



**DESIGN LETTER/REPORT
FOR
BRIARGATE CROSSING EAST
OUTFALL STORM SEWER**

August 2002

Prepared For:

LP47, LLC dba LA PLATA INVESTMENTS
2315 Briargate Parkway, Suite 100
Colorado Springs, CO 80920
(719) 260-7477

Prepared By:

JR ENGINEERING
4310 ArrowsWest Drive
Colorado Springs, CO 80907
(719) 593-2593

Job No. 9540.30

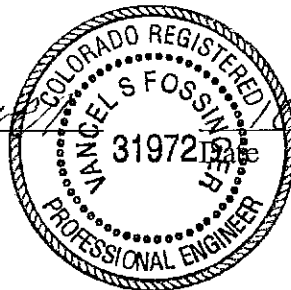
DESIGN LETTER/REPORT
FOR
BRIARGATE CROSSING EAST
OUTFALL STORM SEWER
DRAINAGE REPORT STATEMENT



ENGINEER'S STATEMENT:

The attached report was prepared under my direction and supervision and is correct to the best of my knowledge and belief. I accept responsibility for any liability caused by any negligent acts, errors, or omissions on my part in preparing this report.

Vancel S. Fossinger 10-25-2002
Vancel S. Fossinger, Colorado P.E. #31972
For and On Behalf of JR Engineering



DEVELOPER'S STATEMENT:

I, the developer, have read and will comply with all of the requirements specified in this report.

Business Name: LP47, LLC dba La Plata Investments
By: Thomas Taylor
Thomas Taylor
Title: Director of Development Services
Address: 2315 Briargate Parkway, Suite 100
Colorado Springs, Colorado 80920

CITY OF COLORADO SPRINGS ONLY:

Filed in accordance with Section 15-3-906 of the Code of the City of Colorado Springs, 1980, as amended.

Tim M... .. Jan 23, 2003
City Engineer Date

Conditions:

August 9, 2002



J·R ENGINEERING
A Subsidiary of Westrian

City of Colorado Springs
Subdivision Engineering and Review Team
101 W. Costilla, Room 113
Colorado Springs, CO 80903

ATTN: Mr. Tim Mitros

RE: Design Letter/Report for the Briargate Crossing East Outfall Storm Sewer

Dear Tim:

The purpose of this letter/report is to provide documentation to support the design of the Briargate Crossing East Outfall Storm Sewer. The subject storm sewer will provide a storm sewer outfall for future development at the northeast and southeast corners of the intersection of Union Boulevard and Powers Boulevard. The storm sewer will extend from the southeast corner of the intersection to proposed Pine Creek Detention Facility 'F'. The system will also provide an outfall for runoff collected in a Colorado Department of Transportation (CDOT) storm sewer system to be constructed along the west side of Powers Boulevard.

The design/construction of the storm sewer has been pushed ahead of the development it will serve because much of the facility will be located under or adjacent to a portion of Powers Boulevard planned to be constructed in the near future. Some assumptions about future storm runoff from the parcels have been made in order to facilitate the design of the subject storm sewer. These assumptions are documented below.

Hydrology

The initial design for storm water at the intersection of Powers and Union Boulevards as prepared by URS (CDOT's consultant for the design of Powers Boulevard) provided for drainage for the two major streets and some tributary undeveloped area. It did not provide for future developed condition runoff from the parcels of land located east of Powers Boulevard. Due to timing constraints and other complications, CDOT did not want to upsize the design of their system to accommodate developed flow from the tributary area. Thus, the subject system is needed to support the future development. For the purpose of design of the subject system it was assumed that CDOT system will collect and convey all of the local runoff from Powers and Union Boulevard. The subject system will cross under Union and Powers Boulevards but will not collect or convey any of the runoff from the streets above the point where the initial CDOT system will be connected to the subject system along the west side of Powers Boulevard.

JR Engineering is currently preparing the third Amendment to the Pine Creek Drainage Basin Planning Study. The preliminary HEC-1 model prepared for the study predicts that approximately 49.8 acres of commercial development will contribute a 100-year peak flow rate of 276 cfs to the subject system at the southeast corner of the intersection of Powers and Union

Boulevards. It is assumed this runoff will be collected and conveyed in a future storm sewer system within the commercial development to the upstream end of the subject system (Station 19+24). This flow will be conveyed to the north side of Union Boulevard in a proposed 60" diameter R.C.P.

The model also predicts that approximately 19.2 acres will contribute a 100-year peak flow rate of 97cfs to the subject system at the northeast corner of the intersection of Powers and Union Boulevards. It is assumed this runoff will be collected and conveyed in a future storm sewer system within the commercial development to a 48" diameter R.C.P. stub to be constructed with the subject system. This flow will combine with the flow from the south side of Union at a wye in the subject system (Station 16+49). The HEC-1 model indicates the combined 100-year peak flow rate at this location will be 373 cfs. This flow will be conveyed in a 72" diameter R.C.P. to the west side of Powers Boulevard.

