

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:
Project Number IM 0703-389 & 0703-390
Project Code: 19034 & 19035

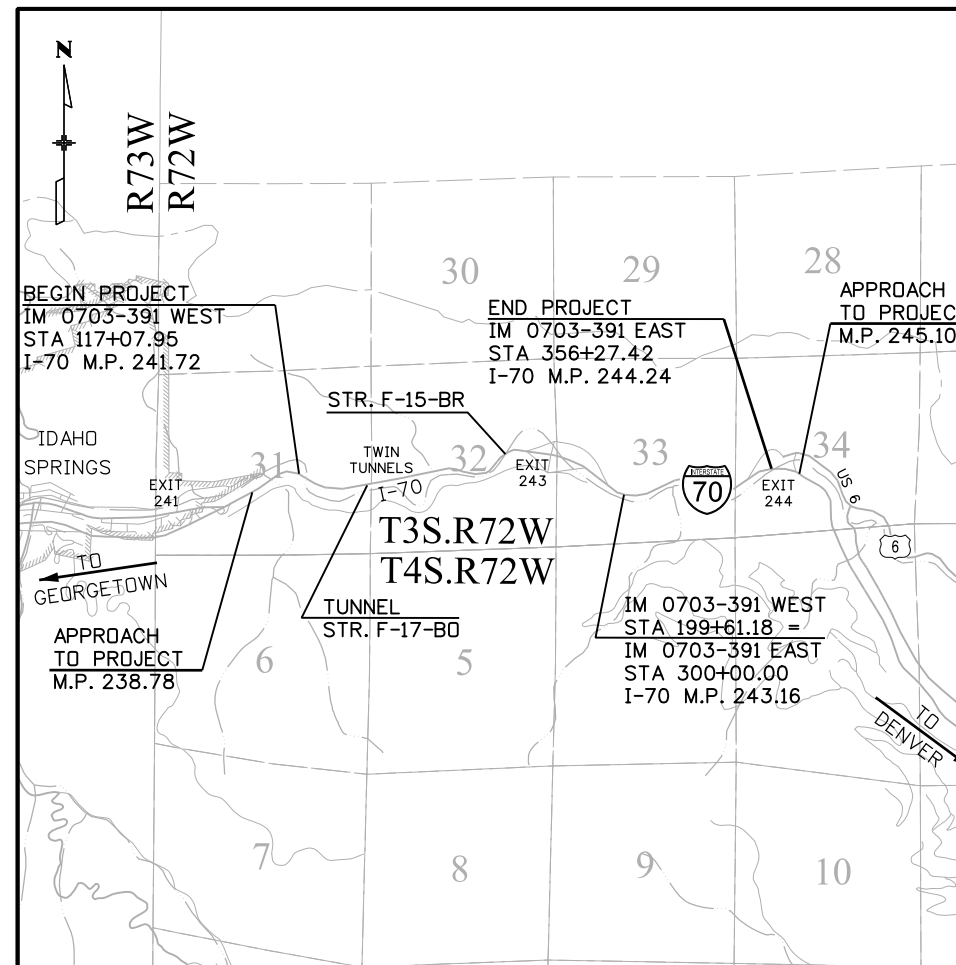
R.O.W. Projects:

R.O.W. Project Description
N/A

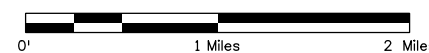
HIGHWAY CONSTRUCTION BID PLANS OF PROPOSED FEDERAL AID PROJECT NO. IM 0703-391 TWIN TUNNELS CLEAR CREEK COUNTY CONSTRUCTION PROJECT CODE NO. 19036 CONSTRUCTION PACKAGE 2

TABULATION OF LENGTH & DESIGN DATA

STATION	FEET		
	ROADWAY	MAJOR STR.	
APPROACH TO PROJECT APPROX. M.P. 238.78			
BEGIN IM 0703-391 - WEST ALIGNMENT STA. 117+07.95 ON I-70, M.P. 241.72	2,403.05		
STA. 141+11.00 BEGIN EASTBOUND TUNNEL STR NO. F-17-B0, M.P. 242.18			786.00
STA. 148+97.00 END EASTBOUND TUNNEL STR NO. F-17-B0, M.P. 242.33			
STA. 172+34.24 BEGIN STRUCTURE NO. F-15-BR, M.P. 242.77	2,337.24		
STA. 175+39.67 END STRUCTURE NO. F-15-BR, M.P. 242.83			305.43
END WEST ALIGNMENT STA. 199+61.18 ON I-70, M.P. 243.16	2,421.51		
BEGIN EAST ALIGNMENT STA. 300+00.00 ON I-70, M.P. 243.16	0.00		
END IM 0703-391 - EAST ALIGNMENT STA. 356+27.42 ON I-70, M.P. 244.24	5,627.42		
APPROACH TO PROJECT APPROX. M.P. 245.10			
TOTAL	12,789.22		1,091.43
SUMMARY OF PROJECT LENGTH	FEET	MILES	
PROJECT GROSS LENGTH	13,880.65	2.63	
DESIGN DATA	I-70	EXIT RAMP 243	EXIT RAMP 244
MAXIMUM RADIUS OF CURVE	3500 FT.	800 FT.	5000 FT.
MAXIMUM GRADE	3.43%	5.51%	3.87%
MINIMUM S.S.D. HORIZONTAL	270 FT.	296 FT.	425 FT.
MINIMUM S.S.D. VERTICAL	300 FT.	428 FT.	308 FT.
MAXIMUM DESIGN SPEED	50 MPH	50 MPH	35 MPH
2035 DESIGN TRAFFIC	DHV = 6000 ADT = 59,200	-	-
DHV TRUCK %	4% SUMMER (DHV) OR 8.5% ANNUAL	4% SUMMER (DHV) OR 8.5% ANNUAL	4% SUMMER (DHV) OR 8.5% ANNUAL
CLEAR ZONE DISTANCE (TANGENT)	22 FT.	22 FT.	22 FT.
CLEAR ZONE DISTANCE (MIN. RADIUS)	33 FT.	31 FT.	22 FT.
CONSTRUCTION CLEAR ZONE (MIN 18')	18 FT.	18 FT.	18 FT.



PROJECT LOCATION MAP



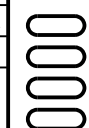
SHEET NO.	INDEX OF SHEETS
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2	STANDARD PLANS LIST
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6-17	TYPICAL SECTIONS
18-31	SUMMARY OF APPROXIMATE QUANTITIES
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36	SUMMARY OF EARTHWORK AND PAVEMENT DESIGN PARAMETERS
37-38	TABULATION OF DRAINAGE STRUCTURES
39	TABULATION OF WATER QUALITY POND INFRASTRUCTURE
40	SURVEY TABULATION SHEET
41-49	EASTBOUND I-70 GEOMETRIC LAYOUTS
50-60	EASTBOUND I-70 REMOVAL PLANS
61-82	EASTBOUND I-70 ROADWAY PLAN AND PROFILES
83-84	EXIT 243 OFF RAMP PLAN AND PROFILE
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87	EXIT 244 OFF RAMP GORE DETAIL
88	EASTBOUND I-70 GUARDRAIL DETAIL PLAN
89-90	EASTBOUND I-70 MISCELLANEOUS DETAILS
91-103	EASTBOUND I-70 GRADING AND DRAINAGE PLANS
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130-136	DRAINAGE DETAILS - WATER QUALITY STRUCTURES
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150	DRAINAGE DETAILS - PIPE RAILING
151	DRAINAGE DETAILS - WATER QUALITY STRUCTURE CONCRETE FOREBAY
152	DRAINAGE DETAILS - RIPRAP
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155-175	I-70 TWIN TUNNELS - PLANS
176	TUNNEL PORTALS - GENERAL INFORMATION
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201-204	EB I-70 OVER CLEAR CREEK BRIDGE - EXISTING BRIDGE REMOVAL PLAN, DETAILS
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295	BOULDER TABULATION AND PLACEMENT DETAILS
296-303	SIGNING, STRIPING, DELINEATOR TABULATIONS AND KEY MAP
304-319	SIGNING PLANS
320-334	SIGNING PLAN DETAILS, SIGN CROSS SECTIONS, AND POST DETAILS
335-347	STRIPING PLANS
348	EASTBOUND I-70 CONSTRUCTION PHASING - SCHEDULE OF TRAFFIC CONTROL DEVICES
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350-352	EASTBOUND I-70 CONSTRUCTION PHASING - MISCELLANEOUS PLANS
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375-378	TWIN TUNNELS DETOUR - ADVANCED MESSAGING INFORMATION
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399-414	ENGINEERING GEOLOGY PLANS
CROSS SECTIONS (UNDER SEPARATE TITLE)	
1	TITLE SHEET
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241-247	EXIT 244 OFF RAMP CROSS SECTIONS

Print Date: 3/10/2013

File Name: 18832DES_CP2_TitleSht.dgn

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

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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

As Constructed

No Revisions:

Revised:

Void:

Contract Information

Contractor:	
Resident Engineer:	
Project Engineer:	
PROJECT STARTED:	ACCEPTED:
Comments:	

Project No./Code

IM 0703-391
19036
Sheet Number 1

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 checked="" type="checkbox"/>		M-607-1 WIRE FENCES AND GATES (3 SHEETS).....	100-102	<input checked="" 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 checked="" type="checkbox"/>	S-614-1 GROUND SIGN PLACEMENT (2 SHEETS) (REVISED ON JULY 24, 2012)....	158-159
<input checked="" 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 checked="" 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 checked="" 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 checked="" type="checkbox"/>		S-614-5 BREAK-AWAY SIGN SUPPORT DETAILS	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 checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	S-614-6 CONCRETE FOOTINGS AND SIGN ISLANDS.....	167-168
<input type="checkbox"/>		M-206-2 EXCAVATION AND BACKFILL FOR BRIDGES (2 SHEETS).....	17-18	<input type="checkbox"/>		M-609-1 CURBS, GUTTERS, AND SIDEWALKS (4 SHEETS) (REVISED ON JULY 24, 2012)....	126-129	<input checked="" type="checkbox"/>		S-614-8 TUBULAR STEEL SIGN SUPPORT DETAILS (5 SHEETS).....	169-173
<input checked="" 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 checked="" type="checkbox"/>		S-614-10 MARKER ASSEMBLY INSTALLATIONS	175
<input checked="" type="checkbox"/>		M-214-1 PLANTING DETAILS	33	<input checked="" type="checkbox"/>		M-614-1 RUMBLE STRIPS (3 SHEETS).....	136-138	<input checked="" type="checkbox"/>		S-614-11 MILEPOST SIGN DETAIL FOR HIGH SNOW AREAS	176
<input type="checkbox"/>	<input checked="" type="checkbox"/>	M-412-1 CONCRETE PAVEMENT JOINTS (5 SHEETS) (REVISED ON JULY 24, 2012)....	34-38	<input type="checkbox"/>		M-614-2 SAND BARREL ARRAYS (2 SHEETS).....	139-140	<input type="checkbox"/>		S-614-12 STRUCTURE NUMBER INSTALLATION	177
<input type="checkbox"/>		M-510-1 STRUCTURAL PLATE PIPE H-20 LOADING.....	39	<input checked="" 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 checked="" type="checkbox"/>		S-614-20 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 checked="" type="checkbox"/>		S-614-21 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-614-22 TYPICAL MULTI-SIGN INSTALLATIONS.....	183
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<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-614-40A ALTERNATIVE TRAFFIC SIGNAL INSTALLATION DETAILS.....	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
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<input type="checkbox"/>		M-604-10 INLET, TYPE C.....	60							S-630-3 FLASHING BEACON (PORTABLE) DETAILS	260
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<input type="checkbox"/>		M-604-12 CURB INLET TYPE R (2 SHEETS).....	62-63							S-630-5 PORTABLE RUMBLE STRIPS (TEMPORARY) (2 SHEETS)	263-264
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<input checked="" type="checkbox"/>		M-604-20 MANHOLES (3 SHEETS).....	65-67							S-630-7 ROLLING ROADBLOCKS FOR TRAFFIC CONTROL.....	266-268
<input type="checkbox"/>		M-604-25 VANE GRATE INLET (5 SHEETS).....	68-72								
<input type="checkbox"/>		M-605-1 SUBSURFACE DRAINS	73								
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<input checked="" type="checkbox"/>		M-606-13 GUARDRAIL TYPE 7 F-SHAPE BARRIER (4 SHEETS).....	93-96								
<input 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 January 15, 2013

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

NEW OR REVISED STANDARD PLAN SHEETS APPLICABLE TO THIS PROJECT, INDICATED BY A MARKED BOX , WILL BE ATTACHED TO THE PLANS.

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Print Date: 3/8/2013		Sheet Revisions			Colorado Department of Transportation			As Constructed		STANDARD PLANS LIST			Project No./Code	
File Name: 18832DES_CP2_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 0703-391	
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				Region 1			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 REPORTS 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.
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. IT IS ANTICIPATED THAT 200 HOURS OF ITEM 203-02330 LABORER WILL BE REQUIRED FOR THIS PROJECT AND USE OF THIS ITEM 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. ALL ROCK BOULDERS GREATER THAN 2 FEET X 2 FEET SHALL BE STOCKPILED FOR USE IN CONSTRUCTION PACKAGE 3. IT IS ASSUMED THAT 700 BOULDERS WILL BE STOCKPILED. IT IS ANTICIPATED THAT 140 HOURS OF ITEM 203-01525 BACKHOE (SPECIAL) AND 140 HOURS OF ITEM 203-01582 TRUCK (DUMP) WILL BE REQUIRED FOR THIS WORK.
13. 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.
14. THE CONTRACTOR SHALL MAINTAIN EXISTING DRAINAGE AT ALL TIMES DURING CONSTRUCTION. TEMPORARY ITEMS REQUIRED TO PROVIDE DRAINAGE SHALL NOT BE PAID FOR SEPARATELY BUT SHALL BE INCLUDED IN THE COST OF THE WORK.
15. IT IS ANTICIPATED THAT 80 HOURS (TOTAL) WILL BE NEEDED FOR POTHOLING. 10 HOURS ARE INCLUDED IN THE ITS TABULATION AND 70 HOURS ARE ESTIMATED FOR VARIOUS POTHOLING REQUIREMENTS FOR THE PROJECT.
16. 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.
17. IT IS ANTICIPATED THAT 1 LUMP SUM DEWATERING WILL BE REQUIRED FOR THIS PROJECT.
18. IT IS ESTIMATED THAT 125 LF OF GUARDRAIL TYPE 3 (SPECIAL) (FURNISH ONLY) WILL BE REQUIRED FOR THIS PROJECT.

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. CONTRACTOR SHALL FOLLOW SECTION 209 OF THE STANDARD SPECIFICATIONS AND APEN TERMS AND CONDITIONS FOR ALL WATERING AND DUST PALLIATIVE PRACTICES.
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.

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Print Date: 3/8/2013		Sheet Revisions			Colorado Department of Transportation			As Constructed		GENERAL NOTES			Project No./Code			
File Name: 18832DES_CP2_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 0703-391			
Horiz. Scale: 1:1 Vert. Scale: NA								Revised:					Structure Numbers		19036	
 4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276								Void:					Subset Sheets: 1 of 3		Sheet Number 3	
					Region 1		CRC									

ENVIRONMENTAL COMMITMENTS

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING EXISTING WETLANDS DURING CONSTRUCTION. PRIOR TO CONSTRUCTION, THE CONTRACTOR AND CDDT 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. WETLAND/RIPARIAN AREAS NOT REQUIRED TO BE IMPACTED BY THE PROJECT SHALL BE PROTECTED FROM CONSTRUCTION ACTIVITIES BY TEMPORARY FENCING.
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. CONSTRUCTION THAT OCCURS BETWEEN APRIL 1 AND AUGUST 31 SHALL ADHERE TO CDDT SPECIFICATION 240-PROTECTION OF MIGRATORY BIRDS. TO AVOID IMPACTS TO NESTING BIRDS IN ACCORDANCE WITH THE MBTA, A QUALIFIED CDDT BIOLOGIST WILL CONDUCT A NEST SURVEY PRIOR TO CONSTRUCTION AT THE REQUEST OF THE CONTRACTOR. IF ACTIVE NESTS ARE FOUND DURING CONSTRUCTION, COORDINATION WITH CPW AND USFWS IS REQUIRED TO DETERMINE AN APPROPRIATE COURSE OF ACTION, WHICH MAY INCLUDE, BUT IS NOT LIMITED TO, A DELAY IN CONSTRUCTION TO AVOID THE BREEDING SEASON.
4. CONSTRUCTION STAGING AND MATERIALS STOCKPILING SHALL BE LOCATED GREATER THAN 50 FEET FROM THE EDGE OF WETLANDS OR THE EDGE OF CLEAR CREEK TO AVOID DISTURBANCE OF VEGETATION AND TO PREVENT POLLUTANT DISCHARGES INTO SENSITIVE HABITATS. FERTILIZERS AND/OR HYDRO-MULCHING SHALL NOT BE ALLOWED WITHIN 50 FEET OF WETLANDS. SPECIFIC LOCATIONS WILL BE DETERMINED DURING CONSTRUCTION WITH THE ENGINEER. CONSIDERING THE NARROWNESS OF THE CORRIDOR AND LIMITED AREAS AVAILABLE, THIS BUFFER MAY NEED TO BE REDUCED. IF THIS BUFFER IS NOT ACHIEVABLE, PLACEMENT OF MATERIALS CLOSER TO THE EDGE OF WETLANDS OR THE EDGE OF WATER SHALL BE APPROVED BY THE ENGINEER AND SHALL REQUIRE APPROPRIATE ADDITIONAL BMPS TO MINIMIZE DISTURBANCE OF VEGETATION AND PREVENT POLLUTANT DISCHARGES INTO SENSITIVE HABITATS. BMPS WILL BE DETERMINED ON A SITE-BY-SITE BASIS AND ANY MODIFICATIONS WILL REQUIRE CDDT ENVIRONMENTAL STAFF APPROVAL.
5. DURING CONSTRUCTION (CONSTRUCTION PACKAGE 1B) AND OPERATION OF THE PORTAL TO PORTAL ACCESS ROAD, THE CONTRACTOR SHALL MAINTAIN 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. THE CONTRACTOR SHALL MAINTAIN A 10' BUFFER ZONE AND FULL BARRICADE PROTECTION AROUND THE MATURE COTTONWOOD TREE IDENTIFIED BY CDDT BIOLOGIST ON THE SOUTH SIDE OF THE EAST TUNNEL PORTAL DURING HAUL ROAD OPERATION AND REMOVAL.
6. 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.
7. A HEALTH AND SAFETY MANAGEMENT PLAN IS REQUIRED FOR THIS PROJECT. THE CONTRACTOR SHALL COMPLY WITH THIS PLAN FOR ALL EXCAVATION ACTIVITIES. 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).
8. THE CONTRACTOR SHALL USE SPOTTERS FOR BRIDGE AND TUNNEL 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. CONSTRUCTION ACTIVITIES THAT PRESENT A SAFETY RISK TO BOATERS WILL BE STOPPED TEMPORARILY UNTIL THE BOATERS HAVE PASSED THROUGH THE CONSTRUCTION AREA. CDDT WILL COORDINATE WITH RAFTING COMPANIES REGARDING PROTOCOLS FOR ON-RIVER COMMUNICATION BETWEEN SPOTTERS AND BOATERS DURING CONSTRUCTION.
9. 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.
10. THE CONTRACTOR SHALL LIMIT NIGHT WORK TO AREAS AWAY FROM RESIDENCES AT HIDDEN VALLEY AND WEST PORTAL WHEN FEASIBLE. IF CDDT RECEIVES 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, CDDT 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.
11. THE CONTRACTOR SHALL PERFORM REGULAR MAINTENANCE ON CONSTRUCTION VEHICLES TO REDUCE EMISSIONS AND HAVE MUFFLERS MAINTAINED TO REDUCE NOISE.
12. THE CONTRACTOR SHALL MAINTAIN PARKING AND PUBLIC ACCESS AT KERMITTS TRAILHEAD AND BOAT LAUNCH DURING CONSTRUCTION.
13. IN ACCORDANCE WITH COLORADO AIR QUALITY REGULATION NO.1 (5CCR1001-3), THE CONTRACTOR SHALL USE ALL AVAILABLE PRACTICAL METHODS THAT ARE TECHNICALLY FEASIBLE AND ECONOMICALLY REASONABLE IN ORDER TO MINIMIZE FUGITIVE DUST EMISSIONS FROM BLASTING ACTIVITIES.
14. THE CONTRACTOR SHALL PREPARE AND IMPLEMENT A FUGITIVE DUST CONTROL PLAN THAT INCLUDES WETTING OF DISTURBED AREAS.
15. THE CONTRACTOR SHALL ENSURE THAT ROADSIDE SOILS ARE STABILIZED AND THAT THE DETOUR ROUTE IS SWEEPED PRIOR TO OPENING CR 314 FOR DETOUR USE. THE CONTRACTOR SHALL ALSO ENSURE THAT THE DETOUR IS SWEEPED ON A PERIODIC BASIS. IT IS ESTIMATED THAT 140 HOURS OF ITEM 208-00106 SWEEPING (SEDIMENT REMOVAL) WILL BE REQUIRED FOR THE DETOUR ROUTE. SEE TABULATION OF STORMWATER QUANTITIES FOR TOTAL QUANTITY OF SWEEPING (SEDIMENT REMOVAL). THE ABOVE 140 HOURS ARE INCLUDED IN THE TOTAL AMOUNT SHOWN IN THE TABULATION OF STORMWATER QUANTITIES.
16. THE CONTRACTOR SHALL IMPLEMENT BMPS TO PREVENT POTENTIAL MINE WASTES FROM BEING EXPOSED IN THE AIR (DUST SUPPRESSION) OR IMPACTING SURFACE WATERS, IN PARTICULAR CLEAR CREEK.
17. THE CONTRACTOR SHALL USE THE CLEANEST FUELS AVAILABLE AT THE TIME (FOR EXAMPLE, LOW-SULFUR FUEL OR BIODIESEL) IN CONSTRUCTION EQUIPMENT AND CONSTRUCTION VEHICLES TO REDUCE GHG EMISSIONS. USE FUEL-EFFICIENT CONSTRUCTION VEHICLES (FOR EXAMPLE, HYBRID TECHNOLOGIES) WHEN POSSIBLE.
18. THE CONTRACTOR SHALL CONSIDER THE USE OF ALTERNATIVE FUELS AND ASPHALT BINDERS WHEN POSSIBLE.
19. THE CONTRACTOR SHALL IMPLEMENT TRAFFIC MANAGEMENT TECHNIQUES THAT MINIMIZE MOTORIST DELAYS AND VEHICLE IDLING (SEE MITIGATION MEASURES IN THE TRANSPORTATION MITIGATION CATEGORY).
20. THE CONTRACTOR SHALL PREPARE AND IMPLEMENT A PLAN TO MINIMIZE THE IDLING OF CONSTRUCTION EQUIPMENT.
21. THE CONTRACTOR SHALL CONDUCT MAINTENANCE ACTIVITIES (SUCH AS, ROADWAY SWEEPING) DURING PERIODS OF REDUCED TRAFFIC VOLUMES WHEN FEASIBLE TO REDUCE IDLING VEHICLES.
22. STAGING AREAS SHALL BE LOCATED AS CLOSE AS POSSIBLE TO THE PROJECT AREA.
23. THE CONTRACTOR SHALL REMOVE COMPONENTS THAT REQUIRE DEMOLITION IN SUCH A MANNER AS TO ENSURE LEAD IS NOT RELEASED AND IS PROPERLY RECYCLED, WHERE POSSIBLE.
24. THE CONTRACTOR SHALL AVOID SANDING, CUTTING, BURNING, OR OTHERWISE CAUSING THE RELEASE OF LEAD FROM PAINT ON THESE STRUCTURES. IF THIS IS NOT POSSIBLE, THE LEAD MUST BE ABATED PROPERLY.
25. THE CONTRACTOR SHALL IMPLEMENT APPROPRIATE BMPS FOR EROSION AND SEDIMENT CONTROL ACCORDING TO THE CDDT EROSION CONTROL AND STORM WATER QUALITY GUIDE (CDDT, 2002), DEVELOP A STORMWATER MANAGEMENT PLAN (WHICH INCLUDES WATER QUALITY MONITORING BY THE CONSTRUCTION CONTRACTOR TO ENSURE EFFECTIVENESS OF TEMPORARY CONSTRUCTION BMPS), AND IMPLEMENT AND MONITOR ANY PROJECT-SPECIFIC BMPS RECOMMENDED BY CPW TO REDUCE IMPACTS OF SEDIMENTATION TO AQUATIC RESOURCES DURING CONSTRUCTION.
26. THE CONTRACTOR SHALL REMOVE ALL MUD, PLANTS AND DEBRIS FROM THE EQUIPMENT (TRACKS, TURRETS, BUCKETS, DRAGS, TEETH, ETC.) AND STEAM PRESSURE WASH EQUIPMENT THAT HAS BEEN PREVIOUSLY USED IN ANOTHER STREAM, RIVER, LAKE, RESERVOIR, POND OR WETLAND TO MEET THE "CERTIFIED CLEAN" STANDARD AND KILL ANY UNDESIRABLE OR NUISANCE SPECIES.
27. EROSION CONTROL BMPS SHALL BE ESTABLISHED AT EACH RETAINING WALL LOCATION TO AVOID OR MINIMIZE SEDIMENTATION WITHIN CLEAR CREEK.
28. THE CONTRACTOR SHALL MANAGE EROSION AND SURFACE WATER AWAY FROM WATER SOURCES AND ENSURE THAT APPROPRIATE TEMPORARY BMPS ARE IN PLACE TO PREVENT MIGRATION OF SEDIMENT FROM WASTE PILES, SLOPES, AND EXCAVATIONS.
29. THE CONTRACTOR SHALL MINIMIZE THE AMOUNT OF DISTURBANCE AND LIMIT THE AMOUNT OF TIME THAT DISTURBED AREAS ARE ALLOWED TO REMAIN NON-VEGETATED.
30. THE CONTRACTOR SHALL MINIMIZE CONSTRUCTION ACTIVITIES IN OR NEAR KNOWN TAILING AREAS.



