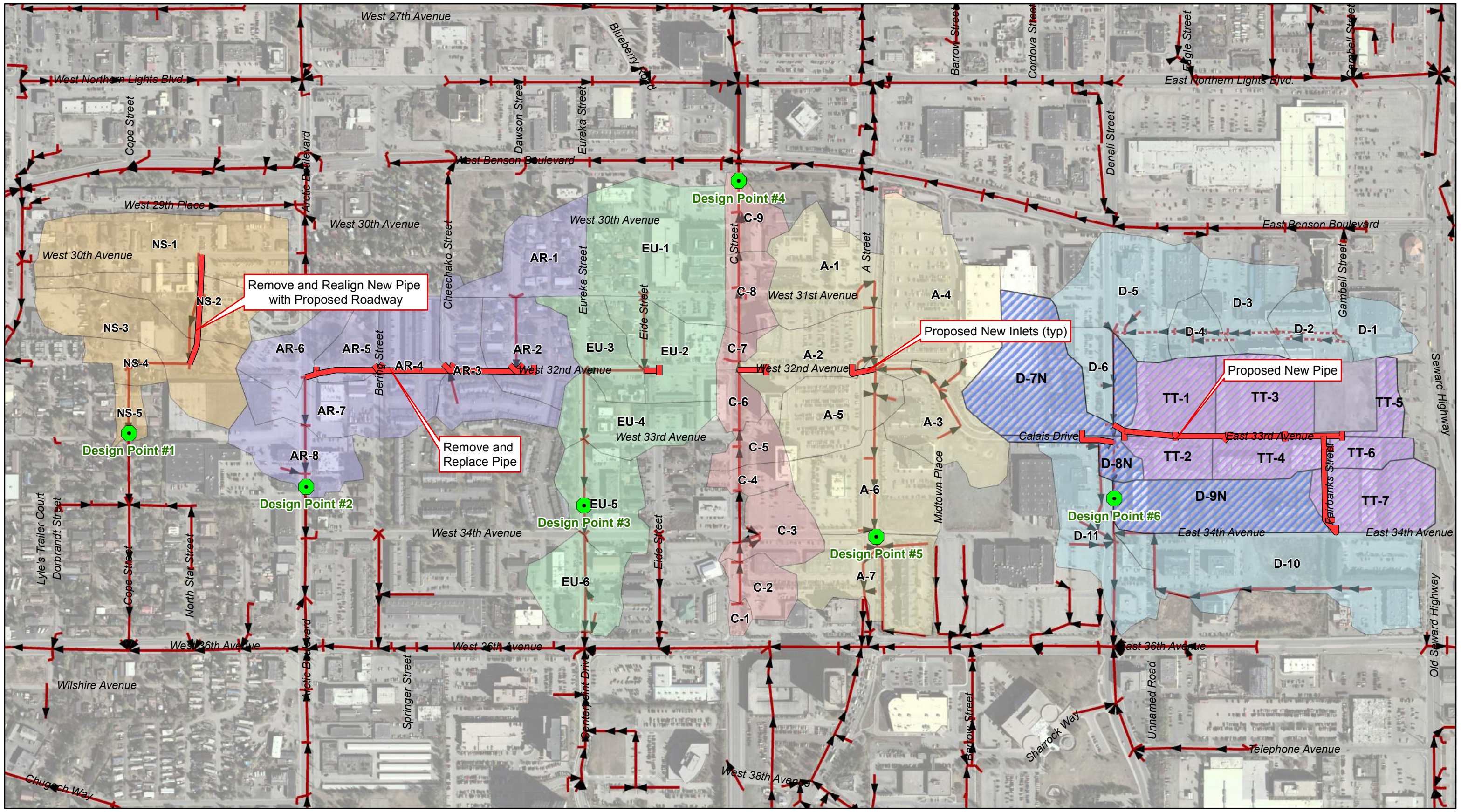


**Existing Ponding Areas
Along Main Project Corridor**
W. 32nd Avenue and E. 33rd Avenue
Upgrade Project

Date: MAR 2019

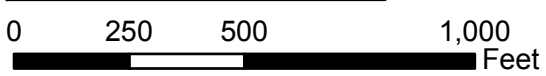
Figure: 4

J:\JobsData\10138.00 W 32nd and E 33rd Avenue Upgrade\00 CADD\04 GIS\StormFig5_Proposed.mxd



Legend

- Revised Catchment Areas
- New Pipe Catchment Areas



Proposed Project Catchment Areas and Storm System W. 32nd Avenue and E. 33rd Avenue Upgrade Project	Date: MAR 2019
	Figure: 5

A detailed map of the project area, showing a grid of streets and contour lines. The map includes a north arrow pointing upwards. A red rectangle highlights the 'PROJECT AREA' in the upper left quadrant, near the intersection of 'ST. JAMES ST.' and 'ST. JAMES ST.'. The map also shows 'TUMBUKAYAN RIVER' and 'SEA FIRM' lines. Contour lines are labeled with values such as 1.00, 1.05, 1.10, 1.15, 1.20, 1.30, 1.60, and 2.00. A scale bar in the bottom right corner indicates a distance of 2.50 units.

