NOTE NO.	STATION	206-01 000 BED COURSE MATERIAL	210-04 010 ADJUST MANHOLE	210-04 020 MODIFY INLET	304-0 9000 AGGREGATE BASE COURSE (SPECIAL)	412-00 600 CONCRETE PAVEMENT (6 INCH)	420-00 103 GEOTEXTILE (EROSION CONTROL) (CLASS 2)	506-00 209 RIPRAP (9 INCH)	603-01180 18 INCH REINFORCED CONCRETE PIPE	603-01240 24 INCH REINFORCED CONCRETE PIPE	603-01300 30 INCH REINFORCED CONCRETE PIPE	603-01360 36 INCH REINFORCED CONCRETE PIPE	603-01420 42 INCH REINFORCED CONCRETE PIPE	603-01480 48 INCH REINFORCED CONCRETE PIPE	603-02480 60 X 38 INCH REINFORCED CONCRETE ELLIPTICAL PIPE	603-05018 18 INCH REINFORCED CONCRETE END SECTION	603-05036 36 INCH REINFORCED CONCRETE END SECTION	603-05048 48 INCH REINFORCED CONCRETE END SECTION	604-00305 INLET TYPE C H=5	604-00310 INLET TYPE C H=10	604-00315 INLET TYPE C H=15	604-16010 INLET TYPE D H=10	604-00550 INLET TYPE D SPECIAL	604-1 9105 INLET TYPE R H=5	604-2 0000 OUTLET STRUCTURE	604-2 5010 VANGE GRATE INLET H=10	604-2 5015 VANGE GRATE INLET H=15	604-2 6006 VANE GRATE INLET DOUBLE H=5	604-2 6010 VANE GRATE INLET DOUBLE H=10	604-2 6015 VANE GRATE INLET DOUBLE H=15	604-3 0005 MANHOLE H=5	604-3 0010 MANHOLE H=10	604-3 0015 MANHOLE H=15	604-3 0020 MANHOLE H=20	605-8 5000 SURFACE SAND FILTER	206-00000 STRUCTURE EXCAVATION	STRUCTURE EXCAVATION*	STRUCTURE BACKFILL CL*	203-00060 EMBANKMENT MATERIAL (COMPLETE IN PLACE)	REMARKS
		CY	EA	EA	CY	SY	SY	CY	LF	LF	LF	LF	LF	LF	LF	EA	EA	EA	EA			EA			EA		EA		EA					SF	CY	CY	CY	CY	
Santa Fe																																								
MAINLINE																																								
703.42 R	703+41.71																															1					11	10		
	PIPE									266																										175	200	152	175	
706.09 L	706+09.04																															1					27	17		
	PIPE									88																										83	64	49	83	
707.01 L	707+01.46																															1					27	18		
	PIPE									167																										155	129	98	155	
708.72 L	708+71.86																															1					26	18		
	PIPE									267																										204	196	150	204	
711.43 L	711+42.83																															1					21	13		
	PIPE									392																										216	296	226	216	
715.37 L	715+37.37																															1					23	14		
	PIPE										96																									70	90	65	70	
716.37 L	716+37.48																															1					30	18		
	PIPE										27																									16	22	16	16	
716.60 L	716+59.55																				1																19	14		
	PIPE										126																									138	119	85	138	
717.99 L	717+98.83																															1					28	20		
	PIPE											175																								306	207	141	306	
718.30 L	718+29.91																															1					25	33		
	PIPE											117																								258	145	99	258	
719.96 L	719+96.41																1																							
LINE A																																								
707.02 R	707+01.83																																	1			1	10		
	PIPE								27																											12	13	11	12	
707.01 L	707+01.46																																							*
LINE B																																								
708.79 R	708+78.64																																	1				11		
	PIPE								35																											6	10	15	6	
708.72 L	708+71.86																																							*
	SHEET 1 TOTAL	0	0	0	0	0	0	0	62	1,180	249	292	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	2	0	1	8	0	0	0	1,638	1,728	1,299	1,638	

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Sheet Revisions

Date:	Comments	Init.

Colorado Department of Transportation
DOT DEPARTMENT OF TRANSPORTATION
8833 South Wadsworth Court
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Phone: 303-972-9112 FAX: 303-972-9114
Region 6 RLB

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TABULATION OF STRUCTURES

Designer: SDH
Detailer: SDH
Sheet Subset: DRAIN TAB
Structure Numbers
Subset Sheets: 1 of 6

Project No./Code
ES6 0852-103
17679
Sheet Number 84

NOTE NO.	STATION	206-01 000 BED COURSE MATERIAL	210-04 010 ADJUST MANHOLE	210-04 020 MODIFY INLET	304-0 9000 AGGREGATE BASE COURSE (SPECIAL)	412-00 600 CONCRETE PAVEMENT (6 INCH)	420-00 103 GEOTEXTILE (EROSION CONTROL) (CLASS 2)	506-00 209 RIPRAP (9 INCH)	603-01180 18 INCH REINFORCED CONCRETE PIPE	603-01240 24 INCH REINFORCED CONCRETE PIPE	603-01300 30 INCH REINFORCED CONCRETE PIPE	603-01360 36 INCH REINFORCED CONCRETE PIPE	603-01420 42 INCH REINFORCED CONCRETE PIPE	603-01480 48 INCH REINFORCED CONCRETE PIPE	603-02480 60 X 38 INCH REINFORCED CONCRETE ELLIPTICAL PIPE	603-05018 18 INCH REINFORCED CONCRETE END SECTION	603-05036 36 INCH REINFORCED CONCRETE END SECTION	603-05048 48 INCH REINFORCED CONCRETE END SECTION	604-00305 INLET TYPE C H=5	604-00310 INLET TYPE C H=10	604-00315 INLET TYPE C H=15	604-16010 INLET TYPE D H=10	604-00550 INLET TYPE D SPECIAL	604-1 9105 INLET TYPE R H=5	604-2 0000 OUTLET STRUCTURE	604-2 5010 VANGE GRATE INLET H=10	604-2 5015 VANGE GRATE INLET H=15	604-2 6006 VANE GRATE INLET DOUBLE H=5	604-2 6010 VANE GRATE INLET DOUBLE H=10	604-2 6015 VANE GRATE INLET DOUBLE H=15	604-3 0005 MANHOLE H=5	604-3 0010 MANHOLE H=10	604-3 0015 MANHOLE H=15	604-3 0020 MANHOLE H=20	605-8 5000 SURFACE SAND FILTER	206-00000 STRUCTURE EXCAVATION	STRUCTURE EXCAVATION*	STRUCTURE BACKFILL CL*	203-00060 EMBANKMENT MATERIAL (COMPLETE IN PLACE)	REMARKS
		CY	EA	EA	CY	SY	SY	CY	LF	LF	LF	LF	LF	LF	LF	EA	EA	EA	EA				EA			EA			EA										
LINE C																																							
711.44 R	711+43.90																														1						17		
	PIPE								42																												0	3	20	0	
711.43 L	711+42.83																																							*
LINE D																																							
716.59 L	716+59.33																				1																2	13		
	PIPE								51																												14	24	22	14	
716.60 L	716+59.55																																							*
C-470																																							
MAINLINE																																							
753.21 R	753+21.34																														1						11	7		
	PIPE									165																											6	104	93	6	
751.54 R	751+53.74																														1						5	7		
	PIPE									101																												11	57		
750.50 R	750+50.18																														1							8		
	PIPE									20																												3	9		
750.51 L	750+50.74																																			1		16	12		
	PIPE									122																												65	69		
749.24 L	749+24.03																																			1		5	14		
	PIPE									163																												15	92		
747.57 L	747+56.71																																			1			16		
	PIPE									330																													190		
744.22 L	744+22.12																																			1			16		
	PIPE									72																													40		
743.47 L	743+46.72																															1							14		
	PIPE										45																													28		
743.63 R	743+62.67																																				1		30	48		
	PIPE**											66																										51	75	51	51	
742.92 R	742+92.12																																				1		57	38		
	SHEET 2 TOTAL	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**93**	**973**	**45**	**66**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**3**	**0**	**1**	**0**	**4**	**1**	**1**	**0**	**70**	**426**	**878**	**70**	

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** SPECIAL TYPE V CONCRETE

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Print Date: 1/15/2010	Sheet Revisions		
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TABULATION OF STRUCTURES

Designer: SDH
Detailer: SDH
Sheet Subset: DRAIN TAB
Structure Numbers
Subset Sheets: 2 of 6

Project No./Code
ES6 0852-103
17679
Sheet Number 85

NOTE NO.	STATION	206-01 000 BED COURSE MATERIAL CY	210-04 010 ADJUST MANHOLE EA	210-04 020 MODIFY INLET EA	304-0 9000 AGGREGATE BASE COURSE (SPECIAL) CY	412-00 600 CONCRETE PAVEMENT (6 INCH) SY	420-00 103 GEOTEXTILE (EROSION CONTROL) (CLASS 2) SY	506-00 209 RIPRAP (9 INCH) CY	603-01180 18 INCH REINFORCED CONCRETE PIPE LF	603-01240 24 INCH REINFORCED CONCRETE PIPE LF	603-01300 30 INCH REINFORCED CONCRETE PIPE LF	603-01360 36 INCH REINFORCED CONCRETE PIPE LF	603-01420 42 INCH REINFORCED CONCRETE PIPE LF	603-01480 48 INCH REINFORCED CONCRETE PIPE LF	603-02480 60 X 38 INCH REINFORCED CONCRETE ELLIPTICAL PIPE LF	603-05018 18 INCH REINFORCED CONCRETE END SECTION EA	603-05036 36 INCH REINFORCED CONCRETE END SECTION EA	603-05048 48 INCH REINFORCED CONCRETE END SECTION EA	604-00305 INLET TYPE C H=5 EA	604-00310 INLET TYPE C H=10 EA	604-00315 INLET TYPE C H=15 EA	604-16010 INLET TYPE D H=10 EA	604-00550 INLET TYPE D SPECIAL EA	604-1 9105 INLET TYPE R H=5 EA	604-2 0000 OUTLET STRUCTURE EA	604-2 5010 VANGE GRATE INLET H=10 EA	604-2 5015 VANGE GRATE INLET H=15 EA	604-2 6006 VANE GRATE INLET DOUBLE H=5 EA	604-2 6010 VANE GRATE INLET DOUBLE H=10 EA	604-2 6015 VANE GRATE INLET DOUBLE H=15 EA	604-3 0005 MANHOLE H=5 EA	604-3 0010 MANHOLE H=10 EA	604-3 0015 MANHOLE H=15 EA	604-3 0020 MANHOLE H=20 EA	605-8 5000 SURFACE SAND FILTER SF	206-00000 STRUCTURE EXCAVATION CY	STRUCTURE EXCAVATION* CY	STRUCTURE BACKFILL CL* CY	203-00060 EMBANKMENT MATERIAL (COMPLETE IN PLACE) CY	REMARKS
	PIPE												414																							1482	558	359	1482	
738.73 R	738+73.41																																	1		76	51		
	PIPE												157																							531	273	176	531	
737.11 R	737+11.05																																1			46	31		
	PIPE												281																							462	409	263	462	
734.25 R	734+25.05																							1												40	16		
	PIPE												141																							125	203	131	125	
732.82 R	732+81.57																																	1		76	51		
	PIPE												258																							565	375	242	565	
730.31 R	730+31.22																																1			42	31		
	PIPE												108																							88	153	99	88	
729.31 R	729+31.42																							1												19	9		
	PIPE												12																								10	7		
729.23 R	729+23.45																																1			30	27		
	PIPE												210																							114	304	196	114	
727.74 R	727+74.28																																1			40	26		
	PIPE												10																							7	8	5	7	
727.82 R	727+82.06																																1			41	26		
	PIPE														131																					287	223	134	287	
727.45 R	727+45.39																							1												35	15		
	PIPE													29																							42	43	26	42	
727.33 R	727+32.61																																1			45	20		
	PIPE													94																							78	170	105	78	
727.16 R	727+15.83					108													1																					
707.00 L	727+00.31		1																																				
727.62 R	727+61.77			1																																			
730.39 R	730+38.94			1																																			
LINE A																																								
727.21 R	727+21.15																				1																11	7		
	PIPE								32																												32	16	13	32	
727.45 R	727+45.39																																							*
LINE B																																								
728.91 R	728+91.27																				1																11	8		
	PIPE										58																										28	52	37	28	*
729.23 R	729+23.45																																							
	PIPE												12																								10	7		
729.31 R	729+31.42																							1												19	9		*
LINE C																																								
730.35 R	730+35.19																				1																20			
	PIPE								61																												88	34	27	88	
	SHEET 3 TOTAL	0	1	2	0	108	0	0	93	0	58	0	1,603	123	131	0	0	1	0	3	0	2	2	0	0	0	0	0	0	0	0	3	3	2	0	3,928	3,390	2,152	3,928	

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Print Date: 1/15/2010	Sheet Revisions	Colorado Department of Transportation	TABULATION OF STRUCTURES
File Name: Drainage SOQ.dgn	Date: / Comments / Init.	8833 South Wadsworth Court Littleton, CO 80128 Phone: 303-972-9112 FAX: 303-972-9114	Designer: SDH Detailer: SDH Sheet Subset: DRAIN TAB
Horiz. Scale: 1:1 Vert. Scale: 1:1		Region 6 RLB	Structure Numbers Subset Sheets: 3 of 6
PBSJ 4601 DTC Boulevard Suite 700 Denver, CO 80237		No Revisions: Revised: Void:	Project No./Code: ES6 0852-103 17679 Sheet Number 86

NOTE NO.	STATION	206-01000 BED COURSE MATERIAL CY	210-04010 ADJUST MANHOLE EA	210-04020 MODIFY INLET EA	304-09000 AGGREGATE BASE COURSE (SPECIAL) CY	412-00600 CONCRETE PAVEMENT (6 INCH) SY	420-00103 GEOTEXTILE (EROSION CONTROL) (CLASS 2) SY	506-00209 RIPRAP (9 INCH) CY	603-01180 18 INCH REINFORCED CONCRETE PIPE LF	603-01240 24 INCH REINFORCED CONCRETE PIPE LF	603-01300 30 INCH REINFORCED CONCRETE PIPE LF	603-01360 36 INCH REINFORCED CONCRETE PIPE LF	603-01420 42 INCH REINFORCED CONCRETE PIPE LF	603-01480 48 INCH REINFORCED CONCRETE PIPE LF	603-02480 60 X 38 INCH REINFORCED CONCRETE ELLIPTICAL PIPE LF	603-05018 18 INCH REINFORCED CONCRETE END SECTION EA	603-05036 36 INCH REINFORCED CONCRETE END SECTION EA	603-05048 48 INCH REINFORCED CONCRETE END SECTION EA	604-00305 INLET TYPE C H=5 EA	604-00310 INLET TYPE C H=10 EA	604-00315 INLET TYPE C H=15 EA	604-16010 INLET TYPE D H=10 EA	604-00550 INLET TYPE D SPECIAL EA	604-19105 INLET TYPE R H=5 EA	604-20000 OUTLET STRUCTURE EA	604-25010 VANGE GRATE INLET H=10 EA	604-25015 VANGE GRATE INLET H=15 EA	604-26006 VANE GRATE INLET DOUBLE H=5 EA	604-26010 VANE GRATE INLET DOUBLE H=10 EA	604-26015 VANE GRATE INLET DOUBLE H=15 EA	604-30005 MANHOLE H=5 EA	604-30010 MANHOLE H=10 EA	604-30015 MANHOLE H=15 EA	604-30020 MANHOLE H=20 EA	605-85000 SURFACE SAND FILTER SF	206-00000 STRUCTURE EXCAVATION CY	STRUCTURE EXCAVATION* CY	STRUCTURE BACKFILL CL1* CY	203-00060 EMBANKMENT MATERIAL (COMPLETE IN PLACE) CY	REMARKS
730.31 R	730+31.22																																					*
	PIPE									47																										26	34	26	26	
730.39 R	730+38.78																																							
LINE D																																							
732.87 R	732+86.90																			1																			
	PIPE								34																											28	17	14	28	
732.82 R	732+81.57																																							*
LINE E																																							
733.88 L	733+88.05																			1																			
	PIPE								35																													15		
734.25 L	734+24.78																																	1			10		
	PIPE								37																											2	8	16	2	
734.25 R	734+25.05																																							*
LINE F																																							
737.11 L	737+10.78																																	1			8	16		
	PIPE								27																												25	15	12	25	
737.11 R	737+11.05																																							*
	PIPE								25																												31	12	10	31	
737.11 R	737+10.76																					1																20	14		
LINE G																																							
741.64 L	741+63.83																												1									10		
	PIPE								83																													37		
740.77 L	740+76.85																																		1			13		
	PIPE								82																													36		
739.93 L	739+92.66																												1									8		
	PIPE								108																													49		
738.83 L	738+82.87																												1									11		
	PIPE								63																												15	19	28	15	
738.73 R	738+73.41																																							*
LINE H																																							
743.04 R	743+04.27																					1																10	7		
	PIPE								33																												14	16	13	14	
742.92 R	742+92.12																																							*
	SHEET 4 TOTAL	0	0	0	0	0	0	0	527	47	0	0	0	0	0	0	0	0	1	2	1	0	0	0	0	3	0	0	2	0	0	1	0	0	0	141	171	361	141	

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Region 6 RLB

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TABULATION OF STRUCTURES

Designer: SDH
Detailer: SDH
Sheet Subset: DRAIN TAB
Structure Numbers
Subset Sheets: 4 of 6

Project No./Code
ES6 0852-103
17679
Sheet Number 87

NOTE NO.	STATION	206-01000 BED COURSE MATERIAL CY	210-04010 ADJUST MANHOLE EA	210-04020 MODIFY INLET EA	304-09000 AGGREGATE BASE COURSE (SPECIAL) CY	412-00600 CONCRETE PAVEMENT (6 INCH) SY	420-00103 GEOTEXTILE (EROSION CONTROL) (CLASS 2) SY	506-00209 RIPRAP (9 INCH) CY	603-01180 18 INCH REINFORCED CONCRETE PIPE LF	603-01240 24 INCH REINFORCED CONCRETE PIPE LF	603-01300 30 INCH REINFORCED CONCRETE PIPE LF	603-01360 36 INCH REINFORCED CONCRETE PIPE LF	603-01420 42 INCH REINFORCED CONCRETE PIPE LF	603-01480 48 INCH REINFORCED CONCRETE PIPE LF	603-02480 60 X 38 INCH REINFORCED CONCRETE ELLIPTICAL PIPE LF	603-05018 18 INCH REINFORCED CONCRETE END SECTION EA	603-05036 36 INCH REINFORCED CONCRETE END SECTION EA	603-05048 48 INCH REINFORCED CONCRETE END SECTION EA	604-00305 INLET TYPE C H=5 EA	604-00310 INLET TYPE C H=10 EA	604-00315 INLET TYPE C H=15 EA	604-16010 INLET TYPE D H=10 EA	604-00550 INLET TYPE D SPECIAL EA	604-19105 INLET TYPE R H=5 EA	604-20000 OUTLET STRUCTURE EA	604-25010 VANGE GRATE INLET H=10 EA	604-25015 VANGE GRATE INLET H=15 EA	604-26006 VANE GRATE INLET DOUBLE H=5 EA	604-26010 VANE GRATE INLET DOUBLE H=10 EA	604-26015 VANE GRATE INLET DOUBLE H=15 EA	604-30005 MANHOLE H=5 EA	604-30010 MANHOLE H=10 EA	604-30015 MANHOLE H=15 EA	604-30020 MANHOLE H=20 EA	605-85000 SURFACE SAND FILTER SF	206-00000 STRUCTURE EXCAVATION CY	STRUCTURE EXCAVATION* CY	STRUCTURE BACKFILL CL1* CY	203-00060 EMBANKMENT MATERIAL (COMPLETE IN PLACE) CY	REMARKS
LINE I																																							
743.49 L	743+49.08																		1																	8	6		
	PIPE										24																										8	14		
743.47 L	743+46.72																																							*
LINE J																																							
744.52 R	744+51.91																			1																9	13		
	PIPE								86																											20	48	39	20	
743.63 R	743+62.67																																							*
LINE K																																							
744.22 R	744+22.13																																	1				10		
	PIPE								25																													10		
744.22 L	744+22.12																																							*
LINE L																																							
742.18 R	742+17.86																		1																	13	4		
	PIPE								19																											4	7	6	4	
742.17 R	742+17.45																								1												7	5		
SE POND																																				9100				
251.50 L	251+50.12																																		1		52	32		
	PIPE									87																										236	202	197	236	
252.31 L	252+30.98																																	1			50	32		
	PIPE									22																										37	49	48	37	
252.37 L	252+37.12					15																			1														SEE DRAIN WQ
251.81 L	251+80.59															1																								
	PIPE								7																											2	6	8	2	
252.01 L	252+01.15															1																								
253.60 L	253+59.87															1																								
	SHEET 5 TOTAL	**0**	**0**	**0**	**0**	**15**	**0**	**0**	**137**	**109**	**24**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**2**	**1**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**1**	**0**	**9,399**	**460**	**423**	**299**	

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ES6 0852-103
17679
Sheet Number 88

NOTE NO.	STATION	206-01 000	210-04 010	210-04 020	304-0 9000	412-00 600	420-00 103	506-00 209	603- 01180	603- 01240	603- 01300	603- 01360	603- 01420	603- 01480	603-02 480	603- 05018	603- 05036	603- 05048	604- 00305	604- 00310	604- 00315	604- 16010	604-0055 0	604-1 9105	604-2 0000	604-2 5010	604-2 5015	604-2 6006	604-2 6010	604-2 6015	604-3 0005	604-3 0010	604-3 0015	604-3 0020	605-8 5000	206- 00000			203- 00060	REMARKS
		BED COURSE MATERIAL	ADJUST MANHOLE	MODIFY INLET	AGGREGATE BASE COURSE (SPECIAL)	CONCRETE PAVEMENT (6 INCH)	GEOTEXTILE (EROSION CONTROL) (CLASS 2)	RIPRAP (9 INCH)	18 INCH REINFORCED CONCRETE PIPE	24 INCH REINFORCED CONCRETE PIPE	30 INCH REINFORCED CONCRETE PIPE	36 INCH REINFORCED CONCRETE PIPE	42 INCH REINFORCED CONCRETE PIPE	48 INCH REINFORCED CONCRETE PIPE	60 X 38 INCH REINFORCED CONCRETE ELLIPTICAL PIPE	18 INCH REINFORCED CONCRETE END SECTION	36 INCH REINFORCED CONCRETE END SECTION	48 INCH REINFORCED CONCRETE END SECTION	INLET TYPE C			INLET TYPE D		INLET TYPE R	OUTLET STRUCTURE	VANGE GRATE INLET		VANE GRATE INLET DOUBLE			MANHOLE				SURFACE SAND FILTER	STRUCTURE EXCAVATION	STRUCTURE EXCAVATION*	STRUCTURE BACKFILL CL1*	EMBANKMENT MATERIAL (COMPLETE IN PLACE)	
																			H=5	H=10	H=15	H=10	SPECIAL	H=5		H=10	H=15	H=5	H=10	H=15	H=5	H=10	H=15	H=20						
		CY	EA	EA	CY	SY	SY	CY	LF	LF	LF	LF	LF	LF	LF	EA	EA	EA	EA				EA		EA		EA			EA				SF	CY	CY	CY	CY	
SPILLWAY																																							
254.59 L	254+59.29	15					22	22																															
TRICKLE CHANNEL																																							
252.49 L	252+48.83	164				41																																	
PIER 7																																							
725.02 L	725+02.37						49	28																												71			
PIER 13																																							
733.67	733+67.26						15	8																												20			
INLFILTRATION TRENCH																																							
769.8 R	769+79.60																																							
	TRENCH				1228		1712																												6030	1340				
776.48 R	776+48.33																																							
SHEET 6 TOTAL		179	0	0	1,228	41	1,798	58	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6,030	1,431	0	0	0	
PROJECT TOTAL		179	1	2	1,228	164	1,798	58	912	2,309	376	358	1,603	123	131	3	1	1	3	8	1	2	2	1	1	3	1	3	5	1	1	16	5	4	6,030	16,607	6,175	5,113	6,076	

* FOR INFORMATION ONLY

NOTES:
1. RUBBER GASKETS CONFORMING TO STANDARD SPECIFICATION SECTION 705.03 ARE REQUIRED FOR ALL CONCRETE PIPE.