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Print Date: 3/8/2013	0000	Sheet Revisions			 Colorado Department of Transportation 425 A Corporate Circle Golden, CO 80401 Phone: 720-497-6918 FAX: 720-497-6901 Region 1	As Constructed	GENERAL NOTES			Project No./Code
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Horiz. Scale: 1:1 Vert. Scale: NA						Revised:	Designer: E. Marsh	Structure Numbers		19036
 4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276				Void:	Detailer: J. Gellner			Sheet Number		
					Subset: Gen Notes	Subset Sheets: 2 of 3		4		

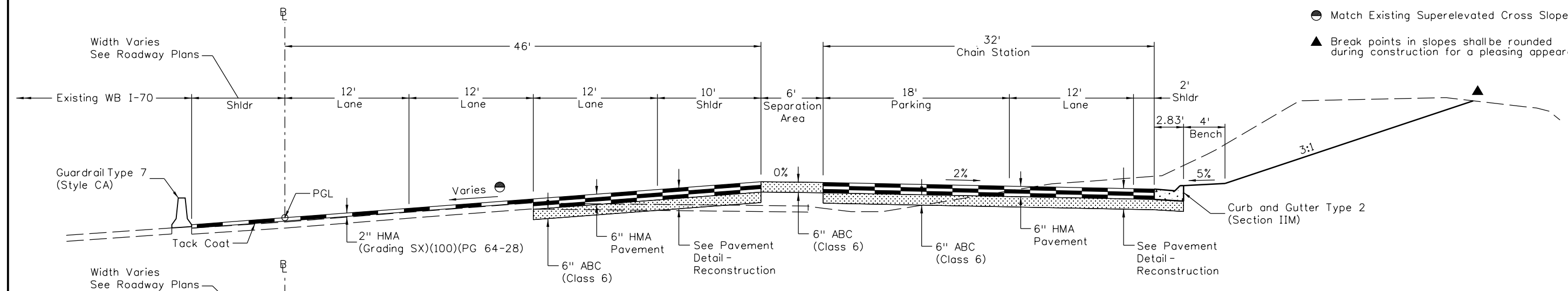
ENVIRONMENTAL COMMITMENTS (CONTINUED)

- 31. THE CONTRACTOR SHALL REMOVE FOOD AND FOOD-RELATED GARBAGE FROM CONSTRUCTION SITE DAILY.
- 32. EROSION CONTROL BLANKETS WILL HAVE FLEXIBLE NATURAL FIBERS TO ALLOW FOR SAFE PASSAGE OF SNAKES THROUGH THE EROSION CONTROL BLANKET.
- 33. IF AN INCREASE IN ANIMAL/VEHICLE COLLISIONS IS OBSERVED DURING OPERATION OF THE EASTBOUND I-70 DETOUR, TEMPORARY FENCING WILL BE CONSIDERED ON THE SOUTH SIDE OF THE ROADWAY.
- 34. AS FEASIBLE ON WEEKENDS AND HOLIDAYS, THE CONTRACTOR SHALL MINIMIZE I-70 CONSTRUCTION ACTIVITIES THAT COULD SHIFT TRAVEL TO ALTERNATIVE ROUTES (SH 9 AND US 285, IN PARTICULAR).
- 35. THE CONTRACTOR SHALL PROHIBIT CONSTRUCTION EQUIPMENT FROM ENTERING THE ORDINARY HIGH WATER MARK (2-YEAR WATER SURFACE ELEVATION) EXCEPT WHERE IDENTIFIED IN THE PLANS.
- 36. THE CONTRACTOR SHALL NOT PLACE RIP-RAP ALONG CLEAR CREEK WITHIN THE 2-YEAR FLOODPLAIN.
- 37. THE CONTRACTOR SHALL ENSURE BMPS AND CONTAINMENT STRUCTURES ARE IN PLACE FOR WORK CONDUCTED WITHIN AND ADJACENT TO THE 2-YEAR WATER SURFACE ELEVATION TO PREVENT CONCRETE WASHOUT AND OTHER POTENTIAL POLLUTANTS FROM REACHING CLEAR CREEK AND WETLANDS.
- 38. THE CONTRACTOR SHALL REFUEL EQUIPMENT WITHIN DESIGNATED REFUELING CONTAINMENT AREA AWAY FROM FLOODPLAIN, CLEAR CREEK, AND WETLANDS.
- 39. THE CONTRACTOR SHALL BRIDGE THE EXISTING SEPTIC SYSTEM AT THE HOUSE WITH CRANE MATS OR A STEEL PLATE TO AVOID DAMAGE TO THE SEPTIC TANKS AND PUMP STATION.
- 40. THE CONTRACTOR SHALL INSTALL HIGH-VISIBILITY MARKINGS TO IDENTIFY SEPTIC SYSTEM FACILITIES, HOUSEHOLD WELLS, AND RESIDENTIAL STRUCTURES, WHERE NEEDED. ANY PROPERTY DAMAGES SHALL BE REPAIRED AT THE EXPENSE OF THE CONTRACTOR.
- 41. UNLESS NECESSITATED BY SAFETY CONCERNS, RIVER CLOSURES DUE TO ROCK BLASTING, BRIDGE DEMOLITION, OR BRIDGE REHABILITATION SHALL NOT OCCUR DURING RAFTING SEASON (JUNE THROUGH AUGUST).

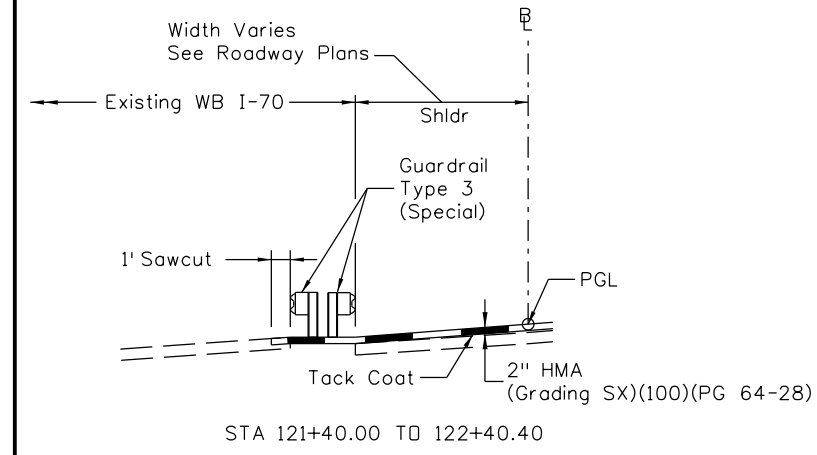
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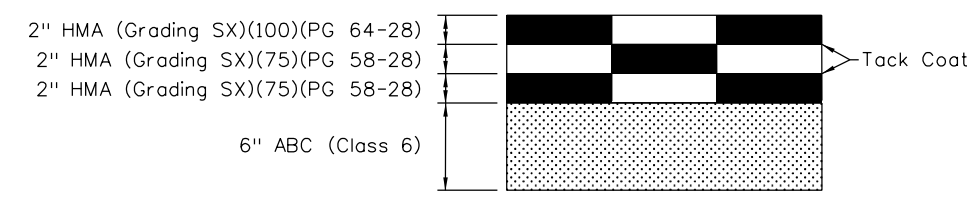
- Notes:
- Match Existing Superelevated Cross Slope
 - ▲ Break points in slopes shall be rounded during construction for a pleasing appearance



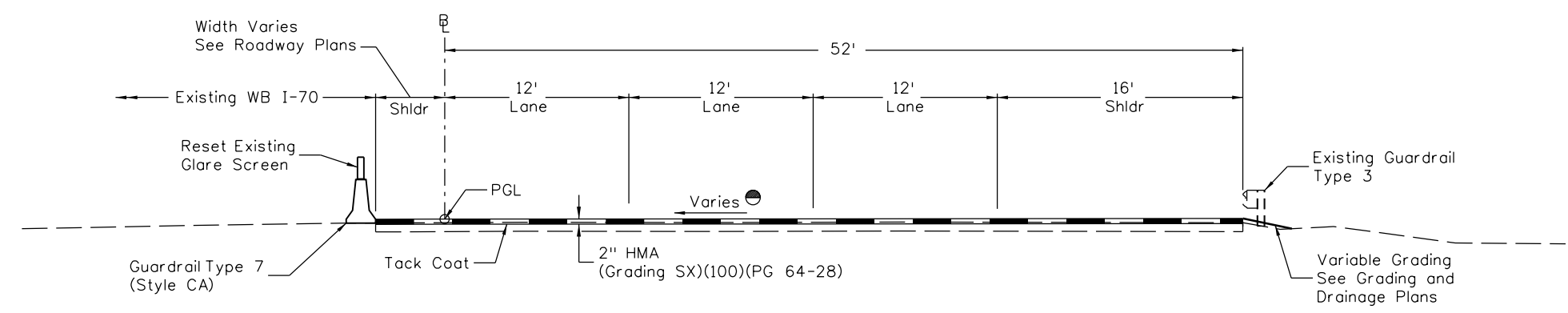
TYPICAL SECTION EASTBOUND I-70
STA 120+49.78 TO 122+40.40



Existing glare screen shall be reset from existing Guardrail Type 7 to Guardrail Type 7 (Style CA) from Sta 117+07.95 to 121+40.00. Mounting system shall be similar to the existing system or as approved by the Engineer. Work will not be paid for separately but included in the cost of Guardrail Type 7 (Style CA).



PAVEMENT DETAIL - RECONSTRUCTION



TYPICAL SECTION EASTBOUND I-70
STA 117+17.82 TO 118+19.80

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Region 1 **CRC**

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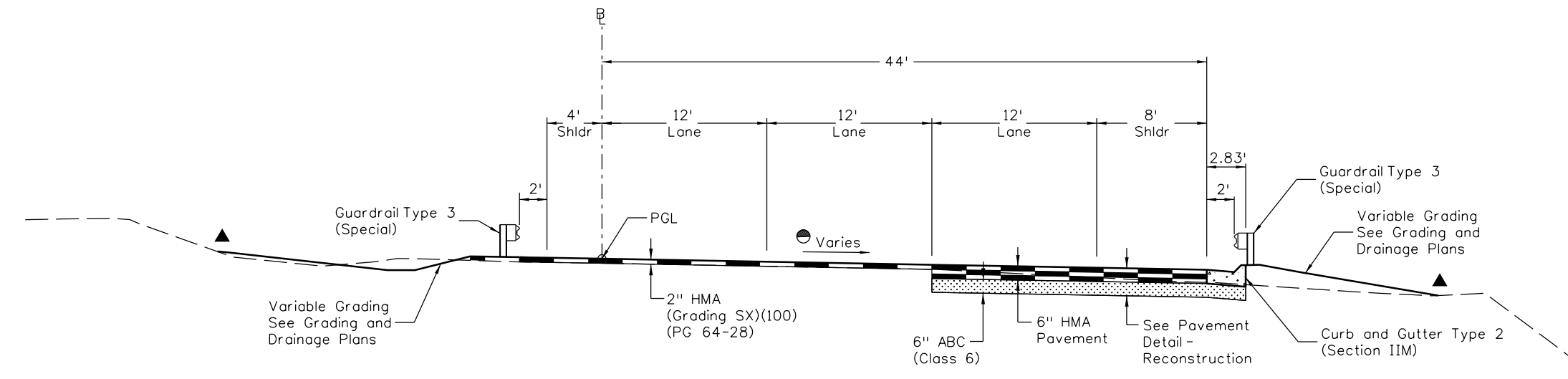
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Designer:	E. Marsh	Structure Numbers	
Detailer:	J. Gellner		
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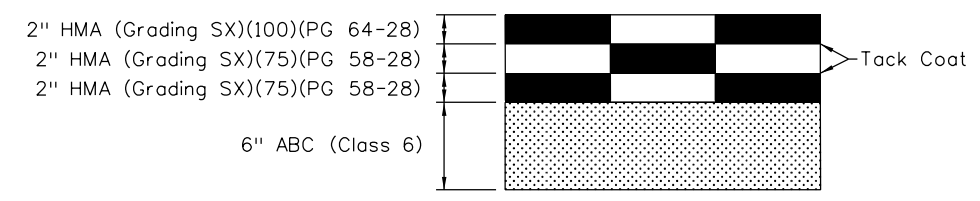
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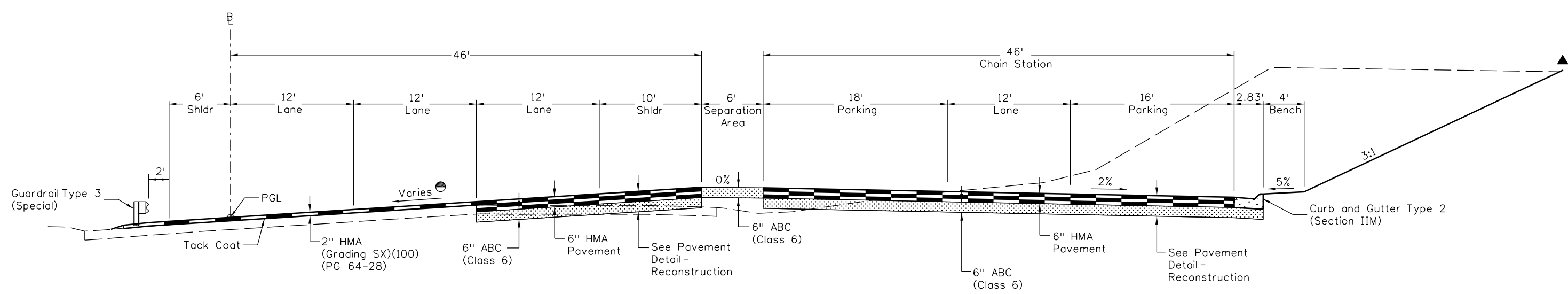
- Notes:
- Match Existing Superelevated Cross Slope
 - ▲ Break points in slopes shall be rounded during construction for a pleasing appearance



TYPICAL SECTION EASTBOUND I-70
STA 129+75.17 TO 130+36.00



PAVEMENT DETAIL - RECONSTRUCTION



TYPICAL SECTION EASTBOUND I-70
123+10.72 TO 126+69.69

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**EASTBOUND I-70
TYPICAL SECTIONS**

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

Structure Numbers
Subset Sheets: 2 of 12

Project No./Code

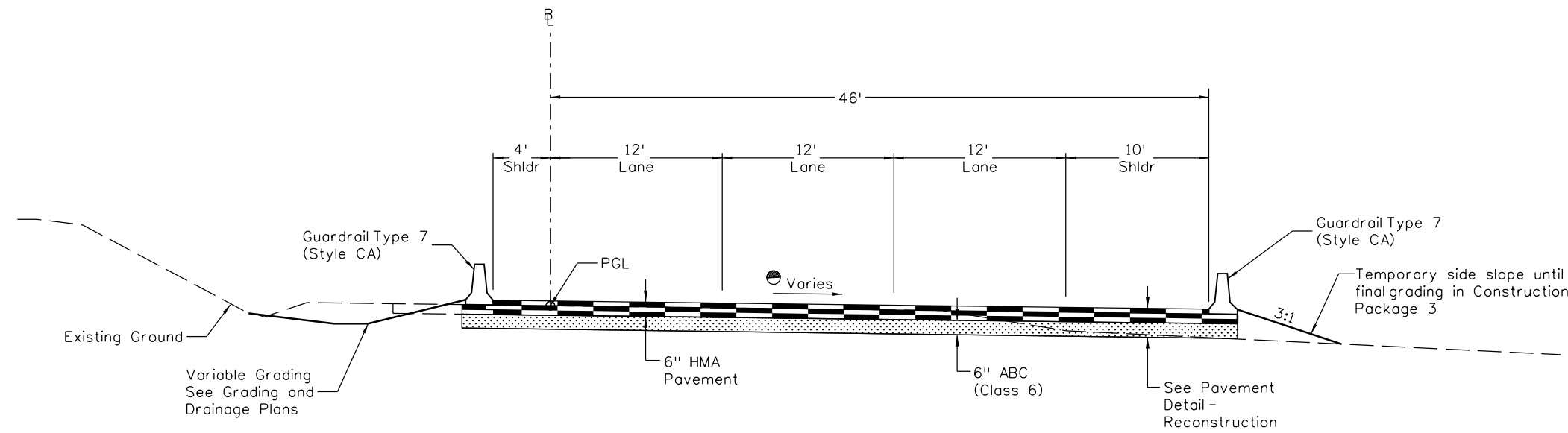
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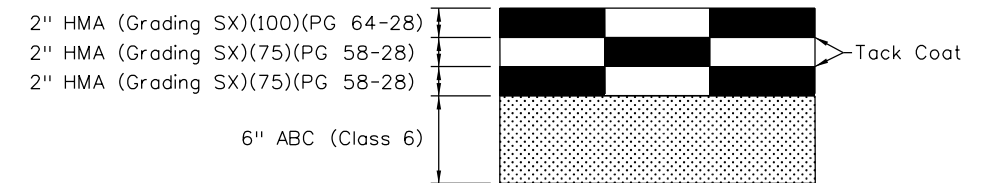
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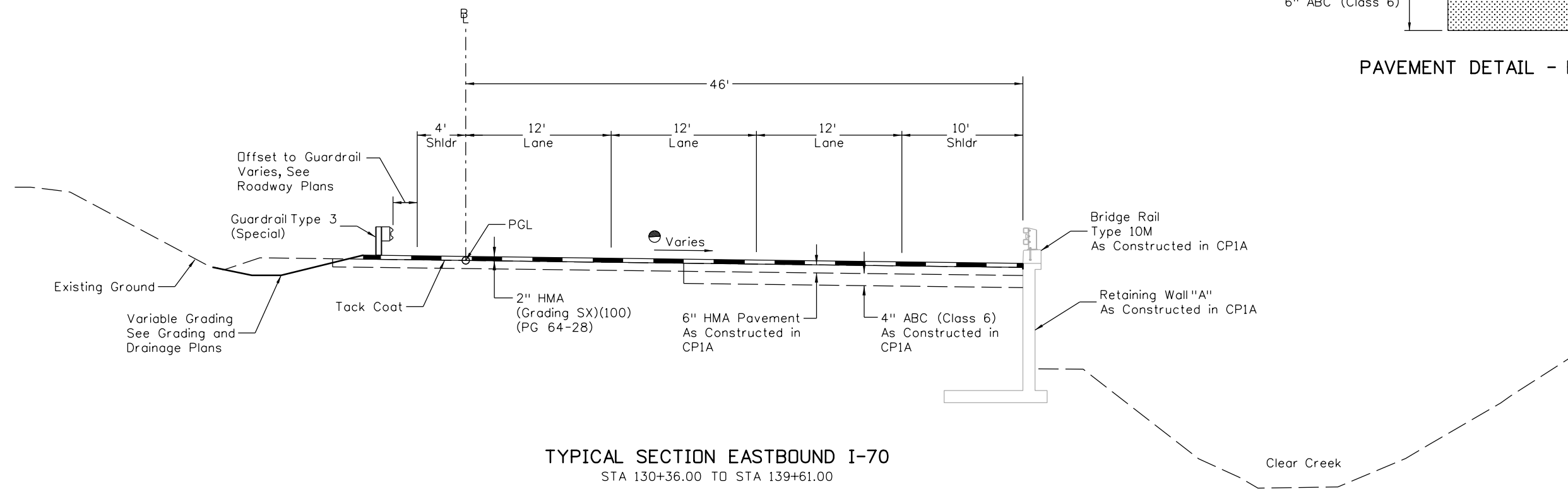
Notes:
 Match Existing Superelevated Cross Slope




TYPICAL SECTION EASTBOUND I-70
 STA 139+61.00 TO STA 139+96.00




PAVEMENT DETAIL - RECONSTRUCTION



TYPICAL SECTION EASTBOUND I-70
 STA 130+36.00 TO STA 139+61.00

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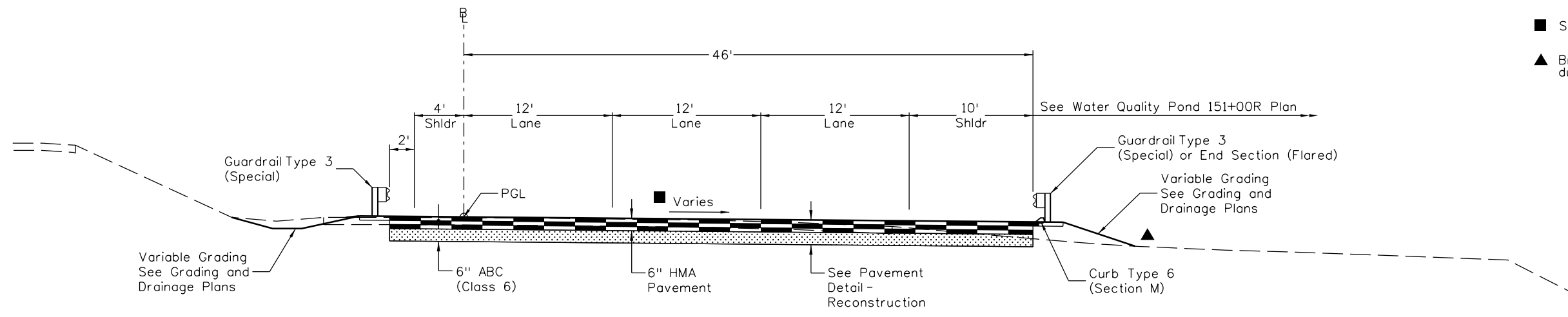
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Designer:	E. Marsh	Structure Numbers	
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Sheet Number 8

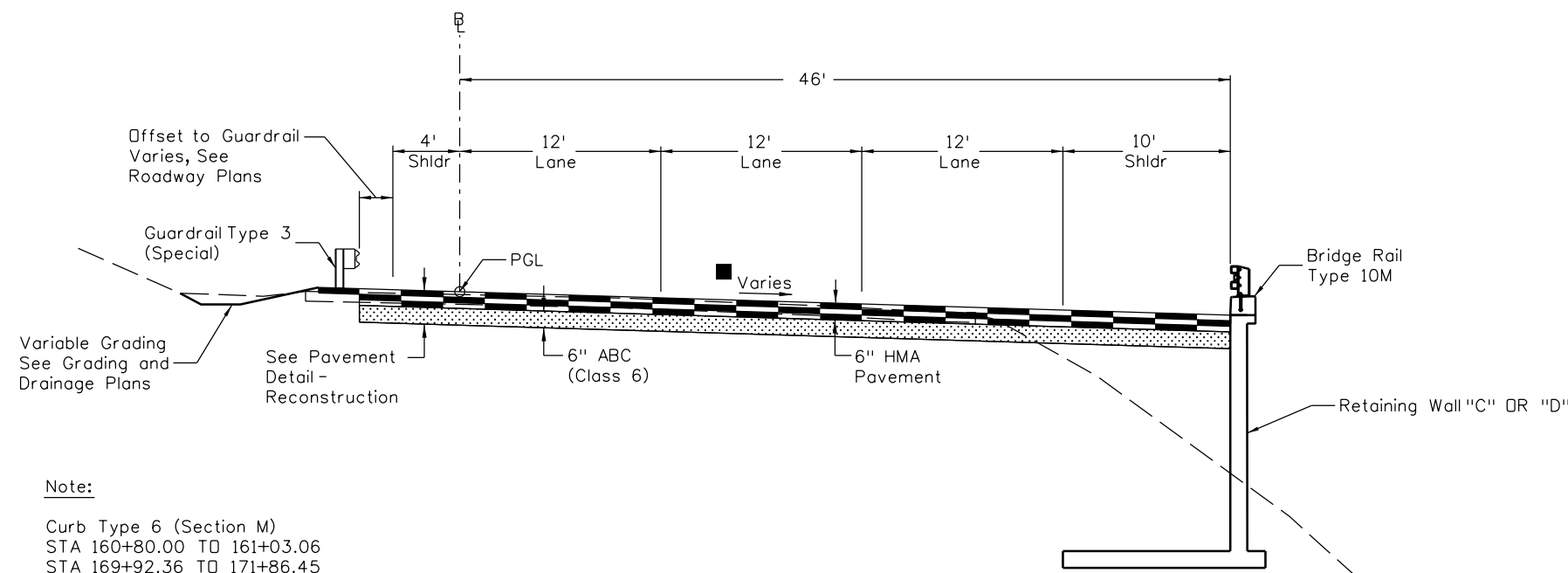
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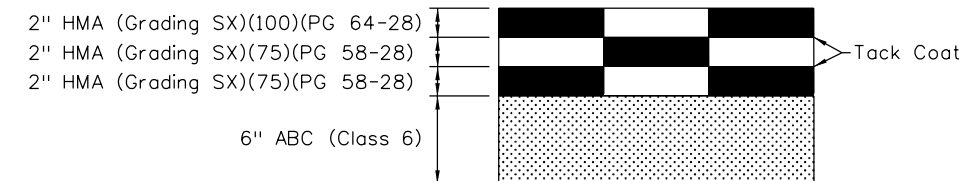
- See Superelevation Diagram
- ▲ Break points in slopes shall be rounded during construction for a pleasing appearance



TYPICAL SECTION EASTBOUND I-70
STA 151+00.00 TO 152+00.00



TYPICAL SECTION EASTBOUND I-70
STA 149+29.22 TO 150+20.24
STA 150+20.24 TO 152+00.00 - See Plans
STA 152+00.00 TO 161+03.06
STA 161+03.06 TO 169+92.36 - See Typical Section Next Sheet
STA 169+92.36 TO 171+86.45



PAVEMENT DETAIL - RECONSTRUCTION

Note:
Curb Type 6 (Section M)
STA 160+80.00 TO 161+03.06
STA 169+92.36 TO 171+86.45

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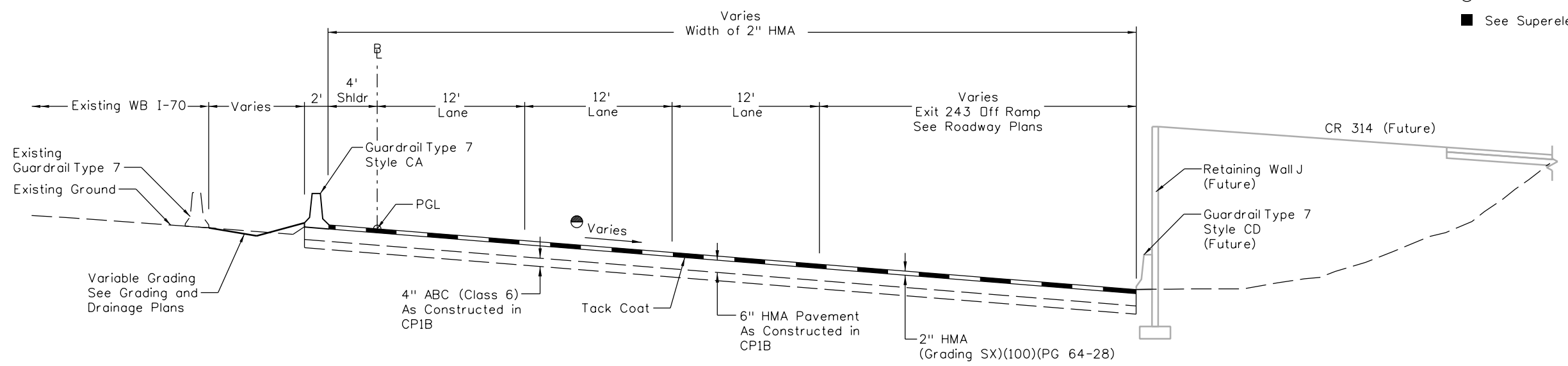
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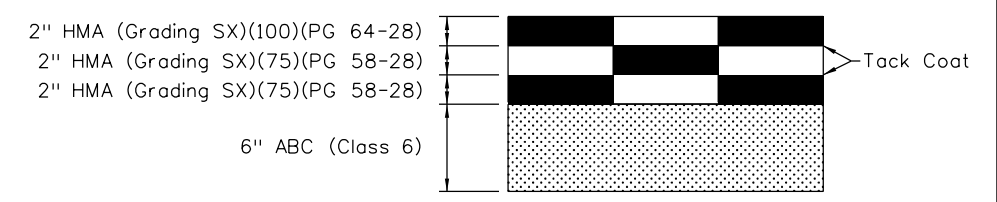
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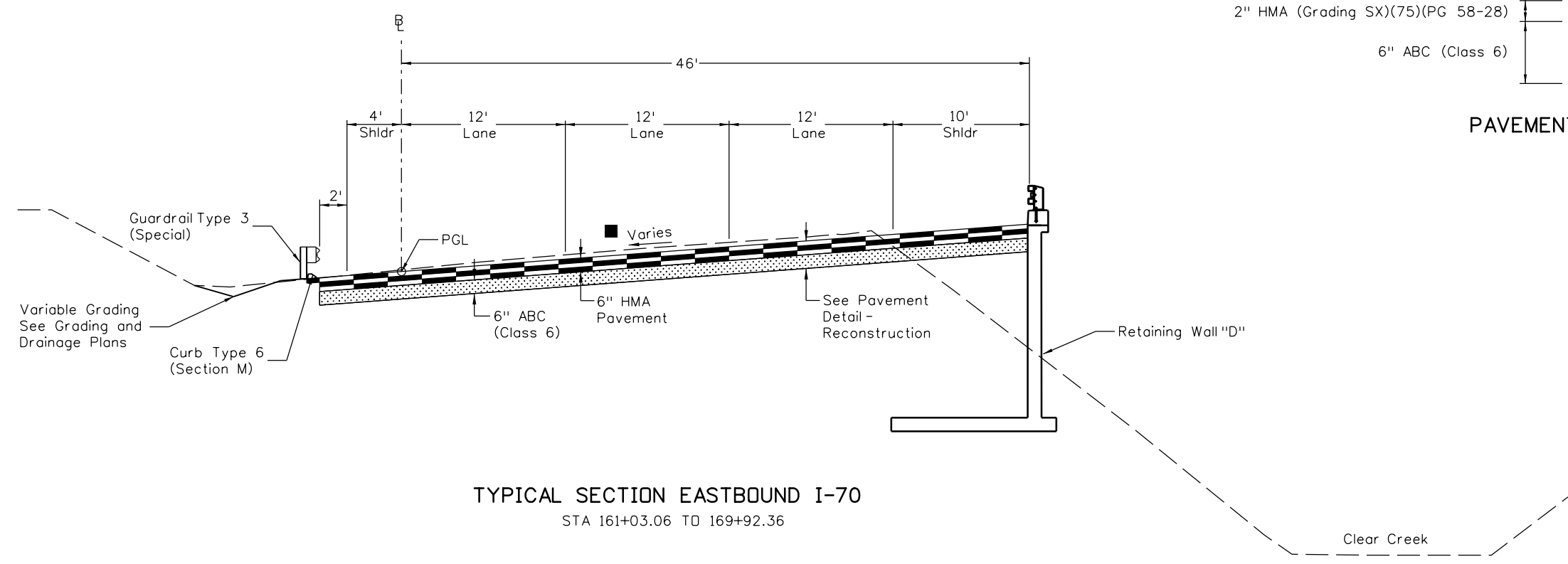
- Notes:
- Match Existing Superelevated Cross Slope
 - See Superelevation Diagram



