

CITY OF ALBUQUERQUE

Planning Department
Brennon Williams, Director



Mayor Timothy M. Keller

August 14, 2020

Ronald Bohannon, P.E.
Tierra West, LLC
5571 Midway Park Place NE
Albuquerque, NM 87109

RE: Sunport South – University Blvd Improvements
Drainage Calculations and Drainage Design
Engineer's Stamp Date: 07/07/20
Hydrology File: Q15D001
CPN # 743382

Dear Mr. Bohannon:

PO Box 1293

Based upon the information provided in your submittal received 07/07/2020 and 08/14/2020, the Drainage Calculations and Drainage Design are approved for Work Order.

Albuquerque

As a reminder, if the project total area of disturbance (including the staging area and any work within the adjacent Right-of-Way) is 1 acre or more, then an Erosion and Sediment Control (ESC) Plan and Owner's certified Notice of Intent (NOI) is required to be submitted to the Stormwater Quality Engineer (Doug Hughes, PE, jhughes@cabq.gov, 924-3420) 14 days prior to any earth disturbance.

NM 87103

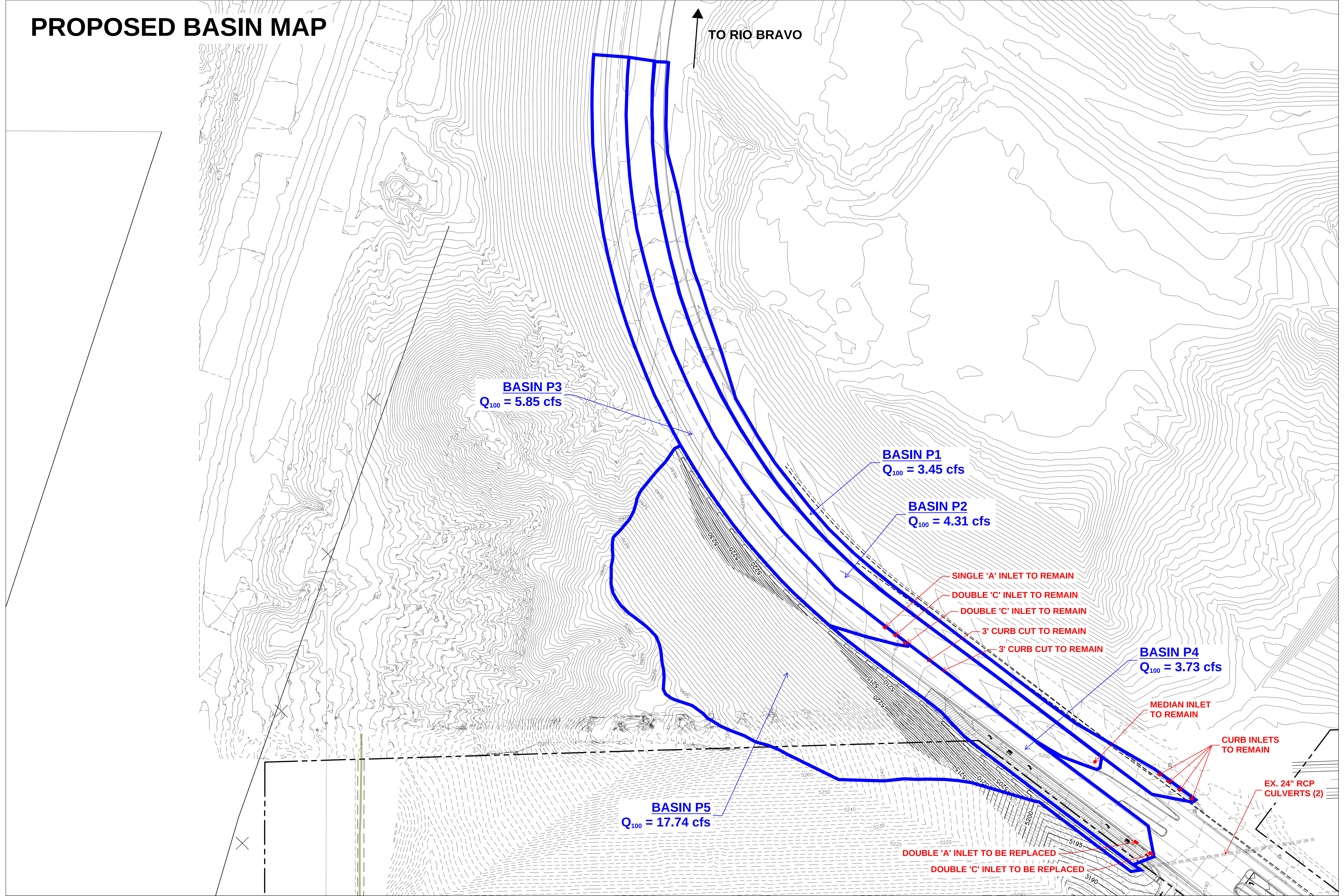
www.cabq.gov

If you have any questions, please contact me at 924-3995 or rbrissette@cabq.gov.

Sincerely,

Renée C. Brissette, P.E. CFM
Senior Engineer, Hydrology
Planning Department

PROPOSED BASIN MAP



DPM Weighted E Method

Precipitation Zone 2

University Blvd, N. of Tijeras Arroyo

Sunport South Business Park - University Inlets

TWLLC Date 6/25/2020

Existing/Proposed Conditions

Basin Descriptions												100-Year, 6-Hr			10-Year, 6-Hr		
Basin ID	Area (sf)	Area (acres)	Area (sq miles)	Treatment A		Treatment B		Treatment C		Treatment D		Weighted E (in)	Volume (ac-ft)	Flow cfs	Weighted E (in)	Volume (ac-ft)	Flow cfs
				%	(acres)	%	(acres)	%	(acres)	%	(acres)						
P1	34,646.69	0.795	0.00124	0%	0.000	15%	0.119	0%	0.000	85%	0.676	1.919	0.127	3.45	1.181	0.078	2.24
P2	59,748.07	1.372	0.00214	0%	0.000	0%	0.000	100%	1.372	0%	0.000	1.130	0.129	4.31	0.520	0.059	2.35
P3	57,828.30	1.328	0.00207	0%	0.000	12%	0.159	0%	0.000	88%	1.168	1.959	0.217	5.85	1.213	0.134	3.82
P4	35,136.01	0.807	0.00126	0%	0.000	3%	0.024	0%	0.000	97%	0.782	2.080	0.140	3.73	1.308	0.088	2.48
P5*	146,744.98	3.369	0.00526	0%	0.000	5%	0.168	0%	0.000	95%	3.200	2.053	0.576	15.43	1.287	0.361	10.21
Total	334,104.05	7.670	0.01198		0.000		0.471		0.000		5.827		1.189	32.77		0.721	21.09

* Basin P5 Q100 + 15% Bulking Factor = 17.74 cfs (35.08 cfs for sum of all basins)

Worksheet for Basin P3 Avg. Road Section

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.02600	ft/ft
Discharge	5.85	ft ³ /s
Section Definitions		

Station (ft)	Elevation (ft)
0+00	2.00
0+00	1.33
0+38	0.68
0+38	1.35

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 2.00)	(0+00, 1.33)	0.013
(0+00, 1.33)	(0+38, 0.68)	0.013
(0+38, 0.68)	(0+38, 1.35)	0.013

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	0.22	ft
Elevation Range	0.68 to 2.00 ft	
Flow Area	1.40	ft ²
Wetted Perimeter	13.03	ft
Hydraulic Radius	0.11	ft
Top Width	12.81	ft
Normal Depth	0.22	ft

Worksheet for Basin P3 Avg. Road Section

Results

Critical Depth	0.30	ft
Critical Slope	0.00473	ft/ft
Velocity	4.17	ft/s
Velocity Head	0.27	ft
Specific Energy	0.49	ft
Froude Number	2.22	
Flow Type	Supercritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.22	ft
Critical Depth	0.30	ft
Channel Slope	0.02600	ft/ft
Critical Slope	0.00473	ft/ft