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Print Date: 1/15/2010
File Name: Drainage SDQ.dgn
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TABULATION OF STRUCTURES

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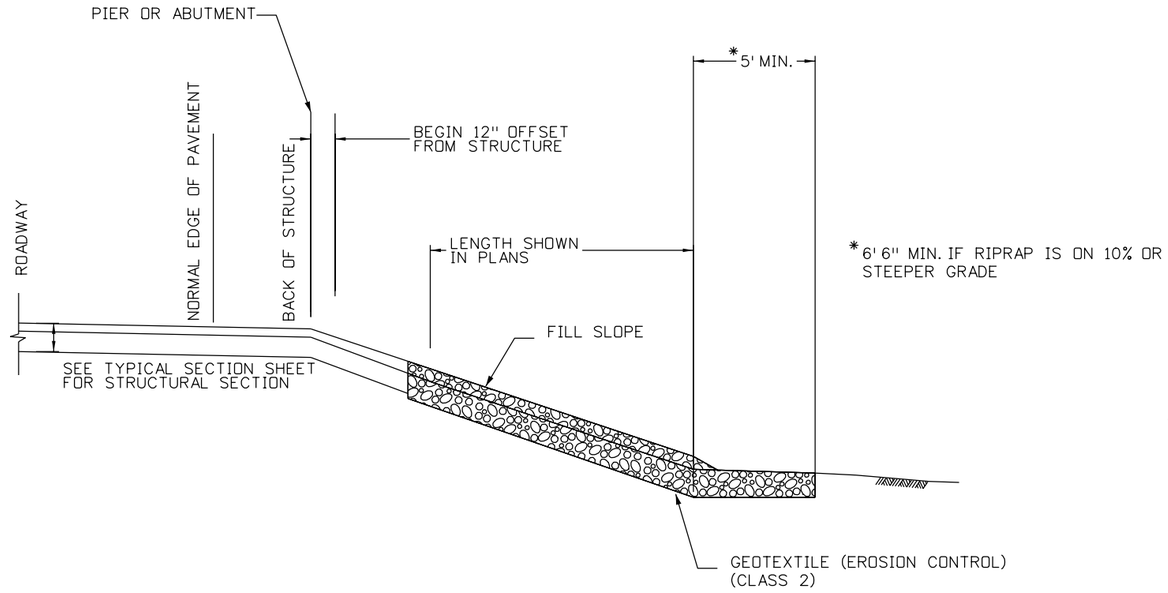
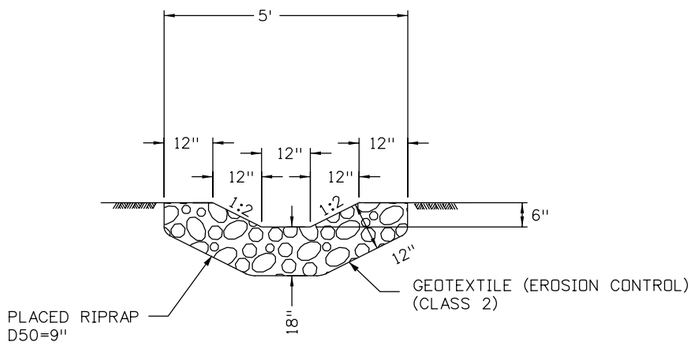
Detailer: SDH
Sheet Subset: DRAIN TAB
Structure Numbers
Subset Sheets: 6 of 6

Project No./Code
ES6 0852-103
17679
Sheet Number 89

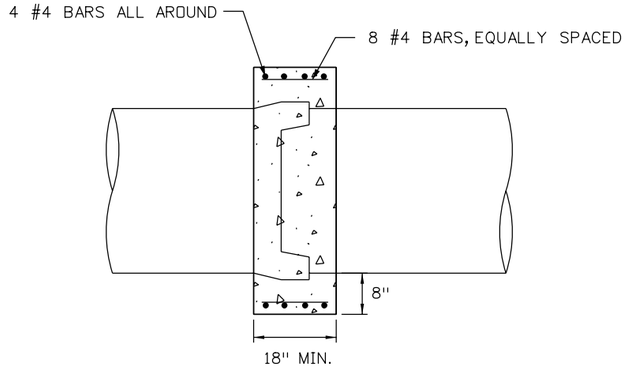


*6' 6" MIN. IF RIPRAP IS ON 10% OR STEEPER GRADE



RIPRAP RUNDOWN

APPROXIMATE STATION: 725+03 AND 733+67
FHWA DETAIL CM608-50



CONCRETE COLLARS

NOTES FOR CONCRETE COLLARS:

1. DIMENSIONS ARE MINIMUM. COLLAR MAY BE SQUARE, ROUND OR SHAPE MAY VARY SO LONG AS MINIMUM DIMENSIONS ARE OBTAINED.

2. ALL CONCRETE COLLARS ARE TO BE CONSTRUCTED WITH SPECIAL TYPE V CONCRETE.

3. ALL REINFORCEMENT SHALL MAINTAIN A 2" MINIMUM CLEARANCE.

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DRAINAGE DETAILS

Designer: AJF
Detailer: AJF
Sheet Subset: DRAIN DE
Structure Numbers
Subset Sheets: 1 of 3

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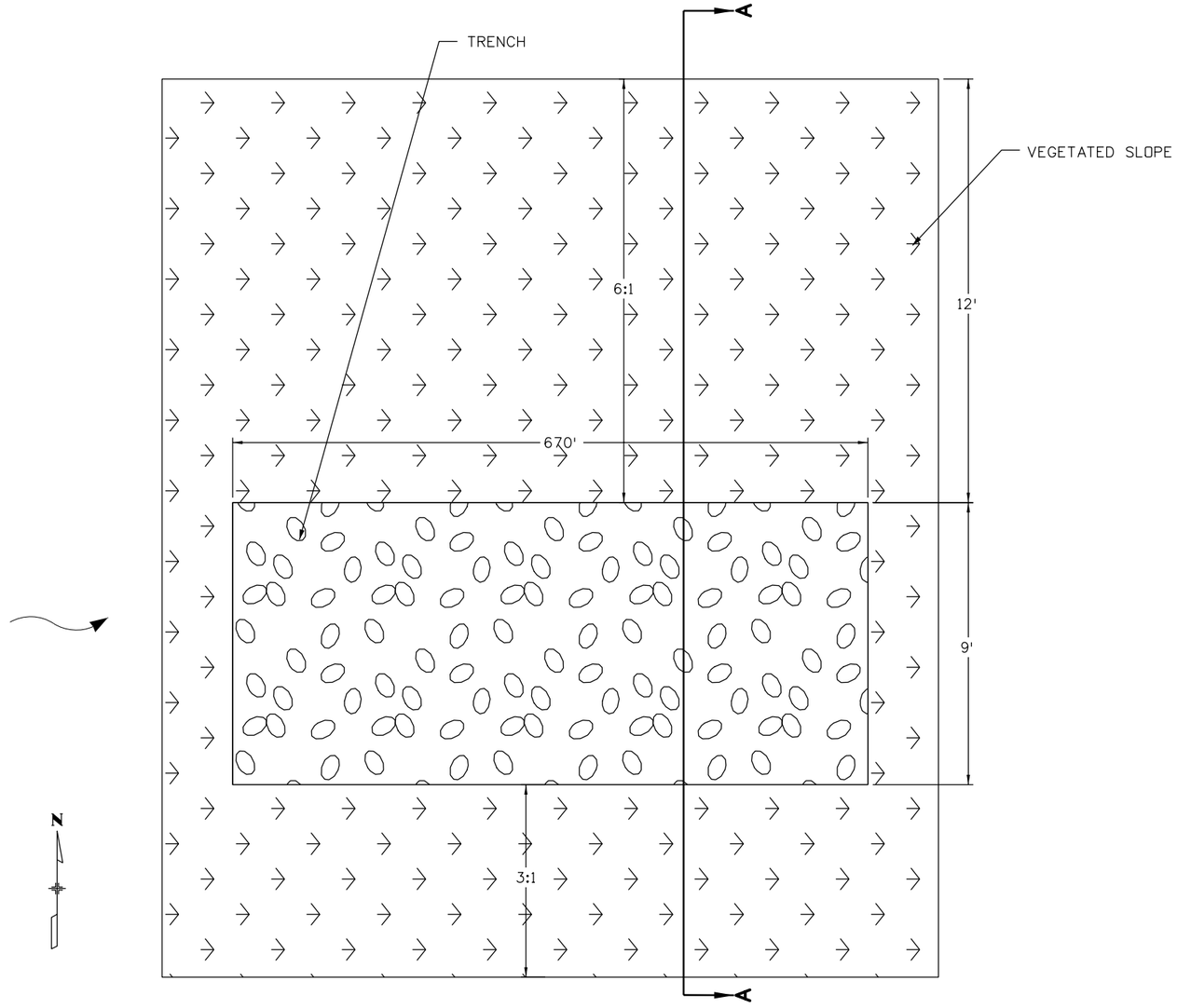
Sheet Number 90



PLAN VIEW

(NOT TO SCALE)

CONSTRUCTION NOTES:

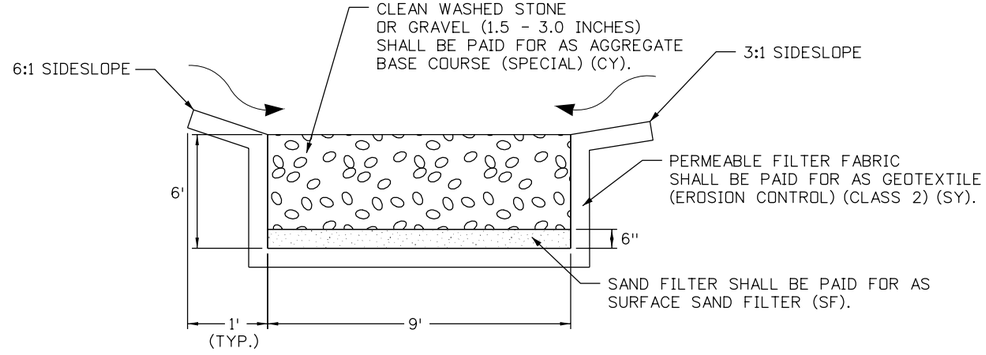
1. CONSTRUCTION OF THE TRENCH SHOULD TAKE PLACE AFTER THE SITE HAS BEEN STABILIZED.

2. SILT FENCE SHOULD BE PLACED AROUND THE PERIMETER OF THE TRENCH DURING ALL PHASES OF CONSTRUCTION.

3. HEAVY EQUIPMENT SHOULD NOT OPERATE ON THE SURFACE OF THE TRENCH LOCATION TO AVOID COMPACTION OF TRENCH MEDIA AND SURROUNDING SOILS.

4. DURING CONSTRUCTION OF THE TRENCH ONLY LIGHT EQUIPMENT SHOULD BE USED TO MINIMIZE COMPACTION OF THE TRENCH FLOOR AND SIDESLOPES THAT REDUCES THE PERCOLATION CAPACITY.

5. TRENCH SHOULD NOT BE USED AS A TEMPORARY SEDIMENT TRAP DURING CONSTRUCTION.



SECTION A - A

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INFILTRATION TRENCH DETAIL

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Detailer: AJF
Sheet Subset: DRAIN DE
Structure Numbers:
Subset Sheets: 2 of 3

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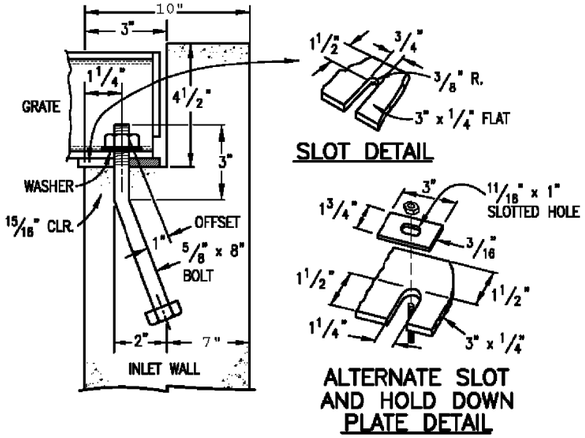
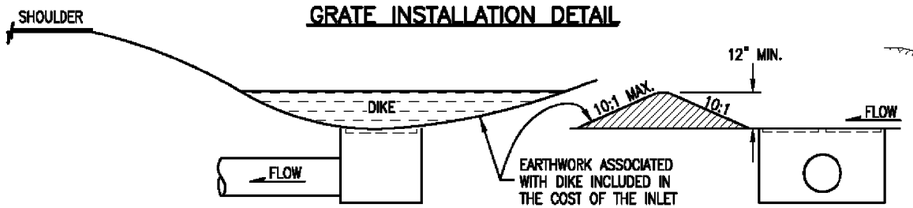
17679
Sheet Number 91



SLOT DETAIL

ALTERNATE SLOT AND HOLD DOWN PLATE DETAIL

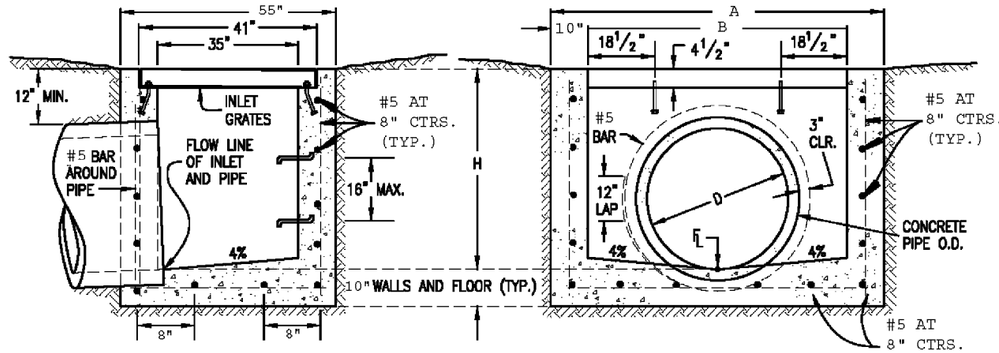
GRATE INSTALLATION DETAIL



TRANSVERSE VIEW

DIKE

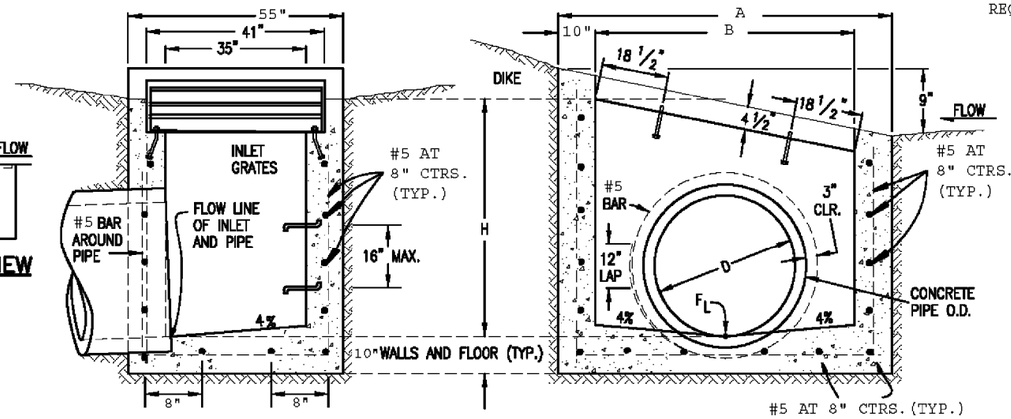
LONGITUDINAL VIEW



TRANSVERSE CROSS SECTION

LONGITUDINAL CROSS SECTION

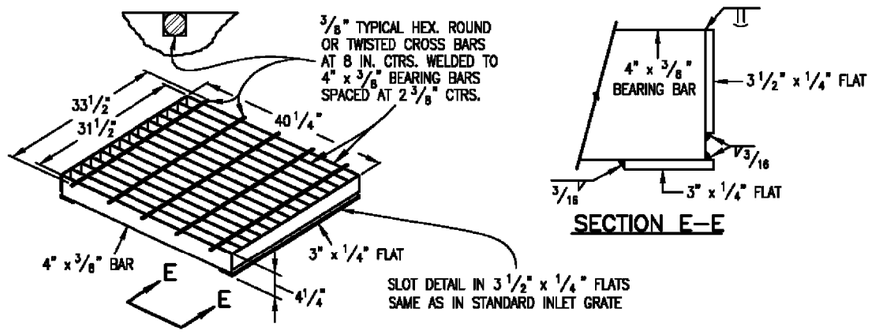
LEVEL GRATE INSTALLATION



TRANSVERSE CROSS SECTION

LONGITUDINAL CROSS SECTION

SLOPING GRATE INSTALLATION



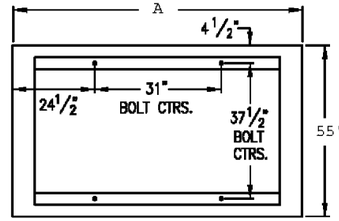
CLOSE MESH GRATE

USE FOR PEDESTRIAN AND BICYCLE AREAS ONLY.

SECTION E–E

GENERAL NOTES

1. CONCRETE SHALL BE CLASS B. INLET MAY BE CAST-IN-PLACE OR PRECAST.
2. SEE PLANS FOR SIZE AND LOCATION OF PIPE.
3. STRUCTURAL STEEL FOR GRATES AND GRATE INSTALLATION HARDWARE SHALL BE GALVANIZED AND SHALL BE IN ACCORDANCE WITH SUBSECTION 712.06.
4. STEPS SHALL BE PROVIDED WHEN INLET DIMENSION "H" IS EQUAL TO OR GREATER THAN 3 FT.-6 IN. AND SHALL CONFORM WITH AASHTO M 199.
5. REINFORCING BARS SHALL BE EPOXY COATED AND DEFORMED #5 AND SHALL HAVE A 2 IN. MIN. CLEARANCE MEASURED FROM THE INSIDE FACE OF INLET. CUT OR BEND BARS AROUND PIPE AS REQUIRED.



PLAN VIEW

(SHOWING ANCHOR BOLT LAYOUT)

	INSIDE DIA., IN.	
	42"	60" X 38"
A	88"	116"
B	68"	96"

"H" FT.	CONCRETE CU. YDS.	STEEL LBS.	WIDTH OF INLET	INSIDE DIA., IN. - "D"
10	9	1009	116"	60 X 38
11	8	924	88"	42

CONCRETE AND STEEL QUANTITIES ARE FOR ONE ENTIRE INLET BEFORE DEDUCTION FOR VOLUME OCCUPIED BY PIPE. WEIGHT OF STEEL INCLUDES A RING FOR THE MAXIMUM PIPE DIAMETER.

QUANTITIES FOR ONE INLET

* UNDER STRUCTURAL REVISIONS

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SPECIAL TYPE D INLET DETAIL

Designer: TYK
Detailer: SDH
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Structure Numbers
Subset Sheets: 3 of 3

Project No./Code
ES6 0852-103
17679
Sheet Number 92

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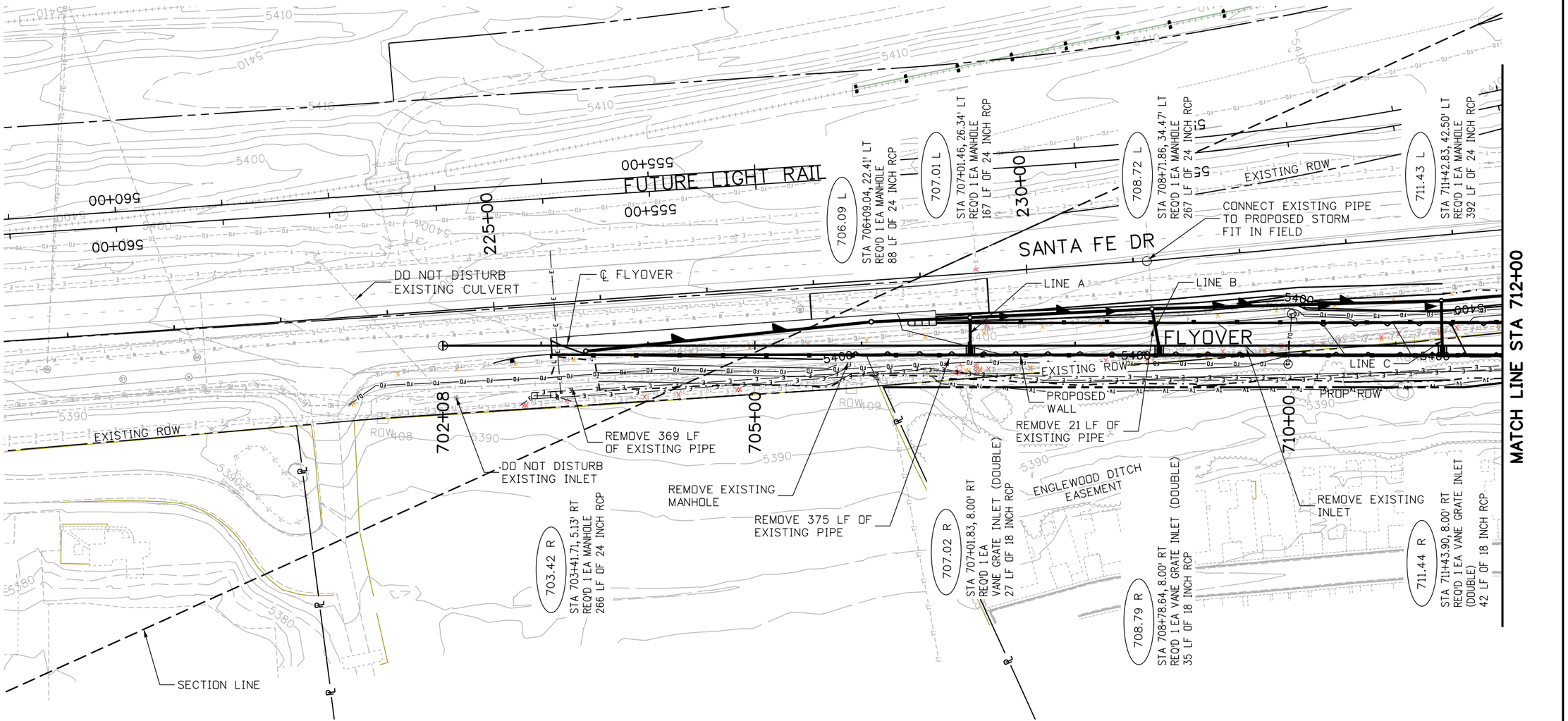

NOTES:

1. FROM EDGE OF ROADWAY TO DOUBLE VANE GRATE, GRADE APRON TO TRANSITION TO MATCH ROADWAY CROSS SLOPE
2. CLASS III CONCRETE PIPE PER ASTM C76 IS TO BE USED UNLESS OTHERWISE NOTED. ALL CONCRETE IS TO MEET A CLASS II SULFATE RESISTANCE LEVEL.
3. SEE WALL PLANS FOR INLET DETAILS.
4. USE CLOSE MESH GATE FOR TYPE C AND TYPE D INLETS UNLESS INDICATED.

Know what's below. Call before you dig.

SCALE 0' 50' 100' 200'

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No Revisions:				ES6 0852-103
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Void:	Detailer: AJF			Sheet Number 93
	Sheet Subset: DRAIN PL	Subset Sheets: 1 of 6		

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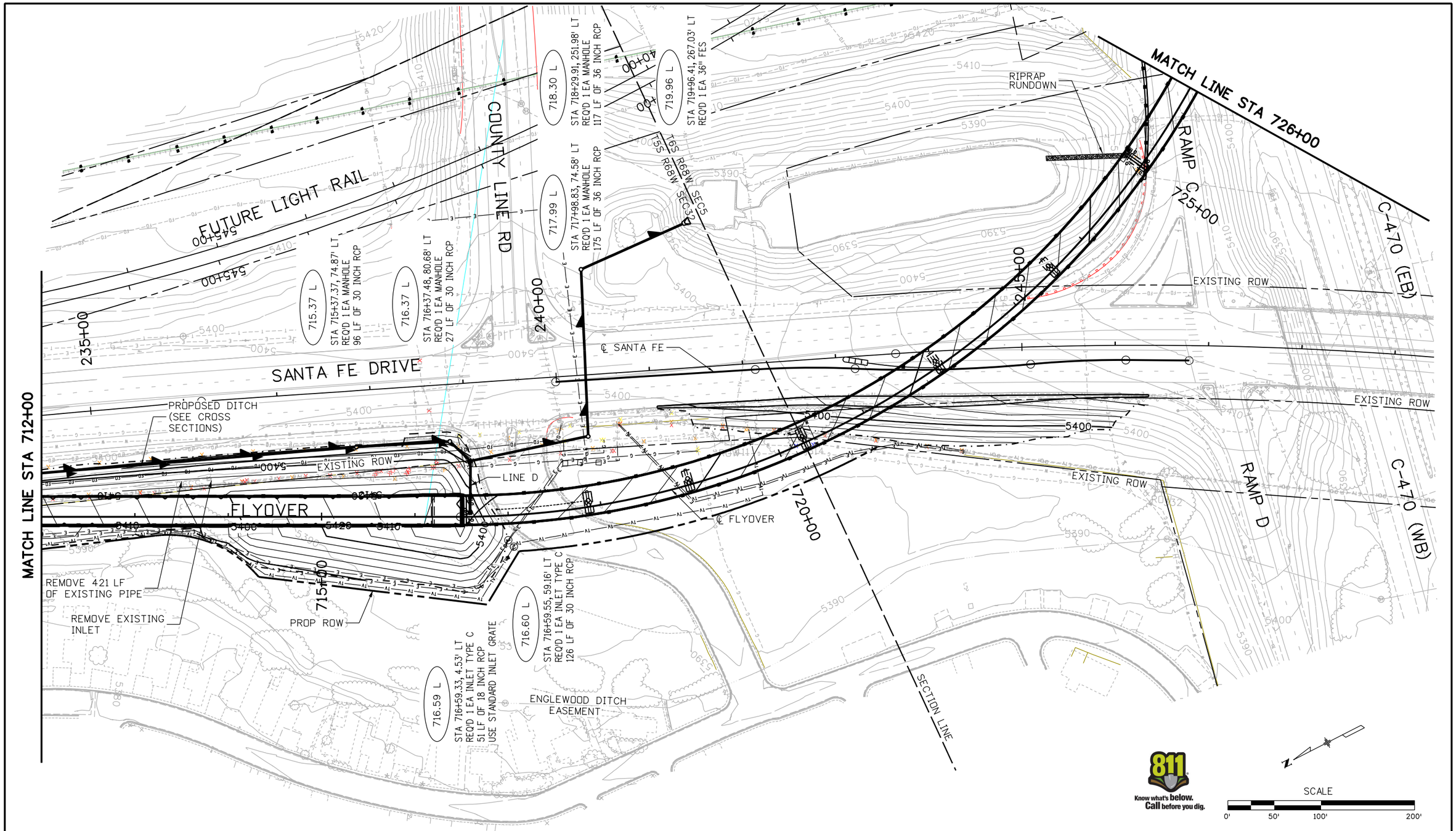

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DRAINAGE PLAN
FLYOVER

Designer:	AJF	Structure Numbers	
Detailer:	AJF		
Sheet Subset:	DRAIN PL	Subset Sheets:	2 of 6

Project No./Code	
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17679	
Sheet Number	94