PROJECT AREA

CATCHMENT SUMMARY AND INPUT PARAMETERS (EXISTING CONDITION)

Catchment ID	Total Area (Acres)	Undisturbed Naturally Vegetated Areas	Directly Connected Impervious Areas (DCIA)	Contributing Grassed or other Landscaped Areas	Total Impervious	Sum check (1.00)	Hydrologic Soil Group	SCS Curve Number	Composite T _c (min)	Composite T _c (hour)
A-1	4.95	0%	93%	7%	4.62	1.00	C	96.4	5.6	0.09
A-2	4.05	0%	91%	9%	3.69	1.00	C	95.9	5.0	0.08
A-3	4.77	28%	57%	15%	2.72	1.00	C	86.6	81.3	1.36
A-4	8.03	0%	97%	3%	7.81	1.00	C	97.3	7.0	0.12
A-5	3.99	0%	96%	4%	3.82	1.00	C	97.0	5.4	0.09
A-6	5.91	16%	76%	8%	4.49	1.00	C	91.6	59.5	0.99
A-7	5.31	0%	82%	18%	4.34	1.00	C	93.6	5.0	0.08
AR-1	3.94	0%	41%	59%	1.62	1.00	C	83.9	70.7	1.18
AR-2	4.08	0%	45%	55%	1.84	1.00	C	84.8	37.0	0.62
AR-3	3.95	0%	50%	50%	1.98	1.00	C	86.0	50.6	0.84
AR-4	4.09	0%	86%	14%	3.52	1.00	C	94.7	5.4	0.09
AR-5	1.78	0%	32%	68%	0.58	1.00	C	81.8	47.9	0.80
AR-6	2.61	0%	41%	59%	1.08	1.00	C	84.0	33.8	0.56
AR-7	3.13	0%	94%	6%	2.95	1.00	C	96.6	5.0	0.08
AR-8	3.08	0%	96%	4%	2.96	1.00	C	97.0	6.1	0.10
C-1	0.35	0%	88%	12%	0.31	1.00	C	95.2	5.0	0.08
C-2	1.77	0%	95%	5%	1.68	1.00	C	96.8	5.3	0.09
C-3	2.56	0%	92%	8%	2.36	1.00	C	96.1	5.0	0.08
C-4	1.01	0%	90%	10%	0.91	1.00	C	95.6	14.0	0.23
C-5	1.26	0%	79%	21%	0.99	1.00	C	92.9	5.0	0.08
C-6	1.12	0%	85%	15%	0.95	1.00	C	94.3	5.0	0.08
C-7	0.67	0%	84%	16%	0.56	1.00	C	94.1	12.5	0.21
C-8	1.81	0%	82%	18%	1.49	1.00	C	93.8	13.4	0.22
C-9	1.73	0%	72%	28%	1.25	1.00	C	91.3	5.0	0.08
D-1	1.97	0%	96%	4%	1.90	1.00	C	97.1	5.0	0.08
D-2	2.07	0%	90%	10%	1.86	1.00	C	95.6	5.0	0.08
D-3	3.17	0%	95%	5%	3.02	1.00	C	96.9	5.0	0.08
D-4	1.47	0%	91%	9%	1.34	1.00	C	95.9	5.0	0.08
D-5	6.19	0%	89%	11%	5.54	1.00	C	95.5	5.5	0.09
D-6	1.63	0%	89%	11%	1.45	1.00	C	95.4	5.0	0.08
D-7	17.56	32%	65%	3%	11.44	1.00	C	88.4	48.7	0.81
D-8	6.38	0%	91%	9%	5.80	1.00	C	95.8	5.0	0.08
D-9	9.45	0%	84%	16%	7.97	1.00	C	94.2	11.6	0.19
D-10	10.25	24%	72%	4%	7.38	1.00	C	90.3	14.9	0.25
D-11	5.21	0%	94%	6%	4.91	1.00	C	96.6	5.8	0.10
EU-1	8.59	0%	80%	20%	6.89	1.00	C	93.2	70.8	1.18
EU-2	4.03	0%	83%	17%	3.34	1.00	C	93.9	5.0	0.08
EU-3	2.82	0%	66%	34%	1.87	1.00	C	89.9	43.9	0.73
EU-4	3.83	0%	81%	19%	3.09	1.00	C	93.4	5.1	0.09
EU-5	3.76	0%	80%	20%	3.01	1.00	C	93.2	5.0	0.08
EU-6	3.67	0%	85%	15%	3.12	1.00	C	94.4	5.0	0.08
NS-1	8.01	0%	84%	16%	6.73	1.00	C	94.2	36.3	0.60
NS-2	3.96	0%	73%	27%	2.89	1.00	C	91.5	34.8	0.58
NS-3	5.87	0%	55%	45%	3.22	1.00	C	87.2	68.3	1.14
NS-4	1.38	0%	67%	33%	0.93	1.00	C	90.2	64.1	1.07
NS-5	0.80	0%	69%	31%	0.55	1.00	C	90.5	5.0	0.08