Cross Section for Basin P3 Avg. Road Section

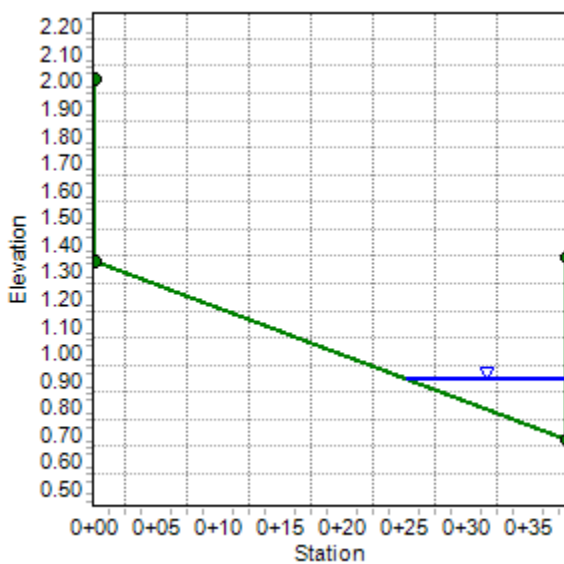
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.02600	ft/ft
Normal Depth	0.22	ft
Discharge	5.85	ft ³ /s

Cross Section Image



Worksheet for Basin P4 Avg. Road Section

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.03200	ft/ft
Discharge	3.98	ft ³ /s
Section Definitions		

Station (ft)	Elevation (ft)
0+00	2.00
0+00	1.33
0+12	1.09
0+34	1.95
0+34	2.62

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 2.00)	(0+34, 2.62)	0.013

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	0.17	ft
Elevation Range	1.09 to 2.62 ft	
Flow Area	1.03	ft ²
Wetted Perimeter	12.42	ft
Hydraulic Radius	0.08	ft
Top Width	12.41	ft
Normal Depth	0.17	ft
Critical Depth	0.23	ft

Worksheet for Basin P4 Avg. Road Section

Results

Critical Slope	0.00504	ft/ft
Velocity	3.88	ft/s
Velocity Head	0.23	ft
Specific Energy	0.40	ft
Froude Number	2.38	
Flow Type	Supercritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.17	ft
Critical Depth	0.23	ft
Channel Slope	0.03200	ft/ft
Critical Slope	0.00504	ft/ft

Cross Section for Basin P4 Avg. Road Section

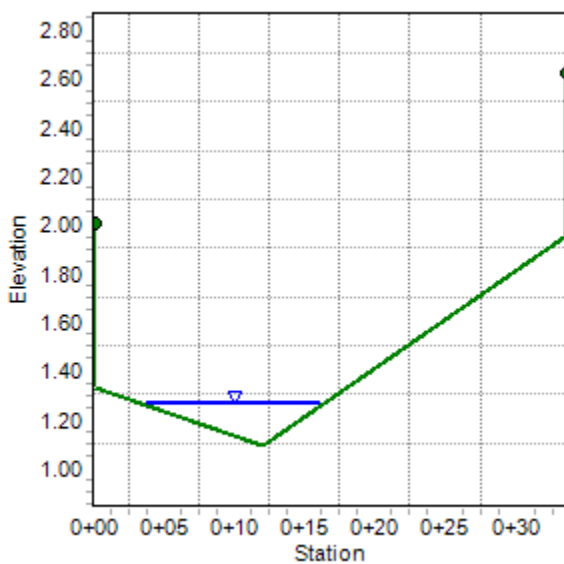
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.03200	ft/ft
Normal Depth	0.17	ft
Discharge	3.98	ft ³ /s

Cross Section Image





TIERRA WEST, LLC

Project Sunport South Date _____

Project No. _____

Meeting Purpose _____ Sheet No. 1 of 2

Attendees _____

Existing Inlet Conditions

Basin P3:

- $Q_{100} = 5.85$ cfs w/ 2.6% Avg. Slope & 0.22' Normal Depth
- Single A Inlet : Capacity = 1.6 cfs (Figure 6.9.9 COA DPM)
 $\rightarrow$ Bypass = $5.85 - 1.6 = 4.25$ cfs
- Double C Inlet : Capacity = 1.65 cfs (Figure 6.9.10 COA DPM)
 $\rightarrow$ Bypass = $4.25 - 1.65 = 2.6$ cfs
- Double C Inlet : Capacity = 1.65 cfs (Figure 6.9.10 COA DPM)
 $\rightarrow$ Bypass = $2.6 - 1.65 = 0.95$ cfs
- Curb Cut : 3' opening

$$L_T = 0.38 Q^{0.51} S_L^{0.058} \left(\frac{1}{n S_x} \right)^{0.46} \quad (\text{Eqn. 7-24 Denver USDCM Vol. 1})$$
$$= 0.38 (0.95)^{0.51} (0.026)^{0.058} \left(\frac{1}{0.013 (0.02)} \right)^{0.46} = 0.37 (0.81) (44.58) = 13.36 \text{ ft}$$
$$E = 1 - \left[1 - \left(\frac{L}{L_T} \right) \right]^{1.8} \quad (\text{Eqn. 7-23 Denver USDCM Vol. 1})$$
$$= 1 - \left[1 - (3/13.36) \right]^{1.8} = 0.37$$
$$\text{Capacity} = 0.37 (0.95) = 0.35 \text{ cfs}$$
$$\rightarrow \text{Bypass} = 0.95 - 0.35 = 0.6 \text{ cfs}$$
- Curb Cut : 3' Opening
 Capacity = 0.35 cfs
 $\rightarrow$ Bypass = ~~0.6~~ $0.6 - 0.35 = 0.25$ cfs to Basin P4





TIERRA WEST, LLC

Project Sunport South Date _____

Project No. _____

Meeting Purpose _____ Sheet No. 2 of 2

Attendees _____

Existing Inlet Conditions

Basin P4:

- $Q_{100} = 3.73 + 0.25 = 3.98$ cfs w/ 3.2% Avg. Slope + 0.17' Normal Depth

- Double A Inlet : Capacity = 1.15 cfs (Figure 6.9.10 CoA DPM)