TYPICAL SECTION EASTBOUND I-70
 STA 175+62.54 TO STA 178+14.86
 (STA 178+14.86 = Beginning of Striped Gore)



PAVEMENT DETAIL - RECONSTRUCTION



TYPICAL SECTION EASTBOUND I-70
 STA 161+03.06 TO STA 169+92.36

Print Date: 3/8/2013
 File Name: 18832DES_CP2_TypSect005.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
 No Revisions:
 Revised:
 Void:

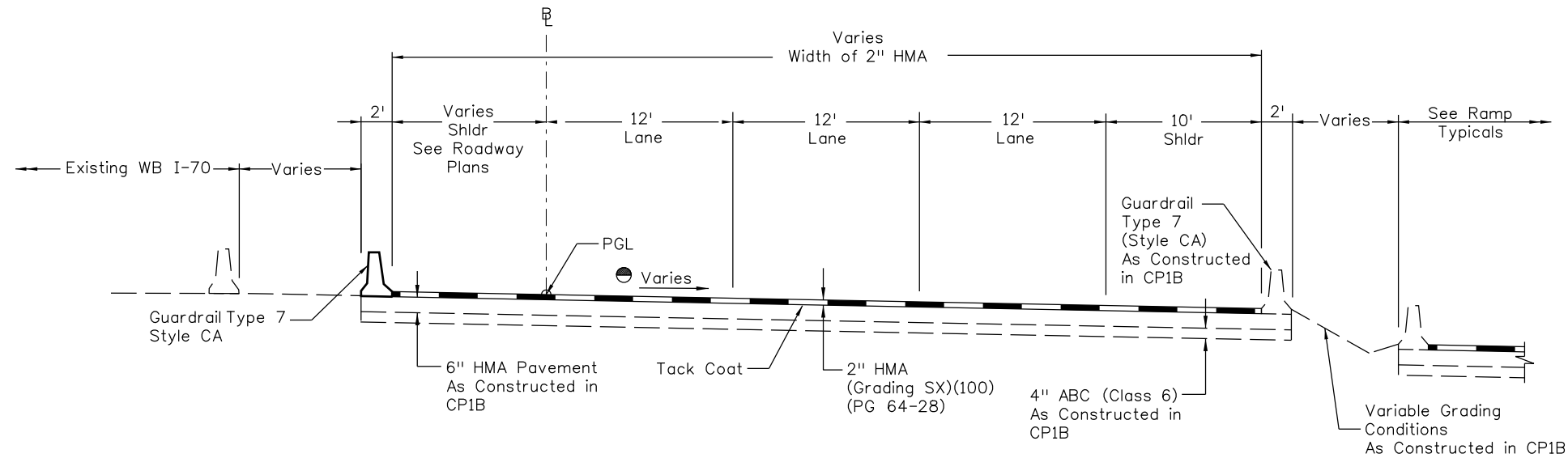
EASTBOUND I-70 TYPICAL SECTIONS			
Designer:	E. Marsh	Structure Numbers	
Detailer:	J. Gellner		
Subset:	Typicals	Subset Sheets: 5 of 12	

Project No./Code
 IM 0703-391
 19036
 Sheet Number 10

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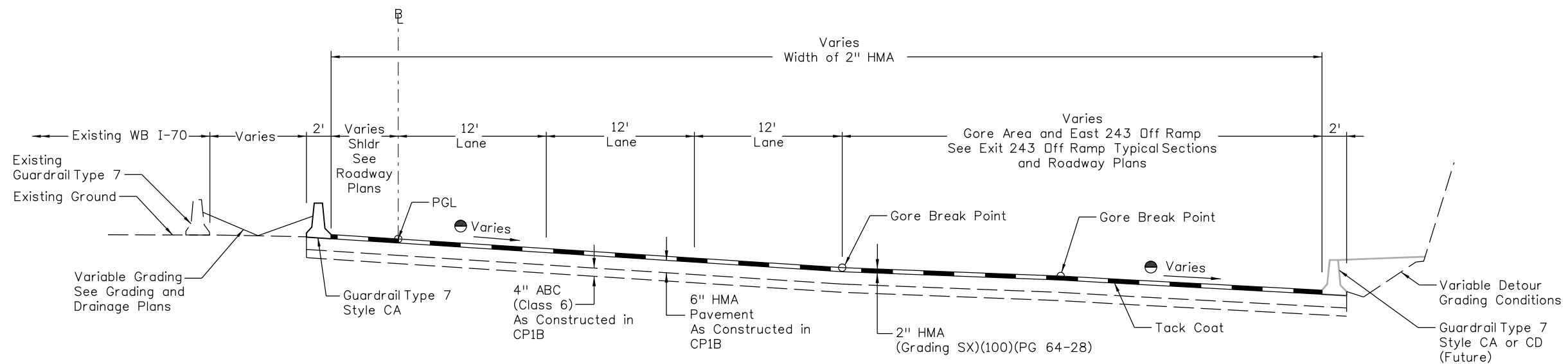
Notes:

● Match Existing Superelevated Cross Slope



TYPICAL SECTION EASTBOUND I-70

STA 180+56.93 TO STA 181+77.13




TYPICAL SECTION EASTBOUND I-70

STA 178+14.86 TO STA 180+56.93
(STA 178+14.86 = Beginning of Striped Gore)

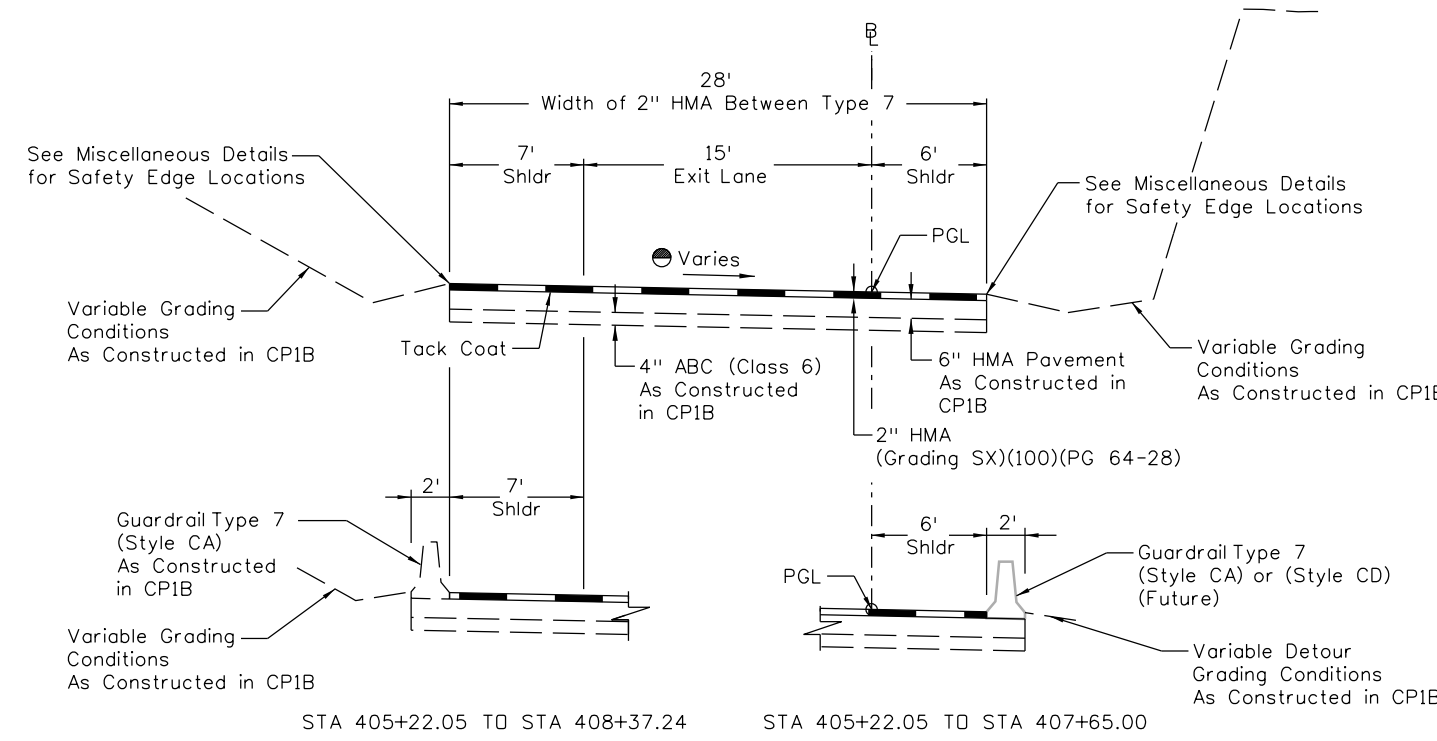
Note:

Proposed grading adjacent to Type 7 is required to insure proper reverse grade ditch flow.

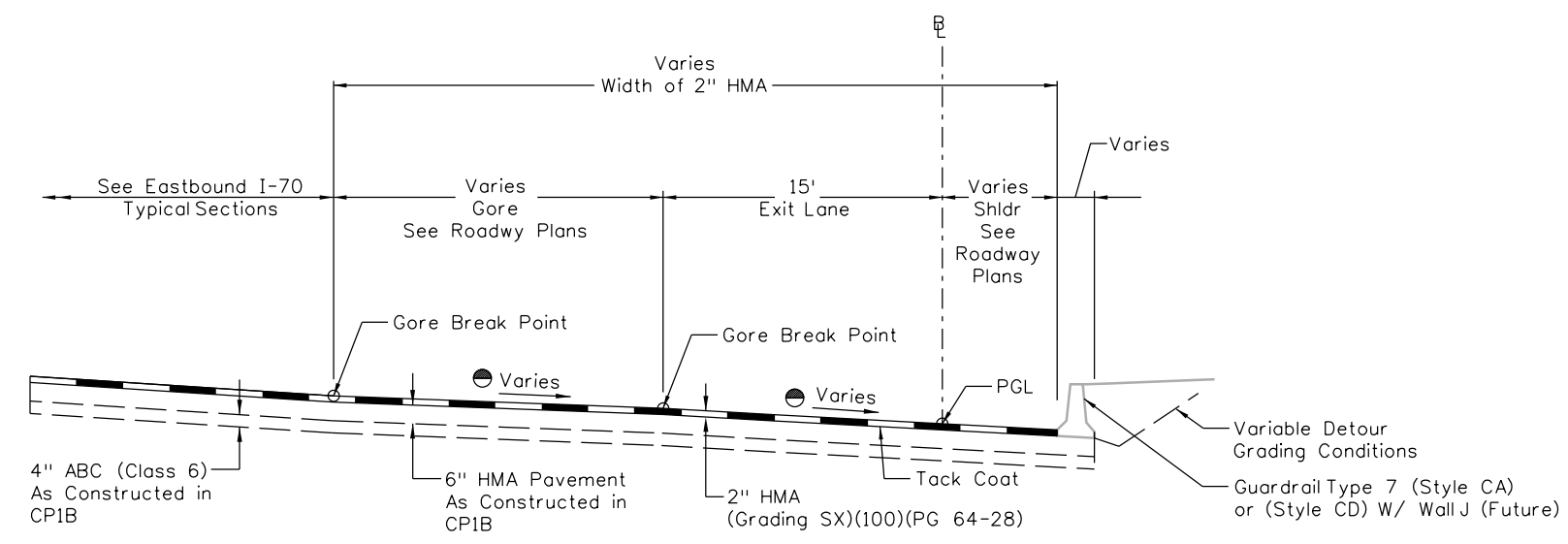
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Horiz. Scale: 1:10 Vert. Scale:						Revised:				Structure Numbers		19036	
ATKINS 4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276						Region 1				Void:		Subset Sheets: 6 of 12	

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Notes:
 ● Match Existing Superelevated Cross Slope



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



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)
 (STA 402+94.51 = Beginning of Striped Gore)

Print Date: 3/8/2013
 File Name: 18832DES_CP2_TypSect007.dgn
 Horiz. Scale: 1:10 Vert. Scale:
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Date:	Comments	Init.

Colorado Department of Transportation

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Region 1 **CRC**

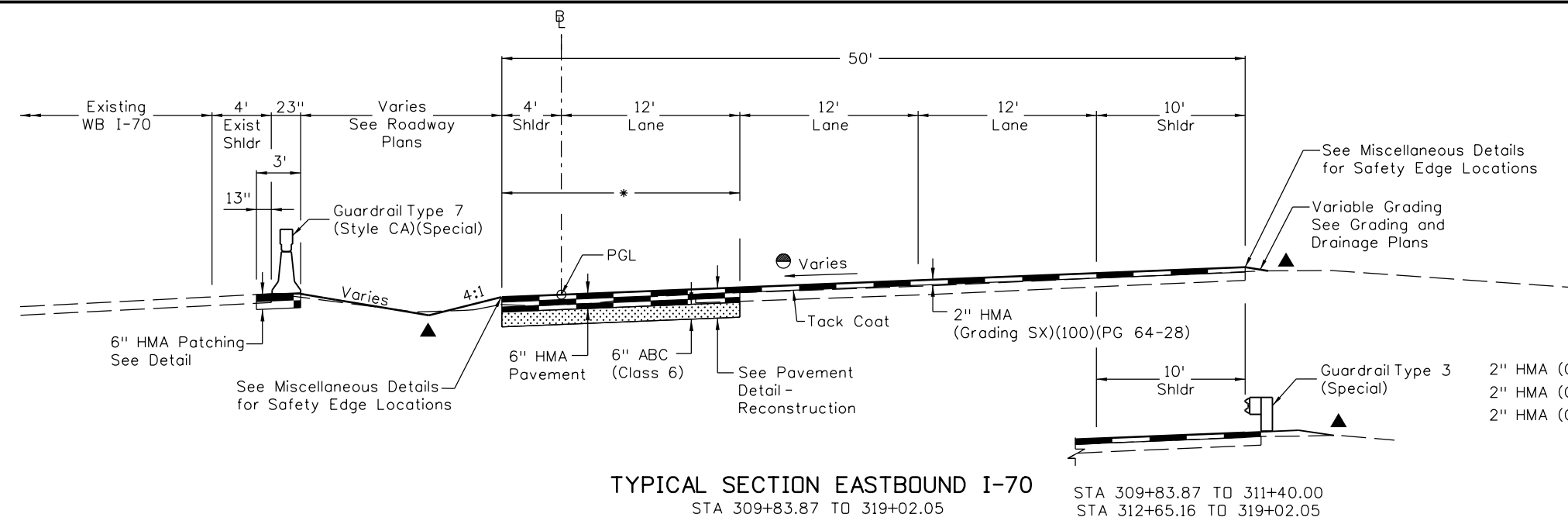
As Constructed
No Revisions:
Revised:
Void:

EASTBOUND I-70 TYPICAL SECTIONS			
Designer:	E. Marsh	Structure Numbers	
Detailer:	J. Gellner		
Subset:	Typicals	Subset Sheets: 7 of 12	

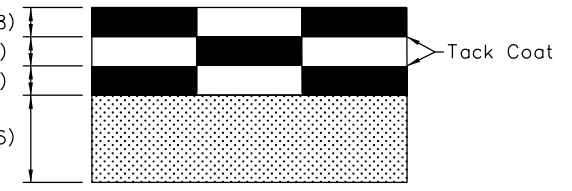
Project No./Code
IM 0703-391
19036
Sheet Number 12

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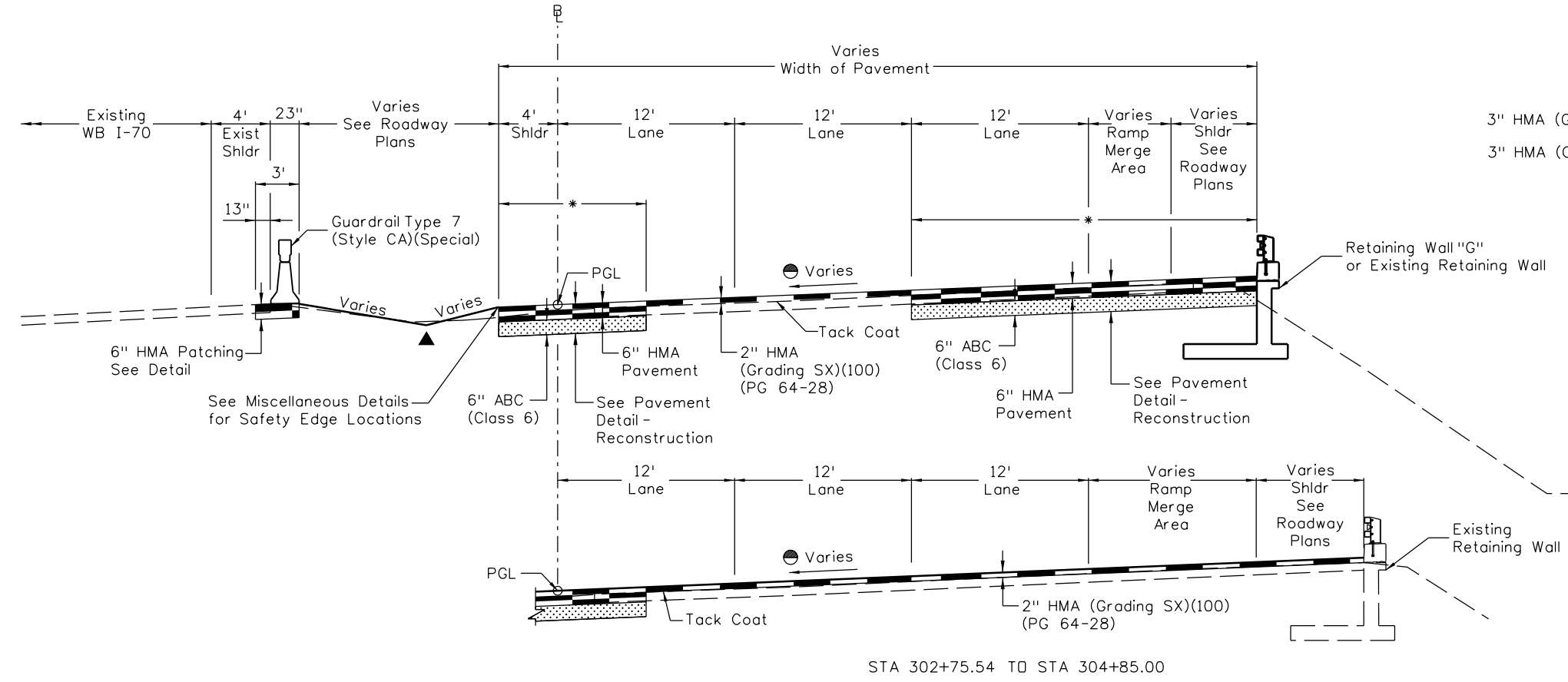
- Notes:
- Match Existing Superelevated Cross Slope
 - * Pavement Reconstruction Width Varies See Eastbound I-70 Plan and Profile Sheets
 - ▲ Break points in slopes shall be rounded during construction for a pleasing appearance



TYPICAL SECTION EASTBOUND I-70
 STA 309+83.87 TO 319+02.05



PAVEMENT DETAIL - RECONSTRUCTION



TYPICAL SECTION EASTBOUND I-70
 STA 302+75.54 TO STA 309+64.66



6" HMA (PATCHING) (ASPHALT) DETAIL

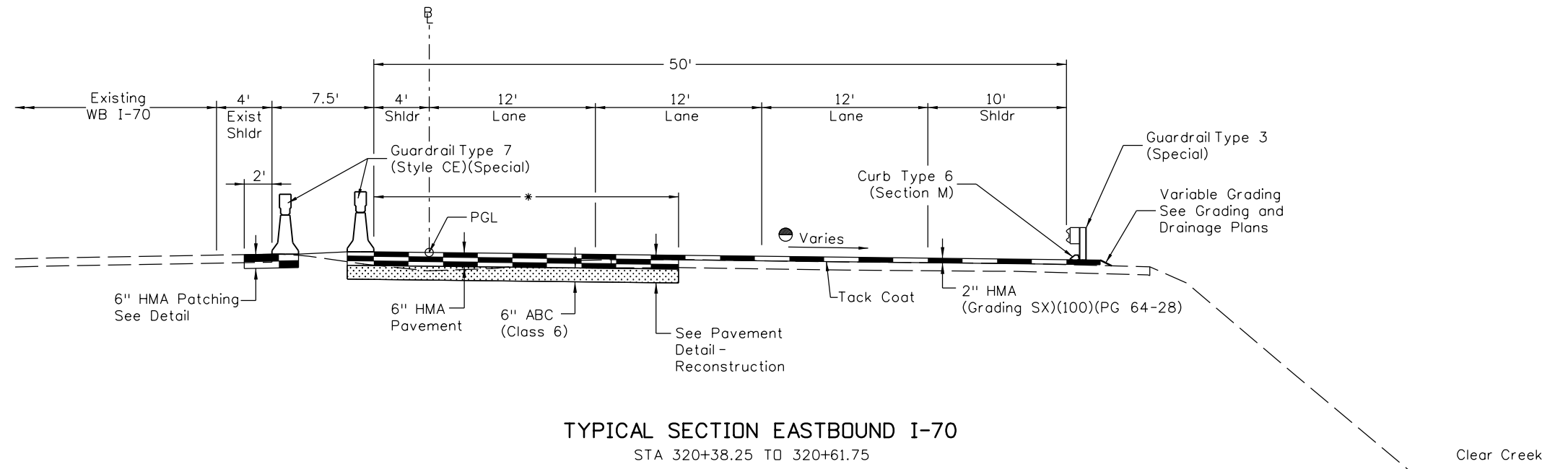
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File Name: 18832DES_CP2_TypSect008.dgn	Date:	Comments	Init.	 425 A Corporate Circle Golden, CO 80401 Phone: 720-497-6918 FAX: 720-497-6901		No Revisions:		Designer: E. Marsh Detailer: J. Gellner Subset: Typicals		IM 0703-391	
Horiz. Scale: 1:10 Vert. Scale: NA						Revised:				Structure Numbers	
ATKINS 4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276				Region 1		Void:		Subset Sheets: 8 of 12		Sheet Number 13	

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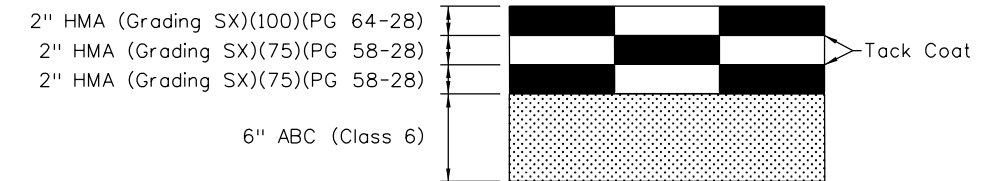
Notes:

● Match Existing Superelevated Cross Slope

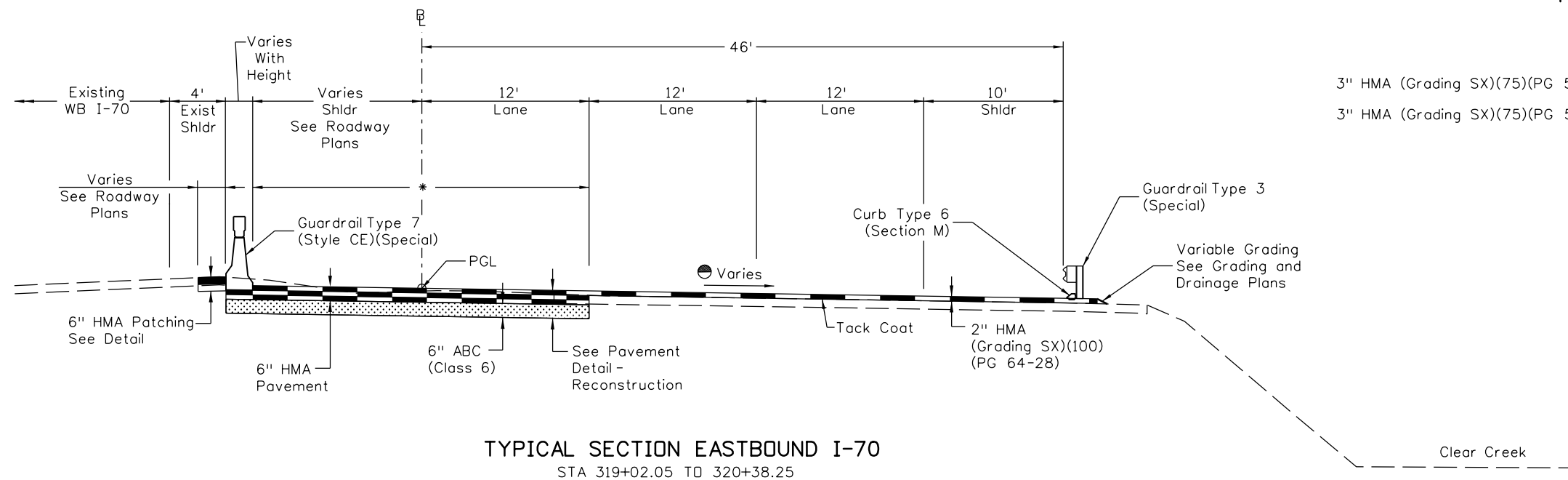
* Pavement Reconstruction Width Varies See Eastbound I-70 Plan and Profile Sheets



TYPICAL SECTION EASTBOUND I-70
STA 320+38.25 TO 320+61.75



PAVEMENT DETAIL - RECONSTRUCTION



TYPICAL SECTION EASTBOUND I-70
STA 319+02.05 TO 320+38.25



6" HMA (PATCHING) (ASPHALT)
DETAIL

Print Date: 3/8/2013

File Name: 18832DES_CP2_TypSect009.dgn

Horiz. Scale: 1:10

Vert. Scale: NA

Sheet Revisions

Date:	Comments	Init.