Near the west side of Powers Boulevard a 72" x 72" x 72" wye will be placed in the system at Station 3+50 to provide a connection for the CDOT storm sewer system to be constructed along the west side of Powers Boulevard. The CDOT system is currently planned to terminate in a small water quality pond near this location. At the current time there is consensus between URS, La Plata Investments and the City that the runoff from this system should be conveyed to Pine Creek Detention Facility 'F' in the subject storm sewer system. What remains to be decided is if the CDOT system will connect directly to the subject system or will discharge to the water quality pond with the outlet of the pond connected to the subject system. The subject system was designed to accommodate either of the above-mentioned connections. The design flow rate of the subject system was established assuming a direct connection of the CDOT system. The preliminary HEC-1 model indicates that the 100-peak flow below the connection will be approximately 530 cfs. This flow will be routed through a 72" diameter RCP to proposed Pine Creek Detention Facility 'F'. A riprap lined stilling basin that will be constructed with the detention facility will accept the flow from the 72" diameter storm sewer. Flow from the stilling basin will be conveyed to the pond bottom via a wide riprap lined rundown channel.

The subject system will have a finite capacity that will not be readily expanded after the construction of Powers Boulevard. In order to allow for some potential increases in the contributing watershed area and imperviousness the system design flow rates were set approximately 10 percent above the above described flow rates. The design flow rates are as follow:

Station 19+24 to Station 16+49 = 300 cfs
Station 16+49 to Station 3+50 = 410 cfs
Station 3+50 to Station 0+70 = 580 cfs

Hydraulics

Hydraulic grade line calculations were done for the system assuming conveyance of the design flow rates. A spreadsheet reflecting the results of the calculations is attached. The hydraulic grade line (HGL) based on the design flow rates is plotted on the plans for the system. Where the calculations indicated partial pipe flow the HGL was plotted at the soffit of the pipe.

An analysis was done to evaluate flow velocities through the system. A table relating discharge, slope and velocity was generated for a range of flows and slopes using Haestad Methods FlowMaster V5.15. The analysis indicates velocities will be high in the 72" portion of the system that will be constructed at slopes between 5 and 7 percent. A minimum thickness of 2" of concrete between the steel and the inside of this pipe has been specified in order to make it more resistant to failure from abrasion.

Pipe and Bedding Class Analysis

The minimum pipe and bedding classes required were determined through use of the "PipePac 2000", as developed by the American Concrete Pipe Association. A copy of the program output is attached.

Due to a wide variation in installation depths three different pipe classes have been specified for this system. In an effort to lessen the potential for confusion during installation the specified pipe classes were defined for entire reaches between fittings and are based on the worst condition for the reach.

Summary

The analysis presented in this letter/report documents the assumptions made in the design of the subject storm sewer system. It is anticipated that the portion of the system above Station 3+75 will be constructed by CDOT along with the construction of Powers Boulevard and will be plugged at both ends. Prior to or concurrent with the development of the parcels located at the northeast and southeast corners of the intersection of Powers and Union Boulevards the system will need to be completed between Station 3+75 and proposed Pine Creek Detention Facility 'F'.

The current design of the system is consistent with the current design of Powers Boulevard and was coordinated with CDOT and U.R.S., their consultant.