**TABLE 1: CATCHMENT RUNOFF SUMMARY
(EXISTING CONDITION)**

Catchment	Area	Peak Runoff (cfs)	
		10-yr, 24-hr Storm (Conveyance Design)	
ID	(Acre)	(cfs)	(cfs/AC)
Arctic Boulevard System			
AR-1	3.94	0.86	0.22
AR-2	4.08	1.36	0.33
AR-3	3.95	1.20	0.30
AR-4	4.09	5.12	1.25
AR-5	1.78	0.42	0.24
AR-6	2.61	0.88	0.34
AR-7	3.13	4.29	1.37
AR-8	3.08	4.01	1.30
Eureka Street/Eide Street System			
EU-1	8.59	3.22	0.37
EU-2	4.03	5.00	1.24
EU-3	2.82	1.18	0.42
EU-4	3.83	4.61	1.20
EU-5	3.76	4.53	1.20
EU-6	3.67	4.65	1.27
C Street System			
C-1	0.35	0.46	1.33
C-2	1.77	2.40	1.36
C-3	2.56	3.45	1.35
C-4	1.01	0.97	0.96
C-5	1.26	1.50	1.19
C-6	1.12	1.41	1.26
C-7	0.67	0.62	0.93
C-8	1.81	1.62	0.89
C-9	1.73	1.90	1.10
A Street System			
A-1	4.95	6.52	1.32
A-2	4.05	5.43	1.34
A-3	4.77	1.14	0.24
A-4	8.03	9.99	1.24
A-5	3.99	5.41	1.36
A-6	5.91	2.25	0.38
A-7	5.31	6.50	1.22
Denali Street System			
D-1	1.97	2.74	1.39
D-2	2.07	2.75	1.33
D-3	3.17	4.39	1.38
D-4	1.47	1.97	1.34
D-5	6.19	7.98	1.29
D-6	1.63	2.15	1.32
D-7	17.56	6.35	0.36
D-8	6.38	8.52	1.34
D-9	9.45	9.20	0.97
D-10	10.25	7.50	0.73
D-11	5.21	6.84	1.31
North Star Street System			
NS-1	8.01	4.56	0.57
NS-2	3.96	2.03	0.51
NS-3	5.87	1.62	0.28
NS-4	1.38	0.47	0.34
NS-5	0.80	0.85	1.06

TABLE 2: PEAK PIPE FLOW SUMMARY (EXISTING CONDITION)

Pipe Segment	Pipe Material	Pipe Diameter (in)	Manning's Coefficient "n"	Length (ft)	Slope (%)	Peak Velocity (ft/s)	Peak Flow (ft ³ /s)	Full Flow Capacity (ft ³ /s)	Pipe Surcharged
Arctic Boulevard System									
AR-P-1	CMP	12	0.024	343.60	0.50%	1.11	0.88	1.36	TRUE
AR-P-2	CMP	15	0.024	314.60	0.20%	1.59	1.96	1.74	TRUE
AR-P-3	CMP	15	0.024	325.00	0.20%	2.48	3.04	1.74	TRUE
AR-P-4	CMP	15	0.024	206.60	0.20%	3.01	3.69	1.74	TRUE
AR-P-5	CMP	15	0.024	89.50	0.30%	3.00	3.68	1.75	TRUE
AR-P-6	Concrete	12	0.013	51.80	0.30%	5.19	4.07	1.78	TRUE
AR-P-7	Concrete	18	0.013	226.60	0.20%	3.46	4.92	5.22	TRUE
AR-P-8	Concrete	18	0.013	224.70	0.30%	4.39	7.76	5.29	TRUE
AR-P-9	Concrete	24	0.013	49.60	0.10%	5.26	11.30	7.18	FALSE
Eureka Street/Eide Street System									
EU-P-1	CPEP	18	0.010	345.90	0.20%	3.60	3.21	6.23	FALSE
EU-P-2	CPEP	18	0.010	284.40	0.30%	4.49	5.93	6.83	FALSE
EU-P-3	CPEP	18	0.010	322.70	0.30%	4.50	6.26	6.84	FALSE
EU-P-4	CPEP	24	0.010	226.70	0.20%	5.33	10.40	14.68	FALSE
