

Oversight / NHS

FHWA REGION VIII OVERSIGHT?  NO  YES

NATIONAL HIGHWAY SYSTEM?  NO  YES

# DEPARTMENT OF TRANSPORTATION STATE OF COLORADO

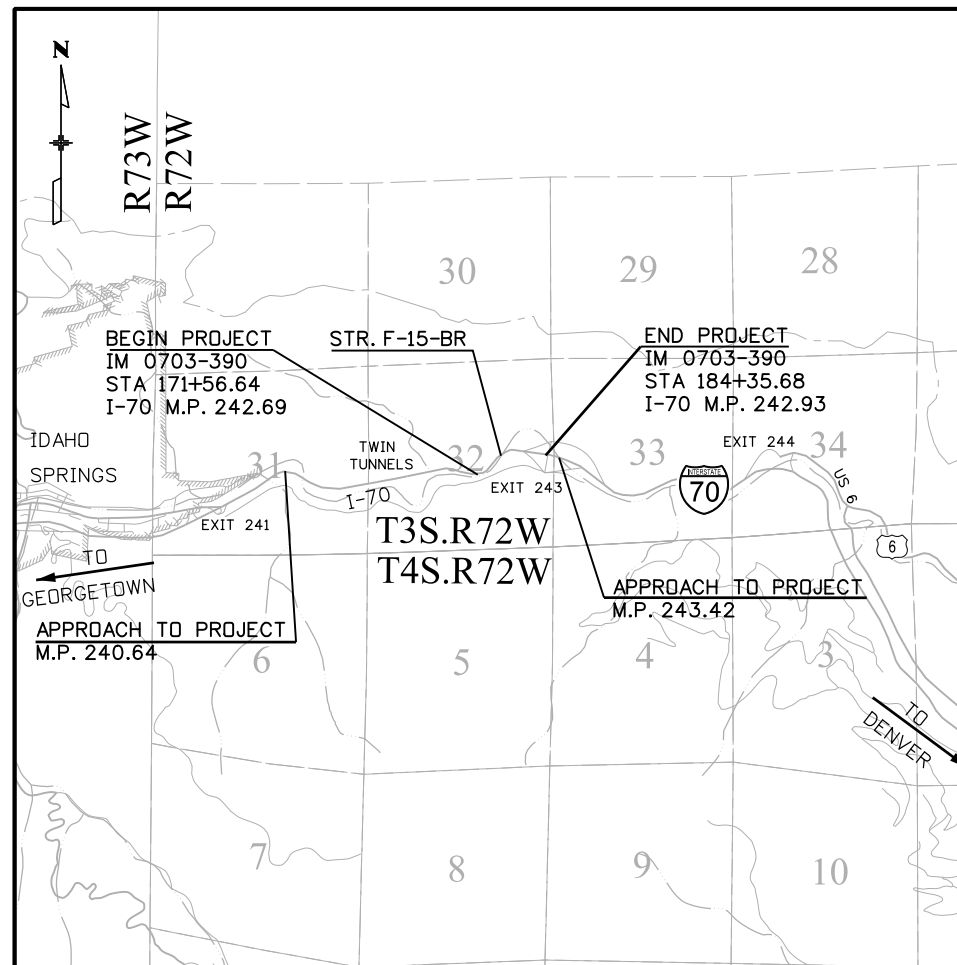
**Related Projects:**  
P. E. UNDER PROJECT: IM 0703-389  
Project Number: 19034  
Project Code:

**R.O.W. Projects:**  
R.O.W. Project Description  
XXXXXXXXXXXXXXXXXX

## HIGHWAY CONSTRUCTION BID PLANS OF PROPOSED FEDERAL AID PROJECT NO. IM 0703-390 TWIN TUNNELS CLEAR CREEK COUNTY CONSTRUCTION PROJECT CODE NO. 19035 CONSTRUCTION PACKAGE 1B

### TABULATION OF LENGTH & DESIGN DATA

STATION	FEET		MAJOR STR.
	I-70	CR 314	
APPROACH TO PROJECT APPROX. M.P. 240.64			
BEGIN IM 0703-390 STA. 171+56.64 ON I-70, M.P. 242.69			
STA. 172+34.24 BEGIN STRUCTURE NO. F-15-BR			305.44
STA. 175+39.67 END STRUCTURE NO. F-15-BR			
BEGIN CR 314 STA. 95+20.46 ON CR 314		759.28	
END CR 314 STA. 102+79.74 ON CR 314			
END IM 0703-390 STA. 184+35.68 ON I-70, M.P. 242.93	1279.04		
APPROACH TO PROJECT APPROX. M.P. 242.42			
<b>TOTAL</b>	1279.04	759.28	305.44
<b>SUMMARY OF PROJECT LENGTH</b>	FEET		MILES
ROADWAY (NET LENGTH)	305.44		0.06
PROJECT GROSS LENGTH	2038.32		0.39
<b>DESIGN DATA</b>	I-70	CR 314	EXIT RAMP 243
MAXIMUM RADIUS OF CURVE	2000 FT.	3000 FT.	800 FT.
MAXIMUM GRADE	1.33%	5.76%	5.51%
MINIMUM S.S.D. HORIZONTAL	345 FT.	223 FT.	425 FT.
MINIMUM S.S.D. VERTICAL	425 FT.	177 FT.	427 FT.
MAXIMUM DESIGN SPEED	50 MPH	25 MPH	50 MPH
2035 DESIGN TRAFFIC	DHV = 6000 ADT = 59,200	DHV = 193 ADT = 1245	-
DHV TRUCK %	4% SUMMER (DHV) OR 8.5% ANNUAL	1.0%	4% SUMMER (DHV) OR 8.5% ANNUAL
CLEAR ZONE DISTANCE (TANGENT)	22 FT.	10 FT.	22 FT.
CLEAR ZONE DISTANCE (MIN. RADIUS)	22 FT.	10 FT.	22 FT.
CONSTRUCTION CLEAR ZONE (MIN 18')	18 FT.	18 FT.	18 FT.



PROJECT LOCATION MAP

SHEET NO.	INDEX OF SHEETS
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5-12	TYPICAL SECTIONS
13-21	SUMMARY OF APPROXIMATE QUANTITIES
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23	TABULATION OF SURFACING
24	SUMMARY OF EARTHWORK AND PAVEMENT DESIGN PARAMETERS
25	SUMMARY OF DRAINAGE ITEMS
26	SURVEY TABULATION
27-32	GEOMETRIC LAYOUTS
33-34	REMOVAL PLANS
35-36	EASTBOUND I-70 PLAN AND PROFILES
37-38	CR 314 PLAN AND PROFILES
39	EXIT 243 OFF RAMP PLAN AND PROFILE
40	ROADWAY DETAILS - GORE DETAIL
41-42	FINAL GRADING AND DRAINAGE PLAN
43	CR 314 STORM SEWER PROFILES
44	DRAINAGE DETAILS - INLET TYPE D (SPECIAL)
45-46	DRAINAGE DETAILS - WATER QUALITY STRUCTURE
47-48	TUNNEL PILLAR BOLTS AND ARCH DOWELS
49-94	STRUCTURES - BRIDGE F-15-BR - EB I-70 OVER CLEAR CREEK
95-99	STRUCTURES - EB I-70 DETOUR OVER CLEAR CREEK
100-117	STRUCTURES - RETAINING WALLS "F", "FF", AND "K"
118	EASTBOUND I-70 DETOUR PLAN AND PROFILE
119	EASTBOUND I-70 DETOUR TEMPORARY GRADING AND DRAINAGE
120	WEST PORTAL DEVELOPMENT GRADING PLAN
121	EAST PORTAL DEVELOPMENT GRADING PLAN
122-125	POTENTIAL ROCK SUPPORT LOCATIONS AND ROCK REINFORCEMENT
126	PORTAL TO PORTAL ACCESS ROAD PLAN AND PROFILE
127	EASTBOUND I-70 TEMPORARY STREAM CROSSING
128-149	ITS PLANS
150	TABULATION OF LIGHTING
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165	TABULATION OF TRAFFIC ENGINEERING ITEMS
166-186	CONSTRUCTION PHASING PLANS
187-188	DETOUR ADVANCED MESSAGING PLANS
189-197	EASTBOUND NIGHTTIME TUNNEL CLOSURE PLANS
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38-43	EXIT 243 OFF RAMP CROSS SECTIONS
44-60	EASTBOUND I-70 DETOUR CROSS SECTIONS
61-74	CONSTRUCTION STAGING AREA CROSS SECTIONS

Print Date: 12/4/2012

File Name: 18832DES\_CP1B\_TitleSht.dgn

Horiz. Scale: 1:1      Vert. Scale: NA

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Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation

425 A Corporate Circle  
Golden, CO 80401  
Phone: 720-497-6918 FAX: 720-497-6901

Region 1 CRC

**As Constructed**

No Revisions: \_\_\_\_\_

Revised: \_\_\_\_\_

Void: \_\_\_\_\_

**Contract Information**

Contractor: \_\_\_\_\_

Resident Engineer: \_\_\_\_\_

Project Engineer: \_\_\_\_\_

PROJECT STARTED: \_\_\_\_\_ ACCEPTED: \_\_\_\_\_

Comments: \_\_\_\_\_

**Project No./Code**

IM 0703-390

19035

Sheet Number 1



17543 1:25:20 PM c:\pw\_work\pbes\pml\common\dms25924\18832DES\_CPIB\_StdPlanList.dgn

PLAN NUMBER	NEW OR REVISED	M STANDARD TITLE	PAGE NUMBER	PLAN NUMBER	NEW OR REVISED	M STANDARD TITLE	PAGE NUMBER	PLAN NUMBER	NEW OR REVISED	S STANDARD TITLE	PAGE NUMBER
<input checked="" type="checkbox"/>		M-100-1 STANDARD SYMBOLS (3 SHEETS).....	1-3	<input type="checkbox"/>		M-607-1 WIRE FENCES AND GATES (3 SHEETS).....	100-102	<input type="checkbox"/>		S-612-1 DELINEATOR INSTALLATIONS (7 SHEETS).....	151-157
<input checked="" type="checkbox"/>		M-100-2 ACRONYMS AND ABBREVIATIONS (4 SHEETS).....	4-7	<input type="checkbox"/>		M-607-2 CHAIN LINK FENCE (3 SHEETS).....	103-105	<input type="checkbox"/>	<input type="checkbox"/>	S-614-1 GROUND SIGN PLACEMENT (2 SHEETS) (REVISED ON JULY 24, 2012).....	<del>158-159</del>
<input type="checkbox"/>		M-203-1 APPROACH ROADS.....	8	<input type="checkbox"/>		M-607-3 BARRIER FENCE.....	106	<input checked="" type="checkbox"/>		S-614-2 CLASS I SIGNS.....	160
<input type="checkbox"/>		M-203-2 DITCH TYPES.....	9	<input type="checkbox"/>		M-607-4 DEER FENCE AND GATES (3 SHEETS).....	107-109	<input type="checkbox"/>		S-614-3 CLASS II SIGNS.....	161
<input checked="" type="checkbox"/>		M-203-11 SUPERELEVATION CROWNED AND DIVIDED HIGHWAYS (3 SHEETS).....	10-12	<input type="checkbox"/>		M-607-10 PICKET SNOW FENCE.....	110	<input type="checkbox"/>		S-614-4 CLASS III SIGNS (3 SHEETS).....	162-164
<input type="checkbox"/>		M-203-12 SUPERELEVATION STREETS (2 SHEETS).....	13-14	<input type="checkbox"/>		M-607-15 ROAD CLOSURE GATE (9 SHEETS).....	111-119	<input type="checkbox"/>		S-614-5 BREAK-AWAY SIGN SUPPORT DETAILS FOR GROUND SIGNS (2 SHEETS).....	165-166
<input checked="" type="checkbox"/>		M-206-1 EXCAVATION AND BACKFILL FOR STRUCTURES (2 SHEETS).....	15-16	<input type="checkbox"/>		M-608-1 CURB RAMPS (6 SHEETS).....	120-125	<input type="checkbox"/>		S-614-6 CONCRETE FOOTINGS AND SIGN ISLANDS FOR CLASS III SIGNS (2 SHEETS).....	167-168
<input checked="" type="checkbox"/>		M-206-2 EXCAVATION AND BACKFILL FOR BRIDGES (2 SHEETS).....	17-18	<input type="checkbox"/>	<input checked="" type="checkbox"/>	M-609-1 CURBS, GUTTERS, AND SIDEWALKS (4 SHEETS) (REVISED ON JULY 24, 2012).....	<del>126-129</del>	<input type="checkbox"/>		S-614-8 TUBULAR STEEL SIGN SUPPORT DETAILS (5 SHEETS).....	169-173
<input type="checkbox"/>		M-208-1 TEMPORARY EROSION CONTROL (12 SHEETS).....	19-30	<input type="checkbox"/>		M-611-1 CATTLE GUARD (2 SHEETS).....	130-131	<input type="checkbox"/>		S-614-9 PEDESTRIAN PUSH BUTTON POST ASSEMBLY.....	174
<input type="checkbox"/>		M-210-1 MAILBOX SUPPORTS (2 SHEETS).....	31-32	<input checked="" type="checkbox"/>		M-613-1 ROADWAY LIGHTING (4 SHEETS).....	132-135	<input type="checkbox"/>		S-614-10 MARKER ASSEMBLY INSTALLATIONS.....	175
<input type="checkbox"/>		M-214-1 PLANTING DETAILS.....	33	<input type="checkbox"/>		M-614-1 RUMBLE STRIPS (3 SHEETS).....	136-138	<input type="checkbox"/>		S-614-11 MILEPOST SIGN DETAIL FOR HIGH SNOW AREAS.....	176
<input type="checkbox"/>	<input type="checkbox"/>	M-412-1 CONCRETE PAVEMENT JOINTS (5 SHEETS) (REVISED ON JULY 24, 2012).....	<del>34-38</del>	<input type="checkbox"/>		M-614-2 SAND BARREL ARRAYS (2 SHEETS).....	139-140	<input checked="" type="checkbox"/>		S-614-12 STRUCTURE NUMBER INSTALLATION.....	177
<input type="checkbox"/>		M-510-1 STRUCTURAL PLATE PIPE H-20 LOADING.....	39	<input type="checkbox"/>		M-615-1 EMBANKMENT PROTECTOR TYPE 3.....	141	<input type="checkbox"/>		S-614-14 FLASHING BEACON AND SIGN INSTALLATIONS (3 SHEETS).....	178-180
<input type="checkbox"/>		M-601-1 SINGLE CONCRETE BOX CULVERT (2 SHEETS).....	40-41	<input type="checkbox"/>		M-615-2 EMBANKMENT PROTECTOR TYPE 5.....	142	<input type="checkbox"/>		S-614-15 TYPICAL POLE MOUNT SIGN INSTALLATIONS.....	181
<input type="checkbox"/>		M-601-2 DOUBLE CONCRETE BOX CULVERT (2 SHEETS).....	42-43	<input type="checkbox"/>		M-616-1 INVERTED SIPHON.....	143	<input type="checkbox"/>		S-614-20 CONCRETE BARRIER SIGN POST INSTALLATIONS.....	182
<input type="checkbox"/>		M-601-3 TRIPLE CONCRETE BOX CULVERT (2 SHEETS).....	44-45	<input type="checkbox"/>		M-620-1 FIELD LABORATORY CLASS 1.....	144	<input type="checkbox"/>		S-614-21 TYPICAL MULTI-SIGN INSTALLATIONS.....	183
<input type="checkbox"/>		M-601-10 HEADWALL FOR PIPES.....	46	<input checked="" type="checkbox"/>		M-620-2 FIELD LABORATORY CLASS 2 (2 SHEETS).....	145-146	<input type="checkbox"/>		S-614-22 TYPICAL TRAFFIC SIGNAL INSTALLATION DETAILS (5 SHEETS).....	184-188
<input type="checkbox"/>		M-601-11 TYPE "S" SADDLE HEADWALLS FOR PIPE.....	47	<input type="checkbox"/>		M-620-11 FIELD OFFICE CLASS 1.....	147	<input type="checkbox"/>		S-614-40 ALTERNATIVE TRAFFIC SIGNAL INSTALLATION DETAILS (4 SHEETS).....	189-192
<input type="checkbox"/>		M-601-12 HEADWALLS AND PIPE OUTLET PAVING.....	48	<input checked="" type="checkbox"/>		M-620-12 FIELD OFFICE CLASS 2.....	148	<input type="checkbox"/>		S-614-41 PEDESTAL POLE AND TEMPORARY SPAN WIRE SIGNALS.....	193
<input type="checkbox"/>		M-601-20 WINGWALLS FOR PIPE OR BOX CULVERTS.....	49	<input type="checkbox"/>		M-629-1 SURVEY MONUMENTS (2 SHEETS).....	149-150	<input type="checkbox"/>		S-614-42 CABINET FOUNDATION DETAIL (4 SHEETS).....	194-197
<input type="checkbox"/>		M-603-1 METAL PIPE (4 SHEETS).....	50-53					<input type="checkbox"/>		S-614-43 TRAFFIC LOOP AND MISCELLANEOUS SIGNAL DETAILS (10 SHEETS).....	198-207
<input checked="" type="checkbox"/>		M-603-2 REINFORCED CONCRETE PIPE.....	54					<input type="checkbox"/>		S-614-50 STATIC SIGN MONOTUBE STRUCTURES (12 SHEETS).....	208-219
<input type="checkbox"/>		M-603-3 PRECAST CONCRETE BOX CULVERT.....	55					<input type="checkbox"/>		S-614-60 DYNAMIC SIGN MONOTUBE STRUCTURES (14 SHEETS).....	220-233
<input type="checkbox"/>		M-603-4 CORRUGATED POLYETHYLENE PIPE (AASHTO M294).....	56					<input checked="" type="checkbox"/>		S-627-1 PAVEMENT MARKINGS (5 SHEETS).....	234-238
<input type="checkbox"/>		M-603-5 POLYVINYL CHLORIDE (PVC) PIPE (AASHTO M304).....	57					<input checked="" type="checkbox"/>		S-630-1 TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION (20 SHEETS).....	239-258
<input checked="" type="checkbox"/>		M-603-10 CONCRETE AND METAL END SECTIONS (2 SHEETS).....	58-59					<input checked="" type="checkbox"/>		S-630-2 BARRICADES, DRUMS, CONCRETE BARRIERS (TEMP.) AND VERTICAL PANELS.....	259
<input type="checkbox"/>		M-604-10 INLET, TYPE C.....	60					<input checked="" type="checkbox"/>		S-630-3 FLASHING BEACON (PORTABLE) DETAILS.....	260
<input checked="" type="checkbox"/>		M-604-11 INLET, TYPE D.....	61					<input checked="" type="checkbox"/>		S-630-4 STEEL SIGN SUPPORT (TEMPORARY) INSTALLATION DETAILS (2 SHEETS).....	261-262
<input type="checkbox"/>		M-604-12 CURB INLET TYPE R (2 SHEETS).....	62-63					<input type="checkbox"/>		S-630-5 PORTABLE RUMBLE STRIPS (TEMPORARY) (2 SHEETS).....	263-264
<input checked="" type="checkbox"/>		M-604-13 CONCRETE INLET TYPE 13.....	64					<input checked="" type="checkbox"/>		S-630-6 EMERGENCY PULL-OFF AREA (TEMPORARY).....	265
<input type="checkbox"/>		M-604-20 MANHOLES (3 SHEETS).....	65-67					<input type="checkbox"/>		S-630-7 ROLLING ROADBLOCKS FOR TRAFFIC CONTROL (3 SHEETS).....	266-268
<input type="checkbox"/>		M-604-25 VANE GRATE INLET (5 SHEETS).....	68-72								
<input checked="" type="checkbox"/>		M-605-1 SUBSURFACE DRAINS.....	73								
<input checked="" type="checkbox"/>		M-606-1 GUARDRAIL TYPE 3 W-BEAM (19 SHEETS).....	74-92								
<input checked="" type="checkbox"/>		M-606-13 GUARDRAIL TYPE 7 F-SHAPE BARRIER (4 SHEETS).....	93-96								
<input checked="" type="checkbox"/>		M-606-14 PRECAST TYPE 7 CONCRETE BARRIER (3 SHEETS).....	97-99								

**COLORADO**  
 DEPARTMENT OF TRANSPORTATION  
**M&S STANDARDS PLANS LIST**  
 July 04, 2012  
 Revised on July 24, 2012

THE STANDARD PLAN SHEETS INDICATED HEREON BY A MARKED BOX ARE TO BE USED TO CONSTRUCT THIS PROJECT.

ALL OF THE M&S STANDARD PLANS, AS SUPPLEMENTED AND REVISED, APPLY TO THIS PROJECT WHEN USED BY DESIGNATED PAY ITEM OR SUBSIDIARY ITEM.

Print Date: 11/30/2012	0000	<b>Sheet Revisions</b>			Colorado Department of Transportation				<b>As Constructed</b>		<b>STANDARD PLANS LIST</b>				<b>Project No./Code</b>	
File Name: 18832DES_CPIB_StdPlanList.dgn		Date:	Comments	Init.	 425 A Corporate Circle Golden, CO 80401 Phone: 720-497-6918 FAX: 720-497-6901				No Revisions:		Designer: E. Marsh Detailer: J. Gellner Subset: SPL				IM 0703-390	
Horiz. Scale: 1:1 Vert. Scale:									Revised:						Structure Numbers	
 4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276				<b>Region 1</b>				Void:		Subset Sheets: 1 of 1				Sheet Number 2		



**GENERAL NOTES:**

1. PROJECT BENCHMARK: ALL ELEVATIONS SHOWN ON THESE PLANS ARE REFERENCED TO THE PROJECT BENCHMARKS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SAFEGUARDING THE PROJECT BENCHMARKS AND OTHER SURVEY MONUMENTS. DAMAGED MONUMENTS SHALL BE RE-ESTABLISHED AND REPLACED BY THE LICENSED LAND SURVEYOR AT THE EXPENSE OF THE CONTRACTOR.
2. SURVEY CONTROL DIAGRAM IS NOT INCLUDED FOR THIS PROJECT. THE CONTRACTOR SHALL REFER TO TWIN TUNNELS CONSTRUCTION PACKAGE 1A; PROJECT NO: IM 0703-389; PROJECT CODE: 19034 FOR SURVEY CONTROL INFORMATION.
3. GEOTECHNICAL INFORMATION AND PAVEMENT STRUCTURAL SECTIONS FOR THIS PROJECT ARE BASED ON THE GEOTECHNICAL ENGINEERING REPORT PREPARED BY YEH AND ASSOCIATES. THE CONTRACTOR SHALL PERFORM WORK IN ACCORDANCE WITH THE GEOTECHNICAL RECOMMENDATIONS.
4. IN THE EVENT THE CONTRACTOR ALLOWS, AUTHORIZES, APPROVES, OR CONSTRUCTS ITEMS THAT DIFFER FROM THE APPROVED PLANS, SPECIFICATIONS, OR OTHER CONTRACT DOCUMENTS WITHOUT WRITTEN APPROVAL BY THE ENGINEER, THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY LIABILITY ARISING FROM SUCH CHANGES.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROMPTLY NOTIFYING THE ENGINEER OF ANY PROBLEMS OR POTENTIAL PROBLEMS IN CONFORMING TO THE DESIGN LINE AND GRADE FOR ANY ELEMENT OF THE CONSTRUCTION WITHIN 7 DAYS. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING THE ENGINEER OF SITE CONDITIONS THAT DIFFER FROM THOSE SHOWN ON THE APPROVED PLANS.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING SAFEGUARDS, SAFETY DEVICES, PROTECTIVE EQUIPMENT, AND ANY OTHER NEEDED ACTION TO PROTECT THE LIFE, HEALTH, AND SAFETY OF THE PUBLIC AND TO PROTECT PROPERTY IN CONNECTION WITH THE PERFORMANCE OF WORK COVERED BY THE CONTRACTOR.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE JOB SITE CONDITIONS THROUGHOUT THE DURATION OF CONSTRUCTION, INCLUDING SAFETY OF ALL PERSONS AND PROTECTION OF PROPERTY. THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED ONLY TO WORKING HOURS. THE CONTRACTOR SHALL DEFEND INDEMNIFY AND HOLD THE OWNER, THE ENGINEER AND THE GOVERNING JURISDICTION HARMLESS FOR ANY AND ALL LIABILITY, IN CONNECTION WITH THE PERFORMANCE OF WORK, EXCEPT FOR LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF THE OWNER, THE ENGINEER, OR THE GOVERNING JURISDICTION.
8. THE CONTRACTOR SHALL HAVE IN HIS POSSESSION AT ALL TIMES THE APPROPRIATE EDITION OF THE GOVERNING JURISDICTION DESIGN AND CONSTRUCTION STANDARDS, ONE SET OF APPROVED CONSTRUCTION PLANS, THE STORM WATER MANAGEMENT PLAN, AND ALL REQUIRED PERMITS.
9. ALL CONSTRUCTION SHALL CONFORM TO THE APPROPRIATE EDITION OF THE SPECIFICATIONS OF THE COLORADO DEPARTMENT OF TRANSPORTATION, AND THE STANDARDS APPLICABLE TO ELEMENTS OF WORK NOT COVERED BY LOCAL AGENCY STANDARDS AND SPECIFICATIONS. REQUIREMENTS OF THE COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT, THE ENVIRONMENTAL PROTECTION AGENCY, FEMA, AND THE U.S. ARMY CORPS OF ENGINEERS SHALL ALSO BE FOLLOWED AS THEY RELATE TO THE WORK. THIS INCLUDES ADHERENCE TO ALL TERMS AND CONDITIONS OF THE AIR POLLUTANT CONTROL DIVISION'S GENERAL CONSTRUCTION PERMIT FOR LAND DEVELOPMENT PROJECTS.
10. 40 HOURS OF LABORER HAVE BEEN INCLUDED FOR NEEDS THAT MAY ARISE DURING CONSTRUCTION. THESE HOURS ARE IN ADDITION TO OTHER LABORER HOURS THAT HAVE BEEN INCLUDED FOR SPECIFIC CONSTRUCTION ACTIVITIES. THE USE OF THESE QUANTITIES WILL BE AT THE SOLE DISCRETION OF THE ENGINEER.
11. THE CONTRACTOR'S STOCKPILE LOCATIONS WITHIN THE PROJECT LIMITS SHALL BE APPROVED BY THE ENGINEER.
12. TREE REMOVAL IS TABULATED IN THE PLANS IN TWO LOCATIONS. SEE TABULATION OF REMOVALS FOR TREE REMOVAL THAT SHALL BE PAID BY THE EACH. SEE THE PORTAL TO PORTAL ACCESS ROAD PLAN SHEET AND TABULATION FOR TREE REMOVAL THAT SHALL NOT BE PAID FOR SEPERATELY BUT INCLUDED IN THE COST OF ITEM 621-00200 HAUL ROAD.
13. ALL TREES GREATER THAN 8 INCHES IN DIAMETER SHALL BE REMOVED IN A MANNER THAT KEEPS THE ROOT BALLS AND STUMPS (APPROXIMATELY 12 TO 14 FEET) INTACT. THE TREES SHALL BE STOCKPILED FOR USE IN CONSTRUCTION PACKAGE 3A OR CONSTRUCTION PACKAGE 3B. STOCKPILING WILL NOT BE PAID FOR SEPERATELY BUT SHALL BE INCLUDED IN ITEM 202-00010 REMOVAL OF TREE.
14. ALL ROCK BOULDERS GREATER THAN 2 FEET X 2 FEET SHALL BE STOCKPILED FOR USE IN CONSTRUCTION PACKAGE 3A OR CONSTRUCTION PACKAGE 3B. IT IS ASSUMED THAT 100 BOULDERS WILL BE STOCKPILED. 20 BACKHOE (SPECIAL) HOURS AND 20 TRUCK (DUMP) HOURS HAVE BEEN INCLUDED FOR THIS WORK.
15. THE CONTRACTOR SHALL ENSURE DAILY THAT THE TRAVELED WAY IS FREE FROM GUARDRAIL GAPS, BLUNT ENDS, ETC. DURING CONSTRUCTION. ALL METHODS PERTAINING TO THESE ISSUES SHALL BE APPROVED BY THE ENGINEER.
16. THE CONTRACTOR SHALL MAINTAIN EXISTING DRAINAGE AT ALL TIMES DURING CONSTRUCTION. TEMPORARY ITEMS REQUIRED TO PROVIDE DRAINAGE SHALL NOT BE PAID FOR SEPERATELY BUT SHALL BE INCLUDED IN THE COST OF THE WORK.
17. IT IS ANTICIPATED THAT 26 HOURS (TOTAL) WILL BE NEEDED FOR POTHOLING. 6 HOURS ARE INCLUDED IN THE ITS TABULATION AND 20 HOURS ARE ESTIMATED FOR VARIOUS POTHOLING REQUIREMENTS FOR THE PROJECT.

**GENERAL NOTES CONTINUED:**

18. FOR PRELIMINARY PLAN QUANTITIES OF MATERIALS, THE FOLLOWING RATES OF APPLICATION WERE USED:  
 TACK COAT DILUTED EMULSIFIED ASPHALT.....@ 0.10 GALS./SQ. YD. (DILUTED)  
 HOT MIX ASPHALT.....@ 110 LBS./SQ. YD./INCH  
 AGGREGATE BASE COURSE (CLASS 6).....@ 133 LBS./CU. FT.
19. IT IS ANTICIPATED THAT 40 HOURS OF ROCK SCALER WILL BE REQUIRED FOR THIS PROJECT.
20. IT IS ANTICIPATED THAT 1 LUMP SUM DEWATERING WILL BE REQUIRED FOR THIS PROJECT.
21. IT IS ANTICIPATED THAT 1 LUMP SUM TUNNEL FORMWORK (FURNISH ONLY) WILL BE REQUIRED FOR THIS PROJECT. SEE ITEM 601-25905 TUNNEL FORMWORK (FURNISH ONLY) PROJECT SPECIFICATION FOR ADDITIONAL REQUIREMENTS.

**ENVIRONMENTAL / FENCING NOTES:**

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING EXISTING WETLANDS DURING CONSTRUCTION. PRIOR TO CONSTRUCTION, THE CONTRACTOR AND CDOT BIOLOGISTS WILL STAKE OUT WETLAND LOCATIONS TO BE PROTECTED BY TEMPORARY ORANGE FENCE. A NATIONWIDE PERMIT #14 (NOW-2011-1778-DEN) HAS BEEN ISSUED FOR THE PROJECT. THE CONTRACTOR SHALL BE SUBJECT TO ITS CONDITIONS.
2. THE PROJECT HAS RECEIVED A SENATE BILL 40 CERTIFICATION FROM THE COLORADO DIVISION OF PARKS AND WILDLIFE. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL THE TERMS AND CONDITIONS OF THE CERTIFICATION WHILE WORKING IN CLOSE PROXIMITY TO THE RIPARIAN HABITAT.
3. DURING CONSTRUCTION AND OPERATION OF THE PORTAL TO PORTAL ACCESS ROAD, THE CONTRACTOR SHALL INSTALL TEMPORARY FENCING TO DELINEATE AND PROTECT RIPARIAN HABITAT (PARTICULARLY OLDER COTTONWOODS AND RIVER BIRCH) IN THE VICINITY OF THE ACCESS ROAD THAT ARE NOT AFFECTED BY THE ACCESS ROAD FOOTPRINT. FOR MINIMAL PROTECTION OF TREES OLDER THAN 4 YEARS OUTSIDE OF THE DIRECT IMPACT AREA OF THE CONSTRUCTION ACCESS ROAD, THE CONTRACTOR SHALL INSTALL BARRICADES BEYOND THE DRIPLINE. FOR EACH INCH OF DIAMETER OF THE TREE'S TRUNK, THE PROTECTION AREA WILL BE EXTENDED AN ADDITIONAL FOOT. FOR ADDITIONAL PROTECTION, A LAYER OF WOOD CHIPS (4 TO 6 INCHES DEEP) SHALL BE PLACED AROUND EACH TREE PRIOR TO PLACEMENT OF THE BARRICADES. FENCING AND BARRICADES SHALL BE PAID UNDER ITEM 607-11580 FENCE (TEMPORARY). WOOD CHIPS WILL NOT BE PAID FOR SEPERATELY BUT SHALL BE INCLUDED IN THE COST OF ITEM 621-00200 HAUL ROAD.
4. THE CONTRACTOR SHALL INSTALL TEMPORARY ORANGE FENCE AT CONSTRUCTION AREAS THAT ARE NEAR THE BANKS OF CLEAR CREEK TO PREVENT ACCESS TO ANGLERS OR PEDESTRIANS.
5. THE CONTRACTOR SHALL FENCE LOCALLY IMPORTANT SITES TO PROTECT THEM FROM CONSTRUCTION DAMAGE. IF THE CONTRACTOR STAGES AT THE CITY OF IDAHO SPRINGS PROPERTY, THE CONTRACTOR SHALL FENCE AND PROTECT THE HISTORIC MINE SHAFT REMNANTS ON THE NORTHWEST PART OF THE PROPERTY. CONTRACTOR SHALL AVOID DISTURBANCE TO THIS LOCALLY IMPORTANT SITE.
6. A HEALTH AND SAFETY MANAGEMENT PLAN IS REQUIRED FOR THIS PROJECT. THE CONTRACTOR SHALL IMPLEMENT THIS PLAN IN ALL REQUIRED INSTANCES AND ALSO IF MINE WASTES ARE DISCOVERED. POSSIBLE MINE WASTES SITES HAVE BEEN IDENTIFIED AT THE WEST PORTAL (EAST OF OLD US 40) AND NEAR HIDDEN VALLEY INTERCHANGE (APPROXIMATE STA 174+00 TO 182+00).
7. THE CONTRACTOR SHALL USE SPOTTERS FOR BRIDGE CONSTRUCTION THAT OCCURS DURING RAFTING SEASON. THE CONTRACTOR SHALL STATION A SPOTTER UPSTREAM OF BRIDGE CONSTRUCTION TO ALERT RAFTERS/BOATERS OF THE CONSTRUCTION AND TO ALSO ALERT CONSTRUCTION CREWS OF APPROACHING RAFTS/BOATS.
8. IF CDOT RECIEVES COMPLAINTS FROM NEARBY RESIDENTS ABOUT NIGHTTIME CONSTRUCTION NOISE, THE CONTRACTOR SHALL MONITOR THE NOISE AT RESIDENTS IMMEDIATELY ADJACENT TO THE CONSTRUCTION ACTIVITIES. IF HOURLY EQUIVALENT NOISE THRESHOLD LEVELS EXCEEDS 66 dba BETWEEN 10 PM AND 7 AM, CDOT SHALL PROVIDE AFFECTED RESIDENTS HOTEL VOUCHERS FOR THE DURATION OF THE CONSTRUCTION ACTIVITY CAUSING ELEVATED NOISE LEVELS. THE COST OF MONITORING AND HOTEL VOUCHERS WILL BE PAID UNDER ITEM 700-73352 F/A HOTEL VOUCHERS.
9. THE EXISTING CHAIN STATION SHALL BE ACCESSIBLE AT ALL TIMES DURING CONSTRUCTION ACTIVITIES.
10. THE CONTRACTOR SHALL NOT STAGE OR STOCKPILE MATERIALS WITHIN 50 FEET OF WETLANDS AND CLEAR CREEK WHERE POSSIBLE.
11. THE CONTRACTOR SHALL CONSIDER THE USE OF ALTERNATIVE FUELS AND ASPHALT BINDERS WHEN POSSIBLE.
12. THE CONTRACTOR SHALL PERFORM REGULAR MAINTENANCE ON CONSTRUCTION VEHICLES TO REDUCE EMISSIONS AND HAVE MUFFLERS MAINTAINED TO REDUCE NOISE.
13. THE CONTRACTOR SHALL MAINTAIN PARKING AND PUBLIC ACCESS AT KERMITTS TRAILHEAD AND BOAT LAUNCH DURING CONSTRUCTION.

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Print Date: 11/30/2012		<b>Sheet Revisions</b>			<b>Colorado Department of Transportation</b>		<b>As Constructed</b>		<b>GENERAL NOTES</b>			<b>Project No./Code</b>			
File Name: 18832DES_CP1B_GenNote01.dgn		Date:	Comments	Init.	 425 A Corporate Circle Golden, CO 80401 Phone: 720-497-6918 FAX: 720-497-6901		No Revisions:		Designer: E. Marsh Detailer: J. Gellner Subset: Gen Notes			IM 0703-390			
Horiz. Scale: 1:1      Vert. Scale: NA							Revised:					Structure Numbers		19035	
<b>ATKINS</b> 4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276							Void:					Subset Sheets: 1 of 2		Sheet Number 3	
					<b>Region 1</b>		<b>CRC</b>								

**PAVEMENT CONSTRUCTION:**

1. DILUTED EMULSIFIED ASPHALT FOR TACK COAT SHALL CONSIST OF 1 PART EMULSIFIED ASPHALT AND 1 PART WATER.
2. REJUVENATING AGENT, IF REQUIRED, WILL BE APPLIED AS SEAL COAT AT THE TIME OF CONSTRUCTION.
3. WATER SHALL BE USED AS A DUST PALLIATIVE WHERE REQUIRED. LOCATIONS SHALL BE AS DIRECTED BY THE ENGINEER. WATER WILL NOT BE MEASURED AND PAID FOR SEPARATELY BUT SHALL BE INCLUDED IN THE COST OF THE WORK.
4. THE FOLLOWING SHALL BE FURNISHED WITH EACH BITUMINOUS PAVER AND SHALL BE USED ON ALL PASSES AND LIFTS OF HOT MIX ASPHALT:
  1. A SKI TYPE DEVICE AT LEAST 30 FEET IN LENGTH.
  2. SHORT SKI OR SHOE.
5. PRIOR TO PLACING THE TOP LIFT OF HOT MIX ASPHALT, THE SURFACE SHALL BE SWEEPED AND CLEANED. THIS WILL NOT BE MEASURED AND PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE COST OF THE ITEM 403 HOT MIX ASPHALT.
6. ASPHALT JOINTS SHALL FALL ON LANE LINES, SHOULDER LINES, OR MEDIAN LINES, EXCEPT WHERE STATED IN THE PLANS.
7. THE CONTRACTOR SHALL NOT PARK ANY VEHICLES IN ANY AREAS NOT APPROVED BY THE ENGINEER.
8. WHERE NEW PAVEMENT IS TO ABUT EXISTING PAVEMENT, THE EXISTING PAVEMENT SHALL BE REMOVED TO A NEAT VERTICAL LINE USING A CUTTING SAW OR OTHER METHOD AS APPROVED BY THE ENGINEER. SAW CUTTING ASPHALT WILL NOT BE PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE COST OF REMOVAL OF ASPHALT MAT.
9. THE CONTRACTOR SHALL PLACE SHOULDERING MATERIAL TO THE TOP OF THE NEW MAT WITHIN 24 HOURS OF PLACEMENT OF THE TOP MAT.
10. SHOULDERING MATERIAL SHALL BE PLACED BY A SHOULDERING MACHINE OR A METHOD APPROVED BY THE ENGINEER. THIS MATERIAL SHALL BE COMPACTED AS PLACED. NO MATERIAL SHALL BE PLACED UNLESS IT CAN BE COMPACTED THAT DAY.
11. SWEEPING OPERATIONS REQUIRED FOR REMOVAL OF ASPHALT MAT WILL NOT BE PAID FOR SEPERATELY, BUT SHALL BE INCLUDED IN THE COST OF THE WORK.


**EARTHWORK/GRADING**

1. MOISTURE-DENSITY CONTROL WILL BE REQUIRED FOR THE FULL DEPTH OF ALL EMBANKMENTS ON THIS PROJECT.
2. DEPTH OF MOISTURE-DENSITY CONTROL FOR THIS PROJECT SHALL BE AS FOLLOWS:  
BASES OF CUTS AND FILLS 1.0 FEET
3. EXCAVATION REQUIRED FOR COMPACTION OF BASES OF CUTS AND FILLS WILL BE CONSIDERED AS SUBSIDIARY TO THAT OPERATION AND WILL NOT BE PAID FOR SEPARATELY.
4. GRADING AND SLOPE STABILITY SHALL BE INSPECTED BY THE ENGINEER DURING ALL EXCAVATIONS TO EVALUATE CHANGING CONDITIONS.
5. TYPE OF COMPACTION FOR THIS PROJECT WILL BE AASHTO T-180.
6. ALL REMOVED MATERIAL NOT APPROVED FOR USE ON THE PROJECT WILL BECOME THE PROPERTY OF THE CONTRACTOR, IN ACCORDANCE WITH SECTION 202 OF THE CDOT STANDARD SPECIFICATION. THE REMOVED MATERIAL SHALL BE DISPOSED OFF PROJECT LIMITS WITHIN 60 (SIXTY) DAYS OF REMOVAL AND PROCESSING.
7. NO CONSTRUCTION ACTIVITIES IN CLEAR CREEK UNLESS APPROVED BY THE ENGINEER.

**UTILITY NOTES**

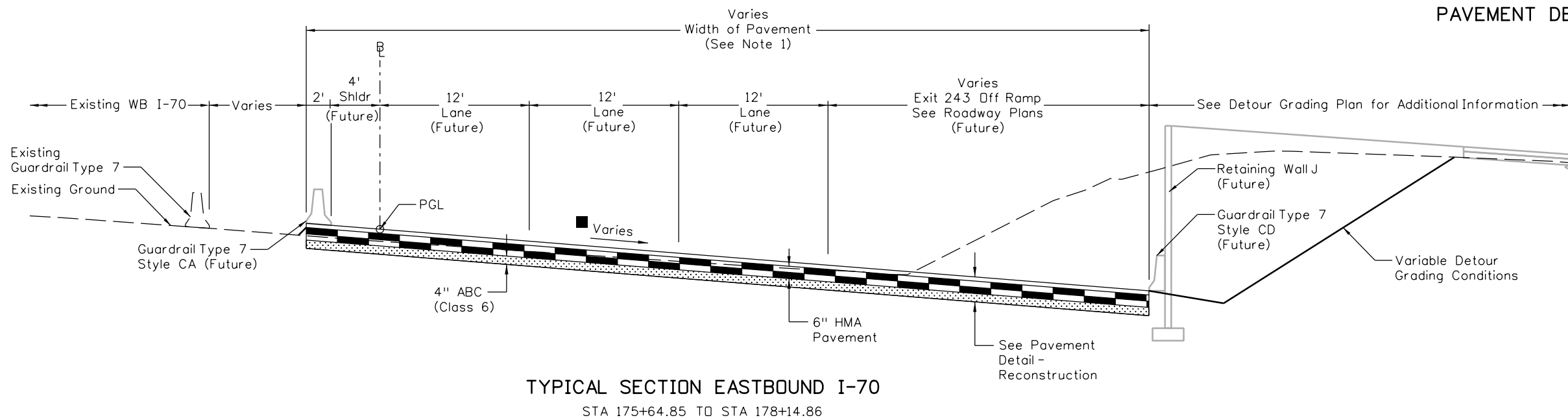
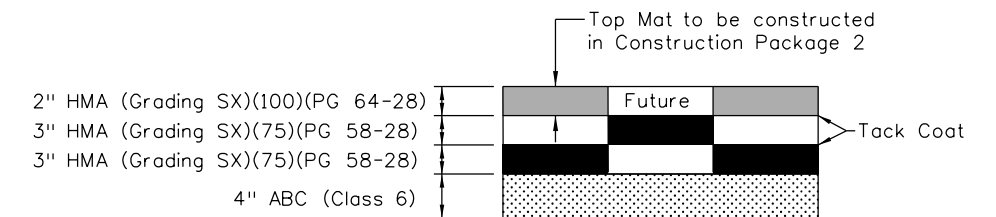
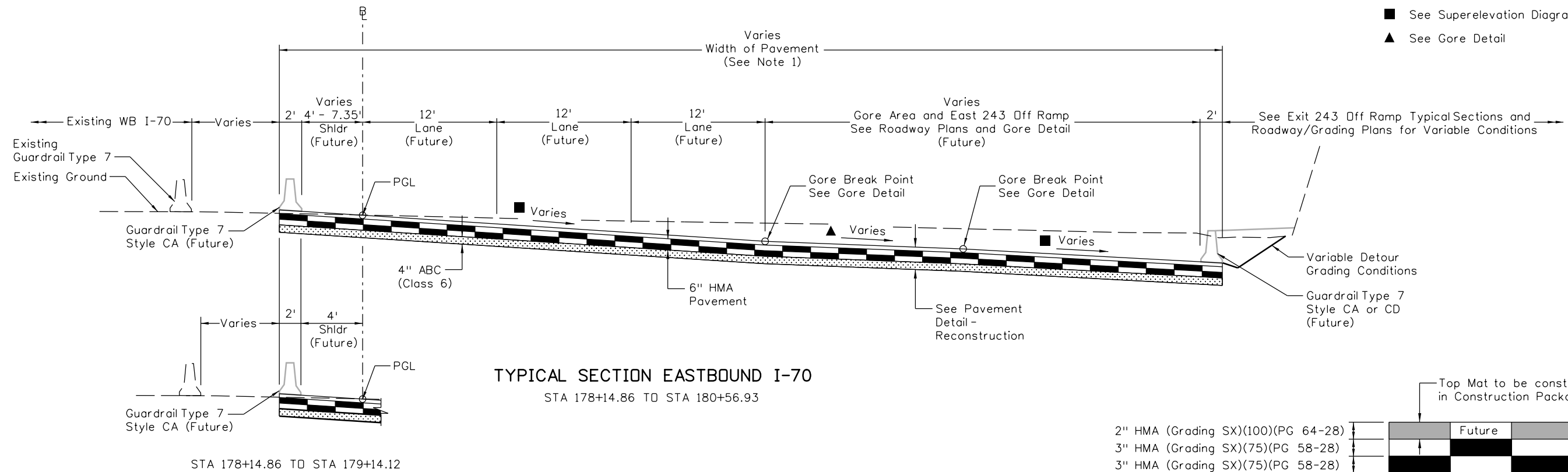
1. THE CONTRACTOR SHALL CONTACT THE UTILITY NOTIFICATION CENTER OF COLORADO FOR LOCATION OF UNDERGROUND GAS, ELECTRIC, AND COMMUNICATION UTILITIES AT LEAST 48 HOURS PRIOR TO CONSTRUCTION (811). THE CONTRACTOR SHALL NOTIFY OTHER APPLICABLE UTILITY COMPANIES AS WELL TO OBTAIN FIELD LOCATES OF ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION.
2. LOCATIONS OF UNDERGROUND UTILITIES AS SHOWN ON THE PLANS WERE TAKEN FROM THE RECORDS OF THE CONTROLLING AGENCIES OR FROM AGENCY MARKINGS IN THE FIELD. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR THEIR COMPLETENESS OR ACCURACY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE EXISTENCE AND/OR LOCATION OF ALL UNDERGROUND UTILITIES AND PARTICIPATE IN THE RESOLUTION OF ANY CONFLICTS PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION OF ALL NECESSARY UTILITY RELOCATIONS WITH THE APPROPRIATE UTILITY COMPANY.
4. ALL UTILITY WORK SHALL BE PERFORMED/INSTALLED IN ACCORDANCE WITH THE CORRESPONDING UTILITY PROVIDER'S DESIGN STANDARDS, INCLUDING DEPTH OF COVER, BEDDING MATERIAL, RELOCATION COORDINATION, AND MATERIAL SPECIFICATIONS.
5. A UTILITY DUCT BANK IS TO BE CONSTRUCTED AFTER PRODUCTION OF THESE PLANS. AS-BUILT INFORMATION WILL BE PROVIDED TO THE CONTRACTOR PRIOR TO CONSTRUCTION.


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Horiz. Scale: 1:1      Vert. Scale: NA							Revised:					Structure Numbers			19035	
<b>ATKINS</b>							Void:					Subset Sheets: 2 of 2			Sheet Number 4	
4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276				<b>Region 1</b>		<b>CRC</b>										

Notes:

- 1. See Detour and Phasing Plans for interim Striping and Concrete Barrier (Temporary)
- See Superelevation Diagram
- ▲ See Gore Detail

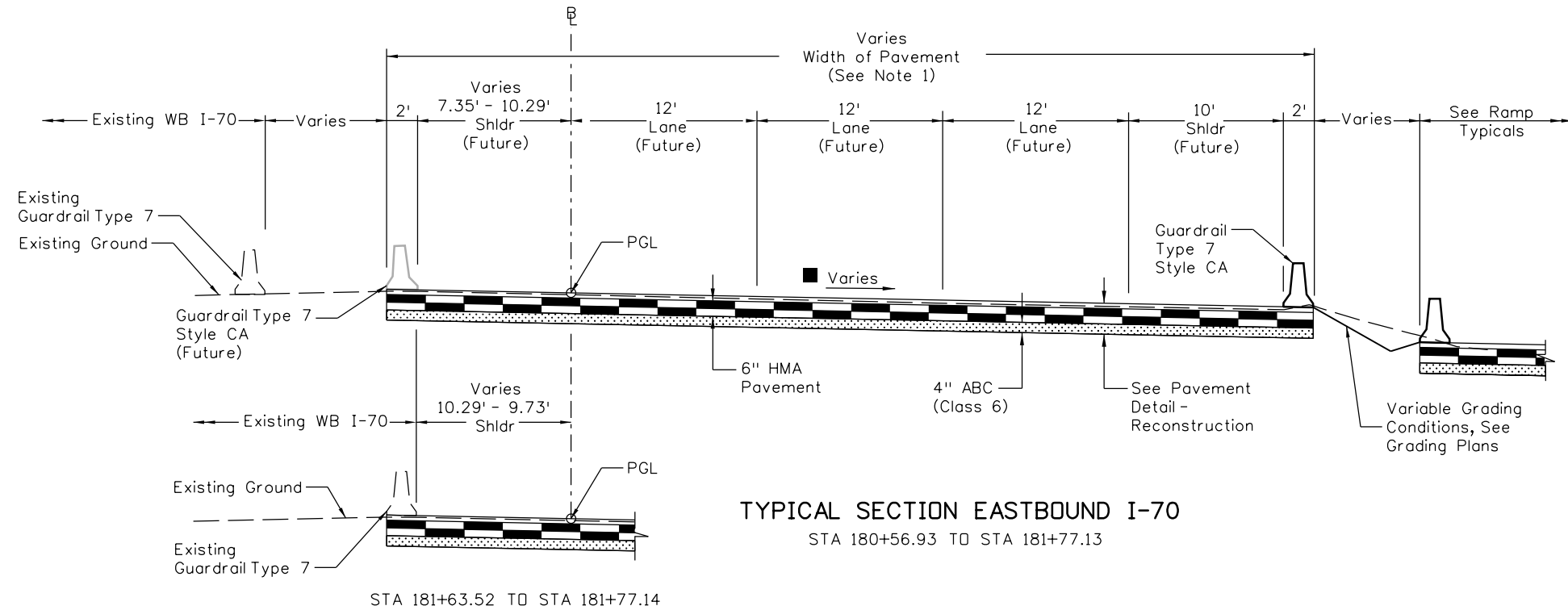


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<b>ATKINS</b> 4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276				<b>Region 1</b>		Void:		Subset: Typicals		Subset Sheets: 1 of 8	
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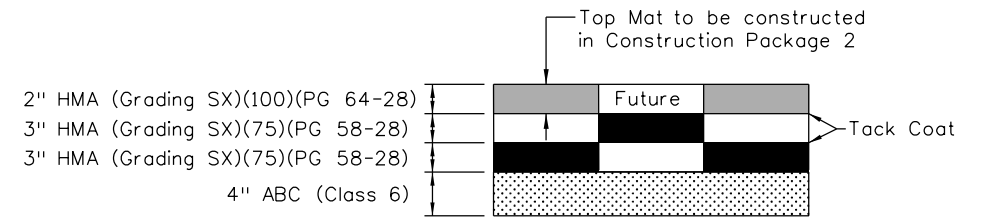
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Notes:

- 1. See Detour and Phasing Plans for interim Striping and Concrete Barrier (Temporary)
- See Superelevation Diagram



TYPICAL SECTION EASTBOUND I-70  
STA 180+56.93 TO STA 181+77.13



PAVEMENT DETAIL - RECONSTRUCTION

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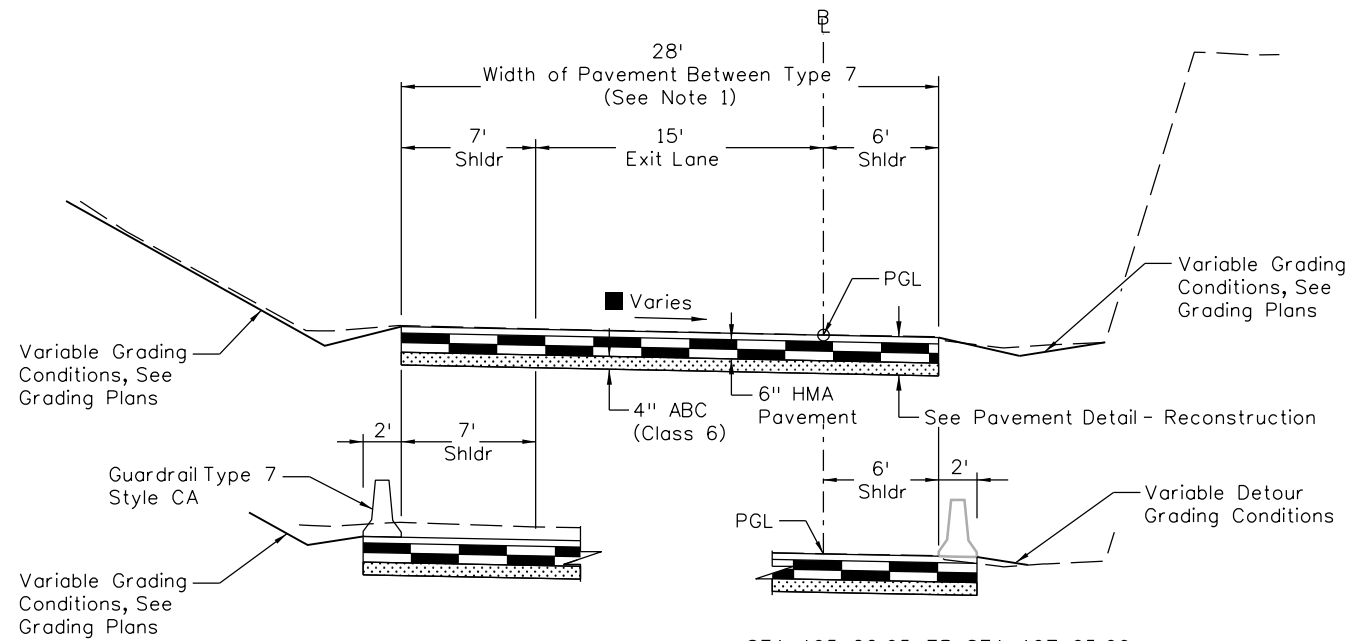
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**Region 1** **CRC**

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No Revisions:
Revised:
Void:

EASTBOUND I-70 TYPICAL SECTIONS			
Designer:	E. Marsh	Structure Numbers	
Detailer:	J. Gellner		
Subset:	Typicals	Subset Sheets: 2 of 8	

<b>Project No./Code</b>
IM 0703-390
19035
Sheet Number 6

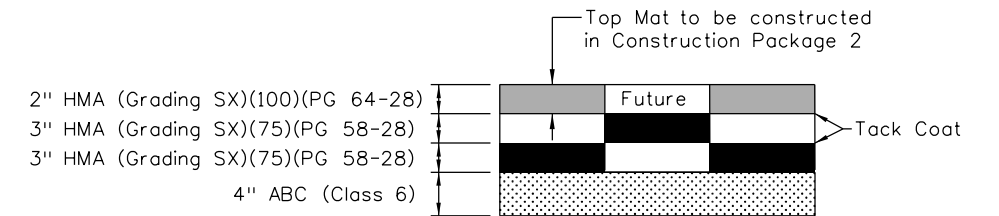


STA 405+22.05 TO STA 408+40.00      STA 405+22.05 TO STA 407+65.00

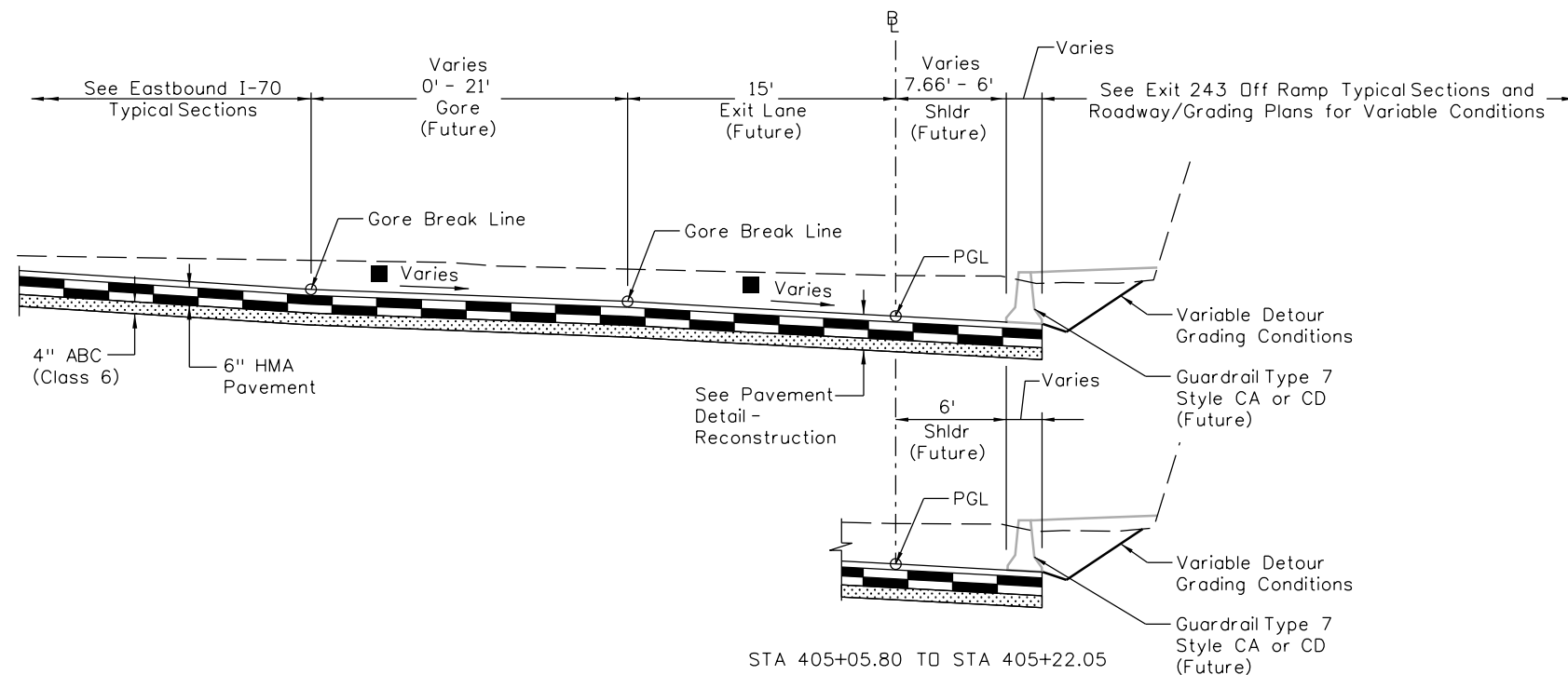
**TYPICAL SECTION - EXIT 243 OFF RAMP**  
STA 405+22.05 TO STA 409+00.00

**Notes:**

- See Detour and Phasing Plans for interim Striping and Concrete Barrier (Temporary).
- See Superelevation Diagram



**PAVEMENT DETAIL - RECONSTRUCTION**




STA 405+05.80 TO STA 405+22.05

**TYPICAL SECTION - EXIT 243 OFF RAMP**  
STA 402+94.51 TO STA 405+22.05  
(EXIT RAMP STA 402+94.51 = I-70 STA 178+14.86)

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Date:	Comments	Init.

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Region 1      CRC

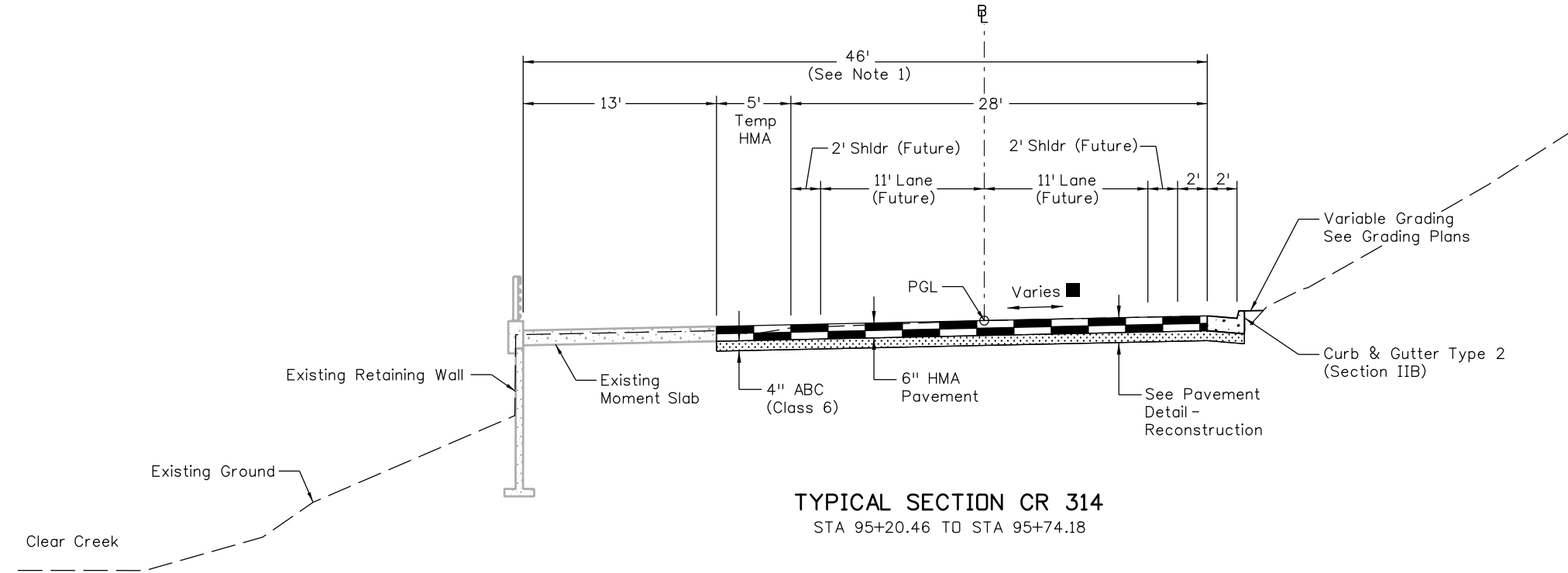
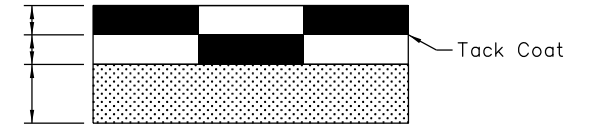
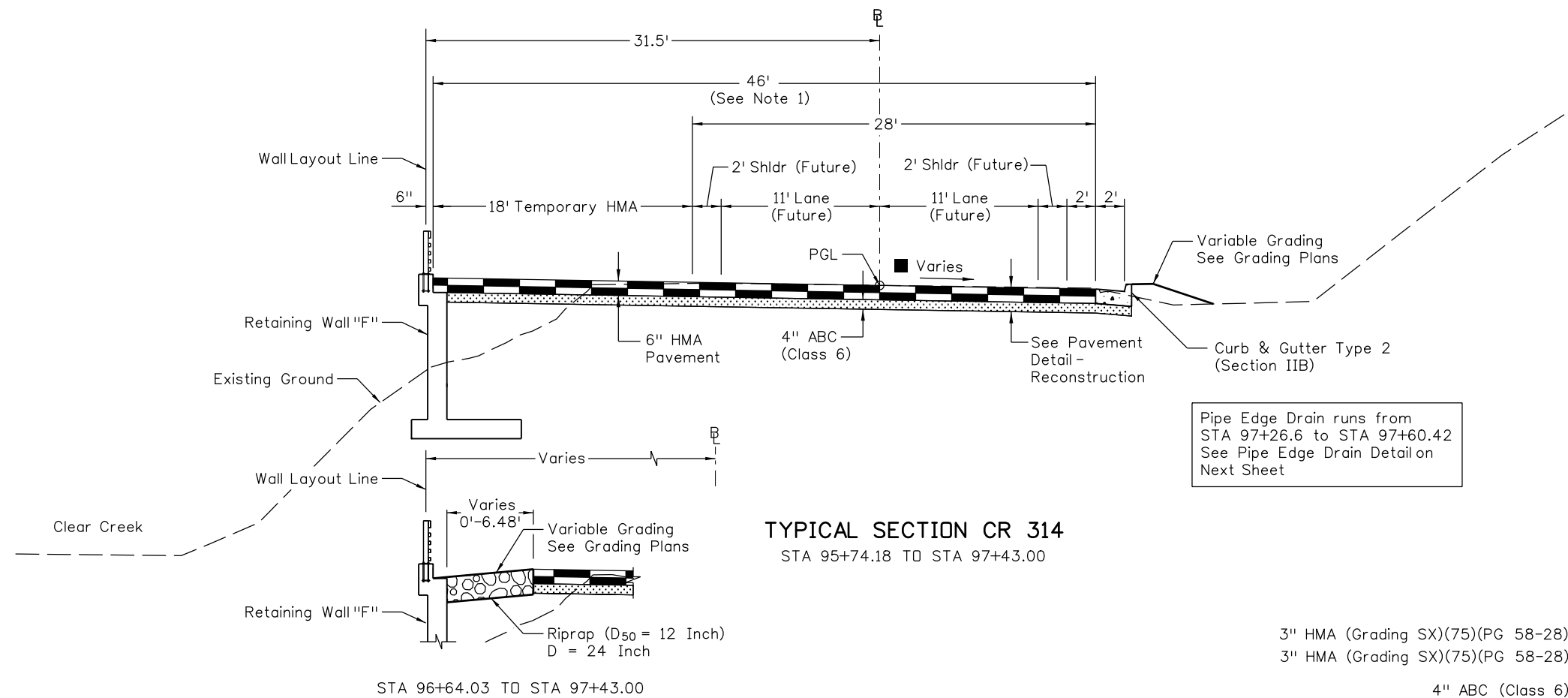
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Designer:	E. Marsh	Structure Numbers	
Detailer:	J. Gellner		
Subset:	Typicals	Subset Sheets: 3 of 8	

<b>Project No./Code</b>
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Sheet Number 7

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- Notes:
- See Detour and Phasing Plans for interim Striping and Concrete Barrier (Temporary)
  - See Superelevation Diagram



PAVEMENT DETAIL - RECONSTRUCTION

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**ATKINS** 4601 DTC Boulevard, Suite 700  
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Date:	Comments	Init.

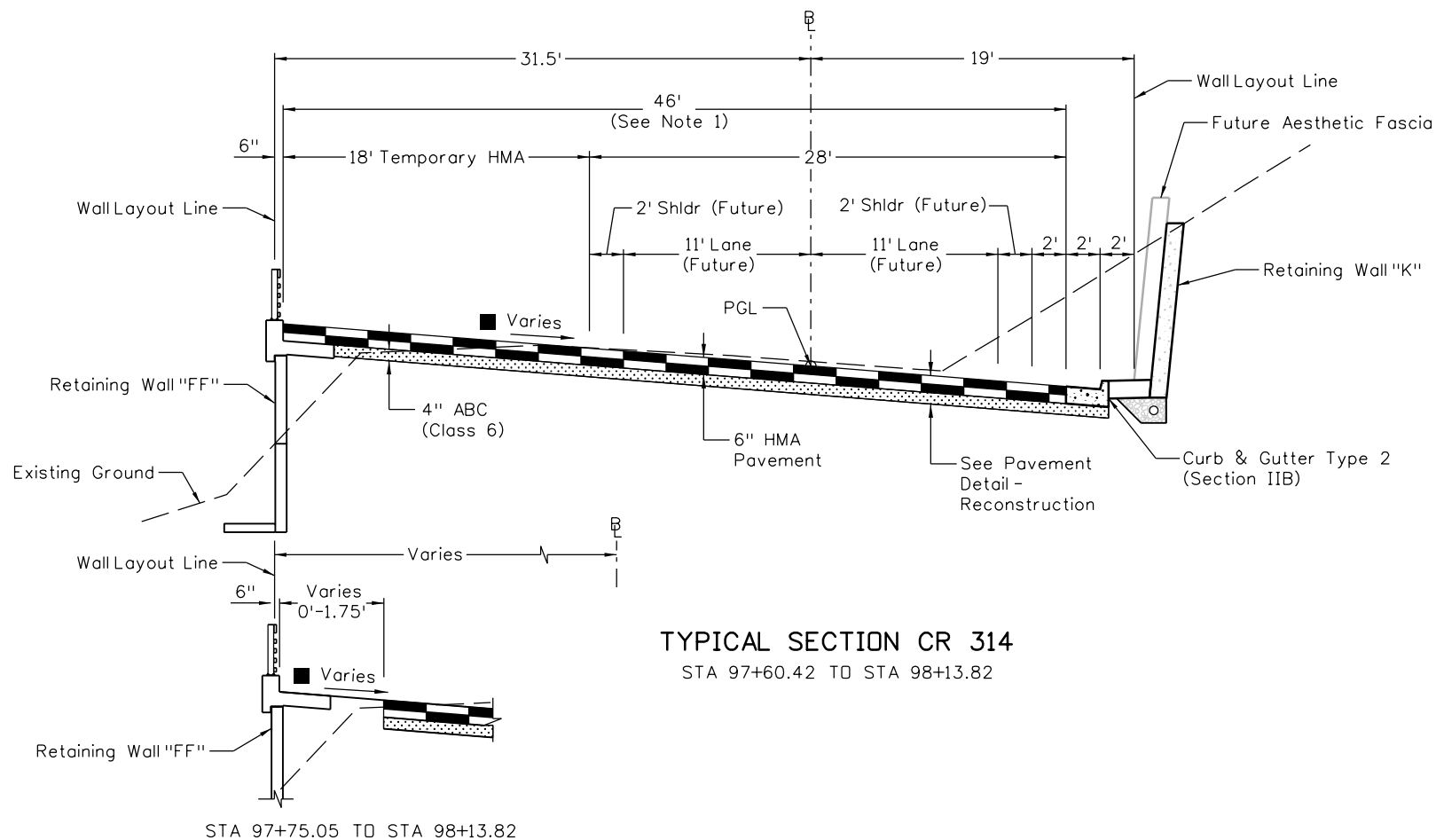
Colorado Department of Transportation  
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 Phone: 720-497-6918 FAX: 720-497-6901  
**Region 1** **CRC**

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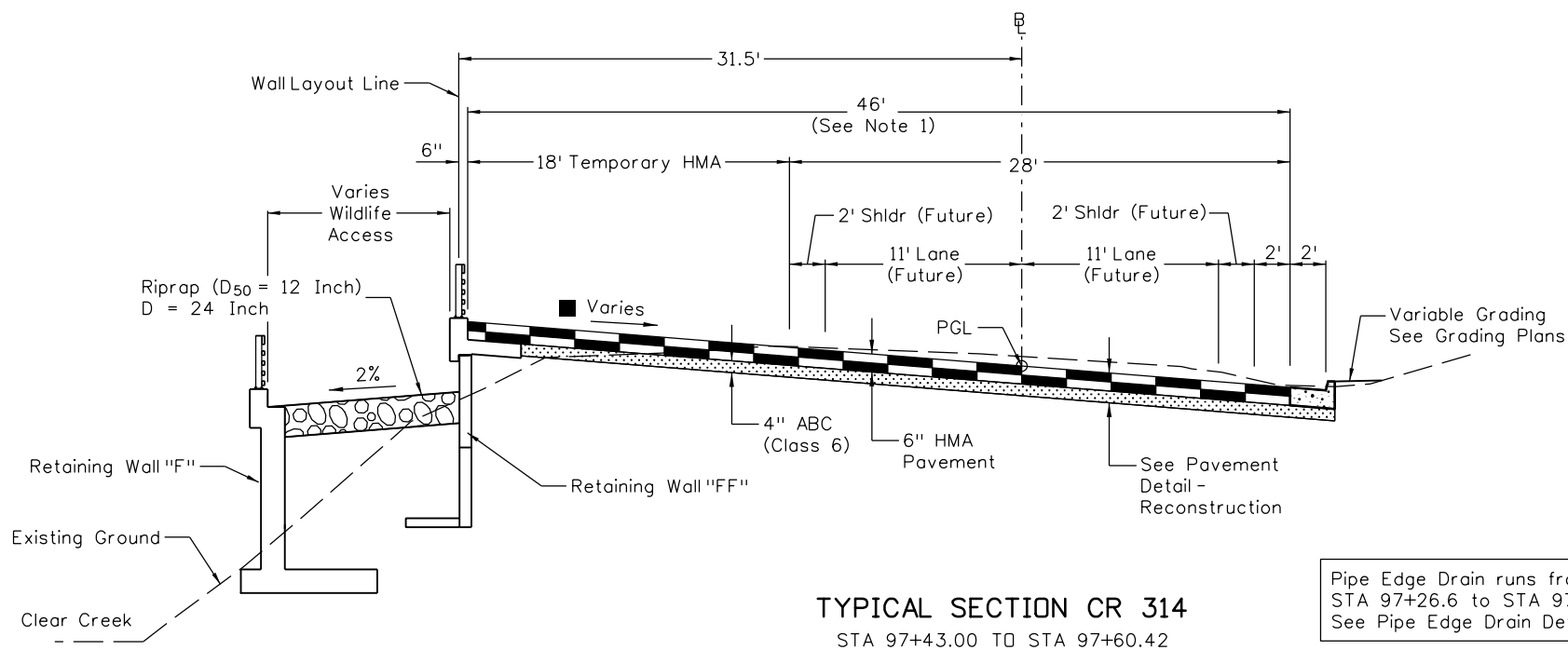
CR 314 TYPICAL SECTIONS			
Designer:	E. Marsh	Structure Numbers	
Detailer:	J. Gellner		
Subset:	Typicals	Subset Sheets: 4 of 8	

**Project No./Code**  
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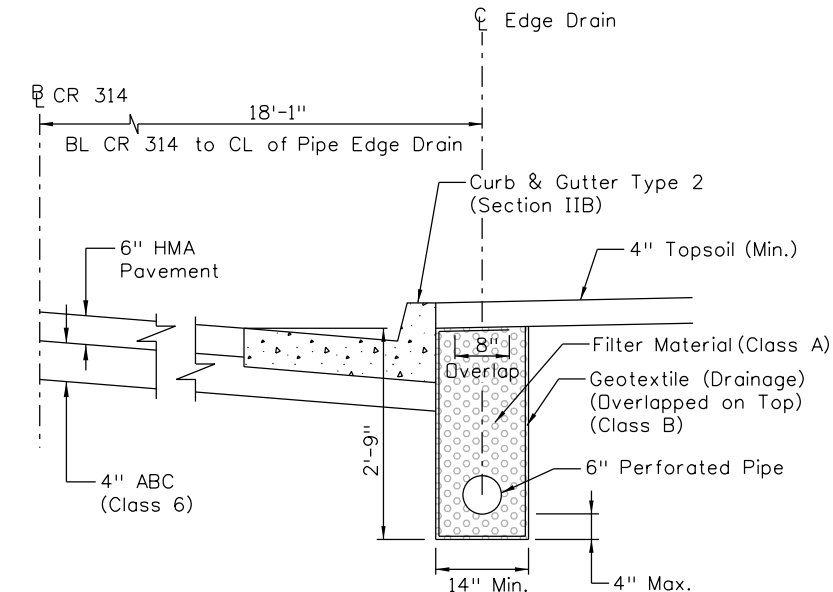
**TYPICAL SECTION CR 314**  
STA 97+60.42 TO STA 98+13.82



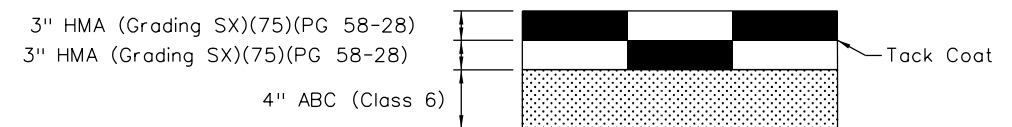
**TYPICAL SECTION CR 314**  
STA 97+43.00 TO STA 97+60.42

Pipe Edge Drain runs from  
STA 97+26.6 to STA 97+60.42  
See Pipe Edge Drain Detail

- Notes:
- See Detour and Phasing Plans for interim Striping and Concrete Barrier (Temporary)
- See Superelevation Diagram



**PIPE EDGE DRAIN DETAIL**  
Connect Wall K Underdrain to Inlet Type D (Special)



**PAVEMENT DETAIL - RECONSTRUCTION**

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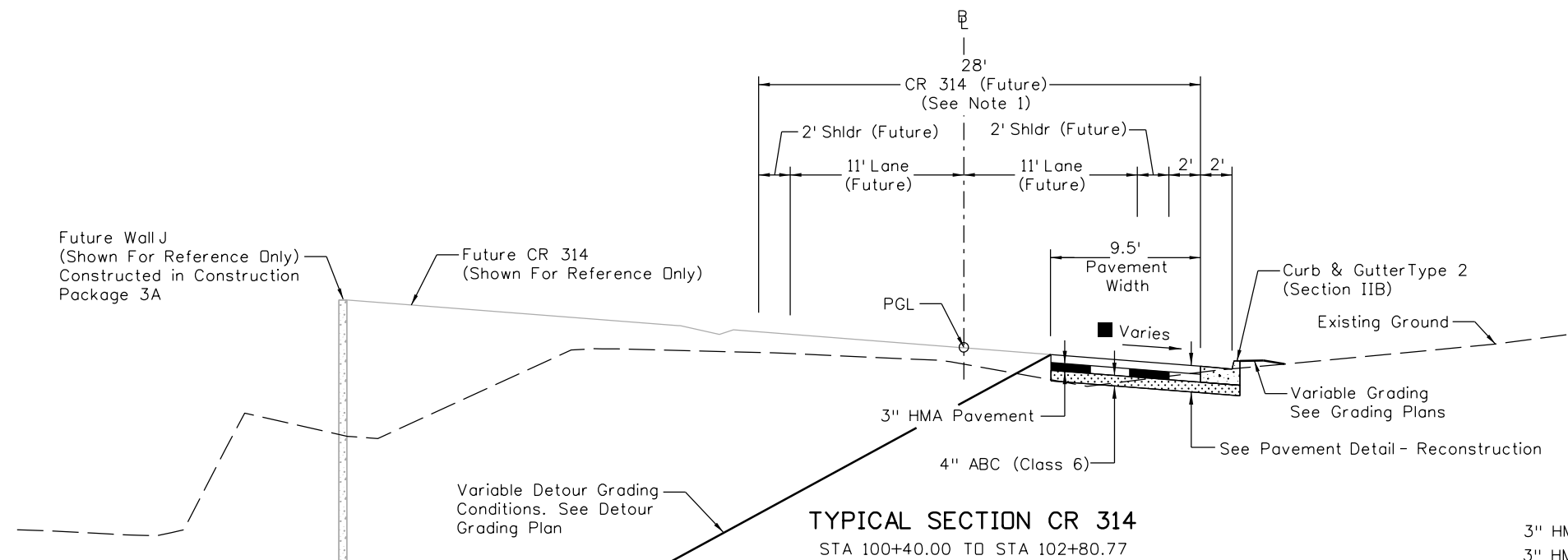
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Detailer: J. Gellner		
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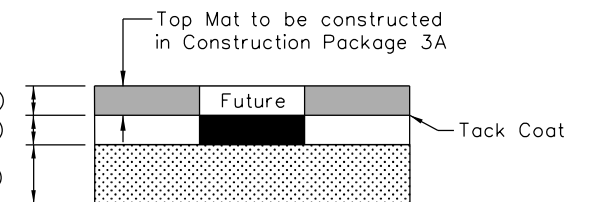
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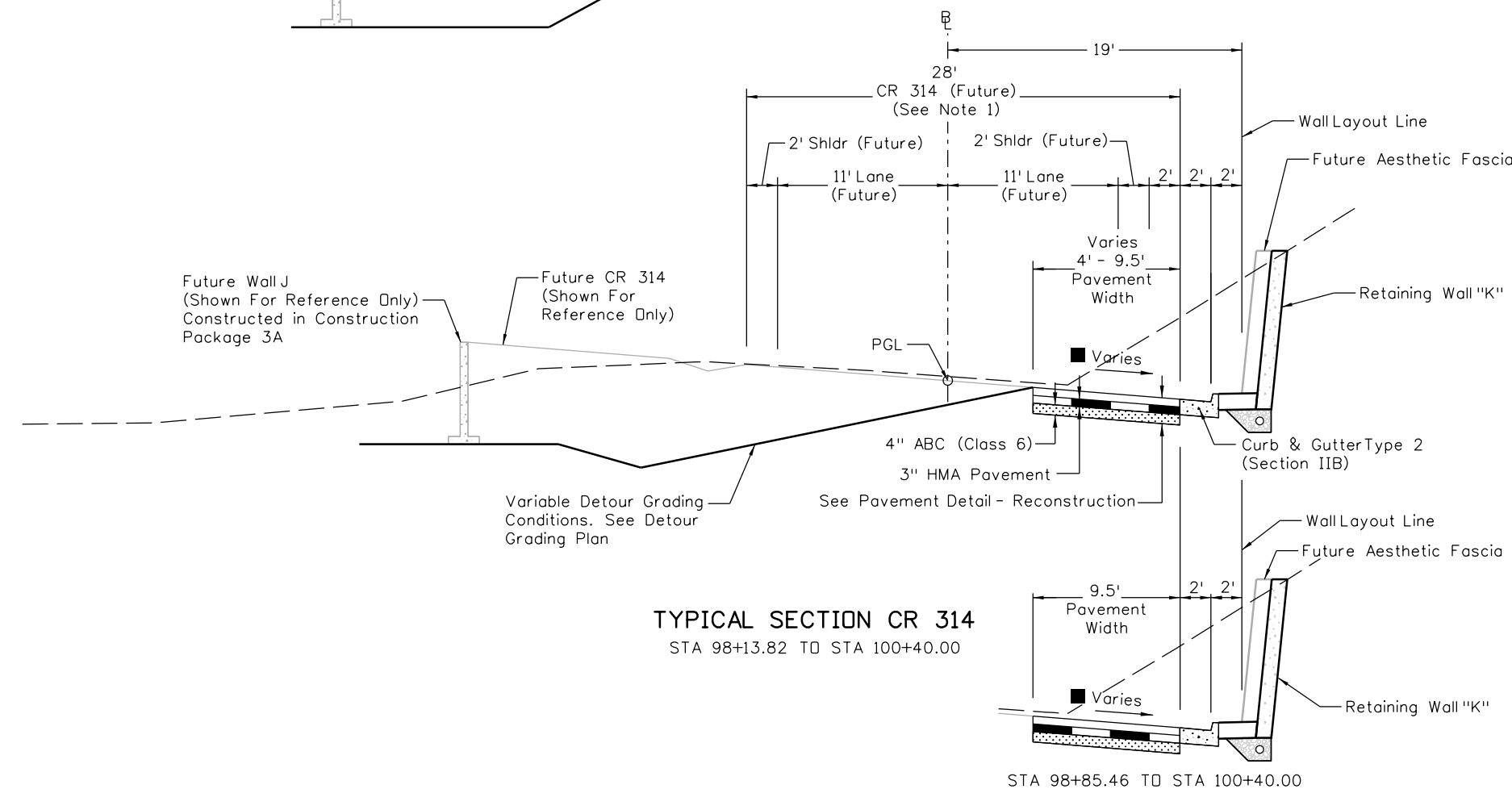
- 1. See Detour and Phasing Plans for interim Striping and Concrete Barrier (Temporary)
- See Superelevation Diagram



3" HMA (Grading SX)(75)(PG 58-28)  
 3" HMA (Grading SX)(75)(PG 58-28)  
 4" ABC (Class 6)



PAVEMENT DETAIL - RECONSTRUCTION



STA 98+85.46 TO STA 100+40.00

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No Revisions:
Revised:
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Detailer:	J. Gellner		
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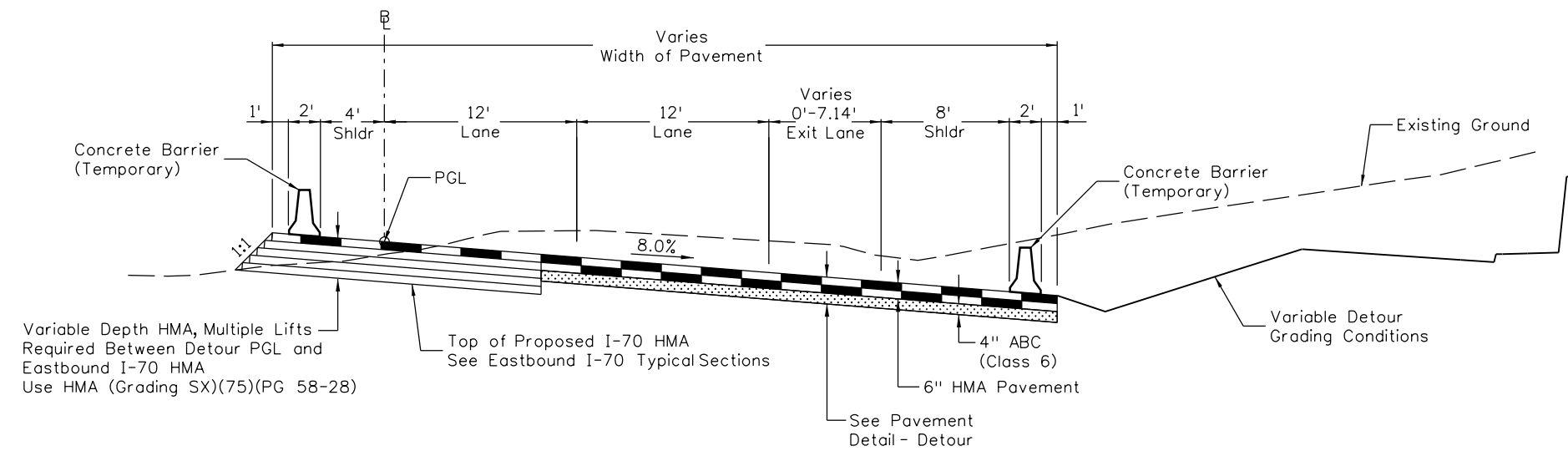
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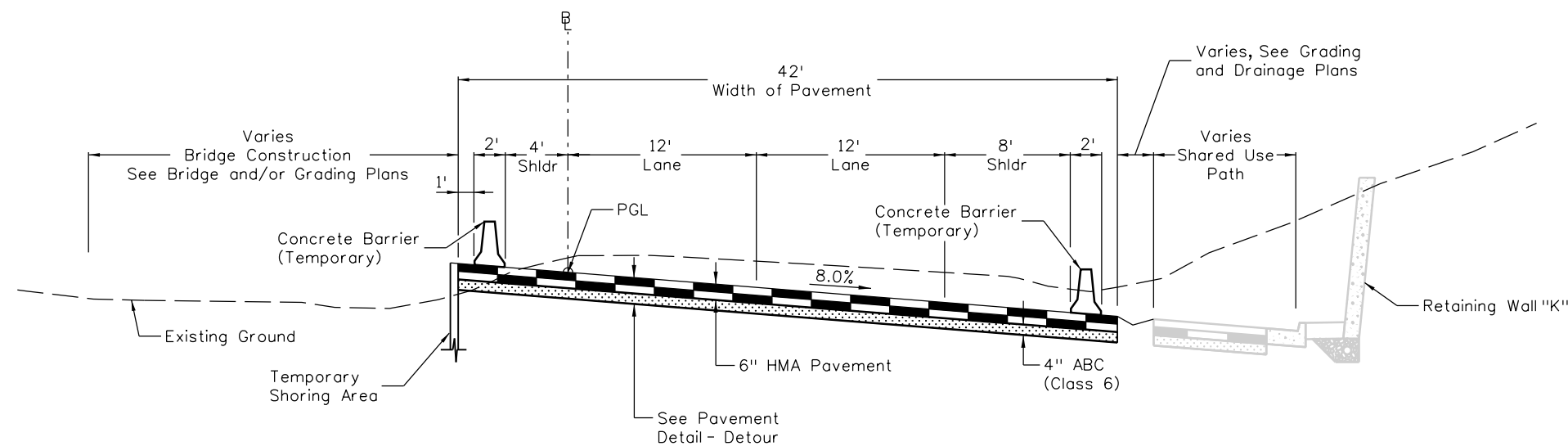
- See Detour and Phasing Plans for interim Striping and Concrete Barrier (Temporary)



**TYPICAL SECTION I-70 DETOUR**  
STA 2044+38.34 TO STA 2046+32.01



**PAVEMENT DETAIL - DETOUR**



**TYPICAL SECTION I-70 DETOUR**  
STA 2043+62.21 TO STA 2044+38.34

Print Date: 11/30/2012  
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Date:	Comments	Init.

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Region 1 **CRC**

**As Constructed**  
No Revisions:  
Revised:  
Void:

DETOUR ROUTE TYPICAL SECTIONS			
Designer:	E. Marsh	Structure Numbers	
Detailer:	J. Gellner		
Subset:	Typicals	Subset Sheets: 7 of 8	

**Project No./Code**  
IM 0703-390  
19035  
Sheet Number 11

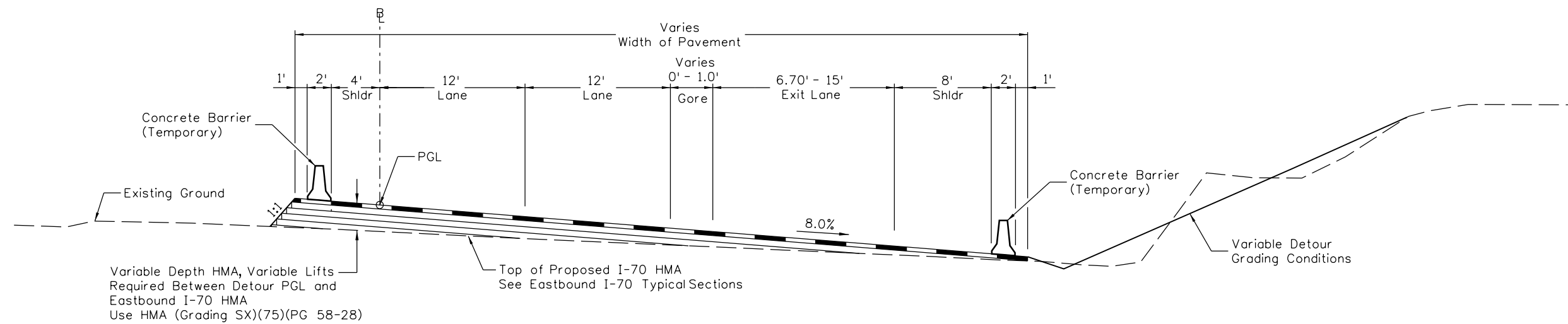
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Notes:

- See Detour and Phasing Plans for interim Striping and Concrete Barrier (Temporary)

SEE EASTBOUND I-70 DETOUR PLAN AND PROFILE  
SEE NOTE 1

**TYPICAL SECTION I-70 DETOUR**  
STA 2046+75.00 TO STA 2050+55.13




**TYPICAL SECTION I-70 DETOUR**  
STA 2045+98.58 TO STA 2046+75.00

Print Date: 12/4/2012
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Sheet Revisions		
Date:	Comments	Init.

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Region 1      CRC

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Revised:
Void:

DETOUR ROUTE TYPICAL SECTIONS			
Designer:	E. Marsh	Structure Numbers	
Detailer:	J. Gellner		
Subset:	Typicals	Subset Sheets: 8 of 8	

<b>Project No./Code</b>
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Sheet Number 12

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INDEX			CONTRACT ITEM NO.	CONTRACT ITEM	UNIT	ROADWAY				DETOUR BRIDGE				BRIDGE F-15-BR				RETAINING WALLS F,FF,K				PROJECT TOTALS	
BOOK	PAGE	SHEET				PLAN	AS CONST.			PLAN	AS CONST.			PLAN	AS CONST.			PLAN	AS CONST.			PLAN	AS CONST.
			201-00000	Clearing and Grubbing	L S	1															1		
			202-00010	Removal of Tree	EACH	58															58		
			202-00090	Removal of Delineator	EACH	8															8		
			202-00210	Removal of Concrete Pavement	SY	2,624															2,624		
			202-00220	Removal of Asphalt Mat	SY	4,328															4,328		
			202-00250	Removal of Pavement Marking	SF	7,346															7,346		
			202-00460	Removal of Portions of Present Structure (Class 3)	SY					21											21		
			202-00495	Removal of Portions of Present Structure	L S	1															1		
			202-00500	Removal of Portions of Present Structure	EACH					2											2		
			202-00700	Removal of Light Standard	EACH	3															3		
			202-00810	Removal of Ground Sign	EACH	7															7		
			202-01000	Removal of Fence	LF	529															529		
			202-01130	Removal of Guardrail Type 3	LF	615															615		
			203-00010	Unclassified Excavation (Complete In Place)	CY	6,188															6,188		
			203-00040	Unclassified Excavation (Special)	CY	16,990															16,990		
			203-00400	Rock Excavation	CY	3,600															3,600		
			203-00599	Rock Scaler	HOUR	40															40		
			203-01500	Blading	HOUR	10															10		
			203-01510	Backhoe	HOUR	10															10		
			203-01525	Backhoe (Special)	HOUR	20											24				44		
			203-01550	Dozing	HOUR	20															20		
			203-01582	Truck (Dump)	HOUR	20											12				32		

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**Region 1** **CRC**

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 Revised:  
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SUMMARY OF APPROXIMATE QUANTITIES			
Designer:	E. Marsh	Structure Numbers	
Detailer:	J. Gellner	Subset Sheets: 1 of 9	
Subset:	Sum Quan		


**Project No./Code**  
 IM 0703-390  
 19035  
 Sheet Number 13

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INDEX			CONTRACT ITEM NO.	CONTRACT ITEM	UNIT	ROADWAY			DETOUR BRIDGE			BRIDGE F-15-BR			RETAINING WALLS F,FF,K			PROJECT TOTALS	
BOOK	PAGE	SHEET				PLAN	AS CONST.		PLAN	AS CONST.		PLAN	AS CONST.		PLAN	AS CONST.		PLAN	AS CONST.
			203-01594	Combination Loader	HOUR	20												20	
			203-01597	Potholing	HOUR	26												26	
			203-02330	Laborer	HOUR	40									24			64	
			206-00000	Structure Excavation	CY						4,549				3,803			8,352	
			206-00065	Structure Backfill (Flow-Fill)	CY	6											6		
			206-00100	Structure Backfill (Class 1)	CY						1,144				3,111			4,255	
			206-00360	Mechanical Reinforcement of Soil	CY						944				111			1,055	
			206-01781	Shoring (Area 1)	L S						1						1		
			206-01782	Shoring (Area 2)	L S						1						1		
			206-01783	Shoring (Area 3)	L S									1			1		
			206-01784	Shoring (Area 4)	L S									1			1		
			206-01785	Shoring (Area 5)	L S	1											1		
			208-00002	Erosion Log (12 Inch)	LF	2,000											2,000		
			208-00021	Silt Fence (Reinforced)	LF	300											300		
			208-00034	Gravel Bag	LF	700											700		
			208-00045	Concrete Washout Structure	EACH	5											5		
			208-00070	Vehicle Tracking Pad	EACH	4											4		
			208-00103	Removal and Disposal of Sediment (Labor)	HOUR	60											60		
			208-00105	Removal and Disposal of Sediment (Equipment)	HOUR	40											40		
			208-00106	Sweeping (Sediment Removal)	HOUR	60											60		
			208-00206	Erosion Control Supervisor	DAY	80											80		
			208-00400	Water Control	L S	1											1		

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SUMMARY OF APPROXIMATE QUANTITIES			
Designer:	E. Marsh	Structure Numbers	
Detailer:	J. Gellner	Subset Sheets: 2	of 9
Subset:	Sum	Quan	

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INDEX			CONTRACT ITEM NO.	CONTRACT ITEM	UNIT	ROADWAY				DETOUR BRIDGE				BRIDGE F-15-BR				RETAINING WALLS F,FF,K				PROJECT TOTALS	
BOOK	PAGE	SHEET				PLAN	AS CONST.			PLAN	AS CONST.			PLAN	AS CONST.			PLAN	AS CONST.			PLAN	AS CONST.
			210-00473	Reset TV Cameras	EACH	1															1		
			210-00476	Reset Microwave Vehicle Radar Detector (MVRD)	EACH	1															1		
			210-00810	Reset Ground Sign	EACH	3															3		
			210-00847	Reset Travel Time Indicator	EACH	1															1		
			210-04020	Modify Inlet	EACH	1															1		
			211-01111	Rock Reinforcement (Dowels)	LF	300										150					450		
			211-01115	Rock Reinforcement (Number 10)	LF	225															225		
			211-01200	Rock Anchor	LF	550															550		
			211-01250	Rock Bolt	LF	225															225		
			211-03005	Dewatering	L S	1															1		
			212-00006	Seeding (Native)	ACRE	0.5															0.5		
			212-00032	Soil Conditioning	ACRE	0.5															0.5		
			213-00012	Spray-on Mulch Blanket	ACRE	0.5															0.5		
			213-00100	Soil Binder	ACRE	0.5															0.5		
			304-06000	Aggregate Base Course (Class 6)	TON	1,656															1,656		
			403-34721	Hot Mix Asphalt (Grading SX) (75) (PG 58-28)	TON	3,147															3,147		
			403-34851	Hot Mix Asphalt (Grading SX) (100) (PG 64-28)	TON				88				315								403		
			411-10255	Emulsified Asphalt (Slow-Setting)	GAL	1,296															1,296		
			420-00000	Geomembrane	SY											181					181		
			420-00103	Geotextile (Erosion Control) (Class 2)	SY	23															23		
			420-00500	Geotextile (Paving)	SY				76												76		
			503-00036	Drilled Caisson (36 Inch)	LF	15															15		

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SUMMARY OF APPROXIMATE QUANTITIES			
Designer:	E. Marsh	Structure Numbers	
Detailer:	J. Gellner	Subset Sheets:	3 of 9
Subset:	Sum	Quan	

Project No./Code
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INDEX			CONTRACT ITEM NO.	CONTRACT ITEM	UNIT	ROADWAY			DETOUR BRIDGE			BRIDGE F-15-BR			RETAINING WALLS F,FF,K			PROJECT TOTALS	
BOOK	PAGE	SHEET				PLAN	AS CONST.		PLAN	AS CONST.		PLAN	AS CONST.		PLAN	AS CONST.		PLAN	AS CONST.
			503-00060	Drilled Caisson (60 Inch)	LF							98						98	
			503-01080	Micropile (8 Inch)	LF							730						730	
			503-02000	Verification Test Pile	EACH							2						2	
			504-04440	Facing (Special)	SF										374			374	
			504-06310	Ground Nail (10 Foot)	EACH										40			40	
			504-06315	Ground Nail (15 Foot)	EACH										160			160	
			506-00212	Riprap (12 Inch)	CY	12									151			163	
			509-00000	Structural Steel	LB				4,555									4,555	
			509-08100	Provide Temporary Support	L S							1						1	
			513-00608	Bridge Drain (8 Inch)	EACH				2									2	
			514-00200	Pedestrian Railing (Steel)	LF										326			326	
			515-00120	Waterproofing (Membrane)	SY				528			1,944						2,472	
			515-00400	Concrete Sealer	SY				325									325	
			515-00410	Concrete Sealer (Calcium Nitrite)	SY				325									325	
			518-01004	Bridge Expansion Device (0-4 Inch)	LF							118						118	
			601-03040	Concrete Class D (Bridge)	CY							1,049						1,049	
			601-03050	Concrete Class D (Wall)	CY										409			409	
			601-25735	Precast Concrete Deck Panel (3.5 Inch)	SY							1,052						1,052	
			601-25905	Tunnel Formwork (Furnish Only)	LS	1												1	
			601-40300	Structural Concrete Coating	SY							3,800			625			4,413	
			602-00000	Reinforcing Steel	LB				605						40,966			41,571	
			602-00020	Reinforcing Steel (Epoxy Coated)	LB							219,900			4,800			224,700	

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SUMMARY OF APPROXIMATE QUANTITIES			
Designer:	E. Marsh	Structure Numbers	
Detailer:	J. Gellner		
Subset:	Sum Quan	Subset Sheets: 4 of 9	

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INDEX			CONTRACT ITEM NO.	CONTRACT ITEM	UNIT	ROADWAY			DETOUR BRIDGE			BRIDGE F-15-BR			RETAINING WALLS F,FF,K			PROJECT TOTALS	
BOOK	PAGE	SHEET				PLAN	AS CONST.		PLAN	AS CONST.		PLAN	AS CONST.		PLAN	AS CONST.		PLAN	AS CONST.
			603-01185	18 Inch Reinforced Concrete Pipe (Complete In Place)	LF	11												11	
			603-01365	36 Inch Reinforced Concrete Pipe (Complete In Place)	LF	109												109	
			604-00505	Inlet Type D (5 Foot)	EACH	1												1	
			604-00506	Inlet Type D (Special) (5 Foot)	EACH	1												1	
			604-00511	Inlet Type D (Special) (10 Foot)	EACH	1												1	
			604-13510	Inlet Type 13 (Double) (10 Foot)	EACH	1												1	
			604-19010	Inlet Special (10 Foot)	EACH	1												1	
			605-00060	6 Inch Perforated Pipe Underdrain	LF									510				510	
			605-82100	Pipe Edge Drain	LF	30												30	
			605-83001	Geocomposite Drain without Pipe	SY									199				199	
			605-84000	Subsurface Drain Outlet	LF									100				100	
			606-00710	Guardrail Type 7 (Style CA)	LF	436												436	
			606-01380	Transition Type 3H	EACH	1												1	
			606-01460	Median Terminal	EACH	1												1	
			606-10700	Bridge Rail Type 7	LF							377						377	
			606-11030	Bridge Rail Type 10M	LF							350						350	
			607-11580	Fence (Temporary)	LF	3,495												3,495	
			607-60116	16 Foot Gate	EACH	1												1	
			609-21020	Curb and Gutter Type 2 (Section II-B)	LF	770												770	
			612-00260	Location Marker (Fiber Optic)(Dome)	EACH	3												3	
			612-00270	Location Marker (Utility)(Flat Slat)	EACH	3												3	

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SUMMARY OF APPROXIMATE QUANTITIES

Designer: E. Marsh	Structure Numbers
Detailer: J. Gellner	
Subset: Sum Quan	Subset Sheets: 5 of 9


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INDEX			CONTRACT ITEM NO.	CONTRACT ITEM	UNIT	ROADWAY		DETOUR BRIDGE		BRIDGE F-15-BR		RETAINING WALLS F,FF,K		PROJECT TOTALS		
BOOK	PAGE	SHEET				PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	
			613-00200	2 Inch Electrical Conduit	LF	700									700	
			613-00206	2 Inch Electrical Conduit (Bored)	LF	285									285	
			613-01200	2 Inch Electrical Conduit (Plastic)	LF	630									630	
			613-04200	2 Inch Electrical Conduit (Liquidtight Flexible Metal)	LF	50									50	
			613-07023	Pull Box (24"x36"x24")	EACH	3									3	
			613-07060	Pull Box (18"x30"x18") Deep	EACH	3									3	
			613-10000	Wiring	L S	1									1	
			613-32400	Light Standard Steel (40 Foot)	EACH	1									1	
			613-33400	Light Standard Timber (40 Foot)	EACH	26									26	
			613-40010	Light Standard Foundation	EACH	1									1	
			613-50100	Lighting Control Center	EACH	2									2	
			613-50150	Secondary Service Pedestal	EACH	1									1	
			613-70250	Luminaire High Pressure Sodium (250 Watt)	EACH	26									26	
			614-72830	Communications Cabinet	EACH	2									2	
			614-72887	Microwave Vehicle Radar Detector	EACH	1									1	
			614-87006	Fiber Optic Termination Panel - 6 Fiber	EACH	2									2	
			614-87010	Fiber Optic Cable (Single Mode) (12 Fiber)	LF	1,275									1,275	
			614-87015	Buffer Tube Fan Out Kit	EACH	2									2	
			614-87320	Closed Circuit Television	EACH	2									2	
			614-87350	Test Fiber Optic Cable	L S	1									1	
			614-87364	Closed Circuit Television Pole with Lowering Device (50 Feet)	EACH	1									1	

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SUMMARY OF APPROXIMATE QUANTITIES			
Designer:	E. Marsh	Structure Numbers	
Detailer:	J. Gellner		
Subset:	Sum Quan	Subset Sheets: 6 of 9	

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INDEX			CONTRACT ITEM NO.	CONTRACT ITEM	UNIT	ROADWAY		DETOUR BRIDGE		BRIDGE F-15-BR		RETAINING WALLS F,FF,K		PROJECT TOTALS		
BOOK	PAGE	SHEET				PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	
			614-87690	Ethernet Switch	EACH	2									2	
			618-00003	Prestressing Steel	MKFT					306					306	
			618-00184	Prestressed Concrete I (BT84)	LF					1,459					1,459	
			620-00002	Field Office (Class 2)	EACH	1									1	
			620-00020	Sanitary Facility	EACH	2									2	
			621-00200	Haul Road	L S	1									1	
			625-00000	Construction Surveying	L S	1									1	
			625-00001	Construction Surveying (Hourly)	HOUR	100									100	
			626-00100	Mobilization (without Autopay)	L S	1									1	
			626-01000	Public Information Services	L S	1									1	
			627-00001	Pavement Marking Paint	GAL	101									101	
			630-00000	Flagging	HOUR	2,000									2,000	
			630-00003	Uniformed Traffic Control	HOUR	250									250	
			630-00007	Traffic Control Inspection	DAY	25									25	
			630-00011	Courtesy Vehicle	DAY	20									20	
			630-00012	Traffic Control Management	DAY	137									137	
			630-80001	Flashing Beacon (Portable)	EACH	14									14	
			630-80336	Barricade (Type 3 M-B) (Temporary)	EACH	7									7	
			630-80341	Construction Traffic Sign (Panel Size A)	EACH	68									68	
			630-80342	Construction Traffic Sign (Panel Size B)	EACH	62									62	
			630-80343	Construction Traffic Sign (Panel Size C)	EACH	48									48	
			630-80344	Construction Traffic Sign (Special)	SF	639									639	

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SUMMARY OF APPROXIMATE QUANTITIES			
Designer:	E. Marsh	Structure Numbers	
Detailer:	J. Gellner	Subset Sheets:	7 of 9
Subset:	Sum	Quan	

Project No./Code
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19035
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INDEX			CONTRACT ITEM NO.	CONTRACT ITEM	UNIT	ROADWAY		DETOUR BRIDGE		BRIDGE F-15-BR		RETAINING WALLS F,FF,K		PROJECT TOTALS		
BOOK	PAGE	SHEET				PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	
			630-80355	Portable Message Sign Panel	EACH	7									7	
			630-80358	Advance Warning Flashing or Sequencing Arrow Panel (C Type)	EACH	2									2	
			630-80360	Drum Channelizing Device	EACH	160									160	
			630-80363	Drum Channelizing Device (With Light) (Flashing)	EACH	25									25	
			630-80367	Portable Traffic Speed Monitor	EACH	2									2	
			630-80369	Portable Variable Speed Limit Sign	EACH	3									3	
			630-80370	Concrete Barrier (Temporary)	LF	16,021									16,021	
			630-80380	Traffic Cone	EACH	200									200	
			630-80384	Tubular Marker	EACH	170									170	
			630-85010	Impact Attenuator (Temporary)	EACH	9									9	
			630-85041	Mobile Attenuator	DAY	100									100	
			641-10000	Shotcrete	SY							421			421	
			700-70010	FORCE ACCOUNT ===== F/A Minor Contract Revisions	F A	1									1	
			700-70011	F/A Partnering	F A	1									1	
			700-70012	F/A Asphalt Pavement Incentive	F A	1									1	
			700-70016	F/A Fuel Cost Adjustment	F A	1									1	
			700-70019	F/A Asphalt Cement Cost Adjustment	F A	1									1	
			700-70021	F/A On-The-Job Trainee	HOUR	1									1	
			700-70034	F/A OCIP Reporting	F A	1									1	
			700-70035	F/A OCIP Safety Comp	F A	1									1	
			700-70072	F/A Obtain Power from Xcel Energy	F A	1									1	

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SUMMARY OF APPROXIMATE QUANTITIES			
Designer:	E. Marsh	Structure Numbers	
Detailer:	J. Gellner		
Subset:	Sum Quan	Subset Sheets: 8 of 9	

Project No./Code
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19035
Sheet Number 20



**TABULATION OF REMOVALS**

LOCATION	SIDE	REMOVAL OF TREE	REMOVAL OF DELINEATOR	REMOVAL OF CONCRETE PAVEMENT	REMOVAL OF ASPHALT MAT	REMOVAL OF PORTIONS OF PRESENT STRUCTURE	REMOVAL OF GROUND SIGN	REMOVAL OF FENCE	REMOVAL OF GUARDRAIL TYPE 3	REMARKS
		EACH	EACH	SY	SY	LS	EA	LF	LF	
		202-00010	202-00090	202-00210	202-00220	202-00495	202-00810	202-01000	202-01130	
<b>EASTBOUND I-70</b>										
STA 175+45.91 TO STA 179+84.90	LT/RT				2,969					ASSUME 6" EXISTING ASPHALT
STA 179+84.90 TO STA 184+35.71	LT/RT			2,624						ASSUME 11" EXISTING CONCRETE
STA 175+44.25 TO STA 176+00.74	LT								58	
STA 178+01.28 TO 179+57.98	RT					1				EXISTING WALL ALONG EXIT 243 OFF RAMP
STA 181+12.51 TO STA 181+96.41	RT								83	
STA 176+77.00 TO STA 183+37.00	RT		5							
<b>CR 314</b>										
STA 95+20.46 TO STA 100+37.96	LT/RT	3			805					
STA 100+37.96 TO 101+90.11	LT	1								
STA 101+90.11 TO STA 102+80.77	RT	1			44					
STA 99+54.28 TO STA 104+12.35	LT								474	
STA 101+03.59 TO STA 104+12.43	LT							529		
STA 98+08	RT		1							
<b>EASTBOUND I-70 DETOUR</b>										
STA 2003+00 TO 2007+00	LT	53								STAGING AREA AND PORTAL EXCAVATION
STA 2043+62.21 TO 2048+14.81	LT		2		510		4			
<b>PROJECT TOTAL</b>		<b>58</b>	<b>8</b>	<b>2,624</b>	<b>4,328</b>	<b>1</b>	<b>4</b>	<b>529</b>	<b>615</b>	

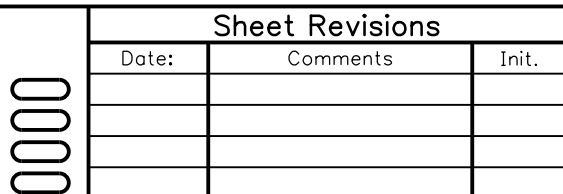

**TABULATION OF MISCELLANEOUS ROADWAY ITEMS**

LOCATION	SIDE	GUARDRAIL TYPE 7 (STYLE CA)	TRANSITION TYPE 3H	MEDIAN TERMINAL	CURB AND GUTTER TYPE 2 (SECTION II-B)	REMARKS
		LF	EA	EA	LF	
		606-00710	606-01380	606-01460	609-21020	
<b>EASTBOUND I-70</b>						
STA 180+56.93 to STA 181+77.14	RT	118	1			
STA 180+41.49	RT			1		QUADGUARD II SYSTEM
<b>EXIT 243 OFF RAMP</b>						
STA 405+22.05 STA 408+37.24	LT	318				INCLUDES CONCRETE PER GORE DETAIL
<b>CR 314</b>						
STA 96+65.00 TO STA 97+98.94	LT					
STA 95+20.46 TO STA 103+05.04	RT				770	
<b>PROJECT TOTAL</b>		<b>436</b>	<b>1</b>	<b>1</b>	<b>770</b>	

**TABULATION OF FENCE (TEMPORARY)**

LOCATION	SIDE	FENCE (TEMPORARY)	REMARKS
		LF	
		607-11580	
<b>EASTBOUND I-70</b>			
STA 129+80.00 TO 139+80.00	RT	1005	WALL "A" CONSTRUCTION AREA - CREEK BANK PROTECTION
<b>EASTBOUND I-70 DETOUR</b>			
STA 2001+80.00 TO 2003+40.00	RT	145	SCOTT LANCASTER BRIDGE - CREEK BANK PROTECTION
STA 2011+70.00 TO 2012+82.00	RT	145	DOGHOUSE RAIL BRIDGE - CREEK BANK (SOUTH) PROTECTION
STA 2013+00.00 TO 2013+60.00	LT	125	DOGHOUSE RAIL BRIDGE - CREEK BANK (NORTH) PROTECTION
STA 2013+80.00 TO 2014+00.00	RT	35	DOGHOUSE RAIL BRIDGE - CREEK BANK (SOUTH) PROTECTION
STA 2014+60.00 TO 2016+20.00	LT	160	DOGHOUSE RAIL BRIDGE - CREEK BANK (NORTH) PROTECTION
<b>CR 314</b>			
STA 95+50.00	LT	50	PERPENDICULAR ACROSS CLEAR CREEK
STA 95+50.00 TO 98+00.00	LT	240	WALL "F" CONSTRUCTION AREA - CREEK BANK PROTECTION
STA 98+00.00 TO 98+80.00	LT	100	WALL "FF" CONSTRUCTION AREA - CREEK BANK PROTECTION
<b>PORTAL-TO-PORTAL HAUL ROAD</b>			
STA 3+90.00 TO 10+60.00	RT	690	CREEK BANK, RIPARIAN, WETLAND PROTECTION
STA 5+90.00 TO 8+35.00	LT	300	RIPARIAN PROTECTION
<b>PROJECT WIDE</b>	LT/RT	500	TO BE DIRECTED BY ENGINEER
<b>PROJECT TOTAL</b>		<b>3,495</b>	


NOTE:  
THE STATION RANGES WITHIN THIS TABULATION ARE APPROXIMATE AND SHALL BE FIELD ADJUSTED DURING CONSTRUCTION. ACTUAL LOCATIONS SHALL BE AGREED UPON BY CDOT ENVIRONMENTAL STAFF, THE ENGINEER, AND THE CONTRACTOR. FENCE LOCATIONS ARE NOT SHOWN IN THE CONSTRUCTION PLANS.

Print Date: 11/30/2012			As Constructed No Revisions: Revised: Void:	TABULATION OF QUANTITIES		Project No./Code IM 0703-389 19034 Sheet Number 22
File Name: I8832DES_CPIB_TabQuantities.dgn				Designer: E. Marsh Detailer: J. Gellner	Structure Numbers	
Horiz. Scale: 1:1 Vert. Scale:				Subset: Tabulations	Subset Sheets: 1 of 4	


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**TABULATION OF SURFACING**

LOCATION		SIDE	304-06000	403-34721			411-10255	REMARKS
			AGGREGATE BASE COURSE (CLASS 6)	HOT MIX ASPHALT (GRADING SX) (75) (PG 58-28)			EMULSIFIED ASPHALT (SLOW-SETTING)	
			TON	TON			GAL	
FROM	TO		2" LIFT	3" LIFT	3" LIFT			
<b>EASTBOUND I-70</b>								
175+44.49	181+77.14	RT	905		748	748	453	
<b>EXIT 243 OFF RAMP</b>								
405+22.05	409+00.00	LT	229		189	189	115	
<b>CR 314</b>								
95+20.46	95+74.18	RT/LT	39		33	33	20	
95+74.18	98+13.82	RT/LT	244		202	202	122	
98+13.82	98+85.46	RT	11		9			
98+85.46	102+80.77	RT	83		69			
<b>EASTBOUND I-70 DETOUR</b>								
2043+62.21	2045+98.58	LT/RT	145		120	120	75	
2045+98.58	2046+75.00	LT/RT			*331		370	*Variable Depth HMA 2" to 25.7" - Assumed avg of 6 lifts
2046+75.00	2050+55.14	LT/RT		155			141	
<b>SUBTOTALS</b>			1,656	155	1,700	1,292	1,155	
<b>PROJECT TOTALS</b>			1,656	3,147			1,296	

Print Date: 12/4/2012  
 File Name: 18832DES\_CPIB\_TabSurfacing.dgn  
 Horiz. Scale: 1:1      Vert. Scale:  
 4601 DTC Boulevard, Suite 700  
 Denver, CO 80237  
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Sheet Revisions		
Date:	Comments	Init.

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 Region 1      CRC

As Constructed
No Revisions:
Revised:
Void:

TABULATION OF SURFACING			
Designer:	E. Marsh	Structure Numbers	
Detailer:	J. Gellner	Subset Sheets: 2 of 4	
Subset:	Tabulations		

Project No./Code
IM 0703-389
19034
Sheet Number 23

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## SUMMARY OF EARTHWORK QUANTITIES

PAY QUANTITY	PROJECT TOTALS	
	PLAN	AS CONST.
<b>UNCLASSIFIED EXCAVATION (COMPLETE IN PLACE) (CY)</b>		
FROM ROADWAY CROSS SECTIONS (I-70)(COMPUTER GENERATED)	3,053	
FROM ROADWAY CROSS SECTIONS (CR 314)(COMPUTER GENERATED)	252	
FROM ROADWAY CROSS SECTIONS (EB I-70 DETOUR)(COMPUTER GENERATED)	2,883	
<b>PROJECT TOTAL FOR PAY QUANTITY</b>	6,188	
FOR INFORMATION ONLY	PROJECT TOTALS	
	PLAN	AS CONST.
<b>EMBANKMENT (CY)</b>		
FROM ROADWAY CROSS SECTIONS (I-70)(COMPUTER GENERATED)	724	
FROM ROADWAY CROSS SECTIONS (CR 314)(COMPUTER GENERATED)	84	
FROM ROADWAY CROSS SECTIONS (EB I-70 DETOUR)(COMPUTER GENERATED)	19	
<b>TOTAL EMBANKMENT</b>	827	
<b>EXCAVATION (CY)</b>		
FROM ROADWAY CROSS SECTIONS (SEE ABOVE)(COMPUTER GENERATED)	6,188	
FROM PIPES/OUTLETS (FIO, STRUCTURE EXCAVATION)	75	
FROM BRIDGE(PAID AS STRUC. EX.)	4,549	
FROM RETAINING WALLS EXCAVATION (PAID AS STRUC. EX.)	3,803	
<b>TOTAL EXCAVATION</b>	14,615	
<b>EARTHWORK BALANCE (CY)</b>		
EMBANKMENT x FACTOR (1.15)	951	
EXCESS EXCAVATION	13,664	
<b>TOTAL</b>	14,615	
<b>COMPACTION (AASHTO T-180) (CY)</b>		
EMBANKMENT (NET)	827	
BASES OF CUTS AND FILLS (1' OVER AREA OF DISTURBANCE) (CY)	4,163	
<b>TOTAL COMPACTION</b>	4,990	
<b>WETTING (MGAL)</b>		
FOR COMPACTION (0.04 M GAL / CY)	200	

- 1) ALL EXCESS EXCAVATION LISTED ABOVE SHALL BE PROPERLY DISPOSED OF OFF SITE AND WILL BE INCIDENTAL TO ITEM 203-00010 UNCLASSIFIED EXCAVATION (COMPLETE IN PLACE).
- 2) SEE WEST AND EAST PORTAL DEVELOPMENT GRADING PLANS FOR UNCLASSIFIED EXCAVATION (SPECIAL) AND ROCK EXCAVATION QUANTITIES. ALL UNCLASSIFIED EXCAVATION (SPECIAL) AND ROCK EXCAVATION SHALL BE CONSIDERED EXCESS EXCAVATION IN ADDITION TO THE QUANTITY OF EXCESS EXCAVATION SHOWN IN THE SUMMARY OF EARTHWORK TABULATION. ALL EXCAVATION ASSOCIATED WITH UNCLASSIFIED EXCAVATION (SPECIAL) AND ROCK EXCAVATION SHALL BE PROPERLY DISPOSED OF OFF SITE AND WILL BE INCIDENTAL TO THE CORRESPONDING EXCAVATION PAY ITEMS.

## PAVEMENT DESIGN PARAMETERS


LOCATION	EASTBOUND I-70 WIDENING OR RECONSTRUCTION	CR 314	EB I-70 DETOUR
<b>FLEXIBLE STRUCTURAL DESIGN DATA</b>			
20-YR FLEXIBLE 18K ESALS	2,300,000	627,251	627,251
INITIAL SERVICEABILITY	4.5	4.5	4.5
TERMINAL SERVICEABILITY	2.5	2.5	2.5
RELIABILITY	95%	80%	80%
OVERALL DEVIATION	0.44	0.44	0.44
ROADBED SOIL RESILIENT MODULUS	25,317.00	18,259.00	18,259.00
REQUIRED STRUCTURAL NUMBER	3.30	2.09	2.09
ABC THICKNESS, INCHES	4	4	4
ABC STRUCTURAL NUMBER	0.48	0.48	0.48
EXISTING PAVEMENT STRUCTURAL NUMBER	-	-	-
HMA STRUCTURAL NUMBER	3.52	2.64	2.64
DESIGN STRUCTURAL NUMBER	4.00	3.12	3.12
CALCULATED HMA DESIGN THICKNESS	3.52/0.44=8.0 IN.	2.64/0.44=6.0 IN	2.64/0.44=6.0 IN.
	<b>USE 8**</b>	<b>USE 6.0"</b>	<b>USE 6"</b>

NOTE:

GEOTECHNICAL INFORMATION FOR THIS PROJECT IS BASED ON THE PAVEMENT STABILIZATION REPORT FOR THE I-70 IDAHO SPRINGS TWIN TUNNELS WIDENING. THE CONTRACTOR SHALL PERFORM WORK IN ACCORDANCE WITH THE GEOTECHNICAL RECOMMENDATIONS.

BECAUSE THE ABOVE PAVEMENT SECTIONS ARE EXPECTED TO BE PLACED DURING WINTER, (2) THREE INCH LIFTS ARE RECOMMENDED TO RETAIN HEAT TO AID COMPACTION AND ENSURE DURABILITY. TO MAINTAIN ELEVATIONS, EACH ABC LAYER WAS REDUCED, BUT THE DESIGN STRUCTURAL NUMBERS ARE INCREASED OVER THE ORIGINAL DESIGN BECAUSE OF THE INCREASED HMA THICKNESS.

\* ONLY THE BOTTOM 2 THREE INCH LIFTS OF MAINLINE I-70 WILL BE PLACED DURING WINTER. THE TOP LIFT OF MAINLINE I-70 WILL BE PLACED AT A LATER DATE AND WILL BE ADDRESSED IN CONSTRUCTION PACKAGE 2.

Print Date: 11/30/2012	0000	<b>Sheet Revisions</b>			<b>Colorado Department of Transportation</b>			<b>As Constructed</b>		<b>SUMMARY OF EARTHWORK AND PAVEMENT DESIGN PARAMETERS</b>			<b>Project No./Code</b>				
File Name: 18832DES_CPIB_SumEarthwork.dgn			Date:	Comments	Init.	 425 A Corporate Circle Golden, CO 80401 Phone: 720-497-6918 FAX: 720-497-6901			No Revisions:		IM 0703-389						
Horiz. Scale: 1:1      Vert. Scale:									Revised:		Designer: E. Marsh		Structure Numbers		19034		
<b>ATKINS</b> 4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276					<b>Region 1</b>			Void:		Detailer: J. Gellner		Subset: Tabulations		Subset Sheets: 3 of 4		Sheet Number 24	



**TO ESTABLISH GEOMETRIC CONTROL FOR THE CONSTRUCTION OF THIS PROJECT, THE DEPARTMENT HAS PROVIDED THE FOLLOWING INFORMATION:**

- Format \*  
 Horizontal Control See Plan Sheet  
 Vertical Control See Plan Sheet  
 Roadway Alignment See Plan Sheet  
 Original Terrain Data See Plan Sheet  
 Other: \_\_\_\_\_

\* Specify the information format, i.e., plan sheet, computer disk, computer printout, or other. The information marked is either contained on the plans or is available from the Engineer.

**TYPE OF PROJECT**

- Landscaping  
 Signalization  
 Safety Improvement  
 Asphalt Overlay  
 Concrete Overlay  
 Minor Widening  
 Major Reconstruction  
 New Roadway Construction  
 Bridge Replacement  
 Bridge Widening  
 New Bridge  
 Other: New Retaining Wall

SURVEY WORK TO BE PERFORMED BY OTHERS: \_\_\_\_\_

**WORK PERFORMED BY THE CONTRACTOR'S SURVEYOR UNDER SECTION 625:**

- Establish and Maintain Project Centerline or Engineer Approved Offset Line(s)  
 Verification and Maintenance of Horizontal and Vertical Control  
 Verify or Determine existing grades and alignments  
 Verify or Determine existing topography  
 Clearing and Grubbing Limits (Section 201)  
 Removal Limits (Section 202)  
 Reset Items (Section 210)  
 Excavation and Embankment (Section 203)

- Excavation  
 Unclassified  
 Stripping  
 Muck  
 Rock  
 Borrow  
 Other: \_\_\_\_\_  
 Potholing

- Embankment  
 Site Grading  
 Erosion Control (Perm)  
 Other: Rock Excavation/ Unclassified Excavation (Sp)  
 As Staked Earthwork Quantities (See General Notes)

- Landscaping  
 Top Soil (Section 207)  
 Seeding (Section 212)  
 Mulching (Section 213)  
 Planting (Section 214)  
 Herbicide (Section 217)  
 Other: \_\_\_\_\_

- Erosion Control (Section 208)  
 Seeding (Temp)  
 Silt Fence  
 Erosion Bales  
 Erosion Logs  
 Riprap (Temp)  
 Other: \_\_\_\_\_

- Roadway Bases  
 Untreated Subgrade  
 Treated Subgrade  
 Aggregate Base Course (Section 304)  
 Reconditioning  
 PMBB - Plant Mix Bituminous Base  
 Other: \_\_\_\_\_

	Slope Staking (Y/N)	Grid (Y/N)	Grade Stakes	Special Interval
Excavation	Y	-	Y	-
	-	-	-	-
	Y	-	Y	-
	-	-	-	-

	Slope Staking (Y/N)	Grid (Y/N)	Grade Stakes	Special Interval
Embankment	Y	-	Y	-
	-	-	-	-
	-	-	-	-
	-	-	-	-

	Grid (Y/N)	Grade (Y/N)	Special Interval	Special Offset
Roadway Bases	-	Y	-	-
	-	Y	-	-
	-	-	-	-
	-	-	-	-

- Pavements  
 HMA - Hot Mix Asphalt (Section 403)  
 Concrete (Section 412)  
 Heating & Scarifying Treatment  
 Prime Coat, Tack Coat & Rejuvenating Agent (Section 407)  
 Seal Coat or Chip Seal (Section 409)  
 Other: \_\_\_\_\_

- Roadway Elements  
 Curb and Gutter (Section 609)  
 Drop inlets - alignment and grades (Section 604)  
 Retaining Walls  
 Guard Rail (Section 606)  
 Sidewalk (Section 608)  
 Overlay Stationing  
 Other: \_\_\_\_\_

- Riprap (Perm) (Section 506)  
 Slope and Ditch Paving (Section 507)

- Minor Structures  
 Structure Excavation limits (Section 206)  
 Culverts (Section 603)  
 Culverts w/ Headwalls and Wingwalls (Section 601)  
 Concrete Box Culverts w/ Headwalls and Wingwalls  
 Pipes (Section 603)  
 Sanitary Sewer  
 Storm Sewer  
 Water  
 Irrigation  
 Miscellaneous  
 Manholes (Section 604)  
 Inlets (Section 604)  
 Other: \_\_\_\_\_

- Major Structures - Overhead Signs (Section 614), Concrete Box Culverts, Bridges - and all other structures assigned a structure number  
 Structure Excavation limits (Section 206)  
 Concrete Box Culverts (Section 603) w/ Headwalls and Wingwalls (Section 601)  
 Piling locations and cut off elevations (Section 502)  
 Caisson locations and elevations (Section 503)  
 Footing locations, alignment, and elevations  
 Abutment/Pier locations, alignment, and elevations  
 Wingwall skew angles/offsets  
 Structural concrete form locations  
 Substructure As-constructed survey required for Bridges (Subsection 601 .12) and Overhead signs (S-614-50)  
 Bridge expansion joint(s) alignment and grade (longitudinal and transverse)  
 Deck grades at Girder 10th or "n" th point locations and elevations  
 Slope and Ditch Paving (Section 507)  
 Other: Wall "F", "FF", "K"

- Fencing (Section 607)  
 Temporary  
 Permanent  
 Sound Barrier  
 Other: \_\_\_\_\_

- Delineators (Section 612)  
 Temporary  
 Permanent

- Lighting (Section 613) and Traffic Control Devices (Permanent) (Section 614)  
 Signal pole locations and elevations  
 Light pole locations and elevations  
 Sign locations  
 Field verify sign post locations, elevations, and lengths before fabrication.  
 Other: Various ITS items

	Grid (Y/N)	Special Interval	Special Offset
Pavements	See note	below	-
	-	-	-
	-	-	-
	-	-	-

	Tangent Interval	Curve Interval	Special Offset
Curb & Gutter	See note	below	-
	-	-	-

	Left Interval	Center Interval	Right Interval
Stationing	See note	below	-
	-	-	-

NOTE - Project Engineer shall determine what is needed for staking in these areas.

- Pavement Marking (Section 627)  
 Striping (Temp)  
 Striping (Perm)  
 Symbols  
 Other: \_\_\_\_\_  
 Temporary Lighting and Construction Traffic Control Devices (Section 630)  
 Signal pole locations and elevations (Temp)  
 Light pole locations and elevations (Temp)  
 Sign Locations (Temp)  
 Other: \_\_\_\_\_  
 Easements (Temp Staking by P.L.S. Only)  
 Right of Way (Temp Staking by P.L.S. Only)

**WORK PERFORMED BY THE CONTRACTOR'S SURVEYOR UNDER SECTION 629:**

- Monumentation (Section 629)  
 Control  
 Right of Way  
 Land corners, Aliquot corners  
 Easements  
 Reference the specified existing monuments: \*\* \_\_\_\_\_  
 Replace the specified existing monuments: \*\* \_\_\_\_\_  
 Locate monuments. It is estimated \_\_\_\_\_ hours are required.

NOTE: All 629 items shall include adequate research, calculations, and evaluations of evidence for monuments to be set.


\*\* A Tabulation of Survey Monuments may be provided on the plans.

**GENERAL NOTES:**

- Unless indicated otherwise on this Survey Tabulation Sheet, all survey work and staking intervals shall be done in accordance with the latest edition of the CDOT Survey Manual.
- Adequate information for establishing lines, grades, and locations for all work items have been specified on the plans. Any additional information required to stake the item or element shall be generated by the Contractor's surveyor.
- The Contractor's surveyor shall provide an estimate of the man-hours necessary to complete the work items indicated on this sheet. A copy of this sheet, with the estimated man-hours written on the blank line to the left of the specified items, shall be submitted with the Survey Schedule to the Engineer 5 days prior to the Presurvey Conference - Construction Survey.
- Stakes and Monuments which are damaged or destroyed by the progress of construction shall be replaced by the Contractor at no additional cost to the Department.
- The Contractor shall furnish an As Staked earthwork quantity to the Engineer prior to completion of twenty percent (20%) of the planned earthwork in any phase as per the CDOT Survey Manual. A printed copy of the As Staked earthwork data and a computer disk in the specified format shall be submitted to the Engineer. The Contractor shall field verify original ground cross sections at a maximum 500 feet intervals.
- Prior to beginning work on any subsequent operation, such as placing base course or paving, the Contractor shall certify in writing to the Engineer that the final grade is within specified tolerance.
- The Contractor's surveyor shall perform all field surveying and calculations necessary to tie plan grades into field grades.
- The Contractor shall coordinate construction staking on the project with any utility work.
- Fieldbooks shall contain daily records of points set and or measurements observed. The information recorded shall contain: date, crew members' names, point no., description, staking information, and sketches. If the survey information is collected electronically, information recorded shall be provided to the Project Engineer in a hard copy format that is intuitive, clear and related to the supplemental information recorded in the field books. All linear surveys, such as slope stakes and blue tops, shall have the station and offset information related to the measured information. Non-linear surveys such as structures staking shall have sketches relating electronic information, such as point numbers, to the sketch.
- The Contractor's surveyor shall submit the following fieldbooks to the Engineer:
  - Horizontal Control (Primary & Secondary)
  - Vertical Control (i.e. Benchmarks)
  - Property Pin Ties
  - Horizontal Alignment
  - Grading
  - Slope Staking
  - Minor Structures
  - Major Structures
  - One fieldbook for each work category shown on this sheet
  - Other Fieldbook(s): \_\_\_\_\_

Print Date: 10-5-2012  
 File Name: 19035Surv\_CP1B\_Tab.dgn  
 Horiz. Scale: 1:1      Vert. Scale: As Noted  
 R1 Field Survey      DAS  
**ATKINS**      4601 DTC Boulevard, Suite 700  
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Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation  
  
 18500 East Colfax Avenue  
 Aurora, CO 80011  
 Phone: 303-365-7409      FAX: 303-365-7350  
 Region 1 - Survey Unit      David A. Stewart

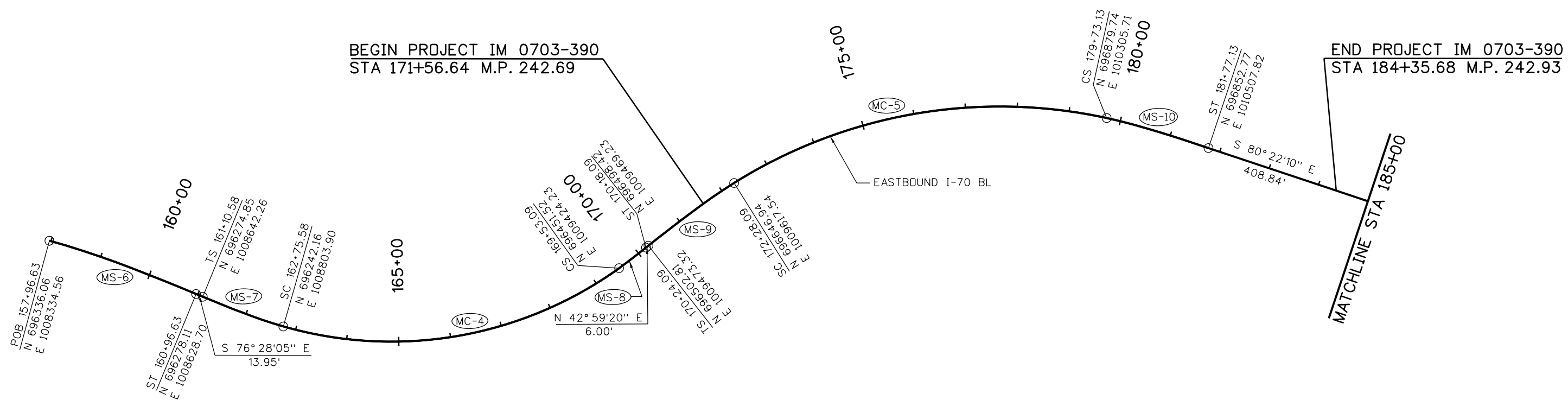
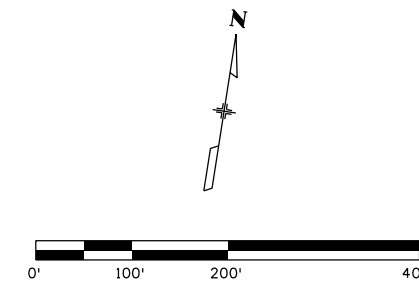
As Constructed	SURVEY TABULATION SHEET		
No Revisions:	Designer: E. Marsh	Structure Numbers	
Revised:	Detailer: J. Gellner		
Void:	Sheet Subset: Survey	Subset Sheets: 1 of 1	

Project No./Code  
 IM 0703-390  
 19035  
 Sheet Number 26




CURVE/SPIRAL TABLE

NUMBER	TYPE	DELTA/THETA	TANGENT	L TAN	S TAN	LENGTH	RADIUS	e (%)	PI STATION	PI NORTHING	PI EASTING
MS-6	SPIRAL	7° 09' 43"		200.16'	100.15'	300.00'		-	158+96.78	696324.95	1008434.09
MS-7	SPIRAL	6° 18' 09"		110.07'	55.06'	165.00'		-	162+20.65	696249.09	1008749.27
MC-4	CURVE	51° 45' 28"	363.84'	-	-	677.51'	750.00'	-	166+39.42	696196.38	1009164.85
MS-8	SPIRAL	2° 28' 58"		43.34'	21.67'	65.00'		-	169+74.76	696466.72	1009439.68
MS-9	SPIRAL	6° 05' 16"		136.08'	68.07'	204.00'		-	171+60.17	696602.35	1009566.11
MC-5	CURVE	44° 27' 59"	392.42'	-	-	745.04'	960.00'	-	176+20.50	696903.99	1009914.05
MS-10	SPIRAL	6° 05' 16"		136.08'	68.07'	204.00'		-	180+41.20	696875.54	1010373.66



Print Date: 11/30/2012  
 File Name: 18832DES\_CPIB\_Geolay001.dgn  
 Horiz. Scale: 1:200      Vert. Scale:  
**ATKINS** 4601 DTC Boulevard, Suite 700  
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Sheet Revisions		
Date:	Comments	Init.

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 Region 1 CRC

As Constructed
No Revisions:
Revised:
Void:

**EASTBOUND I-70  
 GEOMETRIC LAYOUT  
 STA 157+96.63 TO 185+00**

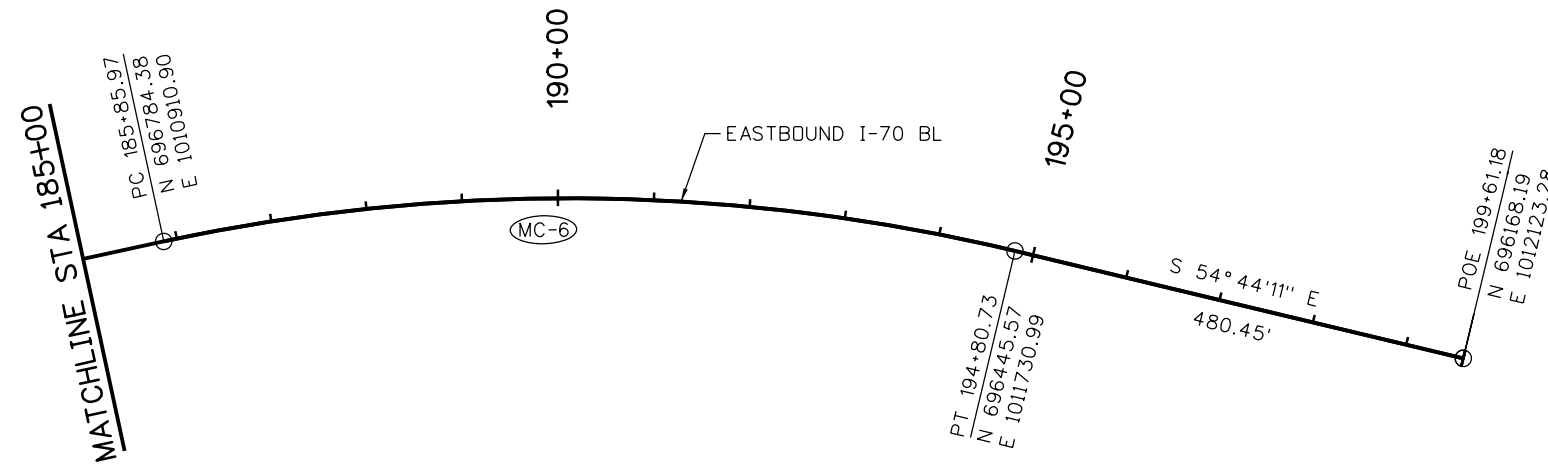
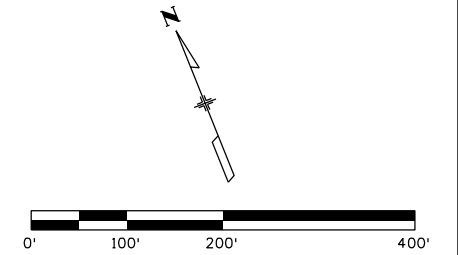
Designer: E. Marsh	Structure Numbers
Detailer: J. Gellner	
Subset: GEOM	Subset Sheets: 1 of 6

Project No./Code
IM 0703-390
19035
Sheet Number 27

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CURVE/SPIRAL TABLE

NUMBER	TYPE	DELTA/THETA	TANGENT	L TAN	S TAN	LENGTH	RADIUS	e (%)	PI STATION	PI NORTHING	PI EASTING
MC-6	CURVE	25° 37'59"	454.99'	-	-	894.76'	2000.00'	-	190+40.96	696708.26	1011359.48

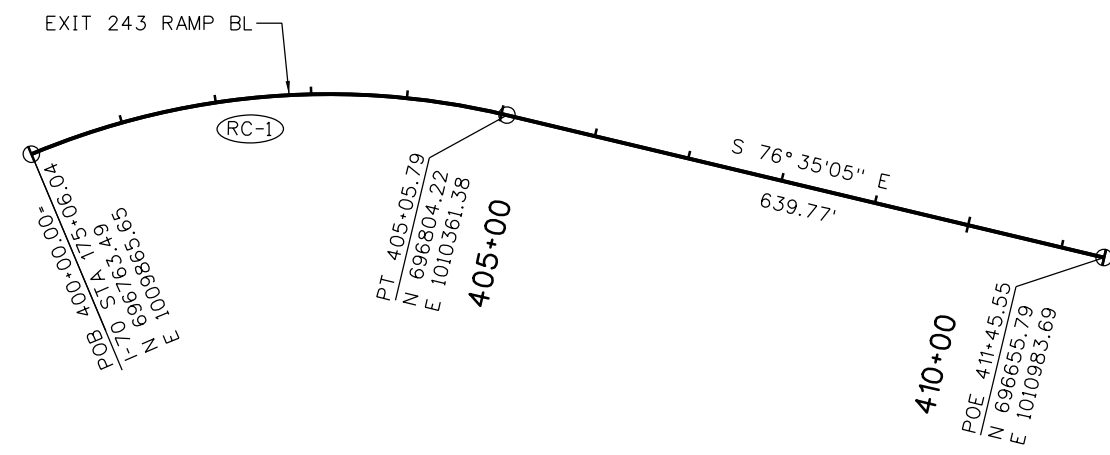
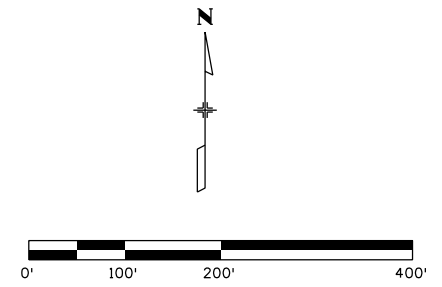


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Print Date: 11/30/2012	0000	<b>Sheet Revisions</b>	<b>Colorado Department of Transportation</b>	<b>As Constructed</b>	<b>EASTBOUND I-70 GEOMETRIC LAYOUT STA 185+00 TO 199+61.18</b>	<b>Project No./Code</b>	
File Name: 18832DES_CPIB_Geolay002.dgn		Date:	Comments	Init.	No Revisions:	Designer: E. Marsh	IM 0703-390
Horiz. Scale: 1:200      Vert. Scale:					Revised:	Detailer: J. Gellner	19035
<b>ATKINS</b> 4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276			 DEPARTMENT OF TRANSPORTATION <b>Region 1</b>	<b>CRC</b>	Void:	Structure Numbers	
			425 A Corporate Circle Golden, CO 80401 Phone: 720-497-6918 FAX: 720-497-6901		Subset: GEOM	28	
					Subset Sheets: 2 of 6	Sheet Number	

CURVE/SPIRAL TABLE

NUMBER	TYPE	DELTA/ THETA	TANGENT	L TAN	S TAN	LENGTH	RADIUS	e (%)	PI STATION	PI NORTHING	PI EASTING
RC-1	CURVE	36° 13' 27"	261.67'	-	-	505.79'	800.00'	-	402+61.67	696864.93	1010106.85



Print Date: 11/30/2012  
 File Name: 18832DES\_CPIB\_Geolay002a.dgn  
 Horiz. Scale: 1:200      Vert. Scale:  
**ATKINS** 4601 DTC Boulevard, Suite 700  
 Denver, CO 80237  
 Phone: (303) 221-7275 Fax: (303) 221-7276

Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation  
  
 425 A Corporate Circle  
 Golden, CO 80401  
 Phone: 720-497-6918 FAX: 720-497-6901  
 Region 1      CRC

As Constructed
No Revisions:
Revised:
Void:

EXIT 243 OFF RAMP  
 GEOMETRIC LAYOUT  
 STA 400+00.00 TO 411+45.55

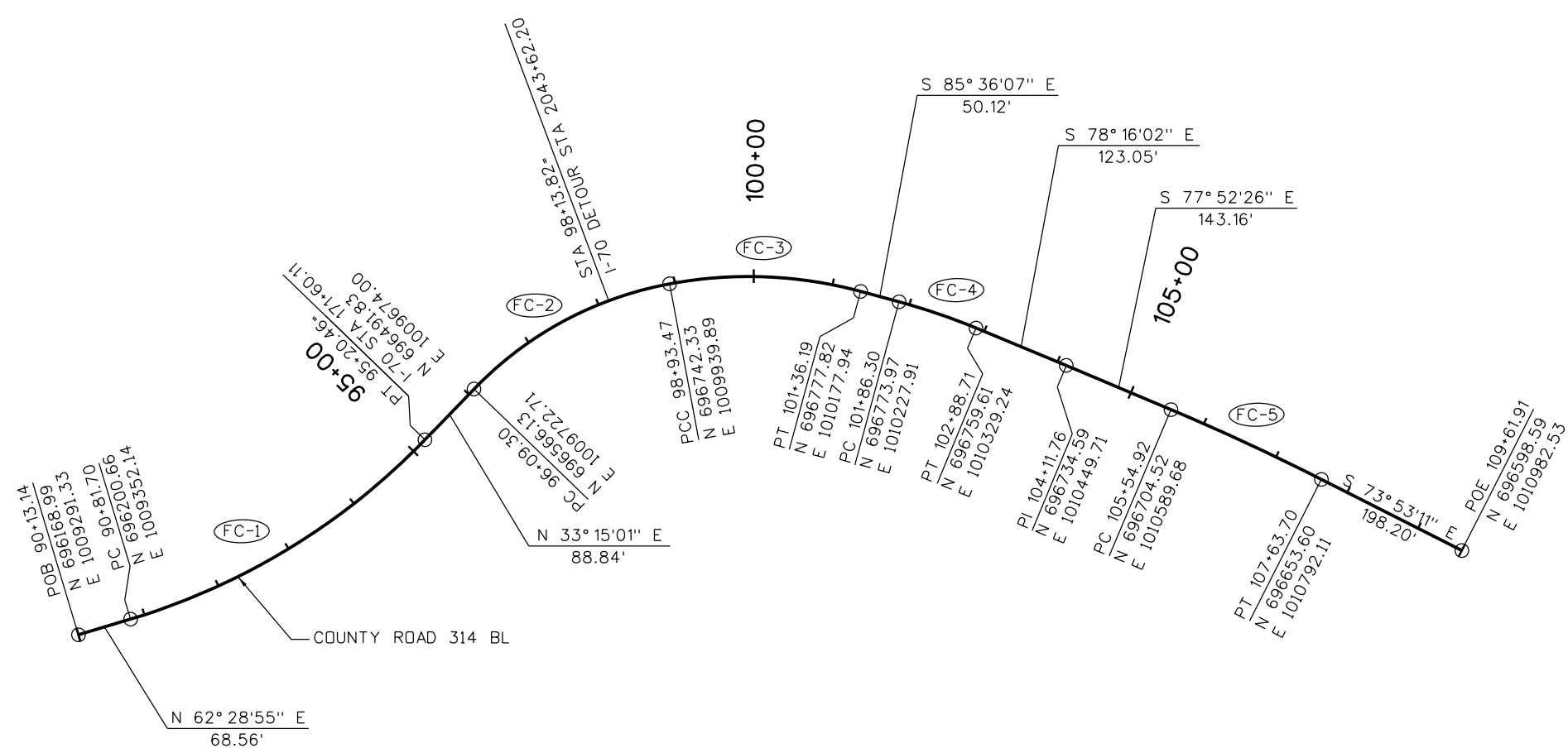
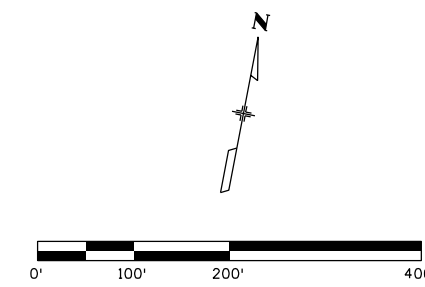
Designer: E. Marsh	Structure Numbers
Detailer: J. Gellner	
Subset: GEOM	Subset Sheets: 3 of 6

Project No./Code  
 IM 0703-390  
 19035  
 Sheet Number 29

17543 7:51:24 AM c:\pwworkspace\pws\common\dms25924\18832DES\_CPIB\_Geolay002a.dgn

CURVE/SPIRAL TABLE

NUMBER	TYPE	DELTA/THETA	TANGENT	L TAN	S TAN	LENGTH	RADIUS	e (%)	PI STATION	PI NORTHING	PI EASTING
FC-1	CURVE	29° 13' 54"	224.27'	-	-	438.76'	860.00'	-	93+05.97	696304.28	1009551.03
FC-2	CURVE	35° 23' 39"	146.78'	-	-	284.16'	460.00'	-	97+56.08	696688.88	1009803.19
FC-3	CURVE	25° 45' 14"	123.45'	-	-	242.72'	540.00'	-	100+16.91	696787.28	1010054.86
FC-4	CURVE	7° 20' 04"	51.27'	-	-	102.41'	800.00'	-	102+37.58	696770.04	1010279.03
FC-5	CURVE	3° 59' 15"	104.43'	-	-	208.78'	3000.00'	-	106+59.35	696682.58	1010691.78

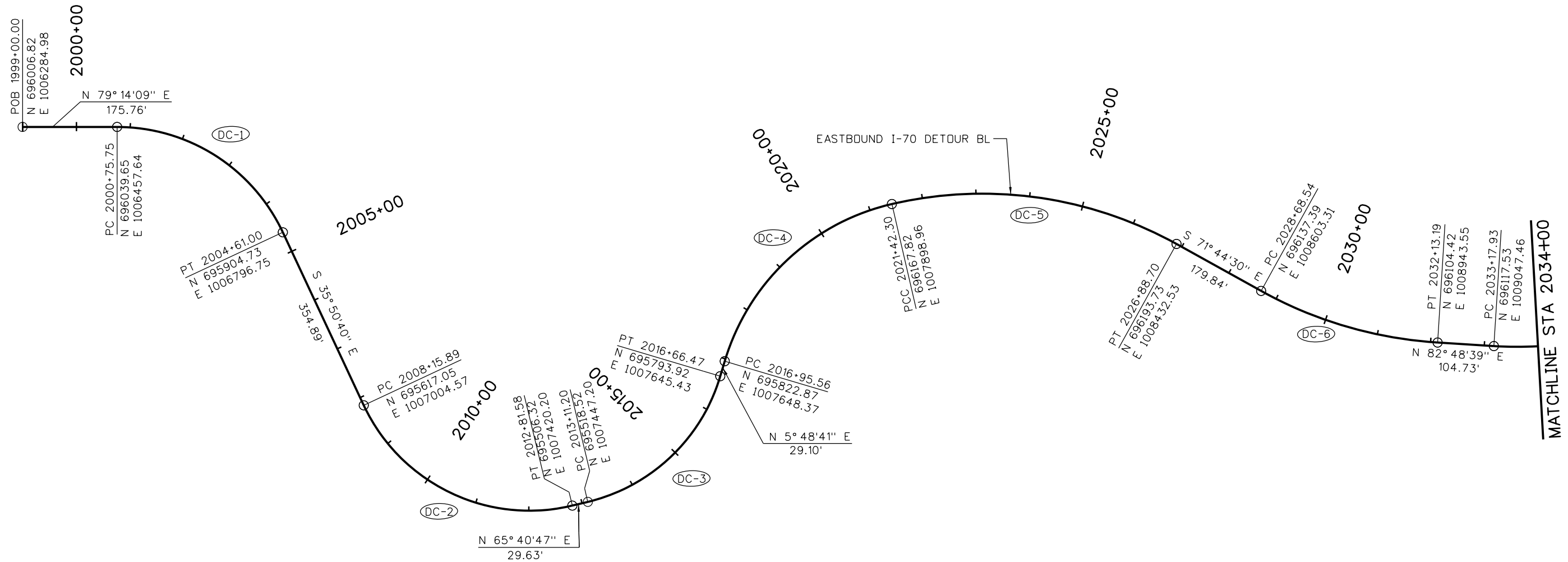
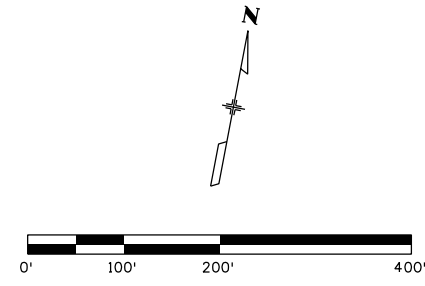


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Print Date: 11/30/2012	0000	<b>Sheet Revisions</b>			<b>Colorado Department of Transportation</b>				<b>As Constructed</b>		<b>COUNTY ROAD 314 GEOMETRIC LAYOUT STA 90+13.14 TO 109+61.91</b>			<b>Project No./Code</b>	
File Name: 18832DES_CPIB_Geolay003.dgn		Date:	Comments	Init.	425 A Corporate Circle Golden, CO 80401 Phone: 720-497-6918 FAX: 720-497-6901				No Revisions:		Designer: E. Marsh Detailer: J. Gellner Subset: GEOM			IM 0703-390	
Horiz. Scale: 1:200      Vert. Scale:									Revised:					Structure Numbers	
<b>ATKINS</b> 4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276					<b>Region 1</b>				Void:		Subset Sheets: 4 of 6			Sheet Number 30	

CURVE/SPIRAL TABLE


NUMBER	TYPE	DELTA/THETA	TANGENT	L TAN	S TAN	LENGTH	RADIUS	e (%)	PI STATION	PI NORTHING	PI EASTING
DC-1	CURVE	64° 55'12"	216.27'	-	-	385.24'	340.00'	-	2002+92.02	696080.04	1006670.11
DC-2	CURVE	78° 28'34"	277.67'	-	-	465.69'	340.00'	-	2010+93.56	695391.96	1007167.17
DC-3	CURVE	59° 52'05"	195.78'	-	-	355.26'	340.00'	-	2015+06.98	695599.15	1007625.60
DC-4	CURVE	60° 22'08"	246.62'	-	-	446.74'	424.00'	-	2019+42.18	696068.22	1007673.35
DC-5	CURVE	42° 04'41"	286.18'	-	-	546.39'	744.00'	-	2024+28.48	696283.39	1008160.76
DC-6	CURVE	25° 26'51"	175.22'	-	-	344.66'	776.00'	-	2030+43.76	696082.49	1008769.71



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Print Date: 11/30/2012  
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Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation  
  
 425 A Corporate Circle  
 Golden, CO 80401  
 Phone: 720-497-6918 FAX: 720-497-6901  
**Region 1** **CRC**

As Constructed
No Revisions:
Revised:
Void:

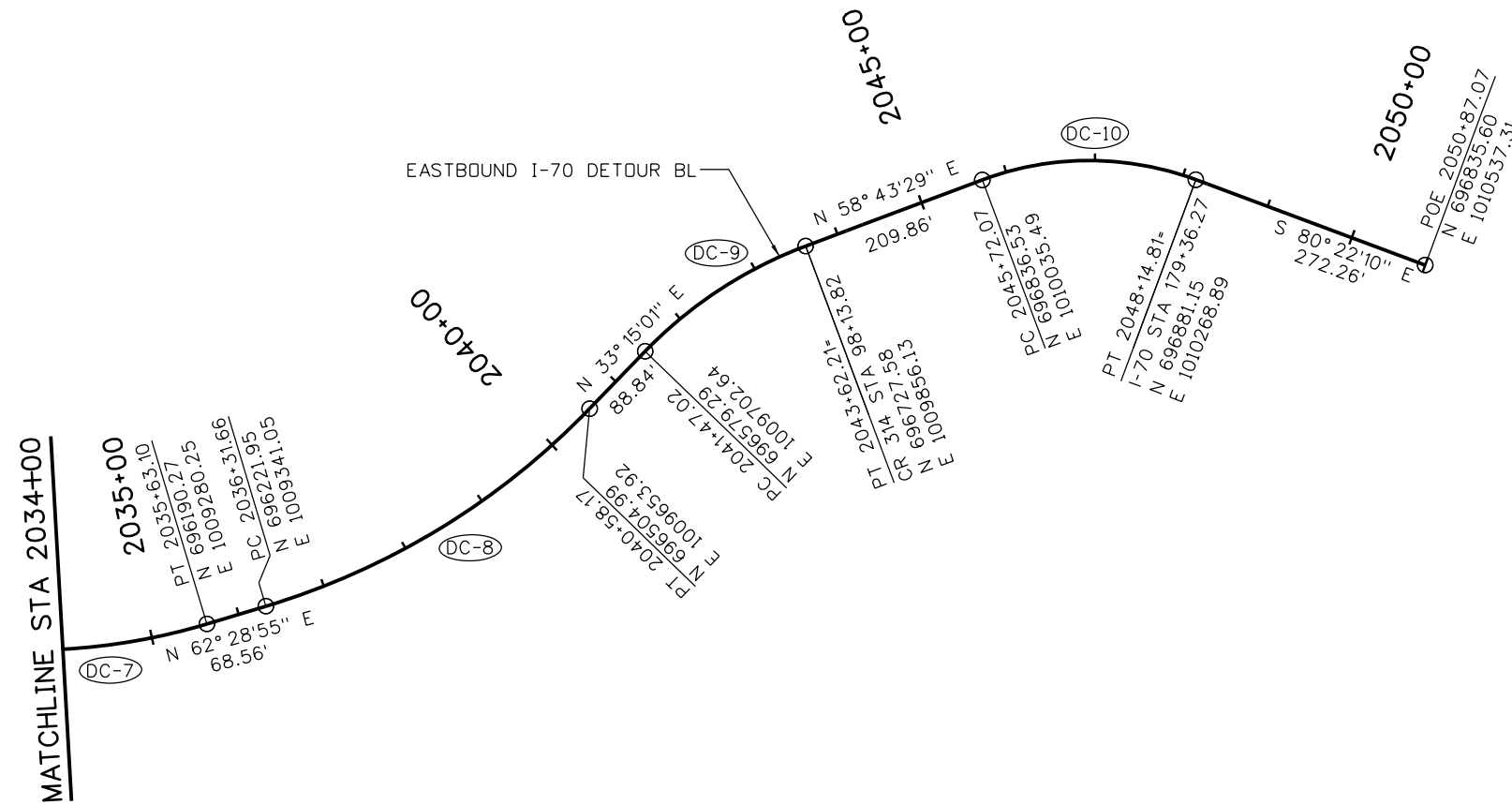
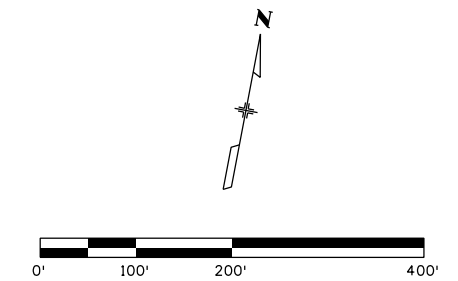
**EASTBOUND I-70 DETOUR  
 GEOMETRIC LAYOUT  
 STA 1999+00 TO 2034+00**

Designer: E. Marsh	Structure Numbers
Detailer: J. Gellner	
Subset: GEOM	Subset Sheets: 5 of 6

Project No./Code
IM 0703-390
19035
Sheet Number 31

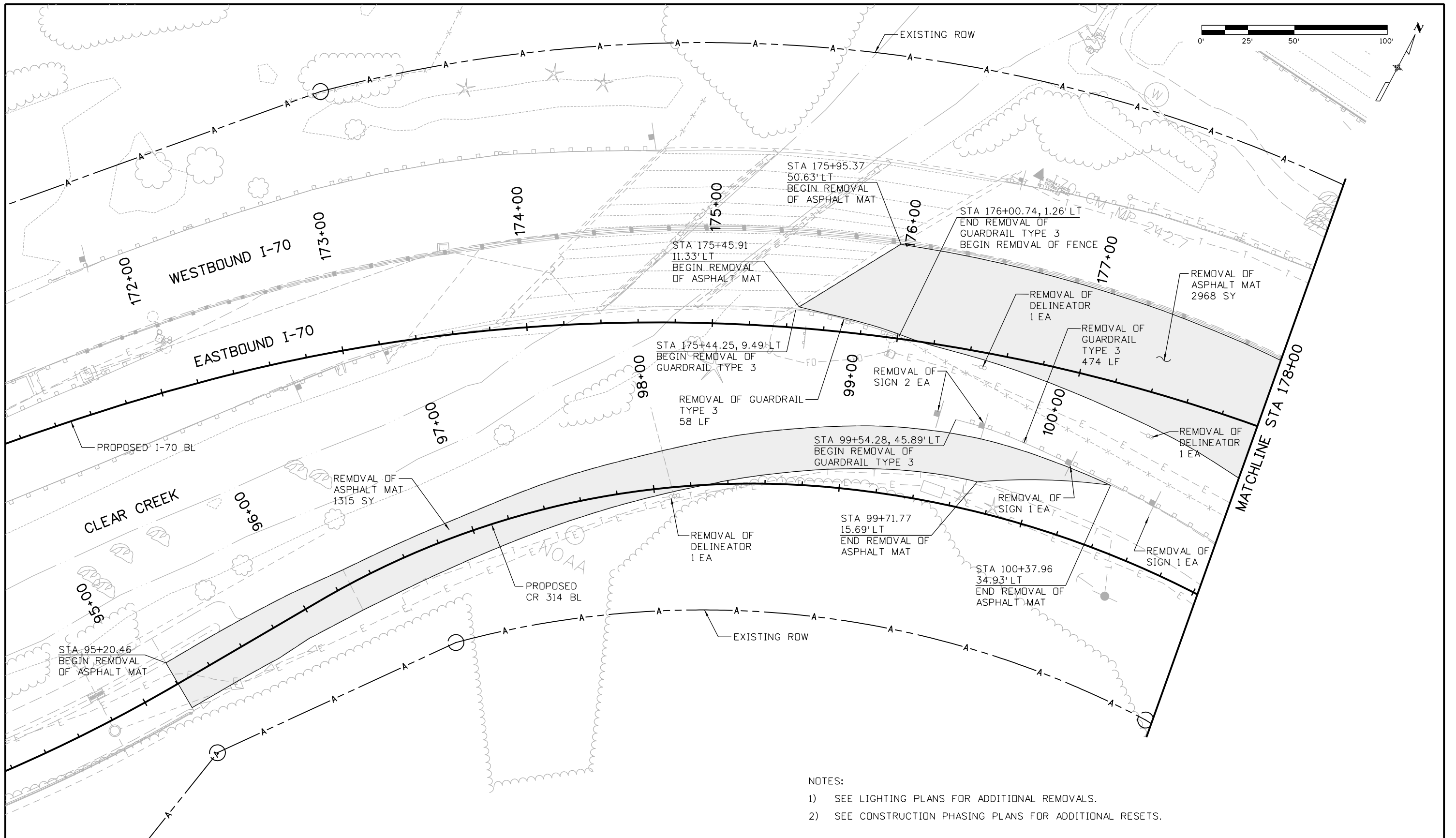
CURVE/SPIRAL TABLE

NUMBER	TYPE	DELTA/THETA	TANGENT	L TAN	S TAN	LENGTH	RADIUS	e (%)	PI STATION	PI NORTHING	PI EASTING
DC-7	CURVE	20° 19' 44"	123.89'	-	-	245.17'	691.00'	-	2034+41.81	696133.03	1009170.37
DC-8	CURVE	29° 13' 54"	218.01'	-	-	426.52'	836.00'	-	2038+49.66	696322.67	1009534.39
DC-9	CURVE	25° 28' 28"	109.40'	-	-	215.19'	484.00'	-	2042+56.42	696670.78	1009762.62
DC-10	CURVE	40° 54' 21"	126.80'	-	-	242.74'	340.00'	-	2046+98.87	696902.36	1010143.87



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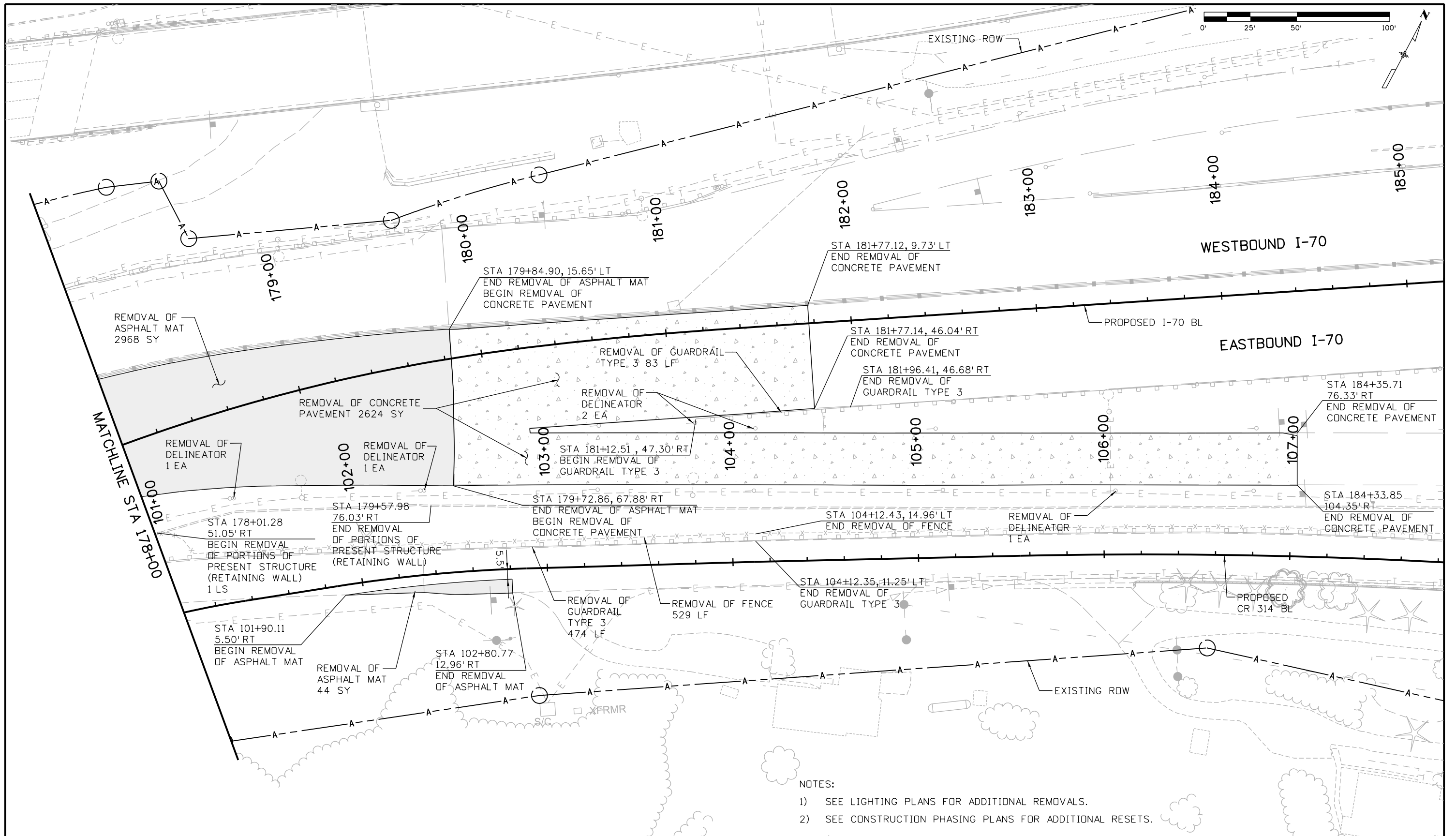
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		Designer: E. Marsh Detailer: J. Gellner Subset: GEOM	Structure Numbers	Subset Sheets: 6 of 6						



- NOTES:
- 1) SEE LIGHTING PLANS FOR ADDITIONAL REMOVALS.
  - 2) SEE CONSTRUCTION PHASING PLANS FOR ADDITIONAL RESETS.