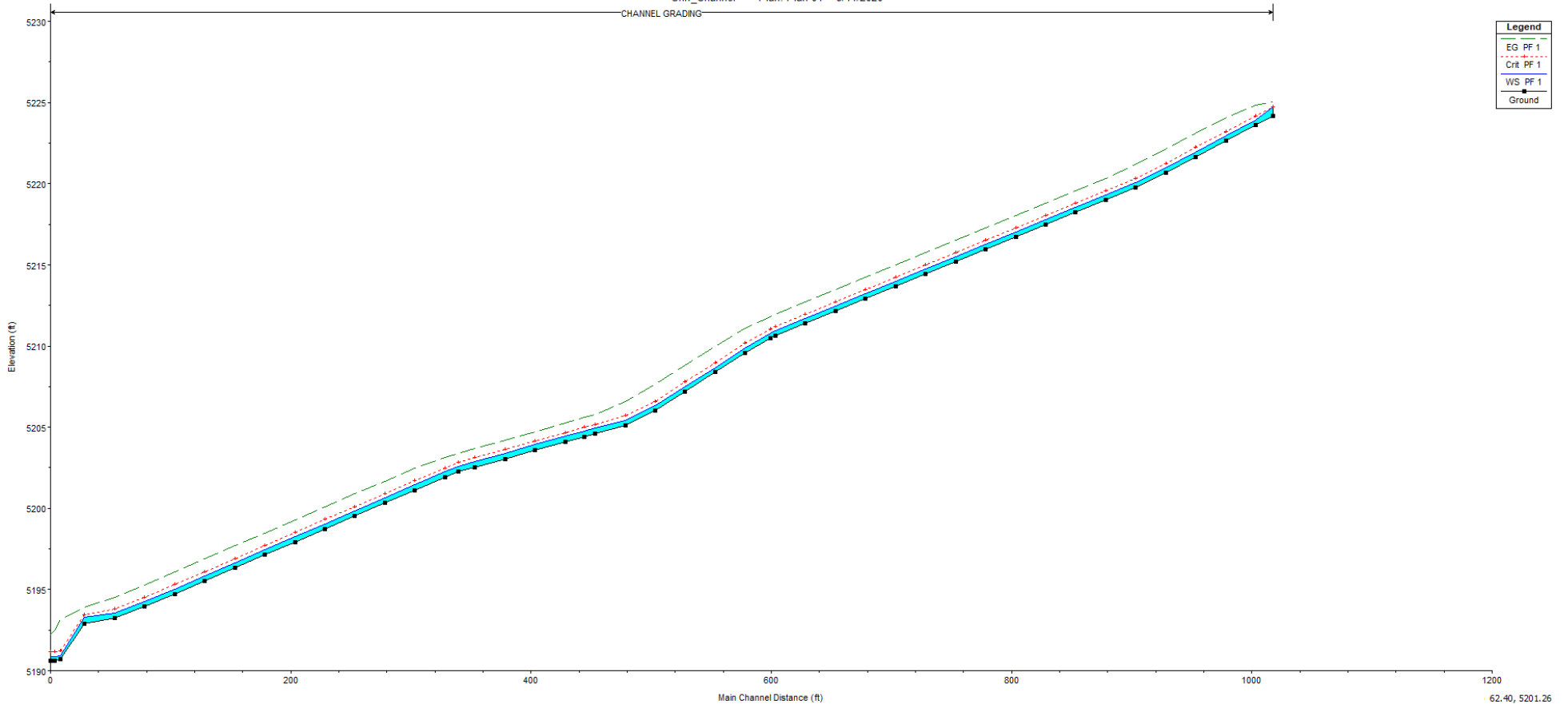
↳ Bypass = $3.98 - 1.15$ cfs = 2.83 cfs

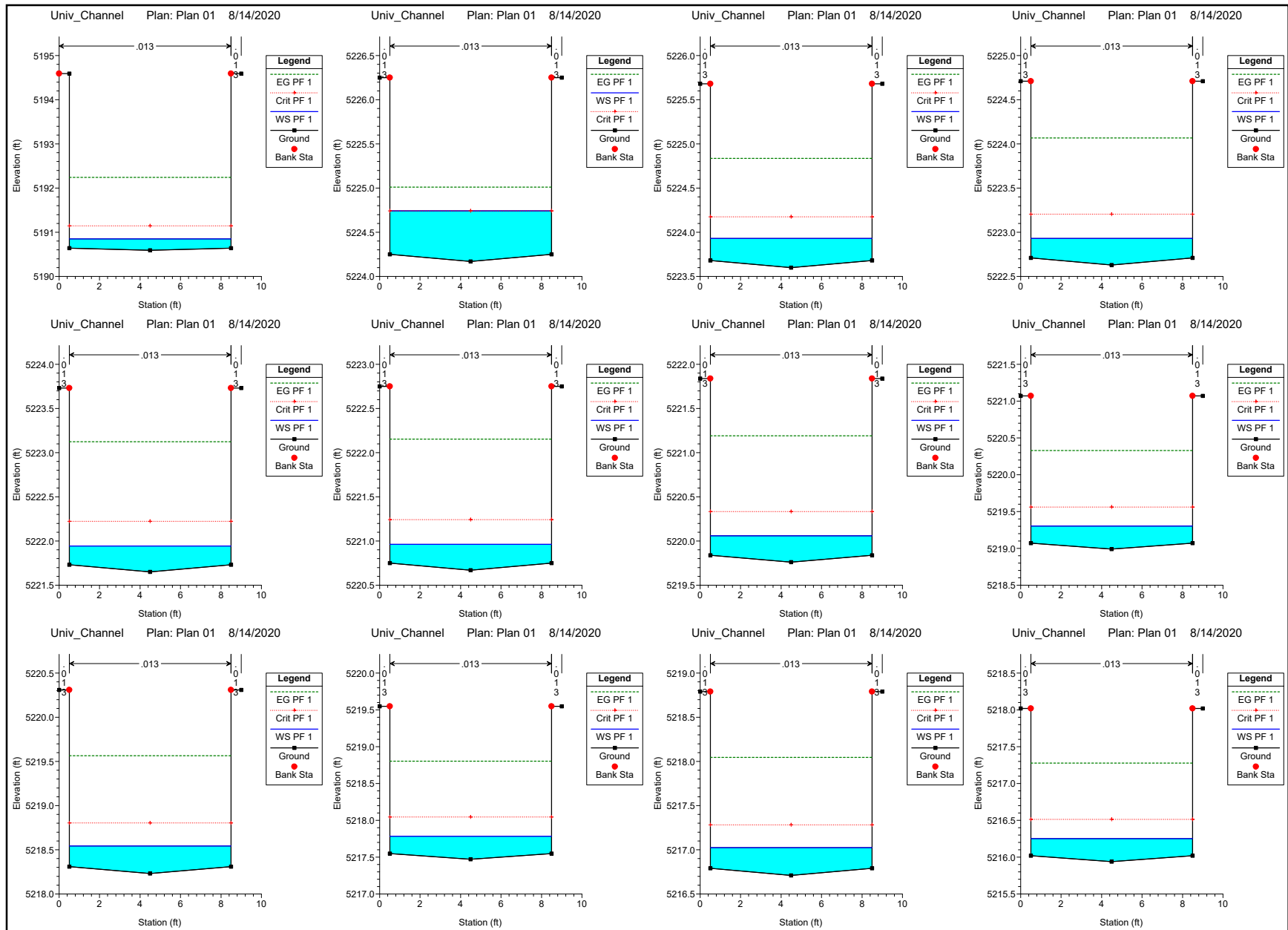
- Double C Inlet : Capacity = 1.15 cfs (Figure 6.9.10 CoA DPM)

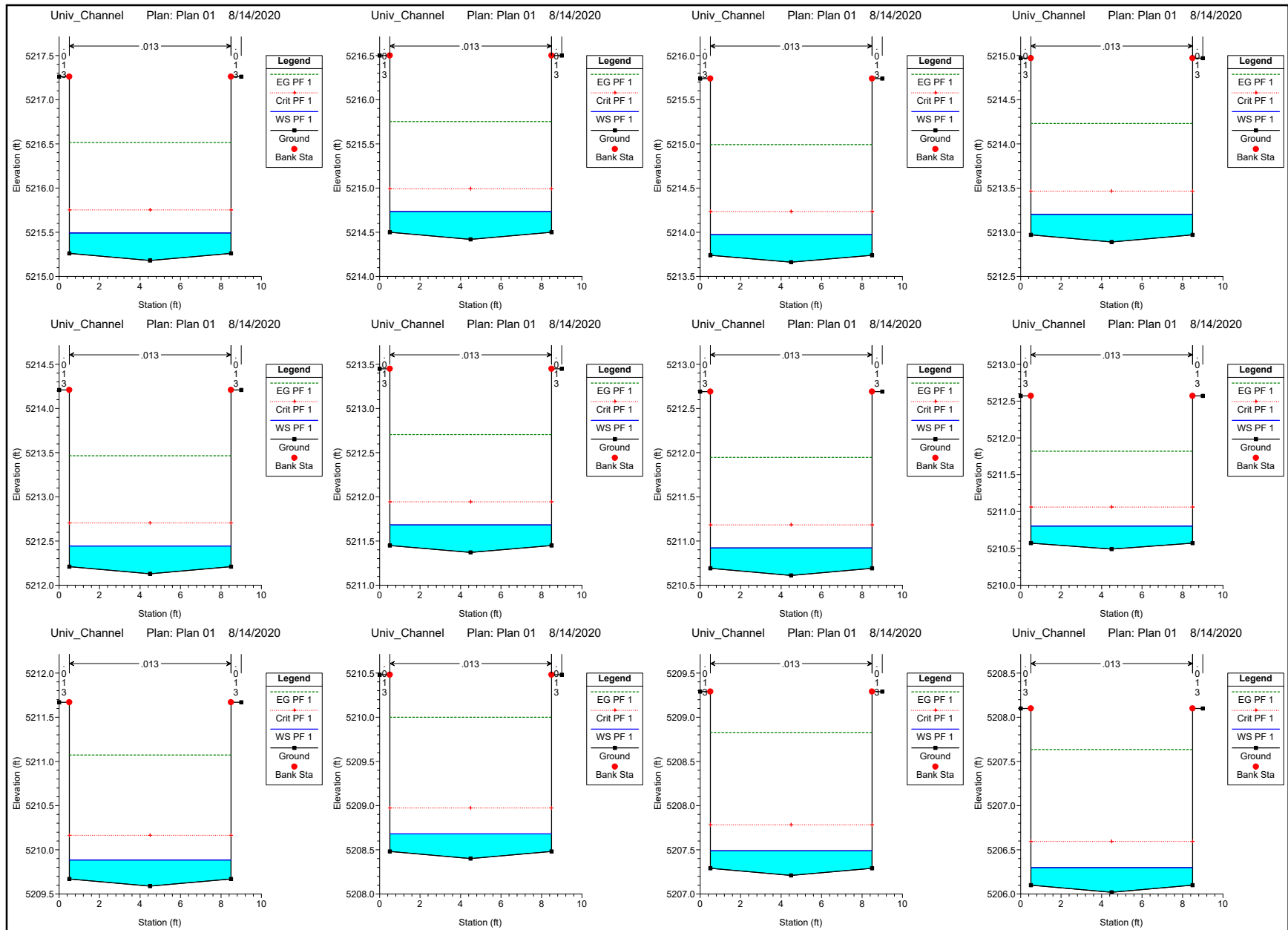
↳ Bypass = $2.83 - 1.15$ cfs = 1.68 cfs to Downstream Systems