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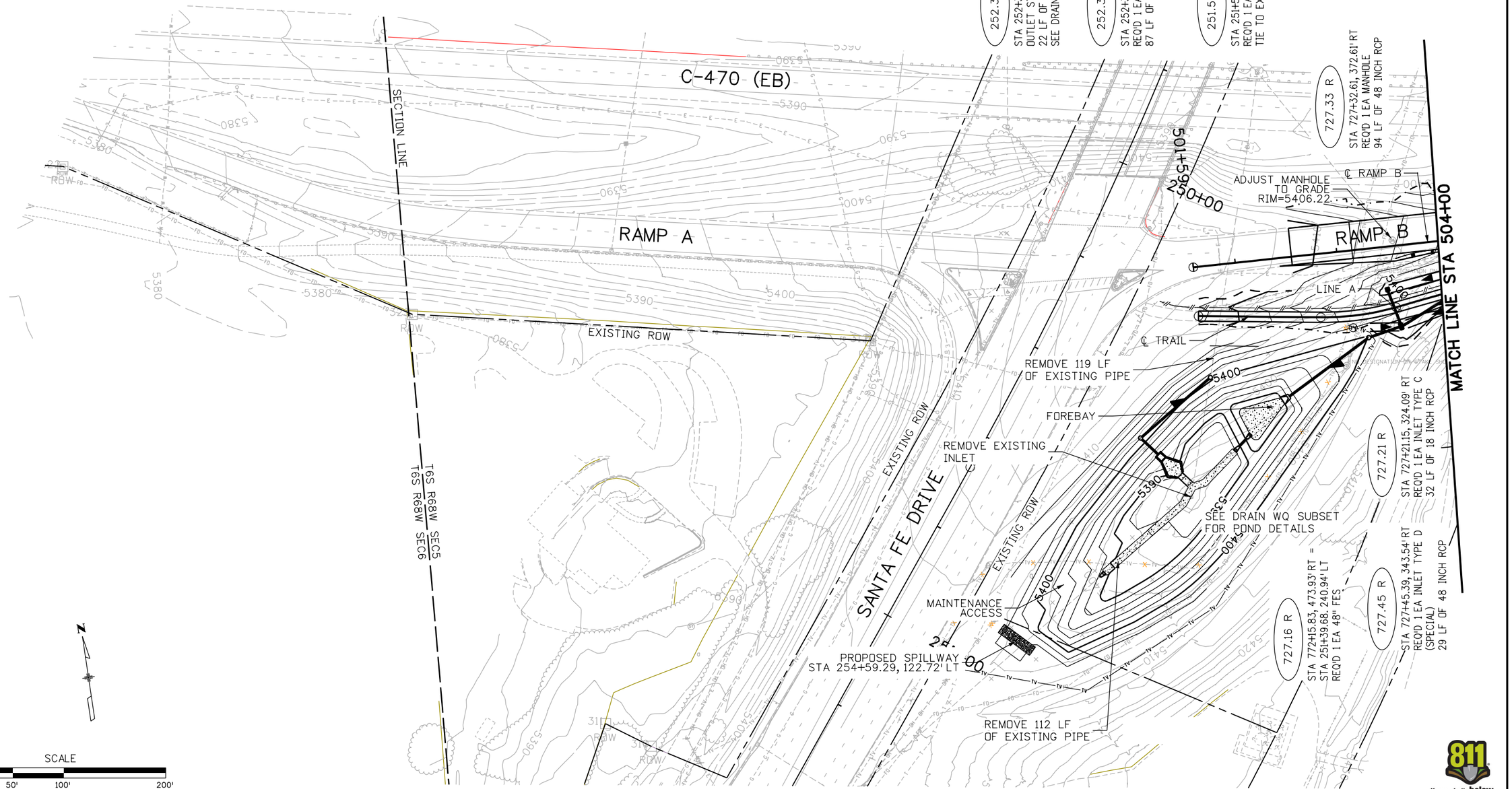

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		Region 6 RLB	

DRAINAGE PLAN RAMP B			
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Detailer: AJF			17679
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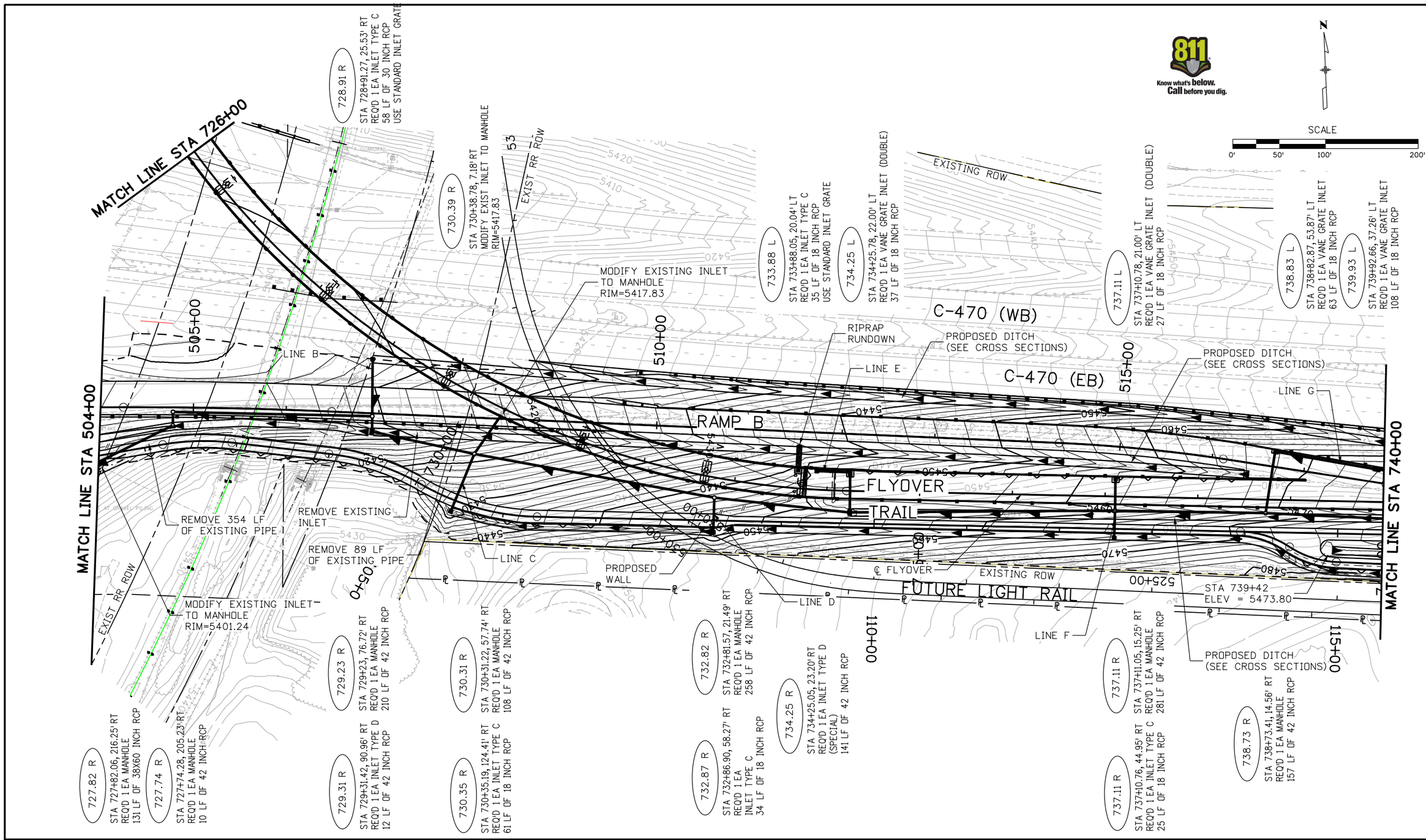

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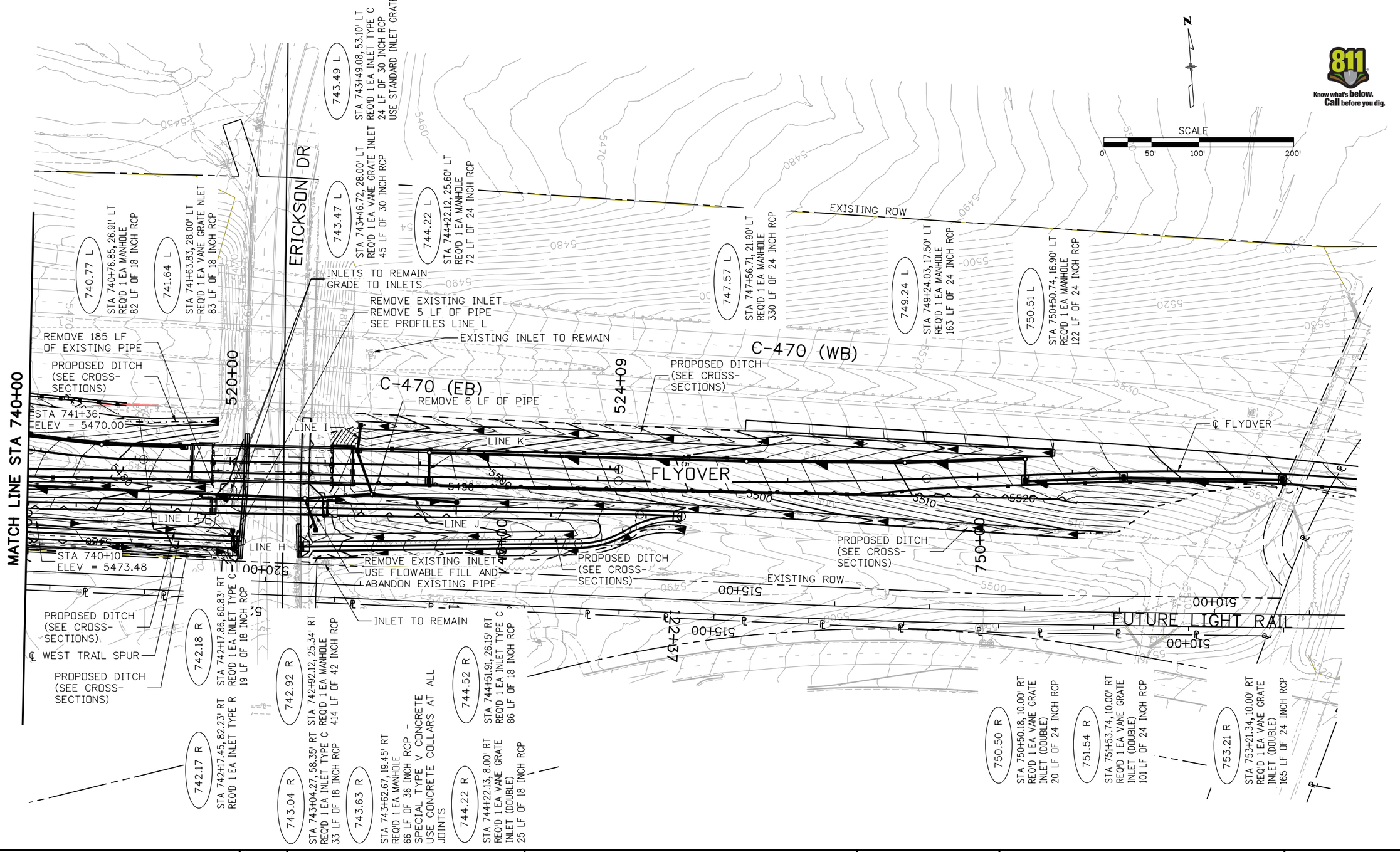

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DRAINAGE PLAN FLYOVER

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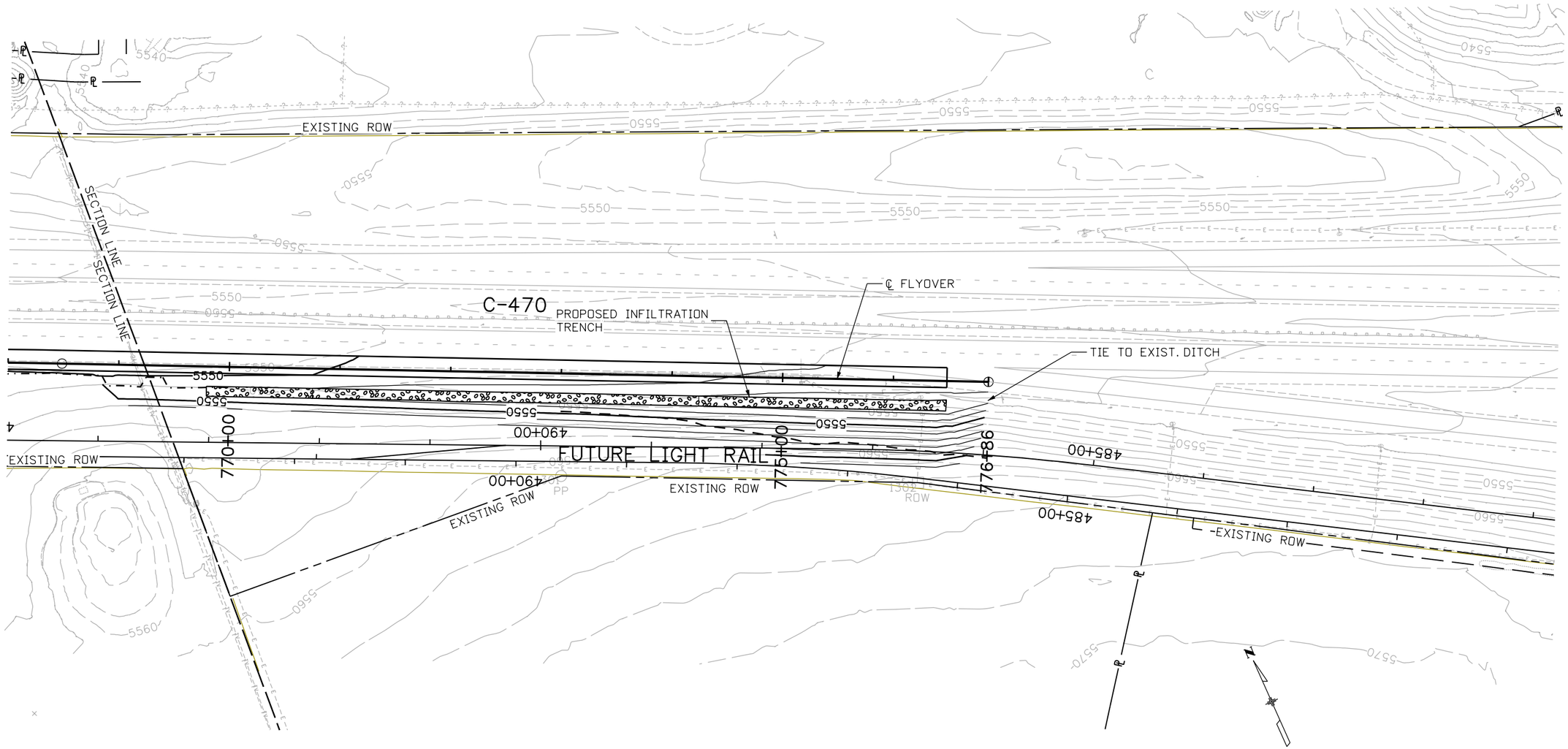

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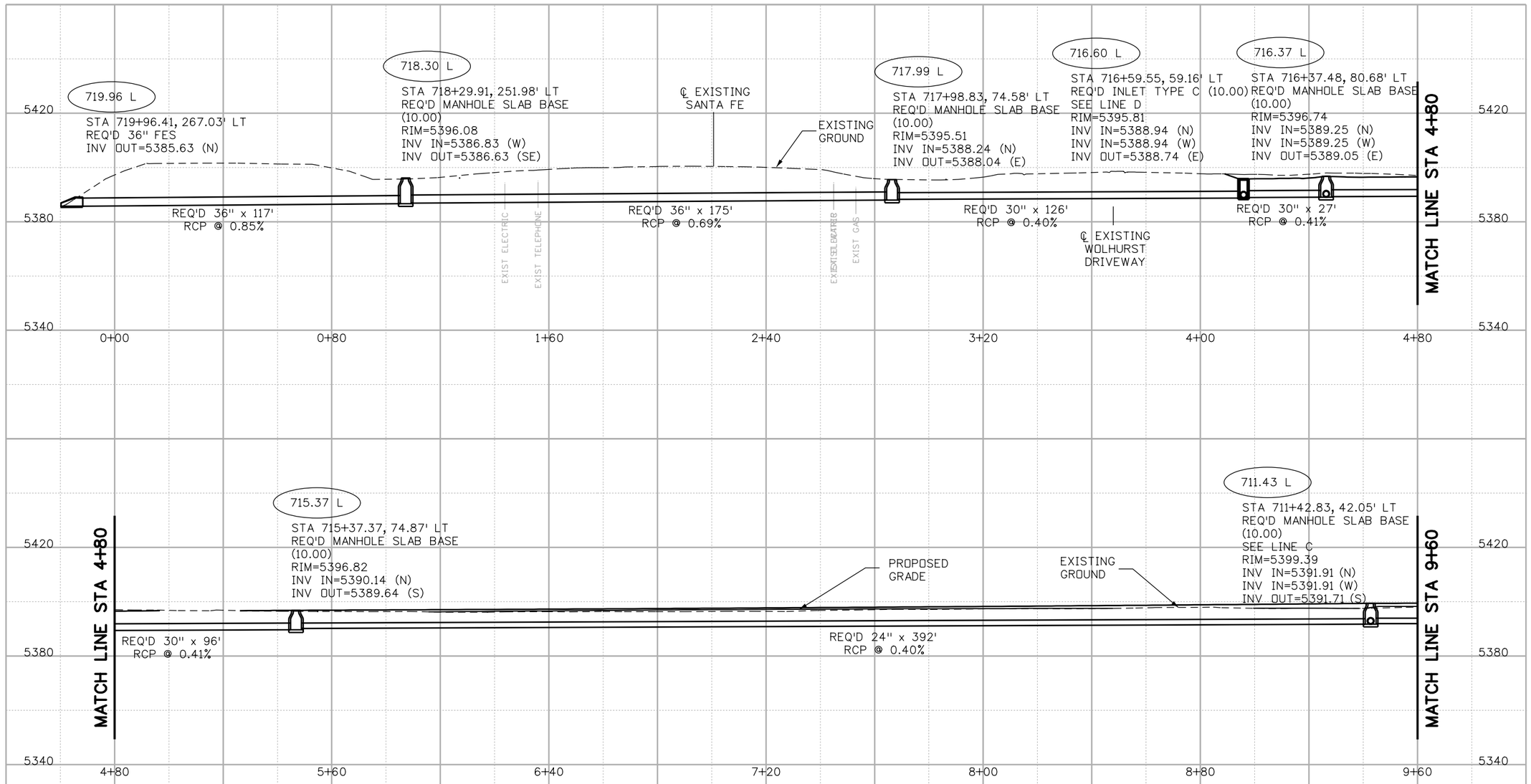

NOTES:

1. CLASS III CONCRETE PIPE PER ASTM C76 IS TO BE USED USED UNLESS OTHERWISE NOTED. ALL CONCRETE IS TO MEET A CLASS II SULFATE RESISTANCE LEVEL.
2. SEE WALL PLANS FOR INLET DETAILS.

UTILITY INFORMATION IS APPROXIMATE, THE CONTRACTOR SHALL FIELD VERIFY ALL INFORMATION. REMOVAL OF ABANDONED UTILITIES REQUIRED TO INSTALL DRAINAGE FACILITIES SHALL BE INCLUDED IN THE COST OF PIPE.

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DRAINAGE PROFILES
SANTA FE/FLYOVER

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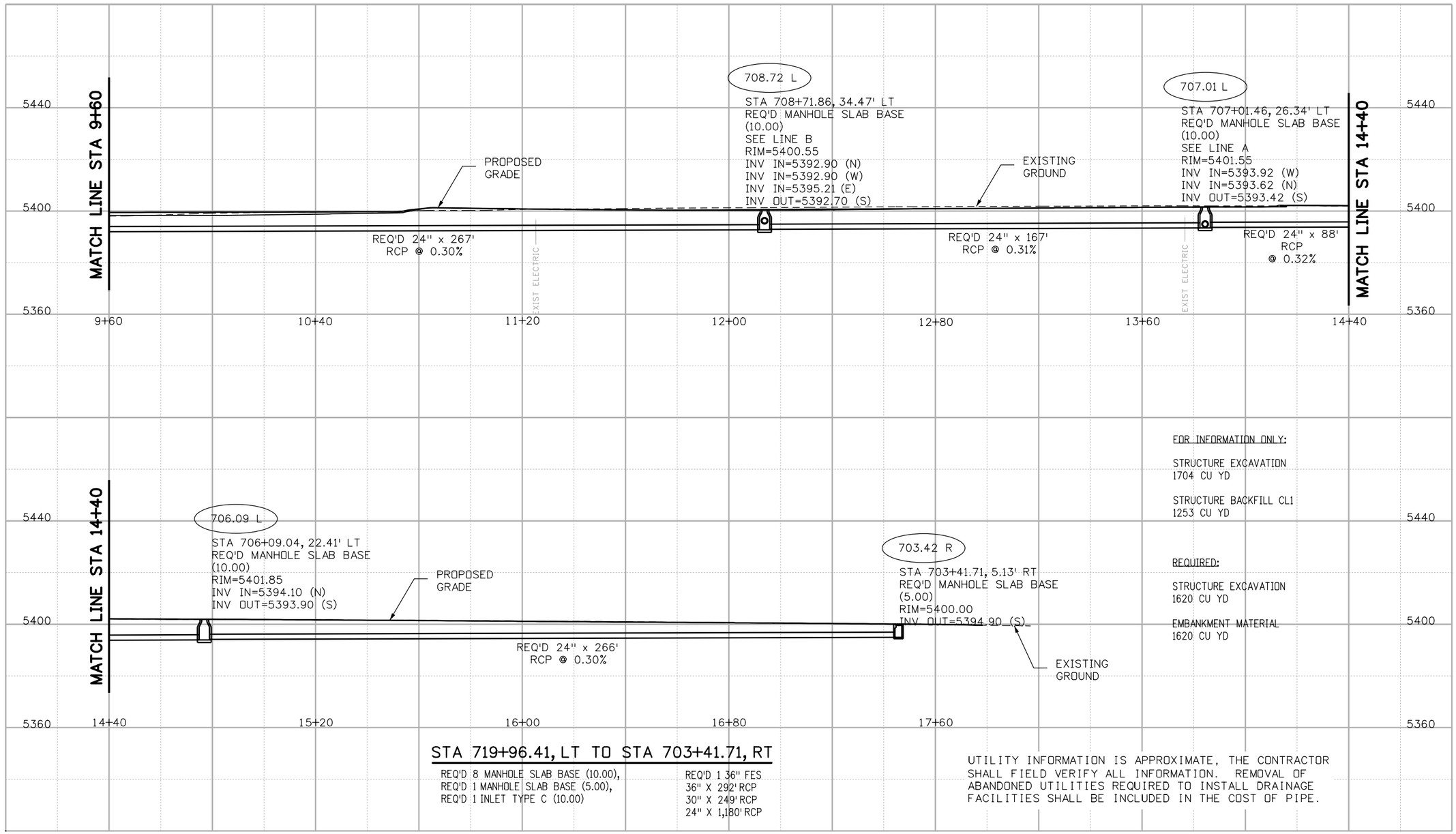
17679
Sheet Number 99



STA 719+96.41, LT TO STA 703+41.71, RT

REQ'D 8 MANHOLE SLAB BASE (10.00),
REQ'D 1 MANHOLE SLAB BASE (5.00),
REQ'D 1 INLET TYPE C (10.00)

REQ'D 1 36" FES
36" X 292' RCP
30" X 249' RCP
24" X 1,180' RCP

UTILITY INFORMATION IS APPROXIMATE, THE CONTRACTOR SHALL FIELD VERIFY ALL INFORMATION. REMOVAL OF ABANDONED UTILITIES REQUIRED TO INSTALL DRAINAGE FACILITIES SHALL BE INCLUDED IN THE COST OF PIPE.

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Structure Numbers
Subset Sheets: 2 of 11

Project No./Code
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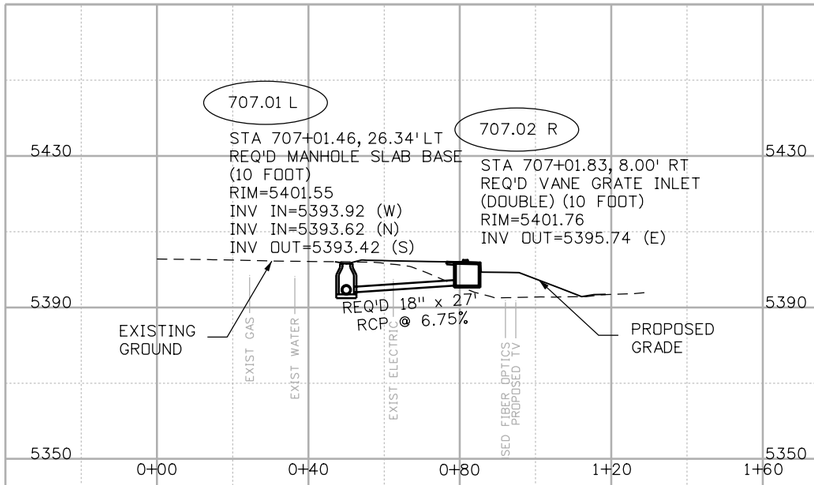
17679
Sheet Number 100



FOR INFORMATION ONLY:

STRUCTURE EXCAVATION
14 CU YD

STRUCTURE BACKFILL CL1
21 CU YD

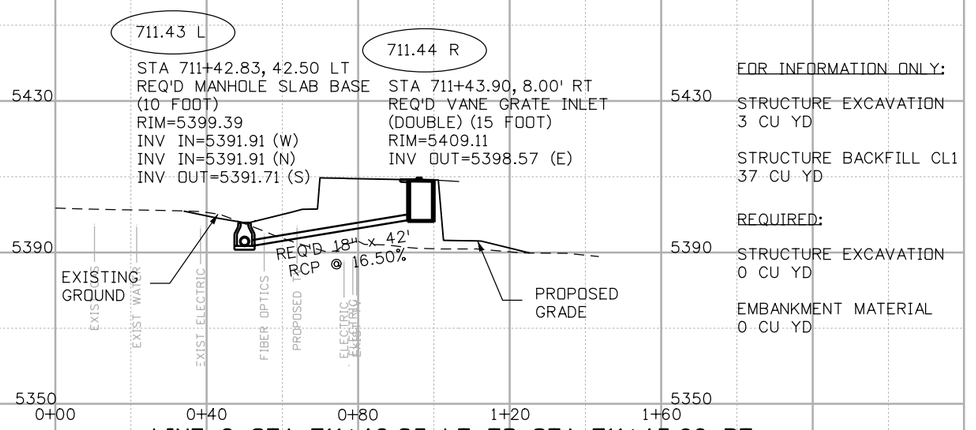
REQUIRED:

STRUCTURE EXCAVATION
12 CU YD

EMBANKMENT MATERIAL
12 CU YD

LINE A: STA 707+01.46, LT TO STA 707+01.83, RT

REQ'D 1 - VANE GRATE INLET (DOUBLE)
(10 FOOT)
18" x 27' RCP



FOR INFORMATION ONLY:

STRUCTURE EXCAVATION
3 CU YD

STRUCTURE BACKFILL CL1
37 CU YD

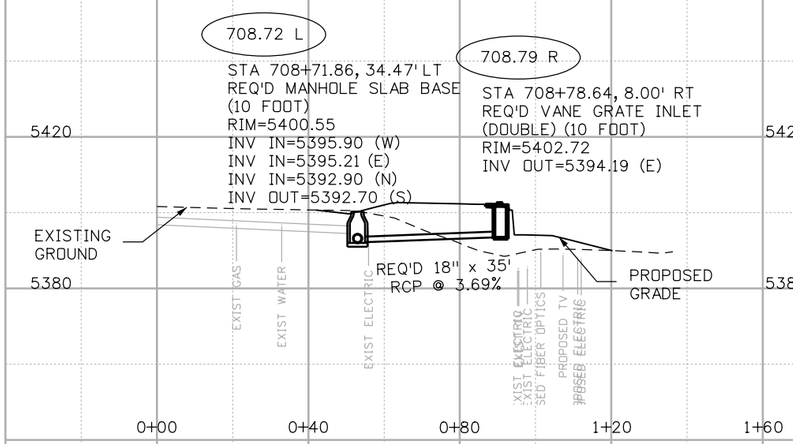
REQUIRED:

STRUCTURE EXCAVATION
0 CU YD

EMBANKMENT MATERIAL
0 CU YD

LINE C: STA 711+42.83, LT TO STA 711+43.90, RT

REQ'D 1 - VANE GRATE INLET (DOUBLE)
(15 FOOT)
18" x 42' RCP



FOR INFORMATION ONLY:

STRUCTURE EXCAVATION
10 CU YD

STRUCTURE BACKFILL CL1
25 CU YD

REQUIRED:

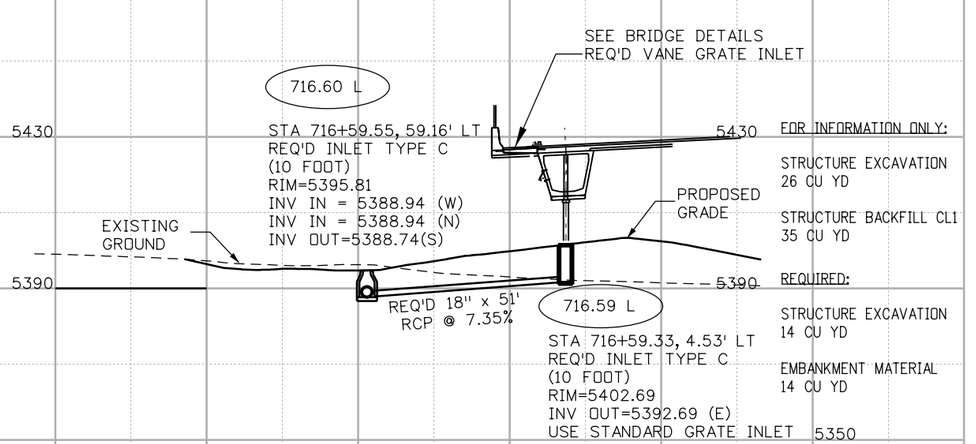
STRUCTURE EXCAVATION
6 CU YD

EMBANKMENT MATERIAL
6 CU YD

LINE B: STA 708+71.86, LT TO STA 708+78.64, RT

REQ'D 1 - VANE GRATE INLET (DOUBLE)
(10 FOOT)
18" x 35' RCP

UTILITY INFORMATION IS APPROXIMATE, THE CONTRACTOR SHALL FIELD VERIFY ALL INFORMATION. REMOVAL OF ABANDONED UTILITIES REQUIRED TO INSTALL DRAINAGE FACILITIES SHALL BE INCLUDED IN THE COST OF PIPE.