Print Date: 11/30/2012		Sheet Revisions		Colorado Department of Transportation		As Constructed		EASTBOUND I-70 REMOVAL PLAN STA 171+40 TO 178+00		Project No./Code	
File Name: 18832DES_CPIB_RMVPlan001.dgn		Date:	Comments	Init.	425 A Corporate Circle Golden, CO 80401 Phone: 720-497-6918 FAX: 720-497-6901		No Revisions:		IM 0703-390		
Horiz. Scale: 1:50      Vert. Scale:					Region 1		Revised:		19035		
ATKINS 4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276					CRC		Void:		Sheet Number 33		
0000							Designer: E. Marsh Detailer: J. Gellner Subset: REMOVALS		Structure Numbers		
							Subset Sheets: 1 of 2				

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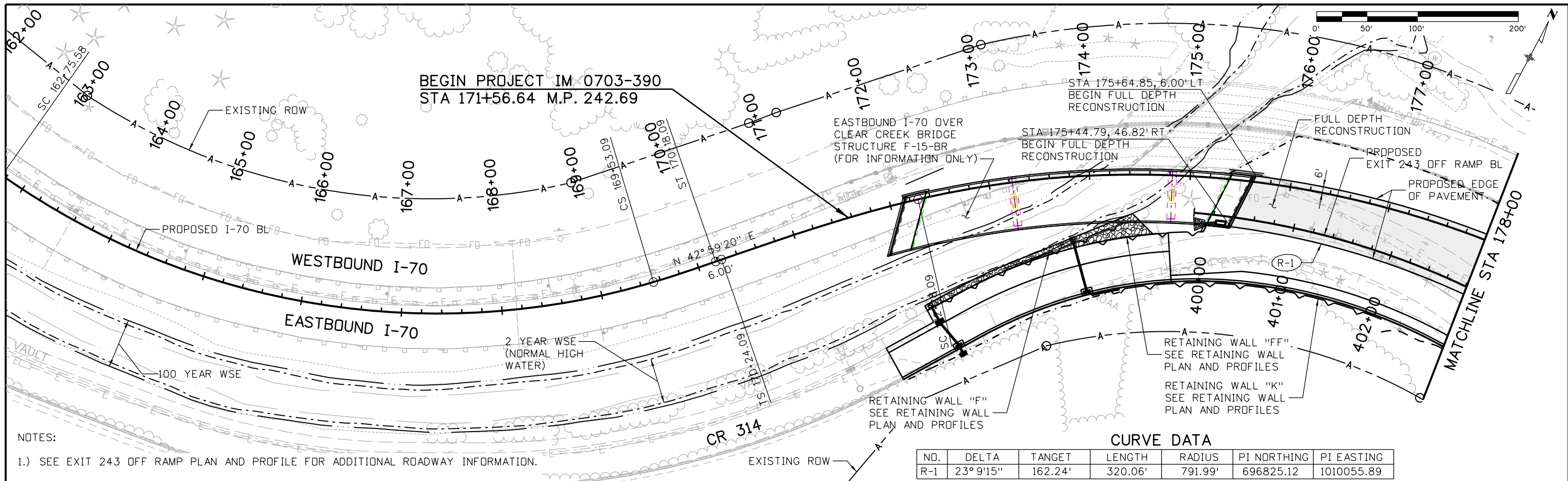


- NOTES:
- 1) SEE LIGHTING PLANS FOR ADDITIONAL REMOVALS.
  - 2) SEE CONSTRUCTION PHASING PLANS FOR ADDITIONAL RESETS.

Print Date: 11/30/2012		<b>Sheet Revisions</b>			<b>Colorado Department of Transportation</b>			<b>As Constructed</b>		<b>EASTBOUND I-70 REMOVAL PLAN STA 178+00 TO 184+35.71</b>			<b>Project No./Code</b>			
File Name: 18832DES_CPIB_RMVPlan002.dgn		Date:	Comments	Init.	 425 A Corporate Circle Golden, CO 80401 Phone: 720-497-6918 FAX: 720-497-6901			No Revisions:		Designer: E. Marsh Detailer: J. Gellner Subset: REMOVALS			IM 0703-390			
Horiz. Scale: 1:50      Vert. Scale:								Revised:					Structure Numbers		19035	
 4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276								Void:					Subset Sheets: 2 of 2		Sheet Number 34	
		Region 1			CRC											

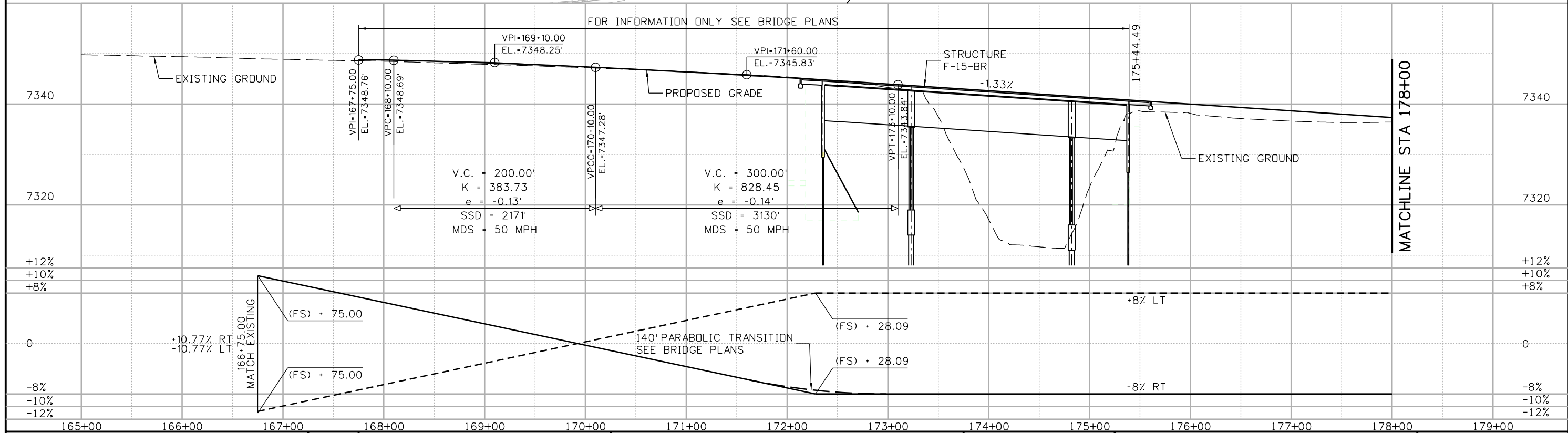
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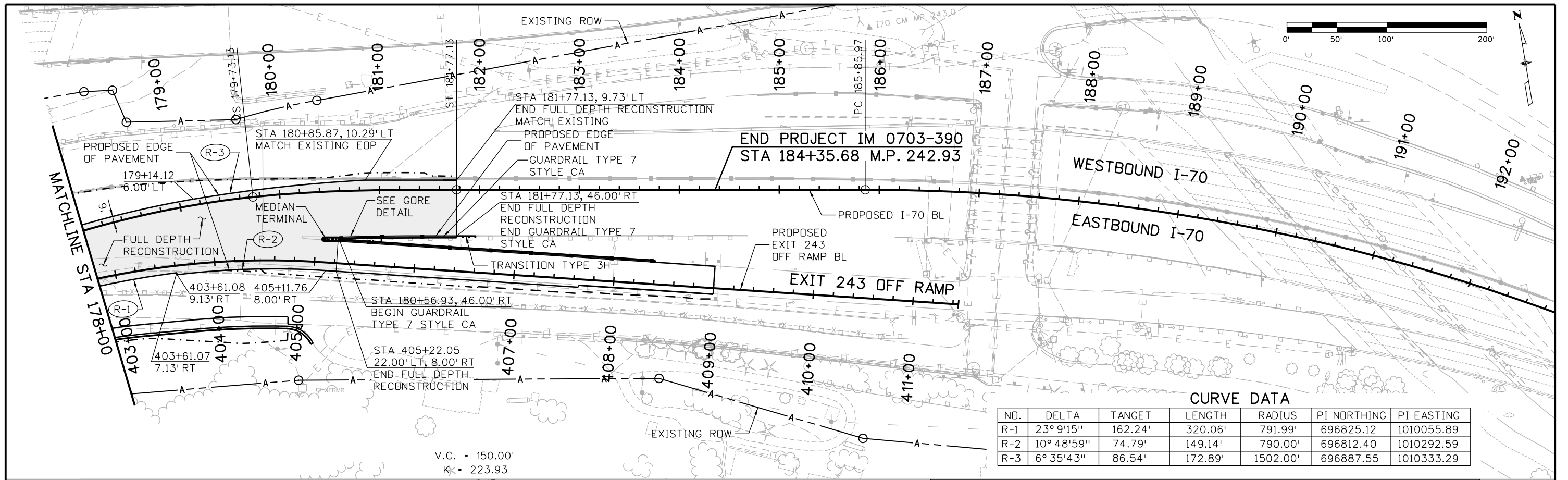
NOTES:  
 1.) SEE EXIT 243 OFF RAMP PLAN AND PROFILE FOR ADDITIONAL ROADWAY INFORMATION.

NO.	DELTA	TARGET	LENGTH	RADIUS	PI NORTHING	PI EASTING
R-1	23° 9' 15"	162.24'	320.06'	791.99'	696825.12	1010055.89



Print Date: 12/3/2012		<b>Sheet Revisions</b> Date:      Comments      Init.		 425 A Corporate Circle Golden, CO 80401 Phone: 720-497-6918 FAX: 720-497-6901 <b>Region 1</b>	<b>As Constructed</b> No Revisions: Revised: Void:	<b>EASTBOUND I-70          PLAN AND PROFILE          STA 167+75 TO 178+00</b>		<b>Project No./Code</b> IM 0703-390 19035 Sheet Number 35
File Name: 18832DES_CPIB_PnPO01.dgn						Designer: E. Marsh Detailer: J. Gellner Subset: ROADWAY	Structure Numbers Subset Sheets: 1 of 6	
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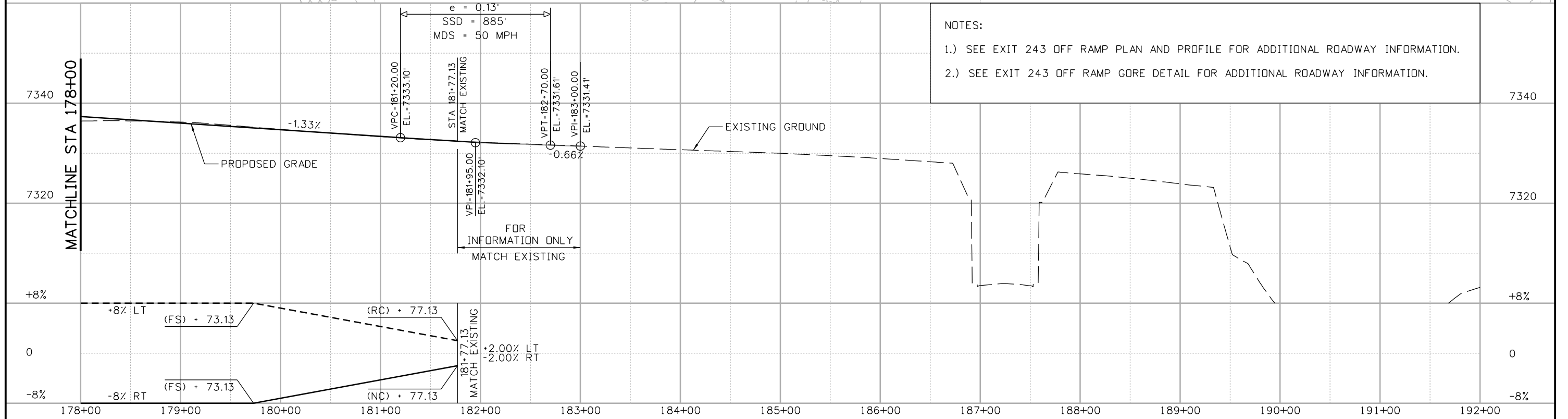


**CURVE DATA**

NO.	DELTA	TANGENT	LENGTH	RADIUS	PI NORTHING	PI EASTING
R-1	23° 9' 15"	162.24'	320.06'	791.99'	696825.12	1010055.89
R-2	10° 48' 59"	74.79'	149.14'	790.00'	696812.40	1010292.59
R-3	6° 35' 43"	86.54'	172.89'	1502.00'	696887.55	1010333.29

V.C. = 150.00'  
 K = 223.93  
 e = 0.13'  
 SSD = 885'  
 MDS = 50 MPH

- NOTES:**
- SEE EXIT 243 OFF RAMP PLAN AND PROFILE FOR ADDITIONAL ROADWAY INFORMATION.
  - SEE EXIT 243 OFF RAMP GORE DETAIL FOR ADDITIONAL ROADWAY INFORMATION.



Print Date: 12/3/2012  
 File Name: 18832DES\_CPIB\_PnP002.dgn  
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Sheet Revisions		
Date:	Comments	Init.

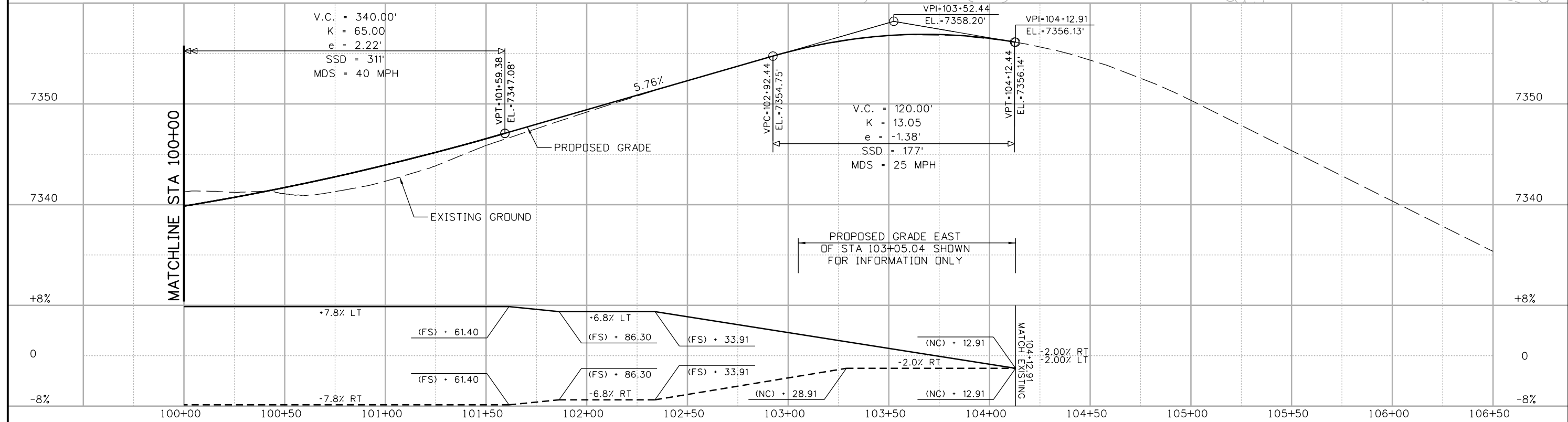
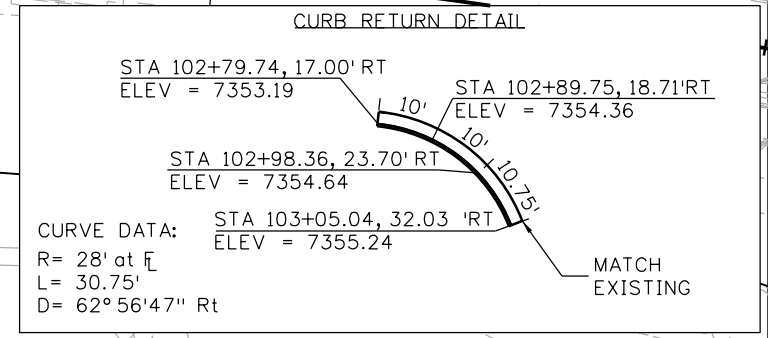
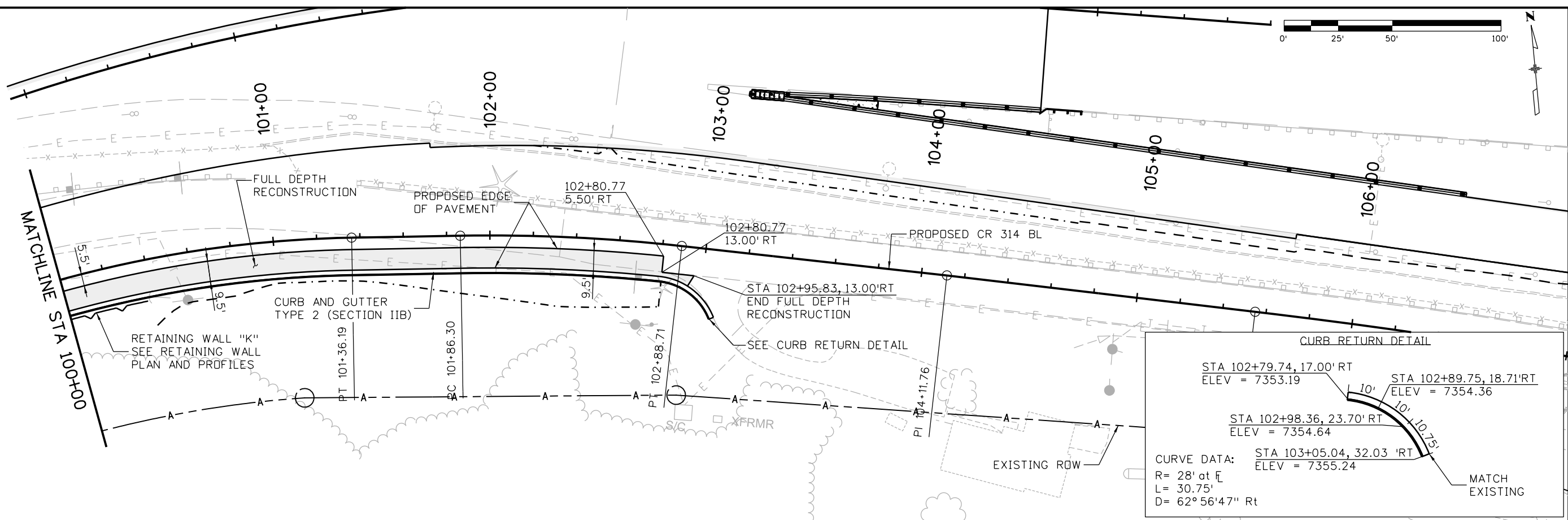
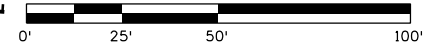
Colorado Department of Transportation  
  
 425 A Corporate Circle  
 Golden, CO 80401  
 Phone: 720-497-6918 FAX: 720-497-6901  
 Region 1 CRC

As Constructed		EASTBOUND I-70 PLAN AND PROFILE STA 178+00 TO 181+77.13	
No Revisions:		Designer: E. Marsh	Structure Numbers
Revised:		Detailer: J. Gellner	
Void:		Subset: ROADWAY	Subset Sheets: 2 of 6

Project No./Code  
 IM 0703-390  
 19035  
 Sheet Number 36

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Print Date: 12/3/2012  
 File Name: I8832DES\_CPIB\_Pn003A.dgn  
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Date:	Comments	Init.

Colorado Department of Transportation  
  
 425 A Corporate Circle  
 Golden, CO 80401  
 Phone: 720-497-6918 FAX: 720-497-6901  
**Region 1** **CRC**

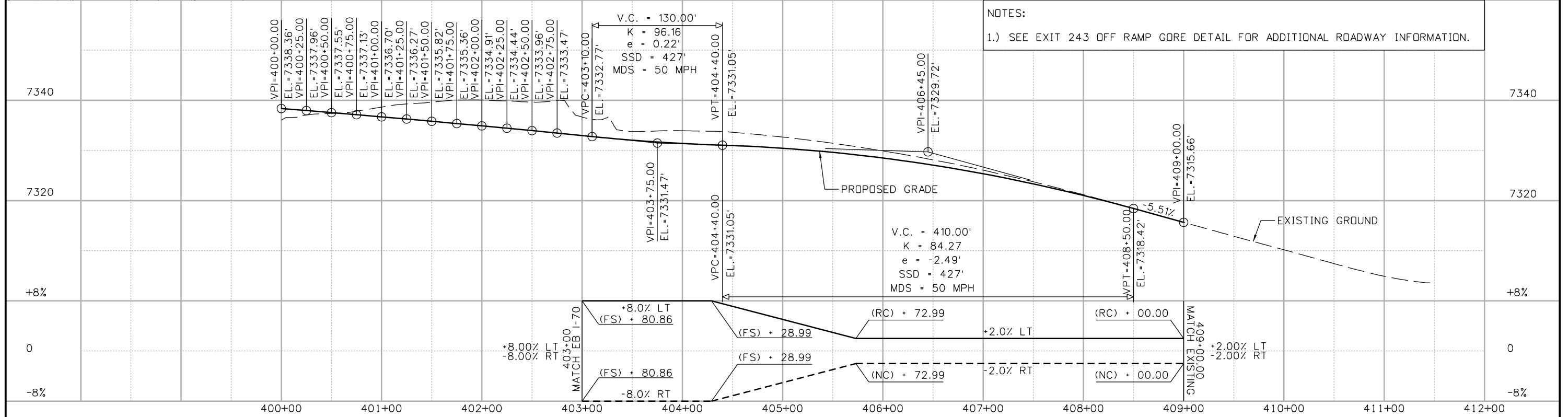
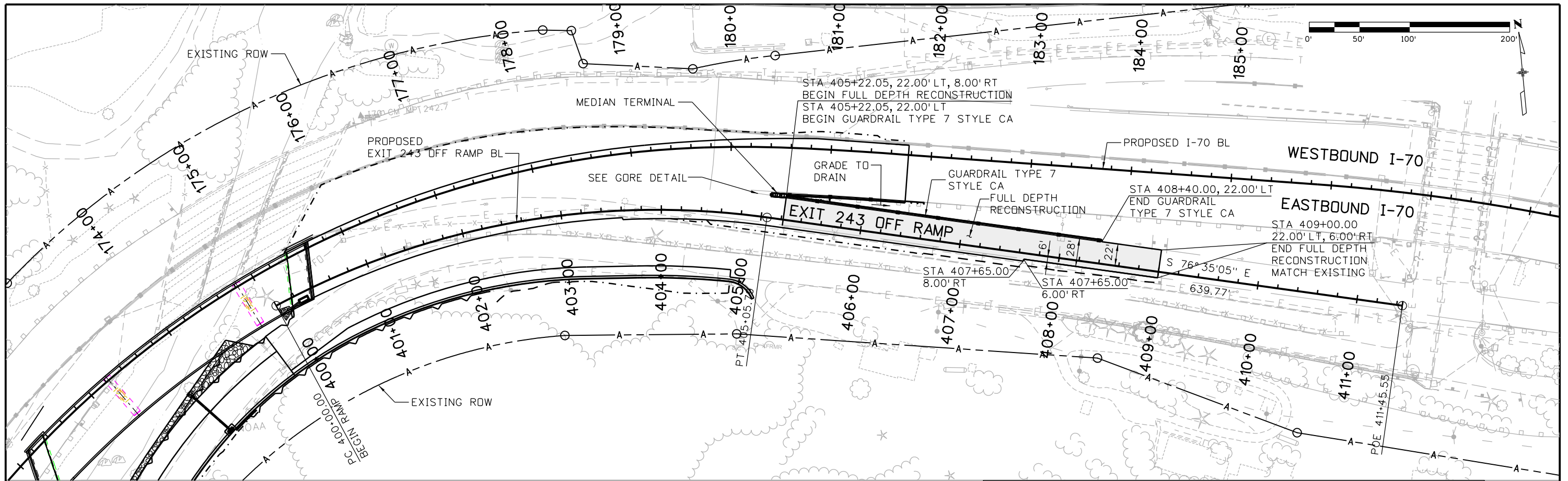
**As Constructed**  
 No Revisions:  
 Revised:  
 Void:

**COUNTY ROAD 314  
 PLAN AND PROFILE  
 STA 100+00 TO 103+05.04**  
 Designer: E. Marsh  
 Detailer: J. Gellner  
 Subset: ROADWAY  
 Structure Numbers  
 Subset Sheets: 4 of 6

**Project No./Code**  
 IM 0703-390  
 19035  
 Sheet Number **38**

17543 3:01:02 PM c:\pwworkspace\pwwork\common\dms25924\18832DES\_CPIB\_Pn003A.dgn





NOTES:  
 1.) SEE EXIT 243 OFF RAMP GORE DETAIL FOR ADDITIONAL ROADWAY INFORMATION.

Print Date: 12/3/2012  
 File Name: 18832DES\_CPIB\_Pn004.dgn  
 Horiz. Scale: 1:100 Vert. Scale:  
**ATKINS** 4601 DTC Boulevard, Suite 700  
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 Phone: (303) 221-7275 Fax: (303) 221-7276

Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation  
 425 A Corporate Circle  
 Golden, CO 80401  
 Phone: 720-497-6918 FAX: 720-497-6901  
**Region 1 CRC**

As Constructed  
 No Revisions:  
 Revised:  
 Void:

**EXIT 243 OFF RAMP  
 PLAN AND PROFILE  
 STA 400+00 TO 409+00**

Designer: E. Marsh  
 Detailer: J. Gellner  
 Subset: ROADWAY

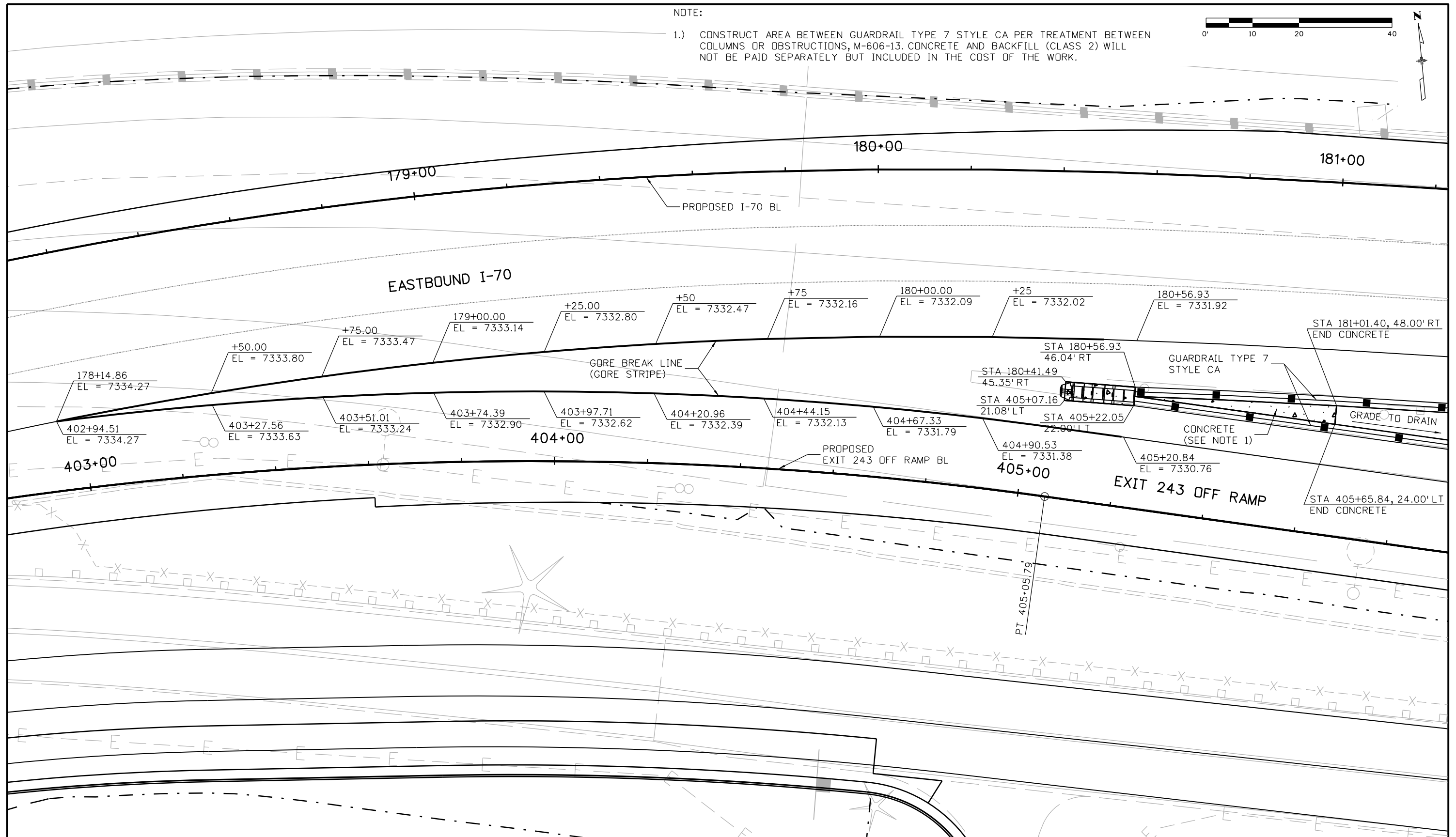
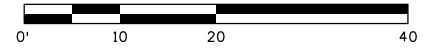
Structure Numbers  
 Subset Sheets: 5 of 6

Project No./Code  
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 19035  
 Sheet Number 39

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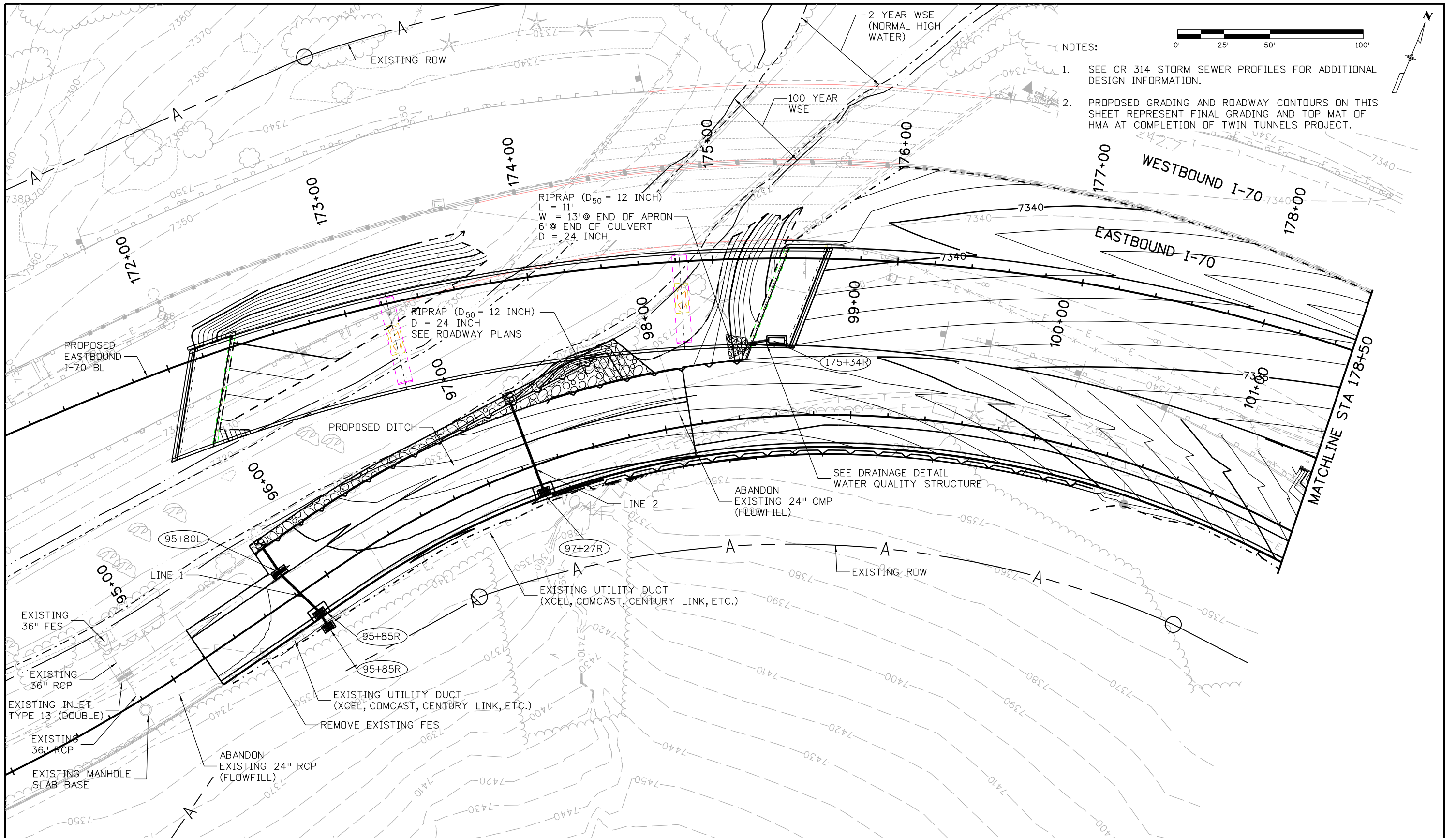
NOTE:

- 1.) CONSTRUCT AREA BETWEEN GUARDRAIL TYPE 7 STYLE CA PER TREATMENT BETWEEN COLUMNS OR OBSTRUCTIONS, M-606-13. CONCRETE AND BACKFILL (CLASS 2) WILL NOT BE PAID SEPARATELY BUT INCLUDED IN THE COST OF THE WORK.



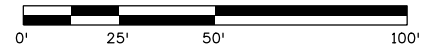
Print Date: 12/3/2012		<b>Sheet Revisions</b> Date:      Comments      Init.			<b>Colorado Department of Transportation</b> 425 A Corporate Circle Golden, CO 80401 Phone: 720-497-6918 FAX: 720-497-6901		<b>As Constructed</b> No Revisions:		<b>EASTBOUND I-70 AT EXIT 243 OFF RAMP GORE DETAIL</b>		<b>Project No./Code</b> IM 0703-390	
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ATKINS 4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276						Region 1	CRC	Void:	Detailer: J. Gellner	Subset: ROADWAY	Subset Sheets: 6 of 6	Sheet Number 40

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NOTES:

1. SEE CR 314 STORM SEWER PROFILES FOR ADDITIONAL DESIGN INFORMATION.
2. PROPOSED GRADING AND ROADWAY CONTOURS ON THIS SHEET REPRESENT FINAL GRADING AND TOP MAT OF HMA AT COMPLETION OF TWIN TUNNELS PROJECT.



Print Date: 12/4/2012

File Name: 18832HYDR\_CP1B\_Plan001.dgn

Horiz. Scale: 1:50

Vert. Scale:

Sheet Revisions

Date:	Comments	Init.

Colorado Department of Transportation



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Golden, CO 80401  
Phone: 720-497-6918 FAX: 720-497-6901

Region 1

CRC

As Constructed

No Revisions:

Revised:

Void:

EASTBOUND I-70/CR 314  
FINAL GRADING AND DRAINAGE PLAN

Designer:	T. Kirkbride	Structure Numbers	
Detailer:	J. Gellner	Subset Sheets:	1 of 6
Subset:	Drainage		

Project No./Code

IM 0703-390

19035

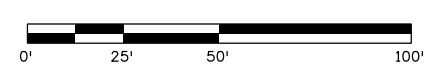
Sheet Number 41



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Denver, CO 80237  
Phone: (303) 221-7275 Fax: (303) 221-7276

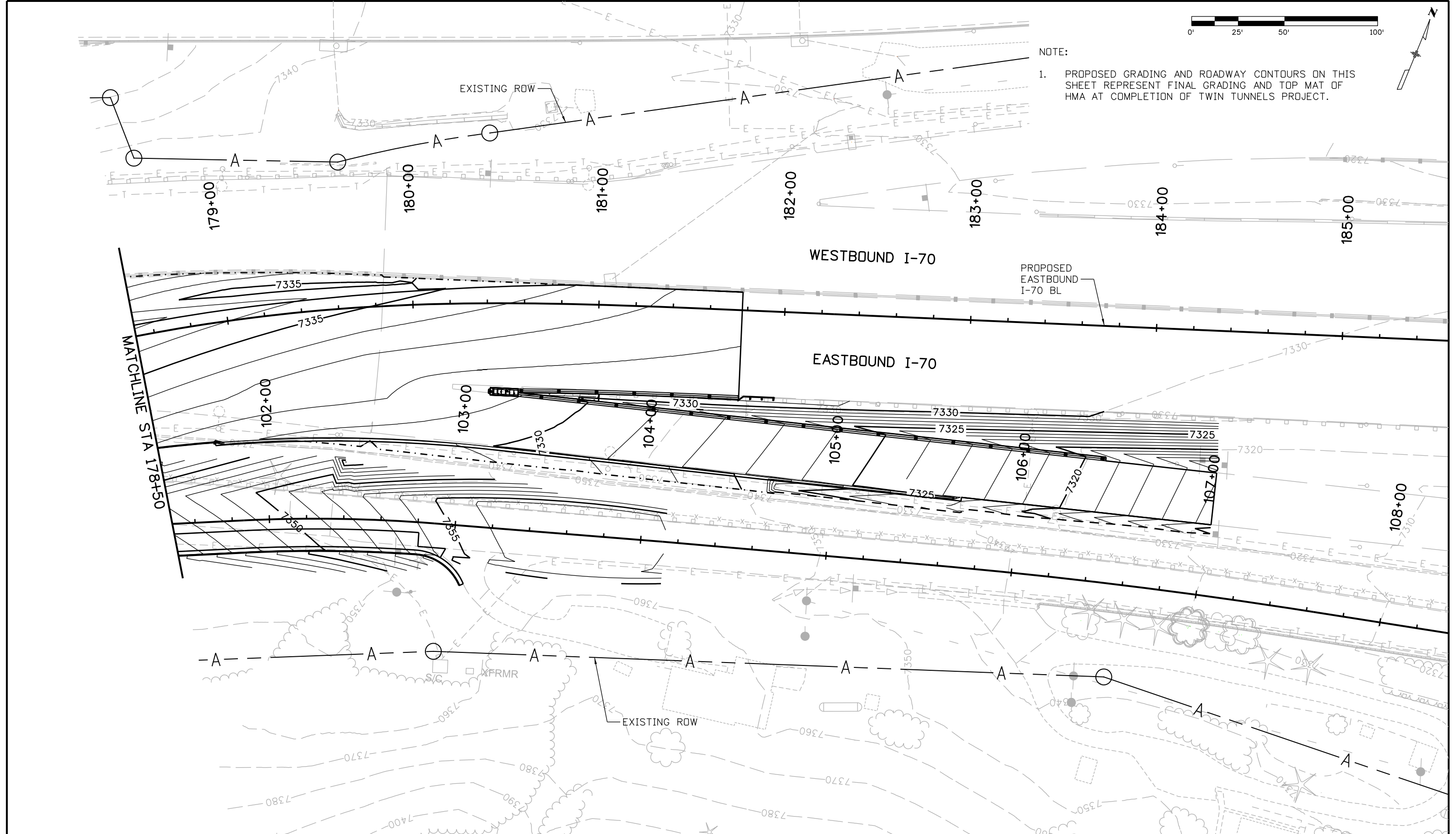
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NOTE:

1. PROPOSED GRADING AND ROADWAY CONTOURS ON THIS SHEET REPRESENT FINAL GRADING AND TOP MAT OF HMA AT COMPLETION OF TWIN TUNNELS PROJECT.



Print Date: 12/4/2012  
 File Name: 18832HYDR\_CP1B\_Plan002.dgn  
 Horiz. Scale: 1:50      Vert. Scale:  
**ATKINS** 4601 DTC Boulevard, Suite 700  
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Sheet Revisions		
Date:	Comments	Init.

**Colorado Department of Transportation**  
  
 425 A Corporate Circle  
 Golden, CO 80401  
 Phone: 720-497-6918 FAX: 720-497-6901  
**Region 1**      **CRC**

**As Constructed**  
 No Revisions:  
 Revised:  
 Void:

**EASTBOUND I-70/CR 314  
 FINAL GRADING AND DRAINAGE PLAN**  
 Designer: T. Kirkbride  
 Detailer: J. Gellner  
 Subset: Drainage

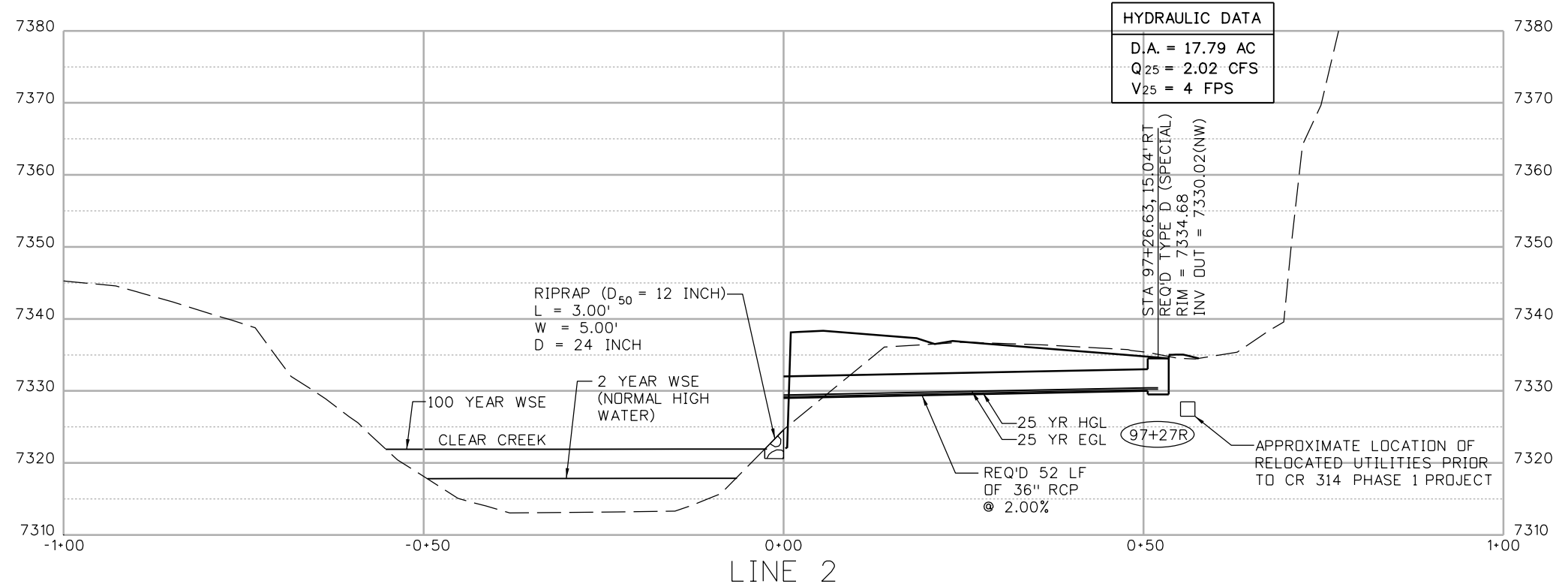
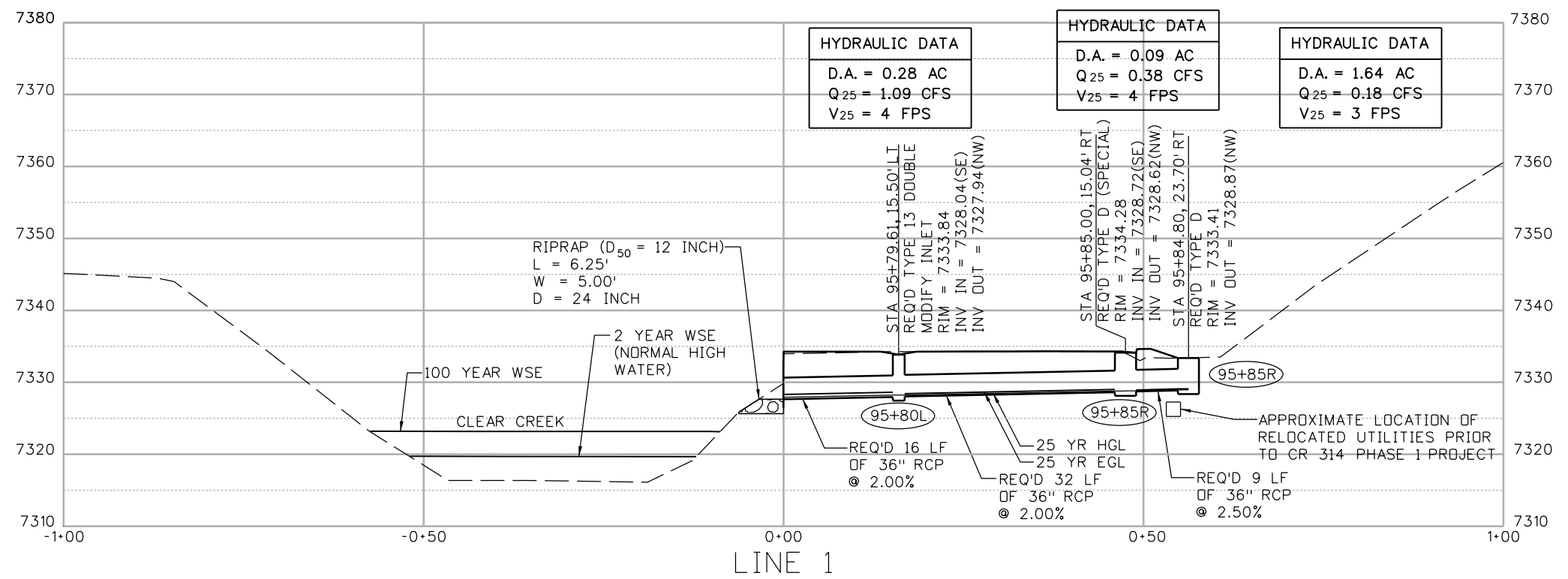
**Project No./Code**  
 IM 0703-390  
 19035  
 Sheet Number 42

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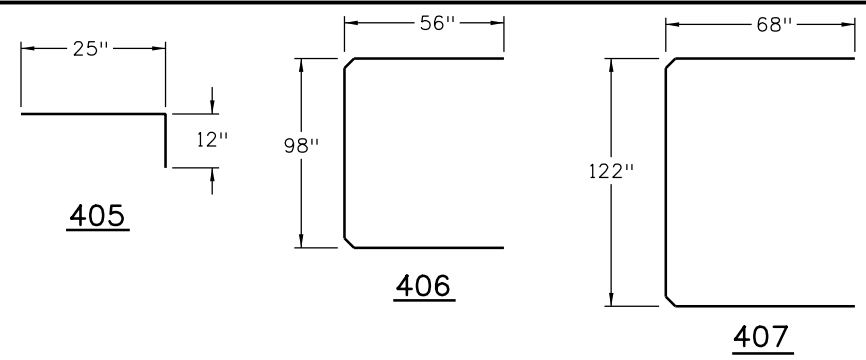
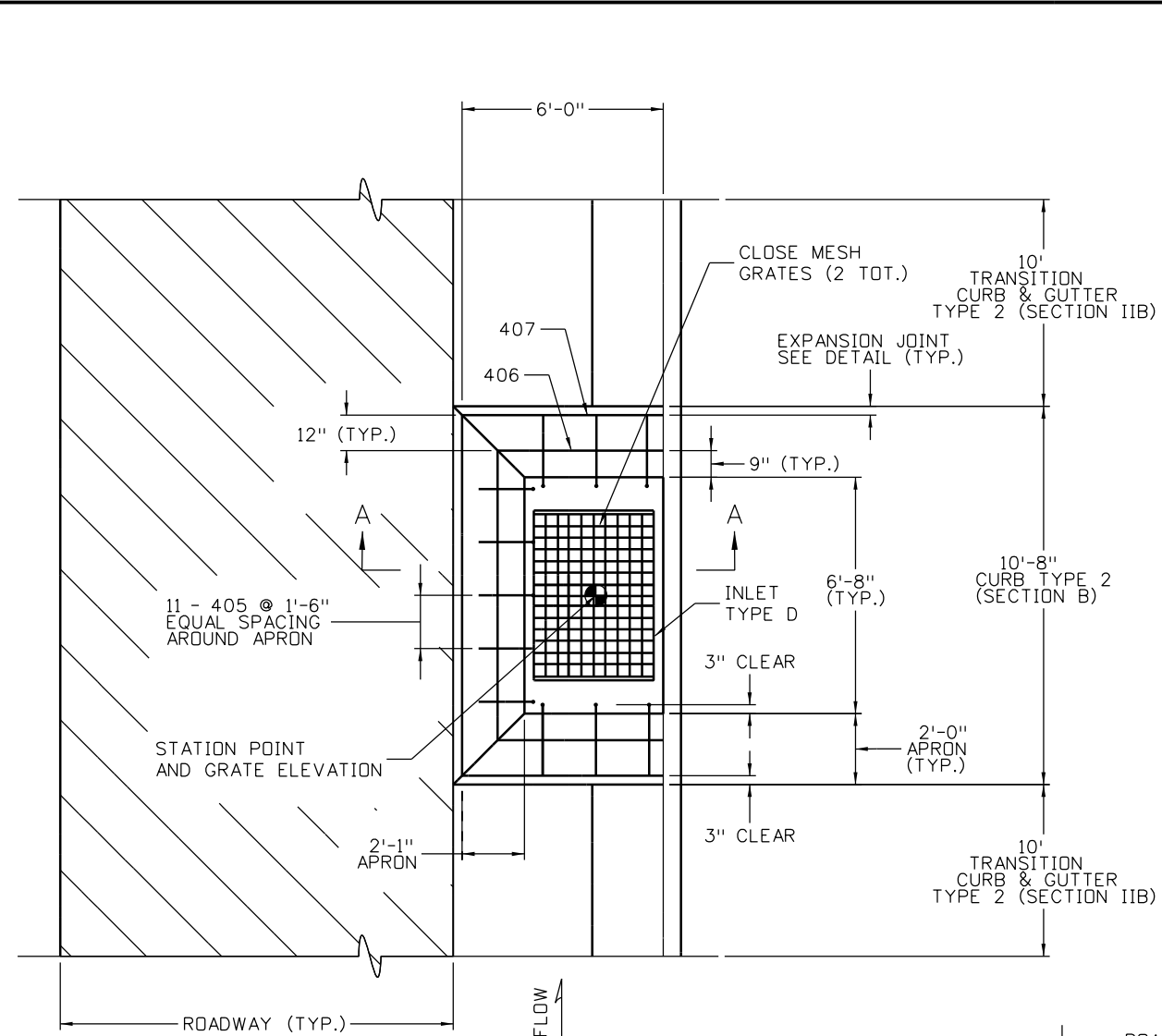
NOTES:

1. SEE EASTBOUND I-70/CR 314 GRADING AND DRAINAGE PLAN FOR ADDITIONAL DESIGN INFORMATION



Print Date: 11/30/2012 File Name: 18832HYDR_CP1B_Xsec02.dgn Horiz. Scale: 1:20      Vert. Scale: 1"=20' <b>ATKINS</b> 4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275    Fax: (303) 221-7276	<b>Sheet Revisions</b> Date:      Comments      Init.			Colorado Department of Transportation  425 A Corporate Circle Golden, CO 80401 Phone: 720-497-6918    FAX: 720-497-6901 <b>Region 1</b> <b>CRC</b>		<b>As Constructed</b> No Revisions: Revised: Void:		<b>COUNTY ROAD 314 STORM SEWER PROFILES</b> Designer: T. Kirkbride    Structure Numbers Detailer: J. Gellner Subset: Drainage      Subset Sheets: 3 of 6		Project No./Code IM 0703-390 19035 Sheet Number <b>43</b>
	0000									

17543 9:59:31 AM c:\paw\_work\pbis\paw\common\dms26356\18832HYDR\_CP1B\_Xsec02.dgn



**INLET APRON BENDING DIAGRAM FOR INLET TYPE D**

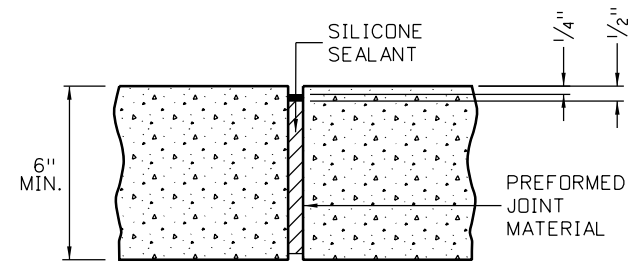
MARK	NO. REQ'D	EACH LENGTH
405	11	3'-1"
406	1	17'-6"
407	1	21'-6"

**BAR LIST FOR CONCRETE APRON**  
(FOR INFORMATION ONLY)

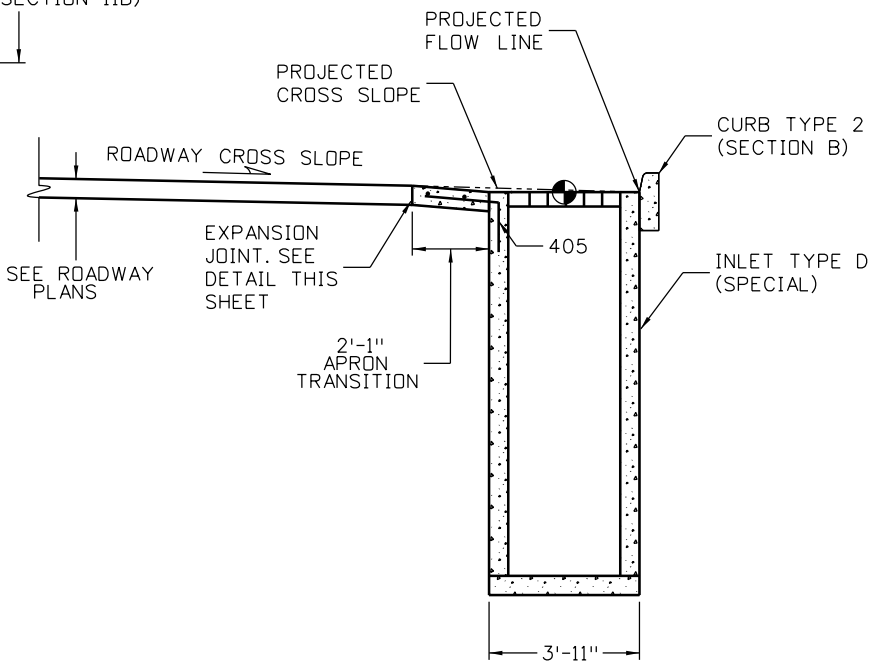
**NOTES:**

1. A 2 FT. CONCRETE TRANSITION APRON SHALL BE CONSTRUCTED AS SHOWN AND SHALL BE KEYED INTO THE INLET.
2. CONCRETE SHALL BE CLASS B;  $f_c = 4,500$  psi.
3. APRON TRANSITION SHALL BE 6" MIN. THICKNESS.
4. THE COST OF THE CONCRETE APRON EXPANSION JOINT AND CURB TYPE 2 (SECTION B) SHALL BE INCLUDED IN THE COST OF INLET TYPE D (SPECIAL).
5. FOR INLET REINFORCING DETAILS, CLOSE MESH GRATE, CONNECTION DETAILS, STEP DETAILS AND ADDITIONAL NOTES SEE M-604-11.
6. REINFORCING SHALL BE GRADE 60 AND EPOXY COATED.
7. FOR EXCAVATION AND BACKFILL DETAILS, SEE M-206-1. EXCAVATION AND BACKFILL (CLASS 1) SHALL NOT BE PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE WORK.
8. FOR INVERT AND TOP ELEVATIONS, SEE DETOUR DRAINAGE SHEETS.

**CONCRETE TRANSITION APRON FOR INLET TYPE D (SPECIAL)**



**EXPANSION JOINT (TYP.)**



**SECTION A-A**

Print Date: 11/30/2012  
 File Name: 125180\_I-70\_Inlet D Detail.dgn  
 Horiz. Scale: NONE Vert. Scale: NONE  
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Date:	Comments	Init.

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**As Constructed**  
 No Revisions:  
 Revised:  
 Void:

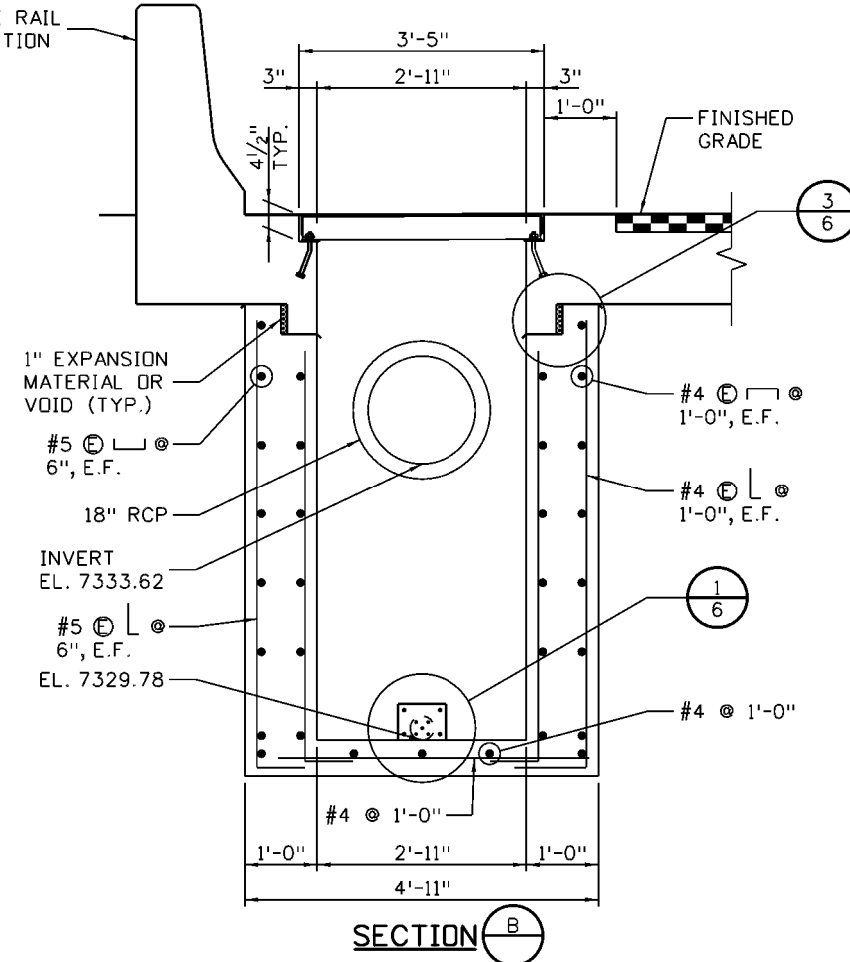
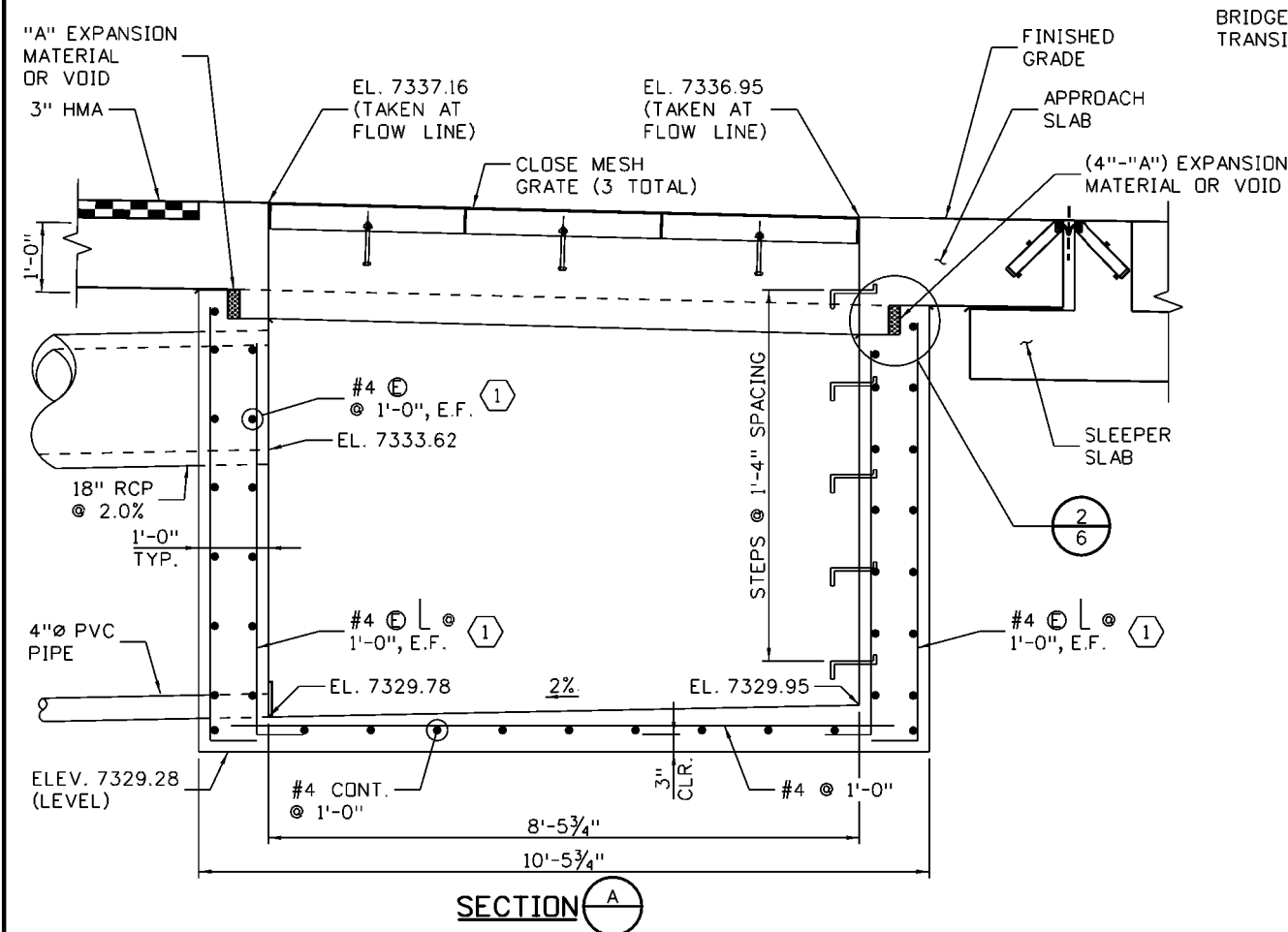
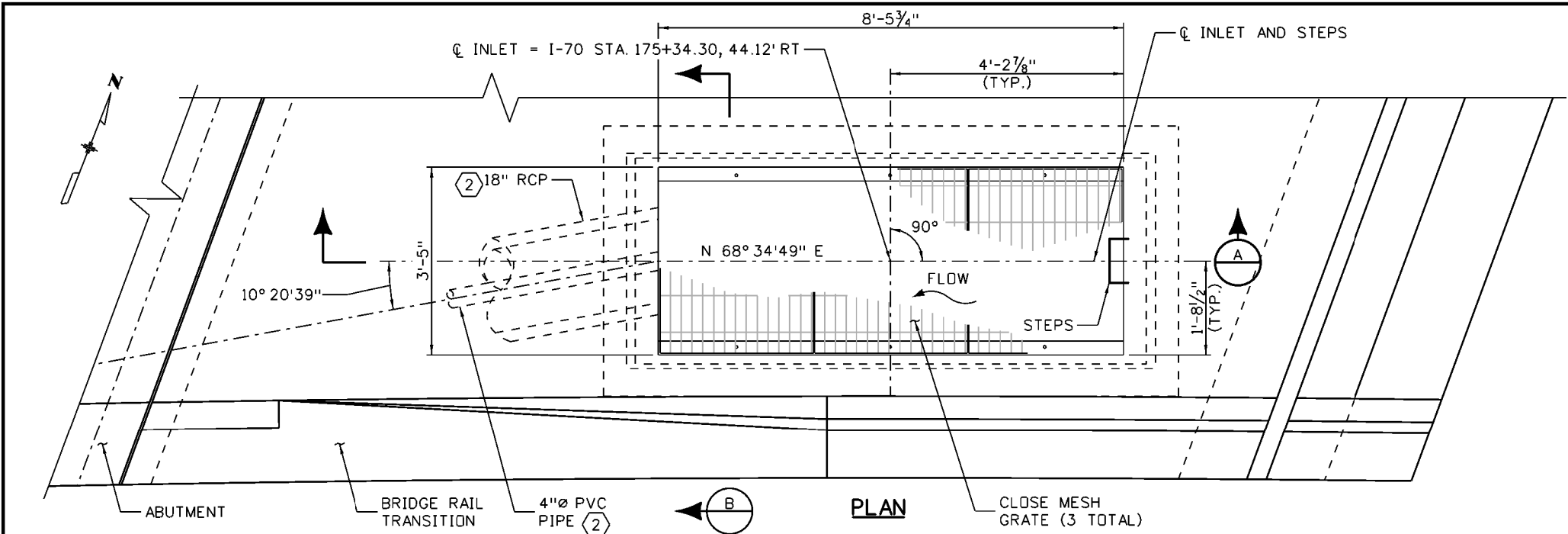
**DRAINAGE DETAIL INLET TYPE D (SPECIAL)**  
 Designer: S. Abraham  
 Detailer: J. Gellner  
 Subset: Drainage  
 Structure Numbers  
 Subset Sheets: 4 of 6

**Project No./Code**  
 IM 0703-390  
 19035  
 Sheet Number **44**

17543 9:59:40 AM c:\pw\_work\pbs\pw\common\dms26356\125180\_I-70\_Inlet D Detail.dgn

18026 2:36:53 PM c:\pw\_work\pws\p1\common\dms25966\18832BRDG\_170\_Inlet01.dgn

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DATE	INITIAL	DATE	INITIAL	DATE	INITIAL
10-12	SA	10-12	SA	10-12	SA
10-12	JL	10-12	JL	10-12	WZ
Checked By		Checked By		Checked By	



**KEYNOTES**

- ① CUT BARS AS NEEDED TO CLEAR PIPES AND CONCRETE OPENINGS.
- ② SEE BRIDGE PLANS FOR OUTLET ELEVATION AT ABUTMENT 4.

**NOTES:**

1. CONCRETE SHALL BE CLASS B CONCRETE: f'c = 4500 psi.
2. FOR ADDITIONAL CLOSE MESH GRATE DETAILS AND GRATE INSTALLATION, SEE M-604-11.
3. STEPS SHALL CONFORM TO AASHTO M 199.
4. THE SLOPE OF THE GRATES SHALL MATCH THE ROADWAY PROFILE AND CROSS SLOPE.
5. PROVIDE WATERTIGHT JOINTS AROUND PIPES.
6. INLET SLAB, WALLS, EXPANSION MATERIAL, PLATE, STEPS, GRATES AND IT'S FITTINGS SHALL BE PAID UNDER INLET (SPECIAL).
7. 4"Ø PVC PIPE SHALL BE PAID UNDER INLET (SPECIAL).
8. FOR APPROACH SLAB DETAILS & BRIDGE RAIL TRANSITION DETAILS SEE BRIDGE PLANS.
9. FOR EXCAVATION AND BACKFILL SEE SHEET M-206-1. EXCAVATION AND BACKFILL SHALL NOT BE PAID SEPARATELY BUT SHALL BE INCLUDED IN THE WORK. BACKFILL SHALL BE CLASS 1.
10. FOR DIMENSION "A", SEE BRIDGE PLANS.

Print Date: 11/30/2012  
 File Name: 18832BRDG\_170\_Inlet01.dgn  
 Horiz. Scale: 1:2.66667 Vert. Scale:  
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No Revisions:
Revised:
Void:

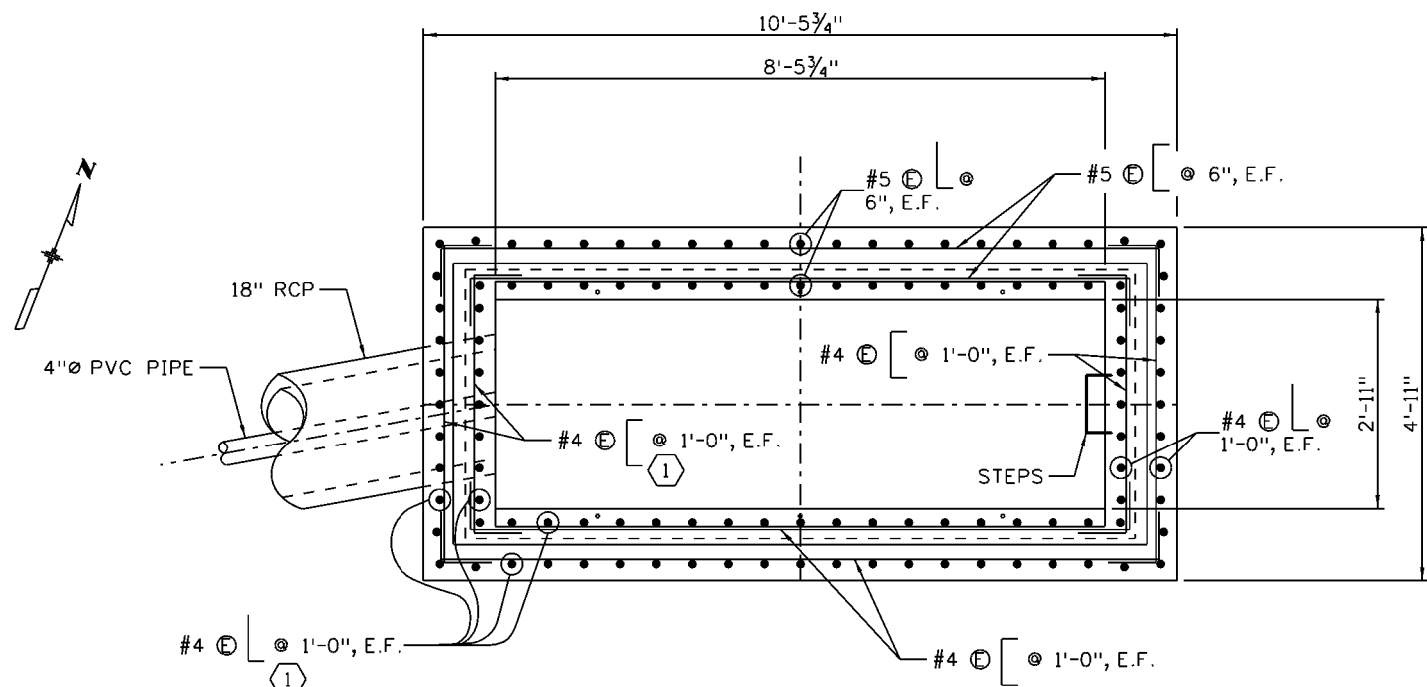
**DRAINAGE DETAILS  
 WATER QUALITY STRUCTURE  
 (SHEET 1 OF 2)**

Designer: S. ABRAHAM  
 Detailer: E. SCHAWO  
 Sheet Subset: DRAINAGE

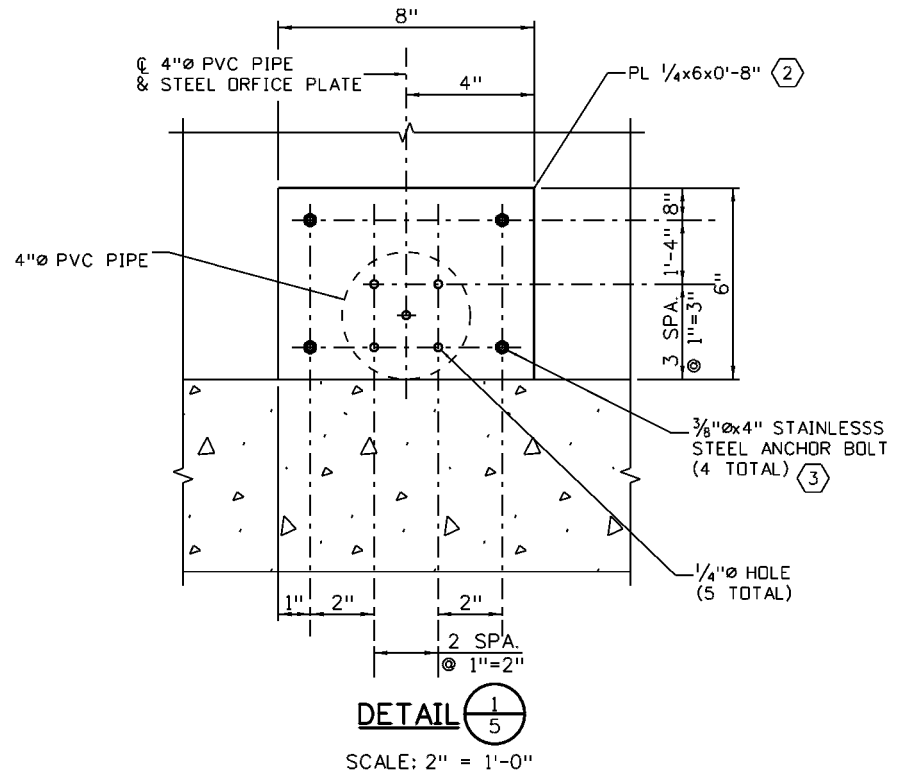
Project No./Code
IM 0703-390
19035
Sheet Number 45

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Checked By	Checked By	Checked By	Checked By	Checked By	Checked By
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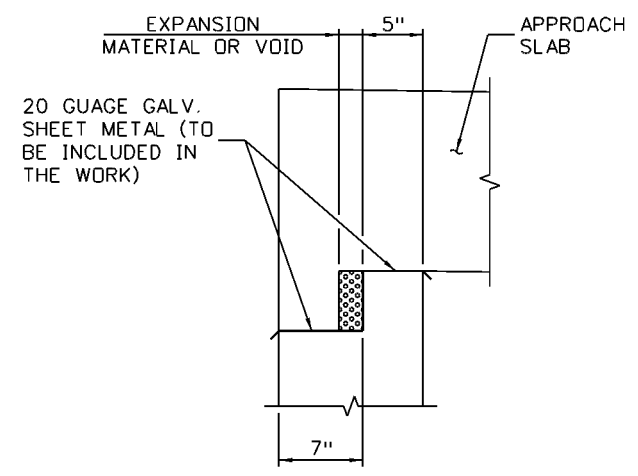
**REINFORCING PLAN**  
SCALE: 3/8" = 1'-0"



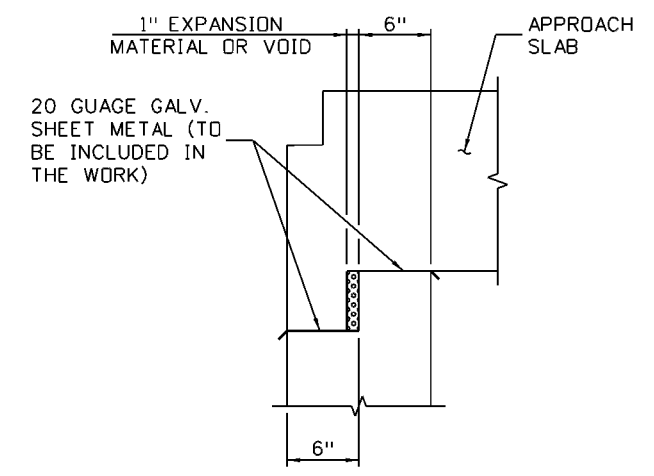
**DETAIL 1**  
SCALE: 2" = 1'-0"

**KEYNOTES**

- ① CUT BARS AS NEEDED TO CLEAR PIPES.
- ② GALVANIZE PLATE AFTER FABRICATION, PROVIDE A GASKET BETWEEN PLATE AND CONCRETE.
- ③ BOLTS SHALL BE PLACED IN 1/2" DIAMETER HOLES WITH STAINLESS STEEL WASHERS, LOCK WASHERS, AND NUTS.



**DETAIL 2**  
SCALE: 3/4" = 1'-0"



**DETAIL 3**  
SCALE: 3/4" = 1'-0"

**SUMMARY OF QUANTITIES (FOR INFORMATION ONLY)**

DESCRIPTION	UNIT	INLET
CONCRETE CLASS B	CY	6.8
REINFORCING STEEL (EPOXY COATED)	LB.	960
STRUCTURAL STEEL	LB.	430
24 INCH REINFORCED CONCRETE PIPE	LF	11
4 INCH PLASTIC PIPE	LF	11

Print Date: 11/30/2012  
 File Name: 18832BRDG\_170\_Inlet02.dgn  
 Horiz. Scale: AS NOTED Vert. Scale:  
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Date:	Comments	Init.

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**Region 1** **CRC**

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Void:

**DRAINAGE DETAILS**  
**WATER QUALITY STRUCTURE**  
**(SHEET 2 OF 2)**

Designer: S. ABRAHAM  
 Detailer: E. SCHAWO  
 Sheet Subset: DRAINAGE

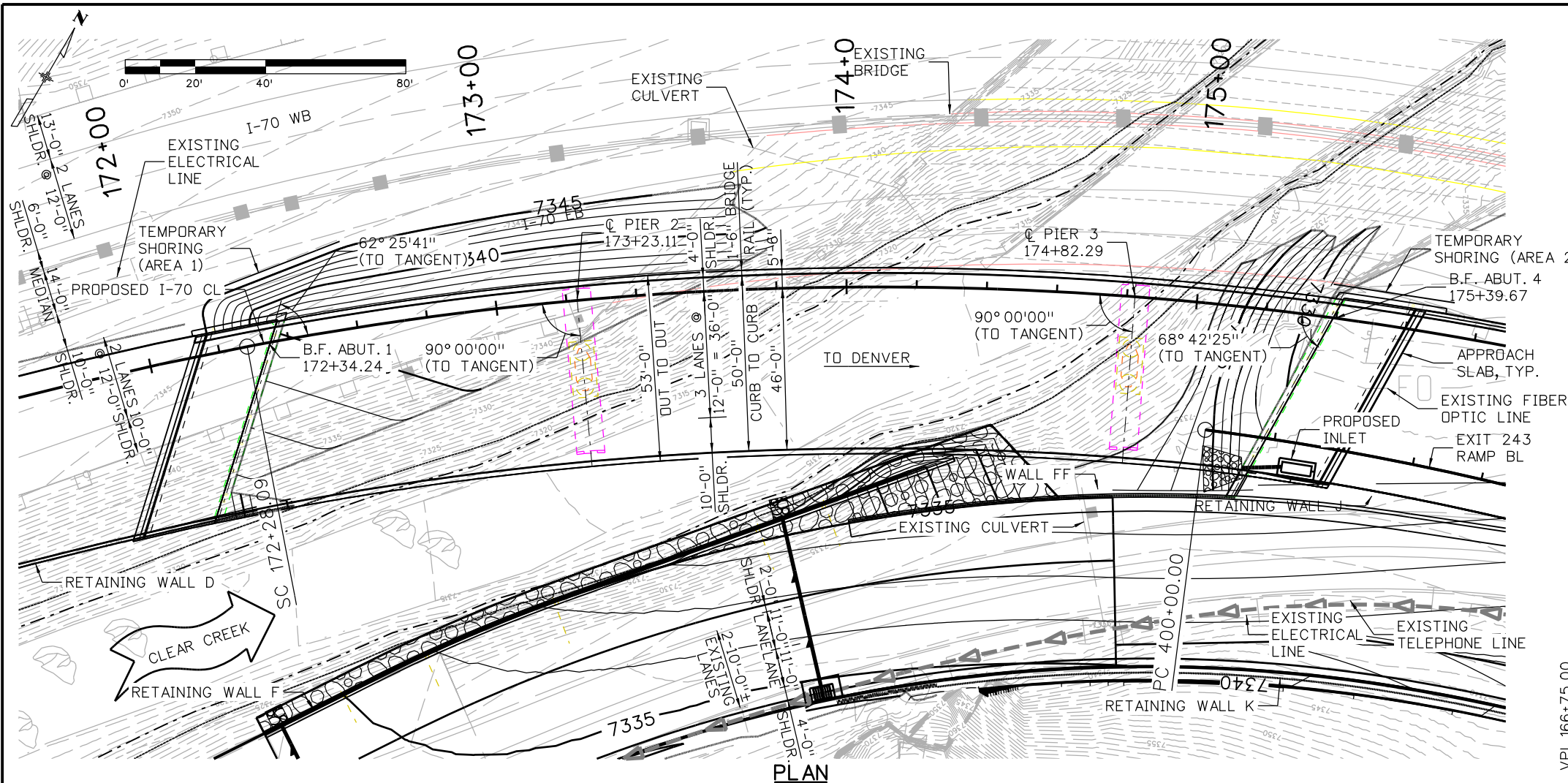
Project No./Code
IM 0703-390
19035
Sheet Number 46



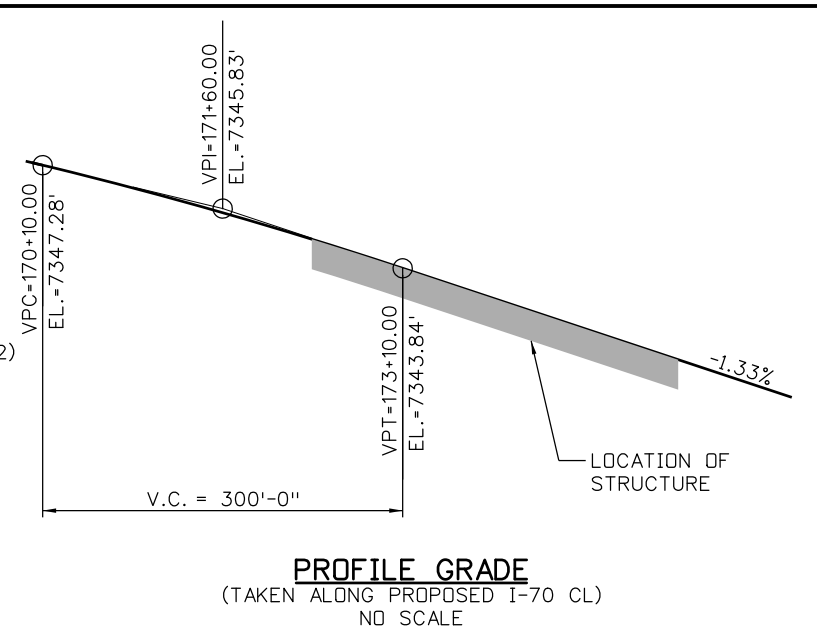




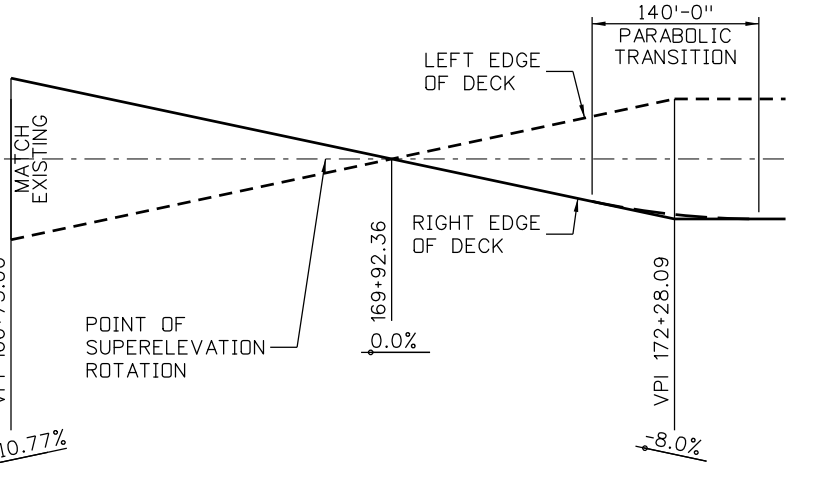




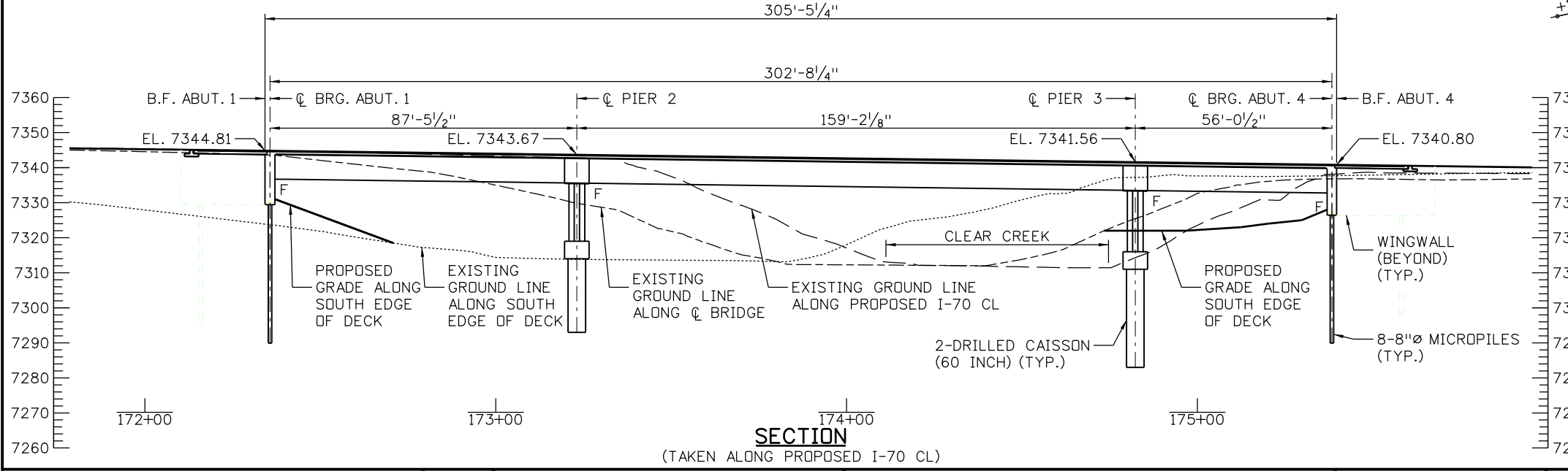
**PLAN**



**PROFILE GRADE**  
(TAKEN ALONG PROPOSED I-70 CL)  
NO SCALE



**PROPOSED I70 SUPERELEVATION PROFILE**



**SECTION**

(TAKEN ALONG PROPOSED I-70 CL)

**HORIZONTAL CURVE DATA:**

$\Delta c = 44^\circ 27'59''$   
 $Tc = 392.42'$   
 $Lc = 745.04'$   
 $Rc = 960.00'$   
 $PI = 176+20.50$   
 $N = 696903.99$   
 $E = 1009914.05$

**HYDRAULIC DATA:**

$DA = 267 \text{ SQ. MI.}$   
 $Q_{50} = 2760 \text{ CFS}$   
 $DHW = 7329.83'$   
 $Q_{100} = 3670 \text{ CFS}$   
 $HW_{50} = 7322.05'$

Design		Detail		Quantities	
DATE	INITIAL	DATE	INITIAL	DATE	INITIAL
06-12	KCS	06-12	KCS	09-12	KCS
10-12	JCF	10-12	JCF	10-12	JCF

Print Date: 12/3/2012  
 File Name: 18832BRDG\_I70\_Gen Layout.dgn  
 Horiz. Scale: 1:40 Vert. Scale: 1:40  
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Sheet Revisions		
Date:	Comments	Init.

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**Region 1** CRC

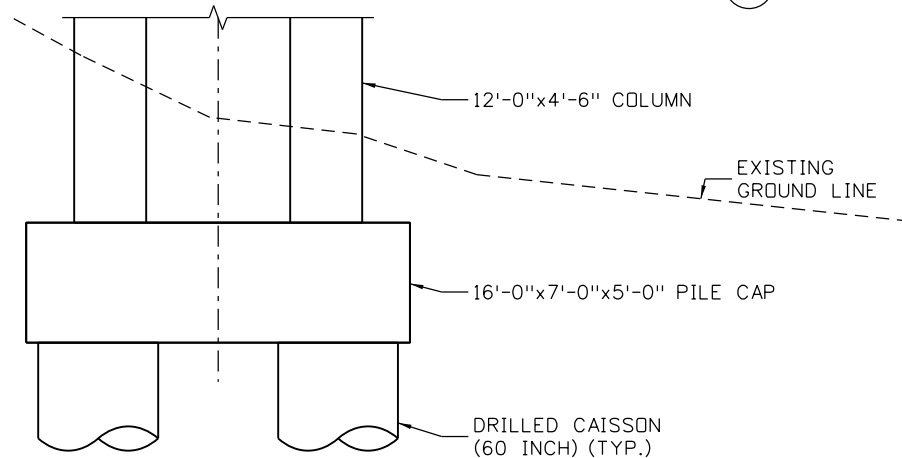
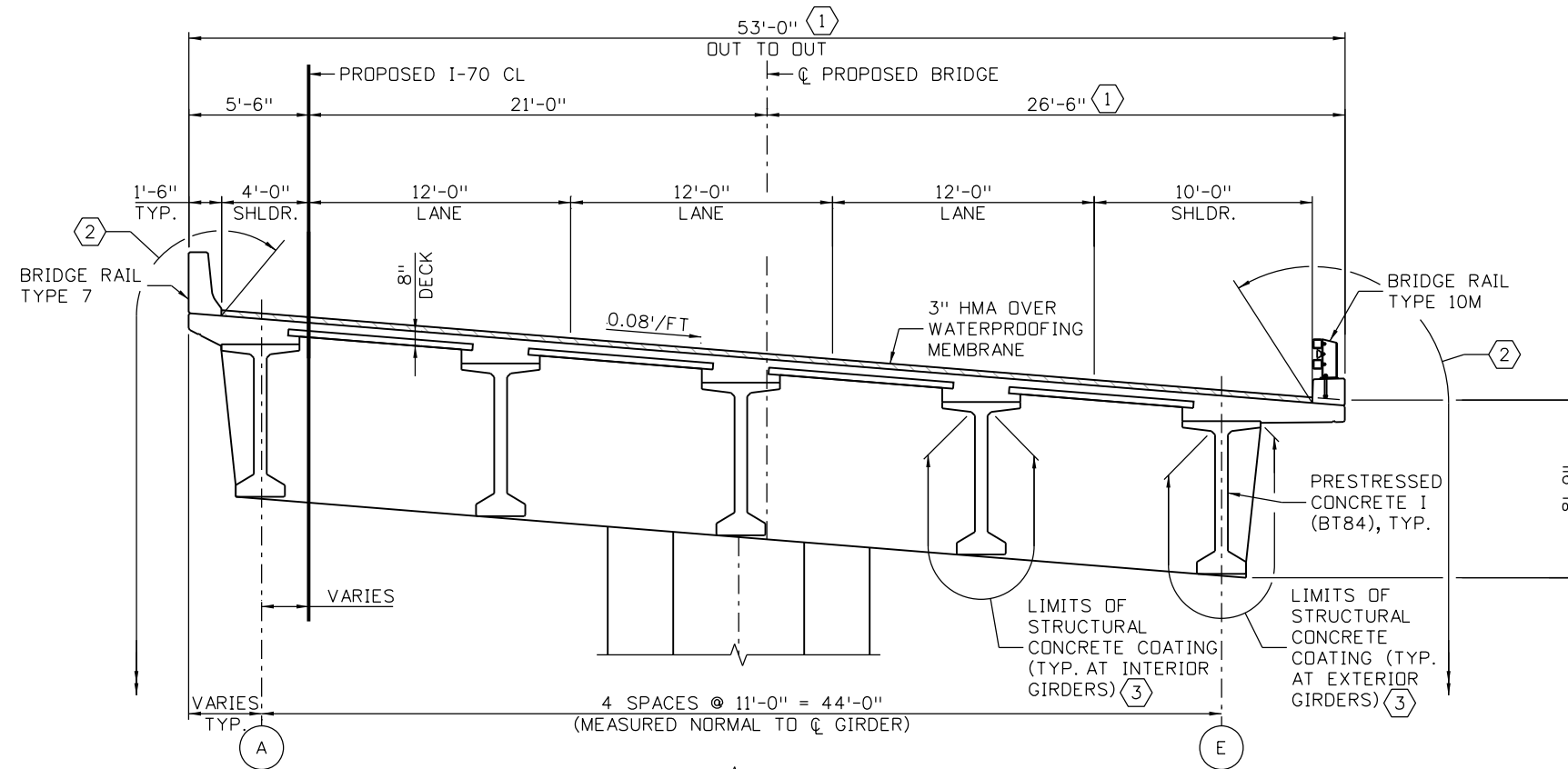
<b>As Constructed</b>	No Revisions:
Revised:	
Void:	

<b>EB I70 OVER CLEAR CREEK BRIDGE GENERAL LAYOUT</b>			
Designer:	K. Saindon	Structure Numbers	F-15-BR
Detailer:	E. Schawo		
Sheet Subset:	BRIDGE	Subset Sheets:	B02 of 46

<b>Project No./Code</b>	IM 0703-390
	19035
Sheet Number	50

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**TYPICAL SECTION**  
(LOOKING AHEAD STATION)

**KEYNOTES:**

- (1) VARIES AT SPAN 3. SEE SHEETS B07 AND B08 FOR DETAILS.
- (2) LIMITS OF STRUCTURAL CONCRETE COATING COLOR NO. 30372 FOR BRIDGE RAILING, DECK OVERHANG, PIER CAPS, PIER COLUMN, ABUTMENTS, AND WINGWALLS TO 1'-0" BELOW FINISHED GRADE.
- (3) LIMITS OF STRUCTURAL CONCRETE COATING COLOR NO. 30219 FOR GIRDERS.

Design		Detail		Quantities	
DATE	INITIAL	DATE	INITIAL	DATE	INITIAL
06-12	KCS	05-12	KCS	09-12	KCS
10-12	JCF	10-12	JCF	10-12	JCF
Designed By	Checked By	Detailed By	Checked By	Quantities By	Checked By

Print Date: 11/30/2012	0000
File Name: 18832BRDG_I70_TypSec01.dgn	
Horiz. Scale: 1:8      Vert. Scale: 1:8	
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<b>ATKINS</b> 4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276	

Sheet Revisions		
Date:	Comments	Init.

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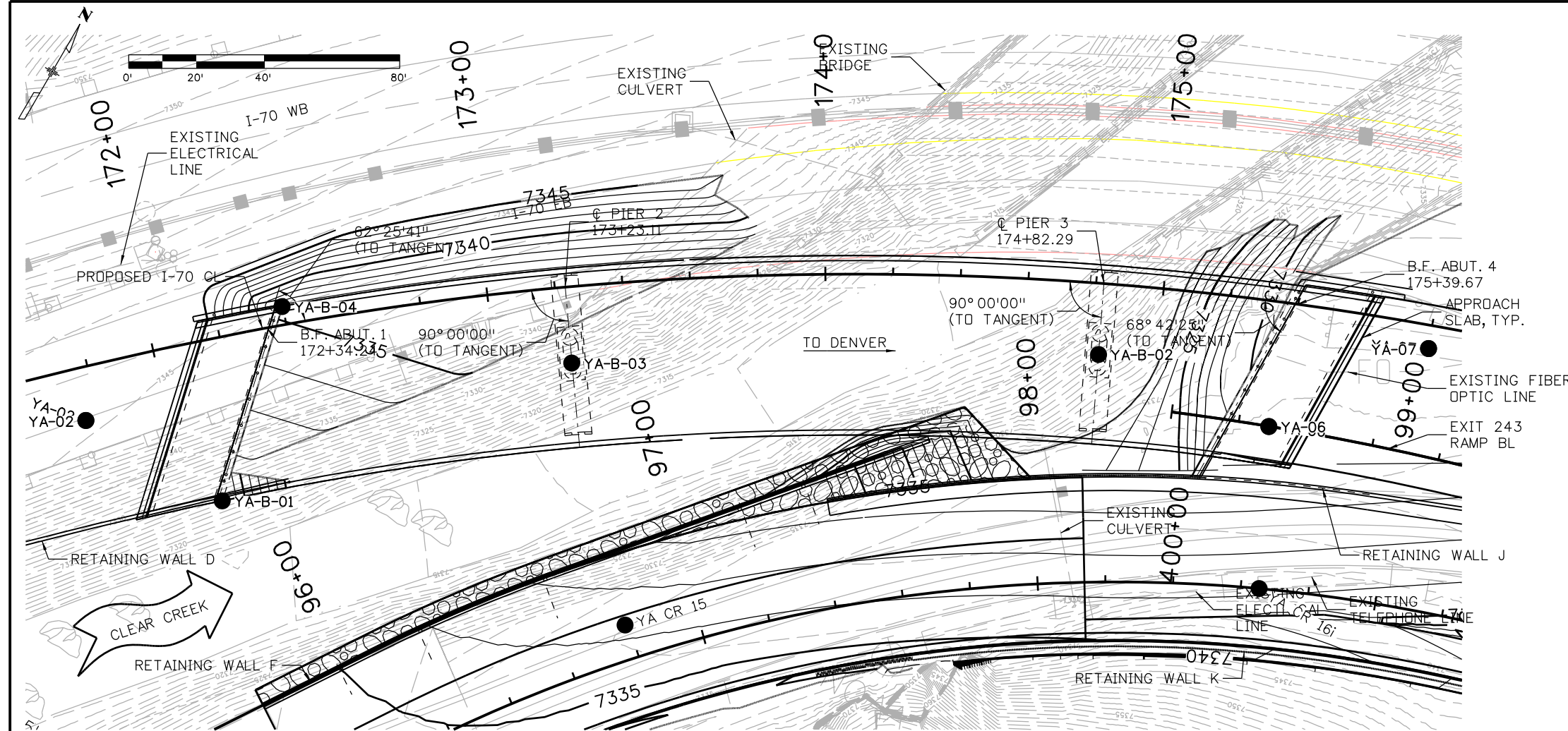
425 A Corporate Circle  
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Region 1      CRC

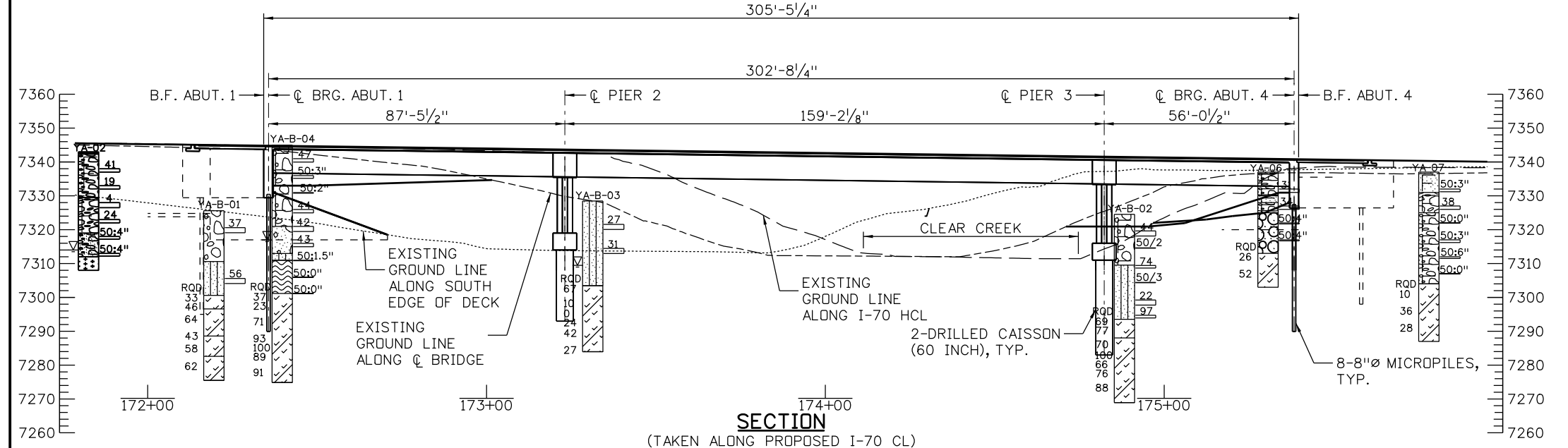
As Constructed	EB I70 OVER CLEAR CREEK BRIDGE		Project No./Code
No Revisions:	TYPICAL SECTION		IM 0703-390
Revised:	Designer: K. Saindon	Structure Numbers	F-15-BR 19035
Void:	Detailer: E. Schawo	Sheet Subset: BRIDGE	Subset Sheets: B03 of 46 Sheet Number 51

17543 3:45:39 PM c:\pw\_work\pbs\pw\common\dms21483\18832BRDG\_I70\_Engineering Geology.dgn

Revision Dates (Preliminary Stage Only)		Quantities	
Design	Initial	Design	Initial
Checked By	Checked By	Checked By	Checked By
Designed By	Designed By	Designed By	Designed By
DATE	DATE	DATE	DATE
06-12	06-12	06-12	06-12
KCS	ERS	KCS	ERS
Checked By	Checked By	Checked By	Checked By
Checked By	Checked By	Checked By	Checked By



PLAN

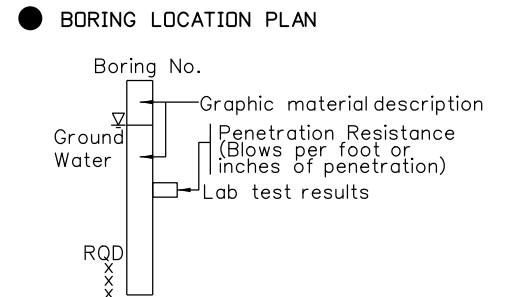


SECTION

(TAKEN ALONG PROPOSED I-70 CL)

LEGEND

	Fill with Sand as major soil		Poorly-graded Gravel with Clay
	Fill with Gravel as major soil		Poorly-graded Gravel with Silt
	Fill with Boulders and cobbles as main material		Poorly-graded Sandy Gravel
	Asphalt		Poorly-graded Gravel
	Poorly-graded Gravelly Sand		Silty Sand
	GNEISS		Weathered Bedrock
	Poorly-graded Sand		GRANITE
	Cobbles and gravel		



Print Date: 12/3/2012

File Name: 18832BRDG\_I70\_Engineering Geology.dgn

Horiz. Scale: 1:40      Vert. Scale: 1:40

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Sheet Revisions		
Date:	Comments	Init.

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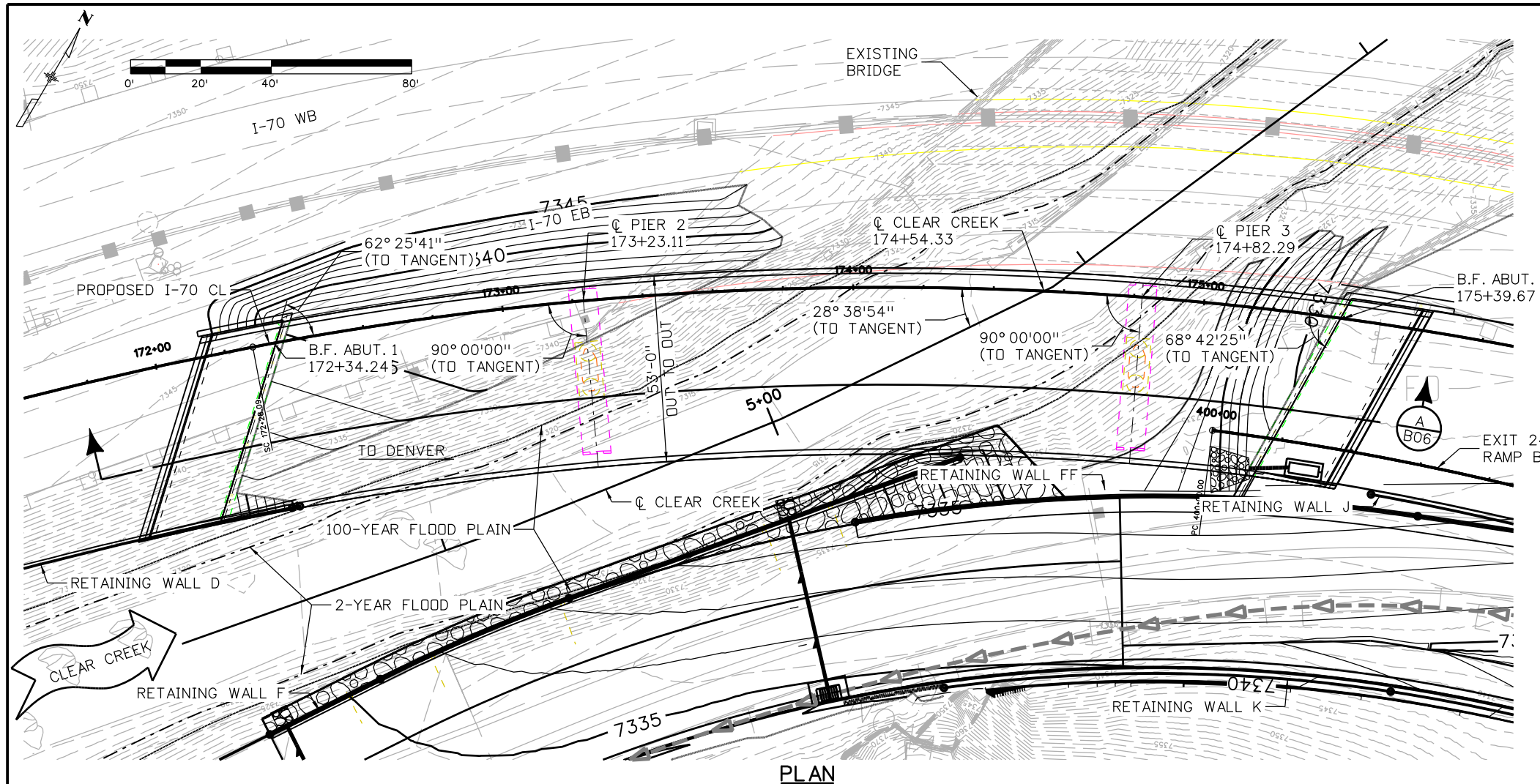
Region 1      CRC

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Revised:	
Void:	

**EB I70 OVER CLEAR CREEK BRIDGE ENGINEERING GEOLOGY**

Designer:	P. Macklin	Structure Numbers	F-15-BR
Detailer:	M. Walz	Subset Sheets:	B04 of 46

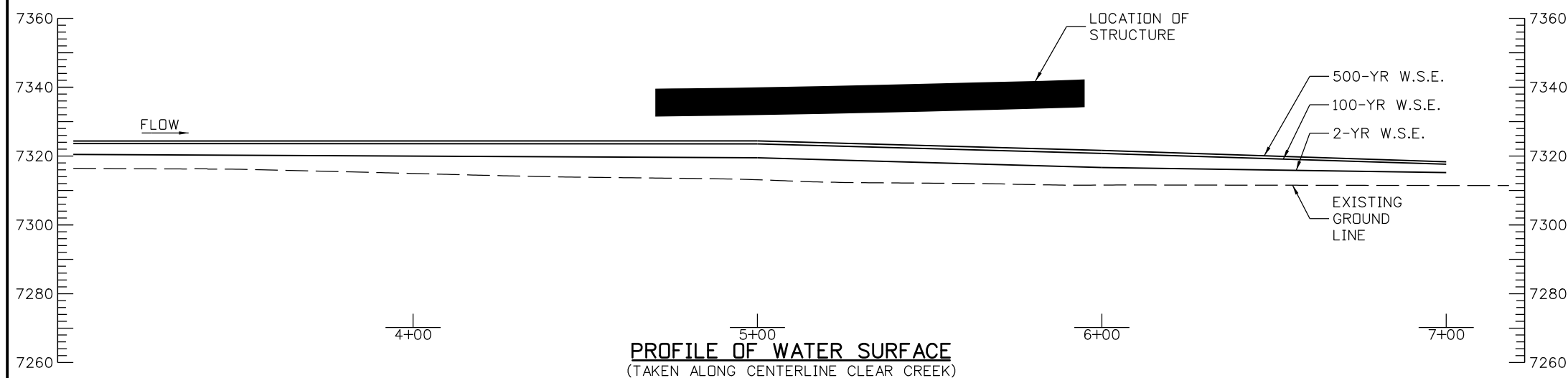
Project No./Code	IM 0703-390
	19035
Sheet Number	52



PLAN

**NOTE:**

THE PLAN DRAWING IS ROTATED 90° FROM THE PROFILE OF WATER SURFACE.



PROFILE OF WATER SURFACE  
(TAKEN ALONG CENTERLINE CLEAR CREEK)

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Design		Detail		Quantities	
DATE	INITIAL	DATE	INITIAL	DATE	INITIAL
09-12	JH	09-12	JH	09-12	CD
10-12	JH	10-12	JH	10-12	JH
Designed By	Checked By	Detailed By	Checked By	Quantities By	Checked By

Print Date: 12/3/2012	
File Name: 18832BRDG_I70_HydDet01.dgn	
Horiz. Scale: 1:40      Vert. Scale: 1:40	
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Sheet Revisions		
Date:	Comments	Init.

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Region 1      CRC

As Constructed
No Revisions:
Revised:
Void:

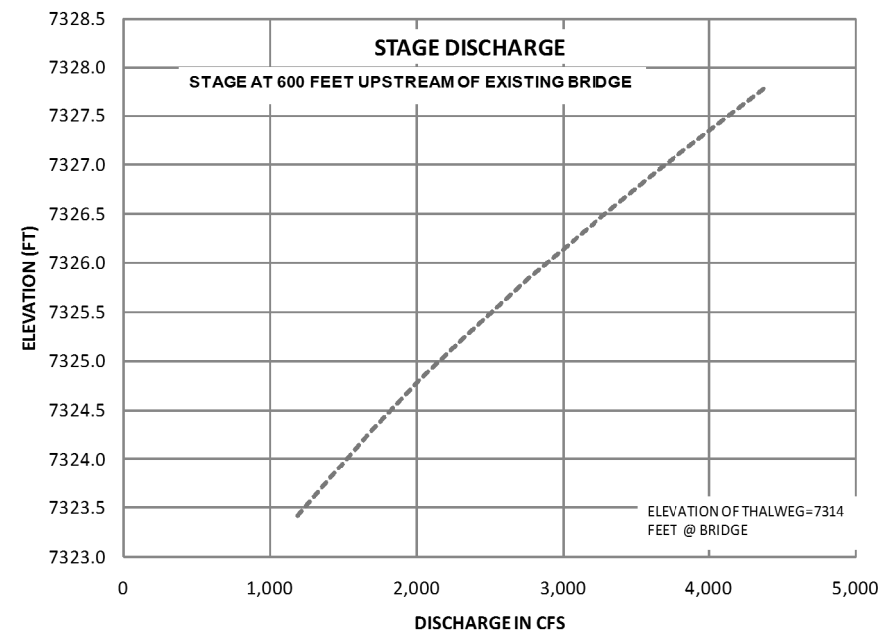
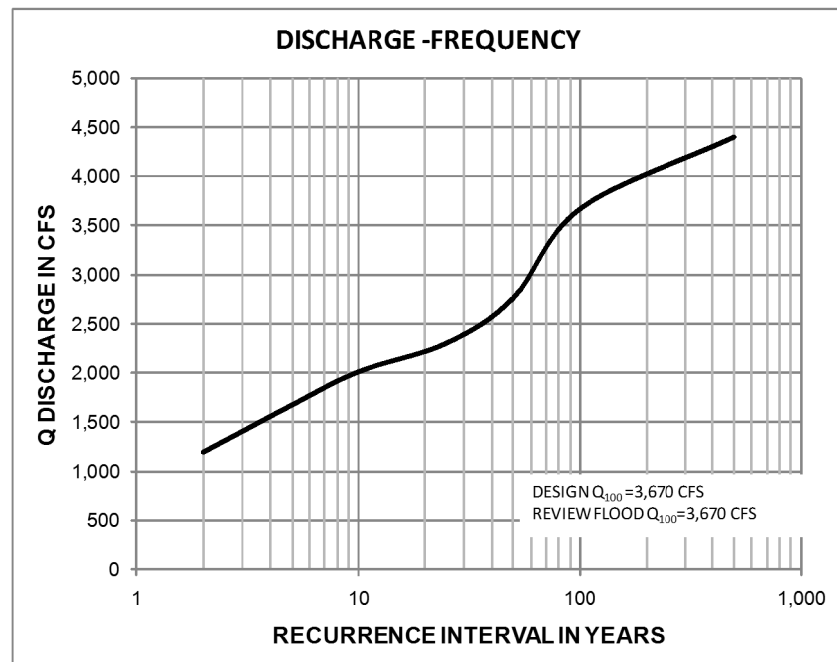
EB I70 OVER CLEAR CREEK BRIDGE BRIDGE HYDRAULIC INFORMATION (SHEET 1 OF 2)			
Designer:	C. Das	Structure Numbers	F-15-BR
Detailer:	E. Schawo	Subset Sheets:	B05 of 46
Sheet Subset:	BRIDGE		

Project No./Code	IM 0703-390
	19035
Sheet Number	53



18026 12:45:51 PM c:\pw\_work\pbes\pwl\common\dms25966\18632BRDG\_170\_HydDet02.dgn

Design		Detail		Quantities	
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JH	10-12	JH	10-12	JH	10-12
Designed By	Checked By	Detailed By	Checked By	Quantities By	Checked By

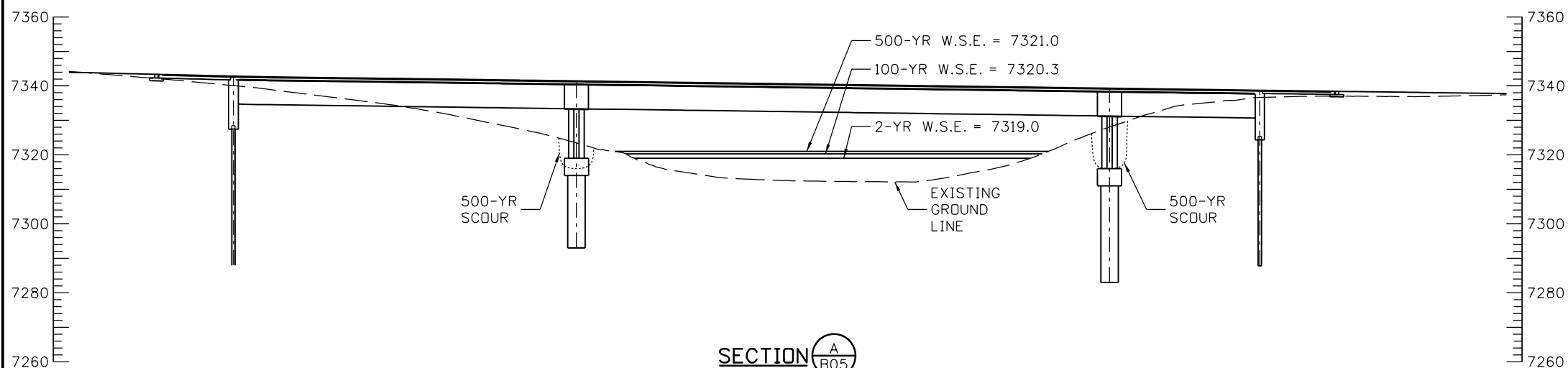


**CHANNEL DESCRIPTION**

BOTTOM MATERIAL: COHESIVE  NON-COHESIVE   
 BOTTOM MATERIAL SIZE: CLAY  SILT  SAND  GRAVEL   
 COBBLES  OTHER   
 STREAM FORM: STRAIGHT  MEANDERING  BRAIDED   
 MANNINGS "N" FOR DESIGN: CHANNEL = 0.035 OVERBANK = 0.055  
 DEBRIS: BRUSH  TREES/LOGS  ICE  OTHER

**CHANNEL HYDRAULICS**

VELOCITY 12.8 fps. FREEBOARD 9.5 FT. MAX. BACKWATER 2.4 FT.



Print Date: 11/30/2012

File Name: 18832BRDG\_170\_HydDet02.dgn

Horiz. Scale: 1:40 Vert. Scale: 1:40

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Region 1 **CRC**

<b>As Constructed</b>
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Void:

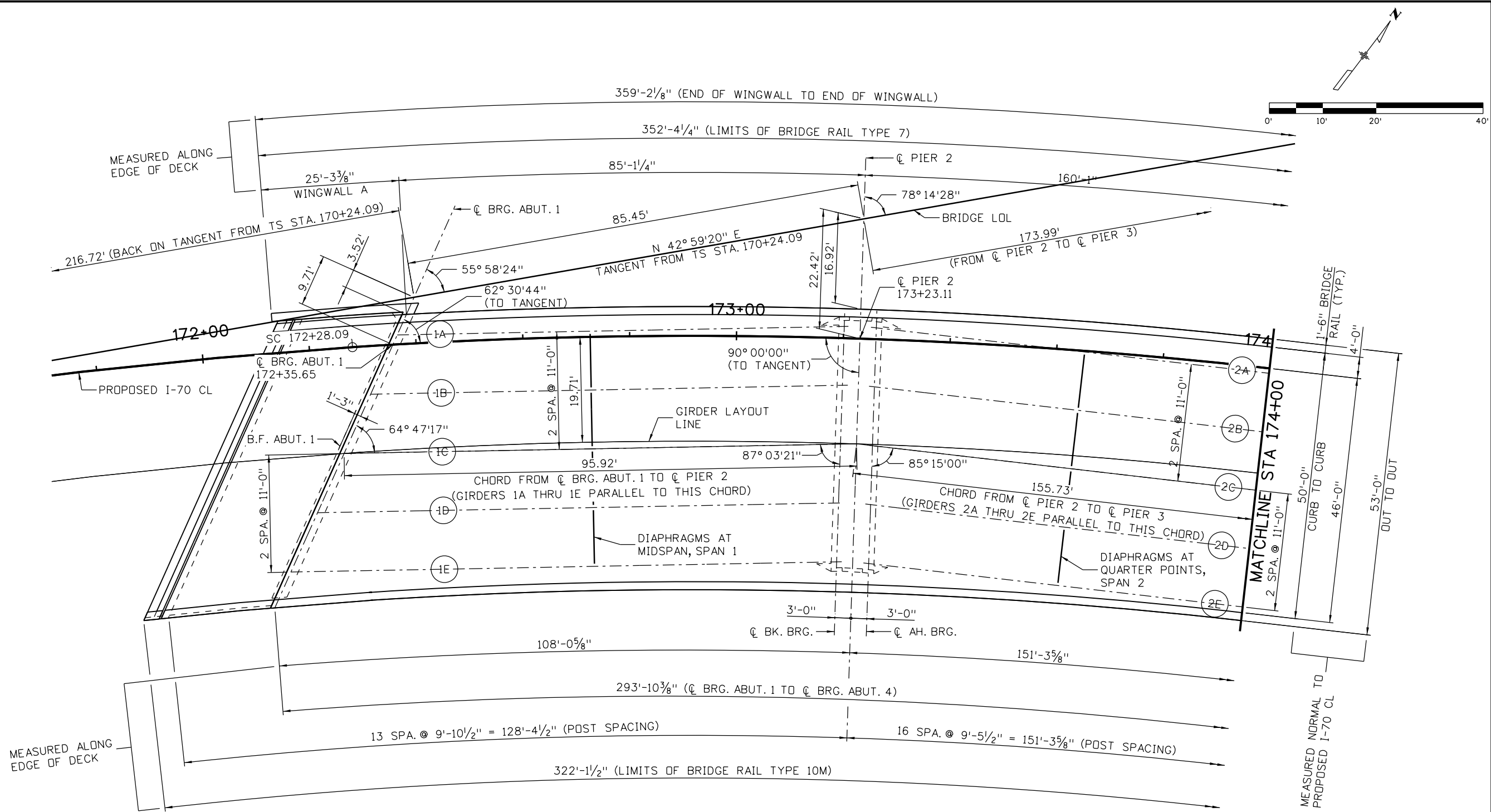
**EB 170 OVER CLEAR CREEK BRIDGE  
 BRIDGE HYDRAULIC INFORMATION  
 (SHEET 2 OF 2)**

Designer:	C. Das	Structure Numbers	F-15-BR
Detailer:	E. Schawo	Subset Sheets:	B06 of 46

<b>Project No./Code</b>
IM 0703-390
19035
Sheet Number <b>54</b>

18026 12:46:36 PM c:\pwwork\jbs\jw\common\dms25966\18832BRDG\_170\_ConstLayout01.dgn

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08-12	KCS	08-12	KCS	09-12	KCS
10-12	JCF	10-12	JCF	10-12	JCF
Designed By	Checked By	Designed By	Checked By	Quantities By	Checked By



**DECK OVERHANG (FEET)**

LOCATION	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95
GIRDER 1A	3.88	4.02	4.13	4.23	4.31	4.37	4.43	4.45	4.45	4.44	4.41	4.36	4.29	4.21	4.11	3.99	3.85	3.70	3.52
GIRDER 1E	6.16	5.85	5.55	5.32	5.13	4.96	4.82	4.71	4.63	4.58	4.55	4.55	4.59	4.65	4.74	4.86	5.00	5.18	5.38
GIRDER 2A	3.97	4.49	4.95	5.34	5.68	5.95	6.17	6.32	6.41	6.44	6.41	6.32	6.17	5.95	5.68	5.34	4.95	4.49	3.97
GIRDER 2E	4.93	4.43	3.99	3.61	3.29	3.03	2.82	2.68	2.59	2.56	2.59	2.68	2.82	3.03	3.29	3.61	3.99	4.43	4.93
GIRDER 3A	3.33	3.38	3.42	3.45	3.48	3.49	3.50	3.51	3.50	3.49	3.47	3.44	3.40	3.36	3.31	3.25	3.18	3.11	3.03
GIRDER 3E	5.68	5.65	5.62	5.59	5.57	5.55	5.53	5.52	5.51	5.50	5.50	5.51	5.55	5.58	5.63	5.67	5.73	5.78	5.84

**CONSTRUCTION LAYOUT**

**NOTES:**

1. DECK OVERHANG DIMENSIONS ARE GIVEN FOR TWENTIETH POINTS ALONG  $\phi$  GIRDER FROM  $\phi$  BEARING TO  $\phi$  BEARING AND ARE NORMAL TO  $\phi$  GIRDER FROM EDGE OF DECK.

Print Date: 11/30/2012  
 File Name: 18832BRDG\_170\_ConstLayout01.dgn  
 Horiz. Scale: 1:20 Vert. Scale:  
 Staff Bridge Branch - Unit 0221 STW

**ATKINS** 4601 DTC Boulevard, Suite 700  
 Denver, CO 80237  
 Phone: (303) 221-7275 Fax: (303) 221-7276

Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation

**DOT** 425 A Corporate Circle  
 Golden, CO 80401  
 Phone: 720-497-6918 FAX: 720-497-6901

Region 1 **CRC**

<b>As Constructed</b>
No Revisions:
Revised:
Void:

**EB 170 OVER CLEAR CREEK BRIDGE  
 CONSTRUCTION LAYOUT  
 (SHEET 1 OF 2)**

Designer: K. Saindon  
 Detailer: E. Schawo  
 Sheet Subset: BRIDGE

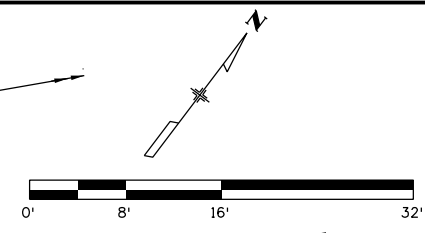
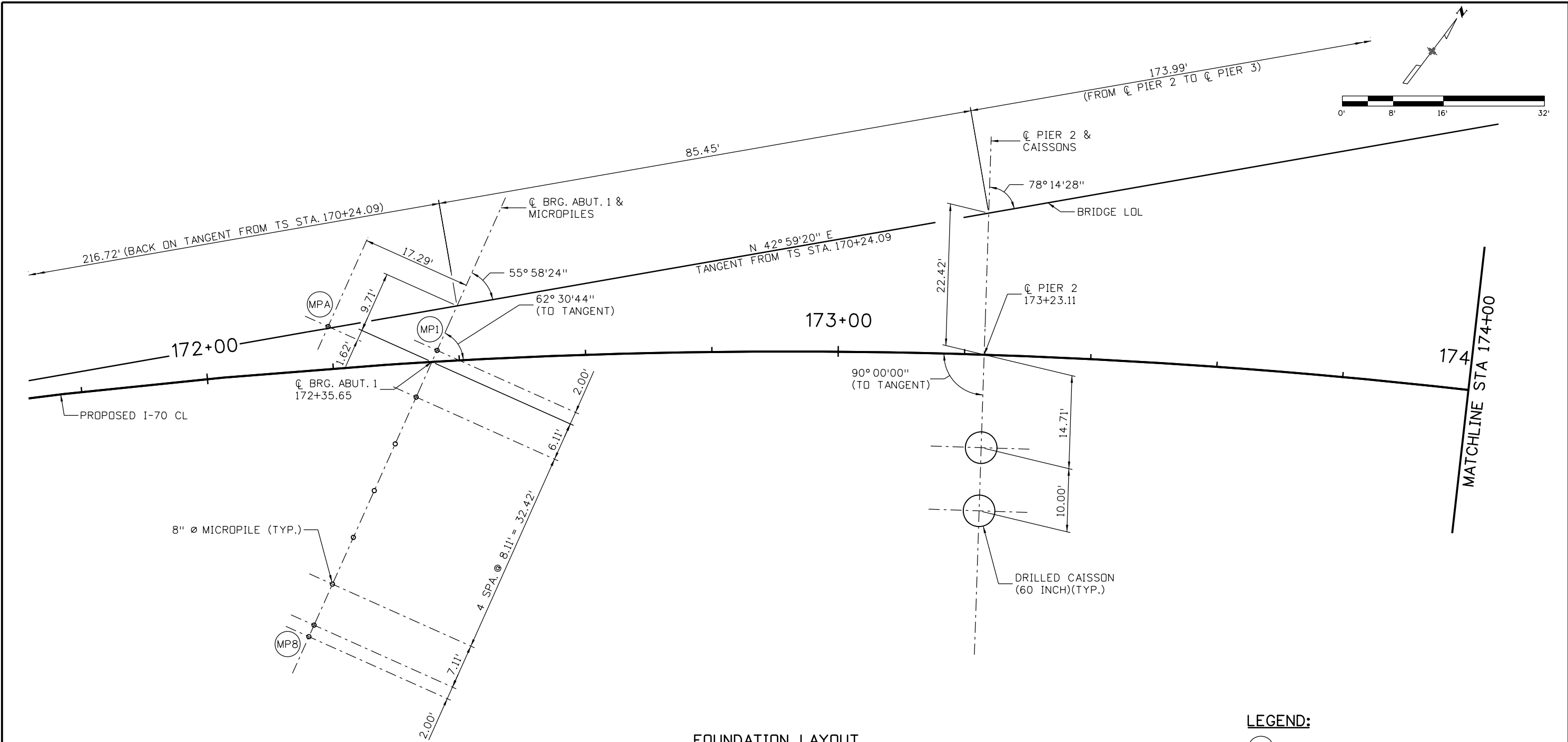
Structure Numbers: F-15-BR  
 Subset Sheets: B07 of 46

<b>Project No./Code</b>
IM 0703-390
19035
Sheet Number <b>55</b>



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Design		Detail		Quantities	
INITIAL	DATE	INITIAL	DATE	INITIAL	DATE
Checked By	KCS	Checked By	JCF	Checked By	KCS
Checked By	JCF	Checked By	JCF	Checked By	JCF



**FOUNDATION LAYOUT**

**LEGEND:**

(MPX) DENOTES MICROPILE NUMBER

**NOTES:**

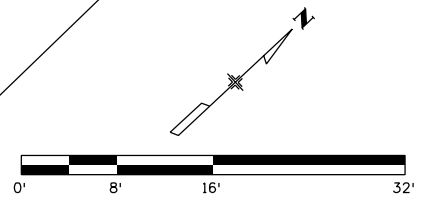
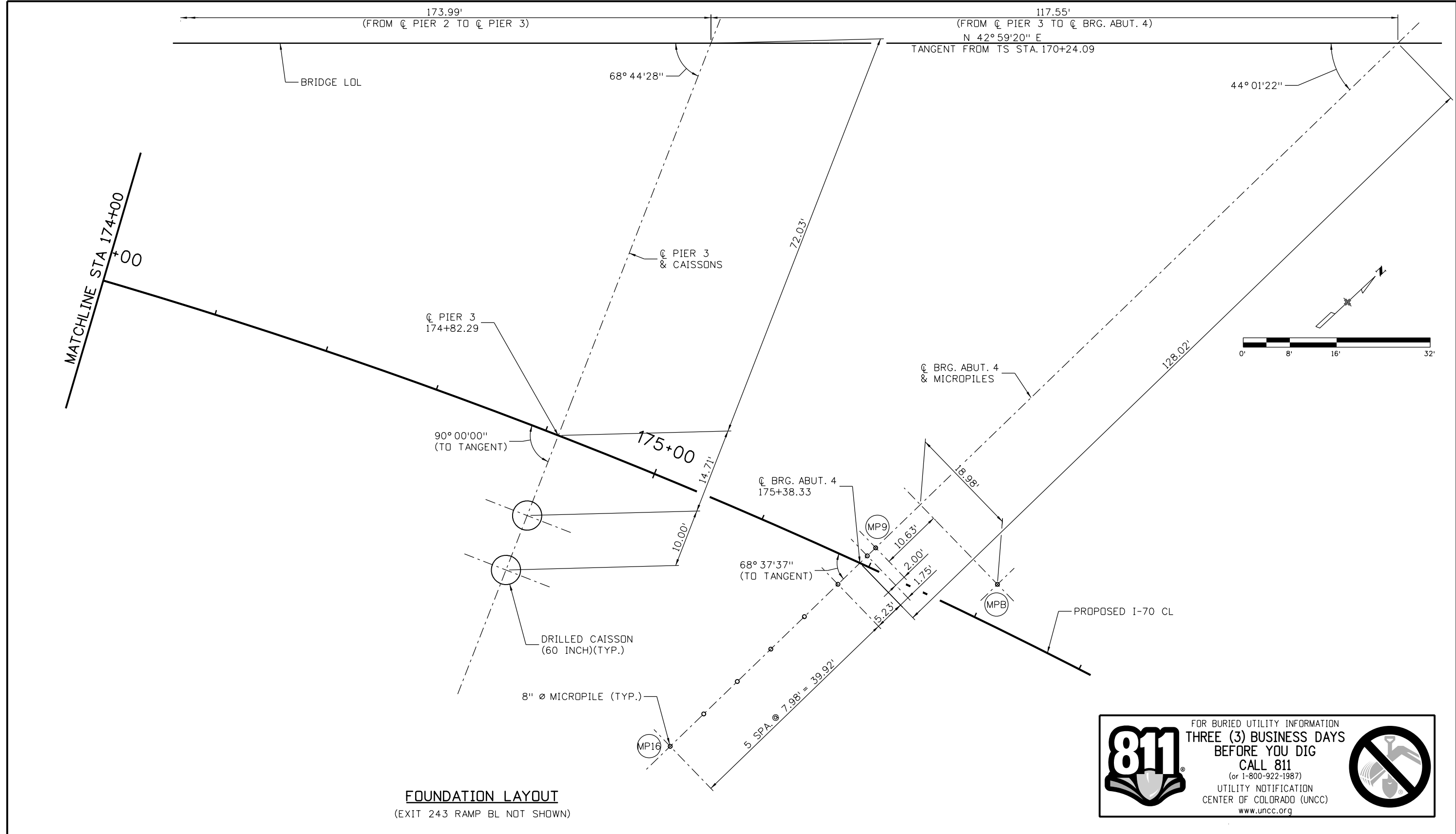
- MICROPILE DIMENSIONS SHOWN ARE AT BOTTOM OF CONCRETE.
- DIMENSIONS SHOWN ARE MEASURED HORIZONTALLY AND DO NOT REFLECT VERTICAL CHANGES DUE TO GRADE OR TERRAIN.

FOR BURIED UTILITY INFORMATION  
**THREE (3) BUSINESS DAYS BEFORE YOU DIG**  
**CALL 811**  
 (or 1-800-922-1987)  
 UTILITY NOTIFICATION  
 CENTER OF COLORADO (UNCC)  
 www.uncc.org


Print Date: 11/30/2012		<b>Sheet Revisions</b>	<b>Colorado Department of Transportation</b>	<b>As Constructed</b>	<b>EB 170 OVER CLEAR CREEK BRIDGE</b>	<b>Project No./Code</b>
File Name: 18832BRDG_170_FoundLyt01.dgn		Date:    Comments    Init.	425 A Corporate Circle Golden, CO 80401 Phone: 720-497-6918    FAX: 720-497-6901	No Revisions:	<b>FOUNDATION LAYOUT</b>	IM 0703-390
Horiz. Scale: 1:16    Vert. Scale:			<b>Region 1</b>	Revised:	<b>(SHEET 1 OF 2)</b>	19035
Staff Bridge Branch - Unit 0221    STW			<b>CRC</b>	Void:	Designer: K. Saindon    Structure: F-15-BR	Sheet Number    57
<b>ATKINS</b> 4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275    Fax: (303) 221-7276					Detailer: E. Schawo    Structure Numbers:	Sheet Subsets: BRIDGE    Subset Sheets: B09 of 46

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Design		Detail		Quantities	
INITIAL	DATE	INITIAL	DATE	INITIAL	DATE
Checked By	JCF	Checked By	JCF	Checked By	JCF
Designed By	KCS	Detailed By	ERS	Quantities By	KCS



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Print Date: 11/30/2012  
 File Name: 18832BRDG\_170\_FoundLyt02.dgn  
 Horiz. Scale: 1:16 Vert. Scale: NONE  
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Date:	Comments	Init.

Colorado Department of Transportation  
 425 A Corporate Circle  
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 Phone: 720-497-6918 FAX: 720-497-6901  
 Region 1 CRC

As Constructed  
 No Revisions:  
 Revised:  
 Void:

EB 170 OVER CLEAR CREEK BRIDGE  
 FOUNDATION LAYOUT  
 (SHEET 2 OF 2)

Designer: K. Saindon  
 Detailer: E. Schawo  
 Sheet Subset: BRIDGE

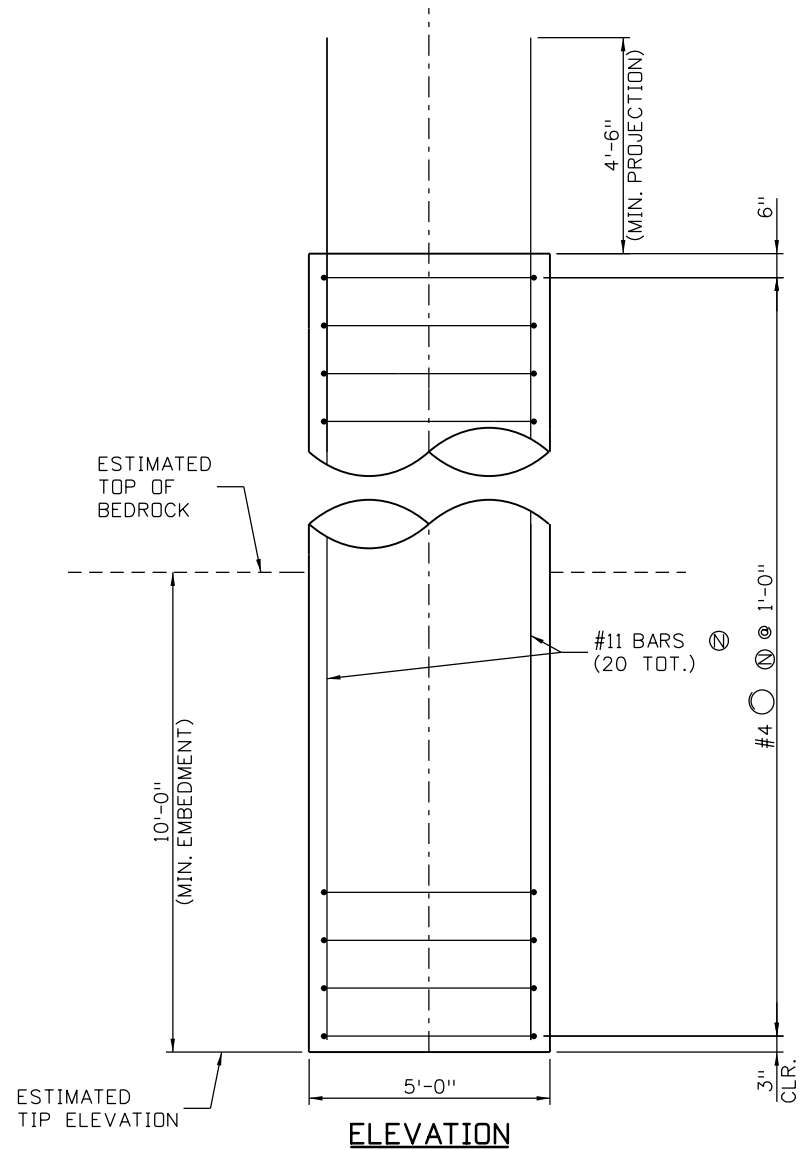
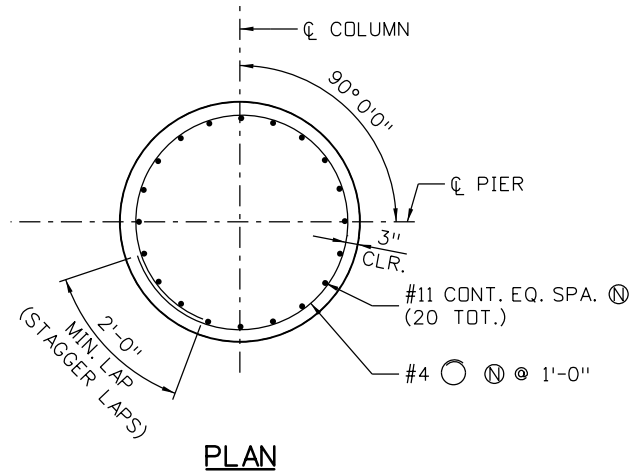
Structure Numbers: F-15-BR  
 Subset Sheets: B10 of 46

Project No./Code  
 IM 0703-390  
 19035  
 Sheet Number 58



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Design		Detail		Quantities	
INITIAL	DATE	INITIAL	DATE	INITIAL	DATE
Checked By	KCS	Checked By	ERS	Checked By	KCS
Checked By	JCF	Checked By	JCF	Checked By	JCF



**CAISSON SUMMARY TABLE**

LOCATION	CAISSON DIAMETER	TOP OF CAISSON ELEV.	ESTIMATED BEDROCK ELEV.	MINIMUM PENETRATION INTO BEDROCK (FT.)	ESTIMATED TIP ELEV.	FACTORED MAXIMUM LOAD (KIPS)	UNFACTORED MAXIMUM LOAD (KIPS)	ACTUAL BEDROCK ELEVATION
PIER 2	60" Ø	7314.0	7303.0	10.00	7293.0	3463	2310	
PIER 3	60" Ø	7311.0	7293.0	10.00	7283.0	3463	2310	

FOR BURIED UTILITY INFORMATION  
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[www.uncc.org](http://www.uncc.org)

**NOTES:**

1. DRILLED CAISSON CONCRETE SHALL BE CLASS BZ.
2. FOR LOCATION OF CAISSON SEE SHEETS B09 AND B10.
3. BARS PROJECTING FROM TOP OF CAISSON SHALL BE PLACED TO FIT INSIDE THE REINFORCING CAGE OF THE PIER COLUMN. PROJECTING BARS SHALL BE INCLUDED IN THE COST OF ITEM 503, DRILLED CAISSON.
4. EACH SHAFT AT A PIER SHALL BE DRILLED, REINFORCED, CONCRETED, AND ALLOWED TO CURE FOR 24 HOURS BEFORE DRILLING BEGINS ON AN ADJACENT SHAFT.
5. PROJECT INSPECTORS SHALL NOTE ACTUAL BEDROCK ELEVATIONS ON AS-BUILT DRAWINGS.

Print Date: 11/30/2012  
 File Name: 18832BRDG\_I70\_Caisson01.dgn  
 Horiz. Scale: 1:4      Vert. Scale: 1:4  
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Sheet Revisions		
Date:	Comments	Init.

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 Phone: 720-497-6918 FAX: 720-497-6901

Region 1 CRC

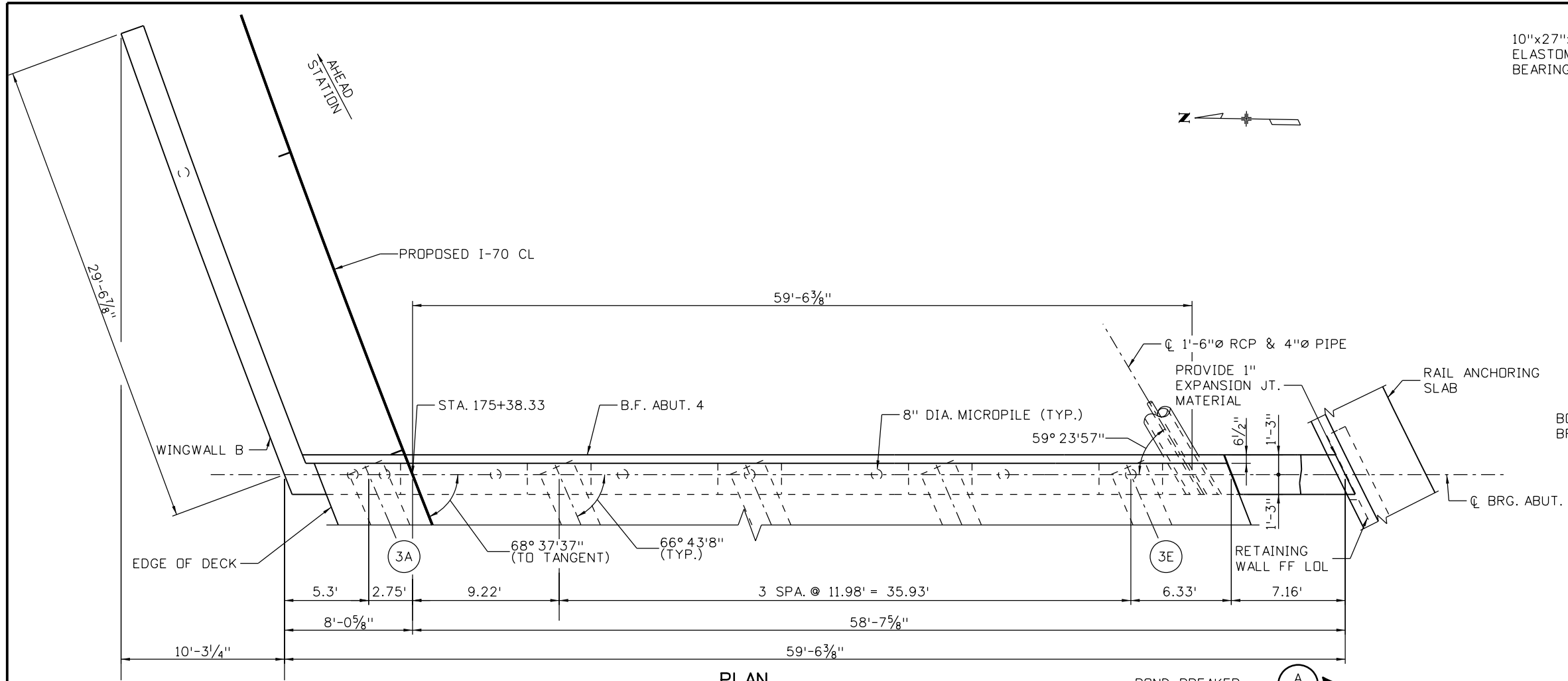
As Constructed	EB I70 OVER CLEAR CREEK BRIDGE CAISSON DETAILS		Project No./Code
No Revisions:			IM 0703-390
Revised:	Designer: K. Saindon	Structure Numbers: F-15-BR	19035
Void:	Detailer: E. Schawo	Sheet Subset: BRIDGE	Sheet Number 59
		Subset Sheets: B11 of 46	



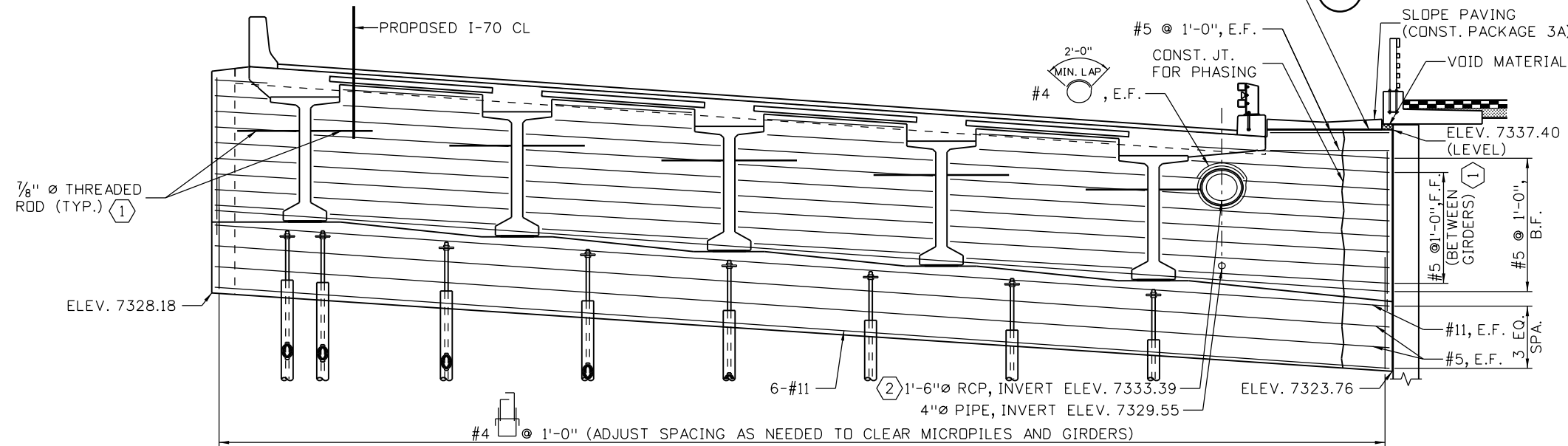


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Checked By	JCF	Checked By	JCF	Checked By	JCF

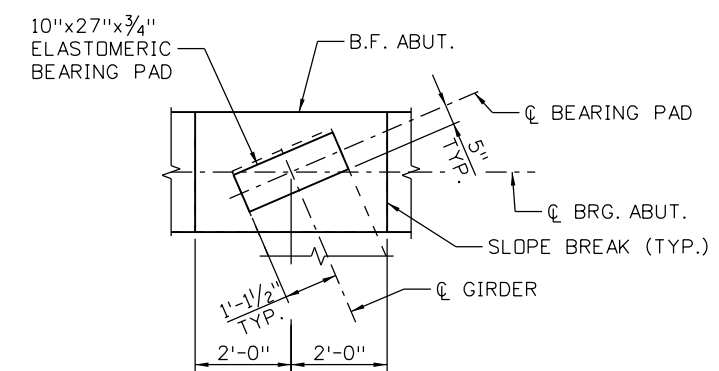


**PLAN**

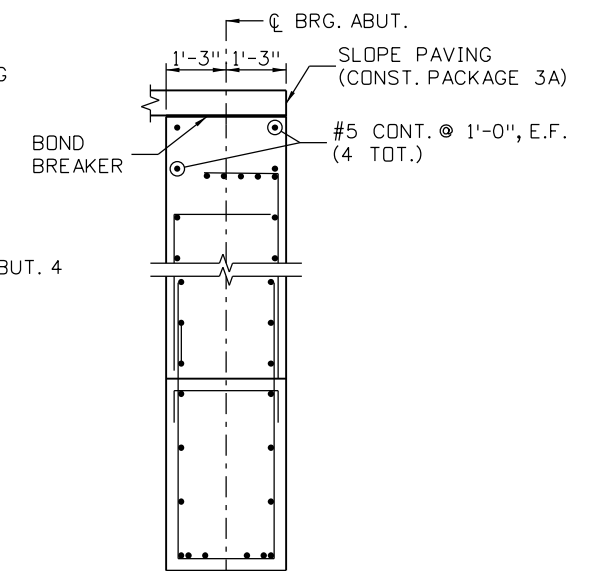


**ELEVATION**

(LOOKING AHEAD STATION)  
(MICROPILE AT WINGWALL NOT SHOWN)



**BEARING SEAT DETAIL**



**SECTION A-A**

(FOR INFORMATION NOT SHOWN, SEE 'TYPICAL SECTION' ON SHEET B12.)

**GIRDER SEAT ELEVATION TABLE**

GIRDER	ELEVATION
3A	7332.18
3B	7331.35
3C	7330.52
3D	7329.69
3E	7328.86

ELEVATIONS TAKEN AT  $\phi$  BRG. AND  $\phi$  GIRDER.

**KEYNOTES:**

- ① CUT BARS AS NEEDED TO CLEAR DRAINAGE PIPES.
- ② PROVIDE 1" CLEAR ALL AROUND PIPE O.D.; PLACE 1" EXPANSION JOINT MATERIAL.

**NOTES:**

- 1. FOR NOTES, SEE SHEET B13.