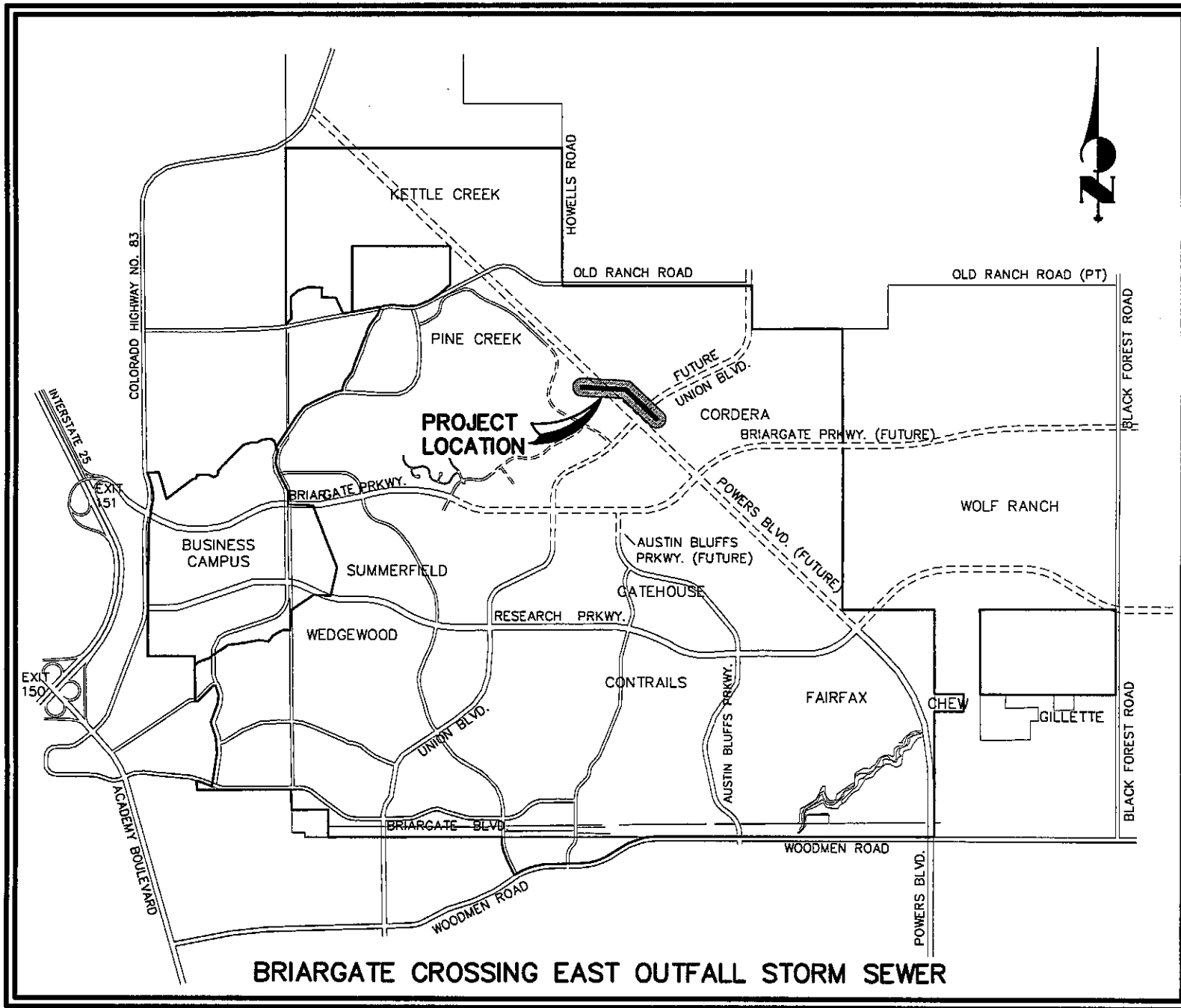
Respectfully submitted,

JR Engineering

Vancel Fossinger, PE
Project Manager

APPENDIX

VICINITY MAP

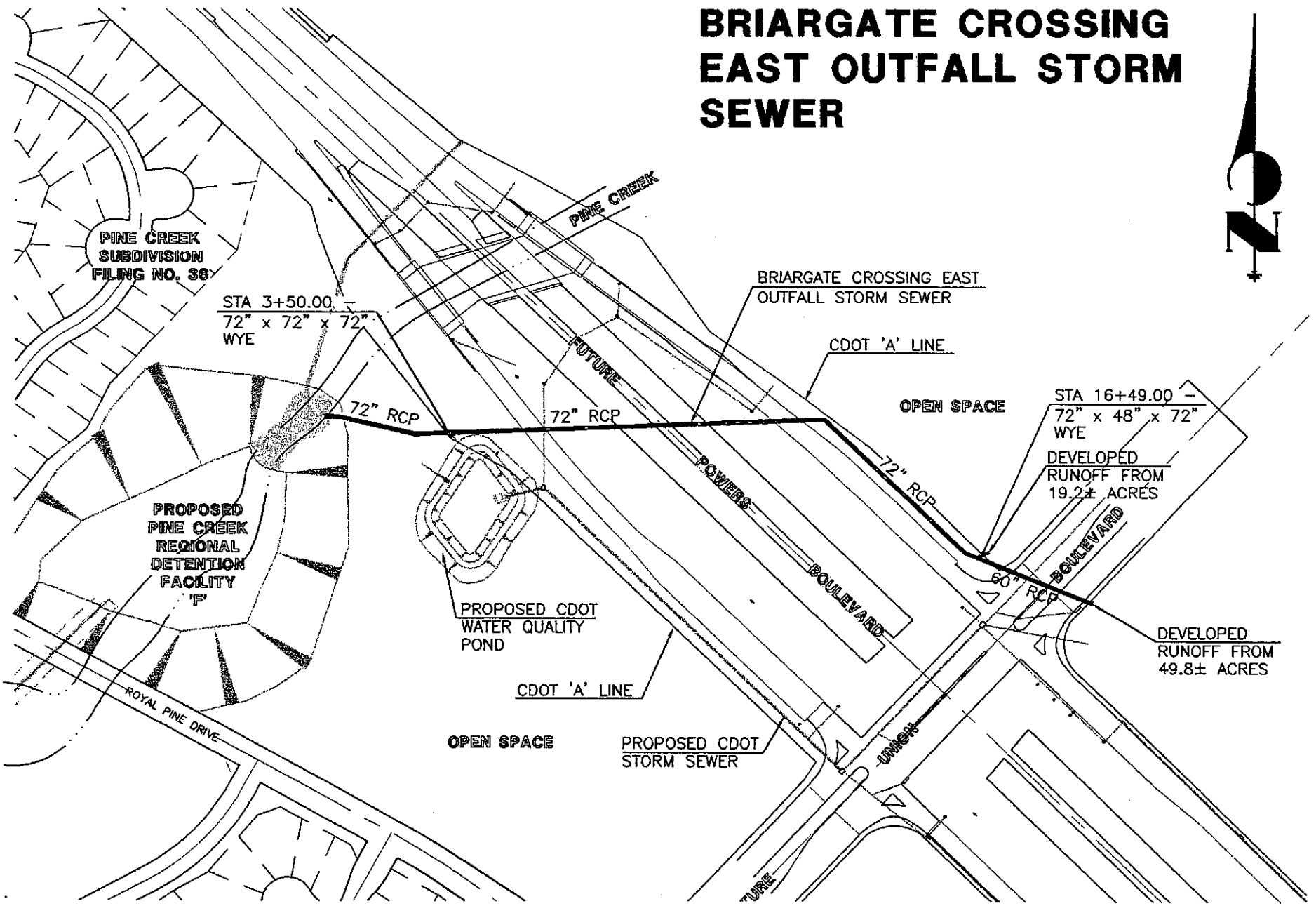


BRIARGATE CROSSING EAST OUTFALL STORM SEWER

VICINITY MAP
N.T.S.