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Region 1

CRC

As Constructed

No Revisions:

Revised:

Void:

EASTBOUND I-70
TYPICAL SECTIONS

Designer:	E. Marsh	Structure Numbers	
Detailer:	J. Gellner		
Subset:	Typicals	Subset Sheets: 9 of 12	

Project No./Code

IM 0703-391

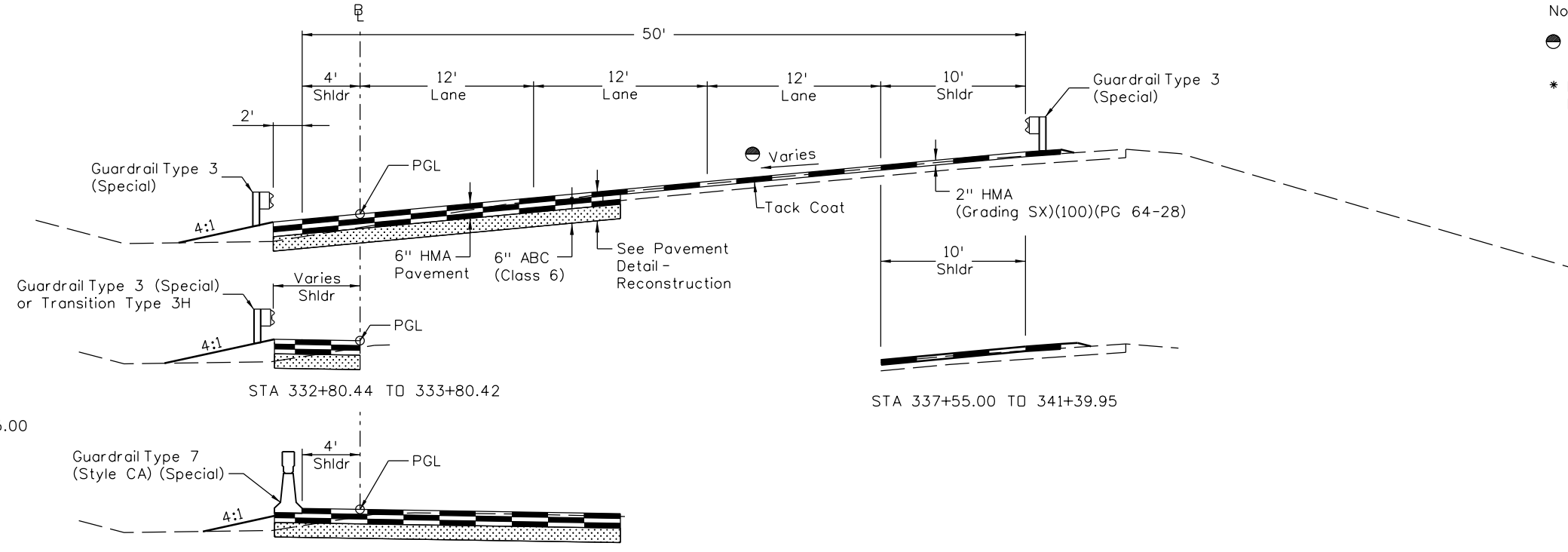
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Sheet Number 14

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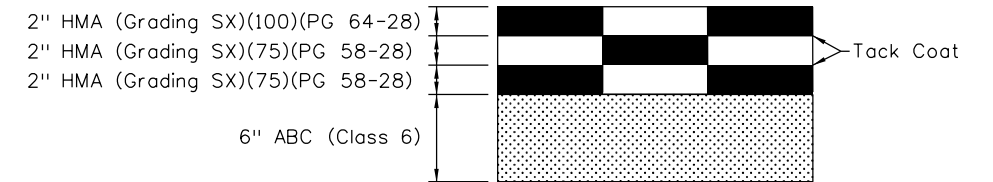
- Notes:
- Match Existing Superelevated Cross Slope
 - * Pavement Reconstruction Width Varies, See Eastbound I-70 Plan and Profile Sheets



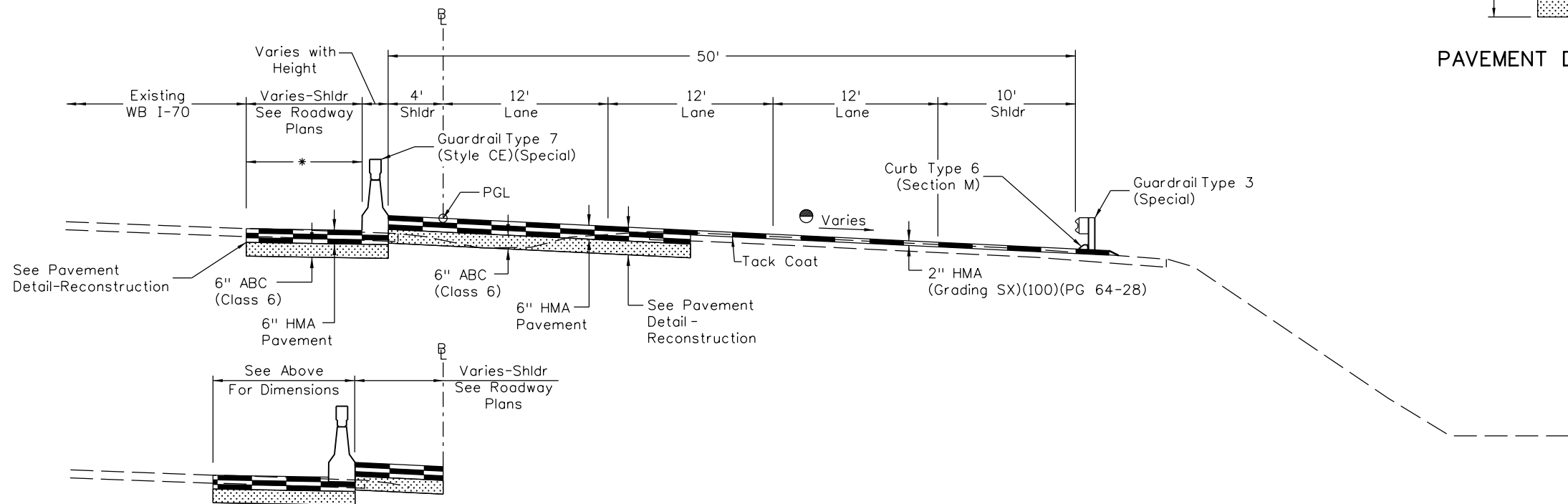
Note:
Curb Type 6 (Section M)
STA 335+00.00 TO 342+25.00

TYPICAL SECTION EASTBOUND I-70

STA 332+00.00 TO 342+60.18
STA 342+60.18 TO 346+47.13 - See Plans



PAVEMENT DETAIL - RECONSTRUCTION



TYPICAL SECTION EASTBOUND I-70

STA 320+61.75 TO 321+92.05
STA 320+61.75 TO 332+00.00

Print Date: 3/8/2013
File Name: 18832DES_CP2_TypSect010.dgn
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Sheet Revisions		
Date:	Comments	Init.

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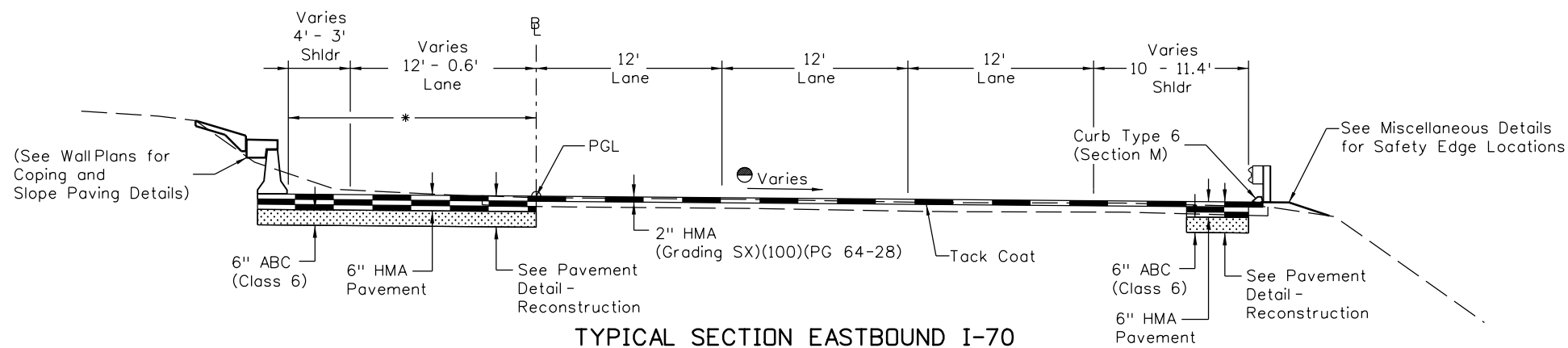
DOT 425 A Corporate Circle
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Phone: 720-497-6918 FAX: 720-497-6901

Region 1 **CRC**

As Constructed	EASTBOUND I-70 TYPICAL SECTIONS	
No Revisions:	Designer: E. Marsh	Structure Numbers
Revised:	Detailer: J. Gellner	
Void:	Subset: Typicals	Subset Sheets: 10 of 12

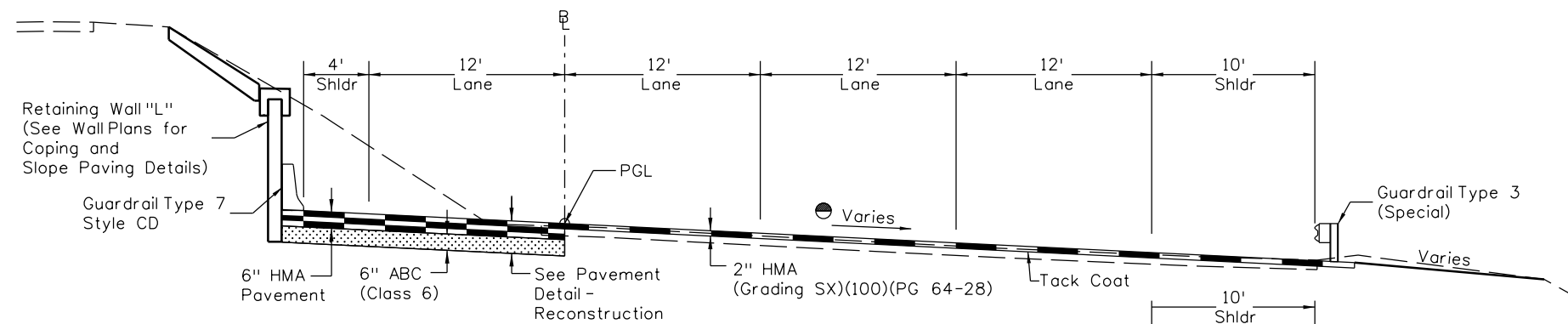
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19036
Sheet Number 15

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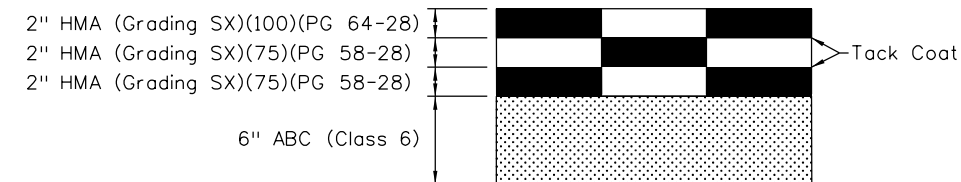
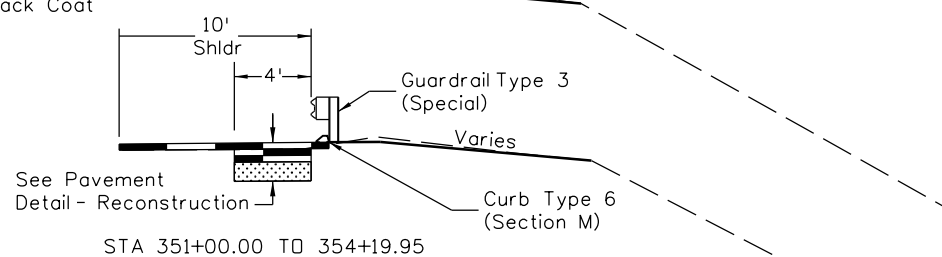
TYPICAL SECTION EASTBOUND I-70

STA 352+75.00 TO 354+19.95

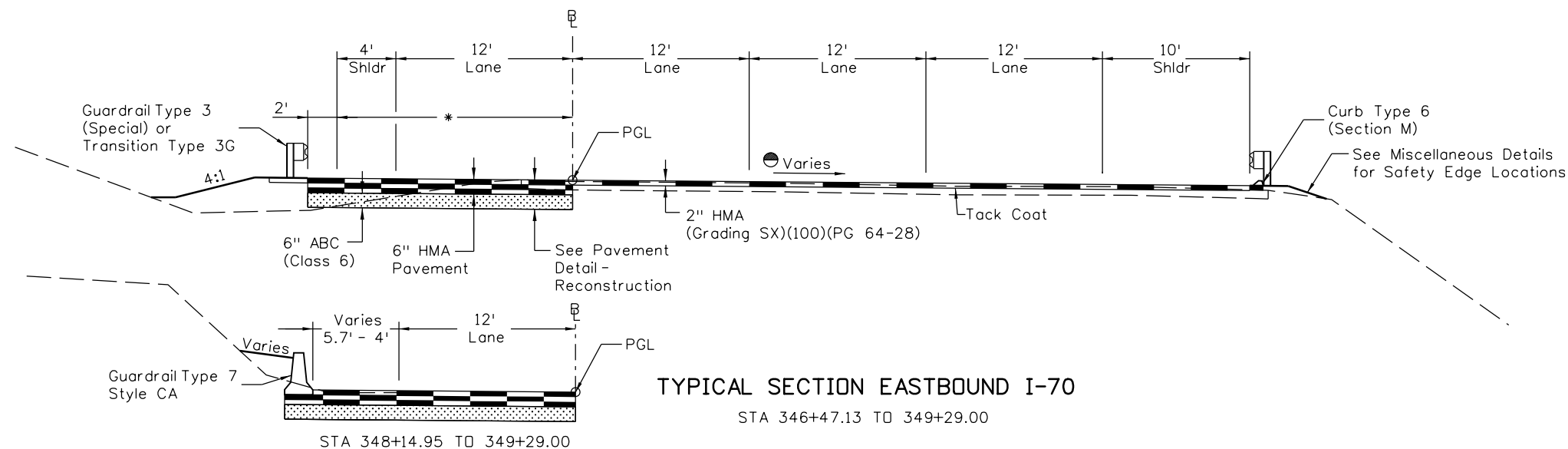


TYPICAL SECTION EASTBOUND I-70

STA 349+29.00 TO 352+75.00



PAVEMENT DETAIL - RECONSTRUCTION



TYPICAL SECTION EASTBOUND I-70

STA 346+47.13 TO 349+29.00

- Notes:
- Match Existing Superelevated Cross Slope
 - * Pavement Reconstruction Width Varies See Eastbound I-70 Plan and Profile Sheets

Print Date: 3/8/2013
 File Name: 18832DES_CP2_TypSect011.dgn
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Date:	Comments	Init.

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Region 1 **CRC**

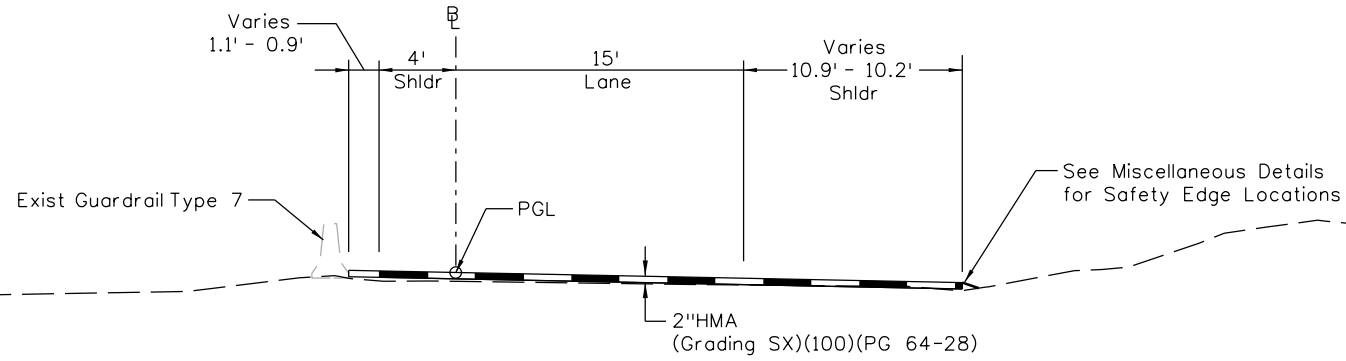
As Constructed
No Revisions:
Revised:
Void:

EASTBOUND I-70 TYPICAL SECTIONS			
Designer:	E. Marsh	Structure Numbers	
Detailer:	J. Gellner		
Subset:	Typicals	Subset Sheets: 11 of 12	

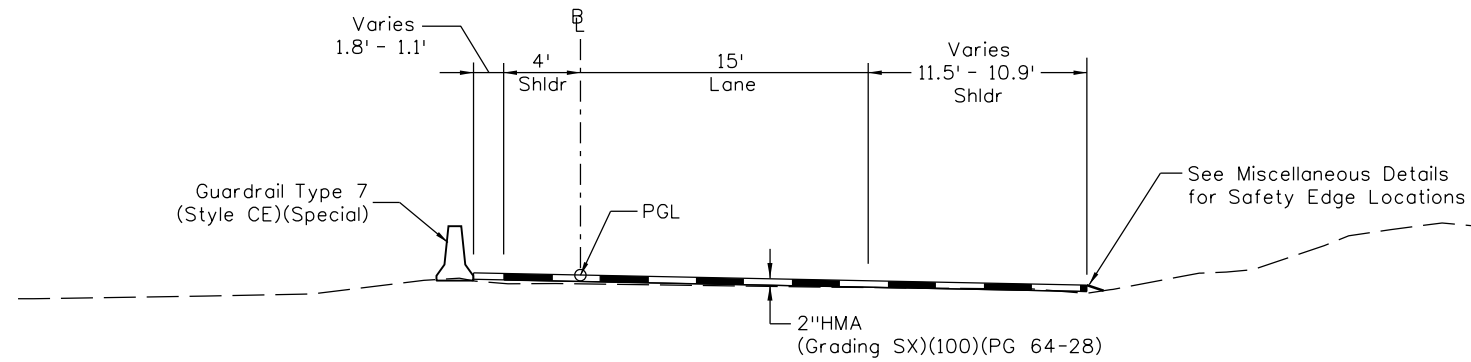
Project No./Code
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Sheet Number 16

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TYPICAL SECTION - US 6 (EXIT 244) OFF RAMP
STA 3010+40.00 TO 3011+09.64




TYPICAL SECTION - US 6 (EXIT 244) OFF RAMP
STA 3010+24.38 TO 3010+40.00

Clear Creek

Clear Creek

Print Date: 3/8/2013	
File Name: 18832DES_CP2_TypSect012.dgn	
Horiz. Scale: 1:10	Vert. Scale: NA
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Date:	Comments	Init.

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 Region 1 CRC

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Revised:
Void:

EASTBOUND I-70 TYPICAL SECTIONS			
Designer:	E. Marsh	Structure Numbers	
Detailer:	J. Gellner		
Subset:	Typicals	Subset Sheets: 12 of 12	

Project No./Code
IM 0703-391
19036
Sheet Number 17


17543 2:02:06 PM c:\pw_work\pwsjpw\common\dms26924\18832DES_CP2_SumQuan001.dgn

INDEX			CONTRACT ITEM NO.	CONTRACT ITEM	UNIT	Roadway		Roadway Drainage and Water Quality		Stormwater Management Plan		ITS		Lighting		Tunnel		Portals		Retaining Walls C,D,G,L		PROJECT TOTALS	
BOOK	PAGE	SHEET				PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	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	11																11	
			202-00019	Removal of Inlet	EACH			10														10	
			202-00021	Removal of Manhole	EACH									1								1	
			202-00024	Removal of Embankment Protector Type 5	EACH	2																2	
			202-00026	Removal of Slope and Ditch Paving	SY														350			350	
			202-00035	Removal of Pipe	LF			1,020						750								1,770	
			202-00037	Removal of End Section	EACH			7														7	
			202-00090	Removal of Delineator	EACH	223																223	
			202-00220	Removal of Asphalt Mat	SY	24,567																24,567	
			202-00240	Removal of Asphalt Mat (Planing)	SY	6,349																6,349	
			202-00250	Removal of Pavement Marking	SF	15,775																15,775	
			202-00400	Removal of Bridge	EACH	1																1	
			202-00440	Removal of Existing Tunnel Liner *	LF									635								635	
			202-00500	Removal of Portions of Present Structure	EACH													2				2	
			202-00700	Removal of Light Standard	EACH								35									35	
			202-00725	Removal of Existing Lighting System	L S							1										1	
			202-00805	Removal of Overhead Sign Structure	EACH	2																2	
			202-00810	Removal of Ground Sign	EACH	43 *																43 *	
			202-00821	Removal of Sign Panel	EACH	4																4	
			202-00827	Removal of Pull Box	EACH							1										1	
			202-00855	Removal of Traffic Signal Controller Cabinet	EACH							1										1	

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Print Date: 3/8/2013
 File Name: 18832DES_CP2_SumQuan001.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:

SUMMARY OF APPROXIMATE QUANTITIES			
Designer:	E. Marsh	Structure Numbers	
Detailer:	J. Gellner		
Subset:	Sum Quan	Subset Sheets: 1 of 14	

Project No./Code
IM 0703-391
19036
Sheet Number 18


16:55 5/4/11 PM c:\pw\work\pbejpw\common\dms26924\18832DES_CP2_SumQuan002.dgn

INDEX			CONTRACT ITEM NO.	CONTRACT ITEM	UNIT	Roadway		Roadway Drainage and Water Quality		Stormwater Management Plan		ITS		Lighting		Tunnel		Portals		Retaining Walls C,D,G,L		PROJECT TOTALS	
BOOK	PAGE	SHEET				PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.
			202-00895	Removal of Impact Attenuator	EACH	1																1	
			202-01000	Removal of Fence	LF	2,093																2,093	
			202-01130	Removal of Guardrail Type 3	LF	14,680 *																14,680 *	
			202-01170	Removal of Guardrail Type 7	LF	239																239	
			202-01300	Removal of End Anchorage	EACH	11																11	
			203-00010	Unclassified Excavation (Complete In Place)	CY	16,551 *																16,551 *	
			203-00400	Rock Excavation	CY														244			244	
			203-01500	Blading	HOUR					30												30	
			203-01510	Backhoe	HOUR					100												100	
			203-01520	Backhoe (Special)	EACH	348																348	
			203-01550	Dozing	HOUR					100												100	
			203-01582	Truck (Dump)	HOUR	244																244	
			203-01594	Combination Loader	HOUR					60												60	
			203-01597	Potholing	HOUR	70					10											80	
			203-02330	Laborer	HOUR	408																408	
			206-00000	Structure Excavation	CY					1,419								3,100			28,278		32,797
			206-00065	Structure Backfill (Flow-Fill)	CY					18												18	
			206-00100	Structure Backfill (Class 1)	CY																24,625		24,625
			206-00200	Structure Backfill (Class 2)	CY					767								283			279		1,329
			206-01781	Shoring (Area 1)	L S																1		1
			206-01782	Shoring (Area 2)	L S																1		1
			208-00002	Erosion Log (12 Inch)	LF					2,700												2,700	

* Indicates a Revised Contract Item No., Contract Item, or Quantity. Revision Occurred After GMP Agreement and Prior to Final Plans (PS&E).

Print Date: 3/9/2013
 File Name: 18832DES_CP2_SumQuan002.dgn
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Sheet Revisions		
Date:	Comments	Init.

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Region 1 **CRC**

As Constructed
No Revisions:
Revised:
Void:


SUMMARY OF APPROXIMATE QUANTITIES			
Designer:	E. Marsh	Structure Numbers	
Detailer:	J. Gellner	Subset Sheets: 2	of 14
Subset:	Sum	Quan	

Project No./Code
IM 0703-391
19036
Sheet Number 19


17543 2:02:24 PM c:\pwwork\pws\pwwork\common\dms26924\18832DES_CP2_SumQuan003.dgn

INDEX			CONTRACT ITEM NO.	CONTRACT ITEM	UNIT	Roadway		Roadway Drainage and Water Quality		Stormwater Management Plan		ITS		Lighting		Tunnel		Portals		Retaining Walls C,D,G,L		PROJECT TOTALS	
BOOK	PAGE	SHEET				PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.
			208-00015	Sand Bag	EACH					200												200	
			208-00034	Gravel Bag	LF					6,600												6,600	
			208-00040	Check Dam	EACH					2												2	
			208-00045	Concrete Washout Structure	EACH					8												8	
			208-00070	Vehicle Tracking Pad	EACH					12												12	
			208-00103	Removal and Disposal of Sediment (Labor)	HOUR					120												120	
			208-00105	Removal and Disposal of Sediment (Equipment)	HOUR					80												80	
			208-00106	Sweeping (Sediment Removal)	HOUR					260												260	
			208-00107	Removal of Trash	HOUR					80												80	
			208-00206	Erosion Control Supervisor	DAY					235												235	
			208-00400	Water Control	L S	1																1	
			209-00300	Water Treat Processing (Tunnel)	MGAL									2,000								2,000	
			210-00473	Reset TV Cameras	EACH							1										1	
			210-00476	Reset Microwave Vehicle Radar Detector (MVRD)	EACH							2										2	
			210-00750	Reset Light Standard	EACH									10								10	
			210-00765	Reset Lighting Control Center *	LS									1								1	
			210-00805	Reset Overhead Sign Structure	EACH	1																1	
			210-00810	Reset Ground Sign	EACH	2																2	
			210-00820	Reset Variable Message Sign	EACH	1																1	
			210-00847	Reset Travel Time Indicator	EACH							1										1	
			210-02900	Relay Riprap	CY															1,315		1,315	
			210-04020	Modify Inlet	EACH			1														1	

* Indicates a Revised Contract Item No., Contract Item, or Quantity. Revision Occurred After GMP Agreement and Prior to Final Plans (PS&E).