FOR INFORMATION ONLY:

STRUCTURE EXCAVATION
26 CU YD

STRUCTURE BACKFILL CL1
35 CU YD

REQUIRED:

STRUCTURE EXCAVATION
14 CU YD

EMBANKMENT MATERIAL
14 CU YD

LINE D: STA 716+59.55, LT TO STA 716+59.33, LT

REQ'D 1 - INLET TYPE C (10 FOOT),
18" x 51' RCP

Print Date: 1/6/2010
File Name: 14679_pDP-V703.dgn
Horiz. Scale: 1:40 Vert. Scale: 1:40

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Sheet Revisions

Date:	Comments	Init.

Colorado Department of Transportation
DEPARTMENT OF TRANSPORTATION
8833 South Wadsworth Court
Littleton, CO 80128
Phone: 303-972-9112 FAX: 303-972-9114
Region 6 RLB

As Constructed
No Revisions:
Revised:
Void:

DRAINAGE PROFILES
SANTA FE/FLYOVER

Designer: WRC/NB
Detailer: WRC/NB
Sheet Subset: DRAIN PR
Structure Numbers
Subset Sheets: 3 of 11

Project No./Code
ES6 0852-103
17679
Sheet Number 101

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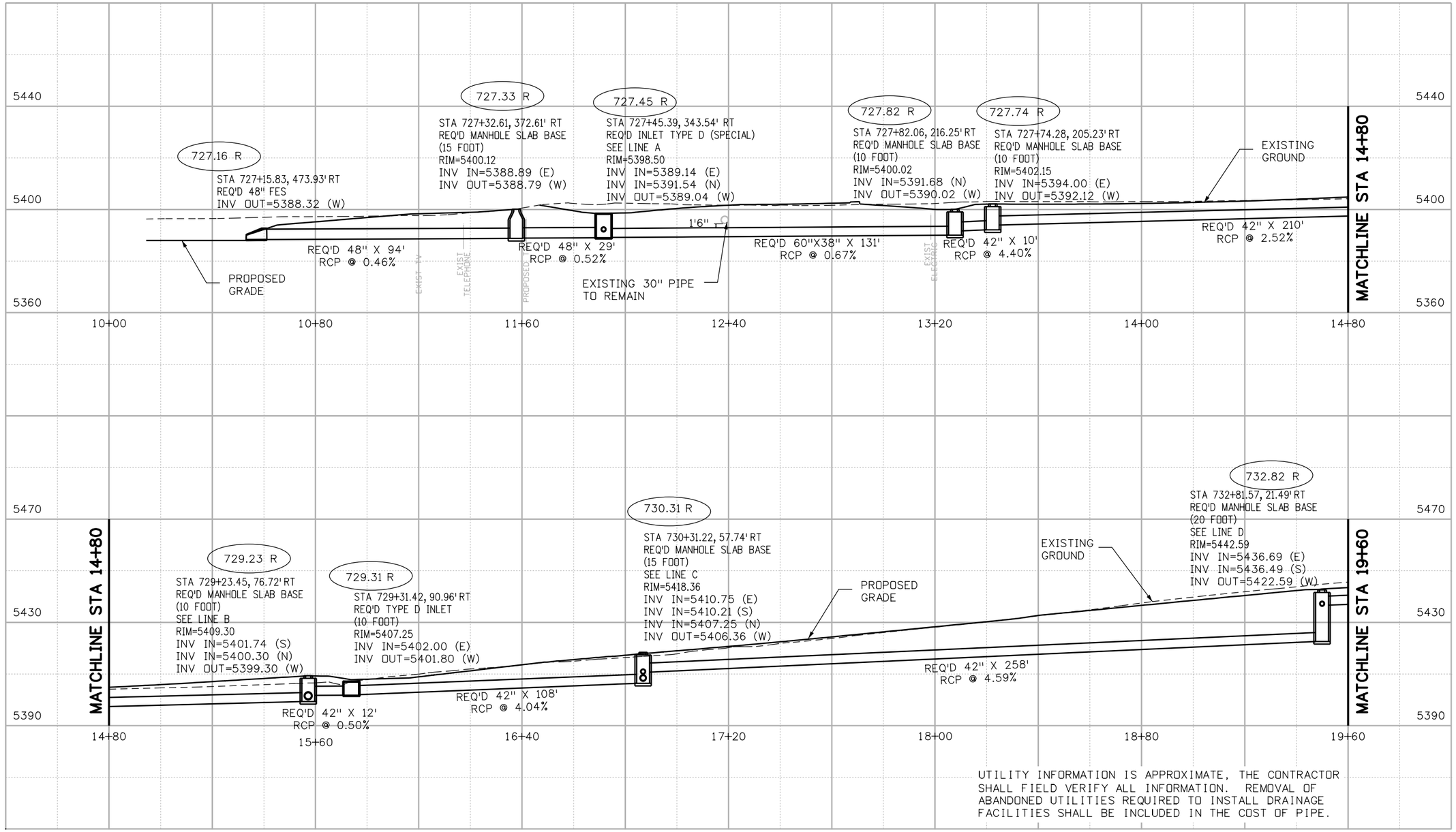

UTILITY INFORMATION IS APPROXIMATE, THE CONTRACTOR SHALL FIELD VERIFY ALL INFORMATION. REMOVAL OF ABANDONED UTILITIES REQUIRED TO INSTALL DRAINAGE FACILITIES SHALL BE INCLUDED IN THE COST OF PIPE.

Print Date: 1/6/2010
File Name: 14679_pDP-V705.dgn
Horiz. Scale: 1:40 Vert. Scale: 1:40

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Date:	Comments	Init.

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Phone: 303-972-9112 FAX: 303-972-9114
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No Revisions:
Revised:
Void:

DRAINAGE PROFILES C-470/FLYOVER

Designer: WRC/NB
Detailer: WRC/NB
Sheet Subset: DRAIN PR
Structure Numbers:
Subset Sheets: 4 of 11

Project No./Code
ES6 0852-103
17679
Sheet Number 102

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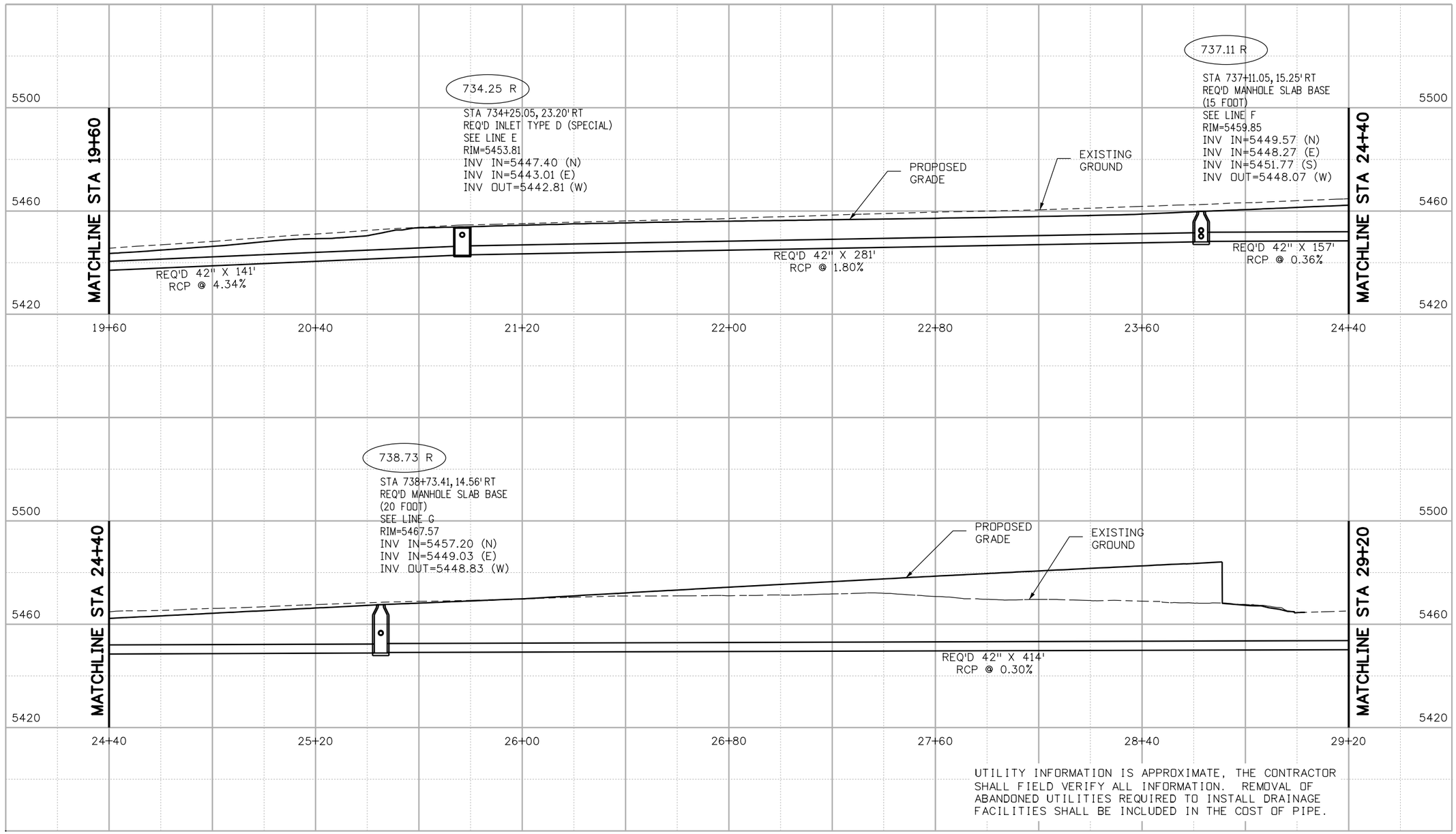

Print Date: 1/6/2010
File Name: 14679_pDP-V706.dgn
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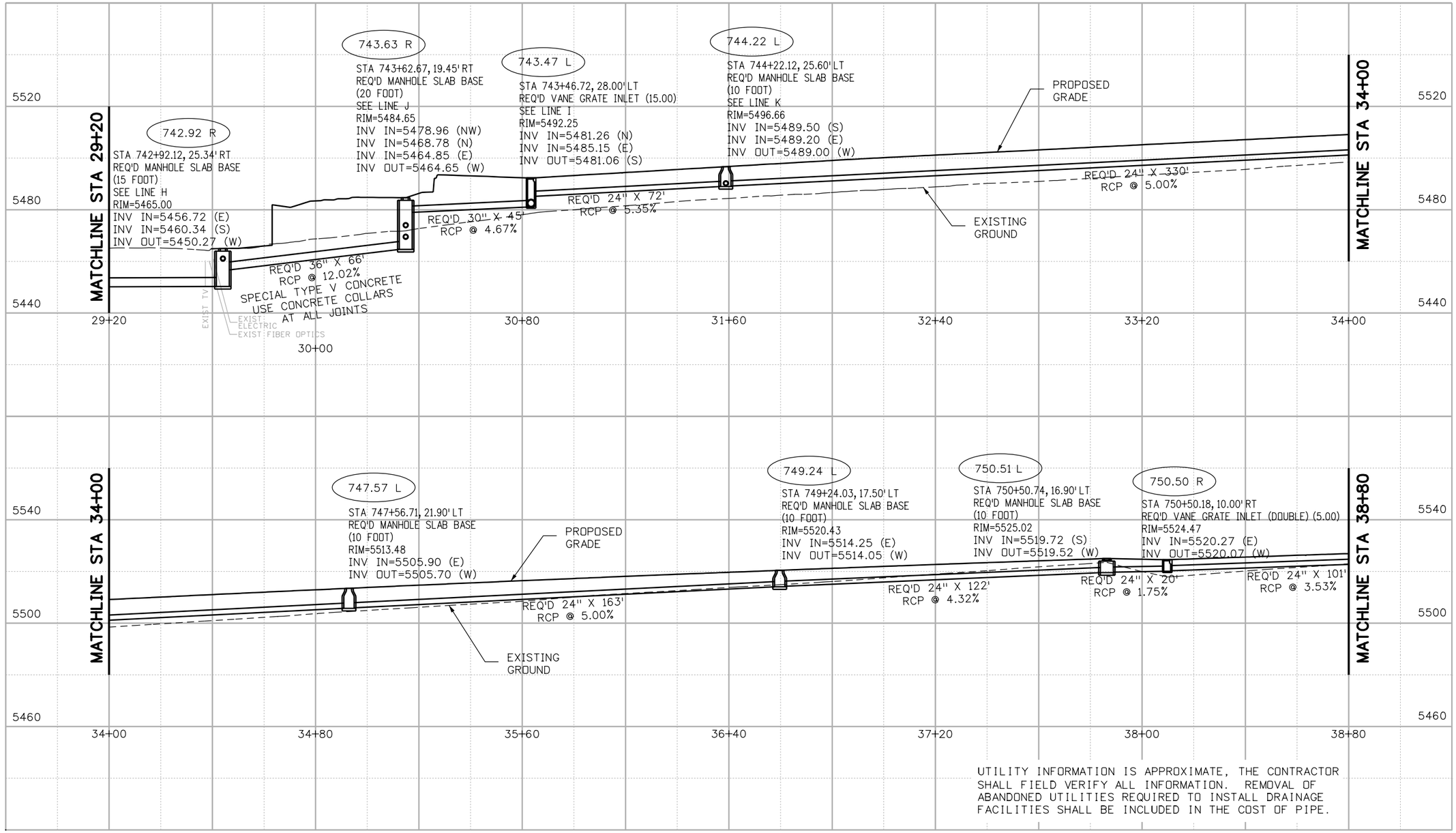
No Revisions:
Revised:
Void:

DRAINAGE PROFILES C-470/FLYOVER

Designer: WRC/NB
Detailer: WRC/NB
Sheet Subset: DRAIN PR
Structure Numbers
Subset Sheets: 5 of 11

Project No./Code
ES6 0852-103
17679
Sheet Number 103



UTILITY INFORMATION IS APPROXIMATE, THE CONTRACTOR SHALL FIELD VERIFY ALL INFORMATION. REMOVAL OF ABANDONED UTILITIES REQUIRED TO INSTALL DRAINAGE FACILITIES SHALL BE INCLUDED IN THE COST OF PIPE.

Print Date: 1/6/2010
File Name: 14679_pDP-V707.dgn
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Sheet Revisions		
Date:	Comments	Init.

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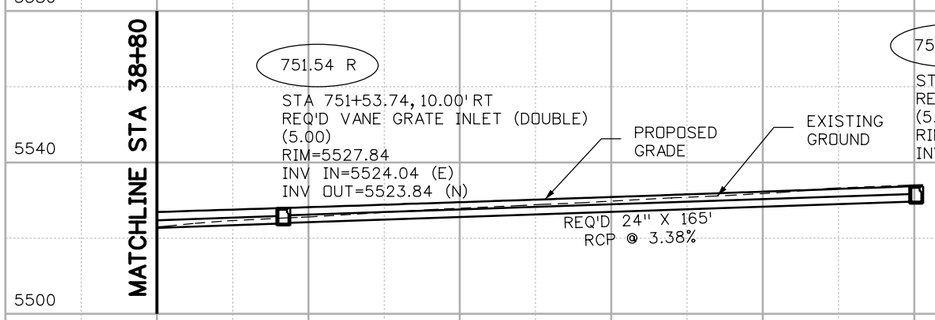
No Revisions:
Revised:
Void:

DRAINAGE PROFILES
C-470/FLYOVER

Designer: WRC/NB
Detailer: WRC/NB
Sheet Subset: DRAIN PR
Structure Numbers
Subset Sheets: 6 of 11

Project No./Code
ES6 0852-103
17679
Sheet Number 104



STA 727+15.83, RT TO STA 753+21.34, RT

REQ'D 7 MANHOLE SLAB BASE (10 FOOT),
REQ'D 4 MANHOLE SLAB BASE (15 FOOT),
REQ'D 3 MANHOLE SLAB BASE (20 FOOT),
REQ'D VANE GRATE INLET DOUBLE (5 FOOT),
REQ'D 1 VANE GRATE INLET (15 FOOT),
REQ'D 1 INLET TYPE D (10 FOOT),
REQ'D 2 INLET TYPE D (SPECIAL),
REQ'D 48" X 308' RCP,
REQ'D 42" X 1387' RCP,
REQ'D 36" X 66' RCP (SPECIAL TYPE V CONCRETE),
REQ'D 30" X 45' RCP,
REQ'D 24" X 973' RCP,
REQ'D 38" X 60" X 131' RCP,
REQ'D 9 36" CONCRETE COLLARS

UTILITY INFORMATION IS APPROXIMATE, THE CONTRACTOR SHALL FIELD VERIFY ALL INFORMATION. REMOVAL OF ABANDONED UTILITIES REQUIRED TO INSTALL DRAINAGE FACILITIES SHALL BE INCLUDED IN THE COST OF PIPE.

FOR INFORMATION ONLY:

STRUCTURE EXCAVATION
3635 CU YD

STRUCTURE BACKFILL CL1
2868 CU YD

REQUIRED:

STRUCTURE EXCAVATION
3882 CU YD

EMBANKMENT MATERIAL
3882 CU YD

Print Date: 1/6/2010
File Name: 14679_pDP-V708.dgn
Horiz. Scale: 1:40 Vert. Scale: 1:40

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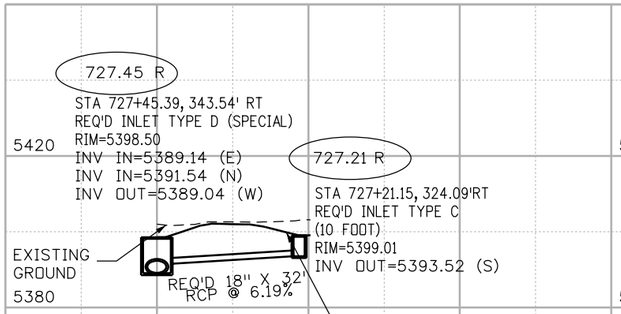
No Revisions:
Revised:
Void:

DRAINAGE PROFILES
C-470/FLYOVER

Designer: WRC/NB
Detailer: WRC/NB
Sheet Subset: DRAIN PR
Structure Numbers
Subset Sheets: 7 of 11

Project No./Code
ES6 0852-103
17679
Sheet Number 105



FOR INFORMATION ONLY:

STRUCTURE EXCAVATION
27 CU YD

STRUCTURE BACKFILL CL1
20 CU YD

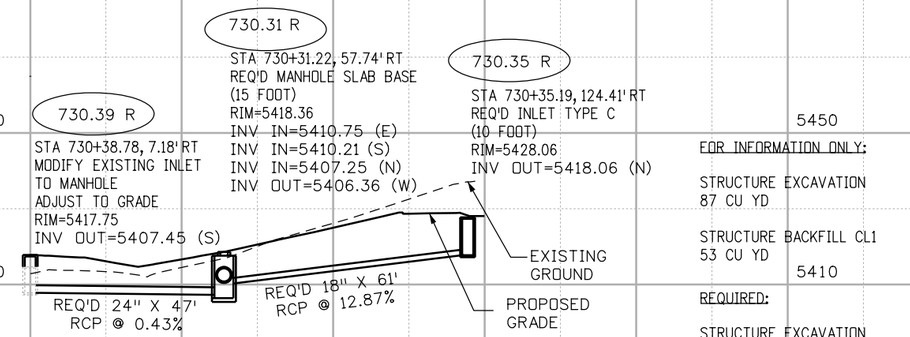
REQUIRED:

STRUCTURE EXCAVATION
32 CU YD

EMBANKMENT MATERIAL
32 CU YD

LINE A: STA 727+21.15, RT TO STA 727+45.39, RT

REQ'D 1 INLET TYPE C (10 FOOT)
18" X 33' RCP



FOR INFORMATION ONLY:

STRUCTURE EXCAVATION
87 CU YD

STRUCTURE BACKFILL CL1
53 CU YD

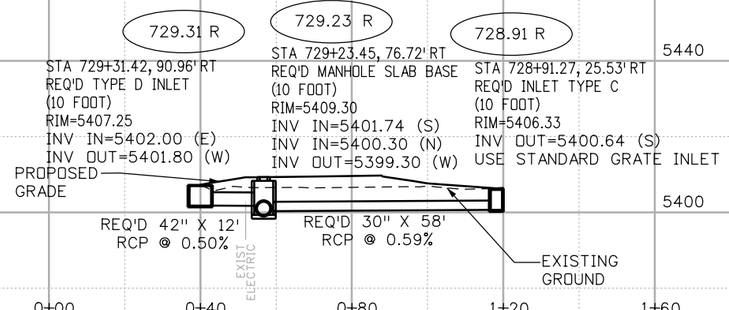
REQUIRED:

STRUCTURE EXCAVATION
114 CU YD

EMBANKMENT MATERIAL
114 CU YD

LINE C: STA 730+31.22, RT TO STA 730+38.78, RT

REQ'D 1 INLET TYPE C (10 FOOT)
18" X 61' RCP
24" X 47' RCP



FOR INFORMATION ONLY:

STRUCTURE EXCAVATION
61 CU YD

STRUCTURE BACKFILL CL1
92 CU YD

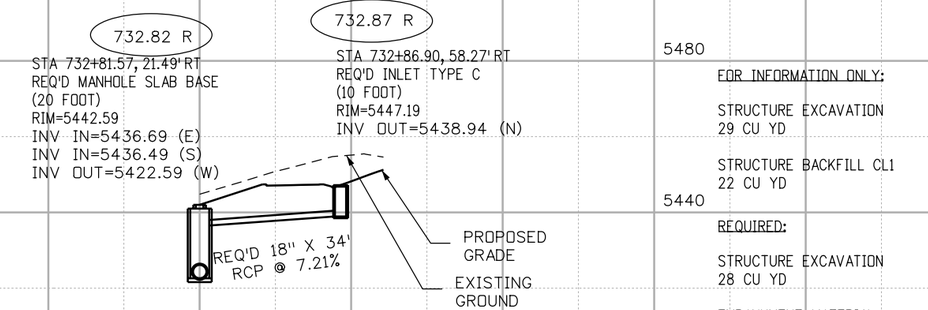
REQUIRED:

STRUCTURE EXCAVATION
28 CU YD

EMBANKMENT MATERIAL
28 CU YD

LINE B: STA 728+91.27, RT TO STA 729+31.42, RT

REQ'D 1 INLET TYPE C (10 FOOT)
30" X 58' RCP



FOR INFORMATION ONLY:

STRUCTURE EXCAVATION
29 CU YD

STRUCTURE BACKFILL CL1
22 CU YD

REQUIRED:

STRUCTURE EXCAVATION
28 CU YD

EMBANKMENT MATERIAL
28 CU YD

LINE D: STA 732+81.57, RT TO STA 732+86.90, RT

REQ'D 1 INLET TYPE C (10 FOOT)
18" X 34' RCP

UTILITY INFORMATION IS APPROXIMATE, THE CONTRACTOR SHALL FIELD VERIFY ALL INFORMATION. REMOVAL OF ABANDONED UTILITIES REQUIRED TO INSTALL DRAINAGE FACILITIES SHALL BE INCLUDED IN THE COST OF PIPE.