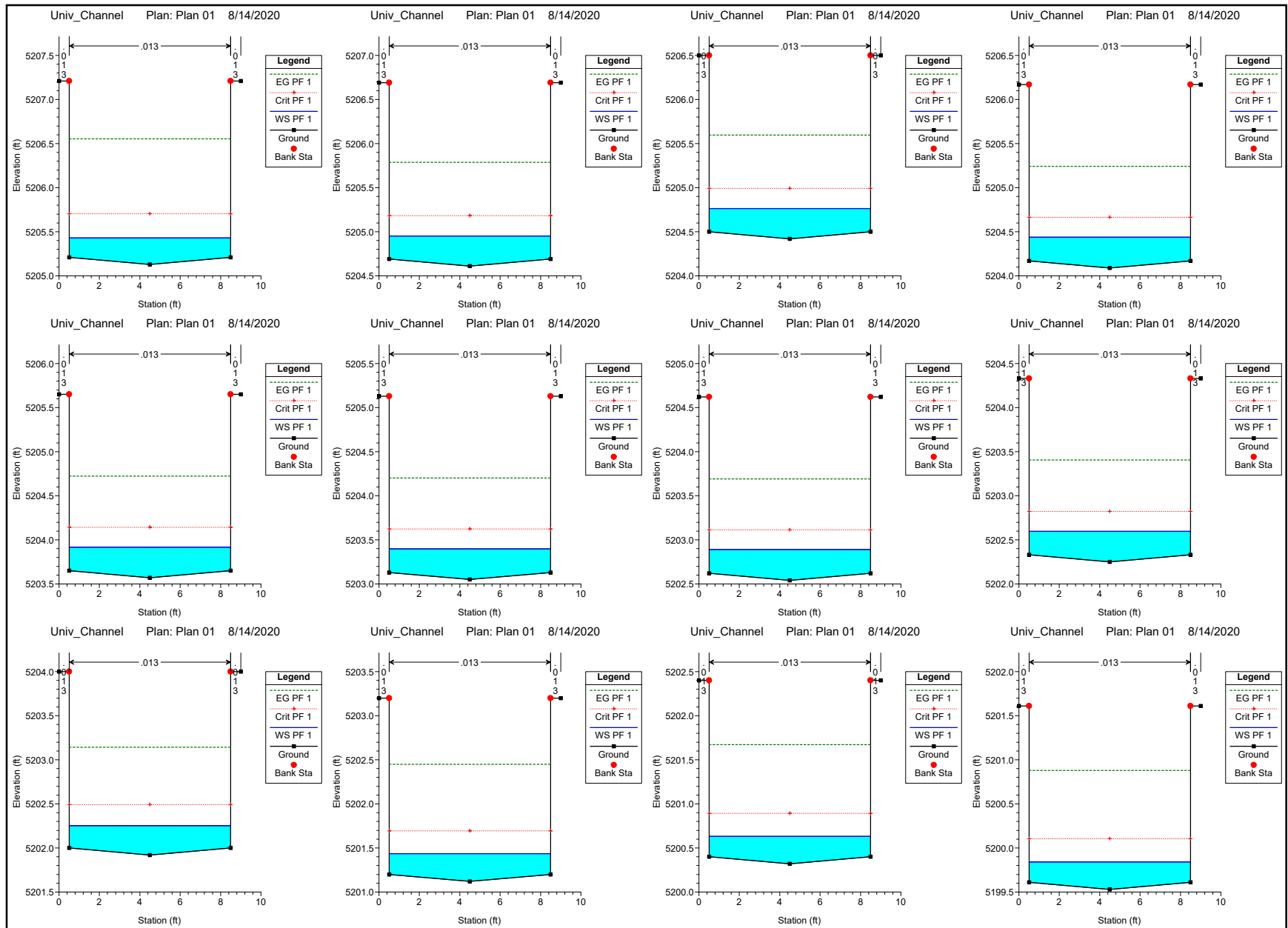


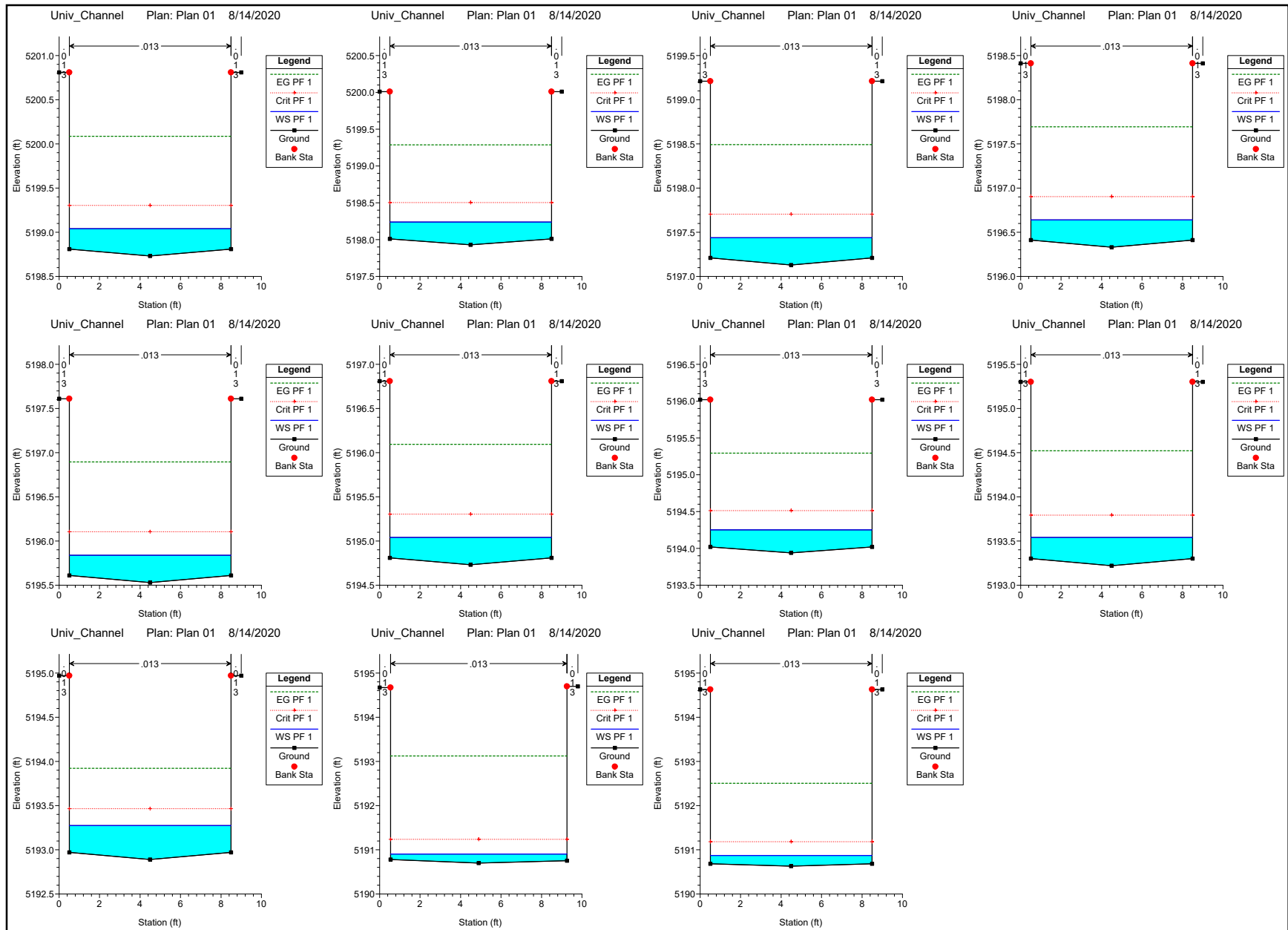
Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
GRADING	1017.92	PF 1	17.74	5224.17	5224.74	5224.74	5225.01	0.003576	4.16	4.27	8.00	1.00
GRADING	1003.32	PF 1	17.74	5223.60	5223.93	5224.17	5224.84	0.025135	7.63	2.32	8.00	2.50
GRADING	978.32	PF 1	17.74	5222.63	5222.93	5223.20	5224.07	0.036371	8.55	2.07	8.00	2.96
GRADING	953.32	PF 1	17.74	5221.65	5221.94	5222.22	5223.13	0.038690	8.72	2.04	8.00	3.05
GRADING	928.32	PF 1	17.74	5220.67	5220.96	5221.24	5222.15	0.039177	8.75	2.03	8.00	3.06
GRADING	903.32	PF 1	17.74	5219.76	5220.06	5220.33	5221.19	0.036149	8.54	2.08	8.00	2.95
GRADING	878.32	PF 1	17.74	5218.99	5219.30	5219.56	5220.33	0.030869	8.13	2.18	8.00	2.75
GRADING	853.32	PF 1	17.74	5218.23	5218.54	5218.80	5219.57	0.030599	8.11	2.19	8.00	2.73
GRADING	828.32	PF 1	17.74	5217.47	5217.78	5218.04	5218.80	0.030513	8.10	2.19	8.00	2.73
GRADING	803.32	PF 1	17.74	5216.71	5217.02	5217.28	5218.05	0.030599	8.11	2.19	8.00	2.73
GRADING	778.32	PF 1	17.74	5215.94	5216.25	5216.51	5217.28	0.030777	8.12	2.18	8.00	2.74
GRADING	753.32	PF 1	17.74	5215.18	5215.49	5215.75	5216.52	0.030690	8.12	2.19	8.00	2.74
GRADING	728.32	PF 1	17.74	5214.42	5214.73	5214.99	5215.75	0.030423	8.10	2.19	8.00	2.73
GRADING	703.32	PF 1	17.74	5213.66	5213.97	5214.23	5214.99	0.030423	8.10	2.19	8.00	2.73
GRADING	678.32	PF 1	17.74	5212.89	5213.20	5213.46	5214.23	0.030957	8.14	2.18	8.00	2.75
GRADING	653.32	PF 1	17.74	5212.13	5212.44	5212.70	5213.47	0.030599	8.11	2.19	8.00	2.73
GRADING	628.32	PF 1	17.74	5211.37	5211.68	5211.94	5212.71	0.030599	8.11	2.19	8.00	2.73
GRADING	603.32	PF 1	17.74	5210.61	5210.92	5211.18	5211.95	0.030599	8.11	2.19	8.00	2.73
GRADING	599.58	PF 1	17.74	5210.49	5210.80	5211.06	5211.82	0.030337	8.09	2.19	8.00	2.72
GRADING	578.32	PF 1	17.74	5209.59	5209.88	5210.16	5211.07	0.039177	8.75	2.03	8.00	3.06
GRADING	553.32	PF 1	17.74	5208.40	5208.68	5208.97	5210.00	0.046312	9.21	1.93	8.00	3.31
GRADING	528.32	PF 1	17.74	5207.21	5207.49	5207.78	5208.83	0.047557	9.29	1.91	8.00	3.35
GRADING	503.32	PF 1	17.74	5206.02	5206.30	5206.59	5207.63	0.047242	9.27	1.91	8.00	3.34