Print Date: 11/30/2012  
 File Name: 18832BRDG\_170\_Abut1\_02.dgn  
 Horiz. Scale: 1:8    Vert. Scale: NONE  
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Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation

**DOT** 425 A Corporate Circle  
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 Phone: 720-497-6918 FAX: 720-497-6901

Region 1    CRC

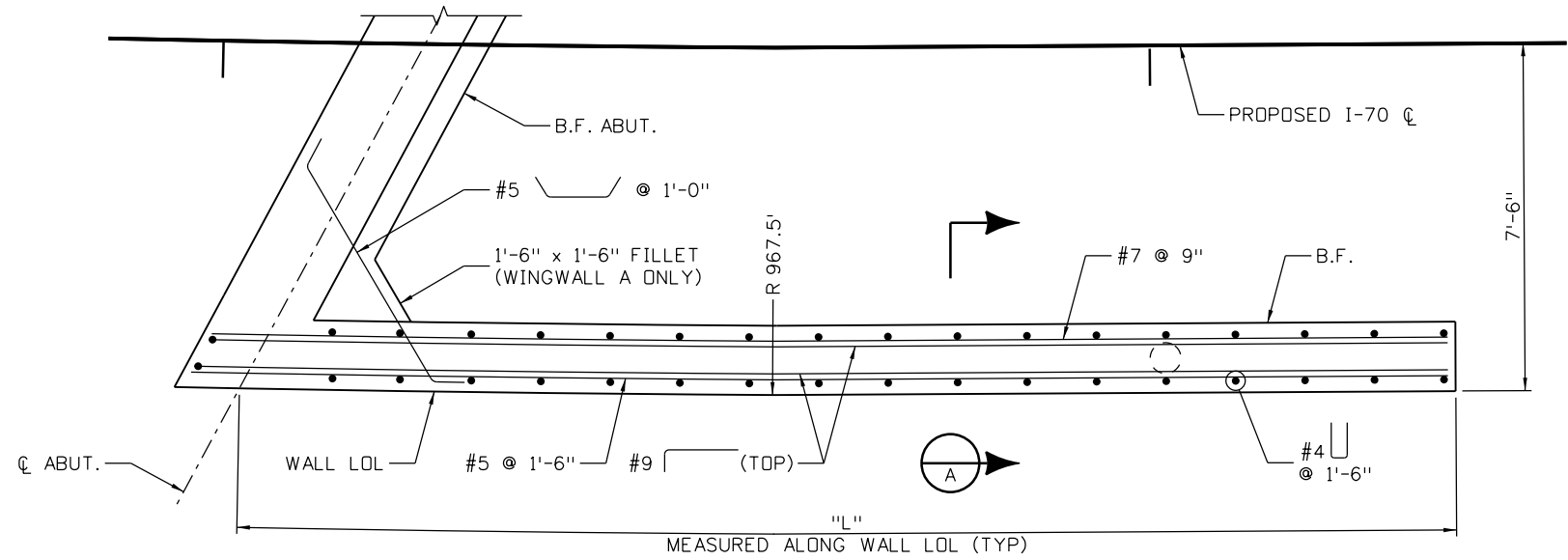
<b>As Constructed</b>
No Revisions:
Revised:
Void:

<b>EB 170 OVER CLEAR CREEK BRIDGE ABUTMENT 4</b>			
Designer:	K. Saindon	Structure Numbers	F-15-BR
Detailer:	E. Schawo	Subset Sheets:	B14 of 46
Sheet Subset:	BRIDGE		

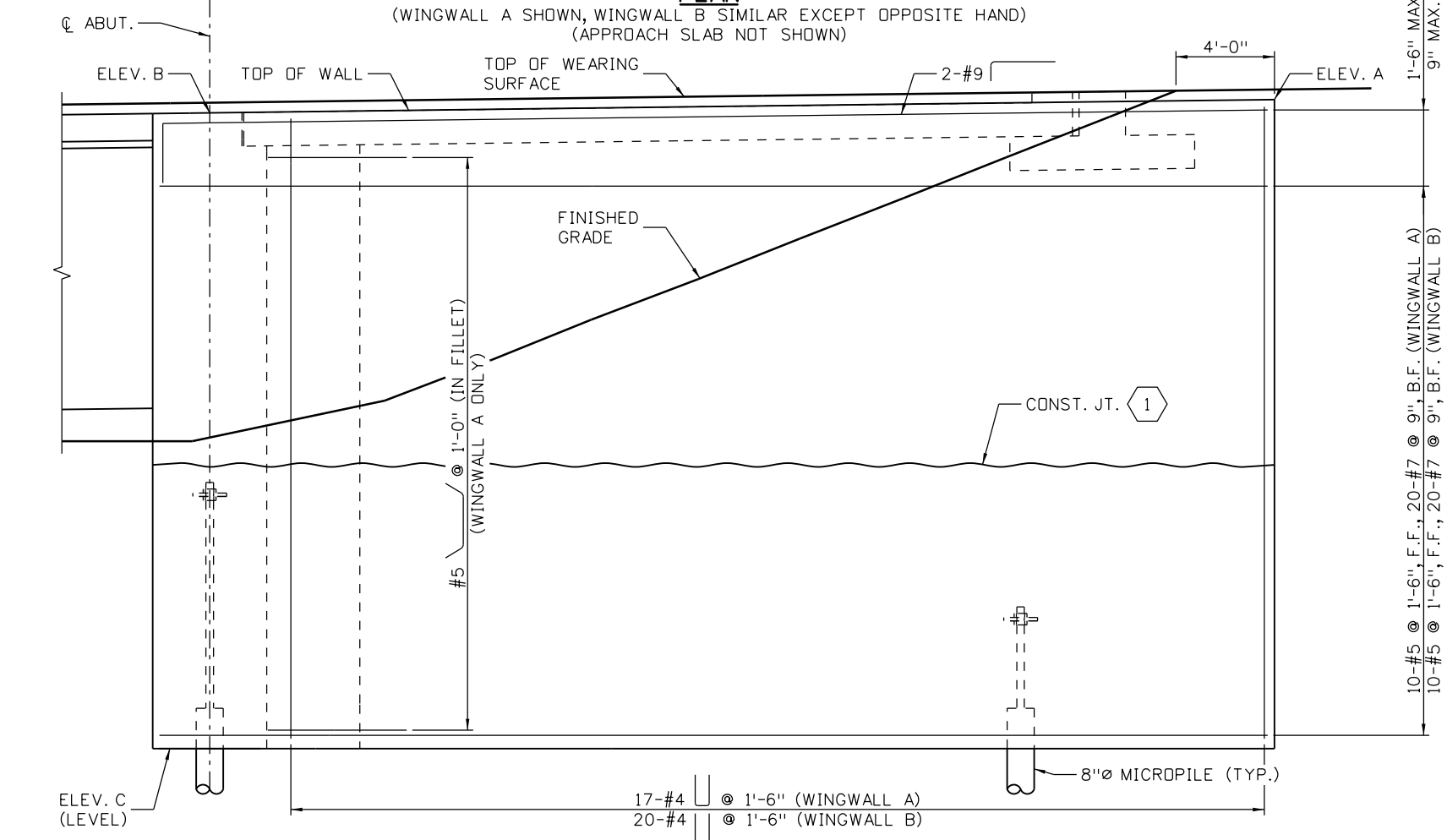
<b>Project No./Code</b>
IM 0703-390
19035
Sheet Number 62

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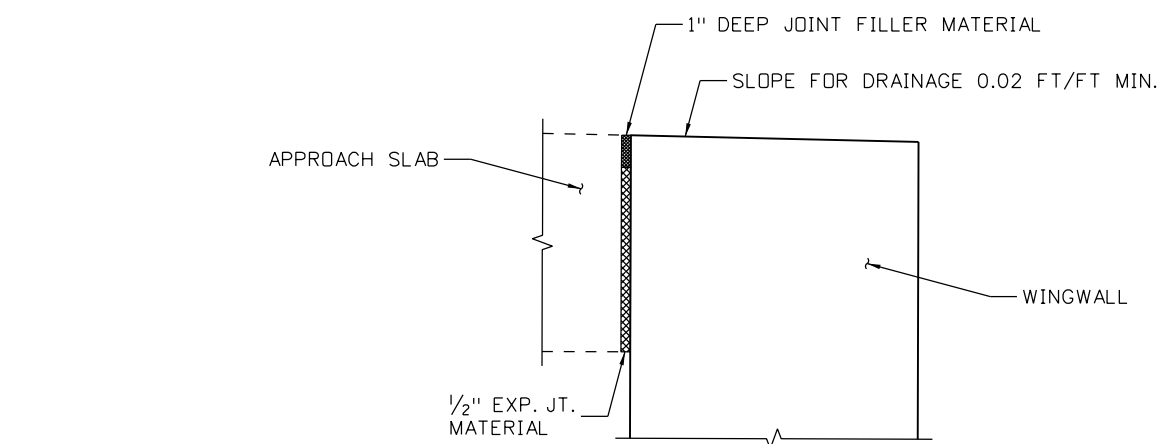
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INITIAL	DATE	INITIAL	DATE	INITIAL	DATE
Designed By	08-12	ERS	09-12	Quantities By	RCS
Checked By	10-12	JCF	10-12	Checked By	JCF



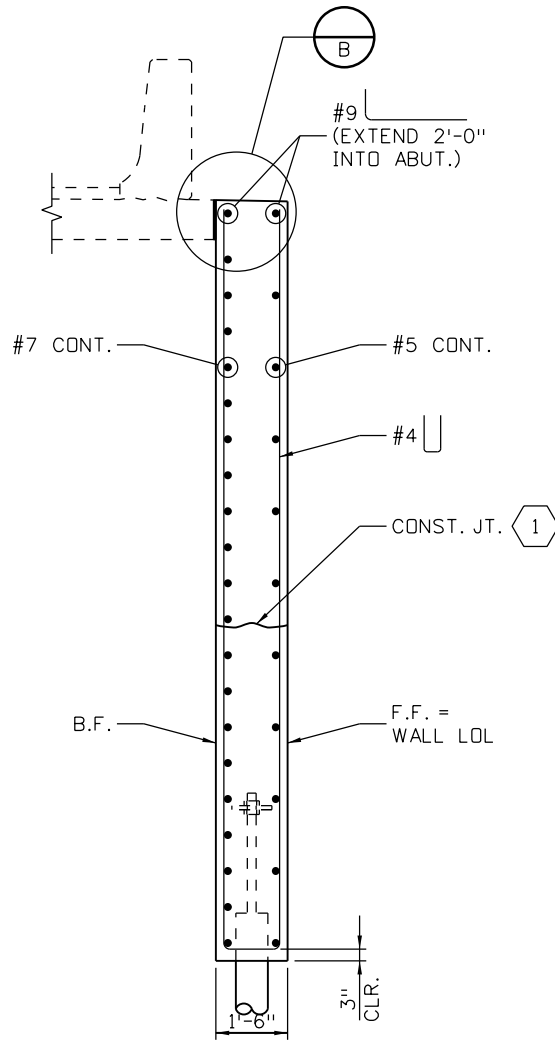
**PLAN**  
(WINGWALL A SHOWN, WINGWALL B SIMILAR EXCEPT OPPOSITE HAND)  
(APPROACH SLAB NOT SHOWN)



**ELEVATION**  
(WINGWALL A SHOWN, WINGWALL B SIMILAR EXCEPT OPPOSITE HAND)



**DETAIL B**



**SECTION A**

**WINGWALL VARIABLE TABLE**

LOCATION	WINGWALL A	WINGWALL B
ELEV. A	7345.20	7340.82
ELEV. B	7344.94	7340.94
ELEV. C	7332.11	7328.18
DIMENSION "L"	26'-3 <sup>1</sup> / <sub>8</sub> "	29'-6 <sup>7</sup> / <sub>8</sub> "

**NOTES:**

1. WINGWALLS SHALL BE CONCRETE CLASS D (BRIDGE).
2. ELEVATIONS SHOWN ARE AT WALL LOL.
3. FOR ABUTMENT DETAILS, SEE SHEETS B13 & B14.

**KEY NOTES:**

- 1 CONSTRUCTION JOINT IS AT EXTERIOR BEARING ELEVATION.
- 2 1/2" EXPANSION JOINT MATERIAL AND 1" DEEP JOINT FILLER MATERIAL WILL NOT BE PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN ITEM 601.

Print Date: 11/30/2012  
 File Name: 18832BRDG\_170\_Wingwalls01.dgn  
 Horiz. Scale: 1:4 Vert. Scale: NONE  
 Staff Bridge Branch - Unit 0221 STW

**ATKINS** 4601 DTC Boulevard, Suite 700  
 Denver, CO 80237  
 Phone: (303) 221-7275 Fax: (303) 221-7276

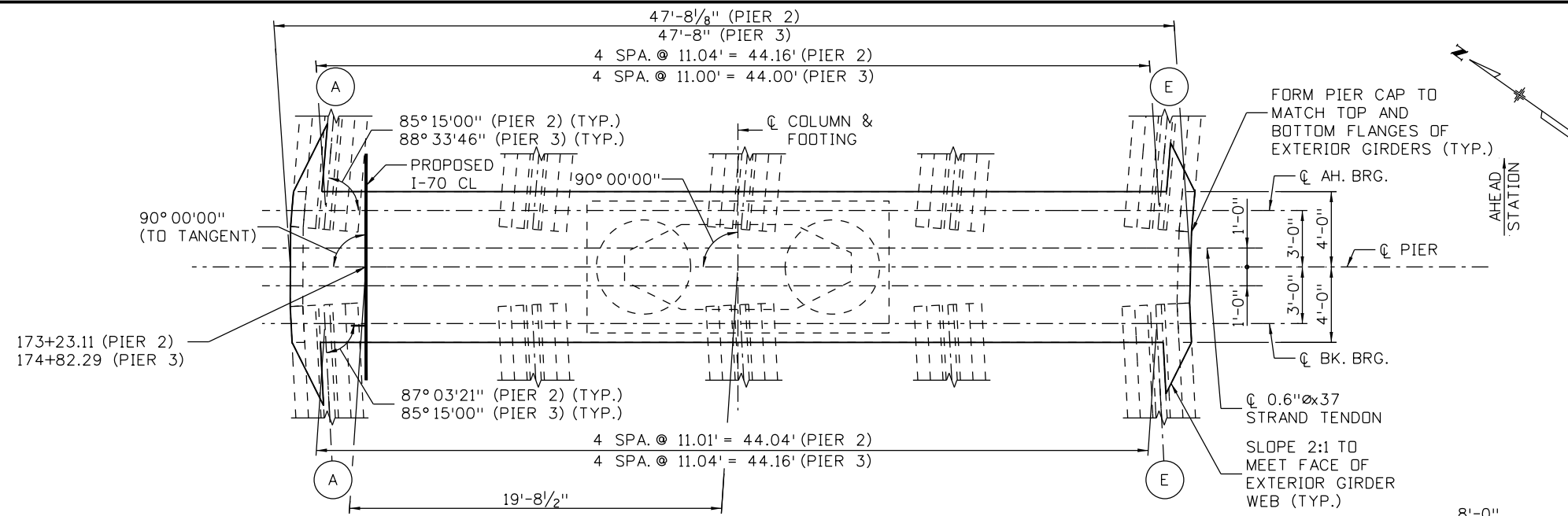
Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation

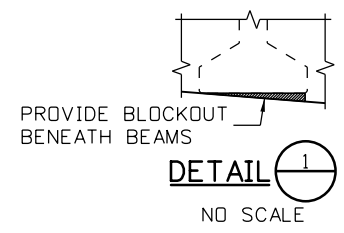
**DOT** 425 A Corporate Circle  
 Golden, CO 80401  
 Phone: 720-497-6918 FAX: 720-497-6901

Region 1 **CRC**

As Constructed	EB 170 OVER CLEAR CREEK BRIDGE WINGWALL DETAILS		Project No./Code
No Revisions:			IM 0703-390
Revised:	Designer: K. Saindon	Structure Numbers: F-15-BR	19035
Void:	Detailer: E. Schawo	Sheet Subset: BRIDGE	Sheet Number 63
		Subset Sheets: B15 of 46	

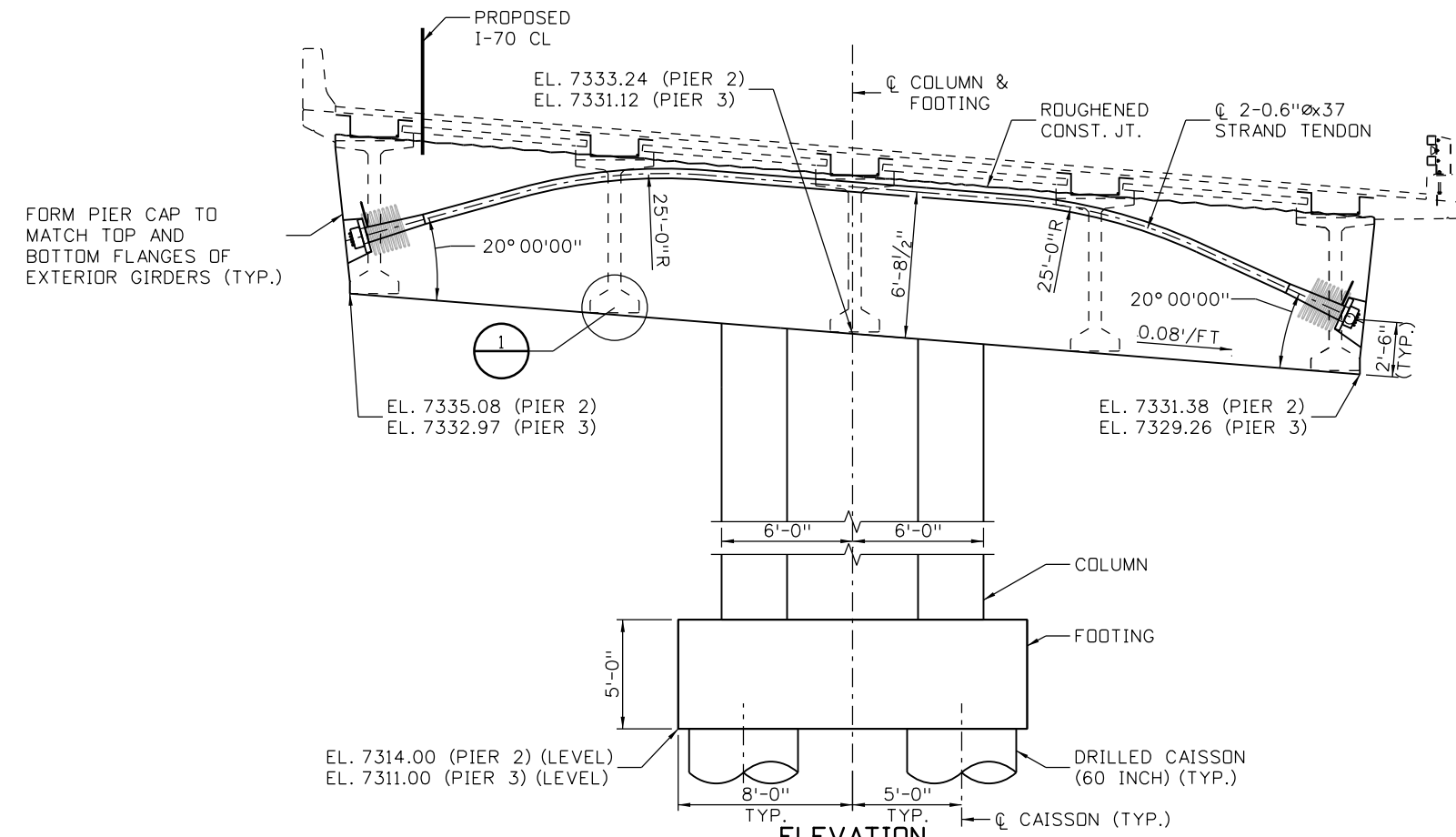


**PLAN**  
(PIER 2 SHOWN, PIER 3 SIMILAR EXCEPT AS NOTED)

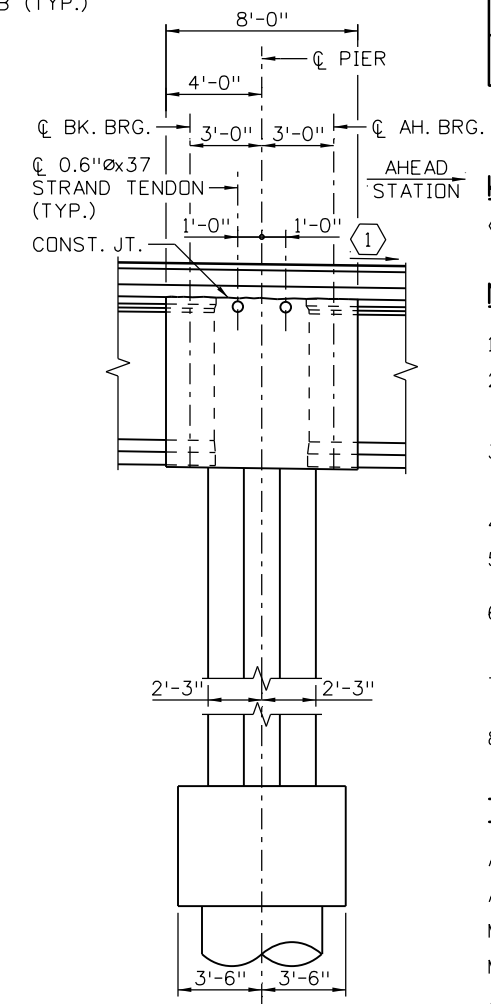


**BOTTOM OF GIRDER ELEVATION TABLE**

LOCATION	GIRDER	GIRDER				
		A	B	C	D	E
PIER 2	BK. BRG.	7335.12	7334.24	7333.36	7332.48	7331.60
	AH. BRG.	7335.04	7334.16	7333.27	7332.39	7331.51
PIER 3	BK. BRG.	7333.00	7332.12	7331.24	7330.36	7329.47
	AH. BRG.	7332.93	7332.05	7331.17	7330.29	7329.41



**ELEVATION**  
(LOOKING AHEAD STATION)  
(PIER 2 SHOWN, PIER 3 SIMILAR EXCEPT AS NOTED)



**TYPICAL SECTION**

**KEYNOTES:**

- ① MATCH LONGITUDINAL GRADE.

**NOTES:**

- PIERS SHALL BE CONCRETE CLASS D (BRIDGE).
- TENDONS SHALL BE SINGLE-END STRESSED WITH ALTERNATE ENDS TO 75% GUTS. THEORETICAL TENDON ELONGATION = 3.74 INCHES.
- EPOXY BONDER, PER STANDARD SPECIFICATION 601.12(N) SHALL BE USED FOR ALL POST-TENSIONING ANCHORAGE BLOCKOUT POURBACKS.
- POLYETHYLENE DUCT IS NOT ALLOWED.
- ELEVATIONS ARE AT @ PIER UNLESS NOTED OTHERWISE.
- PIER CAPS SHALL BE CONSIDERED MASS CONCRETE. REFER TO PROJECT SPECIAL PROVISION 601, MASS CONCRETE, FOR ADDITIONAL REQUIREMENTS.
- FOR PIER COLUMN AND FOOTING DETAILS, SEE SHEET B17.
- FOR GIRDER DETAILS, SEE SHEETS B21 AND B22.

**TENDON DATA:**

ASTM A 416, GRADE 270 LOW-RELAXATION STRAND, 0.6"Ø.  
 APPARENT MODULUS: 28,500 ksi  
 MAXIMUM JACKING STRESS: 75% GUTS  
 MAXIMUM ANCHORING STRESS: 70% GUTS  
 ANCHOR SET: 3/8"  
 FRICTION COEFFICIENT: 0.20  
 WOBBLE COEFFICIENT: 0.0002

Design		Detail		Quantities	
DATE	INITIAL	DATE	INITIAL	DATE	INITIAL
06-12	ERS	06-12	JCS	09-12	JCS
10-12	JCF	10-12	JCF	10-12	JCS

Print Date: 11/30/2012  
 File Name: 18832BRDG\_I70\_Pier01.dgn  
 Horiz. Scale: 1:8 Vert. Scale: 1:8  
 Staff Bridge Branch - Unit 0221  
**ATKINS** 4601 DTC Boulevard, Suite 700  
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Sheet Revisions		
Date:	Comments	Init.

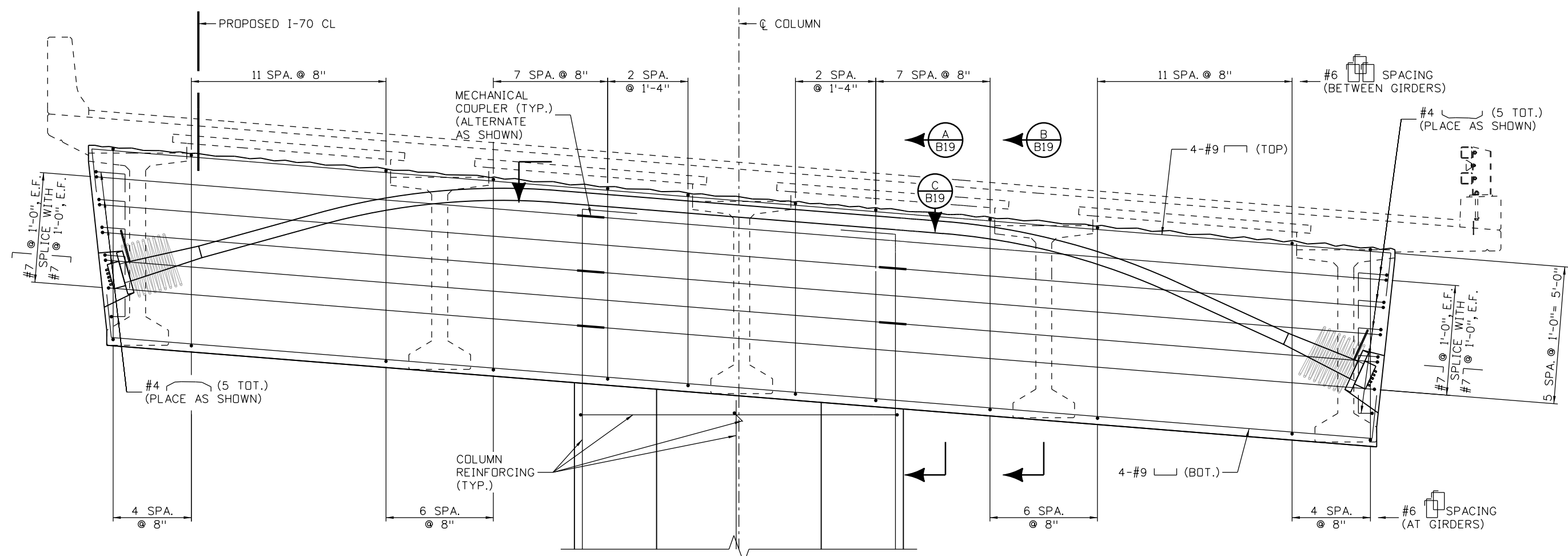
Colorado Department of Transportation  
 425 A Corporate Circle  
 Golden, CO 80401  
 Phone: 720-497-6918 FAX: 720-497-6901  
 Region 1 CRC

As Constructed  
 No Revisions:  
 Revised:  
 Void:

**EB I70 OVER CLEAR CREEK BRIDGE  
 PIER PLAN AND ELEVATION**  
 Designer: K. Saindon  
 Detailer: E. Schawo  
 Sheet Subset: BRIDGE  
 Structure Numbers: F-15-BR  
 Subset Sheets: B16 of 46

Project No./Code  
 IM 0703-390  
 19035  
 Sheet Number 64





**PIER CAP REINFORCING ELEVATION**  
(LOOKING AHEAD STATION)

**NOTES:**

1. FOR ADDITIONAL NOTES AND DETAILS, SEE SHEET B16.
2. FOR PT DUCT BLOCKOUT DETAIL, SEE SHEET B20.
3. ALL REINFORCING STEEL SHALL HAVE A MINIMUM CONCRETE COVER OF 2".

Design		Detail		Quantities	
INITIAL	DATE	INITIAL	DATE	INITIAL	DATE
Designed By	KCS	ERS	06-12	Checked By	RCS
Checked By	JCF	JCF	10-12	Checked By	JCF

Print Date: 11/30/2012
File Name: 18832BRDG_I70_PierCap01.dgn
Horiz. Scale: 1:4      Vert. Scale: 1:4
Staff Bridge Branch - Unit 0221
<b>ATKINS</b> 4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276

Sheet Revisions		
Date:	Comments	Init.

**Colorado Department of Transportation**

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Golden, CO 80401  
Phone: 720-497-6918 FAX: 720-497-6901

**Region 1**      **CRC**

<b>As Constructed</b>
No Revisions:
Revised:
Void:

<b>EB I70 OVER CLEAR CREEK BRIDGE</b>			
<b>PIER CAP</b>			
<b>(SHEET 1 OF 2)</b>			
Designer:	K. Saindon	Structure Numbers	F-15-BR
Detailer:	E. Schawo	Subset Sheets:	B18 of 46
Sheet Subset:	BRIDGE		

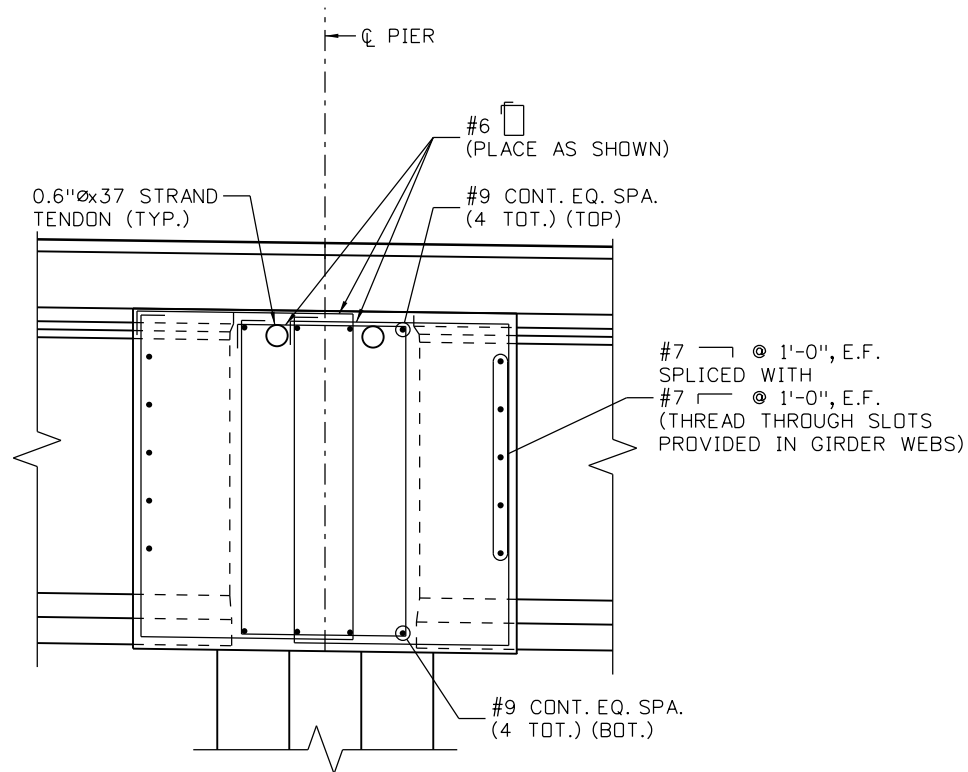
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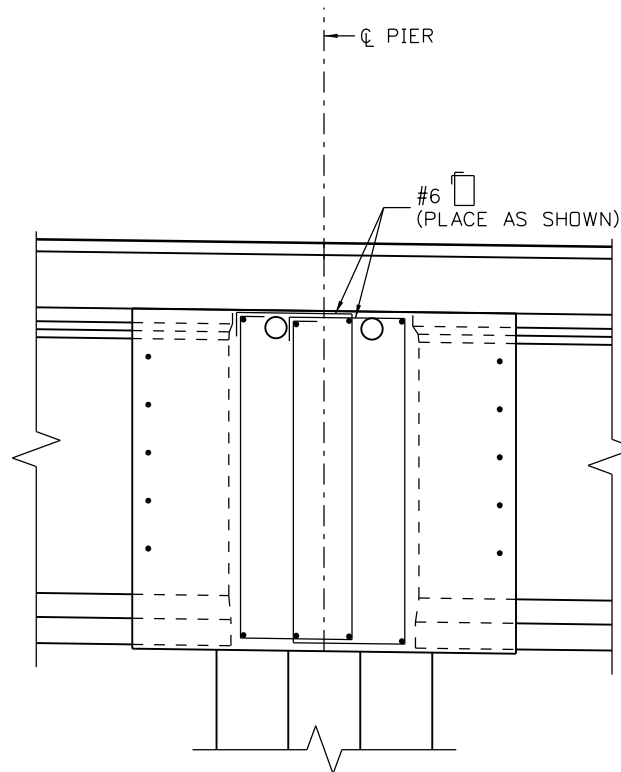


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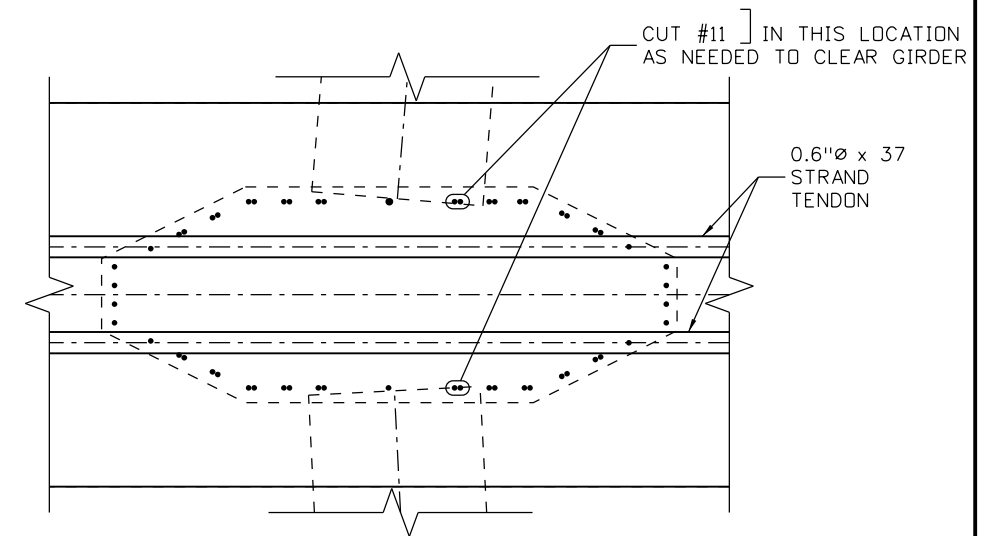
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Checked By	JCF	Checked By	JCF	Checked By	JCF
	09-12		10-12		09-12
	10-12		10-12		10-12



**SECTION A**  
B18  
(BETWEEN GIRDERS)



**SECTION B**  
B18  
(AT GIRDERS)  
(SECTION SIMILAR TO 'SECTION A', EXCEPT AS NOTED)



**SECTION C**  
B18

- NOTES:**
- FOR INFORMATION NOT SHOWN, SEE SHEET B16.
  - FOR GIRDER DETAILS, SEE SHEETS B21 AND B22.
  - ALL REINFORCING STEEL SHALL HAVE A MINIMUM CONCRETE COVER OF 2".

Print Date: 11/30/2012	
File Name: 18832BRDG_170_PierCap02.dgn	
Horiz. Scale: 1:4      Vert. Scale: 1:4	
Staff Bridge Branch - Unit 0221	
<b>ATKINS</b> 4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276	

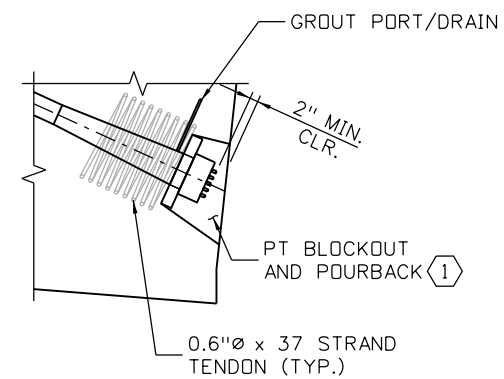
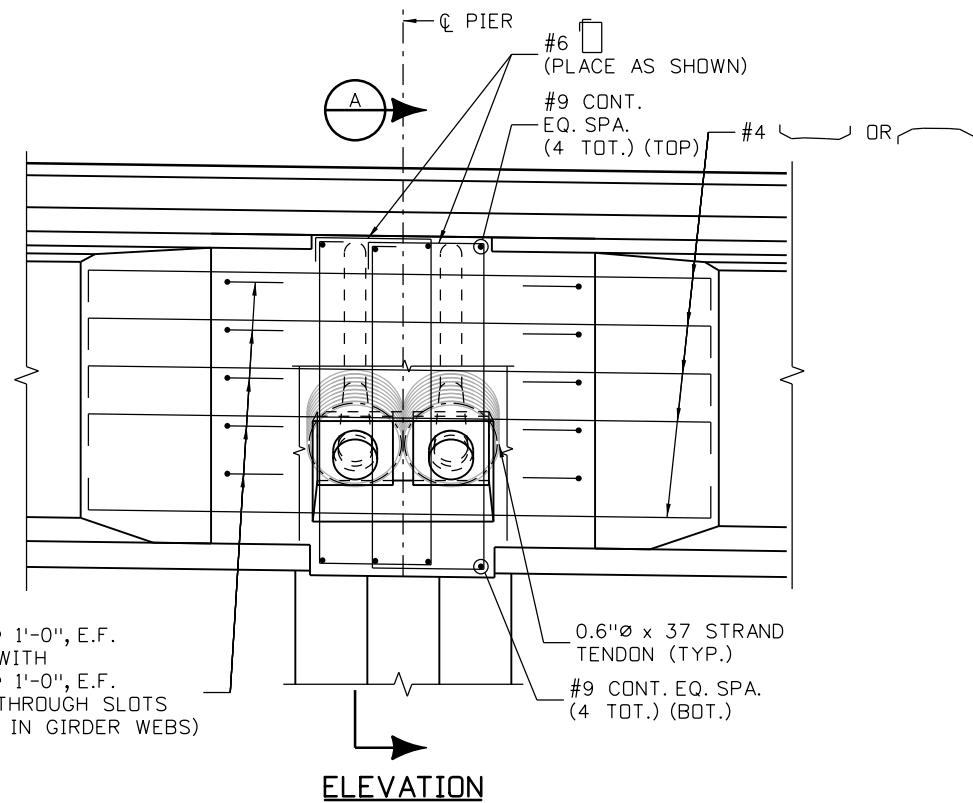
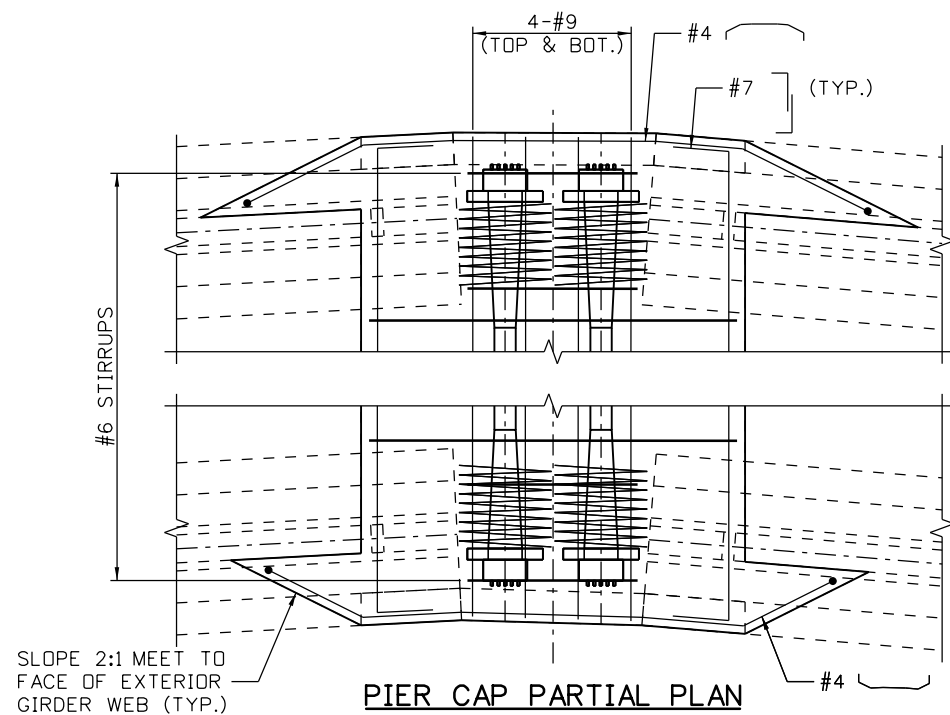
Sheet Revisions		
Date:	Comments	Init.

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Golden, CO 80401  
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Region 1 CRC

As Constructed	EB 170 OVER CLEAR CREEK BRIDGE		Project No./Code	
	PIER CAP (SHEET 2 OF 2)			IM 0703-390
	No Revisions:	Designer: K. Saindon	Structure Numbers	F-15-BR
	Revised:	Detailer: E. Schawo	Sheet Subset: BRIDGE	19035
Void:	Sheet Subset: BRIDGE	Subset Sheets: B19 of 46	Sheet Number 67	



**SECTION A-A**  
(PIER CAP REINFORCING NOT SHOWN FOR CLARITY)

**KEYNOTES:**

(1) EPOXY BONDER, PER STANDARD SPECIFICATION 601.12(N) SHALL BE USED FOR ALL POST-TENSIONING ANCHORAGE BLOCKOUTS POURBACKS. SEE EXP. PIER DIM. & PT SHEET.

**NOTES:**


- CONTRACTOR SHALL SUBMIT A GROUTING CONTROL PLAN WITH PT SHOP DRAWINGS.
- ALL GROUTING SHALL CONFORM TO STANDARD SPECIFICATION 618.09.

Design		Detail		Quantities	
INITIAL	DATE	INITIAL	DATE	INITIAL	DATE
Checked By	KCS	Checked By	JCF	Checked By	KCS
Checked By	JCF	Checked By	JCF	Checked By	JCF

Print Date: 11/30/2012	
File Name: 18832BRDG_I70_PierMiscDet01.dgn	
Horiz. Scale: 1:4	Vert. Scale: 1:4
Staff Bridge Branch - Unit 0221	
<b>ATKINS</b>	4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276

Sheet Revisions		
Date:	Comments	Init.

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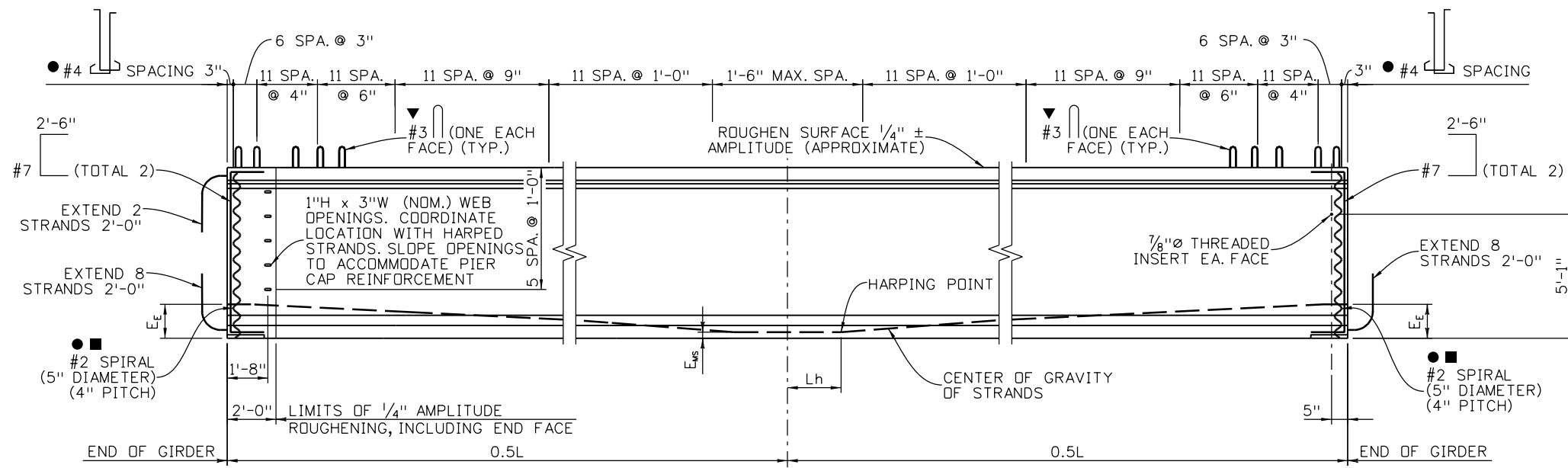
425 A Corporate Circle  
Golden, CO 80401  
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<b>As Constructed</b>
No Revisions:
Revised:
Void:

<b>EB I70 OVER CLEAR CREEK BRIDGE</b>			
<b>PIER CAP</b>			
<b>MISCELLANEOUS DETAILS</b>			
Designer:	K. Saindon	Structure	F-15-BR
Detailer:	E. Schawo	Numbers	
Sheet Subset:	BRIDGE	Subset Sheets:	B20 of 46

<b>Project No./Code</b>
IM 0703-390
19035
Sheet Number <b>68</b>



**GIRDER ELEVATION**  
(AT INTEGRAL PIER CAPS)

**GIRDER ELEVATION**  
(AT ABUTMENTS)

**NOTES:**

ALL WORK NECESSARY TO FABRICATE AND INSTALL THE INTEGRAL PARTS OF THE GIRDER (INCLUDING THE INTERMEDIATE DIAPHRAGMS, 7/8"Ø THREADED RODS, AND LEVELING PADS), AS SHOWN ON THE PLANS, SHALL BE INCLUDED IN THE BID PRICE FOR ITEM NO. 618, PRESTRESSED CONCRETE I (BT84), WITH A PAY UNIT OF FEET WHICH SHALL BE MEASURED BY DIMENSION L.

WHEN APPROVED BY THE ENGINEER, A MINIMUM OF TACK WELDING WILL BE PERMITTED ON ASTM A706 UNCOATED REINFORCING STEEL.

REINFORCING PROJECTING FROM THE TOP OF THE GIRDER AND REINFORCING WITHIN EIGHT FEET OF AN EXPANSION DEVICE IN THE BRIDGE DECK SHALL BE EPOXY COATED. DAMAGED COATING ON GIRDER REINFORCING NEED NOT BE REPAIRED. THE MINIMUM COVER FOR REINFORCING STEEL IS 1".

AT GIRDER ENDS NOT EMBEDDED IN CONCRETE DIAPHRAGMS, CUT STRANDS OFF 1" BELOW THE SURFACE OF THE CONCRETE AND FINISH WITH AN APPROVED EPOXY GROUT. AT GIRDER ENDS EMBEDDED IN CONCRETE DIAPHRAGMS, CUT STRANDS TO PROJECT 3", EXCEPT AS SHOWN. DO NOT MAKE COSMETIC REPAIRS (DAMAGE LESS THAN 1 1/2" DEEP) TO THE PARTS OF THE GIRDERS EMBEDDED IN CONCRETE.

USE LOW RELAXATION STRANDS MEETING THE REQUIREMENTS OF ASTM A-416 GRADE 270. THE MINIMUM CLEAR DISTANCE BETWEEN GROUPS OR INDIVIDUAL STRANDS SHALL BE 2.3(d<sub>s</sub>) BUT NOT LESS THAN 1 1/4". THE MINIMUM COVER FOR PRESTRESSING STEEL IS 1 1/2".

A MINIMUM OF TWO HARPING POINTS SHALL BE USED PER GIRDER. HARPED STRANDS SHALL BE WELL DISTRIBUTED AT THE GIRDER ENDS, STARTING WITHIN 4" OF THE TOP OF THE GIRDER AND DISTRIBUTED SUCH THAT THERE IS NO SPACE BETWEEN STRANDS GREATER THAN 1'-0" AT THE END OF THE GIRDER. AS AN ALTERNATE THE CONTRACTOR MAY PLACE #4 X 10'-0" IN THE SIDES OF THE END OF THE WEB PARALLEL TO THE HARPED STRANDS SUCH THAT THERE IS NO SPACE GREATER THAN 1'-0".

A<sub>s</sub>\* = MINIMUM AREA OF THE PRESTRESSING STEEL.  
d<sub>s</sub> = NOMINAL STRAND DIAMETER.  
f'<sub>s</sub> = ULTIMATE STRENGTH OF PRESTRESSING STEEL.  
F<sub>j</sub> = JACKING FORCE PER GIRDER.  
F<sub>f</sub> = FINAL FORCE PER GIRDER AFTER ALL LOSSES.  
f'<sub>ci</sub> = REQUIRED CONCRETE STRENGTH AT RELEASE OF PRESTRESS FORCE.  
f'<sub>c</sub> = REQUIRED CONCRETE STRENGTH AT 28 DAYS OF AGE.  
L = LENGTH OF GIRDER ALONG THE GRADE OF THE GIRDER.  
Δ = DEFLECTION AT CENTERLINE OF SPAN DUE TO CAST-IN-PLACE SLAB, DIAPHRAGMS, ASPHALT, CURBS, RAILS, AND WALKS.

CONCRETE SHALL BE CLASS PS.

ENTRAINED AIR IS NOT REQUIRED FOR GIRDER CONCRETE.

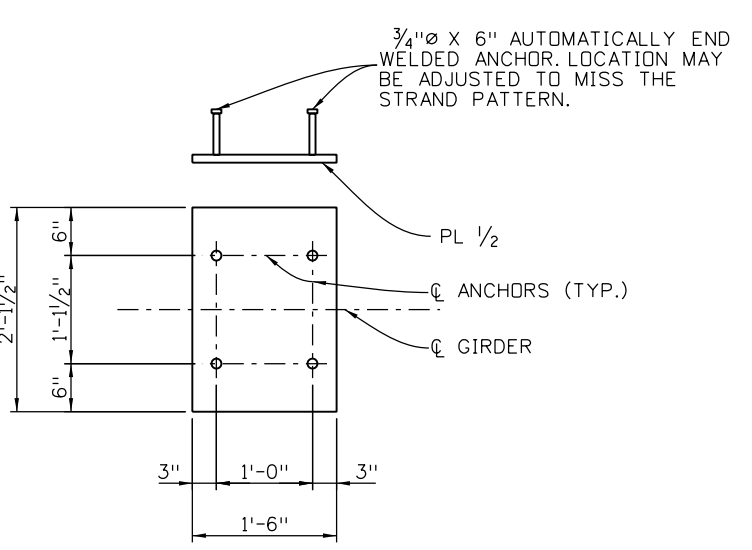
USE 1/2" CHAMFER ON ALL CORNERS, EXCEPT AS NOTED.

PREDICTED ERECTION CAMBER IS THE CAMBER FOR THE GIRDER ALONE AT 90 DAYS. THE CONTRACTOR SHALL LIMIT THE CAMBER GROWTH TO A VALUE NOT TO EXCEED THE PREDICTED CAMBER PLUS 1" PRIOR TO THE DECK POUR BY WEIGHTING, SCHEDULING FABRICATION, POST TENSIONING, OR OTHER MEANS AND MUST REPORT TO THE ENGINEER VALUES OF CAMBER WHICH EXCEED THE PREDICTED CAMBER PLUS 1". REMEDIAL MEASURES, AS APPROVED BY THE ENGINEER, SHALL BE TAKEN IF THE PREDICTED CAMBER PLUS 1" IS EXCEEDED. THE APPROVED REMEDIAL MEASURES SHALL BE FREE OF ANY ADVERSE IMPACT. THE COSTS ASSOCIATED WITH ALL REMEDIAL MEASURES SHALL BE BORNE BY THE CONTRACTOR.

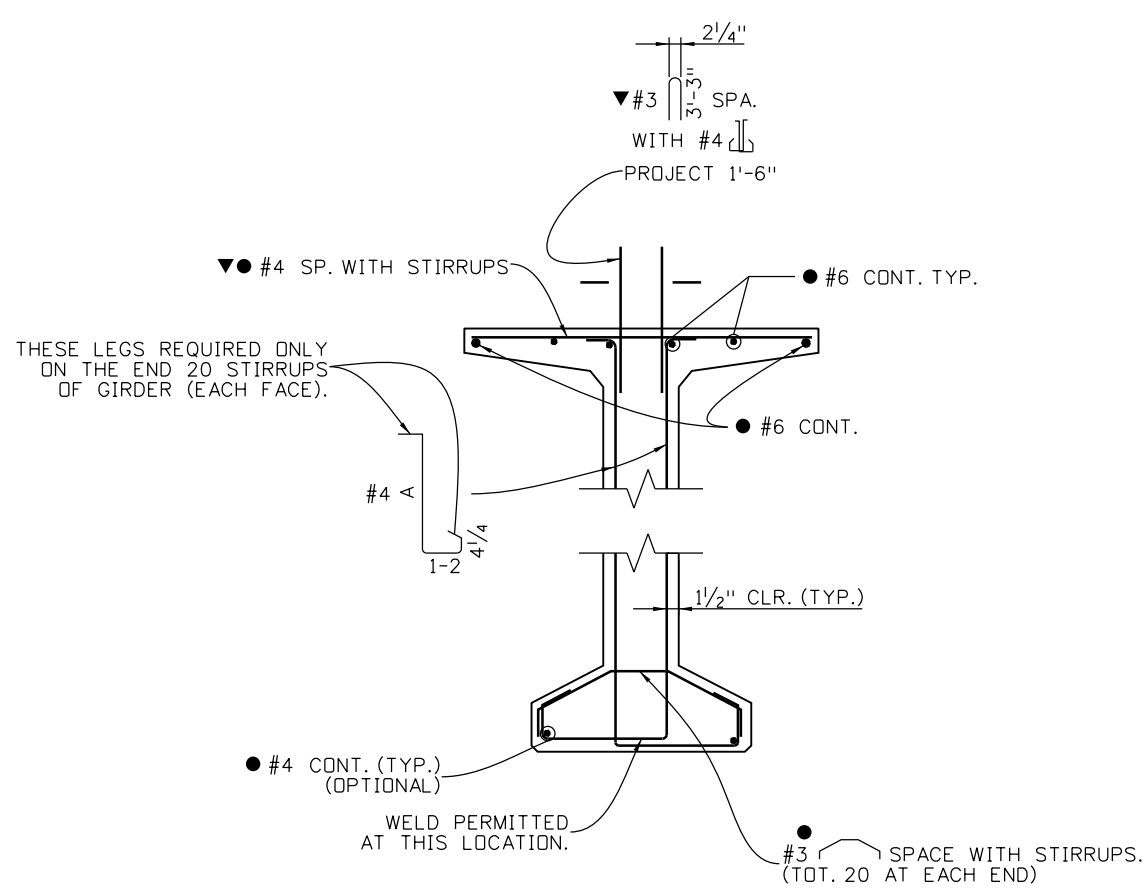
THE CONTRACTOR MAY SUBMIT AN ALTERNATE CROSS TIE ARRANGEMENT, AT THE END OF THE WEB, FOR APPROVAL BY THE ENGINEER.

SPACE WITH #4 FOR STIRRUP SPACINGS OF 9" OR MORE. SPACE AT 1'-0" FOR STIRRUP SPACINGS LESS THAN 9".

D20 WIRES MAY BE USED IN LIEU OF #4. 2 - D20 WIRES MAY BE USED IN LIEU OF #6. D11 OR W10.9 WIRES MAY BE USED IN LIEU OF #3. W5 WIRES MAY BE USED IN LIEU OF #2.



**END PLATE DETAIL**  
GALVANIZE AFTER FABRICATION.



**TYPICAL GIRDER SECTION**  
A = GIRDER DEPTH - 3"

Design		Detail		Quantities	
DATE	INITIAL	DATE	INITIAL	DATE	INITIAL
08-12	KCS	08-12	DET	08-12	RCS
10-12	JCF	10-12	JCF	10-12	JCF
Designed By	Checked By	Designed By	Checked By	Quantity By	Checked By

Print Date: 11/30/2012	
File Name: 18832BRDG_170_Girder01.dgn	
Horiz. Scale: NONE Vert. Scale: NONE	
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Sheet Revisions		
Date:	Comments	Init.

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No Revisions:
Revised:
Void:

EB 170 OVER CLEAR CREEK BRIDGE PRESTRESSED CONCRETE I			
Designer:	K. Saindon	Structure	F-15-BR
Detailer:	E. Schawo	Numbers	
Sheet Subset:	BRIDGE	Subset Sheets:	B21 of 46

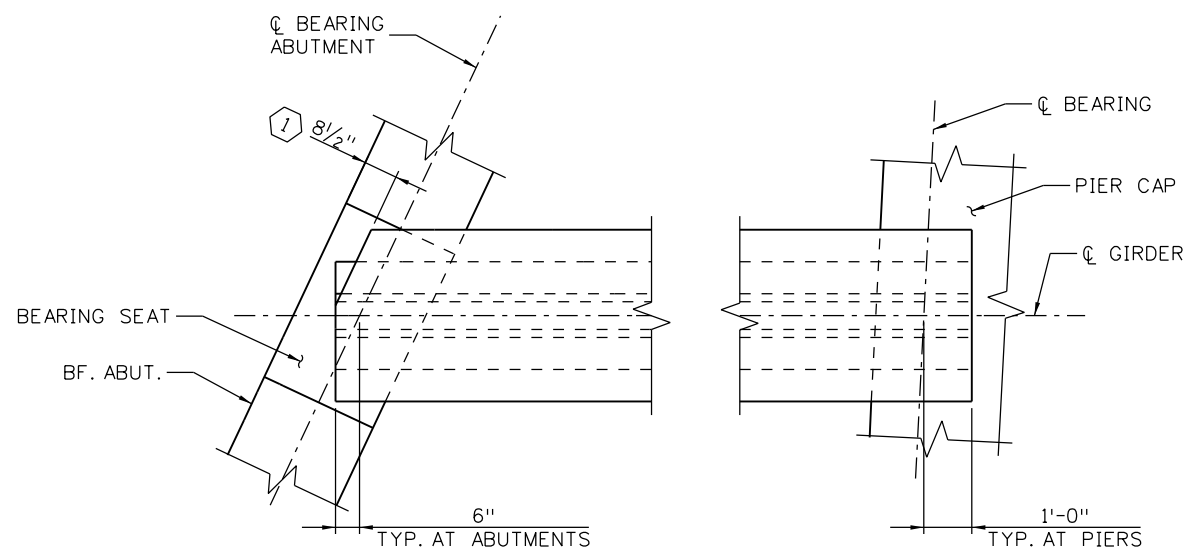
Project No./Code
IM 0703-390
19035
Sheet Number 69

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**GIRDER SCHEDULE**

GIRDER TYPE	SPAN NO.	GIRDER NO.	L (FEET)	L <sub>h</sub> (FEET)	A <sub>s</sub> * (SQ. IN.)	E <sub>MS</sub> (INCH)	E <sub>E</sub> (INCH)	F <sub>i</sub> (KIPS)	F <sub>r</sub> (Kips)	CONCRETE STRENGTH		Δ (INCH)	PREDICTED RELEASE CAMBER (INCH)	PREDICTED ERECTION CAMBER (INCH)	PREDICTED FINAL CAMBER (INCH)
										f' <sub>c</sub> (PSI)	f' <sub>c</sub> (psi)				
BT84	1	A	85.12	8.51	4.34	3.05	15.48	880	788	6500	8500	0.08	0.63	1.12	1.19
BT84	1	B	89.70	8.97	4.34	3.05	15.48	880	788	6500	8500	0.08	0.67	1.19	1.26
BT84	1	C	94.29	9.43	4.34	3.05	15.48	880	788	6500	8500	0.08	0.71	1.25	1.33
BT84	1	D	98.88	9.89	4.34	3.05	15.48	880	788	6500	8500	0.08	0.74	1.30	1.38
BT84	1	E	103.46	10.35	4.34	3.05	15.48	880	788	6500	8500	0.08	0.76	1.34	1.42
BT84	2	A	155.39	15.54	10.42	5.43	20.81	2112	1754	6500	8500	-2.09	3.33	5.84	3.74
BT84	2	B	153.59	15.36	10.42	5.43	20.81	2112	1754	6500	8500	-2.09	3.32	5.83	3.73
BT84	2	C	151.79	15.18	10.42	5.43	20.81	2112	1754	6500	8500	-2.09	3.30	5.80	3.71
BT84	2	D	149.99	15.00	10.42	5.43	20.81	2112	1754	6500	8500	-2.09	3.28	5.78	3.70
BT84	2	E	148.20	14.82	10.42	5.43	20.81	2112	1754	6500	8500	-2.09	3.26	5.74	3.67
BT84	3	A	55.60	5.56	2.60	3.75	14.13	528	474	6500	8500	0.14	0.18	0.33	0.53
BT84	3	B	50.59	5.06	2.60	3.75	14.13	528	474	6500	8500	0.14	0.16	0.28	0.45
BT84	3	C	45.58	4.56	2.60	3.75	14.13	528	474	6500	8500	0.14	0.13	0.24	0.38
BT84	3	D	40.58	4.06	2.60	3.75	14.13	528	474	6500	8500	0.14	0.11	0.20	0.32
BT84	3	E	35.57	3.56	2.60	3.75	14.13	528	474	6500	8500	0.14	0.09	0.15	0.24

AGE OF GIRDERS AT ERECTION SHALL BE GREATER THAN OR EQUAL TO 90 DAYS.



**PLAN**  
(GIRDER AT SPAN 1 SHOWN,  
ALL OTHER SPANS SIMILAR)

**KEYNOTES:**

① CLIP TOP FLANGE OF GIRDER TO MAINTAIN 2" CLEAR FROM APPROACH SLAB SEAT.

Design		Detail		Quantities	
Designed By	Checked By	INITIAL	DATE	INITIAL	DATE
KCS	JCF	KCS	09-12	KCS	10-12
Detailed By	Checked By	Quantity By	Quantity By	Quantity By	Quantity By
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Print Date: 11/30/2012  
 File Name: 18832BRDG\_170\_Girder02.dgn  
 Horiz. Scale: NONE Vert. Scale: NONE  
 Staff Bridge Branch - Unit 0221 STW  
**ATKINS** 4601 DTC Boulevard, Suite 700  
 Denver, CO 80237  
 Phone: (303) 221-7275 Fax: (303) 221-7276

Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation  
 425 A Corporate Circle  
 Golden, CO 80401  
 Phone: 720-497-6918 FAX: 720-497-6901  
**Region 1** **CRC**

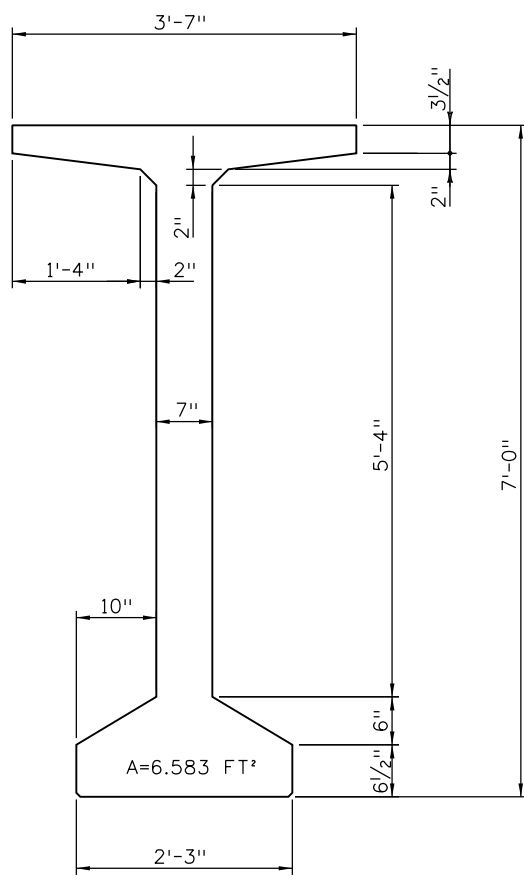
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Revised:
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**EB 170 OVER CLEAR CREEK BRIDGE  
 GIRDER SCHEDULE  
 AND MISCELLANEOUS DETAILS**

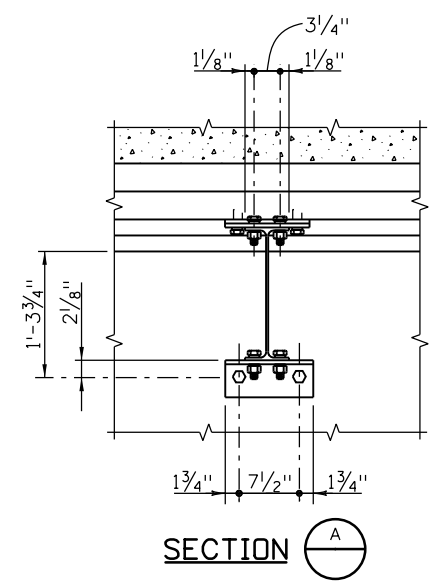
Designer: K. Saindon  
 Detailer: E. Schawo  
 Sheet Subset: BRIDGE

Structure Numbers: F-15-BR  
 Subset Sheets: B22 of 46

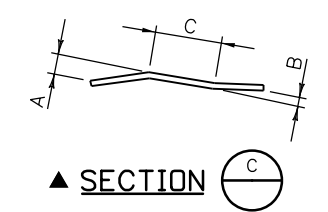
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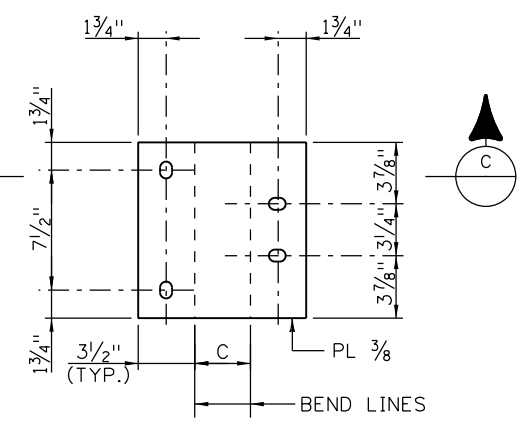
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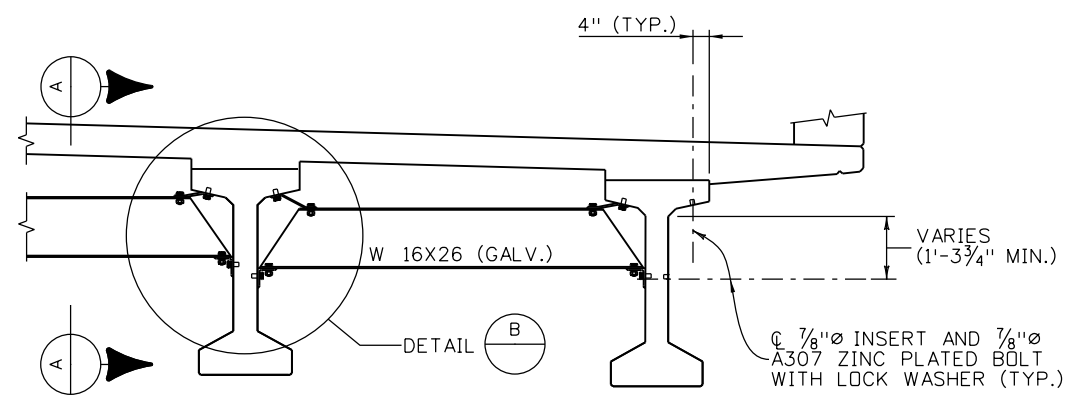
**SECTION A**



**SECTION C**

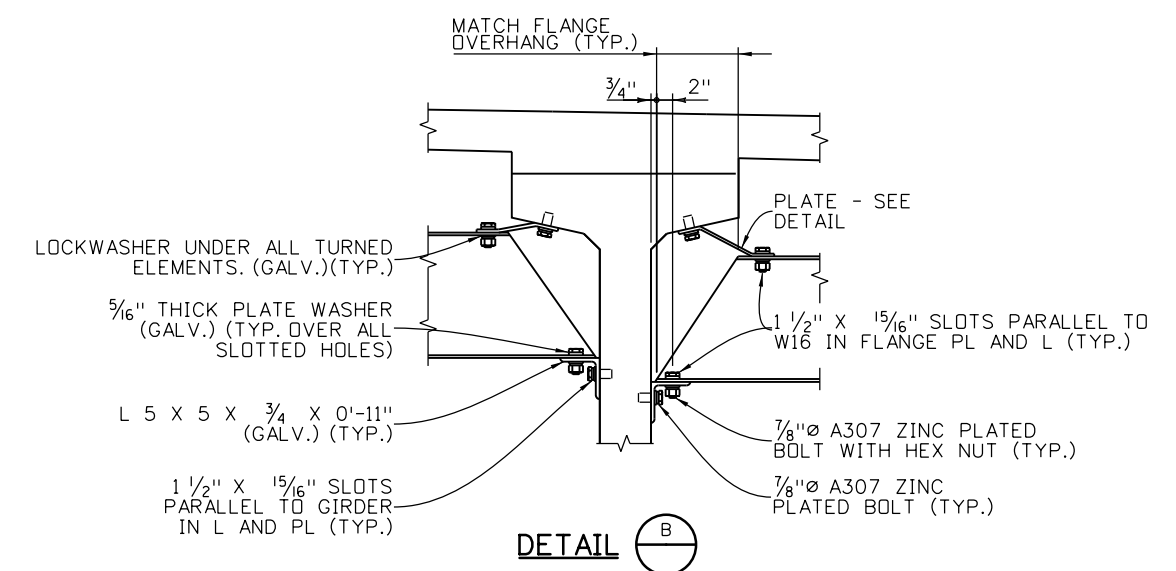


**PLAN (BEFORE BENDING)  
PLATE DETAIL**



**INTERMEDIATE DIAPHRAGM DETAILS**

★ FOR LOCATION OF DIAPHRAGMS, SEE CONSTRUCTION LAYOUT.



**DETAIL B**

**NOTES:**

1. ALL DIAPHRAGM MATERIALS, INCLUDING BOLTS, NUTS, AND WASHERS SHALL BE GALVANIZED. GALVANIZE AFTER FABRICATION.
2. ★ IF THE CONSTRUCTION LAYOUT DOES NOT SPECIFY DIAPHRAGMS, THERE SHALL BE AT LEAST ONE DIAPHRAGM AT MID SPAN.
3. BOLTS, NUTS AND LOCK WASHERS MAY BE ZINC PLATED IN LIEU OF BEING GALVANIZED.
4. ▲ DIMENSIONS A, B AND C SHALL BE SHOWN ON THE SHOP DRAWINGS.
5. THE DIAPHRAGMS MAY BE PLACED ON A SKEW SUCH THAT THEY ARE BETWEEN 80° AND 100° TO THE GIRDERS. ADDITIONALLY, ALL DIAPHRAGMS SHALL BE INSTALLED LEVEL.
6. THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING NECESSARY BRACING REQUIREMENTS AND FOR PROVIDING ADEQUATE BRACING FOR THE SPECIFIC WIND AND WEATHER CONDITIONS TO BE ENCOUNTERED FOR EACH SPECIFIC PROJECT.
7. WHEN BRACING OR DIAPHRAGMS ARE REQUIRED, NO GIRDERS SHALL BE ERRECTED AND LEFT UNBRACED. THE INTERMEDIATE DIAPHRAGMS (WHEN USED) SHALL BE CONNECTED TO THE ADJACENT GIRDERS SIMULTANEOUSLY WITH THE ERECTION OF THE GIRDERS.
8. USE AND INSTALLATION OF THE INTERMEDIATE DIAPHRAGMS SHALL NOT RELIEVE THE CONTRACTOR OF FULL RESPONSIBILITY TO CONSTRUCT THE WORK IN A MANNER WHICH PROVIDES ALL NECESSARY RIGIDITY, SUPPORTS ALL LOADS IMPOSED, AND PROVIDES IN THE FINISHED STRUCTURE THE LINES AND GRADES INDICATED ON THE PLANS.

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INITIAL	DATE	INITIAL	DATE	INITIAL	DATE
Checked By	JCF	Checked By	JCF	Checked By	JCF
Checked By	JCF	Checked By	JCF	Checked By	JCF
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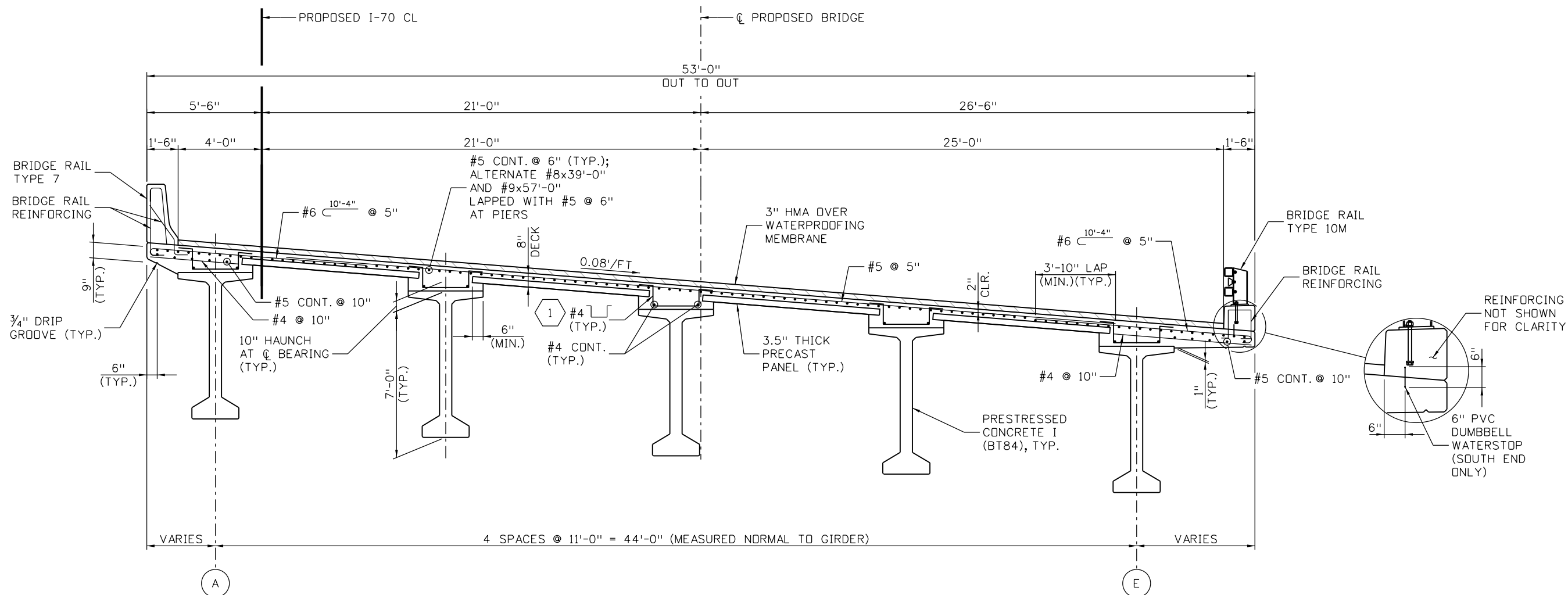
Region 1 CRC

<b>As Constructed</b>
No Revisions:
Revised:
Void:

<b>EB 170 OVER CLEAR CREEK BRIDGE INTERMEDIATE DIAPHRAGM DETAILS</b>			
Designer:	K. Saindon	Structure Numbers	F-15-BR
Detailer:	E. Schawo	Subset Sheets:	B23 of 46
Sheet Subset:	BRIDGE		

<b>Project No./Code</b>
IM 0703-390
19035
Sheet Number 71

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**TYPICAL SECTION**  
(LOOKING AHEAD STATION)

**KEYNOTES:**

1 SPACE #4 BARS WITH GIRDER STIRRUPS. FOR SPACING, SEE SHEET B21.

**NOTES:**

1. DECK SHALL BE CONCRETE CLASS D (BRIDGE).
2. FOR BRIDGE RAIL TYPE 7, SEE SHEET B32.
3. FOR BRIDGE RAIL TYPE 10M, SEE SHEETS B33 AND B34.
4. FOR PRECAST DECK PANEL DETAILS, SEE SHEETS B26 AND B27.
5. ADJUST BOTTOM SLAB REINFORCING AT OVERHANGS TO CLEAR REINFORCING EXTENDED FROM THE GIRDER.

Design		Detail		Quantities	
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09-12	KCS	09-12	KCS	09-12	KCS
10-12	JCF	10-12	JCF	10-12	JCF
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Sheet Revisions		
Date:	Comments	Init.

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As Constructed	EB 170 OVER CLEAR CREEK BRIDGE TYPICAL DECK REINFORCING SECTION
No Revisions:	
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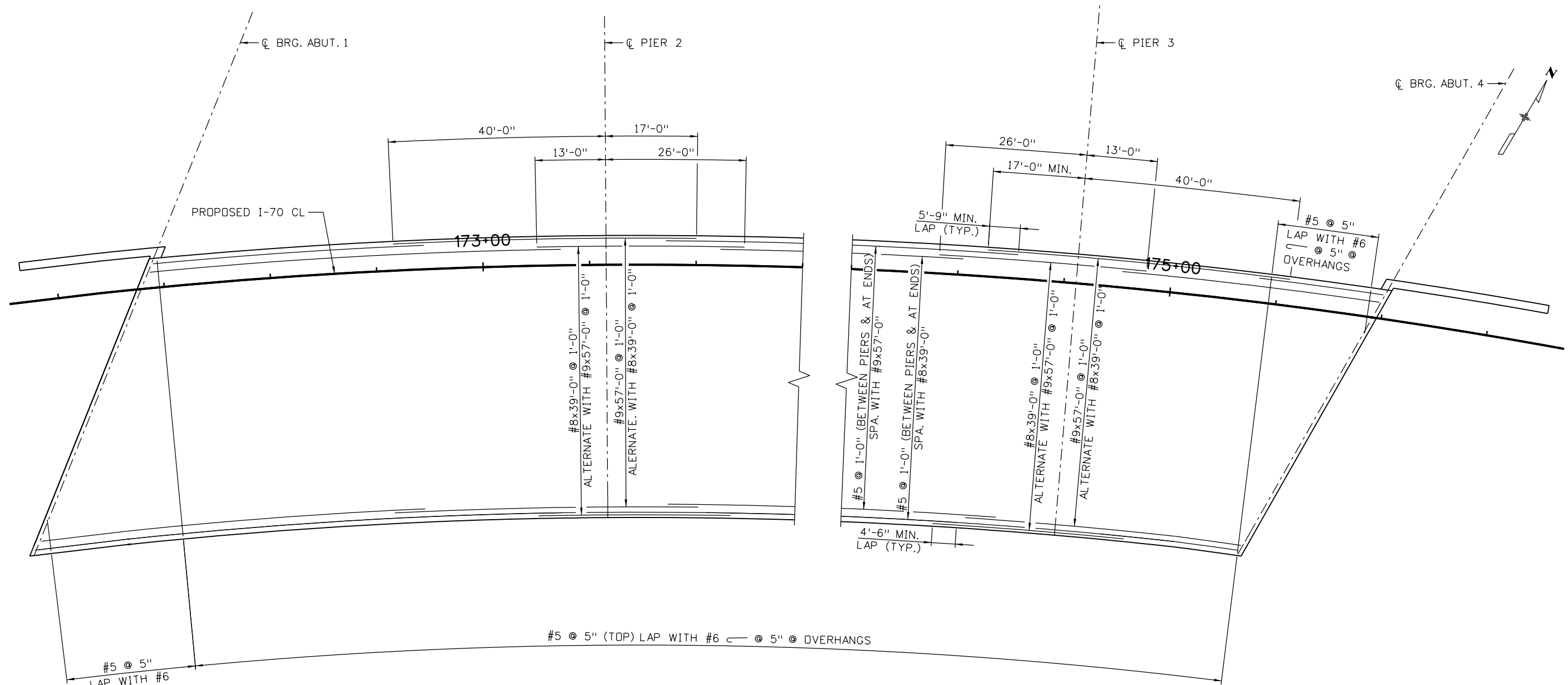
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Detailer:	E. Schawo	Numbers	
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Project No./Code	IM 0703-390
	19035
Sheet Number	72

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Design		Detail		Quantities	
INITIAL	DATE	INITIAL	DATE	INITIAL	DATE
Checked By	KCS	Checked By	JCF	Checked By	KCS
Checked By	JCF	Checked By	JCF	Checked By	JCF



**PARTIAL PLAN**

(BOTTOM SLAB REINFORCING AT OVERHANGS, REINFORCING OVER GIRDER HAUNCH, BRIDGE RAIL REINFORCING, AND PRECAST DECK PANELS NOT SHOWN.)

**NOTES:**

- FOR NOTES AND SECTION SEE SHEET B24.

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File Name: 18832BRDG_170_DeckPlan01.dgn	
Horiz. Scale: 1:20      Vert. Scale: 1:20	
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Sheet Revisions		
Date:	Comments	Init.

**Colorado Department of Transportation**

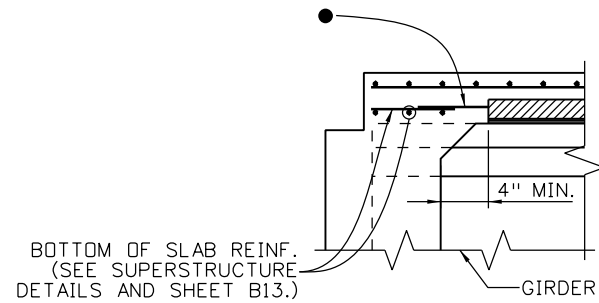
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Golden, CO 80401  
Phone: 720-497-6918 FAX: 720-497-6901

**Region 1**      **CRC**

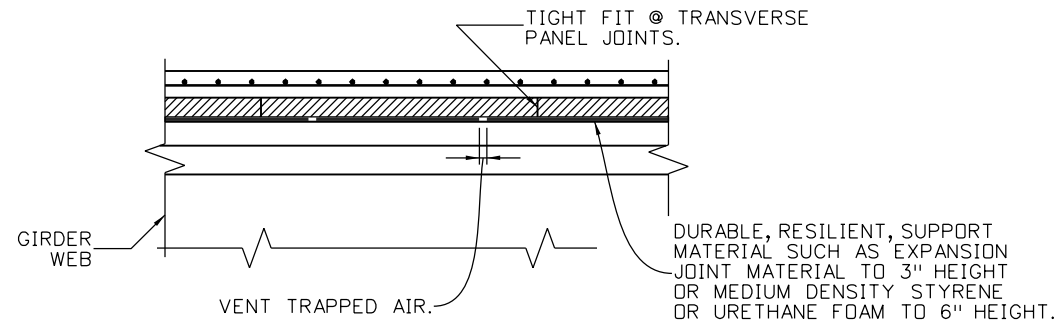
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No Revisions:			IM 0703-390
Revised:	Designer: K. Saindon	Structure Numbers: F-15-BR	19035
Void:	Detailer: E. Schawo	Sheet Subset: BRIDGE	Sheet Number 73
		Subset Sheets: B25 of 46	

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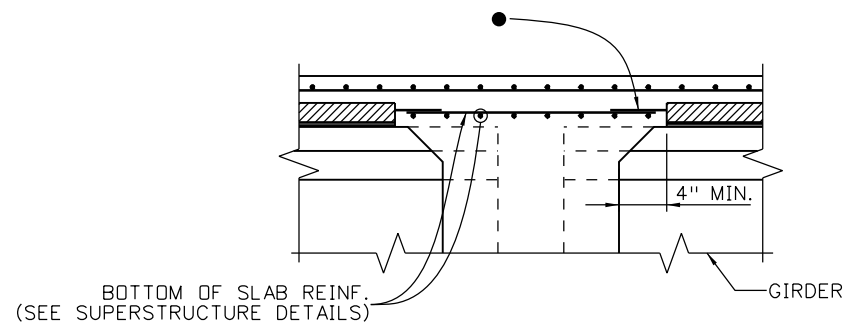
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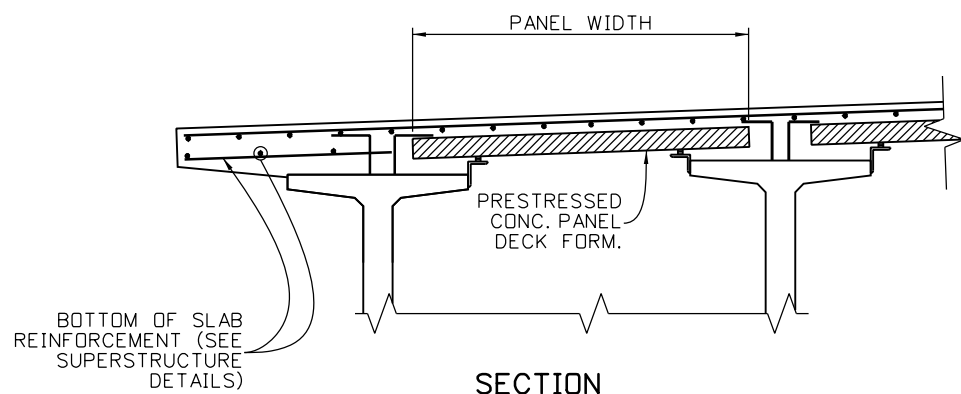
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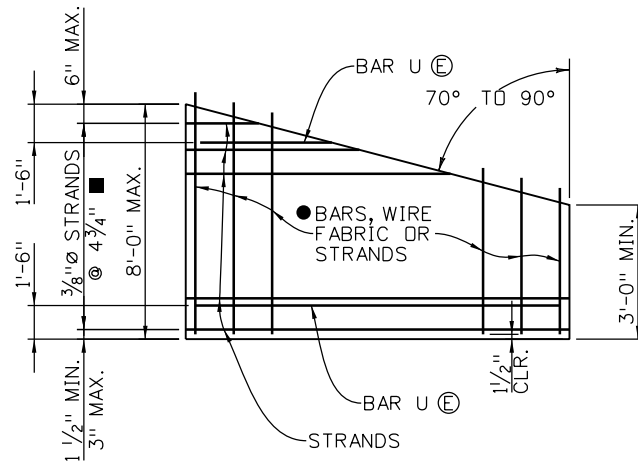
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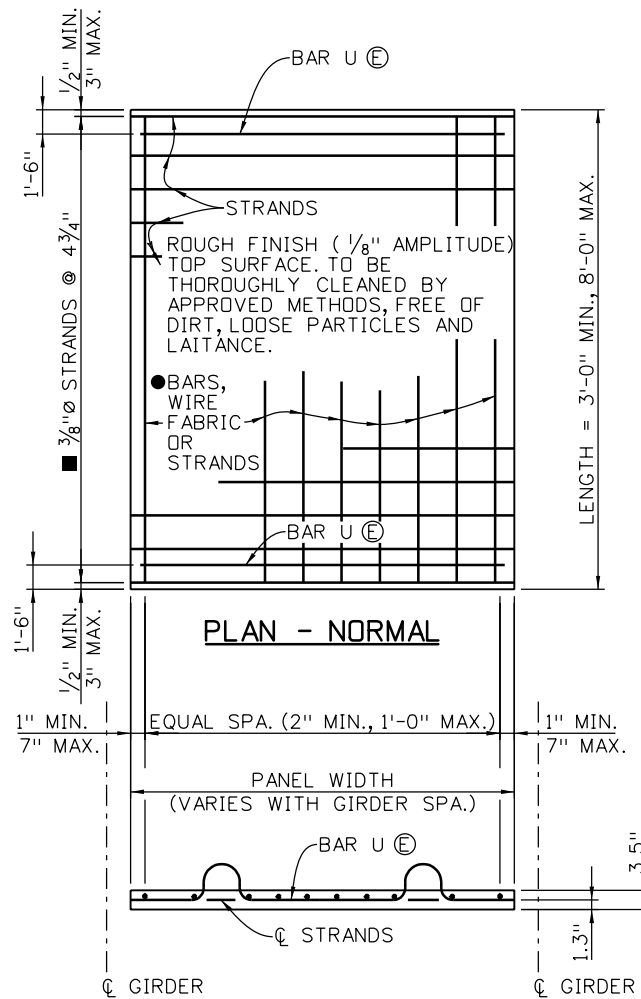
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**SECTION**

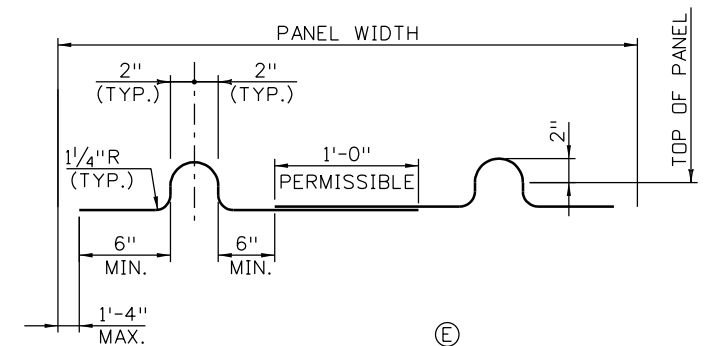


**PLAN - SKEWS 70° TO 90°  
OPTIONAL END PANEL**



**PLAN - NORMAL**

**PRESTRESSED PANEL DETAILS**



**BAR U (#3)  
PRESTRESSED PANEL DETAILS**

**NOTES:**

- SAWING OF PANELS IS ACCEPTABLE IN AREAS WHERE PROJECTING REINFORCEMENT IS NOT REQUIRED. IT IS DESIRABLE TO HAVE THE PRESTRESSING STRANDS PROJECT FROM THE PANELS AS LONG AS THE PROJECTING STRANDS DO NOT INTERFERE WITH OTHER BRIDGE COMPONENTS.
- REINFORCING PERPENDICULAR TO STRANDS MAY BE DEFORMED REINF. BARS, WELDED WIRE FABRIC, OR WELDED DEFORMED BAR MATS, AND SHALL BE PLACED DIRECTLY ABOVE THE STRANDS. MINIMUM AREA OF REINFORCING PERPENDICULAR TO STRANDS SHALL BE 0.11 SQ. IN. PER FT. TENSIONED OR UNTENSIONED STRANDS MAY ALSO BE USED. THESE INDIVIDUAL BARS OR WIRES SHALL BE NO LARGER THAN .375" DIAMETER. FOR LOCATION OF LONGITUDINAL BAR EXTENSIONS, SEE SHEET 2 OF 2.
- MAY BE REDUCED TO 3/8" Ø STRANDS AT 9 1/2" WHEN THE PANEL WIDTH IS LESS THAN 5'-7" AND THE DESIGN SPAN IS LESS THAN 7'-7".
- THE LONGITUDINAL REINFORCING STEEL IN THE CAST-IN-PLACE PORTION OF THE DECK MAY REST DIRECTLY ON THE PANELS AS NECESSARY TO OBTAIN CLEARANCES AT THE TOP OF DECK, UNLESS OTHERWISE NOTED.
- ⓔ DENOTES EPOXY COATED REINFORCING.
- THE TOLERANCE ON STRAND PLACEMENT SHALL NOT EXCEED ± 1/4".
- THE TOLERANCE ON PANEL THICKNESS SHALL NOT EXCEED ± 1/4".
- CONCENTRATED CONSTRUCTION LOADS SHALL NOT EXCEED 500 LB FOR 3" PANELS, 700 LB FOR 3.5" PANELS, NOR 1100 LB FOR 4" PANELS UNLESS THE LOAD IS DISTRIBUTED TO LESS THAN 117 PSF.
- TOTAL LOADS APPLIED TO ANY PANEL DURING CONSTRUCTION SHALL NOT EXCEED 117 PSF.
- BOTTOM FLEXURAL CRACKS, SAGS GREATER THAN .5", OR CAMBERS GREATER THAN .5" WILL BE CONSIDERED EVIDENCE OF MISHANDLING, OVERLOADING, OR EXCEEDING ALLOWABLE TOLERANCES, AND MAY BE CAUSE FOR REJECTING PANELS AT THE ENGINEER'S DISCRETION.

Print Date: 11/30/2012	0000
File Name: 18832BRDG_I70_DeckPanel01.dgn	
Horiz. Scale: NONE Vert. Scale: NONE	
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Sheet Revisions		
Date:	Comments	Init.

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Revised:
Void:

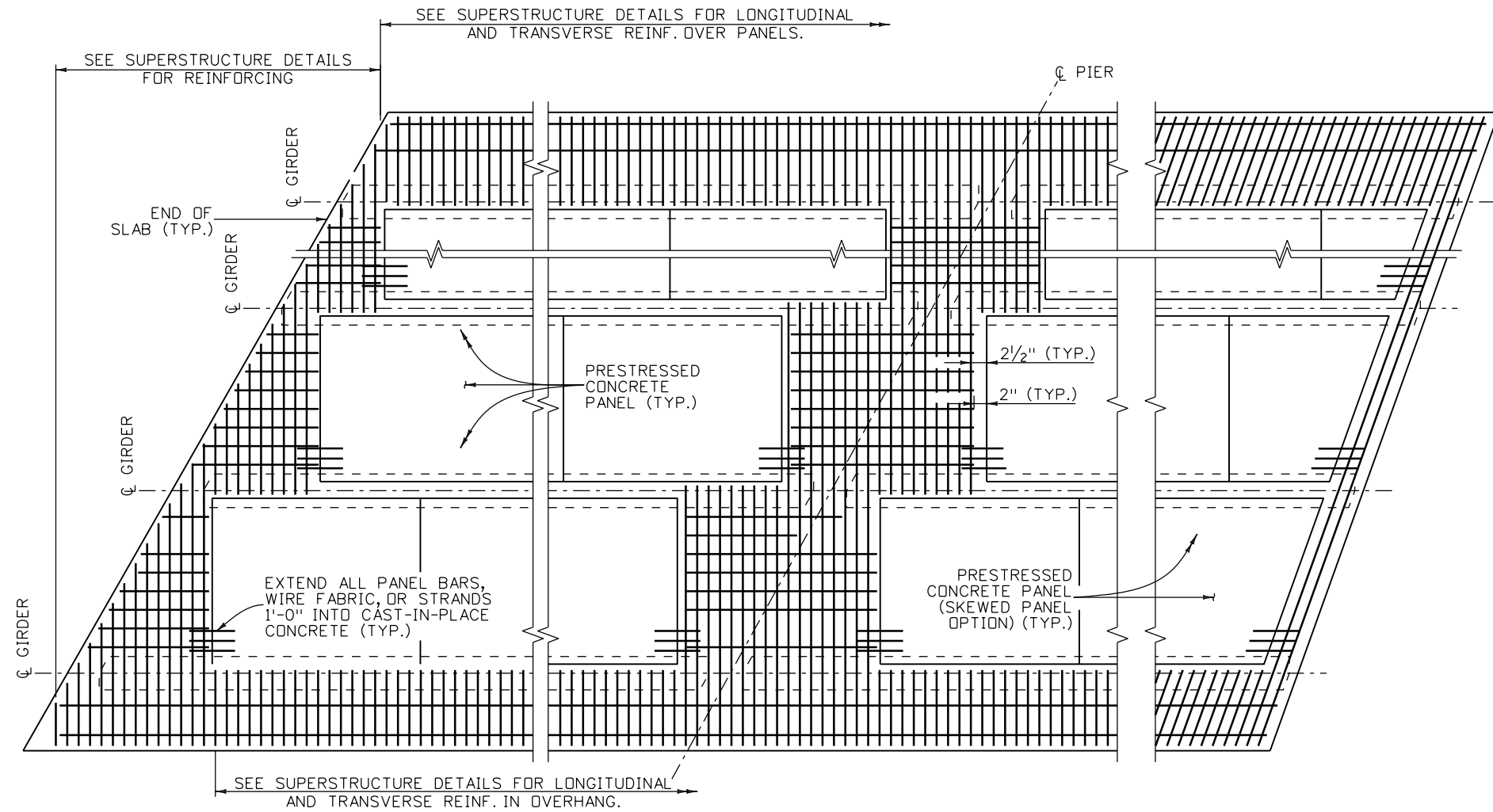
EB I70 OVER CLEAR CREEK BRIDGE PRECAST DECK PANEL FORM (SHEET 1 OF 2)			
Designer:	K. Saindon	Structure	F-15-BR
Detailer:	E. Schawo	Numbers	
Sheet Subset:	BRIDGE	Subset Sheets:	B26 of 46

Project No./Code
IM 0703-390
19035
Sheet Number 74



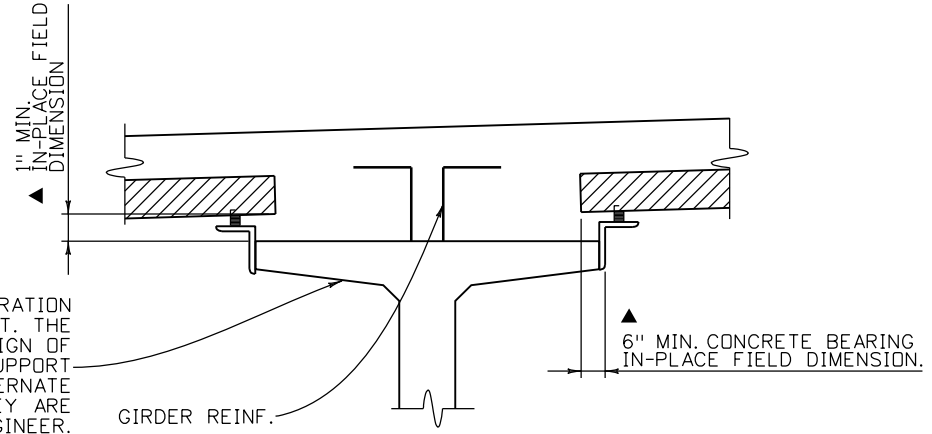
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09-12	KCS	09-12	ERS	09-12	RCS
10-12	JCF	10-12	JCF	10-12	JCF
Designed By	Checked By	Designed By	Checked By	Quantities By	Checked By



**END OF SLAB RECTANGULAR PANEL OPTION AND SKEWS LESS THAN 70°**  
**CONTINUOUS SLAB OVER PIER**  
**END OF SLAB SKEWED PANEL OPTION FOR SKEWS 70° to 90°**  
**PART PLAN**

RECTANGULAR PANEL OPTION SHALL BE USED FOR SKEWS LESS THAN 70°.



**SUPPORT DETAIL**

THE ANGLE AND RESILIENT MATERIAL ARE SHOWN FOR ILLUSTRATION AND SHOW ONLY ONE POTENTIAL METHOD OF SUPPORT. THE CONTRACTOR IS RESPONSIBLE FOR THE SELECTION AND DESIGN OF THE PANEL SUPPORT AND ATTACHMENT TO THE GIRDER. SUPPORT DETAILS SHALL BE SHOWN ON THE SHOP PLANS. ALTERNATE METHODS FOR SUPPORT MAY BE USED, PROVIDED THEY ARE SHOWN ON THE SHOP PLANS AND APPROVED BY THE ENGINEER.

**NOTES:**

1. COMPOSITE TOTAL SLAB DESIGNED FOR HS 25-44 AND ALTERNATE MILITARY LOADING.
2. ALL CONCRETE SHALL BE CLASS PS WITH RELEASE STRENGTH  $f'_c = 4500$  PSI AND MINIMUM 28 DAY STRENGTH  $f'_c = 6000$  PSI. ENTRAINED AIR IS NOT REQUIRED FOR PRECAST PANEL DECK FORM CONCRETE. THE STRENGTH SHALL BE AT LEAST 5000 PSI AT THE TIME OF THE DECK POUR.
3. USE  $\frac{3}{8}$ "  $\phi$  LOW RELAXATION STRANDS MEETING THE REQUIREMENTS OF ASTM A416 GRADE 270. JACKING FORCE PER STRAND ( $F_j$ ) SHALL BE AT LEAST 17.2 KIPS. FINAL FORCE PER STRAND ( $F_r$ ) IS ESTIMATED TO BE 14.2 KIPS.
4. INSTALLATION OF BAR U (#3) IS MANDATORY. ALL FOUR BAR U (#3) LOOPS SHALL BE USED SIMULTANEOUSLY FOR LIFTING THE PANELS.
5. CARE MUST BE TAKEN TO ENSURE PROPER CLEANING OF CONSTRUCTION DEBRIS OFF UNDER THE EDGES OF THE PANELS. WATER, DIRT OR OTHER DEBRIS ON TOP OF THE PANELS WILL INHIBIT THE BOND OF THE CAST-IN-PLACE CONCRETE. IT IS ALSO IMPORTANT THAT ADEQUATE SPACE ( $\Delta$  MIN. 1" X 2") IS PROVIDED FOR THE CONCRETE TO FILL THE SPACE UNDER THE PANEL AS THE SLAB CONCRETE IS PLACED. PANEL LENGTHS AND WIDTH SHALL BE DETERMINED BY THE CONTRACTOR AND SHOWN ON THE SHOP PLANS.
6. THE CONTRACTOR IS RESPONSIBLE FOR THE STABILITY OF THE PANELS ON THE GIRDERS. ERECTED PANELS SHALL BE UNIFORMLY SUPPORTED ALONG THE LENGTH OF THE PANEL. THE CONTRACTOR IS RESPONSIBLE FOR MEETING THE TOTAL SLAB THICKNESS SHOWN ON THE SUPERSTRUCTURE DETAILS.
7. ALL PLANES OF REINFORCING STEEL SHOWN IN THE SUPERSTRUCTURE DETAILS ARE REQUIRED FOR AREAS NOT FORMED WITH PRECAST PANELS. THE TOPS OF THE PANELS AND CONSOLIDATION OF CONCRETE MORTAR.

Print Date: 11/30/2012  
 File Name: 18832BRDG\_170\_DeckPanel02.dgn  
 Horiz. Scale: NONE Vert. Scale: NONE  
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Sheet Revisions		
Date:	Comments	Init.

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Region 1 **CRC**

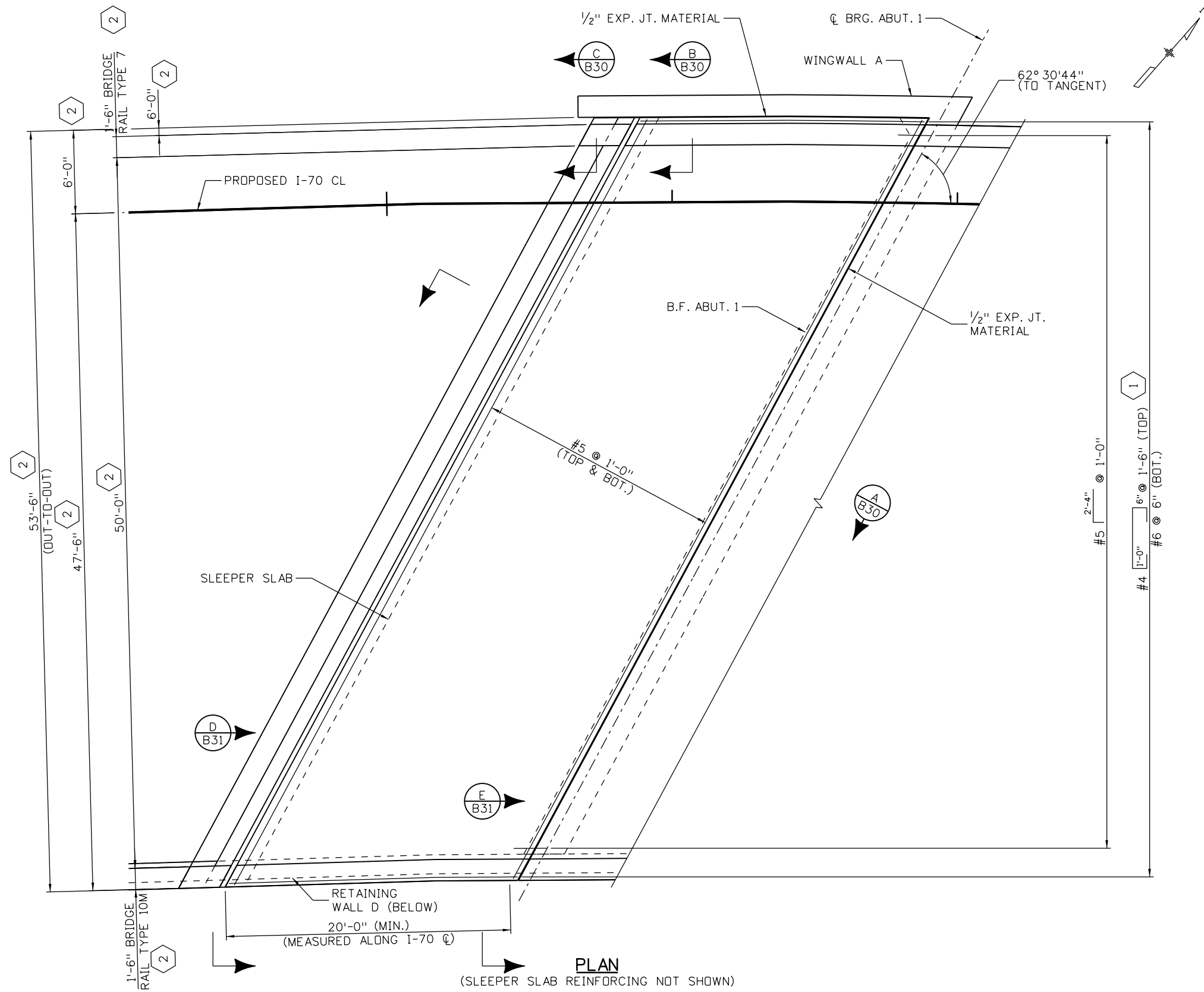
As Constructed	EB 170 OVER CLEAR CREEK BRIDGE PRECAST DECK PANEL FORM (SHEET 2 OF 2)
No Revisions:	
Revised:	
Void:	

Designer:	K. Saindon	Structure Numbers	F-15-BR
Detailer:	E. Schawo		
Sheet Subset:	BRIDGE	Subset Sheets:	B27 of 46

Project No./Code	IM 0703-390
	19035
Sheet Number	75

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INITIAL	DATE	INITIAL	DATE	INITIAL	DATE
Designed By	KCS	08-12	09-12	Checked By	KCS
Checked By	JCF	10-12	10-12	Checked By	JCF



**PLAN**  
(SLEEPER SLAB REINFORCING NOT SHOWN)

**KEYNOTES:**

- 1 CONTRACTOR MAY USE 1'-0" 7"
- 2 MEASURED NORMAL TO PROPOSED I-70 CL.

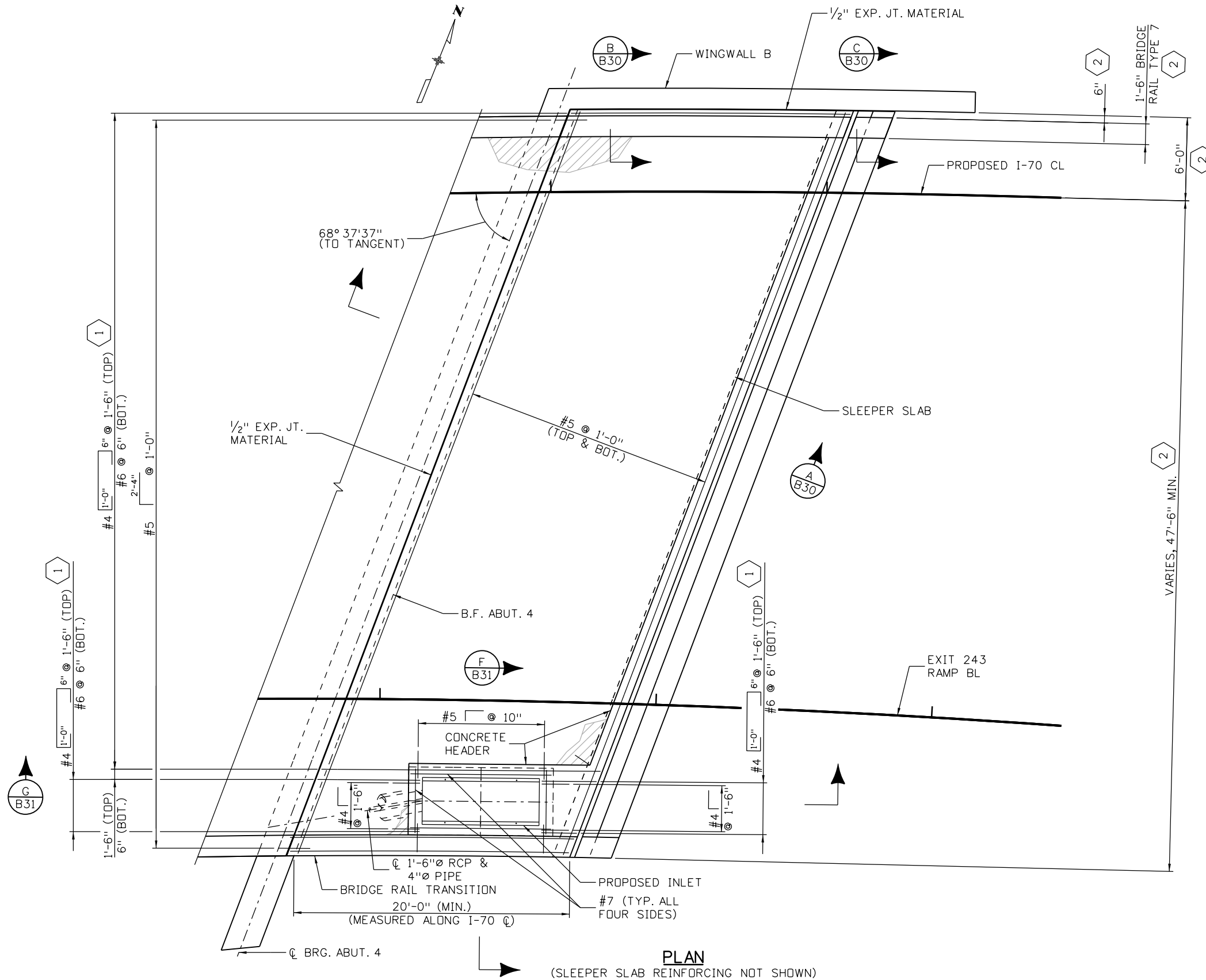
**NOTES:**

- 1. FOR NOTES, SEE SHEET B30.

Print Date: 11/30/2012		<b>Sheet Revisions</b>		<b>Colorado Department of Transportation</b>		<b>As Constructed</b>		<b>EB I70 OVER CLEAR CREEK BRIDGE</b>		<b>Project No./Code</b>				
File Name: 18832BRDG_I70_AppSlab01.dgn		Date:	Comments	Init.	425 A Corporate Circle Golden, CO 80401 Phone: 720-497-6918 FAX: 720-497-6901		No Revisions:  Revised:  Void:		<b>APPROACH SLAB 1</b>		IM 0703-390			
Horiz. Scale: 1:8      Vert. Scale: NONE									Designer: K. Saindon Detailer: E. Schawo		Structure Numbers: F-15-BR		19035	
Staff Bridge Branch - Unit 0221      STW													Sheet Subset: BRIDGE	
<b>ATKINS</b>		4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276		<b>Region 1</b>		<b>CRC</b>								

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10-12	JCF	10-12	JCF	10-12	JCF
Designed By	Checked By	Detailed By	Checked By	Quantities By	Checked By



**LEGEND**

LIMITS OF ASPHALT

**KEYNOTES:**

- 1. CONTRACTOR MAY USE 7"
- 2. MEASURED NORMAL TO PROPOSED I-70 CL.

**NOTES:**

- 1. FOR NOTES, SEE SHEET B30.
- 2. FOR INLET DETAILS, SEE DRAINAGE PLANS.
- 3. FOR BRIDGE RAIL TRANSITION, SEE SHEET B36.

Print Date: 11/30/2012	0000
File Name: 18832BRDC_170_AppSlab02.dgn	
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Staff Bridge Branch - Unit 0221      STW	
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Date:	Comments	Init.

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<b>As Constructed</b>
No Revisions:
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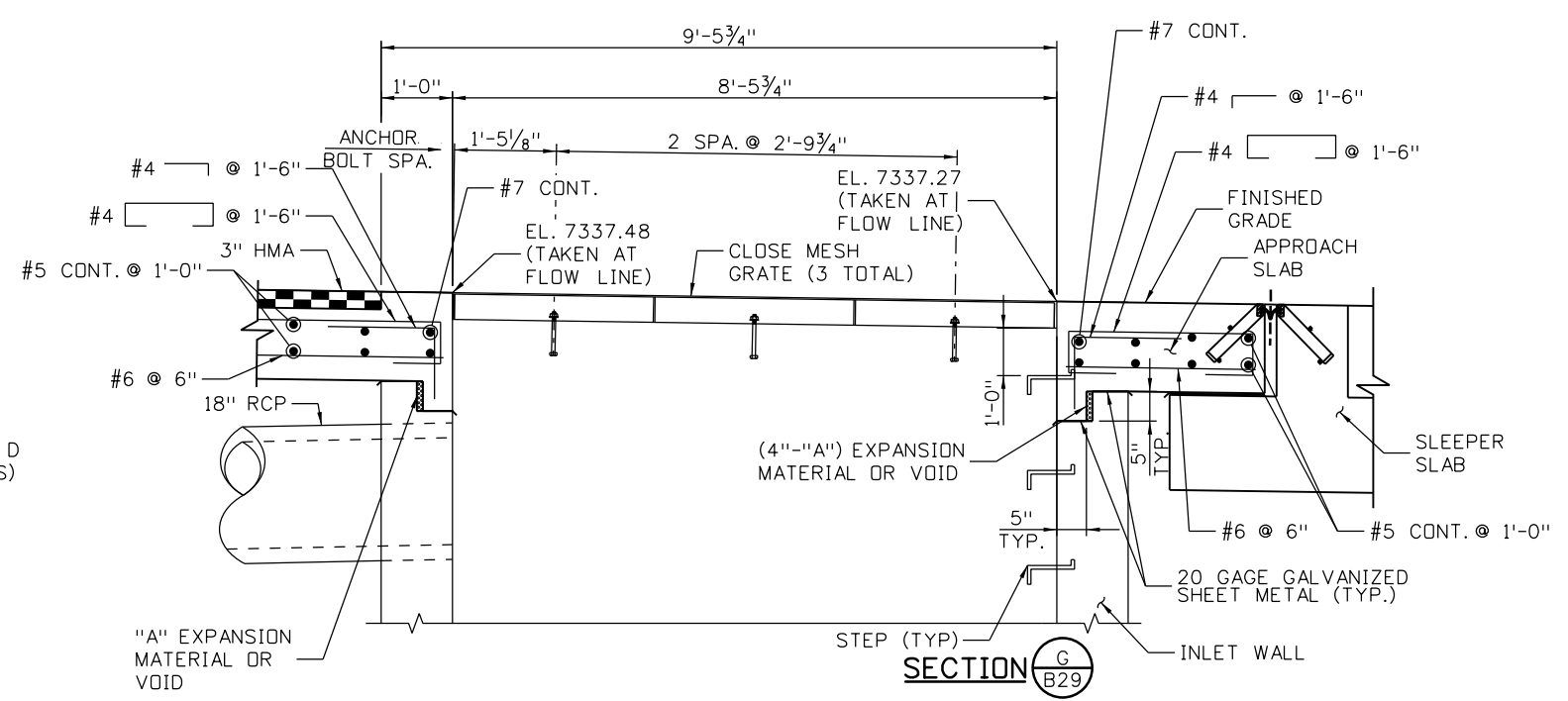
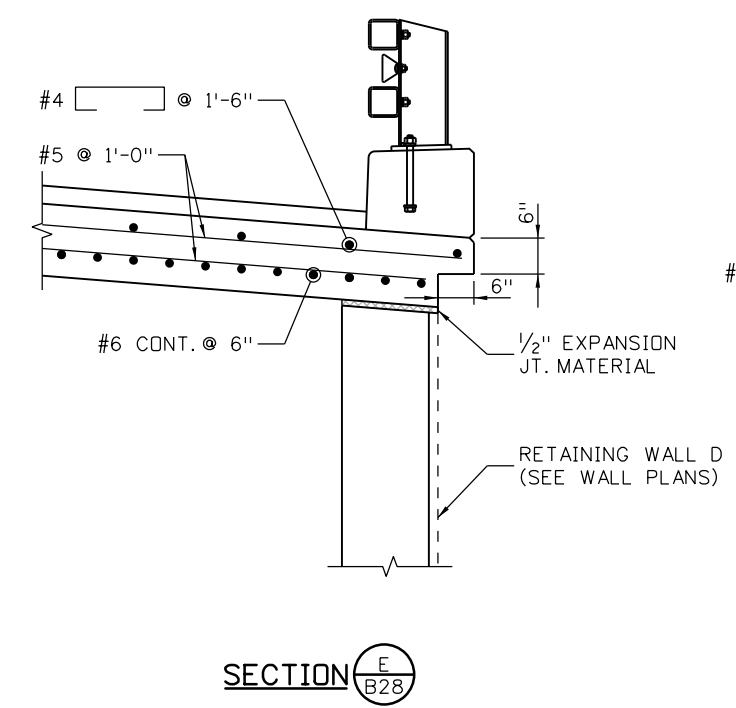
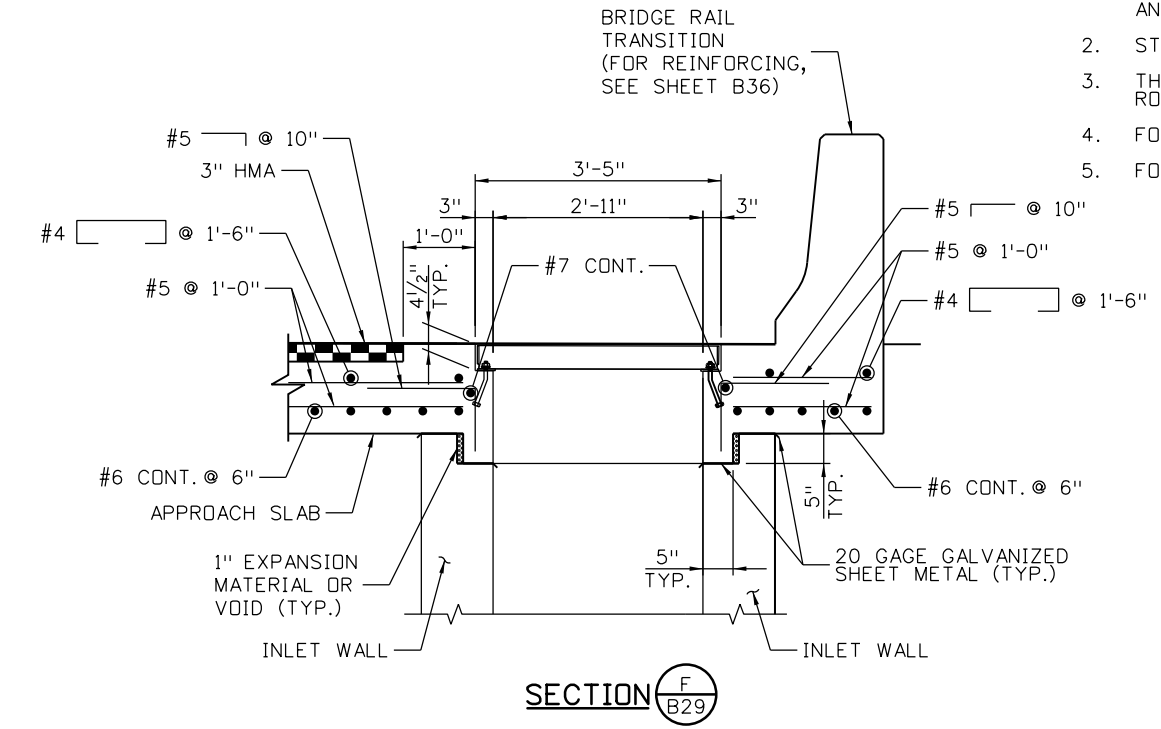
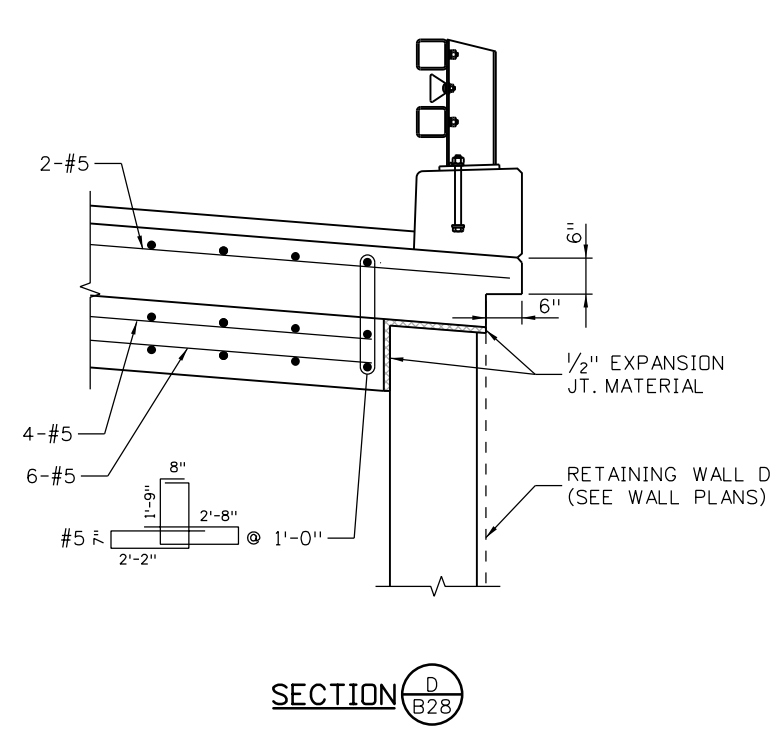
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Designer:	K. Saindon	Structure Numbers	F-15-BR
Detailer:	E. Schawo	Sheet Subset:	BRIDGE
Subst Sheets: B29 of 46		Subst Sheets: B29 of 46	

<b>Project No./Code</b>
IM 0703-390
19035
Sheet Number 77



**NOTES:**

1. FOR ADDITIONAL CLOSE MESH GRATE DETAILS AND GRATE INSTALLATION, SEE M-604-11.
2. STEPS SHALL CONFORM TO AASHTO M 199.
3. THE SLOPE OF THE GRATES SHALL MATCH THE ROADWAY PROFILE AND CROSS SLOPE.
4. FOR DIMENSION "A", SEE SHEET B37.
5. FOR INLET DETAILS, SEE DRAINAGE PLANS.



Design		Detail		Quantity	
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09-12	KCS	09-12	KCS	09-12	KCS
10-12	JCF	10-12	JCF	10-12	JCF

Print Date: 11/30/2012  
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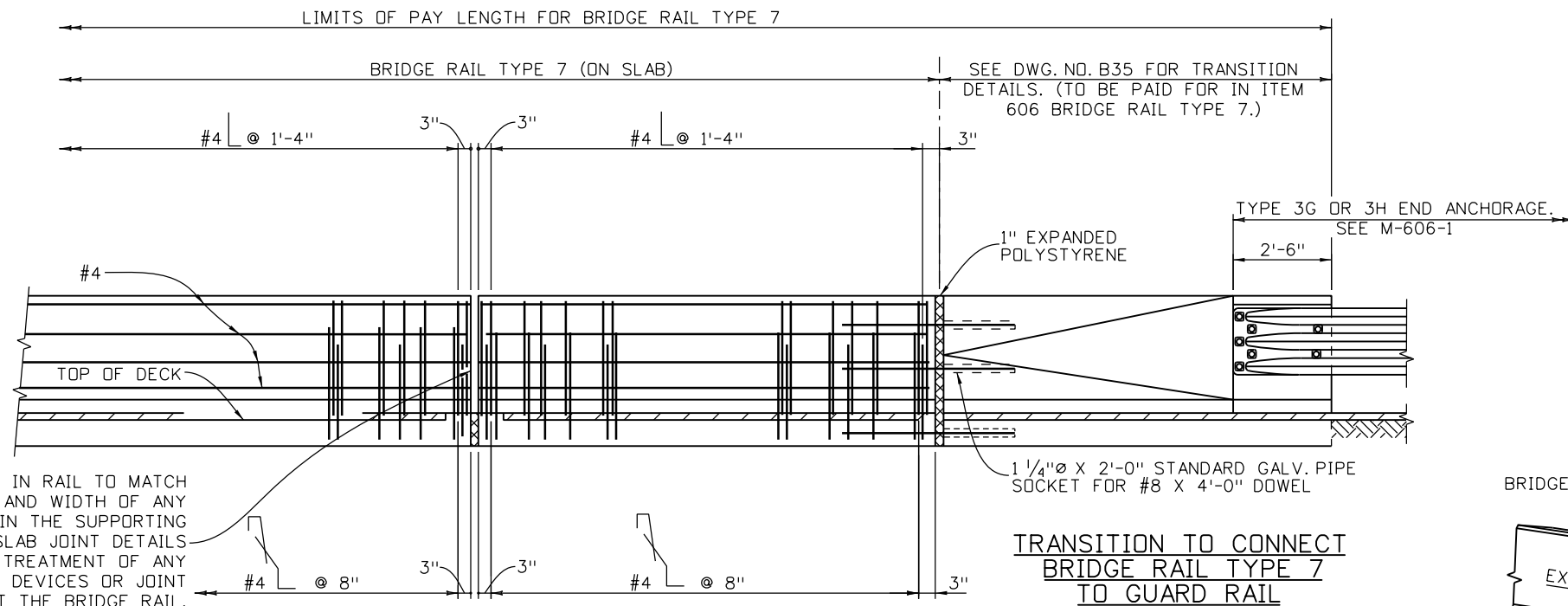
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Date:	Comments	Init.

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 Golden, CO 80401  
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As Constructed  
 No Revisions:  
 Revised:  
 Void:

EB I70 OVER CLEAR CREEK BRIDGE  
 APPROACH SLAB DETAILS  
 SHEET (2 OF 2)  
 Designer: K. Saindon  
 Detailer: E. Schawo  
 Sheet Subset: BRIDGE  
 Structure Numbers: F-15-BR  
 Subset Sheets: B31 of 46

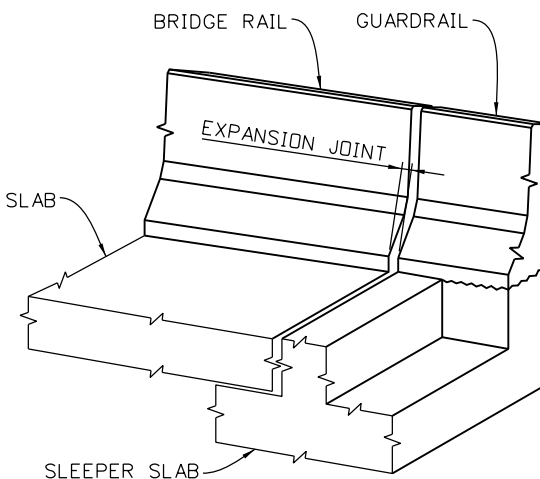
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 Sheet Number 79



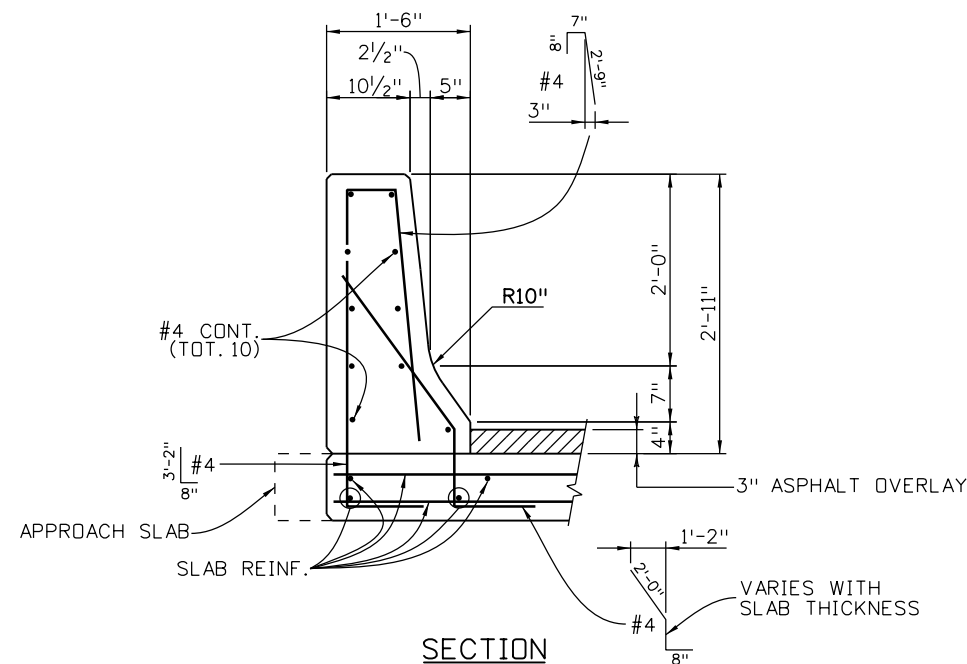
ELEVATION

#8 DOWELS BETWEEN BRIDGE RAIL AND GUARDRAIL ARE NOT REQUIRED WHEN THE GUARDRAIL IS PLACED ON THE SLEEPER SLAB.

APPROACH SLAB



ISOMETRIC VIEW



SECTION

NOTES:

- BACKFILL WINGWALLS AND RETAINING WALLS BEFORE BARRIER IS PLACED.
- ALL BRIDGE RAIL CONCRETE SHALL BE CLASS D.
- LONGITUDINAL REINFORCEMENT SHALL STOP AT ALL EXPANSION JOINTS.
- BRIDGE RAIL SHALL BE CONSTRUCTED PLUMB.
- SEE STD. M-606-1 AND M-606-13 FOR GUARD RAIL TYPE 3 DETAILS AND DETAILS OF TRANSITION.
- CONCRETE AND REINFORCING STEEL SHALL CONFORM TO THE REQUIREMENTS OF SECTIONS 601 AND 602. PAYMENT WILL BE MADE UNDER ITEM 606, BRIDGE RAIL TYPE 7.
- THE SURFACE OF THE RAIL SHALL BE TESTED WITH A 10 FOOT STRAIGHT EDGE LAID ALONG THE SURFACE IN THE LONGITUDINAL DIRECTION. DEVIATION OF THE CONCRETE SURFACE FROM THE STRAIGHT EDGE SHALL BE LESS THAN 1/4" PLUS ALLOWANCE FOR ROADWAY HORIZONTAL AND VERTICAL CURVATURE, IF ANY.

DESIGN DATA

REINFORCED CONCRETE:

CLASS D CONCRETE:  $f_c = 4,500$  PSI  
 REINFORCING STEEL:  $f_y = 60,000$  PSI

INFORMATION ONLY

DESCRIPTION	UNIT	PER LIN. FT.
CONCRETE CLASS D	CU. YD.	0.12
REINFORCING STEEL (EPOXY)	LB.	16.2

Design		Detail		Quantities	
DATE	INITIAL	DATE	INITIAL	DATE	INITIAL
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09-12	JCF	10-12	JCF	10-12	JCF
Designed By	Checked By	Detailed By	Checked By	Quantities By	Checked By

Print Date: 11/30/2012

File Name: 18832BRDG\_170\_BRail7.dgn

Horiz. Scale: NONE Vert. Scale: NONE

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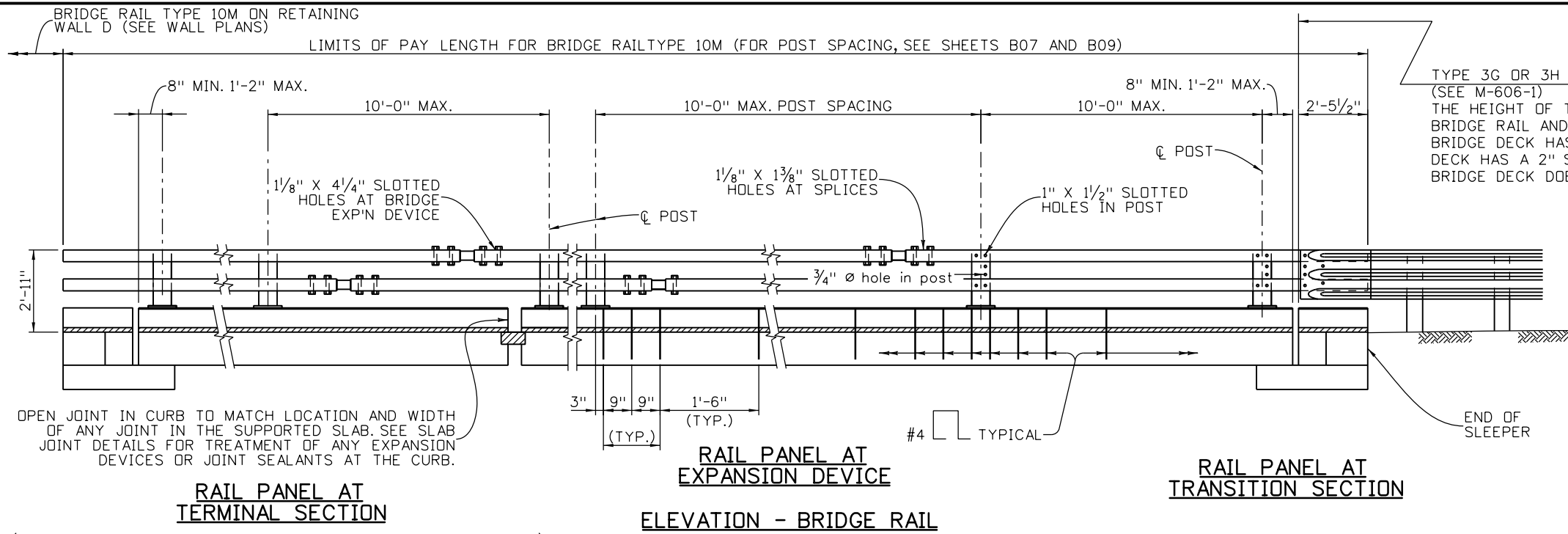
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Date:	Comments	Init.

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Region 1 **CRC**

As Constructed	EB 170 OVER CLEAR CREEK BRIDGE		Project No./Code
No Revisions:	BRIDGE RAIL TYPE 7 (W/GUARDRAIL TYPE 3)		
Revised:	Designer: K. Saindon	Structure Numbers	F-15-BR
Void:	Detailer: E. Schawo	Subset Sheets: B32 of 46	19035
	Sheet Subset: BRIDGE		Sheet Number 80



OPEN JOINT IN CURB TO MATCH LOCATION AND WIDTH OF ANY JOINT IN THE SUPPORTED SLAB. SEE SLAB JOINT DETAILS FOR TREATMENT OF ANY EXPANSION DEVICES OR JOINT SEALANTS AT THE CURB.

**RAIL PANEL AT TERMINAL SECTION**  
(SEE ROADWAY PLANS FOR ENDS NOT ATTACHED TO GUARD RAIL.)

**RAIL PANEL AT EXPANSION DEVICE**  
**ELEVATION - BRIDGE RAIL**

**RAIL PANEL AT TRANSITION SECTION**

TYPE 3G OR 3H TRANSITION (SEE M-606-1)  
THE HEIGHT OF THE TRANSITION WILL VARY TO MATCH BRIDGE RAIL AND ROADWAY GUARDRAIL: 1" WHEN BRIDGE DECK HAS A 3" OVERLAY, 2" WHEN BRIDGE DECK HAS A 2" SILICA FUME OVERLAY AND 4" WHEN BRIDGE DECK DOES NOT HAVE AN OVERLAY.

**NOTES:**

ALL TUBES SHALL BE ASTM A-500 GRADE B.  
ALL POSTS AND BASE PLATES SHALL BE ASTM A-572 GRADE 50.  
ALL OTHER STEEL SHALL BE ASTM A-36 UNLESS OTHERWISE NOTED.

THE ABOVE MATERIAL AND ALL ANCHOR BOLTS AND MISCELLANEOUS BOLTS, NUTS, AND WASHERS SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH SECTION 509. CONCRETE, REINFORCING STEEL, AND STRUCTURAL STEEL ELEMENTS SHALL CONFORM TO THE REQUIREMENTS OF SECTIONS 601, 602 AND 509, RESPECTIVELY.

POST ANCHOR, ENCASED IN CONCRETE, SHALL BE ASTM A-36 (AASHTO M-183) STEEL AND NEED NOT BE GALVANIZED.

THE TUBES SHALL BE SHOP BENT OR FABRICATED TO FIT HORIZONTAL CURVE WHEN RADIUS IS LESS THAN 1,500 FEET.

TUBES SHALL BE CONTINUOUS OVER NOT LESS THAN TWO POSTS. NO WELDED BUTT SPLICES WILL BE ALLOWED IN THE TUBE SECTIONS.

THE CENTERLINE OF THE TUBE SPLICE SHALL BE 1'-8" MINIMUM AND 2'-6" MAXIMUM FROM THE CENTERLINE OF THE POSTS.

ALL BOLTS THAT HAVE LOCK WASHERS SHALL BE TIGHTENED TO SNUG ONLY.

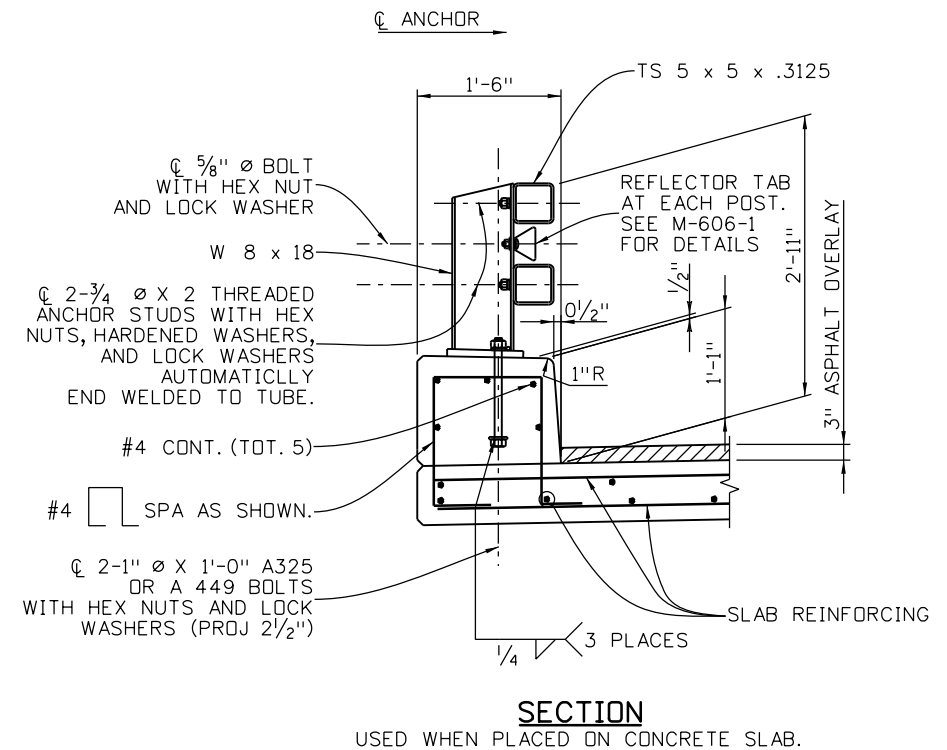
POSTS SHALL BE PERPENDICULAR TO THE LONGITUDINAL ROADWAY GRADE.

ONE OR MORE 10'-0" POST SPACINGS MAY BE REDUCED (6'-8" MIN.) IN ORDER TO MAINTAIN DIMENSIONS FROM THE END OF THE RAIL AND EXPANSION JOINTS.

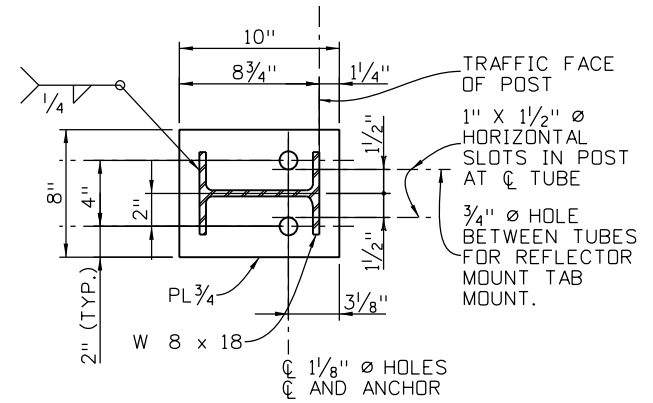
PAYMENT WILL BE MADE UNDER ITEM 606, BRIDGE RAIL TYPE 10M FOR ALL POSTS, POST ANCHORS, BASE PLATES, BACKING PLATES, ANCHOR BOLTS, MISCELLANEOUS BOLTS, NUTS, WASHERS, TUBES, TUBE EXPANSION DEVICES, TUBE SPLICES, END PLATES, CURB CONCRETE (CLASS D), CURB REINFORCING STEEL, AND REFLECTOR TABS.

PRIOR TO FABRICATION OF THIS ITEM, THREE SETS OF WORKING DRAWINGS WHICH COMPLY WITH THE REQUIREMENTS OF SECTION 105, SHALL BE SUBMITTED TO THE ENGINEER FOR INFORMATION ONLY.

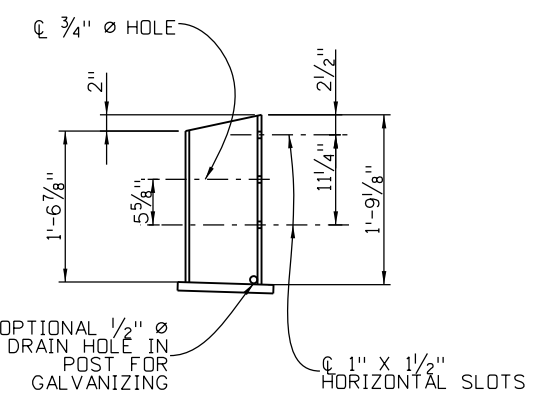
STRUCTURAL STEEL:  
AASHTO M-183 (ASTM A-36)  $f_y = 36,000$  psi  
AASHTO M-223 (ASTM A-572) GRADE 50  $f_y = 50,000$  psi  
COLD FORMED ASTM A-500 GRADE B  $f_y = 46,000$  psi  
FOR ADDITIONAL DETAILS SEE NEXT RAIL SHEETS.



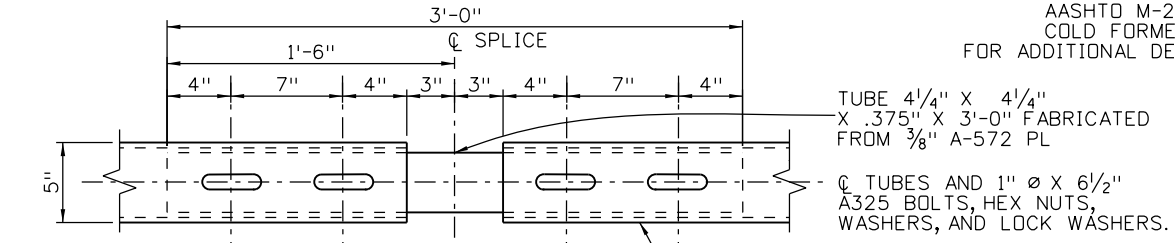
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USED WHEN PLACED ON CONCRETE SLAB.



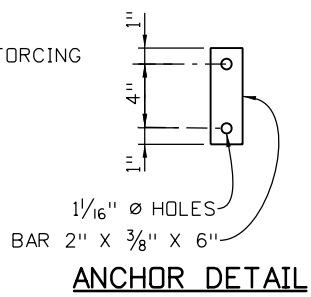
**PLAN - POST DETAIL**



**ELEVATION**



**PLAN - TUBE SPLICE**



**ANCHOR DETAIL**

**INFORMATION ONLY**

DESCRIPTION	UNIT	PER LIN. FT.
STRUCTURAL STEEL (GALVANIZED)	LB.	45.1
CONCRETE CLASS D (BRIDGE)	CU.YD.	.06
REINFORCING STEEL (EPOXY COATED)	LB.	6.6

Design		Detail		Quantity	
DATE	INITIAL	DATE	INITIAL	DATE	INITIAL
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10-12	JCF	10-12	JCF	10-12	JCF
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Date:	Comments	Init.

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Region 1 **CRC**

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No Revisions:
Revised:
Void:

**EB I70 OVER CLEAR CREEK BRIDGE**  
**BRIDGE RAIL TYPE 10M**  
**(SHEET 1 OF 2)**

Designer: K. Saindon  
Detailer: E. Schawo  
Sheet Subset: BRIDGE

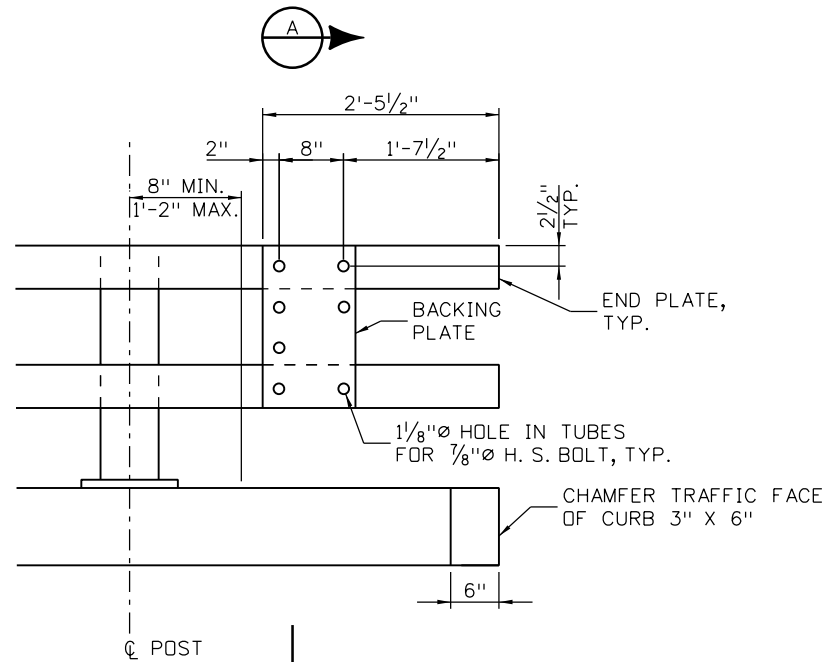
Structure Numbers: F-15-BR  
Subset Sheets: B33 of 46

Project No./Code
IM 0703-390
19035
Sheet Number 81

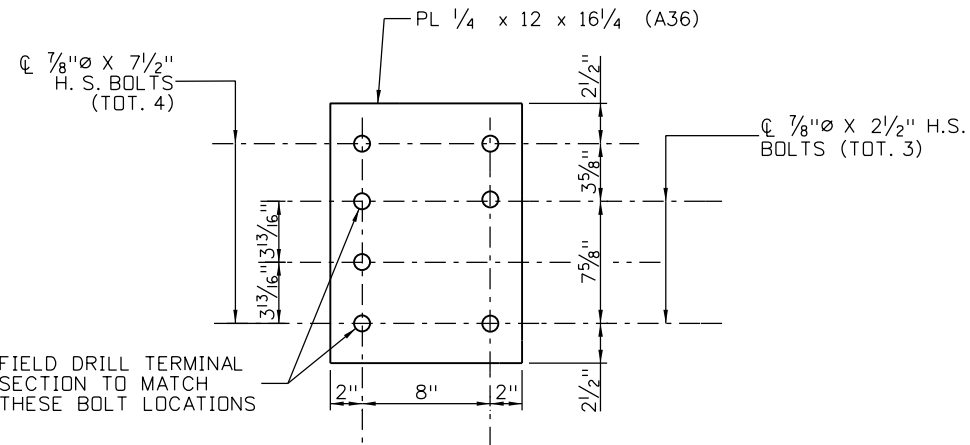
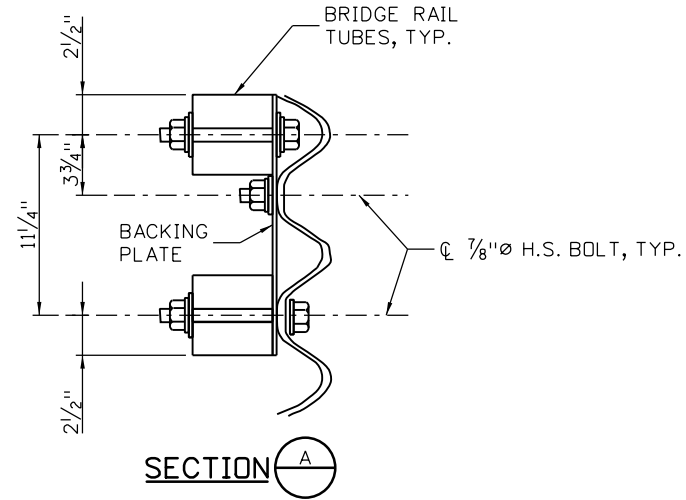
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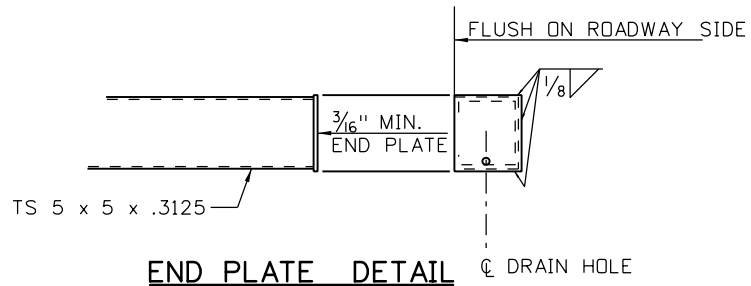
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10-12	JCF	10-12	JCF	10-12	JCF
Designed By	Checked By	Detailed By	Checked By	Quantities By	Checked By



**RAIL TUBE DETAILS**  
(USE WITH BRIDGE RAIL TYPE 10M)  
THRIE BEAM NOT SHOWN.



**BACKING PLATE**  
HOLES ARE 1 1/8" FOR 7/8" H. S. BOLTS WITH  
HEX NUTS, 2 PL WASHERS, AND 1 LOCK WASHER



**END PLATE DETAIL**

Print Date: 11/30/2012  
 File Name: 18832BRDG\_170\_BRail10M02.dgn  
 Horiz. Scale: NONE Vert. Scale: NONE  
 Staff Bridge Branch - Unit 0221 STW

**ATKINS** 4601 DTC Boulevard, Suite 700  
 Denver, CO 80237  
 Phone: (303) 221-7275 Fax: (303) 221-7276

Sheet Revisions		
Date:	Comments	Init.

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 425 A Corporate Circle  
 Golden, CO 80401  
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**Region 1** **CRC**

<b>As Constructed</b>
No Revisions:
Revised:
Void:

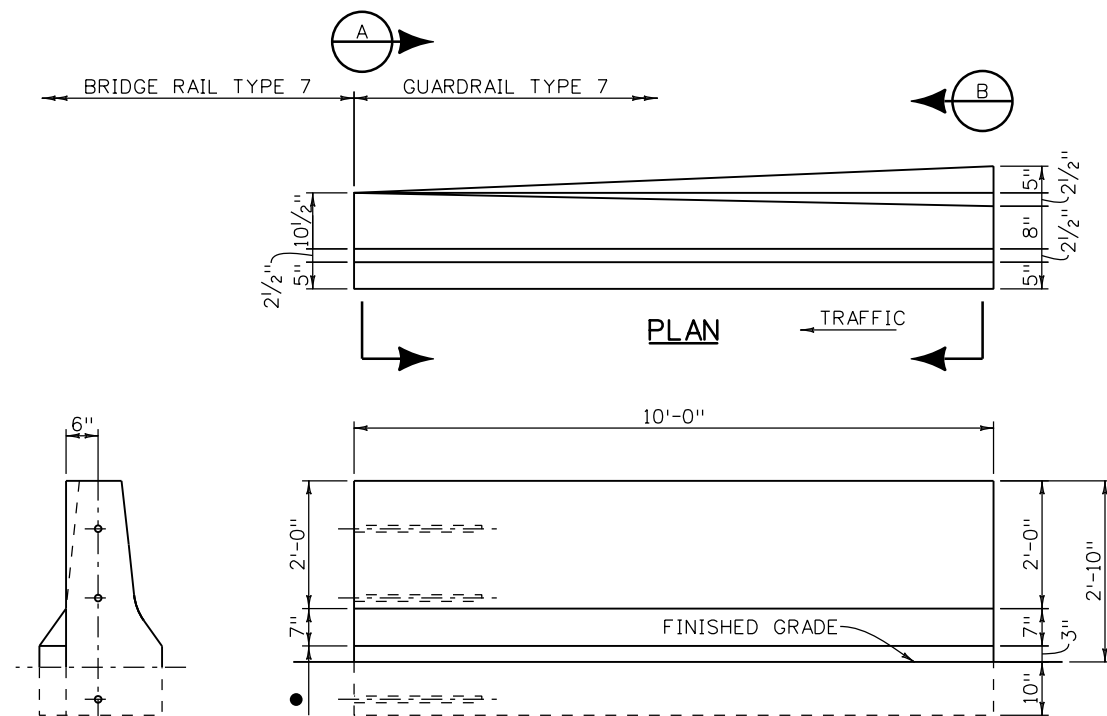
**EB 170 OVER CLEAR CREEK BRIDGE  
 BRIDGE RAIL TYPE 10M  
 (SHEET 2 OF 2)**

Designer: K. Saindon  
 Detailer: E. Schawo  
 Sheet Subset: BRIDGE

Structure Numbers: F-15-BR  
 Subset Sheets: B34 of 46

<b>Project No./Code</b>
IM 0703-390
19035
Sheet Number <b>82</b>

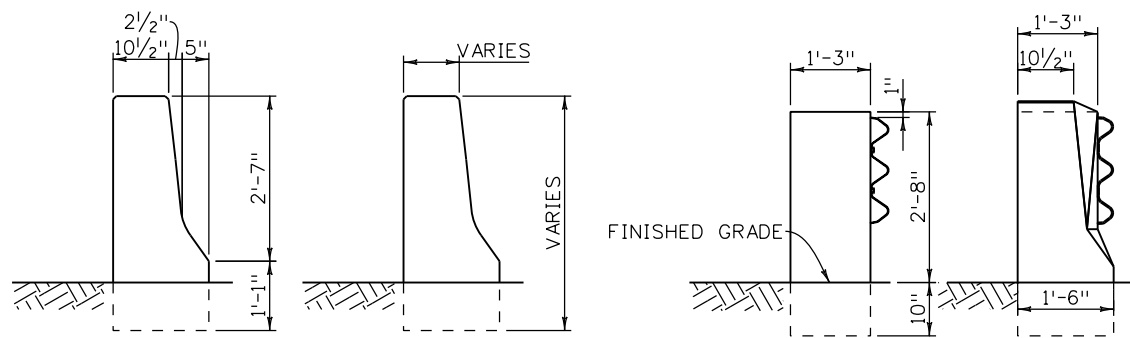




**END** ● MATCH BRIDGE RAIL. 1" WHEN BRIDGE DECK HAS 3" OVERLAY, 2" WHEN BRIDGE DECK HAS A 2" SILICA FUME OVERLAY AND 4" WHEN BRIDGE DECK DOES NOT HAVE AN OVERLAY.

**BRIDGE RAIL TYPE 7 TO ROADWAY SHOULDER TYPE 7 END TRANSITION**

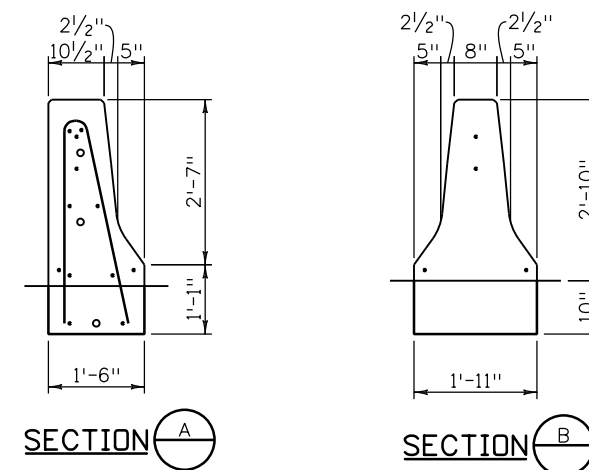
MEASURED AND PAID FOR AS GUARDRAIL TYPE 7. SEE M-606-13 SHEET 2, TRANSITION DETAIL, FOR REINFORCEMENT INFORMATION.



SECTION E

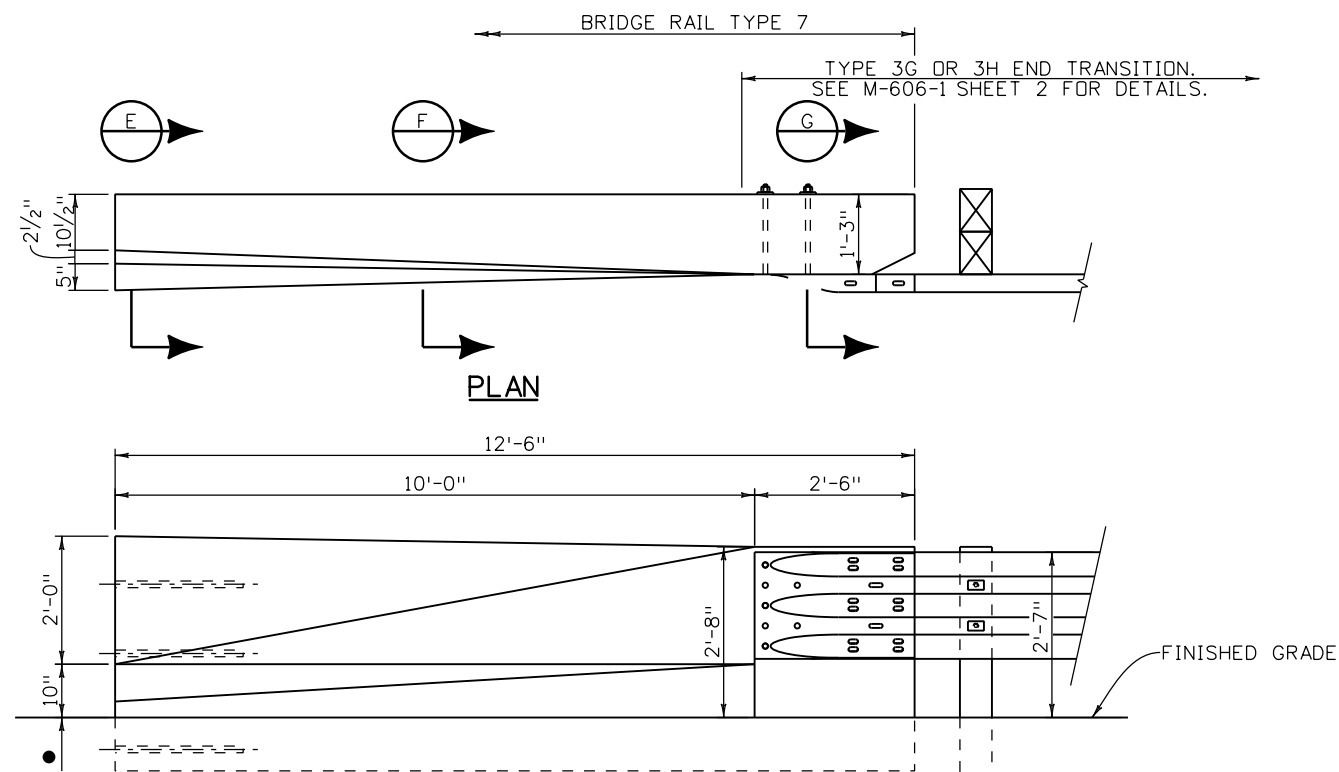
SECTION F

SECTION G



SECTION A

SECTION B



PLAN

ELEVATION

**BRIDGE RAIL TYPE 7 TO GUARDRAIL TYPE 3 END TRANSITION**

● MATCH BRIDGE RAIL. 1" WHEN BRIDGE DECK HAS 3" ASPHALT OVERLAY, 2" WHEN BRIDGE DECK HAS A 2" SILICA FUME OVERLAY AND 4" WHEN BRIDGE DECK DOES NOT HAVE AN OVERLAY.

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11-12	JCF	11-12	JCF	11-12	JCF
Designed By	KCS	Checked By	JCF	Quantities By	RCS
Checked By	JCF	Checked By	JCF	Checked By	JCF

Print Date: 11/30/2012	0000
File Name: 18832BRDG_170_BRailTrans01.dgn	
Horiz. Scale: NONE Vert. Scale: NONE	
Staff Bridge Branch - Unit 0221 STW	
<b>ATKINS</b> 4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276	

Sheet Revisions		
Date:	Comments	Init.