Print Date: 3/8/2013
 File Name: 18832DES_CP2_SumQuan003.dgn
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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:


SUMMARY OF APPROXIMATE QUANTITIES			
Designer:	E. Marsh	Structure Numbers	
Detailer:	J. Gellner		
Subset:	Sum Quan	Subset Sheets: 3	of 14

Project No./Code
IM 0703-391
19036
Sheet Number 20


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INDEX			CONTRACT ITEM NO.	CONTRACT ITEM	UNIT	Roadway		Roadway Drainage and Water Quality		Stormwater Management Plan		ITS		Lighting		Tunnel		Portals		Retaining Walls C,D,G,L		PROJECT TOTALS	
BOOK	PAGE	SHEET				PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.
			210-04028	Modifications to Existing Portals	EACH													2				2	
			211-00007	Mine Strap	EACH										110							110	
			211-00010	Rock Excavation (Class A)	CY										903							903	
			211-00011	Rock Excavation (Class B)	CY										9,741							9,741	
			211-00012	Rock Excavation (Class C)	CY										1,948							1,948	
			211-00013	Rock Excavation (Class D)	CY										1,585							1,585	
			211-00014	Rock Excavation (Class E)	CY										1,585							1,585	
			211-00015	Rock Excavation (Class F)	CY										3,936							3,936	
			211-00980	Spile #9 x 14 Foot, Grade 60 Grouted	EACH										270							270	
			211-00981	Spile #11 x 20 Foot, Grade 60 Grouted	EACH										58							58	
			211-00982	Arch #9 x 16 Foot, Grade 75 Dowel, Resin Grouted	EACH										2,125							2,125	
			211-00983	Sidewall #9 x 12 Foot, Grade 75 Dowel, Resin Grouted	EACH										222							222	
			211-00984	Sidewall #9 x 16 Foot, Grade 75 Dowel, Resin Grouted	EACH										48							48	
			211-00985	Supplemental Rock Reinforcement (Dowels)	LF										700							700	
			211-00986	Supplemental Support #9 x 14 Foot, Grade 75 Spile Grouted	LF										1,400							1,400	
			211-00987	Pillar #9 x 16 Foot, Grade 75 Dowel Cement or Resin Grouted *	EACH										106		14					120	
			211-00988	Portal Protection Canopy (Furnish and Install)	EACH										2							2	
			211-01190	Optical Survey Targets	EACH										64							64	
			211-03005	Dewatering	L S	1																1	
		*	212-00006	Seeding (Native)	LB					6.5												6.5	
			212-00032	Soil Conditioning	ACRE					6.5												6.5	

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SUMMARY OF APPROXIMATE QUANTITIES			
Designer:	E. Marsh	Structure Numbers	
Detailer:	J. Gellner		
Subset:	Sum Quan	Subset Sheets: 4 of 14	

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INDEX			CONTRACT ITEM NO.	CONTRACT ITEM	UNIT	Roadway		Roadway Drainage and Water Quality		Stormwater Management Plan		ITS		Lighting		Tunnel		Portals		Retaining Walls C,D,G,L		PROJECT TOTALS	
BOOK	PAGE	SHEET				PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.
			213-00004	Mulching (Weed Free Straw)	ACRE					3.5												3.5	
			213-00012	Spray-on Mulch Blanket	ACRE					6.5												6.5	
			213-00061	Mulch Tackifier	LB					910												910	
			213-00100	Soil Binder	ACRE					3												3	
			216-00201	Soil Retention Blanket (Straw-Coconut) (Biodegradable Class 1)	SY					6,000												6,000	
			217-00020	Herbicide Treatment	HOUR					40												40	
			304-06000	Aggregate Base Course (Class 6)	TON	10,575 *																10,575 *	
			304-06008	Aggregate Base Course (Class 6) (Special)	CY	70				250												320	
			304-09014	Aggregate Base Course (Special)	TON										2,310		606					2,916	
			309-10600	Lean Concrete Base (6 Inch)	SY									3,457		895						4,352	
			403-00720	Hot Mix Asphalt (Patching) (Asphalt)	TON	675 *																675 *	
			* 403-34721	Hot Mix Asphalt (Grading SX) (75) (PG 58-28) *	TON	7,464																7,464	
			403-34851	Hot Mix Asphalt (Grading SX) (100) (PG 64-28)	TON	8,252 *																8,252 *	
			411-10255	Emulsified Asphalt (Slow-Setting)	GAL	5,532 *																5,532 *	
			412-00600	Concrete Pavement (6 Inch)	SY			46														46	
			412-01250	Concrete Pavement (12-1/2 Inch)	SY	143								3,740		983						4,866	
			420-00000	Geomembrane	SY													193				193	
			420-00103	Geotextile (Erosion Control) (Class 2)	SY			522														522	
			503-00042	Drilled Caisson (42 Inch)	LF	18																18	
			503-00048	Drilled Caisson (48 Inch)	LF	21																21	
			503-00054	Drilled Caisson (54 Inch)	LF	46																46	
			504-06310	Ground Nail (10 Foot)	EACH													38				38	

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SUMMARY OF APPROXIMATE QUANTITIES

Designer:	E. Marsh	Structure Numbers	
Detailer:	J. Gellner	Subset Sheets: 5 of 14	
Subset:	Sum Quan		

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INDEX			CONTRACT ITEM NO.	CONTRACT ITEM	UNIT	Roadway		Roadway Drainage and Water Quality		Stormwater Management Plan		ITS		Lighting		Tunnel		Portals		Retaining Walls C,D,G,L		PROJECT TOTALS		
BOOK	PAGE	SHEET				PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN
			504-06315	Ground Nail (15 Foot)	EACH																77		77	
			506-00206	Riprap (6 Inch)	CY			30															30	
			506-00212	Riprap (12 Inch)	CY			181															181	
			507-00000	Concrete Slope and Ditch Paving	CY			16															16	
			507-00100	Concrete Slope and Ditch Paving (Reinforced)	CY															36			36	
			509-20000	MC 12 x 50 Steel Sets (Install Only)	LF										2,173								2,173	
			509-20001	Steel Sets (Install Only)	EACH										11								11	
			514-00200	Pedestrian Railing (Steel)	LF			452															452	
			515-00400	Concrete Sealer	SY															1,460			1,460	
			601-01000	Concrete Class B	CY			212															212	
			601-03050	Concrete Class D (Wall)	CY													110		3,074			3,184	
			601-06150	Concrete (Patching)	SF															45			45	
			601-13000	Final Lining Concrete (Portals)	CY										1,074								1,074	
			601-13001	Structural Concrete Stain (Special)	SY													1,155					1,155	
			601-13002	Final Lining Concrete Footing	CY										460								460	
			601-13003	Final Lining Concrete Walls and Arch	CY										5,212								5,212	
			601-25750	Modifications to Existing Bridge	LS			1															1	
			601-40300	Structural Concrete Coating	SY			3,903							1,682 *			240		4,264			10,089 *	
			602-00000	Reinforcing Steel	LB															505,358			505,358	
			602-00020	Reinforcing Steel (Epoxy Coated)	LB				22,428									242,420		22,587			287,435	
			602-00026	Reinforcing Steel (Final Lining)(Footing)(Epoxy Coated)	LB										68,098								68,098	
			602-00027	Reinforcing Steel (Final Lining)(Walls and Arch)	LB										387,711								387,711	


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File Name: 18832DES_CP2_SumQuan006.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: Sum Quan				IM 0703-391			
Horiz. Scale: 1:1 Vert. Scale:									Revised:						Structure Numbers		19036	
ATKINS 4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276									Void:						Subset Sheets: 6 of 14		Sheet Number 23	
					Region 1													

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INDEX			CONTRACT ITEM NO.	CONTRACT ITEM	UNIT	Roadway		Roadway Drainage and Water Quality		Stormwater Management Plan		ITS		Lighting		Tunnel		Portals		Retaining Walls C,D,G,L		PROJECT TOTALS	
BOOK	PAGE	SHEET				PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.
			602-00028	Reinforcing Steel (Final Lining)(Walls)(Epoxy Coated)	LB										368,993							368,993	
			602-00210	Welded Wire Fabric	SY										4,651							4,651	
			603-01245	24 Inch Reinforced Concrete Pipe (Complete In Place)	LF			726														726	
			603-01365	36 Inch Reinforced Concrete Pipe (Complete In Place)	LF			1,298														1,298	
			603-05036	36 Inch Reinforced Concrete End Section	EACH			1														1	
			603-50008	8 Inch Plastic Pipe	LF										256							256	
			603-61108	8 Inch Flexible Pipe	LF										150							150	
			604-00505	Inlet Type D (5 Foot)	EACH			9														9	
			604-00510	Inlet Type D (10 Foot)	EACH			6														6	
			604-00511	Inlet Type D (Special) (10 Foot)	EACH			1														1	
			604-19010	Inlet Special (10 Foot)	EACH			10														10	
			604-30010	Manhole Slab Base (10 Foot)	EACH			5														5	
			604-30015	Manhole Slab Base (15 Foot)	EACH			1														1	
			604-39000	Manhole Special	EACH										4							4	
			604-39010	Manhole Special (10 Foot)	EACH			3														3	
			605-00060	6 Inch Perforated Pipe Underdrain	LF														335			335	
			605-00061	6 Inch Perforated Pipe Underdrain (Special)	LF										775							775	
			605-83001	Geocomposite Drain without Pipe	SY														1,409			1,409	
			605-83002	Geocomposite Drain with Pipe	SY													1,130				1,130	
			605-83501	Geocomposite Drain (Tunnel) *	SY										2,406							2,406	
			605-83505	Formation Drain	LF										1,270							1,270	

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SUMMARY OF APPROXIMATE QUANTITIES			
Designer:	E. Marsh	Structure Numbers	
Detailer:	J. Gellner		
Subset:	Sum Quan	Subset Sheets: 7	of 14

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INDEX			CONTRACT ITEM NO.	CONTRACT ITEM	UNIT	Roadway		Roadway Drainage and Water Quality		Stormwater Management Plan		ITS		Lighting		Tunnel		Portals		Retaining Walls C,D,G,L		PROJECT TOTALS	
BOOK	PAGE	SHEET				PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.
		*	606-00305	Guardrail Type 3 (Special) *	LF	9,792 *																9,792 *	
			606-00365	Guardrail Type 3 (Special) (Furnish Only)	LF	125																125	
			606-00710	Guardrail Type 7 (Style CA)	LF	2,413 *																2,413 *	
			606-00716	Guardrail Type 7 (Style CA) (Special)	LF	1,696																1,696	
			606-00730	Guardrail Type 7 (Style CD)	LF														334			334	
			606-00731	Guardrail Type 7 (Style CD) (Special)	LF								1,270			380						1,650	
			606-00741	Guardrail Type 7 (Style CE) (Special)	LF	1,381																1,381	
			606-01340	End Anchorage Type 3D	EACH	3																3	
		*	606-01371	Transition Type 3G (Special) *	EACH	7																7	
		*	606-01381	Transition Type 3H (Special) *	EACH	3 *																3 *	
			606-02005	End Anchorage (Flared)	EACH	5																5	
			606-11030	Bridge Rail Type 10M	LF														2,513			2,513	
			607-00005	End Post	EACH	2																2	
			607-00010	Corner and Line Brace Post	EACH	9																9	
			607-01110	Fence Barbed Wire With Treated Wooden Posts (Special)	LF	2,132																2,132	
			607-11580	Fence (Temporary)	LF	1,935																1,935	
			607-11581	Fence (Temporary) (Special)	LF	542																542	
			607-60116	16 Foot Gate	EACH	1																1	
			607-60212	12 Foot Gate Single (Chain Link)	EACH	1																1	
			609-21021	Curb and Gutter Type 2 (Section II-M)	LF	1,272																1,272	
			609-23000	Gutter (Special)	LF														400			400	
			609-60011	Curb Type 6 (Section M)	LF	4,155 *			353													4,508 *	

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SUMMARY OF APPROXIMATE QUANTITIES			
Designer:	E. Marsh	Structure Numbers	
Detailer:	J. Gellner		
Subset:	Sum Quan	Subset Sheets: 8 of 14	

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INDEX			CONTRACT ITEM NO.	CONTRACT ITEM	UNIT	Roadway		Roadway Drainage and Water Quality		Stormwater Management Plan		ITS		Lighting		Tunnel		Portals		Retaining Walls C,D,G,L		PROJECT TOTALS	
BOOK	PAGE	SHEET				PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.
			612-00001	Delineator (Type I)	EACH	177		15														192	
			612-00003	Delineator (Type III)	EACH	10																10	
			612-00010	Delineator (Special)	EACH	5																5	
			612-00260	Location Marker (Fiber Optic)(Dome)	EACH						5											5	
			612-00270	Location Marker (Utility)(Flat Slat)	EACH						14											14	
			613-00100	1 Inch Electrical Conduit	LF								1,300									1,300	
			613-00200	2 Inch Electrical Conduit	LF								2,836									2,836	
			613-00206	2 Inch Electrical Conduit (Bored)	LF						1,245											1,245	
			613-00300	3 Inch Electrical Conduit	LF													808				808	
			613-00400	4 Inch Electrical Conduit	LF								550									550	
			613-01200	2 Inch Electrical Conduit (Plastic)	LF						1,835		3,620		1,270		380					7,105	
			613-01300	3 Inch Electrical Conduit (Plastic)	LF										1,270		380					1,650	
			613-04200	2 Inch Electrical Conduit (Liquidtight Flexible Metal)	LF						80		10									90	
			613-07017	Pull Box (16"x14"x6")	EACH								79									79	
			613-07023	Pull Box (24"x36"x24")	EACH						5											5	
			613-07025	Pull Box (24"x24"x14")	EACH								10									10	
			613-07036	Pull Box (36"x24"x8")	EACH								1 *									1 *	
			613-07060	Pull Box (18"x30"x18") Deep	EACH						14											14	
			613-10000	Wiring	L S						0.5		0.5									1	
			613-13000	Luminaire (LED)	EACH								51									51	
			613-13100	Luminare Mounting Support System	LS								1									1	
			613-13101	Luminare (LED) (Tunnel)(133 W)	EACH								34									34	

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SUMMARY OF APPROXIMATE QUANTITIES			
Designer:	E. Marsh	Structure Numbers	
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			613-13102	Luminare (LED) (Tunnel)(133 W)(Furnish Only)	EACH									2								2	
			613-13103	Luminare (LED) (Tunnel)(265 W)	EACH									354								354	
			613-13104	Luminare (LED) (Tunnel)(265 W)(Furnish Only)	EACH									2								2	
			613-32400	Light Standard Steel (40 Foot)	EACH						4			7								11	
			613-32405	Light Standard Steel (40 Foot)(2 Arm) *	EACH									10								10	
			613-34300	Light Standard Metal (30 Foot)	EACH									5								5	
			613-40010	Light Standard Foundation	EACH						4			30								34	
			613-50100	Lighting Control Center	EACH									3								3	
			613-50150	Secondary Service Pedestal	EACH						1											1	
			613-50325	Tunnel Lighting Control System	L S									1								1	
			613-75150	Luminaire Metal Halide (150 Watt)	EACH									5								5	
			614-00011	Sign Panel (Class I)	SF	226 *																226 *	
			614-00012	Sign Panel (Class II)	SF	413																413	
			614-00013	Sign Panel (Class III)	SF	1,400																1,400	
			614-00041	Sign Post (Special)	EACH	8																8	
			614-00612	Steel Sign Post (W 6x12)	LF	26																26	
			614-00615	Steel Sign Post (W 6x15)	LF	32																32	
			614-01022	Steel Sign Post (W 10x22)	LF	89																89	
			614-01026	Steel Sign Post (W 10x26)	LF	41																41	
			614-01583	Steel Sign Support (2-1/2 In Round Sch 80) (Post & Slipbase)	EACH	13																13	
			614-01585	Steel Sign Support (2-1/2 Inch Round Sch 80) (Post)	LF	90																90	

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Project No./Code
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INDEX			CONTRACT ITEM NO.	CONTRACT ITEM	UNIT	Roadway		Roadway Drainage and Water Quality		Stormwater Management Plan		ITS		Lighting		Tunnel		Portals		Retaining Walls C,D,G,L		PROJECT TOTALS	
BOOK	PAGE	SHEET				PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.
			614-03001	Concrete Footing (Type 1)	EACH	2																2	
			614-03002	Concrete Footing (Type 2)	EACH	2																2	
			614-03005	Concrete Footing (Type 5)	EACH	4																4	
			614-03006	Concrete Footing (Type 6)	EACH	2																2	
			614-32000	Monotube Overhead Sign Cantilever (20 Inch Diameter)	EACH	1																1	
			614-41800	Monotube Overhead Sign Bridge (18 Inch Diameter)	EACH	1																1	
			614-72830	Communications Cabinet	EACH						4											4	
			614-72887	Microwave Vehicle Radar Detector	EACH						1											1	
			614-80391	Rumble Strip (Grinding)(Asphalt)	LF	12,897 *																12,897 *	
			614-80392	Rumble Strip (Grinding)(Concrete)	LF	3,317																3,317	
			614-85005	Impact Attenuator (Sand Barrel Array)	EACH	2																2	
			614-86007	Serial to IP Converter	EACH						1											1	
			614-87006	Fiber Optic Termination Panel - 6 Fiber	EACH						2											2	
			614-87010	Fiber Optic Cable (Single Mode) (12 Fiber)	LF						5,135											5,135	
			614-87015	Buffer Tube Fan Out Kit	EACH						4											4	
			614-87100	Automatic Traffic Recording Station	EACH						1											1	
			614-87320	Closed Circuit Television	EACH						2											2	
			614-87350	Test Fiber Optic Cable	L S						1											1	
			614-87661	Video Encoder	EACH						1											1	
			614-87690	Ethernet Switch	EACH						4											4	
			615-00050	Embankment Protector Type 5	EACH			9														9	
			620-00002	Field Office (Class 2)	EACH	1																1	


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Print Date: 3/8/2013		Sheet Revisions			Colorado Department of Transportation				As Constructed		SUMMARY OF APPROXIMATE QUANTITIES				Project No./Code			
File Name: 18832DES_CP2_SumQuan011.dgn		Date:	Comments	Init.	 425 A Corporate Circle Golden, CO 80401 Phone: 720-497-6918 FAX: 720-497-6901 Region 1 CRC				No Revisions:		Designer: E. Marsh Detailer: J. Gellner Subset: Sum Quan Subset Sheets: 11 of 14				IM 0703-391			
Horiz. Scale: 1:1 Vert. Scale:									Revised:						Structure Numbers		19036	
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INDEX			CONTRACT ITEM NO.	CONTRACT ITEM	UNIT	Roadway		Roadway Drainage and Water Quality		Stormwater Management Plan		ITS		Lighting		Tunnel		Portals		Retaining Walls C,D,G,L		PROJECT TOTALS	
BOOK	PAGE	SHEET				PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.
			620-00020	Sanitary Facility	EACH	6																6	
			621-00450	Detour Pavement	SY	569																569	
			622-00270	Bollard	EACH			8														8	
			623-05048	6 Inch Gate Valve	EACH			1														1	
			623-06901	Valve Box (Special)	EACH									2								2	
			625-00000	Construction Surveying	L S	1																1	
			625-00001	Construction Surveying (Hourly)	HOUR	100																100	
			625-00002	Construction Survey (Tunnel)	LS									1								1	
			625-00200	Vibration Monitoring (Tunnel)	LS									1								1	
			626-00100	Mobilization (without Autopay)	L S	1																1	
			626-00200	Mobilization (Tunnel)(Without Autopay)	L S									1								1	
			626-01000	Public Information Services	L S	1																1	
			627-00001	Pavement Marking Paint	GAL	444																444	
			627-00005	Epoxy Pavement Marking	GAL	124																124	
			627-00070	Preformed Thermoplastic Pavement Marking	SF	736																736	
			* 627-01010	Preformed Plastic Pavement Marking (Type I) (Inlaid) *	SF	4,880																4,880	
			630-00000	Flagging	HOUR	7,000																7,000	
			630-00003	Uniformed Traffic Control	HOUR	7,500																7,500	
			630-00007	Traffic Control Inspection	DAY	35																35	
			630-00012	Traffic Control Management	DAY	354																354	
			630-80001	Flashing Beacon (Portable)	EACH	17																17	
			630-80336	Barricade (Type 3 M-B) (Temporary)	EACH	4																4	

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 425 A Corporate Circle
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 Phone: 720-497-6918 FAX: 720-497-6901
 Region 1 CRC

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SUMMARY OF APPROXIMATE QUANTITIES			
Designer:	E. Marsh	Structure Numbers	
Detailer:	J. Gellner		
Subset:	Sum Quan	Subset Sheets: 12 of 14	

Project No./Code
IM 0703-391
19036
Sheet Number 29


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INDEX			CONTRACT ITEM NO.	CONTRACT ITEM	UNIT	Roadway		Roadway Drainage and Water Quality		Stormwater Management Plan		ITS		Lighting		Tunnel		Portals		Retaining Walls C,D,G,L		PROJECT TOTALS			
BOOK	PAGE	SHEET				PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.
			630-80341	Construction Traffic Sign (Panel Size A)	EACH	126																	126		
			630-80342	Construction Traffic Sign (Panel Size B)	EACH	121																		121	
			630-80343	Construction Traffic Sign (Panel Size C)	EACH	61																		61	
			630-80344	Construction Traffic Sign (Special)	SF	1,752																		1,752	
			630-80355	Portable Message Sign Panel	EACH	18																		18	
		*	630-80358	Advanced Warning Flashing or Sequencing Panel (C Type)	EACH *	2																		2	
			630-80360	Drum Channelizing Device	EACH	100																		100	
			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	7																		7	
			630-80370	Concrete Barrier (Temporary)	LF	30,272																		30,272	
			630-80380	Traffic Cone	EACH	200																		200	
			630-80384	Tubular Marker	EACH	170																		170	
			630-85010	Impact Attenuator (Temporary)	EACH	11																		11	
			630-85041	Mobile Attenuator	DAY	300																		300	
			641-10000	Shotcrete	SY																220			220	
			641-11000	Shotcrete (Class A)	CY											123								123	
			641-11001	Shotcrete (Class B)	CY											170								170	
			641-11002	Shotcrete (Class C)	CY											170								170	
			641-11003	Shotcrete (Class D)	CY											216								216	
			641-11004	Shotcrete (Portal Brow) (8 Inch)	CY											34								34	
			641-11005	Shotcrete (Smoothing) (Geocomposite Drains)	CY											132								132	

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 Phone: 720-497-6918 FAX: 720-497-6901
 Region 1 **CRC**

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SUMMARY OF APPROXIMATE QUANTITIES			
Designer:	E. Marsh	Structure Numbers	
Detailer:	J. Gellner		
Subset:	Sum Quan	Subset Sheets: 13 of 14	

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19036
Sheet Number 30


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INDEX			CONTRACT ITEM NO.	CONTRACT ITEM	UNIT	Roadway		Roadway Drainage and Water Quality		Stormwater Management Plan		ITS		Lighting		Tunnel		Portals		Retaining Walls C,D,G,L		PROJECT TOTALS	
BOOK	PAGE	SHEET				PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.
			641-11006	Shotcrete (Smoothing)(Supplemental)	CY											35						35	
				FORCE ACCOUNT =====																			
			700-70010	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	
			700-70013	F/A Concrete Pavement Incentive	F A	1																1	
			700-70014	F/A Incentive	F A	1																1	
			700-70016	F/A Fuel Cost Adjustment	F A	1																1	
			700-70018	F/A Roadway Smoothness Incentive	F A	1																1	
			700-70019	F/A Asphalt Cement Cost Adjustment	F A	1																1	
			700-70023	F/A On-The-Job Trainee	F A	1																1	
			700-70031	F/A INTERIM SURFACE REPAIR	F A	1																1	
			700-70034	F/A OCIP	F A	1																1	
			700-70035	F/A OCIP	F A	1																1	
			700-70072	F/A Obtain Power from Xcel Energy	F A	1																1	
			700-70081	F/A Provide Vouchers	F A	1																1	
			700-70100	F/A Relocate Utilities	F A	1																1	
			700-70589	F/A Environmental Health & Safety Management	F A	1																1	
			700-71001	CMGC Shared Rist Contig. Pool	F A	1																1	

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 425 A Corporate Circle
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 Phone: 720-497-6918 FAX: 720-497-6901
 Region 1 CRC

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SUMMARY OF APPROXIMATE QUANTITIES			
Designer:	E. Marsh	Structure Numbers	
Detailer:	J. Gellner	Subset Sheets: 14 of 14	
Subset:	Sum Quan		


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IM 0703-391
19036
Sheet Number 31

TABULATION OF REMOVALS

LOCATION	SIDE	REMOVAL OF TREE	REMOVAL OF EMBANKMENT PROTECTOR TYPE 5	REMOVAL OF DELINEATOR	REMOVAL OF ASPHALT MAT	REMOVAL OF ASPHALT MAT (PLANING)	REMOVAL OF IMPACT ATTENUATOR	REMOVAL OF FENCE	REMOVAL OF GUARDRAIL TYPE 3	REMOVAL OF GUARDRAIL TYPE 7	REMOVAL OF END ANCHORAGE	REMARKS
		EACH	EA	EACH	SY	SY	EA	LF	LF	LF	EA	
		202-00010	202-00024	202-00090	202-00220	202-00240	202-00895	202-01000	202-01130	202-01170	202-01300	
EASTBOUND I-70 WEST ALIGNMENT												
STA 117+07.72 TO STA 118+00.00	LT									92		
STA 117+08.68 TO STA 118+19.76	LT/RT					670						
STA 116+51.26 TO STA 137+92.55	LT							2,093	49			
STA 118+19.76 TO STA 130+36.00	RT	2			2,517							22 SY ASPH MAT REMOVAL FOR 36" RCP
STA 119+75.75 TO STA 184+14.06	LT/RT			75								
STA 123+34.40 TO STA 141+11.00	LT/RT	6			3,343							12 SY ASPH MAT REMOVAL FOR 36" RCP
STA 137+16.25 TO STA 139+61.00	LT/RT					895						
STA 148+97.00 TO STA 173+78.45	LT/RT				11,737							
STA 148+90.64 TO STA 172+09.08	LT								2,317		1	
STA 148+90.68 TO STA 150+50.57	RT								160		1	
STA 151+09.67 TO STA 173+30.99	RT								2,244		1	
STA 175+59.97 TO STA 181+77.13	LT/RT					2,231						
STA 186+42.00	RT		1									
STA 188+04.00	RT		1									
EASTBOUND I-70 EAST ALIGNMENT												
STA 302+72.63 TO STA 332+00.00	LT								5,870			
STA 302+72.69 TO STA 332+00.00	LT				690							
STA 302+72.88 TO STA 338+66.61	LT/RT				1,702							
STA 302+72.89 TO STA 304+85.00	RT					961						
STA 302+90.33 TO STA 353+65.69	LT/RT			148								
STA 305+74.19 TO STA 311+17.72	RT								563		1	
STA 304+85+00 TO STA 309+83.87	RT				1,160							13 SY ASPH MAT REMOVAL FOR 36" RCP
STA 309+89.34 TO STA 347+58.02	RT				2,600							146 SY ASPH MAT REMOVAL FOR 36" RCP
STA 314+44.90 TO STA 332+11.00	RT								1,737		2	
STA 326+19.36 TO STA 331+92.05	RT								563		2	
STA 335+20.00	LT	1										
STA 339+00.00 TO STA 344+00.00	RT				223							
STA 343+94.88 TO STA 354+08.22	RT								1,013		1	
STA 344+07.40 TO STA 354+35.26	LT/RT				337							
STA 345+59.50 TO STA 347+23.21	LT								164		2	
STA 347+62.76 TO STA 354+20.00	RT				200							75 SY ASPH MAT REMOVAL FOR 36" RCP
STA 348+85.00 TO STA 351+30.00	LT	2										
STA 351+18.71 TO STA 356+58.46	LT/RT				58	1,592	1			147		SAND BARREL ARRAY AT GORE
PROJECT TOTAL		11	2	223	24,567	6,349	1	2,093	14,680	239	11	

NOTES:

- 1.) REMOVAL OF GUARDRAIL TRANSITIONS WILL NOT BE PAID FOR SEPERATELY BUT INCLUDED IN THE COST OF REMOVAL OF GUARDRAIL TYPE 3. LENGTHS ARE ADJUSTED TO INCLUDE TRANSITION LENGTH.
- 2.) SEE RETAINING WALL SUMMARY OF QUANTITIES FOR ITEM 202-00026 REMOVAL OF SLOPE AND DITCH PAVING QUANTITY.
- 3.) SEE SIGNING PLANS, LIGHTING PLANS AND GRADING AND DRAINAGE PLANS FOR ADDITIONAL REMOVAL ITEMS.