EU-P-5	CPEP	24	0.010	219.00	0.20%	4.65	10.09	14.68	FALSE
EU-P-6	CPEP	24	0.010	250.30	0.20%	5.41	13.98	14.70	FALSE
EU-P-7	CPEP	24	0.010	197.80	0.20%	4.62	13.96	14.70	TRUE
EU-P-8	HDPE	18	0.010	35.90	0.20%	10.03	17.72	6.03	TRUE
C Street System									
C-P-1	Concrete	18	0.013	191.50	0.20%	0.47	0.74	4.68	TRUE
C-P-2	Concrete	18	0.013	94.00	0.20%	1.15	2.03	4.72	TRUE
C-P-3	Concrete	18	0.013	240.90	0.20%	2.96	5.22	4.69	TRUE
C-P-4	Concrete	18	0.013	204.70	0.20%	3.22	5.69	4.70	TRUE
C-P-5	Concrete	18	0.013	78.90	0.20%	3.97	7.02	4.73	TRUE
C-P-6	Concrete	18	0.013	319.60	0.20%	4.73	8.37	4.70	TRUE
C-P-7	Concrete	18	0.013	344.00	0.20%	5.11	9.04	4.70	TRUE
C-P-8	Concrete	18	0.013	352.40	0.20%	5.82	10.28	4.68	TRUE
C-P-9	CMP	24	0.024	271.60	0.20%	3.73	11.72	5.46	TRUE
A Street System									
A-P-1	RPMP	21	0.012	226.40	0.20%	2.58	6.21	7.65	TRUE
A-P-2	RPMP	21	0.012	60.60	0.20%	4.46	10.72	7.31	TRUE
A-P-3	CMP	18	0.024	83.90	0.30%	0.08	0.12	3.11	TRUE
A-P-4	CMP	18	0.024	161.40	0.30%	1.44	1.14	3.10	TRUE
A-P-5	RPMP	21	0.012	114.60	0.20%	6.94	16.70	7.52	TRUE
A-P-6	RPMP	24	0.012	631.50	0.20%	6.33	19.88	10.68	TRUE
A-P-7	RPMP	24	0.012	87.50	0.20%	6.22	19.53	11.72	TRUE
A-P-8	RPMP	24	0.012	100.40	0.60%	7.39	23.22	18.63	TRUE
A-P-9	RPMP	27	0.012	316.80	0.20%	5.65	22.45	13.06	TRUE
Denali Street System									
D-P-1	CPEP	12	0.010	270.30	0.30%	3.31	2.60	2.54	TRUE
D-P-2	CPEP	12	0.010	233.30	0.30%	3.69	2.90	2.54	TRUE
D-P-3	CPEP	12	0.010	245.40	0.30%	6.40	5.02	2.54	TRUE
D-P-4	CPEP	12	0.010	234.10	0.30%	5.39	4.23	2.53	TRUE
D-P-5	CPEP	12	0.010	55.00	0.30%	5.34	4.19	2.58	TRUE
D-P-6	CPEP	18	0.010	250.20	0.20%	4.41	7.80	6.10	TRUE
D-P-7	CPEP	18	0.010	184.20	0.20%	5.16	9.12	6.12	TRUE
D-P-8	CPEP	18	0.010	65.50	0.20%	6.52	11.52	6.31	TRUE
D-P-9	CPEP	24	0.010	386.00	0.20%	5.70	17.92	12.61	TRUE
D-P-10	CPEP	24	0.010	51.80	0.20%	8.16	25.62	13.55	TRUE
D-P-11	CPEP	24	0.010	38.60	0.10%	10.29	32.32	10.59	TRUE
D-P-12	CPEP	30	0.010	420.10	0.20%	7.87	38.65	23.27	TRUE
North Star Street									
NS-P-1	CMP	12	0.024	164.00	0.30%	2.03	1.60	1.08	TRUE
NS-P-2	CMP	12	0.024	167.70	0.20%	2.02	1.58	0.96	TRUE
NS-P-3	CMP	15	0.024	172.30	0.20%	2.06	2.53	1.74	TRUE
NS-P-4	CMP	15	0.024	283.70	0.20%	2.91	3.57	1.75	TRUE
NS-P-5	CMP	18	0.024	329.10	0.30%	2.32	4.03	2.86	TRUE