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Region 1 CRC

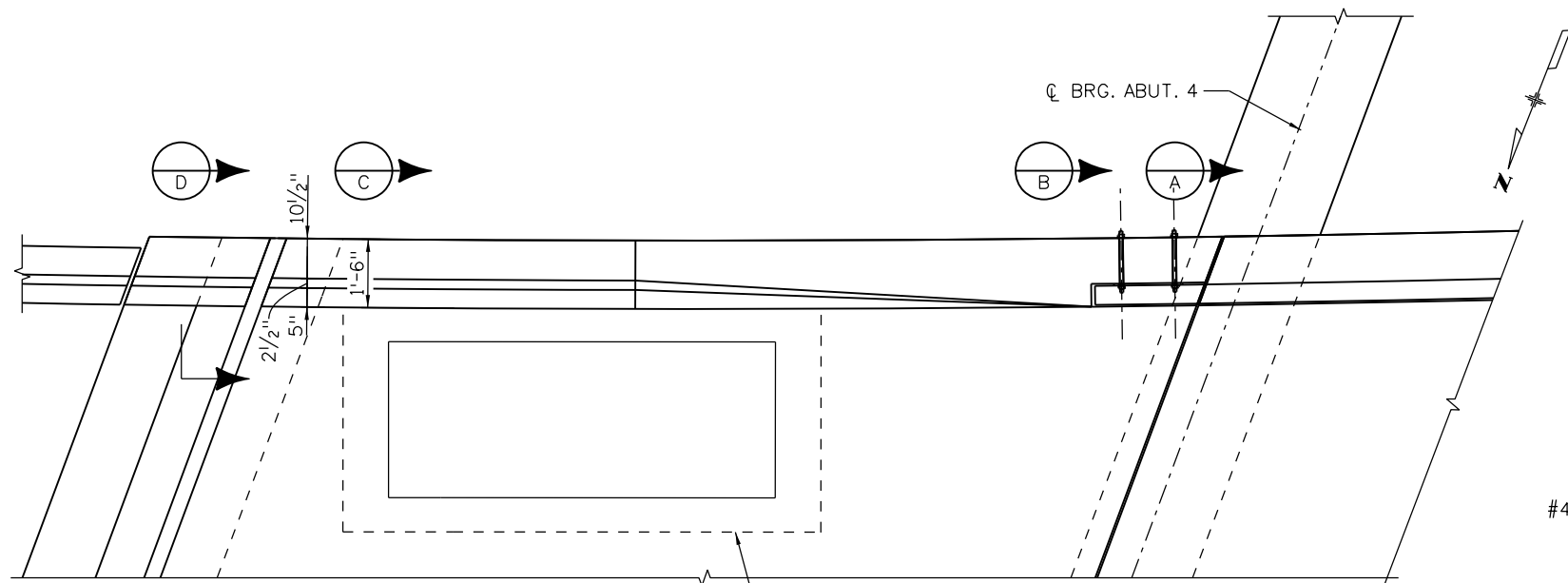
As Constructed	EB 170 OVER CLEAR CREEK BRIDGE
No Revisions:	BRIDGE RAIL TYPE 7
Revised:	GUARDRAIL TRANSITION
Void:	

Designer:	K. Saindon	Structure Numbers	F-15-BR
Detailer:	E. Schawo	Subset Sheets:	B35 of 46
Sheet Subset:	BRIDGE		

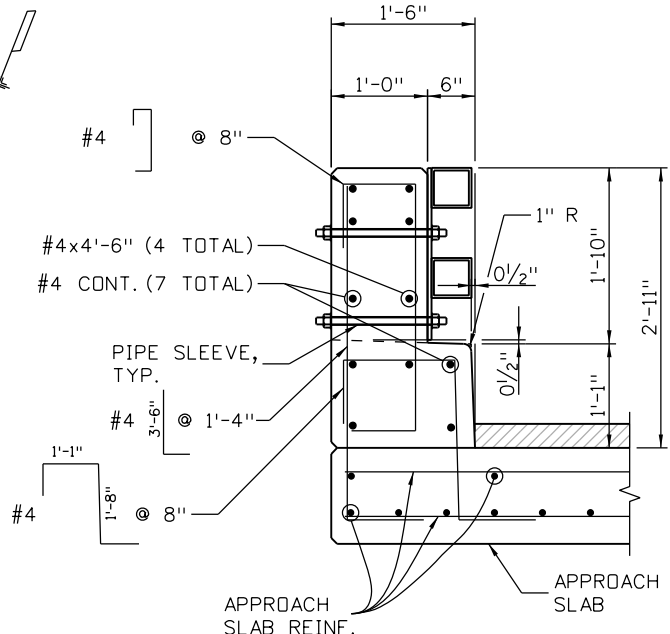
Project No./Code	IM 0703-390
	19035
Sheet Number	83

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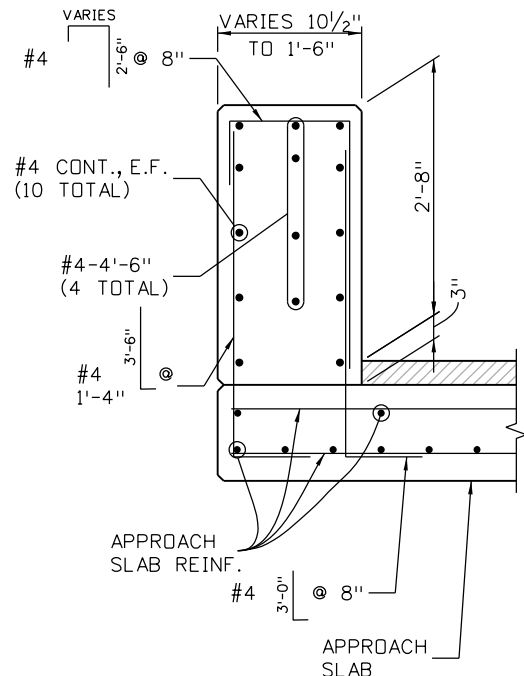
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Checked By	KCS	Checked By	KCS	Checked By	KCS



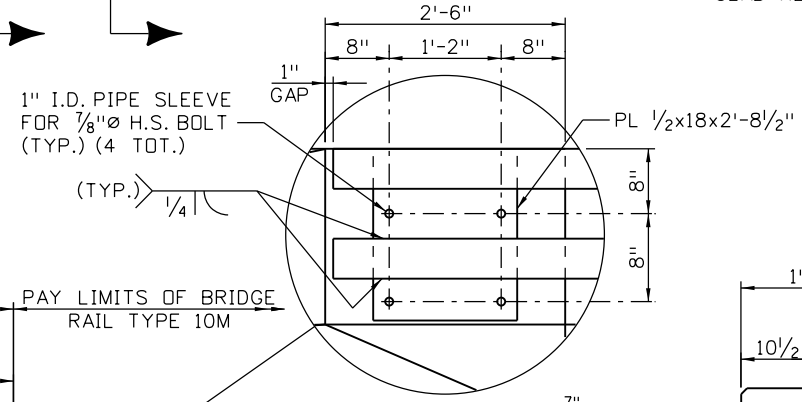
**PLAN**  
(REINFORCING NOT SHOWN)  
SCALE: 1/4" = 1'-0"



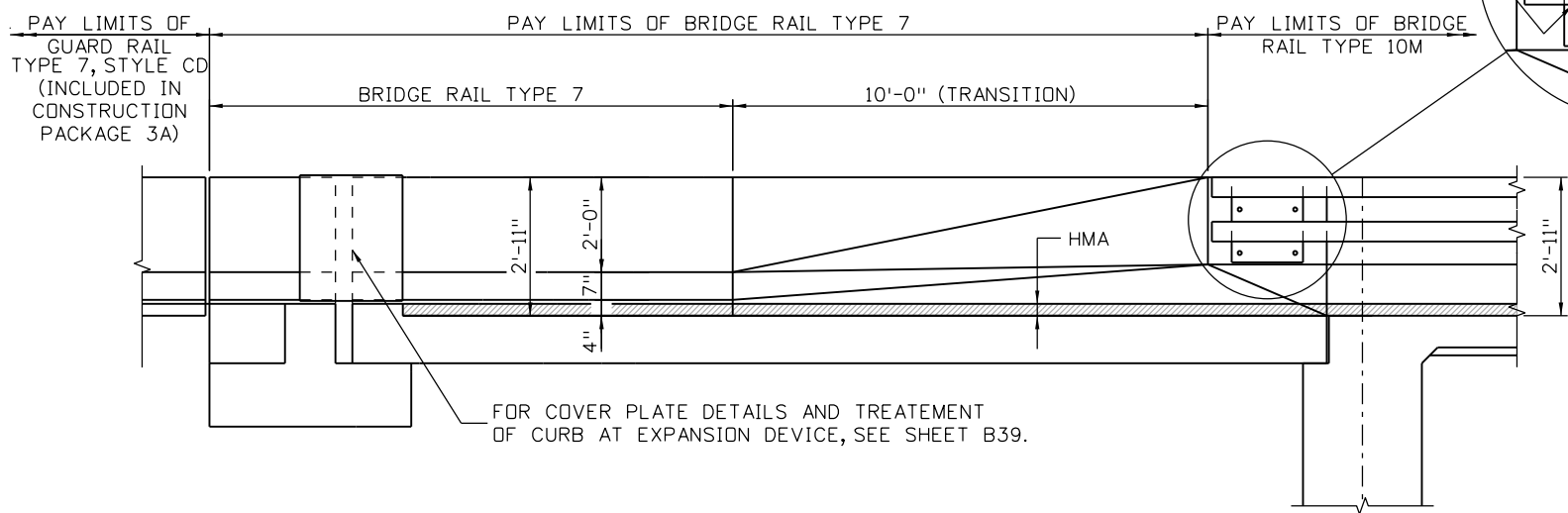
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SCALE: 1/2" = 1'-0"



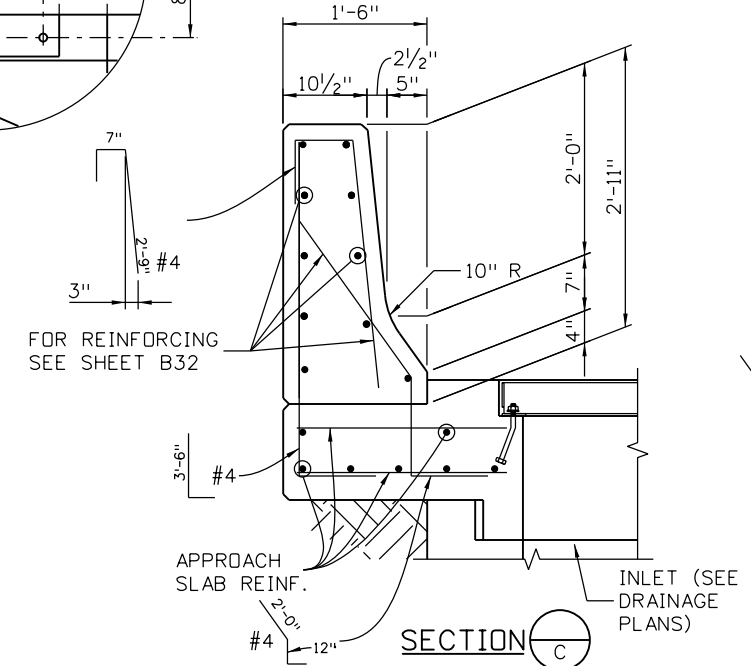
**SECTION B**  
SCALE: 1/2" = 1'-0"



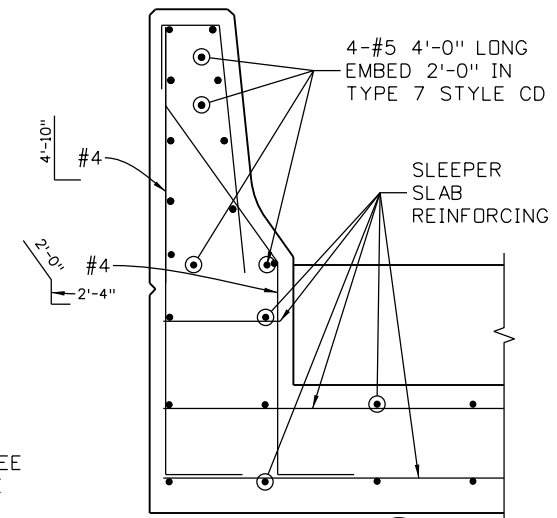
1" I.D. PIPE SLEEVE FOR 7/8" Ø H.S. BOLT (TYP.) (4 TOT.)



**ELEVATION**  
(REINFORCING AND INLET NOT SHOWN)  
SCALE: 1/4" = 1'-0"



**SECTION C**  
SCALE: 1/2" = 1'-0"



**SECTION D**  
(SEE SECTION C FOR INFORMATION NOT SHOWN)  
SCALE: 1/2" = 1'-0"

**NOTES:**  
1. FOR ADDITIONAL NOTES, SEE SHEETS B32 THRU B34.

Print Date: 11/30/2012	0000
File Name: 18832BRDG_170_BRailTrans02.dgn	
Horiz. Scale: AS NOTED Vert. Scale: AS NOTED	
Staff Bridge Branch - Unit 0221 STW	
<b>ATKINS</b> 4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276	

Sheet Revisions		
Date:	Comments	Init.

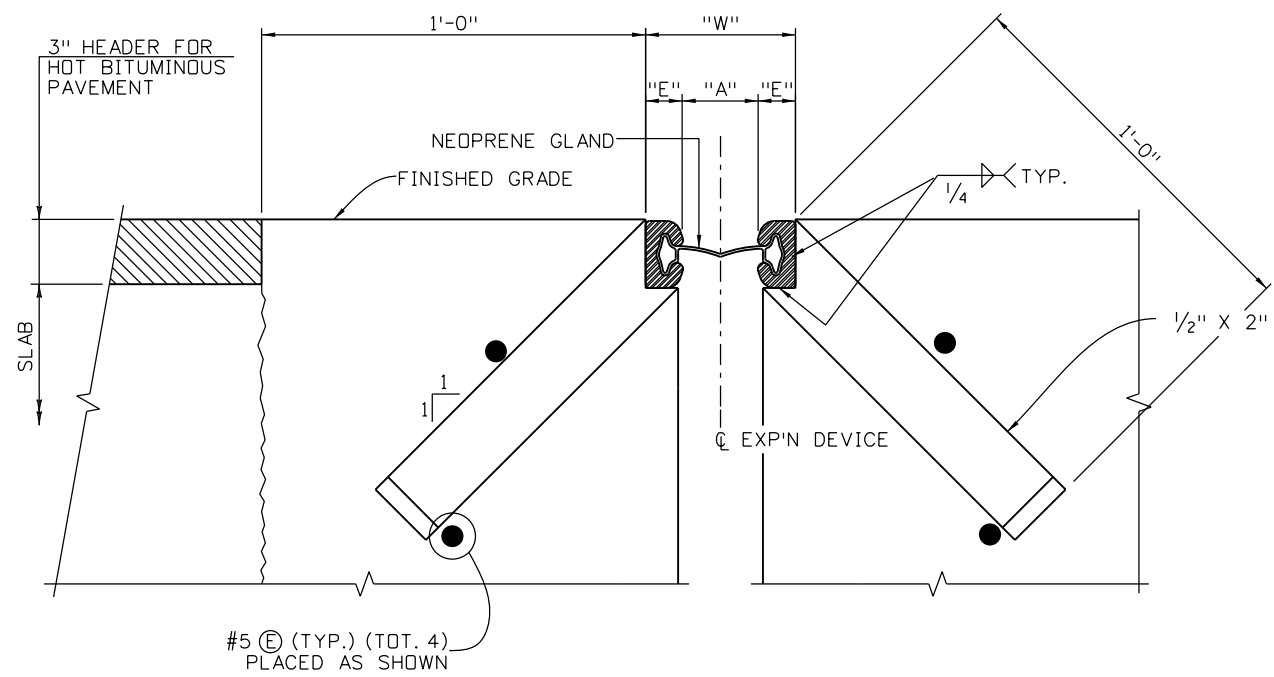
Colorado Department of Transportation



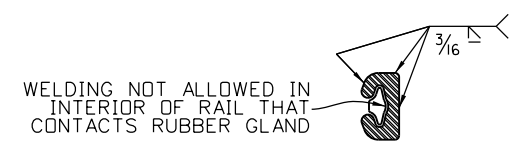
425 A Corporate Circle  
Golden, CO 80401  
Phone: 720-497-6918 FAX: 720-497-6901

Region 1 CRC

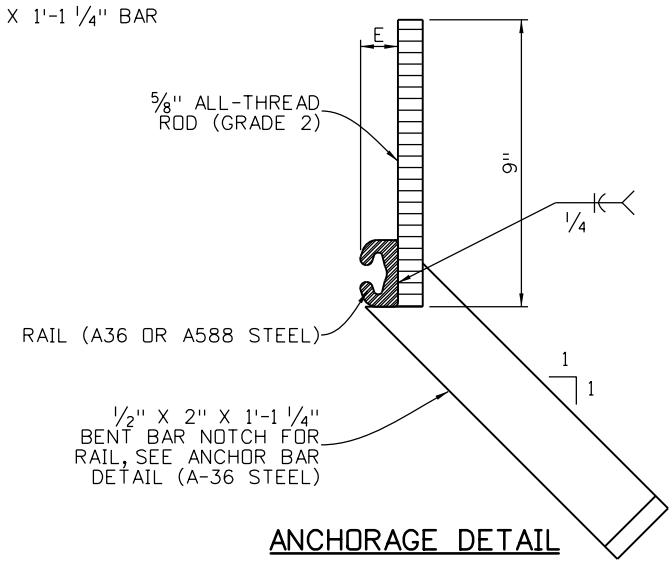
As Constructed	EB 170 OVER CLEAR CREEK BRIDGE		Project No./Code	
	BRIDGE RAIL TYPE 10M TRANSITION			IM 0703-390
	Revised:	Designer: S. Abraham		Structure Numbers: F-15-BR
	Void:	Detailer: E. Schawo		19035
	Sheet Subset: BRIDGE	Subset Sheets: B36 of 46	Sheet Number: 84	



**SECTION THRU STRIP SEAL BRIDGE EXPANSION DEVICE**  
SECTION TAKEN PERPENDICULAR TO  $\phi$  EXP'N DEVICE



**RAIL FIELD SPLICE DETAIL**



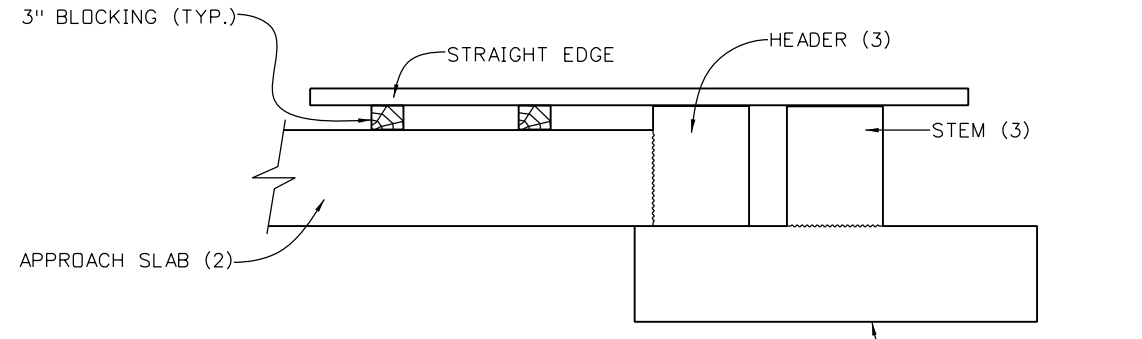
**ANCHORAGE DETAIL**

**NOTES:**

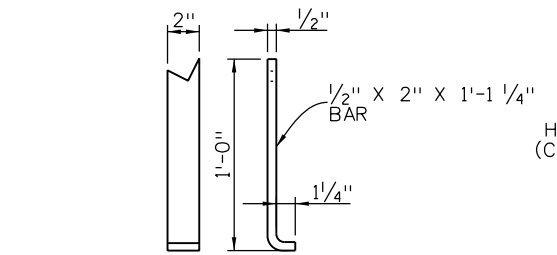
1. THE EXPANSION DEVICE SHALL BE INSTALLED ON GRADE, PARALLEL TO THE SLOPE AND GRADE OF THE DECK.
2. AFTER THE CONCRETE HAS ATTAINED INITIAL SET, THE ATTACHMENTS USED TO HOLD THE EXPANSION DEVICE ASSEMBLY IN IT'S PROPER POSITION SHALL BE REMOVED.
3. DO NOT PAINT STEEL SURFACES IN CONTACT WITH EITHER CONCRETE OR SEAL.
4. "W" AND "E" DIMENSIONS ARE DEPENDENT UPON THE PARTICULAR EXPANSION DEVICE SUPPLIED, AND SHALL BE SHOWN ON THE WORKING DRAWINGS. "E" = 1/4" MIN.
5. SET DIMENSION "A" = 2 INCHES. DO NOT INSTALL THE GLAND UNTIL DIMENSION "A" HAS OPENED UP TO AT LEAST 1 1/2". USE SECTION 518.10(B) IN THE STANDARD SPECIFICATIONS TO DETERMINE THE STRUCTURE TEMPERATURE.
6. THE NEOPRENE GLAND SHALL BE INSTALLED IN ONE PIECE IN ACCORDANCE WITH SECTION 518 OF THE STANDARD SPECIFICATIONS.
7. SEE SECTION 518 IN THE STANDARD SPECIFICATIONS FOR WATER TIGHT INTEGRITY TESTING REQUIREMENTS.
8. SET ELEVATIONS AT TOP OF HEADER AND SLEEPER STEM WITH THE GRADE PROJECTION SCHEME.

**ACCEPTABLE EXPANSION DEVICE ALTERNATES**

D.S. BROWN A2R400-SSA2  
WABO SE400 TYPE A  
E-POXY ENGINEERED MATERIALS S400-A STRIP SEAL



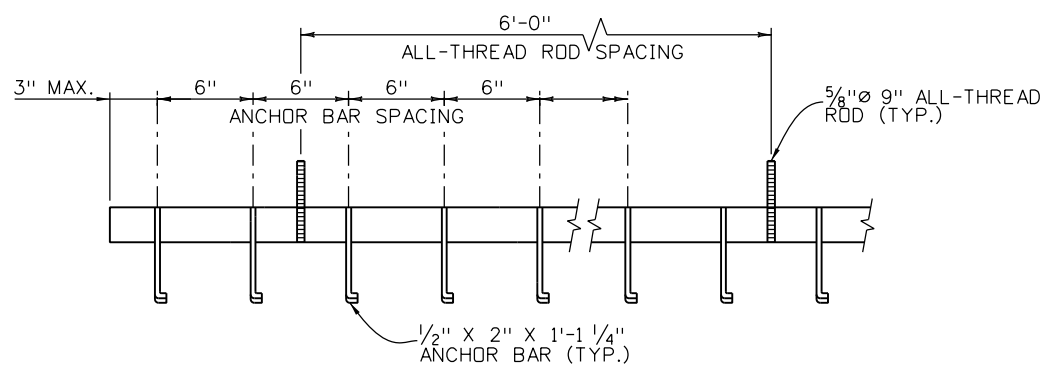
**GRADE PROJECTION SCHEME**  
(NUMBERS IN PARENTHESIS REFER TO FIRST, SECOND AND THIRD CONCRETE POURS)



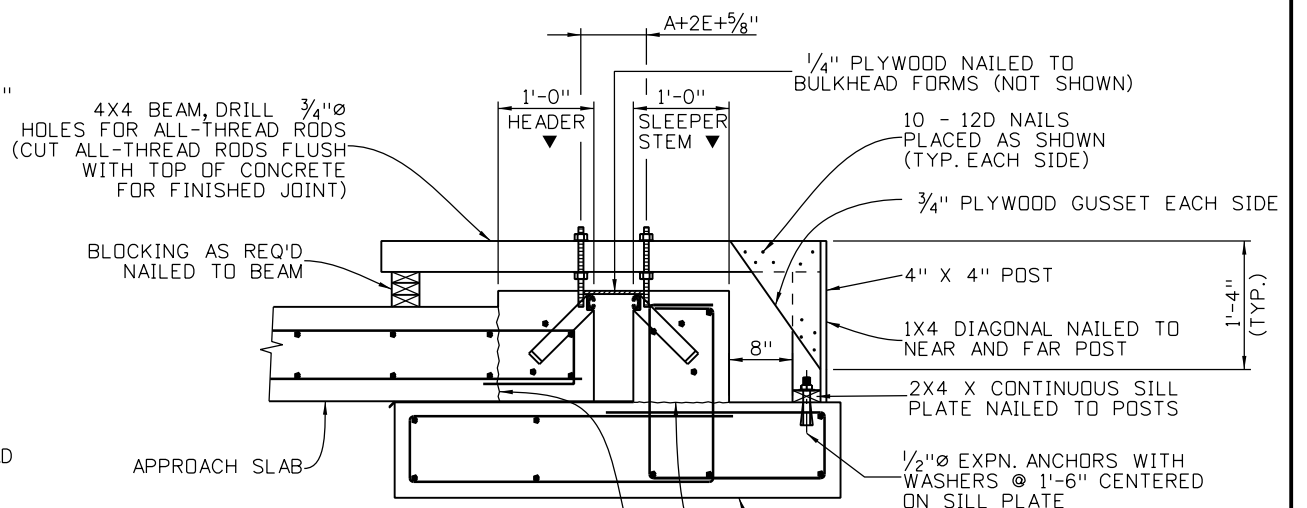
**TYPICAL ANCHOR BAR DETAIL**

STR. TEMP	"A"	"W"*
-10° F	2.89"	5.39"
10° F	2.45"	4.95"
30° F	2.00"	4.50"
50° F	1.57"	4.07"
70° F	1.13"	3.63"
90° F	0.69"	3.19"
110° F	0.25"	2.75"

\* FOR E = 1/4" (MIN.)



**ANCHOR BAR SPACING**



**NOTES:**

1. PROVIDE EXPANSION DEVICE SUPPORT AS SHOWN AT 6'-0" INTERVALS.
2. FOR REINFORCING SEE APPROACH SLAB DETAILS.
3.  $\blacktriangledown$  CONCRETE SHALL BE PLACED AFTER EXPANSION DEVICE HAS BEEN ADJUSTED TO PROPER GRADE AND APPROVED BY THE ENGINEER USING THE GRADE PROJECTION SCHEME.

**MINIMUM SUPPORT BRACKET REQUIREMENTS**

Design	Detail	Quantity	Initial	Date
Designed By	KCS			09-12
Checked By	JCF			10-12
Designed By	KCS			09-12
Checked By	JCF			10-12

Print Date: 11/30/2012  
File Name: 18832BRDG\_170\_ExpDev01.dgn  
Horiz. Scale: NONE Vert. Scale: NONE  
Staff Bridge Branch - Unit 0221 STW

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Denver, CO 80237  
Phone: (303) 221-7275 Fax: (303) 221-7276

Sheet Revisions		
Date:	Comments	Init.

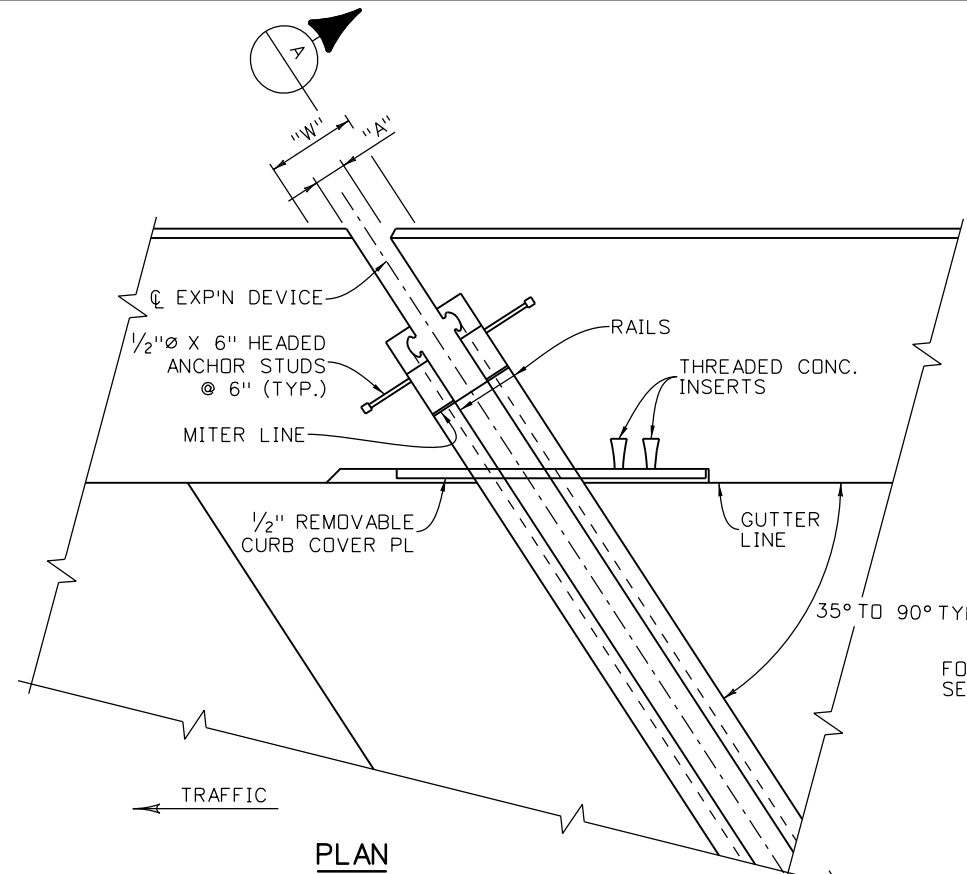
Colorado Department of Transportation

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Golden, CO 80401  
Phone: 720-497-6918 FAX: 720-497-6901

Region 1 **CRC**

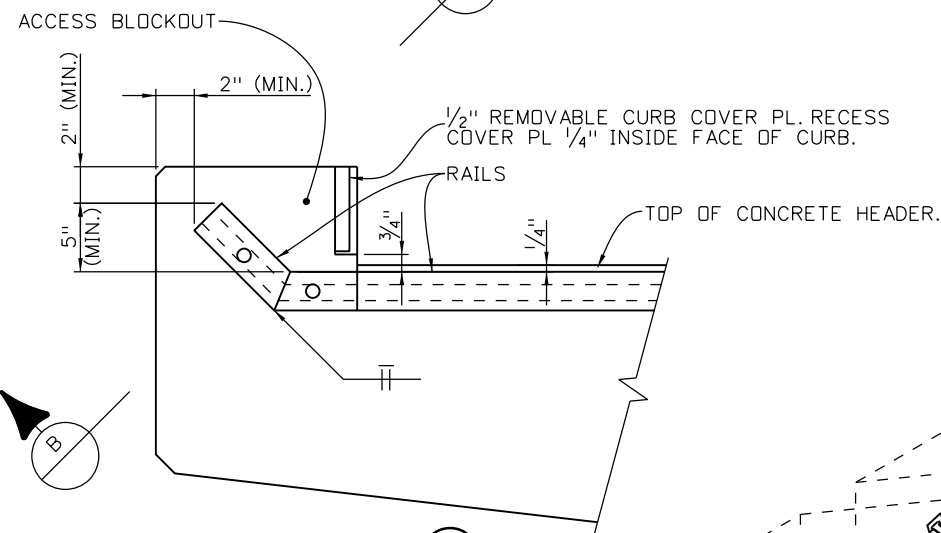
As Constructed	EB 170 OVER CLEAR CREEK BRIDGE BRIDGE EXPANSION DEVICE (0 - 4 INCH)		Project No./Code
No Revisions:	Designer: K. Saindon Structure F-15-BR		IM 0703-390
Revised:	Detailer: E. Schawo Numbers		19035
Void:	Sheet Subset: BRIDGE	Subset Sheets: B37 of 46	Sheet Number 85

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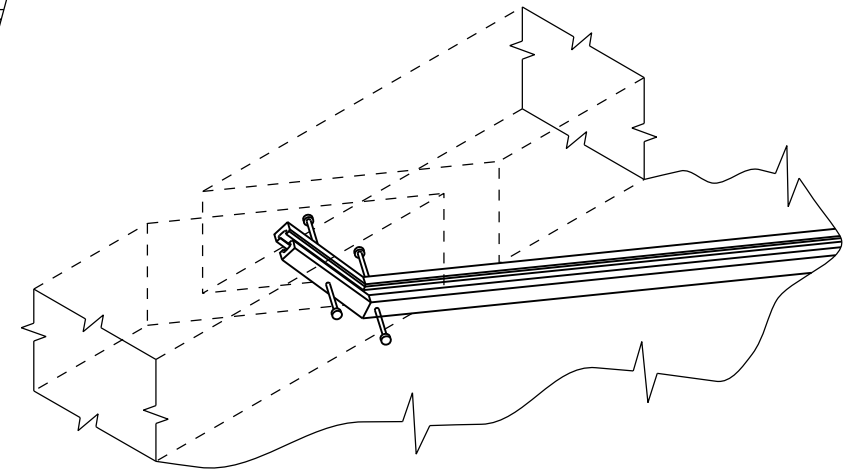


PLAN

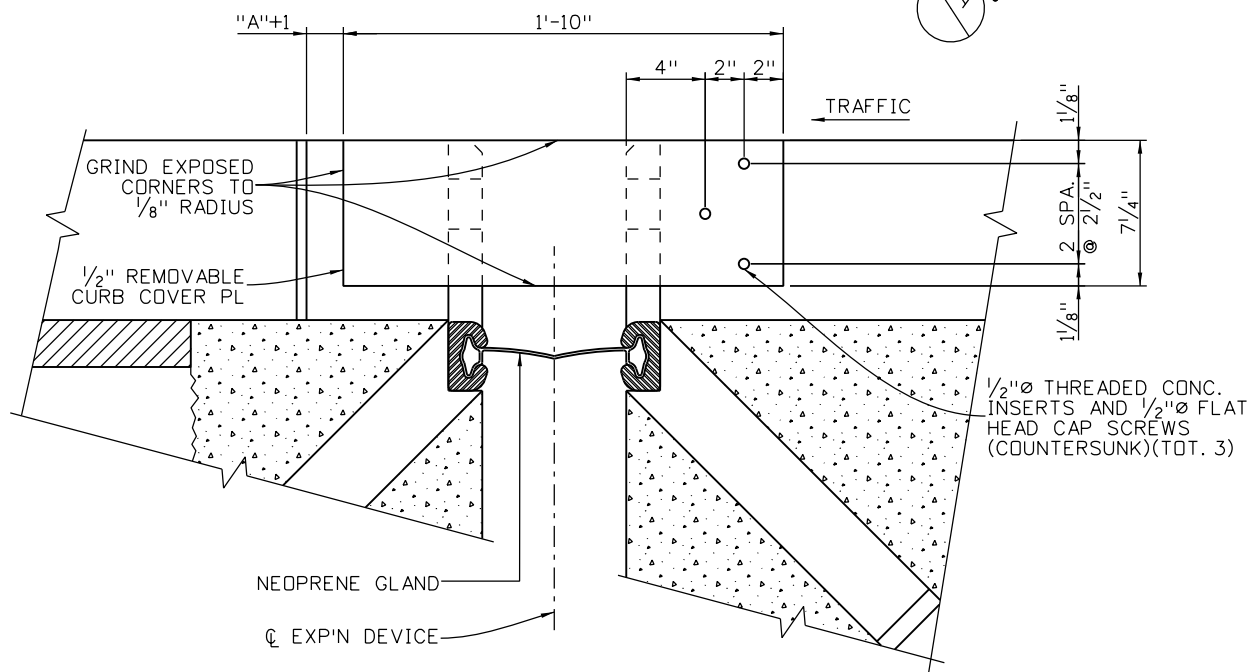
PROVIDE 2" MINIMUM COVER BETWEEN ANCHORS AND ALL CONCRETE SURFACES.



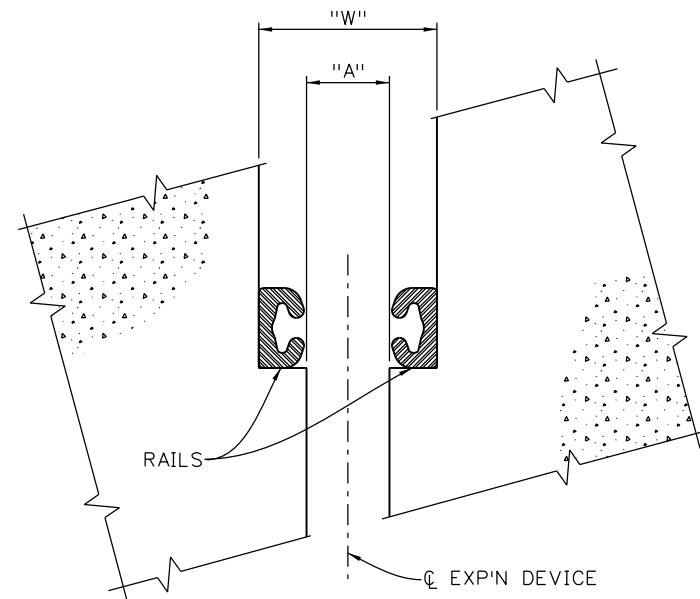
SECTION A



ISOMETRIC VIEW



ELEVATION



SECTION B

Design		Detail		Quantities	
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10-12	JCF	10-12	JCF	10-12	JCF
Designed By	Checked By	Detailed By	Checked By	Quantities By	Checked By

Print Date: 11/30/2012	
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Horiz. Scale: NONE	Vert. Scale: NONE
Staff Bridge Branch - Unit 0221	STW
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Sheet Revisions		
Date:	Comments	Init.

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Region 1 CRC

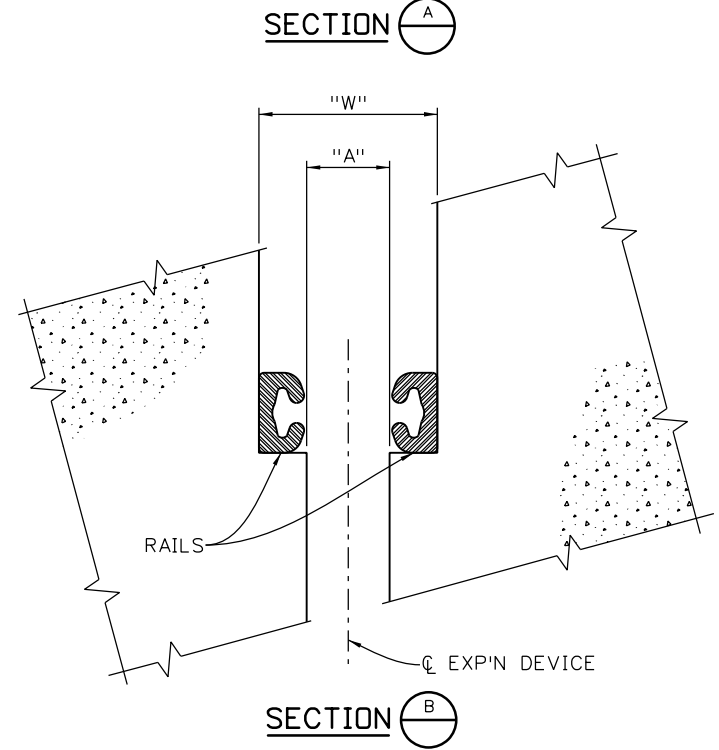
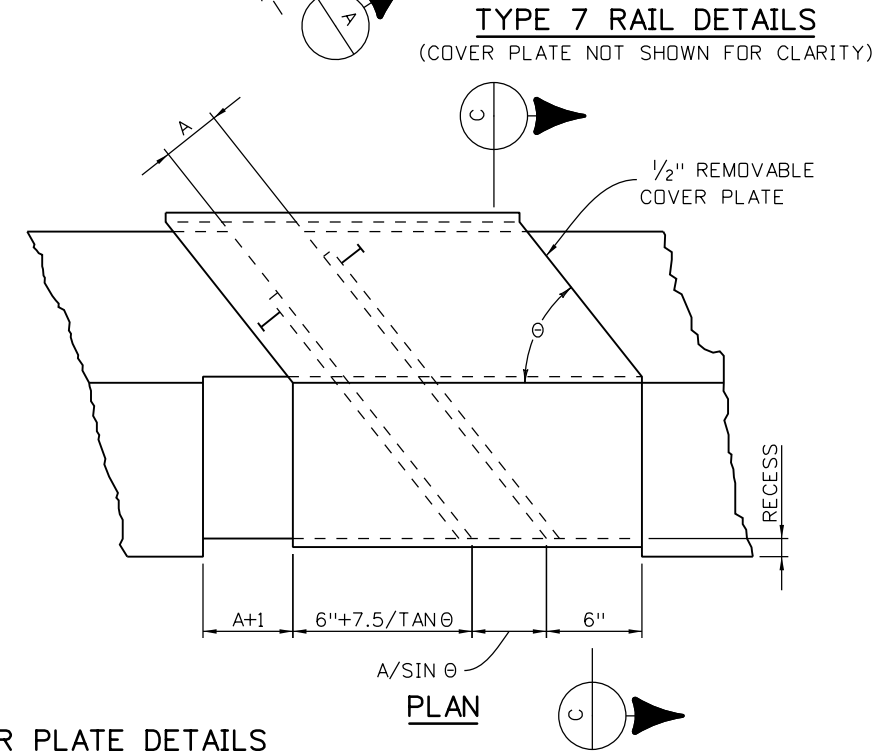
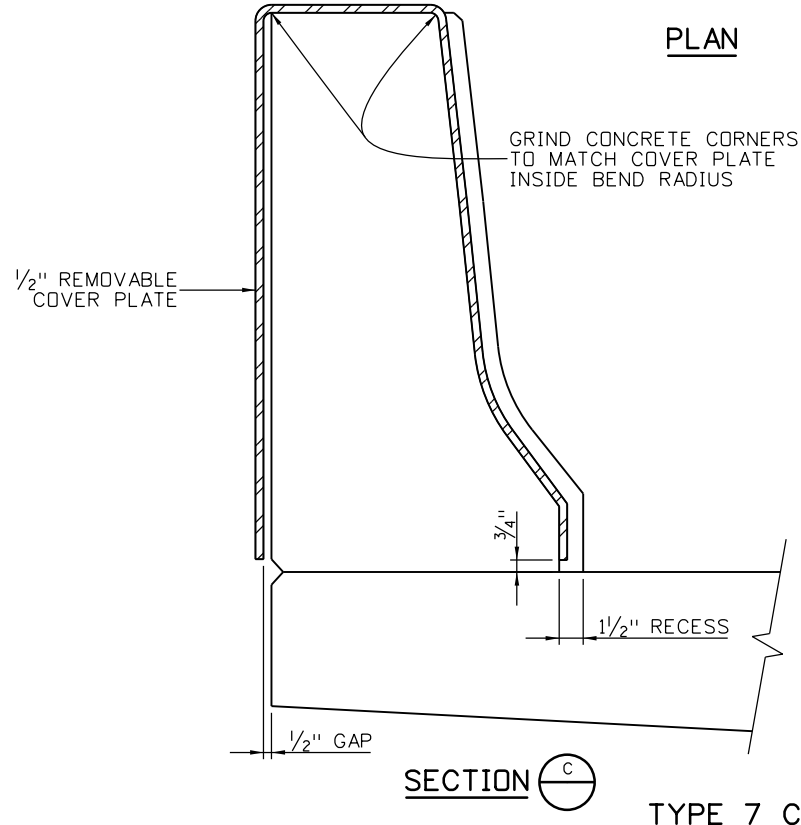
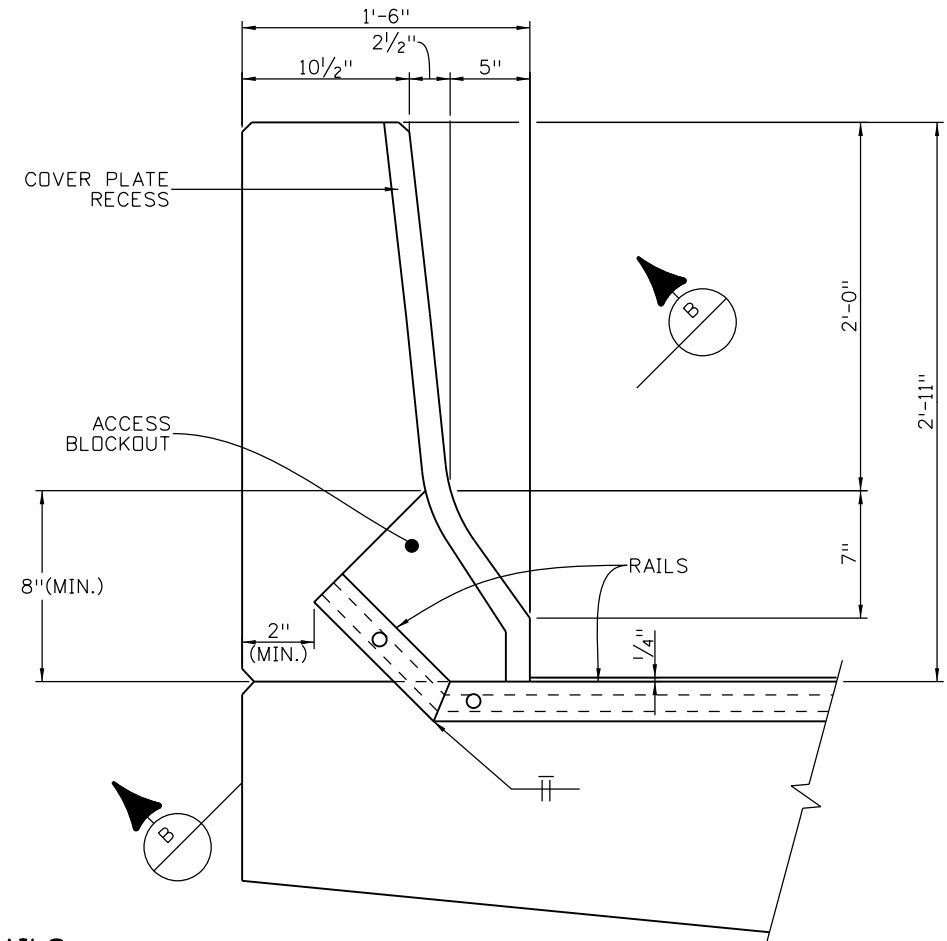
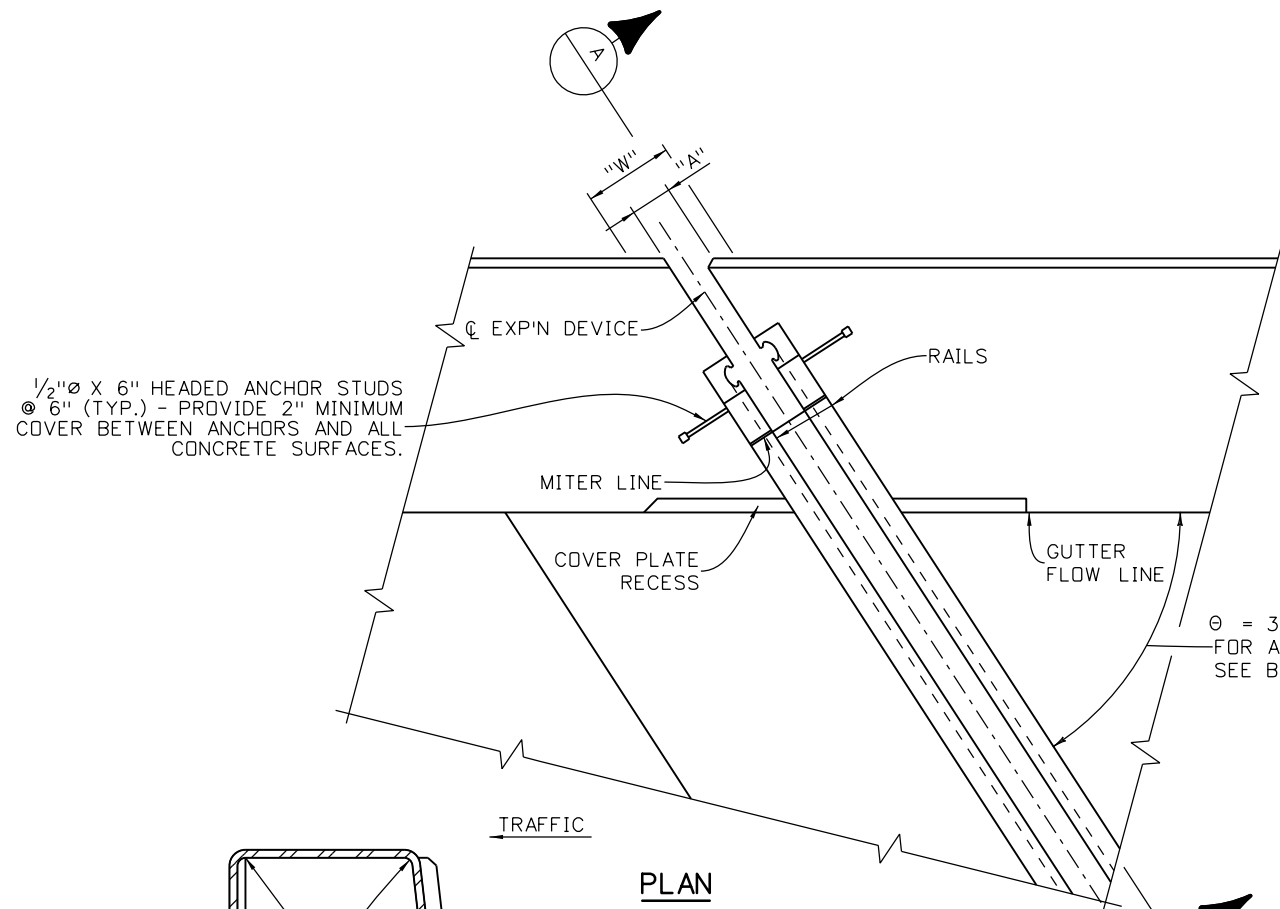
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EB 170 OVER CLEAR CREEK BRIDGE BRIDGE EXPANSION DEVICE COVER PLATE DETAILS (SHEET 1 OF 2)			
Designer:	K. Saindon	Structure	F-15-BR
Detailer:	E. Schawo	Numbers	
Sheet Subset:	BRIDGE	Subset Sheets:	B38 of 46

Project No./Code	
IM 0703-390	
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Sheet Number	86

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Checked By	Checked By	Checked By	Checked By	Checked By	Checked By



Print Date: 11/30/2012

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Region 1 **CRC**

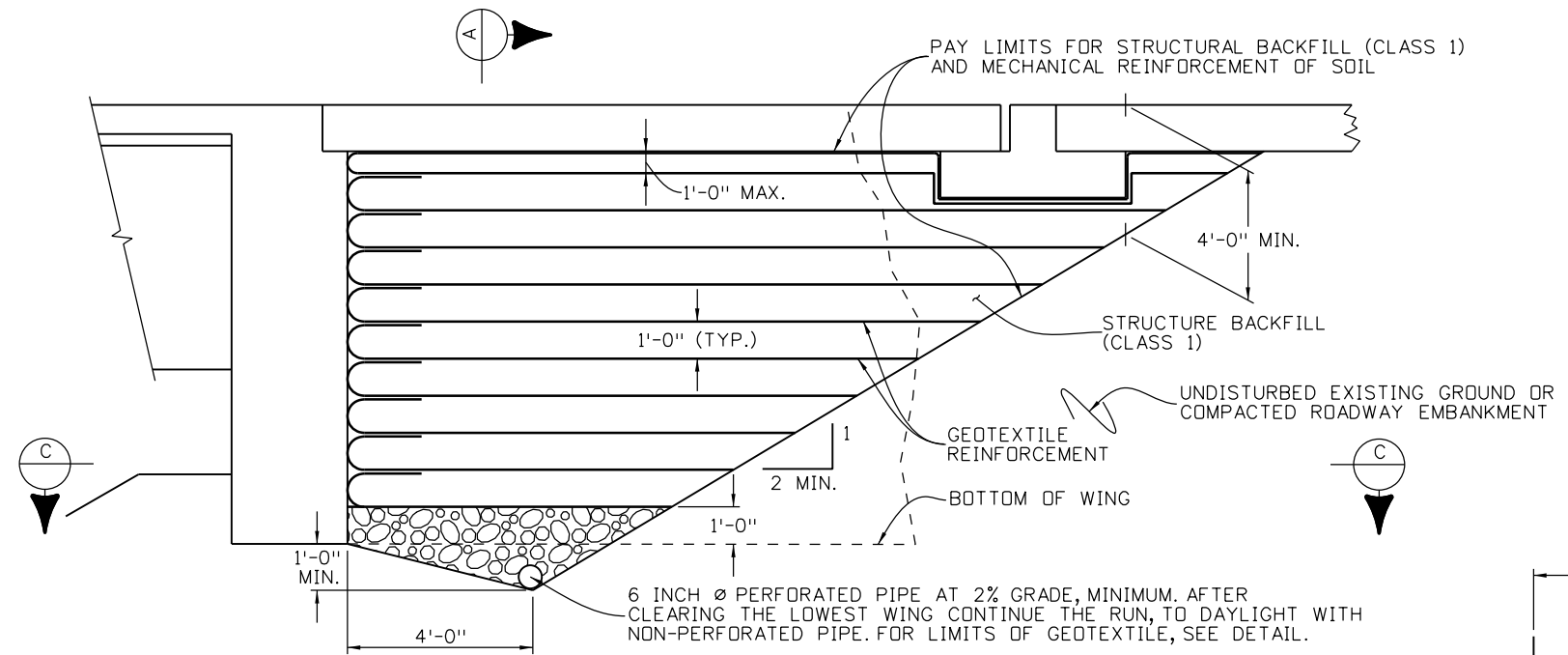
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Revised:	
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EB 170 OVER CLEAR CREEK BRIDGE BRIDGE EXPANSION DEVICE COVER PLATE DETAILS (SHEET 2 OF 2)			
Designer:	K. Saindon	Structure	F-15-BR
Detailer:	E. Schawo	Numbers	
Sheet Subset:	BRIDGE	Subset Sheets:	B39 of 46

Project No./Code	IM 0703-390
	19035
Sheet Number	87

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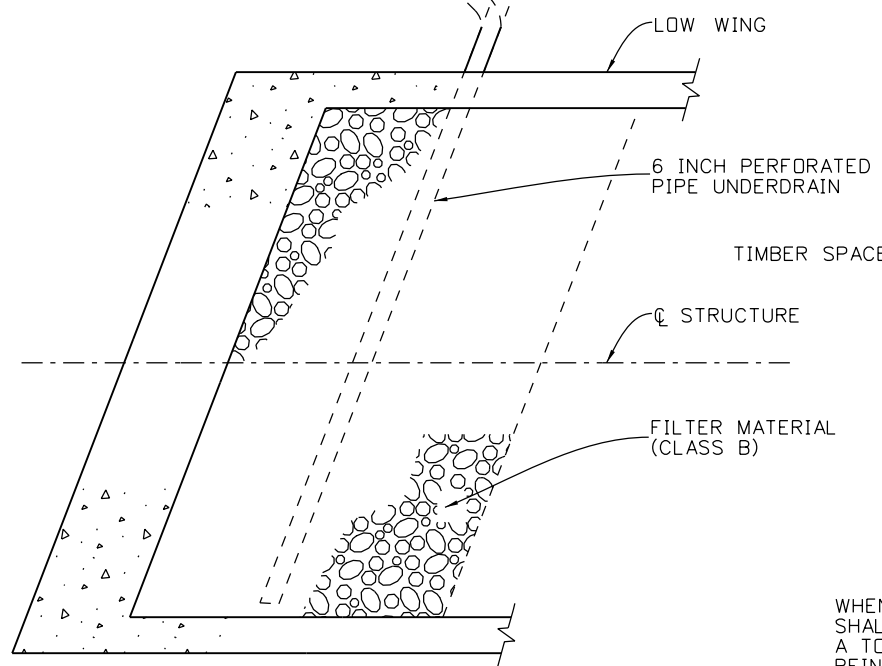
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Checked By	Checked By	Checked By	Checked By	Checked By	Checked By



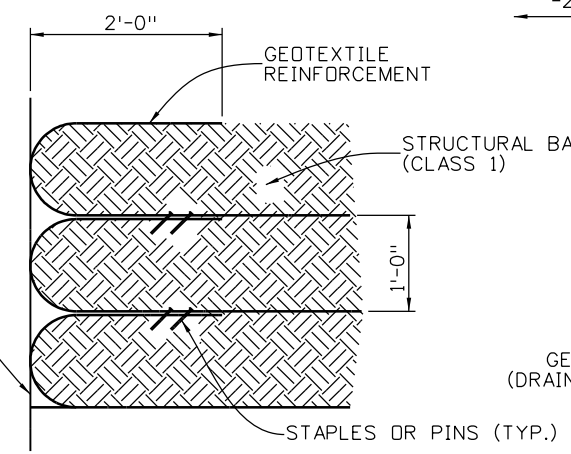
**SECTION PERPENDICULAR TO ABUTMENT**

SUBSURFACE DRAIN OUTLET (6" Ø NON-PERFORATED PIPE). MAX. BEND IN PIPE = 45°

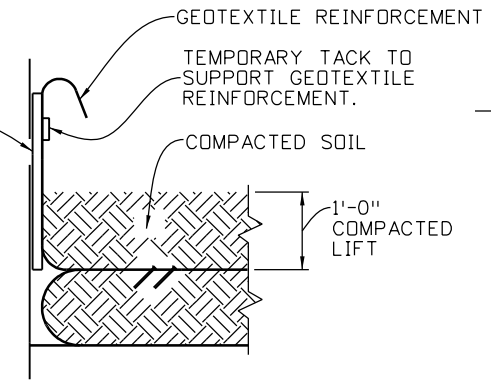
PROVIDE GAP BETWEEN THE ABUTMENT AND BACKFILL. THE GAP WIDTH SHALL BE AT LEAST 0.5% OF THE ABUTMENT HEIGHT, 1" MINIMUM. SEE GAP DETAIL 1 AND 2. DO NOT PROVIDE THIS GAP AT BOTTOM 2 NOR THE TOP 2 LAYERS OF REINFORCED SOIL.



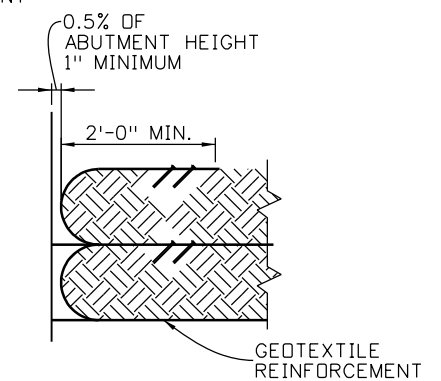
**SECTION C**



**WRAP DETAIL**

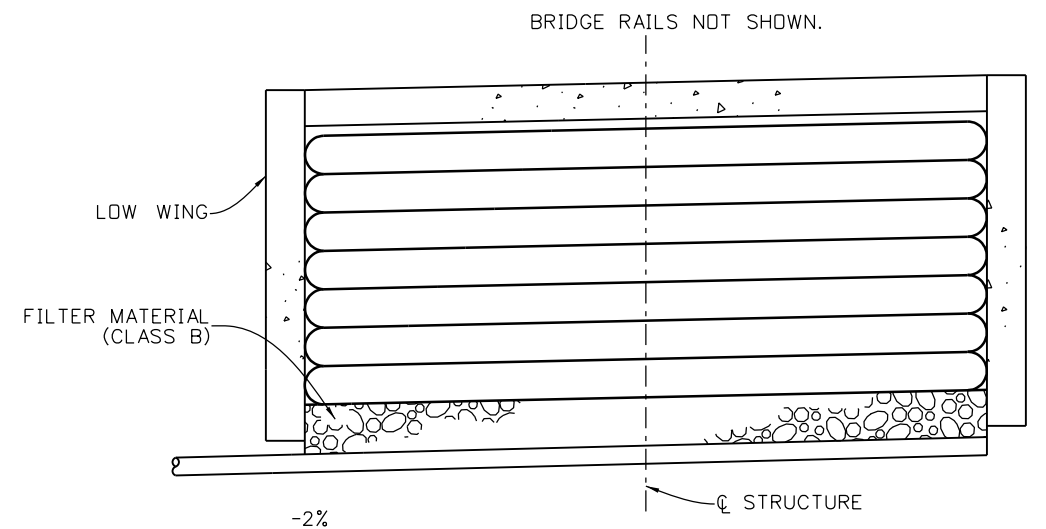


**GAP DETAIL STEP 1**

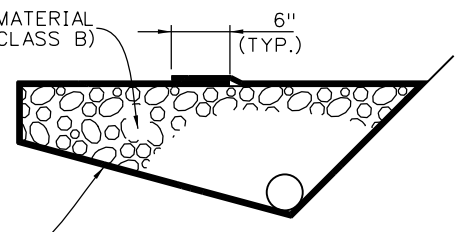


**GAP DETAIL STEP 2**

WHEN REQUIRED, THE GEOTEXTILE REINFORCEMENT WRAP AT BACK FACE OF ABUTMENT SHALL BE TEMPORARILY HUNG WITH A SPACER BOARD AND TACK STRIP. AFTER REACHING A TOTAL OF 1'-0" COMPACTED LIFT, THE TACK STRIP SHALL BE REMOVED AND GEOTEXTILE REINFORCEMENT SHALL BE PULLED BACK SLACK FREE WITH ITS END ANCHORED TO SOIL UNDERNEATH WITH STAPLES OR PINS BEFORE THE SPACER BOARD IS PULLED. ANY ALTERNATE METHOD TO MAINTAIN THE MINIMUM GAP BETWEEN ABUTMENT CONCRETE AND REINFORCED SOIL MAY BE PROPOSED TO THE ENGINEER FOR APPROVAL.



**SECTION A**



**6 INCH PERFORATED PIPE UNDERDRAIN**

6 INCH PERFORATED PIPE UNDERDRAIN INCLUDES ALL FILTER MATERIAL (CLASS B) AND GEOTEXTILE WRAP (DRAINAGE) (CLASS 2).

**NOTES:**

1. GEOTEXTILE REINFORCEMENT SHALL BE WOVEN FABRIC WITH A MINIMUM AVERAGE ROLL VALUE OF 4800 LB/FT FOR INSTALLATIONS WITH A GAP AND 2400 LB/FT FOR INSTALLATIONS WITHOUT A GAP BASED ON ASTM D4595.
2. GEOTEXTILE REINFORCEMENT SHALL BE PLACED BY ALTERNATING MACHINE DIRECTION (MD) WITH CROSS MACHINE DIRECTION (XD) FROM LAYER TO LAYER.
3. THE GEOTEXTILE REINFORCEMENT WRAP AT BACK FACE OF ABUTMENT SHALL BE PULLED BACK SLACK FREE WITH ITS END ANCHORED TO SOIL UNDERNEATH WITH STAPLES OR PINS.
4. MINIMUM SPLICE OF ALL GEOTEXTILE SHALL CONSIST OF 6" OF OVERLAP.
5. PAYMENT WILL BE MADE UNDER ITEM 206 MECHANICAL REINFORCEMENT OF SOIL (CU.YD.) AND ITEM 206 STRUCTURE BACKFILL (CLASS 1) (CU.YD.) AND SHALL INCLUDE THE COST FOR 6 INCH Ø PERFORATED PIPE UNDERDRAIN AND SUBSURFACE DRAIN OUTLET (6 INCH Ø NONPERFORATED PIPE).
6. INSTALLATION OF PIPE UNDERDRAIN AND SUBSURFACE DRAIN OUTLET WILL CONFORM TO THE CONSTRUCTION REQUIREMENTS OF SECTION 605.03 AND 605.06, RESPECTIVELY.

Print Date: 11/30/2012  
 File Name: 18832BRDG\_170\_MSBkf101.dgn  
 Horiz. Scale: NONE Vert. Scale: NONE  
 Staff Bridge Branch - Unit 0221 STW

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 Denver, CO 80237  
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Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation

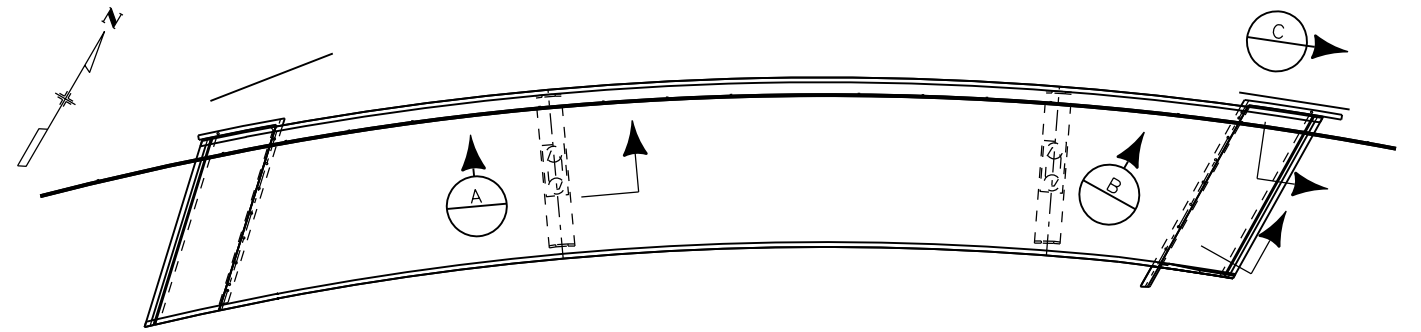
**DOT** 425 A Corporate Circle  
 Golden, CO 80401  
 Phone: 720-497-6918 FAX: 720-497-6901

Region 1 **CRC**

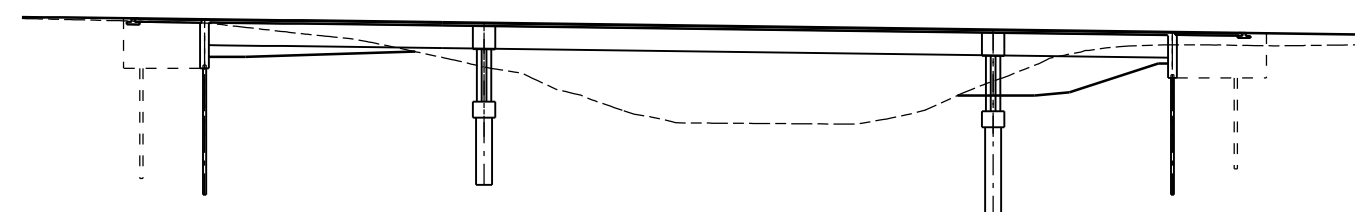
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Revised:	
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EB 170 OVER CLEAR CREEK BRIDGE MECHANICALLY STABILIZED BACKFILL			
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Detailer:	E. Schawo		
Sheet Subset:	BRIDGE	Subset Sheets:	B40 of 46

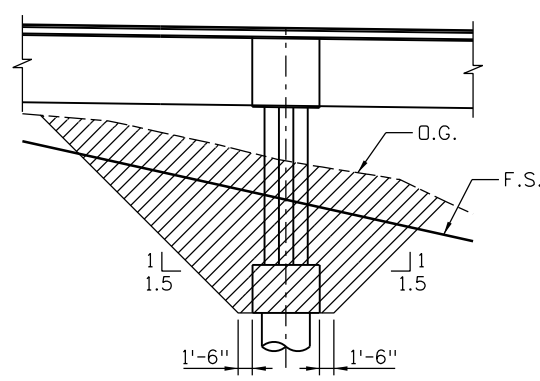
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Sheet Number	88



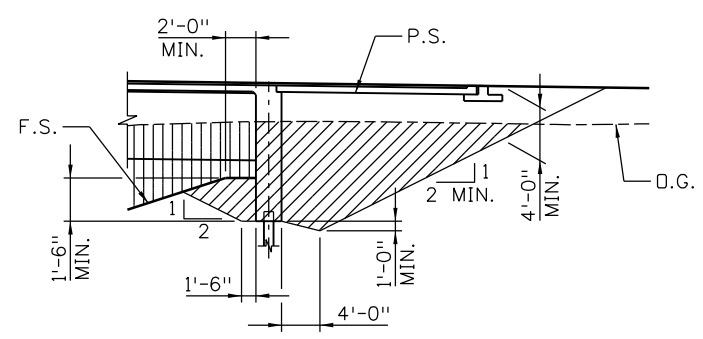
PLAN



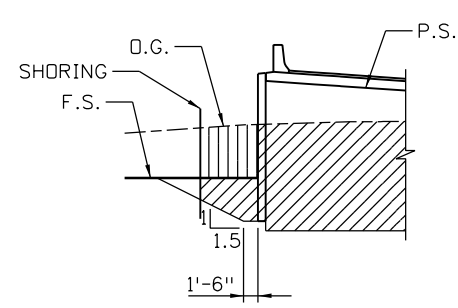
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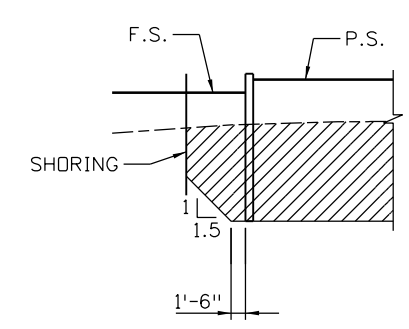
SECTION A  
(EXCAVATION)



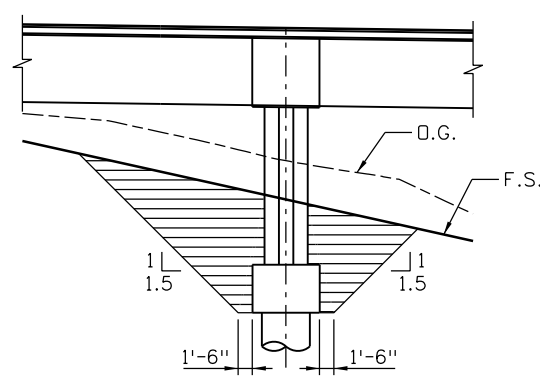
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(EXCAVATION)



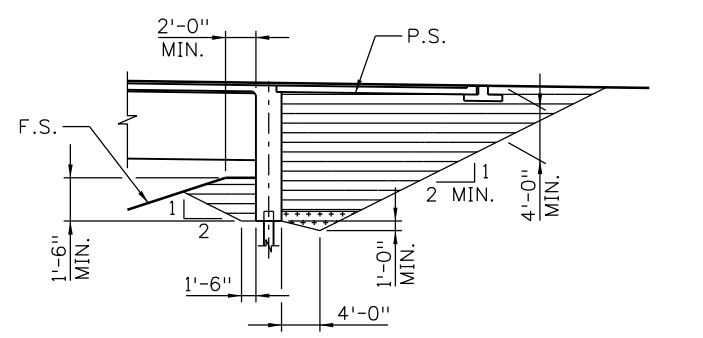
SECTION C  
(EXCAVATION)  
NEAR B.F. ABUT.



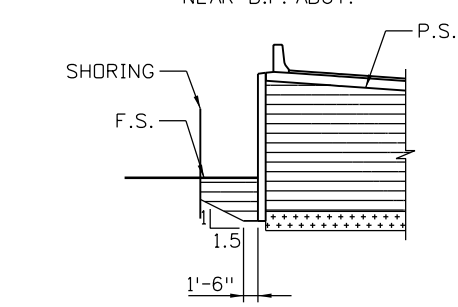
SECTION C  
(EXCAVATION)  
NEAR END OF WINGWALL



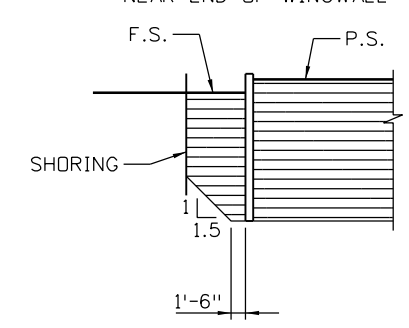
SECTION A  
(BACKFILL)



SECTION B  
(BACKFILL)



SECTION C  
(BACKFILL)  
NEAR B.F. ABUT.



SECTION C  
(BACKFILL)  
NEAR END OF WINGWALL

**NOTES**

- UNLESS SHOWN OTHERWISE IN THE PLANS, THIS DRAWING GIVES THE MINIMUM EXTENT OF STRUCTURE EXCAVATION AND STRUCTURE BACKFILL. THE CONTRACTOR MAY ELECT TO EXTEND THE STRUCTURE EXCAVATION AND STRUCTURE BACKFILL BEYOND THE LIMITS SHOWN HERE. ANY ADDITIONAL EXCAVATION OR BACKFILL BEYOND THESE LIMITS WILL NOT BE MEASURED NOR PAID FOR.
- STRUCTURE FOOTINGS WHICH ARE LOCATED IN ROCK SHALL BE POURED OUT TO UNDISTURBED ROCK, WITHOUT FORMING, IN CONFORMANCE WITH 601.09.
- STRUCTURE EXCAVATION FOR SLOPE PAVING NOT SHOWN.
- FOR ADDITIONAL BACKFILL DETAILS AT ABUTMENT, SEE SHEET B40.

**LEGEND**

- ROADWAY EXCAVATION
- STRUCTURE EXCAVATION
- STRUCTURE BACKFILL (FLOW-FILL), OR STRUCTURE BACKFILL (CLASS 1) WITH MECHANICAL REINFORCEMENT OF SOIL, AS SHOWN ELSEWHERE IN THE PLANS.
- FILTER MATERIAL

**ABBREVIATIONS**

- D.G. ORIGINAL GROUND
- P.S. PLAN SUBGRADE
- F.S. PLAN FINISHED SURFACE

Design		Detail		Quantities	
INITIAL	DATE	INITIAL	DATE	INITIAL	DATE
Designed By	09-12	Detailled By	09-12	Quantity By	09-12
Checked By	10-12	Checked By	10-12	Checked By	10-12

Print Date: 11/30/2012  
 File Name: 18832BRDG\_170\_ExBkfil01.dgn  
 Horiz. Scale: NONE Vert. Scale: NONE  
 Staff Bridge Branch - Unit 0221 STW  
**ATKINS** 4601 DTC Boulevard, Suite 700  
 Denver, CO 80237  
 Phone: (303) 221-7275 Fax: (303) 221-7276

Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation  
 425 A Corporate Circle  
 Golden, CO 80401  
 Phone: 720-497-6918 FAX: 720-497-6901  
 Region 1 CRC

<b>As Constructed</b>	EB 170 OVER CLEAR CREEK BRIDGE EXCAVATION AND BACKFILL
No Revisions:	
Revised:	
Void:	

Designer:	K. Saindon	Structure Numbers	F-15-BR
Detailer:	E. Schawo		
Sheet Subset:	BRIDGE	Subset Sheets:	B41 of 46

<b>Project No./Code</b>	IM 0703-390
	19035
Sheet Number	89

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Run date & time = Wed Oct 24 17:01:12 2012

Input Northing Offset = 696502.810000  
 Input Easting Offset = 1009473.320000  
 Input Bearing = N 42 59 20.0000 E

DESCRIPTION

Units: feet;  
 Project: IM 0703-390; Subaccount: 19035;  
 Designer: KCS; Detailer: ES;  
 Location: I-70 EB over Clear Creek (F-15-BR);  
 3 span BT-84, integral pier caps

HORIZONTAL ALIGNMENT DATA

TS	170+24.0900	T	620.2948						
SC	172+28.0900	Ls	204.0000	SA	6 05 15.64				
PI	176+44.3848	Lc	745.0449	DELTA	56 38 31.00 RT	Dc	5 58 05.92	RADIUS	960.000000
CS	179+73.1349	Ls	204.0000	SA	6 05 15.64				
ST	181+77.1349	T	620.2948						

VERTICAL ALIGNMENT DATA

ELEVATION AT PI	ELEVATION AT GRADE	STATION	ELEVATION AT GRADE	ELEVATION AT PI	PERCENT GRADE
		170+10.0000	PC 7347.3800		-1.033333
		171+60.0000	PI 7345.7187	7345.8300	
		173+10.0000	PT 7343.8350		
		180+50.0000	PC 7332.9933		-1.330000
7332.6630	7333.9930	181+50.0000	PI 7332.9933		
	7332.6544	182+50.0000	PT 7332.6544		-0.008644

TABLE OF ROADWAY CROSS-SLOPES (SUPERELEVATION: E=0.0800)

STATION (DN TANGENT)	SLOPE LEFT	SLOPE RIGHT	VC LENGTH
	0.0200	-0.0200	140.00 (MAX)
162+75.0000	-0.1077	0.1077	140.00 -U-
166+75.0000	-0.1077	0.1077	140.00 -U-
170+75.0000	0.0200	-0.0200	140.00 -U-
174+28.0900	0.0800	-0.0800	140.00 -U-
179+73.1300	0.0800	-0.0800	140.00 -U-
181+26.1349	0.0200	-0.0200	140.00

OFFSET PROFILE CONTROL TO PIVOT POINT = 0.0000 FEET

LIMITS OF VALID ELEVATION AND CROSS-SLOPE DATA

BEGIN	END
170+18.0900	185+00.0000

LAYOUT LINE DATA

LAYOUT LINE DEFINED AS BACK TANGENT

LAYOUT LINE INTERSECTS REF LINE AT	HCL STA	OFFSET	X	Y
	170+24.0900	0.00000000	0.0000	0.0000

SUPPRESS LISTING OPTION

THE FOLLOWING GIRDER LINES WILL NOT BE WRITTEN TO DECK ELEVATION PLOT FILE (WHEN ELEVATION SHEETS ARE REQUESTED)

Base for chord

SEGMENTED GIRDER LINE DATA

SEGMENTED GIRDER LINES ARE PARALLEL TO CHORDS ON GIRDER LINE: Base for chord

SEGMENTED GIRDER LINES ARE BROKEN AT THE FOLLOWING BENT LINES

*REF LINE*	OFFSET OF BASE CHORD FOR GIRDER PATTERN SHIFT
CL ABUT 1	0.000000
CL PIER 2	0.000000
CL PIER 3	0.000000
CL ABUT 4	0.000000

DEAD LOAD DEFLECTION DATA

DEFLECTIONS AT TENTH POINTS FROM FITTED CURVE

0.0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0

FOR BENT LINE: CL ABUT 1 07 CARD(S): 1 GIRDER LINES REFERENCED BY: H

WARNING: NOT ENOUGH DEFLECTION VALUES GIVEN FOR ORDINARY CURVE FIT

INCH	0.0000	-0.0288	-0.0512	-0.0672	-0.0768	-0.0800	-0.0768	-0.0672	-0.0512	-0.0288	0.0000	INCH	A4= 0.00000
FOOT	0.0000	-0.0024	-0.0043	-0.0056	-0.0064	-0.0067	-0.0064	-0.0056	-0.0043	-0.0024	0.0000	FOOT	A3= 0.00000
													A2= 0.00000
													A1= 0.00000
													A0= 0.320000

SLOPE -0.026667

DEFLECTIONS SHOW SIGNIFICANT UPLIFT

FOR BENT LINE: \* UNKNOW \* 07 CARD(S): 1 GIRDER LINES REFERENCED BY: H

WARNING: NOT ENOUGH DEFLECTION VALUES GIVEN FOR ORDINARY CURVE FIT

INCH	0.0000	0.7524	1.3376	1.7556	2.0064	2.0900	2.0064	1.7556	1.3376	0.7524	0.0000	INCH	A4= 0.00000
FOOT	0.0000	0.0627	0.1115	0.1463	0.1672	0.1742	0.1672	0.1463	0.1115	0.0627	0.0000	FOOT	A3= 0.00000
													A2= 0.00000
													A1= 0.00000
													A0=-8.36000

SLOPE 0.696667

-0.696667 SLOPE

FOR BENT LINE: \* UNKNOW \* 07 CARD(S): 1 GIRDER LINES REFERENCED BY: H

WARNING: NOT ENOUGH DEFLECTION VALUES GIVEN FOR ORDINARY CURVE FIT

INCH	0.0000	-0.0504	-0.0896	-0.1176	-0.1344	-0.1400	-0.1344	-0.1176	-0.0896	-0.0504	0.0000	INCH	A4= 0.00000
FOOT	0.0000	-0.0042	-0.0075	-0.0098	-0.0112	-0.0117	-0.0112	-0.0098	-0.0075	-0.0042	0.0000	FOOT	A3= 0.00000
													A2= 0.00000
													A1= 0.00000
													A0=0.560000

SLOPE -0.046667

DEFLECTIONS SHOW SIGNIFICANT UPLIFT

0.0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0

BENT LINE DESCRIPTION	INTERSECTION POINT STATION	OFFSET	FROM LAYOUT LINE ELEVATION	ORDINATE X	PROJECT COORDINATES NORTHING Y	EASTING	PROJECT COORDINATES Y-AXIS	BENT LINE SKEW D	GIRDER LINE LENGTH FROM REF LINE M	ROADWAY CROSS-SLOPE
-----------------------	----------------------------	--------	----------------------------	------------	--------------------------------	---------	----------------------------	------------------	------------------------------------	---------------------

\* HORIZONTAL CONTROL LINE \* AT FINISHED GRADE

*REF LINE*	170+24.0900	0.0000	7347.2334	0.0000	0.0000	696502.8100	1009473.3200	0.0000	0 00 00.00	0.0000 +/- .003816
ASLAB JT1	172+14.2400	0.0000	7345.0633	5.8475	189.9880	696637.7964	1009607.1419	7.0554	28 44 08.17	190.1500 +/- .070153
SC cor dck	172+28.0900	0.0000	7344.8912	7.2192	203.7698	696646.9423	1009617.5425	8.7668	28 28 44.00	204.0000 +/- .073137
BF ABUT 1	172+34.2400	0.0000	7344.8142	7.8910	209.8830	696650.9559	1009622.2022	9.5210	27 34 12.00	210.1500 +/- .074290
CL ABUT 1	172+35.6496	0.0000	7344.7965	8.0505	211.2835	696651.8716	1009623.2739	9.7134	27 29 09.14	211.5596 +/- .074539
BK BRG P2	173+20.1100	0.0000	7343.7005	1	21.3450	696703.7980	1009689.8518	21.8025	0 10 44.58	296.0200 +/- .080000
CL PIER 2	173+23.1100	0.0000	7343.6606	0.0	21.9518	696705.5333	1009692.2990	22.4223	0 00 00.00	299.0200 +/- .080000
AH BRG P2	173+26.1100	0.0000	7343.6207	10	22.5677	696707.2611	1009694.7515	23.0515	-0 10 44.58	302.0200 +/- .080000
BK BRG P3	174+79.2900	0.0000	7341.5834	1	66.0500	696784.9283	1009826.5929	70.8729	0 10 44.58	455.2000 +/- .080000
BegRamp-	174+82.0375	0.0000	7341.5469	67.0418	449.8093	696786.1263	1009829.0655	72.6587	1 25 57.16	457.9475 +/- .080000
CL PIER 3	174+82.2900	0.0000	7341.5435	0.0	67.1334	696786.2360	1009829.2930	72.0353	0 00 00.00	458.2000 +/- .080000
AH BRG P3	174+85.2900	0.0000	7341.5036	10	68.2255	696787.5351	1009831.9970	73.2072	-0 10 44.58	461.2000 +/- .080000
BegInRamp	175+06.0400	0.0000	7341.2277	76.0177	472.0696	696796.2891	1009850.8096	82.3865	0 00 00.00	481.9500 +/- .080000
CL ABUT 4	175+38.3281	0.0000	7340.7982	1	88.9643	696809.0967	1009880.4473	128.0084	21 22 12.32	514.2381 +/- .080000
BF ABUT 4	175+39.6700	0.0000	7340.7804	89.5238	502.8665	696809.6074	1009881.6882	128.8135	21 17 24.00	515.5800 +/- .080000
ASLAB JT4	175+59.6700	0.0000	7340.5144	0.0	98.0647	696817.0121	1009900.2666	141.1027	20 05 46.81	535.5800 +/- .080000

\* LAYOUT LINE \* AT FINISHED GRADE

*REF LINE*	170+24.0900	0.0000	7347.2334	0.0000	0.0000	696502.8100	1009473.3200	0.0000	0 00 00.00	0.0000 +/- .003816
*TS OR PC*	170+24.0900	0.0000	7347.2334	0.0000	0.0000	696502.8100	1009473.3200	0.0000	0 00 00.00	0.0000 +/- .003816
ASLAB JT1	172+17.6116	-6.1921	7345.4608	0.0000	193.9359	696644.6714	1009605.5565	0.0000	34 01 29.01	193.9359 +/- .070929
SC cor dck	172+32.2370	-7.7150	7345.4097	0.0000	208.7438	696655.5032	1009615.6533	0.0000	34 33 59.63	208.7438 +/- .073926
BF ABUT 1	172+38.6082	-8.4499	7345.3934	0.0000	215.2105	696660.2335	1009620.0627	0.0000	34 01 29.01	215.2105 +/- .075045
CL ABUT 1	172+40.0927	-8.6274	7345.3902	0.0000	216.7187	696661.3367	1009621.0911	0.0000	34 01 29.01	216.7187 +/- .075289
BK BRG P2	173+20.1766	-21.8024	7345.4438	0.0000	299.1067	696721.6023	1009677.2679	0.0000	11 45 31.55	299.1067 +/- .080000
CL PIER 2	173+23.1100	-22.4223	7345.4544	0.0000	302.1710	696723.8438	1009679.3573	0.0000	11 45 31.55	302.1710 +/- .080000
AH BRG P2	173+26.0397	-23.0514	7345.4658	0.0000	305.2353	696726.0853	1009681.4467	0.0000	11 45 31.55	305.2353 +/- .080000
BK BRG P3	174+79.4962	-70.8725	7347.2505	0.0000	472.9446	696848.7623	1009795.8004	0.0000	21 15 32.83	472.9446 +/- .080000
CL PIER 3	174+82.2900	-72.0353	7347.3064	0.0000	476.1636	696851.1170	1009797.9953	0.0000	21 15 32.83	476.1636 +/- .080000
BegRamp-	174+83.7262	-72.6376	7347.3354	0.0000	477.8213	696852.3296	1009799.1256	0.0000	22 40 35.73	477.8213 +/- .080000
AH BRG P3	174+85.0774	-73.2069	7347.3630	0.0000	479.3827	696853.4717	1009800.1902	0.0000	21 15 32.83	479.3827 +/- .080000
BegInRamp	175+06.0400	-82.3865	7347.8186	0.0000	503.8320	696871.3560	1009816.8611	0.0000	22 40 35.73	503.8320 +/- .080000
CL ABUT 4	175+79.7950	-120.2149	7349.8639	0.0000	593.6875	696937.0841	1009878.1297	0.0000	45 58 25.45	593.6875 +/- .080000
BF ABUT 4	175+81.2171	-121.0348	7349.9106	0.0000	595.4861	696938.3997	1009879.3561	0.0000	45 58 25.45	595.4861 +/- .080000
ASLAB JT4	176+02.2444	-133.5871	7350.6351	0.0000	622.4066	696958.0917	1009897.7120	0.0000	45 58 25.45	622.4066 +/- .080000

NOTES:

- POSITIVE ROADWAY CROSS SLOPE IS UPWARDS FROM THE PROFILE GRADE LINE.
- THE GIVEN STATIONS, COORDINATES, OFFSETS, AND LENGTHS DEFINE THE LAYOUT OF THE STRUCTURE IN A TWO-DIMENSIONAL HORIZONTAL PLANE. ELEVATIONS DEFINE THE FINAL GRADE OF THE FINISHED CONCRETE DECK. FABRICATION OF STRUCTURAL COMPONENTS THROUGH THE DIRECT USE OF THIS INFORMATION IS NOT INTENDED NOR ADVISED.
- THEORETICAL DECK ELEVATIONS AT GIRDER TENTH POINTS ARE BASED ON THE PREDICTED GIRDER ERECTION CAMBERS SHOWN IN THE GIRDER SCHEDULE AND THE THEORETICAL BEARING SEAT ELEVATIONS FOR ABUTMENTS AND PIERS. CONTRACTOR SHALL SUBMIT FOR REVIEW BY THE ENGINEER THE ACTUAL GIRDER TENTH POINT ELEVATIONS PRIOR TO SETTING OF DECK FORMS. ACTUAL GIRDER CAMBERS EXCEEDING THE VALUES SHOWN IN THE GIRDER SCHEDULE WILL REQUIRE ADJUSTMENT TO THE DECK ELEVATIONS.

Print Date: 11/30/2012

File Name: I883



Design Detail Quantities tables with columns for DATE, INITIAL, JCF, and I-12.

Table for Girder Line A, SEGMENTED GIRD LINE, 0.250000 FEET BELOW FINISHED GRADE. Columns include BENT LINE, STATION, OFFSET, ELEVATION, ELEV+DL, X, Y, NORTHING, EASTING, BENT LNTH, SKEW, GIRDER LNTH, CRS-SLP.

Table for Girder Line B, SEGMENTED GIRD LINE, 0.250000 FEET BELOW FINISHED GRADE. Columns include BENT LINE, STATION, OFFSET, ELEVATION, ELEV+DL, X, Y, NORTHING, EASTING, BENT LNTH, SKEW, GIRDER LNTH, CRS-SLP.

Table for Girder Line C, SEGMENTED GIRD LINE, 0.0000 FT FROM BASE CHORD, 0.250000 FEET BELOW FINISHED GRADE. Columns include BENT LINE, STATION, OFFSET, ELEVATION, ELEV+DL, X, Y, NORTHING, EASTING, BENT LNTH, SKEW, GIRDER LNTH, CRS-SLP.

Table for Girder Line D, SEGMENTED GIRD LINE, 0.0000 FT FROM BASE CHORD, 0.250000 FEET BELOW FINISHED GRADE. Columns include BENT LINE, STATION, OFFSET, ELEVATION, ELEV+DL, X, Y, NORTHING, EASTING, BENT LNTH, SKEW, GIRDER LNTH, CRS-SLP.

Print Date: 11/30/2012
File Name: 18832BRDG\_L170\_DeckElev02.dgn
Horiz. Scale: NONE Vert. Scale: NONE
Staff Bridge Branch - Unit 0221 STW
ATKINS 4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276

Sheet Revisions table with columns: Date, Comments, Init.

Colorado Department of Transportation
425 A Corporate Circle Golden, CO 80401 Phone: 720-497-6918 FAX: 720-497-6901
Region 1 CRC

As Constructed EB I70 OVER CLEAR CREEK BRIDGE DECK ELEVATIONS (SHEET 2 OF 5)
No Revisions:
Revised:
Void:
Designer: K. Saindon
Detailer: E. Schawo
Structure Numbers: F-15-BR
Sheet Subset: BRIDGE Subset Sheets: B43 of 46

Project No./Code IM 0703-390
Sheet Number 91

18026 2:09:46 PM c:\pw\_work\pws\jpw1\common\dms25966\18832BRDG\_170\_DeckElev03.dgn

Design	DATE	INITIAL	DATE	INITIAL
	10-12	JCS	11-12	JCS
Detail	DATE	INITIAL	DATE	INITIAL
	10-12	JCS	11-12	JCS
Quantities	DATE	INITIAL	DATE	INITIAL
	10-12	JCS	11-12	JCS

Girder Line D		SEGMENTED GIRDER LINE				11.0000 FT FROM BASE CHORD				0.250000 FEET BELOW FINISHED GRADE				RT EDGE/DECK		PARALLEL TO HORIZONTAL CONTROL				0.250000 FEET BELOW FINISHED GRADE						
BENT LINE	STATION	OFFSET	ELEVATION	ELEV+DL	X	Y	NORTHING	EASTING	BENT LNTH	SKREW	GIRDER LNTH	CRS-SLP	BENT LINE	STATION	OFFSET	ELEVATION	ELEV+DL	X	Y	NORTHING	EASTING	BENT LNTH	SKREW	GIRDER LNTH	CRS-SLP	
*REF LINE*	170+24.0900	30.7164	7346.8662		30.7164	0.0000	696481.8658	1009495.7886	30.7164	-1 57 39.31	0.0000	-0.003816	*REF LINE*	170+24.0900	47.5000	7346.8022		47.5000	0.0000	696470.4218	1009508.0656	47.5000	0 00 00.00	0.0000	-0.003816	
ASLAB JT1	171+95.9039	32.2894	7342.9272		36.5124	169.2850	696601.7434	1009615.4564	44.0547	32 03 49.70	169.3842	-0.065375	ASLAB JT1	171+86.8383	47.5000	7342.1714		51.0588	159.4642	696584.6410	1009619.4005	61.6060	30 09 00.54	159.5362	-0.062665	
SC cor dck	172+10.2888	31.6238	7342.6735		36.9906	183.2574	696611.6378	1009625.3335	44.9208	32 36 20.32	183.3648	-0.069203	SC cor dck	172+00.8712	47.5000	7341.8063		52.0485	172.8828	696593.7817	1009629.2740	63.2064	29 59 42.05	172.9913	-0.066763	
BF ABUT 1	172+17.3170	31.2304	7342.5922		37.2243	190.0790	696616.4685	1009630.1567	44.9137	32 03 49.70	190.1903	-0.070862	BF ABUT 1	172+08.0126	47.5000	7341.6298		52.7150	179.6882	696598.3735	1009634.3287	63.4836	29 04 34.92	179.8202	-0.066336	
CL ABUT 1	172+18.8361	31.1392	7342.5922	342 5392	37.2748	191.5531	696617.5123	1009631.1977	44.9746	32 03 49.70	191.6654	-0.071203	CL ABUT 1	172+09.5093	47.5000	7341.5936	341.5936	52.7393	181.1125	696599.3306	1009635.3908	63.6336	28 59 43.80	181.2499	-0.069010	
CL ABUT 1	172+19.2413	30.4148	7342.5830	342 5830	36.9918	192.0142	696618.3153	1009631.0125	44.1506	25 11 21.18	0.0000	-0.071293	CL ABUT 1	172+12.6721	47.5000	7341.5180	341.5173	53.0085	184.1198	696601.3469	1009637.6383	4.9788			184.2650	-0.069781
F-1	172+29.2947	30.9205	7342.3575	342 3551	38.0896	201.6500	696624.3425	1009638.6784	9.7515	0.0000	-0.073371	X-0	172+12.7829	47.5000	7341.5154	341.5146	53.0181	184.2251	696601.4173	1009637.7171	6.4277			184.3753	-0.069808	
F-2	172+39.3643	31.3246	7342.1451	342 1408	39.5875	211.2857	696630.3695	1009646.3442	19.5030	-0.075170	X-1	172+23.5181	47.5000	7341.2682	341.2652	54.0004	194.4077	696608.1966	1009645.3787	5.8344			194.6049	-0.072212		
F-3	172+49.4416	31.6266	7341.9470	341.9414	41.0853	220.9215	696636.3967	1009654.0101	29.2544	-0.076685	X-2	172+34.2718	47.5000	7341.0348	341.0301	55.0933	204.5731	696614.8866	1009653.1095	5.3528			204.8290	-0.074296		
F-4	172+59.5243	31.8261	7341.7639	341.7575	42.5831	230.5573	696642.4239	1009661.6759	39.0059	-0.077917	X-3	172+45.0230	47.5000	7340.8157	340.8098	56.2993	214.7210	696621.4873	1009660.9111	4.9858			215.0483	-0.076056		
F-5	172+69.6102	31.9233	7341.5965	341.5899	44.0809	240.1930	696648.4510	1009669.3417	48.0754	-0.078864	X-4	172+55.7707	47.5000	7340.6109	340.6044	57.6184	224.8513	696627.9981	1009668.7834	4.7333			225.2642	-0.077492		
F-6	172+79.6971	31.9180	7341.4452	341.4388	45.5787	249.8288	696654.4781	1009677.0076	58.5089	-0.079526	X-5	172+66.5160	47.5000	7340.4203	340.4136	59.0505	234.9640	696634.4189	1009676.7263	4.5951			235.4779	-0.078604		
F-7	172+89.7828	31.8102	7341.3101	341.3045	47.0765	259.4646	696660.5053	1009684.6734	68.2604	-0.079903	X-6	172+77.2604	47.5000	7340.2440	340.2377	60.5956	245.0591	696640.7498	1009684.7040	4.5713			245.6906	-0.079392		
F-8	172+99.8651	31.6000	7341.1913	341.1870	48.5743	269.1003	696666.5324	1009692.3392	78.0119	-0.080000	X-7	172+88.0052	47.5000	7340.0819	340.0764	62.2536	255.1367	696646.9909	1009692.8243	4.6617			255.9038	-0.079858		
F-9	173+09.9416	31.2875	7341.0828	341.0804	50.0721	278.7361	696672.5596	1009700.0051	87.7633	-0.080000	X-8	172+98.7517	47.5000	7339.9340	339.9298	64.0246	265.1968	696653.1421	1009700.9793	4.8665			266.1185	-0.079858		
BK BRG P2	173+20.0103	30.8727	7340.9820	340.9820	51.5699	288.3719	696678.5867	1009707.6709	97.5148	-0.080000	X-9	173+09.5013	47.5000	7339.7916	339.7893	65.9087	275.2392	696659.2033	1009709.2049	5.1857			276.3363	-0.080000		
CL PIER 2	173+23.1100	30.7243	7340.9527		52.0313	291.3401	696680.4433	1009710.0323	53.1467	2 55 23.72	100.5187	-0.080000	BK BRG P2	173+19.9538	47.5000	7339.6526		67.8484	284.9833	696665.0084	1009717.2679	69.3028	0 11 18.13		286.2716	-0.080000
CL PIER 2	173+23.1100	30.7479	7340.9508		52.0544	291.3353	696680.4240	1009710.0459	53.1702	-4 45 00.64	0.0000	-0.080000	CL PIER 2	173+23.1100	47.5000	7339.6486		67.9059	285.2641	696665.1746	1009717.5014	5.6195			286.5582	-0.080000
AH BRG P2	173+26.2100	30.9924	7340.8900		52.9099	294.2216	696681.9520	1009712.6398	53.1402	-4 45 00.64	3.0103	-0.080000	AH BRG P2	173+26.2662	47.5000	7339.5687		68.9772	290.4128	696668.2103	1009721.7957	5.4873			289.2716	-0.080000
F-1	173+41.4614	32.0523	7340.6024		57.1122	308.4004	696689.4582	1009725.3816	17.9888	-0.080000	X-0	173+25.7881	47.5000	7339.5750		69.0712	290.8574	696668.4715	1009722.1676	70.5517	-0 11 18.13		291.8172	-0.080000		
F-2	173+56.7438	32.8776	7340.3331		61.3146	322.5792	696696.9644	1009738.1235	32.5872	-0.080000	X-1	173+41.1942	47.5000	7339.3701		72.1163	304.7161	696676.5326	1009733.8447	4.4325			306.4610	-0.080000		
F-3	173+72.0495	33.4675	7340.0823		65.5169	336.7580	696704.4706	1009750.8653	62.1641	-0.080000	X-2	173+56.5845	47.5000	7339.1654		75.4810	318.9525	696684.6521	1009746.0131	3.6130			321.0898	-0.080000		
F-4	173+87.3709	33.8216	7339.8502		69.7193	350.9368	696711.9768	1009763.6072	76.9526	-0.080000	X-3	173+71.9629	47.5000	7338.9609		79.0705	333.1223	696692.5695	1009758.3006	3.0280			335.7073	-0.080000		
F-5	174+02.7000	33.9397	7339.6369		78.1240	379.2944	696726.9892	1009789.0910	91.7410	-0.080000	X-4	173+87.3334	47.5000	7338.7565		82.8846	347.2255	696700.2852	1009770.7069	2.6772			350.3173	-0.080000		
F-6	174+18.0291	33.8216	7339.4425		82.3264	393.4732	696734.4963	1009801.8329	106.5295	-0.080000	X-5	174+02.7000	47.5000	7338.5521		86.9230	361.2622	696707.7992	1009783.2319	2.5603			364.9236	-0.080000		
F-7	174+33.3505	33.4675	7339.2670		86.5287	407.6250	696742.0016	1009814.5747	121.3179	-0.080000	X-6	174+18.0666	47.5000	7338.3477		91.1855	375.2325	696715.1119	1009795.8756	2.6772			379.5298	-0.080000		
F-8	174+48.6562	32.8776	7339.1107		90.7311	421.8308	696749.5077	1009827.3166	136.1064	-0.080000	X-7	174+33.4371	47.5000	7338.1433		95.6722	389.1363	696722.2230	1009808.6380	3.0280			394.1398	-0.080000		
F-9	174+63.9386	32.0523	7338.9734		94.9334	436.0096	696757.0139	1009840.0584	150.8948	4 45 00.64	150.8948	-0.080000	BK BRG P3	174+79.1338	47.5000	7337.5355		100.3196	416.7443	696735.8397	1009834.5196	4.4325			423.3861	-0.080000
BK BRG P3	174+81.2400	30.8317	7338.8410		95.4993	437.9189	696758.0247	1009841.7743	103.5004	6 10 03.55	152.8862	-0.080000	BK BRG P3	174+79.6119	47.5000	7337.5292		110.3178	430.0241	696742.1457	1009847.2307	118.3731	0 11 18.13		437.5755	-0.080000
CL PIER 3	174+82.2900	30.7479	7338.8337		95.7889	438.8958	696758.5418	1009842.6522	102.7833	4 45 00.64	153.9052	-0.080000	CL PIER 3	174+82.2900	47.5000	7337.4935		110.4813	430.4481	696742.3443	1009847.6394	5.4873			438.0299	-0.080000
CL PIER 3	174+82.2900	30.7135	7338.8365		95.7568	438.9083	696758.5729	1009842.6372	102.7488	-1 26 12.87	0.0000	-0.080000	BegRamp-	174+80.7878	47.5000	7337.5135		110.8843	431.4906	696742.8321	1009848.6450	120.1743	1 30 25.67		439.1476	-0.080000
AH BRG P3	174+85.3894	30.7839	7338.7896		96.9147	441.6769	696759.8085	1009845.3720	103.9912	-1 26 12.87	3.0009	-0.080000	CL PIER 3	174+82.2900	47.5000	7337.4935		112.4010	432.8217	696743.4535	1009849.9306	119.5353	0 00 00.00		440.5755	-0.080000
F-1	174+89.4333	30.8612	7338.7296		98.4252	445.2886	696761.4205	1009848.9396	6.9158	-0.080000	X-0	174+85.2954	47.5000	7337.4536		112.4410	435.4824	696744.6906	1009852.5055	5.7141			443.4322	-0.080000		
F-2	174+93.4779	30.9220	7338.6710		99.9357	4																				

18026 2:10:20 PM c:\pwwork\work\pws\jpw\1\common\dms25966\18832BRDG\_170\_DeckElev04.dgn

Design		Detail		Quantities	
Designed By	Checked By	INITIAL	DATE	INITIAL	DATE
JCF	JCF	KCS	11-12	KCS	11-12
Detiled By	Checked By	ERS	11-12	JCF	11-12
JCF	JCF	JCF	11-12	JCF	11-12

STATION	OFFSET	ELEVATION	CROSS-SLOPE	STATION	OFFSET	ELEVATION	CROSS-SLOPE
170+90	-4.0000	7346.6282	+0.026638	175+10	-4.0000	7341.4950	+0.080000
171+00	-4.0000	7346.5311	+0.030299	175+20	-4.0000	7341.3620	+0.080000
171+10	-4.0000	7346.4333	+0.034011	175+30	-4.0000	7341.2290	+0.080000
171+20	-4.0000	7346.3346	+0.037776	175+40	-4.0000	7341.0960	+0.080000
171+30	-4.0000	7346.2352	+0.041593	175+50	-4.0000	7340.9630	+0.080000
171+40	-4.0000	7346.1350	+0.045462	175+60	-4.0000	7340.8300	+0.080000
171+50	-4.0000	7346.0339	+0.049376	175+70	-4.0000	7340.6970	+0.080000
171+60	-4.0000	7345.9319	+0.053293	175+80	-4.0000	7340.5640	+0.080000
171+70	-4.0000	7345.8282	+0.057021	175+90	-4.0000	7340.4310	+0.080000
171+80	-4.0000	7345.7223	+0.060469	176+00	-4.0000	7340.2980	+0.080000
171+90	-4.0000	7345.6143	+0.063637	176+10	-4.0000	7340.1650	+0.080000
172+00	-4.0000	7345.5043	+0.066524	176+20	-4.0000	7340.0320	+0.080000
172+10	-4.0000	7345.3921	+0.069132	176+30	-4.0000	7339.8990	+0.080000
172+20	-4.0000	7345.2778	+0.071459	176+40	-4.0000	7339.7660	+0.080000
172+30	-4.0000	7345.1614	+0.073507	176+50	-4.0000	7339.6330	+0.080000
172+40	-4.0000	7345.0429	+0.075274	176+60	-4.0000	7339.5000	+0.080000
170+90	0.0000	7346.5217	+/-0.026638	175+10	0.0000	7341.1750	+/-0.080000
171+00	0.0000	7346.4099	+/-0.030299	175+20	0.0000	7341.0420	+/-0.080000
171+10	0.0000	7346.2972	+/-0.034011	175+30	0.0000	7340.9090	+/-0.080000
171+20	0.0000	7346.1835	+/-0.037776	175+40	0.0000	7340.7760	+/-0.080000
171+30	0.0000	7346.0688	+/-0.041593	175+50	0.0000	7340.6430	+/-0.080000
171+40	0.0000	7345.9531	+/-0.045462	175+60	0.0000	7340.5100	+/-0.080000
171+50	0.0000	7345.8364	+/-0.049376	175+70	0.0000	7340.3770	+/-0.080000
171+60	0.0000	7345.7187	+/-0.053293	175+80	0.0000	7340.2440	+/-0.080000
171+70	0.0000	7345.6001	+/-0.057021	175+90	0.0000	7340.1110	+/-0.080000
171+80	0.0000	7345.4804	+/-0.060469	176+00	0.0000	7339.9780	+/-0.080000
171+90	0.0000	7345.3598	+/-0.063637	176+10	0.0000	7339.8450	+/-0.080000
172+00	0.0000	7345.2382	+/-0.066524	176+20	0.0000	7339.7120	+/-0.080000
172+10	0.0000	7345.1156	+/-0.069132	176+30	0.0000	7339.5790	+/-0.080000
172+20	0.0000	7344.9919	+/-0.071459	176+40	0.0000	7339.4460	+/-0.080000
172+30	0.0000	7344.8674	+/-0.073507	176+50	0.0000	7339.3130	+/-0.080000
172+40	0.0000	7344.7418	+/-0.075274	176+60	0.0000	7339.1800	+/-0.080000
170+90	12.0000	7346.2020	-0.026638	175+10	12.0000	7340.2150	-0.080000
171+00	12.0000	7346.0464	-0.030299	175+20	12.0000	7340.0820	-0.080000
171+10	12.0000	7345.8891	-0.034011	175+30	12.0000	7339.9490	-0.080000
171+20	12.0000	7345.7302	-0.037776	175+40	12.0000	7339.8160	-0.080000
171+30	12.0000	7345.5697	-0.041593	175+50	12.0000	7339.6830	-0.080000
171+40	12.0000	7345.4076	-0.045462	175+60	12.0000	7339.5500	-0.080000
171+50	12.0000	7345.2439	-0.049376	175+70	12.0000	7339.4170	-0.080000
171+60	12.0000	7345.0792	-0.053293	175+80	12.0000	7339.2840	-0.080000
171+70	12.0000	7344.9158	-0.057021	175+90	12.0000	7339.1510	-0.080000
171+80	12.0000	7344.7548	-0.060469	176+00	12.0000	7339.0180	-0.080000
171+90	12.0000	7344.5962	-0.063637	176+10	12.0000	7338.8850	-0.080000
172+00	12.0000	7344.4399	-0.066524	176+20	12.0000	7338.7520	-0.080000
172+10	12.0000	7344.2860	-0.069132	176+30	12.0000	7338.6190	-0.080000
172+20	12.0000	7344.1344	-0.071459	176+40	12.0000	7338.4860	-0.080000
172+30	12.0000	7343.9853	-0.073507	176+50	12.0000	7338.3530	-0.080000
172+40	12.0000	7343.8385	-0.075274	176+60	12.0000	7338.2200	-0.080000
170+90	24.0000	7345.8824	-0.026638	175+10	24.0000	7339.2550	-0.080000
171+00	24.0000	7345.6828	-0.030299	175+20	24.0000	7339.1220	-0.080000
171+10	24.0000	7345.4810	-0.034011	175+30	24.0000	7338.9890	-0.080000
171+20	24.0000	7345.2769	-0.037776	175+40	24.0000	7338.8560	-0.080000
171+30	24.0000	7345.0706	-0.041593	175+50	24.0000	7338.7230	-0.080000
171+40	24.0000	7344.8620	-0.045462	175+60	24.0000	7338.5900	-0.080000
171+50	24.0000	7344.6514	-0.049376	175+70	24.0000	7338.4570	-0.080000
171+60	24.0000	7344.4397	-0.053293	175+80	24.0000	7338.3240	-0.080000
171+70	24.0000	7344.2316	-0.057021	175+90	24.0000	7338.1910	-0.080000
171+80	24.0000	7344.0292	-0.060469	176+00	24.0000	7338.0580	-0.080000
171+90	24.0000	7343.8325	-0.063637	176+10	24.0000	7337.9250	-0.080000
172+00	24.0000	7343.6416	-0.066524	176+20	24.0000	7337.7920	-0.080000
172+10	24.0000	7343.4564	-0.069132	176+30	24.0000	7337.6590	-0.080000
172+20	24.0000	7343.2769	-0.071459	176+40	24.0000	7337.5260	-0.080000
172+30	24.0000	7343.1032	-0.073507	176+50	24.0000	7337.3930	-0.080000
172+40	24.0000	7342.9352	-0.075274	176+60	24.0000	7337.2600	-0.080000
170+90	36.0000	7345.5627	-0.026638	175+10	36.0000	7338.2950	-0.080000
171+00	36.0000	7345.3192	-0.030299	175+20	36.0000	7338.1620	-0.080000
171+10	36.0000	7345.0728	-0.034011	175+30	36.0000	7338.0290	-0.080000
171+20	36.0000	7344.8236	-0.037776	175+40	36.0000	7337.8960	-0.080000
171+30	36.0000	7344.5715	-0.041593	175+50	36.0000	7337.7630	-0.080000
171+40	36.0000	7344.3165	-0.045462	175+60	36.0000	7337.6300	-0.080000
171+50	36.0000	7344.0589	-0.049376	175+70	36.0000	7337.4970	-0.080000
171+60	36.0000	7343.8002	-0.053293	175+80	36.0000	7337.3640	-0.080000
171+70	36.0000	7343.5473	-0.057021	175+90	36.0000	7337.2310	-0.080000
171+80	36.0000	7343.3036	-0.060469	176+00	36.0000	7337.0980	-0.080000
171+90	36.0000	7343.0689	-0.063637	176+10	36.0000	7336.9650	-0.080000
172+00	36.0000	7342.8433	-0.066524	176+20	36.0000	7336.8320	-0.080000
172+10	36.0000	7342.6288	-0.069132	176+30	36.0000	7336.6990	-0.080000
172+20	36.0000	7342.4194	-0.071459	176+40	36.0000	7336.5660	-0.080000
172+30	36.0000	7342.2211	-0.073507	176+50	36.0000	7336.4330	-0.080000
172+40	36.0000	7342.0319	-0.075274	176+60	36.0000	7336.3000	-0.080000
170+90	46.0000	7345.2963	-0.026638	175+10	46.0000	7337.4950	-0.080000
171+00	46.0000	7345.0162	-0.030299	175+20	46.0000	7337.3620	-0.080000
171+10	46.0000	7344.7327	-0.034011	175+30	46.0000	7337.2290	-0.080000
171+20	46.0000	7344.4458	-0.037776	175+40	46.0000	7337.0960	-0.080000
171+30	46.0000	7344.1555	-0.041593	175+50	46.0000	7336.9630	-0.080000
171+40	46.0000	7343.8619	-0.045462	175+60	46.0000	7336.8300	-0.080000
171+50	46.0000	7343.5651	-0.049376	175+70	46.0000	7336.6970	-0.080000
171+60	46.0000	7343.2673	-0.053293	175+80	46.0000	7336.5640	-0.080000
171+70	46.0000	7342.9771	-0.057021	175+90	46.0000	7336.4310	-0.080000
171+80	46.0000	7342.6989	-0.060469	176+00	46.0000	7336.2980	-0.080000
171+90	46.0000	7342.4325	-0.063637	176+10	46.0000	7336.1650	-0.080000
172+00	46.0000	7342.1781	-0.066524	176+20	46.0000	7336.0320	-0.080000
172+10	46.0000	7341.9355	-0.069132	176+30	46.0000	7335.8990	-0.080000
172+20	46.0000	7341.7048	-0.071459	176+40	46.0000	7335.7660	-0.080000
172+30	46.0000	7341.4860	-0.073507	176+50	46.0000	7335.6330	-0.080000
172+40	46.0000	7341.2792	-0.075274	176+60	46.0000	7335.5000	-0.080000

State of Colorado  
 Department of Transportation  
 Staff Bridge Design  
 Bridge Geometry Project Coordinate Converter  
 Version 1.00

Run date & time = Wed Oct 24 17:00:50 2012

Input Northing Offset = 696804.220000  
 Input Easting Offset = 1010361.380000  
 Input Bearing = S 76 35 5.0000 E

DESCRIPTION

Span 3 and Upstation approach ramp control  
 Units: feet;  
 Project: IM 0703-390; Subaccount: 19035;  
 Designer: KCS; Detailer: ES;  
 Location: I-70 EB over Clear Creek (F-15-BR);  
 3 span BT-84, integral pier caps

HORIZONTAL ALIGNMENT DATA

PC	400+00.0029	T	261.6671				
PI	402+61.6700	Lc	505.7848	DELTA	36 13 27.00 RT	Dc	7 09 43.10
PT	405+05.7877	T	261.6671	RADIUS			800.000000

OFFSET HORIZ CONTROL TO PROFILE CONTROL LINE = -36.0000 FEET

VERTICAL ALIGNMENT DATA

ELEVATION AT PI	ELEVATION AT GRADE	STATION	ELEVATION AT GRADE	ELEVATION AT PI	PERCENT GRADE
					-1.033333
		395+03.9600	PC 7347.3800		
		396+53.9600	PI 7345.7187	7345.8300	
		398+03.9600	PT 7343.8350		
					-1.330000
7332.6630	7333.9930	PC	405+43.9600		
	7332.9933	PI	406+43.9600		
	7332.6544	PT	407+43.9600		
					-0.008644

TABLE OF ROADWAY CROSS-SLOPES (SUPERELEVATION: E=0.0800)

STATION	SLOPE LEFT	SLOPE RIGHT	VC LENGTH
(ON TANGENT)	0.0800	-0.0800	75.00 (MAX)

OFFSET PROFILE CONTROL TO PIVOT POINT = 0.0000 FEET

LIMITS OF VALID ELEVATION AND CROSS-SLOPE DATA

BEGIN	399+00.0000	END	403+00.0000
-------	-------------	-----	-------------

LAYOUT LINE DATA

LAYOUT LINE DEFINED AS AHEAD TANGENT

LAYOUT LINE INTERSECTS REF LINE AT HCL STA 405+05.7900 OFFSET 0.00000000 X 0.0000 Y 0.0000

BENT LINES TO DEFINE OFFSETS FOR FLARED GIRDER LINES

INITIAL BENT: BegRamp-  
 TERMINAL BENT: BeginRamp

DEAD LOAD DEFLECTION DATA

DEFLECTIONS AT TENTH POINTS FROM FITTED CURVE

0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

FOR BENT LINE: \* UNKNOW \* 07 CARD(S): 1 GIRDER LINES REFERENCED BY: H

WARNING: NOT ENOUGH DEFLECTION VALUES GIVEN FOR ORDINARY CURVE FIT


INCH
------

18026 2:10:55 PM c:\pwwork\work\pws\pww\1\common\dms25966\18832BRDG\_170\_DeckElev05.dgn

Design		Quantities	
Designed By	Checked By	INITIAL	DATE
KCS	JCF	11-12	11-12
Detailed By		Checked By	
KCS	JCF	11-12	11-12

BENT LINE DESCRIPTION	STATION	INTERSECTION POINT OFFSET	INTERSECTION POINT ELEVATION	FROM LAYOUT LINE ORDINATE	PROJECT COORDINATES NORTHING	PROJECT COORDINATES EASTING	PROJECT COORDINATES LENGTH FROM Y-AXIS	BENT LINE SKEW	GIRDER LINE LENGTH FROM REF LINE	ROADWAY CROSS-SLOPE		
* HORIZONTAL CONTROL LINE * AT FINISHED GRADE												
BegRamp-	399+76.0000	0.0000	7338.6669		168.8155	-492.1225	696754.1868	1009843.5191	209.2639	0 00 00.00		
CL PIER 3	399+77.1360	0.0000	7338.6518		168.1442	-491.2061	696754.6272	1009844.5662	212.3447	-1 25 03.08		
AH BRG P3	399+80.1369	0.0000	7338.6118	10	166.3708	-488.7852	696755.7905	1009847.3325	210.1052	-1 25 03.08		
BegInRamp	400+00.0000	0.0000	7338.3477		154.6328	-472.7614	696763.4906	1009865.6424	191.6830	0 00 00.00		
CL ABUT 4	400+16.9379	0.0000	7338.1224	1	144.7688	-458.9925	696769.8910	1009881.3241	148.5337	22 05 00.89		
BF ABUT 4	400+18.2864	0.0000	7338.1045		143.9960	-457.8874	696770.3863	1009882.5784	147.7408	21 59 13.20		
ASLAB JT4	400+38.3637	0.0000	7337.8374		132.7125	-441.2815	696777.5092	1009901.3490	136.1638	20 32 56.65		
*REF LINE*	405+05.7900	0.0000		0.0	0.0000	0.0000	696804.2200	1010361.3800	0.0000	0 00 00.00		
* LAYOUT LINE * AT FINISHED GRADE												
CL PIER 3	399+71.8830	-212.2798	7355.7040		0.0000	-620.8896	696948.2709	1009757.4320	0.0000	-37 38 30.08		
AH BRG P3	399+74.9394	-210.0409	7355.4842		0.0000	-617.1010	696947.3919	1009761.1172	0.0000	-37 38 30.08		
BegRamp-	399+76.0000	-209.2639	7355.4080		0.0000	-615.7862	696947.0869	1009762.3961	0.0000	-36 13 27.00		
BegInRamp	400+00.0000	-191.6830	7353.6823		0.0000	-586.0358	696940.1846	1009791.3347	0.0000	-36 13 27.00		
CL ABUT 4	400+64.5270	-139.2981	7348.6333		0.0000	-492.2227	696918.4193	1009882.5881	0.0000	-12 55 39.76		
BF ABUT 4	400+65.4580	-138.6267	7348.5672		0.0000	-490.9402	696918.1217	1009883.8356	0.0000	-12 55 39.76		
ASLAB JT4	400+79.5519	-128.7306	7347.5881		0.0000	-471.7443	696913.6681	1009902.5077	0.0000	-12 55 39.76		
*ST OR PT*	405+05.7877	0.0000			0.0000	-0.0023	696804.2205	1010361.3778	0.0000	0 00 00.00		
*REF LINE*	405+05.7900	0.0000			0.0000	0.0000	696804.2200	1010361.3800	0.0000	0 00 00.00		
Girder Line E FLARED GIRDER LINE 0.250000 FEET BELOW FINISHED GRADE												
BENT LINE	STATION	OFFSET	ELEVATION	ELEV+DL	X	Y	NORTHING	EASTING	BENT LNTH	SKEW	GIRDER LNTH	CRS-SLP
BegRamp-	399+76.0000	5.9975	7337.9371		173.6538	-488.5783	696748.6582	1009845.8441	215.2614	-0 01 09.61	0.0000	-0.080000
CL PIER 3	399+77.2844	5.9979	7337.9200		172.8951	-487.5419	696749.1558	1009847.0282	218.3445	-1 26 12.69	1.2844	-0.080000
AH BRG P3	399+80.2854	5.9989	7337.8800		171.1225	-485.1204	696750.3182	1009849.7949	216.1060	-1 26 12.69	4.2854	-0.080000
F-1	399+83.6994	6.0001	7337.8345		169.1060	-482.3656	696751.6406	1009852.9424			7.6994	-0.080000
F-2	399+87.1134	6.0013	7337.7890		167.0894	-479.6108	696752.9630	1009856.0899			11.1134	-0.080000
F-3	399+90.5275	6.0024	7337.7435		165.0728	-476.8559	696754.2854	1009859.2375			14.5275	-0.080000
F-4	399+93.9415	6.0036	7337.6980		163.0562	-474.1011	696755.6079	1009862.3850			17.9415	-0.080000
F-5	399+97.3555	6.0047	7337.6525		161.0396	-471.3463	696756.9303	1009865.5325			21.3556	-0.080000
BegInRamp	400+00.0000	6.0056	7337.6172		159.4776	-469.2124	696757.9546	1009867.9705	197.6886	-0 01 09.61	24.0000	-0.080000
F-6	400+00.7754	6.0055	7337.6069		159.0230	-468.5915	696758.2527	1009868.6800			24.7696	-0.080000
F-7	400+04.2152	5.9960	7337.5819		157.0065	-465.8366	696759.5751	1009871.8275			28.1836	-0.080000
F-8	400+07.6549	5.9718	7337.5181		154.9899	-463.0818	696760.8975	1009874.9750			31.5977	-0.080000
F-9	400+11.0943	5.9330	7337.4755		152.9733	-460.3270	696762.2199	1009878.1225			35.0117	-0.080000
CL ABUT 4	400+14.5333	5.8795	7337.4340		150.9567	-457.5722	696763.5424	1009881.2700	154.8825	23 16 37.63	38.4257	-0.080000
BF ABUT 4	400+15.9039	5.8541	7337.4178		150.1530	-456.4742	696764.0694	1009882.5245	154.0578	23 16 37.63	39.7865	-0.080000
ASLAB JT4	400+36.4026	5.1952	7337.1979		138.1226	-440.0396	696771.9586	1009901.3018	141.7146	23 16 37.63	60.1537	-0.080000
RT EDGE/DECK PARALLEL TO HORIZONTAL CONTROL 0.250000 FEET BELOW FINISHED GRADE												
BENT LINE	STATION	OFFSET	ELEVATION	ELEV+DL	X	Y	NORTHING	EASTING	BENT LNTH	SKEW	GIRDER LNTH	CRS-SLP
BegRamp-	399+76.0000	11.5000	7337.4969		178.0927	-485.3266	696743.5860	1009847.9772	220.7639	0 00 00.00	-522.5193	-0.080000
CL PIER 3	399+77.4206	11.5000	7337.4780		177.2532	-484.1806	696744.1367	1009849.2867	223.8483	-1 25 03.08	-521.0988	-0.080000
X-0	399+80.2835	11.5000	7337.4399		175.5614	-481.8711	696745.2466	1009851.9257	5.5011		-518.2358	-0.080000
AH BRG P3	399+80.4215	11.5000	7337.4381		175.4799	-481.7598	696745.3000	1009852.0529	221.6087	-1 25 03.08	-518.0979	-0.080000
X-1	399+83.6975	11.5000	7337.3945		173.5439	-479.1169	696746.5700	1009855.0728	5.4999		-514.8218	-0.080000
X-2	399+87.1116	11.5000	7337.3491		171.5264	-476.3628	696747.8935	1009858.2198	5.4987		-511.4078	-0.080000
X-3	399+90.5256	11.5000	7337.3037		169.5089	-473.6086	696749.2170	1009861.3670	5.4976		-507.9937	-0.080000
X-4	399+93.9397	11.5000	7337.2583		167.4913	-470.8545	696750.5405	1009864.5140	5.4964		-504.5797	-0.080000
X-5	399+97.3537	11.5000	7337.2129		165.4738	-468.1004	696751.8640	1009867.6610	5.4953		-501.1656	-0.080000
BegInRamp	400+00.0000	11.5000	7337.1777		163.9100	-465.9656	696752.8899	1009870.1004	203.1830	0 00 00.00	-498.5193	-0.080000
X-6	400+00.7789	11.5000	7337.1673		163.4566	-465.3460	696753.1871	1009870.8083	5.4945		-497.7516	-0.080000
X-7	400+04.2427	11.5000	7337.1212		161.4477	-462.5855	696754.5008	1009873.9595	5.5041		-494.3376	-0.080000
X-8	400+07.7067	11.5000	7337.0752		159.4508	-459.8163	696755.8007	1009877.1165	5.5284		-490.9234	-0.080000
X-9	400+11.1707	11.5000	7337.0291		157.4658	-457.0384	696757.0870	1009880.2791	5.5675		-487.5092	-0.080000
CL ABUT 4	400+12.1983	11.5000	7337.0154		156.8793	-456.2127	696757.4660	1009881.2184	160.9591	22 25 22.90	-486.4964	-0.080000
BF ABUT 4	400+13.5698	11.5000	7336.9972		156.0981	-455.1095	696757.9699	1009882.4727	160.1576	22 19 29.29	-485.1446	-0.080000
X-10	400+14.6350	11.5000	7336.9830		155.4927	-454.2518	696758.3598	1009883.4475	5.6214		-484.0947	-0.080000
ASLAB JT4	400+33.9854	11.5000	7336.7257		144.6949	-438.5310	696765.2156	1009901.2445	148.4578	20 51 45.51	-465.0225	-0.080000


Print Date: 11/30/2012  
 File Name: 18832BRDG\_170\_DeckElev05.dgn  
 Horiz. Scale: NONE Vert. Scale: NONE  
 Staff Bridge Branch - Unit 0221 STW



4601 DTC Boulevard, Suite 700  
 Denver, CO 80237  
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Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation



425 A Corporate Circle  
 Golden, CO 80401  
 Phone: 720-497-6918 FAX: 720-497-6901

Region 1 CRC

As Constructed	EB 170 OVER CLEAR CREEK BRIDGE		Project No./Code
No Revisions:	DECK ELEVATIONS (SHEET 5 OF 5)		IM 0703-390
Revised:	Designer: K. Saindon	Structure Numbers	19035
Void:	Detailer: E. Schawo	Sheet Subset: BRIDGE	Sheet Number 94
		Subset Sheets: B46 of 46	

**GENERAL NOTES**

ALL STRUCTURAL STEEL NOT OTHERWISE NOTED SHALL BE PAINTED IN ACCORDANCE WITH SECTION 509 OF THE STANDARD SPECIFICATIONS. THE COLOR SHALL BE BLACK.

STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 36 (ASTM A-36).

ALL BOLTS SHALL BE 3/4" DIAMETER, HIGH STRENGTH, UNLESS OTHERWISE NOTED.

FIELD WELDING OF ANY KIND SHALL NOT BE PERMITTED ON THE STEEL GIRDERS UNLESS SPECIFICALLY CALLED FOR IN THE PLANS.

GRADE 60 REINFORCING STEEL IS REQUIRED.

ⓔ DENOTES EPOXY COATED REINFORCING STEEL.

THE FOLLOWING TABLE GIVES THE MINIMUM LAP SPLICE LENGTH FOR EPOXY COATED REINFORCING BARS PLACED IN ACCORDANCE WITH SUBSECTION 602.06. THESE SPLICE LENGTHS SHALL BE INCREASED BY 25% FOR BARS SPACED AT LESS THAN 6" ON CENTER.

BAR SIZE	#4	#5	#6	#7	#8	#9	#10	#11
SPLICE LENGTH FOR CLASS D CONCRETE	1'-3"	1'-7"	2'-5"	2'-10"	3'-8"	4'-8"	5'-11"	7'-3"

WHEN THE CONTRACTOR ELECTS TO SUBSTITUTE EPOXY COATED REINFORCEMENT FOR BLACK REINFORCING BARS, THE MINIMUM LAP SPLICE SHALL BE AS DESCRIBED ABOVE.

THE FOLLOWING TABLE GIVES THE MINIMUM LAP SPLICE LENGTH FOR BLACK REINFORCING BARS PLACED IN ACCORDANCE WITH SUBSECTION 602.06. THESE SPLICE LENGTHS SHALL BE INCREASED BY 25% FOR BARS SPACED AT LESS THAN 6" ON CENTER.

BAR SIZE	#4	#5	#6	#7	#8	#9	#10	#11
SPLICE LENGTH FOR CLASS D CONCRETE	1'-1"	1'-4"	1'-7"	1'-11"	2'-6"	3'-1"	3'-11"	4'-10"

THE ABOVE SPLICE LENGTHS MAY BE REDUCED BY 20% WHEN 3" OF CLEAR COVER EXISTS AND BAR SPACING IS 6" OR GREATER ON CENTER.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE STABILITY OF THE STRUCTURE DURING CONSTRUCTION.

E.F. = EACH FACE  
F.F. = FAR FACE  
N.F. = NEAR FACE

PERMANENT STEEL DECK FORMS ARE NOT ALLOWED.

STATIONS, ELEVATIONS, AND DIMENSIONS CONTAINED IN THESE PLANS ARE CALCULATED FROM THE "AS CONSTRUCTED PLANS". THESE STATIONS, ELEVATIONS, AND DIMENSIONS MAY BE ADJUSTED TO MEET THE EXISTING STRUCTURE. THE CONTRACTOR SHALL VERIFY ALL DEPENDENT DIMENSIONS IN THE FIELD BEFORE ORDERING OR FABRICATING ANY MATERIAL.

THE INFORMATION SHOWN ON THESE PLANS CONCERNING THE TYPE AND LOCATION OF UNDERGROUND UTILITIES IS NOT GUARANTEED TO BE ACCURATE OR ALL INCLUSIVE. THE CONTRACTOR IS RESPONSIBLE FOR MAKING HIS OWN DETERMINATION AS TO THE TYPE AND LOCATION OF UNDERGROUND UTILITIES AS MAY BE NECESSARY TO AVOID DAMAGE THERETO. THE CONTRACTOR SHALL CONTACT THE UTILITY NOTIFICATION CENTER OF COLORADO AT 1-800-922-1987 AT LEAST 2 DAYS (NOT INCLUDING THE DAY OF NOTIFICATION) PRIOR TO ANY EXCAVATION OR OTHER EARTHWORK.

**DESIGN DATA**

AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SIXTH EDITION, 2012

DESIGN METHOD: LOAD AND RESISTANCE FACTOR DESIGN (MODIFIED GIRDERS ONLY)

LIVE LOAD: HL-93 (DESIGN TRUCK OR TANDEM, AND DESIGN LANE LOAD) AND COLORADO PERMIT VEHICLE

DEAD LOAD: ASSUMES 36 LBS. PER SQ. FT. FOR BRIDGE DECK OVERLAY

REINFORCED CONCRETE:

CLASS D CONCRETE: f'c = 4,500 psi  
REINFORCING STEEL: fy = 60,000 psi

STRUCTURAL STEEL:

AASHTO M270 (ASTM A709) GRADE 36 Fy = 36,000.  
ASSUMED SINGLE-LANE DESIGN- LIFE ADTT FOR FATIGUE  
= 180 (DETOUR CONDITION)  
= 3 (PERMANENT CONDITION)  
BOLTED SURFACE CONDITIONS = CLASS A (SLIP COEFFICIENT 0.33)

**INDEX OF DRAWINGS**

- B01 GENERAL INFORMATION
- B02 GENERAL LAYOUT
- B03 TYPICAL SECTION
- B04 MISCELLANEOUS DETAILS
- B05 CONCRETE DECK REPAIR DETAILS

**SUMMARY OF QUANTITIES**

ITEM NO.	DESCRIPTION	UNIT	TOTAL
202	REMOVAL OF PORTIONS OF PRESENT STRUCTURE	EA	2
202	REMOVAL OF PORTIONS OF PRESENT STRUCTURE (CLASS 3)	SY	21
403	HOT MIX ASPHALT (GRADING SX) (100) (PG 64-28)	TON	88
420	GEOTEXTILE (PAVING)	SY	76
509	STRUCTURAL STEEL	LB	4555
513	BRIDGE DRAIN (8 INCH)	EACH	2
515	WATERPROOFING (MEMBRANE)	SY	528
515	CONCRETE SEALER	SY	325
515	CONCRETE SEALER (CALCIUM NITRITE)	SY	325
601	CONCRETE (PATCHING)	SF	0
602	REINFORCING STEEL	LB	605
627	PAVEMENT MARKING PAINT	GAL	0

①

②

③

③

**KEYNOTES:**

- ① FOR REMOVAL OF TIMBER HEADERS.
- ② CLASS 3 REMOVAL IS FOR REPLACEMENT OF PARTS OF THE DECK AS NEEDED. INCLUDES 0.26 CY OF CONCRETE CLASS D (BRIDGE) PER SY.
- ③ NO QUANTITY IN THIS PROJECT/PHASE. WORK IS IN FUTURE PHASE.

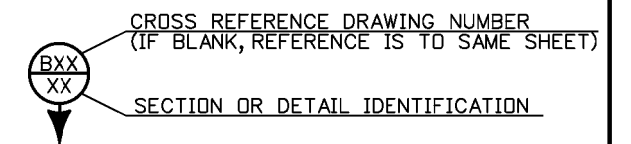
FOR BURIED UTILITY INFORMATION  
**THREE (3) BUSINESS DAYS BEFORE YOU DIG**  
CALL 811  
(or 1-800-922-1987)  
UTILITY NOTIFICATION CENTER OF COLORADO (UNCC)  
www.uncc.org

**BRIDGE DESCRIPTION**

2 SPAN (69'-2 1/8", 73'-9") BRIDGE, CONCRETE SLAB AND STEEL GIRDER REHAB

OVER CLEAR CREEK  
31'-0" ROADWAY CURB TO CURB  
PRECAST TYPE 7 CONCRETE BARRIER  
35'-0" ROADWAY CURB TO CURB AFTER  
PRECAST BARRIER REMOVAL

① → DENOTES KEYNOTE REFERENCE

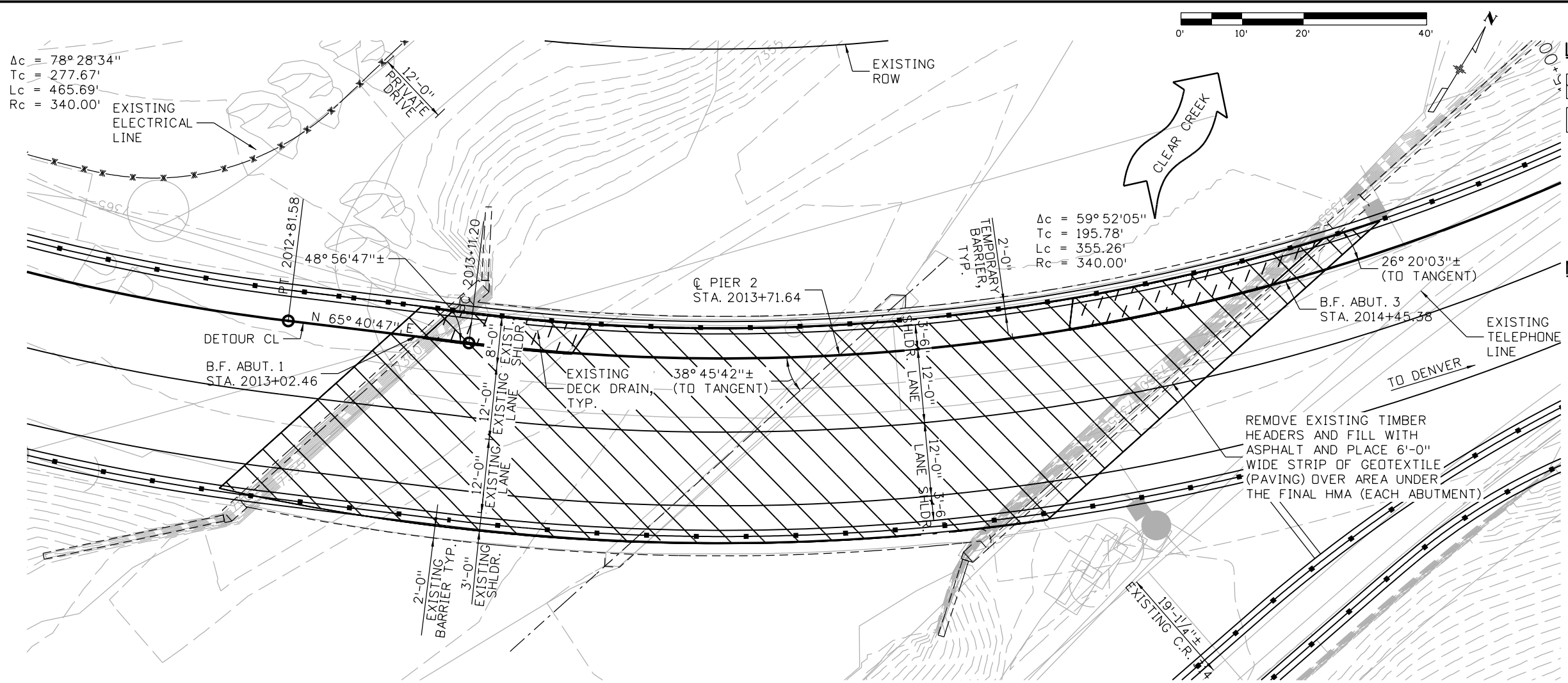


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Design		Detail		Quantities	
INITIAL	DATE	INITIAL	DATE	INITIAL	DATE
Desigined By	07-12	Detailled By	07-12	Quantities By	08-12
Checked By	JTF	Checked By	JTF	Checked By	JTF

Print Date: 11/21/2012	<b>Sheet Revisions</b>		Colorado Department of Transportation	As Constructed	<b>EB I70 DETOUR OVER CLEAR CREEK GENERAL INFORMATION</b>		Project No./Code	
File Name: 18832BRDG_CR314_CP1BGenInfo01.dgn	Date:	Comments:	Init.	No Revisions:	IM 0703-390			
Horiz. Scale: NONE Vert. Scale: NONE				Revised:	19035			
Staff Bridge Branch - Unit 0221 STW				Void:	19035			
<b>ATKINS</b> 4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276			425 A Corporate Circle Golden, CO 80401 Phone: 720-497-6918 FAX: 720-497-6901	Region 1	CRC	Designer: M. McMullen Detailer: E. Schawo Sheet Subset: BRIDGE	Structure Numbers CLR314-W0.7 Subset Sheets: B01 of 5	Sheet Number 95
					Near: Idaho Springs	Sec. 32 Township T3S Range R72W	Detour Sta. 2013+02.46 to Sta. 2014+45.38	

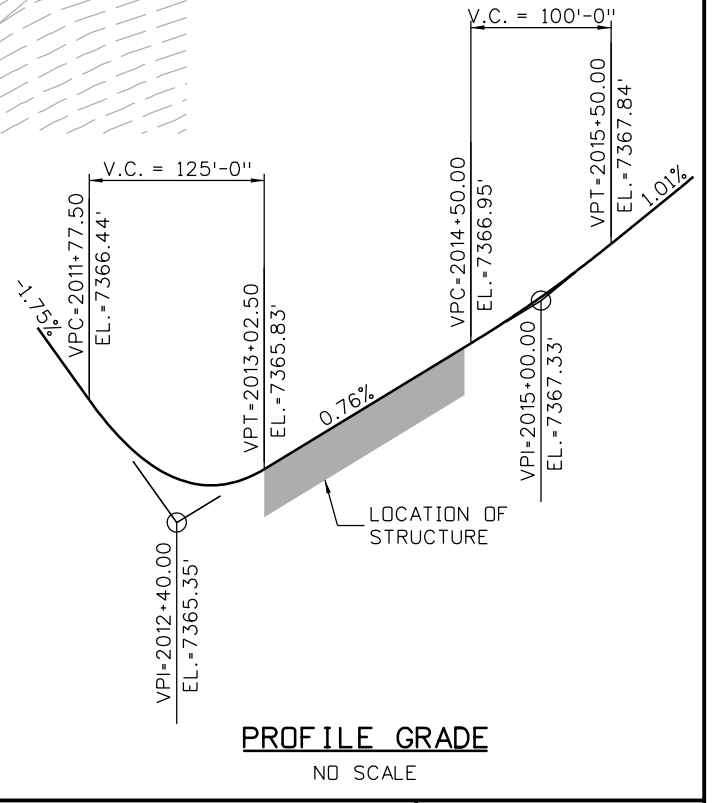
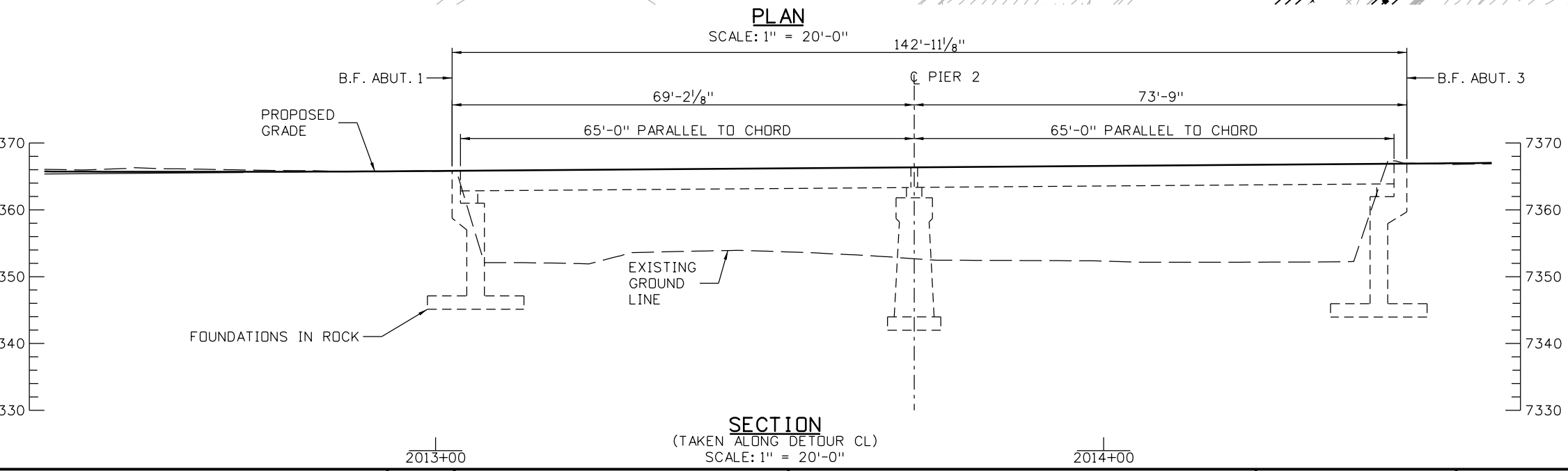




**LEGEND:**

- LIMITS OF HMA OVER WATERPROOFING (MEMBRANE)
- APPROXIMATE LIMITS OF DECK CRACKING

- NOTES**
1. 8" MIN DIA. DRAIN IN REPLACED DECK SEGMENT (2 TOTAL).
  2. REPLACE DECK AS NEEDED DUE TO CRACKING AND DELAMINATION.
  3. PATCH EXISTING RAIL CONCRETE AS NECESSARY.
  4. CONCRETE SEALER SHALL BE APPLIED TO CURBS AND EXISTING RAIL, PAINT EXISTING RAIL.



Design		Detail		Quantities	
DATE	INITIAL	DATE	INITIAL	DATE	INITIAL
05-12	MLM	08-12	MLM	08-12	MLM
10-12	JTF	10-12	JTF	10-12	JTF

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 File Name: 18832BRDG\_CR314\_CP1BGen Layout.dgn  
 Horiz. Scale: 1:20 Vert. Scale: As Noted  
 Staff Bridge Branch - Unit 0221 STW

Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation  
  
 425 A Corporate Circle  
 Golden, CO 80401  
 Phone: 720-497-6918 FAX: 720-497-6901  
 Region 1

As Constructed  
 No Revisions:  
 Revised:  
 Void:

**EB I70 DETOUR OVER CLEAR CREEK GENERAL LAYOUT**

Designer: M. McMullen  
 Detailer: E. Schawo  
 Sheet Subset: BRIDGE

Structure Numbers  
 CLR314-W0.7  
 Subset Sheets: B02 of 5

Project No./Code  
 IM 0703-390  
 19035  
 Sheet Number 96

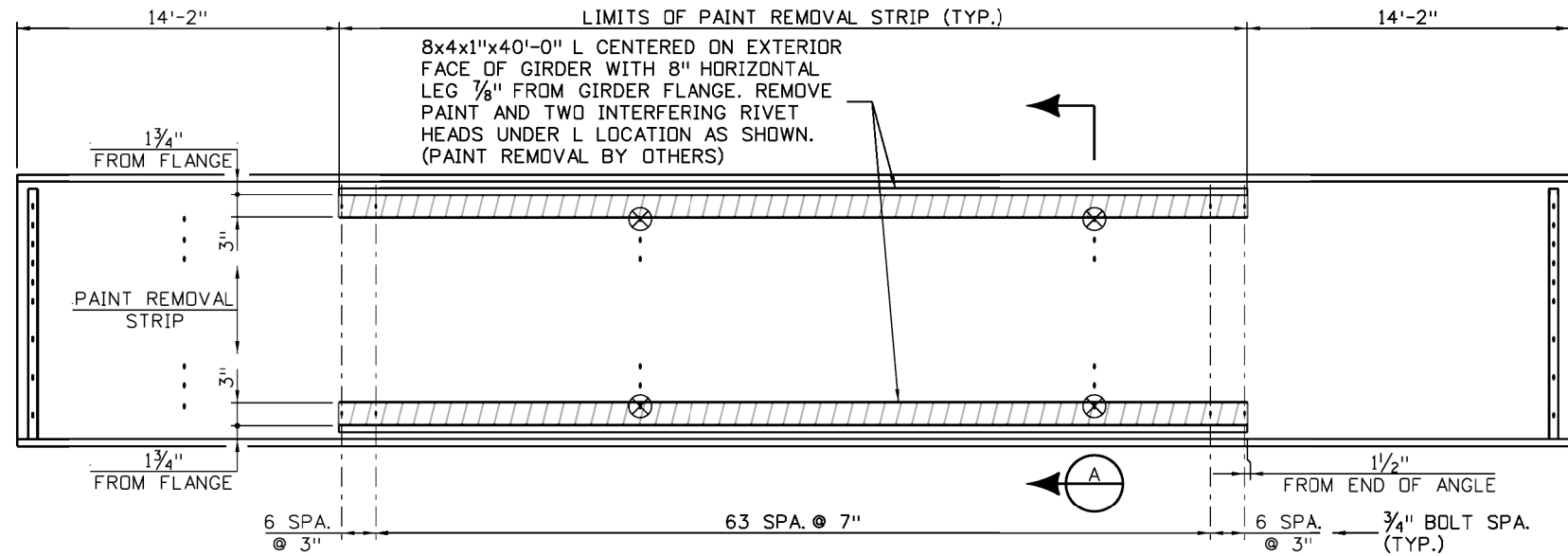
**ATKINS** 4601 DTC Boulevard, Suite 700  
 Denver, CO 80237  
 Phone: (303) 221-7275 Fax: (303) 221-7276

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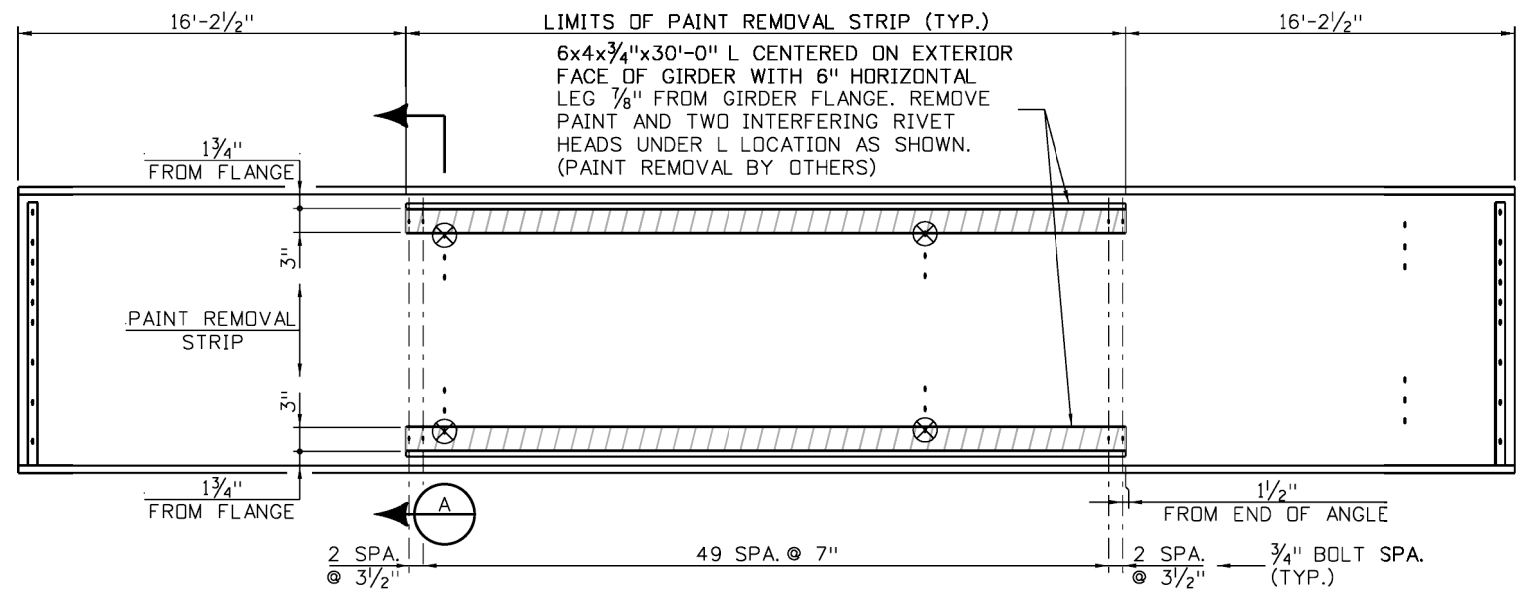
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Design		Detail		Quantities	
DATE	INITIAL	DATE	INITIAL	DATE	INITIAL
05-12	MLM	09-12	ERS	05-12	MLM
10-12	JTF	10-12	JTF	10-12	JTF
Designed By		Detailed By		Quantities By	
Checked By		Checked By		Checked By	



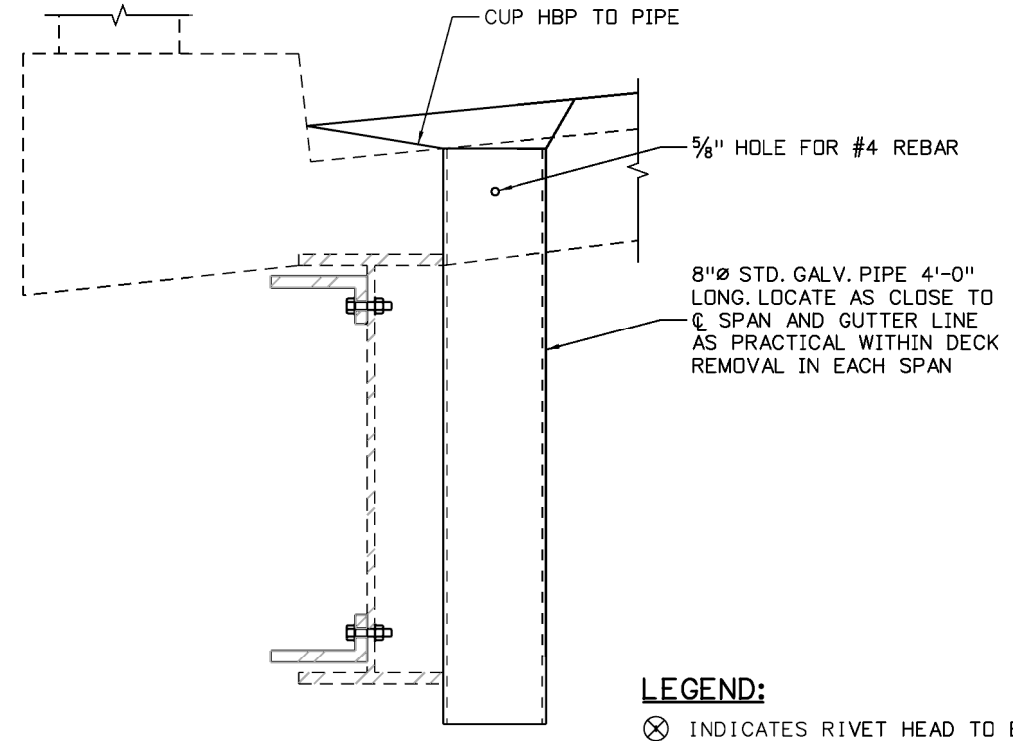
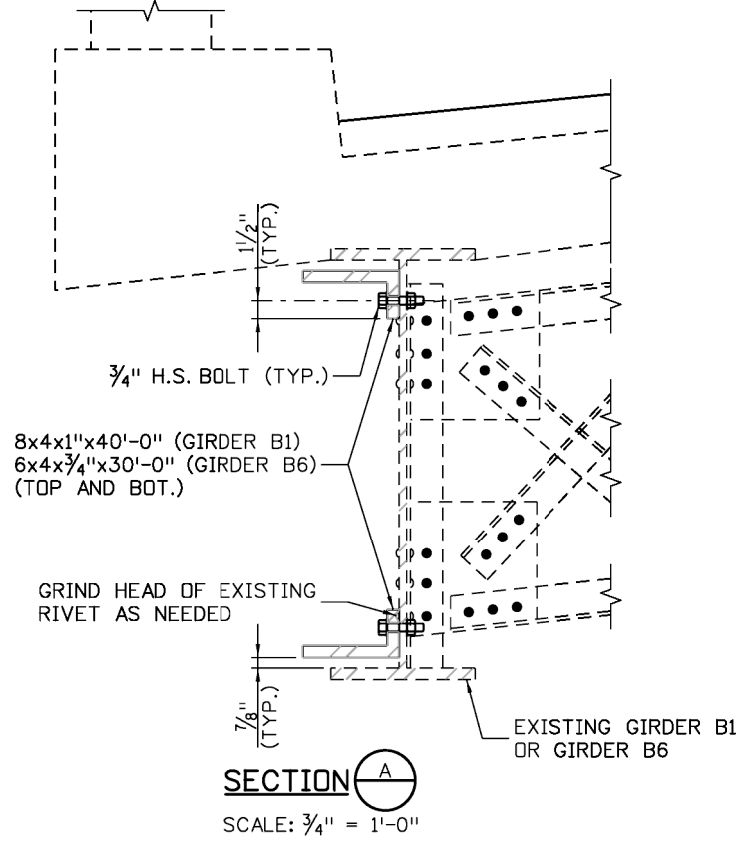
**GIRDER B1 ELEVATION**

SCALE: 1/8" = 1'-0"H,  
1/2" = 1'-0"V



**GIRDER B6 ELEVATION**

SCALE: 1/8" = 1'-0"H,  
1/2" = 1'-0"V



**DRAIN DETAIL**

SCALE: 3/4" = 1'-0"

- LEGEND:**
- ⊗ INDICATES RIVET HEAD TO BE REMOVED.
  - ▨ PAINT REMOVAL STRIP

Print Date: 11/21/2012

File Name: 18832BRDG\_CR314\_CP1BMiscDet01.dgn

Horiz. Scale: 1:8 Vert. Scale: As Noted

Staff Bridge Branch - Unit 0221 STW

**ATKINS** 4601 DTC Boulevard, Suite 700  
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Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation

**DOT** 425 A Corporate Circle  
Golden, CO 80401  
Phone: 720-497-6918 FAX: 720-497-6901

Region 1 **CRC**

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Revised:	
Void:	

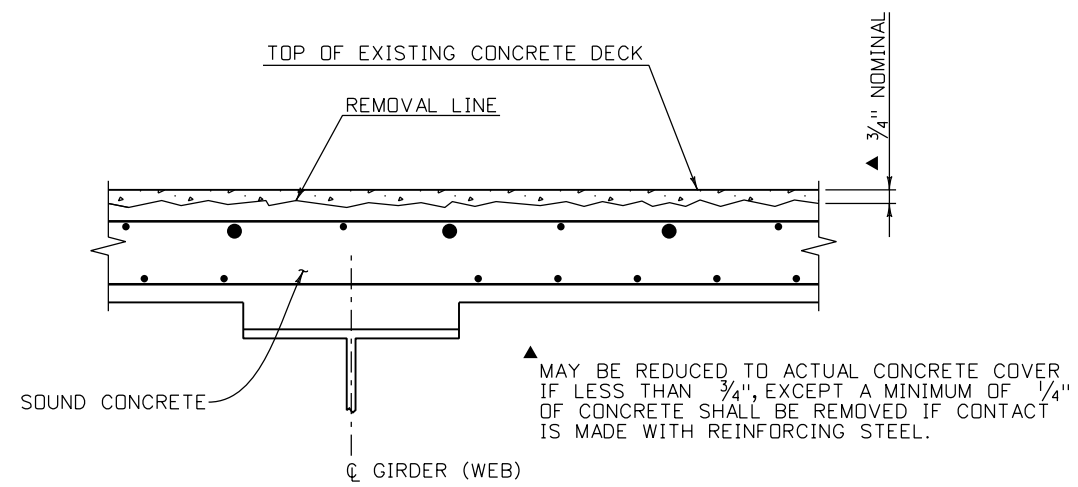
<b>EB I70 DETOUR OVER CLEAR CREEK MISCELLANEOUS DETAILS</b>			
Designer:	M. McMullen	Structure Numbers	CLR314-W0.7
Detailer:	E. Schawo	Subset Sheets:	B04 of 5

<b>Project No./Code</b>	IM 0703-390
	19035
Sheet Number	98

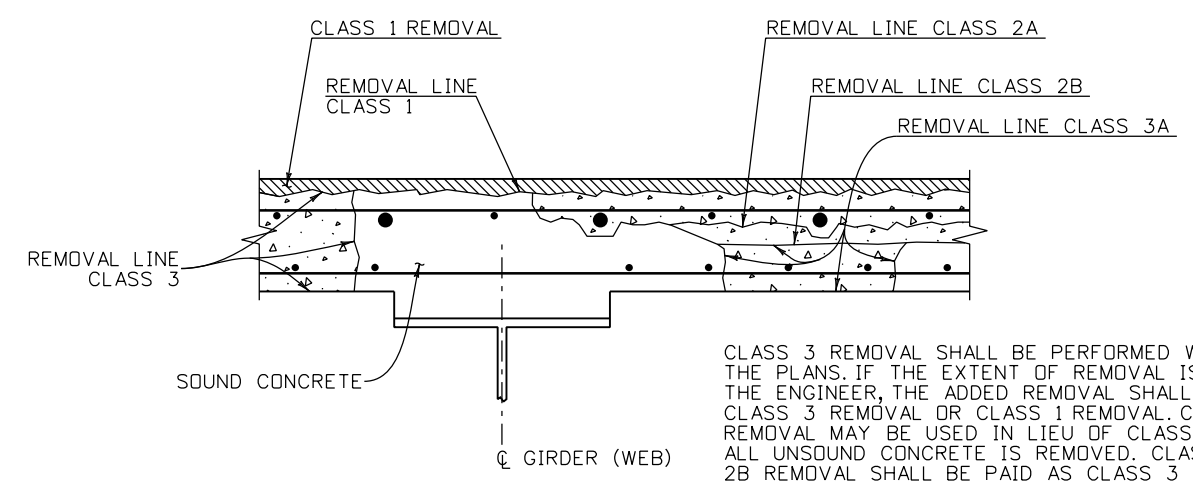


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Design		Detail		Quantities	
DATE	INITIAL	DATE	INITIAL	DATE	INITIAL
05-12	MLM	09-12	MLM	08-12	MLM
10-12	JTF	10-12	JTF	10-12	JTF
Designed By	Checked By	Designed By	Checked By	Quantities By	Checked By

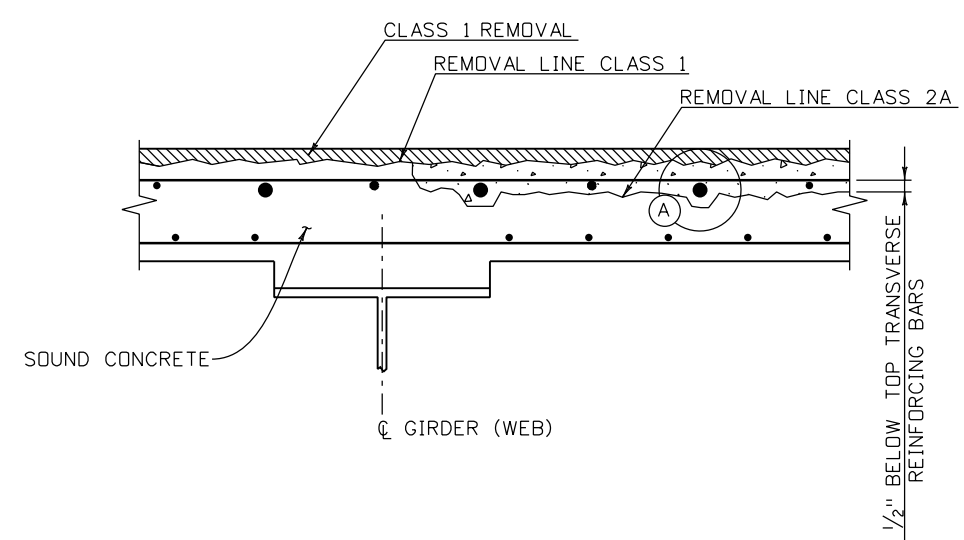


**REMOVAL OF PORTIONS OF PRESENT STRUCTURE (CLASS 1)**

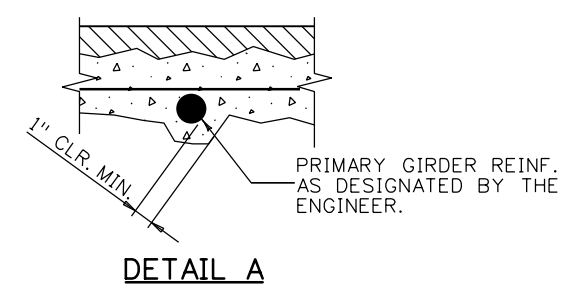


**REMOVAL OF PORTIONS OF PRESENT STRUCTURE (CLASS 3 & 3A)**

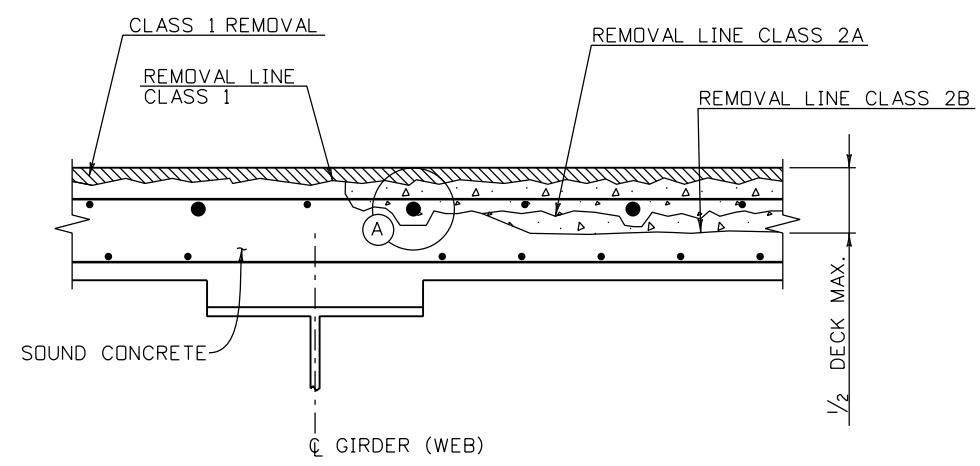
CLASS 3 REMOVAL SHALL BE PERFORMED WHERE SHOWN ON THE PLANS. IF THE EXTENT OF REMOVAL IS INCREASED BY THE ENGINEER, THE ADDED REMOVAL SHALL FULL DEPTH CLASS 3 REMOVAL OR CLASS 1 REMOVAL. CLASS 2A OR 2B REMOVAL MAY BE USED IN LIEU OF CLASS 3 PROVIDED ALL UNSOUND CONCRETE IS REMOVED. CLASS 2A OR CLASS 2B REMOVAL SHALL BE PAID AS CLASS 3 REMOVAL. CLASS 1 REMOVAL SHALL BE PAID FOR AS PATCHING.



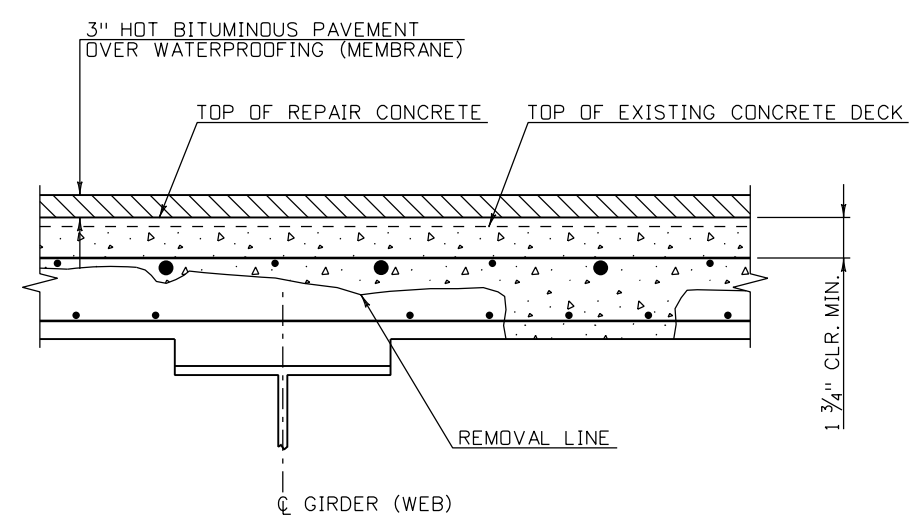
**REMOVAL OF PORTIONS OF PRESENT STRUCTURE (CLASS 2A)**



FOR CLASS 2A, USE WHEN THE VERTICAL EXPOSURE OF THE PRIMARY LONGITUDINAL REINFORCEMENT IS MORE THAN ONE HALF THE BAR DIAMETER. FOR CLASS 2B USE THIS DETAIL AS A MINIMUM.