GRADING	478.32	PF 1	17.74	5205.13	5205.43	5205.70	5206.56	0.035710	8.50	2.09	8.00	2.94
GRADING	453.32	PF 1	17.74	5204.61	5204.95	5205.18	5205.79	0.021997	7.32	2.42	8.00	2.35
GRADING	444.25	PF 1	17.74	5204.42	5204.76	5204.99	5205.60	0.021997	7.32	2.42	8.00	2.35
GRADING	428.32	PF 1	17.74	5204.09	5204.44	5204.66	5205.24	0.020779	7.20	2.46	8.00	2.29
GRADING	403.32	PF 1	17.74	5203.57	5203.92	5204.14	5204.72	0.020779	7.20	2.46	8.00	2.29
GRADING	378.32	PF 1	17.74	5203.05	5203.40	5203.62	5204.20	0.020673	7.19	2.47	8.00	2.28
GRADING	353.32	PF 1	17.74	5202.54	5202.89	5203.11	5203.69	0.020673	7.19	2.47	8.00	2.28
GRADING	339.47	PF 1	17.74	5202.25	5202.60	5202.82	5203.41	0.020886	7.21	2.46	8.00	2.29
GRADING	328.32	PF 1	17.74	5201.92	5202.25	5202.49	5203.14	0.024462	7.57	2.34	8.00	2.47
GRADING	303.32	PF 1	17.74	5201.12	5201.44	5201.69	5202.45	0.030247	8.08	2.20	8.00	2.72
GRADING	278.32	PF 1	17.74	5200.32	5200.63	5200.89	5201.67	0.031504	8.18	2.17	8.00	2.77
GRADING	253.32	PF 1	17.74	5199.53	5199.84	5200.10	5200.88	0.031320	8.17	2.17	8.00	2.76
GRADING	228.32	PF 1	17.74	5198.73	5199.04	5199.30	5200.09	0.031689	8.20	2.16	8.00	2.78
GRADING	203.32	PF 1	17.74	5197.93	5198.24	5198.50	5199.29	0.031784	8.20	2.16	8.00	2.78
GRADING	178.32	PF 1	17.74	5197.13	5197.44	5197.70	5198.49	0.032063	8.23	2.16	8.00	2.79
GRADING	153.32	PF 1	17.74	5196.33	5196.64	5196.90	5197.70	0.032253	8.24	2.15	8.00	2.80
GRADING	128.32	PF 1	17.74	5195.53	5195.84	5196.10	5196.90	0.032253	8.24	2.15	8.00	2.80
GRADING	103.32	PF 1	17.74	5194.73	5195.04	5195.30	5196.10	0.032253	8.24	2.15	8.00	2.80
GRADING	78.32	PF 1	17.74	5193.94	5194.25	5194.51	5195.30	0.031689	8.20	2.16	8.00	2.78
GRADING	53.32	PF 1	17.74	5193.22	5193.54	5193.79	5194.52	0.028647	7.95	2.23	8.00	2.65
GRADING	28.32	PF 1	17.74	5192.89	5193.27	5193.46	5193.92	0.014722	6.47	2.74	8.00	1.95
GRADING	8.39	PF 1	17.74	5190.70	5190.90	5191.24	5193.12	0.120668	11.95	1.48	8.72	5.10
GRADING	3.32	PF 1	17.74	5190.63	5190.87	5191.18	5192.51	0.066179	10.26	1.73	8.00	3.89
GRADING	0	PF 1	17.74	5190.59	5190.85	5191.14	5192.24	0.050929	9.47	1.87	8.00	3.45