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File Name: 18832DES_CP2_TabRemovals.dgn		Date:	Comments	Init.			No Revisions:	Designer: E. Marsh	Structure Numbers	IM 0703-391			
Horiz. Scale: 1:1 Vert. Scale:							Revised:	Detailer: J. Gellner		19036			
				Void:	Subset: Tabulations	Subset Sheets: 1 of 4	Sheet Number 32						
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TABULATION OF GUARDRAIL

LOCATION	SIDE	HOT MIX ASPHALT (PATCHING) (ASPHALT)	STRUCTURAL CONCRETE COATING	GUARDRAIL TYPE 3 (SPECIAL)	GUARDRAIL TYPE 7 (STYLE CA)	GUARDRAIL TYPE 7 (STYLE CA) (SPECIAL)	GUARDRAIL TYPE 7 (STYLE CE) (SPECIAL)	END ANCHORAGE TYPE 3D	TRANSITION TYPE 3G (SPECIAL)	TRANSITION TYPE 3H (SPECIAL)	END ANCHORAGE (FLARED)	IMPACT ATTENUATOR (SAND BARREL ARRAY)	REMARKS
		TON	SY	LF	LF	LF	LF	EA	EA	EA	EA	EA	
		403-00720	601-40300	606-00305	606-00710	606-00716	606-00741	606-01340	606-01371	606-01381	606-02005	614-85005	
EASTBOUND I-70													
STA 117+07.95 TO STA 121+40.00	LT	1			431								
STA 121+40.00 TO STA 122+89.82	LT	4		130					1				
STA 121+40.00 TO STA 139+41.73	LT	54		1,780					1				
STA 139+61.52 TO STA 141+48.00	LT				187								
STA 127+86.54 TO STA 130+17.25	RT	7		235					1		1		
STA 139+61.00 TO STA 139+96.00	RT				35								
STA 148+97.00 TO STA 149+29.22	RT				32								
STA 149+15.75 TO STA 171+94.82	LT	72		2,276					1	1			
STA 151+00.00 TO STA 151+81.25	RT	3		82					1		1		
STA 175+64.13 TO STA 181+77.13	LT				616								
STA 179+65.11 TO STA 185+77.00	LT				614								
STA 302+72.86 TO STA 319+02.05	LT		1,850			1,615							
STA 309+83.20 TO STA 311+40.00	RT	5		163				1		1			
STA 312+65.16 TO STA 337+55.00	RT	79		2,478				1			1		
STA 319+02.05 TO STA 320+61.75	LT		190				160						
STA 320+38.25 TO STA 332+00.00	LT		1,490				1,166						
STA 332+00.00 TO STA 332+80.44	LT		93			81							
STA 332+98.74 TO STA 342+60.18	LT	30		957				1		1			
STA 341+39.95 TO STA 354+08.22	RT	41		1,281					1		1		7FT POSTS 347+00 TO 348+50 & 353+45 TO 354+08.22
STA 343+85.00 TO STA 347+96.20	LT	13		410					1		1		
STA 348+14.95 TO STA 349+29.00	LT				114								
EXIT 244 OFF RAMP													
STA 3007+11.20 TO STA 3009+85.36	LT		200		274							2	
STA 3008+75.27 TO STA 3009+85.36	LT		80		110								
STA 3009+85.36 TO STA 3010+40.00	LT					55							SEE NOTE 1
PROJECT TOTAL		309	3,903	9,792	2,413	1,696	1,381	3	7	3	5	2	

NOTES:

- GUARDRAIL TYPE 7 (STYLE CE) (SPECIAL) AT THIS LOCATION IS PAID FOR AS (SPECIAL) BUT SHALL BE CONSTRUCTED PER GUARDRAIL TYPE 7 (STYLE CE) STANDARDS.

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File Name: 18832DES_CP2_TabGuardrail.dgn								Structure Numbers	Subset Sheets: 2 of 4			
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TABULATION OF MISCELLANEOUS ROADWAY ITEMS

LOCATION	SIDE	END POST	CORNER AND LINE BRACE POST	FENCE BARBED WIRE WITH TREATED WOODEN POSTS (SPECIAL)	CURB AND GUTTER TYPE 2 (SECTION II-M)	CURB TYPE 6 (SECTION M)	REMARKS
		EA	EA	LF	LF	LF	
		607-00005	607-00010	607-01110	609-21021	609-60011	
EASTBOUND I-70							
STA 117+11.76 TO STA 138+69.25	LT	2	9	2,132			
STA 118+19.82 TO STA 120+40.38	RT				230		
STA 120+40.38 TO STA 126+69.69	RT				667		
STA 126+69.69 TO STA 129+58.29	RT				297		
STA 129+58.29 TO STA 130+36.00	RT				78		
STA 150+54.00 TO STA 152+00.00	RT					147	
STA 160+80.00 TO STA 172+15.20	LT					1,020	
STA 319+02.05 TO STA 335+00.00	RT					1,555	
STA 335+00.00 TO STA 341+85.40	LT					650	
STA 341+91.69 TO STA 342+25.00	LT					35	
STA 346+60.00 TO STA 354+19.95	RT					748	
STA 355+65.00 TO STA 355+80.00	LT						
PROJECT TOTAL		2	9	2,132	1,272	4,155	

NOTES:

- SEE FENCE DETAIL FOR FENCE BARBED WIRE WITH TREATED WOODEN POSTS (SPECIAL).
- CONTRACTOR SHALL MODIFY CURB TYPE 6 (SECTION M) TO PROVIDE A 1" MINIMUM OFFSET FROM FACE OF RAIL TO FACE OF CURB.

TABULATION OF FENCE (TEMPORARY)

LOCATION	SIDE	FENCE (TEMPORARY)	REMARKS
		LF	
		607-11580	
EASTBOUND I-70			
STA 310+50.00 TO 315+50.00	RT	570	WETLAND PROTECTION
STA 311+85.00	RT	50	PROTECT EXISTING TREE
STA 337+00.00 TO 344+00.00	RT	815	WETLAND PROTECTION
PROJECT WIDE	LT/RT	500	TO BE DIRECTED BY ENGINEER
PROJECT TOTAL		1,935	

NOTES:

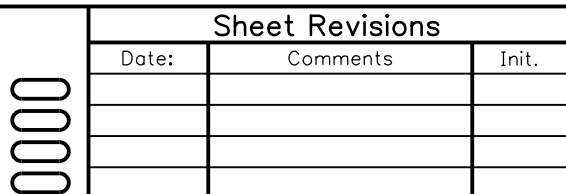

- THE STATION RANGES WITHIN THIS TABULATION ARE APPROXIMATE AND SHALL BE FIELD ADJUSTED DURING CONSTRUCTION. ACTUAL LOCATIONS SHALL BE AGREED UPON BY CDOT ENVIRONMENTAL STAFF, THE ENGINEER, AND THE CONTRACTOR. FENCE LOCATIONS ARE NOT SHOWN IN THE CONSTRUCTION PLANS.

TABULATION OF RUMBLE STRIPS

LOCATION	SIDE	LENGTH AT RUMBLE STRIP	RUMBLE STRIP (GRINDING) (ASPHALT)	RUMBLE STRIP (GRINDING) (CONCRETE)	REMARKS
		LF	LF	LF	
		FOR INFORMATION ONLY	614-80391	614-80392	
EASTBOUND I-70					
STA 119+85.00 TO STA 128+00.00	RT	831	665		
STA 121+40.00 TO STA 138+30.00	LT	1,690	1,352		
STA 129+75.00 TO STA 140+97.00	RT	1,122	898		
STA 148+97.00 TO STA 170+80.00	LT	2,185	1,748		
STA 148+97.00 TO STA 171+86.00	RT	2,310	1,848		
STA 181+77.00 TO STA 193+31.00	RT	1,260		1,260	
STA 181+77.00 TO STA 199+61.00	LT	1,784		1,784	
STA 300+00.00 TO STA 302+73.00	LT	273		273	
STA 302+73.00 TO STA 320+38.00	LT	1,766	1,413		
STA 302+75.00 TO STA 355+60.00	RT	5,317	4,254		
STA 333+80.00 TO STA 342+60.00	LT	900	720		
PROJECT TOTAL			12,897	3,317	

NOTES:

- RUMBLE STRIPS SHALL BE PLACED AND CONSTRUCTED IN ACCORDANCE WITH STANDARD M-614-1.

Print Date: 3/8/2013			425 A Corporate Circle Golden, CO 80401 Phone: 720-497-6918 FAX: 720-497-6901	As Constructed No Revisions: Revised: Void:	TABULATION OF ROADWAY QUANTITIES			Project No./Code IM 0703-391 19036 Sheet Number 34
File Name: 18832DES_CP2_TabMisc.dgn					Designer: E. Marsh Detailer: J. Gellner Subset: Tabulations	Structure Numbers	Subset Sheets: 3 of 4	
Horiz. Scale: 1:1 Vert. Scale:					Region 1		CRC	

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TABULATION OF SURFACING

LOCATION	SIDE	304-06000	304-06008	403-34851	403-34721		403-00720	411-10255	412-01250	REMARKS
		AGGREGATE BASE COURSE (CLASS 6)	AGGREGATE BASE COURSE (CLASS 6) (SPECIAL)	HOT MIX ASPHALT (GRADING SX) (100) (PG 64-28)	HOT MIX ASPHALT (GRADING SX) (75) (PG 58-28)		HOT MIX ASPHALT (PATCHING) (ASPHALT)	EMULSIFIED ASPHALT (SLOW-SETTING)	CONCRETE PAVEMENT (12-1/2 INCH)	
		TON	CY	TON	TON		TON	GAL	SY	
					2" LIFT	2" LIFT	2" LIFT			
EASTBOUND I-70 - WEST ALIGNMENT										
STA 117+07.97 TO STA 119+85.00	LT/RT			231				88		VARIABLE DEPTH HMA STA 118+19.80 TO 119+85.00
STA 119+85.00 TO STA 130+36.00	LT/RT	771		695	282	282		457		
STA 130+36.00 TO STA 139+61.00	LT/RT			586				281		
STA 139+61.00 TO STA 140+83.00	LT/RT	213		75	79	79		70		
STA 140+83.00 TO STA 141+11.00	LT/RT			9				4	81	WEST PORTAL ASPHALT AND CONCRETE SLAB DETAIL
STA 148+97.00 TO STA 149+07.67	LT/RT			7				3	62	EAST PORTAL ASPHALT AND CONCRETE SLAB DETAIL
STA 149+07.67 TO STA 171+86.45	LT/RT	3,977		1,461	1,462	1,462		1,364		
STA 175+62.54 TO STA 180+42.65	LT/RT			372				169		TOP MAT OVER CONSTRUCTION PACKAGE 1B
STA 180+42.65 TO STA 181+77.13	LT/RT			89				41		TOP MAT OVER CONSTRUCTION PACKAGE 1B
SUBTOTAL		4,961	0	3,525	1,823	1,823	0	2,475	143	
CHAIN STATION										
STA 118+19.82 TO STA 129+75.17	RT	1,341		451	451	451		414		
STA 119+85.00 TO STA 128+00.00	RT	167								CHAIN STATION SEPARATION AREA
SUBTOTAL		1,508	0	451	451	451	0	414	0	
EXIT 243 OFF RAMP										
STA 405+11.76 TO STA 409+00.00	LT/RT	0	6	144				64		TOP MAT OVER CONSTRUCTION PACKAGE 1B
EASTBOUND I-70 - EAST ALIGNMENT										
STA 302+75.54 TO STA 304+85.00	LT/RT	33	7	151	0	0	34	72		
STA 304+85.00 TO STA 309+83.87	LT/RT	515	15	323	190	190	54	300		
STA 309+83.87 TO STA 318+00.00	LT/RT	436	30	526	160	160	89	321		
STA 318+00.00 TO STA 332+00.00	LT/RT	1,303	8	940	480	480	32	637		
STA 332+00.00 TO STA 339+00.00	LT/RT	555		450	204	204		322		
STA 339+00.00 TO STA 345+00.00	LT/RT	621		417	229	229		304		
STA 345+00.00 TO STA 356+47.00	LT/RT	530		898	195	195		573		AVG (3) LIFTS FOR VARIABLE HMA OVERLAY
SUBTOTAL		3,993	60	3,705	1,458	1,458	209	2,526	0	
EXIT 244 OFF RAMP										
STA 3010+14.38 TO STA 3011+09.64	LT/RT		4	34			26	15		
PROJECT WIDE DRAINAGE CULVERTS										
ENTIRE PROJECT		0		0	0	0	131	40		NOT SHOWN IN PLANS
TOTAL (PRIOR TO IRREGULARITIES)		10,462	70	7,859	7,464	7,464	366	5,532	143	
IRREGULARITIES		0	0	393	0	0	0	0	0	TOP MAT ONLY; APPLY 5%
TABULATION TOTAL		10,462	70	8,252	7,464	7,464	366	5,532	143	

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Horiz. Scale: 1:1

Vert. Scale:

Sheet Revisions

Date:	Comments	Init.

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Region 1

CRC

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No Revisions:

Revised:

Void:

TABULATION OF ROADWAY QUANTITIES

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

Structure Numbers
Subset Sheets: 4 of 4

Project No./Code

IM 0703-391

19036

Sheet Number 35



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

SUMMARY OF EARTHWORK QUANTITIES

PAY QUANTITY	PROJECT TOTALS	
	PLAN	AS CONST.
UNCLASSIFIED EXCAVATION (COMPLETE IN PLACE) (CY)		
FROM ROADWAY CROSS SECTIONS (EB I-70 WEST ALIGNMENT)(COMPUTER GENERATED)	9,732	
FROM ROADWAY CROSS SECTIONS (EB I-70 EAST ALIGNMENT & WB I-70)(COMPUTER GENERATED)	2,056	
FROM TABULATION OF WATER QUALITY POND INFRASTRUCTURE (COMPUTER GENERATED)	4,763	
PROJECT TOTAL FOR PAY QUANTITY	16,551	
FOR INFORMATION ONLY		
	PROJECT TOTALS	
	PLAN	AS CONST.
EMBANKMENT (CY)		
FROM ROADWAY CROSS SECTIONS (I-70 WEST ALIGNMENT)(COMPUTER GENERATED)	1,772	
FROM ROADWAY CROSS SECTIONS (EB I-70 EAST ALIGNMENT & WB I-70)(COMPUTER GENERATED)	2,824	
FROM EXCESS WASTE AREA (STA 106+50 TO 112+50)(COMPUTER GENERATED)	10,100	
FROM TABULATION OF WATER QUALITY POND INFRASTRUCTURE (COMPUTER GENERATED)	495	
FROM TABULATION OF TUNNEL UNDERDRAIN AND DRAINAGE QUANTITIES	57	
TOTAL EMBANKMENT	15,248	
EXCAVATION (CY)		
FROM ROADWAY CROSS SECTIONS (EB I-70 WEST ALIGNMENT)(COMPUTER GENERATED)	9,732	
FROM ROADWAY CROSS SECTIONS (EB I-70 EAST ALIGNMENT & WB I-70)(COMPUTER GENERATED)	2,056	
FROM TABULATION OF WATER QUALITY POND INFRASTRUCTURE (COMPUTER GENERATED)	4,763	
FROM TABULATION OF WATER QUALITY INFRASTRUCTURE (STRUCTURE EXCAVATION)	1,419	
FROM TABULATION OF DRAINAGE STRUCTURES (STRUCTURE EXCAVATION)	4,512	
FROM TUNNEL SUMMARY OF QUANTITIES (ALL CLASSES)	19,698	
FROM TUNNEL PORTALS SUMMARY OF QUANTITIES (STRUCTURE EXCAVATION & ROCK EXCAVATION)	3,344	
FROM TABULATION OF TUNNEL UNDERDRAIN AND DRAINAGE QUANTITIES	148	
FROM RETAINING WALLS SUMMARY OF QUANTITIES (STRUCTURE EXCAVATION)	28,278	
TOTAL EXCAVATION	73,950	
EARTHWORK BALANCE (CY)		
EMBANKMENT x FACTOR (1.15)	17,535	
EXCESS EXCAVATION	56,415	
TOTAL	73,950	
COMPACTION (AASHTO T-180) (CY)		
EMBANKMENT (NET)	15,248	
BASES OF CUTS AND FILLS (1' OVER AREA OF DISTURBANCE) (CY)	11,900	
TOTAL COMPACTION	27,148	
WETTING (MGAL)		
FOR COMPACTION (0.04 M GAL / CY)	1,086	

NOTES:

1.) ALL EXCESS EXCAVATION LISTED ABOVE SHALL BE PROPERLY DISPOSED OF OFF SITE AND WILL BE INCIDENTAL TO ITEM 203-00010

PAVEMENT DESIGN PARAMETERS

LOCATION	EASTBOUND I-70 WIDENING OR RECONSTRUCTION	EASTBOUND I-70 OVERLAY
FLEXIBLE STRUCTURAL DESIGN DATA		
20-YR FLEXIBLE 18K ESALS	2,300,000	2,300,000
INITIAL SERVICEABILITY	4.5	4.5
TERMINAL SERVICEABILITY	2.5	2.5
RELIABILITY	95%	95%
OVERALL DEVIATION	0.44	0.44
ROADBED SOIL RESILIENT MODULUS	25,317	18,259
REQUIRED STRUCTURAL NUMBER	3.70	3.30
ABC THICKNESS, INCHES	4	4
ABC STRUCTURAL NUMBER	0.72	0.48
EXISTING PAVEMENT LAYER COEFFICIENT	-	0.35
EXISTING PAVEMENT STRUCTURAL NUMBER	0.35	2.45
HMA STRUCTURAL NUMBER	2.64	0.88
DESIGN STRUCTURAL NUMBER	3.36	3.81
CALCULATED HMA DESIGN THICKNESS	2.64 / 0.44 = 6.0 IN.	0.88 / 0.44 = 2.0 IN.
	USE 6.0"	USE 2.0"

NOTES:


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

Print Date: 3/9/2013	0000	Sheet Revisions	Colorado Department of Transportation	As Constructed	SUMMARY OF EATHWORK AND PAVEMENT DESIGN PARAMETERS	Project No./Code	
File Name: 18832DES_CP2_SumEarthwork.dgn		Date:	Comments	Init.	No Revisions:	Designer: E. Marsh	IM 0703-391
Horiz. Scale: 1:1 Vert. Scale:					Revised:	Detailer: J. Gellner	19036
ATKINS 4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276			 DEPARTMENT OF TRANSPORTATION Region 1	Void:	Structure Numbers	Sheet Number 36	
			CRC		Subset: Tabulations	Subset Sheets: 1 of 1	


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TABULATION OF DRAINAGE STRUCTURES

STRUCTURE NAME	STATION - OFFSET	MODIFY INLET	INLET						PIPE INVERT ELEVATIONS		GRADE (%)	REINFORCED CONCRETE PIPE (COMPLETE IN PLACE) 24" LF	REINFORCED CONCRETE PIPE (COMPLETE IN PLACE) 36" LF	REINFORCED CONCRETE END SECTION 36" EACH	REMOVAL OF INLET EACH	REMOVAL OF END SECTION EACH	REMOVAL OF PIPE LF	STRUCTURE BACKFILL (FLOW/FILL) CY	STRUCTURE EXCAVATION (FOR INFORMATION ONLY) CY	STRUCTURE BACKFILL (CLASS I) (FOR INFORMATION ONLY) CY	GEOTEXTILE (EROSION CONTROL) (CLASS 2) SY	RIPRAP (12 INCH) CY	CONCRETE CLASS B CY	REINFORCING STEEL (EPOXY COATED) LB	REMARKS		
			SPECIAL	TYPE D			SLAB BASE	SLAB BASE	SPECIAL	STRUCTURE ELEVATIONS																UPPER	LOWER
			H	H	H	H	H	H	H	RIM																INVERT	
			10	5	10	10	15	10																			
EACH	EACH	EACH	EACH	EACH	EACH	EACH																					
14	318+79.39, 2.03' L 318+79.81, 8.00' L PIPE																							EXISTING STORM			
	319+56.58, 5.93' L PIPE																										
15	322+48.85, 9.17' L PIPE																										
16	327+00.17, 0.51' L 327+00.52, 8.07' L PIPE																							EXISTING STORM			
	327+01.07, 43.33' L PIPE																										
	326+89.00, 43.83' R 330+55.62, 43.87' R PIPE																							WATER QUALITY INLET WATER QUALITY INLET			
18	331+45.46, 0.32' L 331+45.46, 8.02' L PIPE																							EXISTING STORM			
19	335+08.12, 43.87' R PIPE																							WATER QUALITY INLET			
20	335+35.28, 23.07' L PIPE																										
21	342+76.11, 45.33' L PIPE																										
	341+81.97, 20.64' L PIPE																										
22	349+02.24, 16.13' L 349+02.19, 12.83' L PIPE																							EXISTING STORM			
	348+10.36, 10.36' L PIPE																										
23	352+00.00, 43.87' R PIPE																							WATER QUALITY INLET			
24	353+68.07, 12.63' L 353+70.29, 12.63' L PIPE																							EXISTING STORM			
25	354+07.36, 43.82' R PIPE																							WATER QUALITY INLET			
SHEET 2 SUBTOTAL		0	5	2	4	4	1	1																			
SHEET 1 SUBTOTAL		1	5	7	2	1	0	2																			
TABULATION TOTAL		1	10	9	6	5	1	3																			

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TABULATION OF DRAINAGE STRUCTURES

Designer: A. Finseth
 Detailer: J. Gellner
 Subset: Tabulations

Structure Numbers
 Subset Sheets: 2 of 2

Project No./Code
 IM 0703-391
 19036
 Sheet Number **38**


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TABULATION OF WATER QUALITY POND INFRASTRUCTURE AND EMBANKMENT PROTECTORS

LOCATION	UNCLASSIFIED EXCAVATION (COMPLETE IN PLACE)	EMBANKMENT MATERIAL (CIP) (FOR INFORMATION ONLY)	STRUCTURE EXCAVATION	STRUCTURE BACKFILL (CLASS 2)	AGGREGATE BASE COURSE (CLASS 6) (SPECIAL)	CONCRETE PAVEMENT (6 INCH)	GEOTEXTILE (EROSION CONTROL)(CLASS 2)	RIPRAP (6 INCH)	RIPRAP (12 INCH)	CONCRETE SLOPE AND DITCH PAVING	PEDESTRIAN RAILING (STEEL)	CONCRETE CLASS B	REINFORCING STEEL (EPOXY COATED)	24" REINFORCED CONCRETE PIPE (COMPLETE IN PLACE)	INLET TYPE D (SPECIAL) (10 FOOT)	CURB TYPE 6 (SECTION M)	DELINEATOR (TYPE I)	EMBANKMENT PROTECTOR TYPE 5	BOLLARD	6 INCH GATE VALVE	REMARKS
	CY	CY	CY	CY	CY	SY	SY	CY	CY	CY	LF	CY	LB	LF	EACH	LF	EA	EA	EA	EA	
	203-00010	203-00060	206-00000	206-00200	304-06008	412-00600	420-00103	506-00206	506-00212	507-00000	514-00200	601-01000	602-00020	603-01245	604-00511	609-60011	612-00001	615-00050	622-00270	623-05048	
EASTBOUND I-70																					
114+50.00R	188	7			43		38	10									3				
117+50.00R	761	30	18	6	24	15	14	3		2.5		6	417			40	2	1	2		
127+50.00R	3,158	11	87	32	26	17	17	4		2.0		14	1,254			40	2	1	2		
151+00.00R		150	373	154	15	14	16		5	1.0	146	72	8,109	14	1	40	2	1	2	1	ALL EXCAVATION IS STRUCTURE EXCAVATION
163+50.00L										1.0						35		1			
168+07.00L										1.0						38		1			
170+09.00L										1.0						40		1			
186+38.00R										3.0						40		1			
188+10.00R										3.5						40		1			
315+00.00R	594	224	600	379	100		28	4			173	67	7,928	18			2		2		
342+00.00L		57	341	196	31					1.0	133	51	4,364			40	2	1			ALL EXCAVATION IS STRUCTURE EXCAVATION
344+00.00L	62	16			11		33	9									2				
TOTALS	4,763	495	1,419	767	250	46	146	30	5	16.0	452	210	22,072	32	1	353	15	9	8	1	

NOTES:
1.) CONCRETE PAVEMENT (6 INCH) IS FOR CONSTRUCTION OF CONCRETE CURB RAMPS AT IDENTIFIED LOCATIONS.

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Revised:
Void:

TABULATION OF WATER QUALITY POND INFRASTRUCTURE

Designer: D. Friesen	Structure Numbers
Detailer: J. Gellner	
Subset: Tabulations	Subset Sheets: 1 of 1

Project No./Code	IM 0703-391
	19036
Sheet Number	39

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 & Tunneling

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: _____
 Embankment
 Site Grading
 Erosion Control (Perm)
 Other: _____

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

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

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: _____

	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: _____

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

- 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: _____

	Tangent Interval	Curve Interval	Special Offset
Curb & Gutter	25'	25'	-

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

	Left Interval	Center Interval	Right Interval
Stationing	See note	below	-

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

- 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 "C", "D", "G", "L" & Tunnel

- 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

- 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_CP2_Tab.dgn
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 R1 Field Survey DAS

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

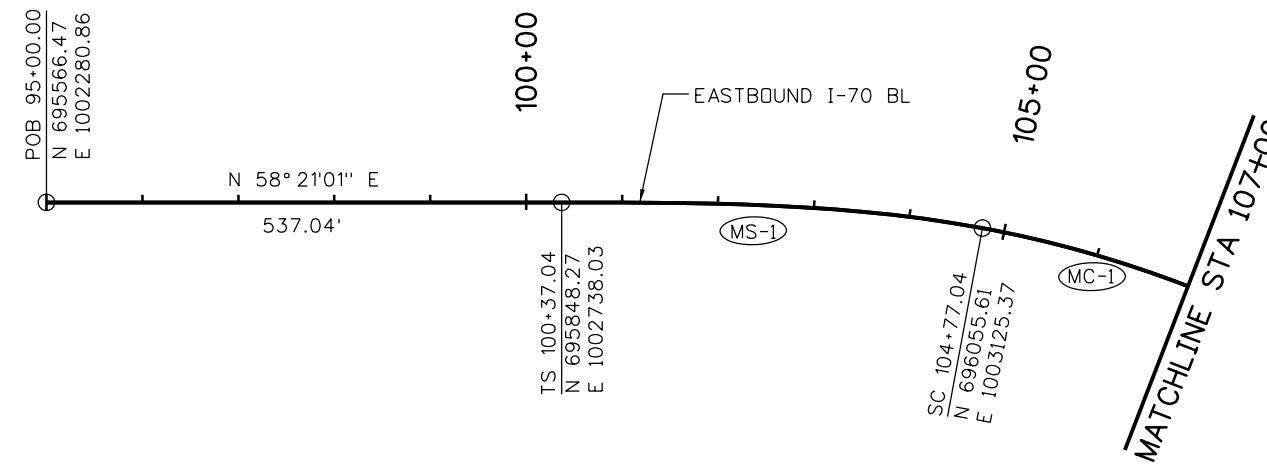
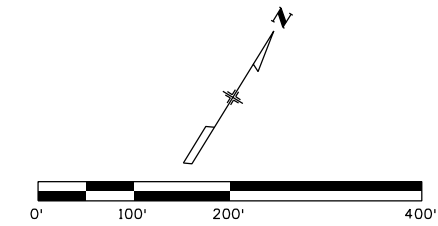
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Date:	Comments	Init.