**REMOVAL OF PORTIONS OF PRESENT STRUCTURE (CLASS 2B)**



**CONCRETE REPLACEMENT**

**NOTES:**

- REMOVAL OPERATIONS SHALL BE COORDINATED WITH THE ENGINEER AND PERFORMED IN A MANNER AS REQUIRED TO ENSURE THE STRUCTURAL INTEGRITY OF THE BRIDGE.
- CARE SHALL BE TAKEN IN REMOVING CONCRETE FROM AROUND STRUCTURAL STEEL ELEMENTS AND REINFORCING STEEL TO PREVENT DAMAGE TO THE STEEL. EXISTING REINFORCING SHALL BE CLEANED SUFFICIENTLY TO BOND TO THE NEW CONCRETE AND TO DETERMINE THE EXTENT OF DAMAGE, IF ANY. SIGNIFICANTLY DAMAGED OR CORRODED REINFORCING SHALL BE REPLACED WITH BLACK #4 GR 60 REINFORCING BARS. LAPS SPLICES THAT ARE NOT STAGGERED SHALL BE INCREASED 30%.
- THESE DETAILS REFLECT THE SCOPE AND NATURE OF THE WORK. THEY ARE NOT INTENDED TO REPRESENT THE ACTUAL STRUCTURE.
- WHEN HBP IS USED, A MINIMUM OF 10 DAYS CURE IS REQUIRED FOR CONCRETE CLASS D OR DT PRIOR TO PLACEMENT OF WATERPROOFING MEMBRANE. IF 10 DAYS IS NOT AVAILABLE, MEMBRANE MAY BE PLACED IF THE DECK PASSES A CONCRETE INTERNAL VAPOR TEST ACCEPTABLE TO THE ENGINEER.
- THE APPLICABLE CLASSES OF REMOVAL SHALL BE AS DESIGNATED BY THE SUMMARY OF QUANTITIES IN THE PLANS. THE ENGINEER MAY ADJUST THE LIMITS OF REMOVAL AS REMOVAL PROCEEDS TO REFLECT ACTUAL CONCRETE AND REINFORCING CONDITION.
- REMOVAL FOR PATCHING IS INCLUDED IN THE PRICE OF PATCHING. THE PATCHING IS INTENDED FOR THE TRAFFIC FACE OF THE EXISTING BRIDGE RAIL, INCLUDING INSIDE THE OPENINGS IN THE RAIL. THE ENGINEER MAY INCREASE THE EXTENT OF PATCHING AND REMOVAL TO REFLECT CONCRETE AND REINFORCING CONDITIONS FOUND DURING REMOVAL. PATCHING MATERIALS SHALL BE CEMENTITIOUS MATERIALS ACCEPTABLE TO THE ENGINEER PLACED IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS.

Print Date: 11/19/2012  
 File Name: 18832BRDG\_CR314\_CP1BDeckRehab.dgn  
 Horiz. Scale: 1:1 Vert. Scale: None  
 Staff Bridge Branch - Unit 0221 STW

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Date:	Comments	Init.

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Region 1 **CRC**

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**EB I70 DETOUR OVER CLEAR CREEK BRIDGE CONCRETE DECK REPAIR DETAILS**

Designer: M. McMullen  
 Detailer: M. McMullen  
 Sheet Subset: BRIDGE

Structure Numbers: CLR314-W0.7  
 Subset Sheets: B05 of 5

Project No./Code
IM 0703-390
19035
Sheet Number 99

**GENERAL NOTES**

STRUCTURE EXCAVATION AND BACKFILL SHALL BE AS SHOWN ON THE PLANS.

EXPANSION JOINT MATERIAL SHALL MEET AASHTO SPECIFICATION M213.

A COLORED STRUCTURAL CONCRETE COATING FINISH WILL BE REQUIRED ON EXPOSED CONCRETE SURFACES TO ONE FOOT BELOW THE GROUND LINE. THE COLOR SHALL BE BEIGE, EQUIVALENT TO FEDERAL STANDARD 595B COLOR NO. 30372.

ALL EXPOSED CONCRETE SURFACES SHALL RECEIVE A CLASS 1 FINAL FINISH TO ONE FOOT BELOW THE GROUND LINE.

ALL REINFORCING STEEL SHALL BE NON-COATED UNLESS OTHERWISE NOTED.

Ⓢ DENOTES EPOXY COATED REINFORCING STEEL.

THE FOLLOWING TABLE GIVES THE MINIMUM LAP SPLICE LENGTH FOR EPOXY COATED REINFORCING BARS PLACED IN ACCORDANCE WITH SUBSECTION 602.06. THESE SPLICE LENGTHS SHALL BE INCREASED BY 25% FOR BARS SPACED AT LESS THAN 6" ON CENTER.

BAR SIZE	#4	#5	#6	#7	#8	#9	#10	#11
SPLICE LENGTH FOR CLASS D CONCRETE	2'-0"	2'-6"	3'-10"	4'-6"	6'-0"	7'-6"	9'-6"	11'-9"

WHEN THE CONTRACTOR ELECTS TO SUBSTITUTE EPOXY COATED REINFORCEMENT FOR BLACK REINFORCING BARS, THE MINIMUM LAP SPLICE SHALL BE AS DESCRIBED ABOVE.

THE FOLLOWING TABLE GIVES THE MINIMUM LAP SPLICE LENGTH FOR BLACK REINFORCING BARS PLACED IN ACCORDANCE WITH SUBSECTION 602.06. THESE SPLICE LENGTHS SHALL BE INCREASED BY 25% FOR BARS SPACED AT LESS THAN 6" ON CENTER.

BAR SIZE	#4	#5	#6	#7	#8	#9	#10	#11
SPLICE LENGTH FOR CLASS D CONCRETE	1'-8"	2'-2"	2'-6"	3'-0"	4'-0"	5'-0"	6'-4"	7'-10"

THE ABOVE SPLICE LENGTHS SHALL BE INCREASED BY 20 PERCENT FOR 3 BAR BUNDLES AND 33 PERCENT FOR 4 BAR BUNDLES.

THE ABOVE SPLICE LENGTHS MAY BE REDUCED BY 20% WHEN 3" OF CLEAR COVER EXISTS AND BAR SPACING IS 6" OR GREATER ON CENTER.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE STABILITY OF THE STRUCTURES, INCLUDING EXCAVATIONS, DURING CONSTRUCTION.

CONSTRUCTION JOINTS NOT SHOWN ON PLANS MAY BE CONSTRUCTED ONLY IF APPROVED BY THE ENGINEER.

ALL CONSTRUCTION JOINTS SHALL BE THOROUGHLY CLEANED BEFORE FRESH CONCRETE IS POURED.

ABBREVIATIONS:

B.F. = BACK FACE	EQ. = EQUALLY	NO. = NUMBER	STA. = STATION
BOT. = BOTTOM	E.W. = EACH WAY	PROJ. = PROJECTION	STD. = STANDARD
CIP = CAST-IN-PLACE	EXP. = EXPANSION	R = RADIUS	STR. = STRUCTURE
CLR. = CLEAR	F.F. = FRONT FACE	RL = REINFORCEMENT LENGTH	TOT. = TOTAL
CONST. = CONSTRUCTION	JT. = JOINT	RT. = RIGHT	TYP. = TYPICAL
CONT. = CONTINUOUS	LCL = LAYOUT LINE	SHLDR. = SHOULDER	
E.F. = EACH FACE	LT. = LEFT	SHT. = SHEET	
EL. = ELEVATION	MAX. = MAXIMUM	SPA. = SPACED	
EMBED. = EMBEDMENT	MIN. = MINIMUM		

FOR STRUCTURE NUMBER INSTALLATION, SEE STANDARD S-614-12.

STATIONS, ELEVATIONS, AND DIMENSIONS CONTAINED IN THESE PLANS ARE CALCULATED FROM A RECENT FIELD SURVEY. THE CONTRACTOR SHALL VERIFY ALL DEPENDENT DIMENSIONS IN THE FIELD BEFORE ORDERING OR FABRICATING ANY MATERIAL.

THE INFORMATION SHOWN ON THESE PLANS CONCERNING THE TYPE AND LOCATION OF UNDERGROUND UTILITIES IS NOT GUARANTEED TO BE ACCURATE OR ALL INCLUSIVE. THE CONTRACTOR IS RESPONSIBLE FOR MAKING HIS OWN DETERMINATION AS TO THE TYPE AND LOCATION OF UNDERGROUND UTILITIES AS MAY BE NECESSARY TO AVOID DAMAGE THERETO. THE CONTRACTOR SHALL CONTACT THE UTILITY NOTIFICATION CENTER OF COLORADO AT 1-800-922-1987 AT LEAST 2 DAYS (NOT INCLUDING THE DAY OF NOTIFICATION) PRIOR TO ANY EXCAVATION OR OTHER EARTHWORK.

**DESIGN DATA**

AASHTO SIXTH EDITION LRFD

DESIGN METHOD: LOAD AND RESISTANCE FACTOR DESIGN

DEAD LOAD: VERTICAL EARTH LOAD = 135 LBS./CU. FT.  
HORIZONTAL EARTH LOAD = 35.1 LBS./CU. FT. (ACTIVE PRESSURE)

LIVE LOAD SURCHARGE = 2 FT. OF EARTH  
MAXIMUM ULTIMATE BEARING PRESSURE = 7.5 KSF

**SOIL NAIL WALLS:**

THE GROUND NAIL WALL HAS BEEN DESIGNED IN GENERAL ACCORDANCE WITH PROCEDURES CONTAINED IN THE FHWA "MANUAL FOR DESIGN AND CONSTRUCTION MONITORING OF GROUND NAIL WALLS", REPORT NO. FHWA-SA-96-069R, USING ALLOWABLE STRESS DESIGN.

HORIZONTAL EARTH LOAD =  $\frac{1}{2} \gamma (DH)^2 K_a$   
= EFFECTIVE UNIT WT. OF EARTH  
DH = DESIGN HEIGHT  
K<sub>a</sub> = ACTIVE LATERAL EARTH PRESSURE COEFFICIENT (SECTION 3.11.5.3, AASHTO SIXTH EDITION)

**WALLS F, FF, & K:**

REINFORCED CONCRETE:  
CLASS D CONCRETE: f'c = 4,500 psi  
REINFORCING STEEL: fy = 60,000 psi

**SUMMARY OF QUANTITIES**

ITEM NO.	DESCRIPTION	UNIT	WALL F	WALL FF	WALL K	TOTAL
206	STRUCTURE EXCAVATION	CY	2960	118	725	3803
206	STRUCTURE BACKFILL (CLASS 1)	CY	2938	173		3111
206	MECHANICAL REINFORCEMENT OF SOIL	CY		111		111
206	SHORING (AREA 3)	LS		1		1
206	SHORING (AREA 4)	LS		1		1
211	ROCK REINFORCEMENT (DOWEL)	LF			150	150
420	GEOMEMBRANE	SY		181		181
504	FACING (SPECIAL)	SF		374		374
504	GROUND NAIL (10 FOOT)	EA			40	40
504	GROUND NAIL (15 FOOT)	EA		105	55	160
506	RIPRAP (12 INCH)	CY	151			151
514	PEDESTRIAN RAILING (STEEL)	LF	212	114		326
601	CONCRETE CLASS D (WALL)	CY	304	70	35	409
601	STRUCTURAL CONCRETE COATING	SY	375	250		625
602	REINFORCING STEEL	LB	36421	4545		40966
602	REINFORCING STEEL (EPOXY COATED)	LB		1300	3500	4800
605	6 INCH PERFORATED PIPE UNDERDRAIN	LF		250	260	510
605	GEOCOMPOSITE DRAIN WITHOUT PIPE	SY	199			199
605	SUBSURFACE DRAIN OUTLET	LF		100		100
641	SHOTCRETE	SY		221	200	421

① EXCAVATION IN FRONT OF WALL FF IS INCLUDED IN EB 170 OVER CLEAR CREEK BRIDGE SET.

**INDEX OF DRAWINGS**

W01	RETAINING WALLS F, FF, AND K GENERAL INFORMATION
W02	RETAINING WALL F STA 600+00 TO 602+11.85
W03	RETAINING WALL F TYPICAL SECTION
W04	RETAINING WALL F MISCELLANEOUS DETAILS
W05	RETAINING WALL F AND FF PEDESTRIAN RAILING (1 OF 2)
W06	RETAINING WALL F AND FF PEDESTRIAN RAILING (2 OF 2)
W07	RETAINING WALL FF AND WALL K GROUND NAIL WALL GENERAL NOTES
W08	RETAINING WALL FF GROUND NAIL DIAGRAM
W09	RETAINING WALL FF GROUND NAIL WALL TYPICAL SECTION
W10	RETAINING WALL FF MSE WALL
W11	RETAINING WALL K STA 1100+50 TO 1102+31.90 GROUND NAIL WALL DIAGRAM
W12	RETAINING WALL K GROUND NAIL WALL TYPICAL SECTION
W13	RETAINING WALL FF AND WALL K GROUND NAIL WALL DETAILS (SHEET 1 OF 2)
W14	RETAINING WALL FF AND WALL K GROUND NAIL WALL DETAILS (SHEET 2 OF 2)
W15	RETAINING WALL FF AND WALL K GROUND NAIL TESTING AND CONSTRUCTION DETAILS
W16	ROCK REINFORCEMENT (DOWEL)
W17	RETAINING WALL FF FASCIA DETAILS (SHEET 1 OF 2)
W18	RETAINING WALL FF FASCIA DETAILS (SHEET 2 OF 2)

FOR BURIED UTILITY INFORMATION  
**THREE (3) BUSINESS DAYS**  
BEFORE YOU DIG  
CALL 811  
(or 1-800-922-1987)  
UTILITY NOTIFICATION  
CENTER OF COLORADO (UNCC)  
[www.uncc.org](http://www.uncc.org)

① — DENOTES KEYNOTE REFERENCE

BXX  
XX — CROSS REFERENCE DRAWING NUMBER (IF BLANK, REFERENCE IS TO SAME SHEET)

— SECTION OR DETAIL IDENTIFICATION

Str. No. WALL-F-15-BF (Retaining Wall F) Near: Idaho Springs Sec. 32 Township T3S Range R72W	C.R. 314 Sta. 95+74.18 to Sta. 97+60.00
Str. No. WALL-F-15-BB (Retaining Wall FF) Near: Idaho Springs Sec. 32 Township T3S Range R72W	I-70 CL Sta. 173+99.87 to Sta. 175+17.18
Str. No. WALL-F-15-BK (Retaining Wall K) Near: Idaho Springs Sec. 32 Township T3S Range R72W	C.R. 314 Sta. 97+60.42 to Sta. 100+40.00

Print Date: 12/4/2012

File Name: I8832DES\_Wall F\_GenInfo01.dgn

Horiz. Scale: NONE Vert. Scale: NONE

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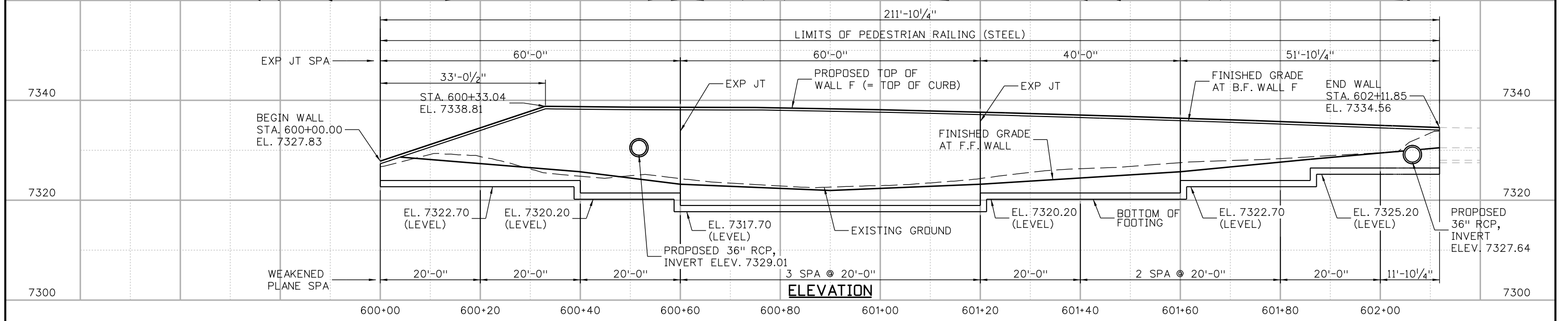
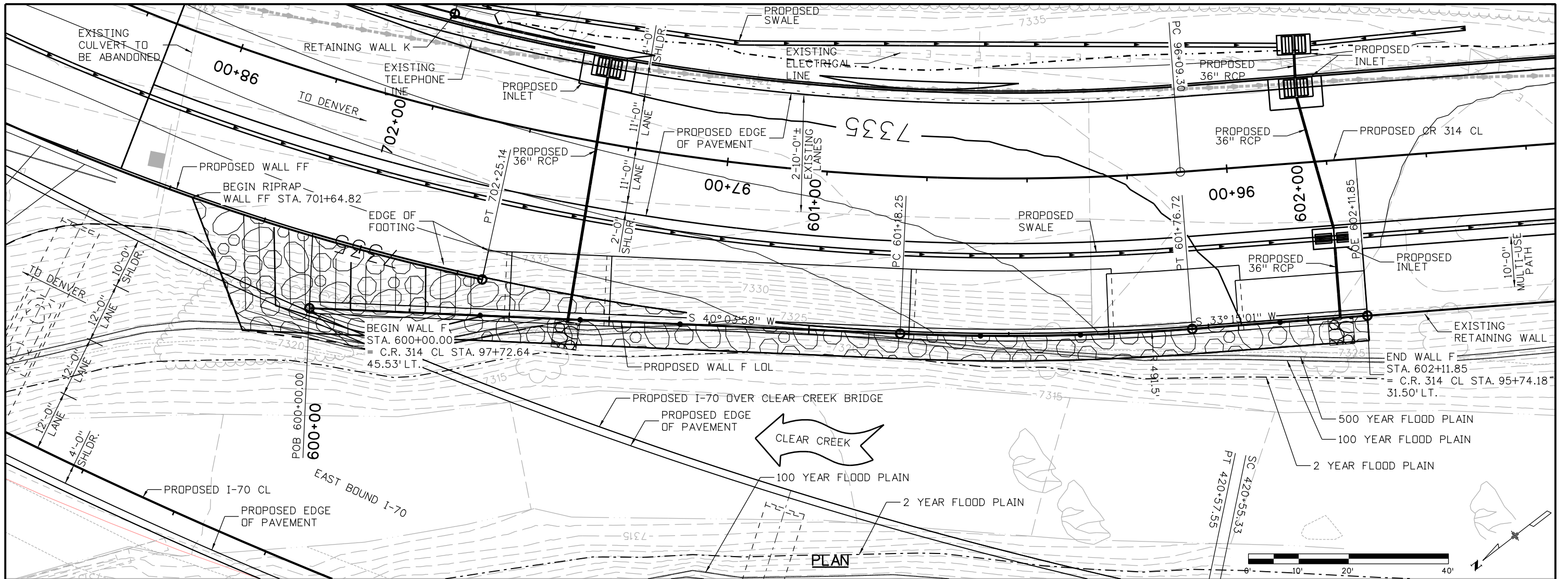
Region 1 CRC

As Constructed
No Revisions:
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Designer: S. ABRAHAM	Structure Numbers: MULTIPLE
Detailer: E. SCHAWO	
Sheet Subset: WALL	Subset Sheets: W01 of 18

Project No./Code
IM 0703-390
19035
Sheet Number 100

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Sheet Revisions		
Date:	Comments	Init.

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 425 A Corporate Circle  
 Golden, CO 80401 Phone: 720-497-6918 FAX: 720-497-6901  
 Region 1 CRC

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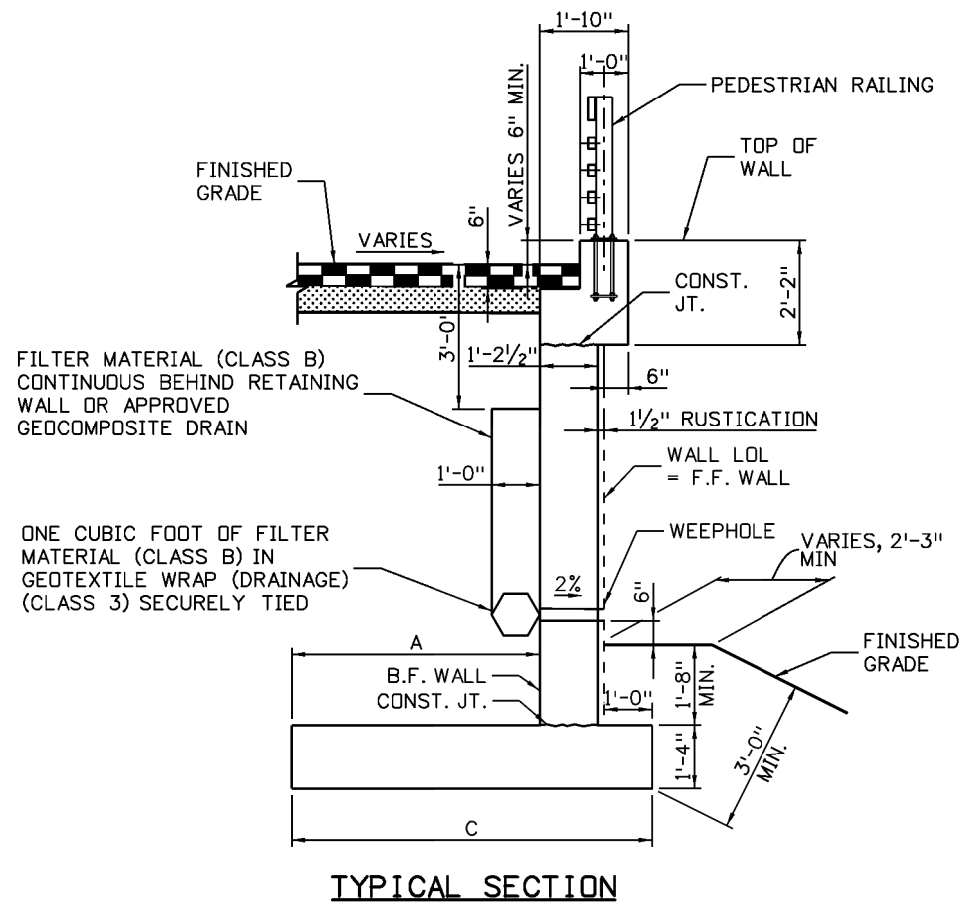
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 Designer: S. ABRAHAM  
 Detailer: E. SCHAWD  
 Sheet Subset: WALL  
 Structure Numbers: WALL-F-15-BF  
 Subset Sheets: W02 of 18

Project No./Code  
 IM 0703-390  
 19035  
 Sheet Number 101

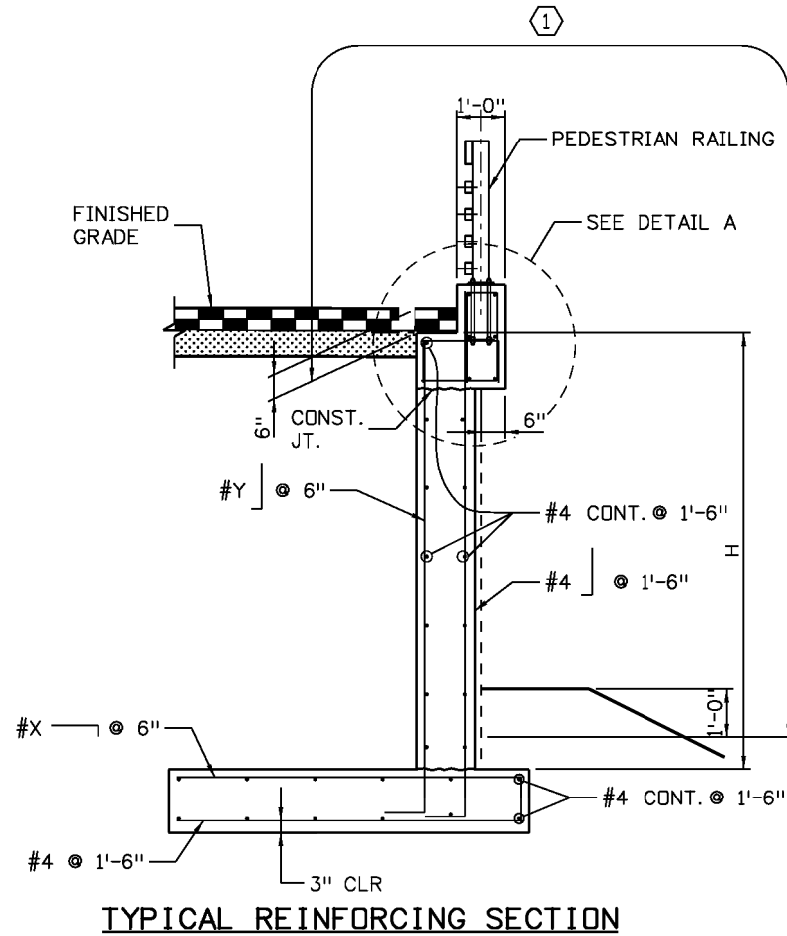
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Designed By	Checked By	Detailed By	Checked By	Quantities By	Checked By



TYPICAL SECTION



TYPICAL REINFORCING SECTION

WALL F VARIABLE TABLE

WALL F					
WALL F STATION RANGE	DESIGN HEIGHT H (FT)	A (FT)	C (FT)	REBAR (X)	REBAR (Y)
600+00.00 TO 600+34.39	10	13.75 TO 6.50	16.08 TO 8.83	#4	#5
600+34.39 TO 600+60.00	16.25	11.67	14.0	#8	#7
600+60.00 TO 601+20.00	18.75	11.67	14.0	#9	#8
601+20.00 TO 601+60.00	15.25	11.67	14.0	#8	#7
601+60.00 TO 601+86.00	11.5	10.67	13.0	#6	#5
601+86.00 TO 602+11.85	8.0	7.67	10.0	#5	#4

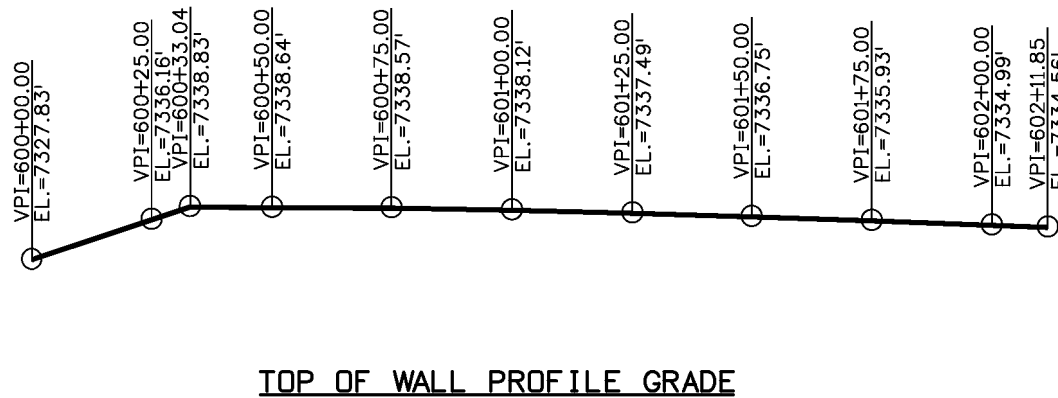
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KEYNOTES

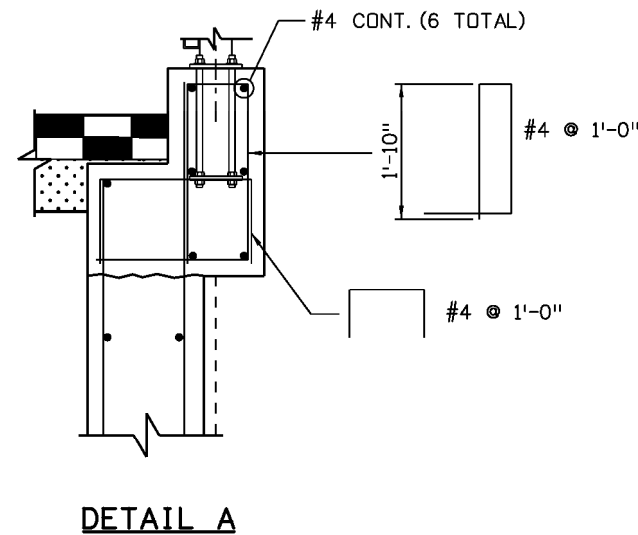
- ① LIMITS OF STRUCTURAL CONCRETE COATING.
- ② FOR FOOTING CONNECTION DETAIL TO WALL FF, SEE SHEET W09.

NOTES:

- CONCRETE SHALL BE CONCRETE CLASS D (WALL).
- WEEPHOLES SHALL BE 3"Ø PVC PIPE.
- FOR PEDESTRIAN RAILING DETAILS, SEE SHEET W05.
- FOR BOULDER DETAILS AT THE FRONT FACE OF WALL, SEE BOULDER INSTALLATION PLAN DETAILS.
- FILTER MATERIAL (CLASS B) OR GEOTEXTILE DRAIN, CLASS 3 GEOTEXTILE WRAP, AND WEEPHOLES SHALL BE INCLUDED IN ITEM 605, GEOTEXTILE DRAIN WITHOUT PIPE.
- FOR DRAINAGE DETAILS, SEE DRAINAGE PLANS.
- RUSTICATION SHALL BE LINER 131, COLORADO RANDOM REVEAL PATTERN BY SCOTT SYSTEM OR APPROVED EQUAL.



TOP OF WALL PROFILE GRADE



DETAIL A

Print Date: 11/21/2012

File Name: 18832BRDG\_WallF\_TypSec01.dgn

Horiz. Scale: 1:4 Vert. Scale: 1:4

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Sheet Revisions

Date:	Comments	Init.

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Golden, CO 80401  
Phone: 720-497-6918 FAX: 720-497-6901

Region 1

CRC

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No Revisions:

Revised:

Void:

RETAINING WALL F  
TYPICAL SECTION

Designer:	S. ABRAHAM	Structure Numbers	WALL-F-15-BF
Detailer:	E. SCHAWO	Subset Sheets:	W03 of 18

Project No./Code

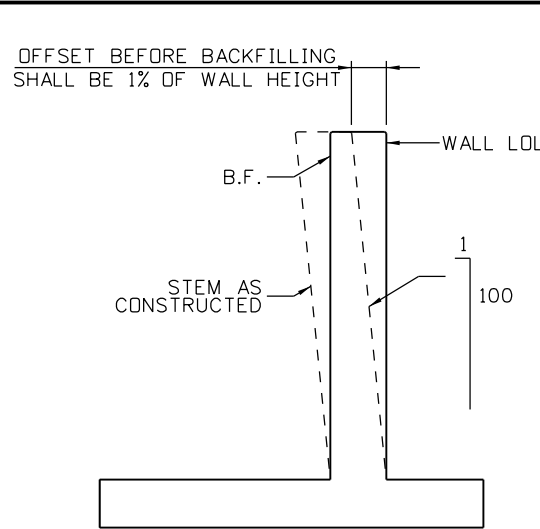
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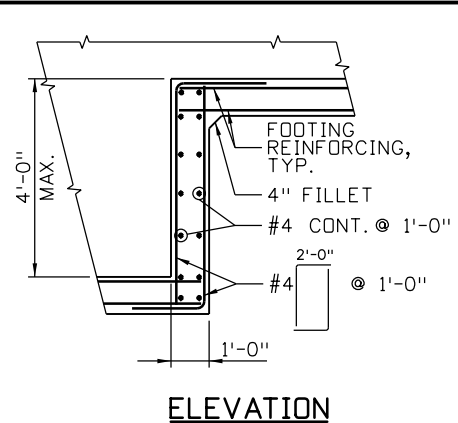
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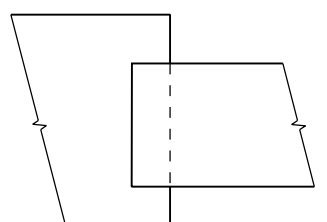
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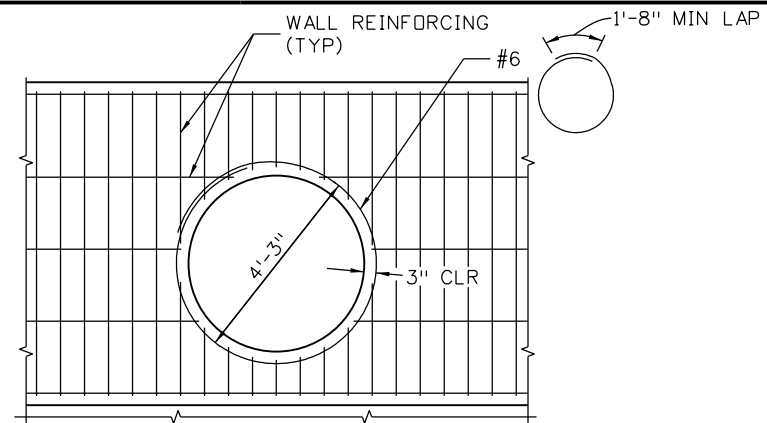
**WALL OFFSETS**



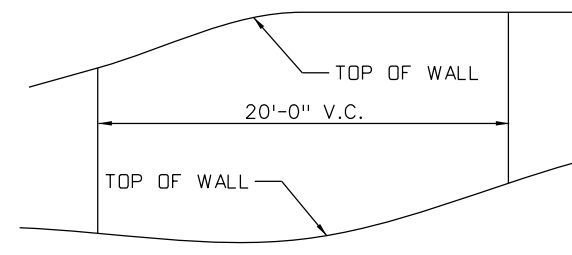
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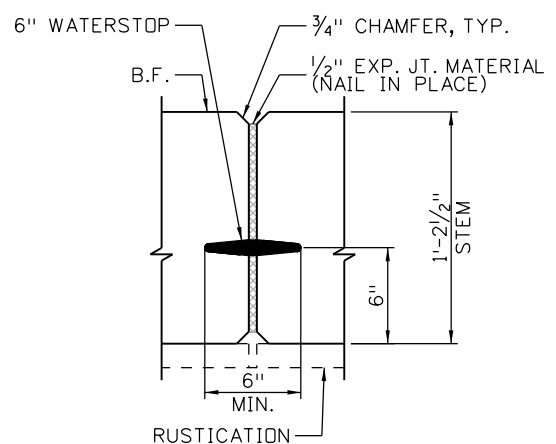
**PLAN FOOTING STEP**



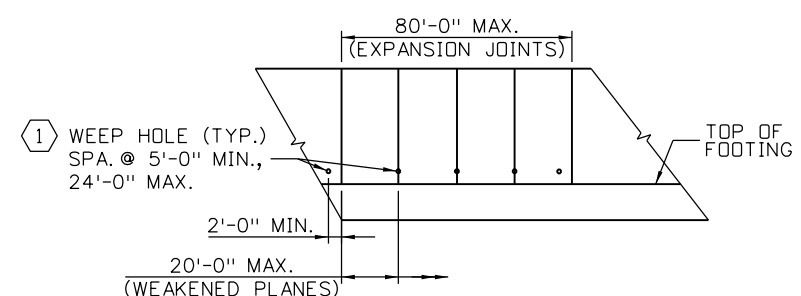
**TYPICAL REINFORCING DETAIL AT PIPE OPENING**



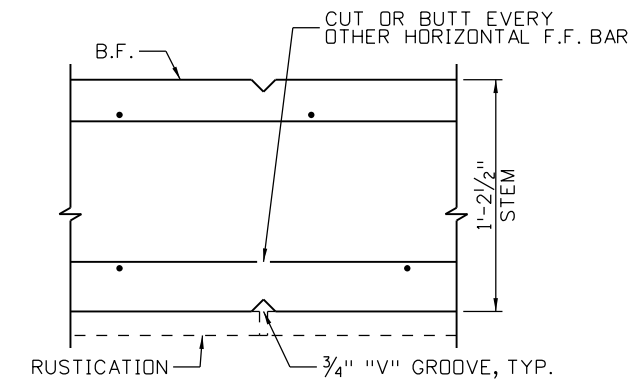
**TOP OF WALL SLOPE CHANGE**



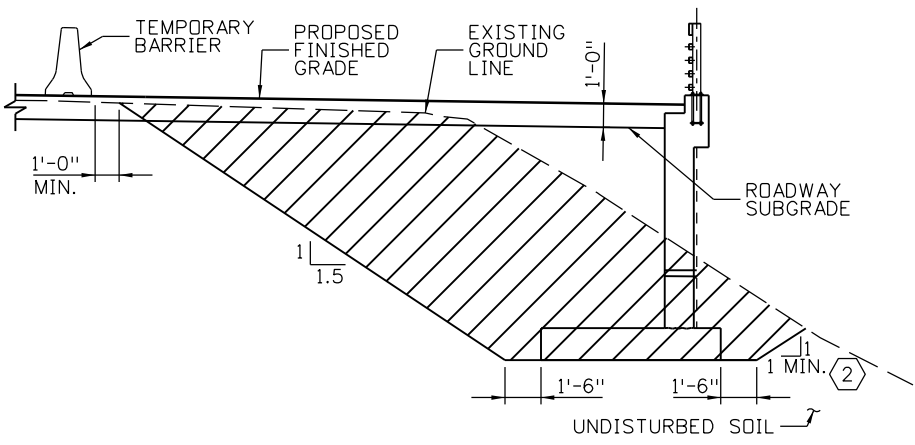
**EXPANSION JOINT**



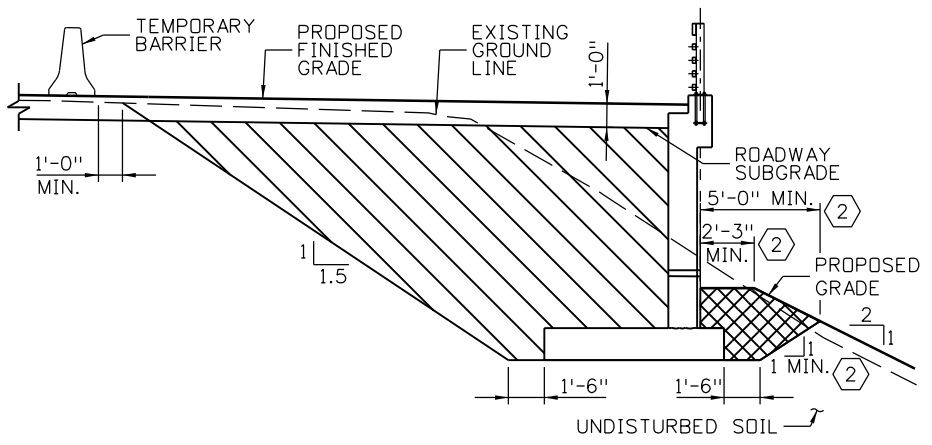
**WALL EXPANSION JOINTS AND WEAKENED PLANES**  
DO NOT EXTEND JOINTS THROUGH FOOTING.



**WEAKENED PLANE**



**EXCAVATION TYPICAL SECTION**



**BACKFILL TYPICAL SECTION**

**LEGEND:**

- STRUCTURE EXCAVATION
- STRUCTURE BACKFILL (CLASS 1)
- RIPRAP (12 INCH)

**KEYNOTES**

- ① WEEPHOLE SPACING SHALL BE ADJUSTED AS NEEDED TO CLEAR INLETS AND MANHOLES BY 2'-0".
- ② EXCAVATION QUANTITIES ARE BASED ON THE MINIMUM REQUIRED VALUES SHOWN.

**NOTES:**

- 1. MATERIALS AND WORK NECESSARY FOR FABRICATION AND INSTALLATION OF WATERSTOP, WEEPHOLE AND EXPANSION MATERIAL SHALL NOT BE MEASURED AND PAID FOR, BUT SHALL BE INCLUDED IN ITEM 601, CONCRETE CLASS D (WALL).
- 2. PROVIDE WATERTIGHT JOINTS AROUND PIPES.
- 3. FOR EXPANSION JOINT AND WEAKEND PLANE SPACING AND LOCATION, SEE WALL LAYOUTS.
- 4. FOR PEDESTRIAN RAILING DETAILS, SEE SHEET W05.

Print Date: 11/21/2012  
 File Name: 18832DES\_WallF\_MiscDet01.dgn  
 Horiz. Scale: NONE Vert. Scale: NONE  
 Staff Bridge Branch - Unit 0221 STW

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Date:	Comments	Init.

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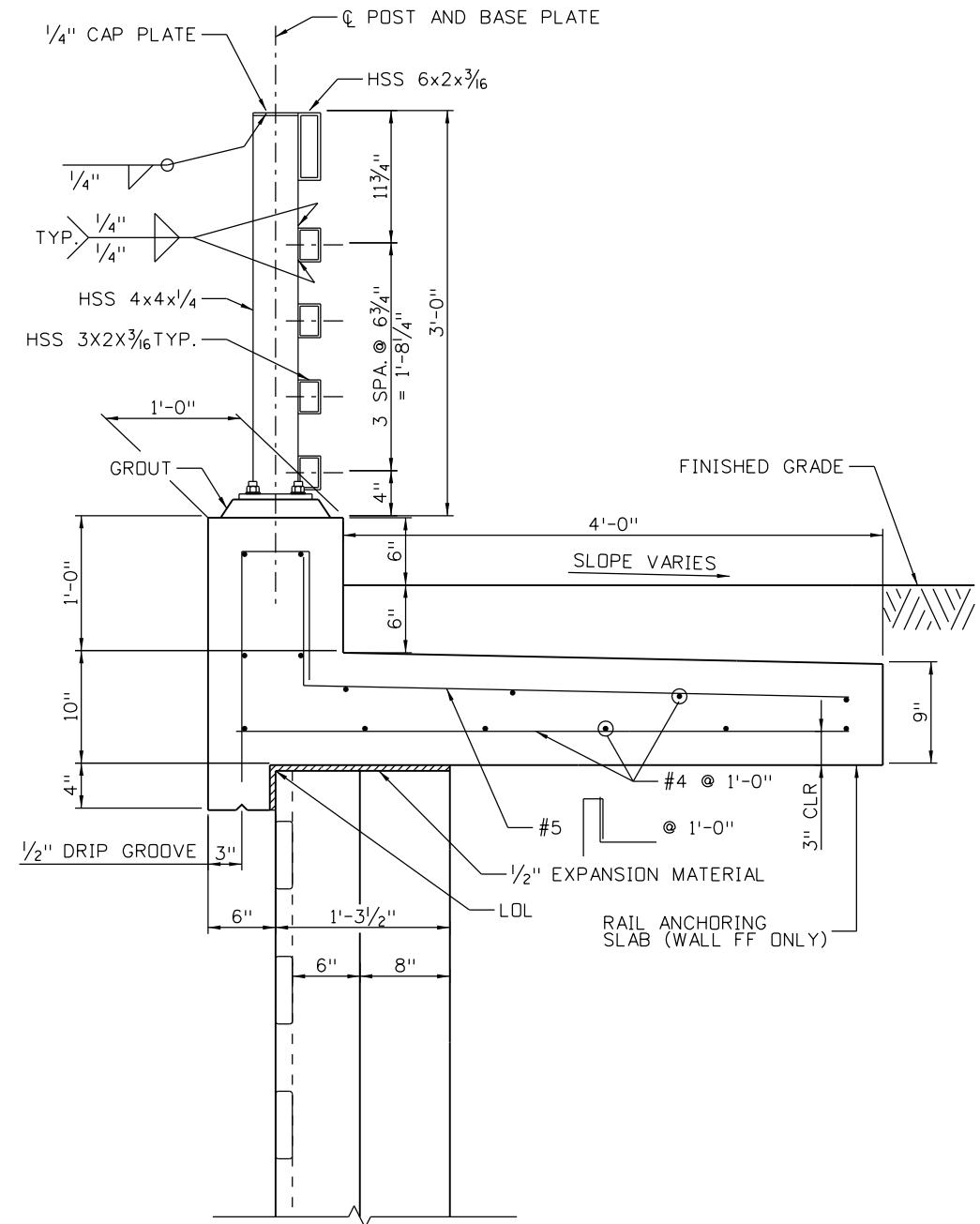
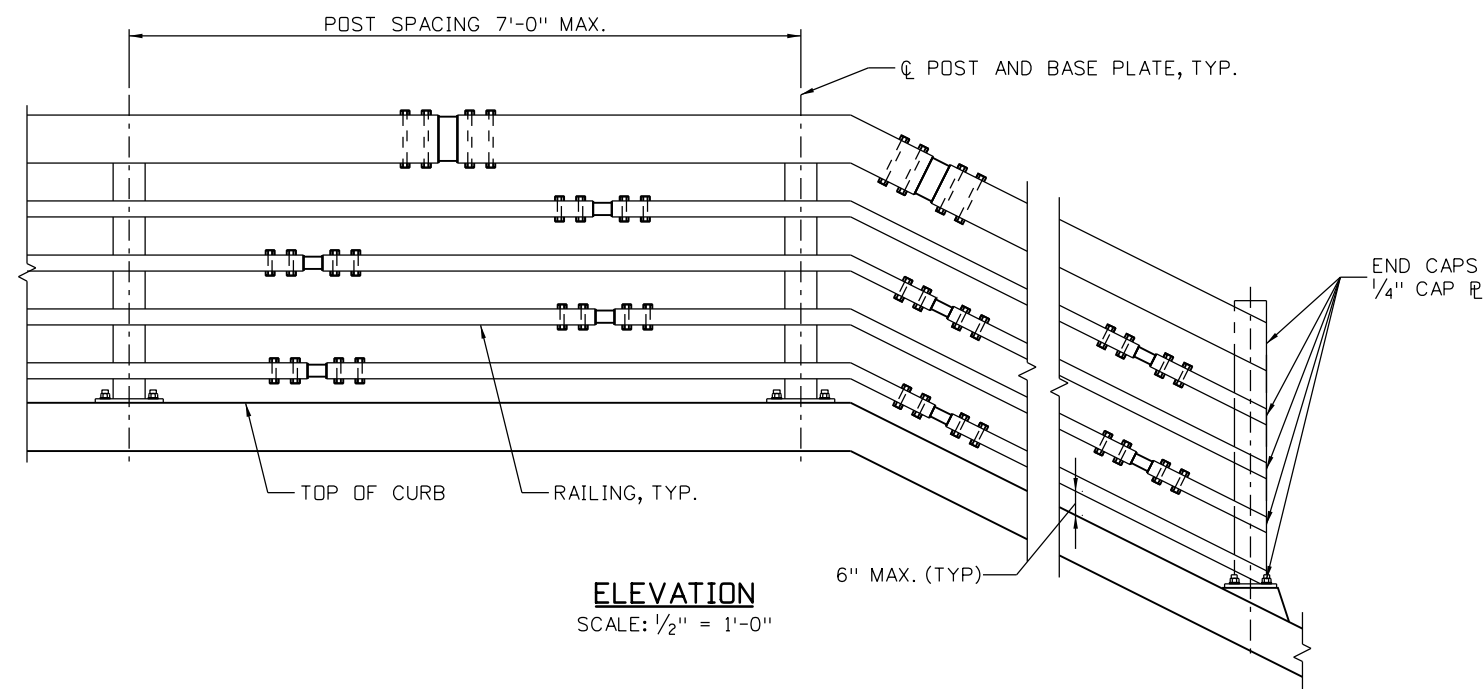
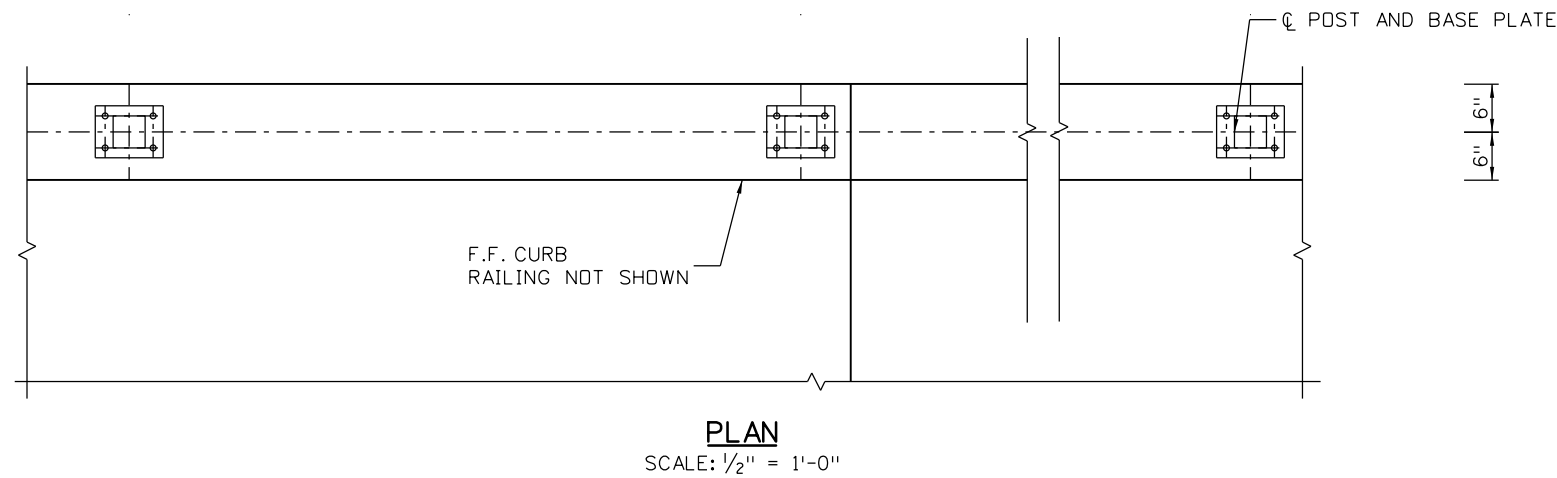
425 A Corporate Circle  
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Region 1 **CRC**

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No Revisions:
Revised:
Void:

RETAINING WALL F MISCELLANEOUS DETAILS			
Designer:	S. ABRAHAM	Structure Numbers	WALL-F-15-BF
Detailer:	E. SCHAWO	Subset Sheets:	W04 of 18

Project No./Code
IM 0703-390
19035
Sheet Number 103



**TYPICAL SECTION AT WALL FF**  
**STA. 701+17.65 TO STA. 702+25.14**  
 SCALE: 1/2" = 1'-0"  
 (FOR WALL F CURB & WALL DETAILS SEE SHEET W03)

Design		Detail		Quantities	
DATE	INITIAL	DATE	INITIAL	DATE	INITIAL
10-12	SA	10-12	SA	10-12	SA
10-12	JL	10-12	JL	10-12	WZ
10-12	SA	10-12	SA	10-12	SA
10-12	JL	10-12	JL	10-12	WZ

Print Date: 11/21/2012  
 File Name: 18832DES\_WallF\_PedRail01.dgn  
 Horiz. Scale: AS NOTED Vert. Scale: AS NOTED  
 Staff Bridge Branch - Unit 0221 STW  
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Date:	Comments	Init.

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 Golden, CO 80401  
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 Region 1 CRC

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 No Revisions:  
 Revised:  
 Void:

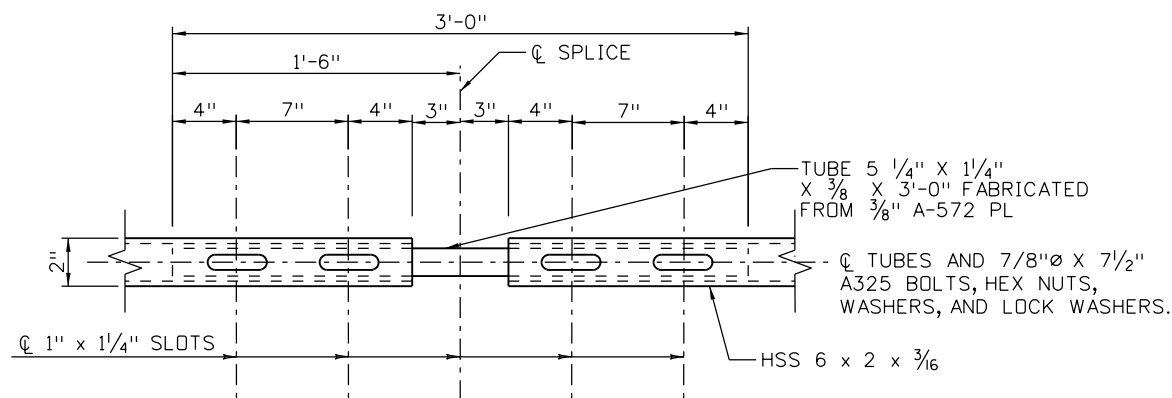
**RETAINING WALL F AND FF PEDESTRIAN RAILING (SHEET 1 OF 2)**  
 Designer: S. ABRAHAM  
 Detailer: E. SCHAWO  
 Sheet Subset: WALL  
 Structure Numbers: WALL-F-15-BF  
 Subset Sheets: W05 of 18

Project No./Code  
 IM 0703-390  
 19035  
 Sheet Number 104

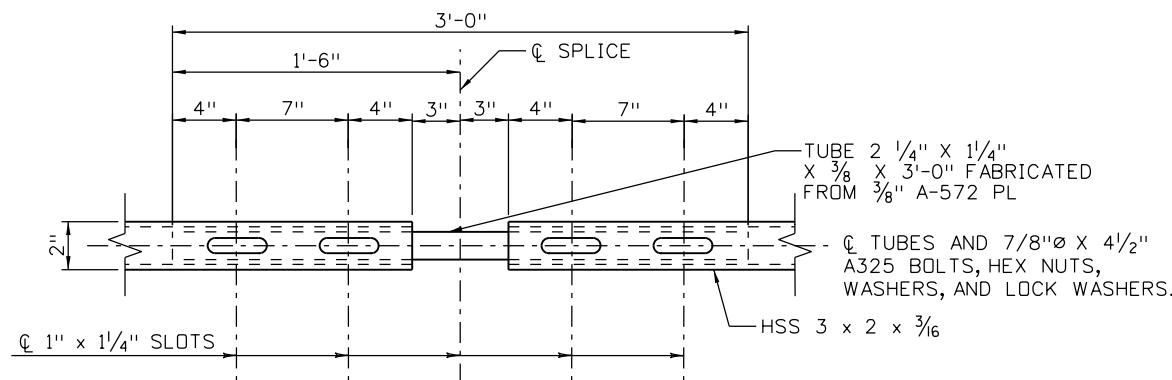
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Design		Detail		Quantities	
Designed By	Checked By	INITIAL	DATE	INITIAL	DATE
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Checked By	Checked By	Checked By	Checked By	Checked By	Checked By
		WZ	10-12	WZ	10-12



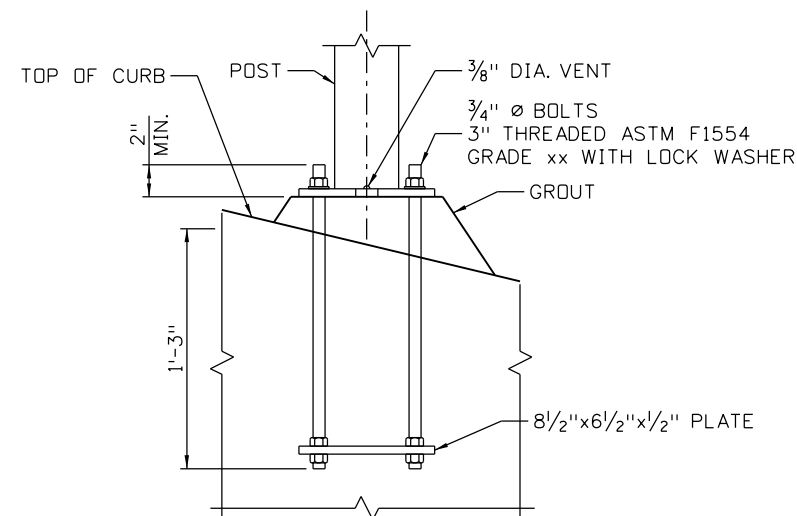
**PLAN - 6x2x3/16 TUBE SPLICE**  
SCALE: 1" = 1'-0"



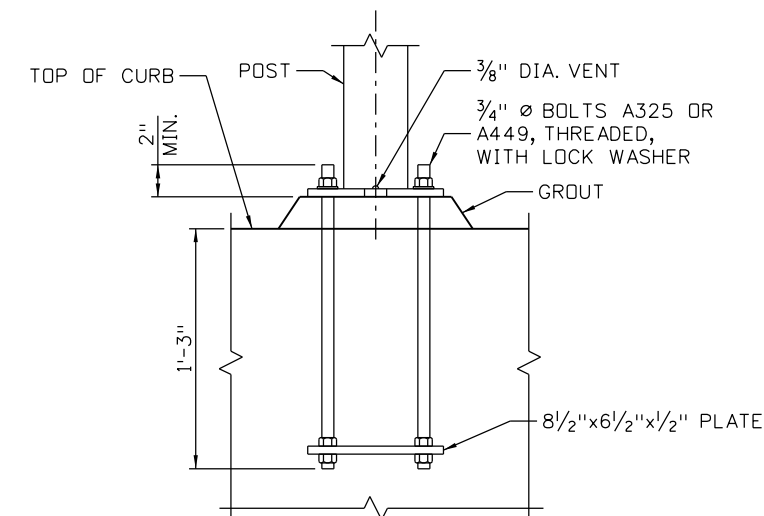
**PLAN - 3x2x3/16 TUBE SPLICE**  
SCALE: 1" = 1'-0"

**QUANTITIES (INFORMATION ONLY)**

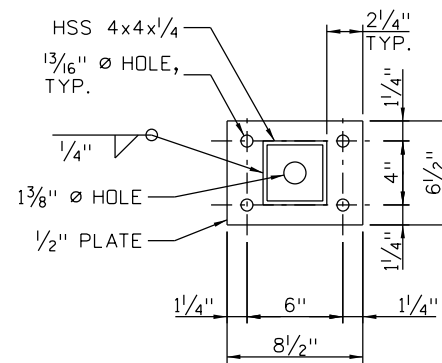
ITEM NO.	DESCRIPTION	UNIT	LB/FT
509	STRUCTURAL STEEL (GALVANIZED)	LB.	37



**ANCHORAGE DETAIL AT SLOPED DECK**  
SCALE: 1" = 1'-0"



**ANCHORAGE DETAIL**  
SCALE: 1" = 1'-0"



**BASE PLATE DETAIL**  
(ANCHORAGE PLATE SIMILAR)  
SCALE: 1" = 1'-0"

**NOTES:**

- ALL STEEL SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A123. ALL POSTS AND BASE PLATES SHALL BE ASTM A-572 GRADE 50. ALL TUBES SHALL BE ASTM A-500 GRADE B. ALL OTHER STEEL SHALL BE ASTM A-36.
- STRUCTURAL STEEL SHALL CONFORM TO THE REQUIREMENTS OF SECTION 509.
- TUBES SHALL BE SHOP BENT AND FABRICATED FOR ANGLES GREATER THAN 5 DEGREES AND CURVE WHEN RADIUS IS LESS THAN 1,500 FEET.
- TUBES SHALL BE CONTINUOUS OVER NOT LESS THAN TWO POSTS. NO WELDED BUTT SPLICES WILL BE ALLOWED IN THE TUBE SECTIONS.
- THE CENTERLINE OF THE TUBE SPLICE SHALL BE 1'-8" MINIMUM AND 2'-6" MAXIMUM FROM THE CENTERLINE OF THE POSTS.
- PRIOR TO FABRICATION OF THIS ITEM, WORKING DRAWINGS SHALL BE SUBMITTED TO THE ENGINEER FOR INFORMATION ONLY.
- ALL RAILINGS SHALL BE SHOP FABRICATED.
- ALL POSTS SHALL BE PLUMB.
- POSTS, TUBES, BASE PLATE, ANCHORAGE, BOLTS, NUTS AND FITTINGS SHALL BE INCLUDED IN ITEM NO. 504, PEDESTRIAN RAILING (STEEL).
- SLOT BOTH INNER AND OUTER TUBES. STAGGER TOP AND BOTTOM SPLICES INTO DIFFERENT POST SPACINGS.
- CONCRETE SHALL BE CLASS D (WALL).
- EXPOSED SURFACES OF POSTS, TUBES, AND BASE PLATES SHALL BE PAINTED IN ACCORDANCE WITH SECTION 509. TOP COAT SHALL BE FOREST BROWN.

Print Date: 11/21/2012  
File Name: 18832DES\_WallF\_PedRail02.dgn  
Horiz. Scale: AS NOTED Vert. Scale: AS NOTED  
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Date:	Comments	Init.

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No Revisions:
Revised:
Void:

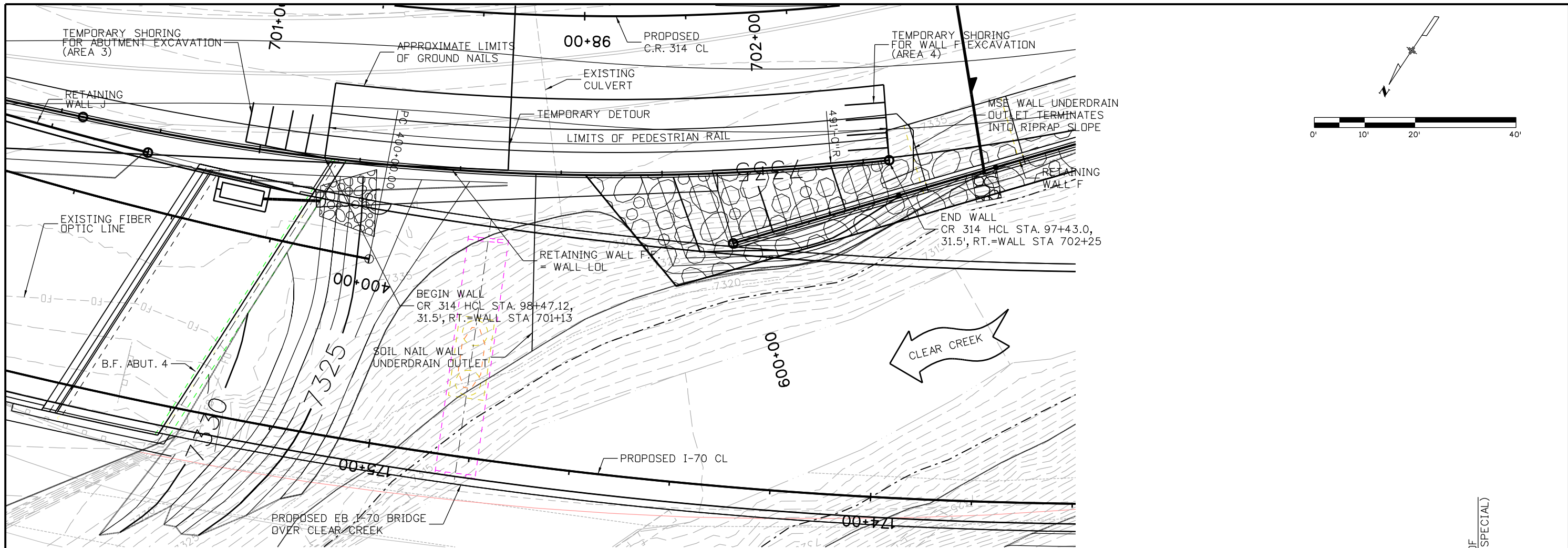
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Designer:	S. ABRAHAM	Structure Numbers	WALL-F-15-BF
Detailer:	A. RANK	Subset Sheets:	W06 of 18

<b>Project No./Code</b>
IM 0703-390
19035
Sheet Number 105



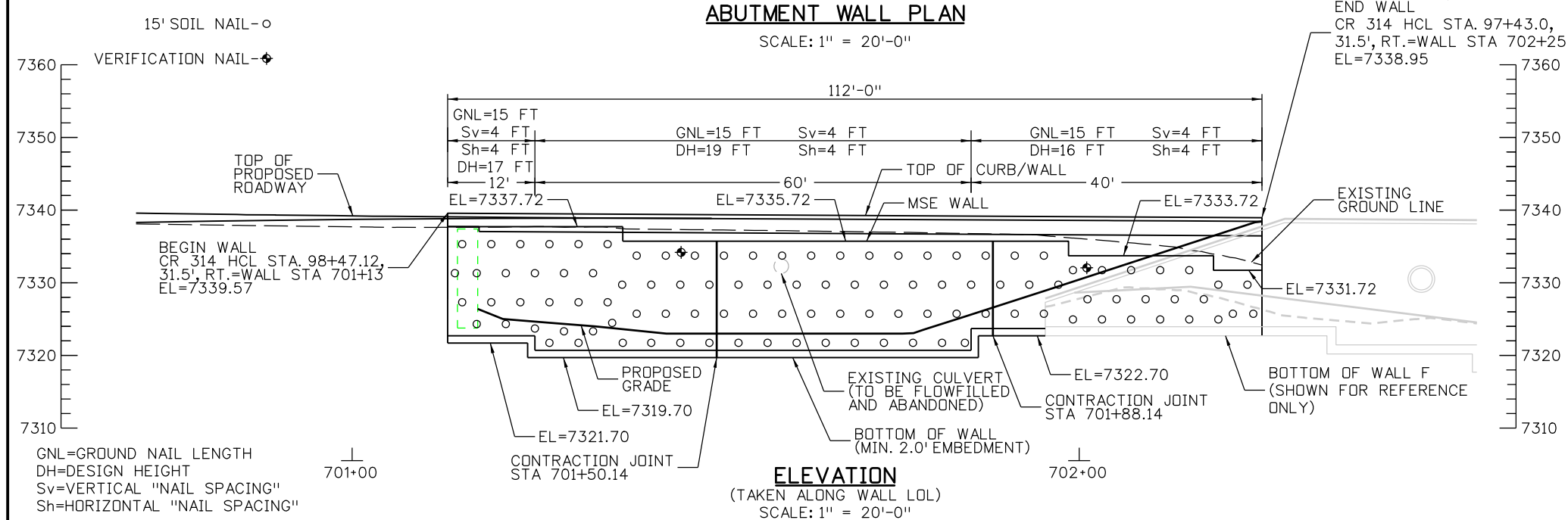






**ABUTMENT WALL PLAN**

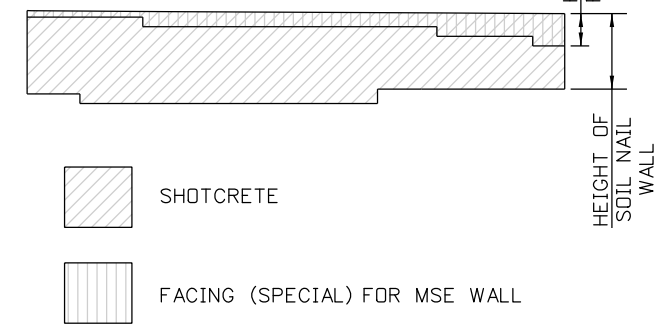
SCALE: 1" = 20'-0"



**ELEVATION**

(TAKEN ALONG WALL LOL)

SCALE: 1" = 20'-0"



**WALL FF QUANTITIES ELEVATION**

NOTE:  
1. FLOW FILL QUANTITY FOR EXISTING CULVERT IS INCLUDED IN DRAINAGE PLANS.

Design		Detail		Quantities	
INITIAL	DATE	INITIAL	DATE	INITIAL	DATE

Print Date: 12/4/2012  
 File Name: 18832BRDG\_I70\_AbutWall GNW.dgn  
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 Staff Bridge Branch - Unit 0221 STW  
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Date:	Comments	Init.

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**Region 1** CRC

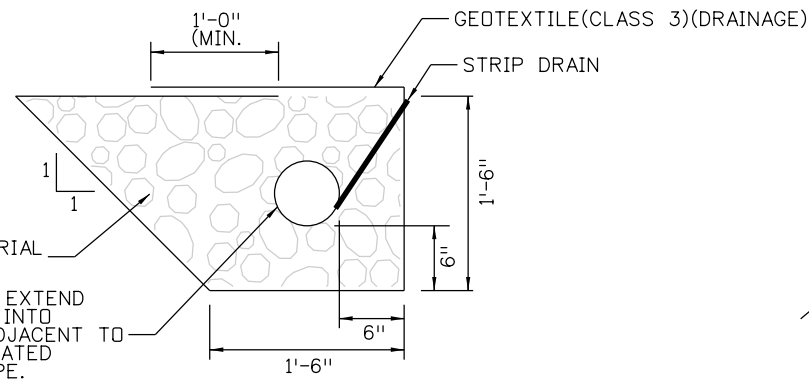
As Constructed
No Revisions:
Revised:
Void:

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Designer:	P. MACKLIN	Structure Numbers	WALL-F-15-BB
Detailer:	M. WALZ	Subset Sheets:	W08 of 18
Sheet Subset:	BRIDGE		

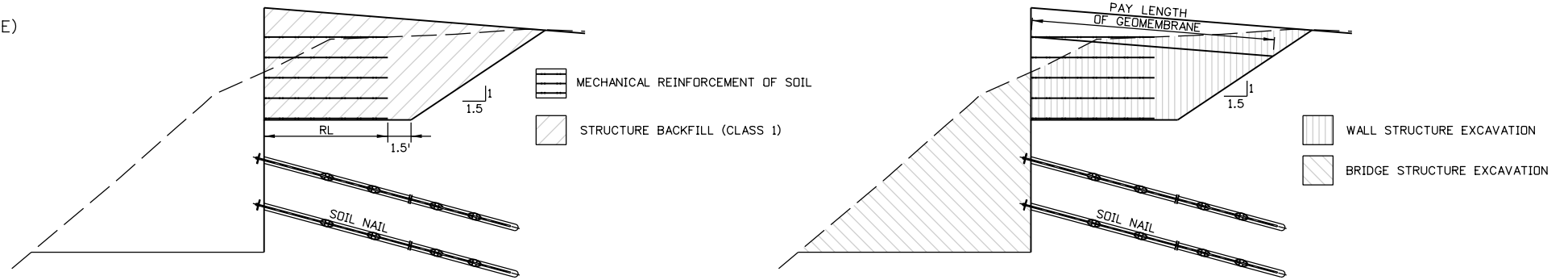
Project No./Code
IM 0703-390
19035
Sheet Number 107

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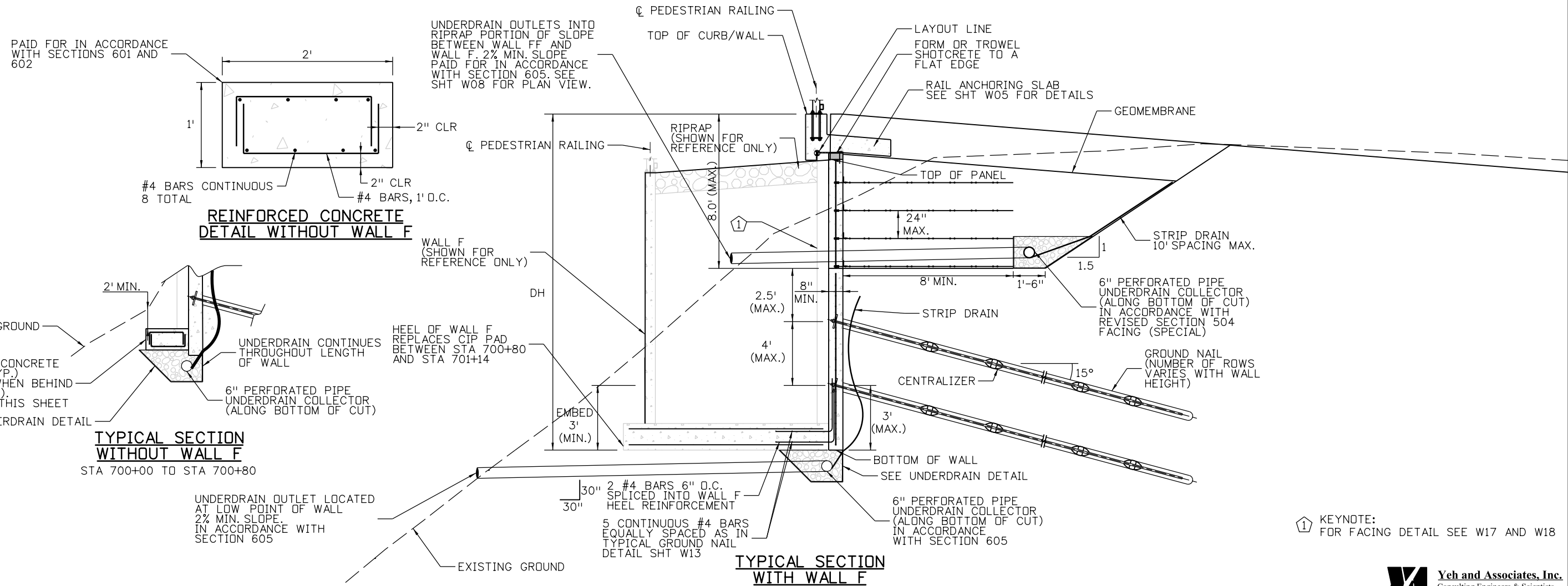
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 Design  
 Initial Date 10/12  
 Checked By BPV  
 Detail  
 Initial Date 10/12  
 Checked By  
 Quantities  
 Initial Date  
 Checked By



**UNDERDRAIN DETAIL**



**WALL FF QUANTITIES SECTIONS**



**REINFORCED CONCRETE  
DETAIL WITHOUT WALL F**

**TYPICAL SECTION  
WITHOUT WALL F**

**TYPICAL SECTION  
WITH WALL F**

KEYNOTE:  
FOR FACING DETAIL SEE W17 AND W18

**Yeh and Associates, Inc.**  
Consulting Engineers & Scientists

Print Date: 11/26/2012	0000
File Name: 18832DES_GNW_TypicalSection01.dgn	
Horiz. Scale: 1:5      Vert. Scale:	
Staff Bridge Branch-Unit 0221      STW	
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DEPARTMENT OF TRANSPORTATION

Region 1

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Phone: 720-497-6905 FAX: 720-497-6901

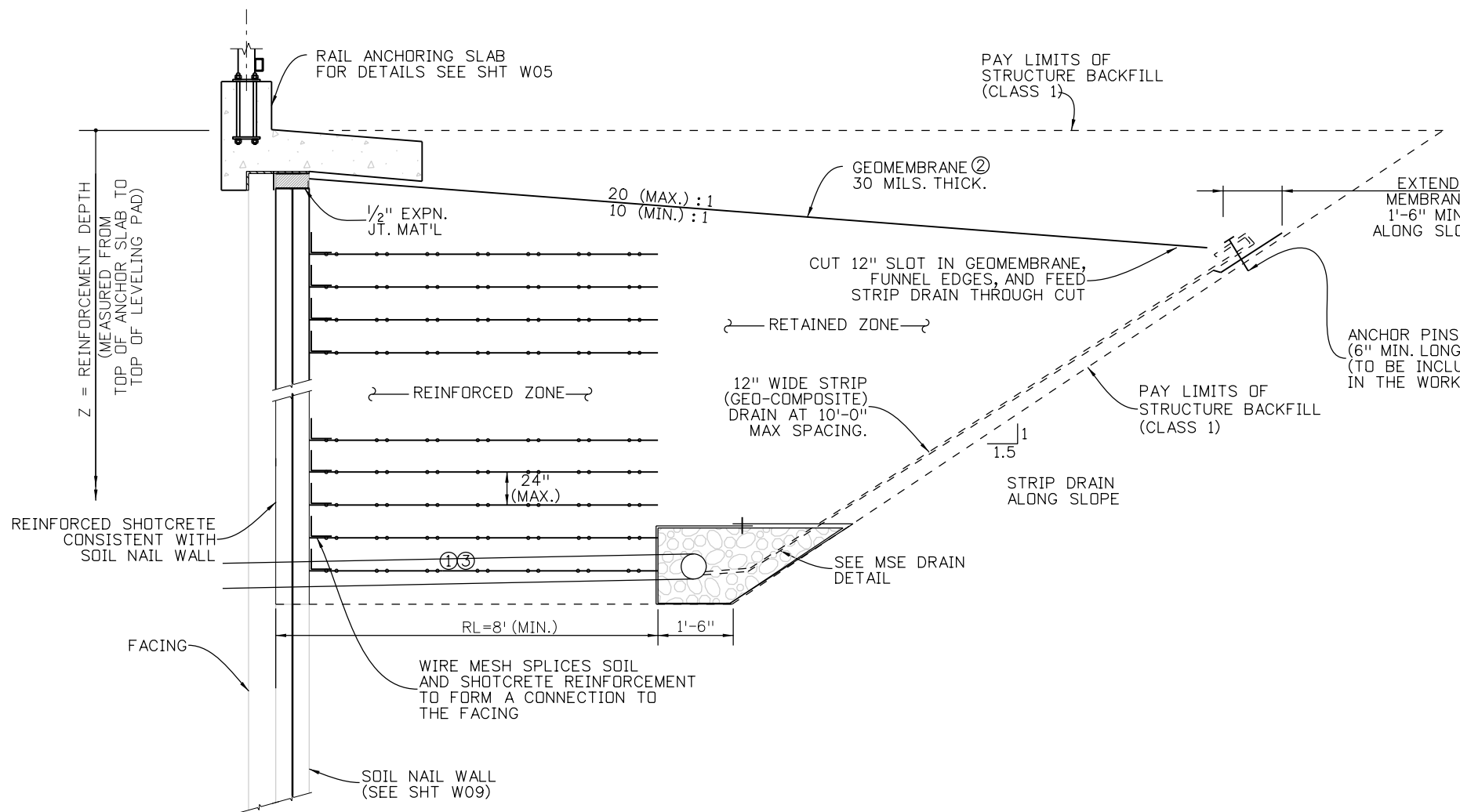
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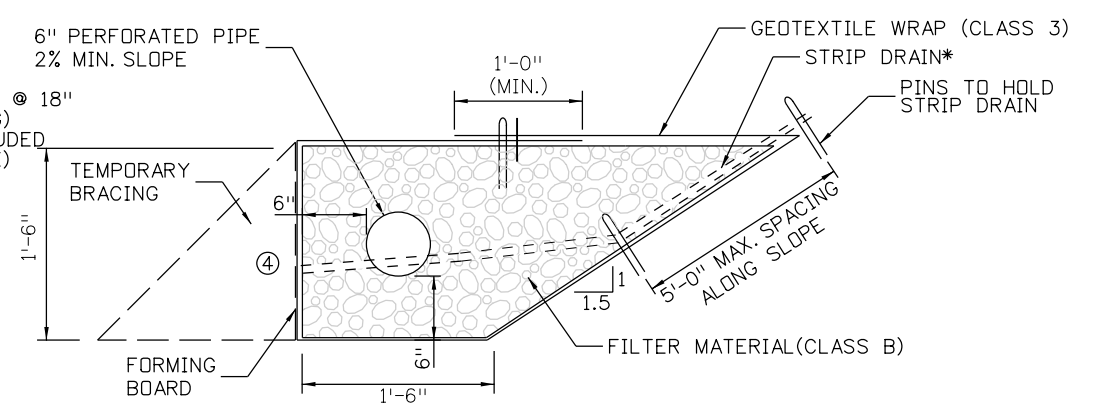
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Designer:	P. MACKLIN	Structure Numbers	WALL-F-15-BB
Detailer:	M. WALZ	Subset Sheets:	W09 of 18

Project No./Code
IM 0703-390
19035
Sheet Number 108

Quantities	INITIAL	DATE	Quantities By	Checked By
Design	INITIAL	DATE	Quantities By	Checked By
Designed By	PRM	10/12	Detailed By	10/12
Checked By	BPV	10/12	Checked By	



**TYPICAL SECTION**



**MSE UNDERDRAIN DETAIL**

\* GEOTEXTILE FABRIC FLOW RATE = 140 gpm/sq ft (MIN.) AND CORE FLOW RATE OF 21 gpm/ft (MIN.)

**NOTES:**

- ① SOIL REINFORCEMENT MAY BE CUT TO ACCOMMODATE PIPE INSTALLATION. THE CUT SHALL BE MADE IN A DIRECTION PARALLEL TO THE PIPE CENTERLINE, AS SEEN IN A PLAN VIEW.
- ② THE GEOMEMBRANE SHALL BE INSTALLED WITH A CONSTANT SLOPE FROM THE FACING BLOCK ALL THE WAY TO THE BACK, IN CONJUNCTION WITH THE GEO-COMPOSITE DRAIN DRAINS AT AND ALONG THE TEMPORARY CUT SLOPE. THE GEO-COMPOSITE DRAINS THAT CONNECT TO THE WATER COLLECTOR SYSTEM SHALL BE MINIMUM 12" IN WIDTH AT 10' MAXIMUM SPACING.
- ③ ALL PIPES AND PIPE JOINTS SHALL BE CORRUGATED H.D.P.E.
- ④ ONE SIDE TEMPORARY FORMING BOARD IS REQUIRED TO BUILD DRAIN DETAIL. THE FILTER MATERIAL SHALL BE WRAPPED WITH EROSION CONTROL GEOTEXTILE (CLASS 3).

\* QUANTITIES OF PERFORATED PIPES (IN.), AND DRAIN PIPES (IN.) SHALL BE BASED ON THE WALL LENGTH IN THE LAYOUT PLAN.

Print Date: 11/21/2012	0000
File Name: 18832 WallFF MSE Detail.dgn	
Horiz. Scale: 1:1      Vert. Scale:	
Staff Bridge Branch-Unit 0221      STW	
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Sheet Revisions		
Date:	Comments	Init.

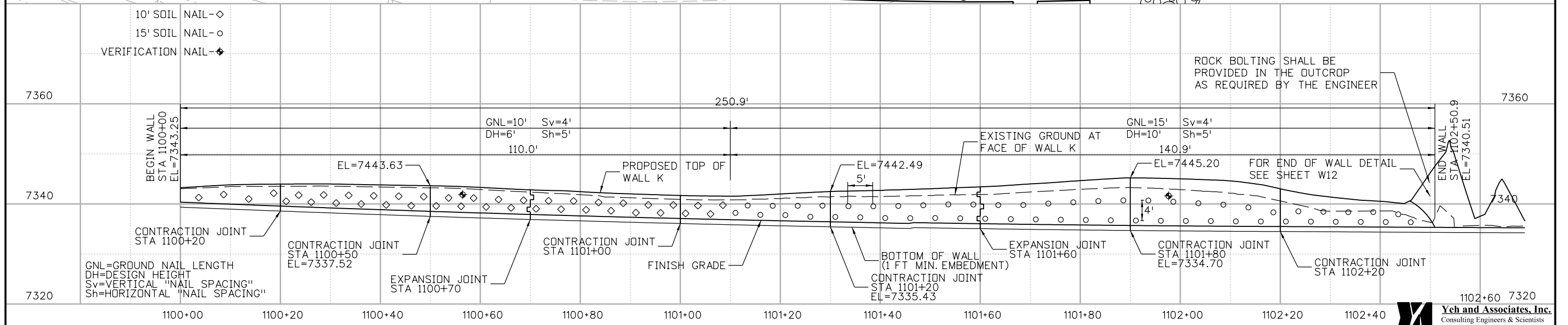
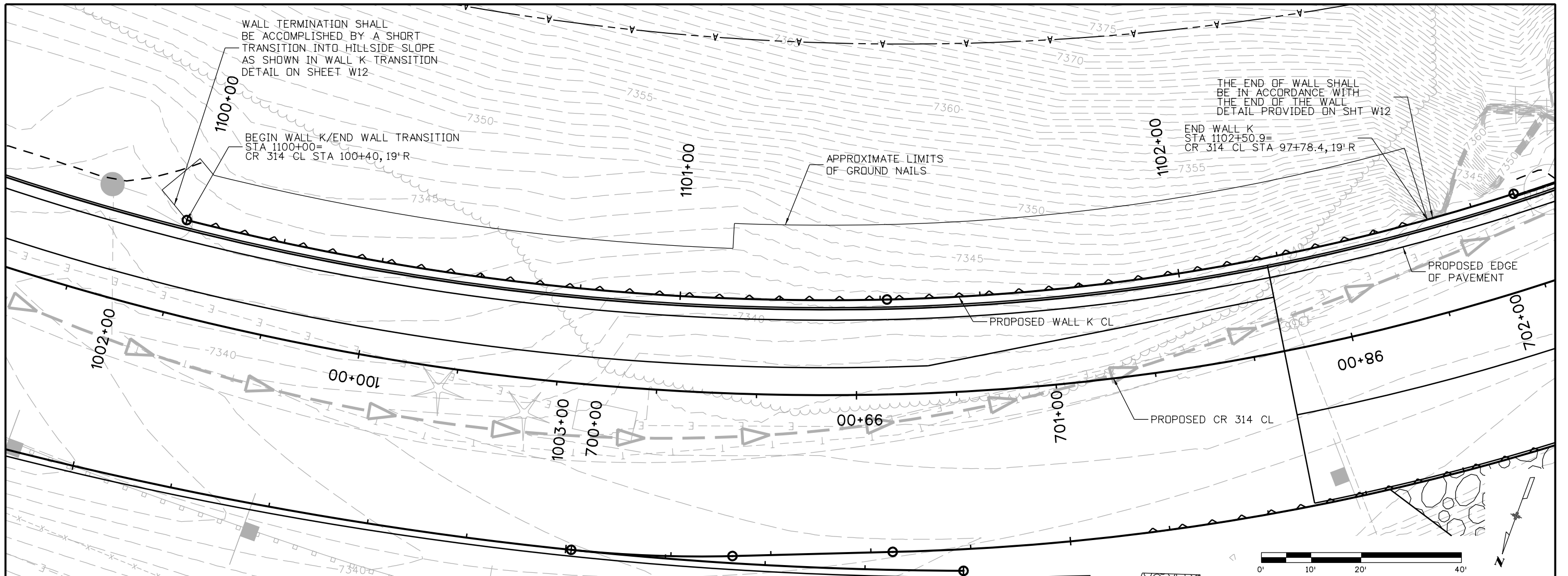
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Region 1      CRC

As Constructed	No Revisions:		Project No./Code	
	Revised:			IM 0703-390
	Void:			19035
RETAINING WALL FF MSE WALL		Designer: P. MACKLIN	Structure Numbers	
		Detailer: M. WALZ	WALL-F-15-BB	
		Subset:	Subset Sheets: W10 of 18	
			Sheet Number 109	



Quantities	INITIAL	DATE
Quantities By		
Checked By		
Design	INITIAL	DATE
Designed By		
Checked By		
Detail	INITIAL	DATE
Detailed By		
Checked By		

Print Date: 11/20/2012  
 File Name: 18832DES\_WallK\_GNW001.dgn  
 Horiz. Scale: 1:20 Vert. Scale: 1:20  
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 Revised:  
 Void:

**RETAINING WALL K**  
 STA 1100+50 TO 1102+31.90  
 GROUND NAIL DIAGRAM

Designer: P. MACKLIN  
 Detailer: M. WALZ  
 Sheet Subset: WALL

Structure Numbers: WALL-F-15-BK  
 Subset Sheets: W11 of 18

Project No./Code  
 IM 0703-390  
 19035  
 Sheet Number 110

**Yeh and Associates, Inc.**  
 Consulting Engineers & Scientists













**1.0 GENERAL NOTES FOR ROCK REINFORCEMENT (DOWEL)**

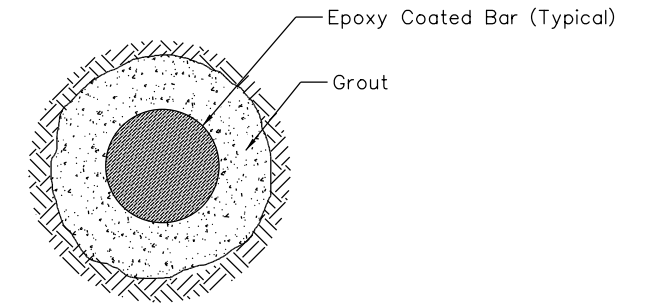
- 1.1 Rock Reinforcement (Dowel): Grade 75, #8 bar, (ASTM A-615), epoxy coated (ASTM A-775), bearing plate 8"x8"x1/2" (ASTM-36), beveled washers (ASTM A-536), hex nut (ASTM A-108). All hardware and bars shall be epoxy coated.
- 1.2 Outer nuts and plates shall be painted to match the colors of the surrounding environment if visible after final grading.
- 1.3 Contractor to verify quantities prior to ordering. Quantities provided for information only.

**2.0 INSTALLATION CONSTRUCTION SEQUENCE**

- 2.1 The Engineer will mark locations and orientations of the rock reinforcement in the field based on the quantities and general locations provided in the plans.
- 2.2 One coupler is allowed per anchor. Coupler shall be epoxy coated.
- 2.3 Rock Reinforcement (Dowel) to be grouted in one phase. Grout shall be tremied from bottom to top of hole.

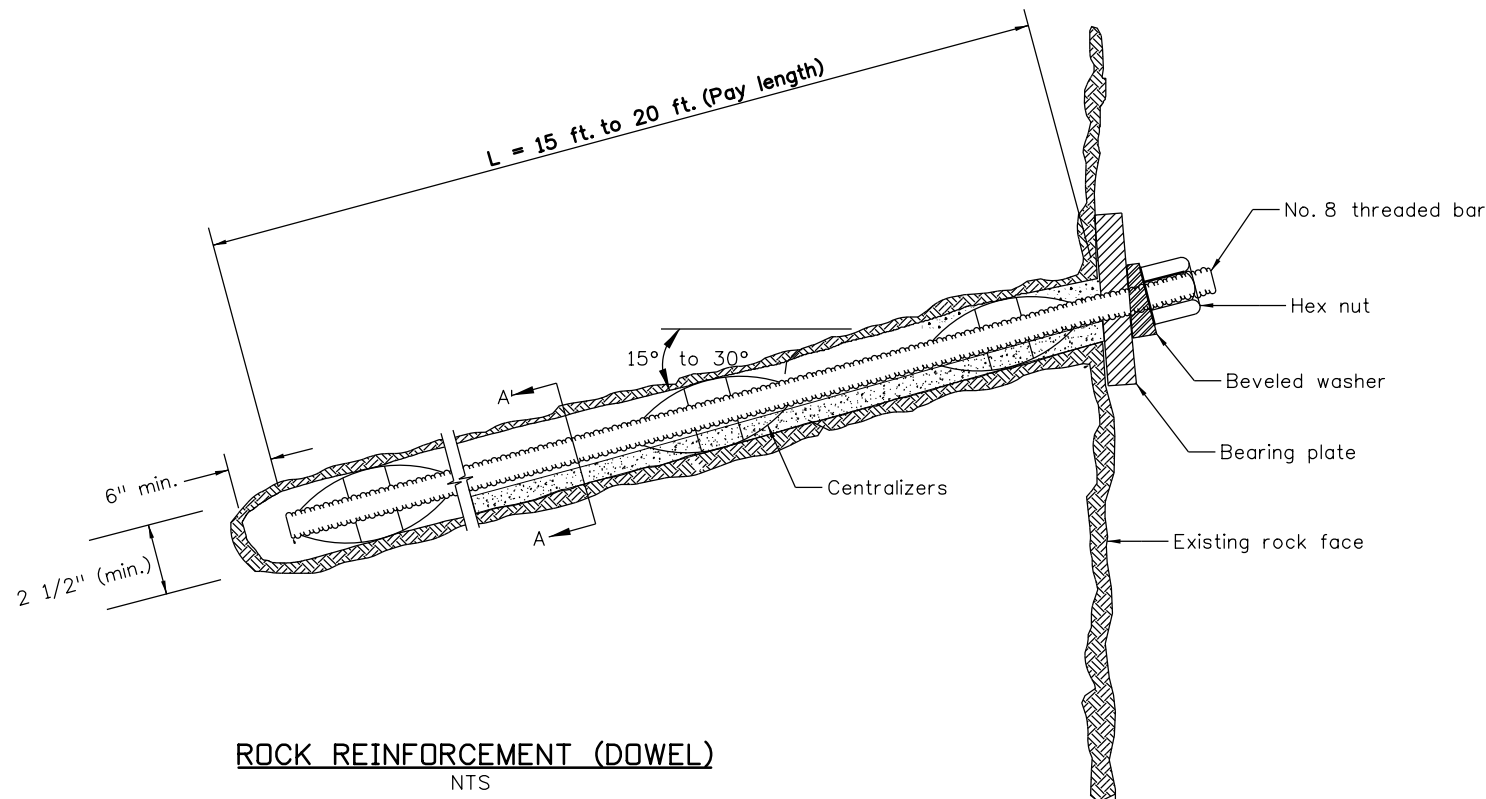
**3.0 DESIGN ASSUMPTIONS**

- 3.1 The Test Load (TL) for the Rock Reinforcement (Dowel) will be 10 kips or as directed by the Engineer. A minimum of five (5) percent of the Rock Reinforcement (Dowel) shall have a lift-off test.

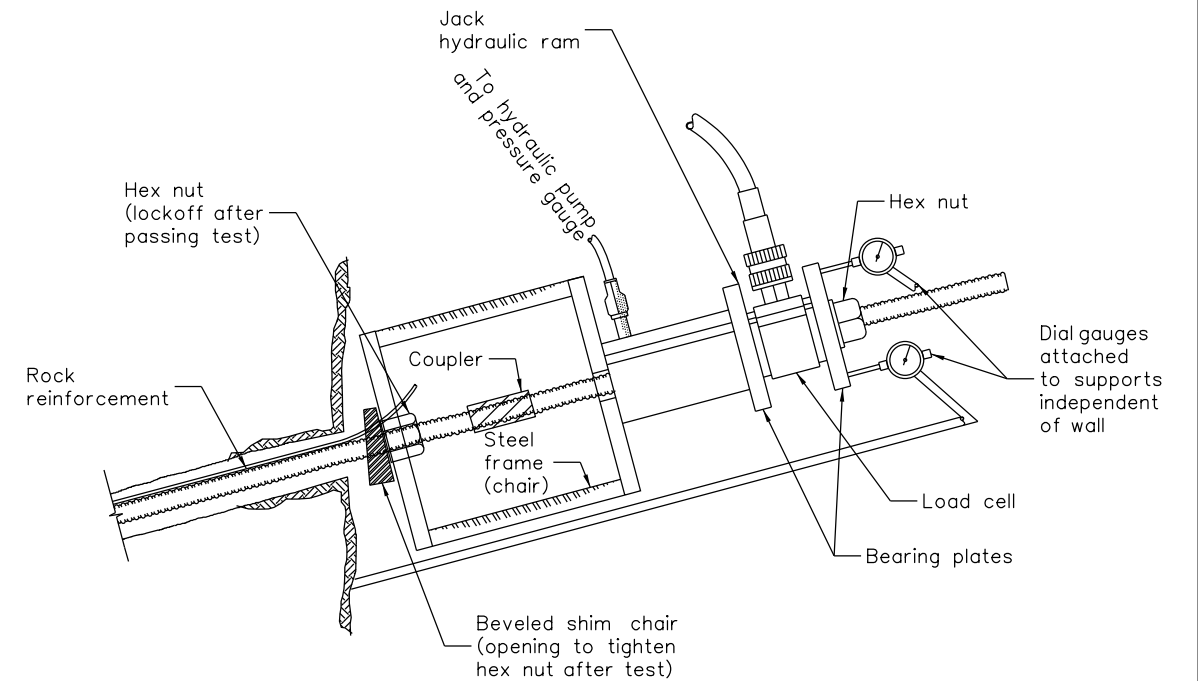


**BONDED LENGTH CROSS SECTION A-A'**  
NTS

ROCK REINFORCEMENT (DOWELS)		
ITEM NO.	ITEM	ESTIMATED QUANTITY
211-01111	ROCK REINFORCEMENT (DOWEL)	150 LF



**ROCK REINFORCEMENT (DOWEL)**  
NTS



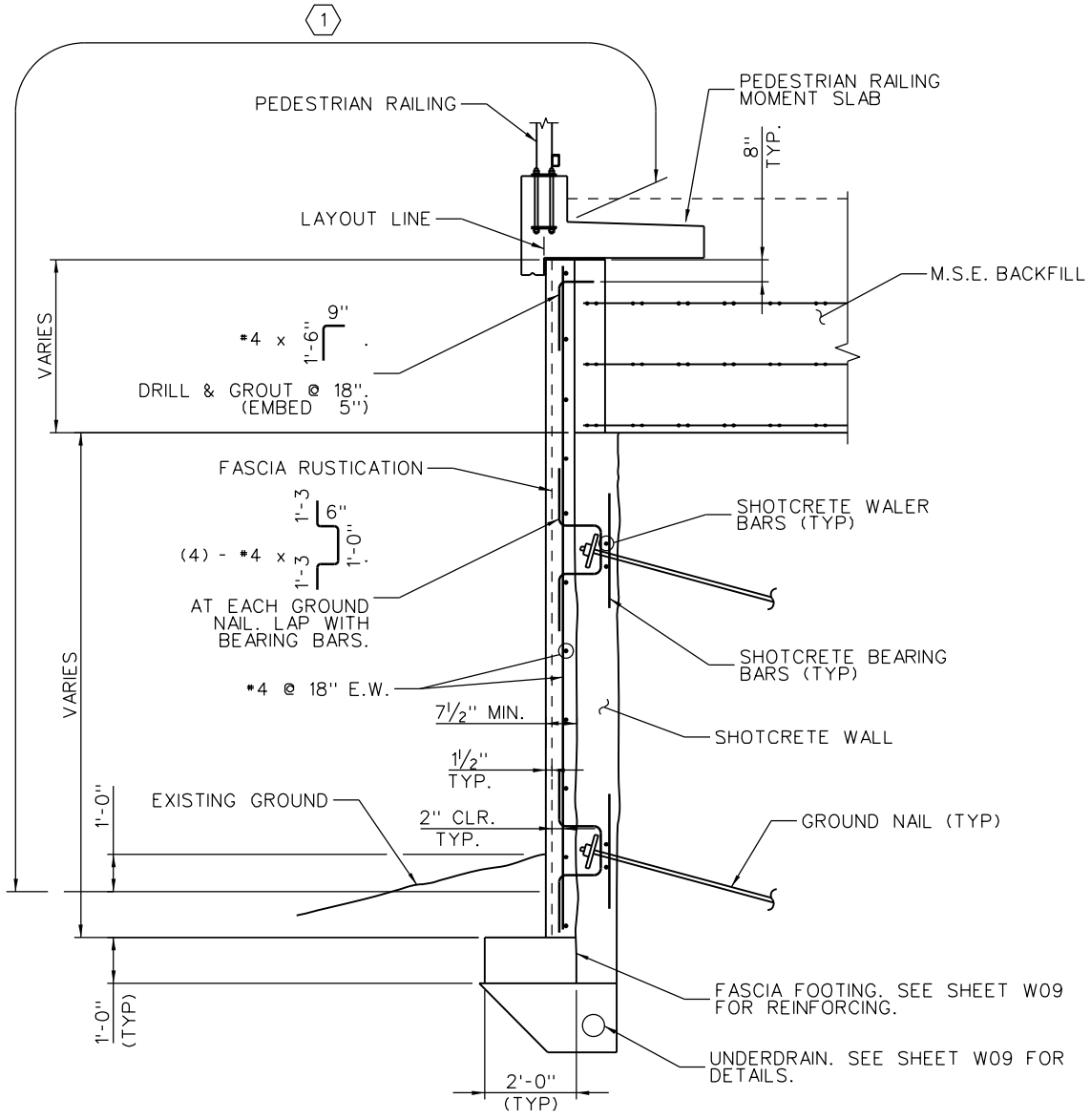
**ROCK REINFORCEMENT TESTING DETAIL**  
NTS

Quantities	INITIAL	DATE
Detail		
Quantities By		
Checked By		
Design	INITIAL	DATE
Designed By	PRM	10/12
Checked By	BPV	10/12

Print Date: 11/20/2012	<b>Sheet Revisions</b>			Colorado Department of Transportation	As Constructed	RETAINING WALL K			Project No./Code
File Name: 18832 Rock Bolt.dgn	Date:	Comments	Init.			ROCK REINFORCEMENT (DOWEL)			
Horiz. Scale: 1:1				425 A Corporate Circle Golden, CO 80401 Phone: 720-497-6905 FAX: 720-497-6901	No Revisions:	Designer:	P. MACKLIN	Structure	WALL-F-15-BK
Staff Bridge Branch-Unit 0221					Region 1	Revised:	Detailer:	M. WALZ	
<b>ATKINS</b> 4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276				CR	Void:	Subset:		Subset Sheets: W16 of 18	Sheet Number 115

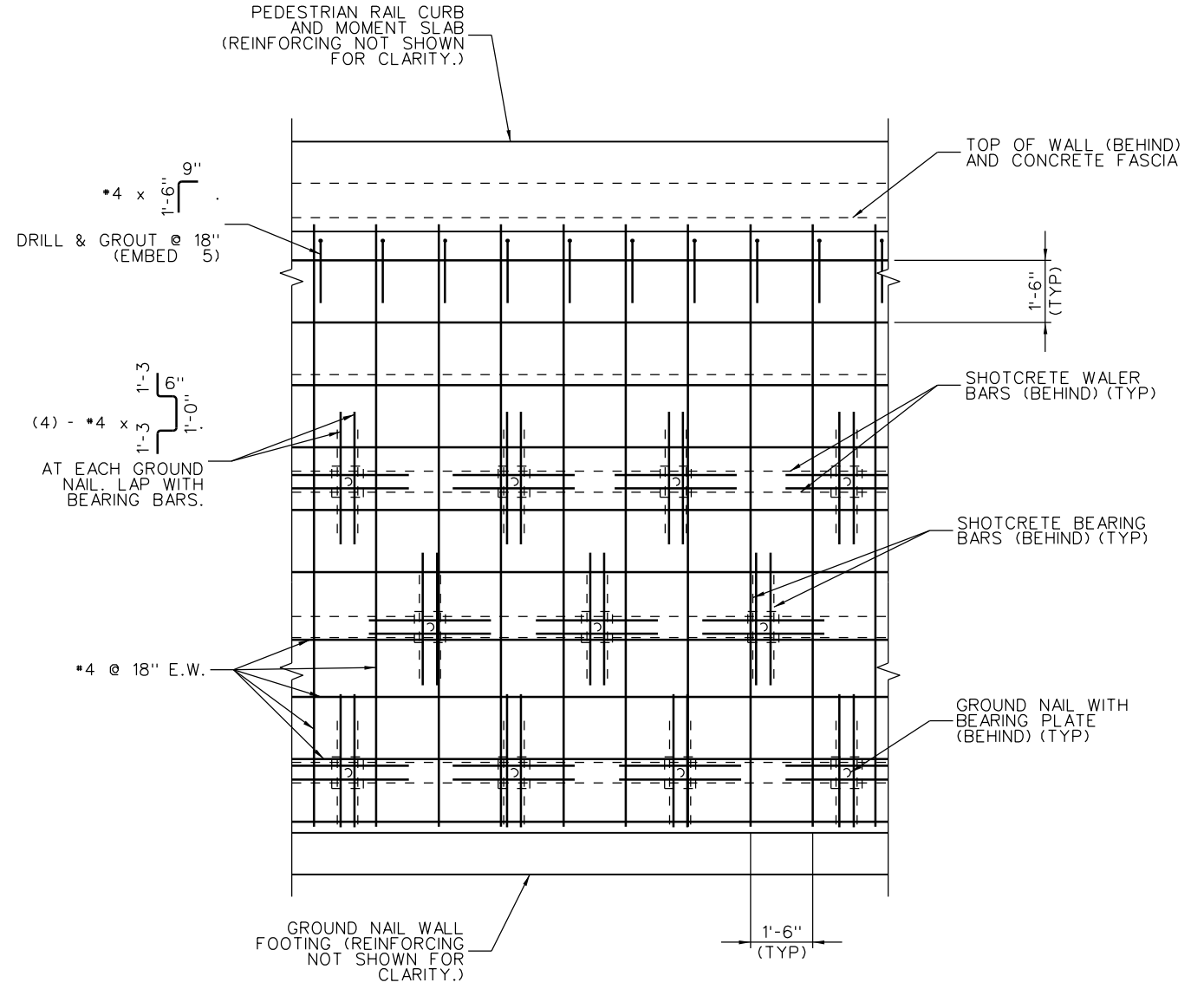


Mike Walz 5:36:06 PM c:\paw\work\18832\18832.dwg 11/20/2012 11:20:06 AM



**FASCIA TYPICAL SECTION**

(TYPICAL FASCIA FOOTING SECTION WITHOUT WALL F SHOWN. SEE SHEET W18 FOR FOOTING SECTION WITH WALL F.)



**FASCIA ELEVATION**

**KEYNOTES:**

① LIMITS OF STRUCTURAL CONCRETE COATING.

**NOTES:**

1. CONCRETE SHALL BE CONCRETE CLASS D (WALL).
2. REFER TO GROUND NAIL WALL SHEETS FOR TOP AND BOTTOM OF GROUND NAIL AND M.S.E. WALLS AND GROUND NAIL LOCATIONS.
3. AT CONTRACTOR'S OPTION, WALL FASCIA MAY BE CONSTRUCTED USING PRECAST CONCRETE PANELS. IF CONTRACTOR ELECTS TO USE PRECAST PANELS, SHOP DRAWINGS DETAILING PANEL LAYOUTS, REINFORCING, AND ATTACHMENTS TO GROUND NAIL WALL SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW.
4. CONCRETE BID ITEM QUANTIES FOR WALL FASCIA INCLUDE 7 1/2" OF CONCRETE THICKNESS OVER THE FACE AREA DEFINED ON THE WALL ELEVATION.
5. FOR GENERAL NOTES, SEE SHEET W01.



Design		Detail		Quantities	
INITIAL	DATE	INITIAL	DATE	INITIAL	DATE
JAZ	11-12	JJM	11-12	JAZ	11-12
Checked By		Checked By		Checked By	
JJM	11-12	JAZ	11-12	JJM	11-12

Print Date: 12/4/2012	0000
File Name: 18832DES_WallFF_FasDet01.dgn	
Horiz. Scale: NONE      Vert. Scale: NONE	
Staff Bridge Branch - Unit 0221      STW	
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Sheet Revisions		
Date:	Comments	Init.

**Colorado Department of Transportation**

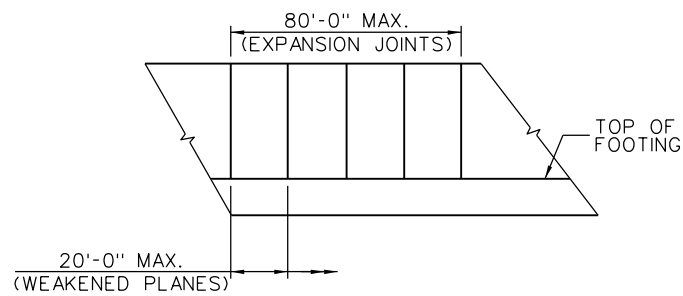
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Golden, CO 80401  
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**Region 1**      **CRC**

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Revised:
Void:

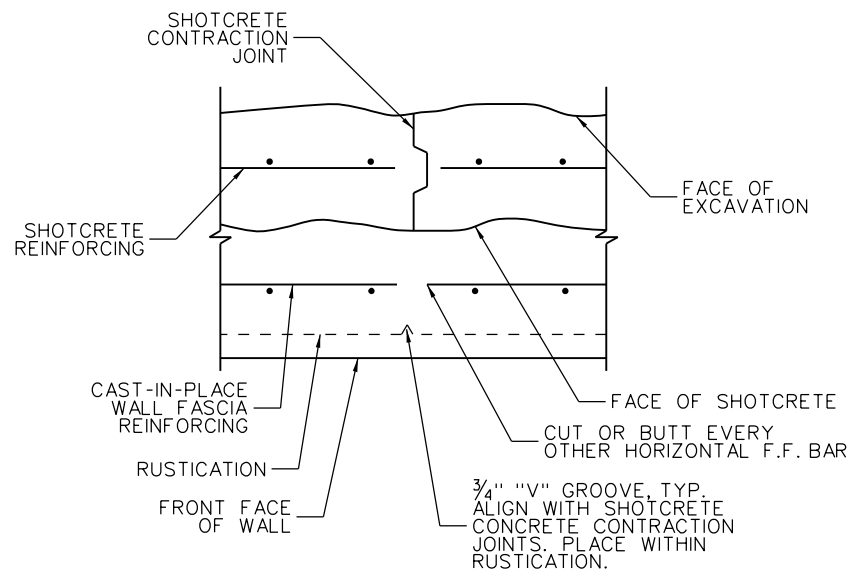
<b>RETAINING WALL FF FASCIA DETAILS (SHEET 1 OF 2)</b>			
Designer:	J. MIGLIACCIO	Structure Numbers	WALL-F-15-BB
Detailer:	J. MIGLIACCIO	Subset Sheets:	W17 of 18
Sheet Subset:	WALL		

<b>Project No./Code</b>
IM 0703-390
19035
Sheet Number 116

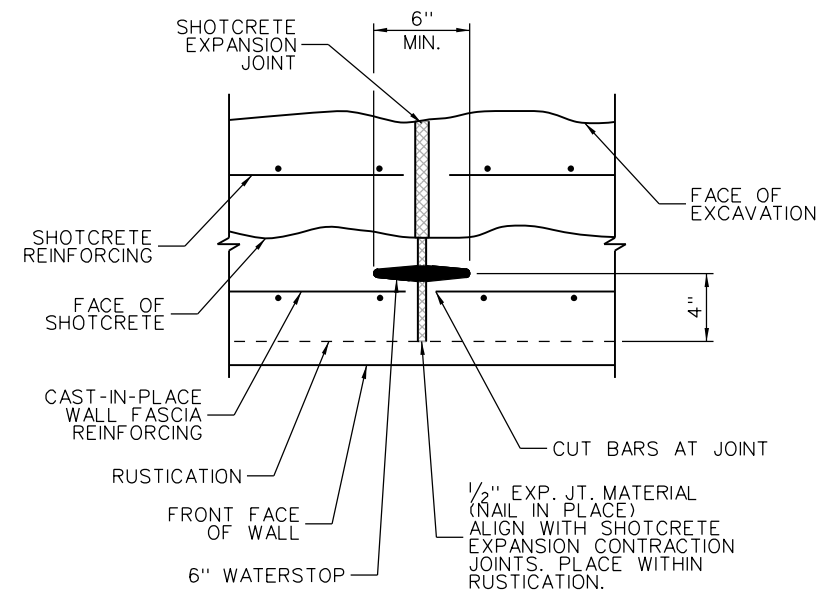


**WALL EXPANSION JOINTS AND WEAKENED PLANES**

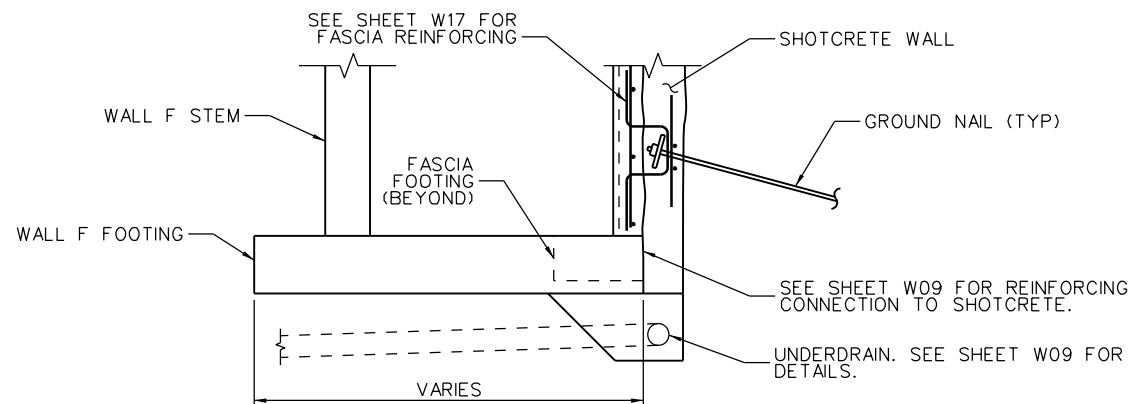
DO NOT EXTEND EXPANSION JOINTS THROUGH FOOTING.



**WEAKENED PLANE**



**EXPANSION JOINT**



**FASCIA TYPICAL SECTION WITH WALL F FOOTING INTERFACE**

**NOTES:**

1. MATERIALS AND WORK NECESSARY FOR FABRICATION AND INSTALLATION OF WATERSTOP, FORMLINER, AND EXPANSION MATERIAL SHALL NOT BE MEASURED AND PAID FOR, BUT SHALL BE INCLUDED IN ITEM 601, CONCRETE CLASS D (WALL).
2. FOR EXPANSION JOINT AND WEAKEND PLANE SPACING AND LOCATION, SEE WALL LAYOUTS.
3. FOR GENERAL NOTES, SEE SHEET W01.
4. PRECAST PANELS MAY BE SUBSTITUTED FOR CAST-IN-PLACE FASCIA AT CONTRACTOR'S OPTION.
5. RUSTICATION SHALL BE LINER 131, COLORADO RANDOM REVEAL PATTERN BY SCOTT SYSTEM OR APPROVED EQUAL.



Design		Detail		Quantities	
INITIAL	DATE	INITIAL	DATE	INITIAL	DATE
JAZ	11-12	JJM	11-12	JAZ	11-12
Checked By		Checked By		Checked By	
JJM	11-12	JAZ	11-12	JJM	11-12

Print Date: 11/21/2012  
 File Name: 18832DES\_WallFF\_FasDet02.dgn  
 Horiz. Scale: NONE Vert. Scale: NONE  
 Staff Bridge Branch - Unit 0221 STW  
**ATKINS** 4601 DTC Boulevard, Suite 700  
 Denver, CO 80237  
 Phone: (303) 221-7275 Fax: (303) 221-7276

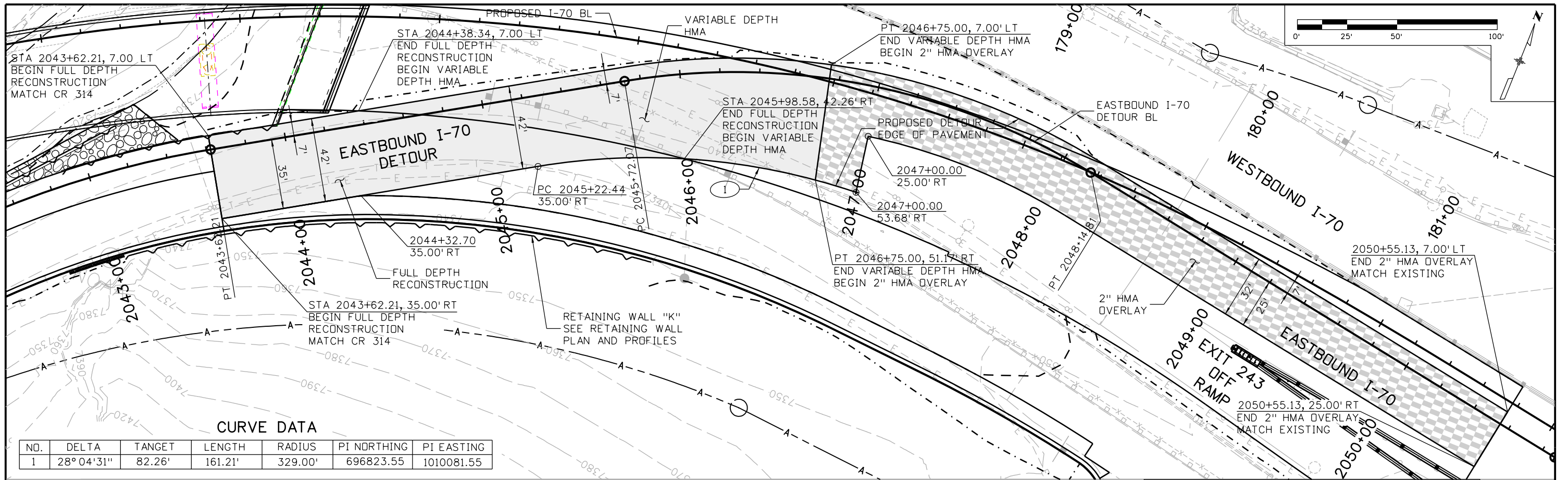
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Date:	Comments	Init.

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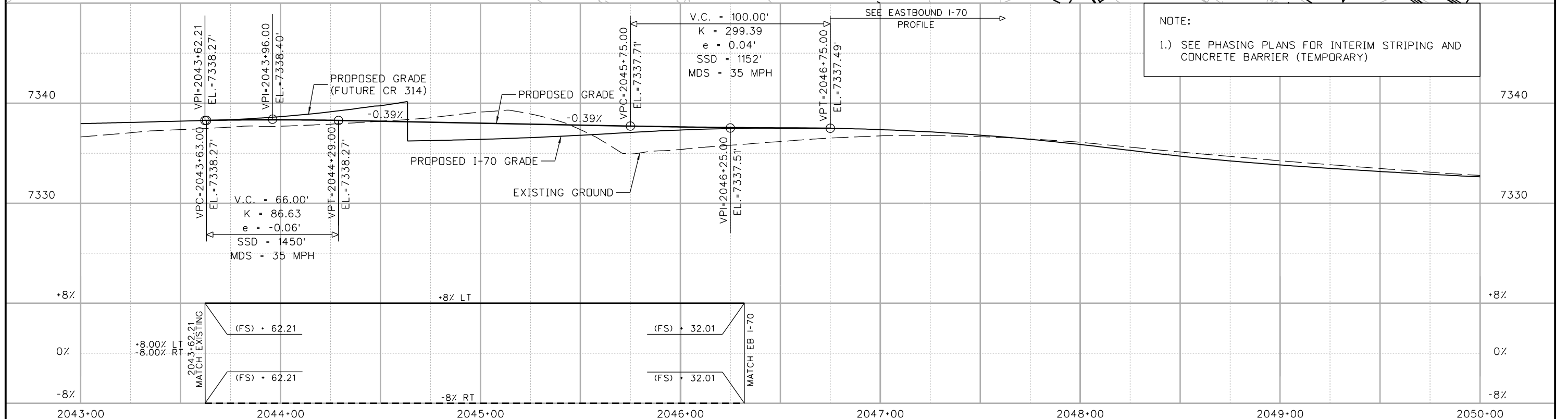
RETAINING WALL FF FASCIA DETAILS (SHEET 2 OF 2)			
Designer:	J. MIGLIACCIO	Structure	WALL-F-15-BB
Detailer:	J. MIGLIACCIO	Numbers	
Sheet Subset:	WALL	Subset Sheets:	W18 of 18

Project No./Code
IM 0703-390
19035
Sheet Number 117



**CURVE DATA**

NO.	DELTA	TANGENT	LENGTH	RADIUS	PI NDRTHING	PI EASTING
1	28° 04' 31"	82.26'	161.21'	329.00'	696823.55	1010081.55



Print Date: 12/4/2012  
 File Name: 18832DES\_CPIB\_EBDetour\_Pn001.dgn  
 Horiz. Scale: 1:50 Vert. Scale: 1"=10'  
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 Phone: (303) 221-7275 Fax: (303) 221-7276

Sheet Revisions		
Date:	Comments	Init.

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 Region 1 **CRC**

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No Revisions:
Revised:
Void:

**EASTBOUND I-70 DETOUR  
 PLAN AND PROFILE  
 STA 2043+62.21 TO 2048+14.81**

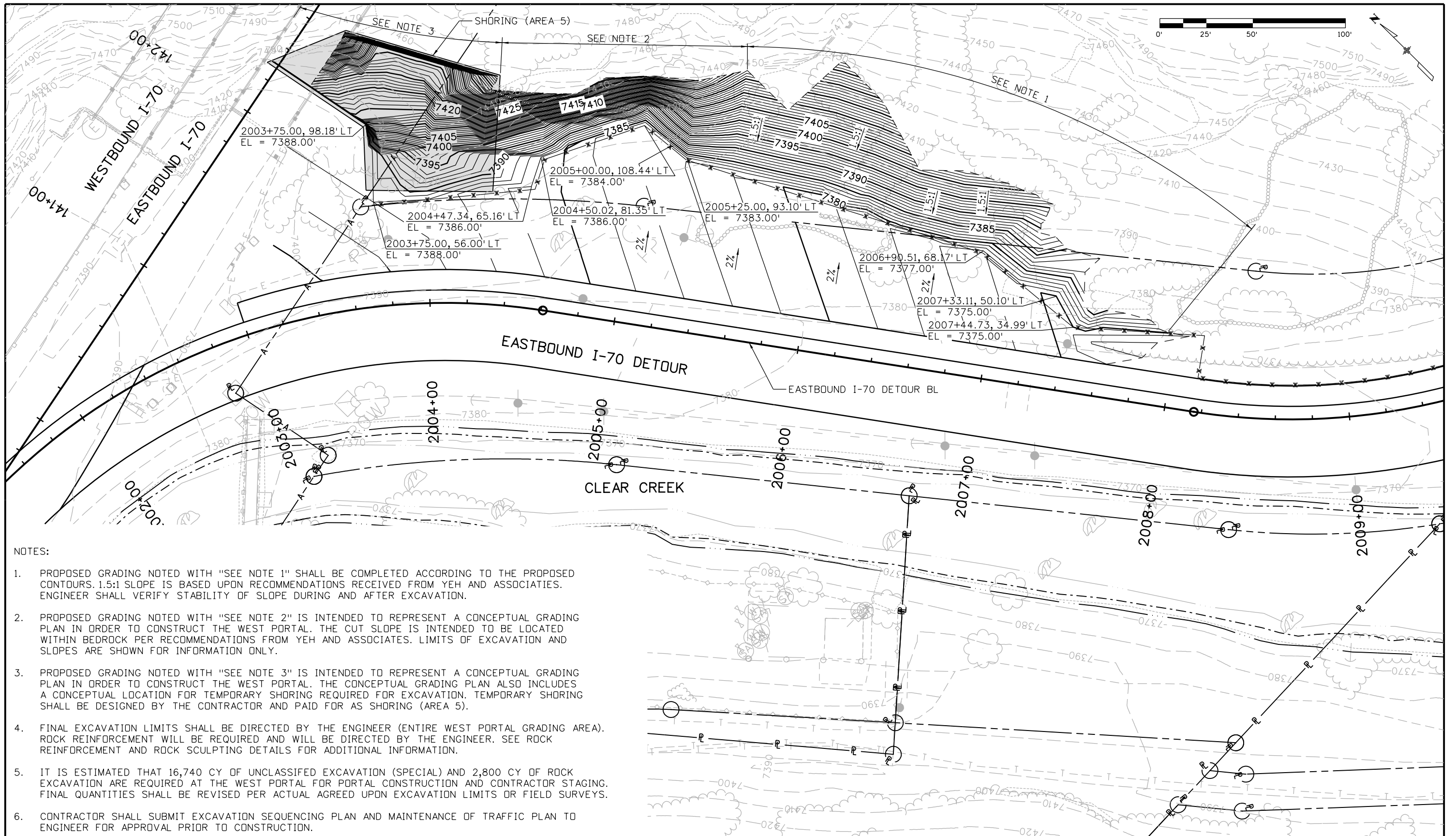
Designer:	E. Marsh	Structure Numbers	
Detailer:	J. Gellner	Subset Sheets:	1 of 2
Subset:	Detour		

<b>Project No./Code</b>
IM 0703-390
19035
Sheet Number 118

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**NOTES:**

1. PROPOSED GRADING NOTED WITH "SEE NOTE 1" SHALL BE COMPLETED ACCORDING TO THE PROPOSED CONTOURS. 1.5:1 SLOPE IS BASED UPON RECOMMENDATIONS RECEIVED FROM YEH AND ASSOCIATES. ENGINEER SHALL VERIFY STABILITY OF SLOPE DURING AND AFTER EXCAVATION.
2. PROPOSED GRADING NOTED WITH "SEE NOTE 2" IS INTENDED TO REPRESENT A CONCEPTUAL GRADING PLAN IN ORDER TO CONSTRUCT THE WEST PORTAL. THE CUT SLOPE IS INTENDED TO BE LOCATED WITHIN BEDROCK PER RECOMMENDATIONS FROM YEH AND ASSOCIATES. LIMITS OF EXCAVATION AND SLOPES ARE SHOWN FOR INFORMATION ONLY.
3. PROPOSED GRADING NOTED WITH "SEE NOTE 3" IS INTENDED TO REPRESENT A CONCEPTUAL GRADING PLAN IN ORDER TO CONSTRUCT THE WEST PORTAL. THE CONCEPTUAL GRADING PLAN ALSO INCLUDES A CONCEPTUAL LOCATION FOR TEMPORARY SHORING REQUIRED FOR EXCAVATION. TEMPORARY SHORING SHALL BE DESIGNED BY THE CONTRACTOR AND PAID FOR AS SHORING (AREA 5).
4. FINAL EXCAVATION LIMITS SHALL BE DIRECTED BY THE ENGINEER (ENTIRE WEST PORTAL GRADING AREA). ROCK REINFORCEMENT WILL BE REQUIRED AND WILL BE DIRECTED BY THE ENGINEER. SEE ROCK REINFORCEMENT AND ROCK SCULPTING DETAILS FOR ADDITIONAL INFORMATION.
5. IT IS ESTIMATED THAT 16,740 CY OF UNCLASSIFIED EXCAVATION (SPECIAL) AND 2,800 CY OF ROCK EXCAVATION ARE REQUIRED AT THE WEST PORTAL FOR PORTAL CONSTRUCTION AND CONTRACTOR STAGING. FINAL QUANTITIES SHALL BE REVISED PER ACTUAL AGREED UPON EXCAVATION LIMITS OR FIELD SURVEYS.
6. CONTRACTOR SHALL SUBMIT EXCAVATION SEQUENCING PLAN AND MAINTENANCE OF TRAFFIC PLAN TO ENGINEER FOR APPROVAL PRIOR TO CONSTRUCTION.

Print Date: 11/30/2012	
File Name: 18832DES_CPIB_GRPlan001.dgn	
Horiz. Scale: 1:50	Vert. Scale: 1"=10'
<b>ATKINS</b>	
4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276	

Sheet Revisions		
Date:	Comments	Init.

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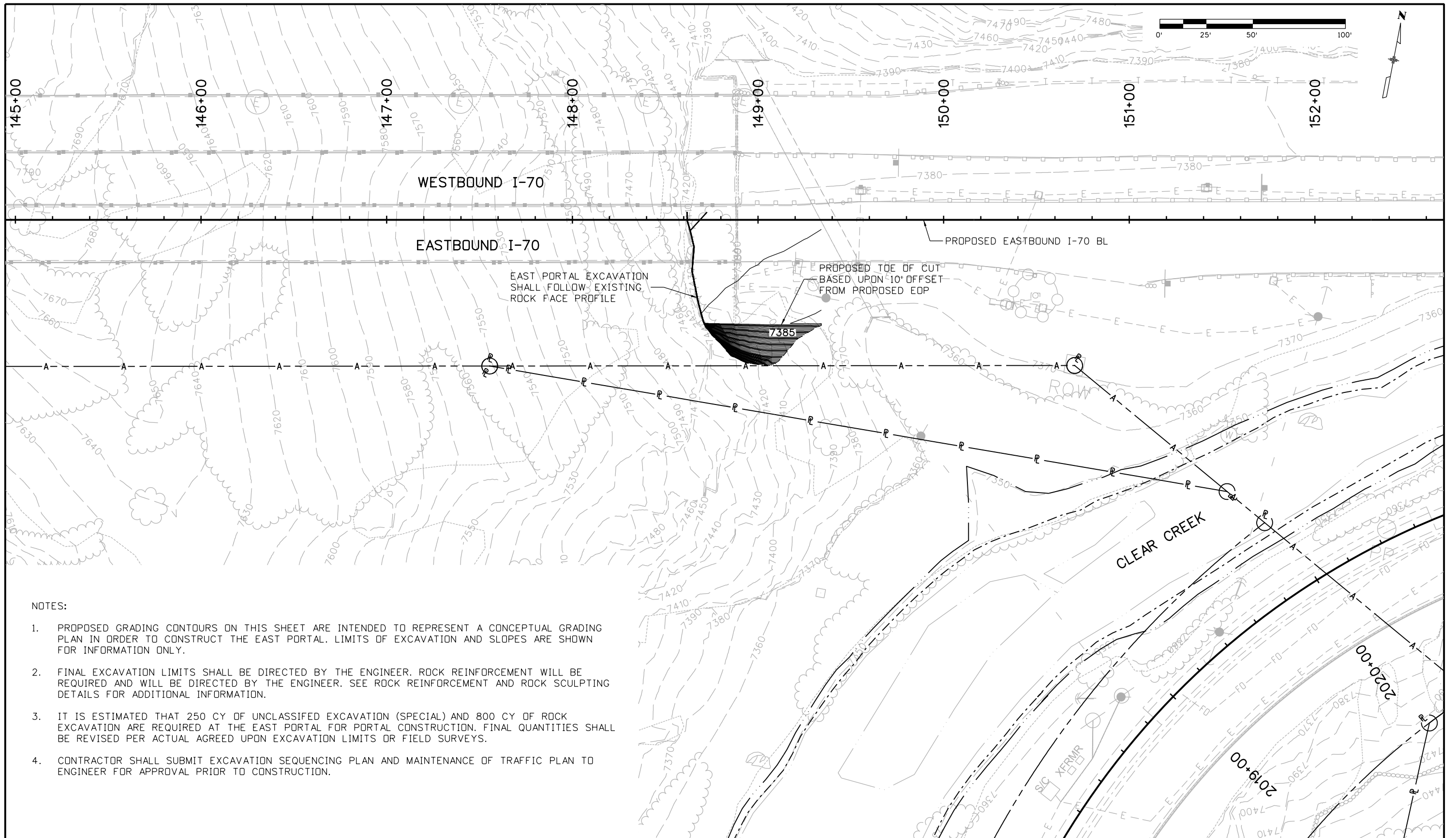
Region 1 CRC

<b>As Constructed</b>
No Revisions:
Revised:
Void:

<b>WEST PORTAL DEVELOPMENT GRADING PLAN</b>		
Designer:	E. Marsh	Structure Numbers
Detailer:	J. Gellner	
Subset:	Port Grading	Subset Sheets: 1 of 2

<b>Project No./Code</b>
IM 0703-390
19035
Sheet Number 120

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**NOTES:**

1. PROPOSED GRADING CONTOURS ON THIS SHEET ARE INTENDED TO REPRESENT A CONCEPTUAL GRADING PLAN IN ORDER TO CONSTRUCT THE EAST PORTAL. LIMITS OF EXCAVATION AND SLOPES ARE SHOWN FOR INFORMATION ONLY.
2. FINAL EXCAVATION LIMITS SHALL BE DIRECTED BY THE ENGINEER. ROCK REINFORCEMENT WILL BE REQUIRED AND WILL BE DIRECTED BY THE ENGINEER. SEE ROCK REINFORCEMENT AND ROCK SCULPTING DETAILS FOR ADDITIONAL INFORMATION.
3. IT IS ESTIMATED THAT 250 CY OF UNCLASSIFIED EXCAVATION (SPECIAL) AND 800 CY OF ROCK EXCAVATION ARE REQUIRED AT THE EAST PORTAL FOR PORTAL CONSTRUCTION. FINAL QUANTITIES SHALL BE REVISED PER ACTUAL AGREED UPON EXCAVATION LIMITS OR FIELD SURVEYS.
4. CONTRACTOR SHALL SUBMIT EXCAVATION SEQUENCING PLAN AND MAINTENANCE OF TRAFFIC PLAN TO ENGINEER FOR APPROVAL PRIOR TO CONSTRUCTION.

Print Date: 11/30/2012  
 File Name: I8832DES\_CPIB\_GRPlan002.dgn  
 Horiz. Scale: 1:50      Vert. Scale: 1"=10'  
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Date:	Comments	Init.

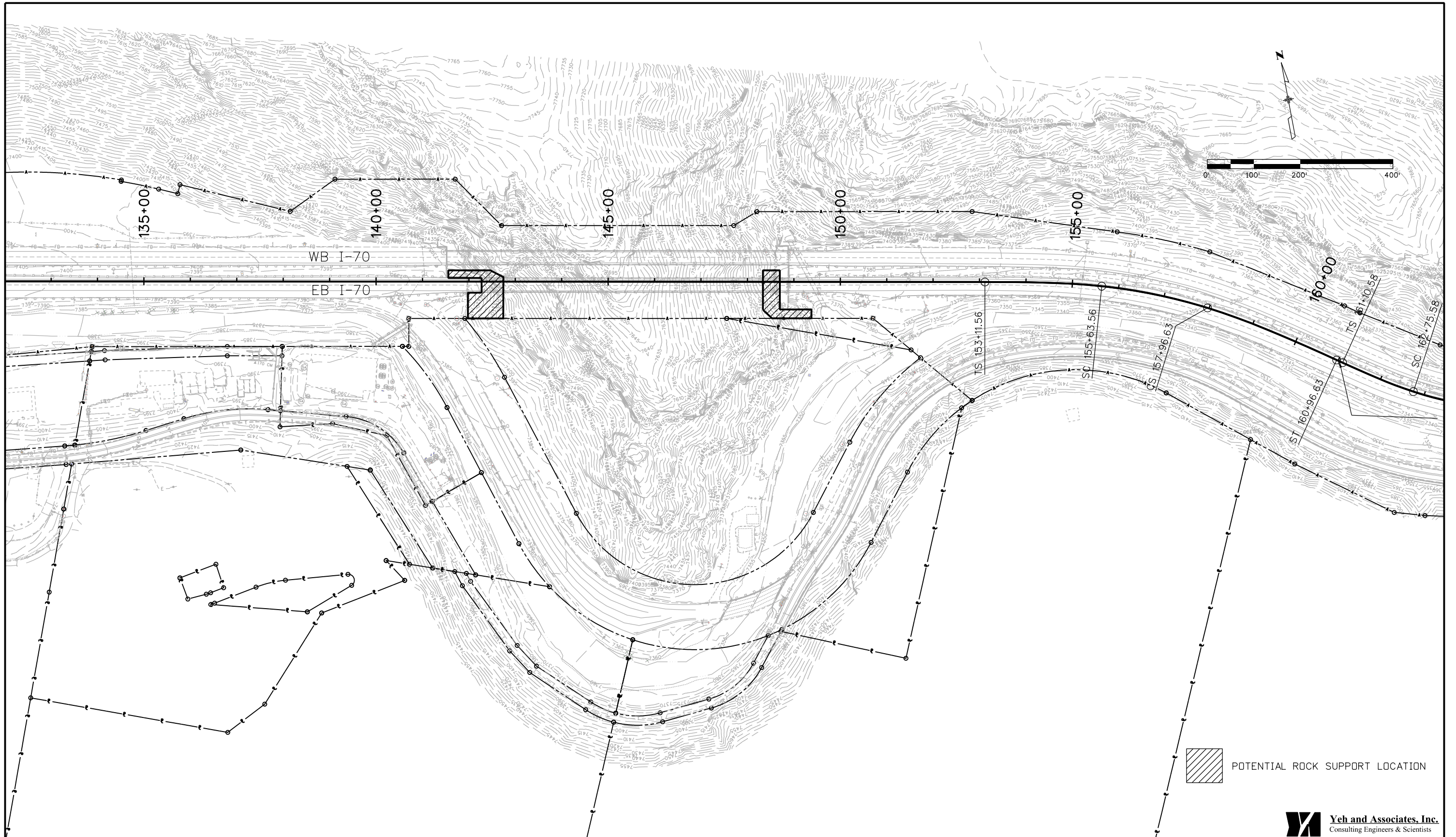
Colorado Department of Transportation  
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 Phone: 720-497-6918 FAX: 720-497-6901  
**Region 1** **CRC**

**As Constructed**  
 No Revisions:  
 Revised:  
 Void:

**EAST PORTAL DEVELOPMENT GRADING PLAN**  
 Designer: E. Marsh  
 Detailer: J. Gellner  
 Subset: Port Grading  
 Structure Numbers  
 Subset Sheets: 2 of 2

**Project No./Code**  
 IM 0703-390  
 19035  
 Sheet Number 121





Mike Walz 10:37:44 AM c:\pw\_work\pbs\pw\common\dms33734\18832 PotentialRock Support Locations.dgn

Print Date: 11/16/2012  
 File Name: 18832 PotentialRock Support Locations.dgn  
 Horiz. Scale:                      Vert. Scale:

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Revised:
Void:

**PORTAL DEVELOPMENT  
 POTENTIAL ROCK  
 SUPPORT LOCATIONS**

Designer: H. HUME  
 Detailer: M. WALZ  
 Subset: PORTAL DEV

Structure Numbers  
 Subset Sheets: 1 of 4

<b>Project No./Code</b>
IM 0703-390
19035
Sheet Number 122

**Yeh and Associates, Inc.**  
 Consulting Engineers & Scientists



**1.0 GENERAL NOTES FOR ROCK REINFORCEMENT (DOWEL)**

1.1 Rock Reinforcement (Dowel): Grade 75, #8 bar, (ASTM 615), epoxy coated (ASTM A-775), bearing plate 8"x8"x1/2" (A-36), beveled washers (ASTM A-536), hex nut (ASTM A-108). All hardware and bars shall be epoxy coated.

1.2 Outer nuts and plates shall be painted to match corridor colors if visible after final grading.

1.3 Contractor to verify quantities prior to ordering. Quantities provided for information only.

**2.0 INSTALLATION CONSTRUCTION SEQUENCE**

2.1 The Engineer will mark locations and orientations of the rock reinforcement in the field based on the quantities and general locations provided in the plans which may range from top of cut to roadway level.

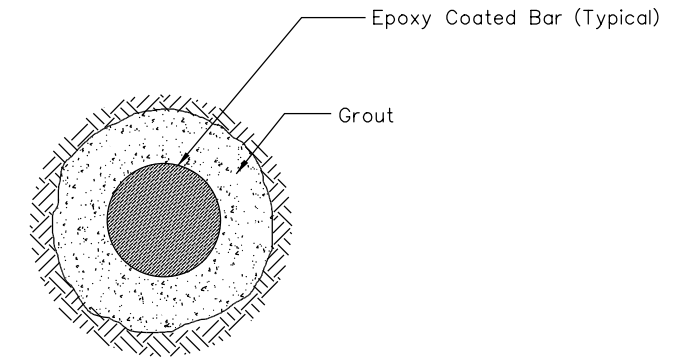
2.2 One coupler is allowed per anchor. Coupler shall be epoxy coated.

2.3 Rock Reinforcement (Dowel) to be grouted in one phase. Grout shall be tremied from bottom to top of hole.

**3.0 DESIGN ASSUMPTIONS**

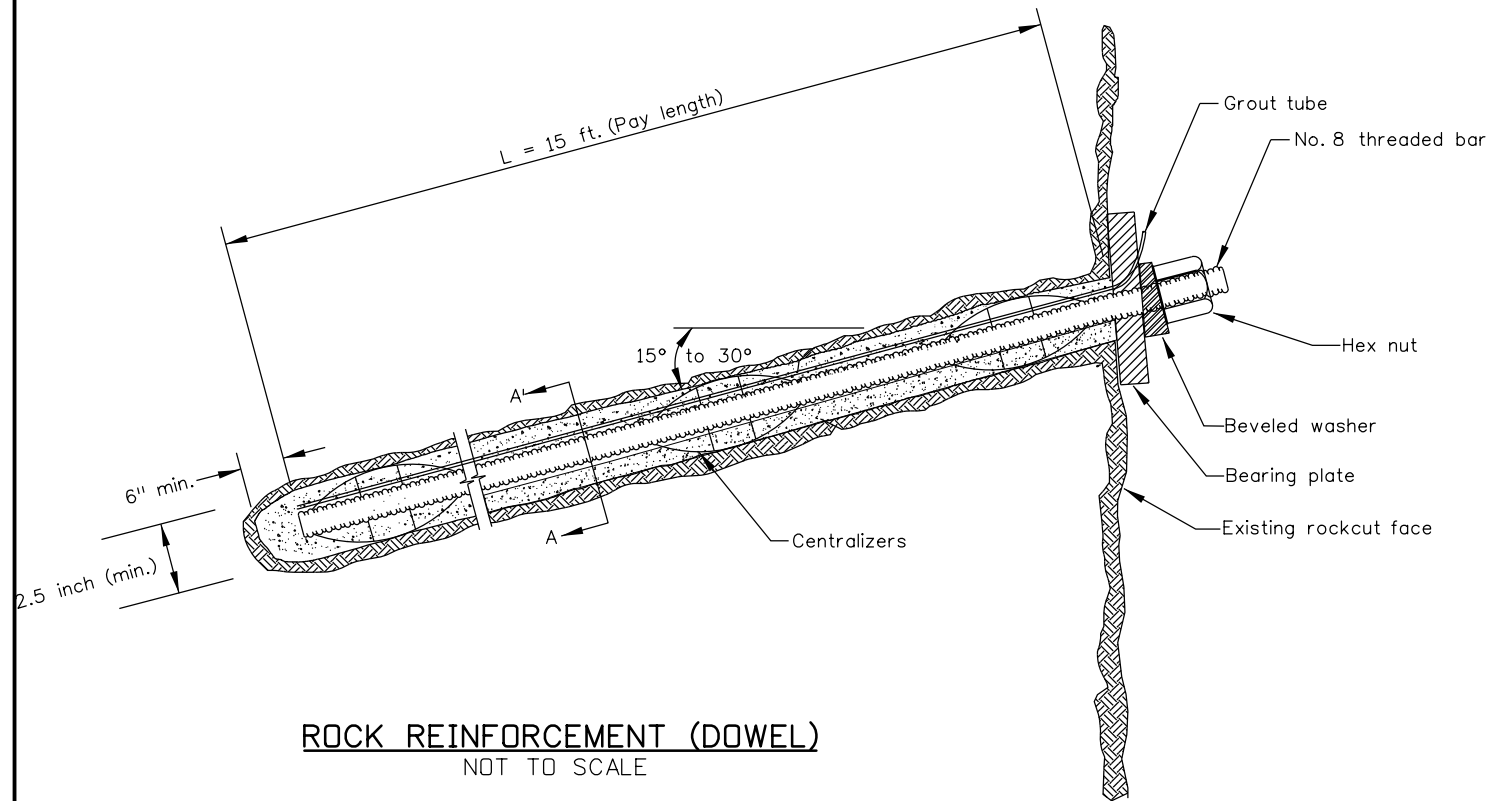
3.1 The design assumes the Rock Reinforcement (Dowel) will be in metamorphic rock with an ultimate bond stress of 12 ksf.

3.2 The Test Load (TL) for the Rock Reinforcement (Dowel) will be 15 kips or as directed by the Engineer. A minimum of five (5) percent of the Rock Reinforcement (Dowel) shall have a lift-off test.

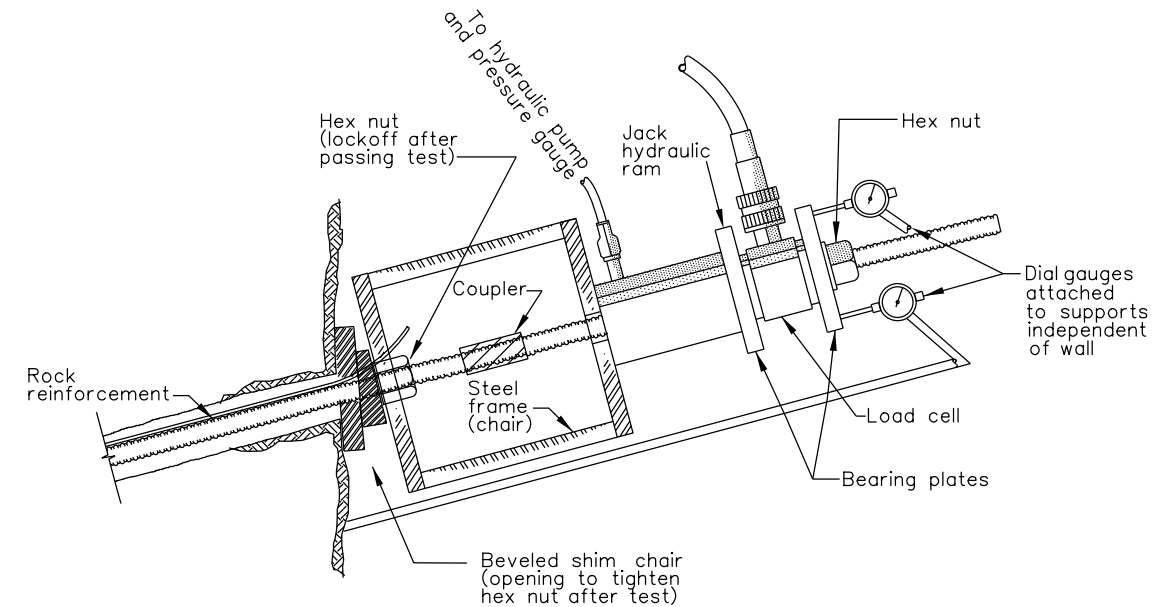


**BONDED LENGTH CROSS SECTION A-A'**  
NOT TO SCALE

ROCK REINFORCEMENT (DOWELS)		
ITEM NO.	ITEM	ESTIMATED QUANTITY
211-01111	ROCK REINFORCEMENT (DOWEL)	300 LF



**ROCK REINFORCEMENT (DOWEL)**  
NOT TO SCALE



**ROCK REINFORCEMENT TESTING DETAIL**  
NOT TO SCALE



Print Date: 11/16/2012  
File Name: 18832 Rock DowelDetail.dgn  
Horiz. Scale: 1:1 Vert. Scale:  
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Region 1 **CRC**

<b>As Constructed</b>
No Revisions:
Revised:
Void:

<b>PORTAL DEVELOPMENT ROCK REINFORCEMENT (DOWEL)</b>			
Designer:	H. HUME	Structure Numbers	
Detailer:	M. WALZ		
Subset:	PORTAL DEV	Subset Sheets:	2 of 4

<b>Project No./Code</b>
IM 0703-390
19035
Sheet Number 123

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**1.0 GENERAL NOTES FOR ROCK REINFORCEMENT (NUMBER 10) AND ROCK BOLT**

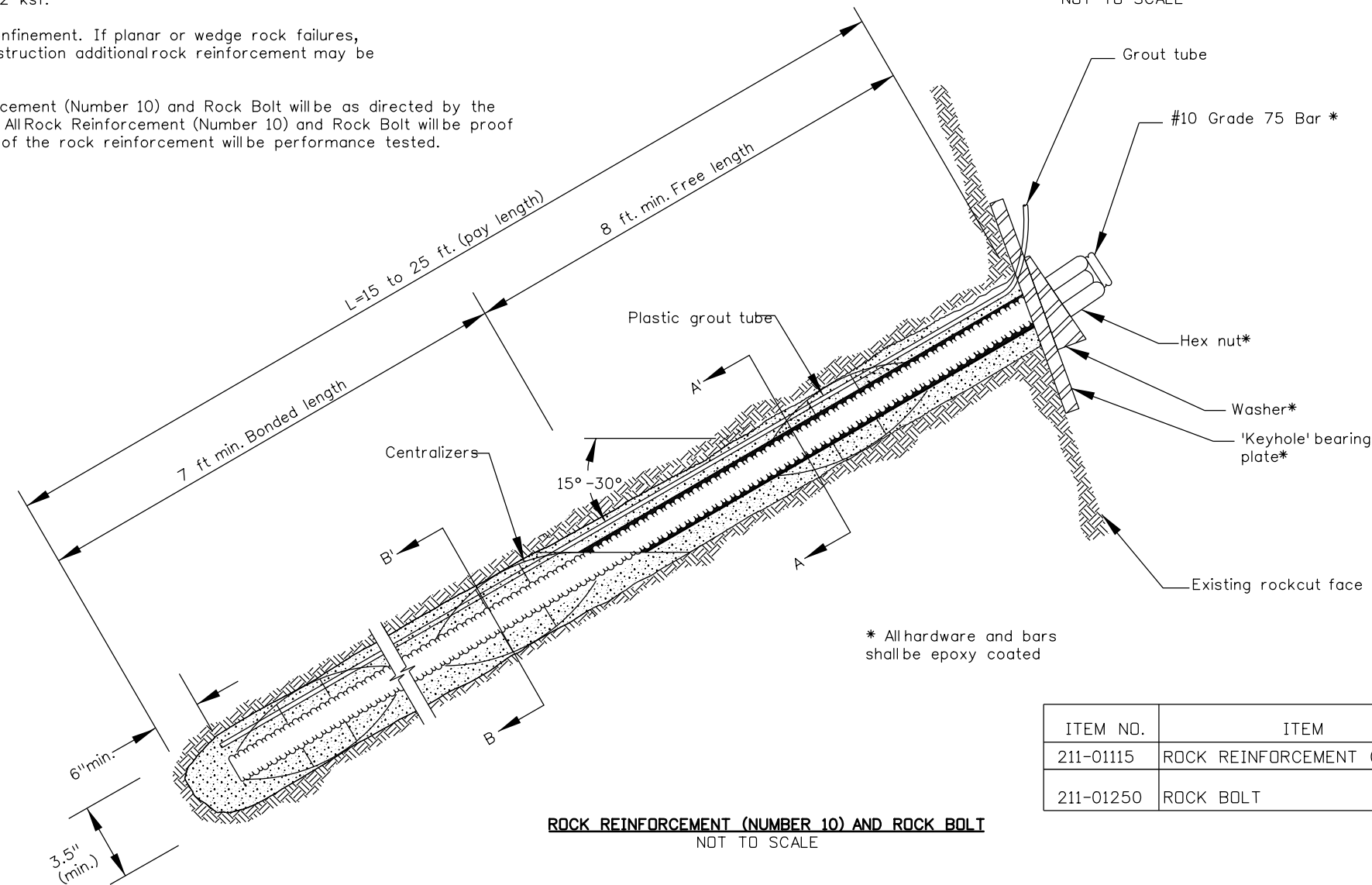
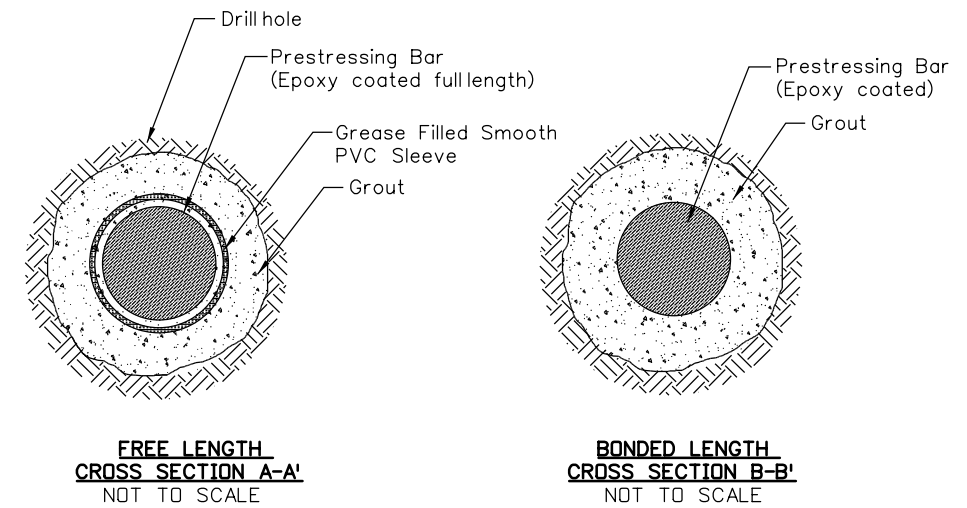
- 1.1 Rock Reinforcement No. 10 and Rock Bolts are all considered rock reinforcement.
- 1.2 Rock Reinforcement (Number 10) and Rock Bolt: Grade 75, #10 bar (ASTM 645), epoxy coated (ASTM A-775), bearing plate-keyhole 8"x8"x3/4" (A-36), beveled washers (ASTM A-536), hex nut (ASTM A-29). All hardware and bars that are exposed shall be epoxy coated.
- 1.3 Outer nuts and plates shall be painted to match corridor colors if visible after final grading.
- 1.4 Contractor to verify quantities prior to ordering. Quantities provided for information only.

**2.0 INSTALLATION CONSTRUCTION SEQUENCE**

- 2.1 The Engineer will mark locations and orientations of the Rock Reinforcement (Number 10) and Rock Bolt in the field based on the quantities and general locations provided in the plans which may range from the top of cut to the roadway level.
- 2.2 Rock Reinforcement (Number 10) and Rock Bolt to be grouted to allow post tensioning of anchor.

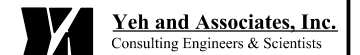
**3.0 DESIGN ASSUMPTIONS**

- 3.1 The design assumes the bond zone of the rock reinforcement will be in metamorphic rock with an ultimate unit bond stress of 12 ksf.
- 3.2 Rock reinforcement designed to provide confinement. If planar or wedge rock failures, that daylight out of slope, occur during construction additional rock reinforcement may be required as directed by the Engineer.
- 3.3 The Design Load (DL) for the Rock Reinforcement (Number 10) and Rock Bolt will be as directed by the Engineer, typically between 20 to 30 kips. All Rock Reinforcement (Number 10) and Rock Bolt will be proof or performance tested. A minimum of 5% of the rock reinforcement will be performance tested.



ITEM NO.	ITEM	ESTIMATED QUANTITY	REMARKS
211-01115	ROCK REINFORCEMENT (NUMBER 10)	225 LF	CONVENTIONAL DRILLING
211-01250	ROCK BOLT	225 LF	DIFFICULT ACCESS DRILLING

**ROCK REINFORCEMENT (NUMBER 10) AND ROCK BOLT**  
NOT TO SCALE



Print Date: 11/16/2012  
 File Name: 18832 Rock Reinforcement.dgn  
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**PORTAL DEVELOPMENT  
 ROCK REINFORCEMENT (NUMBER 10)  
 AND ROCK BOLT**

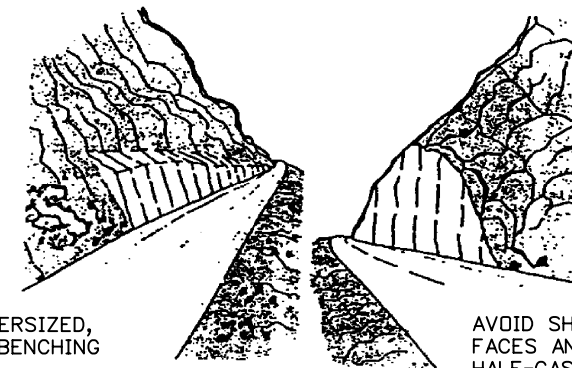
Designer: H. HUME      Structure Numbers  
 Detailer: M. WALZ  
 Subset: PORTAL DEV      Subset Sheets: 3 of 4

<b>Project No./Code</b>
IM 0703-390
19035
Sheet Number 124

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## ROCK SCULPTING NOTES

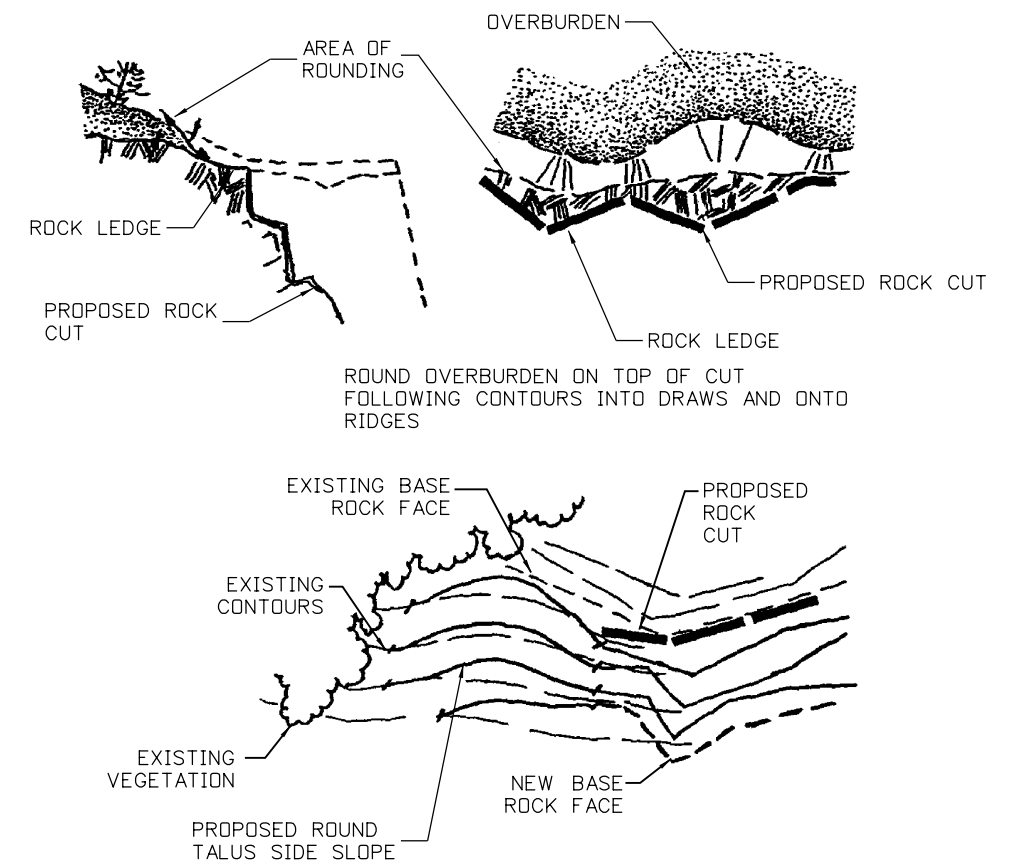
- 1) The intent of the Rock Sculpting concept is to avoid the construction of unnatural rock cuts.
- 2) Information provided in the plans is to supplement the following: direction given in the field by the Engineer, Roadway Cross Sections, Roadway Layout, and Standard Plans and Specifications.
- 3) Construction access, Blasting Plans, and Rock Removal Plans shall be submitted to the Engineer for approval prior to construction.
- 4) Existing seams and natural fractures in the rock shall be used to shape the cuts and benches.
- 5) All loose rock shall be removed as directed in the field by the Engineer.
- 6) All benching, pockets, and sculpting shall be accomplished in top-down construction during the excavation of the rock cut.
- 7) All Rock Sculpting concepts are to be incorporated into the Contractor's rock excavation operation and included in the cost of Unclassified Excavation.



## CUTS NOT TO BE CONSTRUCTED



PERSPECTIVE VIEW OF TYPICAL CUT

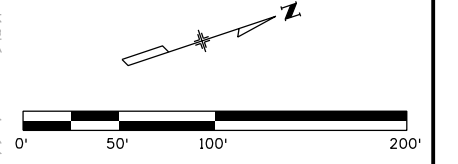
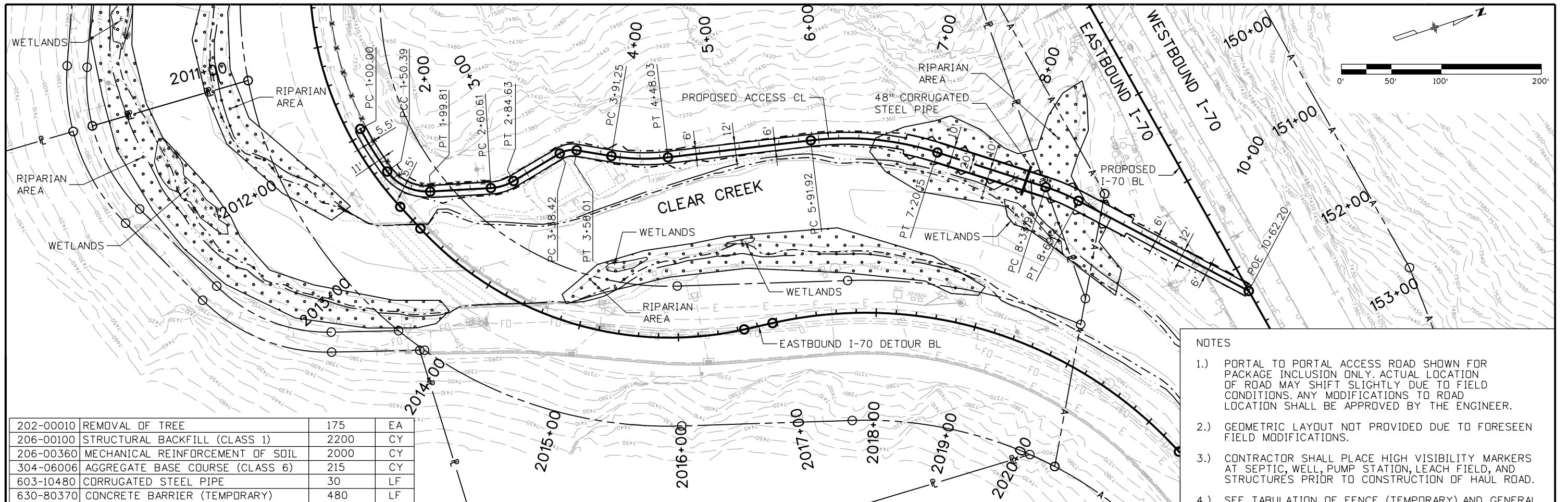


## ROUNDING, OVERBURDEN, AND SIDE SLOPES

**Yeh and Associates, Inc.**  
Consulting Engineers & Scientists

Print Date: 11/16/2012	<b>Sheet Revisions</b>			Colorado Department of Transportation		As Constructed		PORTAL DEVELOPMENT ROCK SCULPTING		Project No./Code	
File Name: 18832 Rock Sculpting.dgn	Date:	Comments	Init.	 425 A Corporate Circle Golden, CO 80401 Phone: 720-497-6905 FAX: 720-497-6901		No Revisions:		Designer: H. HUME Detailer: M. WALZ Subset: PORTAL DEV		IM 0703-390  19035  Sheet Number 125	
Horiz. Scale:      Vert. Scale:											
<b>ATKINS</b> 4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276											

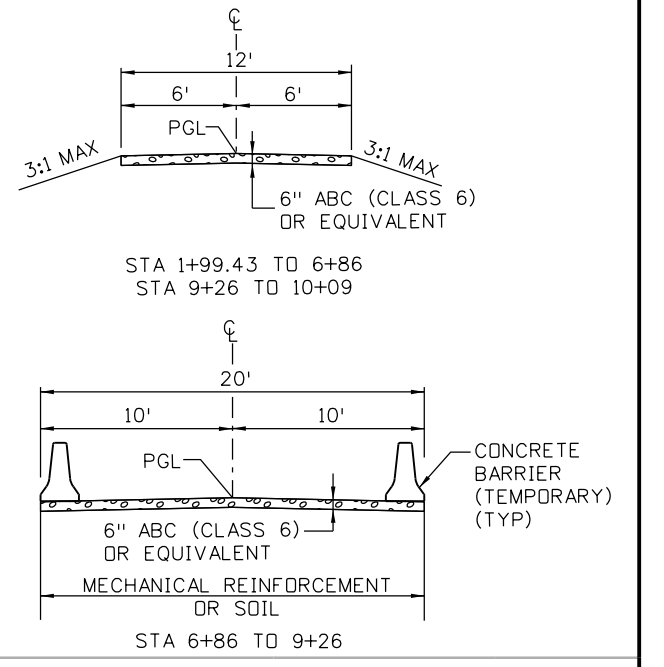
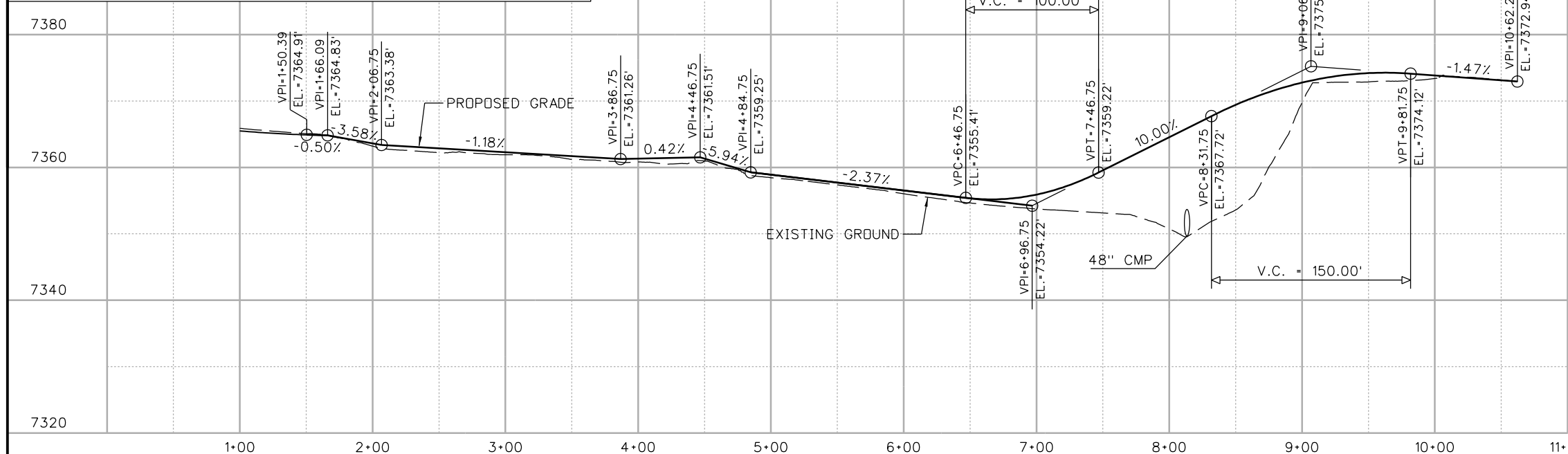
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202-00010	REMOVAL OF TREE	175	EA
206-00100	STRUCTURAL BACKFILL (CLASS 1)	2200	CY
206-00360	MECHANICAL REINFORCEMENT OF SOIL	2000	CY
304-06006	AGGREGATE BASE COURSE (CLASS 6)	215	CY
603-10480	CORRUGATED STEEL PIPE	30	LF
630-80370	CONCRETE BARRIER (TEMPORARY)	480	LF

PORTAL TO PORTAL ACCESS ROAD WILL BE PAID FOR AS ITEM 621-00200 HAUL ROAD (1 LUMP SUM). ITEMS AND QUANTITIES LISTED ARE FOR INFORMATION ONLY.