CATCHMENT SUMMARY AND INPUT PARAMETERS (PROPOSED CONDITION)

Catchment ID	Total Area (Acres)	Undisturbed Naturally Vegetated Areas	Directly Connected Impervious Areas (DCIA)	Contributing Grassed or other Landscaped Areas	Total Impervious	Sum check (1.00)	Hydrologic Soil Group	SCS Curve Number	Composite T _c (min)	Composite T _c (hour)
A-1	4.95	0%	93%	7%	4.62	1.00	C	96.4	5.6	0.09
A-2	4.05	0%	91%	9%	3.69	1.00	C	95.9	5.0	0.08
A-3	4.77	28%	57%	15%	2.72	1.00	C	86.6	81.3	1.36
A-4	8.03	0%	97%	3%	7.81	1.00	C	97.3	7.0	0.12
A-5	3.99	0%	96%	4%	3.82	1.00	C	97.0	5.4	0.09
A-6	5.91	16%	76%	8%	4.49	1.00	C	91.6	59.5	0.99
A-7	5.31	0%	82%	18%	4.34	1.00	C	93.6	5.0	0.08
AR-1	3.94	0%	41%	59%	1.62	1.00	C	83.9	70.7	1.18
AR-2	4.08	0%	45%	55%	1.84	1.00	C	84.8	37.0	0.62
AR-3	3.95	0%	50%	50%	1.98	1.00	C	86.0	50.6	0.84
AR-4	4.09	0%	86%	14%	3.52	1.00	C	94.7	5.4	0.09
AR-5	1.78	0%	32%	68%	0.58	1.00	C	81.8	47.9	0.80
AR-6	2.61	0%	41%	59%	1.08	1.00	C	84.0	33.8	0.56
AR-7	3.13	0%	94%	6%	2.95	1.00	C	96.6	5.0	0.08
AR-8	3.08	0%	96%	4%	2.96	1.00	C	97.0	6.1	0.10
C-1	0.35	0%	88%	12%	0.31	1.00	C	95.2	5.0	0.08
C-2	1.77	0%	95%	5%	1.68	1.00	C	96.8	5.3	0.09
C-3	2.56	0%	92%	8%	2.36	1.00	C	96.1	5.0	0.08
C-4	1.01	0%	90%	10%	0.91	1.00	C	95.6	14.0	0.23
C-5	1.26	0%	79%	21%	0.99	1.00	C	92.9	5.0	0.08
C-6	1.12	0%	85%	15%	0.95	1.00	C	94.3	5.0	0.08
C-7	0.67	0%	84%	16%	0.56	1.00	C	94.1	12.5	0.21
C-8	1.81	0%	82%	18%	1.49	1.00	C	93.8	13.4	0.22
C-9	1.73	0%	72%	28%	1.25	1.00	C	91.3	5.0	0.08
D-1	1.97	0%	96%	4%	1.90	1.00	C	97.1	5.0	0.08
D-2	2.07	0%	90%	10%	1.86	1.00	C	95.6	5.0	0.08
D-3	3.17	0%	95%	5%	3.02	1.00	C	96.9	5.0	0.08
D-4	1.47	0%	91%	9%	1.34	1.00	C	95.9	5.0	0.08
D-5	6.19	0%	89%	11%	5.54	1.00	C	95.5	5.5	0.09
D-6	1.63	0%	89%	11%	1.45	1.00	C	95.4	5.0	0.08
D-7N	7.23	0%	98%	2%	7.09	1.00	C	97.5	6.1	0.10
D-8N	1.13	0%	98%	2%	1.11	1.00	C	97.5	6.3	0.11
D-9N	5.51	0%	73%	27%	4.03	1.00	C	91.6	7.6	0.13
D-10	10.25	24%	72%	4%	7.38	1.00	C	90.3	14.9	0.25
D-11	5.21	0%	94%	6%	4.91	1.00	C	96.6	5.8	0.10
EU-1	8.59	0%	80%	20%	6.89	1.00	C	93.2	70.8	1.18
EU-2	4.03	0%	83%	17%	3.34	1.00	C	93.9	5.0	0.08
EU-3	2.82	0%	66%	34%	1.87	1.00	C	89.9	43.9	0.73
EU-4	3.83	0%	81%	19%	3.09	1.00	C	93.4	5.1	0.09
EU-5	3.76	0%	80%	20%	3.01	1.00	C	93.2	5.0	0.08
EU-6	3.67	0%	85%	15%	3.12	1.00	C	94.4	5.0	0.08
TT-1	3.13	0%	90%	10%	2.82	1.00	C	95.6	5.8	0.10
TT-2	1.71	0%	90%	10%	1.54	1.00	C	95.6	5.4	0.09
TT-3	3.96	0%	90%	10%	3.56	1.00	C	95.6	5.8	0.10
TT-4	2.36	0%	90%	10%	2.12	1.00	C	95.6	5.8	0.10
TT-5	1.03	0%	90%	10%	0.93	1.00	C	95.6	7.0	0.12
TT-6	1.20	0%	90%	10%	1.08	1.00	C	95.6	5.0	0.08
TT-7	3.95	0%	73%	27%	2.88	1.00	C	91.5	5.4	0.09
NS-1	8.01	0%	84%	16%	6.73	1.00	C	94.2	36.3	0.60
NS-2	3.96	0%	73%	27%	2.89	1.00	C	91.5	34.8	0.58
NS-3	5.87	0%	55%	45%	3.22	1.00	C	87.2	68.3	1.14
NS-4	1.38	0%	67%	33%	0.93	1.00	C	90.2	64.1	1.07
NS-5	0.80	0%	69%	31%	0.55	1.00	C	90.5	5.0	0.08