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			Project No./Code
No Revisions:				IM 0703-391
Revised:	Designer: E. Marsh	Structure Numbers		19036
Void:	Detailer: J. Gellner	Sheet Subset: Survey	Subset Sheets: 1 of 1	Sheet Number 40

CURVE/SPIRAL TABLE

NUMBER	TYPE	DELTA/THETA	TANGENT	L TAN	S TAN	LENGTH	RADIUS	e (%)	PI STATION	PI NORTHING	PI EASTING
MS-1	SPIRAL	10° 28' 10"	-	293.85'	147.13'	440.00'	-	-	103+30.88	696002.45	1002988.17
MC-1	CURVE	31° 13' 45"	336.49'	-	-	656.24'	1204.00'	-	108+13.53	696177.19	1003439.13



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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:

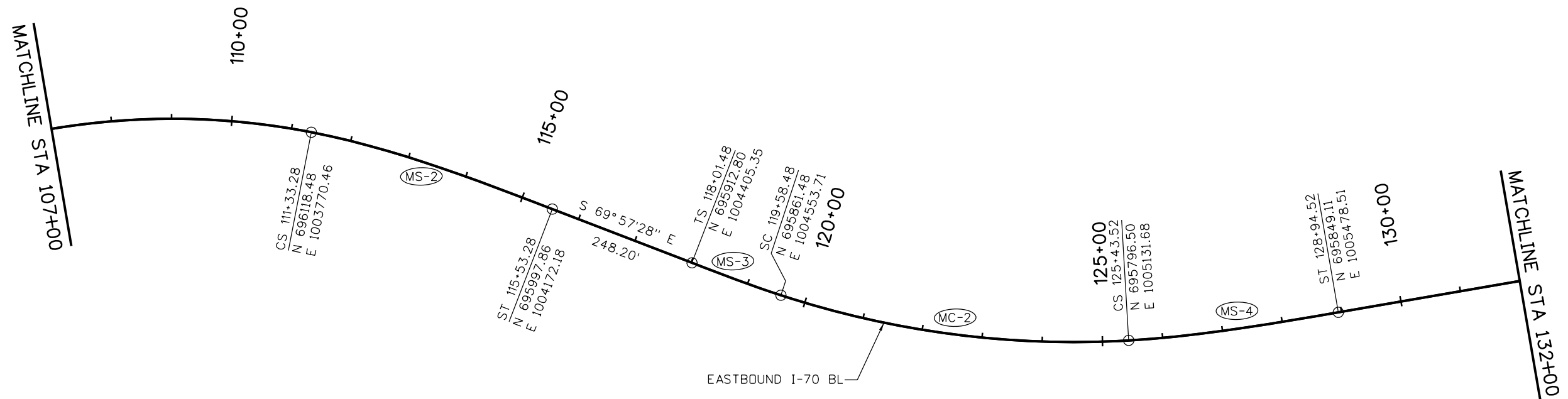
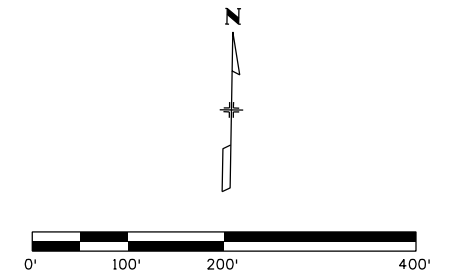
**EASTBOUND I-70
 GEOMETRIC LAYOUT
 STA 95+00 TO 107+00**

Designer: E. Marsh	Structure Numbers
Detailer: J. Gellner	
Subset: GEOM	Subset Sheets: 1 of 9

Project No./Code
IM 0703-391
19036
Sheet Number 41

CURVE/SPIRAL TABLE

NUMBER	TYPE	DELTA/THETA	TANGENT	L TAN	S TAN	LENGTH	RADIUS	e (%)	PI STATION	PI NORTHING	PI EASTING
MS-2	SPIRAL	9° 59' 36"		280.45'	140.41'	420.00'		-	112+73.69	696093.98	1003908.72
MS-3	SPIRAL	2° 52' 59"		104.68'	52.35'	157.00'		-	119+06.16	695876.93	1004503.69
MC-2	CURVE	21° 29' 14"	296.00'	-	-	585.04'	1560.00'	-	122+54.48	695774.16	1004836.53
MS-4	SPIRAL	6° 26' 45"		234.16'	117.14'	351.00'		-	126+60.66	695805.34	1005248.49

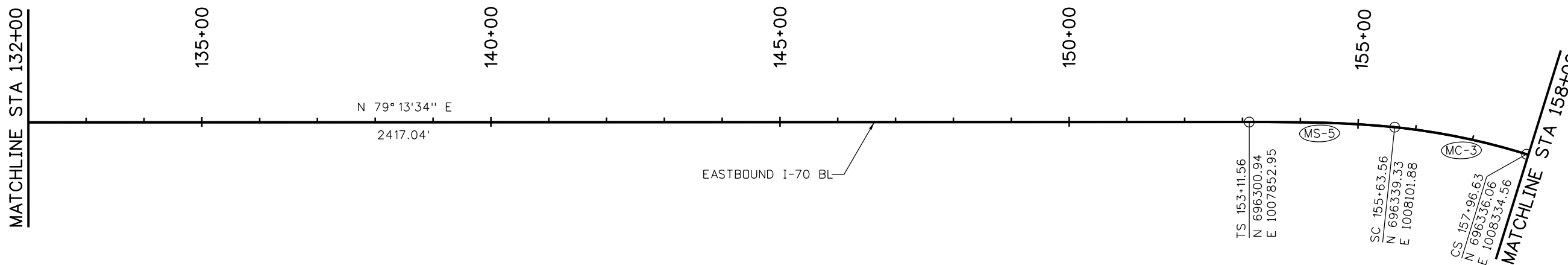
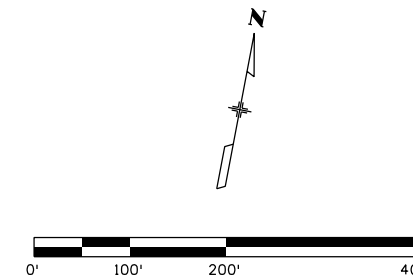


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Date:	Comments	Init.																	

CURVE/SPIRAL TABLE

NUMBER	TYPE	DELTA/THETA	TANGENT	L TAN	S TAN	LENGTH	RADIUS	e (%)	PI STATION	PI NORTHING	PI EASTING
MS-5	SPIRAL	6° 00' 58"		168.10'	84.09'	252.00'		-	154+79.66	696332.36	1008018.09
MC-3	CURVE	11° 07' 41"	116.90'	-	-	233.06'	1200.00'	-	156+80.46	696349.03	1008218.38



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Print Date: 3/8/2013
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Date:	Comments	Init.

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 Phone: 720-497-6918 FAX: 720-497-6901
Region 1 **CRC**

As Constructed
No Revisions:
Revised:
Void:

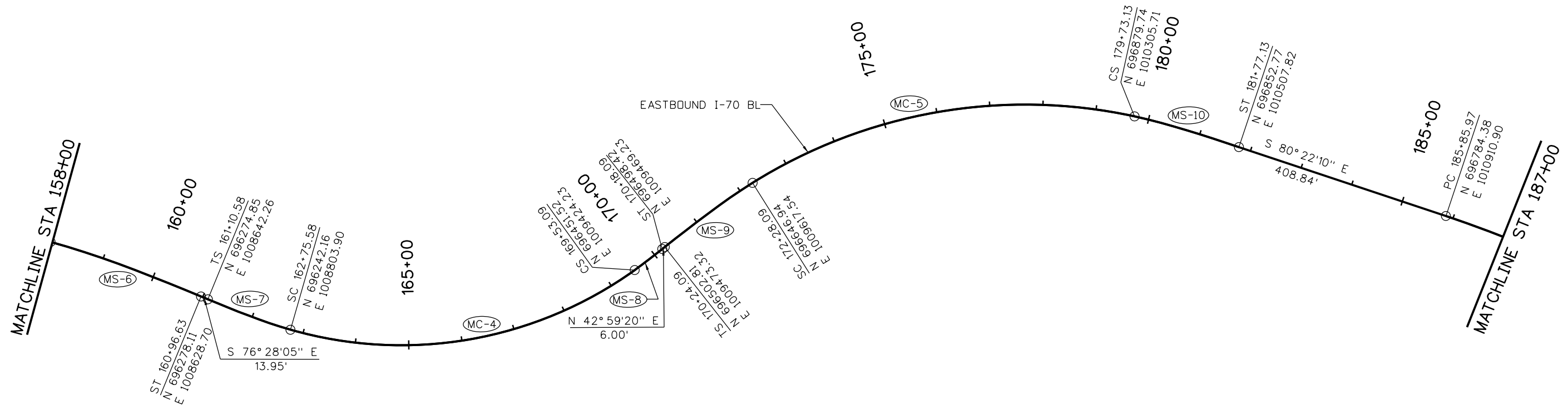
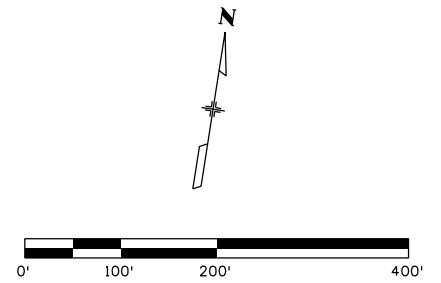
**EASTBOUND I-70
 GEOMETRIC LAYOUT
 STA 132+00 TO 158+00**

Designer: E. Marsh	Structure Numbers
Detailer: J. Gellner	
Subset: GEOM	Subset Sheets: 3 of 9

Project No./Code
IM 0703-391
19036
Sheet Number 43

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

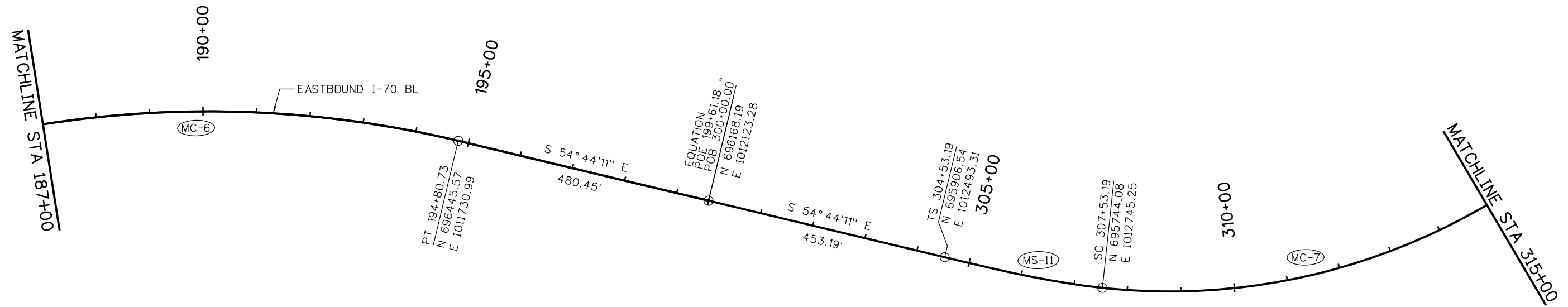
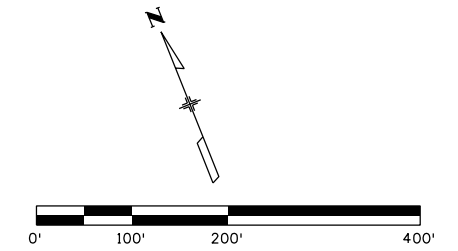


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Subset: GEOM	Subset Sheets: 4 of 9																																						
Project No./Code																																							
IM 0703-391																																							
19036																																							
Sheet Number 44																																							

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
MS-11	SPIRAL	7° 20' 44"		200.17'	100.16'	300.00'		-	306+53.36	695790.98	1012656.75
MC-7	CURVE	50° 19' 23"	549.60'	-	-	1027.62'	1170.00'	-	313+02.79	695486.75	1013230.89

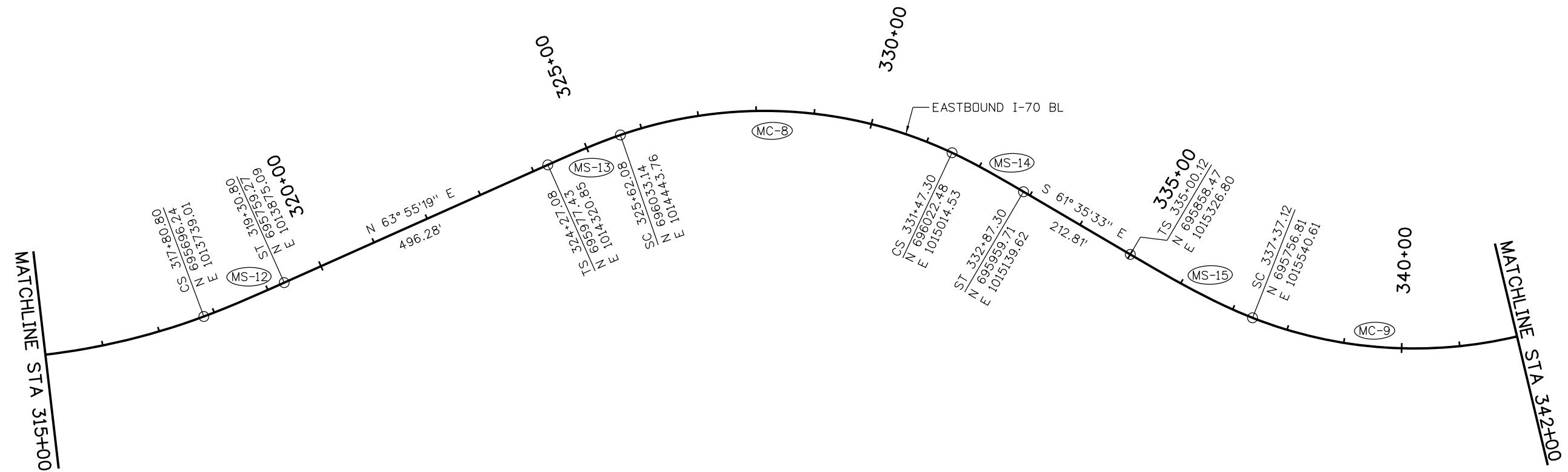
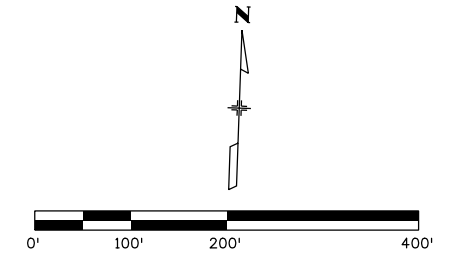


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File Name: 18832DES_CP2_Geology005.dgn		Date:	Comments	Init.	425 A Corporate Circle Golden, CO 80401 Phone: 720-497-6918 FAX: 720-497-6901				No Revisions:		Designer: E. Marsh Detailer: J. Gellner Subset: GEOM			IM 0703-391	
Horiz. Scale: 1:200 Vert. Scale:									Revised:					Structure Numbers	
ATKINS 4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276					Region 1 CRC				Void:		Subset Sheets: 5 of 9			Sheet Number 45	


CURVE/SPIRAL TABLE

NUMBER	TYPE	DELTA/THETA	TANGENT	L TAN	S TAN	LENGTH	RADIUS	e (%)	PI STATION	PI NORTHING	PI EASTING
MS-12	SPIRAL	3° 40'22"		100.02'	50.02'	150.00'		-	318+30.82	695715.30	1013785.25
MS-13	SPIRAL	5° 05'20"		90.04'	45.03'	135.00'		-	325+17.12	696017.01	1014401.72
MC-8	CURVE	44° 07'10"	307.98'	-	-	585.22'	760.00'	-	328+70.06	696143.46	1014731.31
MS-14	SPIRAL	5° 16'38"		93.37	46.70	140.00'		-	331+94.01	696004.13	1015057.48
MS-15	SPIRAL	8° 56'01"		158.20'	79.18'	237.00'		-	336+58.32	695783.21	1015465.95
MC-9	CURVE	50° 44'16"	360.37'	-	-	673.01'	760.00'	-	340+97.49	695636.67	1015880.36



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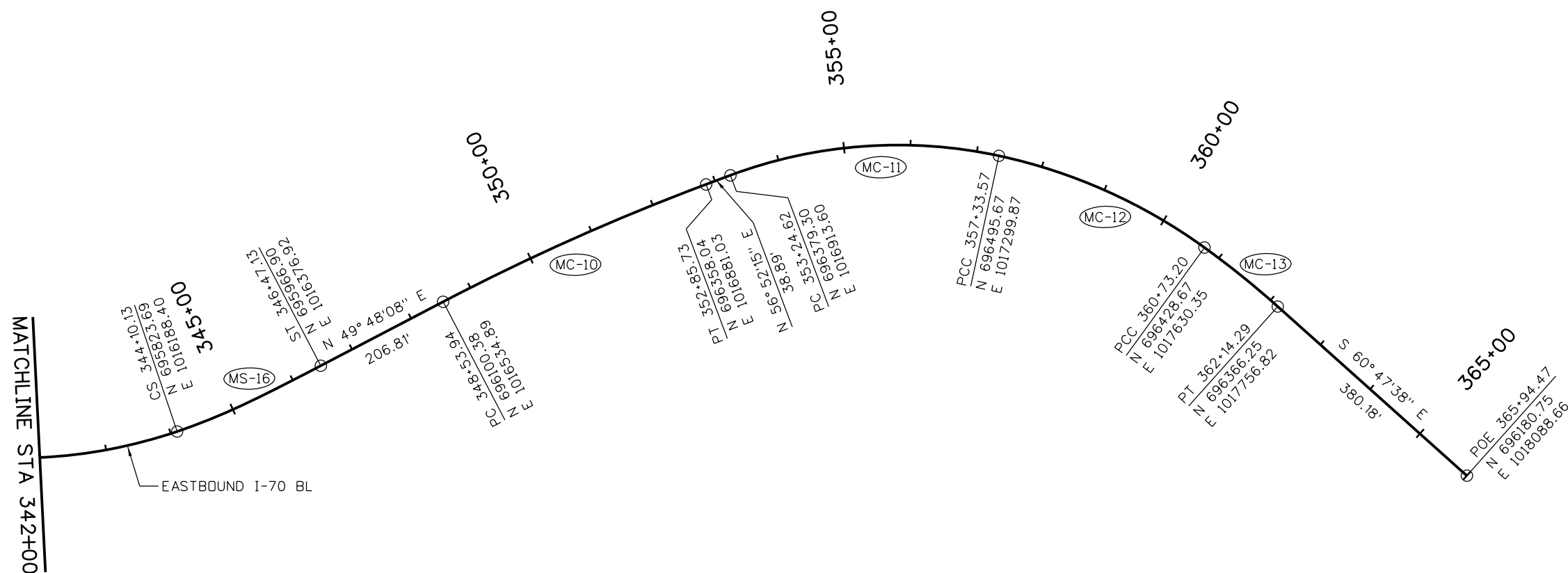
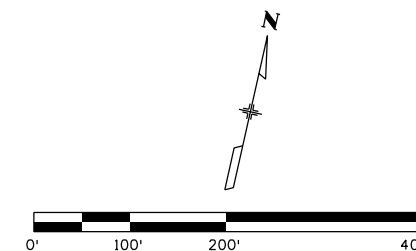
**EASTBOUND I-70
 GEOMETRIC LAYOUT
 STA 315+00 TO 342+00**
 Designer: E. Marsh
 Detailer: J. Gellner
 Subset: GEOM
 Structure Numbers
 Subset Sheets: 6 of 9

Project No./Code
 IM 0703-391
 19036
 Sheet Number **46**

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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
MS-16	SPIRAL	8° 56' 01"	-	158.20'	79.18'	237.00'	-	-	344+89.31	695864.79	1016256.08
MC-10	CURVE	7° 04' 06"	216.17'	-	-	431.79'	3500.00'	-	350+70.11	696239.90	1016700.00
MC-11	CURVE	32° 43' 31"	210.22'	-	-	408.95'	716.00'	-	355+34.84	696494.19	1017089.65
MC-12	CURVE	23° 43' 51"	172.28'	-	-	339.63'	820.00'	-	359+05.86	696496.89	1017472.15
MC-13	CURVE	5° 52' 45"	70.61'	-	-	141.09'	1375.00'	-	361+43.81	696400.71	1017695.18



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Date:	Comments	Init.

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Region 1 **CRC**

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Revised:
Void:

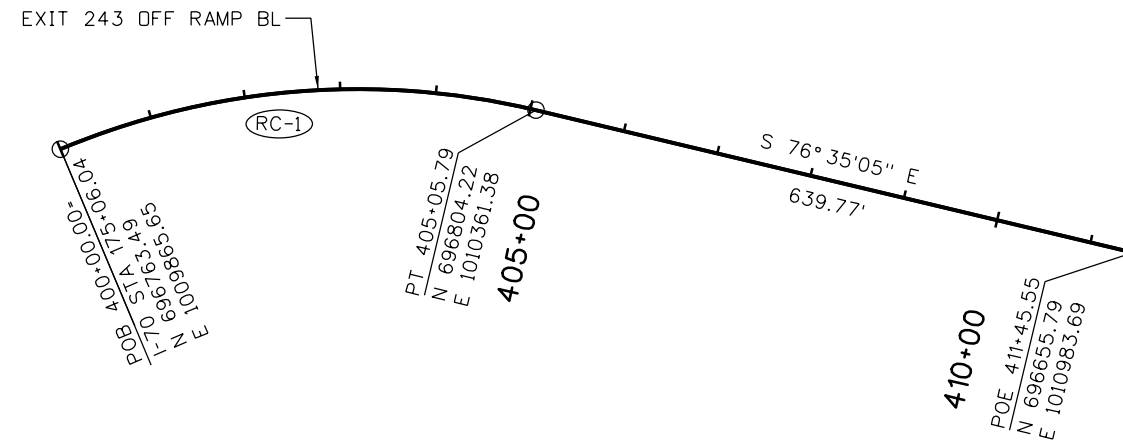
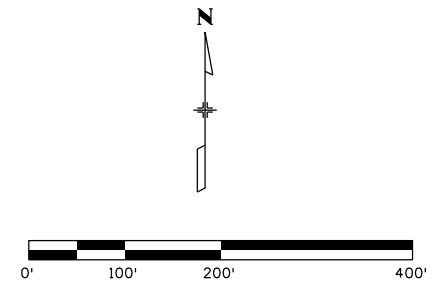
**EASTBOUND I-70
 GEOMETRIC LAYOUT
 STA 342+00 TO 365+94.47**

Designer: E. Marsh	Structure Numbers
Detailer: J. Gellner	
Subset: GEOM	Subset Sheets: 7 of 9

Project No./Code
IM 0703-391
19036
Sheet Number 47

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



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Print Date: 3/8/2013
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Sheet Revisions		
Date:	Comments	Init.

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Region 1 **CRC**

As Constructed
No Revisions:
Revised:
Void:

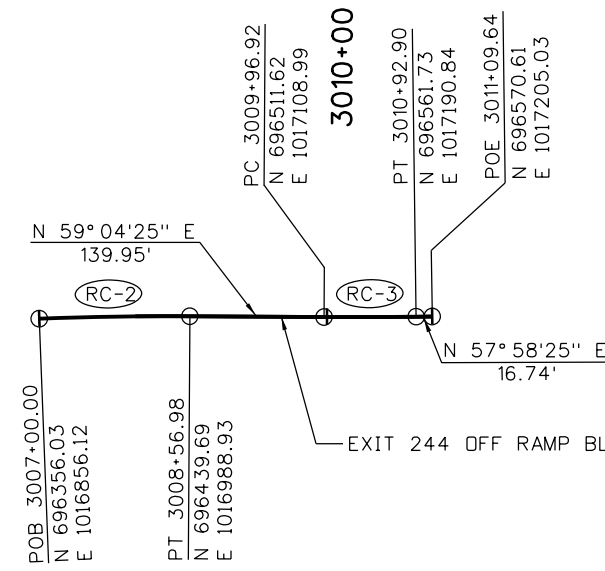
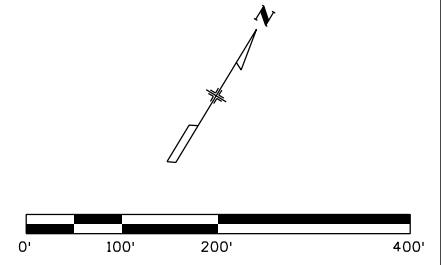
**EXIT 243 OFF RAMP
 GEOMETRIC LAYOUT
 STA 400+00.00 TO 411+45.55**

Designer: E. Marsh	Structure Numbers
Detailer: J. Gellner	
Subset: GEOM	Subset Sheets: 8 of 9

Project No./Code
IM 0703-391
19036
Sheet Number 48

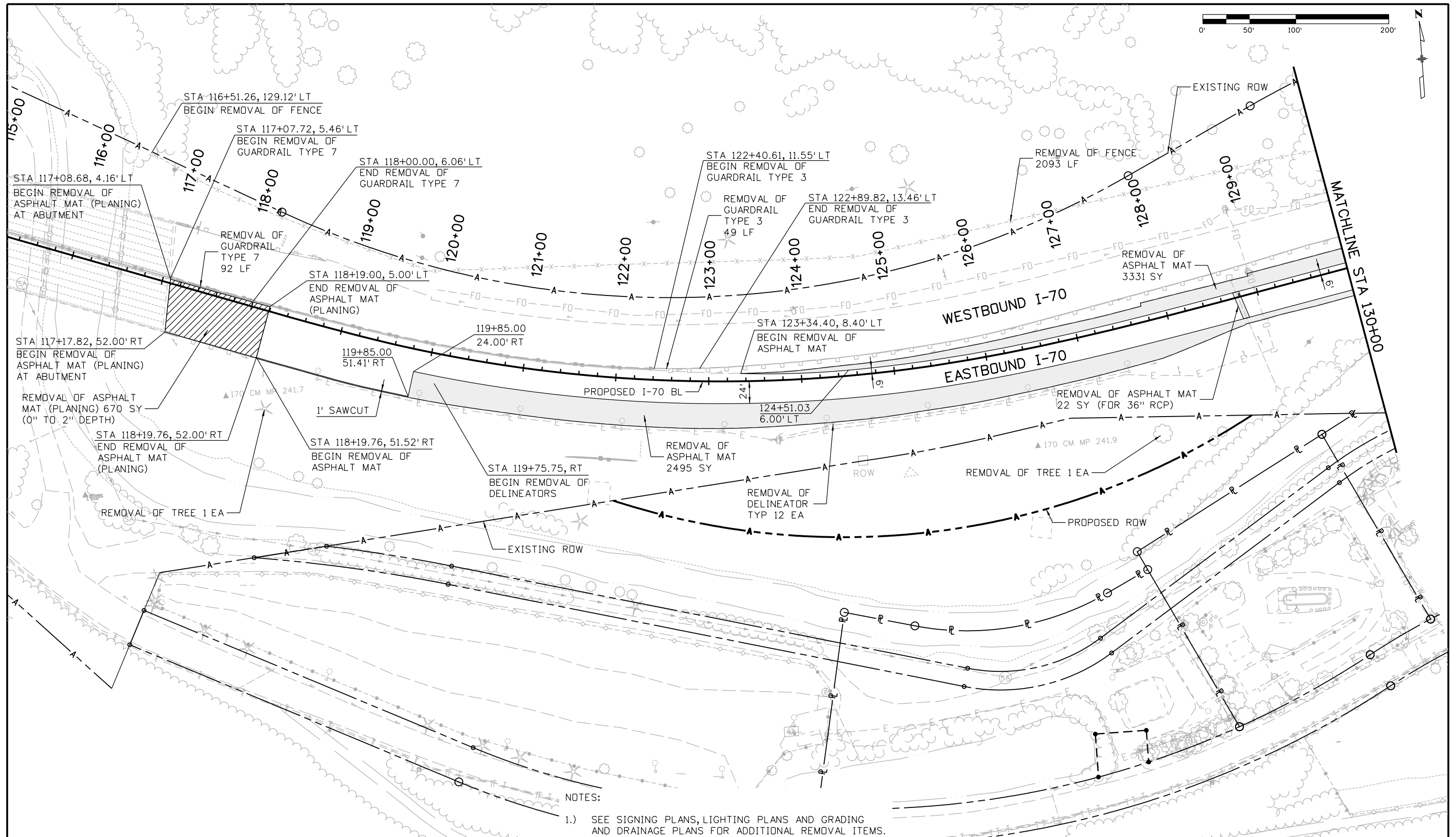
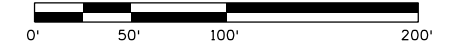
CURVE/SPIRAL TABLE

NUMBER	TYPE	DELTA/THETA	TANGENT	L TAN	S TAN	LENGTH	RADIUS	e (%)	PI STATION	PI NORTHING	PI EASTING
RC-2	CURVE	2° 33' 39"	78.50'	-	-	156.98'	3512.00'	-	3007+78.50	696399.35	1016921.59
RC-3	CURVE	1° 05' 59"	47.99'	-	-	95.98'	5000.00'	-	3010+44.92	696536.28	1017150.15



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Print Date: 3/8/2013 File Name: 18832DES_CP2_Geoloy009.dgn Horiz. Scale: 1:200 Vert. Scale:		Sheet Revisions			Colorado Department of Transportation		As Constructed	EXIT 244 OFF RAMP GEOMETRIC LAYOUT STA 3007+00.00 TO 3011+09.64		Project No./Code					
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Date:	Comments	Init.													
4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276		Region 1		CRC	Revised:	Designer: E. Marsh Structure Numbers	19036								
		Void:	Detailer: J. Gellner	Subset: GEOM Subset Sheets: 9 of 9	Sheet Number 49										



NOTES:
 1.) SEE SIGNING PLANS, LIGHTING PLANS AND GRADING AND DRAINAGE PLANS FOR ADDITIONAL REMOVAL ITEMS.