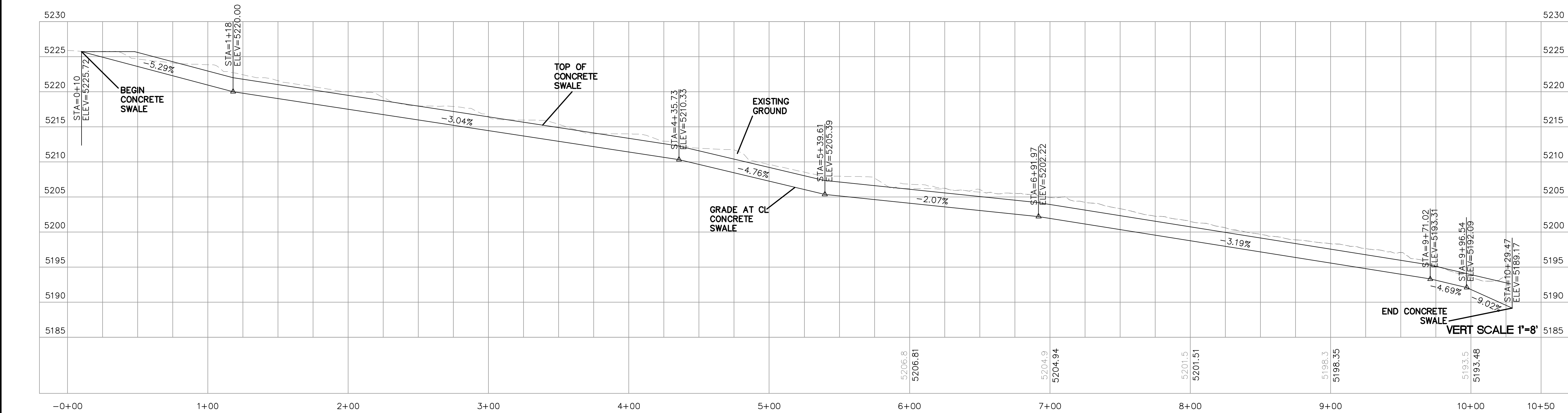






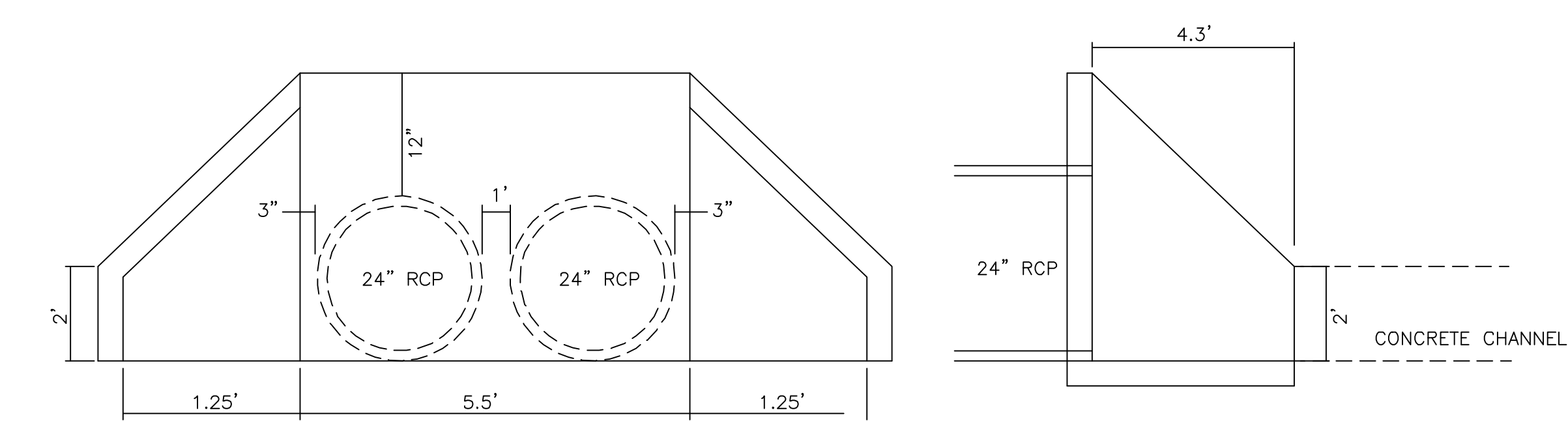




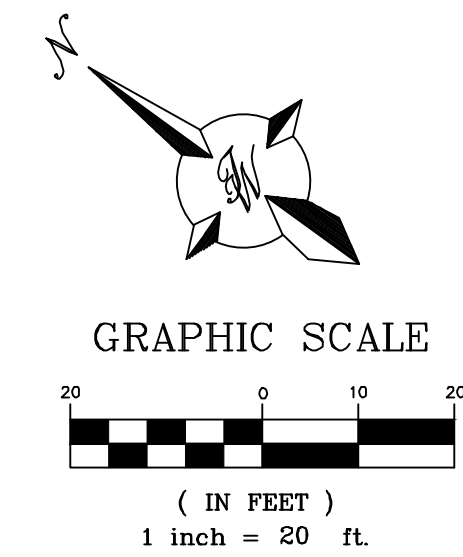


ALL EXISTING UTILITIES SHOWN WERE OBTAINED FROM RESEARCH, AS-BUILTS, SURVEYS OR INFORMATION PROVIDED BY OTHERS. IT SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO CONDUCT ALL NECESSARY FIELD INVESTIGATIONS PRIOR TO AND INCLUDING ANY EXCAVATION, TO DETERMINE THE ACTUAL LOCATION OF UTILITIES AND OTHER IMPROVEMENTS, PRIOR TO STARTING THE WORK. ANY CHANGES FROM THIS PLAN SHALL BE COORDINATED WITH AND APPROVED BY THE ENGINEER.

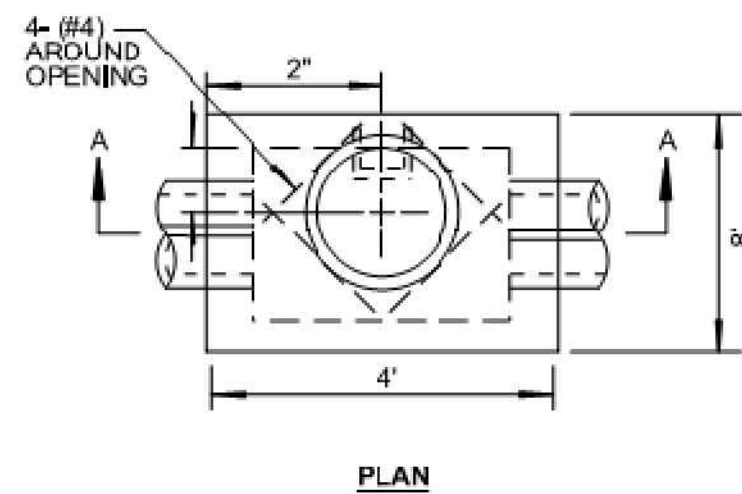
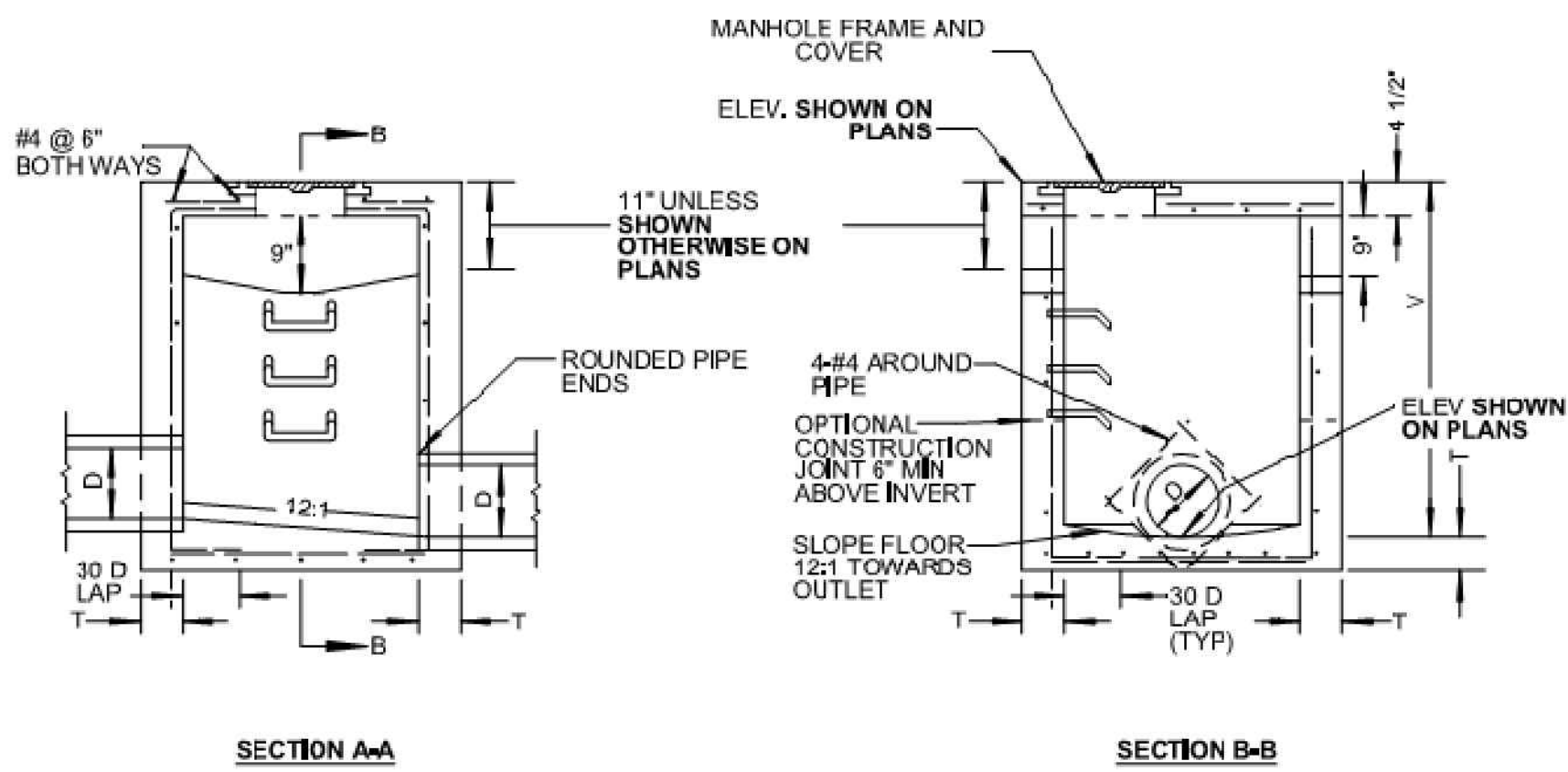
DESIGN REVIEW COMMITTEE	CITY ENGINEER APPROVAL	LAST DESIGN UPDATE	MO./DAY/YR.	MO./DAY/YR.
CITY PROJECT NO. 743382	ZONE MAP NO. M-15-Z	SHEET 15	OF 21	