**TABLE 3: CATCHMENT RUNOFF SUMMARY
(PROPOSED CONDITION)**

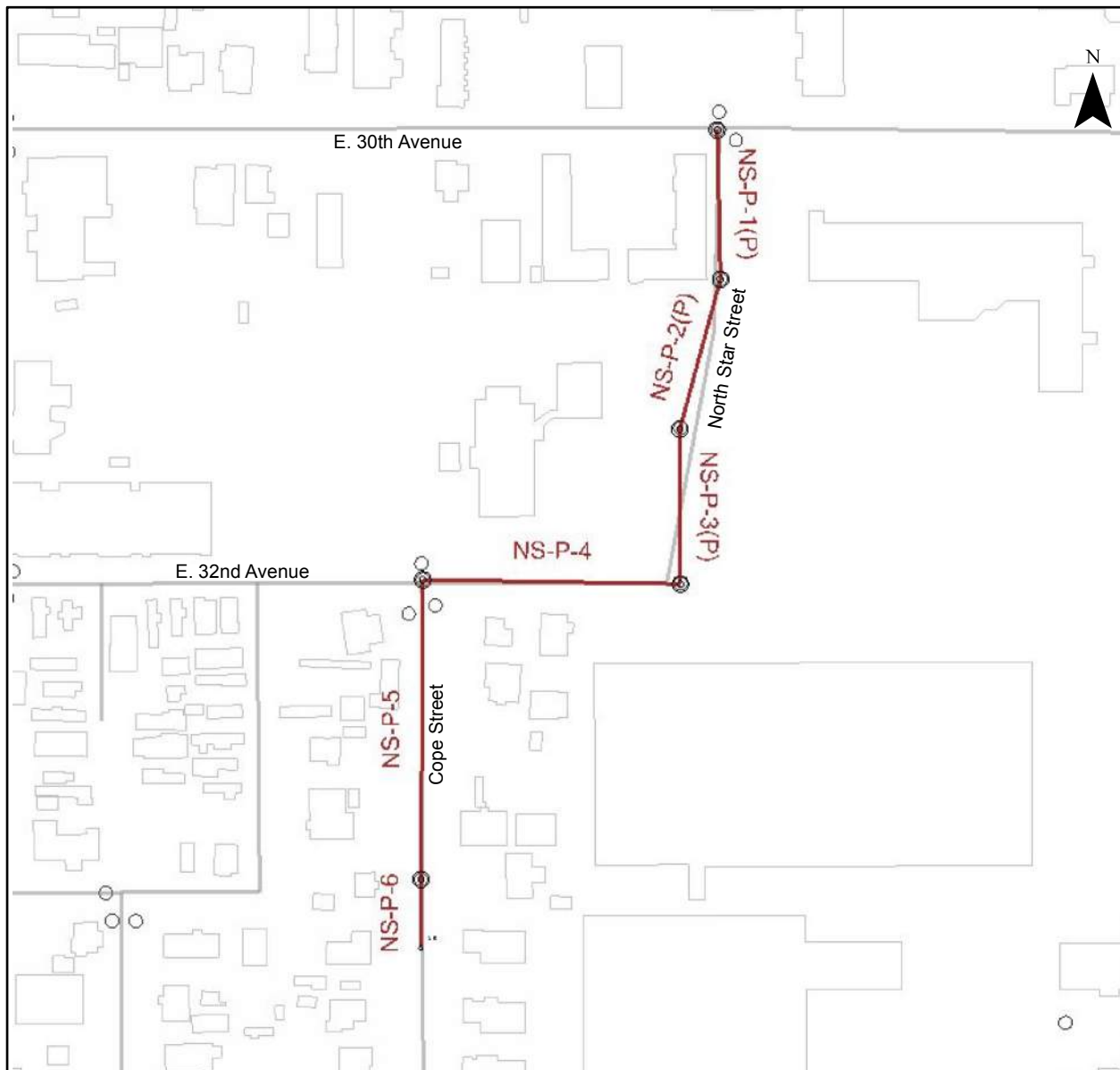
Catchment	Area	Peak Runoff (cfs)	
		10-yr, 24-hr Storm (Conveyance Design)	
ID	(Acre)	(cfs)	(cfs/AC)
Arctic Boulevard System			
AR-1	3.94	0.86	0.22
AR-2	4.08	1.36	0.33
AR-3	3.95	1.20	0.30
AR-4	4.09	5.12	1.25
AR-5	1.78	0.42	0.24
AR-6	2.61	0.88	0.34
AR-7	3.13	4.29	1.37
AR-8	3.08	4.01	1.30
Eureka Street/Eide Street System			
EU-1	8.59	3.22	0.37
EU-2	4.03	5.00	1.24
EU-3	2.82	1.18	0.42
EU-4	3.83	4.61	1.20
EU-5	3.76	4.53	1.20
EU-6	3.67	4.65	1.27
C Street System			
C-1	0.35	0.46	1.33
C-2	1.77	2.40	1.36
C-3	2.56	3.45	1.35
C-4	1.01	0.97	0.96
C-5	1.26	1.50	1.19
C-6	1.12	1.41	1.26
C-7	0.67	0.62	0.93
C-8	1.81	1.62	0.89
C-9	1.73	1.90	1.10
A Street System			
A-1	4.95	6.52	1.32
A-2	4.05	5.43	1.34
A-3	4.77	1.14	0.24
A-4	8.03	9.99	1.24
A-5	3.99	5.41	1.36
A-6	5.91	2.25	0.38
A-7	5.31	6.50	1.22

Catchment	Area	Peak Runoff (cfs)	
		10-yr, 24-hr Storm (Conveyance Design)	
ID	(Acre)	(cfs)	(cfs/AC)
Denali Street System			
D-1	1.97	2.74	1.39
D-2	2.07	2.75	1.33
D-3	3.17	4.39	1.38
D-4	1.47	1.97	1.34
D-5	6.19	7.98	1.29
D-6	1.63	2.15	1.32
D-7N	7.23	9.55	1.32
D-8N	1.13	1.48	1.31
D-9N	5.51	6.13	1.11
D-10	10.25	7.50	0.73
D-11	5.21	6.84	1.31
North Star Street System			
NS-1	8.01	4.56	0.57
NS-2	3.96	2.03	0.51
NS-3	5.87	1.62	0.28
NS-4	1.38	0.47	0.34
NS-5	0.80	0.85	1.06
33rd Avenue System			
TT-1	3.13	3.97	1.27
TT-2	1.71	2.27	1.33
TT-3	3.96	5.03	1.27
TT-4	2.36	3.00	1.27
TT-5	1.03	1.21	1.17
TT-6	1.20	1.59	1.33
TT-7	3.95	4.69	1.19

TABLE 4: PEAK PIPE FLOW SUMMARY (PROPOSED CONDITION)