STORM SEWER SYSTEM SCHEMATIC

BRIARGATE CROSSING EAST OUTFALL STORM SEWER



SCALE: 1" = 300'

J-R ENGINEERING
A Subsidiary of Westcon

430 ArrowsWest Drive • Colorado Springs, CO 80907
719-593-2593 • Fax 719-528-6683 • www.jrengineering.com

HYDRAULIC CALCULATIONS

BXE OUTFALL STORM SEWER

MANNINGS n = 0.013

HGL CALCULATION

8/9/2002 18:33

STATION	PIPE SIZE (inches)	PEAK RATE (cfs)	AREA (sf)	VELOCITY (fps)	CONV. K	FRICTION SLOPE (ft/ft)	LENGTH (ft)	JUNCTION DATA		BEND LOSS K	FRICTION LOSS (ft)	BEND LOSS (ft)	JUNCTION LOSS (ft)	MH LOSS (ft)	CONTRACT LOSS (ft)	TOTAL LOSS (ft)	ENERGY	VELOCITY	HYDRAULIC	outfall
								LATERAL SIZE (inches)	LATERAL ANGLE (degrees)								GRADE LINE (elevation)	HEAD (ft)	GRADE LINE (elevation)	
70.61	72	580	28.260	20.52	4237	0.0187					0.00	0.00	0.00			0.00	6944.54	6.54	6938.00	outfall
100.00	72	580	28.260	20.52	4237	0.0187	29.39				0.55	0.00	0.00			0.55	6945.09	6.54	6938.55	
100.00	72	580	28.260	20.52	4237	0.0187	0.00			0.1	0.00	0.65	0.00			0.65	6945.74	6.54	6939.20	bend
276.00	72	580	28.260	20.52	4237	0.0187	176.00				3.30	0.00	0.00			3.30	6955.23	6.54	6948.69	
276.00	72	580	28.260	20.52	4237	0.0187	0.00			0.15	0.00	0.98	0.00			0.98	6956.21	6.54	6949.67	bend
350.00	72	580	28.260	20.52	4237	0.0187	74.00				1.39	0.00	0.00			1.39	6960.14	6.54	6953.60	
350.00	72	410	28.260	14.51	4237	0.0094	0.00	72	45		0.00	0.00	2.48			2.48	6962.62	3.27	6959.35	junction
610.00	72	410	28.260	14.51	4237	0.0094	260.00				2.43	0.00	0.00			2.43	6974.14	3.27	6970.84	
610.00	72	410	28.260	14.51	4237	0.0094	0.00			0.05	0.00	0.16	0.00			0.16	6974.27	3.27	6971.01	grade break
1188.00	72	410	28.260	14.51	4237	0.0094	578.00				5.41	0.00	0.00			5.41	6979.89	3.27	6976.62	
1188.00	72	410	28.260	14.51	4237	0.0094	0.00			0.3	0.00	0.98	0.00			0.98	6980.87	3.27	6977.60	bend
1620.00	72	410	28.260	14.51	4237	0.0094	432.00				4.04	0.00	0.00			4.04	6984.92	3.27	6981.65	
1620.00	72	410	28.260	14.51	4237	0.0094	0.00			0.15	0.00	0.49	0.00			0.49	6985.41	3.27	6982.14	bend
1649.00	72	410	28.260	14.51	4237	0.0094	29.00				0.27	0.00	0.00			0.27	6985.68	3.27	6982.41	
1649.00	60	300	19.625	15.29	2604	0.0133	0.00	48	45		0.00	0.00	1.24			1.24	6986.92	3.63	6983.29	junction
1924.00	60	300	19.625	15.29	2604	0.0133	275.00				3.65	0.00	0.00			3.65	6990.63	3.63	6987.00	
1924.00	60	300	19.625	15.29	2604	0.0133	0.00				0.00	0.00	0.00			0.00	6990.63	3.63	6987.00	end

BXE OUTFALL STORM SEWER

LATERAL 1

MANNINGS n = 0.013

HGL CALCULATION

8/9/2002 18:33

STATION	PIPE SIZE (inches)	PEAK RATE (cfs)	AREA (sf)	VELOCITY (fps)	CONV. K	FRICTION SLOPE (ft/ft)	LENGTH (ft)	JUNCTION DATA		BEND LOSS K	FRICTION LOSS (ft)	BEND LOSS (ft)	JUNCTION LOSS (ft)	MH LOSS (ft)	CONTRACT LOSS (ft)	TOTAL LOSS (ft)	ENERGY	VELOCITY	HYDRAULIC
								LATERAL SIZE (inches)	LATERAL ANGLE (degrees)								GRADE LINE (elevation)	HEAD (ft)	GRADE LINE (elevation)
100.00	48	100	12.560	7.96	1435	0.0049					0.00	0.00	0.00			0.00	6984.27	0.98	6983.29
100.00	48	100	12.560	7.96	1435	0.0049	0.00				0.00	0.00	0.00			0.00	6984.27	0.98	6983.29
130.00	48	100	12.560	7.96	1435	0.0049	30.00				0.15	0.00	0.00			0.15	6984.42	0.98	6983.43
130.00	48	100	12.560	7.96	1435	0.0049	0.00				0.00	0.00	0.00			0.00	6985.23	0.98	6984.25