- NOTES**
- 1.) PORTAL TO PORTAL ACCESS ROAD SHOWN FOR PACKAGE INCLUSION ONLY. ACTUAL LOCATION OF ROAD MAY SHIFT SLIGHTLY DUE TO FIELD CONDITIONS. ANY MODIFICATIONS TO ROAD LOCATION SHALL BE APPROVED BY THE ENGINEER.
  - 2.) GEOMETRIC LAYOUT NOT PROVIDED DUE TO FORESEEN FIELD MODIFICATIONS.
  - 3.) CONTRACTOR SHALL PLACE HIGH VISIBILITY MARKERS AT SEPTIC, WELL, PUMP STATION, LEACH FIELD, AND STRUCTURES PRIOR TO CONSTRUCTION OF HAUL ROAD.
  - 4.) SEE TABULATION OF FENCE (TEMPORARY) AND GENERAL NOTES FOR TEMPORARY FENCE REQUIREMENTS.



Print Date: 11/30/2012  
 File Name: 18832DES\_CPIB\_PortAcc\_PnF001.dgn  
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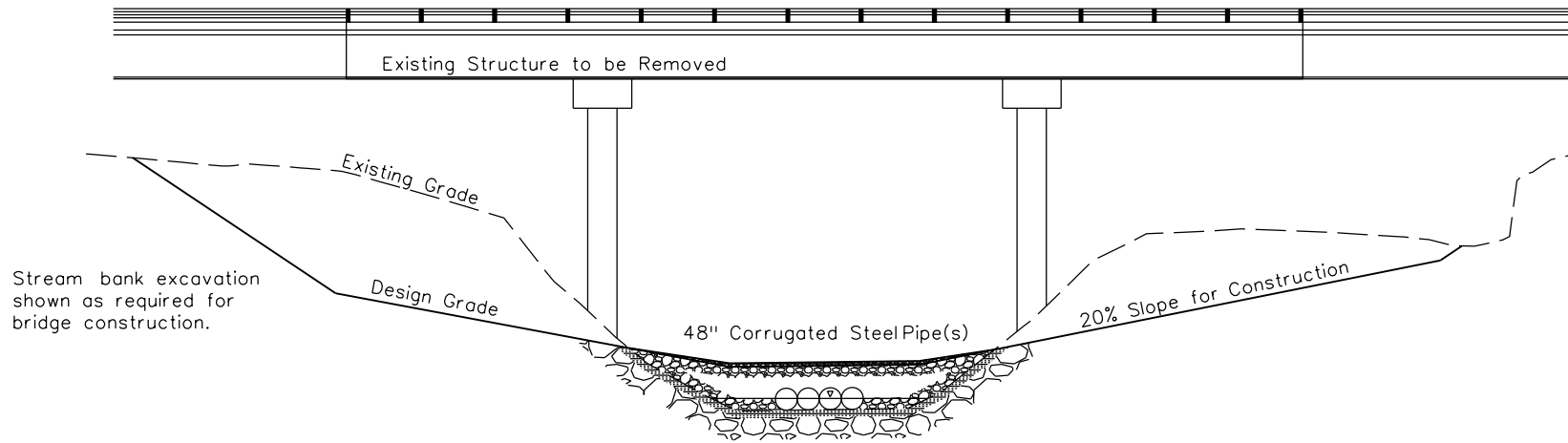
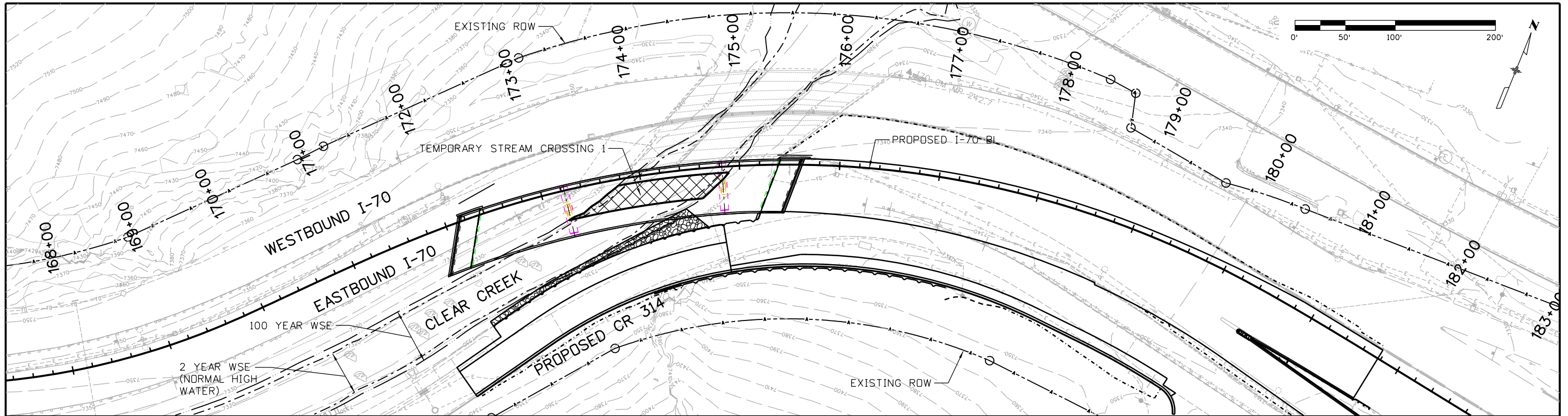
Colorado Department of Transportation  
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 Golden, CO 80401  
 Phone: 720-497-6918    FAX: 720-497-6901  
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 No Revisions:  
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**PORTAL TO PORTAL ACCESS ROAD PLAN AND PROFILE**  
 Designer: Kraemer  
 Detailer: J. Gellner  
 Subset: Kraemer  
 Structure Numbers:  
 Subset Sheets: 1 of 2

**Project No./Code**  
 IM 0703-390  
 19035  
 Sheet Number 126

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Stream bank excavation shown as required for bridge construction.

**Sediment Control BMPs:**

- Geotextile, Class A (Nonwoven) fabric beneath stream crossing to separate imported materials
- Geotextile, Class A (Nonwoven) fabric beneath crushed rock to filter out tracked material
- Temporary Slope Stabilization prior to use
- Vehicle Tracking Pads at egress points on either side of TSC to minimize sediment build up on top of TSC
- Post construction bank stabilization

**Crossing Materials:**

- Washed Rip Rap for embankment
- Washed 1-1/2" crushed rock for driving surface


ITEM		QUANTITY
206-00510	FILTER MATERIAL (CLASS A)	300 SY
506-00206	RIPRAP (6 INCH)	17 CY
506-00212	RIPRAP (12 INCH)	234 CY
603-10480	48 INCH CORRUGATED STEEL PIPE	225 LF

TEMPORARY STREAM CROSSING WILL BE PAID FOR AS ITEM 208-00400 WATER CONTROL (1 LUMP SUM). ITEMS AND QUANTITIES LISTED ARE FOR INFORMATION ONLY.

Print Date: 11/30/2012	0000
File Name: 18832DES_CPIB_Creek_Plan001.dgn	
Horiz. Scale: 1:100      Vert. Scale:	

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Revised:
Void:

<b>EASTBOUND I-70 TEMPORARY STREAM CROSSING</b>			
Designer:	Kraemer	Structure Numbers	
Detailer:	J. Gellner		
Subset:	Kraemer	Subset Sheets: 2 of 2	

<b>Project No./Code</b>
IM 0703-390
19035
Sheet Number 127

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**ITS GENERAL NOTES**

1. A LOCATING WIRE (ONE #12 AWG INSULATED) AND PULL TAPE SHALL BE PLACED IN ALL CONDUIT. THIS WORK SHALL BE INCLUDED IN THE UNIT PRICE FOR FIBER OPTIC CABLE (SINGLE MODE) (12 STRANDS) AND WILL NOT BE PAID SEPARATELY.
2. ALL CONDUIT SHALL BE SCHEDULE 80 HDPE AND AT A MINIMUM DEPTH OF 48 INCHES.
3. ALL FIBER OPTIC SPLICING AND TERMINATION WILL BE PERFORMED BY COMCAST. CONTRACTOR SHALL CONTACT BILL KASCEK WITH CDOT AT 303-564-5549 TWO WEEKS PRIOR TO SPLICING TO COORDINATE FIBER OPTIC CABLE SPLICING.
4. THE BID QUANTITIES OF THE PROJECT ARE THE RESULT OF A QUANTITY TAKEOFF BY THE ENGINEER. THE CONTRACTOR SHALL, HOWEVER, SATISFY HIMSELF AS TO THE ACCURACY OF ALL QUANTITIES.
5. ALL ITEM LOCATIONS ARE APPROXIMATE AND ARE TO BE FIELD LOCATED. CONTRACTOR SHALL TRY TO LOCATE FIELD DEVICES OUTSIDE OF CONSTRUCTION ACTIVITIES AND IMPACT AREAS OF THE MULTIPLE CONSTRUCTION PACKAGES.
6. A PORTION OF THIS PROJECT INCLUDES PULLING FIBER OPTIC CABLES THROUGH EXISTING CONDUIT OR PULL BOXES / MANHOLES. CONTRACTOR SHALL NOT DAMAGE ANY EXISTING CABLES IN THE EXISTING CONDUIT OR PULL BOXES / MANHOLES.
7. CONTRACTOR SHALL CONTACT MATT BECKER, CDOT ITS, AT 303-512-5856 PRIOR TO INSTALLING FIBER OPTIC CABLE WITHIN THE I-70 DUCT BANK FOR DIRECTION AS TO WHICH EXISTING CONDUIT TO USE AND FOR COORDINATION OF ITS FIELD DEVICE RELOCATION.
8. FIBER TESTING CANNOT COMMENCE UNTIL ALL FIBER WORK FOR THAT SEGMENT IS COMPLETE.
9. SALVAGE ALL EQUIPMENT TO APPROPRIATE AGENCY; CDOT REGION 1 OR CDOT ITS.
10. CONTRACTOR SHALL COIL 50 LF OF EACH FIBER OPTIC CABLE IN PULL BOXES AND MANHOLES.
11. CONTRACTOR SHALL NOT EXCEED 48 HOURS OF DOWN-TIME FOR RELOCATED ITS DEVICES AND DEVICES CANNOT BE INOPERABLE ON WEEKENDS. ALL POWER, COMMUNICATION AND INFRASTRUCTURE SHALL BE IN PLACE FOR THE PROPOSED LOCATION OF THE RELOCATED DEVICE BEFORE THE EXISTING DEVICE IS REMOVED.
12. IT IS ESTIMATED THAT 6 HOURS OF PAY ITEM – POTHOLING WILL BE REQUIRED FOR ITS CONSTRUCTION ACTIVITIES.
13. ALL WIRE SIZED SHALL CONFORM TO THE NATIONAL ELECTRIC CODE. WIRING SHALL BE PAID FOR AS 1 LUMP SUM.
14. IT IS ESTIMATED THAT 2 BUFFER TUBE FAN-OUT KITS WILL BE REQUIRED.

**ABBREVIATIONS**

- AVE AVENUE
- BLVD BOULEVARD
- CCTV CLOSED CIRCUIT TELEVISION
- CDOT COLORADO DEPARTMENT OF TRANSPORTATION
- COMM COMMUNICATIONS
- LF LINEAR FEET
- LS LUMP SUM
- LT LEFT
- MVRD MICROWAVE VEHICLE RADAR DETECTOR
- PKWY PARKWAY
- RD ROAD
- RT RIGHT
- SH STATE HIGHWAY
- SMFO SINGLE MODE FIBER OPTIC
- ST STREET
- STA STATION
- TTI TRAVEL TIME INDICATOR

**LEGEND**

<u>EXISTING</u>	<u>PROPOSED</u>	
		CCTV
	- E - - - E - - - E - - -	ELECTRICAL CONDUIT
- ITS - - - ITS - - - ITS - - -	- ITS - - - ITS - - - ITS - - -	ITS CONDUIT
		PULL BOX
		MVRD
		TTI
		MANHOLE
		GROUND-MOUNT VMS
		POLE
		SECONDARY SERVICE PEDESTAL

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File Name: 18832TRAF_CPIB_ITSLegend01.dgn		Date:	Comments	Init.		425 A Corporate Circle Golden, CO 80401 Phone: 720-497-6918 FAX: 720-497-6901	No Revisions:	Designer: JRD    Structure Numbers Detailer: JRD Subset: ITS    Subset Sheets: 1 of 22			IM 0703-390
Horiz. Scale: NDT TD SCALE    Vert. Scale:							Region 1				CRC
4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276						Void:	Sheet Number 128				




Jason.Duffy 9:38:48 AM c:\pw...work\pbbjpw\common\dms21566\18832TRAF\_CPIB\_ITSLegend01.dgn

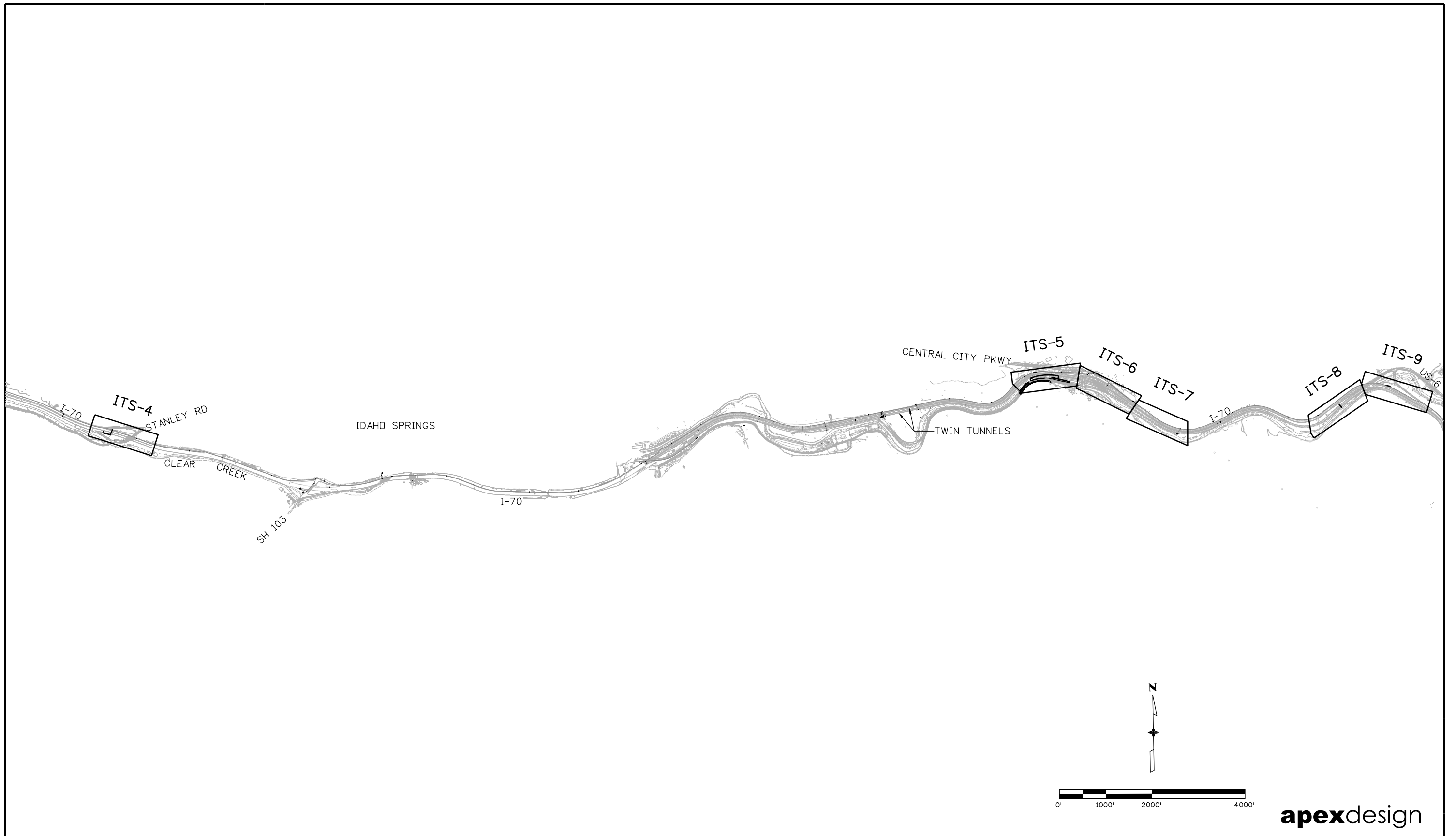


ITEM	DESCRIPTION	UNIT	ITS PLAN SUBSET SHEET TABULATIONS						TOTALS	
			4	5	6	7	8	9	PLAN	AS CONST.
203-01597	POTHOLING	HOUR							6	
210-00473	RESET CCTV CAMERAS	EACH		1					1	
210-00476	RESET MICROWAVE VEHICLE RADAR DETECTOR	EACH		1					1	
210-00847	RESET TRAVEL TIME INDICATOR	EACH				1			1	
503-00036	DRILLED CAISSON (36 INCH)	LF						15	15	
612-00260	LOCATION MARKER (FIBER OPTIC) (DOME)	EACH	2					1	3	
612-00270	LOCATION MARKER (UTILITY) (FLAT SLAT)	EACH	2					1	3	
613-00206	2 INCH ELECTRICAL CONDUIT (BORED)	LF	285						285	
613-01200	2 INCH ELECTRICAL CONDUIT (PLASTIC)	LF	335	50				245	630	
613-04200	2 INCH ELECTRICAL CONDUIT (LIQUIDTIGHT FLEXIBLE METAL)	LF	10	30				10	50	
613-07023	PULL BOX (24"X36"X24")	EACH	2					1	3	
613-07060	PULL BOX (18"X30"X18")(DEEP)	EACH	2					1	3	
613-10000	WIRING	LS							0.5	
613-32400	LIGHT STANDARD STEEL (40 FOOT)	EACH	1						1	
613-40010	LIGHT STANDARD FOUNDATION	EACH	1						1	
613-50150	SECONDARY SERVICE PEDESTAL	EACH	1						1	
614-72830	COMMUNICATIONS CABINET	EACH	1					1	2	
614-72887	MICROWAVE VEHICLE RADAR DETECTOR	EACH	1						1	
614-87006	FIBER OPTIC TERMINATION PANEL - 6 FIBER	EACH	1					1	2	
614-87010	FIBER OPTIC CABLE (SINGLE MODE) (12 STRAND)	LF	430				65	780	1275	
614-87015	BUFFER TUBE FAN-OUT KIT	EACH	1					1	2	
614-87320	CLOSED CIRCUIT TELEVISION	EACH	1					1	2	
614-87350	TEST FIBER OPTIC CABLE	LS							1	
614-87364	CLOSED CIRCUIT TELEVISION POLE WITH LOWERING DEVICE (50 FEET)	EACH						1	1	
614-87690	ETHERNET SWITCH	EACH	1					1	2	
614	FIBER OPTIC SPLICE CLOSURE *	EACH	1				1		2	

\* INCLUDED IN THE COST OF FIBER OPTIC CABLE (SINGLE MODE) (12 STRAND). FURNISH TO CDOT ITS.

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Horiz. Scale: NDT TD SCALE Vert. Scale:					425 A Corporate Circle Golden, CO 80401 Phone: 720-497-6918 FAX: 720-497-6901		Revised:		Designer: JRD Structure Numbers			19035	
 4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276				<b>Region 1</b>		Void:		Detailer: JRD			Sheet Number 129		
				<b>CRC</b>				Subset: ITS			Subset Sheets: 2 of 22		



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<b>ATKINS</b> 4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276								Void:		Subset: ITS		Subset Sheets: 3 of 22	Sheet Number 130	

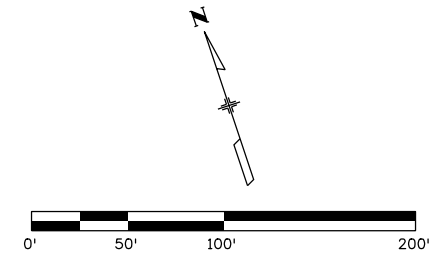
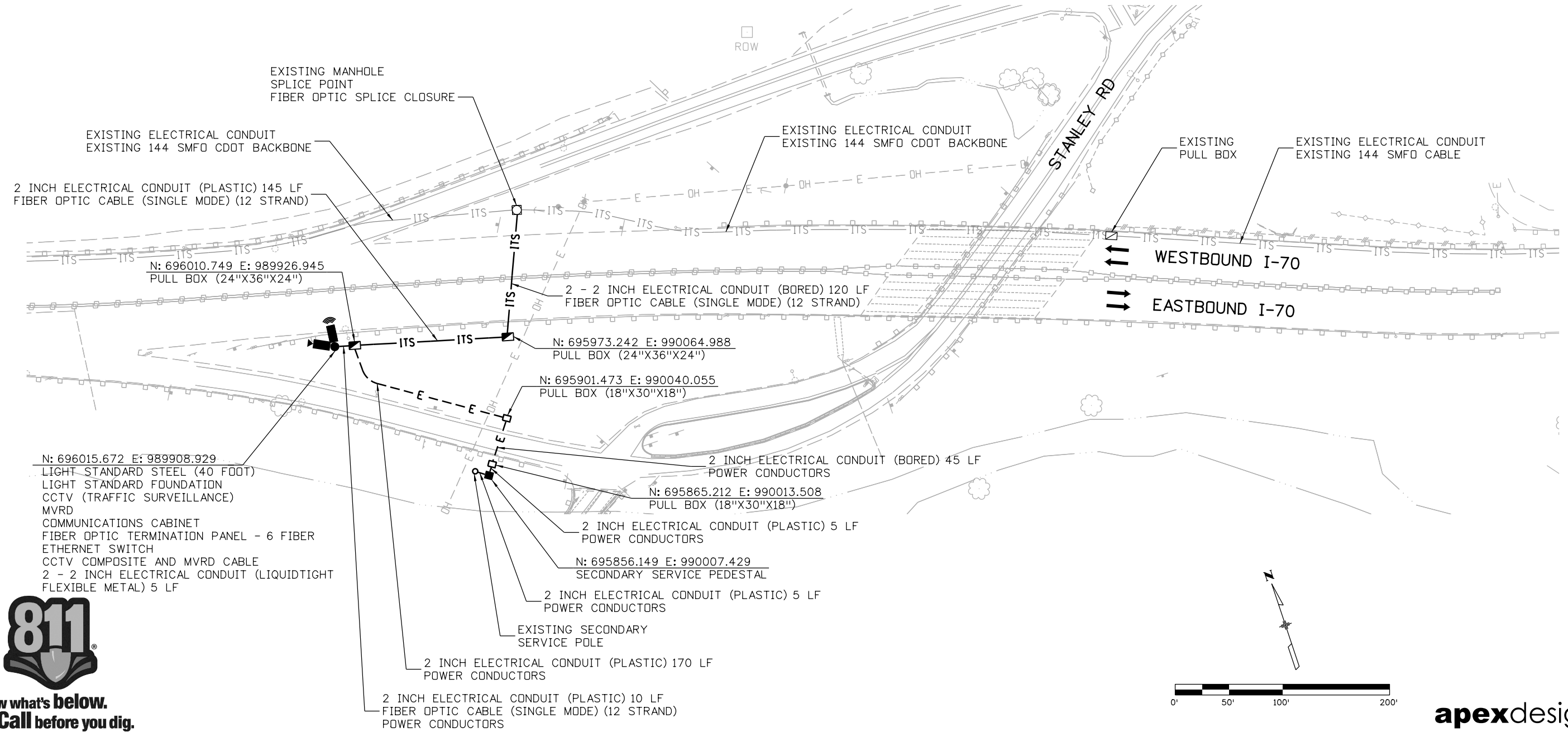
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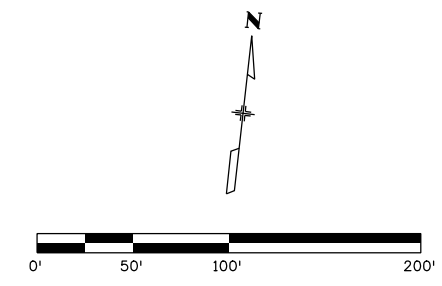
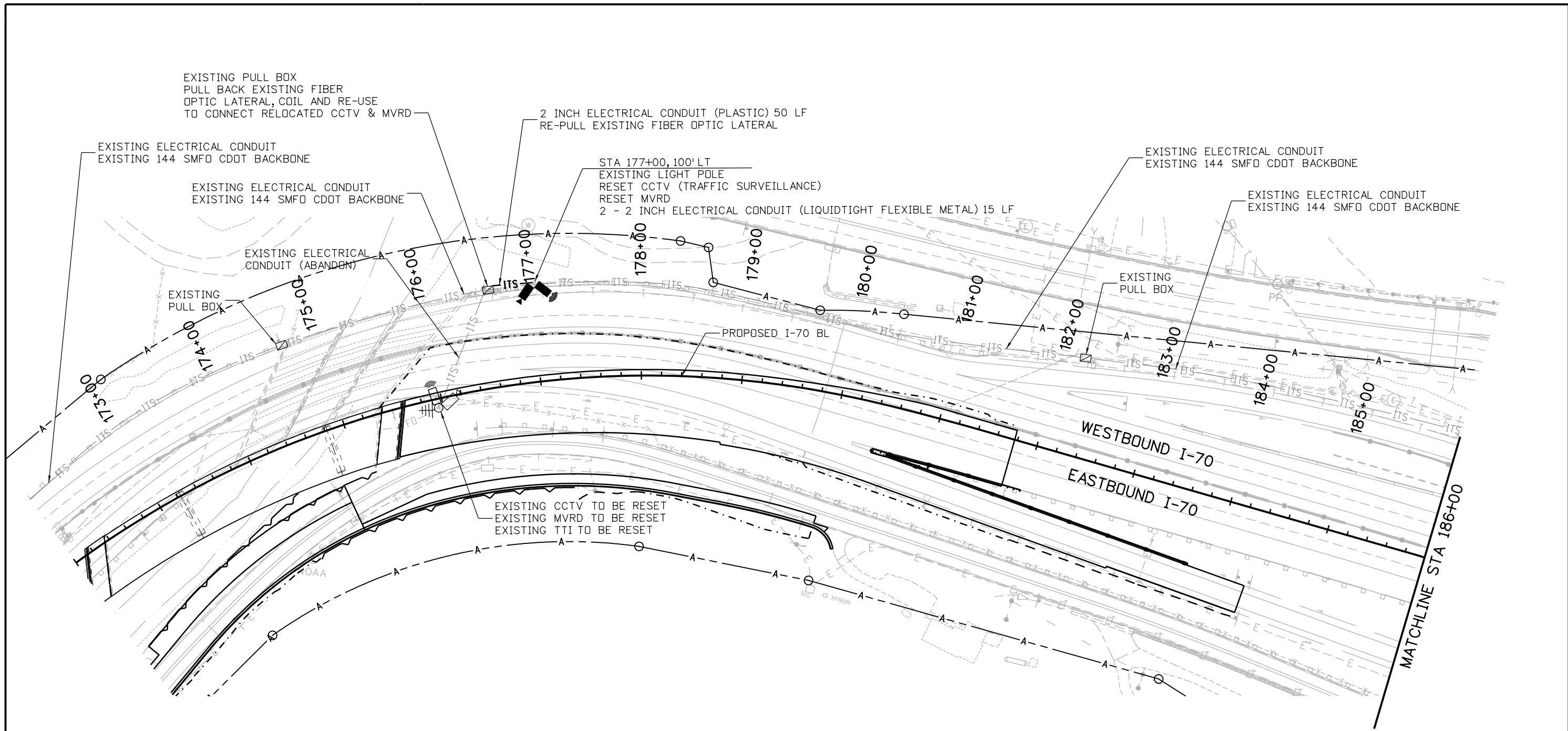


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4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276								Void:		Detailer:	JRD	Numbers		Sheet Number 131	
										Subset:	ITS	Subset Sheets: 4	of 22		



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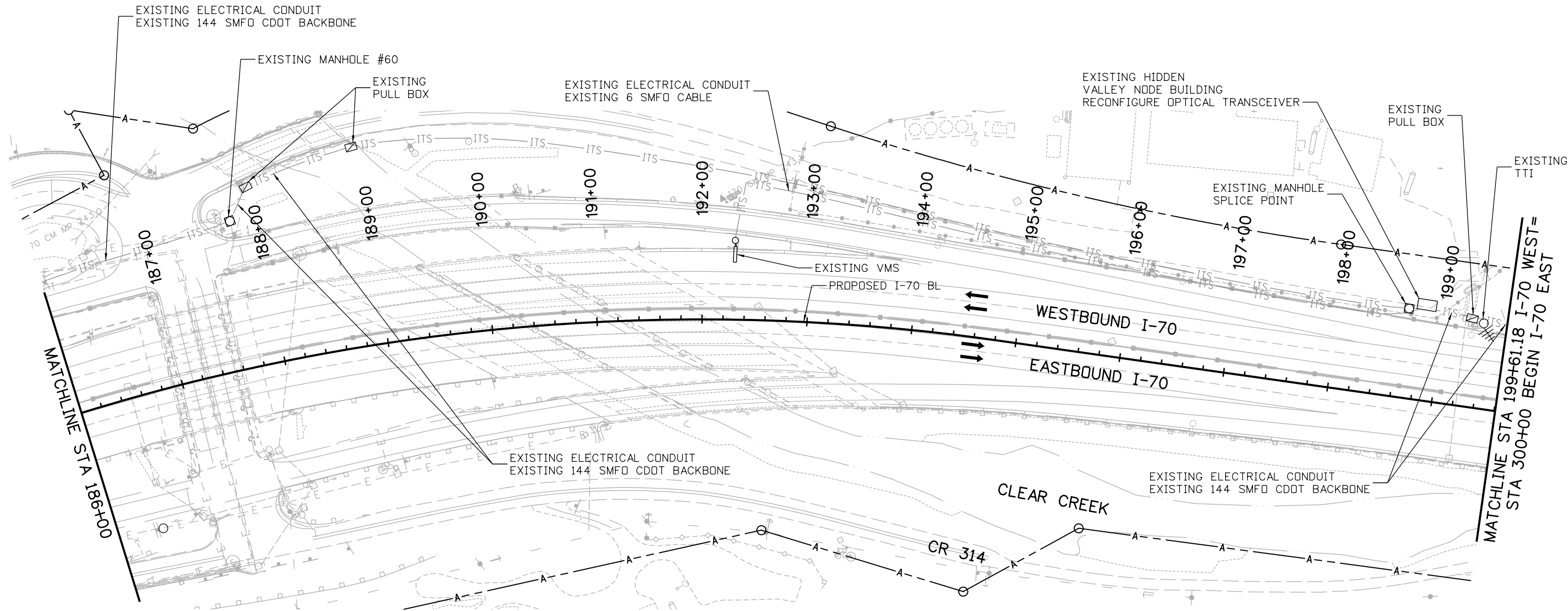
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 Phone: 720-497-6918 FAX: 720-497-6901  
 Region 1 CRC

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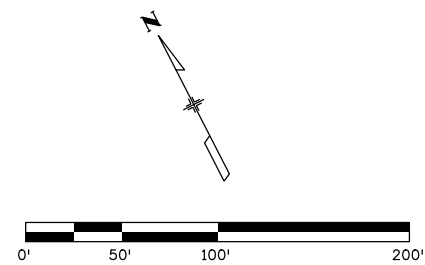
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Project No./Code
IM 0703-390
19035
Sheet Number 132

Jason.Duffy 9:39:36 AM c:\pw\_work\jbs\jw\common\dms21566\18832TRAF\_CPIB\_ITSPan002.dgn



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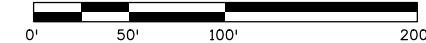
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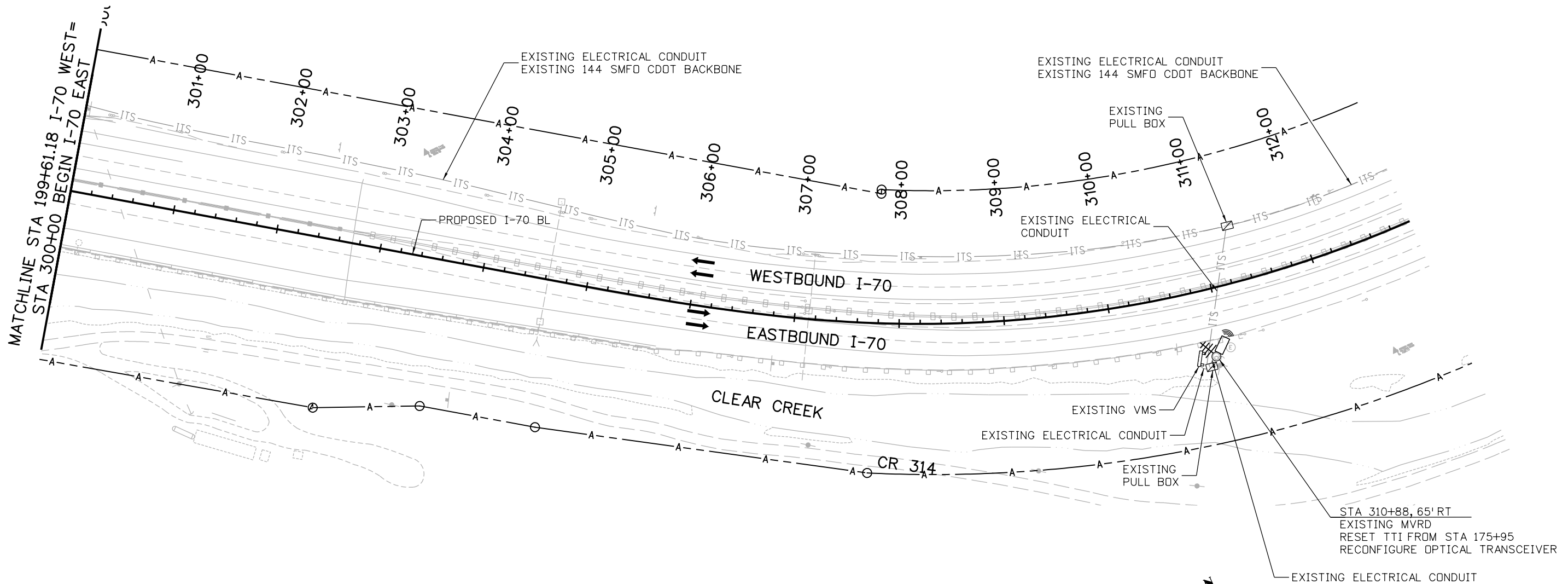
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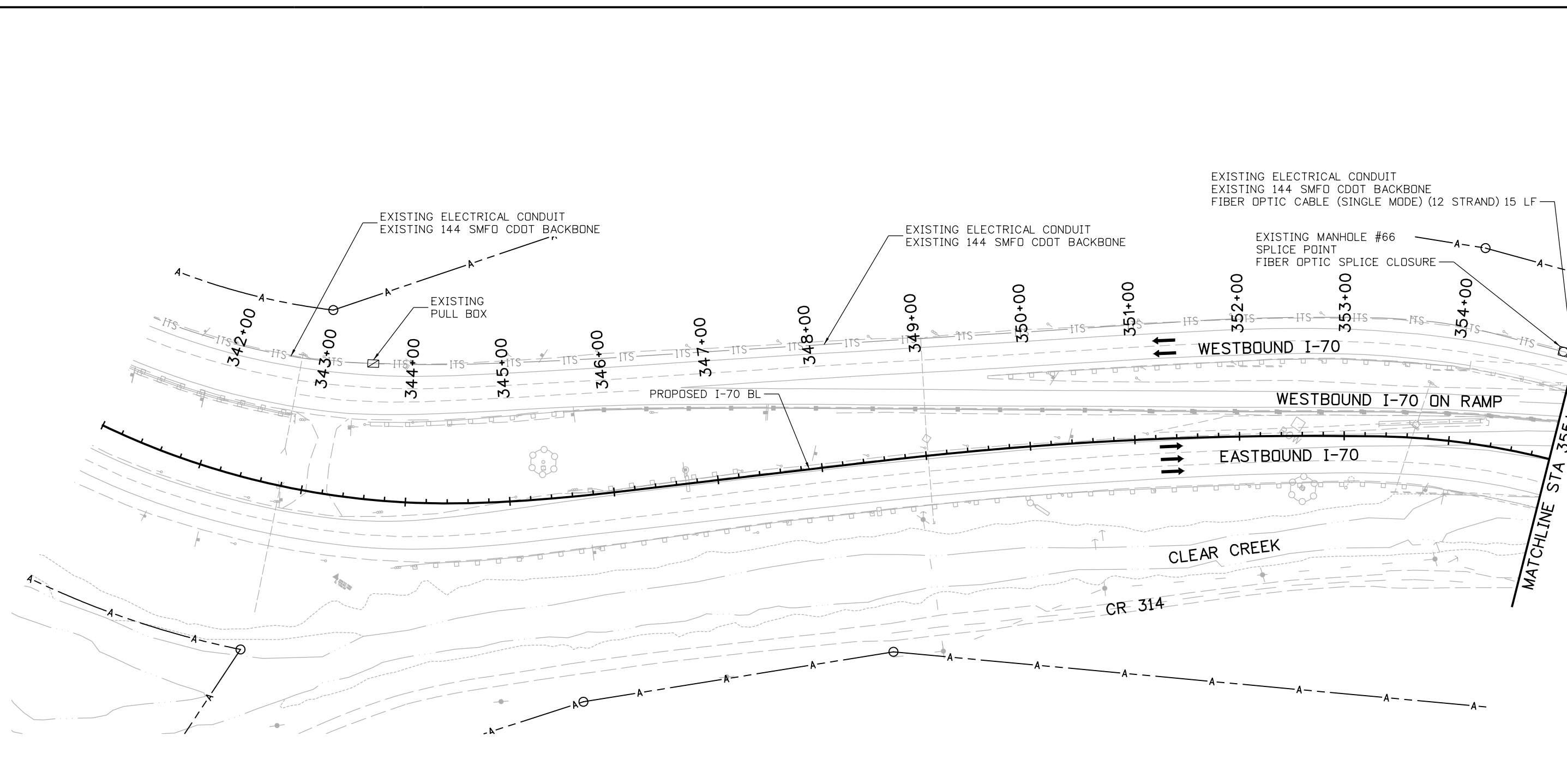
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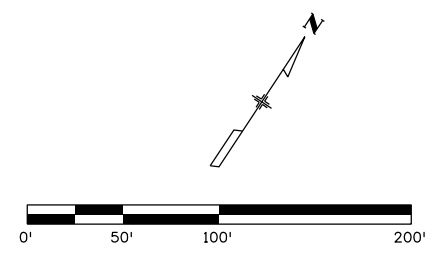
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<b>Project No./Code</b>
IM 0703-390
19035
Sheet Number 134

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		4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275    Fax: (303) 221-7276	Designer: JRD Detailer: JRD Subset: ITS	Structure Numbers Subset Sheets: 8 of 22						

EXISTING ELECTRICAL CONDUIT  
 EXISTING 144 SMFD CDOT BACKBONE  
 FIBER OPTIC CABLE (SINGLE MODE) (12 STRAND) 15 LF

2 INCH ELECTRICAL CONDUIT (PLASTIC) 80 LF  
 FIBER OPTIC CABLE (SINGLE MODE) (12 STRAND)

EXISTING ELECTRICAL CONDUIT  
 EXISTING 144 SMFD CDOT BACKBONE  
 FIBER OPTIC CABLE (SINGLE MODE) (12 STRAND) 520 LF

EXISTING  
 PULL BOX

STA 360+65, 80' LT  
 CCTV POLE WITH LOWERING DEVICE (50 FOOT)  
 DRILLED CAISSON (36 INCH) 15 LF  
 CCTV (TRAFFIC SURVEILLANCE)  
 COMMUNICATIONS CABINET  
 FIBER OPTIC TERMINATION PANEL - 6 FIBER  
 ETHERNET SWITCH  
 CCTV COMPOSITE CABLE  
 2 - 2 INCH ELECTRICAL CONDUIT (LIQUIDTIGHT FLEXIBLE METAL) 5 LF

2 INCH ELECTRICAL CONDUIT (PLASTIC) 130 LF  
 POWER CONDUCTORS

STA 361+65, 95' LT  
 PULL BOX (18"X30"X18")

2 INCH ELECTRICAL CONDUIT (PLASTIC) 5 LF  
 POWER CONDUCTORS

EXISTING ELECTRICAL CONDUIT  
 EXISTING 144 SMFD CDOT BACKBONE

EXISTING  
 SERVICE PEDESTAL

PROPOSED I-70 BL

EXISTING  
 PULL BOX

STA 360+60, 80' LT  
 PULL BOX (24"X36"X24")

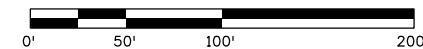
2 - 2 INCH ELECTRICAL CONDUIT (PLASTIC) 15 LF  
 FIBER OPTIC CABLE (SINGLE MODE) (12 STRAND)  
 POWER CONDUCTORS

WESTBOUND I-70

EASTBOUND I-70



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Print Date: 11/21/2012  
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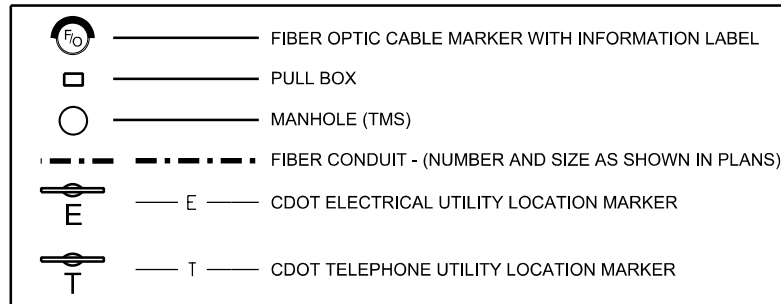
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No Revisions:
Revised:
Void:

ITS PLAN STA 355+00 TO 365+96.69			
Designer:	JRD	Structure	
Detailer:	JRD	Numbers	
Subset:	ITS	Subset Sheets:	9 of 22

Project No./Code
IM 0703-390
19035
Sheet Number 136

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# LEGEND



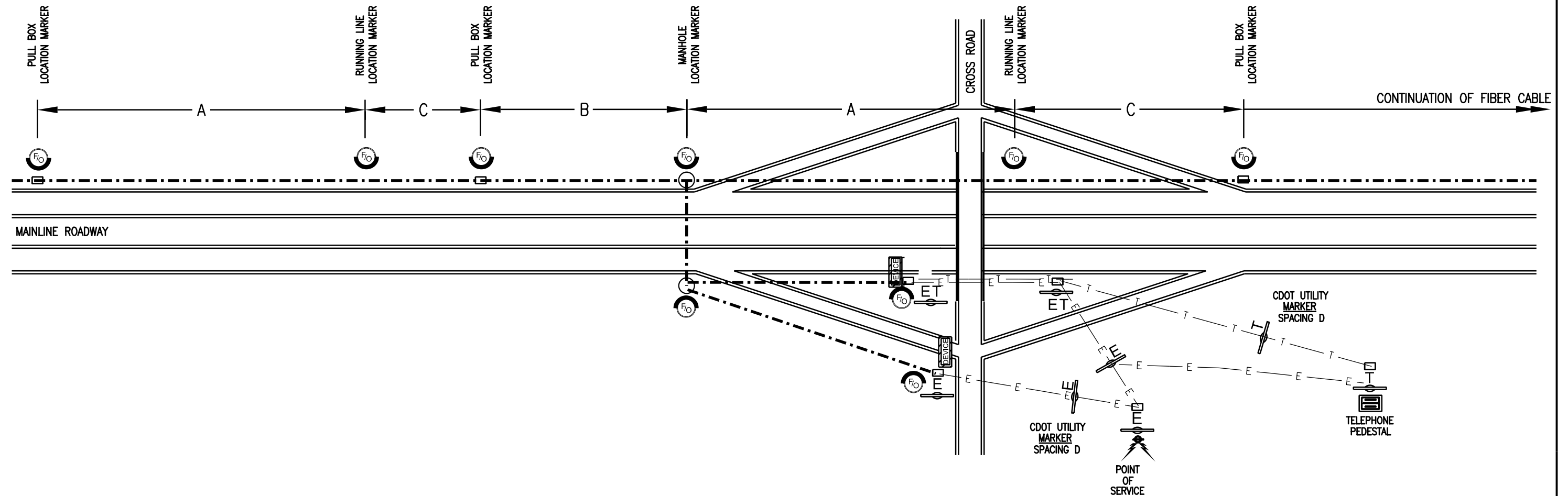
# LOCATION MARKER SPACING

MEASUREMENT	DESCRIPTION	DISTANCE (FEET)
A	FIBER OPTIC RUNNING LINE MARKER SPACING	1000
B	HANDHOLE MARKER SPACING	< 1000
C	ADDITIONAL FIBER OPTIC RUNNING LINE MARKER SPACING	C=A-B (WHERE REQUIRED) < 1000
D	UTILITY MARKER SPACING	* ■

- \* UTILITY LOCATION MARKERS FOR DEVICE POWER SOURCE ELECTRIC RUNS TO BE INSTALLED AT BEGINNING AND END OF UTILITY CONDUIT. IF RUNNING LINE IS LONGER THAN 500 FEET ONE ADDITIONAL MARKER SHALL BE INSTALLED AT THE MIDPOINT OF CONDUIT RUN.
- UTILITY LOCATION MARKERS FOR RUNNING LINE ELECTRICAL CONDUIT TO BE INSTALLED AT BEGINNING AND END OF UTILITY CONDUIT, AT ALL MANHOLES AND AT A MAXIMUM SPACING OF 1000' ALONG LINE BETWEEN MANHOLES.

# FIBER OPTIC AND CDOT UTILITY LOCATION MARKER INSTALLATION NOTES:

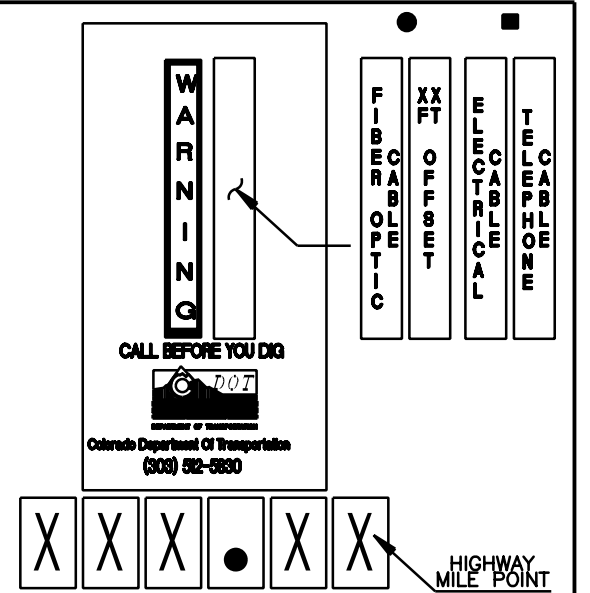
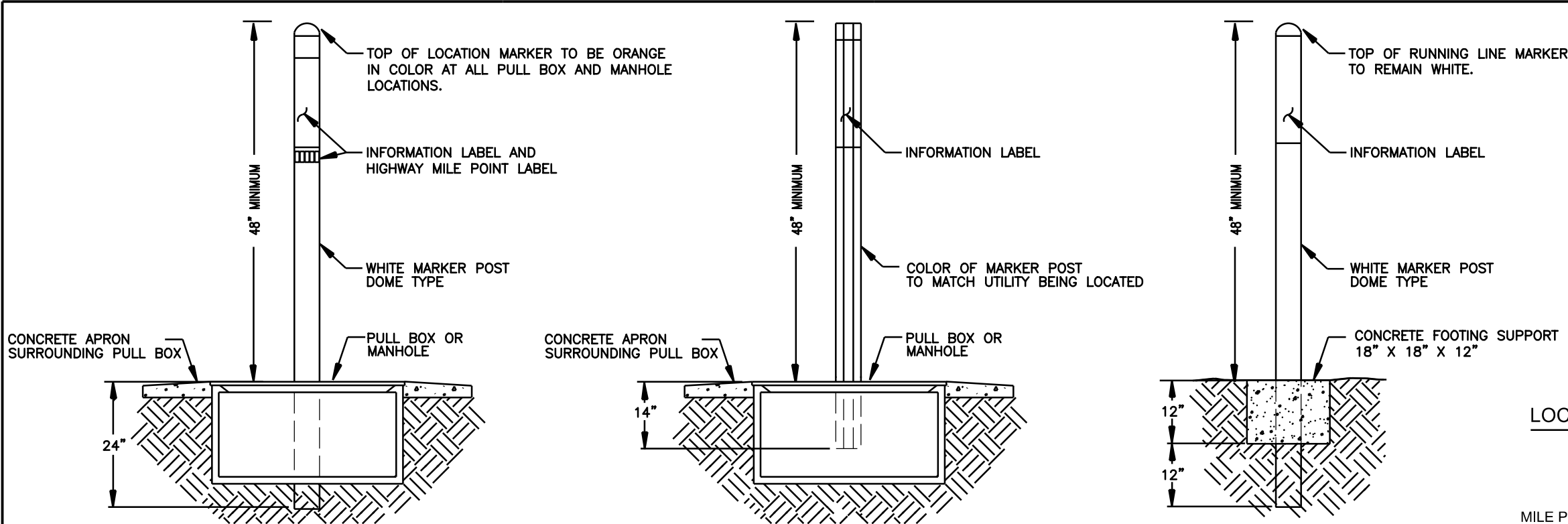
1. AREA AROUND LOCATION MARKER INSTALLATION SHALL BE RETURNED TO EXISTING GRADE AND CONDITION. THIS WORK SHALL NOT BE PAID FOR SEPARATELY, BUT BE INCLUDED IN THE COST OF LOCATION MARKER ITEM.
2. LOCATION MARKERS SHALL BE INSTALLED AT EACH PULL BOX AND MANHOLE ALONG BOTH THE BACKBONE AND LATERAL FIBER OPTIC CABLE RUNS THROUGHOUT THE PROJECT. ADDITIONAL MARKERS SHALL BE INSTALLED ALONG THE RUNNING LINE.
3. UTILITY LOCATION MARKERS SHALL BE INSTALLED AT BOTH THE UTILITY POINT OF SERVICE PULL BOX AND THE EQUIPMENT PULL BOX OR MANHOLE AT PROJECT DEVICE. ADDITIONAL MARKERS, IF REQUIRED, SHALL BE INSTALLED AT MID LOCATIONS ALONG THE UTILITY LINE AS SHOWN ON THE PLANS.
4. CONCRETE FOOTING SUPPORT FOR FIBER OPTIC CABLE LOCATION MARKERS AT PULL BOX LOCATIONS SHALL BE INCLUDED IN THE COST OF EACH PULL BOX SHOWN IN THE PROJECT.
5. CONCRETE FOOTING SUPPORTS FOR FIBER OPTIC CABLE RUNNING LINE MARKERS ARE TO BE INCLUDED IN LOCATION MARKER ITEM.
6. UTILITY LOCATION MAKERS SHALL BE INSTALLED PER THE MANUFACTURER'S RECOMMENDATIONS. CONCRETE SUPPORT FOUNDATIONS SHALL NOT BE REQUIRED FOR UTILITY LOCATION MARKERS.
7. LANDSCAPE LOCATION MARKERS SHALL BE INSTALLED IN LANDSCAPE AREAS AND AREAS SUCH AS PARKING LOTS WHICH COULD HAVE VEHICULAR TRAFFIC.
8. THE CONTRACTOR SHALL PROVIDE THE PROJECT ENGINEER AN AS-BUILT DRAWING SHOWING THE INSTALLED LOCATIONS OF ALL MARKER TYPES.
9. LOCATION MARKERS SHALL HAVE INFORMATION LABELS ATTACHED WITH ADHESIVE TO WITHSTAND HEAT AND COLD. INFORMATION ON LABELS SHALL INCLUDE CDOT CONTACT INFORMATION. NUMBERS INDICATING THE HIGHWAY MILE POINT OF THE PULL BOX OR MANHOLE, TO THE HUNDRETH OF A MILE, SHALL BE INSTALLED BENEATH THE INFORMATION LABELS AS SHOWN ON SHEET TWO OF THIS PROJECT DETAIL.
10. WHERE REQUIRED ON NATIONAL FOREST SERVICE LAND, MARKERS SHALL BE BROWN (Fed #20059) IN COLOR. INFORMATION LABELS SHALL HAVE BLACK LETTERING ON THE BROWN BACKGROUND.



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File Name: Fiber Marker Sheets 01.dgn		Date:	Comments:	Init.			Designer: CDOT	Structure Numbers		
Horiz. Scale: NTS      Vert. Scale:							Detailer: CDOT	Subset Sheets: 10 of 22		
4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276				<b>CRC</b>						

Jason.Duffy 11:00:30 AM P:\Projects\1210109 - Twin Tunnels\18832\Traffic\ITS\Drawings\Fiber Marker Sheets 01.dgn





**LOCATION MARKER INFORMATION LABELING**

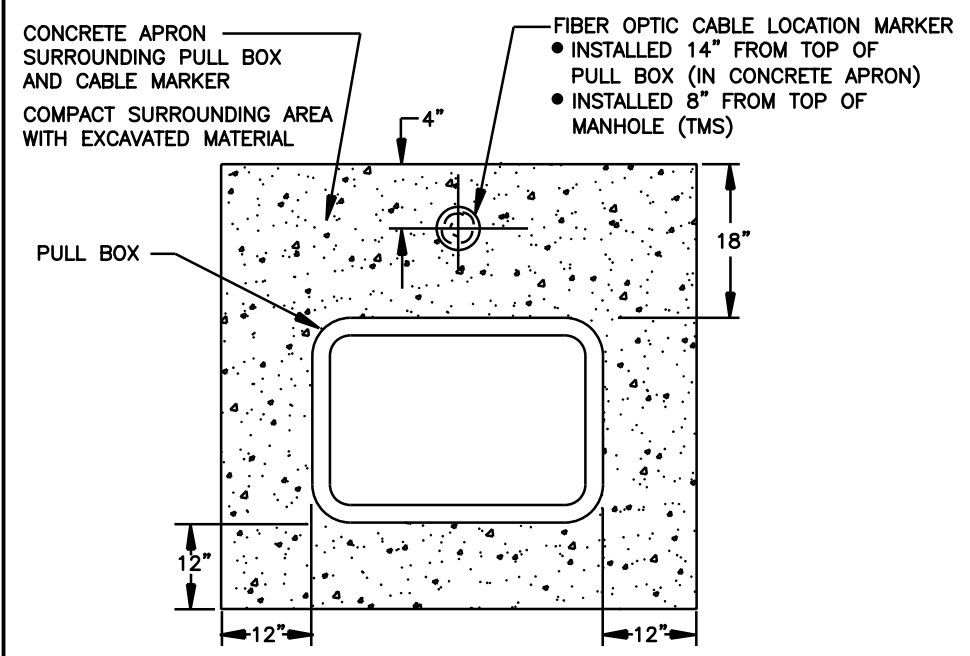
LABEL WITH CDOT CONTACT INFORMATION  
 BLACK LETTERING ON ORANGE BACKGROUND

- FOR FIBER OPTIC DOME MARKERS
- FOR CDOT UTILITY FLAT MARKERS

MILE POINT REFERENCE LABEL (5 NUMBERS / 1 DECIMAL POINT)  
 MILE POINT DESIGNATION TO BE TO 100TH OF A MILE  
 BLACK NUMBERS WITH WHITE BACKGROUND

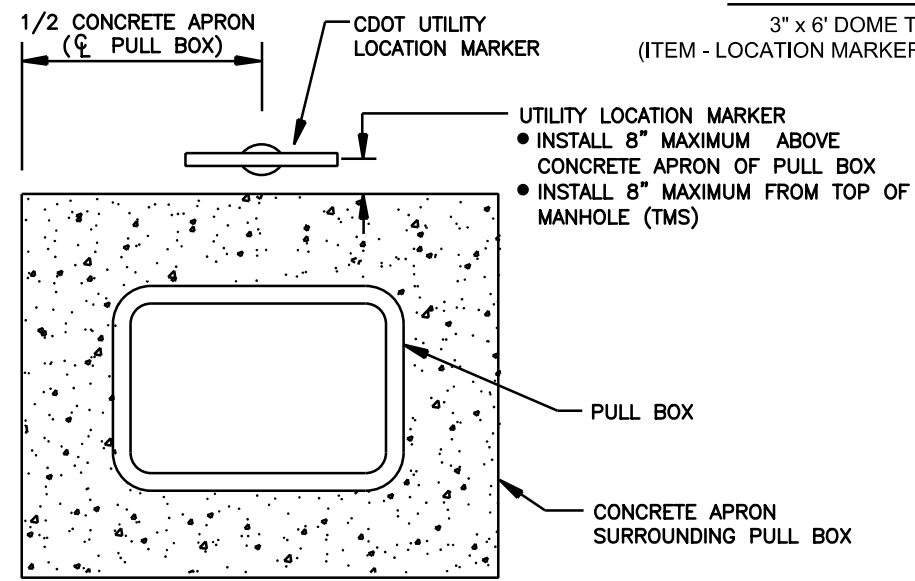
**FIBER OPTIC RUNNING LINE LOCATION MARKER**

3" x 6" DOME TYPE POST  
 (ITEM - LOCATION MARKER (FIBER OPTIC)(DOME))



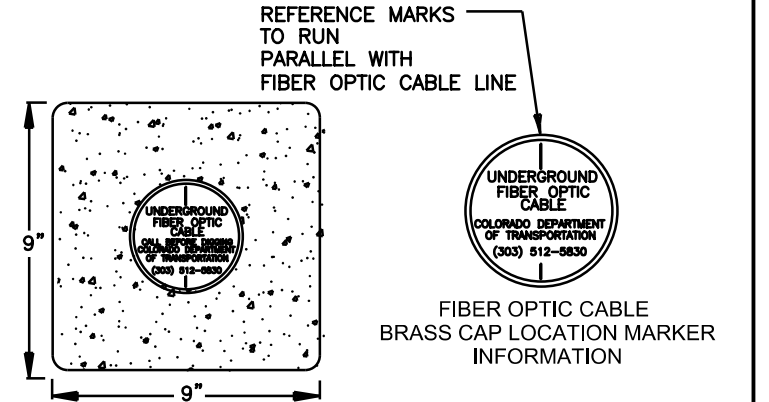
**PULL BOX AND MANHOLE FIBER OPTIC LOCATION MARKER**

3" x 6" DOME TYPE POST  
 (ITEM - LOCATION MARKER (FIBER OPTIC)(DOME))



**CDOT UTILITY LOCATION MARKER**

3 1/2" X 62" FLAT TYPE POST  
 ELECTRICAL POWER RUNNING LINES AND  
 TELEPHONE RUNNING LINES  
 ITEM - LOCATION MARKER (UTILITY)(FLAT SLAT)



**LANDSCAPE LOCATION MARKER**

BRASS CAP SURVEY MONUMENT USED AS FIBER OPTIC CABLE MARKER  
 WITH CONCRETE FOOTING SUPPORT  
 (ITEM - LOCATION MARKER (FIBER OPTIC)(BRASS CAP))

Print Date: 11/20/2012  
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Colorado Department of Transportation

**DOT** 425 A Corporate Circle  
 Golden, CO 80401  
 Phone: 720-497-6918 FAX: 720-497-6901

Region 1 **CRC**

As Constructed	FIBER OPTIC AND UTILITY MARKER DETAIL	
No Revisions:	Designer:	CDOT
Revised:	Detailer:	CDOT
Void:	Subset:	ITS

Project No./Code
IM 0703-390
19035
Sheet Number 138

Jason.Duffy 11:00:31 AM P:\Projects\18832\_Traffic\ITS\Drawings\Fiber Marker Sheets 02.dgn

- DIRECTION OF FIBER OPTIC CABLE RUN (BACKBONE AND LATERAL CABLES)
- DEVICE ATTACHED (LATERAL CABLE)
- FOOTAGE MEASUREMENT AT PULL BOX OR ITS MANHOLE LOCATION (BACKBONE AND LATERAL CABLES)
- TYPE OF CABLE (BACKBONE AND LATERAL CABLES)
- FIBER MANUFACTURER (BACKBONE AND LATERAL CABLES)
- NUMBER OF FIBERS IN CABLE (BACKBONE AND LATERAL CABLES)
- DATE OF INSTALLATION (BACKBONE AND LATERAL CABLES)

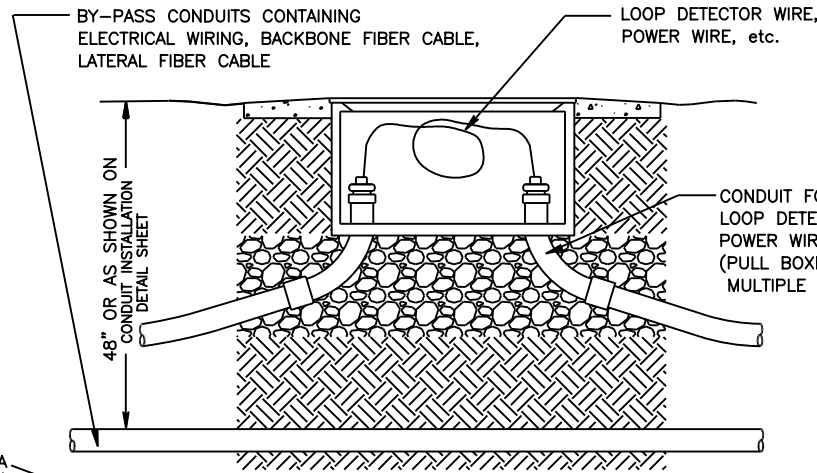
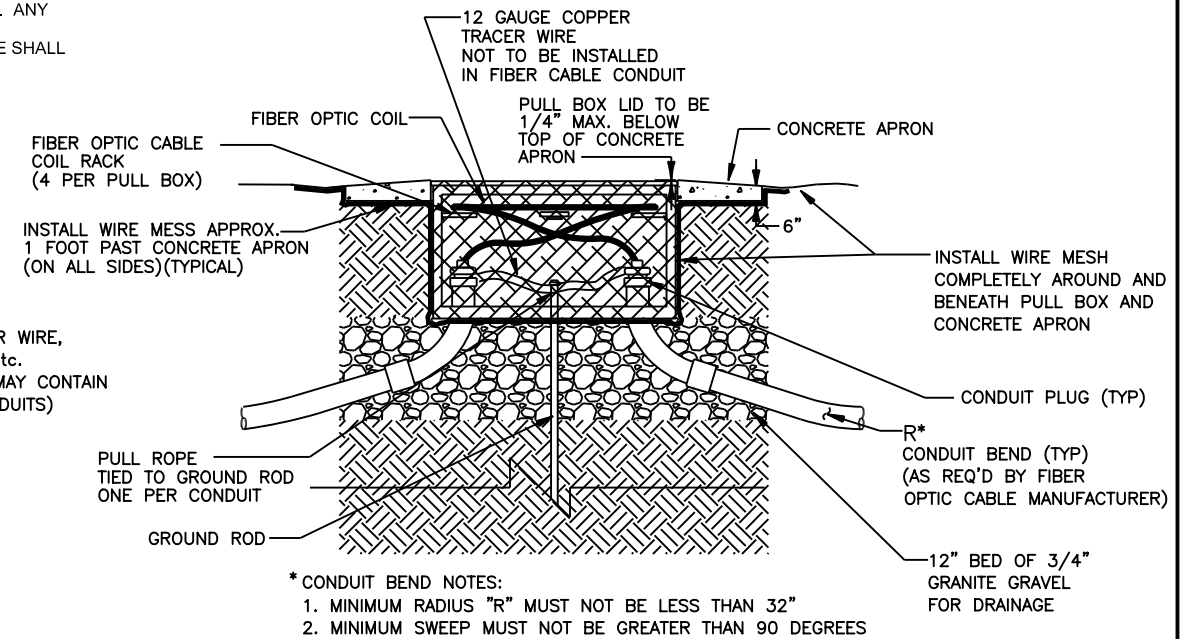
### FIBER CABLE LABEL

TO BE ATTACHED TO EACH FIBER OPTIC CABLE LOCATED IN ALL PULL BOX AND ITS MANHOLES

ITS PULL BOX TYPE	MINIMUM DIMENSIONS (Inches)			Knockout Mouse Hole Type
	A	B	C	
PULL BOX - (13" x 24" x 18")	13	24	18	2
PULL BOX - (24" x 36" x 24")	24	36	24	4
PULL BOX - (36" x 40" x 24")	36	40	24	4
PULL BOX - (SURFACE MOUNTED)	24	24	8	NA

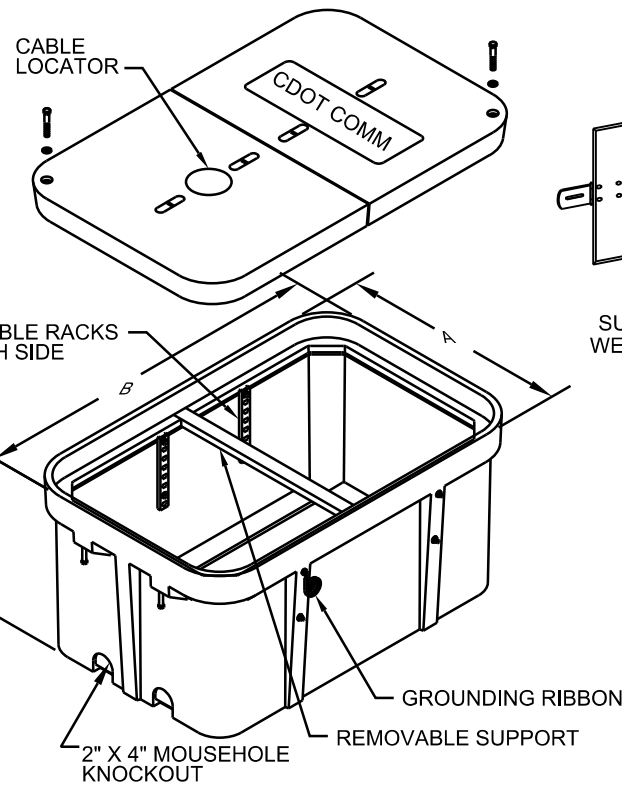
### PULL BOX NOTES:

1. CONDUITS DEPICTED ON THIS SHEET ARE REPRESENTATIVE ONLY. EXACT NUMBER OF CONDUITS INSTALLED AND CONDUIT SIZE SHALL BE AS TABULATED AND SHOWN ON THE PLANS.
2. DESIGNATION FOR THE INSTALLTION OF ELECTRICAL WIRING AND FIBER OPTIC CABLE IN THE BACKBONE CONDUIT SYSTEM IS DESCRIBED IN THE PROJECT SPECIFICATIONS.
3. CONDUIT CENTERLINE SHALL BE ALIGNED WITHIN THE PULL BOX TO FACILITATE FIBER OPTIC CABLE PULLING.
4. CONDUIT PLUGS SHALL BE INSTALLED IN ALL CONDUITS, BOTH WITH AND WITHOUT WIRE OR CABLE AND SHALL BE INCLUDED IN THE COST OF ELECTRICAL CONDUIT ITEM.
5. WEATHERPROOF TAGS SHALL BE INSTALLED ON ALL FIBER CABLES AND SHALL BE INCLUDED IN THE COST OF ELECTRICAL CONDUIT ITEM.
6. TRACER WIRE AND PULL ROPE SHALL BE INCLUDED IN THE COST OF ELECTRICAL CONDUIT ITEM.
  - MAIN BACKBONE AND LATERAL FIBER CABLE CONDUIT -
  - IF INSTALLATION INCLUDES MULTIPLE RUNS OF CONDUIT, PULL ROPE SHALL BE INSTALLED IN EACH INDIVIDUAL CONDUIT. TRACER WIRE SHALL BE INSTALLED IN ONLY ONE CONDUIT. ANY CONDUIT CONTAINING FIBER OPTIC CABLE SHALL NOT HAVE TRACER WIRE INSTALLED.
  - IF INSTALLATION INCLUDES ONLY ONE RUN OF CONDUIT, PULL ROPE AND TRACER WIRE SHALL BE INSTALLED IN SAME CONDUIT AS FIBER CABLE.
7. SEE 612 - MARKER SPECIFICATION FOR TRACER BALL REQUIREMENTS
8. ALL PULL BOX TYPES SHALL BE PAID FOR UNDER THE CORRESPONDING PULL BOX ITEM, AND SHALL BE SIZED AS TABULATED AND SHOWN IN THE PLANS.
9. PULL BOXES SHALL HAVE A CONCRETE APRON SLOPED AWAY FROM PULL BOX OPENING. THE COST OF THE CONCRETE APRON SHALL BE PAID FOR AS PART OF PULL BOX ITEM.
10. SEE PROJECT SPECIFICATIONS FOR THE QUANTITY OF BOTH FIBER OPTIC BACKBONE AND LATERAL CABLE TO BE COILED IN EACH PUL BOX.
11. FIBER OPTIC CABLE COILS WITHIN PULL BOXES SHALL BE TIED TO EACH CABLE RACK. PLASTIC WIRE TIES SHALL NOT BE ALLOWED. CAUTION SHALL BE TAKEN TO COIL THE FIBER CABLE PER MANUFACTURER'S RECOMMENDATIONS.
12. ALL WORK TO INSTALL PULL BOX SHALL INCLUDE BUT NOT BE LIMITED TO SAW CUTTING OF PAVEMENT, REMOVAL OF PAVEMENT, CONCRETE, EARTHWORK, ALL LANDSCAPE RESTORATION AND SHALL BE PAID FOR AS PART OF PULL BOX.
13. PULL BOX TYPES AS DEPICTED ON THIS PROJECT DETAIL SHEET SHALL NOT BE INSTALLED IN THE ASPHALT OR CONCRETE SHOULDER OF THE ROADWAY.

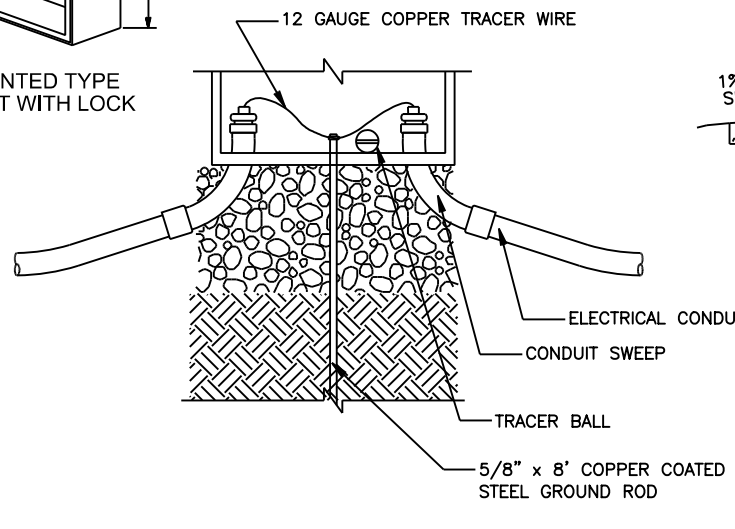


### CONDUIT BYPASS DETAIL

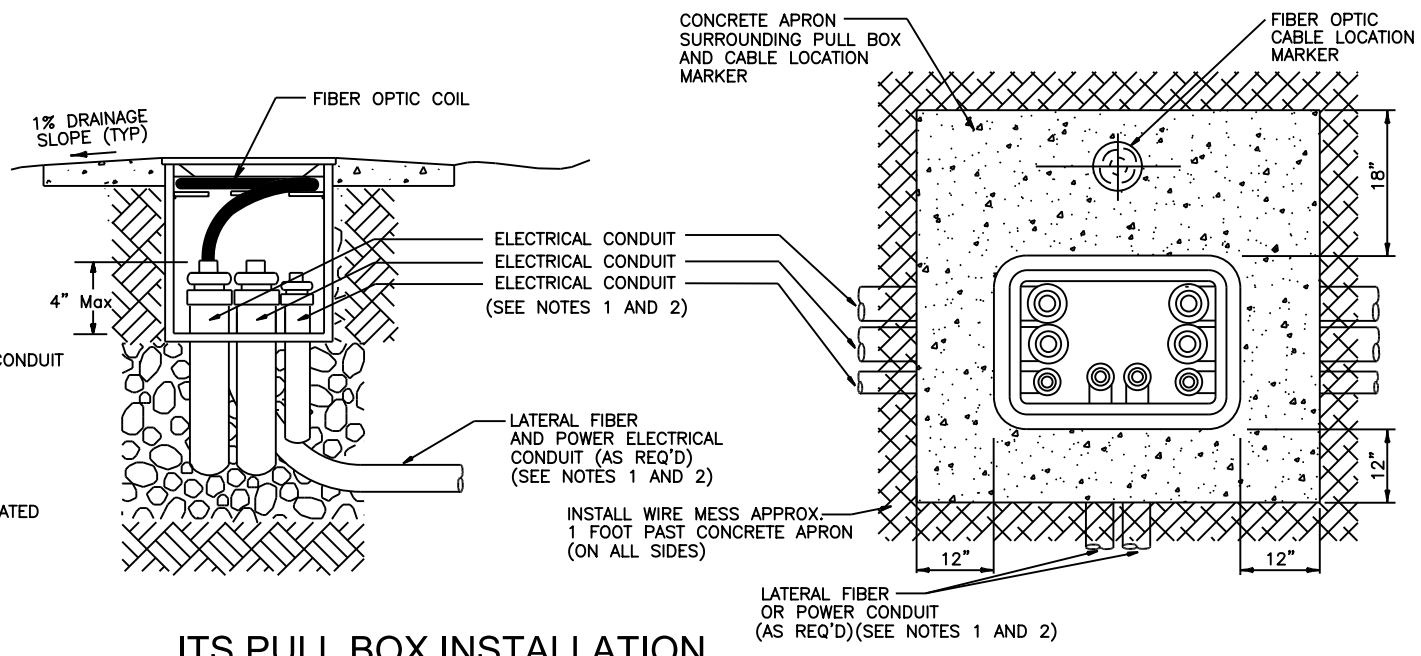
- \* CONDUIT BEND NOTES:
1. MINIMUM RADIUS "R" MUST NOT BE LESS THAN 32"
  2. MINIMUM SWEEP MUST NOT BE GREATER THAN 90 DEGREES



### 2' X 3' BOX (or LARGER)



### GROUNDING DETAIL

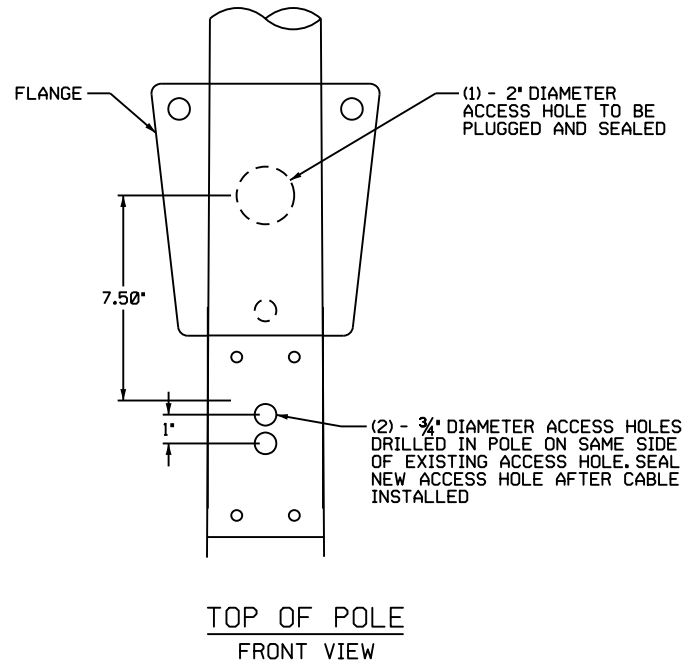
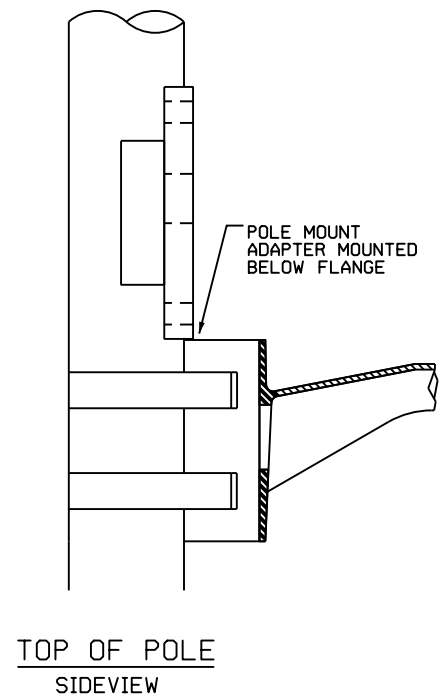
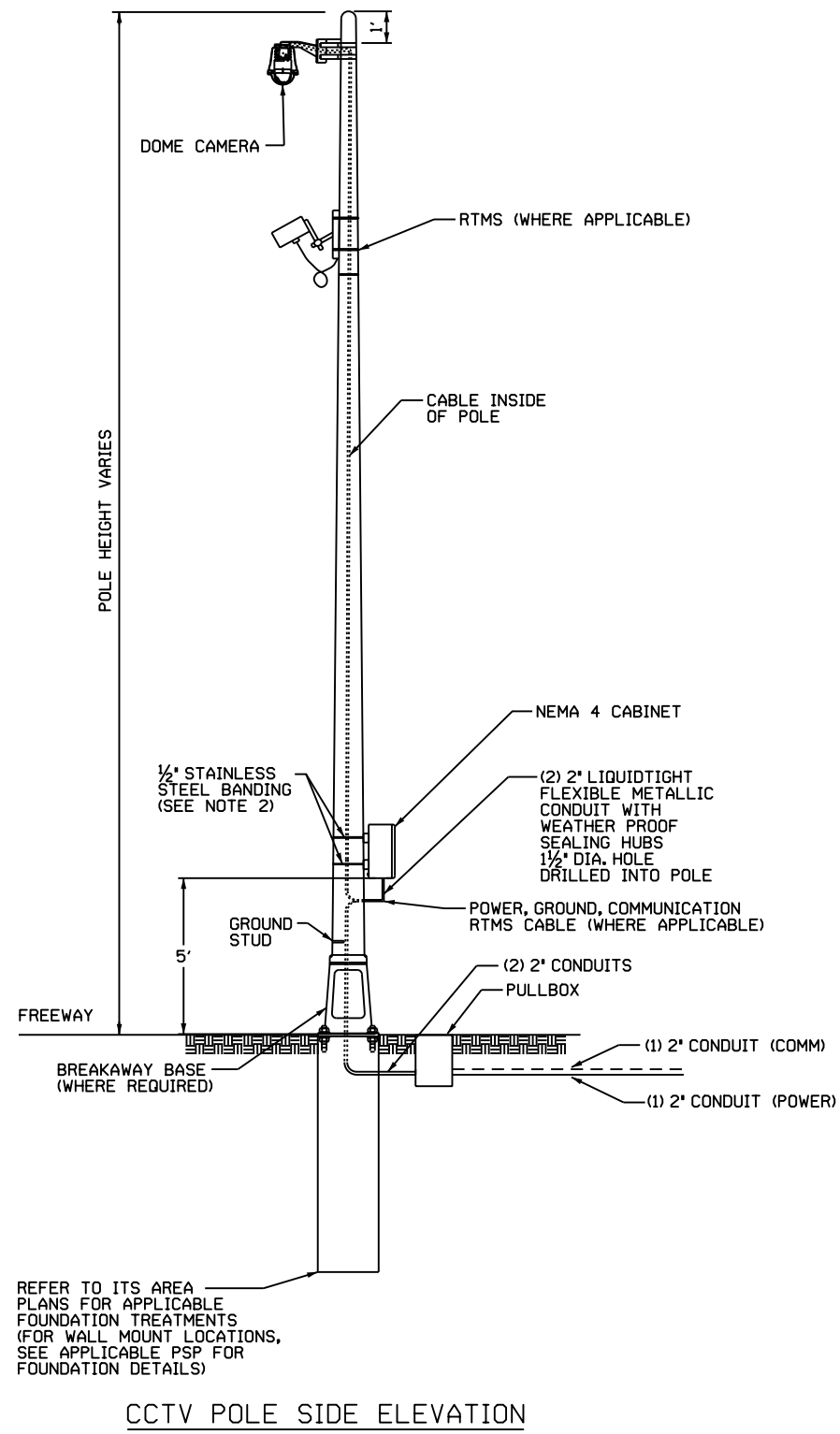


### ITS PULL BOX INSTALLATION

Print Date: 11/20/2012	<b>Sheet Revisions</b>			Colorado Department of Transportation	As Constructed	<b>PULL BOX DETAIL</b>		Project No./Code	
File Name: PullBox.dgn	Date:	Comments	Init.	425 A Corporate Circle Golden, CO 80401 Phone: 720-497-6918 FAX: 720-497-6901 Region 1	No Revisions:	Designer:	CDOT	Structure	IM 0703-390
Horiz. Scale: NTS	Vert. Scale:				Revised:	Detailer:	CDOT	Numbers	19035
<b>ATKINS</b>	4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276				Void:	Subset:	ITS	Subset Sheets: 12 of 22	Sheet Number 139

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**NOTES:**

1. SEE STANDARD M-613-1 FOR BREAKAWAY DEVICES WHERE APPLICABLE.
2. STEEL STRAPS USED FOR ATTACHING BOTH THE POLE MOUNT ADAPTER AND CCTV CABINET TO THE POLE SHALL HAVE A THICKNESS OF 0.040", MINIMUM WIDTH OF 1/2", AND BE MANUFACTURED OUT OF TYPE 201 STAINLESS STEEL.
3. ALL DRILLED HOLES SHALL BE CLEAN AND FREE OF ANY SHARP OBJECTS SO AS NOT TO DAMAGE CABLE DURING INSTALLATION. GALVANIZING DAMAGED BY DRILLING OR ERECTION SHALL BE PAINTED WITH ZINC-RICH PAINT IN ACCORDANCE WITH CDOT SPECIFICATION 509.26.

Print Date: 11/20/2012	
File Name: cctv pole.dgn	
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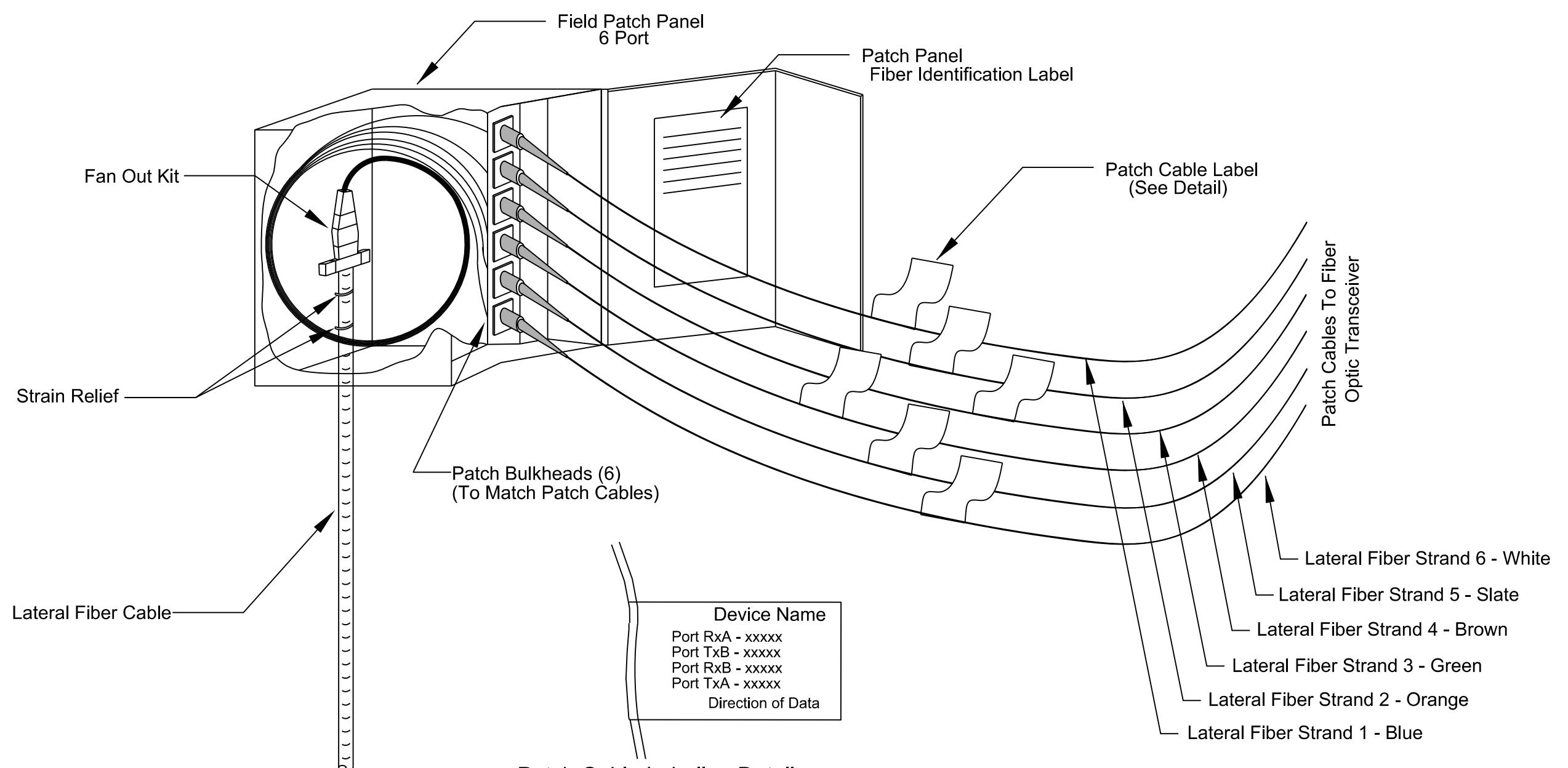
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CCTV POLE DETAIL			
Designer:	CDOT	Structure Numbers	
Detailer:	CDOT		
Subset:	ITS	Subset Sheets: 13 of 22	

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IM 0703-390
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Sheet Number 140



**Device Name**  
 Port RxA - xxxxx  
 Port TxB - xxxxx  
 Port RxB - xxxxx  
 Port TxA - xxxxx  
 Direction of Data

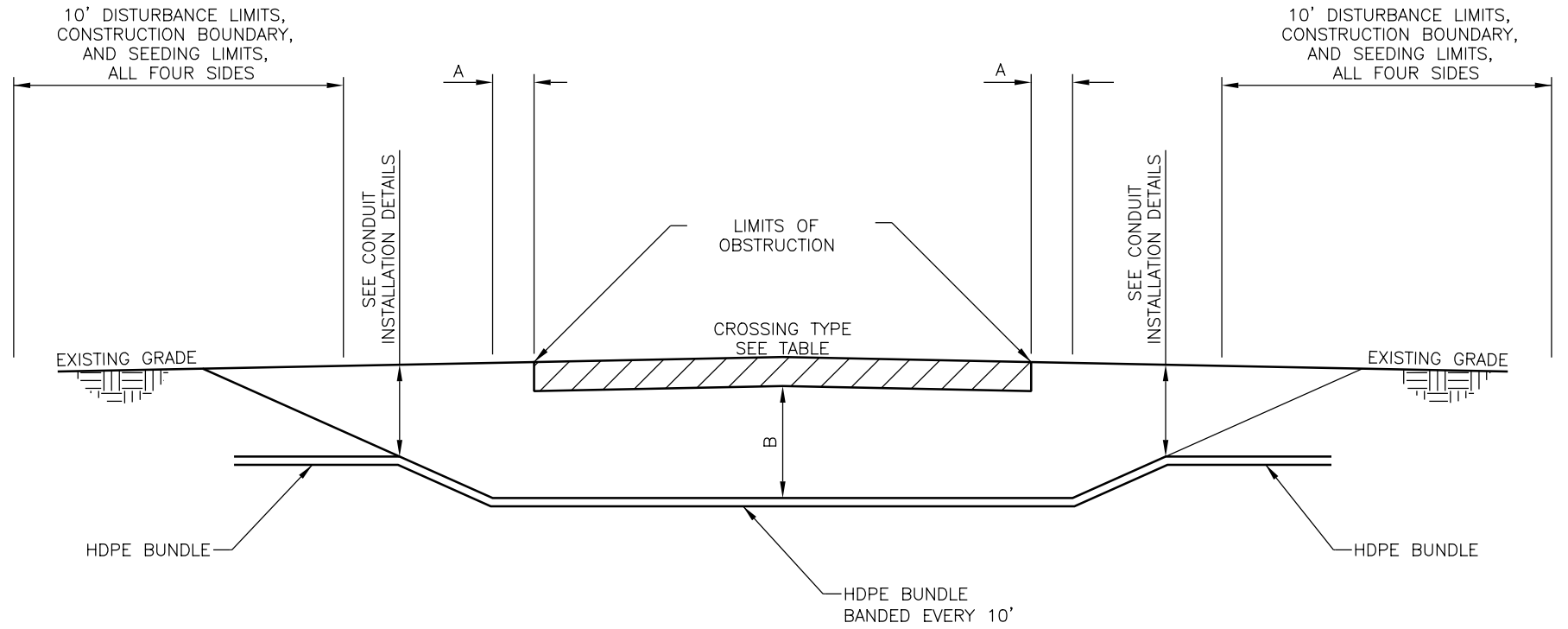
**Patch Cable Labeling Detail:**  
 The following information shall be supplied on label -  
 - Field Device Name  
 - Optical Transceiver Data Communications Port (Example = Tx or Rx)

Jason.Duffy 11:00:34 AM P:\Projects\120109 - Twin Tunnels\18832\Traffic\ITS\Drawings\6 Termination Field Panel.dgn

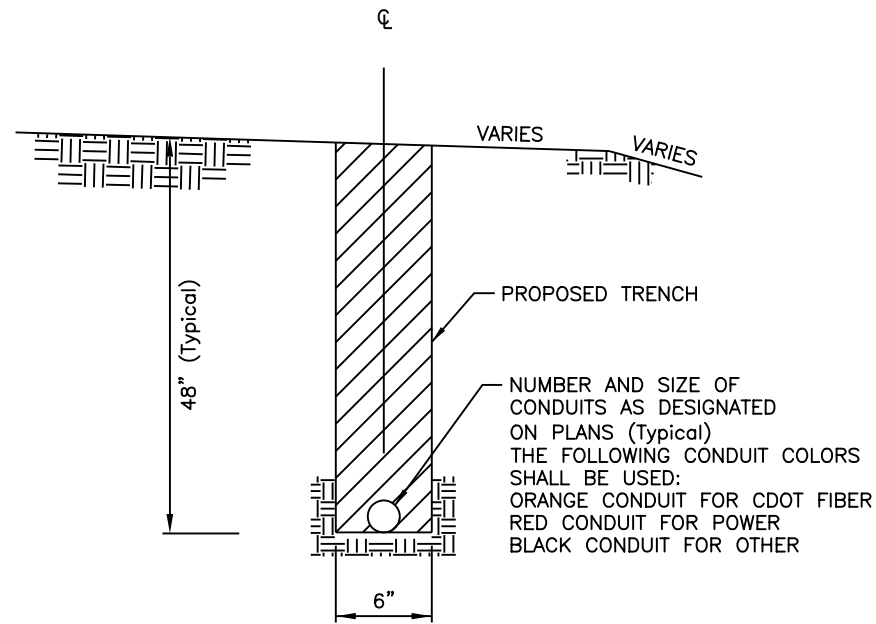
Print Date: 11/20/2012		<b>Sheet Revisions</b>			<b>Colorado Department of Transportation</b> 425 A Corporate Circle Golden, CO 80401 Phone: 720-497-6918 FAX: 720-497-6901 <b>Region 1</b>	<b>As Constructed</b> No Revisions: Revised: Void:	<b>FIBER OPTIC TERMINATION PANEL</b> <b>DETAIL</b>			Project No./Code	
File Name: 6 Termination Field Panel.dgn		Date:	Comments	Init.						IM 0703-390	
Horiz. Scale: NTS      Vert. Scale:								Designer: CDOT	Structure Numbers	19035	
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					Subset: ITS	Subset Sheets: 14 of 22					

**NOTES:**

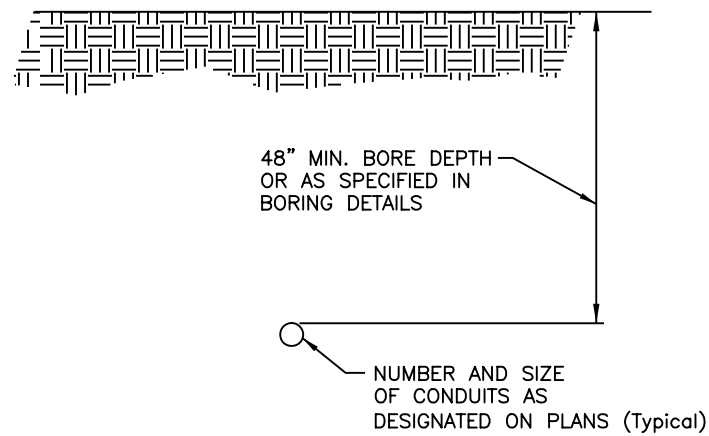
1. CONTRACTOR SHALL CONFORM TO THE APPLICABLE AGENCY REQUIREMENTS AND SPECIFICATION FOR BORE CROSSINGS.
2. EXCAVATIONS AND DISTURBANCE LIMITS REQUIRE SEEDING AND MULCHING.
3. CONTRACTOR SHALL BACKFILL AND REGRADE SITE TO MATCH EXISTING CONDITIONS.
4. CONTRACTOR MUST REPAIR ANY DAMAGE TO PAVEMENT CAUSED BY ERRANT BORING AT THEIR COST.
5. TRENCHES SHALL BE FILLED IN BY THE END OF THE WORK DAY. CONTRACTOR SHALL USE A BMP ON THE DOWNSTREAM SIDE OF ANY REMAINING SPOILS TO PREVENT THE TRANSPORT OF THE SEDIMENT DURING A RAIN EVENT.



**DIRECTIONAL BORE PROFILE**  
NTS



**TRENCHING IN FILL**  
NTS




**DIRECTIONAL BORE**  
NTS

CROSSING TYPE	A	B
CULVERT	5' MIN	48" MIN
DRIVEWAY	5' MIN	48" MIN
DITCH	15' MIN	48" MIN
CROSS ROAD	15' MIN	48" MIN
FREEWAY	15' MIN	48" MIN
PRAIRIE DOGS	15' MIN	84" MIN
TREE	20' MIN	84" MIN
WATERWAY	50' MIN	48" MIN
WETLAND	50' MIN	48" MIN

**apexdesign**

Print Date: 11/20/2012  
 File Name: DetailConduit.dgn  
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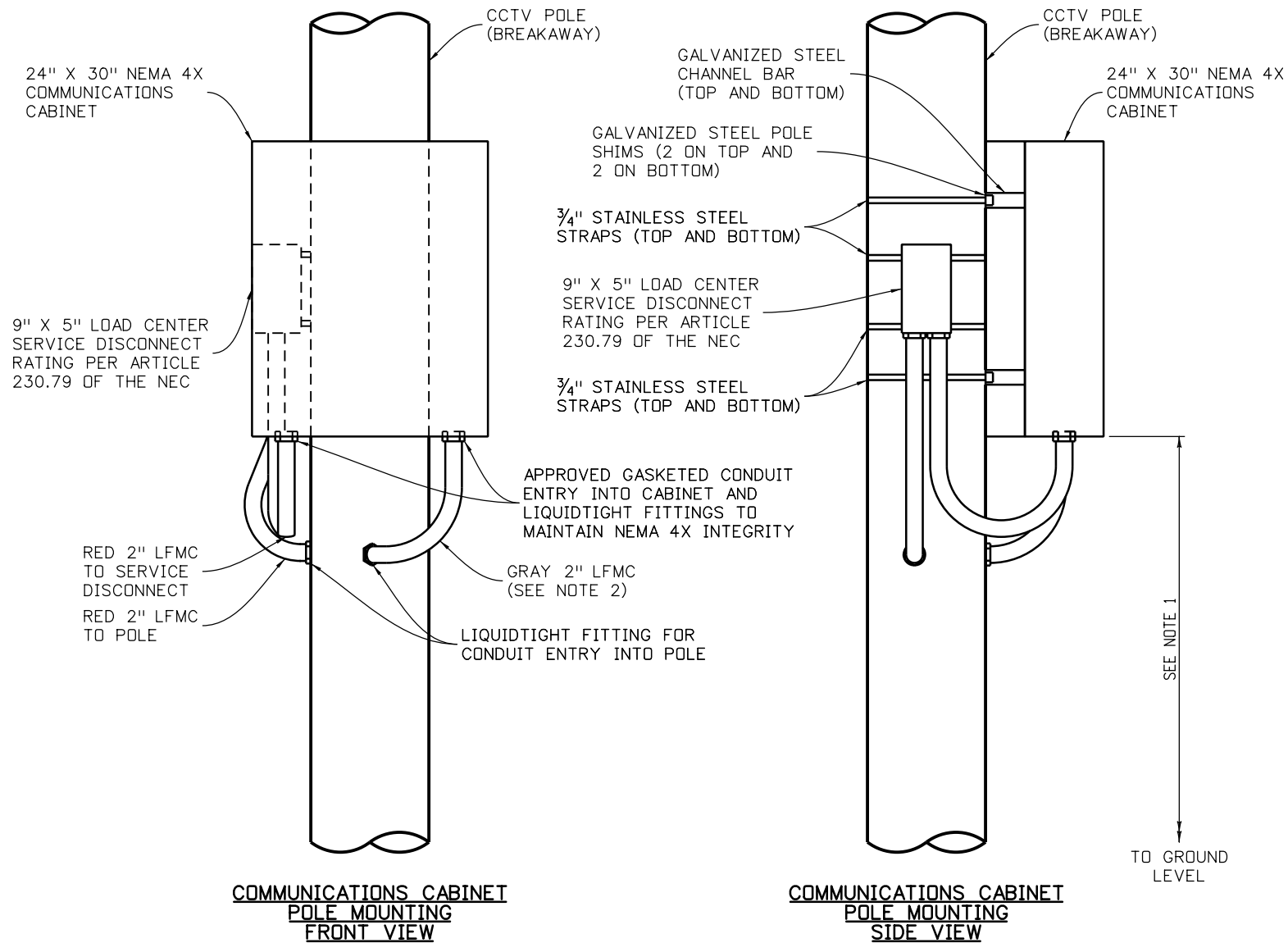
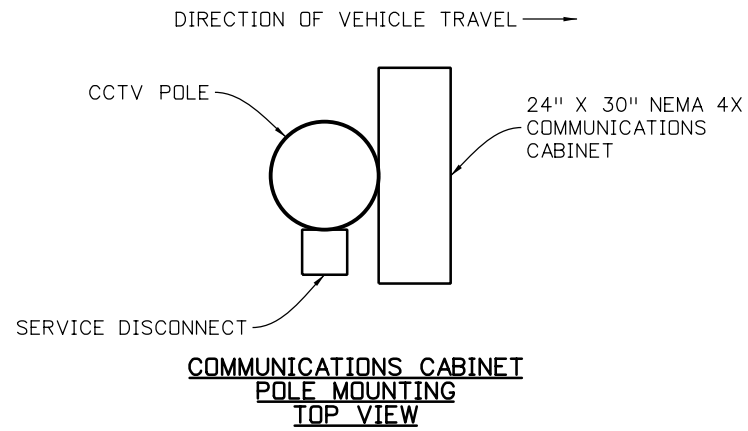
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CONDUIT INSTALLATION DETAIL		
Designer: C.SIGSBURY	Structure Numbers	
Detailer: C.SIGSBURY		
Subset: ITS	Subset Sheets: 15 of 22	

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Sheet Number 142



NOTES:

1. TYPICAL MOUNTING HEIGHT (TO BOTTOM OF CABINET):  
7' IF POLE INSTALLED INSIDE CLEAR ZONE  
5'-6" IF POLE INSTALLED BEHIND GUARDRAIL OR OUTSIDE CLEAR ZONE
2. SEE PROJECT SPECIAL PROVISIONS FOR DEVICE SPECIFIC VARIATIONS IN CONDUIT AND ENTRY SIZE.

Print Date: 11/20/2012
File Name: CDOT Standard-5.dgn
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Region 1      CRC

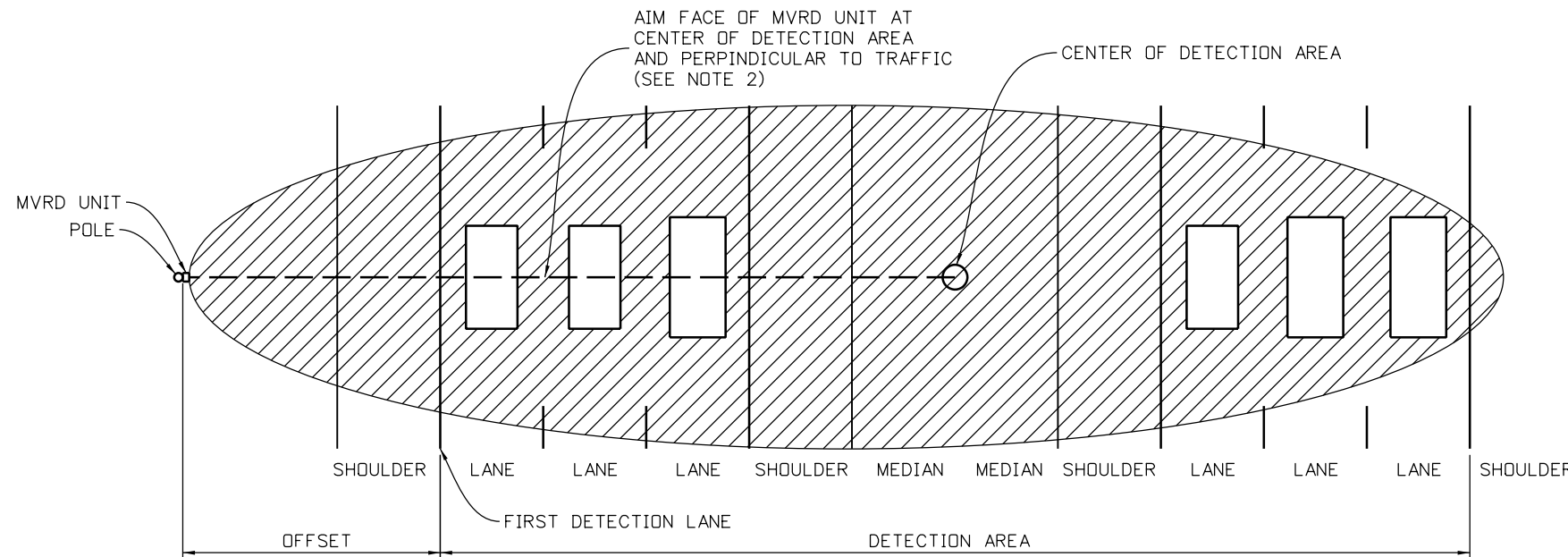
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COMMUNICATIONS CABINET POLE MOUNTING PROJECT STANDARD			
Designer:	CDOT	Structure Numbers	
Detailer:	CDOT		
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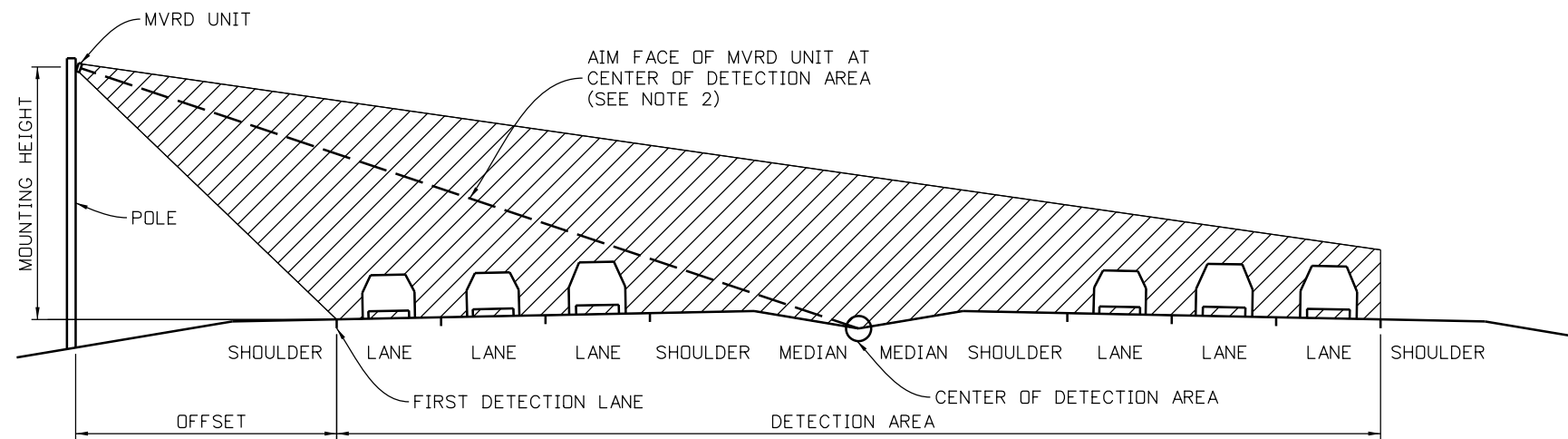
Project No./Code
IM 0703-390
19035
Sheet Number 143

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**TYPICAL MVRD INSTALLATION TOP VIEW**



**TYPICAL MVRD INSTALLATION CROSS SECTION**

**NOTES:**

1. THIS DETAIL SPECIFIC TO WAVETRONIX SMARTSENSOR MVRD INSTALLATION.
2. SHOWN FOR BI-DIRECTIONAL DETECTION. SAME PRINCIPLES APPLY WHEN ONLY ONE DIRECTION OF TRAFFIC IS DETECTED.
3. SEE MANUFACTURER INSTALLATION INSTRUCTIONS FOR EQUIPMENT CONFIGURATION.
4. WAVETRONIX SMARTSENSOR HAS A DISTANCE LIMITATION OF 250' FROM DETECTOR TO FAR SIDE OF DETECTION AREA.

**MVRD Mounting Recommendations**

Offset from first detection lane (ft)	Recommended Mounting Height (ft)	Minimum Mounting Height (ft)	Maximum Mounting Height (ft)
6	12	9	19*
7	12	9	19*
8	12	9	20*
9	12	9	21
10	12	9	22
11	12	9	23
12	13	10	24
13	13	11	25
14	14	11	26
15	15	12	26
16	15	12	27
17	16	13	28
18	17	14	29
19	17	14	30
20	18	15	30
21	19	15	31
22	20	16	31
23	22	16	32
24	24	16	33
25	26	17	33
26	26	17	34
27	27	18	35
28	27	18	35
29	27	18	36
30	29	19	37
31	29	19	37
32	29	19	38
33	30	19	39
34	30	19	39
35	30	20	40
36	30	20	41
37	31	20	41
38	31	21	42
39	33	21	43
40	33	22	43
41	34	22	44
42	34	22	44
43	35	22	45
44	35	23	46
45	36	23	46
46	36	23	47
47	36	24	48
48	38	24	48
49	38	24	49
50-230	39	25	Must be ≤ offset

\*Reduction in the number of reported speeds

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**Region 1** **CRC**

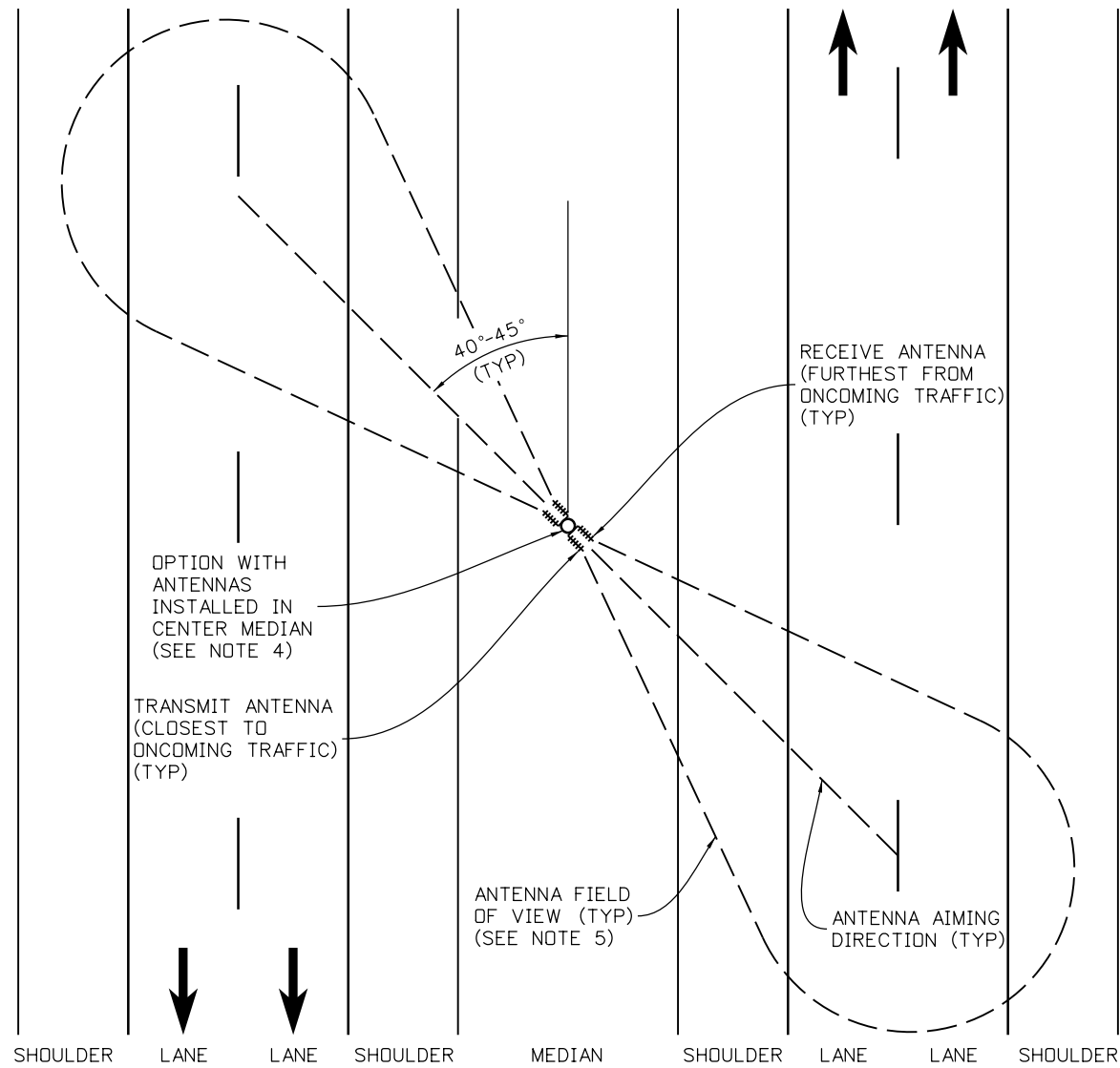
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**MVRD INSTALLATION PROJECT STANDARD**

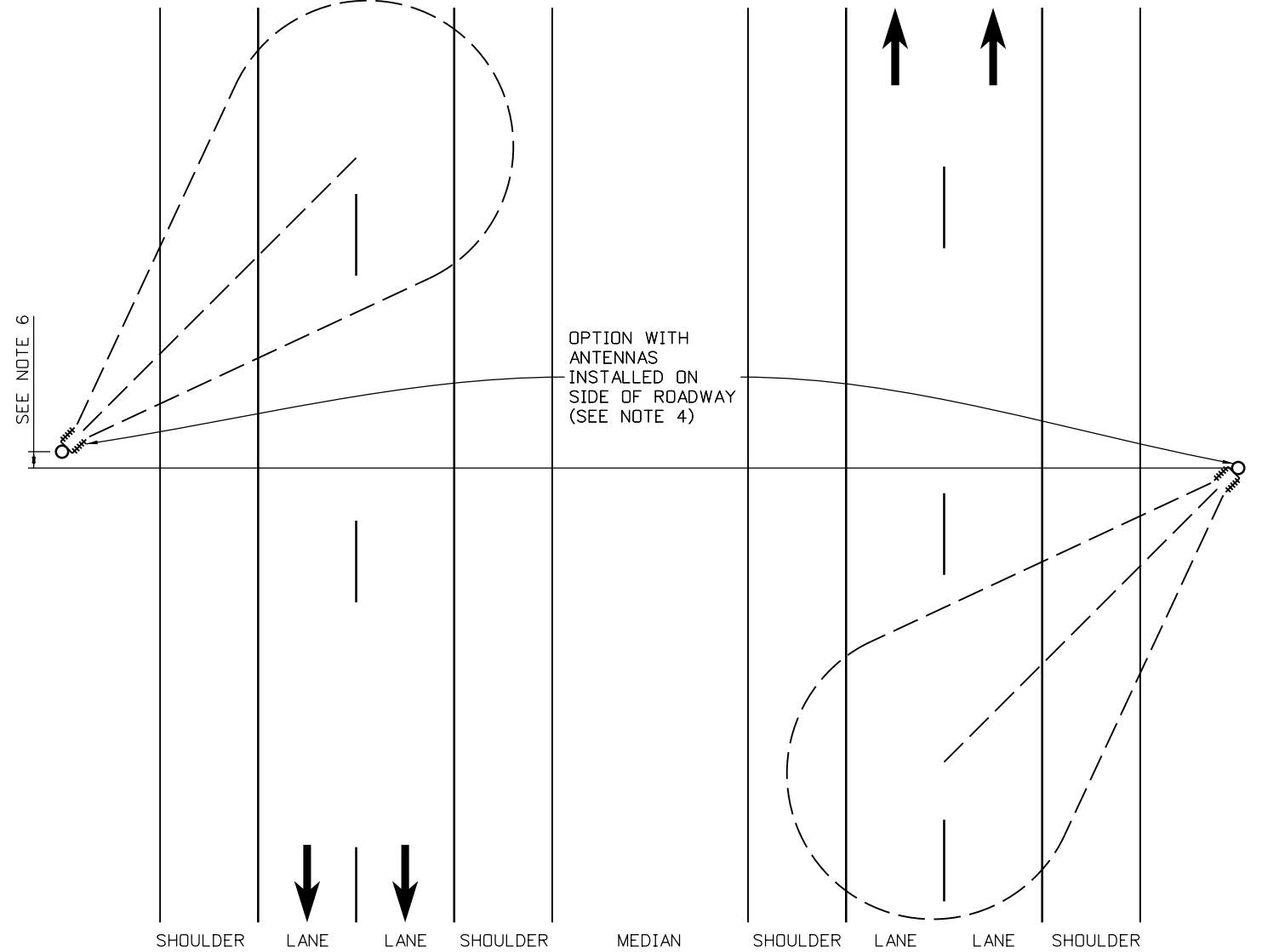
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Detailer:	CDOT		
Subset:	ITS	Subset Sheets: 17 of 22	

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 IM 0703-390  
 19035  
 Sheet Number **144**





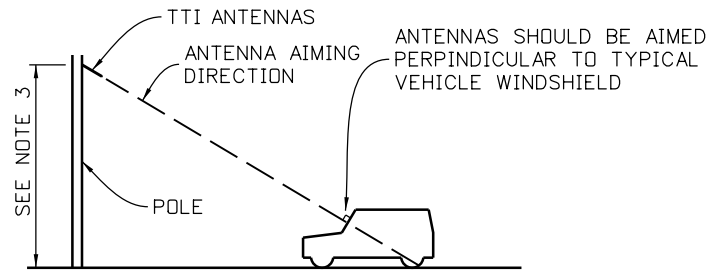
**TTI ANTENNA AIMING-TYPICAL PLAN VIEW  
CENTER MEDIAN INSTALLATION**



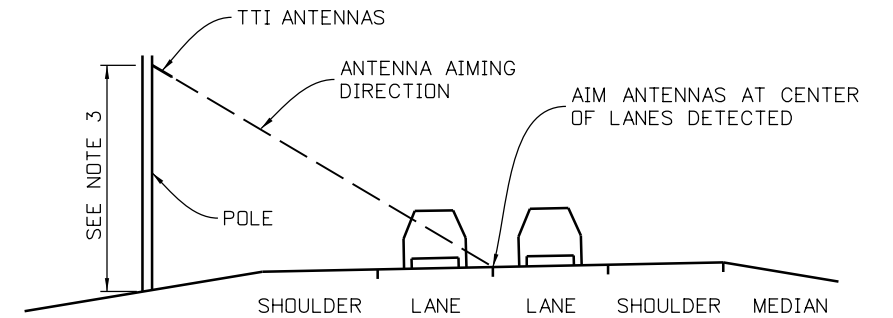
**TTI ANTENNA AIMING-TYPICAL PLAN VIEW  
ROADSIDE INSTALLATION**

**NOTES:**

1. TWO LANE, TWO DIRECTION DETECTION SHOWN. ADJUST AS NEEDED FOR SITE SPECIFIC NUMBER OF LANES AND DIRECTIONS DETECTED.
2. SEE MANUFACTURER INSTALLATION INSTRUCTIONS FOR EQUIPMENT CONFIGURATION AND ADDITIONAL ANTENNA MOUNTING REQUIREMENTS.
3. ANTENNA MOUNTING HEIGHT VARIES BY LOCATION. ADJUST ANTENNA MOUNTING HEIGHT TO ADDRESS AIMING CRITERIA IN PLAN, SECTION, AND PROFILE VIEWS.
4. ANTENNAS SHALL BE HORIZONTALLY POLARIZED AND THERE SHALL BE A 2-FOOT MINIMUM SEPARATION BETWEEN PAIRED ANTENNAS.
5. MAXIMUM ANTENNA FIELD OF VIEW IS 70 FEET.
6. OFFSET ANTENNA INSTALLATIONS IN ORDER TO MINIMIZE INTERFERENCE BETWEEN ANTENNA READERS.




**TTI ANTENNA AIMING-TYPICAL PROFILE VIEW**



**TTI ANTENNA AIMING-TYPICAL SECTION VIEW**

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<b>TTI ANTENNA AIMING PROJECT STANDARD</b>			
Designer:	CDOT	Structure Numbers	
Detailer:	CDOT		
Subset:	ITS	Subset Sheets: 18 of 22	

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**GENERAL NOTES**

1. ALL STRUCTURAL STEEL SHALL CONFORM TO THE REQUIREMENTS SHOWN IN THE MATERIALS TABLE.
2. POLES SHALL BE FABRICATED INTO THE LARGEST PRACTICAL SECTIONS PRIOR TO GALVANIZING. SPLICE LOCATIONS AND DETAILS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL AND THE CONTRACTOR SHALL NOT COMMENCE FABRICATION UNTIL SUCH SPLICE LOCATIONS ARE APPROVED. THE MINIMUM LENGTH OF ANY TELESCOPIC (SLIP TYPE) FIELD SPLICES SHALL BE 1.5 TIMES THE INSIDE DIAMETER OF THE EXPOSED END OF THE FEMALE SECTION.
3. ALL CONCRETE SHALL BE CLASS BZ WITH AIR ENTRAINMENT; REINFORCING STEEL SHALL BE GRADE 60. CAISSON FOUNDATIONS SHALL REACH THE SEVEN DAY PREDICTED STRENGTH BEFORE POLES ARE ERECTED THEREON.
4. A DISCONNECT FOR THE POWER SUPPLY TO THE CAMERA SHALL BE PROVIDED AS SHOWN IN THE ROADWAY PLANS.
5. POLE SHALL BE GROUNDED IN ACCORDANCE WITH APPLICABLE ELECTRICAL CODES.
6. NPS = NOMINAL PIPE SIZE; O.D. = OUTSIDE DIAMETER.
7. SHOP DRAWINGS SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW IN ACCORDANCE WITH SUBSECTION 105.02 OF THE STANDARD SPECIFICATIONS.
8. CAISSONS, POLES AND SURVEY WORK SHALL BE PAID FOR IN ACCORDANCE WITH BID ITEMS 503, 614 AND 625 RESPECTIVELY.
9. THERE SHALL BE NO PENETRATIONS OF POLES OTHER THAN AS SHOWN ON THESE PLANS UNLESS APPROVED BY THE ENGINEER PRIOR TO FABRICATION.
10. ATTACH CONTROLLER CABINET TO POST WITH TWO 1/2" WIDE STAINLESS STEEL BANDS AND STAINLESS STEEL FLARED LEG BRACKETS WITH HEX HEAD BOLTS (BAND-IT D315 OR EQUIVALENT).
11. ALL PIPE MEMBERS SHALL BE HOT-DIP GALVANIZED INSIDE AND OUTSIDE AFTER FABRICATION AS PER ASTM A123, UNLESS PAINTING IS CALLED FOR ON THE PLANS. PAINTING SHALL CONFORM TO SECTION 522, DUPLEX COATING SYSTEM. ALL NUTS, BOLTS AND WASHERS FOR POLE STRUCTURES SHALL BE GALVANIZED AFTER FABRICATION AS PER ASTM A123 OR ASTM A153, AS APPROPRIATE, AND SHALL NOT BE PAINTED.

**GENERAL NOTES (CONTINUED)**

12. WELDING OF STEEL SHALL CONFORM TO THE REQUIREMENTS OF AWS D 1.1. ALL AREAS TO BE WELDED SHALL BE GROUND TO BRIGHT METAL. NO BUTT WELD SPLICES WILL BE PERMITTED. ALL WELDING AND REQUIRED TESTING SHALL BE COMPLETE BEFORE ANY MATERIAL IS GALVANIZED.
- ENHANCED MAGNETIC PARTICLE TESTING SHALL BE PERFORMED ON AREAS DEFINED IN AWS D1.1 AND HEREIN. ENHANCED MAGNETIC PARTICLE TESTING SHALL BE CONDUCTED IN ACCORDANCE WITH ASTM E 709 AND AWS D 1.1, EXCEPT AS AMENDED HEREIN. ALTERNATING CURRENT SHALL BE USED. THE YOKE SPACING SHALL BE BETWEEN 2 AND 4 INCHES. THE MINIMUM LIFTING POWER SHALL BE 10 LBS. RED DRY PARTICLES SHALL BE USED. THE LIGHT INTENSITY SHALL MEET ASTM E 709, SECTION 7. PARTICLE APPLICATION AND SPECIMEN PREPARATION SHALL MEET THE REQUIREMENTS OF ASTM E 709 SECTIONS 9 AND 15, EXCEPT WHITE NON-AQUEOUS DEVELOPER MEETING ASTM E 165, TYPE 3, SHALL BE APPLIED TO THE TEST SURFACE PRIOR TO TESTING.

THE YOKES SHALL BE SET IN TWO POSITIONS WHEN TESTING THE WELD OR BASE METAL. THEY SHALL BE POSITIONED BOTH NORMAL AND PARALLEL WITH RESPECT TO THE WELD AXIS AND ROLLING DIRECTION OF THE BASE METAL.

ENHANCED MAGNETIC PARTICLE TESTS SHALL BE PERFORMED AT THE FOLLOWING LOCATIONS:

- (1) BASE METAL. ALL AREAS CONTACTED BY THE CARBON ARC GOUGE ELECTRODE, THE ELECTRODE CUP, AND THE WELDING ELECTRODE. ALL THREE CONDITIONS ARE ARC STRIKES.
- (2) FILLET WELDS. EACH DESIGN WELD SIZE ON MAIN MEMBER TO MAIN MEMBER AND SECONDARY MEMBER TO MAIN MEMBER WELDMENTS. ALL STOP-STARTS AND WELD TERMINI. ALL LINEAR INDICATIONS SHALL FURTHER BE EVALUATED WITH 10X OR 30X MAGNIFICATION. VERIFICATION SHALL BE RESOLVED BY EXCAVATION.
- (3) GROOVE WELDS. ALL THROUGH THICKNESS EDGES ON TRANSVERSE BUTT JOINT WELDMENTS IN TENSION AREAS.
- (4) REPAIRS. ALL REPAIR WELDS TO CORRECT DEFECTS IN GROOVE AND FILLET WELDS, PLATE CUT EDGES, CORRECTION OF FABRICATION ERRORS IN CUTTING, PUNCHING, DRILLING, OR FITTING, AND MEMBERS WHICH ARE TACKED OR WELDED AND SUBSEQUENTLY CUT APART AND REWELDED.

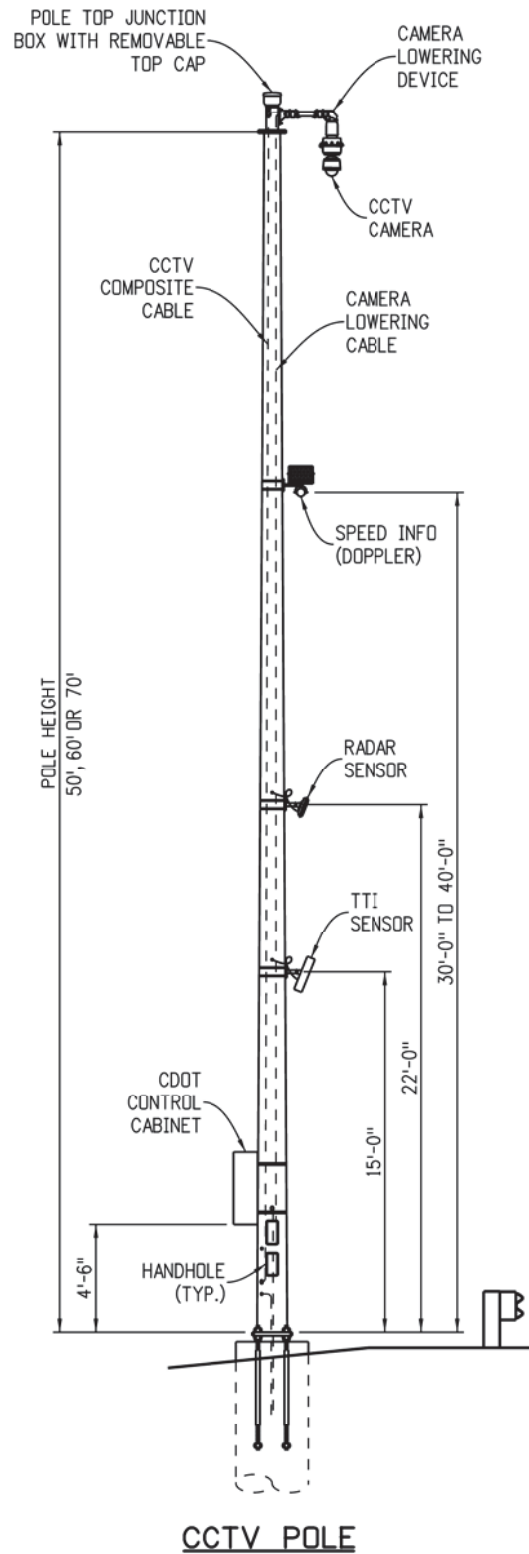
13. ALL CIRCUMFERENTIAL AND ALL LONGITUDINAL PIPE SEAM WELDS WITHIN 5" OF FULL PENETRATION CIRCUMFERENTIAL GROOVE WELDS SHALL BE FULL PENETRATION GROOVE WELDS AND SHALL BE INSPECTED AS SPECIFIED HEREIN. THE ACCEPTABLE MAXIMUM WELD UNDERCUT IS 0.01".

**MATERIALS**

COMPONENT	ASTM DESIGNATION	MIN. YIELD (KSI)
POSTS SHAFT	A595 GR. A OR A572	55
BASE PLATES	A36	36
POLE TOP PLATE	A36	36
TENON - D.O.M. TUBING	---	50
ANCHOR BOLTS	F1554 GR. 55	55
H.S. BOLTS	A325	---
H.S. NUTS	A563	---
WASHERS	F436	---
GALVANIZING	A123 & A153	---

**INDEX**

1. CCTV POLE WITH LOWERING DEVICE - GENERAL NOTES
2. CCTV POLE WITH LOWERING DEVICE - POLE DETAILS (1)
3. CCTV POLE WITH LOWERING DEVICE - POLE DETAILS (2)
4. CCTV POLE WITH LOWERING DEVICE - FOUNDATION DETAILS



**DESIGN DATA**

- SPECIFICATIONS:**
- DESIGN: "STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS", AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (2009 AASHTO).
- WIND DESIGN: 110 MPH VELOCITY (3-SECOND GUST)  
1" MAXIMUM POLE TOP DEFLECTION @ 30 MPH VELOCITY (NO GUST FACTOR)
- FATIGUE DESIGN: VORTEX SHEDDING - MODE 1 VIBRATION FOR POLE ONLY  
NATURAL WIND GUST - ON POLE AND ATTACHMENTS  
GALLOPING AND TRUCK INDUCED GUSTS - NOT APPLICABLE
- LOADINGS:
1. TOP OF POLE: 2.50 SF EPA, 95 LB
  2. 40' FROM BASE: 2.00 SF EPA, 30 LB
  3. 22' FROM BASE: 1.50 SF EPA, 5 LB
  4. 15' FROM BASE: 3.50 SF EPA, 10 LB
  5. 6' FROM BASE: 10.00 SF EPA, 100 LB
- CONSTRUCTION: CDOT STANDARD SPECIFICATIONS, THESE SHEETS AND PROJECT PLANS.

**CCTV POLE X-SECTION SHEET(S) SHALL SHOW:**

1. POLE LOCATION (HIGHWAY, STATION AND DIRECTION)
2. OFFSET FROM SHOULDER
3. POLE HEIGHT
4. CAISSON DIAMETER AND MINIMUM EMBEDMENT
5. TOP OF CAISSON ELEVATION
6. CAISSON PAY LENGTH
7. STATIONS AND OFFSETS TO CAISSON
8. GUARDRAIL PROTECTION LIMITS
9. LOCATION OF DISCONNECT FOR THE POWER SUPPLY
10. LOCATION OF REMOTE ACCESS CABINET ON POLE
11. AS CONSTRUCTED BLOCK

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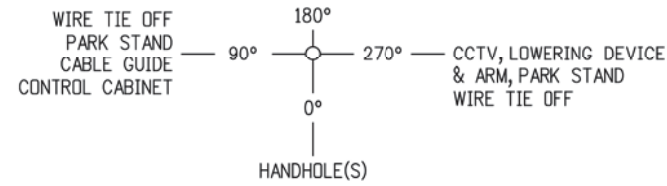
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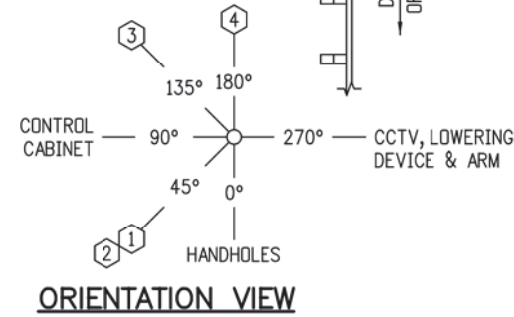
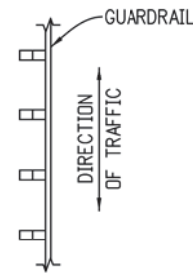
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Revised:	Designer: MDF	Structure: JRM	19035
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- POLE DETAILS (1) -

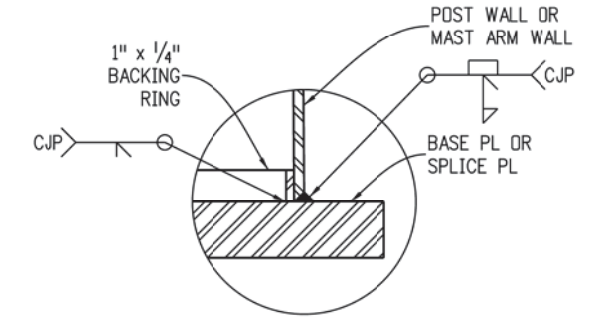


**ORIENTATION VIEW**

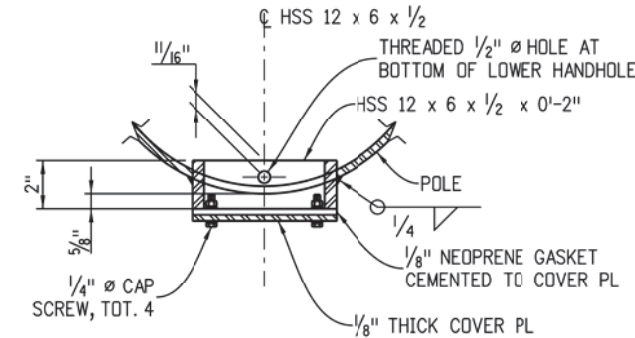
ALL ANGLES MEASURED CLOCKWISE FROM HANDHOLE AS VIEWED FROM SMALL END OF POLE.



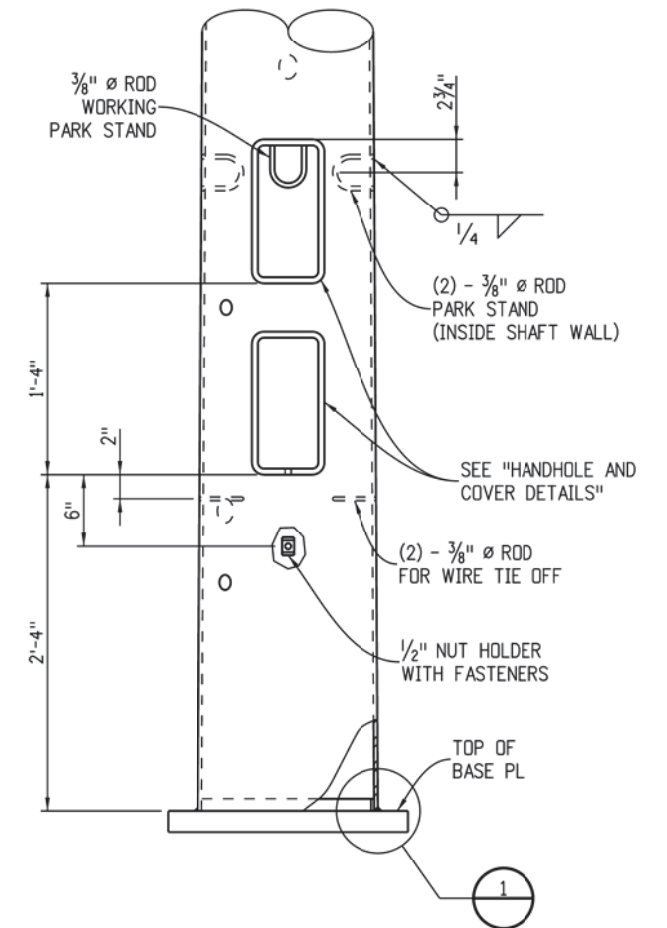
POLE DATA			
POLE HEIGHT (FT)	BASE DIAMETER (IN)	TOP DIAMETER (IN)	WALL THICKNESS (IN)
50'	15.00	8.00	0.3125
60'	19.00	10.60	0.3125
70'	24.00	14.20	0.3750



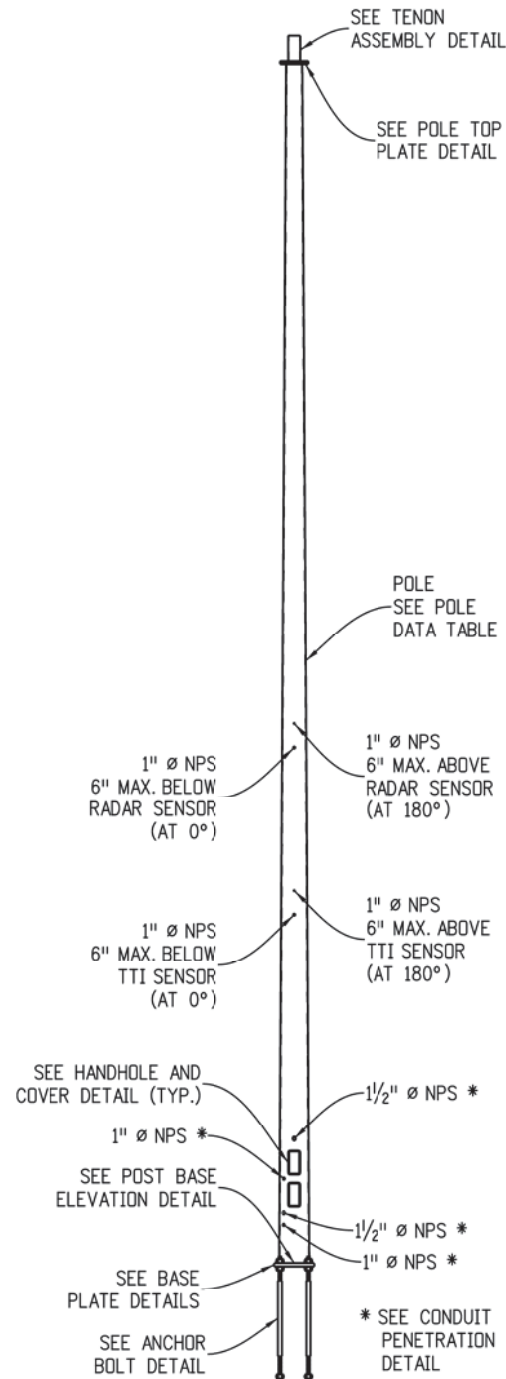
**DETAIL 1**



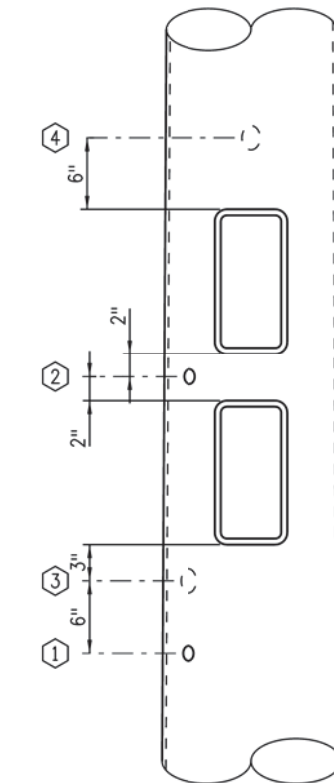
**HANDHOLE AND COVER DETAILS**



**POST BASE ELEVATION**



**POST ELEVATION**



**CONDUIT PENETRATION DETAIL**

① AND ② 1" Ø NPS  
③ AND ④ 1 1/2" Ø NPS  
PLUG ALL THREADED PENETRATIONS WITH RECESSED PLUGS

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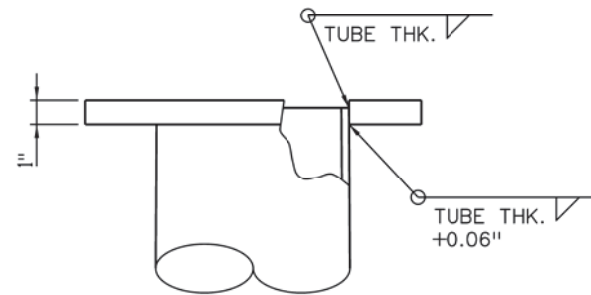
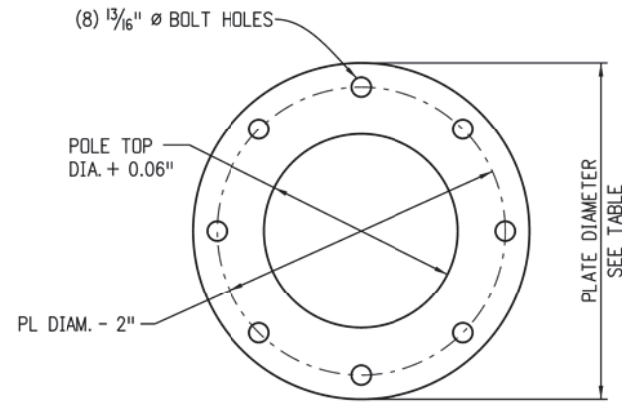
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Detailer:	JRM		
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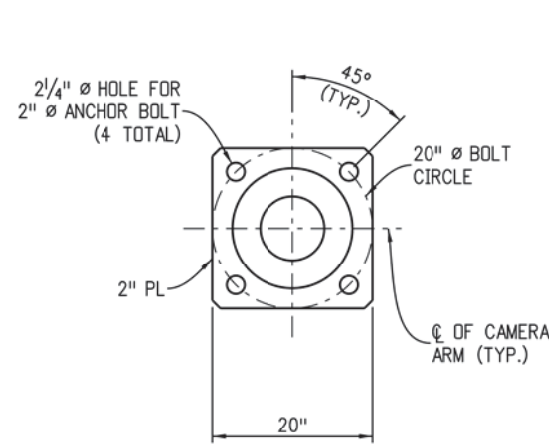
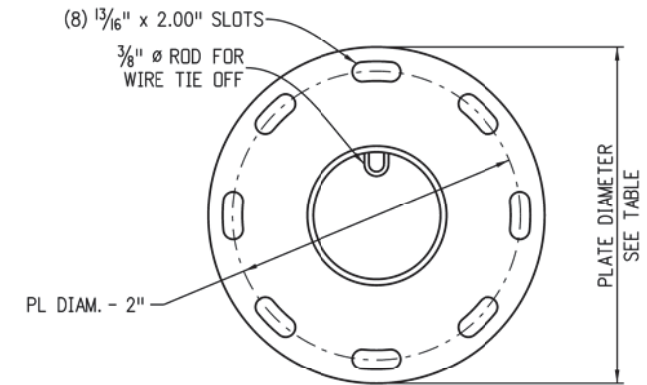
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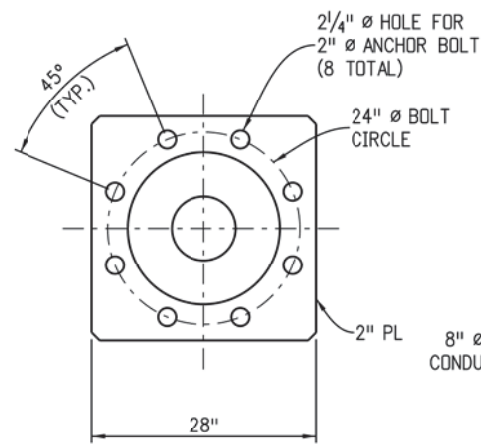
TENON/TOP PLATE	
POLE HEIGHT (FT)	PLATE DIAMETER (IN)
50'	14.00
60'	18.00
70'	22.00



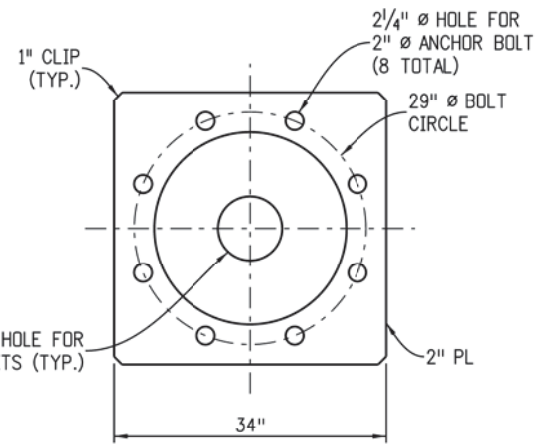
POLE TOP PLATE



50' POLE

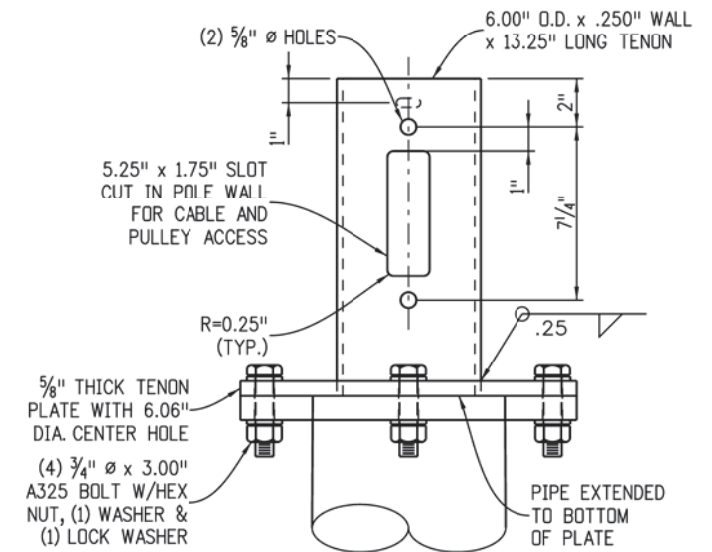


60' POLE



70' POLE

BASE PLATE DETAILS



TENON ASSEMBLY

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CCTV POLE WITH LOWERING DEVICE

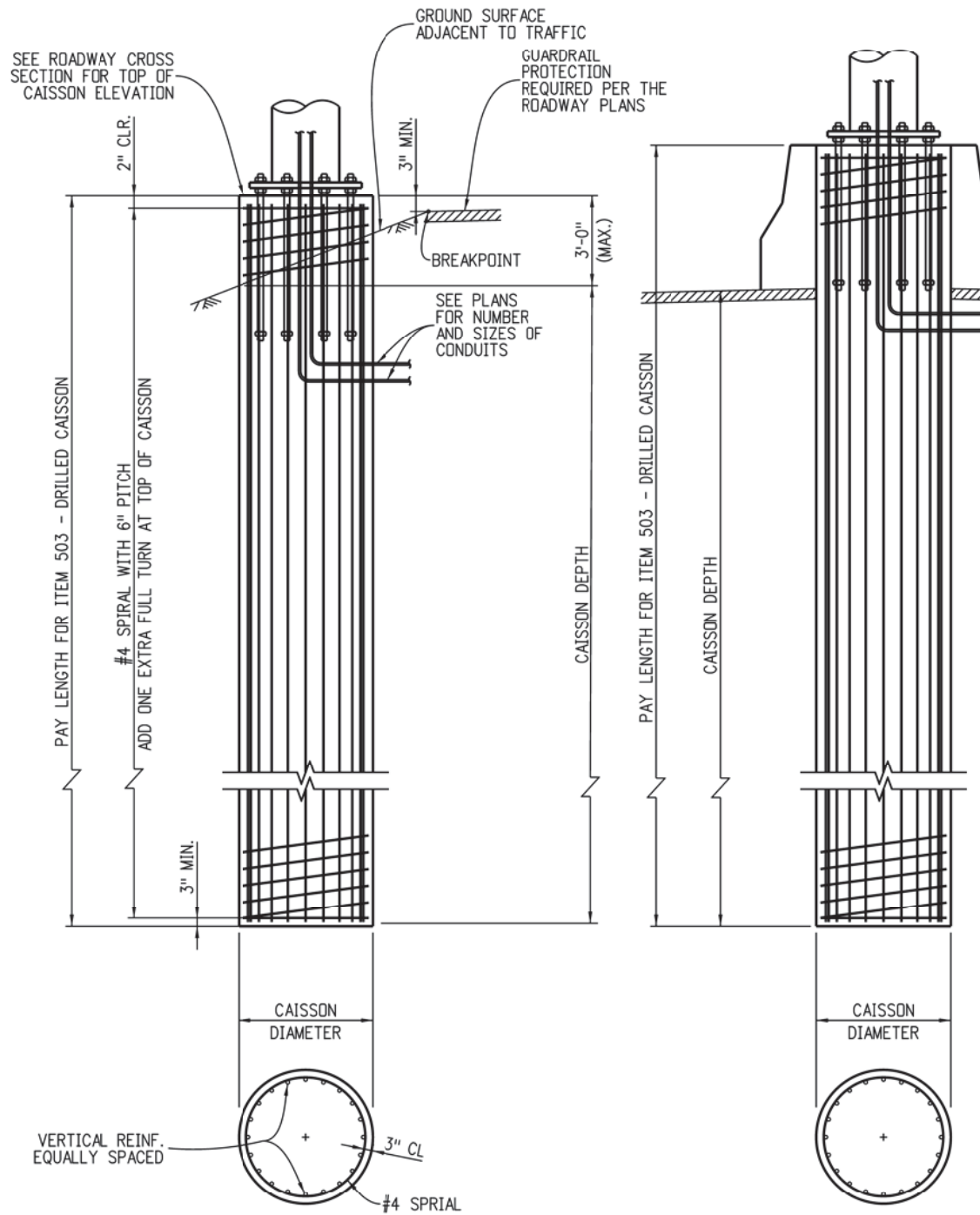
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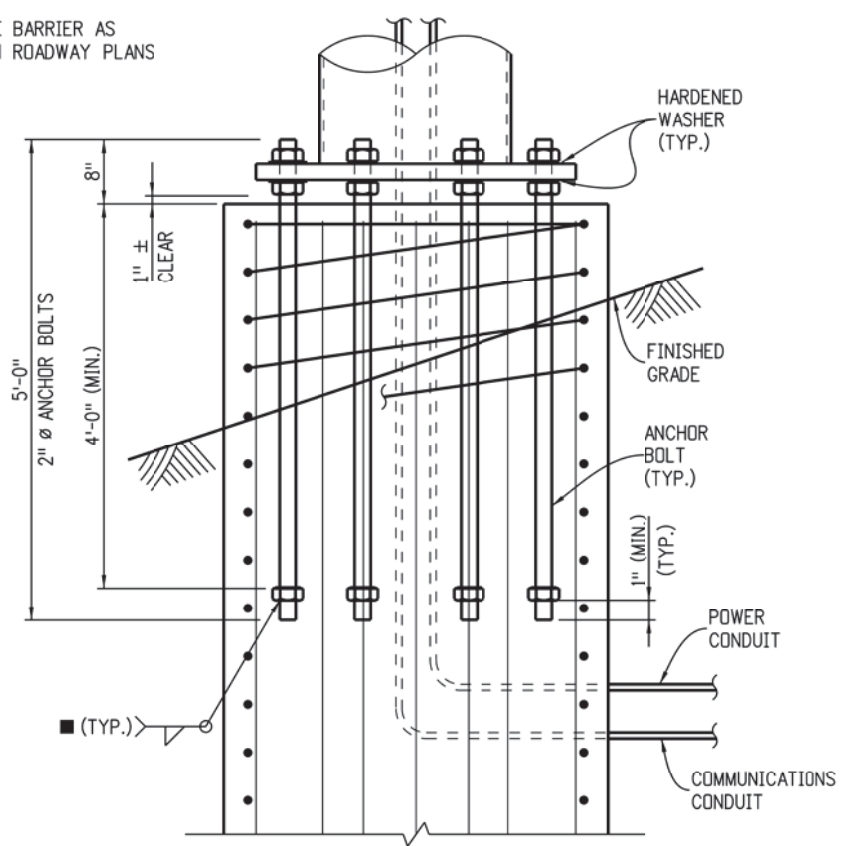
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POLE HEIGHT	PIPE O.D. AT BASE (IN)	CAISSON DIAMETER (IN)	CAISSON DEPTH (FT)	VERTICAL REINF.
50'	15	36	15	12 - #9
60'	19	42	18	14 - #9
70'	24	48	21	18 - #9



**ANCHOR BOLT DETAIL**

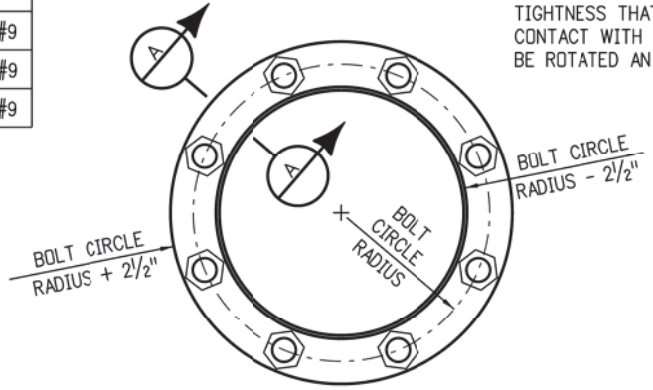
■ WELDING PROCEDURE IS NOT REQUIRED FOR THIS WELD

**CAISSON DRILLING AND INSTALLATION NOTES**

- CAISSONS SHALL BE PLACED AGAINST UNDISTURBED EARTH. WET OR CAVING HOLES SHALL BE BACKFILLED WITH FLOW-FILL AND REDRILLED AFTER A THREE DAY CURING PERIOD WITHOUT THE USE OF A CASING; OR OTHER METHOD APPROVED BY THE ENGINEER.
- THE DESIGN HEREIN ASSUMES THAT POLE SUPPORTS ARE INSTALLED WITHIN THE ROADWAY PRISM WITH THE FOLLOWING SOIL PARAMETERS:  
 SOIL DENSITY = 110 LB./CU. FT.  
 SOIL COHESION = 750 LB./SQ. FT. FOR MEDIUM STIFF COHESIVE SOIL  
 SOIL φ ANGLE = 30° FOR MEDIUM DENSE COHESIONLESS SOIL  
 SF = 3.0 FOR FLEXURAL RESISTANCE.
- CONTACT THE ENGINEER IF ANY OF THE FOLLOWING SOIL CONDITIONS ARE ENCOUNTERED DURING DRILLING:  
 (A) POLE SUPPORT WILL NOT BE INSTALLED WITHIN THE ROADWAY PRISM.  
 (B) THE SOIL HAS A HIGH ORGANIC CONTENT OR CONSISTS OF SATURATED SILT AND CLAY.  
 (C) THE SITE WON'T SUPPORT THE WEIGHT OF THE DRILLING RIG.  
 (D) THE FOUNDATION SOILS ARE NOT HOMOGENOUS.  
 (E) FIRM BEDROCK IS ENCOUNTERED.  
 (F) HIGH GROUNDWATER IS ENCOUNTERED.  
 (G) LARGE BOULDERS ARE ENCOUNTERED.
- THE CONTRACTOR SHALL PROVIDE A SURVEY OF THE POLE FOUNDATION TO VERIFY PLACEMENT SOON AFTER WORK ON THE FOUNDATION HAS BEEN COMPLETED. THE SURVEY SHALL CONFORM TO THE REQUIREMENTS OF SECTION 625, CONSTRUCTION SURVEYING. THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER A COPY OF THE SURVEY NOTES DETAILING THE FOUNDATION LOCATION AND ELEVATION AND THE ANCHOR BOLT LOCATIONS, PROJECTIONS, AND ORIENTATIONS. THE ELEVATION OF THE GROUND SURROUNDING THE FOUNDATION SHALL ALSO BE PROVIDED. THE CONTRACTOR SHALL COMPARE THE SURVEY INFORMATION TO THE REVIEWED SHOP DRAWINGS AND RECONCILE ANY DIFFERENCES BETWEEN THEM. THE CONTRACTOR SHALL SUBMIT ALL PROPOSED ADJUSTMENTS OR MODIFICATIONS TO THE ENGINEER FOR APPROVAL.

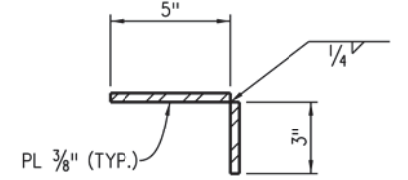
**NOTES**

- THREAD UPPER 8" AND GALVANIZE UPPER 1'-0" OF THE ANCHOR BOLTS.
- ANCHOR BOLTS SHALL BE SET WITH A STEEL TEMPLATE UNTIL THE CONCRETE HAS CURED AT LEAST TWO DAYS.
- THERE SHALL BE NO GROUT PAD INSTALLED ON TOP OF THE EXISTING FOUNDATIONS.
- THE ANCHOR BOLTS SHALL BE TIGHTENED USING THE TURN-OF-NUT METHOD. THE BOLTS SHALL FIRST BE TIGHTENED TO SNUG TIGHT, WHICH IS DEFINED AS THE TIGHTNESS THAT EXISTS WHEN THE UPPER AND LOWER NUTS/WASHERS ARE IN FIRM CONTACT WITH THE BASE PLATE. THE UPPER AND LOWER NUTS SHALL EACH THEN BE ROTATED AN ADDITIONAL 1/2 TURN (30° ± 5°) USING A SLUGGING WRENCH.