Print Date: 1/6/2010
File Name: 14679_pDP-V709.dgn
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DEPARTMENT OF TRANSPORTATION
8833 South Wadsworth Court
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Region 6 RLB

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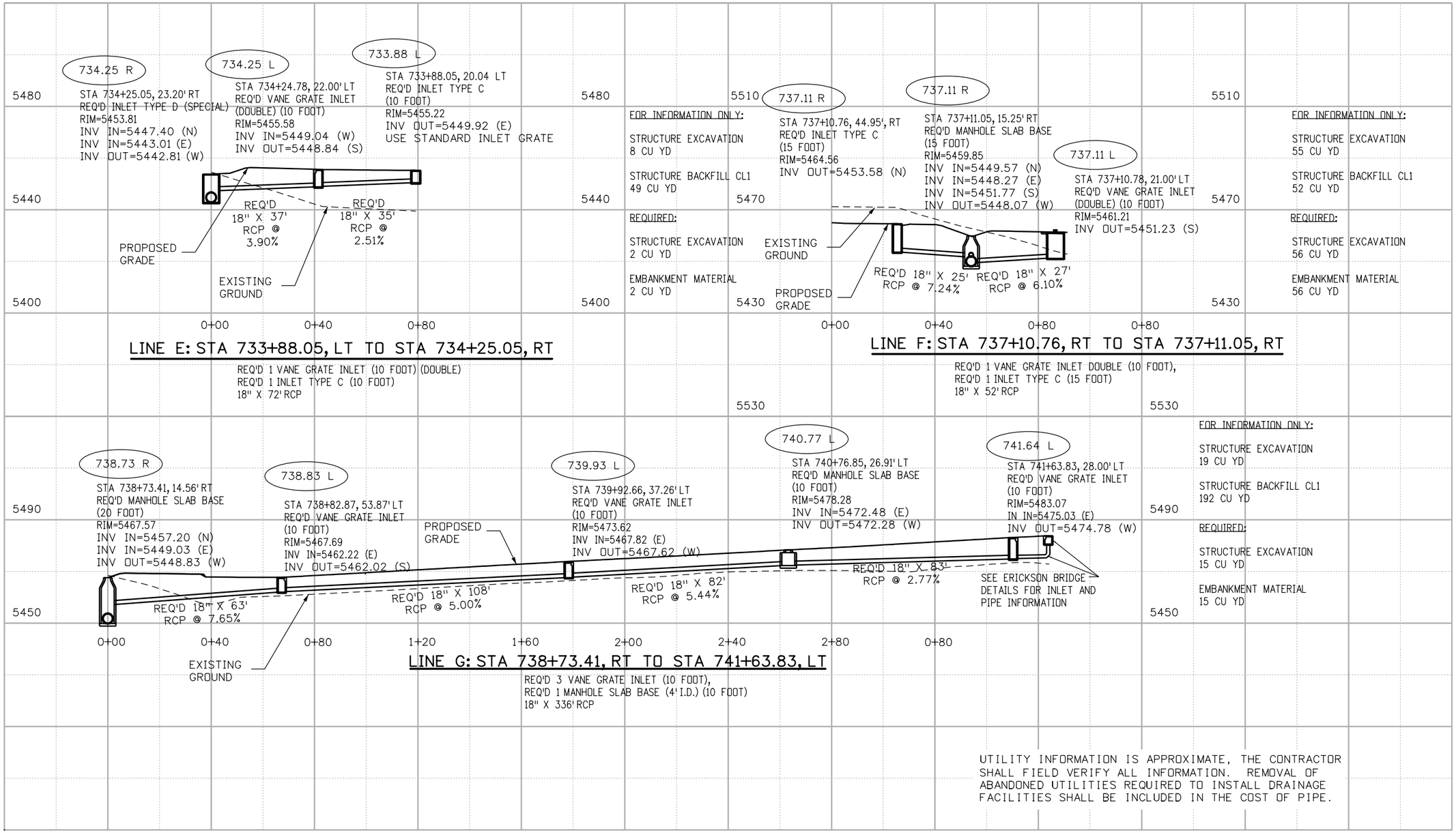
No Revisions:
Revised:
Void:

DRAINAGE PROFILES
C-470/FLYOVER

Designer: WRC/NB
Detailer: WRC/NB
Sheet Subset: DRAIN PR
Structure Numbers
Subset Sheets: 8 of 11

Project No./Code
ES6 0852-103
17679
Sheet Number 106



Print Date: 1/6/2010	Sheet Revisions	Colorado Department of Transportation	As Constructed
File Name: 14679_pDP-V710.dgn	Date: / Comments / Init.	8833 South Wadsworth Court Littleton, CO 80128 Phone: 303-972-9112 FAX: 303-972-9114	No Revisions:
Horiz. Scale: 1:40 Vert. Scale: 1:40		Region 6 RLB	Revised:
PBS 4601 DTC Boulevard Suite 700 Denver, CO 80237			Void:

DRAINAGE PROFILES C-470/FLYOVER			Project No./Code
			ES6 0852-103
Designer: WRC/NB	Structure Numbers		17679
Detailer: WRC/NB			
Sheet Subset: DRAIN PR	Subset Sheets: 9 of 11		Sheet Number 107

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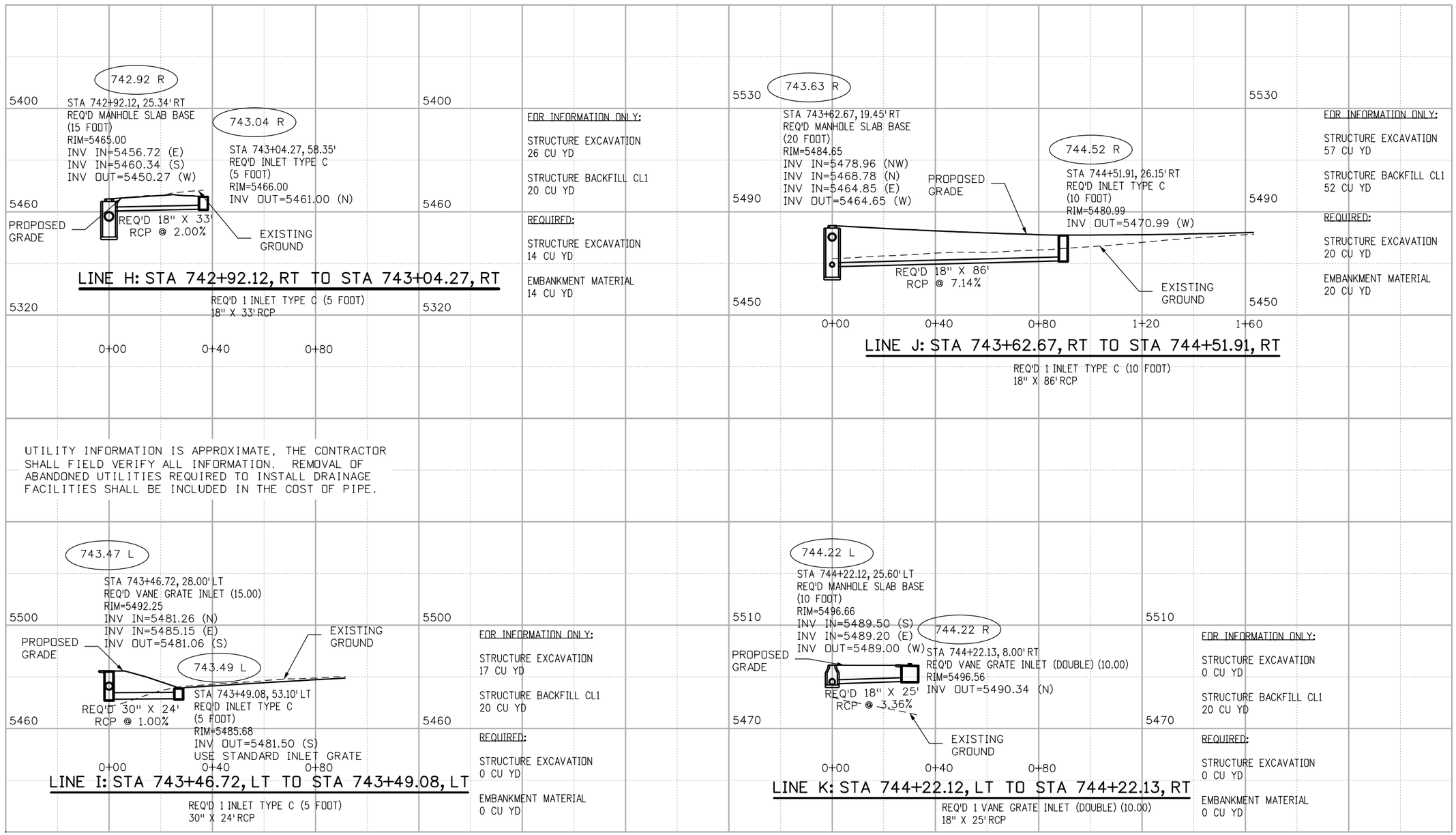

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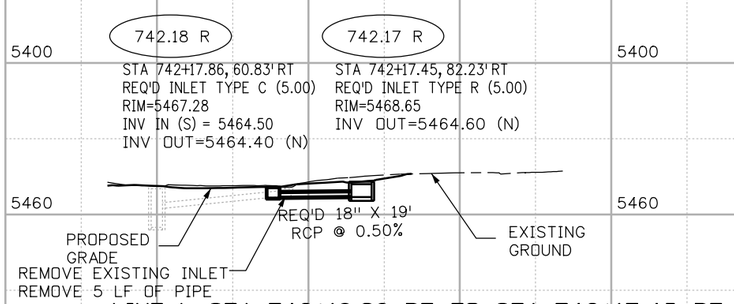
Print Date: 1/6/2010	Sheet Revisions	Colorado Department of Transportation	As Constructed
File Name: 14679_pDP-V711.dgn	Date: Comments: Init.	8833 South Wadsworth Court Littleton, CO 80128 Phone: 303-972-9112 FAX: 303-972-9114	No Revisions:
Horiz. Scale: 1:40 Vert. Scale: 1:40		Region 6 RLB	Revised:
PBS 4601 DTC Boulevard Suite 700 Denver, CO 80237			Void:

DRAINAGE PROFILES C-470/FLYOVER			Project No./Code
			ES6 0852-103
Designer: WRC/NB	Structure Numbers		17679
Detailer: WRC/NB			Sheet Number 108
Sheet Subset: DRAIN PR	Subset Sheets: 10 of 11		



FOR INFORMATION ONLY:

STRUCTURE EXCAVATION
27 CU YD

STRUCTURE BACKFILL CL1
15 CU YD

REQUIRED:

STRUCTURE EXCAVATION
4 CU YD

EMBANKMENT MATERIAL
4 CU YD

UTILITY INFORMATION IS APPROXIMATE, THE CONTRACTOR SHALL FIELD VERIFY ALL INFORMATION. REMOVAL OF ABANDONED UTILITIES REQUIRED TO INSTALL DRAINAGE FACILITIES SHALL BE INCLUDED IN THE COST OF PIPE.

Print Date: 1/6/2010
File Name: 14679_pDP-V712.dgn
Horiz. Scale: 1:40 Vert. Scale: 1:40

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Sheet Revisions

Date:	Comments	Init.

Colorado Department of Transportation
DOT DEPARTMENT OF TRANSPORTATION
8833 South Wadsworth Court
Littleton, CO 80128
Phone: 303-972-9112 FAX: 303-972-9114
Region 6 RLB

As Constructed
No Revisions:
Revised:
Void:

DRAINAGE PROFILES
C-470/FLYOVER

Designer: WRC/NB
Detailer: WRC/NB
Sheet Subset: DRAIN PR
Structure Numbers
Subset Sheets: 11 of 11

Project No./Code
ES6 0852-103
17679
Sheet Number 109

STA 772+15.83, 473.93, RT =
STA 251+39.68, 240.94' LT
REQ'D 48" FES

STA 251+80.59, 227.68' LT
REQ'D 18" FES

5' FOREBAY BERM

REQ'D 18" X 7' RCP

STA 252+01.15, 221.12' LT
REQ'D 18" FES
BEGIN CONCRETE TRICKLE CHANNEL
SEE SOUTHEAST POND DETAILS

REMOVE EXISTING
18" X 118' RCP

REMOVE EXISTING STRUCTURE

REMOVE EXISTING
18" X 162' RCP

FOREBAY
6" CONCRETE
BOTTOM

MICROPOOL
CONCRETE BOTTOM

STA 251+50.12, 167.37' LT
REQ'D 1 EA 5' MANHOLE
TIE INTO EXISTING
18" RCP

STA 252+30.98, 133.39' LT
REQ'D 1 EA 5' MANHOLE

STA 252+37.12, 156.53' LT
REQ'D 1 EA OUTLET STRUCTURE
SEE SOUTHEAST POND
STRUCTURE DETAIL

STA 253+59.87, 165.56' LT
REQ'D 18" FES
TIE TO EXISTING 18" RCP
BEGIN CONCRETE TRICKLE CHANNEL
SEE SOUTHEAST POND DETAILS

12' MAINTENANCE
ACCESS

SPILLWAY
SEE SOUTHEAST POND DETAILS

EXISTING ROW

SANTA FE DRIVE

SANTA FE ℄

RAMP B

GENERAL NOTES:

1. OVEREXCAVATE ALL SURFACES BY 6".
2. 6" OF TOPSOIL IS TO BE PLACED TO FINISH GRADE.
3. SEED ALL DISTURBED SURFACES WITH NATIVE GRASSES PER CDOT ENGINEER.
4. ALL GRADING SHALL BE COMPLETED TO THE SATISFACTION OF THE ENGINEER.
5. ALL EMBANKMENT AND FILL MATERIAL WILL BE COMPACTED TO 98% OF THE MAXIMUM DENSITY (ASTMD 698) AT 1% BELOW TO 3% ABOVE OPTIMUM MOISTURE CONTENT PRIOR TO BEING DELIVERED TO THE FILL AREA.
6. THE GROUND SURFACE UNDERLYING EMBANKMENTS SHALL BE STRIPPED AND CLEARED OF ALL ORGANIC MATERIAL, SCARIFIED TO A DEPTH OF 8" AND RECOMPACTED PRIOR TO FILL PLACEMENT.
7. NO EMBANKMENT MATERIAL WILL BE PLACED WITHOUT WRITTEN APPROVAL OF THE FOUNDATION FROM THE ENGINEER.
8. EMBANKMENT BACKFILL SHALL BE PLACED IN HORIZONTAL LIFTS NOT TO EXCEED 6" IN HEIGHT (LOOSE MEASUREMENT).

SOUTHEAST POND DETAILS
EURV= 2.10 AC-FT
10-YR VOLUME= 4.49 AC-FT
100-YR ELEVATION= 5397.70
100-YR RELEASE= 34.0 CFS

SCALE
0 20 40 80

Know what's below. Call before you dig.

Print Date: 1/6/2010
File Name: 14679_pDWQ-V701.dgn
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Sheet Revisions		
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Phone: 303-972-9112 FAX: 303-972-9114
Region 6 RLB

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No Revisions:
Revised:
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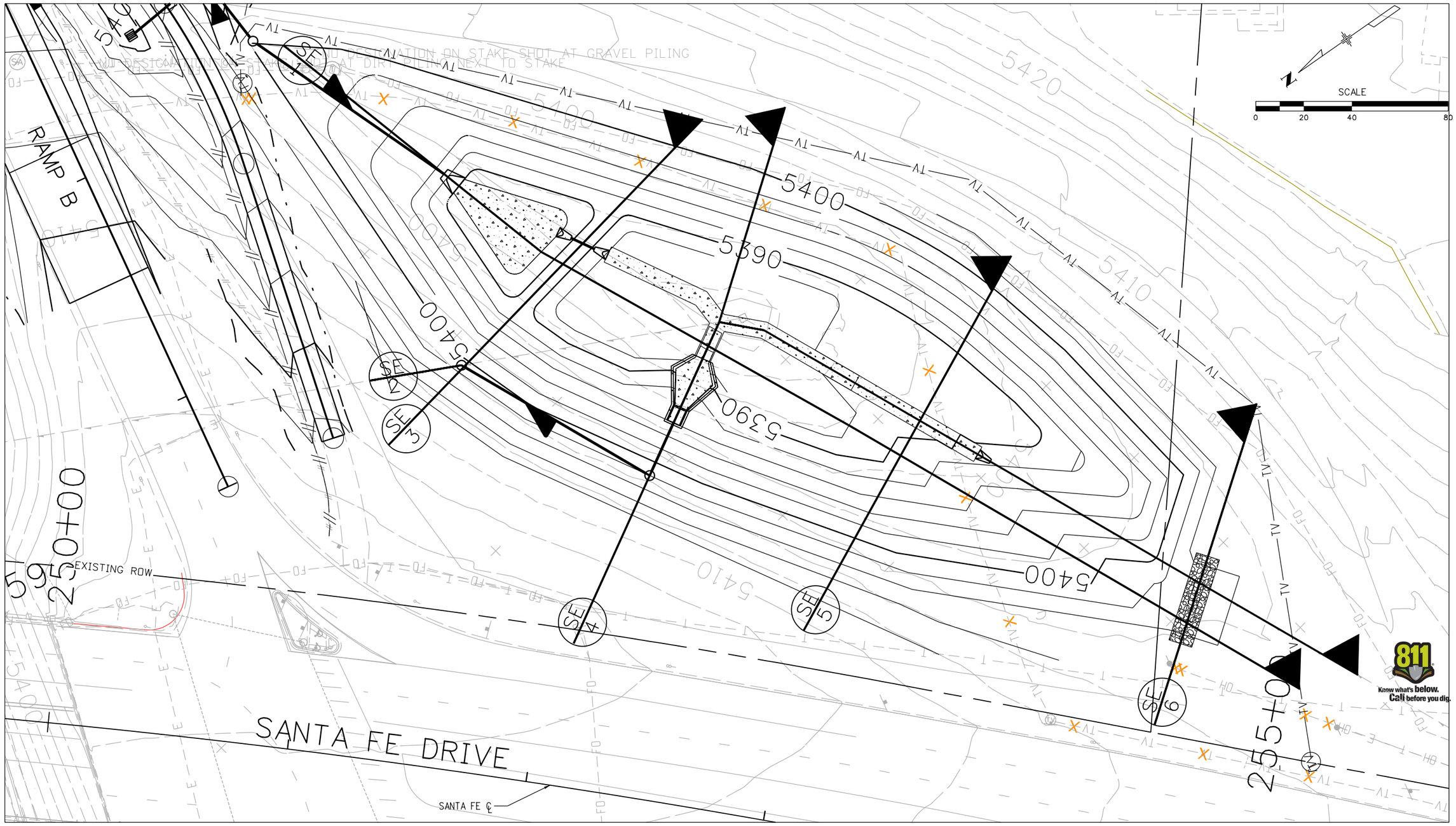
WATER QUALITY
SOUTHEAST POND LAYOUT

Designer: TYK
Detailer: TYK
Sheet Subset: DRAIN WQ
Structure Numbers:
Subset Sheets: 1 of 9

Project No./Code
ES6 0852-103
17679
Sheet Number 110

12244 3:48:18 PM S:\Tranpro\100002375\14679\Consultants\Hydraulics\Drawings\14679_pDWQ-V701.dgn



Print Date: 1/6/2010		Sheet Revisions			Colorado Department of Transportation	As Constructed	WATER QUALITY SOUTHEAST POND SECTION LINES	Project No./Code
File Name: 14679_pDWQ-V702.dgn		Date:	Comments	Init.	8833 South Wadsworth Court Littleton, CO 80128 Phone: 303-972-9112 FAX: 303-972-9114	No Revisions:	Designer: TYK	ES6 0852-103
Horiz. Scale: 1:40 Vert. Scale: As Noted						Revised:	Detailer: TYK	17679
PBS&J 4601 DTC Boulevard Suite 700 Denver, CO 80237	0000				Region 6 RLB	Void:	Sheet Subset: DRAIN WQ	Sheet Number 111
							Structure Numbers / Subset Sheets: 2 of 9	

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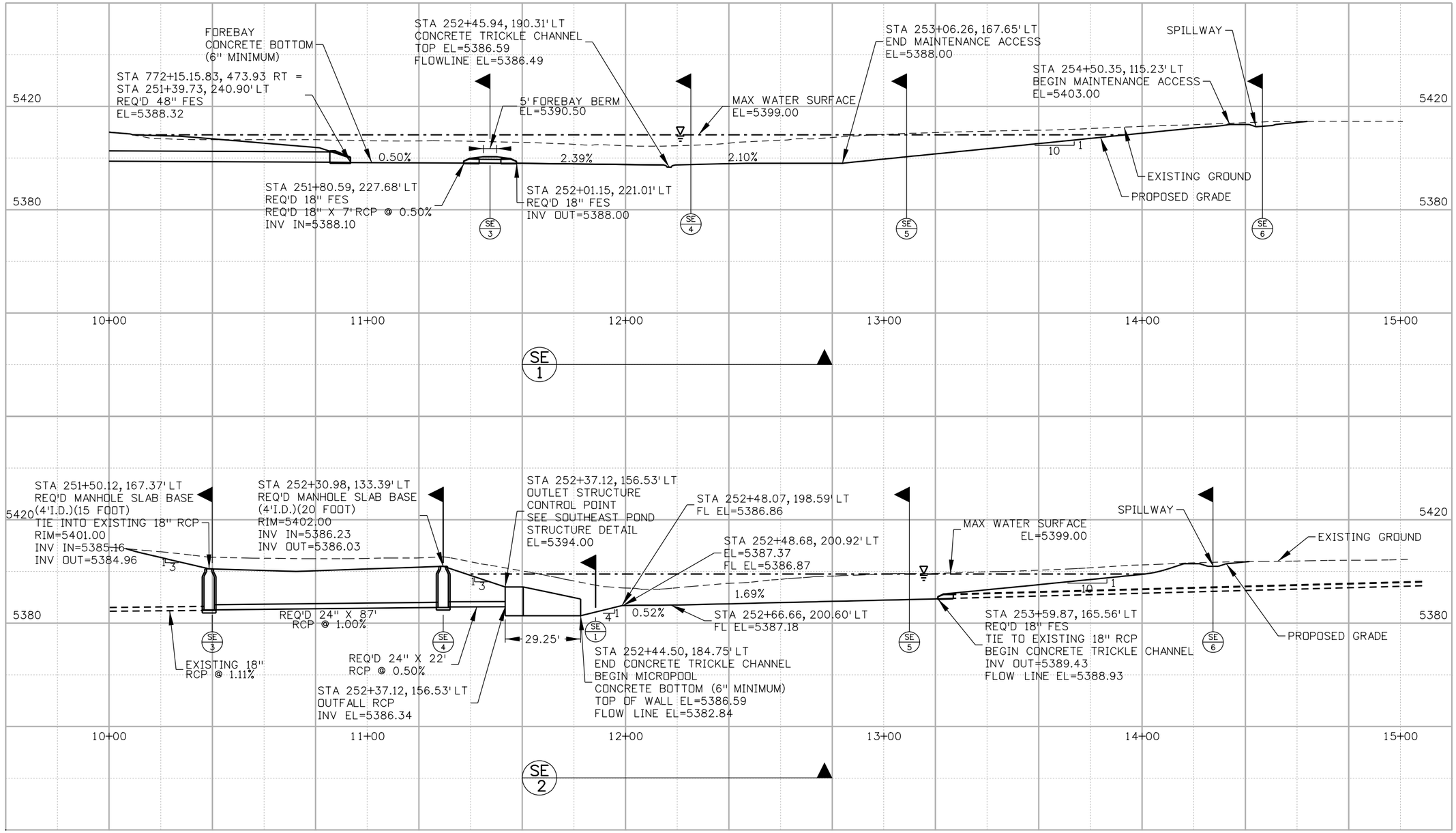

Print Date: 1/6/2010	Sheet Revisions	Colorado Department of Transportation	As Constructed
File Name: 14679_pDWQ-V703.dgn	Date: Comments: Init.	8833 South Wadsworth Court Littleton, CO 80128 Phone: 303-972-9112 FAX: 303-972-9114	No Revisions:
Horiz. Scale: 1:40 Vert. Scale: 1:40		Region 6 RLB	Revised:
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WATER QUALITY SOUTHEAST POND CROSS SECTION

Designer: TYK	Structure Numbers		Project No./Code: ES6 0852-103
Detailer: TYK			17679
Sheet Subset: DRAIN WQ	Subset Sheets: 3 of 9		Sheet Number 112

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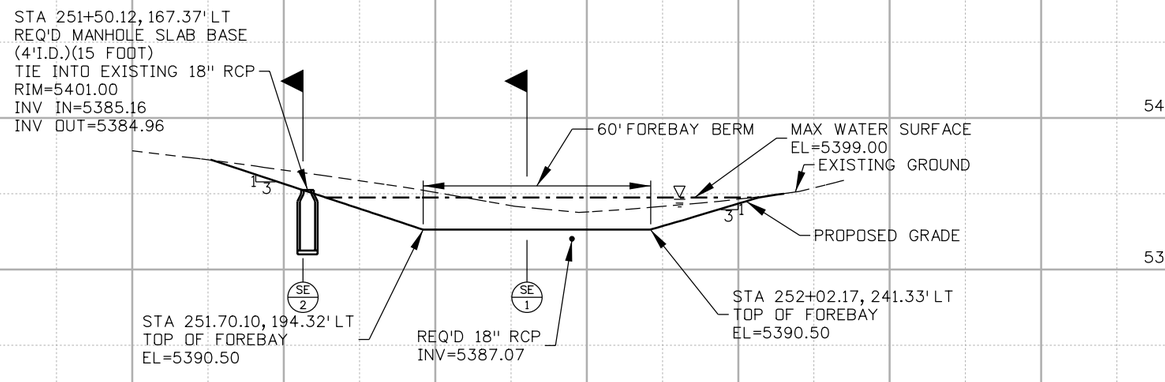