Table
Rating Table for Circular Channel

Project Description	
Project File	x:\2950000.all\2954030\flowmaster\outfall .fm2
Worksheet	Outfall Storm Sewer
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Channel Depth

Constant Data	
Mannings Coefficient	0.013
Diameter	72.00 in

Input Data				
	Minimum	Maximum	Increment	
Channel Slope	0.010000	0.070000	0.010000 ft/ft	
Discharge	100.00	600.00	100.00	cfs

Rating Table			
Discharge (cfs)	Channel Slope (ft/ft)	Depth (ft)	Velocity (ft/s)
100.00	0.010000	1.98	12.25
100.00	0.020000	1.66	15.71
100.00	0.030000	1.50	18.15
100.00	0.040000	1.39	20.10
100.00	0.050000	1.32	21.76
100.00	0.060000	1.26	23.21
100.00	0.070000	1.21	24.51
200.00	0.010000	2.90	14.76
200.00	0.020000	2.39	19.06
200.00	0.030000	2.14	22.09
200.00	0.040000	1.98	24.51
200.00	0.050000	1.87	26.55
200.00	0.060000	1.79	28.35
200.00	0.070000	1.72	29.96
300.00	0.010000	3.73	16.25
300.00	0.020000	3.00	21.19
300.00	0.030000	2.67	24.64
300.00	0.040000	2.47	27.39
300.00	0.050000	2.32	29.71
300.00	0.060000	2.21	31.75
300.00	0.070000	2.12	33.57
400.00	0.010000	4.64	17.04
400.00	0.020000	3.59	22.69
400.00	0.030000	3.16	26.50
400.00	0.040000	2.90	29.53

Table
Rating Table for Circular Channel

Rating Table			
Discharge (cfs)	Channel Slope (ft/ft)	Depth (ft)	Velocity (ft/s)
400.00	0.050000	2.72	32.08
400.00	0.060000	2.59	34.31
400.00	0.070000	2.48	36.31
500.00	0.010000	N/A	0.00
500.00	0.020000	4.19	23.71
500.00	0.030000	3.63	27.91
500.00	0.040000	3.32	31.19
500.00	0.050000	3.10	33.95
500.00	0.060000	2.94	36.35
500.00	0.070000	2.81	38.50
600.00	0.010000	N/A	0.00
600.00	0.020000	4.93	24.14
600.00	0.030000	4.13	28.94
600.00	0.040000	3.73	32.49
600.00	0.050000	3.47	35.45
600.00	0.060000	3.27	38.02
600.00	0.070000	3.12	40.31

**PIPE AND BEDDING
CLASS CALCULATIONS**

Three Edge Bearing Analysis - Summary

Project Description

Project Title: BXE OUTFALL
Project Location:
Contract Number:
Country:
Units: English
Alternative: 60"

Consultant:
Contractor:
Analyzed By:
Date: 29-Jul-02
Comply To: ASTM

D-LOAD REQUIREMENTS FOR A 60 in. DIAMETER CIRCULAR PIPE

PIPE DATA

Inner Diameter (in.) 60
Wall 'B' Thickness (in.) 6.000

INSTALLATION CONDITIONS

Minimum Depth of Fill (ft) 1.00
Maximum Depth of Fill (ft) 40.00
Soil Density (lb/cu. ft) 120.0
Installation Type Positive Projecting Embankment
Positive Projection Ratio 0.50
Soil Lateral Pressure Ratio 0.33
Soil Lateral Pressure/Friction Term ($k\mu$) 0.1000
Soil Lateral Fraction (m) 0.50
Settlement Ratio 0.70

ADDITIONAL LOADS

Live Load AASHTO HS-20
No Surcharge Load

FACTOR OF SAFETY

Factor of Safety on 0.01 Inch Crack D-Load (Earth,Live) 1.00 1.00
Factor of Safety on Ultimate Earth and Live Load (ASTM C 76)
DL.01 Less Than or Equal To 2000 lbs/ft/ft 1.50
DL.01 Greater Than or Equal To 3000 lbs/ft/ft 1.25
DL.01 Between 2000 and 3000 lbs/ft/ft Interpolated

D-LOAD REQUIREMENTS FOR A 60 in. DIAMETER CIRCULAR PIPE
Comparison of required D-Load Values for Selected Bedding Types