**BOLT TEMPLATE**

(8 BOLT SHOWN, 4 BOLT SIMILAR)



**SECTION A**

**ROADSIDE SHOULDER INSTALLATION**

**MEDIAN RAIL INSTALLATION**

(SEE ROADSIDE SHOULDER INSTALLATION FOR ADDITIONAL INFORMATION)

**CAISSON FOUNDATION DETAILS**

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File Name: CCTV_04of4.dgn		Date:	Comments:	Init.		No Revisions:	Revised:		Designer: MDF			IM 0703-390	
Horiz. Scale: NTS		Vert. Scale: As Noted					Void:	Detailer: JRM		Structure Numbers:			19035
Unit Information	JKS					Sheet Subset: ITS		Subset Sheets: 22 of 22			Sheet Number 149		

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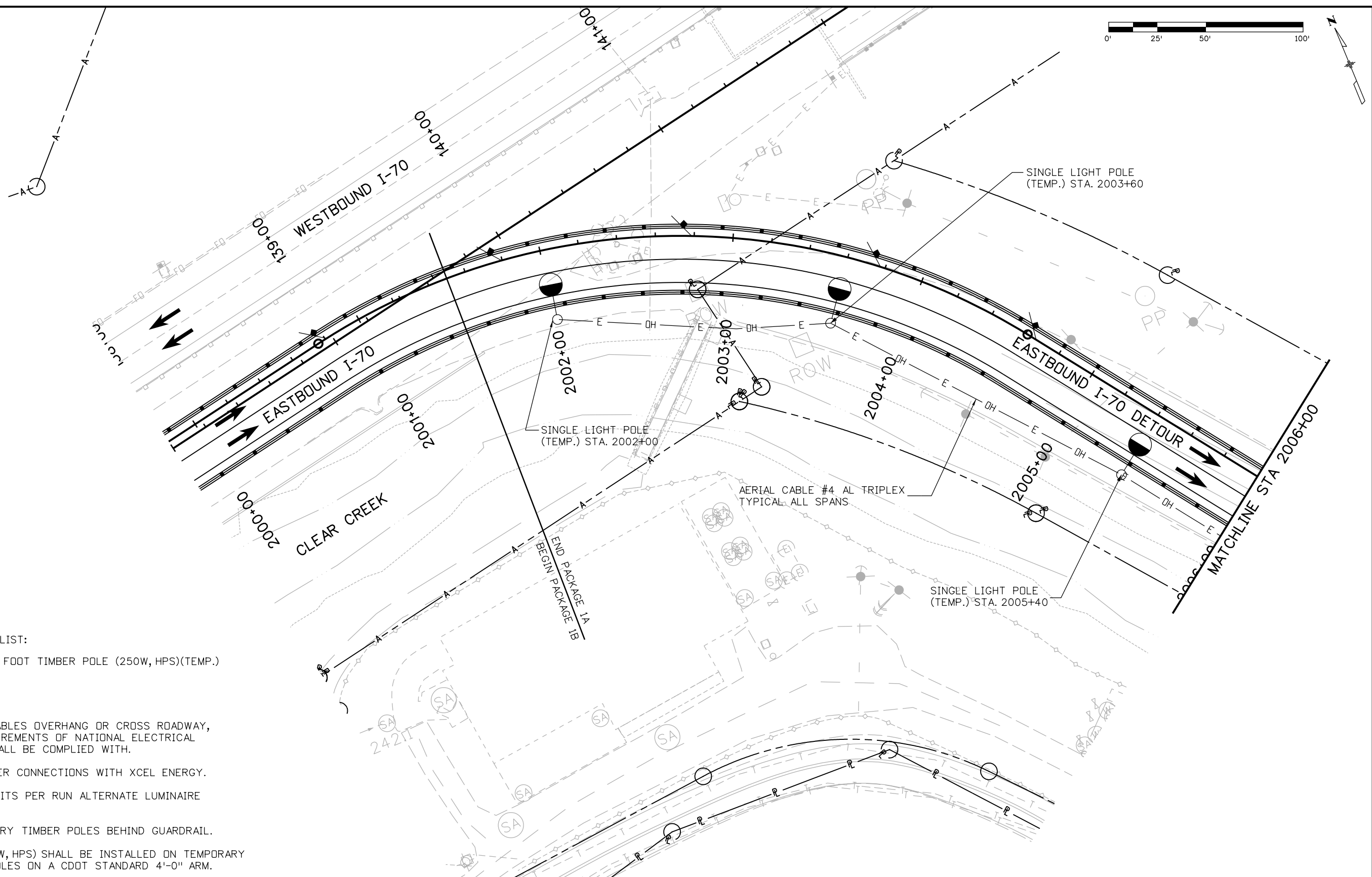
### TABULATION OF LIGHTING QUANTITIES

PAY ITEM	DESCRIPTION	UNIT	QUANTITY	REMARKS
202-00700	REMOVAL OF LIGHT STANDARD	EACH	3	SEE NOTE 2
613-00200	2 INCH ELECTRICAL CONDUIT	LF	700	
613-10000	WIRING	LS	0.5	
	NO. 4 ALUMNIUM TRIPLEX CABLE	LF	5000	
	1/C NO. 6 CU	LF	2500	
613-33400	LIGHT STANDARD TIMBER (40 FOOT)	EACH	26	
613-50100	LIGHTING CONTROL CENTER	EACH	2	TEMPORARY LIGHTING CONTROL CENTER AND CHAIN UP AREA LIGHTING CONTROL CENTER
613-70250	LUMINAIRE HIGH PRESSURE SODIUM (250 WATT)	EACH	26	
700-70072	F/A OBTAIN POWER FROM EXCEL ENERGY	F A	1	POWER FOR THE TEMPORARY LIGHTING CONTROL CENTER AND CHAIN UP AREA LIGHTING CONTROL CENTER

**NOTE:**

1. NO. 4 ALUMINUM TRIPLEX CABLE IS NOT PAID FOR SEPARATELY, BUT IS SUBSIDIARY TO WIRING (ITEM: 613-10000).
2. CONTRACTOR SHALL REMOVE THE LIGHT POLE FOUNDATIONS AND ANY MISCELLANEOUS ELEMENTS, RELATING TO THE LIGHT POLE OR LIGHT POLE FOUNDATION, IN THEIR ENTIRETY, THIS WORK IS INCIDENTAL AND SHALL BE INCLUDED IN REMOVAL OF LIGHT STANDARD (ITEM: 202-00700).

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Date:	Comments	Init.																				



SYMBOL LIST:

○● NEW 40 FOOT TIMBER POLE (250W, HPS)(TEMP.)

NOTES:

1. WHERE AERIAL CABLES OVERHANG OR CROSS ROADWAY, CLEARANCE REQUIREMENTS OF NATIONAL ELECTRICAL SAFETY CODE SHALL BE COMPLIED WITH.
2. COORDINATE POWER CONNECTIONS WITH XCEL ENERGY.
3. PROVIDE 2 CIRCUITS PER RUN ALTERNATE LUMINAIRE CONNECTIONS.
4. INSTALL TEMPORARY TIMBER POLES BEHIND GUARDRAIL.
5. LUMINAIRES (250W, HPS) SHALL BE INSTALLED ON TEMPORARY 40'-0" TIMBER POLES ON A CDOT STANDARD 4'-0" ARM.

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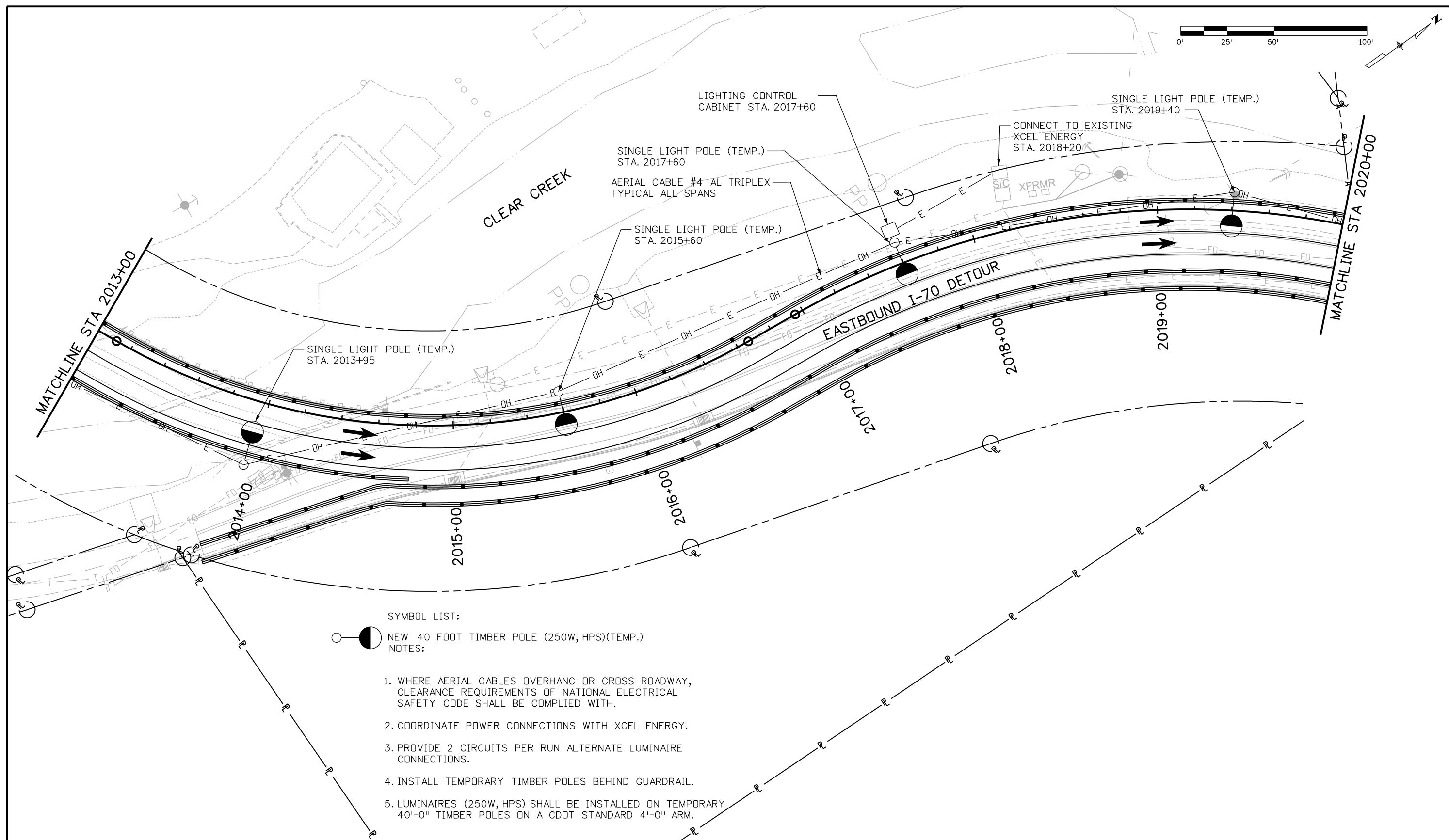
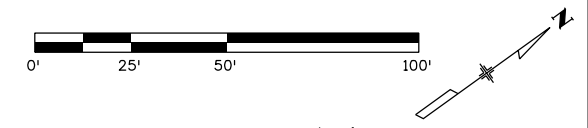
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Subset: LIGHTING CP 1B	Subset Sheets: 2 of 13	

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Sheet Number 151

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- SYMBOL LIST:
- NEW 40 FOOT TIMBER POLE (250W, HPS)(TEMP.)
- NOTES:
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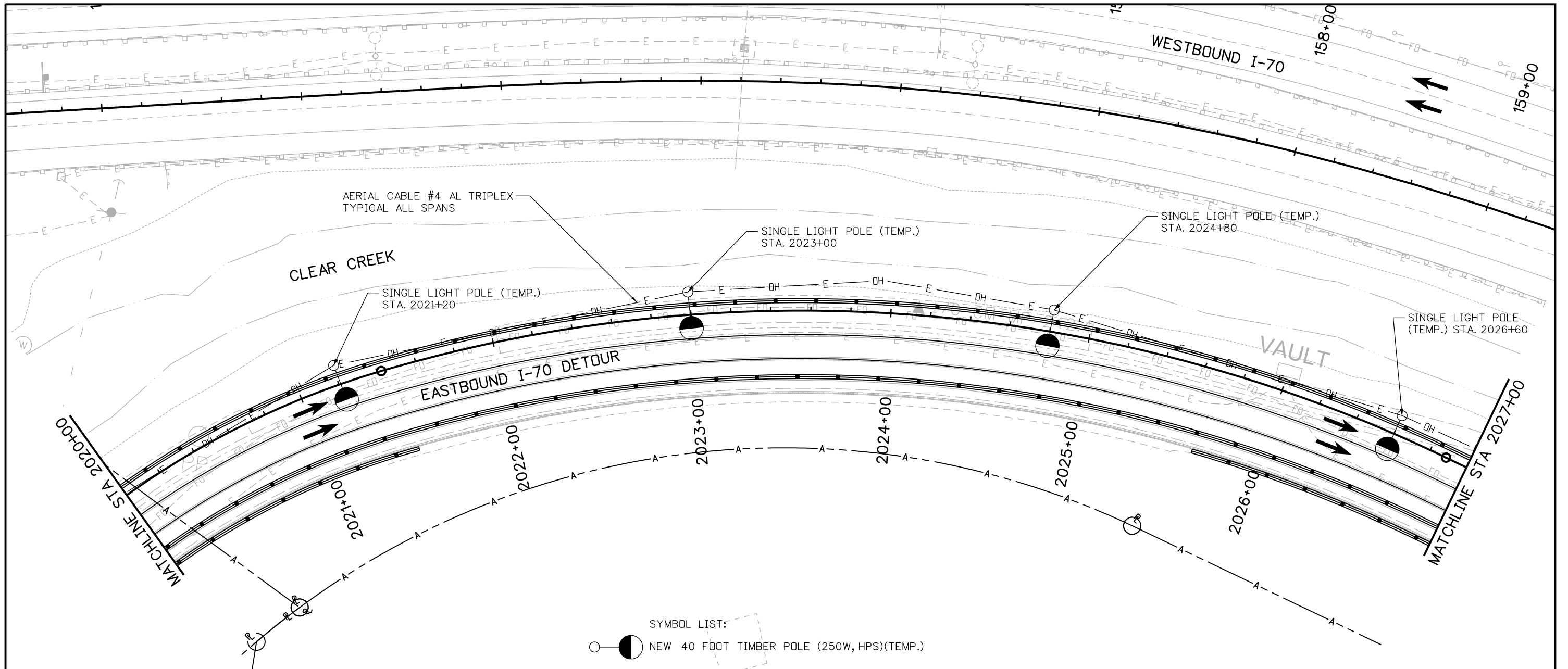
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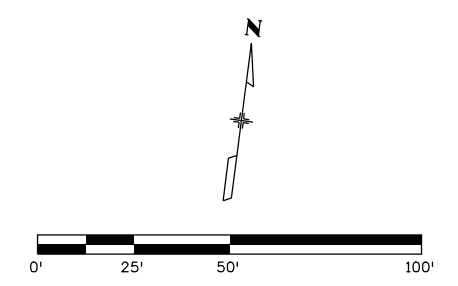
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Sheet Number 153

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SYMBOL LIST:  
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Region 1      CRC

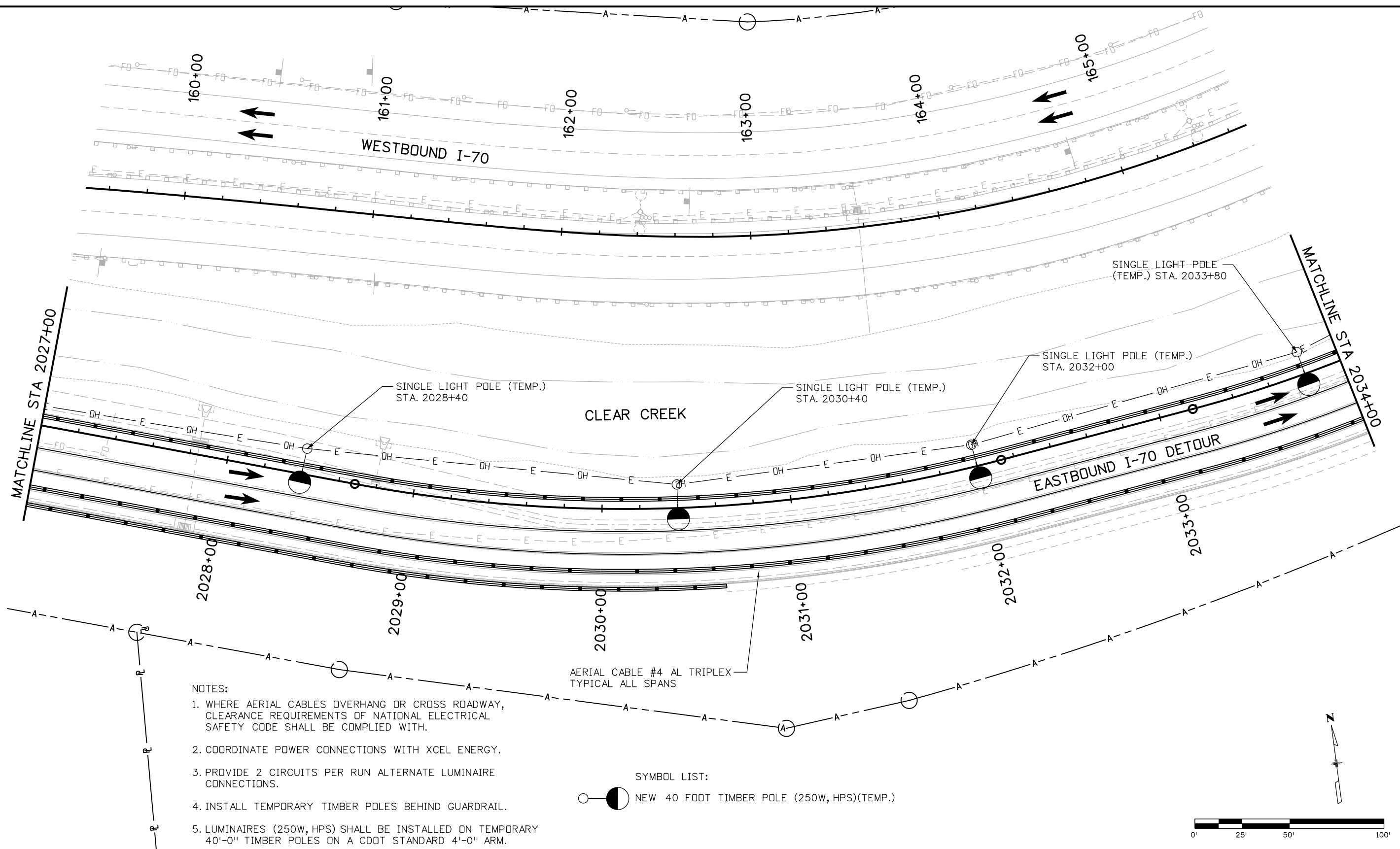
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Designer:	JPK/JPS	Structure Numbers
Detailer:	JMG	
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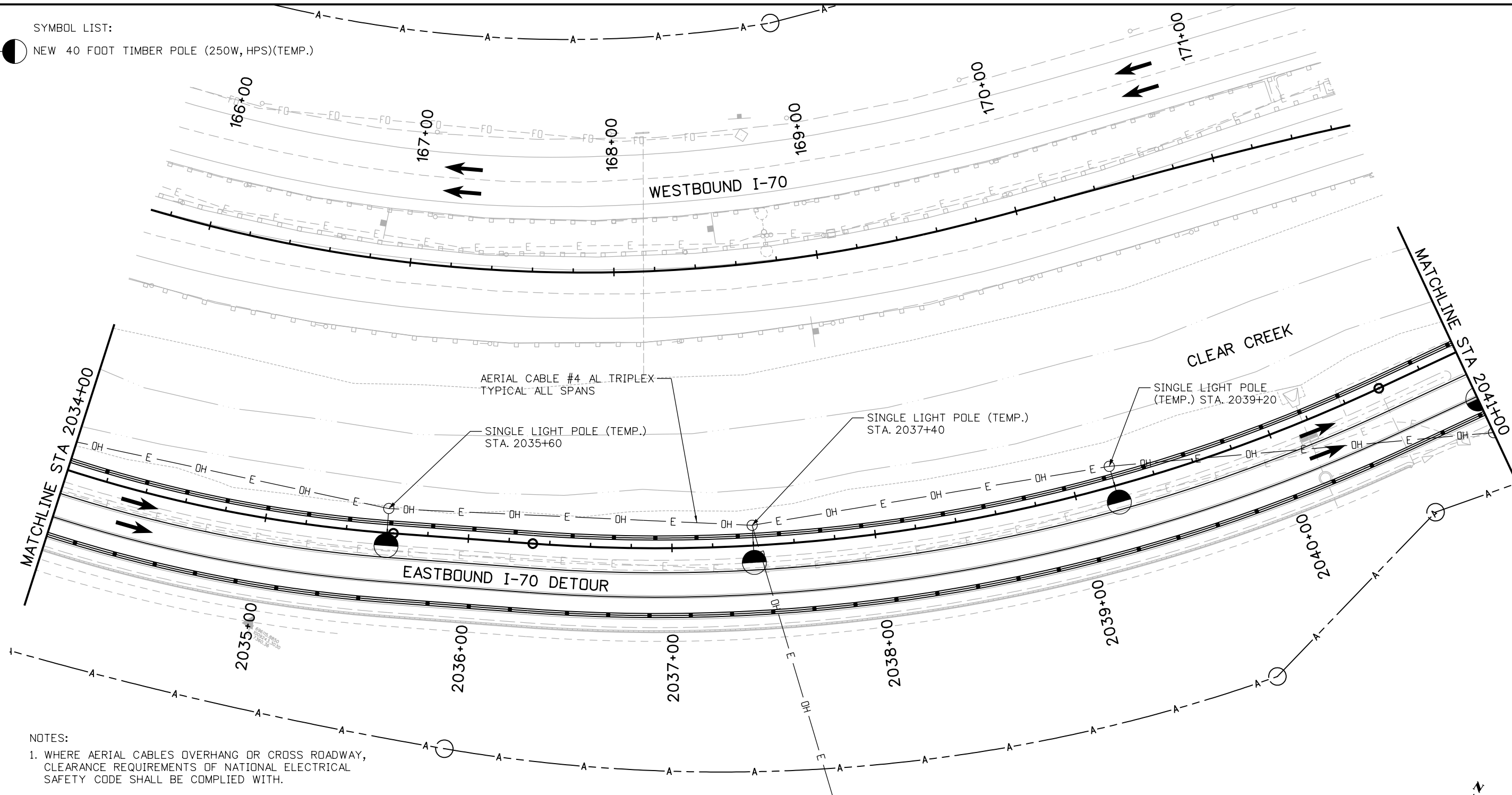
**Region 1**    **CRC**

<b>As Constructed</b>
No Revisions:
Revised:
Void:

<b>I-70 TWIN TUNNELS LIGHTING PLAN</b>		
Designer: JPK/JPS	Structure Numbers	
Detailer: JMG		
Subset: LIGHTING CP 1B	Subset Sheets: 6 of 13	

<b>Project No./Code</b>
C 0703-390
19035
Sheet Number 155

SYMBOL LIST:  
 NEW 40 FOOT TIMBER POLE (250W, HPS)(TEMP.)




- NOTES:
1. WHERE AERIAL CABLES OVERHANG OR CROSS ROADWAY, CLEARANCE REQUIREMENTS OF NATIONAL ELECTRICAL SAFETY CODE SHALL BE COMPLIED WITH.
  2. COORDINATE POWER CONNECTIONS WITH XCEL ENERGY.
  3. PROVIDE 2 CIRCUITS PER RUN ALTERNATE LUMINAIRE CONNECTIONS.
  4. INSTALL TEMPORARY TIMBER POLES BEHIND GUARDRAIL.
  5. LUMINAIRES (250W, HPS) SHALL BE INSTALLED ON TEMPORARY 40'-0" TIMBER POLES ON A CDOT STANDARD 4'-0" ARM.

CONNECT TO XCEL ENERGY POWER SUPPLY

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Print Date: 11/21/2012  
 File Name: 19305PHAS\_CP1B\_Lighting006.dgn  
 Horiz. Scale: 1:50 Vert. Scale: N/A



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Date:	Comments	Init.

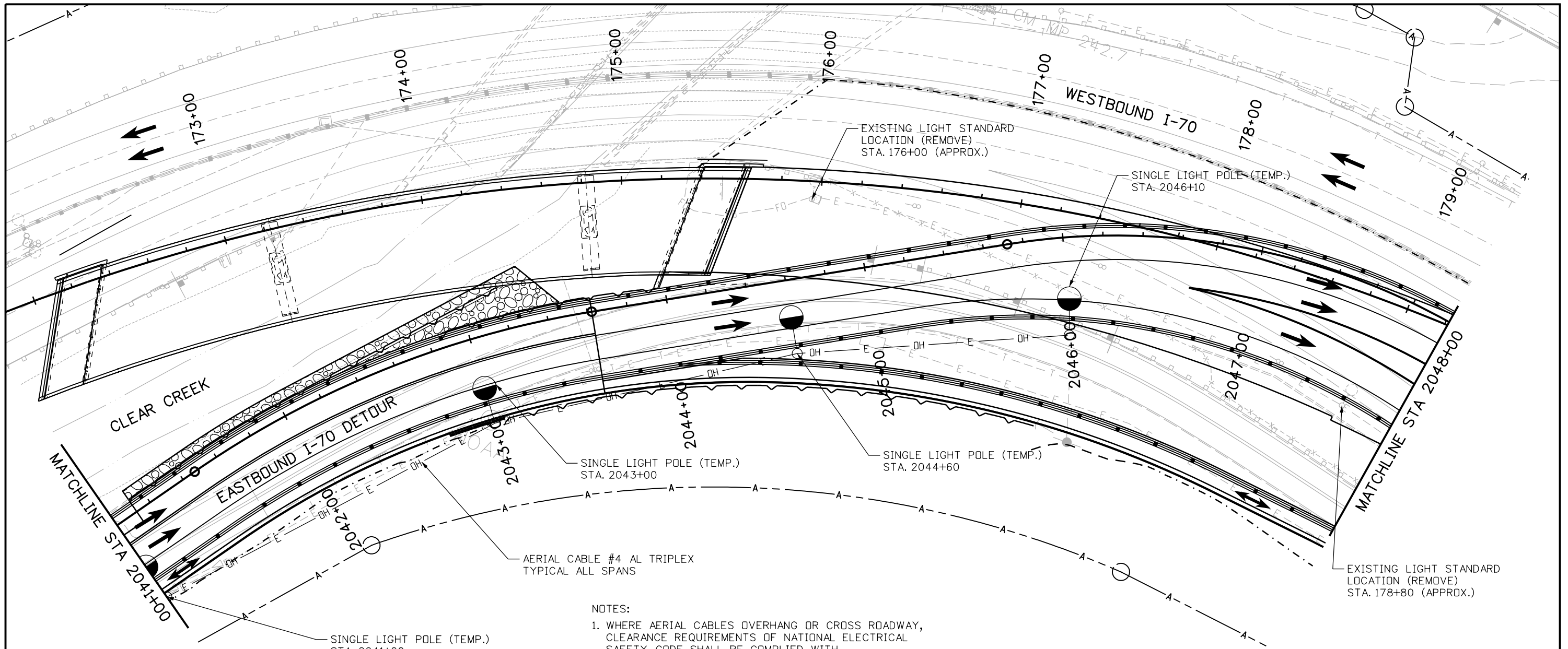
Colorado Department of Transportation  
 425 A Corporate Circle  
 Golden, CO 80401  
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 Region 1 CRC



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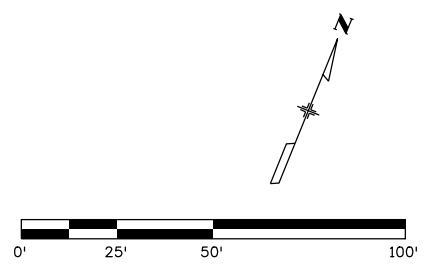
I-70 TWIN TUNNELS LIGHTING PLAN		
Designer: JPK/JPS	Structure Numbers	
Detailer: JMG		
Subset: LIGHTING CP 1B	Subset Sheets: 7 of 13	

Project No./Code
C 0703-390
19035
Sheet Number 156



SYMBOL LIST:  
 NEW 40 FOOT TIMBER POLE (250W, HPS)(TEMP.)

- NOTES:
- WHERE AERIAL CABLES OVERHANG OR CROSS ROADWAY, CLEARANCE REQUIREMENTS OF NATIONAL ELECTRICAL SAFETY CODE SHALL BE COMPLIED WITH.
  - COORDINATE POWER CONNECTIONS WITH XCEL ENERGY.
  - PROVIDE 2 CIRCUITS PER RUN ALTERNATE LUMINAIRE CONNECTIONS.
  - INSTALL TEMPORARY TIMBER POLES BEHIND GUARDRAIL.
  - LUMINAIRES (250W, HPS) SHALL BE INSTALLED ON TEMPORARY 40'-0" TIMBER POLES ON A CDOT STANDARD 4'-0" ARM.
  - CONTRACTOR SHALL REMOVE THE LIGHT POLE FOUNDATIONS AND ANY MISCELLANEOUS ELEMENTS, RELATING TO THE LIGHT POLE OR LIGHT POLE FOUNDATION, IN THEIR ENTIRETY, THIS WORK IS INCIDENTAL AND SHALL BE INCLUDED IN REMOVAL OF LIGHT STANDARD (ITEM: 202-00700).
  - EXISTING LIGHT STANDARD LOCATION (REMOVE) STA. 181+08 (APPROX.) NOT SHOWN ON THE PLANS.



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 File Name: 19305PHAS\_CP1B\_Lighting007.dgn  
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Sheet Revisions		
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**I-70 TWIN TUNNELS LIGHTING PLAN**

Designer: JPK/JPS	Structure Numbers
Detailer: JMG	
Subset: LIGHTING CP 1B	Subset Sheets: 8 of 13

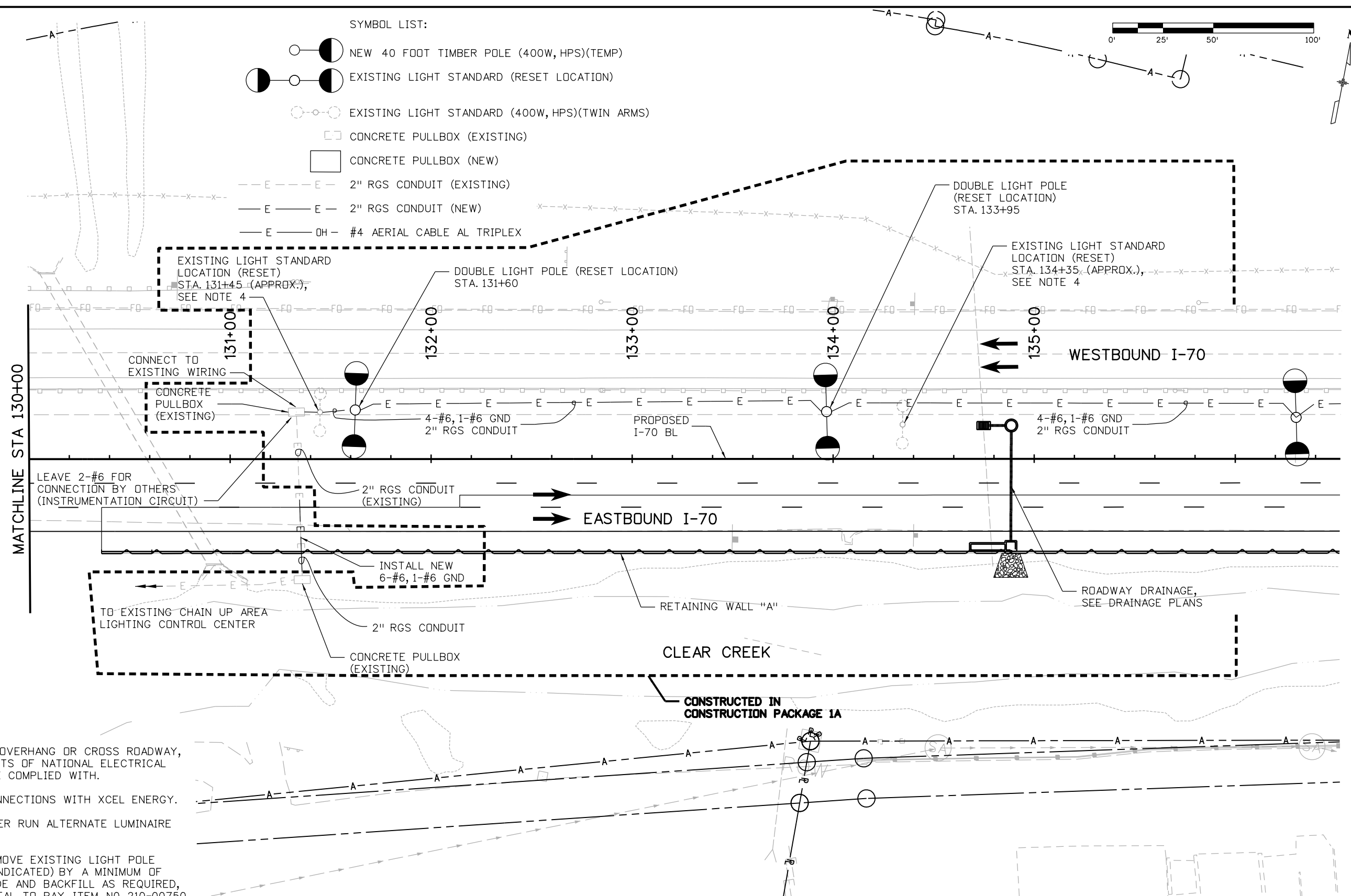
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 C 0703-390  
 19035  
 Sheet Number 157

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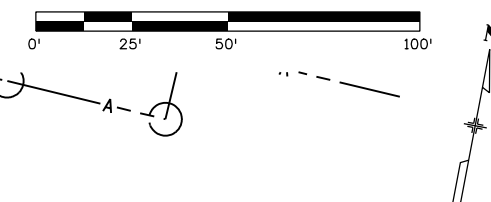




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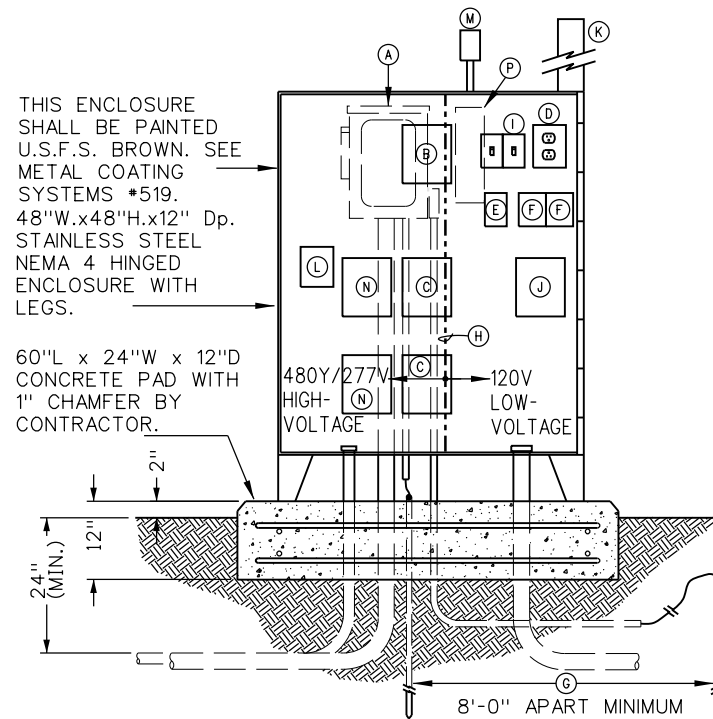


- SYMBOL LIST:**
- NEW 40 FOOT TIMBER POLE (400W, HPS)(TEMP)
  - EXISTING LIGHT STANDARD (RESET LOCATION)
  - EXISTING LIGHT STANDARD (400W, HPS)(TWIN ARMS)
  - CONCRETE PULLBOX (EXISTING)
  - CONCRETE PULLBOX (NEW)
  - 2" RGS CONDUIT (EXISTING)
  - 2" RGS CONDUIT (NEW)
  - #4 AERIAL CABLE AL TRIPLEX



- NOTES:**
1. WHERE AERIAL CABLES OVERHANG OR CROSS ROADWAY, CLEARANCE REQUIREMENTS OF NATIONAL ELECTRICAL SAFETY CODE SHALL BE COMPLIED WITH.
  2. COORDINATE POWER CONNECTIONS WITH XCEL ENERGY.
  3. PROVIDE 2 CIRCUITS PER RUN ALTERNATE LUMINAIRE CONNECTIONS.
  4. CONTRACTOR SHALL REMOVE EXISTING LIGHT POLE FOUNDATIONS (WHERE INDICATED) BY A MINIMUM OF 12 INCHES BELOW GRADE AND BACKFILL AS REQUIRED, THIS WORK IS INCIDENTAL TO PAY ITEM NO. 210-00750.

Print Date: 11/27/2012	<b>Sheet Revisions</b>	<b>Colorado Department of Transportation</b>	<b>As Constructed</b>	<b>I-70 TWIN TUNNELS LIGHTING PLAN</b>	<b>Project No./Code</b>
File Name: 19305PHAS_CP1B_Lighting009.dgn	Date:      Comments      Init.	 425 A Corporate Circle Golden, CO 80401 Phone: 720-497-6918 FAX: 720-497-6901 <b>Region 1</b>	No Revisions:	Designer: JPK/JPS	C 0703-390
Horiz. Scale: 1:50      Vert. Scale: N/A			Revised:	Detailer: JMG	19035
<b>ATKINS</b> <b>PARSONS BRINCKERHOFF</b>		<b>CRC</b>	Void:	Subset: LIGHTING CP 1B	Sheet Number 159
				Structure Numbers	
				Subset Sheets: 10 of 13	



THIS ENCLOSURE SHALL BE PAINTED U.S.F.S. BROWN. SEE METAL COATING SYSTEMS #519. 48"W.x48"H.x12" Dp. STAINLESS STEEL NEMA 4 HINGED ENCLOSURE WITH LEGS.

60"L x 24"W x 12"D CONCRETE PAD WITH 1" CHAMFER BY CONTRACTOR.

NOTE: -ALL COMPONENTS LISTED SHALL BE INCLUDED IN THE LIGHTING  
 -CONTROL CENTER PAY ITEM.  
 -PROVIDE A 5"W x 3"H, BLACK, PHENOLIC LABEL WITH ¼"H.

WHITE LETTER, LABEL, SCREW ATTACHED TO THE FRONT COVER OF THE ENCLOSURE. LABEL TO BE ENGRAVED WITH THE MILE POST AND LCC15.

**COMPONENT LIST**

- Ⓐ FUSED DISCONNECT SWITCH - NEMA 3R, 30A, 3-POLE, 600-VOLT, HEAVY DUTY, UL LISTED FOR SERVICE EQUIPMENT AND FRS-R FUSES AS SHOWN ON ONE-LINE DIAGRAM w/NEUTRAL & GROUND BARS. MOUNTED ON BACK SIDE OF ENCLOSURE.
- Ⓑ 1600 VA, CONTROL TRANSFORMER - 277V-1Ph (PRI), 120V-1Ph (SEC) W/SECONDARY FUSING AS SHOWN ON THE SCHEMATIC DETAIL. MOUNT TRANSFORMER INSIDE THE NEMA 4 ENCLOSURE SO THAT THE 120V SIDE IS IN THE LOW-VOLTAGE SECTION ON THE PANEL AND THE 277V SIDE IS IN THE HIGH-VOLTAGE SECTION.
- Ⓒ 30-AMP, 4-POLE, 600-VOLT CONTACTS, MECHANICALLY HELD LIGHTING CONTACTOR. FURNISH WITH 120-VOLT COIL.
- Ⓓ GFCI MAINT. RECEPTACLE IN A 1-GANG BACK BOX WITH COVER.
- Ⓔ TELEMETRY RELAY - INDICATING 120VAC (CONTACTS) SOLID STATE RELAY WITH 3-32 VDC INPUT, DPDT (2-FORM C) RELAY W/SCREW TERMINAL BASE.
- Ⓕ CONTROL RELAY - 120V COIL, 15-AMP CONTACTS, DPDT (2-FORM C) RELAY W/SCREW TERMINAL BASE. MAX. INRUSH 20.5VA, MAX. SEALED 4.5VA.
- Ⓖ 5/8"x 10'-0" Lg, COPPER-CLAD DRIVEN GROUND ROD WITH GROUND CONDUCTOR CADWELDED TO ROD. (2 REQUIRED)
- Ⓗ PROVIDE METAL PARTITION DIVIDER INSIDE NEMA 4 ENCLOSURE WITH LOW- VOLTAGE (120V) ON ONE SIDE AND HIGH VOLTAGE (480V) ON THE OTHER.
- Ⓘ LOCAL CONTROL SWITCH - (2) 120/277V RATED, SPDT, 20-AMP, TOGGLE SWITCH WITH BACK BOX AND COVER PLATE. TEST CHAIN STATION LTG., TEST MEDIAN LIGHTING.
- Ⓙ FIBER OPTIC TRANSCEIVER - 12VDC, (2) FIBER TRANSCEIVER WITH TO CONVERT FIBER INTO A COPPER WIRED CONNECTION. FURNISHED AND INSTALLED BY CDOT STATE FORCES.
- Ⓚ 6'-0" x 4"W, ORANGE, FIBER GLASS MARKER POLE (2 BOLTS MIN.) BOLTED TO THE BACK OF NEMA 4 ENCLOSURE AND EXTENDED UP 48" ABOVE ENCLOSURE.
- Ⓛ DC POWER SUPPLY - 120VAC/12VDC POWER SUPPLY FOR THE FIBER OPTIC TRANSCEIVER ITEM "E" & "J" ABOVE. WITH SECONDARY FUSING.
- Ⓜ PHOTOCONTROL - 120V
- Ⓝ 20A 3 POLE ENCLOSED CIRCUIT BREAKER
- Ⓟ METER SOCKET

**LIGHTING CONTROL CENTER - LCC15 (480V-3PH)**

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**ATKINS** **PARSONS BRINCKERHOFF**

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Date:	Comments	Init.

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 Phone: 720-497-6918 FAX: 720-497-6901

Region 1 **CRC**

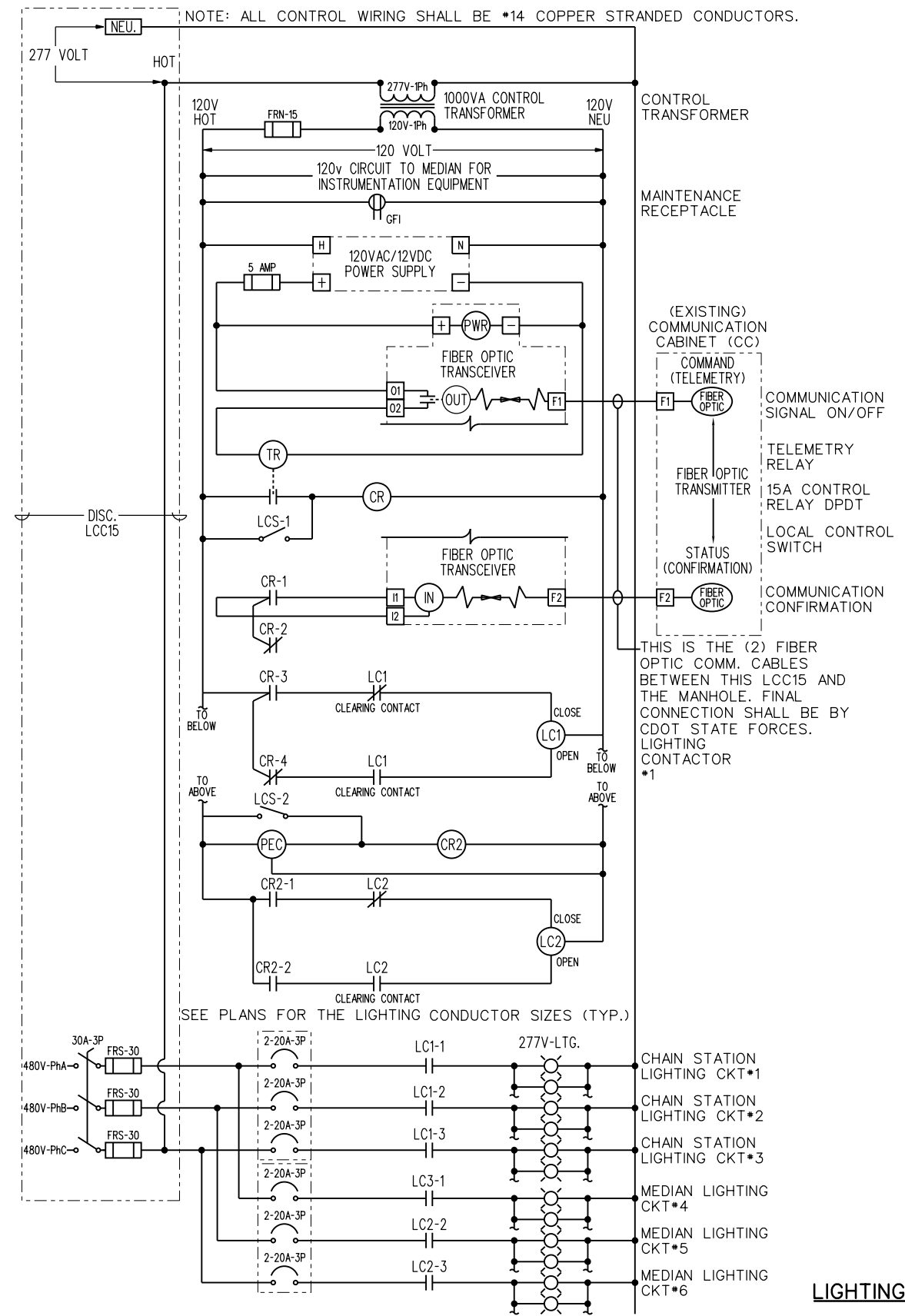
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No Revisions:
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**I-70 TWIN TUNNELS LIGHTING PLAN DETAILS**

Designer: JPK/JPS	Structure Numbers
Detailer: JMG	
Subset: LIGHTING CP 1B	Subset Sheets: 11 of 13

Project No./Code
C 0703-390
19035
Sheet Number 160





LIGHTING CONTROL SCHEMATIC LCC15 (480V-3Ph)

Print Date: 11/21/2012	<b>Sheet Revisions</b>			Colorado Department of Transportation		As Constructed		I-70 TWIN TUNNELS		Project No./Code	
File Name: 19305PHAS_CP1B_Detail004.dgn	Date:	Comments	Init.	425 A Corporate Circle		No Revisions:		LIGHTING PLAN DETAILS		C 0703-390	
Horiz. Scale: N.T.S. Vert. Scale: N/A				Golden, CO 80401		Revised:		Designer: JPK/JPS		19035	
<b>ATKINS</b> <b>PARSONS BRINCKERHOFF</b>				Phone: 720-497-6918 FAX: 720-497-6901		Void:		Detailer: JMG		19035	
				Region 1				Structure Numbers		19035	
				CRC				Subset: LIGHTING CP 1B		Sheet Number 162	
								Subset Sheets: 13 of 13			

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# SCHEDULE OF CONSTRUCTION TRAFFIC CONTROL DEVICES

SIGNS					
SIGN CODE	LEGEND	DESCRIPTION	PANEL SIZE		
			A	B	C
			EA	EA	EA
36G20-5p	WORK/ZONE	36" X 24"	28		
48G20-10	XYZ/CONSTRUCTION/ THANKS YOU/555-555-5555	48" X 48"		2	
48G20-11	CDOT ROAD/WORK/MM YY-MM YY/FOR INFORMATION/CALL/XXX-XXX-XXXX	48" X 60"			4
36M4-8A	END/DETOUR	36" X 24"	3		
36M4-9aL	BIKE SYMB PED SYMB/DETOUR/LEFT ARROW	36" X 24"	2		
36M4-9L	DETOUR/LEFT ARROW	36" X 24"	2		
36M4-9aR	BIKE SYMB PED SYMB/DETOUR/RIGHT ARROW	36" X 24"	2		
36M4-9R	DETOUR/RIGHT ARROW	36" X 24"	1		
48R2-1(35)	SPEED/LIMIT/35	48" X 60"			12
48R2-1(45)	SPEED/LIMIT/45	48" X 60"			4
48R2-1(55)	SPEED/LIMIT/55	48" X 60"			4
48R2-1(60)	SPEED/LIMIT/60	48" X 60"			2
36R2-6p	FINES/DOUBLE	36" X 24"	13		
48R4-1	DO/NOT/PASS	48" X 60"			4
48R4-2	PASS/WITH/CARE	48" X 60"			4
48R4-7	KEEP RIGHT SYMBOL	48" X 60"			1
48R4-8	KEEP LEFT SYMBOL	48" X 60"			1
48R5-1	DO/NOT/ENTER	48" X 48"		2	
42R5-1A	WRONG/WAY	42" X 30"		2	
48R11-2	ROAD/CLOSED	48" X 30"		3	
60R11-3a	ROAD CLOSE X MILE AHEAD/LOCAL TRAFFIC ONLY	60" X 30"			1
48R52-6A	BEGIN/FINES/DOUBLE/IN WORK/ZONE	48" X 60"			4
48R52-6B	END/FINES/DOUBLE/IN WORK/ZONE	48" X 60"			3
W1-3R	CURVE RIGHT	48" X 48"		1	
W1-3L	CURVE LEFT	48" X 48"		1	
48W1-4bR	DOUBLE SHIFT (RIGHT)	48" X 48"		2	
W1-8R	CHEVRONS RIGHT	30" X 36"	10		
W1-8L	CHEVRONS LEFT	30" X 36"	3		
W3-5(45)	SPEED LIMIT AHEAD (45)	48" X 48"		2	
W13-1(25)	25 M.P.H.	30" X 30"	2		
48W4-2L	LANE ENDS (LEFT) SYMBOL	48" X 48"		4	
96W4-50	USE BOTH/LANES DURING/CONSTRUCTION	96" X 60"			4
48W4-51	USE BOTH/LANES TO/MERGE/POINT	48" X 60"		8	
48W4-52	TAKE/TURNS/MERGE/HERE	48" X 60"		4	
48W6-3	TWO-WAY TRAFFIC SYMBOL	48" X 48"		14	
W13-2(30)	EXIT 30 M.P.H.	36" X 48"		1	
W16-9p	AHEAD	30" X 18"	2		
W20-1	ROAD WORK AHEAD	48" X 48"		5	
W20-1	ROAD WORK 1 MILE	48" X 48"		2	
W20-2	DETOUR AHEAD	48" X 48"		1	
48W20-5L	LEFT LANE/CLOSED/ 1/ 2 MILE	48" X 48"		4	
48W21-5a	SHOULDER/WORK	48" X 48"		4	
TOTALS			68	62	48

# SCHEDULE OF CONSTRUCTION TRAFFIC CONTROL DEVICES CONT'D

SIGNS					
SIGN CODE	LEGEND	DESCRIPTION	SIZE (SF)	QUANT. (EA)	TOTAL SF
SPECIAL	DETOUR/UP ARROW	60" X 48"	20	4	80
SPECIAL	TUNNEL CLOSED USE DETOUR	48" X 60"	20	2	40
SPECIAL	CAUTION SHARP CURVES/SPEED LIMIT/35	120" X 96"	80	1	80
SPECIAL	TRAIL/CLOSED	48" X 30"	10	2	20
SPECIAL	DELAYS POSSIBLE/WB 70/AT TWIN TUNNELS/E OF IDAHO SPGS/511	96" X 72"	48	2	96
SPECIAL	CENTRAL/CITY/PKWAY	48" X 48"	16	10	160
SPECIAL	DETOUR/ANGLED ARROW	60" X 48"	20	2	40
SPECIAL	TRUCKS/ENTERING/ROADWAY	48" X 48"	16	1	16
SPECIAL	DO NOT/FOLLOW/TRUCKS	48" X 48"	16	2	32
SPECIAL	I-70 FRONTAGE ROAD CLOSED/LOCAL TRAFFIC ONLY	60" X 30"	12.5	6	75
TOTALS					639


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**Region 1**      **CRC**

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**EASTBOUND I-70  
CONSTRUCTION PHASING PLAN**

Designer:	E. Flagg	Structure Numbers	
Detailer:	B. Riley		
Subset:	Phasing	Subset Sheets: 1 of 34	

<b>Project No./Code</b>
IM 0703-390
19035
Sheet Number <b>164</b>

## TABULATION OF TRAFFIC ENGINEERING ITEMS

ITEM NUMBER	ITEM DESCRIPTION	UNIT	PROJECT TOTAL
202-00250	REMOVAL OF PAVEMENT MARKING	SF	7,346
202-00810	REMOVAL OF GROUND SIGN	EACH	3
210-00810	RESET GROUND SIGN	EACH	3
607-60116	16 FOOT GATE	EACH	1
627-00001	PAVEMENT MARKING PAINT	GAL	101
630-00000	FLAGGING	HOUR	2000
630-00003	UNIFORM TRAFFIC CONTROL	HOUR	250
630-00007	TRAFFIC CONTROL INSPECTION	DAY	25
630-00011	COURTESY VEHICLE	DAY	20
630-00012	TRAFFIC CONTROL MANAGEMENT	DAY	137
630-80001	FLASHING BEACON (PORTABLE)	EACH	14
630-80336	BARRICADE (TYPE 3 M-B) (TEMPORARY)	EACH	7
630-80341	CONSTRUCTION TRAFFIC SIGN (PANEL SIZE A)	EACH	68
630-80342	CONSTRUCTION TRAFFIC SIGN (PANEL SIZE B)	EACH	62
630-80343	CONSTRUCTION TRAFFIC SIGN (PANEL SIZE C)	EACH	48
630-80344	CONSTRUCTION TRAFFIC SIGN (SPECIAL)	SF	639
630-80355	PORTABLE MESSAGE SIGN PANEL	EACH	7
630-80358	ADVANCE WARNING FLASHING OR SEQUENCING ARROW PANEL (C TYPE)	EACH	2
630-80360	DRUM CHANNELIZING DEVICE	EACH	160
630-80363	DRUM CHANNELIZING DEVICE (WITH LIGHT) (FLASHING)	EACH	25
630-80367	PORTABLE TRAFFIC SPEED MONITOR	EACH	2
630-80369	PORTABLE VARIABLE SPEED LIMIT SIGN	EACH	3
630-80370	CONCRETE BARRIER (TEMPORARY)	LF	16,021 *
630-80380	TRAFFIC CONE	EACH	200
630-80384	TUBULAR MARKER	EACH	170
630-85010	IMPACT ATTENUATOR (TEMPORARY)	EACH	9 **
630-85041	MOBILE ATTENUATOR	DAY	100

\* CONCRETE BARRIER (TEMPORARY) QUANTITY INCLUDES 1382 LF REQUIRED FROM CONSTRUCTION PACKAGE 0 EMERGENCY CROSSOVERS.

\*\* IMPACT ATTENUATOR (TEMPORARY) INCLUDES (5) EACH REQUIRED FROM CONSTRUCTION PACKAGE 0 AT VARIOUS LOCATIONS.

## TRAFFIC CONTROL GENERAL NOTES:

1. I-70 SHALL MAINTAIN A CONSTRUCTION WORK ZONE SPEED LIMIT OF 45 MPH UNTIL PHASE 3, AT WHICH TIME THE DETOUR WILL BE SIGNED FOR 35 MPH.
2. ALL TAPERS, DETOURS, ETC. ON I-70 SHALL BE SET USING 45 MPH.
3. MHT'S FOR ALL CONSTRUCTION PHASES SHALL BE SUBMITTED BY THE CONTRACTOR FOR APPROVAL PRIOR TO START OF EACH PHASE.
4. I-70 SHALL BE OPEN TO TRAFFIC DURING ALL HOURS EXCEPT AS PERMITTED BY THE TWIN TUNNELS WIDENING ROAD AND LANE CLOSURE STRATEGY (CURRENT VERSION).
5. REMOVAL OF TEMPORARY PAVEMENT MARKING PAINT FOR CONSTRUCTION PHASING WILL BE PAID FOR UNDER ITEM 202-00250 REMOVAL OF PAVEMENT MARKING.

## CONSTRUCTION PHASING GENERAL NOTES:

1. DURING CONSTRUCTION OPERATIONS ALL TRAVEL LANES SHALL BE A MINIMUM 11-FOOT WIDE AT ALL TIMES. MINIMUM SHOULDER WIDTH SHALL BE 2-FOOT. A 4-FOOT WIDE SHOULDER IS PREFERRED IF CONSTRUCTION LIMITS PERMIT.
2. SEE THE PROJECT SPECIAL PROVISIONS FOR ADDITIONAL REQUIREMENTS.
3. IF THE VERTICAL DROP OFF IS GREATER THAN 4 INCHES, SAFETY SLOPES OF 10:1 MINIMUM SHALL BE MAINTAINED ADJACENT TO ALL TRAVEL LANES.
4. FRONTAGE ROAD CR314 WILL BE CLOSED THROUGHOUT ALL PHASES. SEE SHEET 2 OF SUBSET FOR DETOUR PLAN. ACCESS TO BUSINESSES ON CR314 WILL BE MAINTAINED.

### PHASE 1

DESCRIPTION:  
COMPLETE WORK WITHIN PHASE 1 CONSTRUCTION AREA.

TRAFFIC:  
TWO LANES OF TRAFFIC WILL BE MAINTAINED AT ALL TIMES. TRAFFIC WILL BE SHIFTED TO THE NORTH SIDE OF THE EXISTING PAVEMENT.

### PHASE 2


DESCRIPTION:  
COMPLETE WORK WITHIN PHASE 2 CONSTRUCTION AREA.

TRAFFIC:  
TWO LANES OF TRAFFIC WILL BE MAINTAINED AT ALL TIMES. TRAFFIC WILL BE SHIFTED TO THE NORTH SIDE OF THE EXISTING PAVEMENT. THE EB OFF-RAMP AT HIDDEN VALLEY/CENTRAL CITY WILL BE CLOSED AND TRAFFIC WILL BE DETOURED AS SHOWN ON SHEET 8 OF THIS SUBSET.

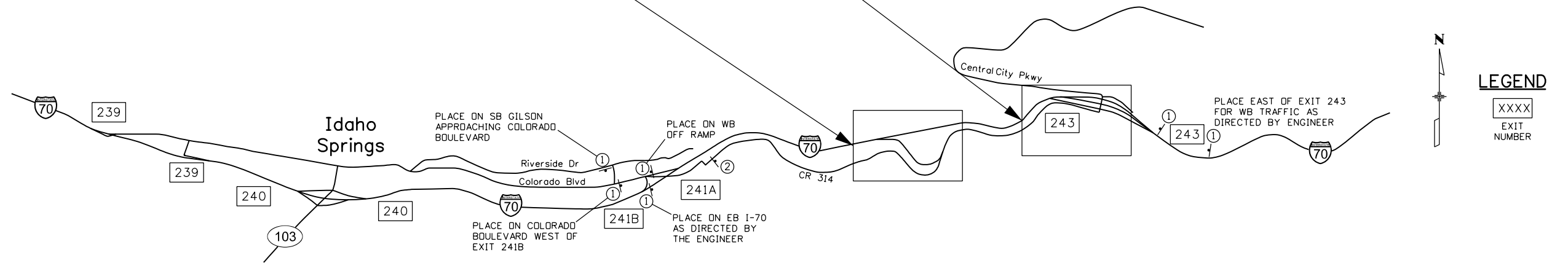
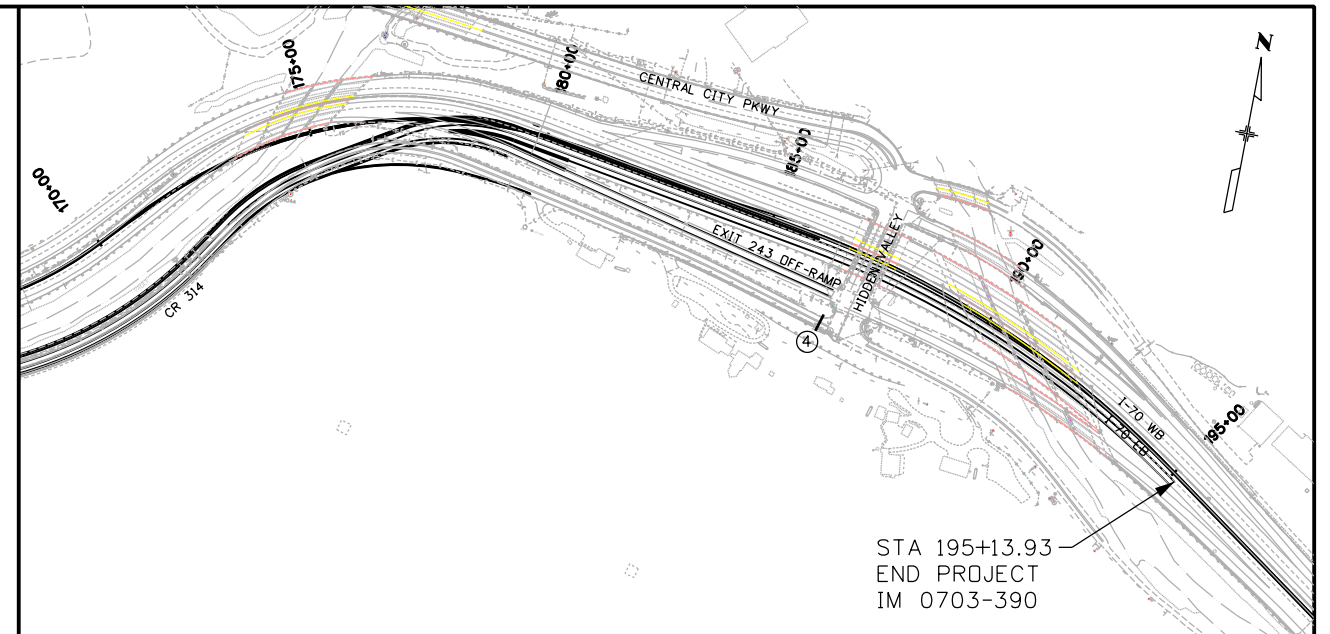
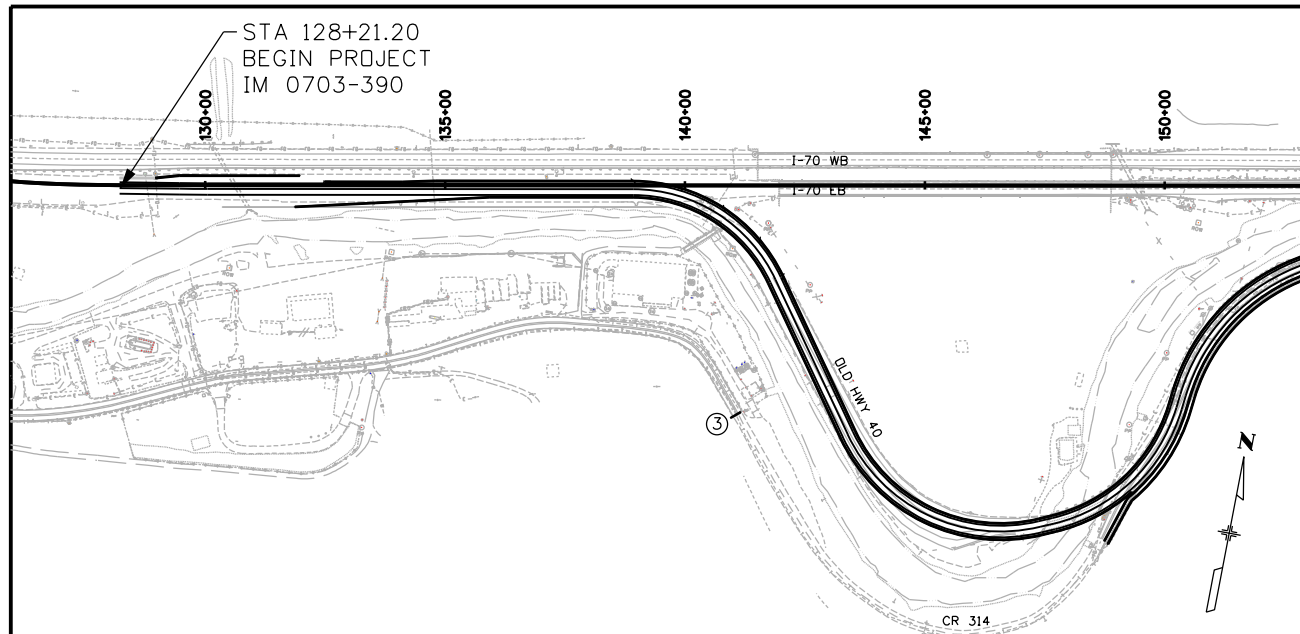
### PHASE 3

DESCRIPTION:  
COMPLETE WORK AS NECESSARY TO CONSTRUCT EAST AND WEST DETOUR TRANSITIONS. DETOUR TRANSITIONS REQUIRE VARIABLE HMA THICKNESS CONSTRUCTION WHICH REQUIRE MULTIPLE HMA LIFTS.

TRAFFIC:  
INDIVIDUAL CONSTRUCTION PHASES FOR MAINTENANCE OF TRAFFIC DURING DETOUR TRANSITION CONSTRUCTION ARE NOT INCLUDED IN THIS PLAN SET. CONTRACTOR SHALL SUBMIT SEPARATE MHT'S FOR MAINTENANCE OF TRAFFIC FOR THE COMPLETION OF EAST AND WEST TRANSITIONS.

Print Date: 11/30/2012	0000	<b>Sheet Revisions</b>			<b>Colorado Department of Transportation</b>			<b>As Constructed</b>		<b>EASTBOUND I-70 CONSTRUCTION PHASING PLAN</b>			<b>Project No./Code</b>	
File Name: 18832PHAS_CPIB_TCTab2.dgn		Date:	Comments	Init.	 425 A Corporate Circle Golden, CO 80401 Phone: 720-497-6918 FAX: 720-497-6901			No Revisions:		Designer: E. Flagg Detailer: B. Riley Subset: Phasing			IM 0703-390	
Horiz. Scale: 1:1      Vert. Scale:								Revised:					Structure Numbers	
<b>ATKINS</b> 4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276					<b>Region 1</b>			<b>CRC</b>		Subset Sheets: 2 of 34		Sheet Number 165		





**NOTES:**

- CONTRACTOR SHALL PROVIDE CONSTRUCTION TRAFFIC CONTROL IN ACCORDANCE WITH CDOT STANDARD PLANS, SECTION 630 OF THE STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, AND THE CURRENT EDITION OF THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MUTCD).
- REFER TO PHASING PLANS FOR LANE WIDTH REQUIREMENTS AND ADDITIONAL INFORMATION.
- SIGNING FOR CONSTRUCTION TRAFFIC CONTROL SHALL INCLUDE: PROJECT INFORMATION SIGNS; FINES DOUBLED IN WORK ZONE SIGNS; G-20-10 "THANK YOU" SIGNS, PLACE AS DIRECTED BY ENGINEER. PLACEMENT SHALL BE COORDINATED WITH CONCURRENT CONSTRUCTION PHASE.
- THE CONTRACTOR SHALL SUBMIT DETAILED TRAFFIC CONTROL PLANS FOR EACH PHASE OF CONSTRUCTION AND THE PROPOSED METHOD OF HANDLING TRAFFIC (MHT), TO THE ENGINEER FOR APPROVAL.
- THE PROPOSED SIGN LOCATION AND SPACING ARE APPROXIMATE. EXACT SIGN PLACEMENT SHALL BE AS DIRECTED BY THE ENGINEER. LOCATIONS WILL BE DEPENDENT ON SITE CONDITIONS AND OTHER SIGNING REQUIREMENTS.
- CONTRACTOR SHALL COORDINATE WITH LOCAL BUSINESSES TO IDENTIFY ACCESS RESTRICTIONS AND MINIMIZE IMPACTS OF THE CONSTRUCTION.
- FOR TEMPORARY CONCRETE BARRIER, REFLECTORS SHALL BE INSTALLED THAT MEET THE MINIMUM REQUIREMENTS OF STANDARD TYPICAL DELINEATOR INSTALLATIONS, EXCEPT THE MAXIMUM SPACING SHALL BE 20 FEET.
- TWO PORTABLE MESSAGE PANELS SHALL BE ASSUMED AS PART OF MHT PLANS, LOCATED AS DIRECTED BY THE ENGINEER.
- REFER TO TWIN TUNNELS INCIDENT MANAGEMENT PLAN AND PROJECT SPECIAL PROVISIONS FOR EMERGENCY ACCESS REQUIREMENTS.

LEGEND

XXXX  
EXIT NUMBER

① I-70 FRONTAGE ROAD CLOSED LOCAL TRAFFIC ONLY  
Special 60x30

② ROAD CLOSED X MILES AHEAD LOCAL TRAFFIC ONLY  
R11-3a 60x30

③ ROAD CLOSED

④ ROAD CLOSED

⑤ CDOT ROAD WORK MM YY-MM YY FOR INFORMATION CALL XXX-XXX-XXXX G20-11

⑥ BEGIN FINES DOUBLE IN WORK ZONE R52-6a

⑦ END FINES DOUBLE IN WORK ZONE R52-6b

⑧ XYZ CONSTRUCTION THANKS YOU 555-555-5555 G20-10

SEE NOTE 3

EXISTING CDOT VMS  
1-70 FRONTAGE RD/ CR 314 CLOSED  
LOCAL TRAFFIC ONLY

WESTBOUND VMS LOCATIONS  
MM 246-TOP OF FLOYD HILL  
MM 250-EL RANCHO  
EASTBOUND VMS LOCATIONS  
MM 232-EMPIRE JUNCTION  
MM 237-FALL RIVER

UTILIZE EXISTING CDOT VARIABLE MESSAGE BOARDS ON I-70 AS DIRECTED BY ENGINEER AND COORDINATE WITH CDOT TRAFFIC MANAGEMENT CENTER

Print Date: 11/30/2012  
File Name: 18832PHAS\_CPIB\_PH\_Closure\_Plan001.dgn  
Horiz. Scale: 1:100 Vert. Scale: NA

**ATKINS** 4601 DTC Boulevard, Suite 700  
Denver, CO 80237  
Phone: (303) 221-7275 Fax: (303) 221-7276

Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation

**DOT** 425 A Corporate Circle  
Golden, CO 80401  
Phone: 720-497-6918 FAX: 720-497-6901

Region 1 **CRC**

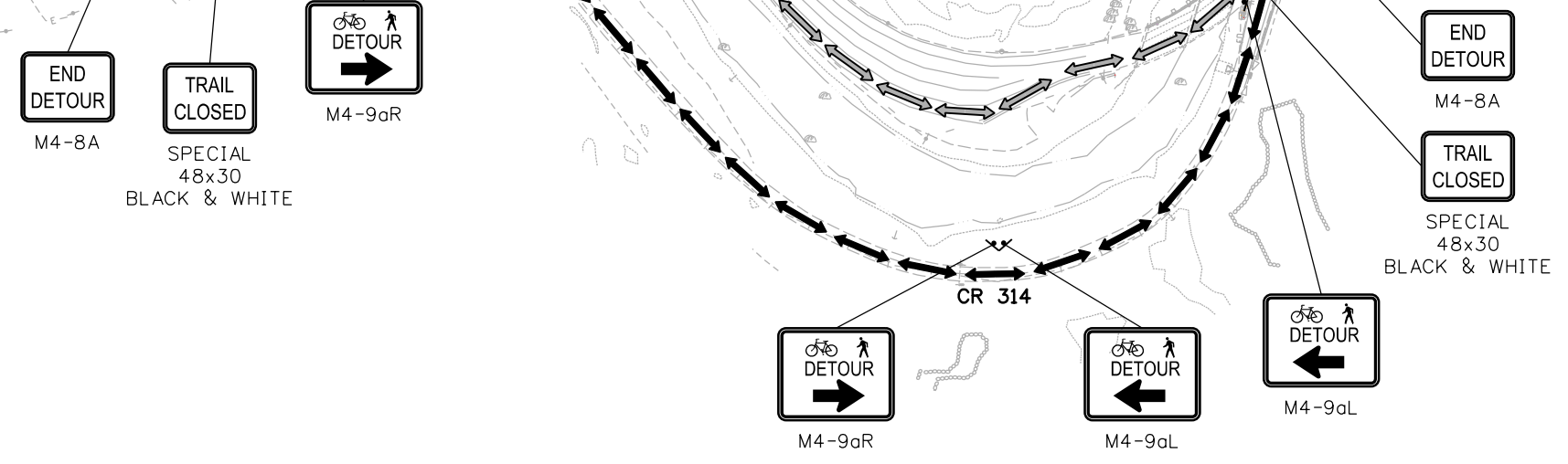
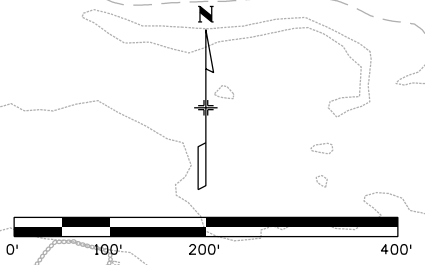
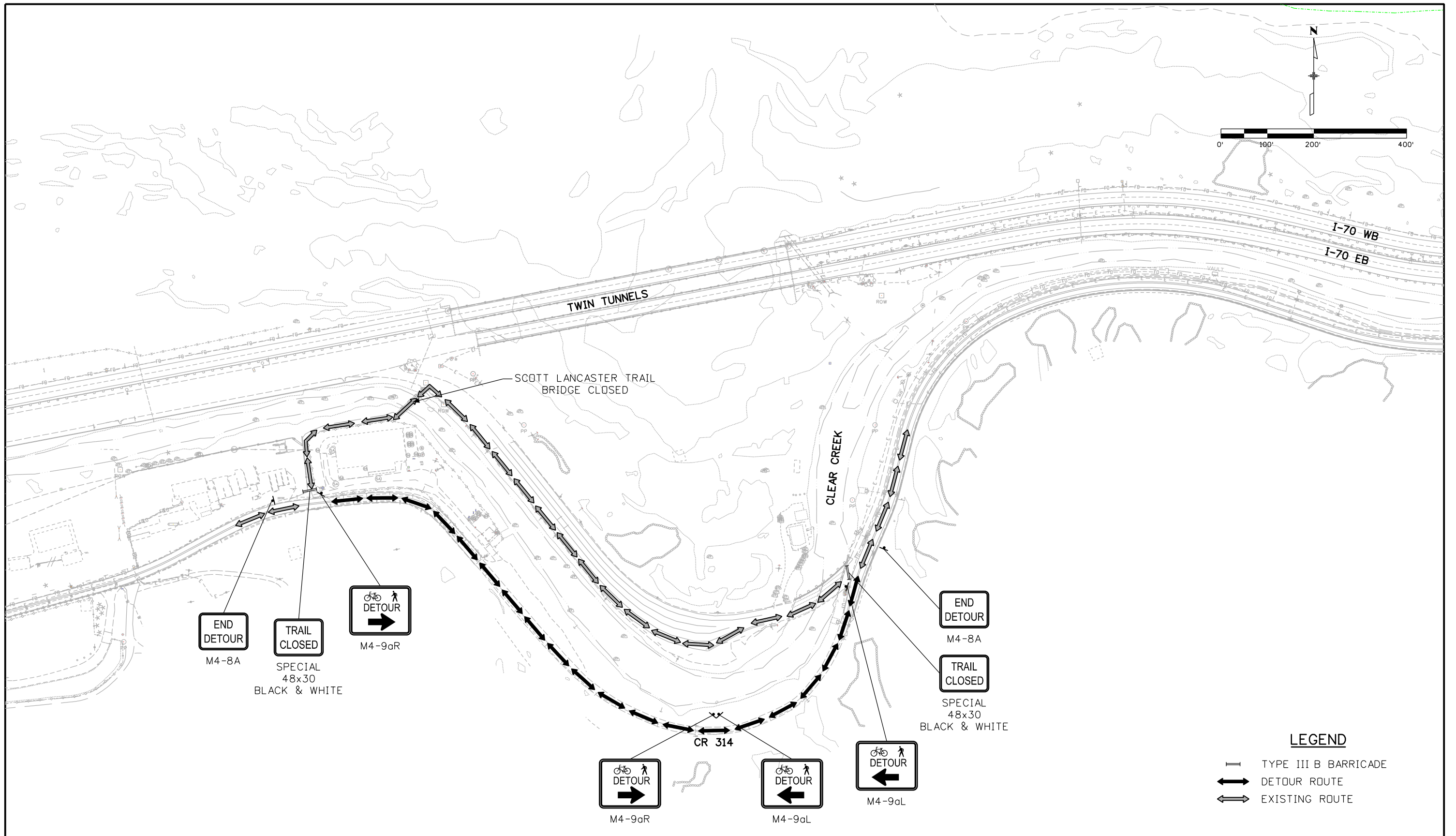
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No Revisions:		Designer:	E. Flagg
Revised:		Detailer:	B. Riley
Void:		Subset:	Phasing
		Structure Numbers	
		Subset Sheets:	3 of 34

Project No./Code  
IM 0703-390

19035

Sheet Number 166

17543 9:09:18 AM c:\pwworkspace\pws\1\common\dms25924\18832PHAS\_CPIB\_PH\_Closure\_Plan001.dgn



**LEGEND**

	TYPE III B BARRICADE
	DETOUR ROUTE
	EXISTING ROUTE

Print Date: 11/30/2012  
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 Horiz. Scale: 1:200      Vert. Scale:  
**ATKINS** 4601 DTC Boulevard, Suite 700  
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Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation  
  
 425 A Corporate Circle  
 Golden, CO 80401  
 Phone: 720-497-6918 FAX: 720-497-6901  
 Region 1      CRC

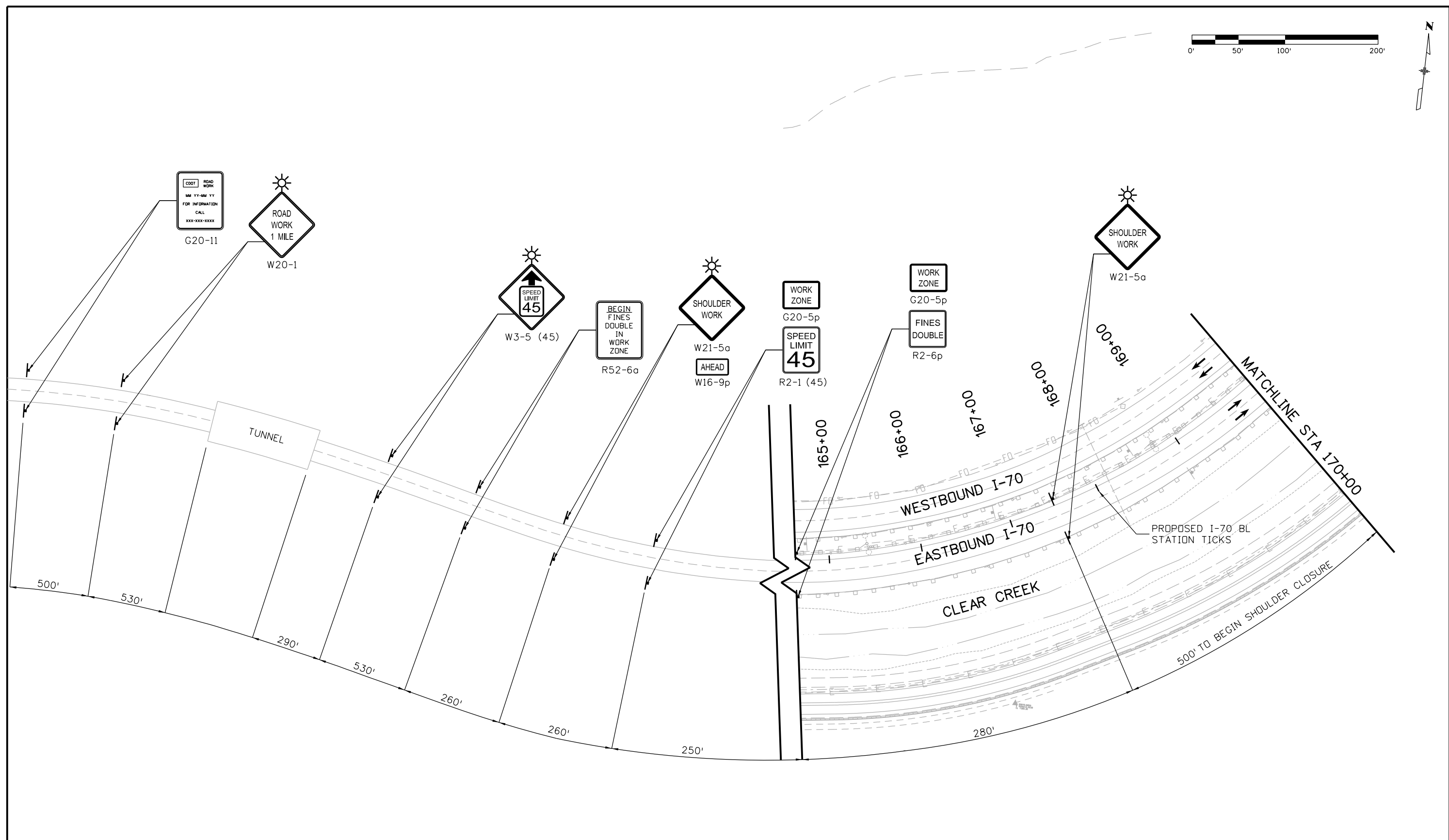
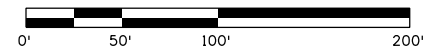
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 Void:

**EASTBOUND I-70 DETOUR  
 CONSTRUCTION PHASING PLAN  
 SHARED PATH SIGNING**

Designer:	E. Flagg	Structure Numbers	
Detailer:	B. Riley		
Subset:	Phasing	Subset Sheets: 4	of 34

**Project No./Code**  
 IM 0703-390  
 19035  
 Sheet Number 167

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 Phone: (303) 221-7275 Fax: (303) 221-7276

Sheet Revisions		
Date:	Comments	Init.

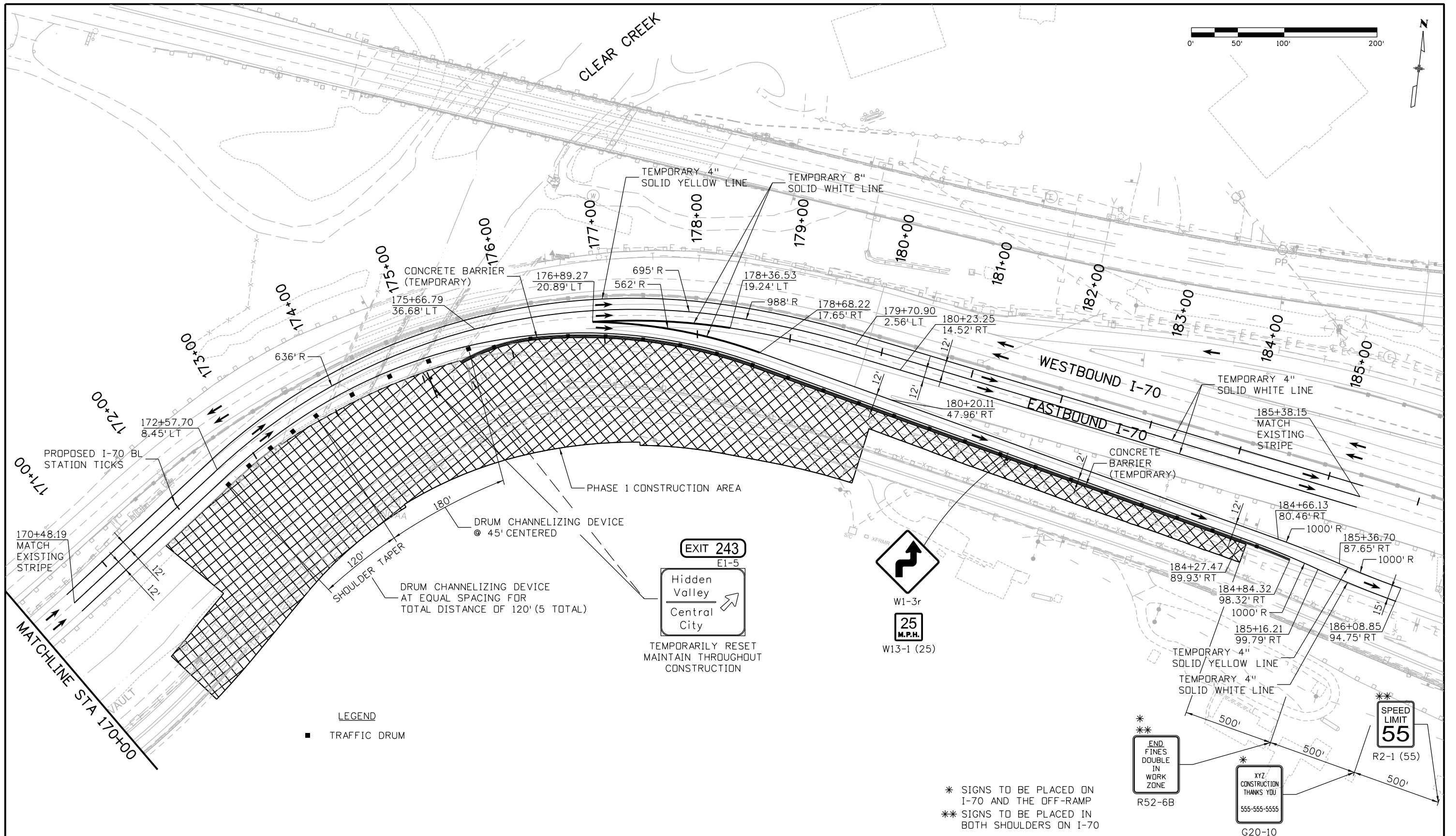
Colorado Department of Transportation  
  
 425 A Corporate Circle  
 Golden, CO 80401  
 Phone: 720-497-6918 FAX: 720-497-6901  
**Region 1**      **CRC**

**As Constructed**  
 No Revisions:  
 Revised:  
 Void:

**EASTBOUND I-70  
 CONSTRUCTION PHASING PLAN  
 PHASE 1**  
 Designer: E. Flagg  
 Detailer: B. Riley  
 Subset: Phasing  
 Structure Numbers  
 Subset Sheets: 5 of 34

**Project No./Code**  
 IM 0703-390  
 19035  
 Sheet Number 168

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Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation  
 425 A Corporate Circle  
 Golden, CO 80401  
 Phone: 720-497-6918 FAX: 720-497-6901  
**Region 1** **CRC**

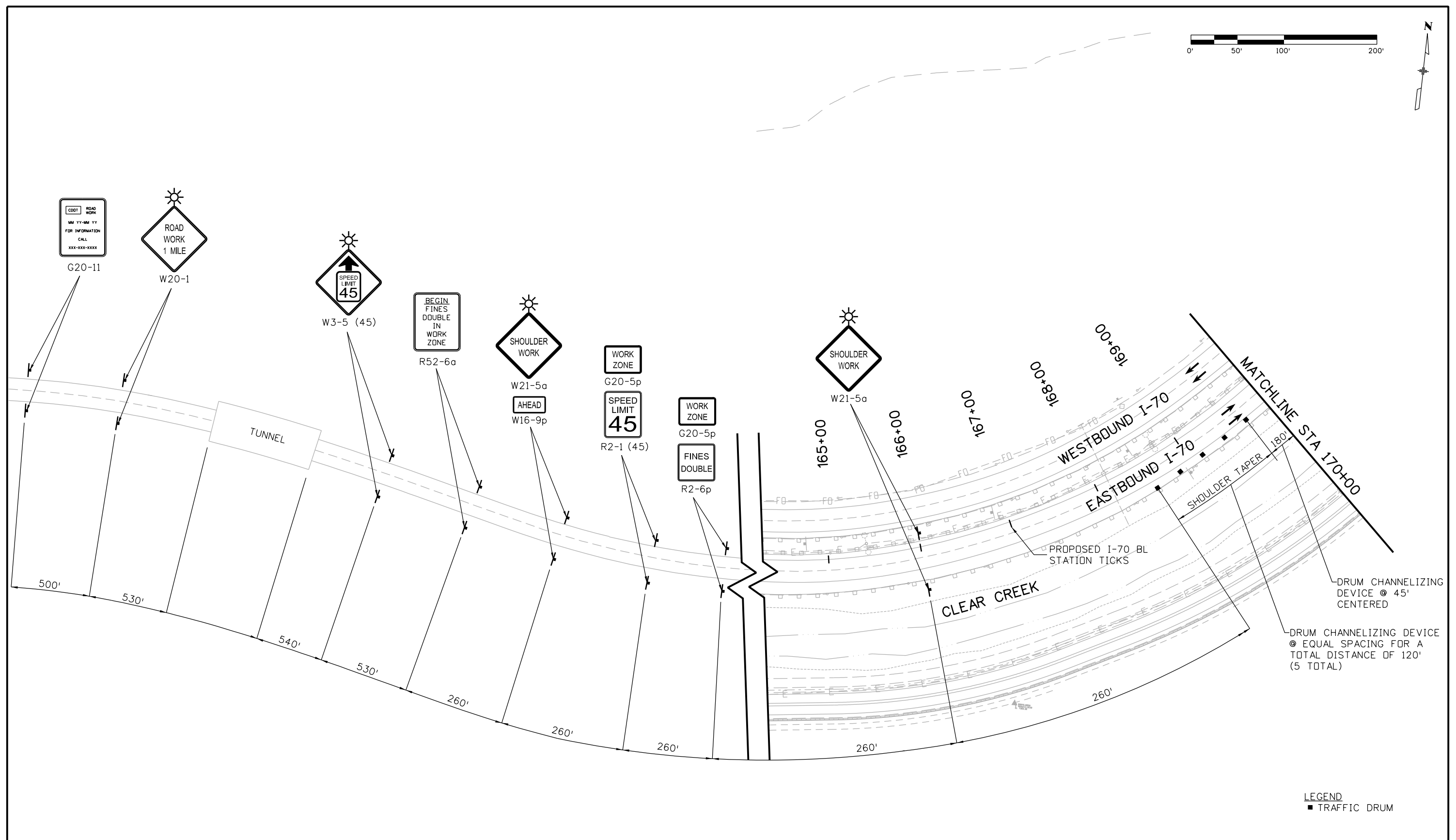
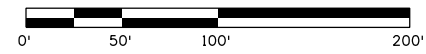
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 Revised:  
 Void:

**EASTBOUND I-70  
 CONSTRUCTION PHASING PLAN  
 PHASE 1**  
 Designer: E. Flagg  
 Detailer: B. Riley  
 Subset: Phasing  
 Structure Numbers  
 Subset Sheets: 6 of 34

**Project No./Code**  
 IM 0703-390  
 19035  
 Sheet Number 169

\* SIGNS TO BE PLACED ON I-70 AND THE OFF-RAMP  
 \*\* SIGNS TO BE PLACED IN BOTH SHOULDERS ON I-70





LEGEND  
 ■ TRAFFIC DRUM

Print Date: 11/30/2012  
 File Name: 18832PHAS\_CPIB\_PH2\_Plan001.dgn  
 Horiz. Scale: 1:100 Vert. Scale:  
**ATKINS** 4601 DTC Boulevard, Suite 700  
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 Phone: (303) 221-7275 Fax: (303) 221-7276

Sheet Revisions		
Date:	Comments	Init.

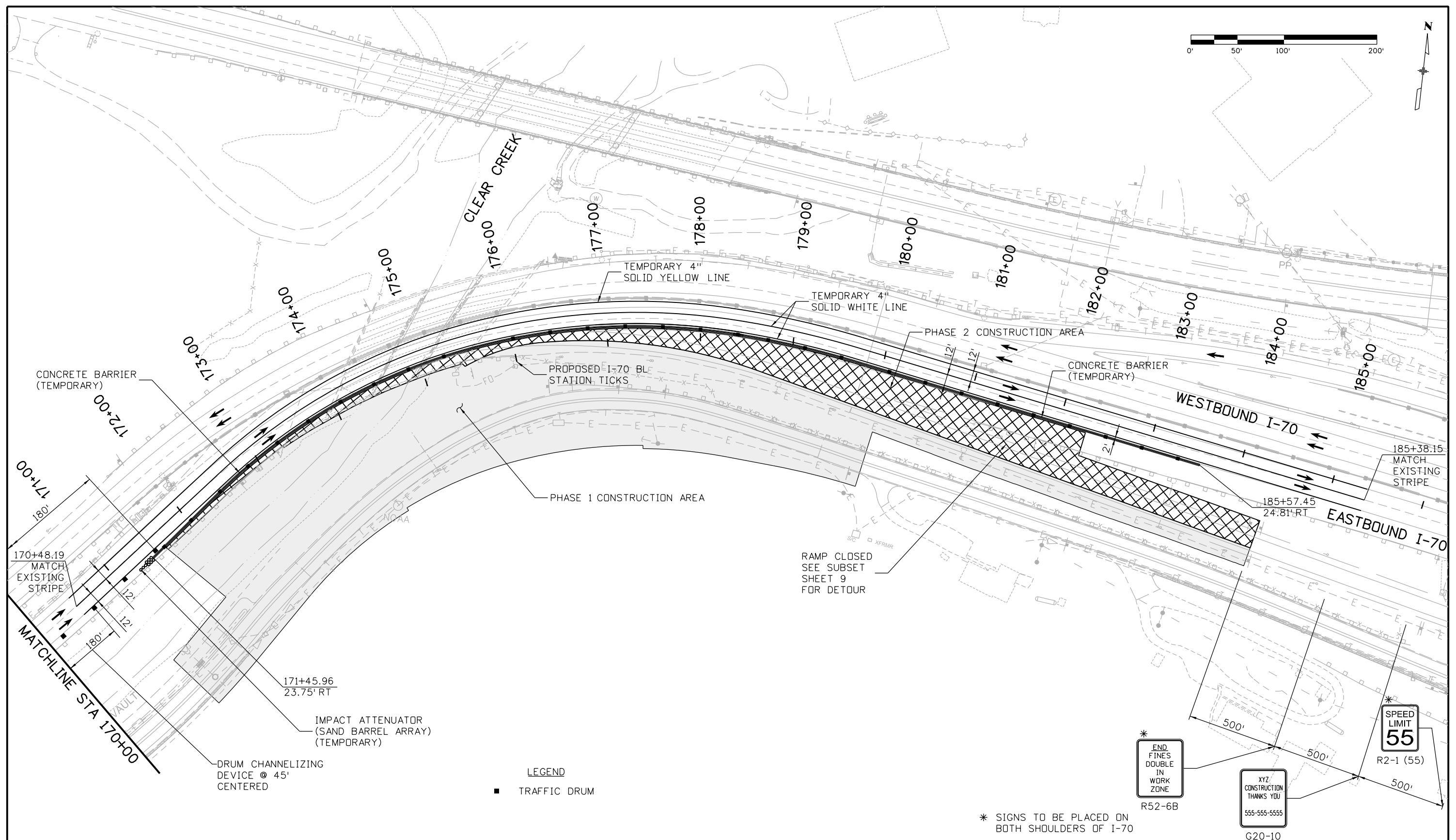
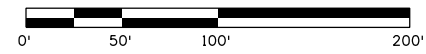
Colorado Department of Transportation  
  
 425 A Corporate Circle  
 Golden, CO 80401  
 Phone: 720-497-6918 FAX: 720-497-6901  
 Region 1 CRC

As Constructed  
 No Revisions:  
 Revised:  
 Void:

**EASTBOUND I-70  
 CONSTRUCTION PHASING PLAN  
 PHASE 2**  
 Designer: E. Flagg  
 Detailer: B. Riley  
 Subset: Phasing  
 Structure Numbers  
 Subset Sheets: 7 of 34

Project No./Code  
 IM 0703-390  
 19035  
 Sheet Number 170

17543 9:10:07 AM c:\p\_w\_work\pbes\pwl\common\dms25924\18832PHAS\_CPIB\_PH2\_Plan001.dgn



**LEGEND**

- TRAFFIC DRUM

\* SIGNS TO BE PLACED ON BOTH SHOULDERS OF I-70

Print Date: 11/30/2012  
 File Name: 18832PHAS\_CPIB\_PH2\_Plan002.dgn  
 Horiz. Scale: 1:100      Vert. Scale:  
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Sheet Revisions		
Date:	Comments	Init.

**Colorado Department of Transportation**  
  
 425 A Corporate Circle  
 Golden, CO 80401  
 Phone: 720-497-6918 FAX: 720-497-6901  
**Region 1** **CRC**

**As Constructed**  
 No Revisions:  
 Revised:  
 Void:

**EASTBOUND I-70  
 CONSTRUCTION PHASING PLAN  
 PHASE 2**

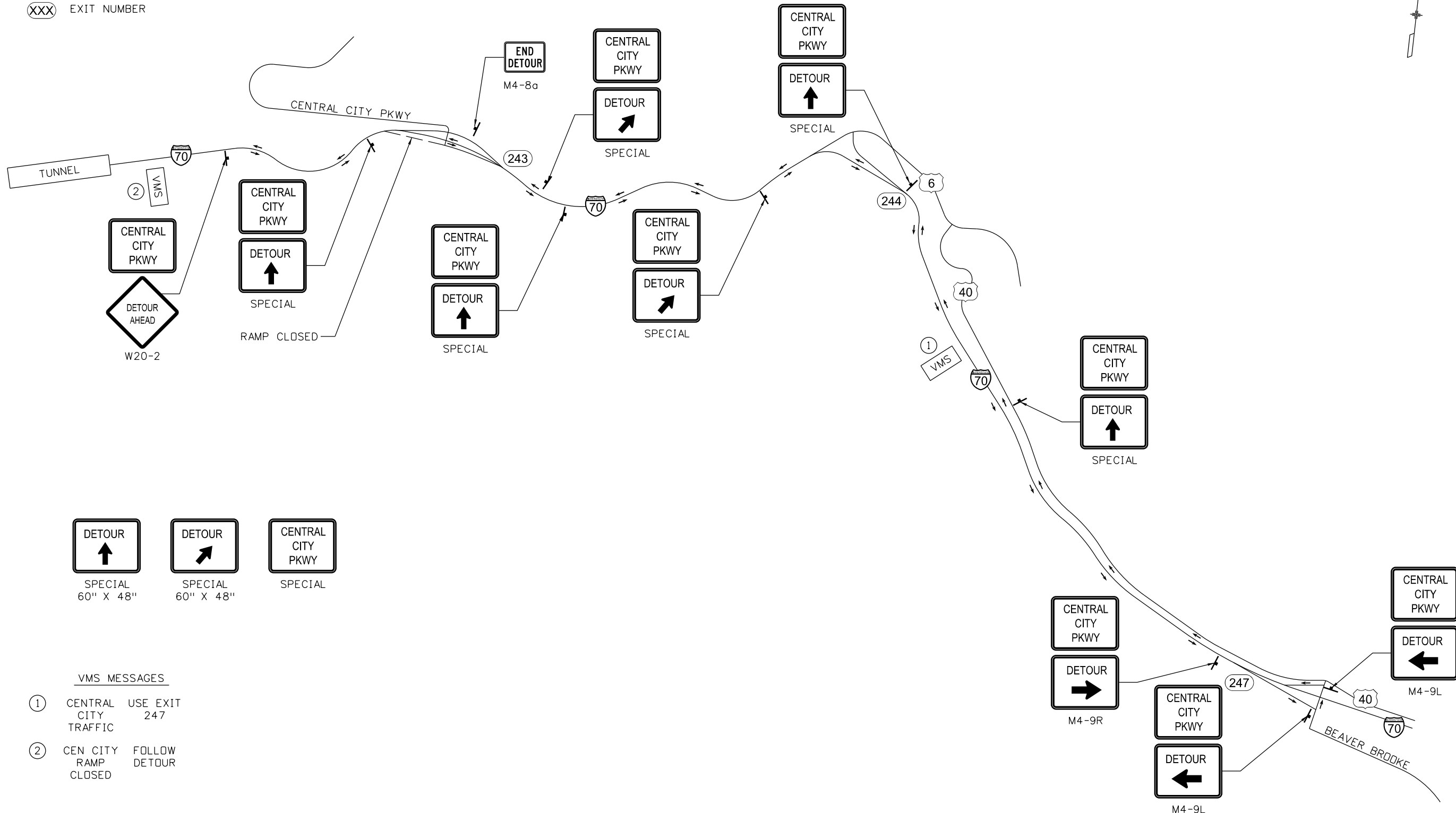
Designer: E. Flagg    Structure  
 Detailer: B. Riley    Numbers  
 Subset: Phasing    Subset Sheets: 8 of 34

**Project No./Code**  
 IM 0703-390  
 19035  
 Sheet Number 171

17543 9:10:17 AM c:\pw\_work\pbis\pw1\common\dms25924\18832PHAS\_CPIB\_PH2\_Plan002.dgn

LEGEND

- — CLDSURE
- VMS PORTABLE VARIABLE MESSAGE SIGN
- XXX EXIT NUMBER



VMS MESSAGES

- ① CENTRAL USE EXIT TRAFFIC 247
- ② CEN CITY FOLLOW RAMP DETOUR CLOSED

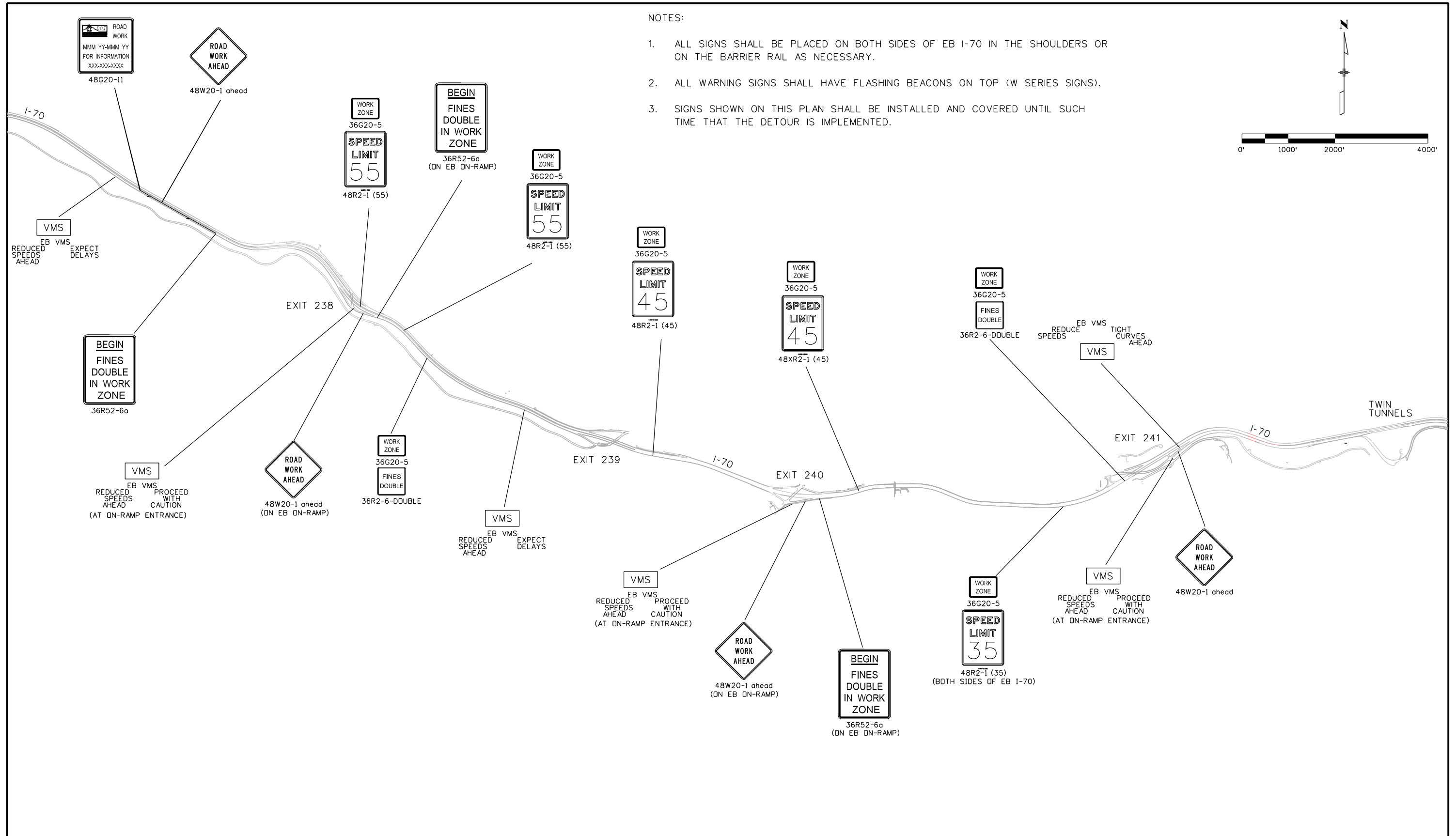
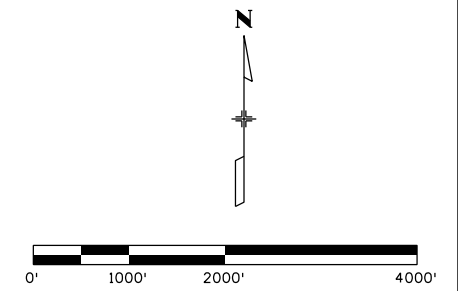
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Print Date: 11/30/2012		<b>Sheet Revisions</b>	<b>Colorado Department of Transportation</b>	<b>As Constructed</b>	<b>EASTBOUND I-70 CONSTRUCTION PHASING PLAN PHASE 2</b>	<b>Project No./Code</b>
File Name: 18832PHAS_CPIB_PH2_Plan003.dgn		Date:      Comments      Init.	425 A Corporate Circle Golden, CO 80401 Phone: 720-497-6918 FAX: 720-497-6901	No Revisions:	Designer: E. Flagg	IM 0703-390
Horiz. Scale: 1:100      Vert. Scale:				Revised:	Detailer: B. Riley	19035
<b>ATKINS</b>	4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276		<b>Region 1</b>	Void:	Subset: Phasing	Sheet Number 172
			<b>CRC</b>		Structure Numbers	Subset Sheets: 9 of 34



NOTES:

1. ALL SIGNS SHALL BE PLACED ON BOTH SIDES OF EB I-70 IN THE SHOULDERS OR ON THE BARRIER RAIL AS NECESSARY.
2. ALL WARNING SIGNS SHALL HAVE FLASHING BEACONS ON TOP (W SERIES SIGNS).
3. SIGNS SHOWN ON THIS PLAN SHALL BE INSTALLED AND COVERED UNTIL SUCH TIME THAT THE DETOUR IS IMPLEMENTED.



Print Date: 11/30/2012  
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 Horiz. Scale: 1:2000 Vert. Scale:  
**ATKINS** 4601 DTC Boulevard, Suite 700  
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Sheet Revisions		
Date:	Comments	Init.

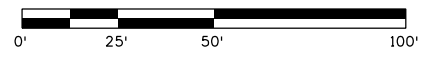
Colorado Department of Transportation  
 425 A Corporate Circle  
 Golden, CO 80401  
 Phone: 720-497-6918 FAX: 720-497-6901  
**Region 1** **CRC**

As Constructed  
 No Revisions:  
 Revised:  
 Void:

**TWIN TUNNELS DETOUR  
 ADVANCED SIGNING**  
 Designer: E. Flagg  
 Detailer: J. Gellner  
 Subset: Phasing  
 Structure Numbers  
 Subset Sheets: 10 of 34

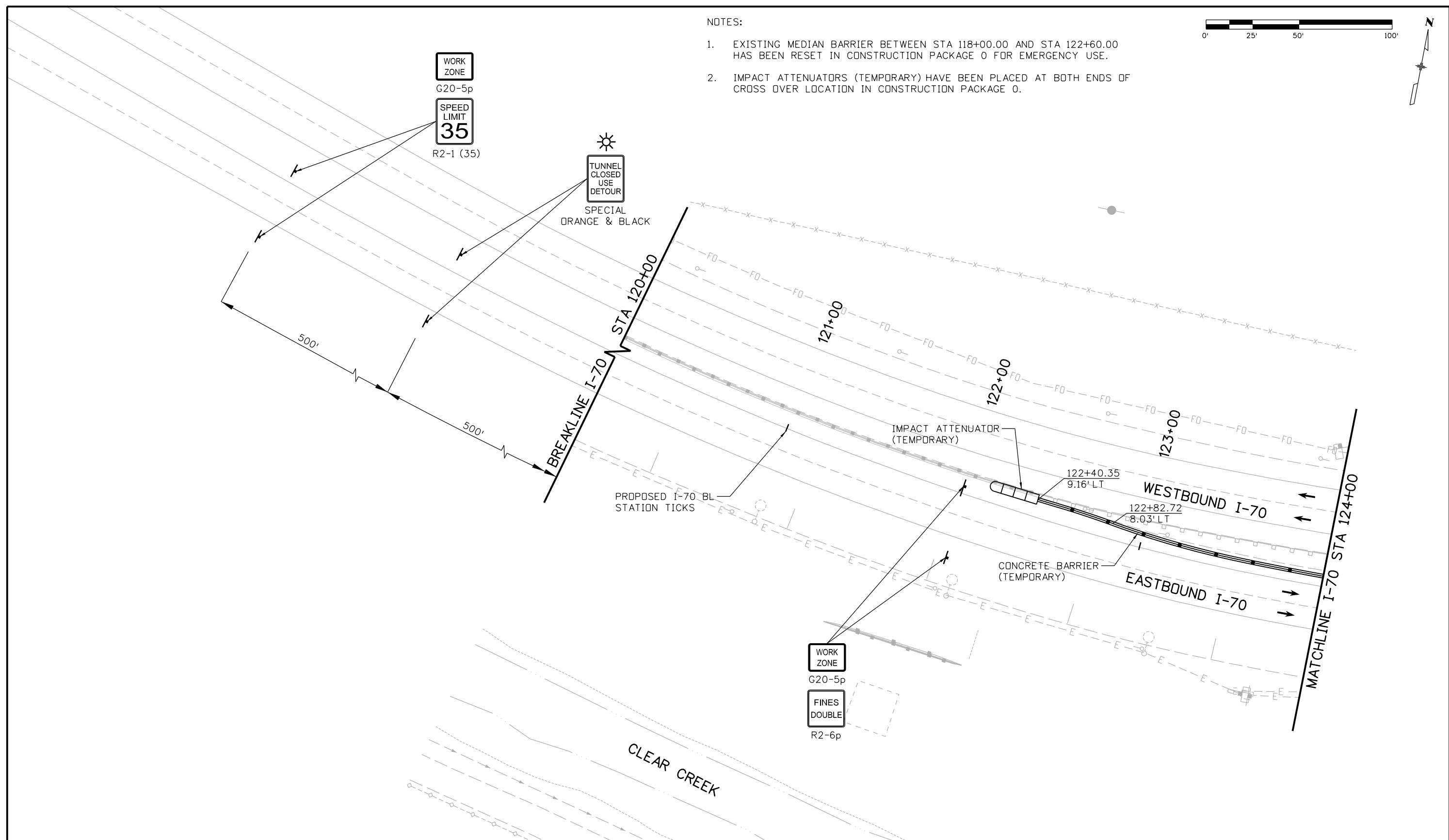
Project No./Code  
 IM 0703-390  
 19035  
 Sheet Number 173

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**NOTES:**

- EXISTING MEDIAN BARRIER BETWEEN STA 118+00.00 AND STA 122+60.00 HAS BEEN RESET IN CONSTRUCTION PACKAGE 0 FOR EMERGENCY USE.
- IMPACT ATTENUATORS (TEMPORARY) HAVE BEEN PLACED AT BOTH ENDS OF CROSS OVER LOCATION IN CONSTRUCTION PACKAGE 0.



Print Date: 11/30/2012  
 File Name: 18832PHAS\_CPIB\_PH3\_Plan001.dgn  
 Horiz. Scale: 1:50      Vert. Scale:  
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 Denver, CO 80237  
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Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation  
  
 425 A Corporate Circle  
 Golden, CO 80401  
 Phone: 720-497-6918 FAX: 720-497-6901  
**Region 1**      **CRC**

**As Constructed**  
 No Revisions:  
 Revised:  
 Void:

**EASTBOUND I-70 DETOUR  
 CONSTRUCTION PHASING PLAN  
 PHASE 3**

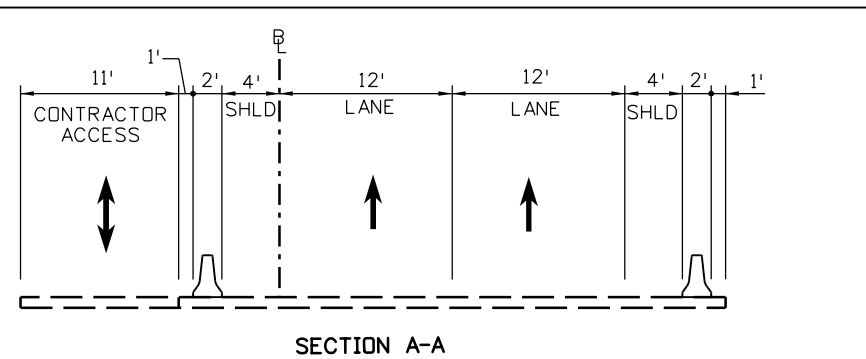
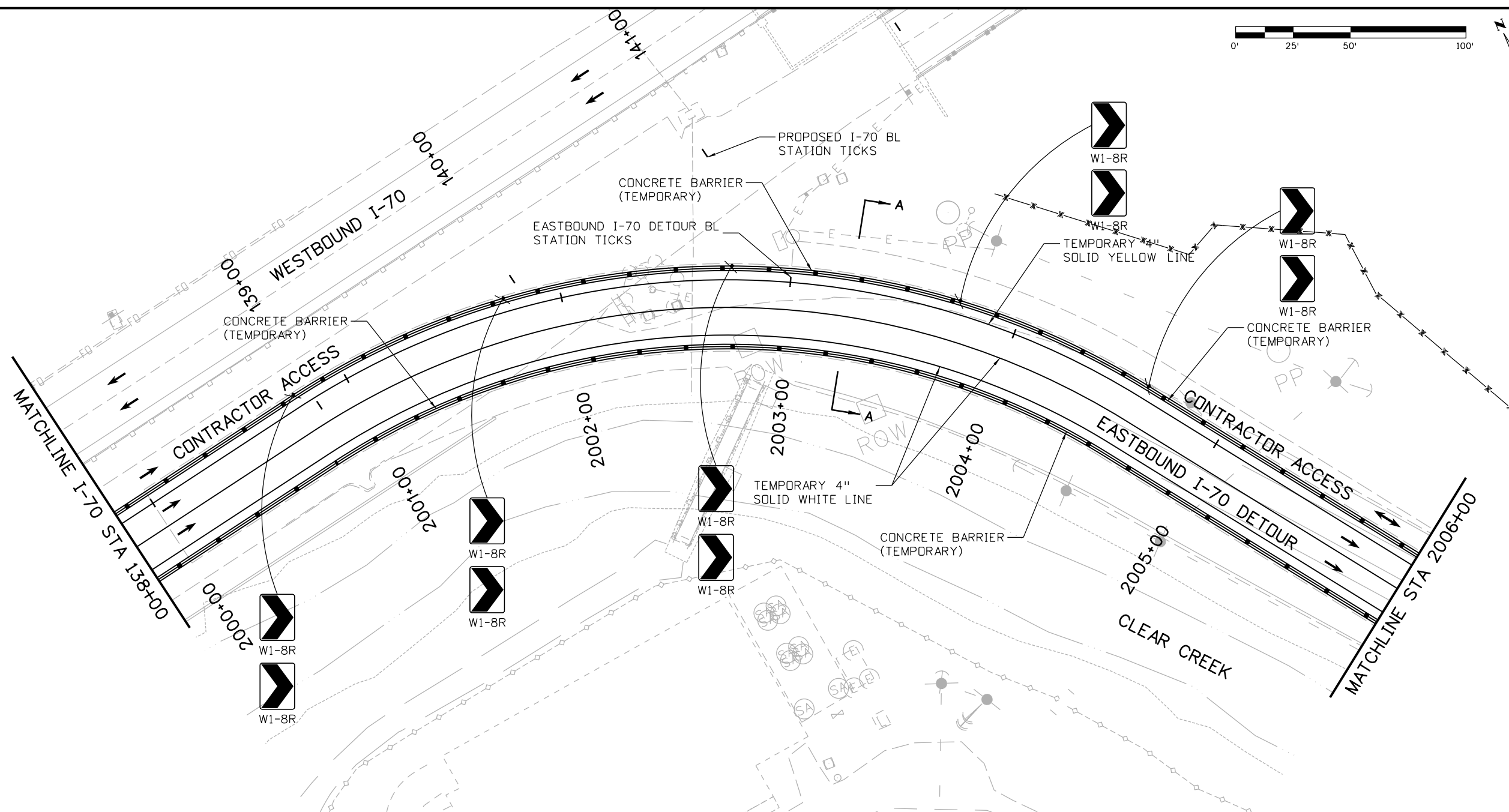
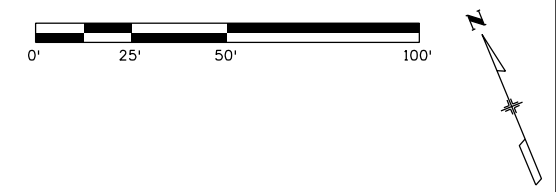
Designer:	E. Flagg	Structure Numbers	
Detailer:	B. Riley		
Subset:	Phasing	Subset Sheets: 11	of 34

**Project No./Code**  
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 Sheet Number 174

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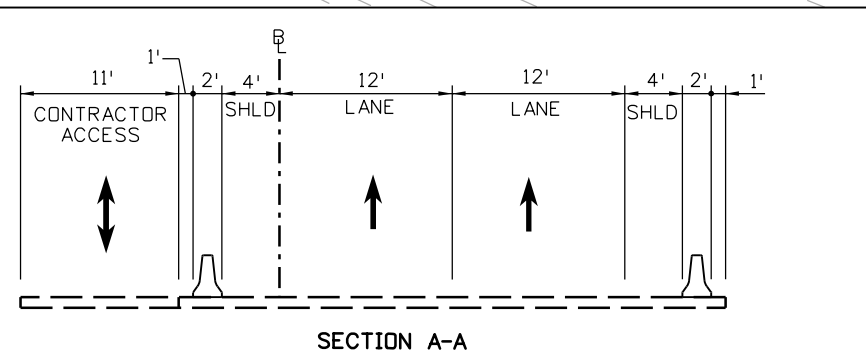
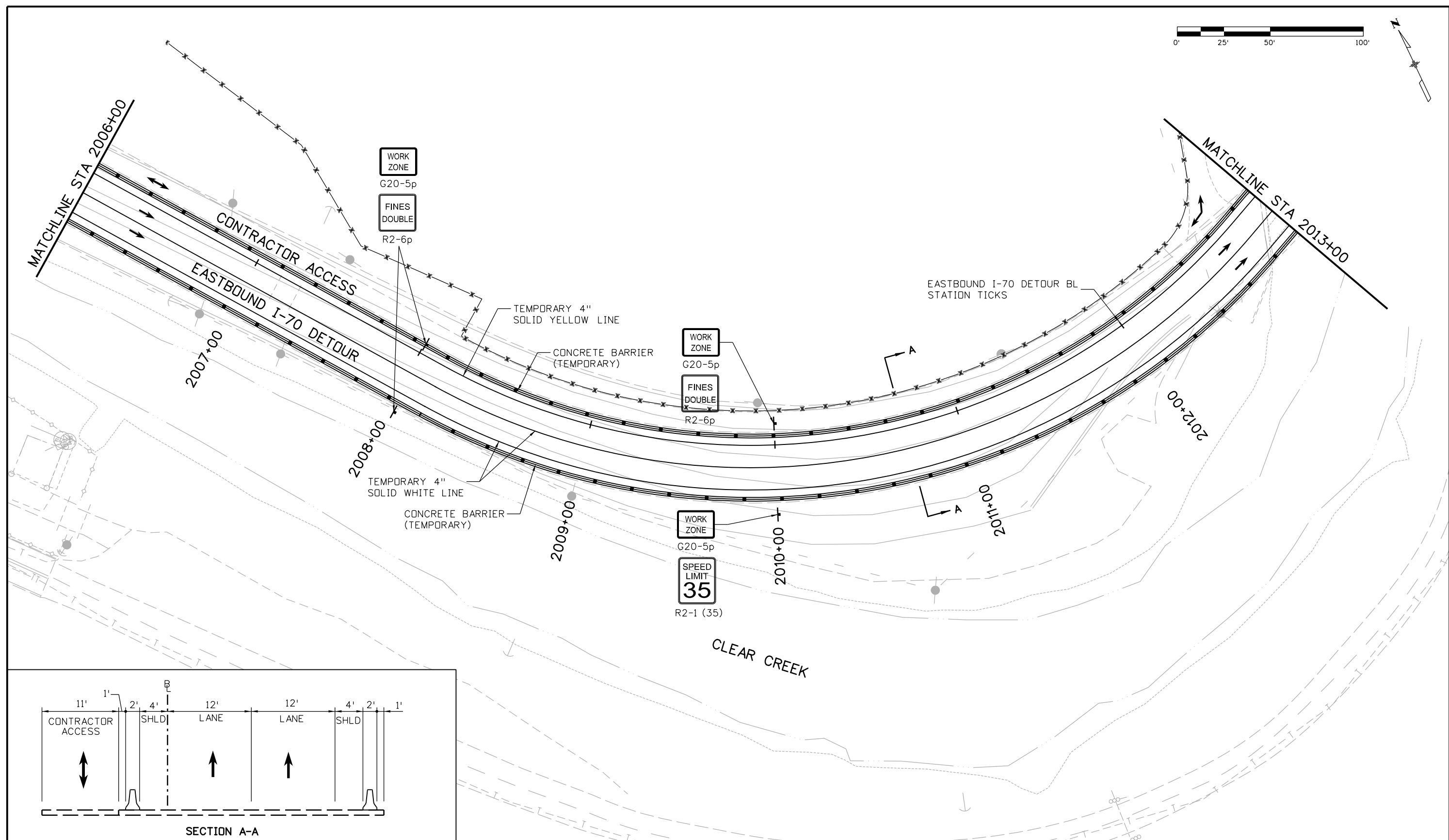
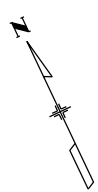
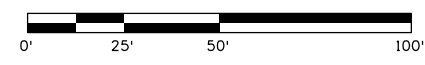




NOTE:  
 1. CONCRETE BARRIER (TEMPORARY) BETWEEN STA 2002+00 AND 2003+00 SHALL BE STABILIZED PER M-606-14.

Print Date: 11/30/2012		Sheet Revisions		Colorado Department of Transportation		As Constructed		EASTBOUND I-70 DETOUR CONSTRUCTION PHASING PLAN PHASE 3		Project No./Code	
File Name: 18832PHAS_CPIB_PH3_Plan004.dgn		Date:	Comments	Init.	425 A Corporate Circle Golden, CO 80401 Phone: 720-497-6918 FAX: 720-497-6901		No Revisions:		IM 0703-390		
Horiz. Scale: 1:50 Vert. Scale:					Region 1		Revised:		19035		
ATKINS 4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276					CRC		Void:		Sheet Number 177		
0000								Designer: E. Flagg Structure Numbers			
								Detailer: B. Riley			
								Subset: Phasing		Subset Sheets: 14 of 34	

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Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation  
  
 425 A Corporate Circle  
 Golden, CO 80401  
 Phone: 720-497-6918 FAX: 720-497-6901  
 Region 1      CRC

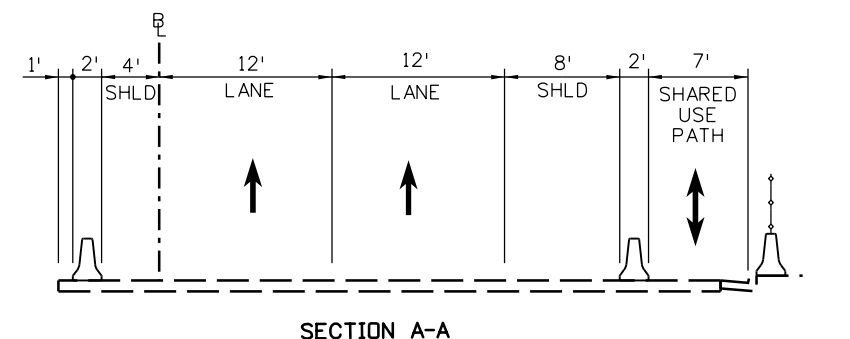
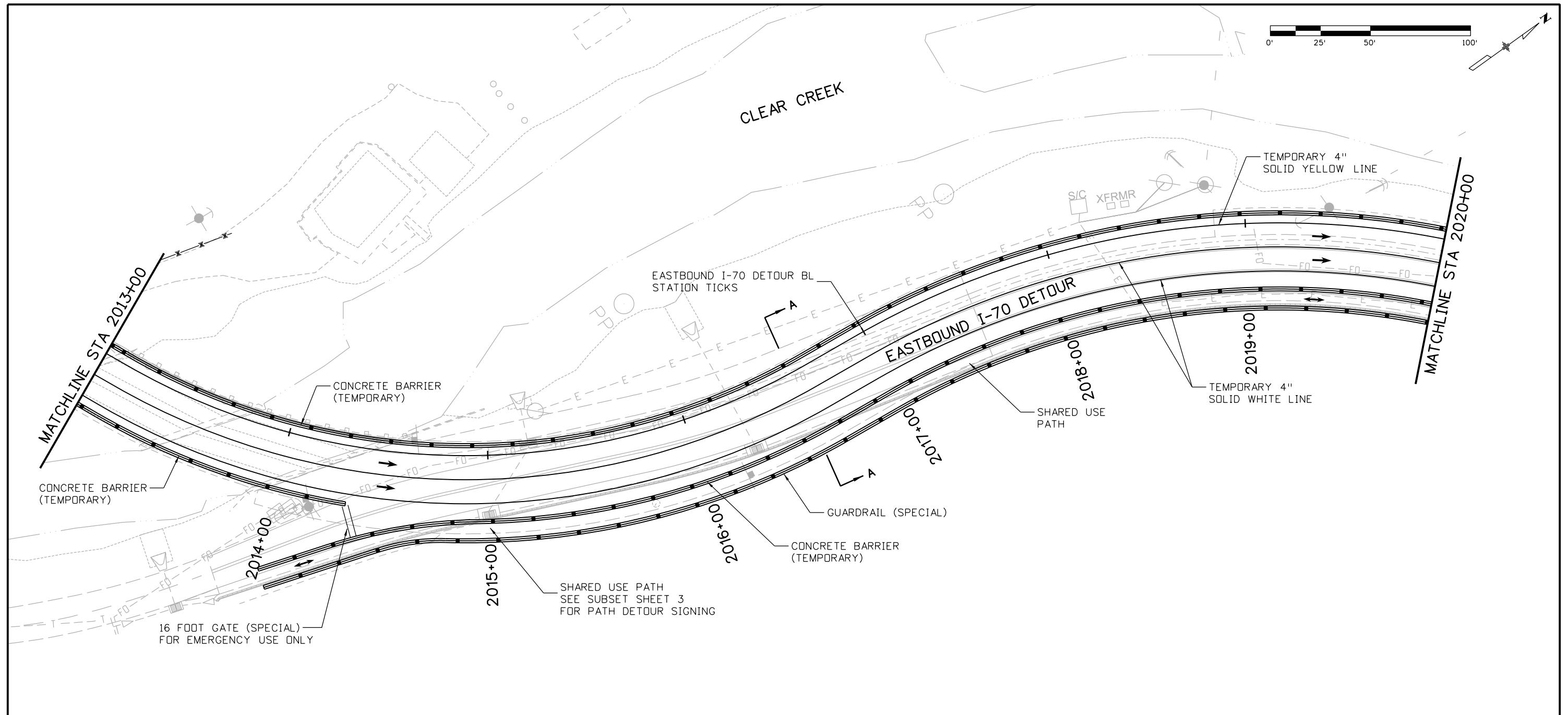
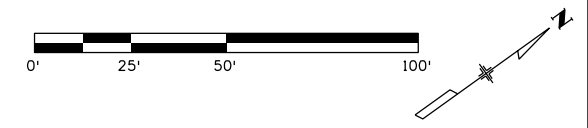
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**EASTBOUND I-70 DETOUR  
 CONSTRUCTION PHASING PLAN  
 PHASE 3**

Designer: E. Flagg  
 Detailer: B. Riley  
 Subset: Phasing

Structure Numbers  
 Subset Sheets: 15 of 34

Project No./Code  
 IM 0703-390  
 19035  
 Sheet Number 178



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**ATKINS** 4601 DTC Boulevard, Suite 700  
 Denver, CO 80237  
 Phone: (303) 221-7275 Fax: (303) 221-7276

Sheet Revisions		
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Colorado Department of Transportation  
  
 425 A Corporate Circle  
 Golden, CO 80401  
 Phone: 720-497-6918 FAX: 720-497-6901  
 Region 1 CRC

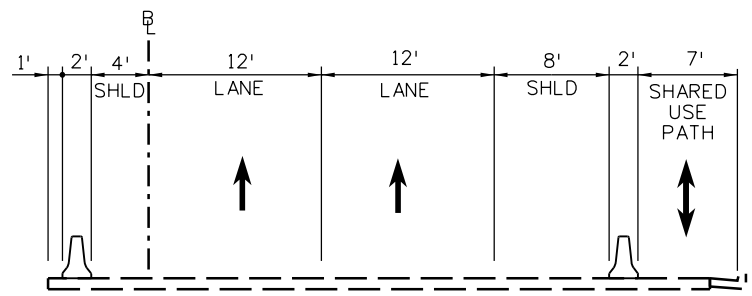
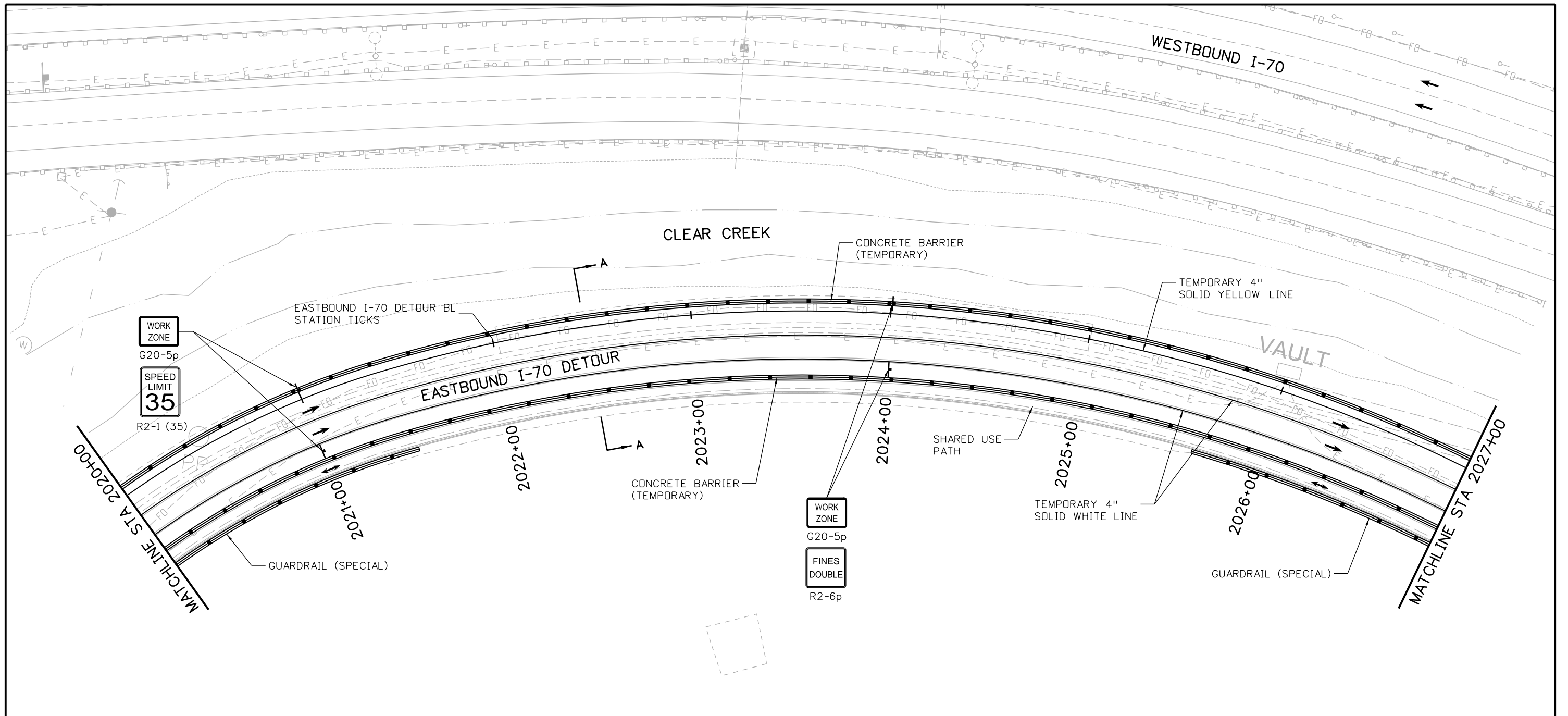
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**EASTBOUND I-70 DETOUR  
 CONSTRUCTION PHASING PLAN  
 PHASE 3**

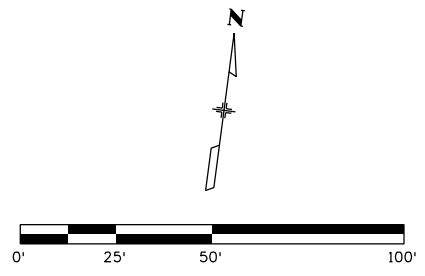
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Detailer:	B. Riley		
Subset:	Phasing	Subset Sheets: 16 of 34	

Project No./Code  
 IM 0703-390  
 19035  
 Sheet Number 179





SECTION A-A



Print Date: 11/30/2012  
 File Name: 18832PHAS\_CPIB\_PH3\_Plan007.dgn  
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**ATKINS** 4601 DTC Boulevard, Suite 700  
 Denver, CO 80237  
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Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation  
  
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 Golden, CO 80401  
 Phone: 720-497-6918 FAX: 720-497-6901  
 Region 1 **CRC**

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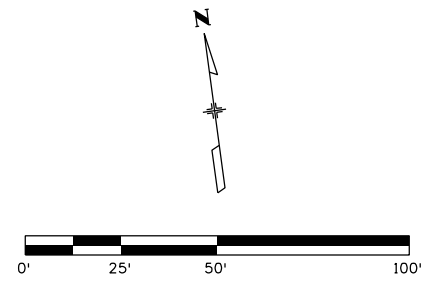
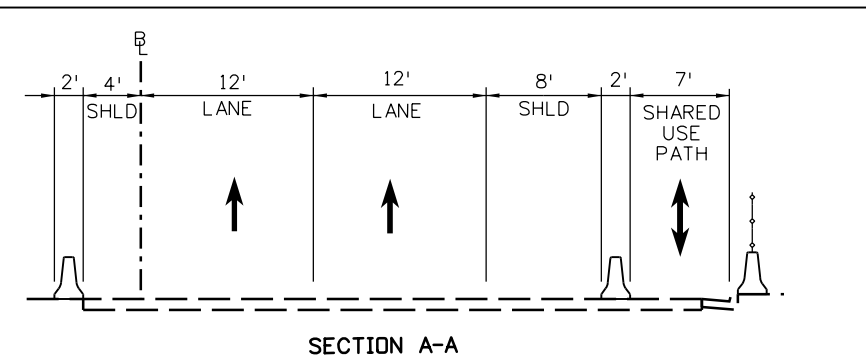
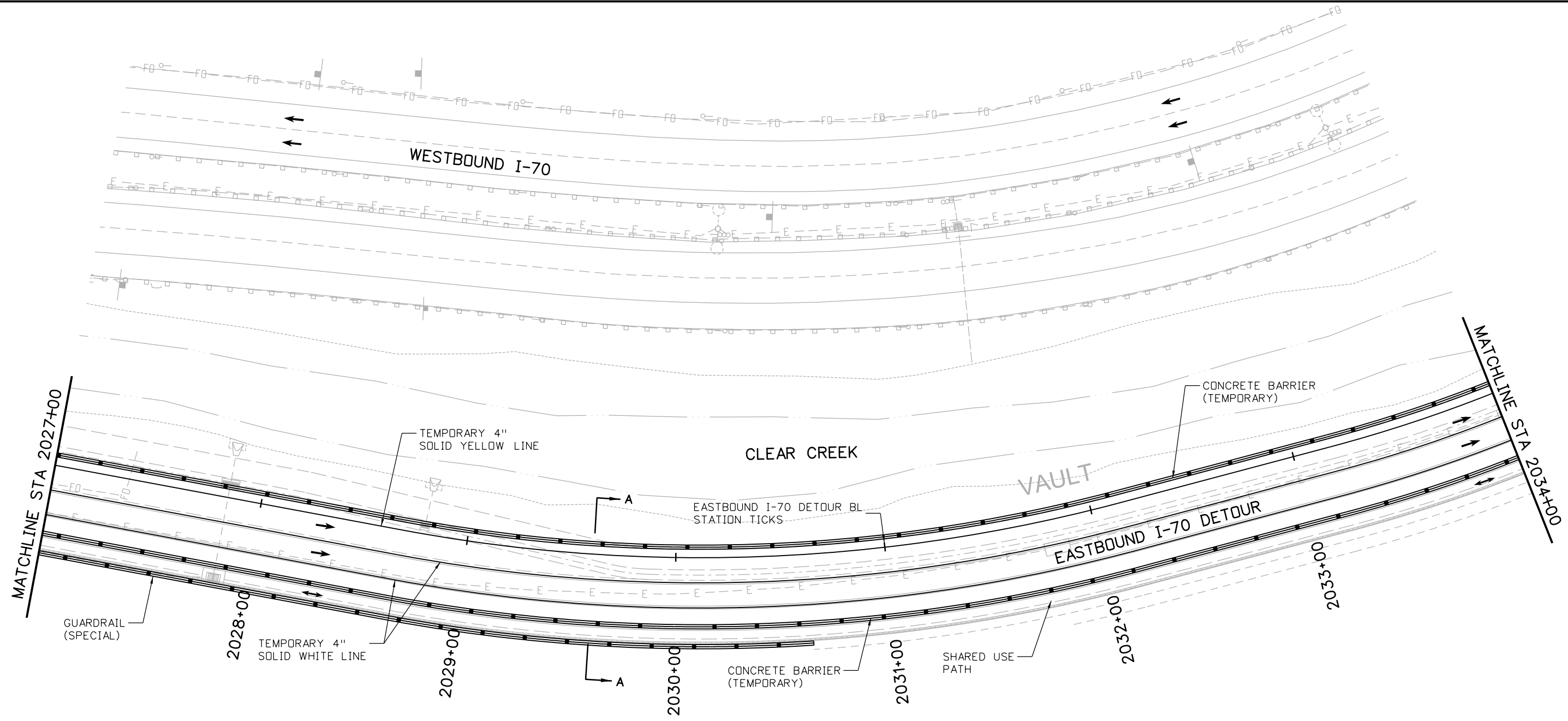
**EASTBOUND I-70 DETOUR  
 CONSTRUCTION PHASING PLAN  
 PHASE 3**


Designer:	E. Flagg	Structure Numbers	
Detailer:	B. Riley		
Subset:	Phasing	Subset Sheets: 17 of 34	

Project No./Code  
 IM 0703-390  
 19035  
 Sheet Number 180

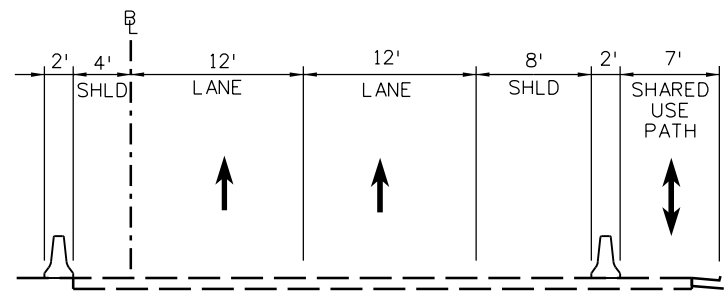
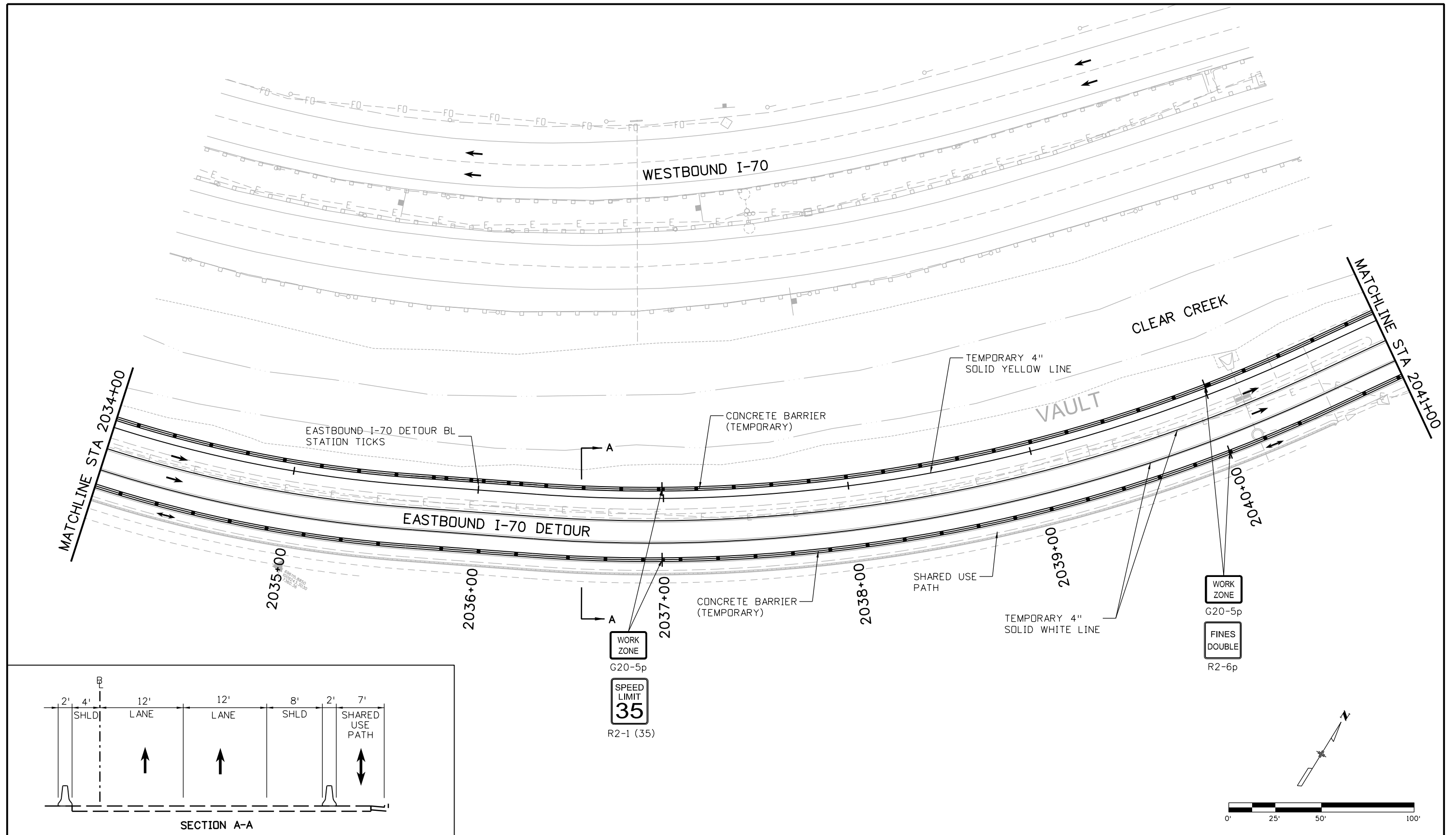
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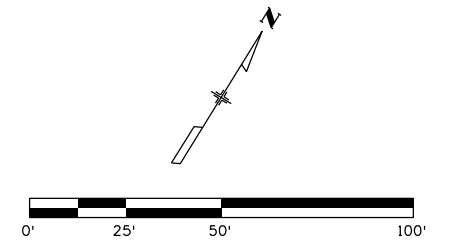





Print Date: 11/30/2012		<b>Sheet Revisions</b> Date:                      Comments                      Init.		<b>Colorado Department of Transportation</b>  425 A Corporate Circle Golden, CO 80401 Phone: 720-497-6918    FAX: 720-497-6901		<b>As Constructed</b> No Revisions: Revised: Void:		<b>EASTBOUND I-70 DETOUR CONSTRUCTION PHASING PLAN PHASE 3</b>			Project No./Code	
File Name: 18832PHAS_CPIB_PH3_Plan008.dgn											IM 0703-390	
Horiz. Scale: 1:50                      Vert. Scale:				 <b>Region 1</b>		<b>CRC</b>		Designer: E. Flagg    Structure Numbers Detailer: B. Riley Subset: Phasing    Subset Sheets: 18 of 34			19035 Sheet Number 181	
 4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275    Fax: (303) 221-7276												

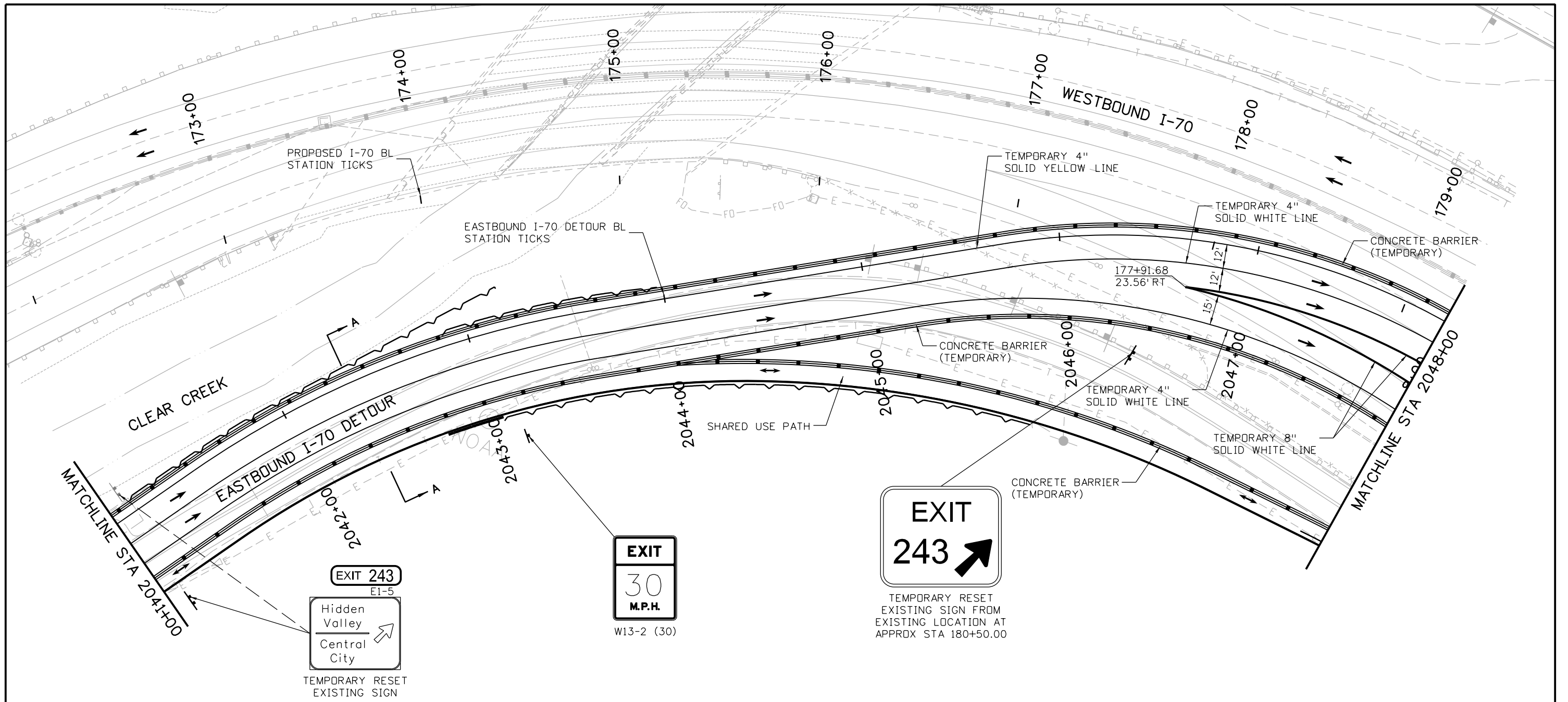
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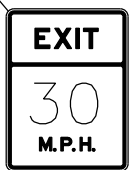
SECTION A-A



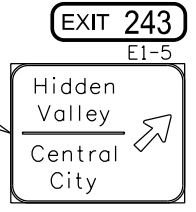
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File Name: 18832PHAS_CPIB_PH3_Plan009.dgn											
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 4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276											



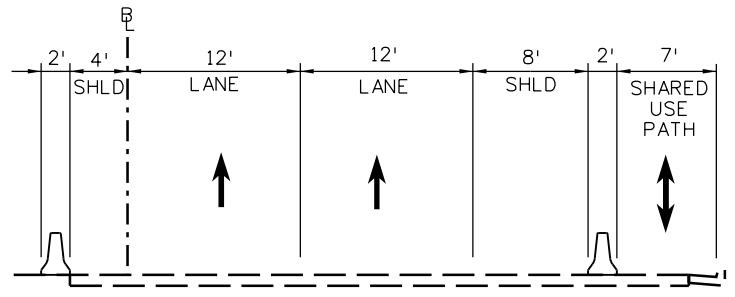
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EXISTING LOCATION AT  
APPROX STA 180+50.00



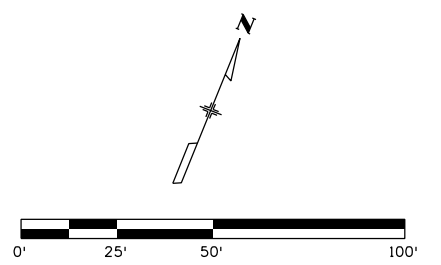
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SECTION A-A



Print Date: 11/30/2012  
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Horiz. Scale: 1:50 Vert. Scale:  
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Phone: (303) 221-7275 Fax: (303) 221-7276

Sheet Revisions		
Date:	Comments	Init.

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 Golden, CO 80401  
 Phone: 720-497-6918 FAX: 720-497-6901  
 Region 1 CRC

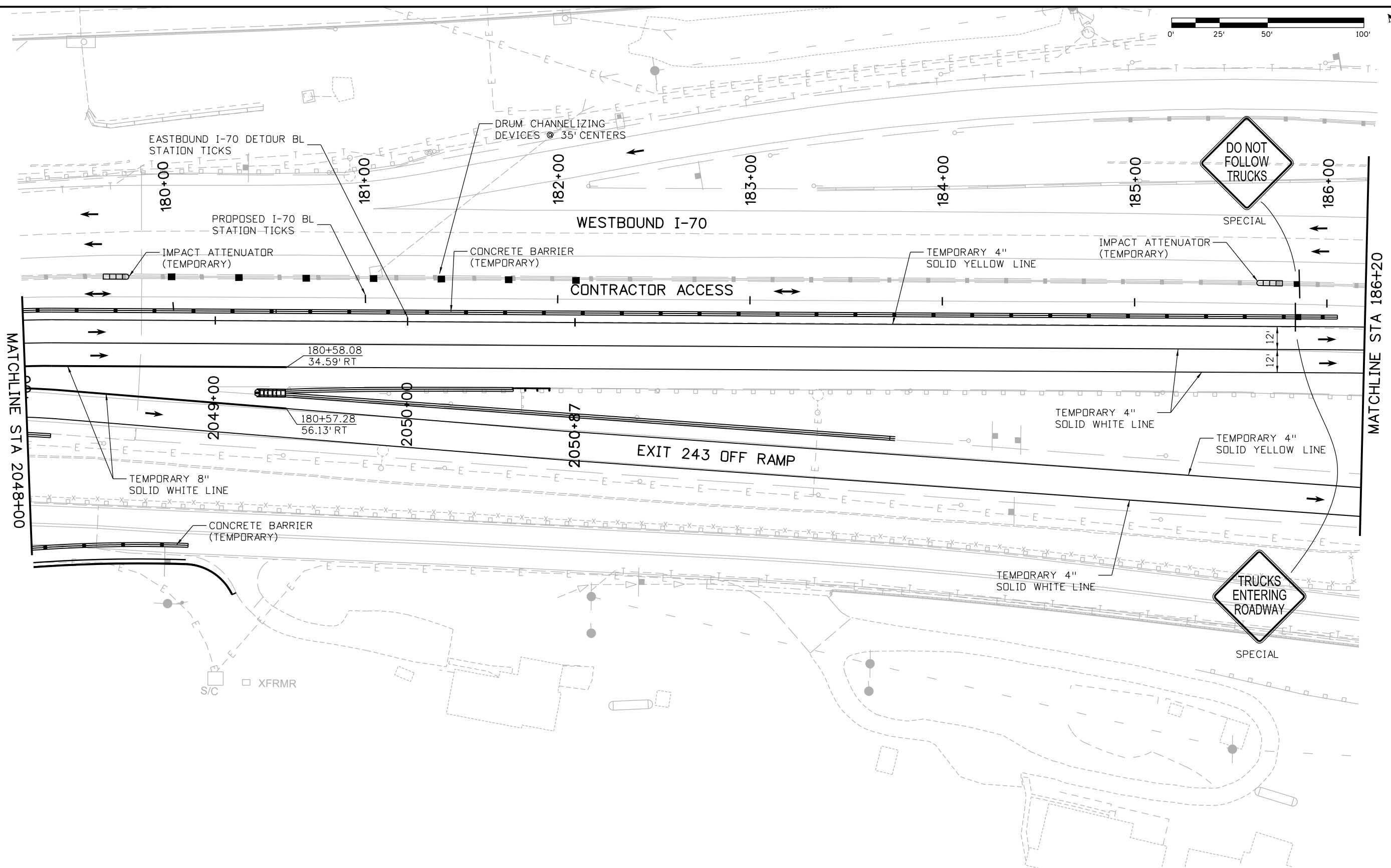
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 Void:

**EASTBOUND I-70 DETOUR  
CONSTRUCTION PHASING PLAN  
PHASE 3**

Designer:	E. Flagg	Structure Numbers	
Detailer:	B. Riley		
Subset:	Phasing	Subset Sheets: 20 of 34	

Project No./Code  
 IM 0703-390  
 19035  
 Sheet Number 183

17543 9:12:13 AM c:\pw\_work\pbl\pbl\1\18832PHAS\_CPIB\_PH3\_Plan010.dgn




MATCHLINE STA 2048+00

MATCHLINE STA 186+20

Print Date: 11/30/2012
File Name: 18832PHAS_CPIB_PH3_Plan011.dgn
Horiz. Scale: 1:50      Vert. Scale:
<b>ATKINS</b> 4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276

Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation



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Golden, CO 80401  
Phone: 720-497-6918 FAX: 720-497-6901

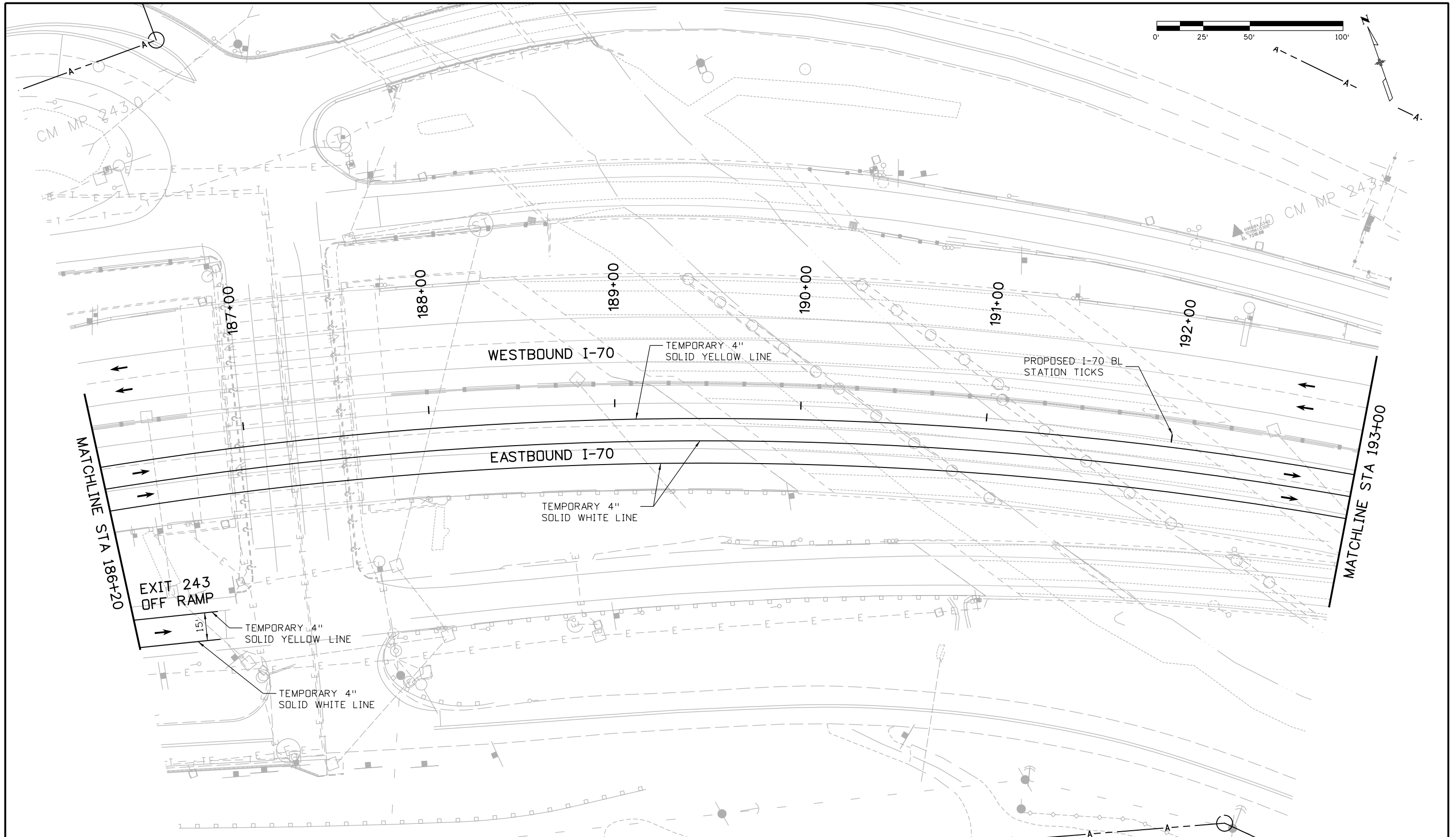
Region 1 CRC

<b>As Constructed</b>
No Revisions:
Revised:
Void:

EASTBOUND I-70 DETOUR CONSTRUCTION PHASING PLAN PHASE 3			
Designer:	E. Flagg	Structure Numbers	
Detailer:	B. Riley		
Subset:	Phasing	Subset Sheets: 21 of 34	

<b>Project No./Code</b>
IM 0703-390
19035
Sheet Number 184

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Print Date: 11/30/2012  
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 Horiz. Scale: 1:50      Vert. Scale:  
**ATKINS** 4601 DTC Boulevard, Suite 700  
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Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation  
  
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 Golden, CO 80401  
 Phone: 720-497-6918 FAX: 720-497-6901  
 Region 1 CRC

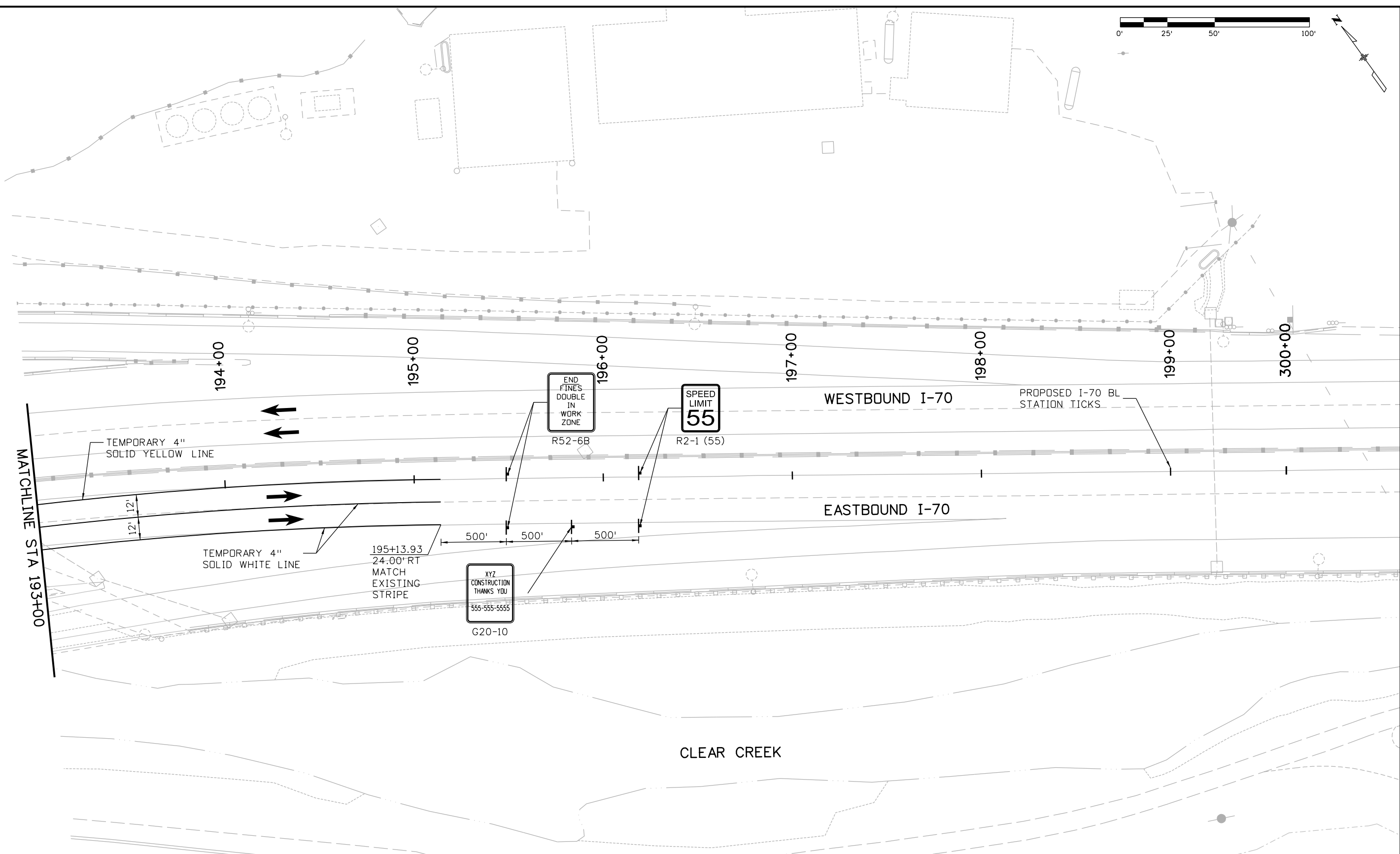
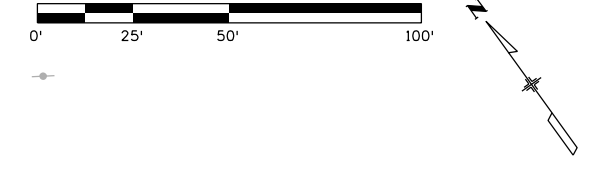
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 Revised:  
 Void:

**EASTBOUND I-70 DETOUR  
 CONSTRUCTION PHASING PLAN  
 PHASE 3**

Designer:	E. Flagg	Structure Numbers	
Detailer:	B. Riley	Subset Sheets:	22 of 34
Subset:	Phasing		


Project No./Code  
 IM 0703-390  
 19035  
 Sheet Number 185

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Print Date: 11/30/2012  
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Sheet Revisions		
Date:	Comments	Init.