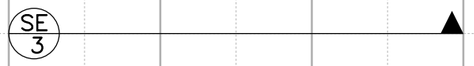

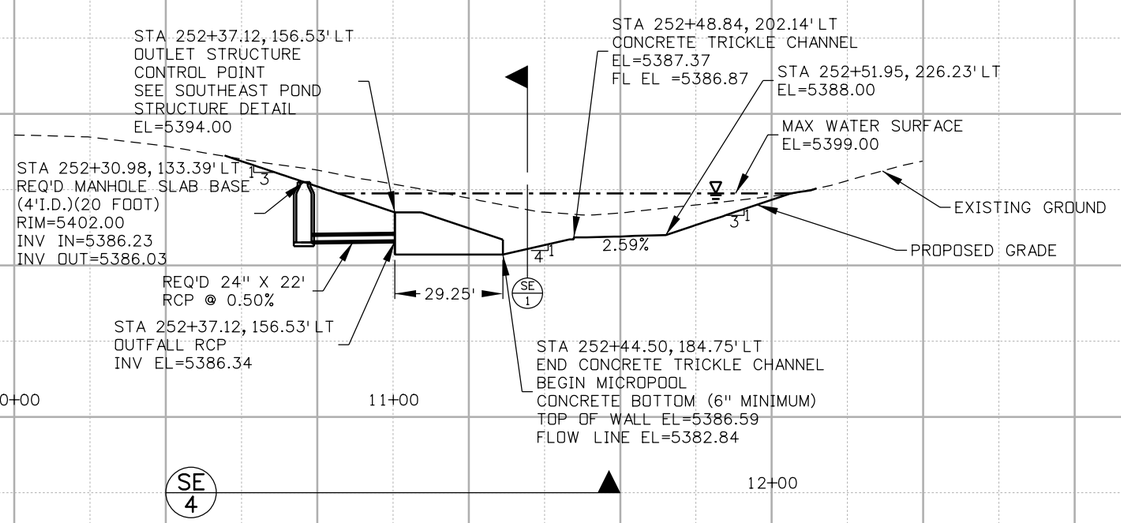

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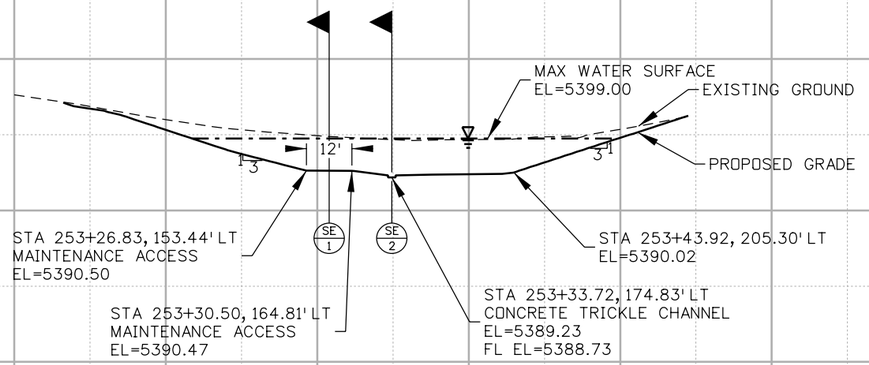
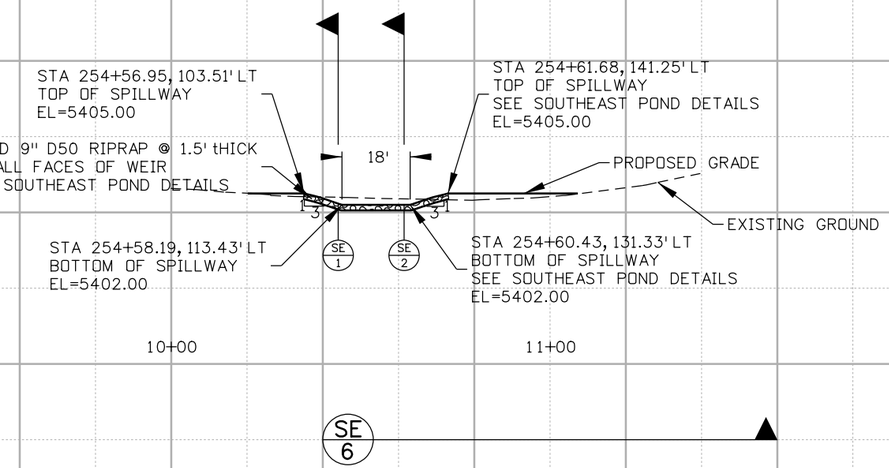
File Name: 14679_pDWQ-V704.dgn		Date:	Comments	Init.	8833 South Wadsworth Court Littleton, CO 80128 Phone: 303-972-9112 FAX: 303-972-9114	No Revisions:		ES6 0852-103
Horiz. Scale: 1:40 Vert. Scale: 1:40					Region 6 RLB	Revised:	Designer: TYK / Detailer: TYK / Sheet Subset: DRAIN WQ	17679
PBSJ 4601 DTC Boulevard Suite 700 Denver, CO 80237						Void:	Structure Numbers / Subset Sheets: 4 of 9	Sheet Number 113





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WATER QUALITY SOUTHEAST POND CROSS SECTION			Project No./Code
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Detailer: TYK			17679
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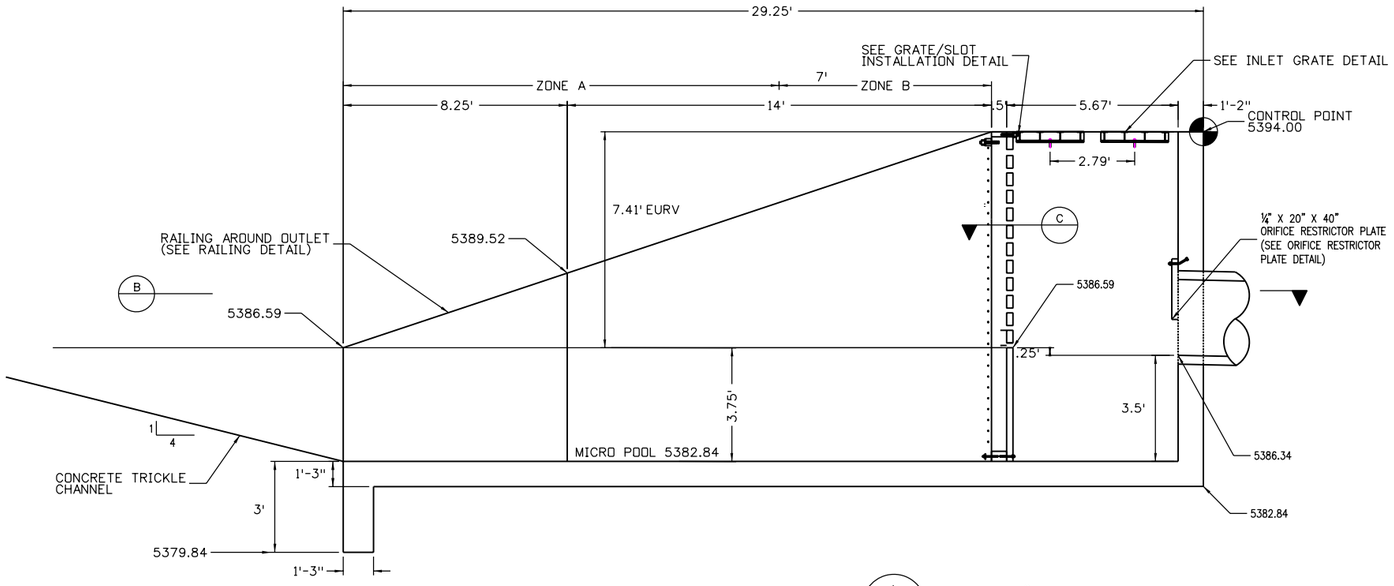
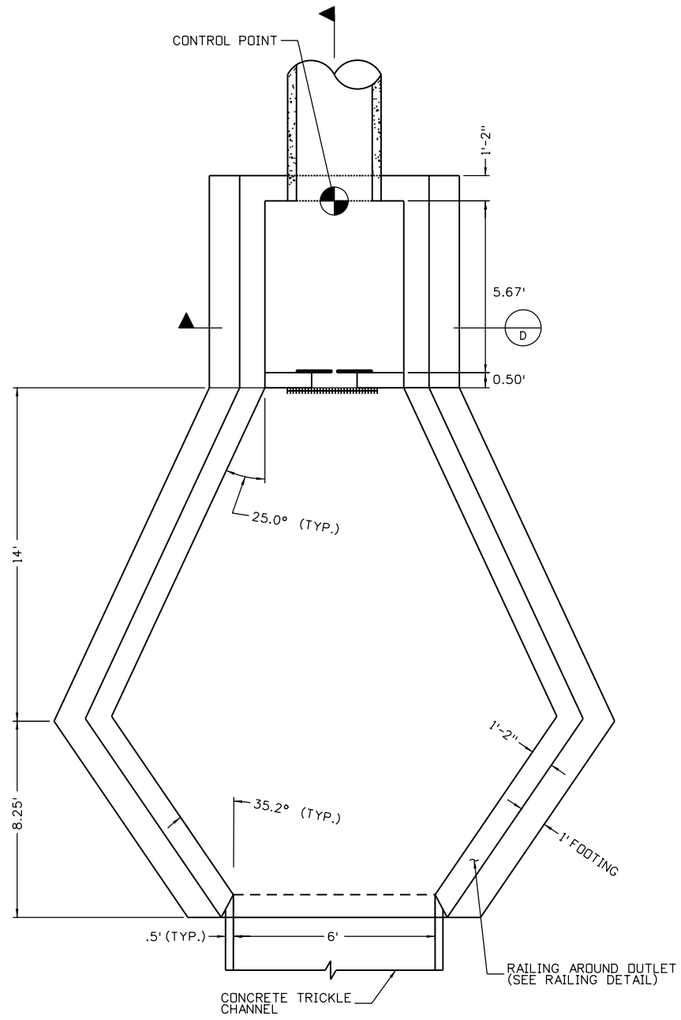


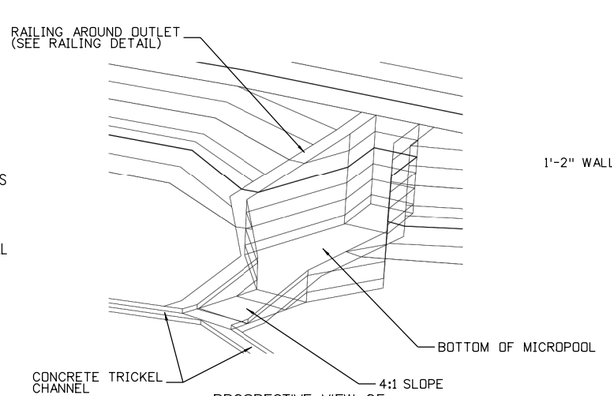
A SECTION 24" OUTLET STRUCTURE



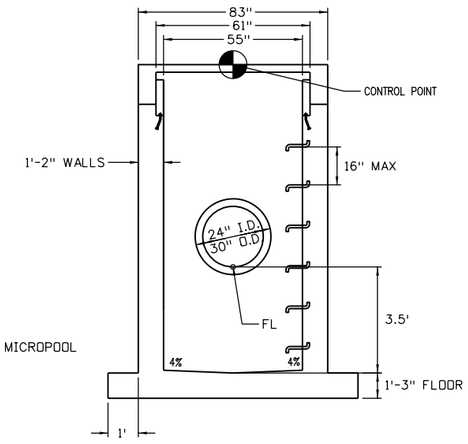
B SECTION 24" OUTLET STRUCTURE

GENERAL NOTES:

1. CONCRETE SHALL BE CLASS D.
2. EXPOSED CONCRETE CORNERS SHALL BE CHAMFERED ¾".
3. OUTLET WALLS SHALL BE FORMED BOTH INSIDE AND OUTSIDE. CASTING OF SIDEWALLS AGAINST EARTH IS NOT PERMITTED.
4. SCREEN PANEL SHALL BE KLEMP KRP SERIES ALUMINUM BAR GRATE WITH 3/16" X 2¼" BARS ON 1 3/16" CENTERS, OR EQUAL AS APPROVED BY CDOT ENGINEER. PANEL SHALL BE ATTACHED TO INLET BY INTERMITTENT STAINLESS STEEL BOLTS ALONG EDGES OF FRAME.
5. HARDWARE SHALL BE STAINLESS STEEL OR GALVANIZED.
6. ALL MATERIALS AND WORKMANSHIP NECESSARY FOR CONSTRUCTION OF OUTLET STRUCTURE SHALL BE INCLUDED IN THE COST OF OUTLET STRUCTURE.
7. STEPS SHALL BE PROVIDED AND SHALL BE IN ACCORDANCE WITH AASHTO M199.
8. RAILING SHALL BE INSTALLED ON STRUCTURE AND WINGWALLS (SEE RAILING DETAIL).
9. A WORKING DRAWING SUBMITTAL IS REQUIRED.



PROSPECTIVE VIEW OF SOUTHEAST POND STRUCTURE
NOT TO SCALE



D SECTION 24" OUTLET STRUCTURE

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File Name: 14679_pDWQ-V706.dgn		Date:	Comments	Init.	8833 South Wadsworth Court Littleton, CO 80128 Phone: 303-972-9112 FAX: 303-972-9114	No Revisions:	Designer: TYK	ES6 0852-103
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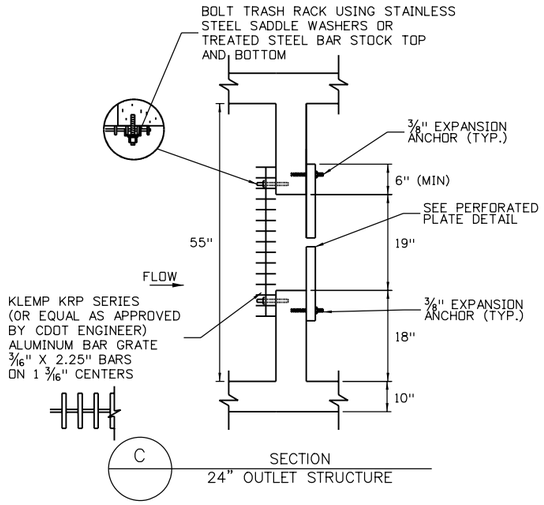
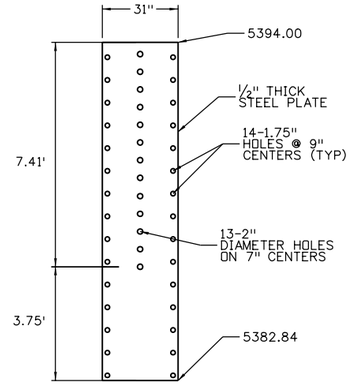
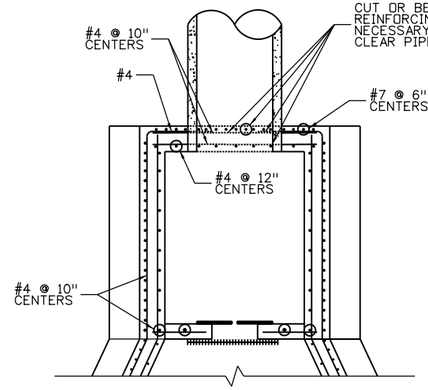


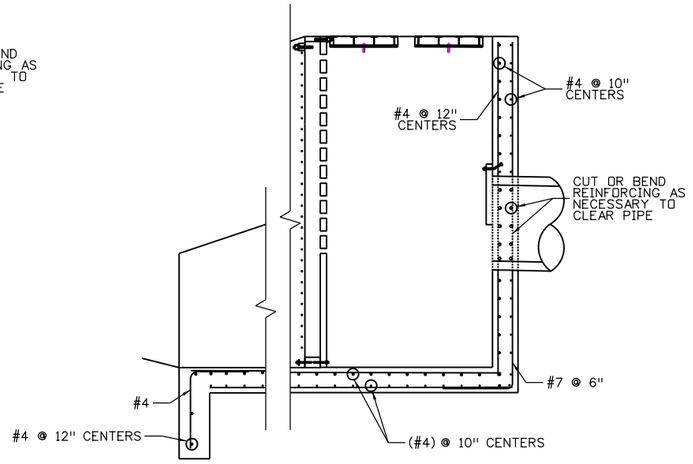
SECTION
24" OUTLET STRUCTURE



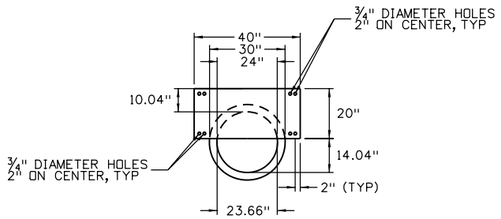
PERFORATED PLATE DETAIL



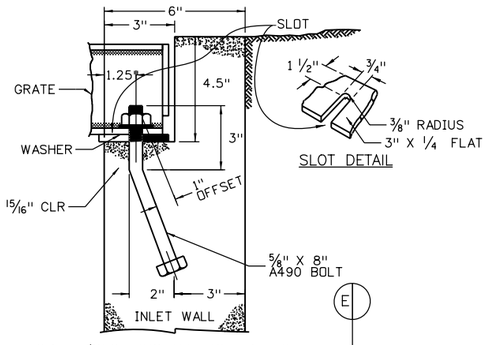
24" OUTLET STRUCTURE
PLAN VIEW



24" OUTLET STRUCTURE

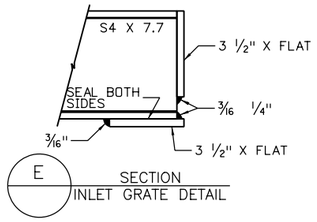


ORIFICE RESTRICTOR PLATE DETAIL



SLOT DETAIL

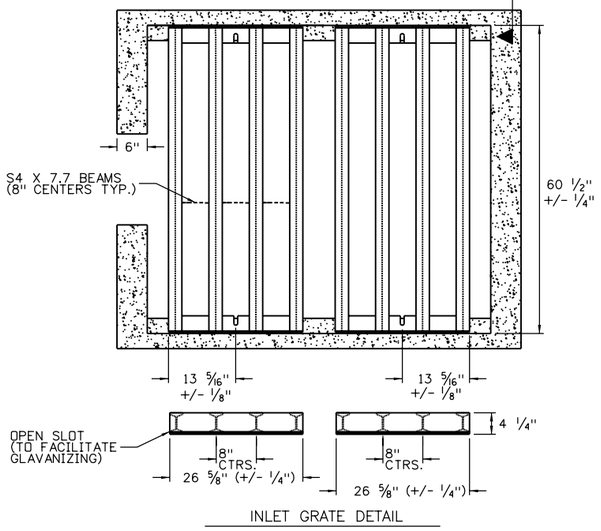
GRATE/SLOT INSTALLATION DETAIL



SECTION
INLET GRATE DETAIL

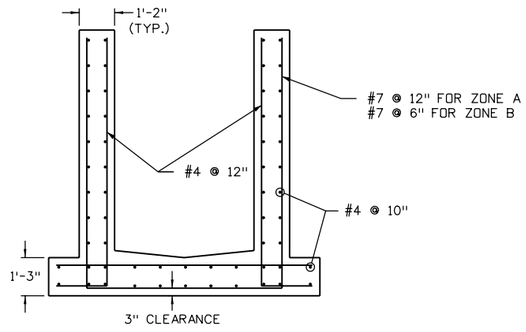
GRATE QUANTITIES (2 GRATES REQ'D.)

NO. PIECES	DESCRIPTION	LENGTH	LB. PER FT.	WEIGHT (LBS.)
8	S4 X 7.7 BEAM	60½"	7.7	311
4	3 ½" x ½" FLAT	26⅝"	2.98	26
4	3" x ½" FLAT	26⅝"	2.55	24

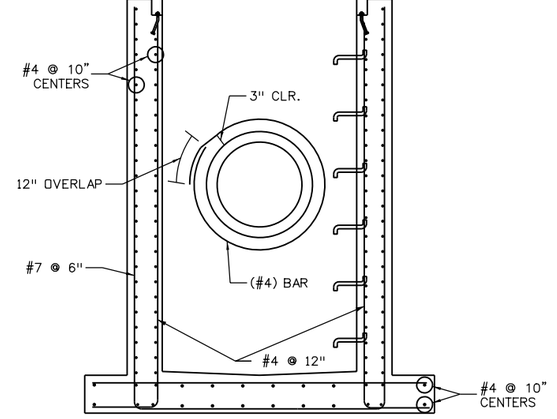


INLET GRATE DETAIL

24" OUTLET STRUCTURE DETAILS
NOT TO SCALE



24" OUTLET STRUCTURE
TYPICAL SECTION



24" OUTLET STRUCTURE

GENERAL NOTE:

1. REINFORCING BARS SHALL BE GRADE 60, DEFORMED, AND SHALL HAVE A MINIMUM 2" CLEARANCE. CLEAR COVER FOR FLOOR BARS SHALL BE 3".

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Horiz. Scale: N/A Vert. Scale: As Noted				Region 6 RLB	Revised:
PBSJ 4601 DTC Boulevard Suite 700 Denver, CO 80237					Void:

WATER QUALITY SOUTHEAST POND STRUCTURE			Project No./Code
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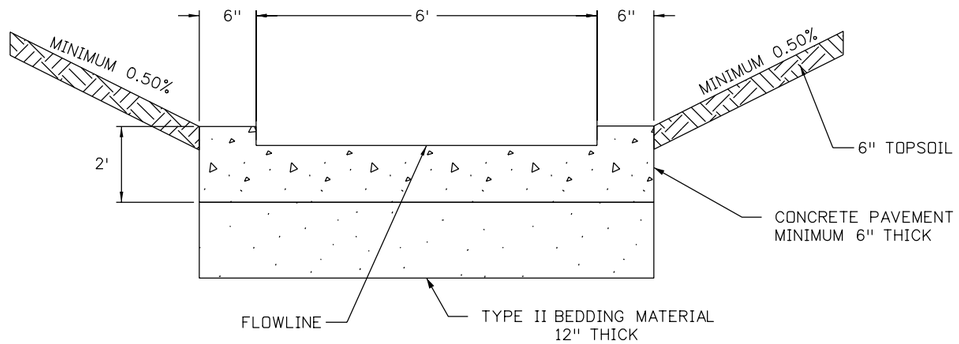
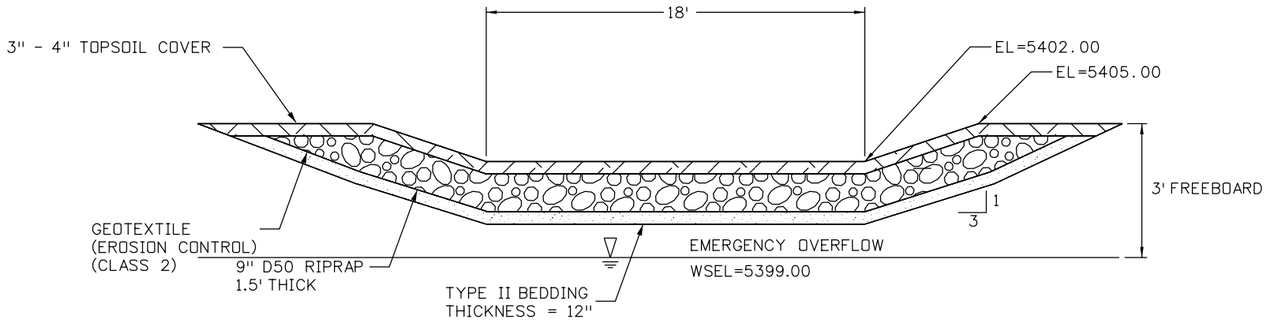
CONCRETE LINED TRICKLE CHANNEL



SPILLWAY DETAIL



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PBS&J 4601 DTC Boulevard Suite 700 Denver, CO 80237					Void:

WATER QUALITY SOUTHEAST POND DETAILS			Project No./Code
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Detailer: AJF			17679
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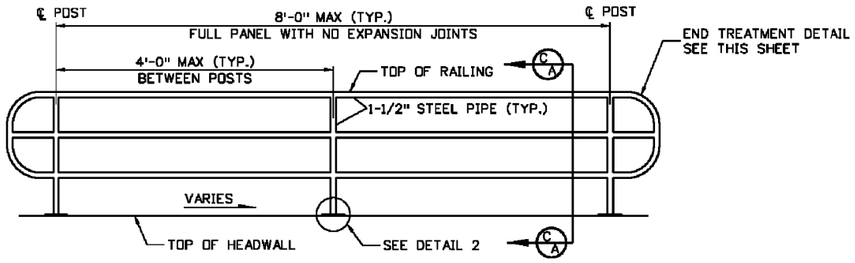
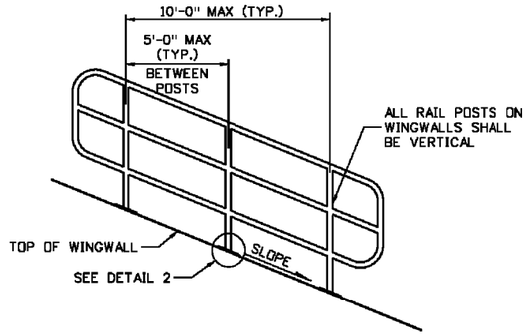
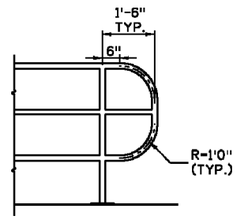


ELEVATION VIEW OF HEADWALL RAILING
N.T.S.



ELEVATION VIEW OF WINGWALL "A" & "B" RAILING
N.T.S.



TYPICAL END TREATMENT DETAIL
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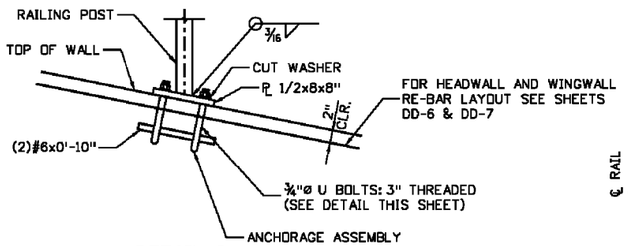

DETAIL 2
ANCHORAGE DETAIL
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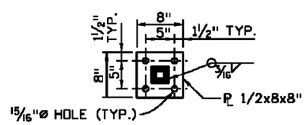
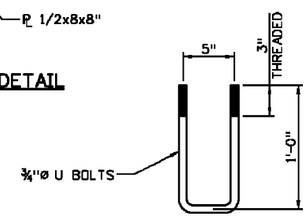
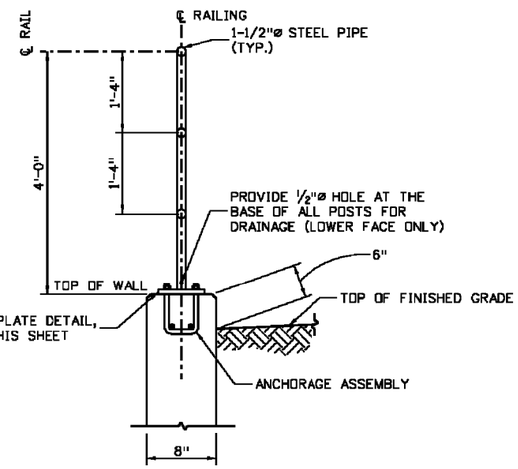


BASE PLATE DETAIL
N.T.S.