Pipe Segment	Pipe Material	Pipe Diameter (in)	Manning's Coefficient "n"	Length (ft)	Slope (%)	Peak Velocity (ft/s)	Peak Flow (ft³/s)	Full Flow Capacity (ft³/s)	Pipe Surcharged
Arctic Boulevard System									
AR-P-1(P)	CPEP	18	0.010	54.00	0.30%	3.97	0.86	7.43	FALSE
AR-P-2(P)	CPEP	18	0.010	314.60	0.30%	3.55	2.05	7.46	FALSE
AR-P-3(P)	CPEP	18	0.010	325.00	0.30%	4.05	3.23	7.50	FALSE
AR-P-4(P)	CPEP	18	0.010	206.60	0.30%	3.15	5.41	7.48	TRUE
AR-P-5(P)	CPEP	18	0.010	89.50	0.30%	3.14	5.55	7.50	TRUE
AR-P-6(P)	CPEP	18	0.010	51.80	0.30%	3.30	5.83	7.59	TRUE
AR-P-7	Concrete	18	0.013	226.60	0.30%	3.69	6.52	5.67	TRUE
AR-P-8	Concrete	18	0.013	224.70	0.30%	5.20	9.20	5.29	TRUE
AR-P-9	Concrete	24	0.013	50.20	0.10%	5.60	13.10	7.14	FALSE
Eureka Street/Eide Street System									
EU-P-1	CPEP	18	0.010	345.90	0.20%	3.60	3.21	6.23	FALSE
EU-P-2	CPEP	18	0.010	284.40	0.30%	4.49	5.93	6.83	FALSE
EU-P-3	CPEP	18	0.010	322.70	0.30%	4.50	6.26	6.84	FALSE
EU-P-4	CPEP	24	0.010	226.70	0.20%	5.33	10.40	14.68	FALSE
EU-P-5	CPEP	24	0.010	219.00	0.20%	4.65	10.09	14.68	FALSE
EU-P-6	CPEP	24	0.010	250.30	0.20%	5.41	13.98	14.70	FALSE
EU-P-7	CPEP	24	0.010	197.80	0.20%	4.62	13.96	14.70	TRUE
EU-P-8	CPEP	18	0.010	35.90	0.20%	10.03	17.72	6.03	TRUE
C Street System									
C-P-1	Concrete	18	0.013	191.50	0.20%	0.47	0.74	4.68	TRUE
C-P-2	Concrete	18	0.013	94.00	0.20%	1.15	2.03	4.72	TRUE
C-P-3	Concrete	18	0.013	240.90	0.20%	2.96	5.22	4.69	TRUE
C-P-4	Concrete	18	0.013	204.70	0.20%	3.22	5.69	4.70	TRUE
C-P-5	Concrete	18	0.013	78.90	0.20%	3.97	7.02	4.73	TRUE
C-P-6	Concrete	18	0.013	319.60	0.20%	4.73	8.37	4.70	TRUE
C-P-7	Concrete	18	0.013	344.00	0.20%	5.11	9.04	4.70	TRUE
C-P-8	Concrete	18	0.013	352.40	0.20%	5.82	10.28	4.68	TRUE
C-P-9	CMP	24	0.024	271.60	0.20%	3.73	11.72	5.46	TRUE
A Street System									
A-P-1	RPMP	21	0.012	226.40	0.20%	2.58	6.21	7.65	TRUE
A-P-2	RPMP	21	0.012	60.60	0.20%	4.46	10.72	7.31	TRUE
A-P-3	CMP	18	0.024	83.90	0.30%	0.08	0.12	3.11	TRUE
A-P-4	CMP	18	0.024	161.40	0.30%	1.44	1.14	3.10	TRUE
A-P-5	RPMP	21	0.012	114.60	0.20%	6.95	16.71	7.52	TRUE
A-P-6	RPMP	24	0.012	631.50	0.20%	6.32	19.86	10.68	TRUE
A-P-7	RPMP	24	0.012	87.50	0.20%	6.21	19.51	11.72	TRUE
A-P-8	RPMP	24	0.012	100.40	0.60%	7.39	23.21	18.63	TRUE
A-P-9	RPMP	27	0.012	316.80	0.20%	5.64	22.44	13.06	TRUE
Denali Street System									
D-P-1	CPEP	12	0.010	270.30	0.30%	3.30	2.59	2.54	TRUE
D-P-2	CPEP	12	0.010	233.30	0.30%	4.05	3.18	2.54	TRUE
D-P-3	CPEP	12	0.010	245.40	0.30%	5.04	3.96	2.54	TRUE
D-P-4	CPEP	12	0.010	234.10	0.30%	5.92	4.65	2.53	TRUE
D-P-5	CPEP	12	0.010	55.00	0.30%	5.79	4.55	2.58	TRUE
D-P-6	CPEP	18	0.010	250.20	0.20%	4.54	8.03	6.10	TRUE
D-P-7	CPEP	18	0.010	184.20	0.20%	5.04	8.91	6.12	TRUE
D-P-7N(P)	CPEP	18	0.010	81.80	0.20%	5.26	9.29	7.33	TRUE
D-P-8	CPEP	18	0.010	65.50	0.20%	8.42	14.87	6.31	TRUE
D-P-9	CPEP	24	0.010	386.00	0.20%	6.69	21.02	12.61	TRUE
D-P-10	CPEP	24	0.010	51.80	0.20%	8.22	25.82	13.55	TRUE
D-P-11	CPEP	24	0.010	38.60	0.10%	10.31	32.41	10.59	TRUE
D-P-12	CPEP	30	0.010	420.10	0.20%	7.83	38.45	23.27	TRUE
33rd Avenue									
TT-P-1(P)	CPEP	18	0.010	76.20	0.30%	1.50	2.66	6.96	TRUE
TT-P-2(P)	CPEP	18	0.010	410.40	0.30%	2.11	3.72	7.68	TRUE
TT-P-3(P)	CPEP	24	0.010	461.90	0.30%	1.89	5.95	15.00	TRUE
TT-P-4(P)	CPEP	24	0.010	240.70	0.30%	3.83	12.02	15.86	TRUE
TT-P-5(P)	CPEP	24	0.010	224.50	0.30%	3.88	12.21	15.20	TRUE
TT-P-6(P)	CPEP	24	0.010	86.60	0.30%	5.63	17.70	15.48	TRUE
North Star Street									
NS-P-1(P)	CPEP	18	0.003	163.80	0.30%	2.58	4.55	7.98	TRUE
NS-P-2(P)	CPEP	18	0.003	170.40	0.30%	1.69	2.98	7.19	TRUE
NS-P-3(P)	CPEP	18	0.003	170.00	0.30%	2.38	4.21	7.21	TRUE
NS-P-4	CPEP	15	0.003	282.60	0.30%	3.87	4.76	1.81	TRUE
NS-P-5	CPEP	18	0.003	329.10	0.30%	2.78	4.91	2.94	TRUE
NS-P-6	CPEP	18	0.003	74.10	0.30%	3.41	5.35	3.10	FALSE