Pipe Depth (ft)	Type B	Type C
1.00	332 (CL-I)	406 (CL-I)
2.00	315 (CL-I)	385 (CL-I)
3.00	336 (CL-I)	409 (CL-I)
4.00	369 (CL-I)	448 (CL-I)
5.00	420 (CL-I)	509 (CL-I)
6.00	482 (CL-I)	584 (CL-I)
7.00	551 (CL-I)	668 (CL-I)
8.00	627 (CL-I)	759 (CL-I)
9.00	708 (CL-I)	856 (CL-II)
10.00	794 (CL-I)	959 (CL-II)
11.00	884 (CL-II)	1067 (CL-III)
12.00	978 (CL-II)	1180 (CL-III)
13.00	1076 (CL-III)	1298 (CL-III)
14.00	1178 (CL-III)	1421 (CL-IV)
15.00	1265 (CL-III)	1524 (CL-IV)
16.00	1350 (CL-III)	1627 (CL-IV)
17.00	1435 (CL-IV)	1729 (CL-IV)
18.00	1521 (CL-IV)	1833 (CL-IV)
19.00	1606 (CL-IV)	1936 (CL-IV)
20.00	1692 (CL-IV)	2038 (CL-V)
21.00	1777 (CL-IV)	2141 (CL-V)
22.00	1863 (CL-IV)	2244 (CL-V)
23.00	1948 (CL-IV)	2347 (CL-V)
24.00	2034 (CL-V)	2451 (CL-V)
25.00	2120 (CL-V)	2554 (CL-V)
26.00	2206 (CL-V)	2657 (CL-V)
27.00	2291 (CL-V)	2760 (CL-V)
28.00	2377 (CL-V)	2863 (CL-V)
29.00	2463 (CL-V)	2967 (CL-V)
30.00	2549 (CL-V)	3070 (3070)
31.00	2635 (CL-V)	3174 (3174)
32.00	2721 (CL-V)	3277 (3277)
33.00	2807 (CL-V)	3380 (3380)
34.00	2893 (CL-V)	3484 (3484)
35.00	2979 (CL-V)	3587 (3587)
36.00	3065 (3065)	3691 (3691)
37.00	3151 (3151)	3794 (3794)
38.00	3237 (3237)	3898 (3898)
39.00	3323 (3323)	4001 (4001)
40.00	3409 (3409)	4105 (4105)

Selected Depth: 20 ft. (closest pipe depth : 20 ft)

Reinforced Pipe Classes for 0.01 in. crack per ASTM C76 (lb/ft/ft):

Three Edge Bearing Analysis - Summary

Project Description

<p>Project Title: BXE OUTFALL Project Location: Contract Number: Country: Units: English Alternative: 72"</p>	<p>Consultant: Contractor: Analyzed By: Date: 29-Jul-02 Comply To: ASTM</p>
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D-LOAD REQUIREMENTS FOR A 72 in. DIAMETER CIRCULAR PIPE

PIPE DATA

Inner Diameter (in.)	72
Wall 'B' Thickness (in.)	7.000

INSTALLATION CONDITIONS

Minimum Depth of Fill (ft)	1.00
Maximum Depth of Fill (ft)	40.00
Soil Density (lb/cu. ft)	120.0
Installation Type	Positive Projecting Embankment
Positive Projection Ratio	0.50
Soil Lateral Pressure Ratio	0.33
Soil Lateral Pressure/Friction Term ($k\mu$)	0.1000
Soil Lateral Fraction (m)	0.50
Settlement Ratio	0.70

ADDITIONAL LOADS

Live Load	AASHTO HS-20
No Surcharge Load	

FACTOR OF SAFETY

Factor of Safety on 0.01 Inch Crack D-Load (Earth,Live)	1.00	1.00
Factor of Safety on Ultimate Earth and Live Load (ASTM C 76)		
DL.01 Less Than or Equal To 2000 lbs/ft/ft	1.50	
DL.01 Greater Than or Equal To 3000 lbs/ft/ft	1.25	
DL.01 Between 2000 and 3000 lbs/ft/ft	Interpolated	

D-LOAD REQUIREMENTS FOR A 72 in. DIAMETER CIRCULAR PIPE
Comparison of required D-Load Values for Selected Bedding Types