U BOLT DETAIL
N.T.S.



SECTION C/A
N.T.S.

NOTES:

1. ALL PIPE SHALL BE 1 1/2" NOMINAL DIAMETER, SCH. 40 STEEL CONFORMING TO THE REQUIREMENTS IN ASTM A53 GRADE B STEEL (fy=35 ksi), AND ALL PLATES, BOLTS AND NUTS SHALL MEET THE REQUIREMENTS IN AASHTO M270 FOR GRADE 36 ksi STEEL.

2. ALL STEEL SHALL BE PAINTED AFTER FABRICATION IN ACCORDANCE WITH SECTION 509 OF CDOT STANDARD SPECIFICATION.

3. RAILINGS, ANCHORAGE ASSEMBLIES AND ALL PLATES, BOLTS, AND NUTS SHALL BE PAID FOR AS ITEM 514 PIPE RAILING.

4. PIPE RAILING SHALL BE PAINTED WITH A TWO-COAT INORGANIC ZINC POLYURETHANE PAINT SYSTEM AS SPECIFIED IN SECTION 708.03 AND SHALL HAVE A MINIMUM DRY FILM THICKNESS OF 4.0 MILS. THE TOP COAT SHALL BE A COLOR MATCHING FEDERAL STANDARD 595B COLOR NO. 17000-BLACK.

5. ANCHORAGE ASSEMBLY (PLATES, BOLTS & NUTS) SHALL BE GALVANIZED AFTER FABRICATION.

6. THE CONTRACTOR SHALL FIELD-MEASURE THE WINGWALLS AND BASE PLATE LOCATIONS PRIOR TO FABRICATION OF PIPE RAILING TO VERIFY DIMENSION REQUIREMENTS.

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Horiz. Scale: N/A Vert. Scale: N/A				Region 6 RLB	Revised:	Structure Numbers: / Subset Sheets: 9 of 9
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SITE DESCRIPTION

Additional information for permitted projects.
For information only to fulfill the CDPS-SCP (Colorado Discharge Permit – Stormwater Construction Permit)

A. PROJECT SITE DESCRIPTION:

Project is to construct a flyover bridge from southbound Santa Fe Drive beginning at West Mineral Avenue Drive to eastbound C-470 east of Lucent Boulevard, roadway widening on Santa Fe Drive to accommodate placement of flyover bridge piers, grading and paving on the C-470 eastbound on-ramp and merge into the flyover bridge, new bridge at Erickson Drive, continuous auxiliary lane between flyover/ramp merge with C-470 and the eastbound off-ramp to Lucent Boulevard, retaining walls and grading and paving to bike path, Construction activities include utility relocations, grading, paving, wall and bridge construction, drainage improvements, bike path relocation, signing improvements, lighting improvements and seeding. Onsite drainage will be collected and treated in water quality ponds and an infiltration located along the corridor. Roadway widening and bike path includes excavations and embankments.

B. PROPOSED SEQUENCING FOR MAJOR ACTIVITIES:

1. Utility relocation
2. Embankment for roadway widening
3. Water quality/sediment pond installation
4. Storm drain system installation
5. Construct new bridges
6. Paving
7. Bike path relocation
8. 9. Signing and striping
10. Seeding

C. ACRES OF DISTURBANCE:

Total area of construction site: 43.1 acres
Total area of disturbance: 43.1 acres
Acreage of seeding: 12.9 acres

D. EXISTING SOIL DATA:

Based on the Natural Resources Conservation Service (NRCS) Soil Survey of Douglas County, Colorado the soils in the vicinity of C-470 are comprised of the Bresser-Truckton, Buick-Satanta, Fondis and Renohill-Buick. These soils are classified as a Type B or C hydrologic soil group. Type C will be used for analysis. These soils have a slow infiltration rate when thoroughly wet and consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. The rate of water transmission is slow.

E. EXISTING VEGETATION, INCLUDING PERCENT COVER:

Documentation is required to support that the site has been stabilized to 70 percent of pre-disturbance cover and does not show signs of accelerated erosion. Accelerated erosion shall be defined as rills of 2-inches deep or more, earth slides, mud flows, sediment deposition, or evidence of concentrated flows of water over bare soils. Prior to construction disturbance the Contractor shall create photographic documentation and measure existing plant cover: One 50-foot transect/5 acres of disturbance in accordance with Section 4:11:2 item of the CDOT Erosion Control and Stormwater Quality guide (2002). Photographs at each transect shall support the measurements of pre-disturbance and final stabilization. Measurements will not be paid separately but included in the price of the work.

Date of survey: To be determined by Contractor

F. POTENTIAL POLLUTANT SOURCES:

Potential Pollutant Sources include the following activities: disturbed soils, stock piles, vehicle tracking of sediments, management of contaminated soils, loading and unloading operations, vehicle and equipment maintenance and fueling, dust or particulate generating processes, routine maintenance activities involving fertilizers, pesticides, detergents, fuels, solvents, or oils; on-site waste management practices, concrete truck/equipment washing, dedicated asphalt and concrete batch plants, non-industrial waste sources (worker trash and portable toilets). Any other potential pollutant sources that can be identified by the Contractor shall be documented in the SWMP. See Section 4.B.

See First Construction Activities under *Potential Pollutant Sources*. The ECS shall prepare a list of all potential pollutants and their locations in accordance with subsection 107.25.

G. RECEIVING WATER:

1. Outfall locations:
TABLE 1. OUTFALL LOCATIONS

SIZE	TYPE	LOCATION	OUTFALL	RECEIVING WATERS
18”	RCP	724+43 L	Pond Outlet	South Platte
24”	RCP	727+11 R	Pond Outlet	South Platte
	Trench	776+48 R	Exist 36” RCP	High Line Canal

2. Names of receiving water(s) on site and the ultimate receiving water: South Platte River and Highline Canal
3. Distance ultimate receiving water is from project: Varies, approximately 1,056 feet from junction of nearest outfall pipe.
4. Does the receiving water have an approved TMDL: No

H. ALLOWABLE NON-STORMWATER DISCHARGES:

The Contractor may require a dewatering permit from the Colorado Department of Public Health and Environment (CDPHE). Discharges to the ground of water from construction dewatering activities may be authorized by the general permit if the following conditions apply:

1. The source is groundwater and/or groundwater combined with stormwater that does not contain pollutants in concentrations exceeding the State groundwater standards in Regulations 5 CCR 1002-41 and 42;
2. The source is identified in the SWMP;
3. BMPs are included in the SWMP, as required by Part I.C.3(c)(8) of the CDPS General Permit No. COR-030000; and
4. The above discharges do not leave the site as surface runoff or to surface waters.

If discharges to the ground from construction dewatering activities that do not meet the above criteria must be covered under a separate CDPS discharge permit. Contaminated groundwater requiring coverage under a separate CDPS discharge permit may include groundwater contaminated with pollutants from a landfill, mining activity, industrial pollutant plume, underground storage tank, or other source.

I. ENVIRONMENTAL IMPACTS:

1. Wetland Impacts: No
2. Stream Impacts: No
3. Threatened and Endangered Species: No
4. Historic Impacts: No

2. SITE MAP COMPONENTS:

Pre-construction
A. Construction Site Boundaries: See Erosion Control Plan/SWMP Site Map
B. All Areas Of Ground Surface Disturbance: See Erosion Control Plan/SWMP Site Map
C. Areas Of Cut And Fill: See Erosion Control Plan/SWMP Site Map

A. Location Of All Structural BMPs Identified In The SWMP: See Erosion Control Plan/SWMP Site Map
B. Location Of Non-Structural BMPs As Applicable In The SWMP: See Erosion Control Plan/SWMP Site Map
C. Springs, Stream, Wetlands And Other Surface Water: See Erosion Control Plan/SWMP Site Map
D. Protection Of Trees, Shrubs, Cultural Resources And Mature Vegetation: See Erosion Control Plan/SWMP Site Map

3. SWMP ADMINISTRATOR FOR DESIGN:

The original design for this project, including drainage plans and SWMP have been designed by the following Engineer:

SWMP Engineering Firm: PBS&J
SWMP Engineer: Tammy Kirkbride, P.E.
Address: 4601 DTC Blvd, Suite 700
Denver, CO 80237
Phone: 303.221.7275

Once the Contractor takes ownership of the SWMP they will become the Owner and assume responsibility for all design changes to the SWMP, implementation and maintenance.

4. STORMWATER MANAGEMENT CONTROLS FIRST CONSTRUCTION ACTIVITIES

The Contractor Shall Perform The Following:

A. DESIGNATE A SWMP ADMINISTRATOR/EROSION CONTROL SUPERVISOR (ECS) (To be filled out at time of construction; designate the individual(s) responsible for implementing, maintaining and revising SWMP, including the title and contact information. The activities and responsibilities of the administrator shall address all aspects of the projects SWMP.)

B. POTENTIAL POLLUTANT SOURCES
Evaluate, identify and describe all potential sources of pollutants at the site in accordance with CDOT Construction Details subsection 107.25 and place in the SWMP notebook. All BMPs related to potential pollutants shall be shown on the SWMP site map by the contractor's ECS.

C. BEST MANAGEMENT PRACTICES (BMPs) FOR STORMWATER POLLUTION PREVENTION PHASED BMP IMPLEMENTATION

During design: Fields in Table 2 are marked when used in the SWMP.
During construction: The ECS shall update the checked boxes to match site conditions.

Structural BMP practices for erosion and sediment control are listed in Table 2. Structural BMP practices may include, but are not limited to:

TABLE 2. STRUCTURAL BMPs FOR EROSION AND SEDIMENT CONTROL

BMP	TYPE OF CONTROL	BMP AS DESIGNED	IN USE ON SITE	FIRST CONSTRUCTION ACTIVITIES	DURING CONSTRUCTION	INTERIM/FINAL STABILIZATION
Check Dams/Erosion Logs	Sediment	X		X	X	
Silt Fence	Sediment	X		X	X	
Erosion Logs	Sediment	X		X	X	X
Infiltration Trench	Sediment	X				X
Inlet Protection/ Erosion Logs	Sediment	X		X	X	
Outlet Protection/ Erosion Logs	Erosion	X			X	
Concrete Washout	Construction	X			X	
Stabilized Construction Entrance	Construction	X		X	X	
Dewatering	Sediment	X			X	
OTHER						

NON-STRUCTURAL BMP practices for erosion and sediment control are listed in Table 3. Non-structural BMPs may include but are not limited to the following:

TABLE 3. NON-STRUCTURAL BMPs FOR EROSION AND SEDIMENT CONTROL

BMP	TYPE OF CONTROL	BMP AS DESIGNED	IN USE ON SITE	FIRST CONSTRUCTION ACTIVITIES	DURING CONSTRUCTION	INTERIM/FINAL STABILIZATION
Soil Conditioning	Erosion	X			X	
Seeding, Permanent	Erosion	X				X
Mulch/Mulch Tackifier	Erosion	X			X	X
Soil Binder	Erosion				X	
Soil Retention Blanket	Erosion	X			X	X
Vegetative Buffer Strips	Erosion			X	X	X
Protection of Vegetation/Trees	Erosion	X		X	X	X
Preservation of Mature Vegetation	Erosion	X		X	X	X
Flexible Growth Medium	Erosion	X			X	X
OTHER						

Erosion control devices are surface treatments that stabilize soil exposed by excavation or grading and are used to limit the amount of erosion on site. Sediment control BMPs capture soil that has been eroded, devices are designed to capture sediment on the project site. Construction BMPs are used to control sediment associated with construction access and staging. BMPs are indicated on the Erosion Control Plans. BMP installation details and general narratives are in the SWMP notebook.

NARRATIVES

STATE HIGHWAY NO. C-470 AND SANTA FE DR/US 85
General Design BMP placement: Prior to construction commencing silt fence shall be place to prevent the initial construction activity from causing sediment to leave the site. Inlet protection should be placed on existing inlets in the project area. Construction Entrances and Concrete Washouts should be placed.

During construction check dams, erosion logs, and erosion control blankets should be placed as identified on the Erosion Control Plans. Once drainage structures have been placed, inlet protection should be placed around the perimeter of the inlet.

Once BMPs are installed, they shall be maintained continuously throughout the duration of the project and into the establishment phase. Once final grading has been established BMPs listed in Table 3 should be placed. Once vegetation has reached 70-percent of pre-disturbance cover temporary BMPs may be removed.

Narratives for BMPs used for Design are listed below.

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STORMWATER MANAGEMENT PLAN

Designer: AJF
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EROSION LOGS
Erosion logs are used to capture and filter sediment laden run-off from disturbed areas during construction.

As Outlet Protection: shall be placed at existing culverts as shown in the plans and where disturbance may be occurring adjacent to the outlet and cause sediment laden water to enter pipe. Logs shall be placed prior to work commencing at these locations to filter sediment laden runoff. Where the slope has been worked above new and/or existing pipes (inlet/outlet) and sediment may enter the pipe from above, a log shall wrap the top of pipe and run down slope to direct water away from pipe. Logs shall be j-hooked or placed in such a manner at these locations that sediment laden water will not go around the ends of logs directly into the pipe or ditch. Outlet protection is used as an energy dissipation device to prevent scour and erosion at the pipe outlet by reducing the velocity and energy of the concentrated flow. Outlet protection shall be placed at the outlet of pipes immediately after the pipe is installed. See Erosion Control Plans for locations.

As Check Dam: shall be placed in areas indicated in the plans or as directed as soon as possible, immediately in most cases after ditch grading has been completed (a completed ditch is one that is acting as a conduit for water). Ditches not directed to have riprap placed shall be permanently stabilized with-in 48 hours of completion during the seeding season. When seeding cannot occur due to seasonal constraints mulch/mulch tackifier shall be placed along with checks at intervals specified. If erosion occurs in the ditch, mulch and mulch tackifier shall be replaced by a blanket (straw/coconut) as a temporary measure. Seeding and crimping in ditch lines shall follow contour; crimping and drill rows running down a ditch line will not be allowed. Concrete lined ditches shall use erosion logs as temporary protection until concrete lining has been complete.

Erosion logs shown in the Erosion Control Plans are a graphical representation only and do not represent the actual length or configuration of erosion logs be installed.

SILT FENCE
Silt fence shall be used to capture sediment laden run-off from disturbed areas during construction. It shall be placed on the contour; ends shall be j-hooked to prevent water from running around the ends of fence. A maximum drainage area of one-quarter acre per 100-feet of silt fence length; maximum slope length behind the barrier is 100-feet; maximum gradient behind the barrier is 2:1. Posts shall be spaced a maximum of three-feet apart. Along the toe of fills, install the silt fence for runoff to pond and sediment to settle. A minimum distance of five-feet from the toe of the fill is recommended. The height of the silt fence from the ground surface shall be a minimum of 24-inches and shall not exceed 36-inches.

INFILTRATION TRENCH
An infiltration trench will be used to treat roadway runoff. Roadway runoff will drain through a grass swale to the infiltration trench where it will be treated for 48-hours. Construction of the trench should take place after the site has been stabilized. Silt fence should be placed around the perimeter of the infiltration trench during all phases of construction. Heavy equipment should not operate on the surface where the trench will be located to avoid soil compaction. During construction of the trench only light equipment such as backhoes or wheel and ladder type trenchers should be used to minimize compaction of the surrounding soils. During and after excavation, all excavated materials should be placed downstream, away from the trench, to prevent redepositing during runoff events. Infiltration trenches should not be used as temporary sediment traps during construction.

GRAVEL BAG – INLET PROTECTION
Single and Double Vane Grates, Type C and Type D Inlets will be used for this project. Inlet Protection is used to intercept and filter sediment-laden runoff and prevent it from entering storm drainage systems. Inlet protection should be used throughout construction, but used as a temporary feature. Storm drain inlet protection shall be placed immediately after installation of inlets and on existing inlets prior to clearing and grubbing. During construction, the erosion control supervisor shall place the appropriate BMP at the inlet openings to prevent sediment and/or pollutants from entering. See Erosion Control Plans for placement.

CONCRETE WASHOUTS
Facilities or designated work areas where concrete waste is generated from demolition activities; where concrete is used as a construction material; where concrete trucks or concrete coated equipment are washed on site as permitted by the engineer; where slurries containing Portland cement concrete (PCC) or asphalt concrete are generated: and where mortar-mixing areas exist. During construction, the contractor may move the concrete washouts to convenient locations on the site. Concrete Washout location can be determined by the Contractor and checked by the ECS and maintained as required. Temporary concrete washout facilities shall be located 50 horizontal feet from drainage ways, inlets, and receiving waters unless otherwise approved by the Engineer. If a concrete washout is within 300-feet of a road or highway access, a stabilized construction entrance must be built as part of the washout, or at the entrance to the road or highway. When approved by the engineer an “urban” concrete washout structure may be used. Urban concrete washout examples are wooden boxes lined with heavy duty plastic or waterproof 55 gallon drums. After use the structure must be removed from the project site and properly vegetated.

STABILIZED CONSTRUCTION ENTRANCE
Used to reduce the amount of mud tracked onto paved public roads by vehicles or runoff leaving the construction site. Used as a temporary feature. See CDOT Standard Plan M-208-01 for detail.

DEWATERING
Shall be performed to remove accumulated water and sediments from sediment traps, basins and excavated areas. The contractor shall notify the engineer of all planned discharges. All dewatering operations must comply with applicable CDPS and local permits as well as regional and watershed-specific discharge requirements, including CDOT Standard Specifications. Sediment control measures, such as sediment traps (SC5) sediment basins (SC 6) and dewatering structures (SC 7) shall be implemented to treat sediment-laden excess water from construction sites. Other sediment control measures such as filtration devices can be utilized on if approved by the engineer. Perform routine spot-checks to ensure dewatering techniques are properly implemented.

SOIL CONDITIONING
Soil surface roughening, terracing and round at tops of cuts, transitions and roadway ditches to facilitate plant establishment and minimize soil erosion. Used to temporarily stabilize disturbed areas and to protect from wind and water erosion. Disturbed surfaces shall be left in the roughened condition at all times by equipment tracking, scarifying or disking the surface on the contour with a 2 to 4 inch minimum variation in the soil surface. Round channel bottoms to avoid V-shaped ditches and round the tops of cuts and the toes of fill slopes.

PERMANENT SEEDING – SEEDING(NATIVE)
Seeding is used to control runoff and erosion on disturbed areas. Drill seeding shall occur on slopes flatter than 3:1 and shall occur on the contour of the slope. Completed areas shall be seeded within 48 hours during seeding season. Seeded areas shall be inspected frequently for areas of failure. Slopes that are too steep for drill seeding shall have seed broadcast at double the rate and raked into the surface.

MULCH/MULCH TACKIFIER
Mulching and mulch tackifier is used for temporary erosion control on incomplete slope, stockpiles and on slopes when seeding is not allowed due to seasonal constraints. It is also used to cover permanent or temporary seeded areas. Mulch and mulch tackifier shall be in accordance with CDOT Construction Details subsection 213.03 (a). Crimping in ditch lines shall follow the contour, crimp rows running down a ditch line shall not be allowed.

SOIL BINDER
Shall be sprayed onto the surface of exposed soils to hold the soil in place and minimize erosion from runoff and wind. Shall be used in combination with mulches to temporarily stabilize soils in stockpiles, berms or when slopes cannot be seeded due to seasonal constraints. Apply soil binder over roughened soil surface. If rill erosion occurs, this is an indication of poor product mixture and/or application and shall be reapplied at the contractor’s expense. Do not use in areas with vehicular traffic. Soil binder shall be reapplied every 6 to 12 months or when the surface has been disturbed/broken.

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STORMWATER MANAGEMENT PLAN

Designer: AJF
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SOIL RETENTION BLANKET
Shall be placed in areas shown on the Site Map or as directed; all slopes 3:1 and steeper shall receive a blanket. Slopes shall be properly prepared prior to placement of blanket. If rills, rocks, etc. are present they shall be removed prior to placing blanket to ensure blanket is placed on the soil with no tenting; see specification and M&S Standards. Plastic soil retention blankets will be placed in all ditches exceeding 2% and straw/coconut soil retention blankets will be used on all slopes steeper than 3:1.

VEGETATIVE BUFFER STRIPS AND PROTECTION ON EXISTING VEGETATION
Existing vegetation shall be used as a BMP on the project. Existing vegetation helps with erosion and sediment control and protects water quality. Areas of preserved vegetation shall be marked on the Erosion Control Plans by the ECS. The amount of sediment reaching buffer strips shall be kept to a minimum by placing temporary and permanent erosion control features on disturbed slopes. If sediment does enter buffer strips and covers existing vegetation it shall be cleaned and re-seeded as directed. Sediment in vegetative ditches shall be avoided to prevent sediment laden water from exiting the project site. All vegetative ditch outfalls (from CDOT right of way) shall be protected with erosion logs or berms as shown in the plans or as directed.

PROTECTION OF WETLANDS AND MATURE TREES
There are no wetlands that have been identified on this project.
A combination of erosion logs and fence (plastic) shall be used as directed by the engineer and/or CDOT Landscape Architect to protect mature trees. Erosion logs shall be installed prior to performing any construction work that disturbs vegetation.

FLEXIBLE GROWTH MEDIUM
Flexible Growth Medium (FGM) shall consist of wood fibers bound together by adhesive and photodegradable synthetic fibers and premixed in an air stream at the factory. The fibers may be crimped or uncrimped. The wood fibers shall be manufactured expressly from clean whole wood chips and contain a range of fiber lengths, with a minimum of 25 percent of the fibers averaging 0.4 inches long. The adhesive binder shall be formulated to form a water resistant bond. The fibers shall be colored yellow or green with a water-soluble, non-toxic dye to help the operator apply the material uniformly. The mixture shall also contain a copolymer gel. A sample of the FGM shall be submitted for approval at least two weeks in advance of its use on the project. The FGM shall be applied at the rate of 2600 lbs per acre. There shall be no cure time once placed on the area of application. FGM shall not be applied in ditches or other areas of concentrated flow.

D. OFFSITE DRAINAGE (RUN ON WATER)
   1. Describe and record BMPs on the SWMP site map that have been implemented to address run-on water in accordance with subsection 208.03.

E. STABILIZED CONSTRUCTION ENTRANCE
   1. BMPs shall be implemented in accordance with subsection 208.04.

F. PERIMETER CONTROL
   1. Perimeter control shall be established as the first item on the SWMP to prevent the potential for pollutants leaving the construction site boundaries, entering the stormwater drainage system, or discharging to state waters.
   2. Perimeter control may consist of vegetation buffers, berms, silt fence, erosion logs, existing landforms, or other BMPs as approved.
   3. Perimeter control shall be in accordance with subsection 208.04.

5. DURING CONSTRUCTION

RESPONSIBILITIES OF THE SWMP ADMINISTRATOR/EROSION CONTROL SUPERVISOR DURING CONSTRUCTION
The SWMP should be considered a "living document" that is continuously reviewed and modified. During construction, the following items shall be added, updated, or amended as needed by the SWMP Administrator/Erosion Control Supervisor (ECS) in accordance with section 208.

A. MATERIALS HANDLING AND SPILL PREVENTION – The Contractor shall prepare a Spill Prevention, Control and Countermeasure (SPCC) Plan prior to construction that lists all potential contaminants that will be kept with the SWMP on site.
B. STOCKPILE MANAGEMENT – topsoil stockpiles shall be stabilized by spraying a flexible growth medium on soil immediately upon completion of stockpile completion. Toes of stockpiles shall be protected immediately with a berm, silt fence, etc. as directed by the ECS with the Engineers approval. Stockpiles and BMPs shall be marked on the site map. Other erodible stockpiles (including spoils piles) shall be protected immediately with gravel bags, berms, erosion logs, etc. as directed. BMP shall be indicated on the Erosion Control Plans. When piles need to be accessed during the day, BMP may be removed for short periods of time for access to the pile. BMP shall be back in place at the end of the day.
C. GRADING AND SLOPE STABILIZATION
D. SURFACE ROUGHENING
E. STABILIZED CONSTRUCTION ENTRANCE
F. TEMPORARY STABILIZATION – see section 4C and 5B.
G. CONCRETE WASHOUT – No concrete batch will be allowed on CDOT right of way
   1. Concrete washout water or waste from field laboratories and paving equipment shall be contained in accordance with subsection 208.05.
H. SAW CUTTING
I. NEW INLET/CULVERT PROTECTION – See Narrative in Section 4
J. STREET CLEANING – should be used to remove sediment transported onto streets to prevent the sediment from entering a storm drain or watercourse. Visible sediment tracking shall be swept and vacuumed on a daily basis.

6. INSPECTIONS

A. Inspections shall be in accordance with CDOT Construction Details subsection 208.03 (c).

7. BMP MAINTENANCE

A. Maintenance shall be in accordance with CDOT Construction Details subsection 208.04 (e). In addition CDPHE has the following requirements. All erosion and sediment control practices and other protective measures identified in the SWMP must be maintained in effective operating condition. Proper selection and installation of BMPs and implementation of comprehensive Inspection and Maintenance procedures, in accordance with the SWMP, should be adequate to meet this condition. BMPs that are not adequately maintained in accordance with good engineering, hydrologic and pollution control practices, including removal of collected sediment outside the acceptable tolerances of the BMPs, are considered to be no longer operating effectively and must be addressed in accordance with Part I.D.8 of the CDPS General Permit for Stormwater Discharges Associated with Construction Activity see 7.B. A specific timeline for implementing maintenance procedures is not included in this permit because BMP maintenance is expected to be proactive, not responsive. Observations resulting in BMP maintenance activities can be made during a site inspection, or during general observations of site conditions.

B. REPLACEMENT AND FAILED BMPs: Adequate site assessment must be performed as part of comprehensive Inspection and Maintenance procedures, to assess the adequacy of BMPs at the site, and necessity of changes to those BMPs to ensure continued effective performance. Where site assessment results in the determination that new or replacement BMPs are necessary, the BMPs must be installed to ensure on-going implementation of BMPs. Where BMPs have failed, resulting in noncompliance with Part I.D.2, they must be addressed as soon as possible, immediately in most cases to minimize the discharge of pollutants. When new BMPs are installed or BMPs are replaced, the SWMP must be updated in accordance with Part I.D.5(c) of the Permit.

C. REPORTING: No scheduled reporting requirements are included in the permit; however, CDPHE reserves the right to request that a copy of the inspection reports be submitted.