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 Golden, CO 80401  
 Phone: 720-497-6918 FAX: 720-497-6901  
 Region 1      CRC

As Constructed  
 No Revisions:  
 Revised:  
 Void:

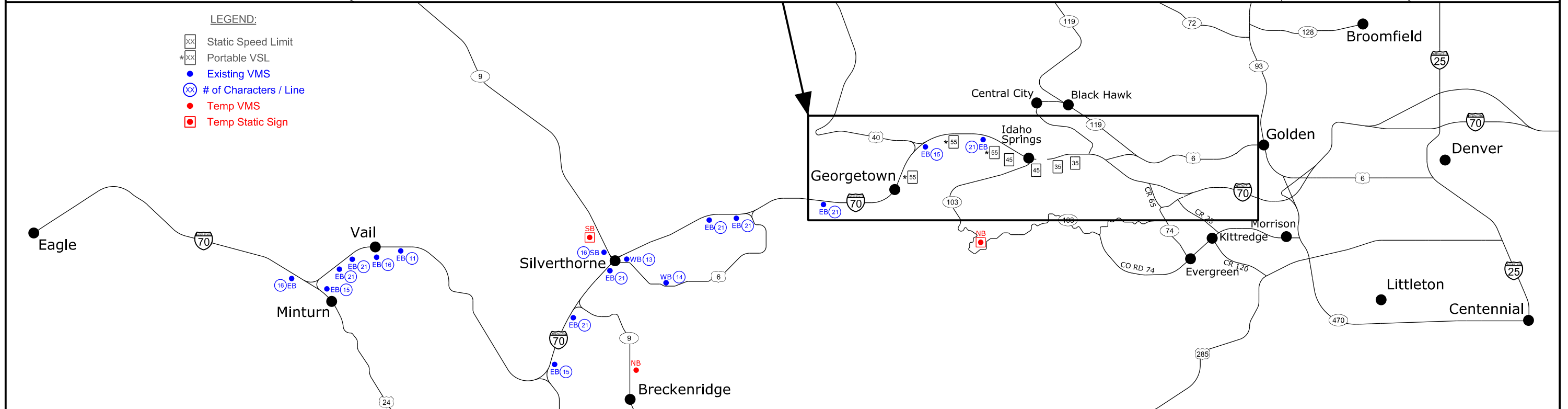
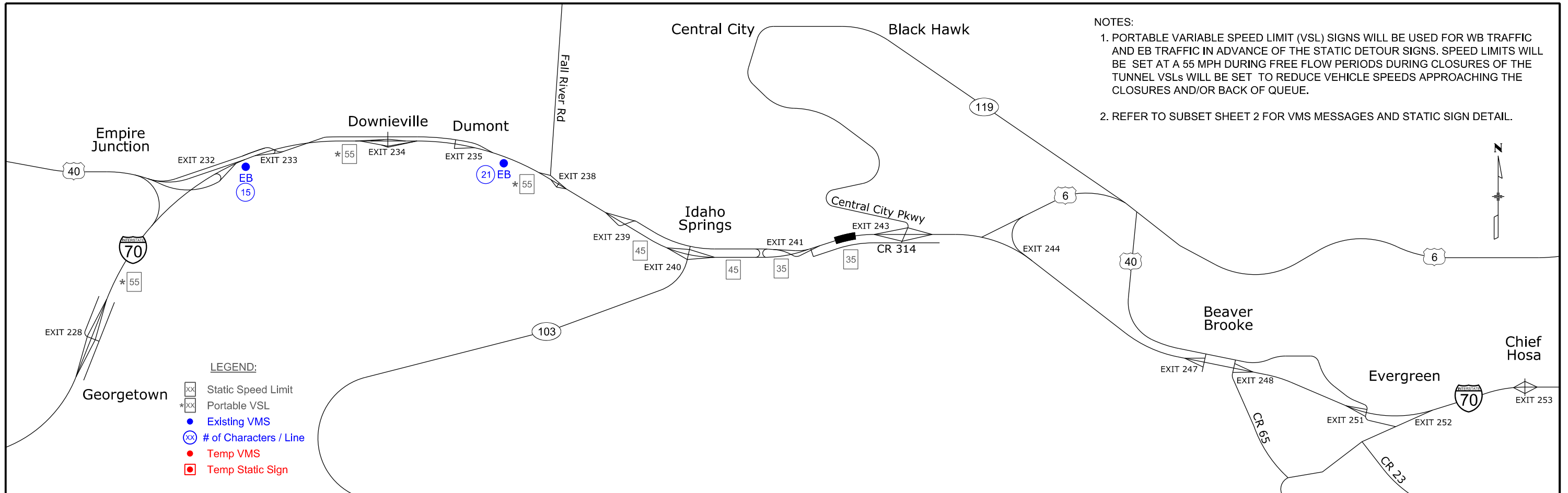
**EASTBOUND I-70 DETOUR  
 CONSTRUCTION PHASING PLAN  
 PHASE 3**

Designer:	E. Flagg	Structure Numbers	
Detailer:	B. Riley		
Subset:	Phasing	Subset Sheets: 23 of 34	

Project No./Code  
 IM 0703-390  
 19035  
 Sheet Number 186

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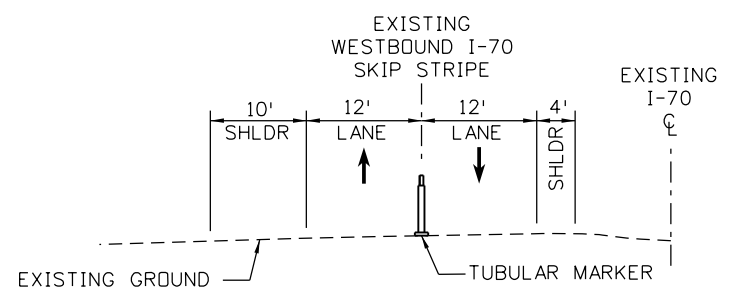
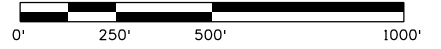




Print Date: 11/30/2012	<b>Sheet Revisions</b>			Colorado Department of Transportation 425 A Corporate Circle Golden, CO 80401 Phone: 720-497-6918 FAX: 720-497-6901	As Constructed No Revisions:	<b>TWIN TUNNELS DETOUR ADVANCED MESSAGING EXHIBIT</b>			Project No./Code	
File Name: 18832TRAF_CPIB_Adv Message Exhibit.dgn	Date:	Comments	Init.						IM 0703-390	
Horiz. Scale: 1:27525 Vert. Scale:				Region 1	Revised:	Designer: E. Flagg	Structure	19035		
<b>ATKINS</b> 4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276					CR	Void:	Detailer: B. Riley	Numbers	Sheet Number 187	
						Subset: Phasing	Subset Sheets: 24 of 34			

17543 9:12:50 AM c:\pw\_work\pbes\pbes\1\18832TRAF\_CPIB\_Adv Message Exhibit.dgn





TYPICAL SECTION  
WESTBOUND I-70 DETOUR  
USING EASTBOUND I-70

Print Date: 11/30/2012  
 File Name: 18832DES\_EB Tunnel Closure\_Key01.dgn  
 Horiz. Scale: 1:500 Vert. Scale: NA  
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Date:	Comments	Init.

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 Region 1 CRC

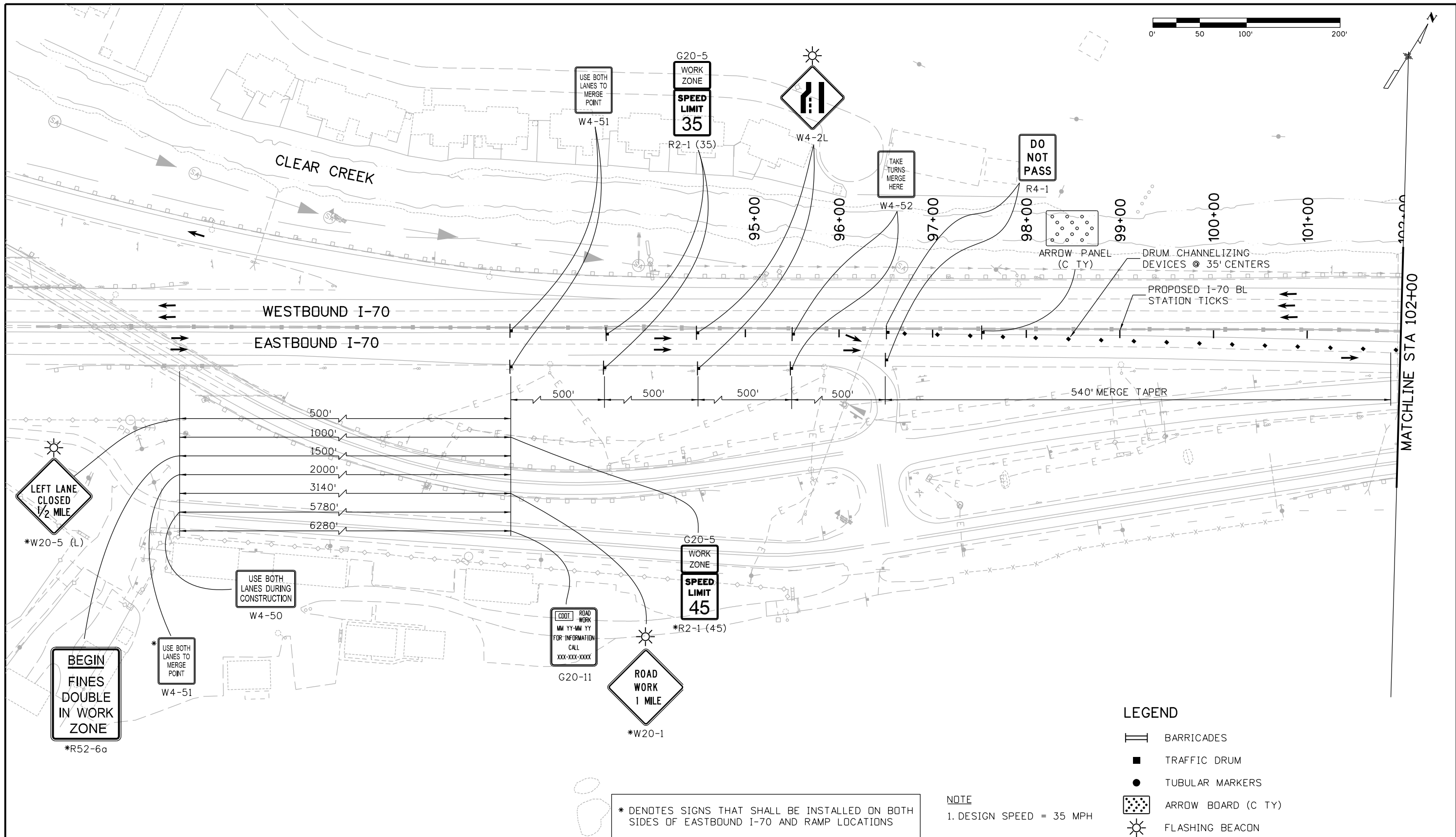
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 Revised:  
 Void:

**EASTBOUND NIGHTTIME  
 TUNNEL CLOSURE  
 KEY PLAN**  
 Designer: E. Flagg  
 Detailer: J. Gellner  
 Subset: Phasing  
 Structure Numbers  
 Subset Sheets: 26 of 34

Project No./Code  
 IM 0703-390  
 19035  
 Sheet Number 189

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**LEGEND**

- BARRICADES
- TRAFFIC DRUM
- TUBULAR MARKERS
- ARROW BOARD (C TY)
- FLASHING BEACON

NOTE  
1. DESIGN SPEED = 35 MPH

\* DENOTES SIGNS THAT SHALL BE INSTALLED ON BOTH SIDES OF EASTBOUND I-70 AND RAMP LOCATIONS

Print Date: 11/30/2012  
 File Name: 18832DES\_EB Tunnel Closure\_Plan001A.dgn  
 Horiz. Scale: 1:100 Vert. Scale: NA

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Sheet Revisions		
Date:	Comments	Init.

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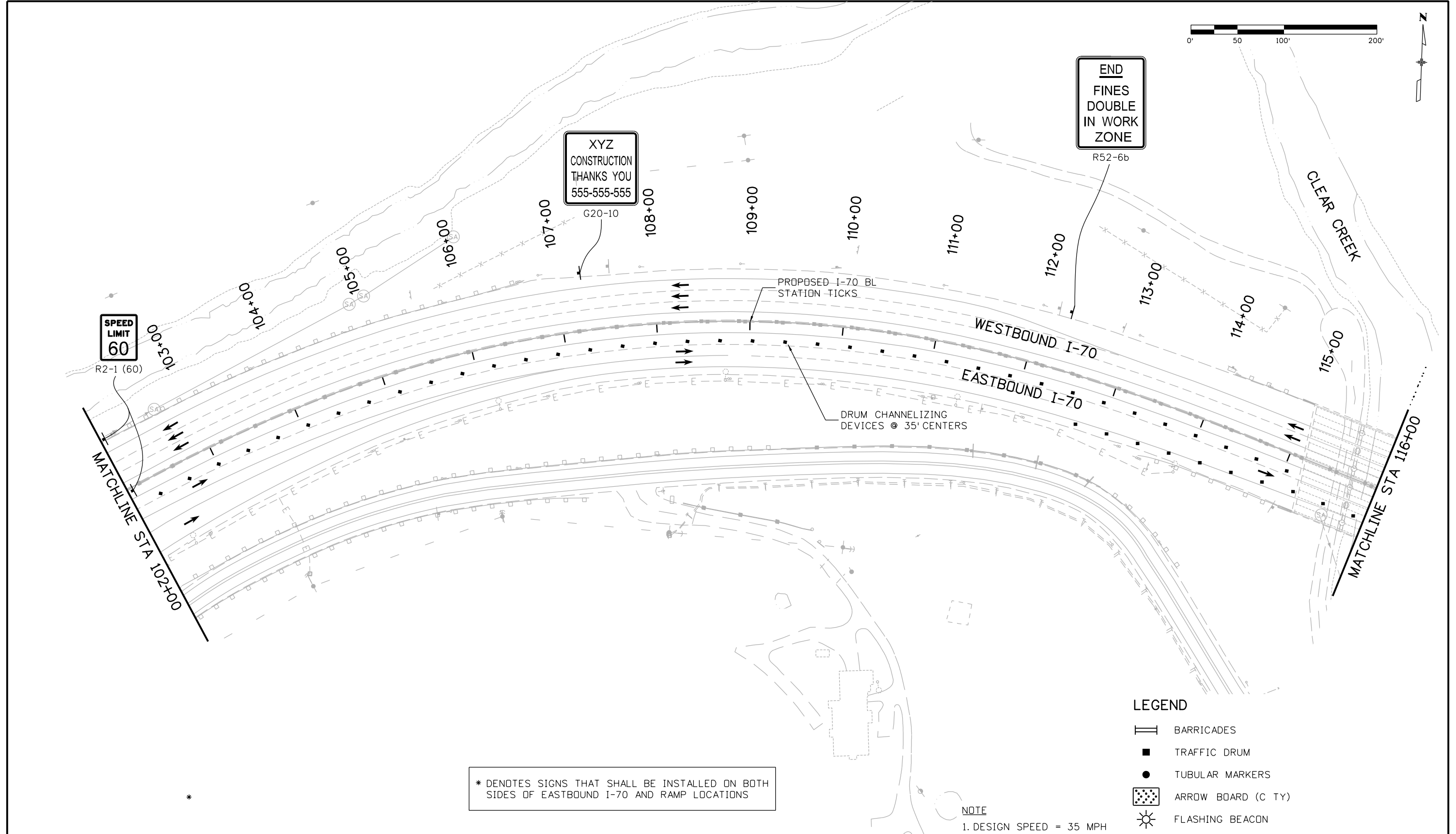
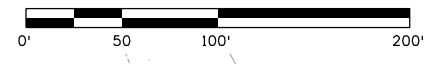
425 A Corporate Circle  
 Golden, CO 80401  
 Phone: 720-497-6918 FAX: 720-497-6901

Region 1 **CRC**

As Constructed	
No Revisions:	
Revised:	
Void:	

EASTBOUND NIGHTTIME TUNNEL CLOSURE TRAFFIC CONTROL PLAN			
Designer:	E. Flagg	Structure Numbers	
Detailer:	J. Gellner		
Subset:	Phasing	Subset Sheets: 27 of 34	

Project No./Code	IM 0703-390
	19035
Sheet Number	190



**SPEED LIMIT 60**

XYZ  
CONSTRUCTION  
THANKS YOU  
555-555-555

**END FINES DOUBLE IN WORK ZONE**

PROPOSED I-70 BL STATION-TICKS

DRUM CHANNELIZING DEVICES @ 35' CENTERS

MATCHLINE STA 102+00

MATCHLINE STA 116+00

**LEGEND**

- BARRICADES
- TRAFFIC DRUM
- TUBULAR MARKERS
- ARROW BOARD (C TY)
- FLASHING BEACON

\* DENOTES SIGNS THAT SHALL BE INSTALLED ON BOTH SIDES OF EASTBOUND I-70 AND RAMP LOCATIONS

NOTE  
1. DESIGN SPEED = 35 MPH

Print Date: 11/30/2012  
 File Name: 18832DES\_EB Tunnel Closure\_Plan001.dgn  
 Horiz. Scale: 1:100 Vert. Scale: NA

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 Phone: (303) 221-7275 Fax: (303) 221-7276

Sheet Revisions		
Date:	Comments	Init.

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Region 1 **CRC**

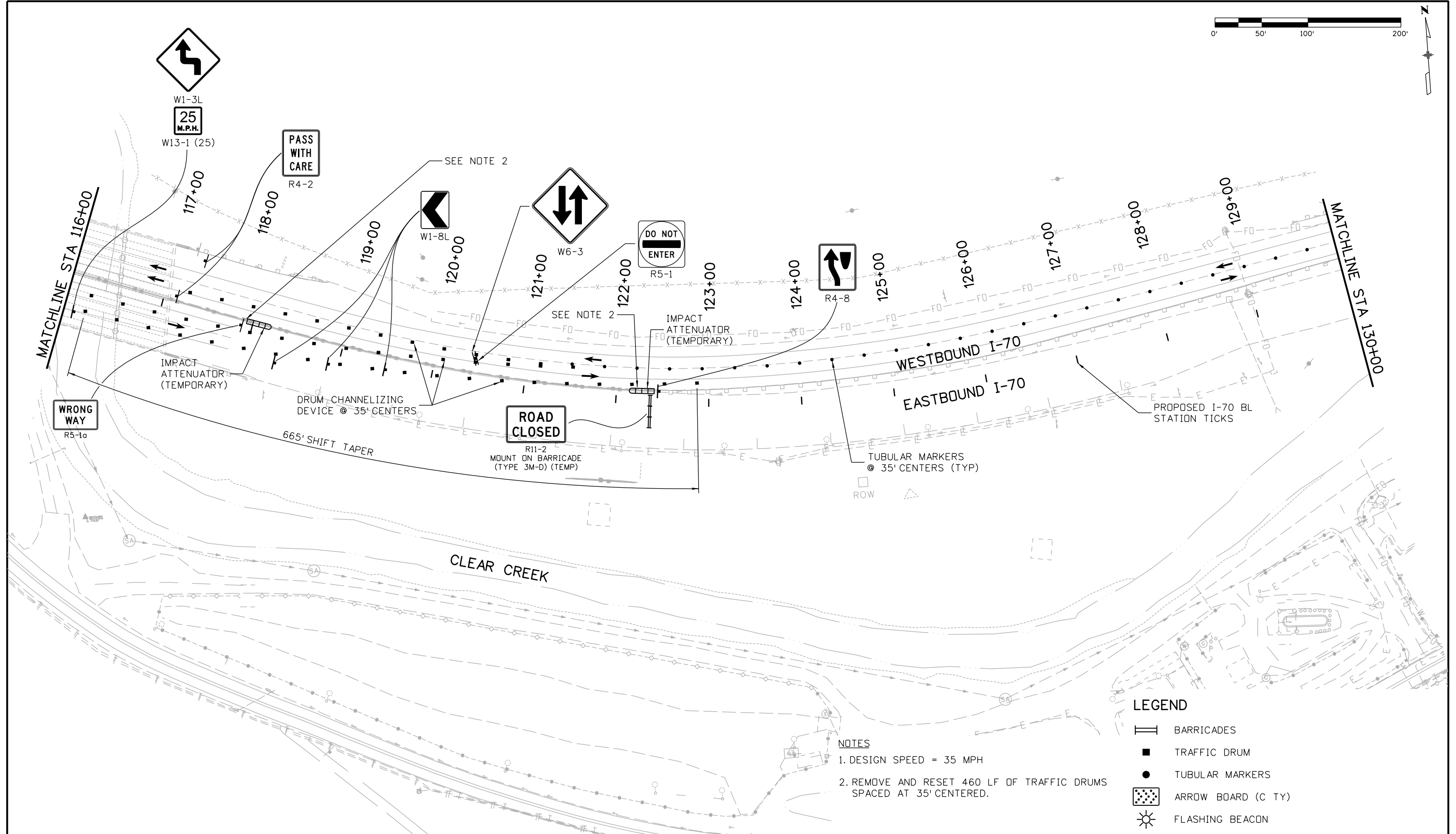
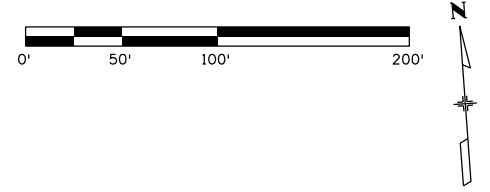
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No Revisions:
Revised:
Void:

<b>EASTBOUND NIGHTTIME TUNNEL CLOSURE TRAFFIC CONTROL PLAN</b>		
Designer:	E. Flagg	Structure Numbers
Detailer:	J. Gellner	
Subset:	Phasing	Subset Sheets: 28 of 34

<b>Project No./Code</b>
IM 0703-390
19035
Sheet Number 191

17543 9:13:32 AM c:\pw\work\pws\pwwork\common\dms25924\18832DES\_EB Tunnel Closure\_Plan001.dgn





- NOTES**
- DESIGN SPEED = 35 MPH
  - REMOVE AND RESET 460 LF OF TRAFFIC DRUMS SPACED AT 35' CENTERED.

- LEGEND**
- BARRICADES
  - TRAFFIC DRUM
  - TUBULAR MARKERS
  - ARROW BOARD (C TY)
  - FLASHING BEACON

Print Date: 11/30/2012  
 File Name: 18832DES\_EB Tunnel Closure\_Plan002.dgn  
 Horiz. Scale: 1:100 Vert. Scale: NA

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Sheet Revisions		
Date:	Comments	Init.

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 Phone: 720-497-6918 FAX: 720-497-6901

Region 1 CRC

**As Constructed**

No Revisions:  
 Revised:  
 Void:

**EASTBOUND NIGHTTIME TUNNEL CLOSURE TRAFFIC CONTROL PLAN**

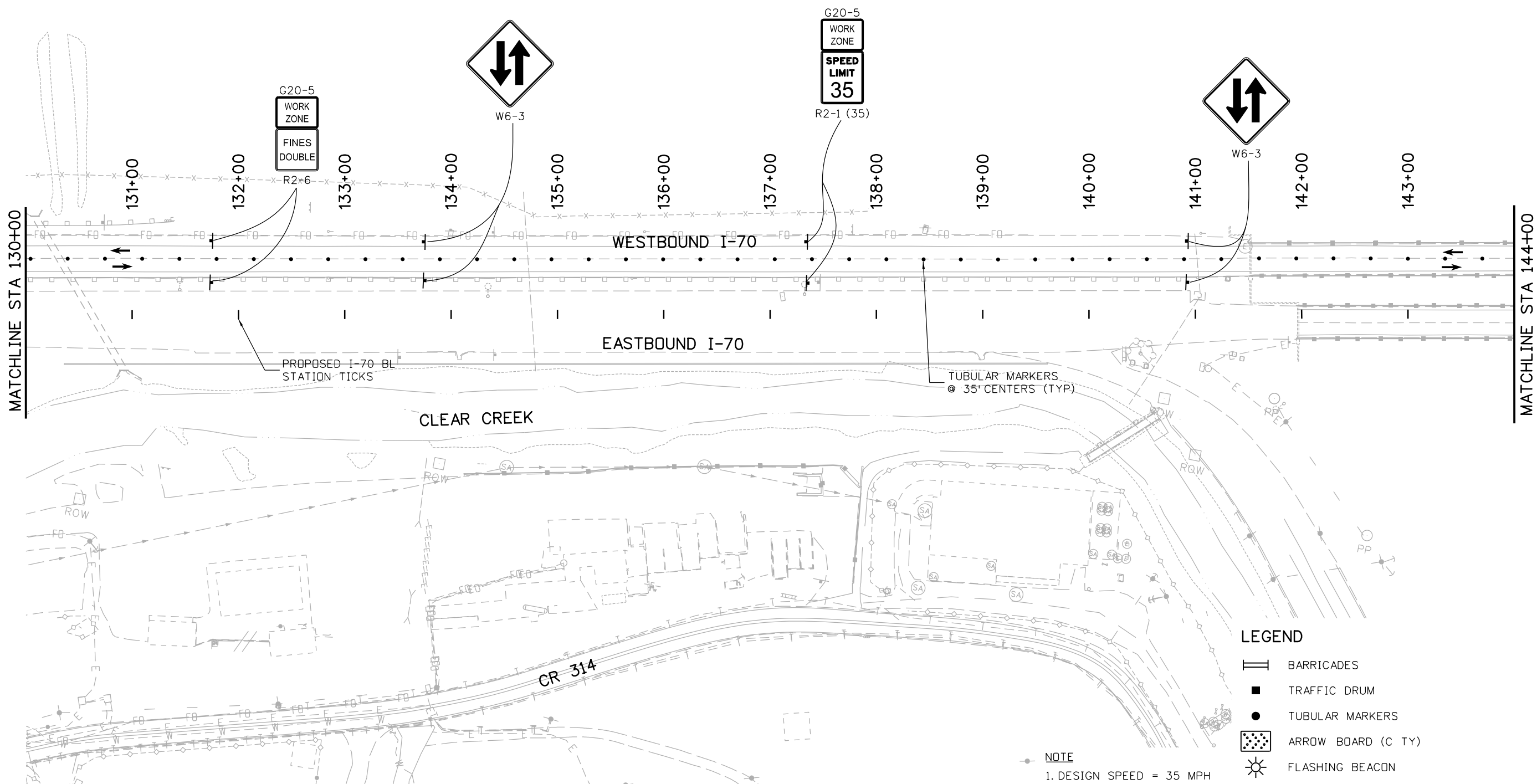
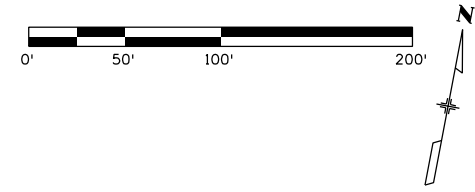
Designer: E. Flagg  
 Detailer: J. Gellner  
 Subset: Phasing

Structure Numbers  
 Subset Sheets: 29 of 34

**Project No./Code**

IM 0703-390  
 19035  
 Sheet Number 192

17543 9:13:41 AM c:\pw\work\pba\pba\18832DES\_EB Tunnel Closure\_Plan002.dgn



- LEGEND**
- BARRICADES
  - TRAFFIC DRUM
  - TUBULAR MARKERS
  - ARROW BOARD (C TY)
  - FLASHING BEACON


**NOTE**  
1. DESIGN SPEED = 35 MPH

Print Date: 11/30/2012  
 File Name: 18832DES\_EB Tunnel Closure\_Plan003.dgn  
 Horiz. Scale: 1:100      Vert. Scale: NA

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Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation



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Region 1 CRC

**As Constructed**

No Revisions:  
 Revised:  
 Void:

**EASTBOUND NIGHTTIME  
 TUNNEL CLOSURE  
 TRAFFIC CONTROL PLAN**

Designer: E. Flagg  
 Detailer: J. Gellner  
 Subset: Phasing

Structure Numbers  
 Subset Sheets: 30 of 34

**Project No./Code**

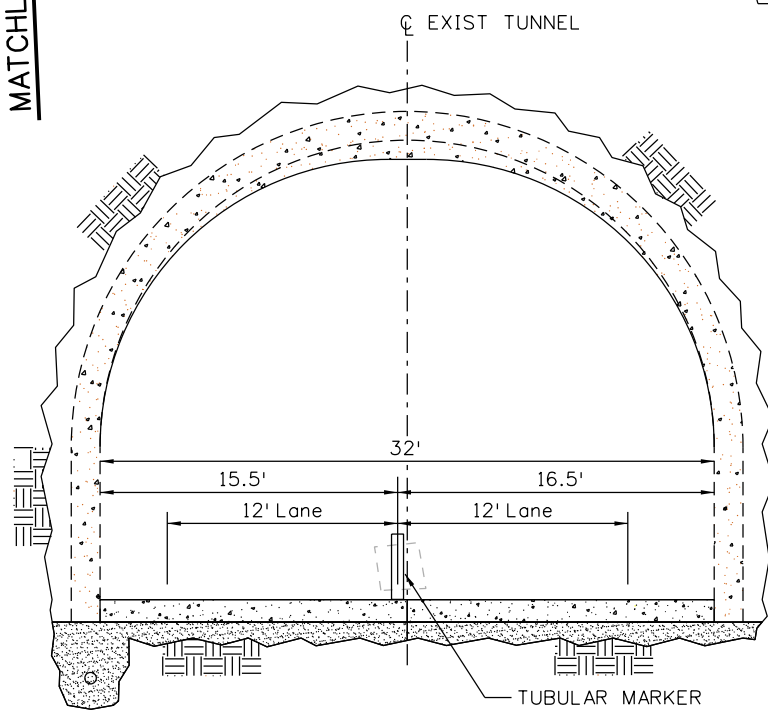
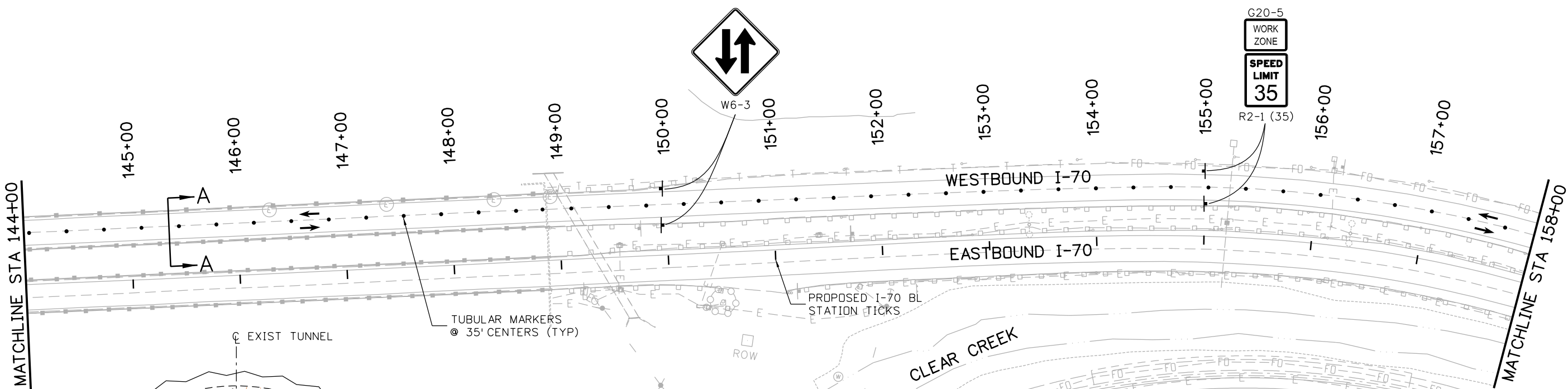
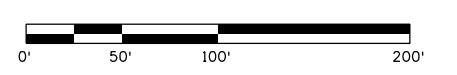
IM 0703-390

19035

Sheet Number 193

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**SECTION A-A (EXISTING WB TUNNEL)  
APPROXIMATE DIMENSIONS**

- LEGEND**
- BARRICADES
  - TRAFFIC DRUM
  - TUBULAR MARKERS
  - ARROW BOARD (C TY)
  - FLASHING BEACON

**NOTE**  
1. DESIGN SPEED = 35 MPH

Print Date: 11/30/2012  
 File Name: 18832DES\_EB Tunnel Closure\_Plan004.dgn  
 Horiz. Scale: 1:100      Vert. Scale:  
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 Phone: (303) 221-7275 Fax: (303) 221-7276

Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation  
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 Golden, CO 80401  
 Phone: 720-497-6918 FAX: 720-497-6901  
**Region 1** **CRC**

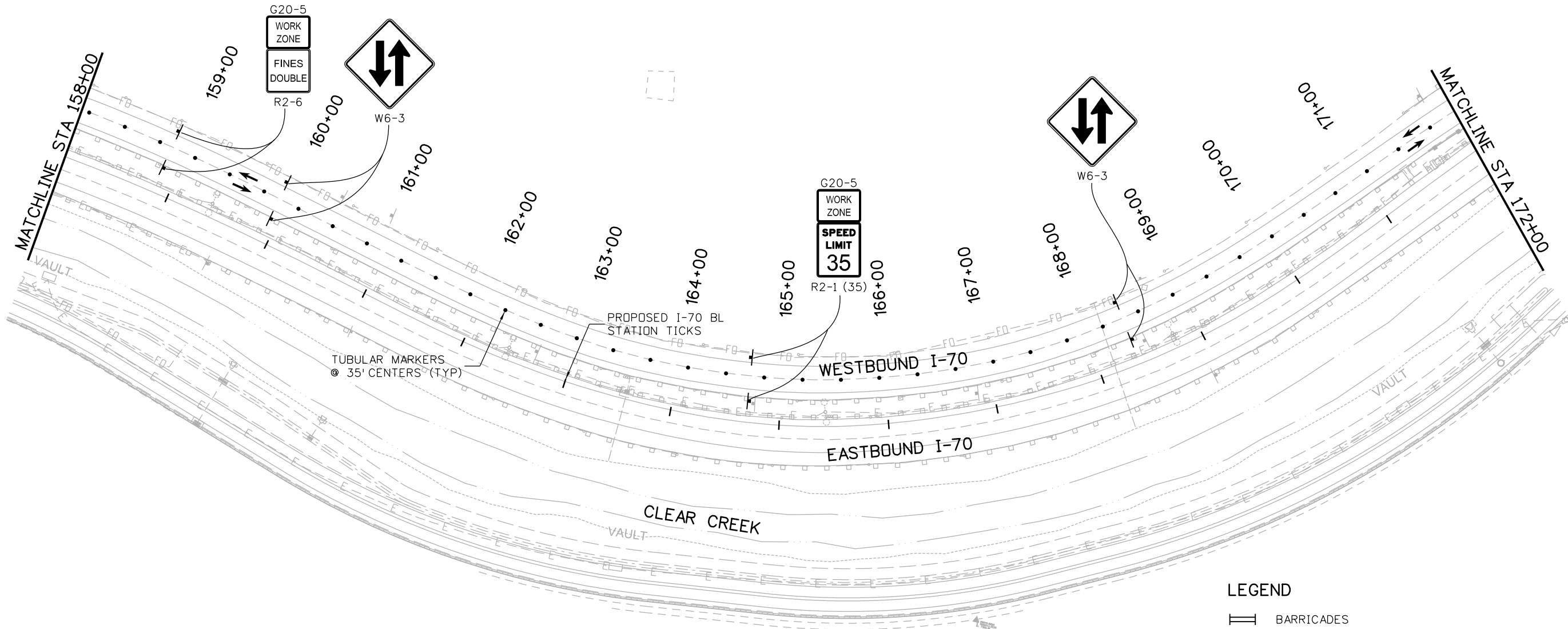
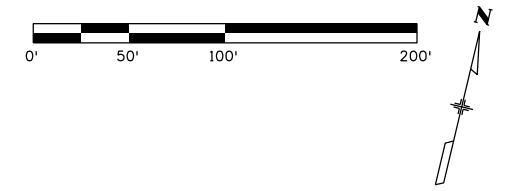
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**EASTBOUND NIGHTTIME  
TUNNEL CLOSURE  
TRAFFIC CONTROL PLAN**

Designer:	E. Flagg	Structure Numbers	
Detailer:	J. Gellner		
Subset:	Phasing	Subset Sheets: 31	of 34

**Project No./Code**  
 IM 0703-390  
 19035  
 Sheet Number 194


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Print Date: 11/30/2012  
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 Phone: (303) 221-7275 Fax: (303) 221-7276

Sheet Revisions		
Date:	Comments	Init.

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 Golden, CO 80401  
 Phone: 720-497-6918 FAX: 720-497-6901  
 Region 1      CRC

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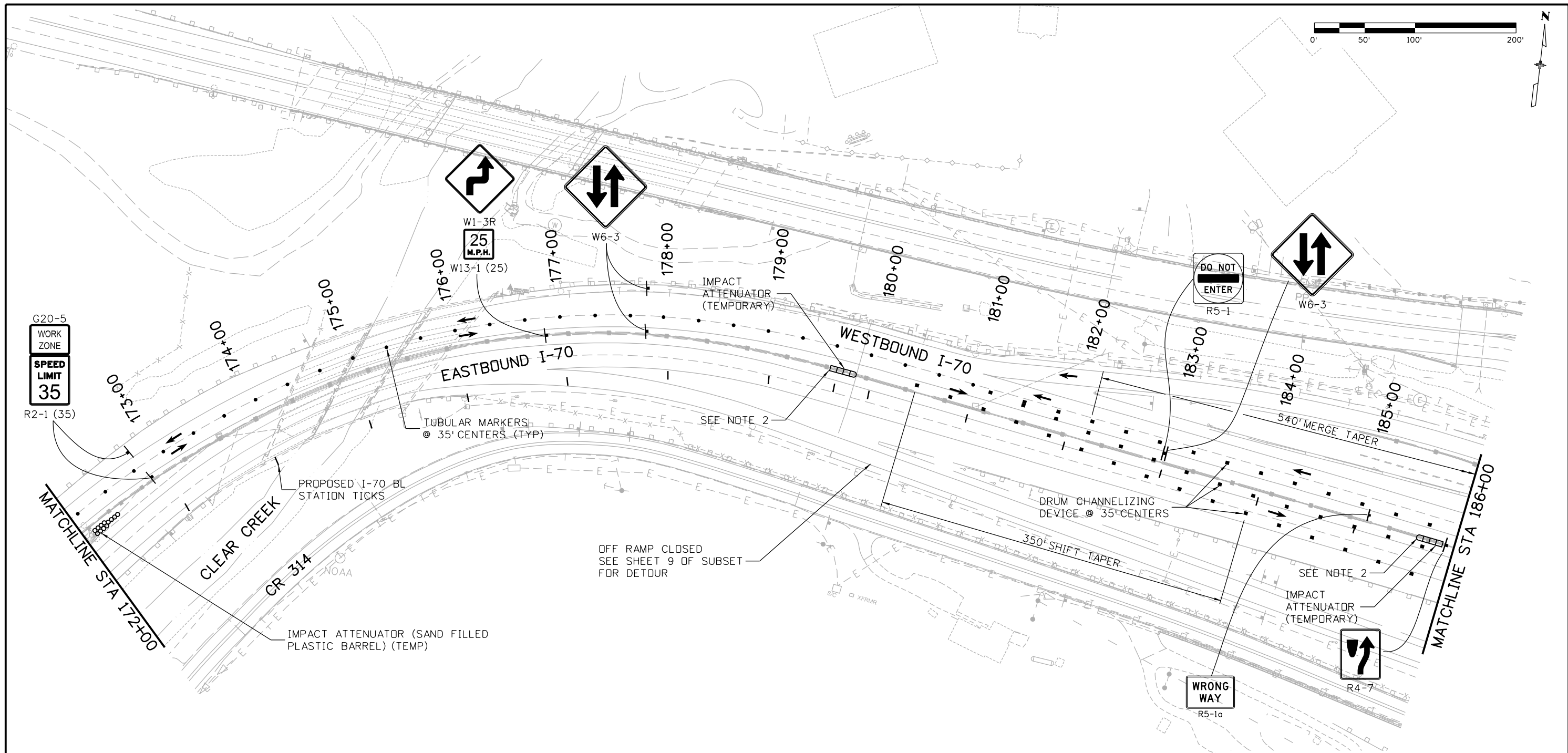
**EASTBOUND NIGHTTIME  
 TUNNEL CLOSURE  
 TRAFFIC CONTROL PLAN**

Designer: E. Flagg  
 Detailer: J. Gellner  
 Subset: Phasing

Structure Numbers  
 Subset Sheets: 32 of 34

Project No./Code  
 IM 0703-390  
 19035  
 Sheet Number 195

17543 9:14:21 AM c:\pw\work\pba\pba\common\dms25924\18832DES\_EB Tunnel Closure\_Plan006.dgn



**LEGEND**

	BARRICADES
	TRAFFIC DRUM
	TUBULAR MARKERS
	ARROW BOARD (C TY)
	FLASHING BEACON

- NOTES**
- DESIGN SPEED = 35 MPH
  - REMOVE AND RESET 614 LF OF TRAFFIC DRUMS SPACED AT 35' CENTERED.

Print Date: 11/30/2012  
 File Name: 18832DES\_EB Tunnel Closure\_Plan006.dgn  
 Horiz. Scale: 1:100 Vert. Scale:  
**ATKINS** 4601 DTC Boulevard, Suite 700  
 Denver, CO 80237  
 Phone: (303) 221-7275 Fax: (303) 221-7276

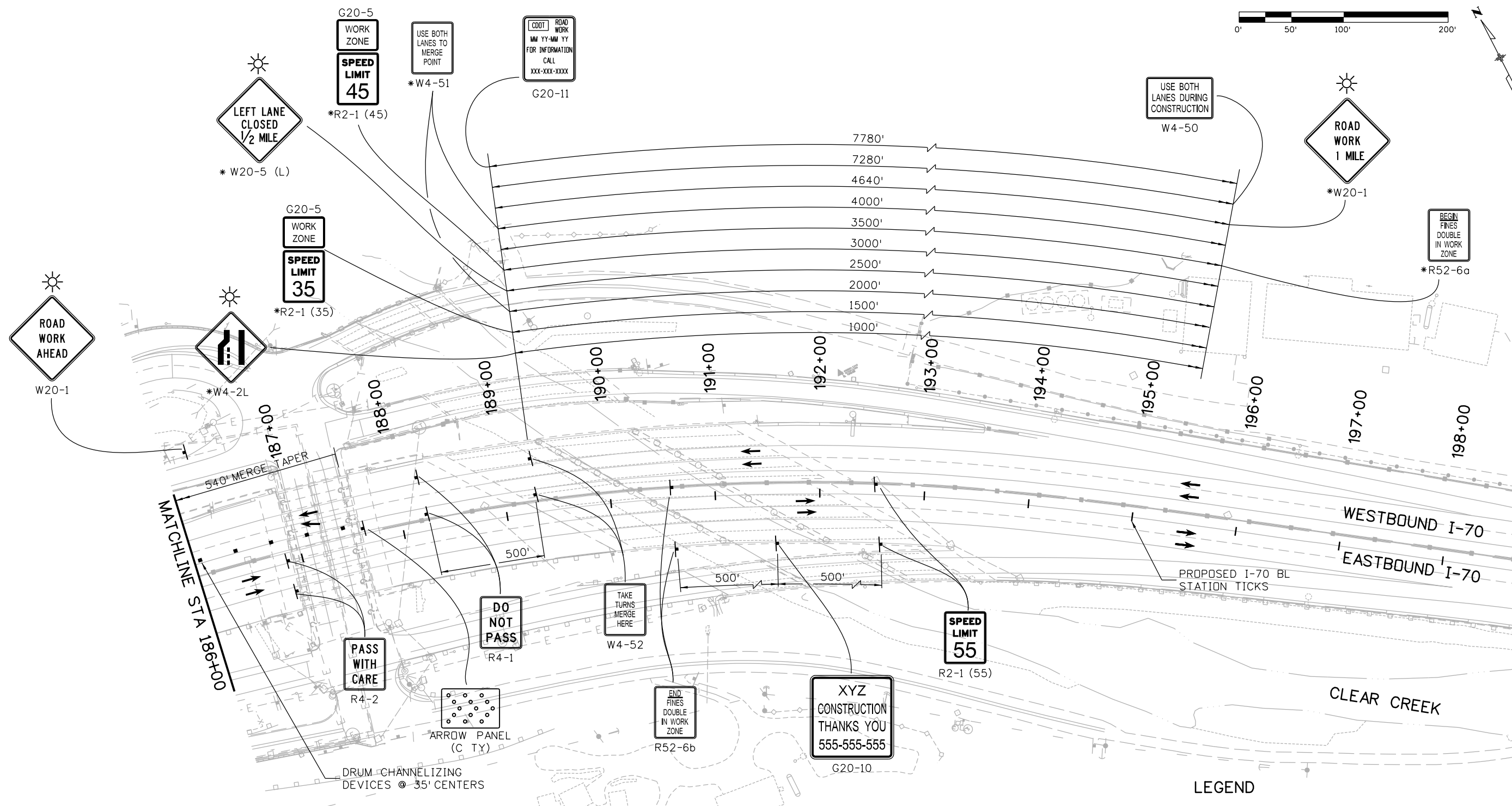
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Colorado Department of Transportation  
  
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 Phone: 720-497-6918 FAX: 720-497-6901  
**Region 1** **CRC**

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No Revisions:
Revised:
Void:

<b>EASTBOUND NIGHTTIME TUNNEL CLOSURE TRAFFIC CONTROL PLAN</b>			
Designer:	E. Flagg	Structure Numbers	
Detailer:	J. Gellner		
Subset:	Phasing	Subset Sheets: 33 of 34	

<b>Project No./Code</b>
IM 0703-390
19035
Sheet Number 196



**LEGEND**

	BARRICADES
	TRAFFIC DRUM
	TUBULAR MARKERS
	ARROW BOARD (C TY)
	FLASHING BEACON

\* DENOTES SIGNS THAT SHALL BE INSTALLED ON BOTH SIDES OF WESTBOUND I-70 AND RAMP LOCATIONS

**NOTE**  
1. DESIGN SPEED = 35 MPH

Print Date: 11/30/2012  
 File Name: 18832DES\_EB Tunnel Closure\_Plan007.dgn  
 Horiz. Scale: 1:100 Vert. Scale:  
**ATKINS** 4601 DTC Boulevard, Suite 700  
 Denver, CO 80237  
 Phone: (303) 221-7275 Fax: (303) 221-7276

Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation  
  
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 Golden, CO 80401  
 Phone: 720-497-6900 FAX: 720-497-6901  
 Region 1 CRC

**As Constructed**  
 No Revisions:  
 Revised:  
 Void:

**EASTBOUND NIGHTTIME TUNNEL CLOSURE TRAFFIC CONTROL PLAN**  
 Designer: E. Flagg  
 Detailer: J. Gellner  
 Subset: Phasing  
 Structure Numbers  
 Subset Sheets: 34 of 34

**Project No./Code**  
 IM 0703-390  
 19035  
 Sheet Number 197

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**1. SITE DESCRIPTION**

For Information Only to fulfill the CDPS-SCP (Colorado Discharge Permit System - Stormwater Construction Permit) Update to reflect current project site conditions.

**A. OVERALL PROJECT SITE DESCRIPTION:**

This project will include widening of the eastbound tunnel and highway to three lanes, curve flattening for enhanced mobility operations and safety between Idaho Springs and Floyd Hill.

Construction will include blasting, jack hammering, excavation, grading, paving, wall and bridge construction, drainage improvements, signing and striping and site stabilization. This project includes widening the eastbound tunnel and replacing the existing Clear Creek Bridge at MP 242.8. The bridge has been designed to span the 100-year floodplain. Onsite drainage will be collected and treated in new special type D water quality inlets or water quality ponds that are being constructed along the roadway. Drainage systems within the eastbound roadway will be improved. Riprap will be placed at stormwater outfalls. Grading activities will include grading between the widened roadway and Clear Creek, water quality basins, and widening the shoulder to provide a paved chain up area. Electrical, telephone and cable utilities will be relocated to accommodate the proposed improvements. Median lighting will be removed and replaced with this project as well as power feed for the new chain station lighting.

A detour and phased construction will be necessary to complete the tunnel and highway widening and bridge replacement. This work includes temporary drainage facilities and temporary grading, paving and application of concrete barrier rail.

This Storm Water Management Plan (SWMP) covers construction best management practices (BMPs) associated with the overall Twin Tunnels project and provides quantities and details for construction package 1A. The anticipated construction packages for the Twin Tunnels project are outlined below. As each construction package is developed, the SWMP will be updated.

**Construction Package 1A**

- Detour paving (I-70 median west of tunnel, Detour Route (west of tunnel to CR 314 to "no-work area")
- Temporary concrete barrier for shared use path on detour route along CR 314
- Wall A
- Drainage system associated with Wall A
- Removal of existing high mast light adjacent to west portal
- Temporary lighting and resets on I-70
- Temporary wildlife fencing
- Removal of Automatic Traffic Recorder and installation portable ATR
- Power installation for air quality monitors
- Traffic control for I-70 median detour paving (traffic shifts, lane closures)
- Temporary stormwater erosion control
- Lab trailer and electrical setup
- Public Information Program

**Construction Package 1B**

- Pillar stabilization (rock bolts and grouting)
- Pre-installed arch dowels (16' bolts)
- Portal establishment (anything not done in Pkg 1A) (excavation, soil nails, shotcrete, etc.)
- Doghouse Rail Bridge rehabilitation
- East detour cross-over to EB I-70
- CR 314 detour construction (barrier, signing, striping)
- Retaining walls F, FF, and K
- Drainage system associated with retaining walls
- New bridge over Clear Creek at Hidden Valley (HV)
- Portions of EB I-70 between bridge and HV.
- Traffic control for CR 314 detour, lane closures
- Temporary stormwater erosion control
- Portal-to-portal access road (LS bid item, quantities FYI only; specs cover sealing)
- Creek crossing
- Tunnel liner form
- Public Information Program

**Construction Package 2**

- Tunnel construction (excavation, lining, paving, barrier, drainage, lighting, signing, striping)
- Portal construction
- Retaining walls C, D, G, and L
- Temp barrier along HV off-ramp
- Remainder of drainage system
- Chain station reconstruction (removal, earthwork, paving, lighting)
- Paving
- Signing
- Striping
- Installation/relocation of permanent ITS components (tolling equip, side fire radars, cameras, relocated ATR)
- Permanent wildlife fencing on WB I-70 at west portal
- Removal of portal-to-portal access road
- Remove detour paving in median west of tunnel
- Install guardrail in median west of tunnel

- Traffic control for CR 314 detour, blasting stoppages, lane closures
- Temporary erosion control stabilization
- Temporary stormwater erosion control
- Public Information Program

**Construction Package 3A**

- Wall J
- Noise barrier
- CR 314 retaining wall fascia
- Deconstruct detour on Old US 40/CR 314 (remove barrier, signing, lighting, striping, etc.)
- Final work on CR 314 to re-open to traffic
- Riparian area reconstruction
- Permanent seeding
- Any landscaping selected
- Any enhancements selected
- Temporary stormwater erosion control
- Traffic control for lane closures on I-70 and CR 314 as necessary
- Public Information Program

**Construction Package 3B**

- Old US 40/game check area reclamation and trailhead improvements
- Any enhancements selected
- Temporary stormwater erosion control
- Traffic control as necessary
- Public Information Program

**B. PROPOSED SEQUENCING FOR MAJOR ACTIVITIES:**

**Package 1A**

1. Construct the detour along Old US 40 and CR 314 including temporary drainage improvements and temporary paving, new ditch, and temporary concrete barrier.
2. Construct temporary construction phasing along I-70 median, shifting traffic into the median west of the tunnel including grading, temporary paving, a temporary drainage ditch and an inlet extension.
3. Construction of Wall A including excavation wall construction, backfill and paving.
4. Installation of drainage system concurrent with construction of Wall A, including storm sewer replacement including segment through Wall A, water quality inlet and outlet riprap installation.
5. Sign relocation in area of Wall A.

**Package 1B**

**Bridge Construction**

1. Excavation/construction of bridge Wall FF alternating with construction of Wall K
2. Excavation of bridge abutment & construction of access road to Pier 3
3. Installation/Removal of Temporary Stream Crossing for access to Pier 2
4. Substructure construction of Pier 2 & 3
5. Pier 3 Column Construction
6. Pier 3 Falsework Construction
7. Micropile & abutment construction of Abutment 4
8. Excavation and construction of Wall F
9. Grading/Paving/Striping of I-70 Detour East Tie-In
10. Package 2 – I-70 Detour Traffic Switch
11. Remaining Superstructure Bridge Construction
12. Approach slab construction
13. I-70 Tie-In to Existing


**Portal to Portal Access Road (beginning at same time as bridge construction)**

1. Clear & Grub of Existing Vegetation
2. Protection of Existing leach field
3. Protection of existing house
4. MSE Fill Wall Construction

**West Portal Slope Excavation (beginning at same time as bridge construction)**

**C. ACRES OF DISTURBANCE:**

1. Total Limits of Disturbance: 42.7 acres
2. Total Permanent Disturbance: 22.08 acres
3. Acreage of seeding: 0.5 acres

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4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276		Region 1      CRC						Designer: J. Hollon Detailer: J. Gellner Subset: SWMPNOTE		Structure Numbers Subset Sheets: 1 of 5		

**D. EXISTING SOIL DATA:**

Soil types for the project area have been determined using the Natural Resources Conservation Service (NRCS) Soil Survey for Clear Creek County. Based on NRCS, the soils in the vicinity of the tunnel are part of the Cathedral-Resort Rock outcrop complex, soil groups. This soil is classified as a Type D soil group.

Type D soils have a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

**E. EXISTING VEGETATION, INCLUDING PERCENT COVER:**

The majority of the project area consists of existing I-70 pavement, existing paved and vegetated median, rock fill slopes along Clear Creek, existing pavement along Old US 40 and existing CR 314 pavement. Vegetated areas are limited to portions of the I-70 median, adjacent area to CR 314 and adjacent area to Old US 40. The majority of the existing vegetation is native grass with some small trees and bushes adjacent to Old US 40 and CR 314. The estimated vegetation cover for the I-70 mainlines is approximately 15 percent while the estimated vegetation cover for the detour is approximately 10 percent.

**F. POTENTIAL POLLUTANTS SOURCES:**

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: See SWMP site maps for locations.
2. Names of receiving water(s) on site and the ultimate receiving water: Clear Creek is the ultimate receiving water on site.
3. Distance ultimate receiving water is from project: Clear Creek is immediately adjacent to the project.

**H. ALLOWABLE NON-STORMWATER DISCHARGES:**

Concrete washout, saw cutting and dewatering are anticipated on the project.

1. Groundwater and stormwater dewatering: Discharges to the ground of water from construction dewatering activities may be authorized provided that:
  - a. the source is groundwater and/or groundwater combined with stormwater that does not contain pollutants
  - b. the source and BMPs are identified in the SWMP
  - c. discharges do not leave the site as surface runoff or to surface waters.
2. If discharges do not meet the above criteria a separate permit from the Department of Health will be required. Contaminated groundwater requiring coverage under a separate permit may include groundwater contaminated with pollutants from a landfill, mining activities, industrial pollutant plumes, underground storage tank, etc.
1. **ENVIRONMENTAL IMPACTS:**
  1. Wetland Impacts: **YES** NO; Temporary impacts of approximately 0.03 acres (EA, July 2012)
  2. Stream Impacts: **YES** NO; Temporary impacts associated with bridge replacement and retaining wall construction. Approximately 0.11 to 0.16 acres within the 2-year floodplain (EA, July 2012)
  3. Threatened and Endangered Species: None anticipated on this project.

**2. SITE MAP COMPONENTS:**

Pre-construction

- A. **PROJECT CONSTRUCTION POTENTIAL SITE BOUNDARIES:** See SWMP site maps.
- B. **ALL AREAS OF GROUND SURFACE DISTURBANCE:** See SWMP site maps.
- C. **AREAS OF CUT AND FILL:** See SWMP site maps.
- D. **LOCATION OF ALL STRUCTURAL BMPs IDENTIFIED IN THE SWMP:** See SWMP site maps.
- E. **LOCATION OF NON-STRUCTURAL BMPs AS APPLICABLE IN THE SWMP:** Location of the following to be located by the Erosion Control Supervisor (ECS): Material management, material usage, spill prevention and control, sanitary and septic waste management, liquid waste management, hazardous waste management, vehicle and equipment management, concrete washout structure.
- F. **SPRINGS, STREAMS, WETLANDS AND OTHER SURFACE WATER:** See SWMP site maps.
- G. **PROTECTION OF TREES, SHRUBS, CULTURAL RESOURCES AND MATURE VEGETATION:** See SWMP site maps.
- H. **AREAS USED FOR STORING AND STOCKPILING OF MATERIALS, STAGING AREAS (field trailer, fueling, etc) and BATCH PLANTS:** To be determined by ESC.

\*ECS to revise site maps in accordance to 208.03

**3. SWMP ADMINSTRATOR FOR DESIGN:**

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**4. STORMWATER MANAGEMENT CONTROLS FIRST CONSTRUCTION ACTIVITIES**

THE CONTRACTOR SHALL PERFORM THE FOLLOWING:

**A. DESIGNATE A SWMP ADMINISTRATOR/EROSION CONTROL SUPERVISOR**

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

Name/Title: \_\_\_\_\_ Contact information: \_\_\_\_\_

**B. POTENTIAL POLLUTANT SOURCES**

Evaluate, identify and describe all potential sources of pollutants at the site in accordance with 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: "BMP as Designed" boxes are marked when used in the SWMP. During construction: the ECS shall update the narratives, include new narratives and update the "In use on site" boxes to match which BMPs are currently in use on site. Clearly describe the relationship between the phases of construction and the implementation of BMP controls.




STRUCTURAL BMPs that may be potentially used on the project for erosion and sediment control; practices may include, but are not limited to:

BMP	Type of Control	In Use On Site	BMP As Designed	1A	1B	2	3	4
Earth Berm/Diversion	erosion							
* Check Dams	Sediment			X				
Erosion Logs	sediment			X	X			
Permanent Sediment Trap/Basin (used as temporary BMP)	sediment							
Embankment Protector	erosion							
Outlet Protection	erosion			X	X			
Concrete Washouts	construction			X	X			
Vehicle Tracking Pad	construction			X	X			
Dewatering	sediment				X			
Temporary Stream Crossing	erosion				X			
Other								

NON-STRUCTURAL BMPs that may be potentially used on the project for erosion and sediment control; practices may include, but are not limited to:

BMP	Type of Control	In Use On Site	BMP As Designed	Final Stabilized 1A	Final Stabilized 1B	Final Stabilized 2	Final Stabilized 3	Final Stabilized 4
Surface Roughening/Grading Techniques	erosion			X	X			
Seeding Permanent	erosion			X	X			
Mulch/Mulch Tackifier	erosion				X			
Soil Binder	erosion			X	X			
Soil Retention Blanket	erosion							
Turf Reinforcement Mat	erosion							
Vegetative Buffer Strips	erosion			X	X			
Protection of Trees	erosion			X	X			
Preservation of Mature Vegetation	erosion			X	X			
Spray-on Mulch Blanket	erosion							
Scheduling	construction							
SwEEPing	erosion							
Vehicle & Equipment Cleaning	construction							

\*Check dams may be rock, erosion logs, silt dike, silt berm, etc. as indicated in the narratives and SWMP site map.

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Erosion control devices are used to limit the amount of soil loss on site.  
 Sediment control devices are designed to capture sediment on the project site.  
 Construction control are BMPs related to construction access and staging.  
 BMP locations are indicated on the SWMP site map.

**NARRATIVES**

**CONCRETE WASHOUT STRUCTURE**

Concrete washout structure may include excavation with erosion bales or fabricated concrete washout structure in accordance with subsection 208.20(k) placed on the pavement within the lane closure area. Concrete washout will be used for cleaning operations associated with concrete construction activities. Contaminated water within concrete washout structure will be properly disposed of by contractor off site and will not enter any receiving waters.

**TOPSOIL/WINDROW**

Prior to slope and/or embankment work commencing, existing topsoil and vegetation shall be scraped to a depth of 4", this topsoil/vegetation shall then be placed in windrows at the toe of slope for the duration of work. Upon completion of slope and/or embankment work the windrowed topsoil shall then be evenly distributed over completed slope to a depth of 4" prior to the application of fertilizer, soil conditioning and native seeding. The cost of this work shall be Included in Item-Topsoil.

**ERIOSION LOGS**

Erosion logs are used to capture and filter sediment laden run-off from disturbed areas during construction.

Inlet/outlet protection - shall be placed at existing inlets as shown in the plans and where disturbance may be occurring adjacent to pipe and cause sediment laden water to enter pipe. Logs shall be placed prior to work commencing at these locations to filter sediment laden water from entering pipe. 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 in to pipe or ditch.

Ditch checks/stabilization of ditches - logs 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, (completed ditch is one that is acting as a conduit for water) Ditches not directed to have riprap placed shall be permanently stabilized with 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 ditch, mulch and mulch tackifier shall be replaced by a blanket (straw/coconut) as a temporary measure. Once seeding can occur blanket shall be removed and disposed of; new BMPs (logs, blanket or mulch/mulch tackifier) shall be placed.

Toes of Slopes - logs are to be placed prior to work commencing for toes of slope locations. Logs shall be placed on the contour with ends of logs j-hooked to prevent water from running around the ends causing erosion.

**GRAVEL BAG DITCH CHECKS/STABILIZATION OF DITCHES**

Gravel bags 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, (completed ditch is one that is acting as a conduit for water) or in existing ditch lines to prevent the transport of sediment from adjacent work areas. Gravel bag ditch checks shall be installed according to Standard plan M-208-1 (erosion log ditch installation) in which the gravel bag ditch check shall have a low point in the center.

**GRAVEL BAG INLET/OUTLET PROTECTION**

Gravel bags shall be placed at existing inlets as shown in the plans and where disturbance may be occurring adjacent to pipe and cause sediment laden water to enter pipe. Gravel bags shall be placed prior to work commencing at these locations to filter sediment laden runoff. Gravel bag inlet/outlet protection shall be installed according to Standard Plan M-208-1 (culvert erosion log installation) in which gravel bags 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 in to pipe or ditch. Gravel bags shall be used at Type C inlets when surrounded by paving and erosion logs cannot be staked in. Bags shall be used at culvert pipes where erosion logs cannot be installed correctly as trenching/staking is not possible due to limited space or hard surfaces. See plan sheets for locations.

**GRAVEL BAG INLET PROTECTION**

Gravel bags shall be used at Type C/D inlets when surrounded and erosion logs cannot be staked in. Gravel bags shall be placed prior to work commencing at these locations to filter sediment laden runoff. Gravel bag inlet protection shall be shall be installed according to Standard Plan M-208-1 (Gravel bag filter at drop inlet). See plan sheets for locations.

**SPRAY-ON MULCH BLANKET**

Spray-on mulch blanket is used to stabilize erodible stockpiles that may be in place for an extended period of time or may be used in lieu of mulch/mulch tackifier or blanket in seeding operations. Spray-on mulch blanket shall not be used in areas of concentrated flows (i.e. ditch lines). Spray-on mulch blanket can be used in small disturbed areas requiring seeding when crimping of mulch will be difficult.

**CREEK PROTECTION/TOE OF SLOPE BMP**

Prior to work commencing along creek for fill-wall construction, BMPs shall be placed at toe of existing slope to protect creek from sediment and debris entering the water. BMPs shall be removed immediately upon completion of work in that area. BMP selection in the specific construction areas shall be determined by existing conditions and as directed by Engineer. BMPs may be erosion logs (20 Inch), sheet pile, temporary berm/rock berm, etc. Creek protection shall be placed in areas directed by the Erosion Control Supervisor, as approved by the Engineer. BMP locations shall be added to the site map with a specific narrative as to why they are being used at that location.

**ROCK CHECKS/CHECK DAMS**

Checks are used to capture and filter sediment laden run-off from disturbed areas during construction.

Rock ditch checks - Using rock available on site, checks 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, (completed ditch is one that is acting as a conduit for water); or in ditches that are acting as a conduit for water even if not completed. When seeding cannot occur due to seasonal constraints mulch/mulch tackifier shall be placed along with checks at intervals specified. If erosion occurs in ditch, mulch and mulch tackifier shall be replaced by a blanket (straw/coconut) as a temporary measure. Once seeding can occur blanket shall be removed and disposed of; new BMPs (logs, blanket or mulch/mulch tackifier) shall be placed. Rock checks shall be paid for by 203 Combination Loader hours, or as directed.

**TEMPORARY ROCK BERM**

Berms shall be made of rock available on site. Berms may be used as temporary toe of slope protection for work above the creek or as directed. The rock berms shall be installed prior to any work commencing on slope above. Berms are a temporary feature that may be used to slow runoff and prevent sediment and debris from reaching creek. They shall be removed once permanent seeding has taken place. Rock berms shall be paid for by 203 Combination Loader hours, or as directed. Berms shall be placed in areas directed by the Erosion Control Supervisor, as approved by the Engineer. Berm locations shall be added to the site map with a specific narrative as to why they are being used at that location.

**DEWATERING**

Dewatering may be required on the project. Dewatering shall be done in such a manner as to prevent potential pollutants from entering state waters. The Contractor is responsible for obtaining a permit from Colorado Department of Health and Environment. The ECS shall add the permit to the SWMP notebook. The ECS shall add dewatering BMP locations and applicable narrative to the SWMP site maps/SWMP notebook.

**SEEPS**

There is a potential for seeps to be found during excavation of the hillside. Seeps that are located on the project shall have their locations added to the SWMP site maps. Water from seeps shall be directed/diverted through undisturbed portions of the project. If seep water is allowed to enter disturbed areas a dewatering permit may be needed from the Colorado Department of Health and Environment if conditions of 1.H cannot be met.

**TEMPORARY BERM**

Temporary berms shall be made of compacted soil. Berm ends shall be j-hooked to prevent water from running around the ends, causing sediment laden water to exit off the project site. Where this is not possible, outfall areas at ends of berms shall have sediment control devices in place to prevent erosion occurring or be directed into a sediment trap or slope drain. Berms area a temporary feature and shall be removed once permanent seeding has taken place. Berms shall be paid for by Dozing hours, or as directed. Berms shall be placed in areas directed by the Erosion Control Supervisor, as approved by the Engineer. Berm locations shall be added to the site map with a specific narrative as to why they are being used at that location.

**PERMANENT SEEDING**

Seeding is used to control runoff and erosion on disturbed areas. Drill seeding shall occur on slopes flatter than 2:1 and shall occur on the contour of the slope. Completed areas (any portion of a slope that is at final grade) shall be seeded within 48 hours during seeding seasons. Seeded areas shall be inspected frequently for areas of failure. Slopes that are too steep for drill seeding shall have seed hand broadcast at double the rate and raked into the surface or shall be seeded by hydroseeder, see interim and final seeding. Seeding in ditch lines shall follow the contour, drill rows running down a ditch line shall not be allowed.

**MULCH AND MULCH TACKIFIER**

Mulch and mulch tackifier shall be in accordance with section 213.03(a). Crimping in ditch lines shall follow the contour, crimp rows running down a ditch line shall not be allowed.

**SURFACE ROUGHENING**

Grading techniques shall be used for both interim and temporary stabilization of all disturbance areas and to minimize the potential for wind and water erosion.

**PROTECTION OF WETLANDS AND MATURE TREES.**

Prior o construction commencing, orange plastic fence shall be placed in combination with erosion log to prevent encroachment of construction traffic and sediment into state waters. Fence (plastic) shall be placed adjacent to the wetlands; erosion logs shall be placed between the plastic fence and disturbance areas. A combination of silt fence or erosion logs and fence (plastic) shall be used in areas indicated in the plans to protect mature trees.



**VEGETATIVE BUFFER STRIPS AND PROTECTION ON EXISTING VEGETATION**

Existing vegetation shall be used as a BMP on the project. Existing vegetation aids with erosion and sediment control, and protects water quality. Areas of preserved vegetation shall be marked on the site map; preserved vegetation are those areas outside of disturbance (shoulder operation limit) line to the right of way fence. 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/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 COOT right of way) construction site boundaries, entering the stormwater drainage system, or discharging to state waters. shall be protected with erosion logs as shown In the plans or as directed.

**SOIL RETENTION BLANKET**

Shall be placed in areas as shown on the plans or as directed; all slopes 3:1 and steeper shall receive blanket. Typically ditches that have a grade steeper than 2% shall have blanket places. Soils shall be properly prepared prior to placing blanket. Slope shall be properly prepared prior to placing blanket. If rills, plant material, rocks, weeds, 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.

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					Subset: SWMPNOTE	Subset Sheets: 3 of 5				



On slopes when seeding cannot occur due to seasonal constraints a temporary berm, erosion log or other 8MP shall be placed at the top of slope to prevent stormwater from flowing onto slope and causing erosion; In addition flexible growth medium or mulch/mulch tackifier shall be applied on the slopes. If erosion occurs on slope, flexible growth medium or mulch and mulch tackifier shall be replaced by a blanket (straw/coconut) as a temporary measure. Once seeding can occur blanket shall be removed and disposed of; new soil retention blanket shall be placed.

**PERMANENT BASINS**

Sediment traps/basins (water quality ponds) shall be constructed early in the project prior to storm sewers/ditches going on line to capture storm flow. See subsection 20B.05 for requirements. Ponds shall be cleaned as needed, during construction. Cleaning shall be paid for as Sediment Removal and Disposal.

**TEMPORARY STREAM CROSSING**

Temporary bridges shall be of wood, metal or other appropriate material. Pipes can be of reinforced concrete, corrugated metal or plastic. All temporary crossings shall be removed within 14 calendar days after the structure is no longer needed.

**SOIL BINDER**

Soil binders provide temporary soil stabilization. Soil binders are sprayed onto the surface of exposed soils to hold the soil in place and minimize erosion from runoff and wind. Soil binders, in combination with hydro-mulches, are used to temporarily stabilize soils in stockpiles, berms, or when slopes cannot be seeded due to seasonal constraints. These materials can stabilize areas where vegetation cannot be established and provide immediate protection.

**HYDROMULCH**

Hydromulch provides temporary soil stabilization. Hydromulch is sprayed onto the surface of exposed soil to hold the soil in place until permanent vegetation has established.

BMP DETAILS AND NARRATIVES NOT COVERED BY THE SWMP OR STANDARD PLAN M-208-1 SHALL BE ADDED TO THE SWMP NOTEBOOK BY THE ECS.

**D. OFFSITE DRAINAGE (RUN ON WATER)**

- 1. Describe and record BMPs on the SWMP site map that has been implemented to address off site run-on water in accordance with subsection 208.03.

**E. VEHICLE TRACKING PAD**

- 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 vegetative buffers, berms, 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.

During construction, indicate how items that have not been addressed during design are being handled in construction. If items are covered in the template or other sections of the SWMP notebook indicate below what section the discussion takes place.

**A. CONSTRUCTION BEST MANAGEMENT PRACTICES**

*Assessment:* Assess soil conditions, vegetation and hydrologic features to minimize disturbance. *Avoidance and minimization:* Implement measures to avoid or minimize soil disturbances early to reduce the need for Structural BMPs. Preserve trees, bushes and strips of natural vegetation in the area of construction. Shall be done in accordance with contract Standard Specifications.  
*Construction scheduling and phasing:* Develop a schedule that takes into consideration the seasons and periods of heaviest precipitation as well as available planting season. Implement project phasing if needed. Shall be done in accordance with contract Standard Specifications.  
*Stormwater management plan:* Implement SWMP and modify contractor as necessary to reflect actual site conditions.  
*Inspection and maintenance:* Utilize inspections to determine whether the appropriate BMPs have been implemented and whether maintenance or repair is required. Shall be done in accordance with contract Standard Specifications.

**B. MATERIALS HANDLING AND SPILL PREVENTION**

*Stockpile management:* Manage stockpiles to reduce associated stormwater pollutants from entering storm drains and watercourses from typical soil, concrete, asphalt, or aggregate stockpiles found at construction sites. Erodible stockpiles (including spoils piles) shall be protected immediately with gravel bags, berms, erosion logs, etc. as directed. BMP shall be indicated on the site map. 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. Record stockpiles on the SWMP site map. No stockpiling and/or staging shall occur within the ordinary high water mark on the channel. Shall be done in accordance with contract Standard Specifications.

*Material management:* Implement proper handling and storage of materials in order to prevent spills or leaks into the storm drains or watercourses. Shall be done in accordance with contract Standard Specifications.

*Material use:* Implement material use BMP to ensure minimal water quality impacts from the use of construction materials. Shall be done in accordance with contract Standard Specifications.

*Spill prevention and control:* Implement to prevent and control spills to ensure that spills and leaks do not result in water quality impacts. This BMP only applies to spills caused by the contractor and addresses the need for a Spill Prevention and Control Plan and Cleanup Response Procedures. Shall be done in accordance with contract Standard Specifications.

**C. WASTE MANAGEMENT**

*Concrete waste management:* Concrete wash out water or waste from grouting and concrete equipment shall be contained in accordance with subsection 208.05. Saw cutting and drilling shall be done in accordance with subsection 107.25, 208.04, 208.05

*Solid waste management:* Storage areas for solid waste should be located at least 50 feet from drainage ways and watercourses, where possible, and shall not be located in areas susceptible to frequent flooding. Solid waste storage located within 50 feet of a drainageway or watercourse shall be covered. All solid waste storage areas shall be protected from the wind. Solid waste shall be segregated properly into various categories for recycling or disposal. Shall be done in accordance with contract Standard Specifications.

*Sanitary and Septic waste management:* Temporary sanitary facilities shall be properly connected into a sanitary sewer system where permissible to prevent illicit discharges. Shall be done in accordance with contract Standard Specifications.

*Liquid waste management:* All liquid wastes shall be contained in designated areas such as sediment basins, holding pits or portable tanks. Designated containment areas shall be located away from drainage ways, inlets, receiving waters, areas of high traffic and areas susceptible to flooding. Shall be done in accordance with contract Standard Specifications.

*Hazardous waste management:* Requirements must adhere to CDOT Standard Specifications for hazardous waste storage, transportation and disposal. Waste containers shall be stored and managed in temporary containment facilities and must be located away from high-traffic areas, waterway, drainage inlets, sensitive habitats and areas prone to flooding or ponding. Shall be done in accordance with contract Standard Specifications.

*Contaminated waste management:* Contractor is responsible for identifying pollutant-specific handling and disposal procedures for contaminated soils at the project site in accordance with CDOT Standard Specifications. Shall be done in accordance with contract Standard Specifications.

**D. GENEARL POLLUTION PREVENTION**

*Wind erosion control:* Implement practices, such as applying water or dust palliatives, to be implemented during construction operations to prevent wind erosion from exposed soil surfaces. Shall be done in accordance with contract Standard Specifications.

*Paving Operations:* Implement practices during paving and grinding operations to prevent associated stormwater pollutants from entering storm drains and watercourses. Shall be done in accordance with contract Standard Specifications.

*Street sweeping and vacuuming:* Visible sediment tracking shall be swept and vacuumed on a daily basis. Shall be done in accordance with subsection 208.03 (c)

*Vehicle and equipment management:* Implement practices to be used during vehicle and equipment fueling, cleaning, and maintenance to prevent associated stormwater pollutants from entering storm drains and watercourses. Shall be done in accordance with contract Standard Specifications.

**6. INSPECTIONS**



Inspections shall be in accordance with subsection 208.03 (c).

**7. BMP MAINTENANCE**

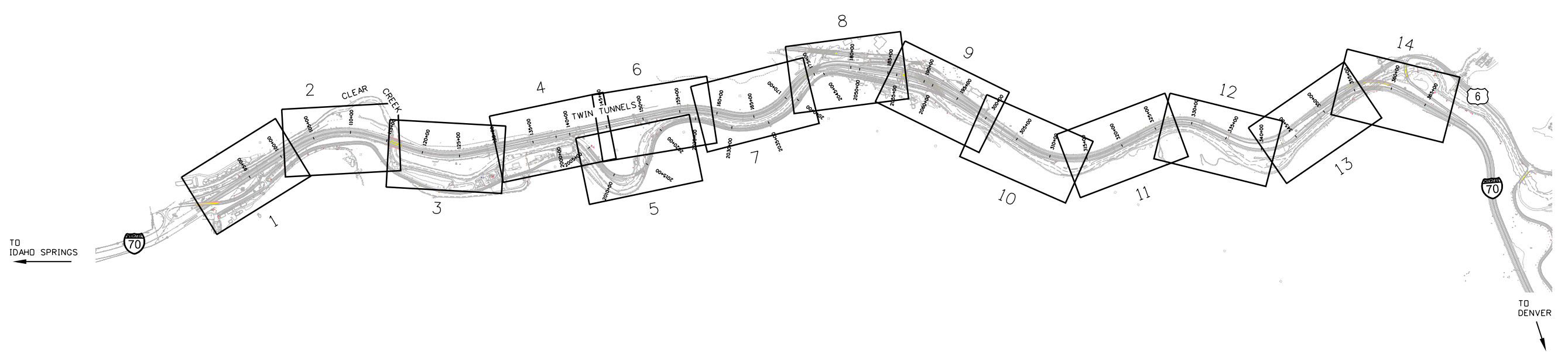
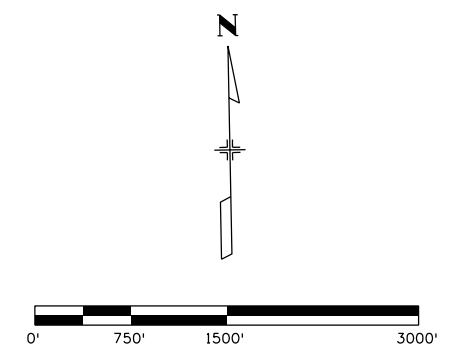
Maintenance shall be in accordance with subsection 208.04 (f).

**8. RECORD KEEPING**

Records shall be kept in accordance with subsection 208.03 (c).

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Horiz. Scale: 1:1 Vert. Scale: NA				Revised:								Structure Numbers	
 4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276								Void:		Subset: SWMPNOTE		Sheet Number 201	
										Subset Sheets: 4 of 5			
					<b>Region 1</b>								





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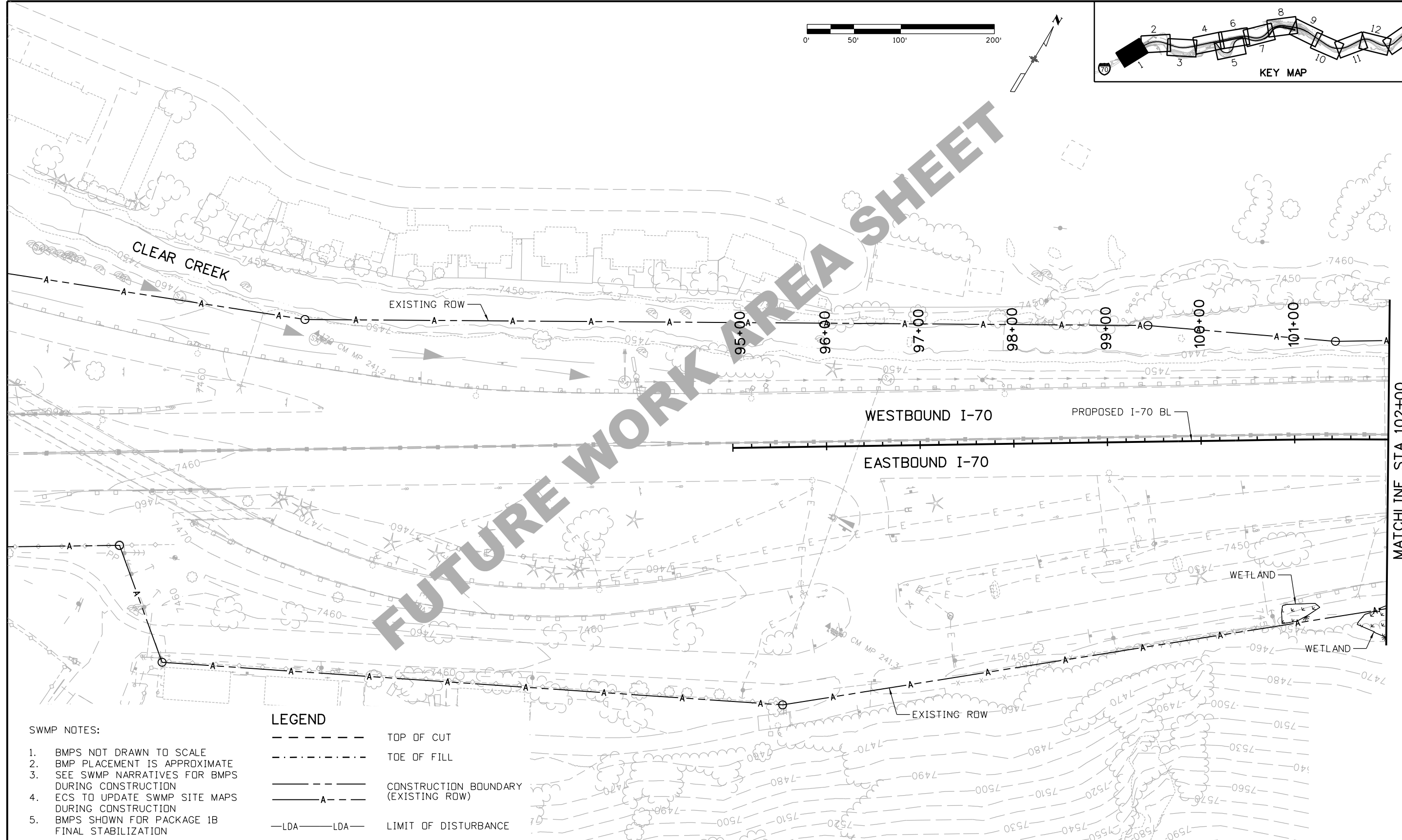
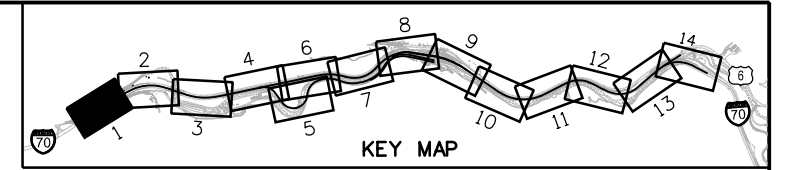
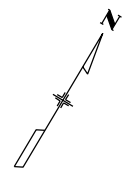
**EASTBOUND I-70  
 STORMWATER MANAGEMENT PLAN  
 SHEET KEY MAP**

Designer: J. Hollon  
 Detailer: J. Gellner  
 Subset: Keymap

Structure Numbers  
 Subset Sheets: 1 of 1

Project No./Code  
 IM 0703-390  
 19035  
 Sheet Number 203

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**SWMP NOTES:**

1. BMPS NOT DRAWN TO SCALE
2. BMP PLACEMENT IS APPROXIMATE
3. SEE SWMP NARRATIVES FOR BMPS DURING CONSTRUCTION
4. ECS TO UPDATE SWMP SITE MAPS DURING CONSTRUCTION
5. BMPS SHOWN FOR PACKAGE 1B FINAL STABILIZATION

**LEGEND**

- TOP OF CUT
- - - TOE OF FILL
- CONSTRUCTION BOUNDARY (EXISTING ROW)
- A-A- LDA LDA LIMIT OF DISTURBANCE

Print Date: 12/4/2012  
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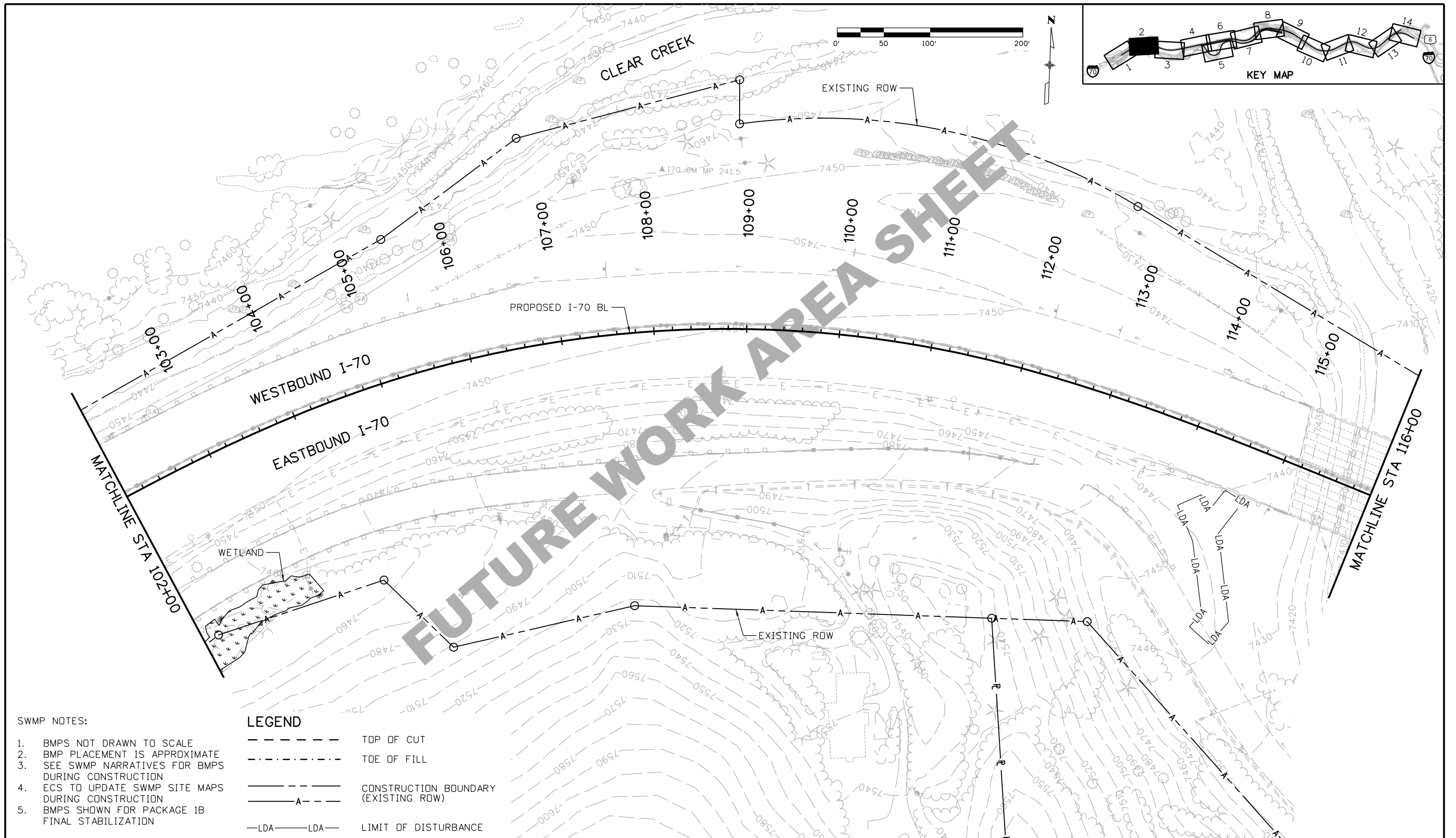
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**EASTBOUND I-70  
 STORMWATER MANAGEMENT PLAN  
 SITE MAP**

Designer:	J. Hollon	Structure Numbers	
Detailer:	J. Gellner	Subset Sheets:	1 of 14
Subset:	SWMP		

<b>Project No./Code</b>	IM 0703-390
	19035
Sheet Number	204

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**SWMP NOTES:**

1. BMPs NOT DRAWN TO SCALE
2. BMP PLACEMENT IS APPROXIMATE
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4. ECS TO UPDATE SWMP SITE MAPS DURING CONSTRUCTION
5. BMPs SHOWN FOR PACKAGE 1B FINAL STABILIZATION

**LEGEND**

- TOP OF CUT
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- CONSTRUCTION BOUNDARY (EXISTING ROW)
- LDA- LDA- LIMIT OF DISTURBANCE

FUTURE WORK AREA SHEET

Print Date: 12/4/2012

File Name: 18832HYDR\_CPIB\_SWMP002.dgn

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**EASTBOUND I-70  
STORMWATER MANAGEMENT PLAN  
SITE MAP**

Designer:	J. Hollon	Structure Numbers	
Detailer:	J. Gellner	Subset Sheets:	2 of 14
Subset:	SWMP		

Project No./Code

IM 0703-390

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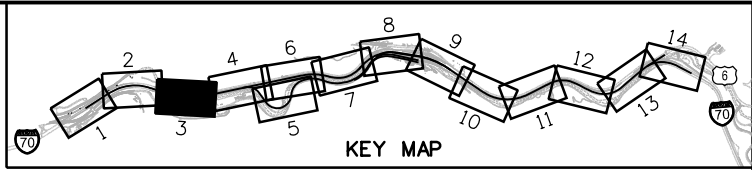
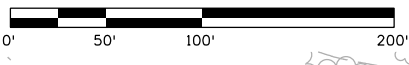
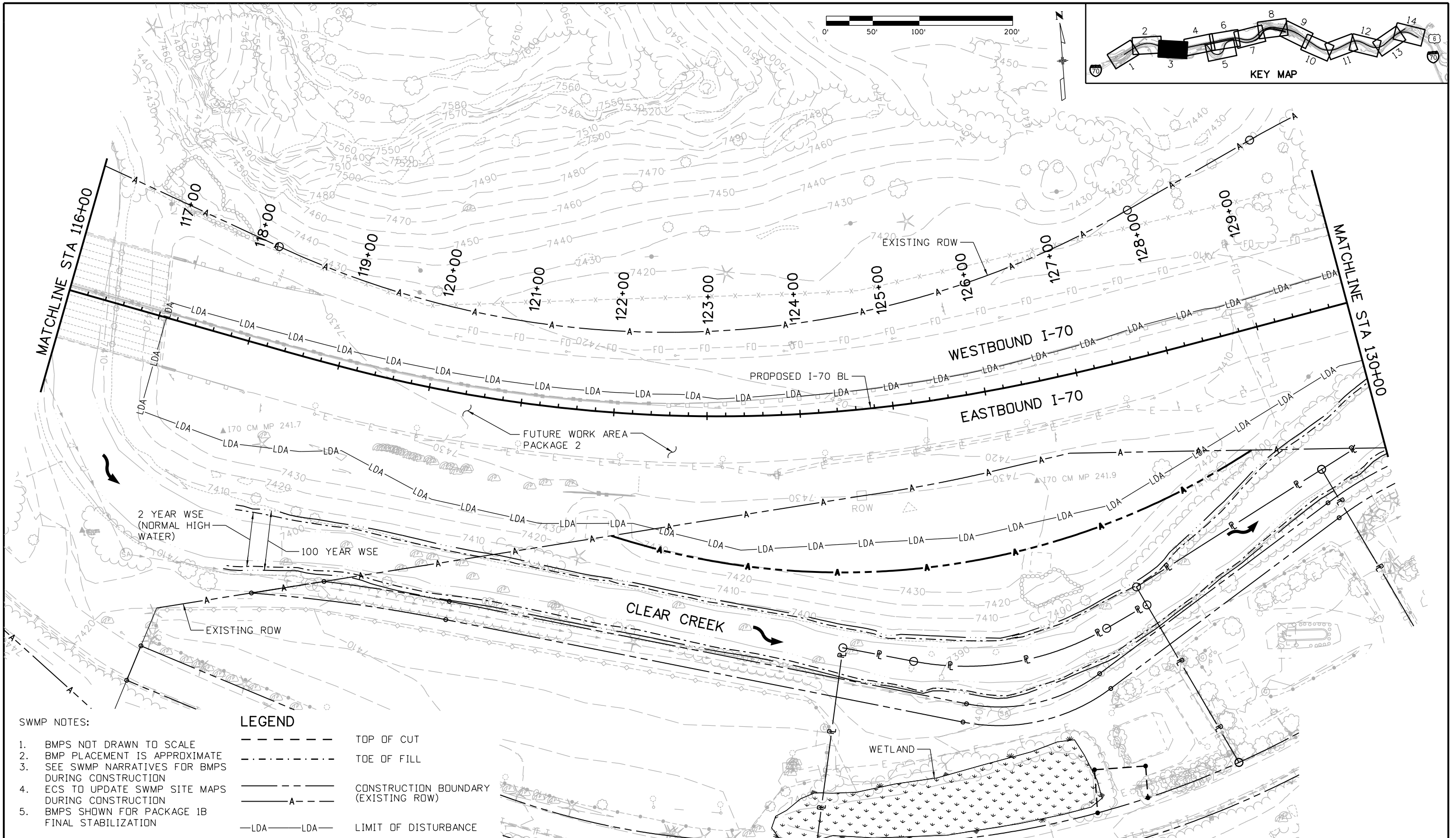
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**SWMP NOTES:**

1. BMPs NOT DRAWN TO SCALE
2. BMP PLACEMENT IS APPROXIMATE
3. SEE SWMP NARRATIVES FOR BMPs DURING CONSTRUCTION
4. ECS TO UPDATE SWMP SITE MAPS DURING CONSTRUCTION
5. BMPs SHOWN FOR PACKAGE 1B FINAL STABILIZATION

**LEGEND**

- TOP OF CUT
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- CONSTRUCTION BOUNDARY (EXISTING ROW)
- A- - - - - LIMIT OF DISTURBANCE

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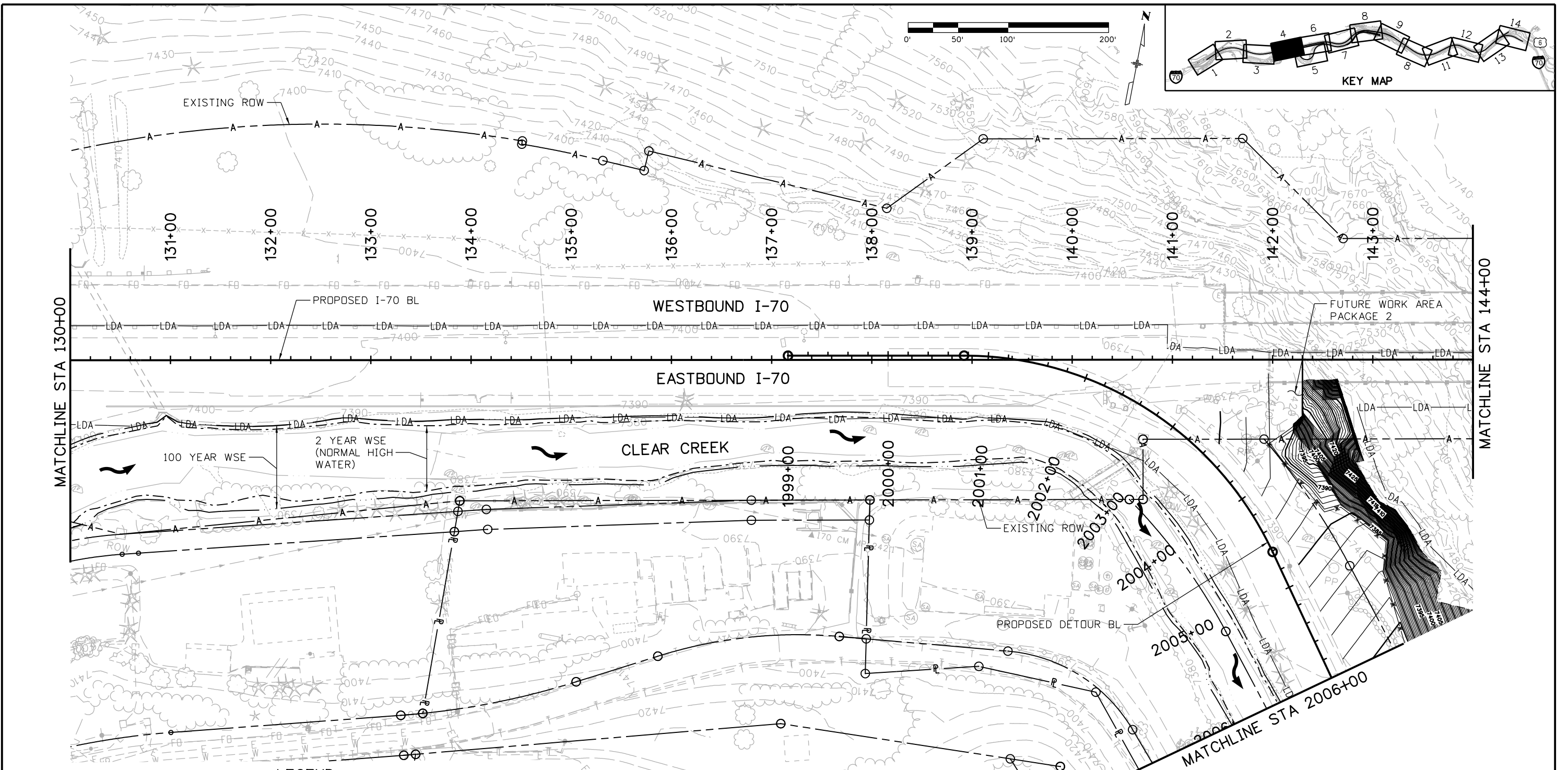
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**EASTBOUND I-70  
 STORMWATER MANAGEMENT PLAN  
 SITE MAP**

Designer:	J. Hollon	Structure Numbers	
Detailer:	J. Gellner		
Subset:	SWMP	Subset Sheets:	3 of 14

Project No./Code	IM 0703-390
	19035
Sheet Number	206

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**SWMP NOTES:**


1. BMPs NOT DRAWN TO SCALE
2. BMP PLACEMENT IS APPROXIMATE
3. SEE SWMP NARRATIVES FOR BMPs DURING CONSTRUCTION
4. ECS TO UPDATE SWMP SITE MAPS DURING CONSTRUCTION
5. BMPs SHOWN FOR PACKAGE 1B FINAL STABILIZATION

**LEGEND**

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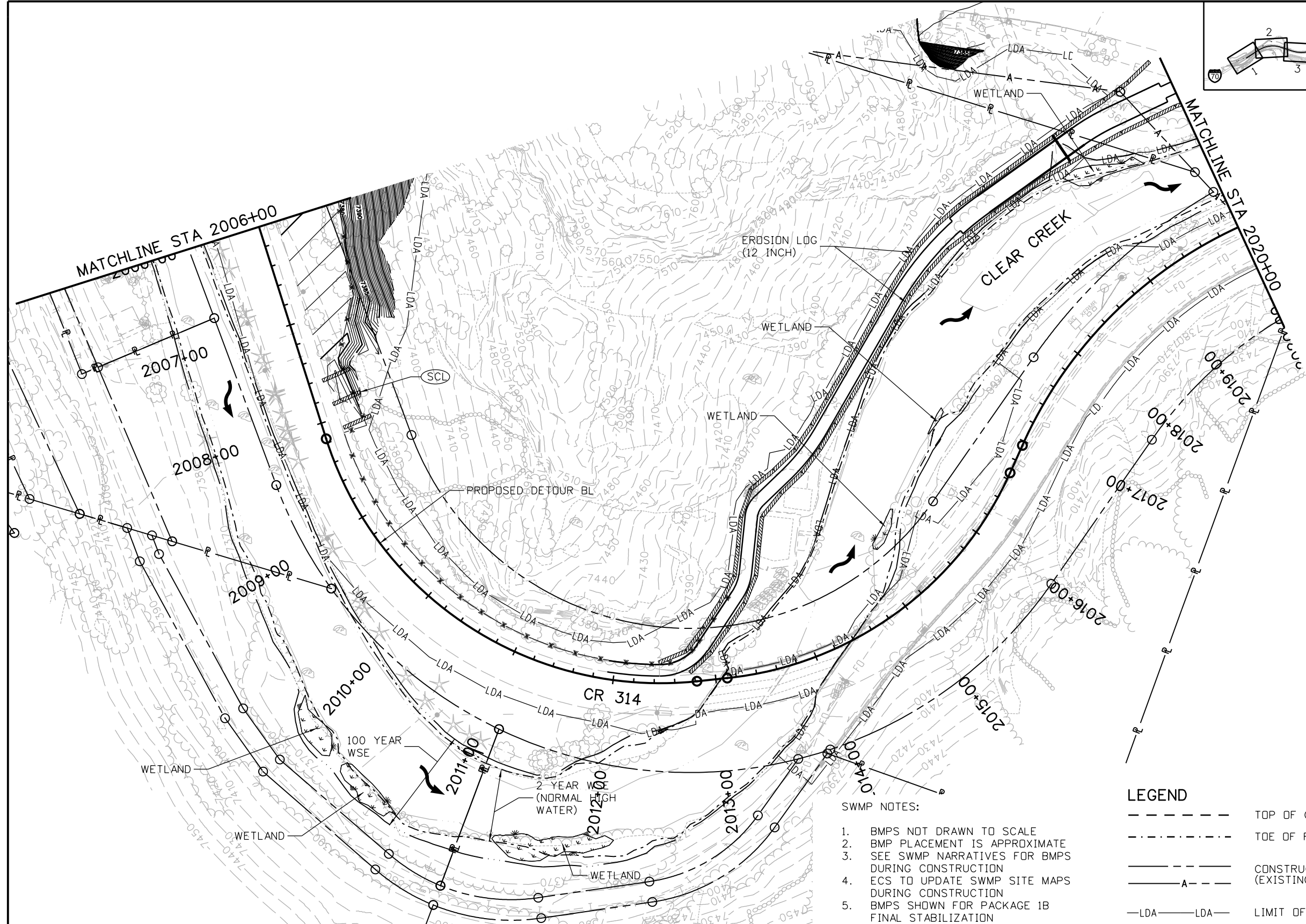
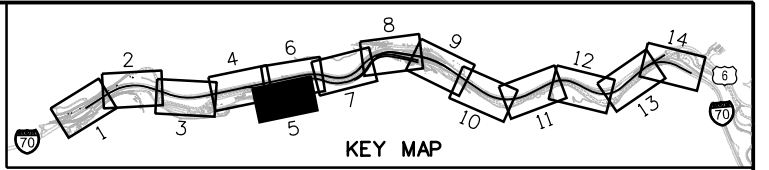
**EASTBOUND I-70  
 STORMWATER MANAGEMENT PLAN  
 SITE MAP**

Designer:	J. Hollon	Structure Numbers	
Detailer:	J. Gellner	Subset Sheets:	4 of 14
Subset:	SWMP		

Project No./Code  
 IM 0703-390  
 19035  
 Sheet Number 207

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- SWMP NOTES:**
1. BMPs NOT DRAWN TO SCALE
  2. BMP PLACEMENT IS APPROXIMATE
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  4. ECS TO UPDATE SWMP SITE MAPS DURING CONSTRUCTION
  5. BMPs SHOWN FOR PACKAGE 1B FINAL STABILIZATION

**LEGEND**

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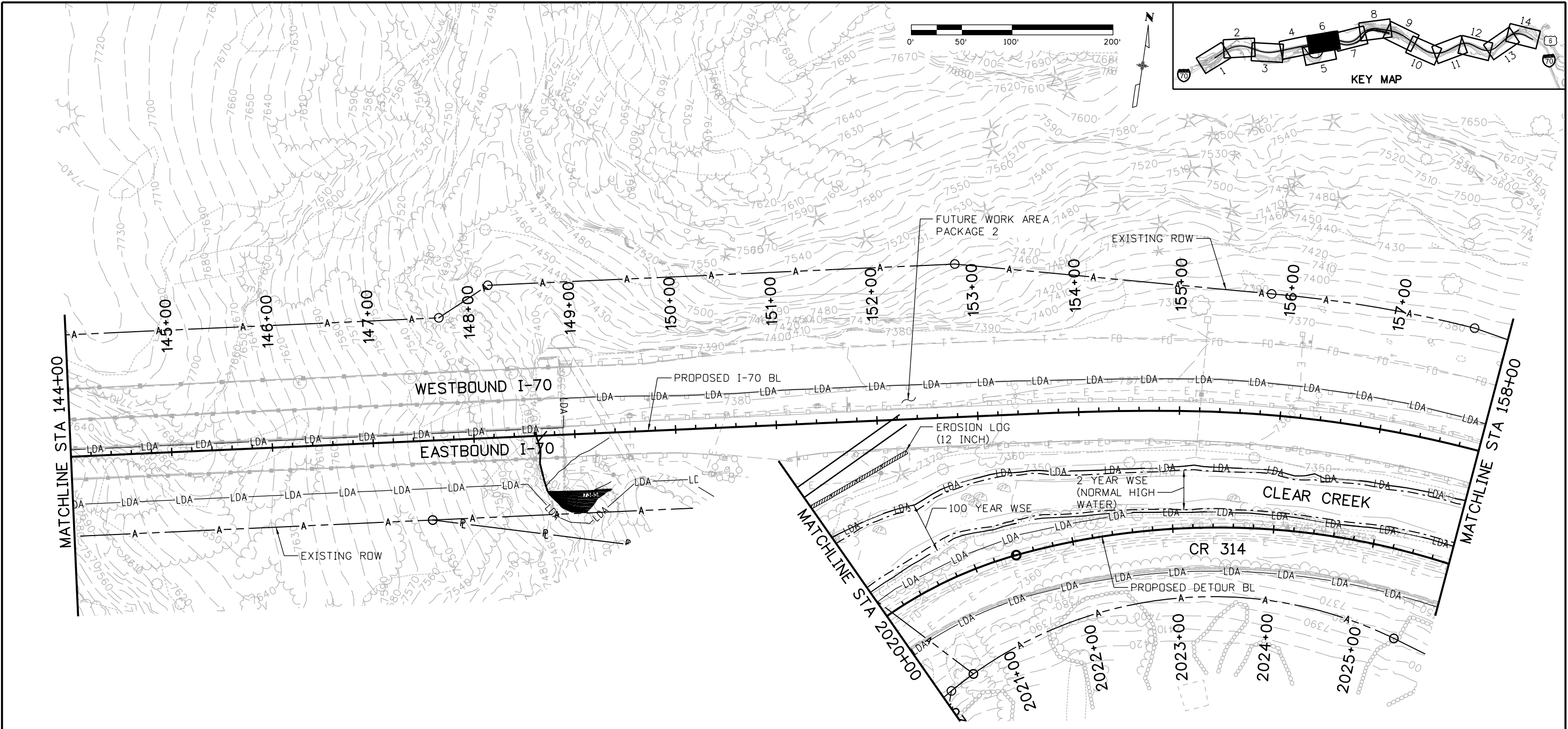
**EASTBOUND I-70  
 STORMWATER MANAGEMENT PLAN  
 SITE MAP**

Designer: J. Hollon  
 Detailer: J. Gellner  
 Subset: SWMP

Structure Numbers  
 Subset Sheets: 5 of 14

**Project No./Code**  
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 Sheet Number 208

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4. ECS TO UPDATE SWMP SITE MAPS DURING CONSTRUCTION
5. BMPs SHOWN FOR PACKAGE 1B FINAL STABILIZATION

**LEGEND**

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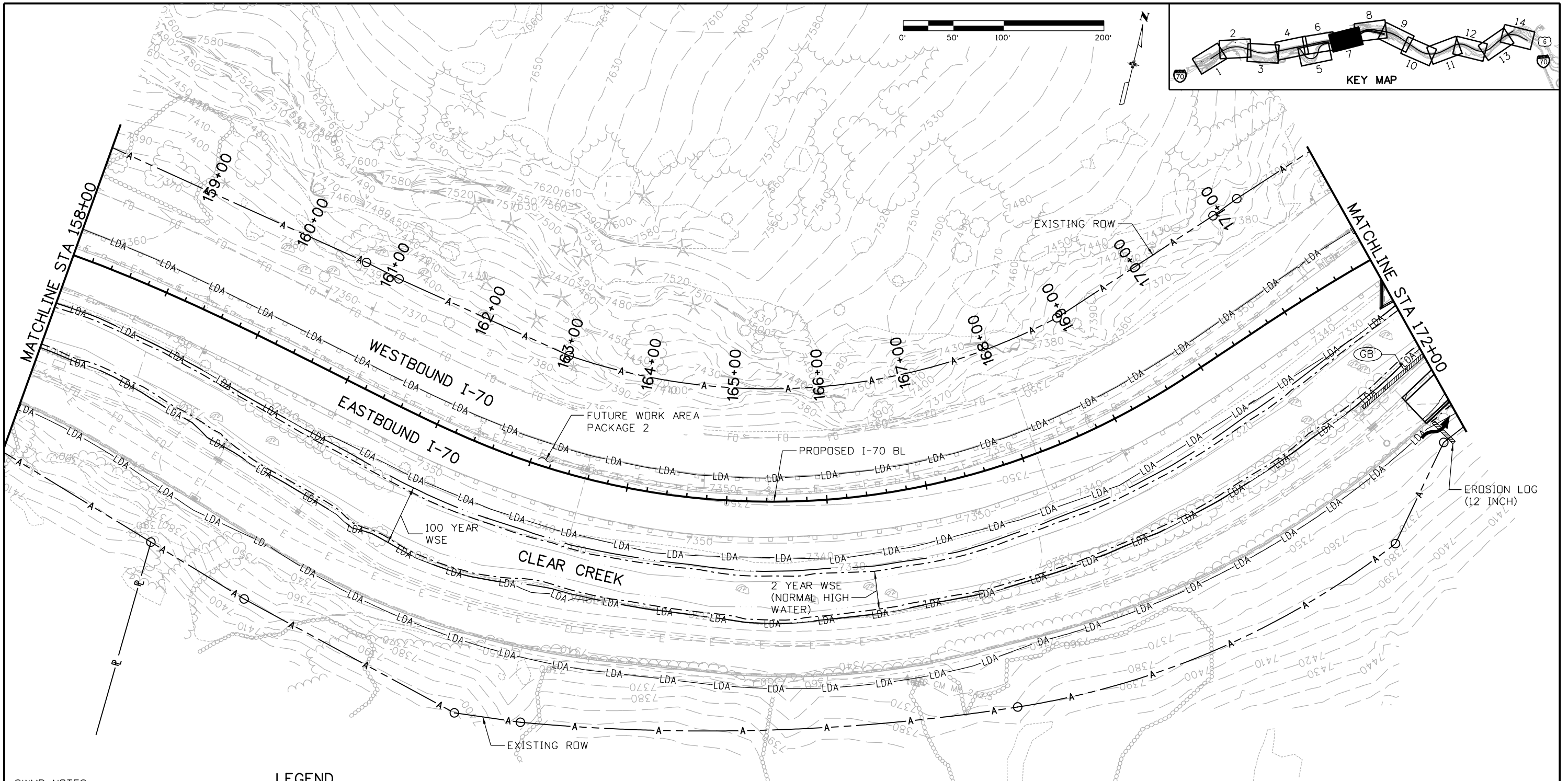
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**EASTBOUND I-70  
 STORMWATER MANAGEMENT PLAN  
 SITE MAP**

Designer:	J. Hollon	Structure Numbers	
Detailer:	J. Gellner	Subset Sheets:	6 of 14
Subset:	SWMP		

Project No./Code	IM 0703-390
	19035
Sheet Number	209

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**SWMP NOTES:**

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2. BMP PLACEMENT IS APPROXIMATE
3. SEE SWMP NARRATIVES FOR BMPS DURING CONSTRUCTION
4. ECS TO UPDATE SWMP SITE MAPS DURING CONSTRUCTION
5. BMPS SHOWN FOR PACKAGE 1B FINAL STABILIZATION

**LEGEND**

- TOP OF CUT
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- A- -A- LIMIT OF DISTURBANCE

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File Name: 18832HYDR\_CP1B\_SWMP006.dgn

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**EASTBOUND I-70  
STORMWATER MANAGEMENT PLAN  
SITE MAP**

Designer:	J. Hollon	Structure Numbers	
Detailer:	J. Gellner	Subset Sheets:	7 of 14
Subset:	SWMP		

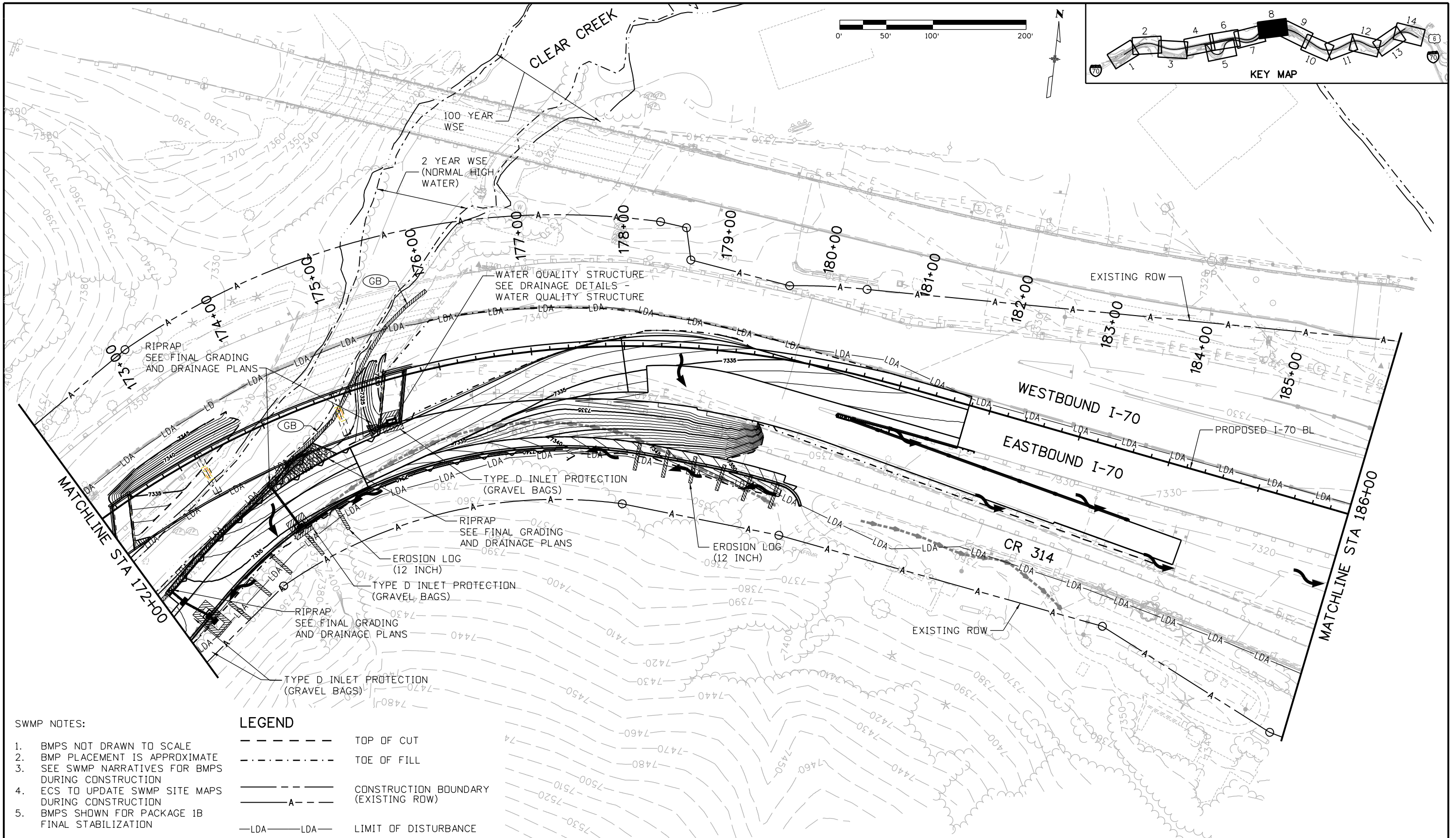
Project No./Code

IM 0703-390

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Sheet Number 210





**SWMP NOTES:**

1. BMPS NOT DRAWN TO SCALE
2. BMP PLACEMENT IS APPROXIMATE
3. SEE SWMP NARRATIVES FOR BMPS DURING CONSTRUCTION
4. ECS TO UPDATE SWMP SITE MAPS DURING CONSTRUCTION
5. BMPS SHOWN FOR PACKAGE 1B FINAL STABILIZATION

**LEGEND**

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- CONSTRUCTION BOUNDARY (EXISTING ROW)
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Print Date: 12/4/2012

File Name: 18832HYDR\_CP1B\_SWMP007.dgn

Horiz. Scale: 1:100

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**Sheet Revisions**

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**EASTBOUND I-70  
STORMWATER MANAGEMENT PLAN  
SITE MAP**

Designer: J. Hollon  
Detailer: J. Gellner  
Subset: SWMP

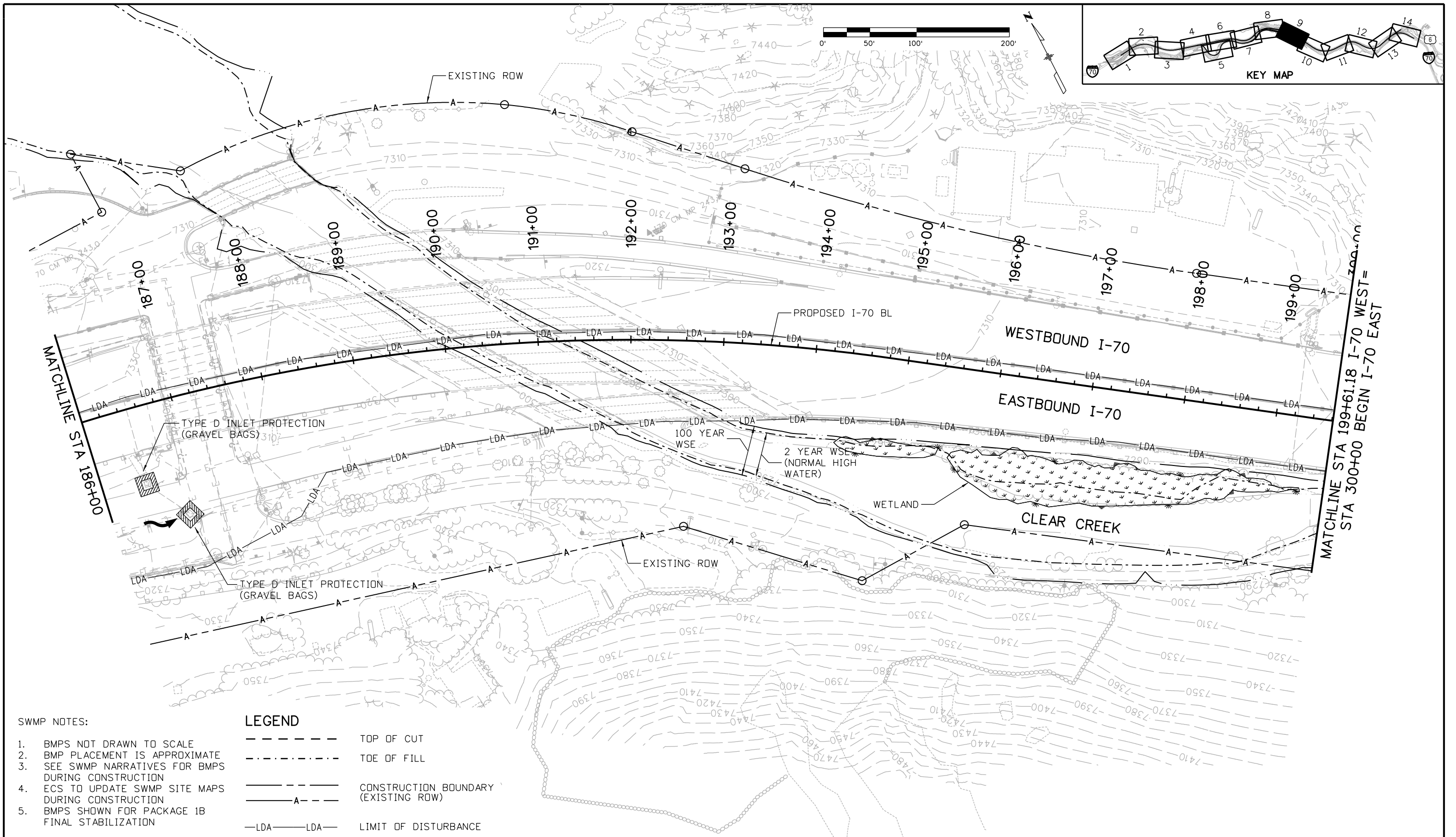
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Subset Sheets: 8 of 14

Project No./Code

IM 0703-390

19035

Sheet Number 211



**SWMP NOTES:**

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2. BMP PLACEMENT IS APPROXIMATE
3. SEE SWMP NARRATIVES FOR BMPS DURING CONSTRUCTION
4. ECS TO UPDATE SWMP SITE MAPS DURING CONSTRUCTION
5. BMPS SHOWN FOR PACKAGE 1B FINAL STABILIZATION

**LEGEND**

- TOP OF CUT
- - - - - TOE OF FILL
- CONSTRUCTION BOUNDARY (EXISTING ROW)
- - - - - LIMIT OF DISTURBANCE

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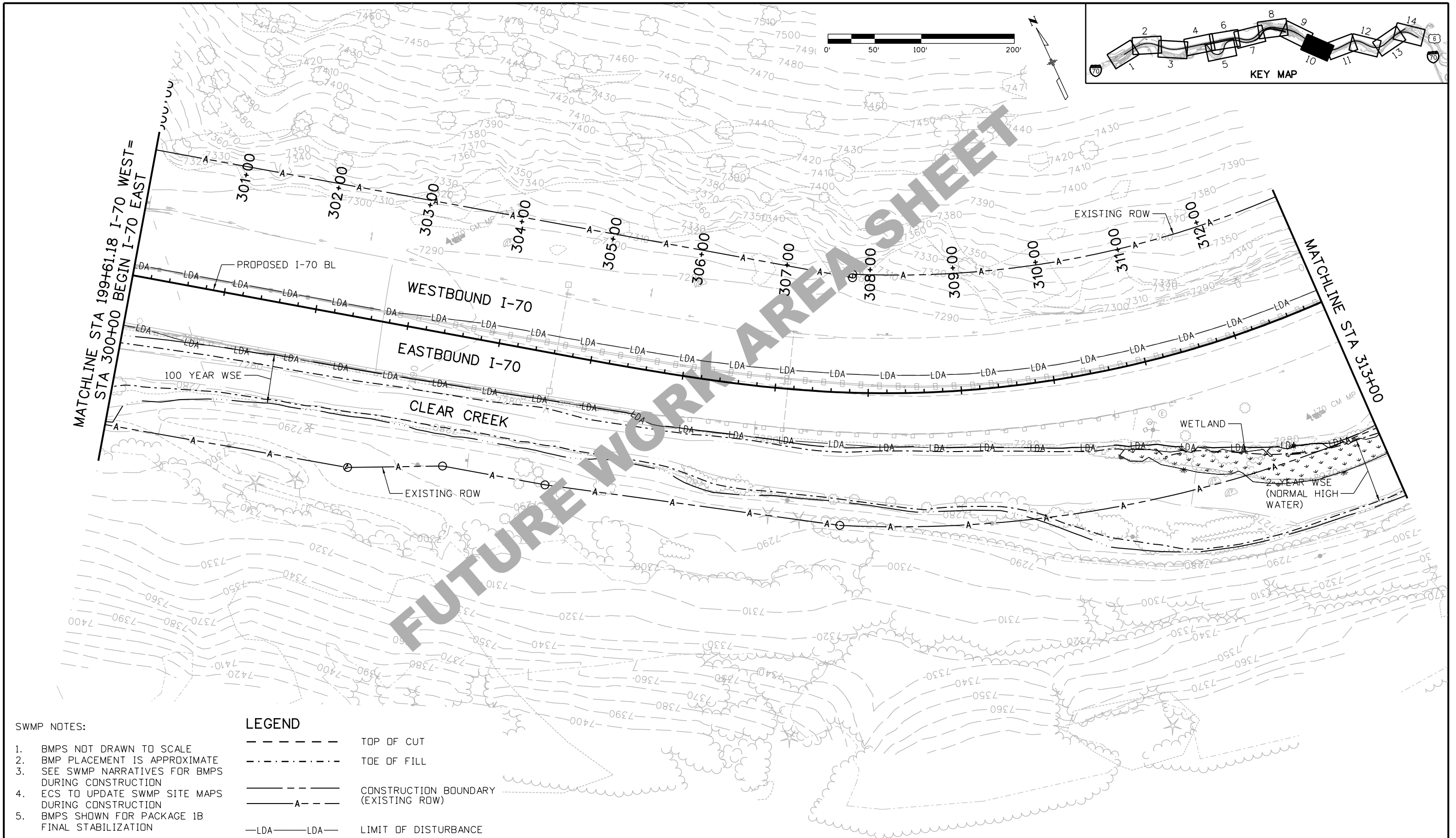
**EASTBOUND I-70  
 STORMWATER MANAGEMENT PLAN  
 SITE MAP**

Designer: J. Hollon  
 Detailer: J. Gellner  
 Subset: SWMP

Structure Numbers  
 Subset Sheets: 9 of 14

Project No./Code	IM 0703-390
	19035
Sheet Number	212

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**SWMP NOTES:**

1. BMPS NOT DRAWN TO SCALE
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5. BMPS SHOWN FOR PACKAGE 1B FINAL STABILIZATION

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Print Date: 12/4/2012

File Name: 18832HYDR\_CP1B\_SWMP009.dgn

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**EASTBOUND I-70  
STORMWATER MANAGEMENT PLAN  
SITE MAP**

Designer: J. Hollon  
Detailer: J. Gellner  
Subset: SWMP

Structure Numbers  
Subset Sheets: 10 of 14

Project No./Code

IM 0703-390

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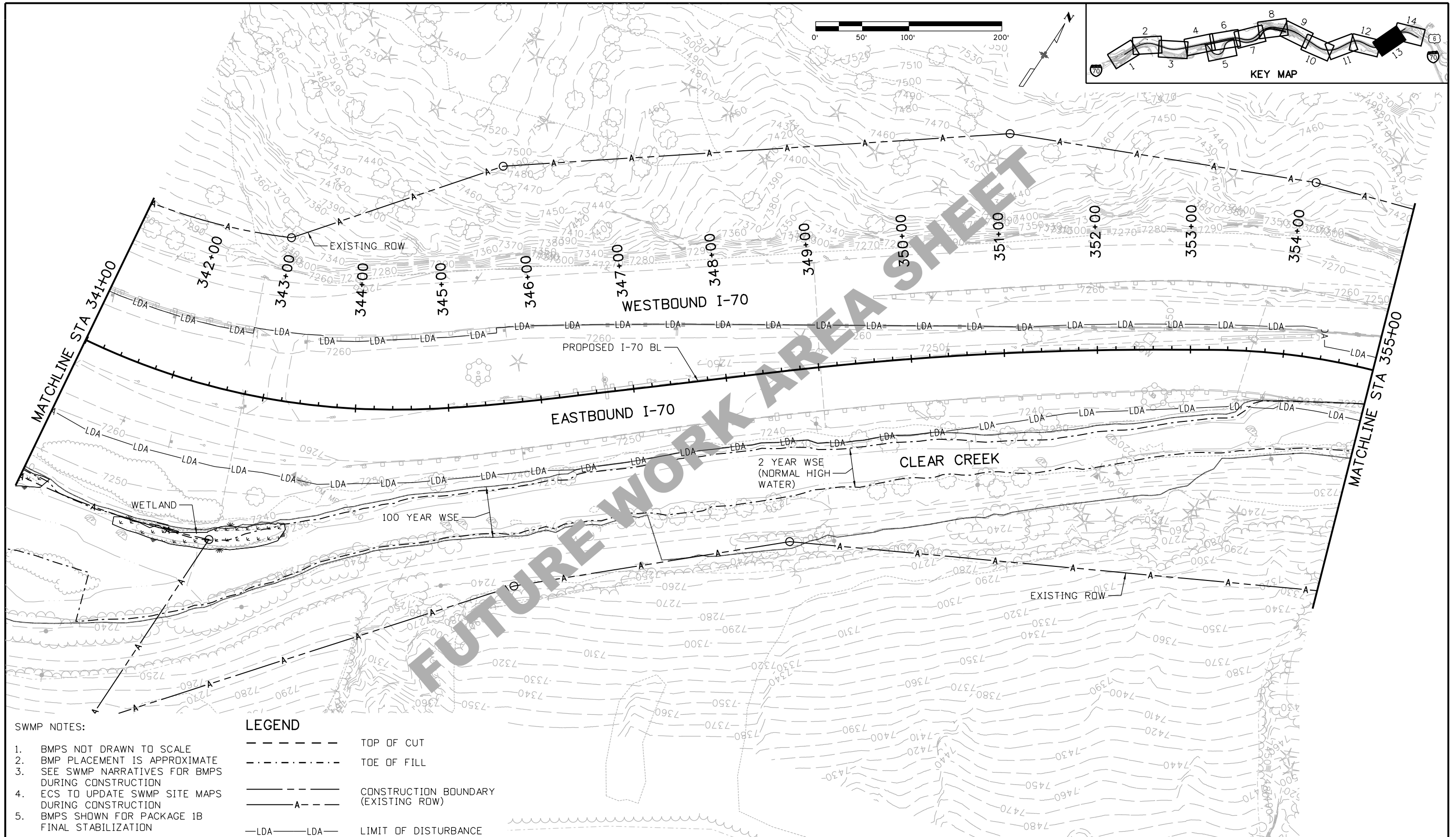
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**SWMP NOTES:**

1. BMPS NOT DRAWN TO SCALE
2. BMP PLACEMENT IS APPROXIMATE
3. SEE SWMP NARRATIVES FOR BMPS DURING CONSTRUCTION
4. ECS TO UPDATE SWMP SITE MAPS DURING CONSTRUCTION
5. BMPS SHOWN FOR PACKAGE 1B FINAL STABILIZATION

**LEGEND**

- TOP OF CUT
- - - - - TOE OF FILL
- CONSTRUCTION BOUNDARY (EXISTING ROW)
- - - - - LIMIT OF DISTURBANCE

Print Date: 12/4/2012  
 File Name: I8832HYDR\_CP1B\_SWMP012.dgn  
 Horiz. Scale: 1:100    Vert. Scale: 1"=20'

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 Denver, CO 80237  
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Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation

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 Golden, CO 80401  
 Phone: 720-497-6918 FAX: 720-497-6901

Region 1 **CRC**

No Revisions:	
Revised:	
Void:	

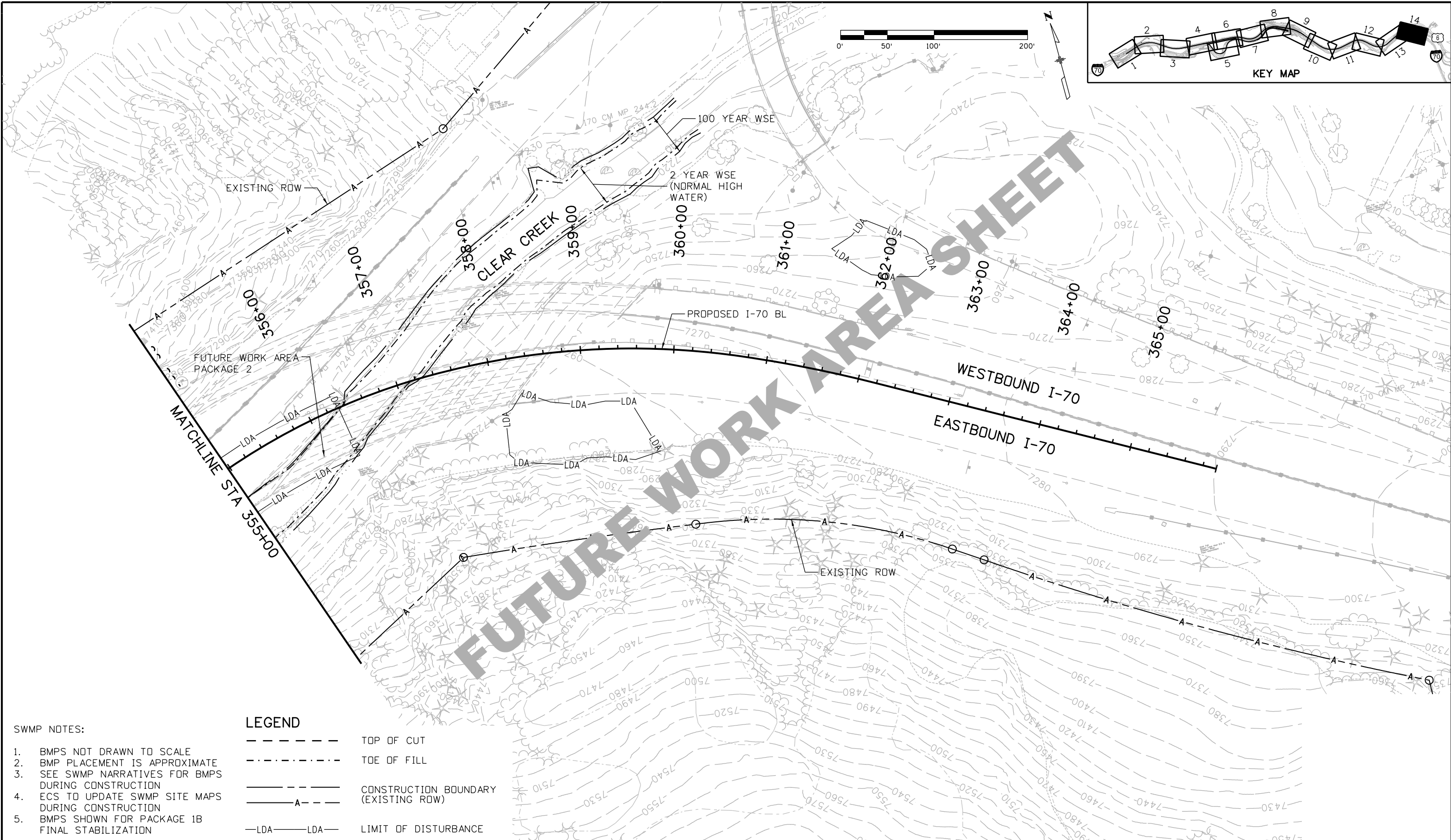
**EASTBOUND I-70  
 STORMWATER MANAGEMENT PLAN  
 SITE MAP**

Designer: J. Hollon  
 Detailer: J. Gellner  
 Subset: SWMP

Structure Numbers  
 Subset Sheets: 13 of 14

Project No./Code	IM 0703-390
	19035
Sheet Number	216

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**SWMP NOTES:**

1. BMPs NOT DRAWN TO SCALE
2. BMP PLACEMENT IS APPROXIMATE
3. SEE SWMP NARRATIVES FOR BMPs DURING CONSTRUCTION
4. ECS TO UPDATE SWMP SITE MAPS DURING CONSTRUCTION
5. BMPs SHOWN FOR PACKAGE 1B FINAL STABILIZATION

**LEGEND**

- TOP OF CUT
- - - - - TOE OF FILL
- CONSTRUCTION BOUNDARY (EXISTING ROW)
- A - - - - - LIMIT OF DISTURBANCE
- LDA - - - - - LIMIT OF DISTURBANCE

Print Date: 12/4/2012  
 File Name: 18832HYDR\_CP1B\_SWMP013.dgn  
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Date:	Comments	Init.

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Region 1      CRC





















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Revised:	
Void:	

**EASTBOUND I-70  
 STORMWATER MANAGEMENT PLAN  
 SITE MAP**

Designer:	J. Hollon	Structure Numbers	
Detailer:	J. Gellner		
Subset:	SWMP	Subset Sheets: 14 of 14	

Project No./Code	IM 0703-390
	19035
Sheet Number	217

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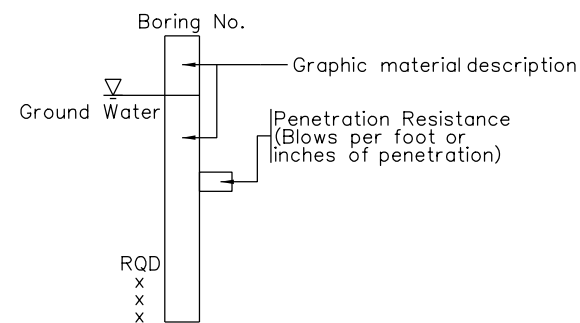
 Asphalt	 Cobbles and gravel	 Low Plasticity Clay	 Concrete
 Fill with Silt as major soil	 Fill with Clay as major soil	 Fill with Gravel as major soil	 Fill with Sand as major soil
 Poorly-graded Sandy Gravel	 Silty Gravel	 GNEISS	 Poorly-graded Gravel
 Void	 Silty Sand	 Poorly-graded Gravelly Sand	 Topsoil
 Sandstone	 Weathered Bedrock	 GRANITE	 Quartz Pegmatite

● BORING LOCATION

**SAMPLE TYPE**

 Modified California Sampler	 Split Spoon
---	---

**TYPICAL TEST HOLE LOG**



**RQD**  
Rock Quality Designation

**% Recovery**  
Length of Core Recovered/Length of Core Drilling Run

**Joint Spacing**  
Noted near actual depth

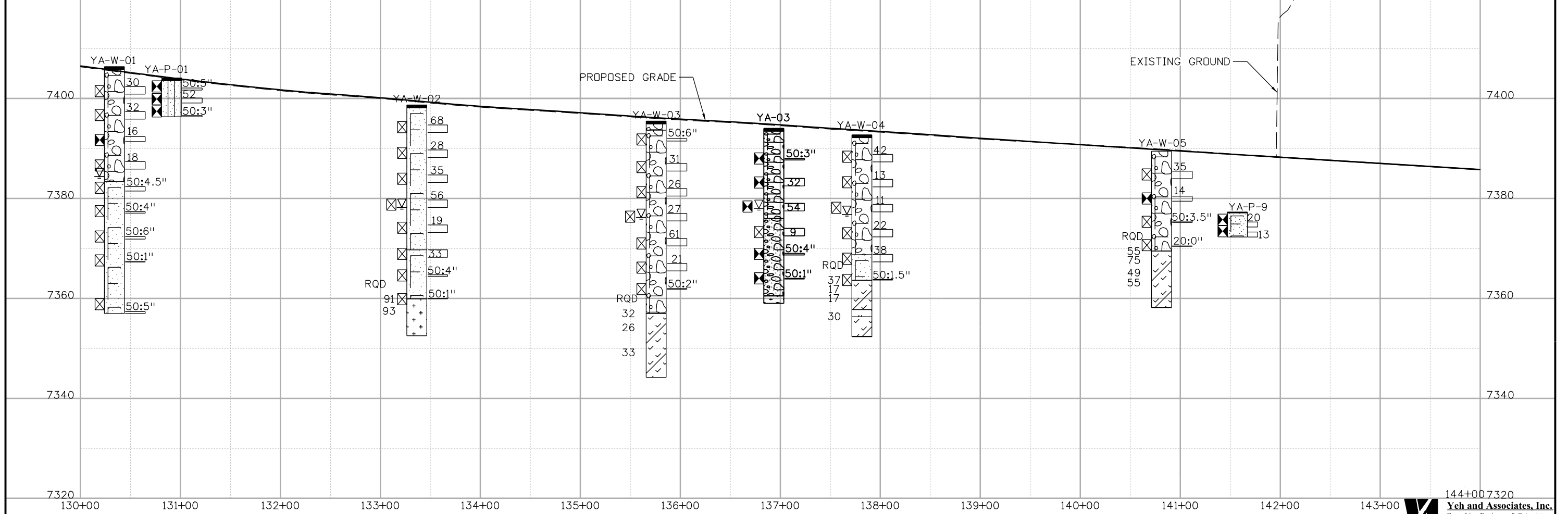
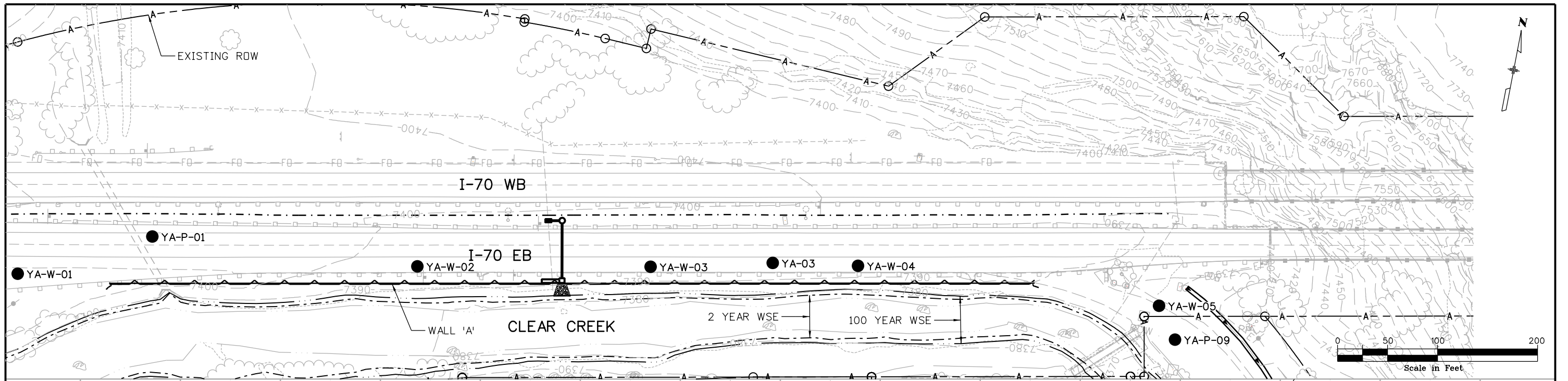
**Fracture Frequency**  
Fractures per foot

**Weathering Grade**  
 WI Fresh  
 WII Slightly Weathered  
 WIII Moderately Weathered  
 WIV Completely Weathered or Decomposed  
 WV Residual Soil

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Print Date: 11/19/2012		<b>Sheet Revisions</b>				<b>As Constructed</b>		<b>EASTBOUND I-70 ENGINEERING GEOLOGY LEGEND</b>			<b>Project No./Code</b>	
File Name: 18832 Engineering Geology Legend.dgn		Date:	Comments	Init.		No Revisions:					IM 0703-390	
Horiz. Scale: 1:1      Vert. Scale:						Revised:	Designer: H. HUME	Structure Numbers			19035	
Staff Bridge Branch-Unit 0221      STW						Void:	Detailer: M. WALZ	Subset Sheets:	1 of 6		Sheet Number 218	
<b>ATKINS</b> 4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276		<b>Colorado Department of Transportation</b> 425 A Corporate Circle Golden, CO 80401 Phone: 720-497-6918 FAX: 720-497-6901 <b>Region 1</b> <b>CRC</b>										



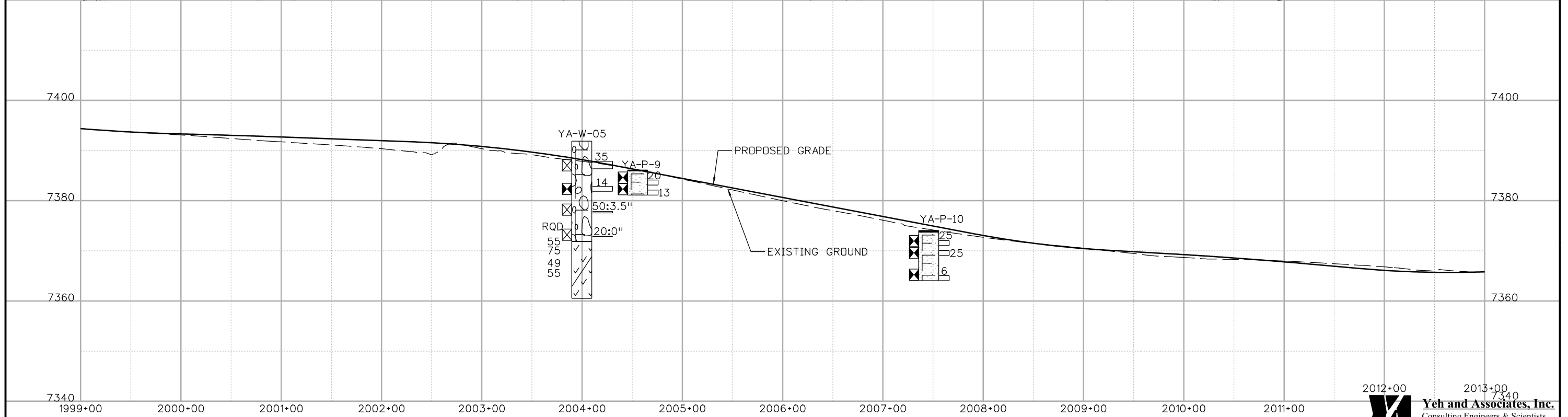
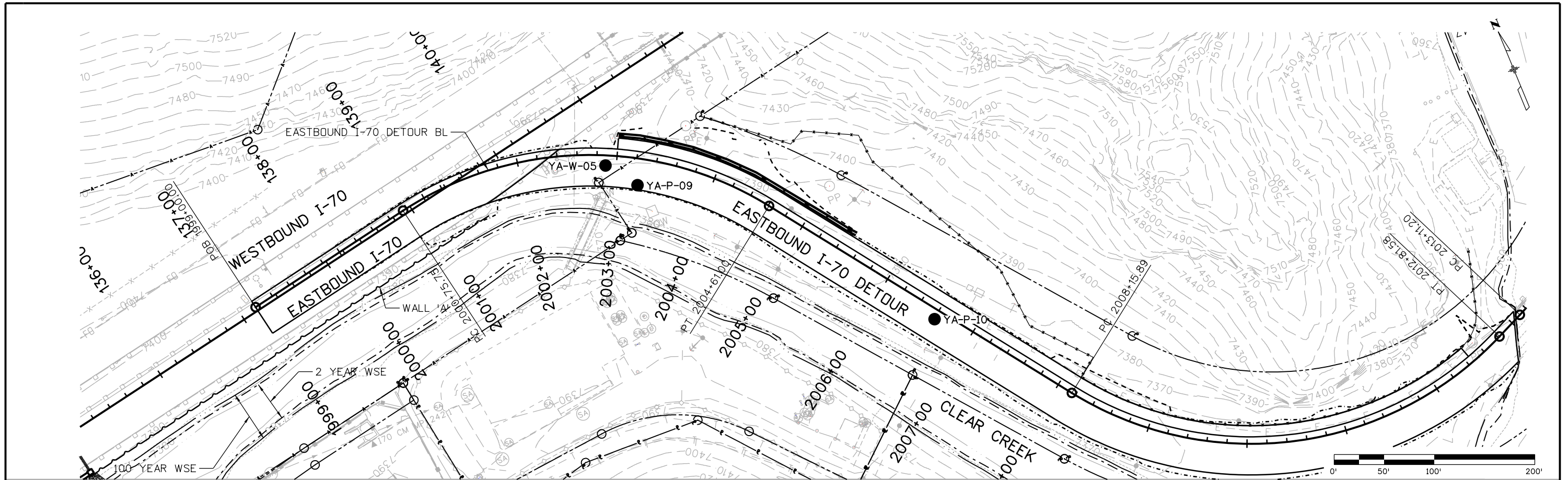


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Print Date: 11/19/2012 File Name: 18832 WallEngineering Geology01.dgn Horiz. Scale: 1:100    Vert. Scale: Staff Bridge Branch-Unit 0221    STW		<b>Sheet Revisions</b> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 15%;">Date:</th> <th style="width: 55%;">Comments</th> <th style="width: 30%;">Init.</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </tbody> </table>	Date:	Comments	Init.										 <b>Region 1</b>	<b>As Constructed</b> No Revisions: Revised: Void:	<b>EASTBOUND I-70 ENGINEERING GEOLOGY PAVING AND WALL</b> Designer: H. HUME    Structure Detailer: M. WALZ    Numbers Subset: Geology    Subset Sheets: 2 of 6	<b>Project No./Code</b> IM 0703-390 19035 Sheet Number 219
Date:	Comments	Init.																

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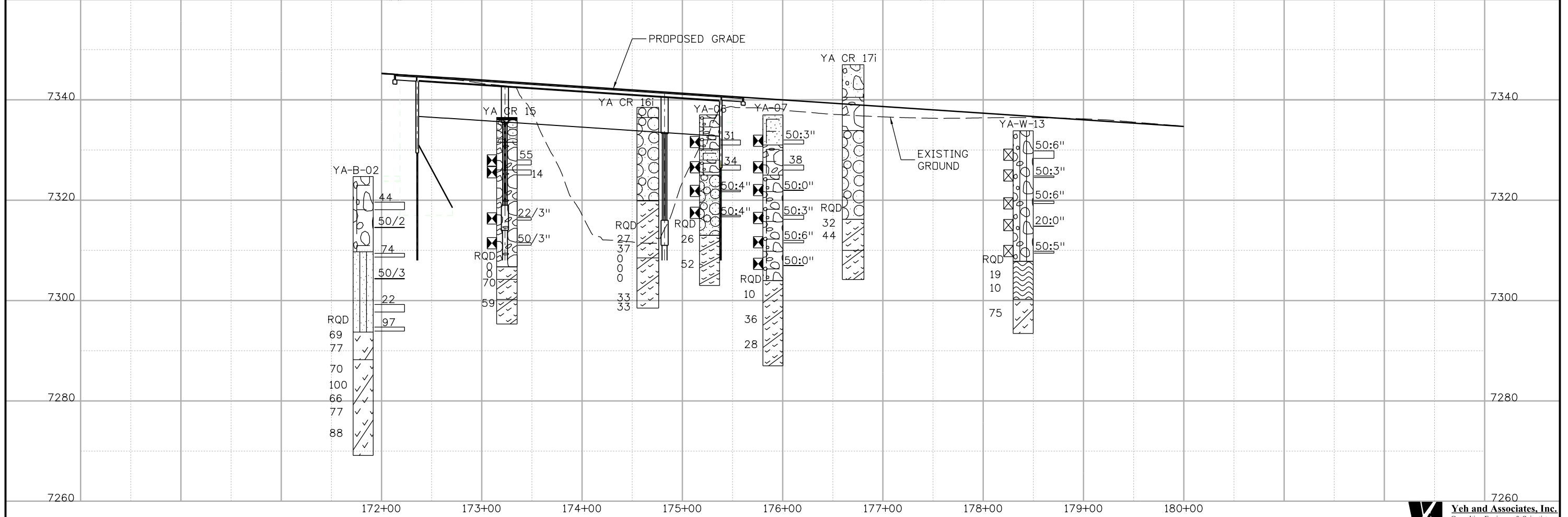
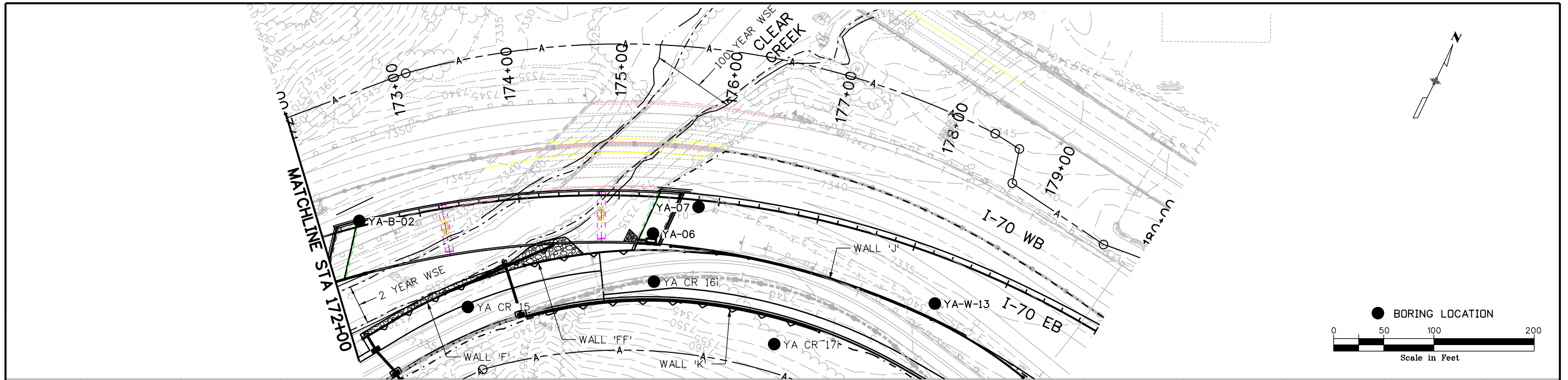
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File Name: 18832 EBDetour_Engineering Geology01.dgn		Date:	Comments	Init.	425 A Corporate Circle Golden, CO 80401 Phone: 720-497-6918 FAX: 720-497-6901		No Revisions:		IM 0703-390		
Horiz. Scale: 1:100 Vert. Scale:					Region 1 CRC		Revised:		19035		
ATKINS 4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276							Void:		Sheet Number 220		
							Designer: H. Hume Detailer: M. Walz Subset: Geology		Structure Numbers Subset Sheets: 3 of 6		

2012+00 2013+00  
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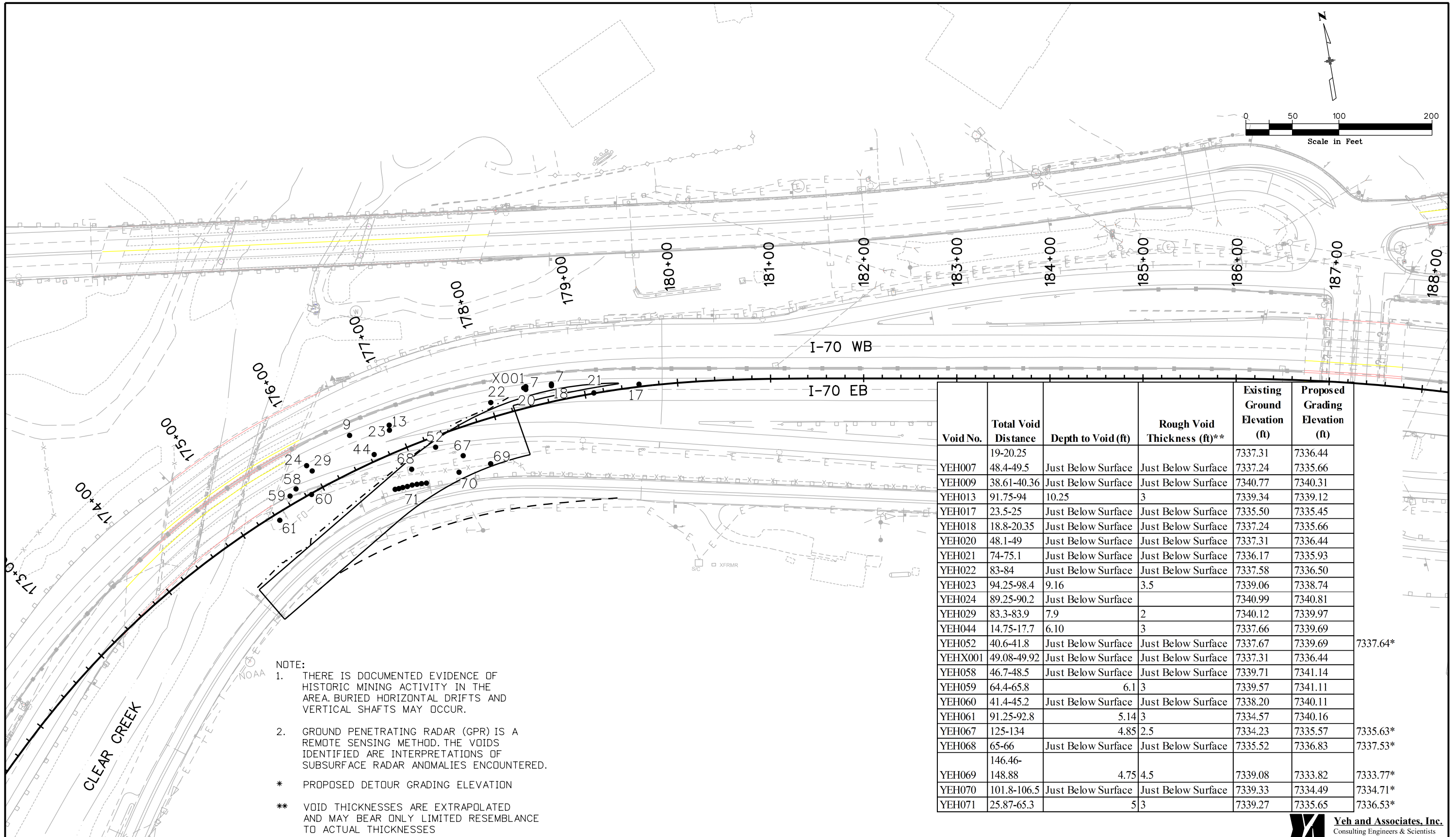


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Date:	Comments	Init.																					

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NOTE:  
 1. THERE IS DOCUMENTED EVIDENCE OF HISTORIC MINING ACTIVITY IN THE AREA. BURIED HORIZONTAL DRIFTS AND VERTICAL SHAFTS MAY OCCUR.  
 2. GROUND PENETRATING RADAR (GPR) IS A REMOTE SENSING METHOD. THE VOIDS IDENTIFIED ARE INTERPRETATIONS OF SUBSURFACE RADAR ANOMALIES ENCOUNTERED.  
 \* PROPOSED DETOUR GRADING ELEVATION  
 \*\* VOID THICKNESSES ARE EXTRAPOLATED AND MAY BEAR ONLY LIMITED RESEMBLANCE TO ACTUAL THICKNESSES

Void No.	Total Void Distance	Depth to Void (ft)	Rough Void Thickness (ft)**	Existing Ground Elevation (ft)	Proposed Grading Elevation (ft)
	19-20.25			7337.31	7336.44
YEH007	48.4-49.5	Just Below Surface	Just Below Surface	7337.24	7335.66
YEH009	38.61-40.36	Just Below Surface	Just Below Surface	7340.77	7340.31
YEH013	91.75-94	10.25	3	7339.34	7339.12
YEH017	23.5-25	Just Below Surface	Just Below Surface	7335.50	7335.45
YEH018	18.8-20.35	Just Below Surface	Just Below Surface	7337.24	7335.66
YEH020	48.1-49	Just Below Surface	Just Below Surface	7337.31	7336.44
YEH021	74-75.1	Just Below Surface	Just Below Surface	7336.17	7335.93
YEH022	83-84	Just Below Surface	Just Below Surface	7337.58	7336.50
YEH023	94.25-98.4	9.16	3.5	7339.06	7338.74
YEH024	89.25-90.2	Just Below Surface		7340.99	7340.81
YEH029	83.3-83.9	7.9	2	7340.12	7339.97
YEH044	14.75-17.7	6.10	3	7337.66	7339.69
YEH052	40.6-41.8	Just Below Surface	Just Below Surface	7337.67	7339.69
YEHX001	49.08-49.92	Just Below Surface	Just Below Surface	7337.31	7336.44
YEH058	46.7-48.5	Just Below Surface	Just Below Surface	7339.71	7341.14
YEH059	64.4-65.8	6.1	3	7339.57	7341.11
YEH060	41.4-45.2	Just Below Surface	Just Below Surface	7338.20	7340.11
YEH061	91.25-92.8	5.14	3	7334.57	7340.16
YEH067	125-134	4.85	2.5	7334.23	7335.57
YEH068	65-66	Just Below Surface	Just Below Surface	7335.52	7336.83
YEH069	146.46-148.88	4.75	4.5	7339.08	7333.82
YEH070	101.8-106.5	Just Below Surface	Just Below Surface	7339.33	7334.49
YEH071	25.87-65.3	5	3	7339.27	7335.65

7337.64\*  
7335.63\*  
7337.53\*  
7333.77\*  
7334.71\*  
7336.53\*

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Print Date: 11/19/2012  
 File Name: 18832 Void Survey.dgn  
 Horiz. Scale: 1:100 Vert. Scale:  
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 Denver, CO 80237  
 Phone: (303) 221-7275 Fax: (303) 221-7276

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 Phone: 720-497-6905 FAX: 720-497-6901  
**Region 1** **CRC**

As Constructed	I-70 GPR VOID SURVEY AT HIDDEN VALLEY PRIMARY VOIDS			Project No./Code
No Revisions:				IM 0703-390
Revised:	Designer:	H. HUME	Structure Numbers	19035
Void:	Detailer:	M. WALZ	Subset Sheets:	6 of 6
				Sheet Number 223

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