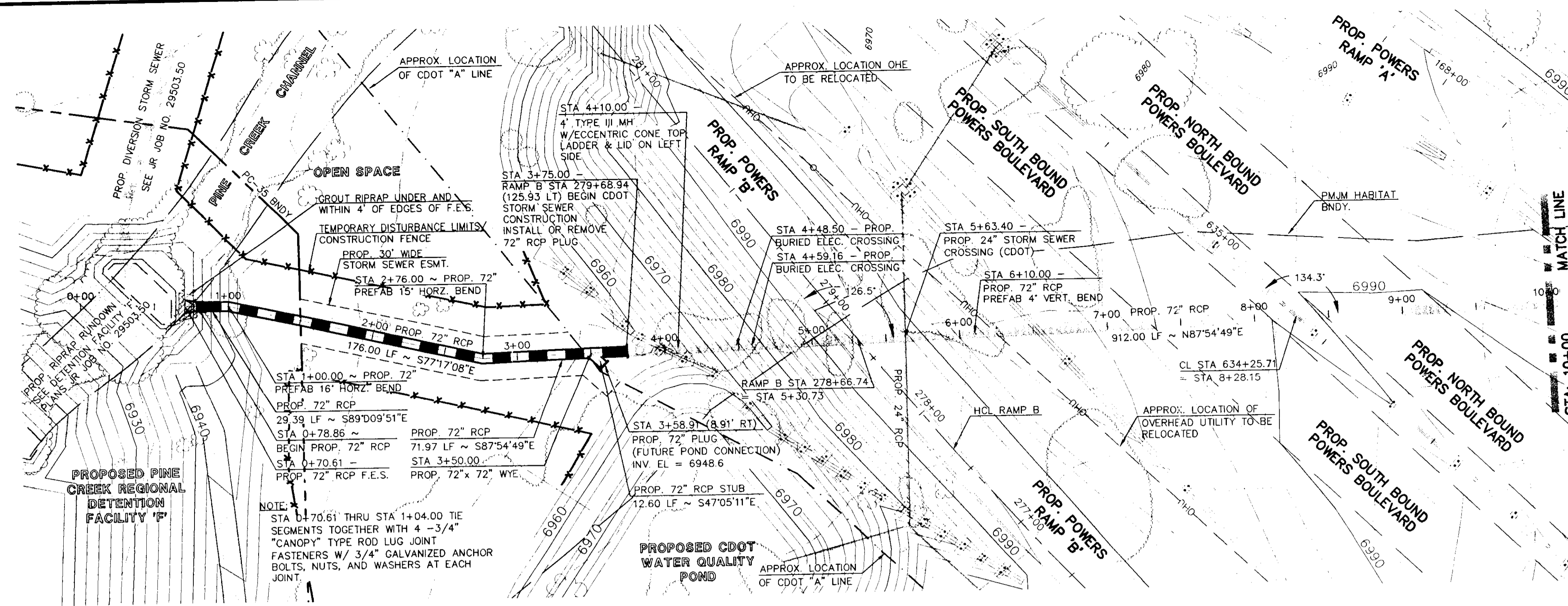
Pipe Depth (ft)	Type B	Type C
1.00	296 (CL-I)	362 (CL-I)
2.00	277 (CL-I)	339 (CL-I)
3.00	299 (CL-I)	365 (CL-I)
4.00	354 (CL-I)	431 (CL-I)
5.00	405 (CL-I)	492 (CL-I)
6.00	466 (CL-I)	565 (CL-I)
7.00	533 (CL-I)	646 (CL-I)
8.00	605 (CL-I)	733 (CL-I)
9.00	682 (CL-I)	825 (CL-II)
10.00	763 (CL-I)	922 (CL-II)
11.00	847 (CL-II)	1024 (CL-III)
12.00	935 (CL-II)	1129 (CL-III)
13.00	1026 (CL-III)	1238 (CL-III)
14.00	1120 (CL-III)	1351 (CL-IV)
15.00	1217 (CL-III)	1468 (CL-IV)
16.00	1318 (CL-III)	1589 (CL-IV)
17.00	1417 (CL-IV)	1709 (CL-IV)
18.00	1503 (CL-IV)	1812 (CL-IV)
19.00	1588 (CL-IV)	1914 (CL-IV)
20.00	1673 (CL-IV)	2017 (CL-V)
21.00	1760 (CL-IV)	2121 (CL-V)
22.00	1845 (CL-IV)	2224 (CL-V)
23.00	1930 (CL-IV)	2326 (CL-V)
24.00	2016 (CL-V)	2429 (CL-V)
25.00	2101 (CL-V)	2532 (CL-V)
26.00	2187 (CL-V)	2635 (CL-V)
27.00	2272 (CL-V)	2738 (CL-V)
28.00	2358 (CL-V)	2841 (CL-V)
29.00	2443 (CL-V)	2944 (CL-V)
30.00	2529 (CL-V)	3047 (3047)
31.00	2614 (CL-V)	3149 (3149)
32.00	2700 (CL-V)	3252 (3252)
33.00	2786 (CL-V)	3355 (3355)
34.00	2871 (CL-V)	3458 (3458)
35.00	2957 (CL-V)	3561 (3561)
36.00	3042 (3042)	3664 (3664)
37.00	3128 (3128)	3768 (3768)
38.00	3214 (3214)	3871 (3871)
39.00	3299 (3299)	3974 (3974)
40.00	3385 (3385)	4077 (4077)

Selected Depth: 20 ft. (closest pipe depth : 20 ft)

Reinforced Pipe Classes for 0.01 in. crack per ASTM C76 (lb/ft/ft):