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STORMWATER MANAGEMENT PLAN				Project No./Code
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Detailer: SDH				
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Record Keeping

A. Records shall be in accordance with CDOT Construction Details subsection 208.03 (c).
The permittee shall retain copies of the SWMP and all reports required by this permit and records of all data used to complete the application to be covered by the permit, for three years after expiration or inactivation of permit coverage. The permittee shall retain a copy of the SWMP required by this permit at the construction site from the date of project initiation to the date of expiration or inactivation of permit coverage, unless another location, specified by the permittee, is approved by CDPHE.

9. INTERIM AND FINAL STABILIZATION

A. SEEDING PLAN
Soil preparation, soil conditioning or topsoil, seeding (native), mulching (weed free), and mulch tackifier will be required for an estimated 11.1 acres of disturbed area within the right-of-way limits which are not surfaced. The following type and rates shall be used:

COMMON NAME	BOTANICAL NAME	POUNDS PLS/ACRE
Western wheatgrass	Pascopyrum smithii v. Arriba	4.0
Sideoats grama	Bouteloua curtipendula v. Vaughn	2.0
Smooth brome	Bromus inermis v. Lincoln	10.0
Canby bluegrass (wet)	Poa canbyi	2.0
Sanburg bluegrass	Poa sandbergii	2.0
Prairie junegrass	Koeleria cristata	0.2
Blue grama	Bouteloua gracilis v. Hachita	2.0
Gaillardia	Gaillardia aristata	1.0
Blue flax	Linum lewisii	0.2
Prairie coneflower	Ratibida columnaris	0.3
Flanders poppy	Papaver rhoeas	0.1
Regreen/Triticum	Aestivum x Elytrigia elongate	3.0
	Total	27.4

B. SEEDING APPLICATION: Drill seed 0.25 inch to 0.5 inch into the soil. In small areas not accessible to a drill, hand broadcast at double the rate and rake 0.25 inch to 0.5 inch into soil.

C. MULCHING APPLICATION: Apply 1 ½ tons of certified weed free hay per acre mechanically crimped into the soil in combination with an organic mulch tackifier.

D. SPECIAL REQUIREMENTS: Due to high failure rates, hydromulching and/or hydroseeding will not be allowed.

E. SOIL CONDITIONING AND FERTILIZER REQUIREMENTS:
1. Humate shall be applied at 1,200 lbs./acre.
2. Fertilizer shall consist of 90% fungal biomass (mycelium) and 10% potassium-magnesia with a grade of 6-1-3 or approved equal. Fertilizer shall be applied at 2,000 lbs/acre.

F. RESEEDING OPERATIONS/CORRECTIVE STABILIZATION
Prior to final acceptance:
1. Seeded areas shall be reviewed during the 14 day inspections by the Erosion Control Supervisor for bare soils caused by surface or wind erosion. Bare areas caused by surface or gully erosion, blown away mulch, etc. shall be regraded, seeded, mulched and have mulch tackifier (or blanket) applied as necessary.
2. Areas where seed has not germinated after one season shall be evaluated by the Engineer and CDOT Landscape Architect. Areas that have not germinated shall have seed, mulch and mulch tackifier (or blanket) applied. Work shall be paid for by the appropriate bid item.
3. The Contractor shall maintain seeding/mulch/tackifier, mow to control weeds or apply herbicide to control weeds in the seeded areas until final acceptance.

10. PRIOR TO FINAL ACCEPTANCE

A. Final acceptance shall be in accordance with CDOT Construction Details subsection 208.061.

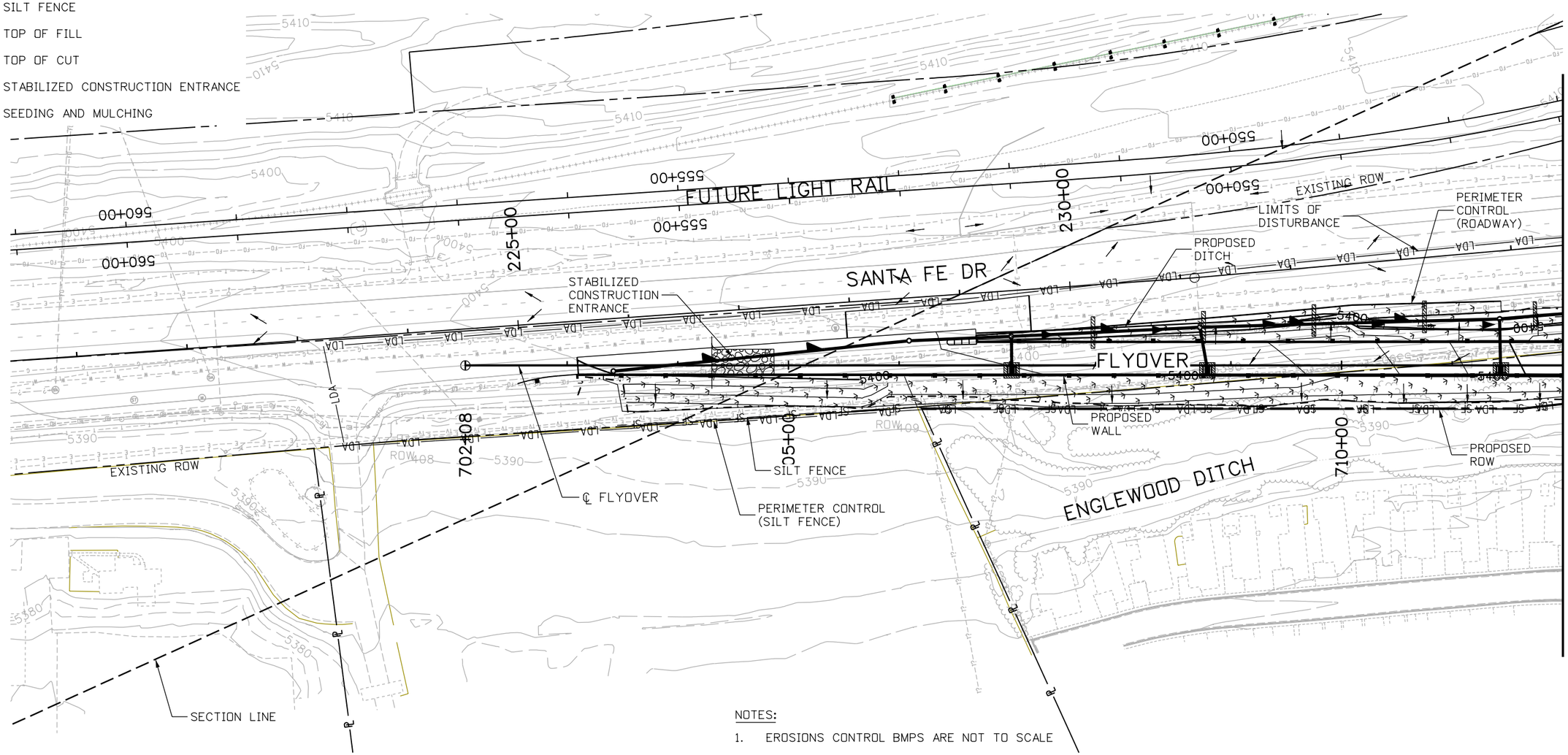
11. TABULATION OF STORMWATER QUANTITIES

PAY ITEM	DESCRIPTION	UNIT	QUANTITY
208	Erosion Log (12 Inch)	LF	11,900
208	Concrete Washout Structure	Each	8
208	Gravel Bag	LF	2,110
208	Stabilized Construction Entrance	Each	49
208	Sediment Removal And Disposal (Equip.)	Hour	100
208	Sediment Removal And Disposal (Labor)	Hour	100
208	Erosion Control Supervisor	Day	420
208	Silt Fence	LF	17,600
211	Dewatering	LS	1
212	Seeding (Native)	Acre	52
212	Soil Conditioning	Acre	52
213	Soil Binder	Acre	52
213	Flexible Growth Medium	Acre	52
213	Mulching (Weed Free Hay)	Acre	52
213	Mulch Tackifier	Lb	5,200
216	Soil Retention Blanket (Straw/Coconut)	Sq Yd	53,724
217	Herbicide Treatment	Hour	15
700	Erosion Control	Fa	-

1. BMP maintenance shall be paid for as: 208 Sediment Removal and Disposal Hours
2. It is estimated that 8 concrete washout structures will be required on the project. One concrete washout structure shall be used for the field laboratories.
3. It is estimated that 60 hours of Sediment Removal and Disposal (Equipment) and Sediment Removal and Disposal (Labor) may be required for miscellaneous erosion control work as directed by the Engineer. Work shall be paid for as 208 Sediment Removal and Disposal.
4. It is estimated that 49 stabilized construction entrances will be required as directed to minimize vehicle tracking control. Locate BMP on the Erosion Control Plans.
5. Maintenance of seeded areas shall be paid for as: 700 Erosion Control.
6. Quantities are shown as estimated project totals. Erosion logs, vehicle tracking pads, gravel bags (inlet protection) along traffic areas and concrete washouts shall be replaced every 3 months or as needed. Silt fence and gravel bags along non-traffic areas shall be replaced every 6 months or as needed.
7. Estimated 3 permanent seeding applications.
8. Estimated project duration is 20 months.

LEGEND

- EROSION LOGS
- INLET PROTECTION-GRAVEL BAGS
- LDA — LIMITS OF DISTURBANCE
- SF — SILT FENCE
- TOP OF FILL
- TOP OF CUT
- STABILIZED CONSTRUCTION ENTRANCE
- SEEDING AND MULCHING



NOTES:

1. EROSIONS CONTROL BMPS ARE NOT TO SCALE
2. CONTRACTOR MAY MOVE VEHICLE TRACKING PADS AND CONCRETE WASH FOR PHASING REQUIREMENTS.
3. ANY DISTURBANCES NOT NOTED IN PLANS ARE AT THE RESPONSIBILITY OF THE CONTRACTOR TO SEED AND ESTABLISH VEGETATION AT THE CONTRACTOR'S EXPENSE.
4. EROSION CONTROL LOGS ARE ALSO USED AS CHECK DAMS AND OUTLET PROTECTION.

811 Know what's below. Call before you dig.

SCALE 0' 50' 100' 200'

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EROSION CONTROL SWMP SITE PLAN			Project No./Code
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Detailer: SDH			17679
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LEGEND

- EROSION LOGS
- INLET PROTECTION-GRAVEL BAGS
- LDA — LIMITS OF DISTURBANCE
- SF — SILT FENCE
- TOP OF FILL
- TOP OF CUT
- STABILIZED CONSTRUCTION ENTRANCE
- SEEDING AND MULCHING

MATCH LINE STA 712+00

MATCH LINE STA 726+00

FUTURE LIGHT RAIL

COUNTY LINE RD

SANTA FE DRIVE

℄ SANTA FE

FLYOVER

℄ FLYOVER

RAMP C

RAMP D

C-470 (EB)

C-470 (WB)

ENGLEWOOD DITCH

PROPOSED DITCH

PERIMETER CONTROL (ROADWAY)

PERIMETER CONTROL (SILT FENCE)

PERIMETER CONTROL (TRAIL)

EXISTING WATER QUALITY POND

LIMITS OF DISTURBANCE

SILT FENCE

STABILIZED CONSTRUCTION ENTRANCE

PROP ROW

235+00 240+00 245+00 540+00 545+00 715+00 720+00 725+00

SCALE 0' 50' 100' 200'

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EROSION CONTROL SWMP SITE PLAN

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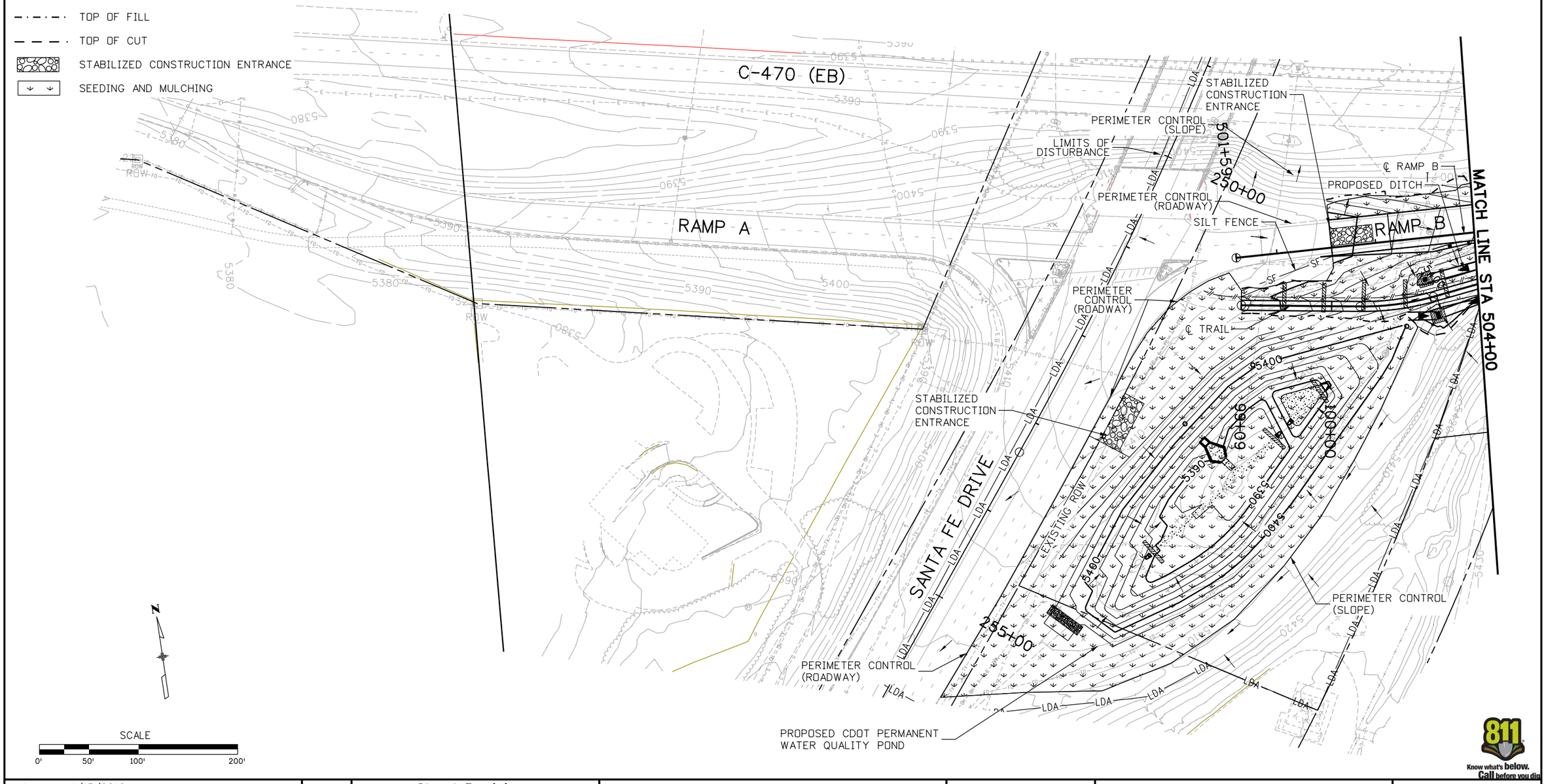
LEGEND

- EROSION LOGS
- INLET PROTECTION-GRAVEL BAGS
- LDA — LIMITS OF DISTURBANCE
- SF — SILT FENCE
- TOP OF FILL
- TOP OF CUT
- STABILIZED CONSTRUCTION ENTRANCE
- SEEDING AND MULCHING



N

SCALE
0' 50' 100' 200'

Know what's below. Call before you dig

Print Date: 1/15/2010	Sheet Revisions	Colorado Department of Transportation	As Constructed
File Name: 14679_pES-P401.dgn	Date: Comments Init.	8833 South Wadsworth Court Littleton, CO 80128 Phone: 303-972-9112 FAX: 303-972-9114	No Revisions:
Horiz. Scale: 1:100 Vert. Scale: As Noted		Region 6 RLB	Revised:
PBSJ 4601 DTC Boulevard Suite 700 Denver, CO 80237			Void:

EROSION CONTROL SWMP SITE PLAN			
Designer: SDH	Structure Numbers		Project No./Code ES6 0852-103
Detailer: SDH			17679
Sheet Subset: EROSION	Subset Sheets: 3 of 7		Sheet Number 126

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LEGEND

- EROSION LOGS
- INLET PROTECTION-GRAVEL BAGS
- LDA — LIMITS OF DISTURBANCE
- SF — SILT FENCE
- TOP OF FILL
- TOP OF CUT
- STABILIZED CONSTRUCTION ENTRANCE
- SEEDING AND MULCHING

Know what's below. Call before you dig.

N

SCALE 0' 50' 100' 200'

MATCH LINE STA 726+00

MATCH LINE STA 504+00

MATCH LINE STA 740+00

SILT FENCE

505+00

510+00

515+00

525+00

105+00

110+00

115+00

PERIMETER CONTROL (ROADWAY)

LIMITS OF DISTURBANCE

C-470 (WB)

C-470 (EB)

PROPOSED DITCH

RAMP B

FLYOVER

TRAIL

PROPOSED WALL

PERIMETER CONTROL (SLOPE)

FUTURE LIGHT RAIL

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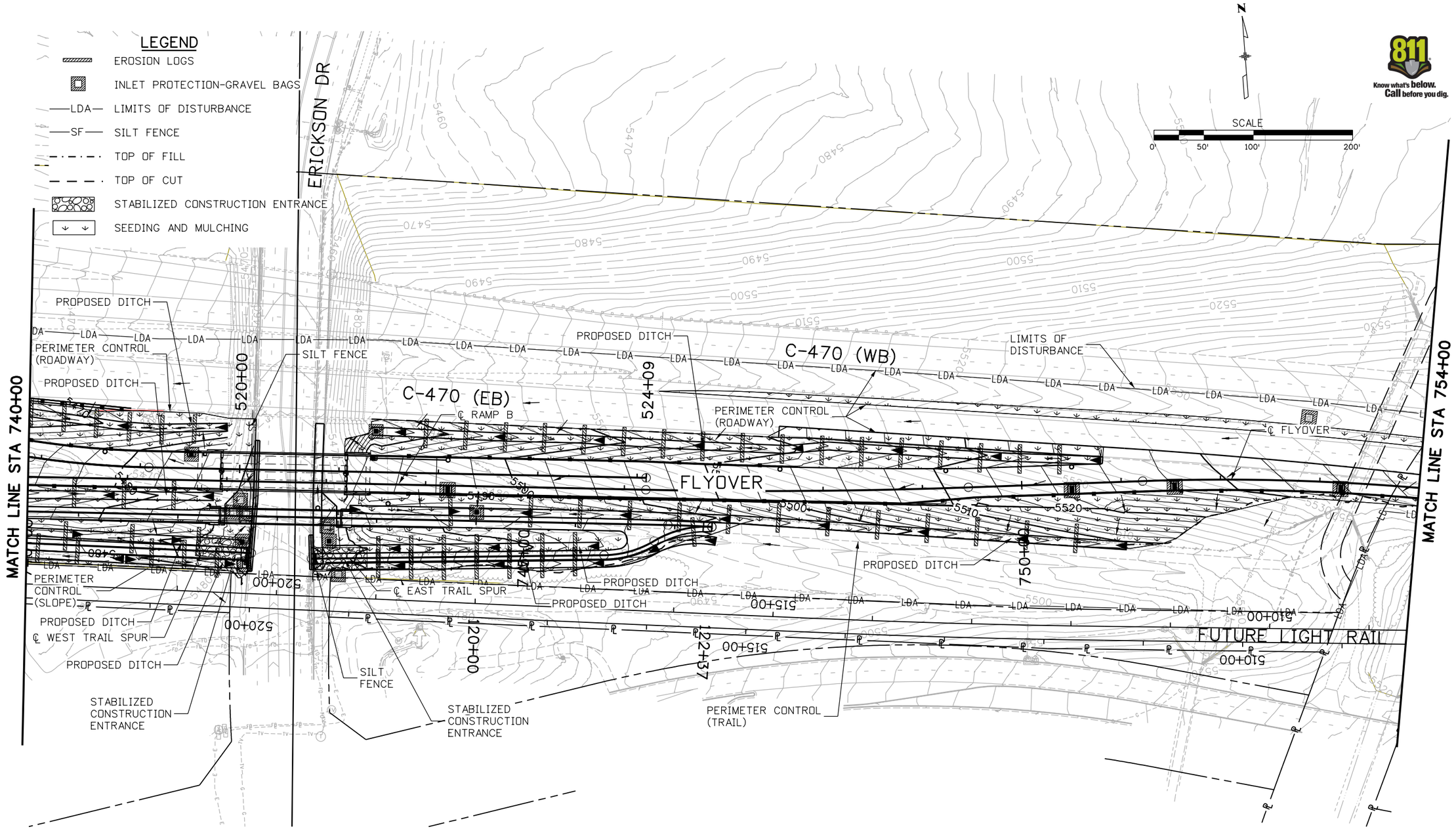
Print Date: 1/15/2010		Sheet Revisions			Colorado Department of Transportation	As Constructed	EROSION CONTROL SWMP SITE PLAN	Project No./Code
File Name: 14679_pES-P703.dgn		Date:	Comments	Init.	8833 South Wadsworth Court Littleton, CO 80128 Phone: 303-972-9112 FAX: 303-972-9114	No Revisions:		ES6 0852-103
Horiz. Scale: 1:100 Vert. Scale: As Noted					Region 6 RLB	Revised:	Designer: SDH / Structure Numbers	17679
PBS&J 4601 DTC Boulevard Suite 700 Denver, CO 80237	0000					Void:	Detailer: SDH / Sheet Subset: EROSION / Subset Sheets: 4 of 7	Sheet Number 127



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File Name: 14679_pES-P704.dgn		Date:	Comments	Init.	8833 South Wadsworth Court Littleton, CO 80128 Phone: 303-972-9112 FAX: 303-972-9114	No Revisions:				ES6 0852-103
Horiz. Scale: 1:100 Vert. Scale: As Noted						Revised:	Designer: SDH	Structure Numbers		17679
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							Sheet Subset: EROSION	Subset Sheets: 5 of 7		

Print Date: 1/15/2010	Sheet Revisions	Colorado Department of Transportation	As Constructed
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		Region 6 RLB	

EROSION CONTROL SWMP SITE PLAN			Project No./Code
Designer: SDH	Structure Numbers		ES6 0852-103
Detailer: SDH			17679
Sheet Subset: EROSION	Subset Sheets: 6 of 7		Sheet Number 129

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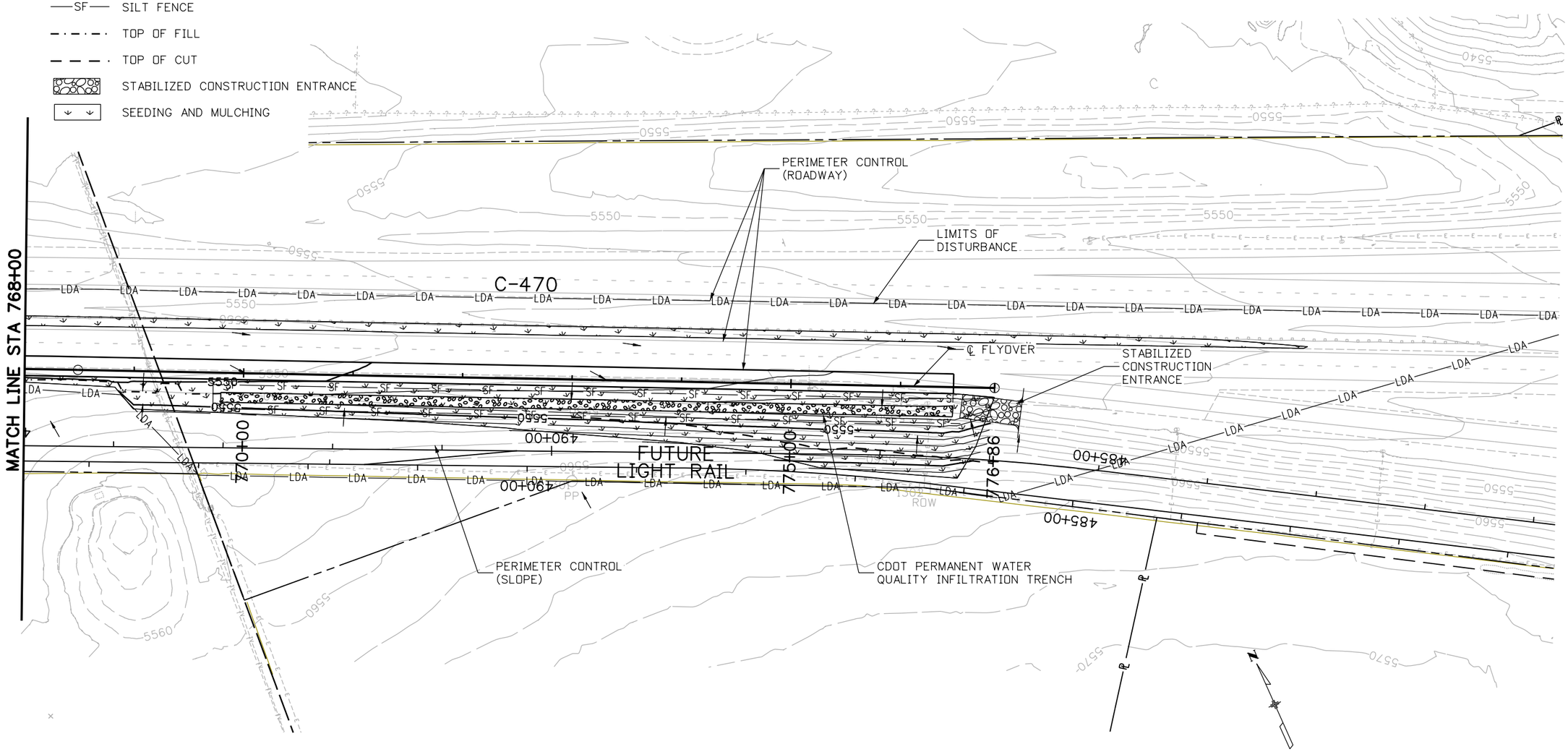
LEGEND

- EROSION LOGS
- INLET PROTECTION-GRAVEL BAGS
- —LDA— LIMITS OF DISTURBANCE
- —SF— SILT FENCE
- TOP OF FILL
- TOP OF CUT
- STABILIZED CONSTRUCTION ENTRANCE
- SEEDING AND MULCHING



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EROSION CONTROL SWMP SITE PLAN

Designer:	SDH	Structure Numbers	
Detailer:	SDH		
Sheet Subset:	EROSION	Subset Sheets:	7 of 7

Project No./Code	
ES6 0852-103	
17679	
Sheet Number	130

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