Placeholder for Water Quality Summary



**Note: Pipes with (P) names are existing, and are being replaced in this project with larger diameter pipe.*

Storm Drain Model Pipe Labels

Correlates with StormCAD Output

Date: MAR 2019

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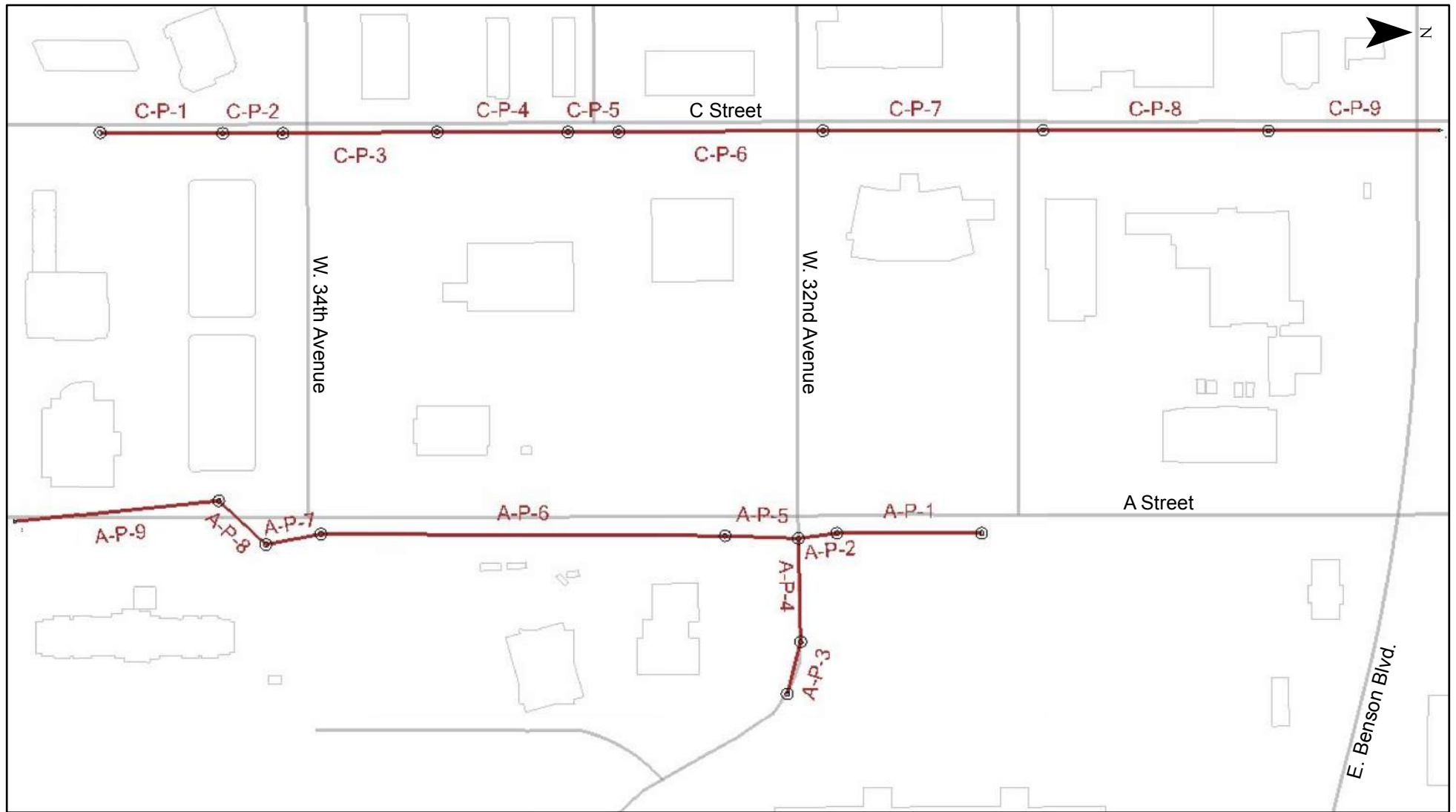
**Note: Pipes with (P) names are existing, and are being replaced in this project with larger diameter pipe.*

Storm Drain Model Pipe Labels

Correlates with StormCAD Output

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Storm Drain Model Pipe Labels

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**Note: Pipes with (P) names are existing, and are being replaced in this project with larger diameter pipe.*

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