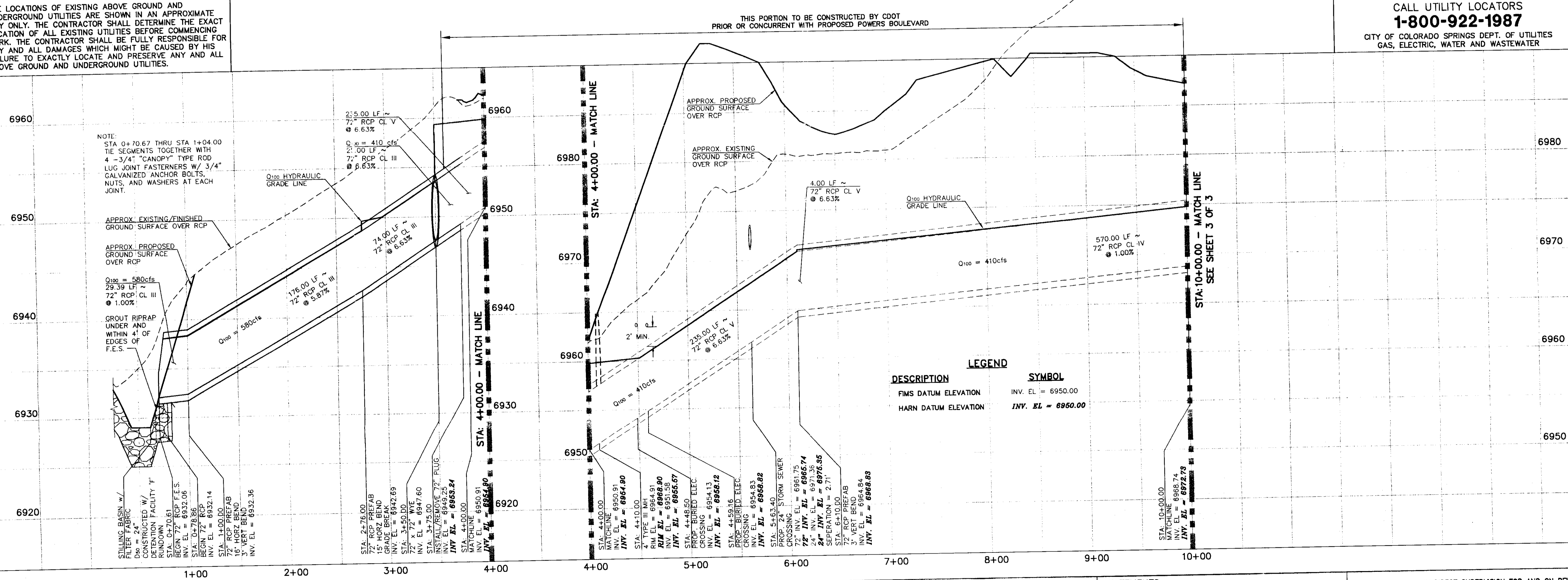
COPY OF PLAN SET

12950000.dwg 12954030.ctb 10/14/02 15:56:31 2002



BRIARGATE CROSSING EAST STORM SEWER - PHASE I

THIS PORTION TO BE CONSTRUCTED BY CDOT
PRIOR OR CONCURRENT WITH PROPOSED POWERS BOULEVARD



STATEMENT:

THE CITY OF COLORADO SPRINGS RECOGNIZES THE DESIGN ENGINEER AS HAVING RESPONSIBILITY FOR THE DESIGN; THE CITY HAS LIMITED ITS SCOPE OF REVIEW ACCORDINGLY.

RESUBMITTAL REQUIRED IF CONSTRUCTION HAS NOT COMMENCED WITHIN 180 DAYS AFTER REVIEW DATE.

REVIEW:

STREET DESIGN: _____ DATE _____
CURB & GUTTER REVIEW _____ DATE _____
FINAL REVIEW _____ DATE _____

DRAINAGE DESIGN: DRAINAGE BASIN FILED IN ACCORDANCE WITH SECTION 15-3-906 OF COLORADO SPRINGS 1980, AS AMENDED

DATE: 10/21/2002

LEGEND

DESCRIPTION	SYMBOL
FIMS DATUM ELEVATION	INV. EL. = 6950.00
HARN DATUM ELEVATION	INV. EL. = 6960.00

BENCHMARKS (FIMS DATUM):

- "+" CHISELED IN THE NORTH END OF MEDIAN CURB IN PROMONTORY PEAK DRIVE IN PC-25 BETWEEN LOTS 21 AND 25 ELEVATION 6885.13
- NORTHWEST BOLT ON THE TOP FLANGE OF A FIRE HYDRANT AT THE INTERSECTION OF PROMONTORY PEAK DRIVE AND CHAPEL HILLS DRIVE, ELEVATION = 6857.32

STATEMENTS:

- SEWER - ANY CHANGES OR ALTERATIONS EFFECTING THE GRADE, ALIGNMENT, ELEVATION, AND DEPTH OF COVER OF SEWERS AND APPURTENANCES SHOWN ON THIS DRAWING SHALL BE THE RESPONSIBILITY OF THE OWNER/DEVELOPER. THE OWNER/DEVELOPER SHALL BE RESPONSIBLE FOR ALL OPERATIONAL DAMAGES AND DEFECTS IN INSTALLATION AND MATERIAL FOR MAINS AND SERVICES FROM THE DATE OF APPROVAL UNTIL FINAL ACCEPTANCE IS ISSUED.
- WATER - THIS APPROVAL SUBJECT TO THE FINAL STREET GRADE LEAVING A MINIMUM COVER OF 5'(FIVE FEET) OVER THE WATER MAIN. ANY CHANGES SHALL BE AT THE EXPENSE OF THE OWNER OR DEVELOPER.

BY: [Signature]

PREPARED UNDER MY DIRECT SUPERVISION FOR AND ON BEHALF OF JR ENGINEERING

[Signature]
VANCEL S. FOSSINGER, COLORADO P.E. #31972

PROFESSIONAL ENGINEER

31972

DATE: 10/21/2002

UNTIL SUCH TIME AS THESE DRAWINGS ARE APPROVED BY THE APPROPRIATE AGENCIES, JR ENGINEERING APPROVES THEIR USE ONLY FOR THE PURPOSES DESIGNATED BY WRITTEN AUTHORIZATION.

PREPARED FOR
LP47, LLC dba LA PLATA INVESTMENTS

2315 BRIARGATE PARKWAY, SUITE 100
COLORADO SPRINGS, COLORADO 80920
719-260-7477 FAX 719-260-7088

JR ENGINEERING
A Subsidiary of Warriner

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719-592-2538 • Fax 719-526-6818
www.jrengineering.com

BY	DATE	REVISION

H-SCALE 1" = 50'
V-SCALE 1" = 5'

DESIGNED BY: DLM
DRAWN BY: DLM
CHECKED BY: [Signature]

DATE: 10/14/02

BRIARGATE CROSSING EAST

STORM SEWER PLAN

PHASE I

SHEET 2 OF 3

JOB NO. 29540.30