ALL EXISTING UTILITIES SHOWN WERE OBTAINED FROM RESEARCH, AS-BUILTS, SURVEYS OR INFORMATION PROVIDED BY OTHERS. IT SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO CONDUCT ALL NECESSARY FIELD INVESTIGATIONS PRIOR TO AND INCLUDING ANY EXCAVATION, TO DETERMINE THE ACTUAL LOCATION OF UTILITIES AND OTHER IMPROVEMENTS, PRIOR TO STARTING THE WORK. ANY CHANGES FROM THIS PLAN SHALL BE COORDINATED WITH AND APPROVED BY THE ENGINEER.



DESIGN REVIEW COMMITTEE	CITY ENGINEER APPROVAL	LAST DESIGN UPDATE	MO./DAY/YR.	MO./DAY/YR.
CITY PROJECT NO. 743382	ZONE MAP NO. M-15-Z	SHEET 16	OF 21	

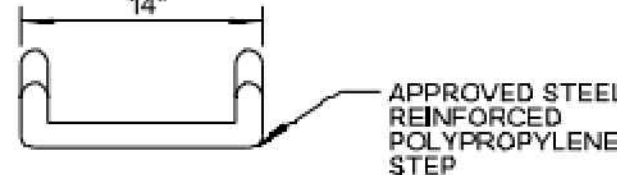
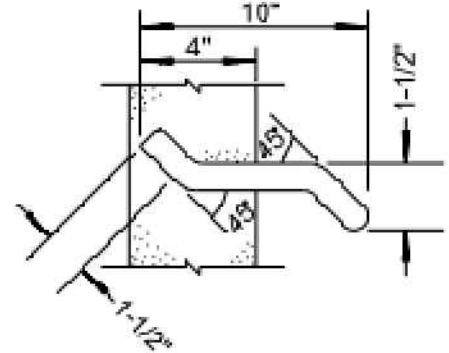
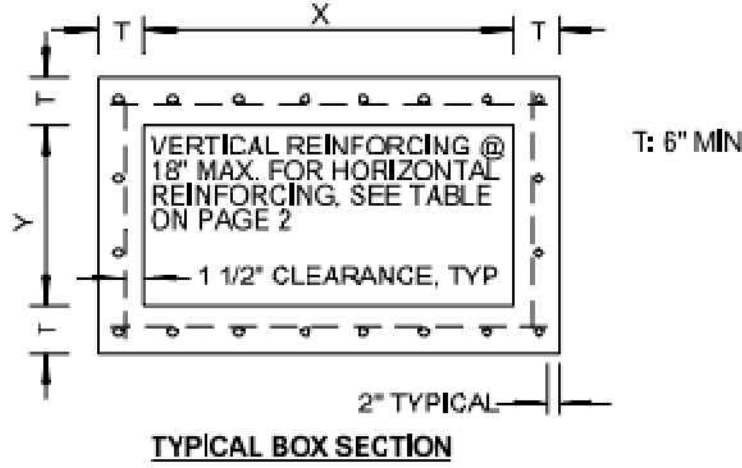


NOTES

1. WHEN V EXCEEDS 4', STEPS SHALL BE INSTALLED.
2. EXPOSED EDGES OF CONCRETE SHALL BE ROUNDED WITH A RADIUS OF 1/2".
3. CONSTRUCT OPENINGS ON BOTH SIDES UNLESS OTHERWISE SHOWN ON PLANS.
4. MAINTAIN 1-1/2" CLEAR SPACING BETWEEN REINFORCING AND SURFACE.
5. INSTALL 1" STEEL PROTECTION BAR.
6. DIAMETER "D" SHALL BE 18" MAX, FOR LARGER DIAMETER PIPES THIS DRAWING MUST BE MODIFIED.
7. SEE SDD-114 FOR ADDITIONAL NOTES AND DETAILS.

NOTES:

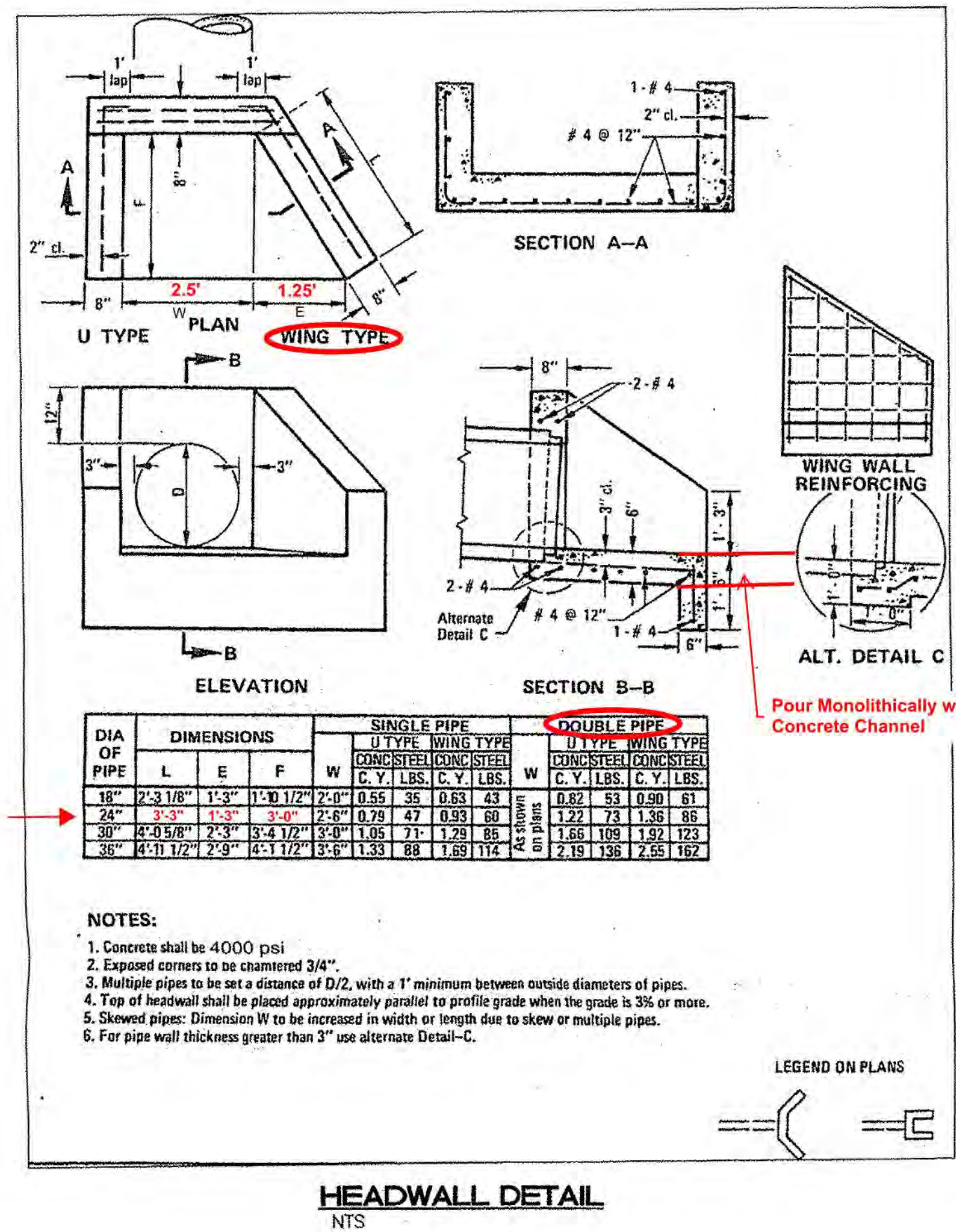
1. CONCRETE SHALL BE 560-C-3250 UNLESS OTHERWISE NOTED.
2. REINFORCING STEEL SHALL COMPLY WITH THIS DRAWING UNLESS OTHERWISE SPECIFIED.
3. REINFORCING STEEL SHALL BE INTERMEDIATE GRADE DEFORMED BARS CONFORMING TO LATEST ASTM SPECIFICATIONS.
4. BENDS SHALL BE IN ACCORDANCE WITH LATEST ACI CODE.
5. MINIMUM SPLICE LENGTH FOR REINFORCING SHALL BE 30 DIAMETERS.
6. FLOOR SHALL HAVE A WOOD TROWEL FINISH AND, EXCEPT WHERE USED AS JUNCTION BOXES, SHALL HAVE A MINIMUM SLOPE OF 1:12 TOWARD THE OUTLET.
7. DEPTH (V) IS MEASURED FROM THE TOP OF THE STRUCTURE TO THE FLOWLINE OF THE BOX.
8. WALL THICKNESS AND REINFORCING STEEL REQUIRED MAY BE DECREASED IN ACCORDANCE WITH TABLE LOCATED ON SHEET 2.
9. WALL THICKNESS SHALL BE STEPPED ON THE OUTSIDE OF THE BOX.
10. WHEN THE STRUCTURE DEPTH (V) EXCEEDS 4', STEPS SHALL BE CAST INTO THE WALL AT 16" INTERVALS FROM 15" ABOVE FLOOR TO WITHIN 12" OF TOP OF STRUCTURE, PLACE STEPS IN WALL WITHOUT PIPE OPENING, OTHERWISE OVER OPENING OF SMALLEST DIAMETER.
11. ALTERNATE STEP MAY BE AN APPROVED STEEL REINFORCED POLYPROPYLENE STEP.
12. UPON APPROVAL OF THE ENGINEER, AS DEFINED BY SECTION 6703 OF THE BUSINESS AND PROFESSIONS CODE, THE USE OF PRECAST STORM STRUCTURES IS ACCEPTABLE AS AN ALTERNATE TO CAST-IN-PLACE. PRECAST UNITS SHALL CONFORM TO ASTM STANDARDS AND BE MANUFACTURED IN A PERMANENT FACILITY DESIGNED FOR THAT PURPOSE.
13. TYPICAL REINFORCEMENT LAP SHALL BE 30 TIMES THE BAR DIAMETER MINIMUM. DIMENSION T SHALL BE 6" MINIMUM.
14. MARK EVERY STORM DRAIN INLET WITHIN THE PROJECT BOUNDARIES WITH ADHESIVE DECAL-DISCS ON EXISTING INLETS OR AN IMBEDDED CONCRETE STAMP ON NEW INLETS.
15. ON CURB INLETS, PLACE MARKER ON TOP OF THE INLET ROOF. ON CATCH BASIN, IMPRINT STAMP NEXT TO INLET GRATE.
16. NO RECYCLED WATER SHALL ENTER INTO STORM DRAIN.



BOX SECTION HORIZONTAL REINFORCEMENT			
MAXIMUM SPAN X OR Y	DEPTH V	THICKNESS T	HOR. & FLR. REINF.
3'-0" TO 4'-0"	4'-0"	6"	#4 18"
4'-1" TO 7'-0"		6"	#4 12"
7'-0" TO 8'-0"		6"	#4 8"
3'-0" TO 4'-0"		6"	#4 18"
4'-1" TO 5'-0"	4'-1" TO 8'-0"	6"	#4 12"
5'-1" TO 6'-0"		6"	#4 8"
6'-1" TO 8'-0"		6"	#4 6"
3'-0" TO 4'-0"		6"	#4 18"
4'-1" TO 5'-0"	8'-1" TO 12'-0"	8"	#4 12"
5'-1" TO 6'-0"		8"	#4 8"
6'-1" TO 8'-0"		8"	#4 6"
3'-0" TO 4'-0"		8"	#4 12"
4'-1" TO 5'-0"	12'-1" TO 16'-0"	8"	#4 12"
5'-1" TO 6'-0"		8"	#4 8"
6'-1" TO 8'-0"		8"	#4 6"
3'-0" TO 4'-0"		8"	#4 12"
4'-1" TO 5'-0"	16'-1" TO 20'-0"	10"	#4 12"
5'-1" TO 6'-0"		10"	#4 8"
6'-1" TO 8'-0"		10"	#4 6"
3'-0" TO 4'-0"		10"	#4 12"
4'-1" TO 5'-0"	20'-1" TO 24'-0"	10"	#4 8"
5'-1" TO 6'-0"		10"	#4 6"
6'-1" TO 8'-0"		12"	#6 8"
3'-0" TO 4'-0"		12"	#6 8"

CONCRETE JUNCTION BOX DETAIL

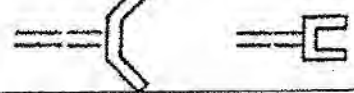
NTS



NOTES:

1. Concrete shall be 4000 psi
2. Exposed corners to be chamfered 3/4".
3. Multiple pipes to be set a distance of D/2, with a 1" minimum between outside diameters of pipes.
4. Top of headwall shall be placed approximately parallel to profile grade when the grade is 3% or more.
5. Skewed pipes: Dimension W to be increased in width or length due to skew or multiple pipes.
6. For pipe wall thickness greater than 3" use alternate Detail-C.

LEGEND ON PLANS



HEADWALL DETAIL

NTS

AS BUILT INFORMATION		BENCH MARKS		SURVEY INFORMATION		ENGINEER'S SEAL	
CONTRACTOR	WORK	4 C.R.S. MONUMENT "4_015"	DATE	NO.	BY	NO.	BY
DATE	STANDARD A.C.R.S. BRASS DISC	NEW MEXICO STATE PLANE COORDINATES	DATE	NO.	REMARKS	NO.	DATE
DATE	ACCEPTANCE BY	(CENTRAL ZONE-N.A.D. 1983)	DATE	NO.	DESIGN	NO.	DATE
DATE	FIELD	N=1,456,811.252	DATE	NO.	DESIGNED BY: VP	NO.	DATE
DATE	DRAWINGS	E=1,529,332.100	DATE	NO.	DRAWN BY: pm	NO.	DATE
DATE	CORRECTED BY	PUBLISHED EL=5309.844 (NAVD 1988)	DATE	NO.	DRAWN NAME:	NO.	DATE
DATE	RECORDED BY	GROUND TO GRID FACTOR=0.99964077	DATE	NO.	CHECKED BY: RRB	NO.	DATE
DATE	NO.	DELTA ALPHA ANGLE=-072 46.04"	DATE	NO.		NO.	DATE

TERRA WEST, LLC 5571 MIDWAY PARK PLACE NE ALBUQUERQUE, NEW MEXICO 87109 (505) 858-3100 www.tierrawestllc.com		CITY OF ALBUQUERQUE PUBLIC WORKS DEPARTMENT ENGINEERING GROUP	
UNIVERSITY BLVD IMPROVEMENTS CONCRETE HEADWALL DETAILS		DESIGN REVIEW COMMITTEE CITY ENGINEER APPROVAL LAST DESIGN UPDATE	
CITY PROJECT NO. 743382		ZONE MAP NO. M-15-Z	
SHEET 18		OF 21	