Print Date: 3/8/2013
 File Name: 18832DES_CP2_RMVPlan001.dgn
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 Region 1 CRC

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 Revised:
 Void:

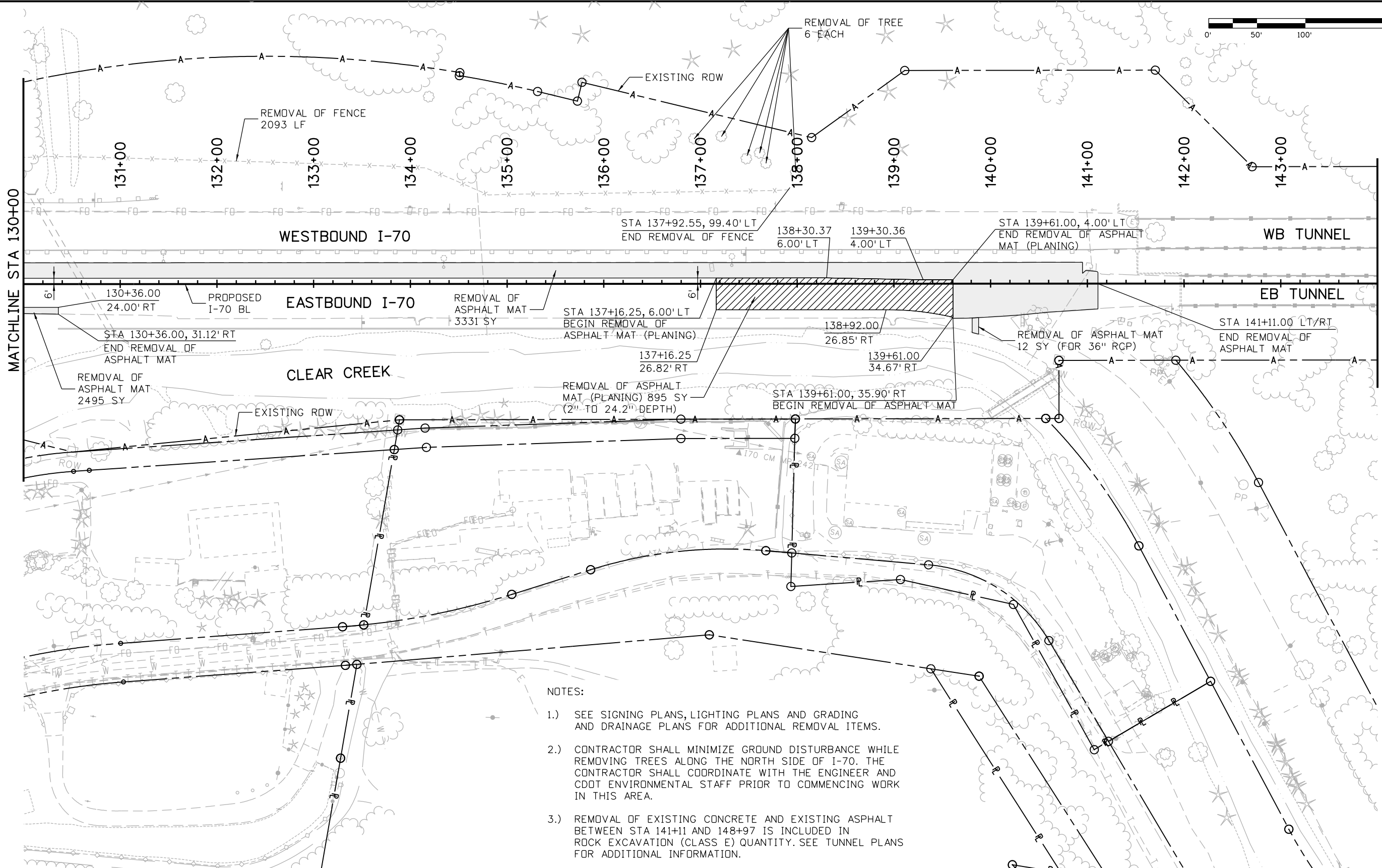
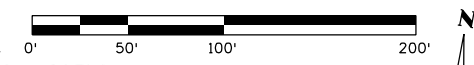
**EASTBOUND I-70
 REMOVAL PLAN
 STA 116+00 TO 130+00**

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


Structure Numbers
 Subset Sheets: 1 of 11

Project No./Code
 IM 0703-391
 19036
 Sheet Number 50

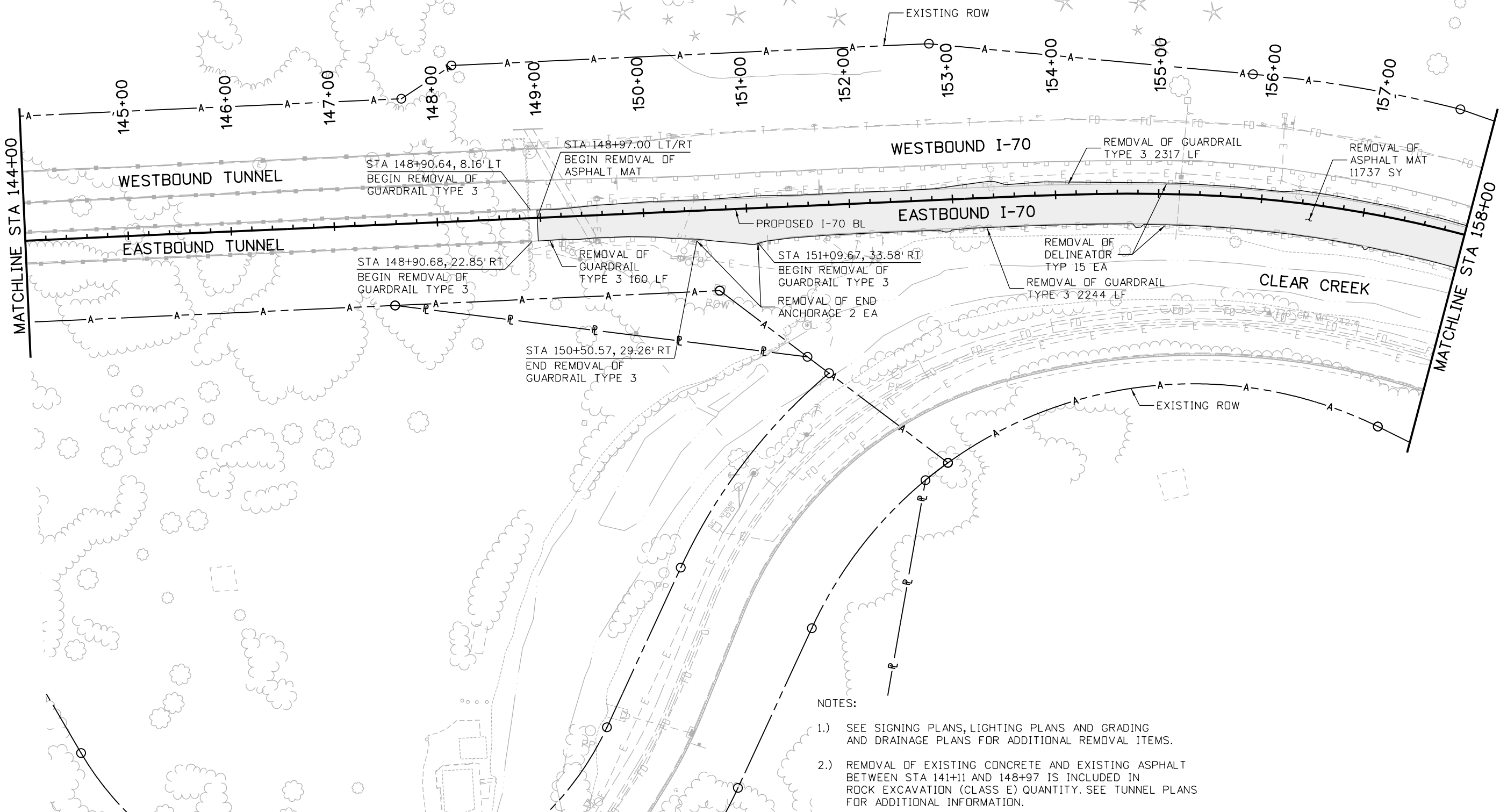
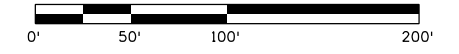
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- NOTES:
- 1.) SEE SIGNING PLANS, LIGHTING PLANS AND GRADING AND DRAINAGE PLANS FOR ADDITIONAL REMOVAL ITEMS.
 - 2.) CONTRACTOR SHALL MINIMIZE GROUND DISTURBANCE WHILE REMOVING TREES ALONG THE NORTH SIDE OF I-70. THE CONTRACTOR SHALL COORDINATE WITH THE ENGINEER AND CDOT ENVIRONMENTAL STAFF PRIOR TO COMMENCING WORK IN THIS AREA.
 - 3.) REMOVAL OF EXISTING CONCRETE AND EXISTING ASPHALT BETWEEN STA 141+11 AND 148+97 IS INCLUDED IN ROCK EXCAVATION (CLASS E) QUANTITY. SEE TUNNEL PLANS FOR ADDITIONAL INFORMATION.

Print Date: 3/8/2013		Sheet Revisions			Colorado Department of Transportation			As Constructed		EASTBOUND I-70 REMOVAL PLAN STA 130+00 TO 144+00			Project No./Code			
File Name: 18832DES_CP2_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 0703-391			
Horiz. Scale: 1:100 Vert. Scale: NA								Revised:					Structure Numbers		19036	
 4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276								Void:					Subset Sheets: 2 of 11		Sheet Number 51	
					Region 1			CRC								

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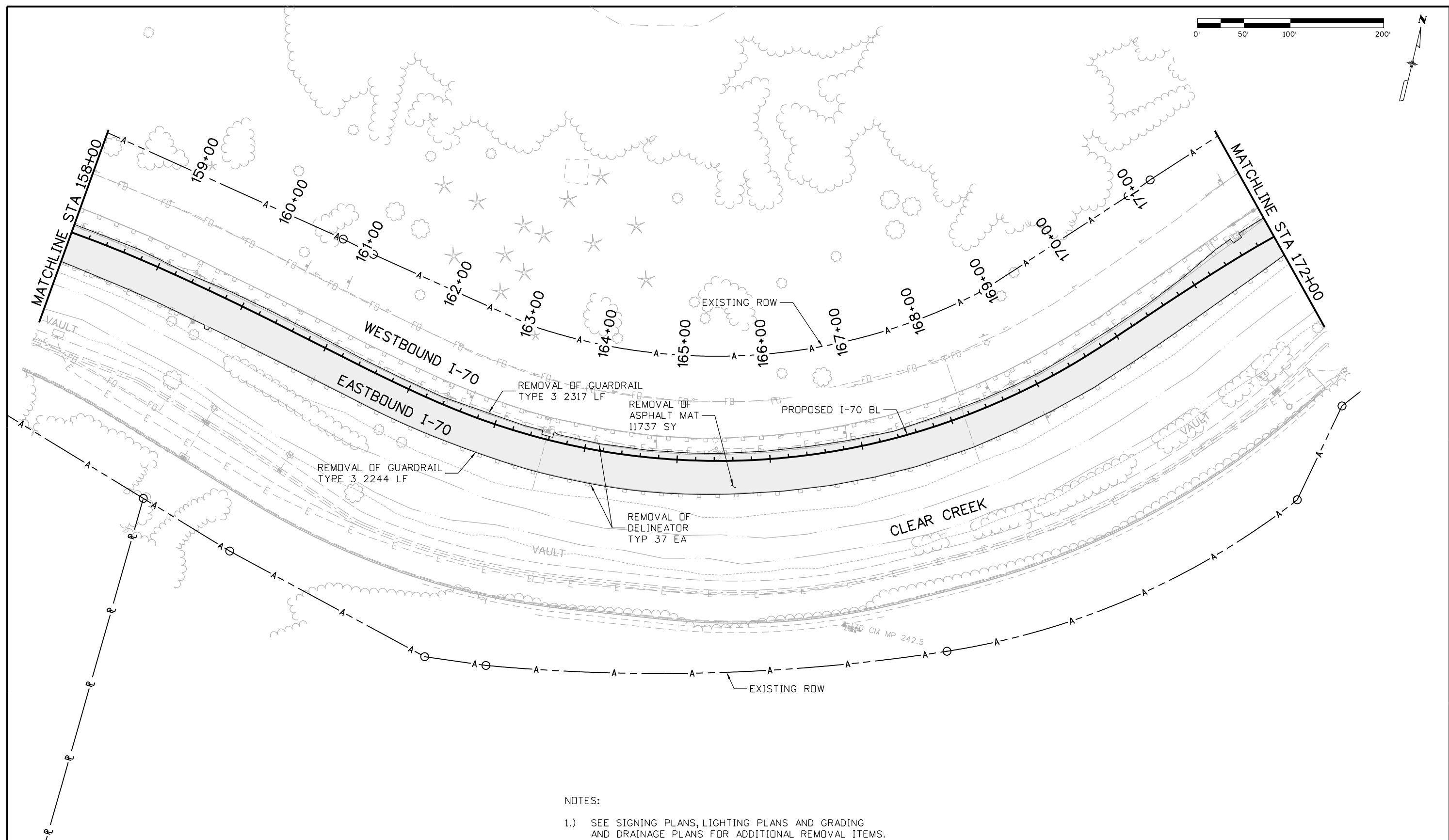
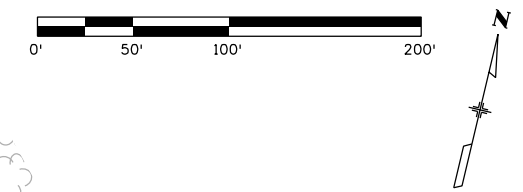
NOTES:

- 1.) SEE SIGNING PLANS, LIGHTING PLANS AND GRADING AND DRAINAGE PLANS FOR ADDITIONAL REMOVAL ITEMS.
- 2.) REMOVAL OF EXISTING CONCRETE AND EXISTING ASPHALT BETWEEN STA 141+11 AND 148+97 IS INCLUDED IN ROCK EXCAVATION (CLASS E) QUANTITY. SEE TUNNEL PLANS FOR ADDITIONAL INFORMATION.

Print Date: 3/8/2013 File Name: 18832DES_CP2_RMVPlan003.dgn Horiz. Scale: 1:100 Vert. Scale: NA	0000	Sheet Revisions <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.										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:	EASTBOUND I-70 REMOVAL PLAN STA 144+00 TO 158+00 Designer: E. Marsh Detailer: J. Gellner Subset: Removals	Structure Numbers Subset Sheets: 3 of 11	Project No./Code IM 0703-391 19036 Sheet Number 52
Date:	Comments	Init.																	

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- NOTES:
- 1.) SEE SIGNING PLANS, LIGHTING PLANS AND GRADING AND DRAINAGE PLANS FOR ADDITIONAL REMOVAL ITEMS.

Print Date: 3/8/2013
 File Name: 18832DES_CP2_RMVPlan004.dgn
 Horiz. Scale: 1:100 Vert. Scale: NA

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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
 REMOVAL PLAN
 STA 158+00 TO 172+00**

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

Structure Numbers
 Subset Sheets: 4 of 11

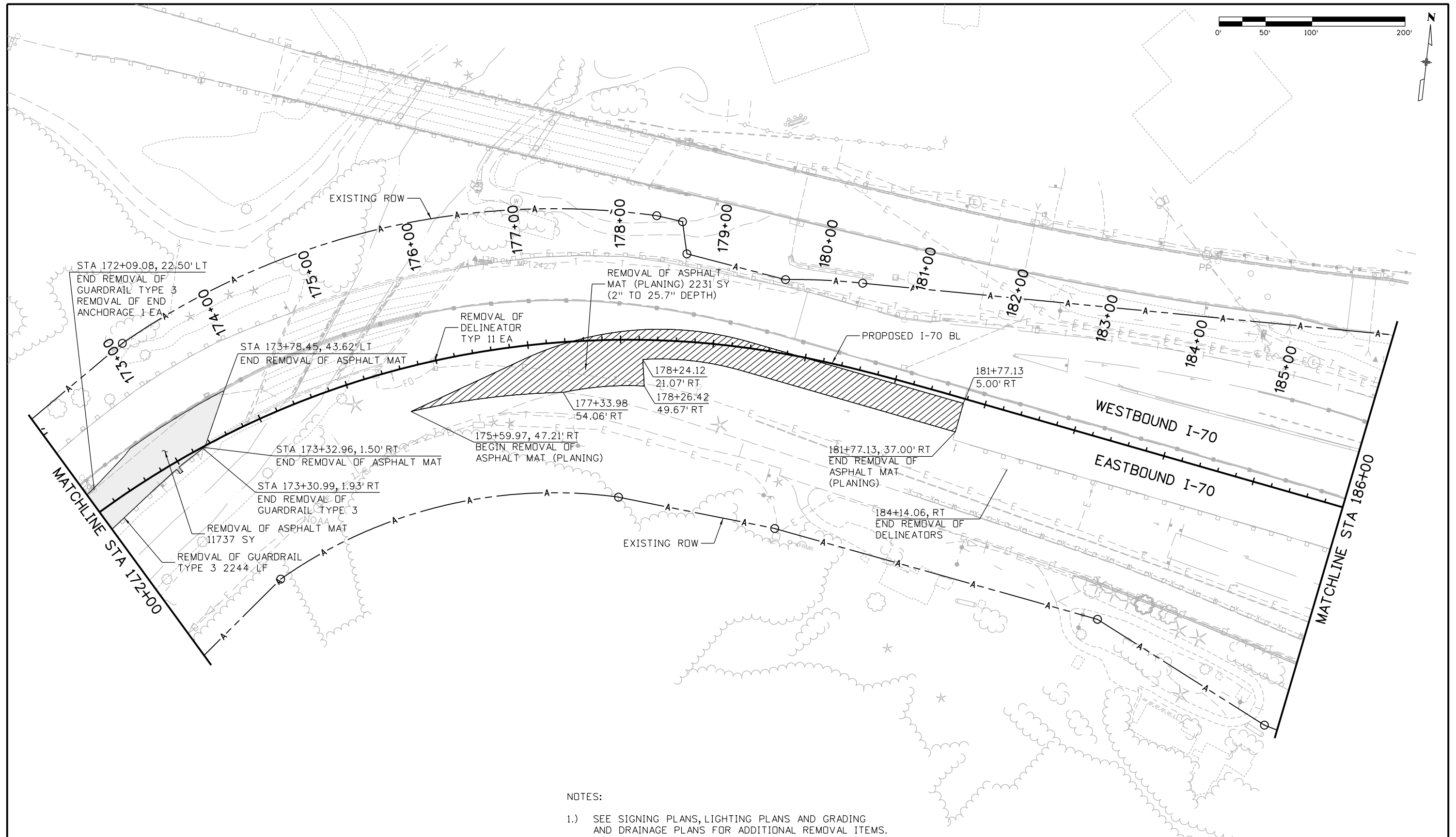
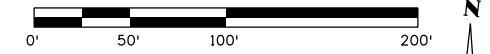
Project No./Code

IM 0703-391

19036

Sheet Number **53**

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NOTES:


- 1.) SEE SIGNING PLANS, LIGHTING PLANS AND GRADING AND DRAINAGE PLANS FOR ADDITIONAL REMOVAL ITEMS.

Print Date: 3/8/2013
 File Name: 18832DES_CP2_RMVPlan005.dgn
 Horiz. Scale: 1:100 Vert. Scale: NA

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Sheet Revisions		
Date:	Comments	Init.

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Region 1 CRC

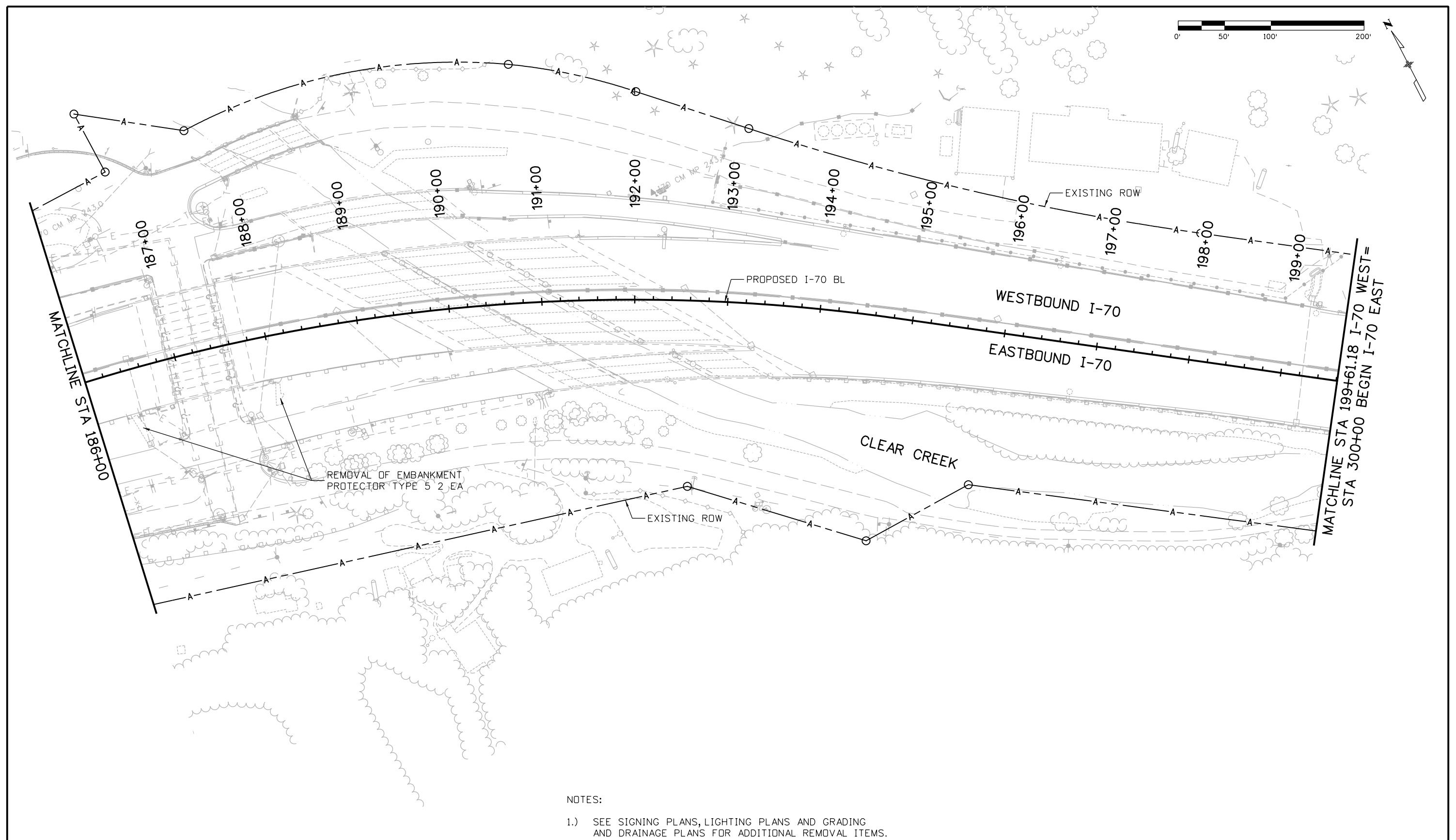
As Constructed
No Revisions:
Revised:
Void:

**EASTBOUND I-70
 REMOVAL PLAN
 STA 172+00 TO 186+00**

Designer: E. Marsh	Structure Numbers
Detailer: J. Gellner	
Subset: Removals	Subset Sheets: 5 of 11

Project No./Code
IM 0703-391
19036
Sheet Number 54

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NOTES:

- 1.) SEE SIGNING PLANS, LIGHTING PLANS AND GRADING AND DRAINAGE PLANS FOR ADDITIONAL REMOVAL ITEMS.

Print Date: 3/8/2013
 File Name: 18832DES_CP2_RMVPlan006.dgn
 Horiz. Scale: 1:100 Vert. Scale: NA
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Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation

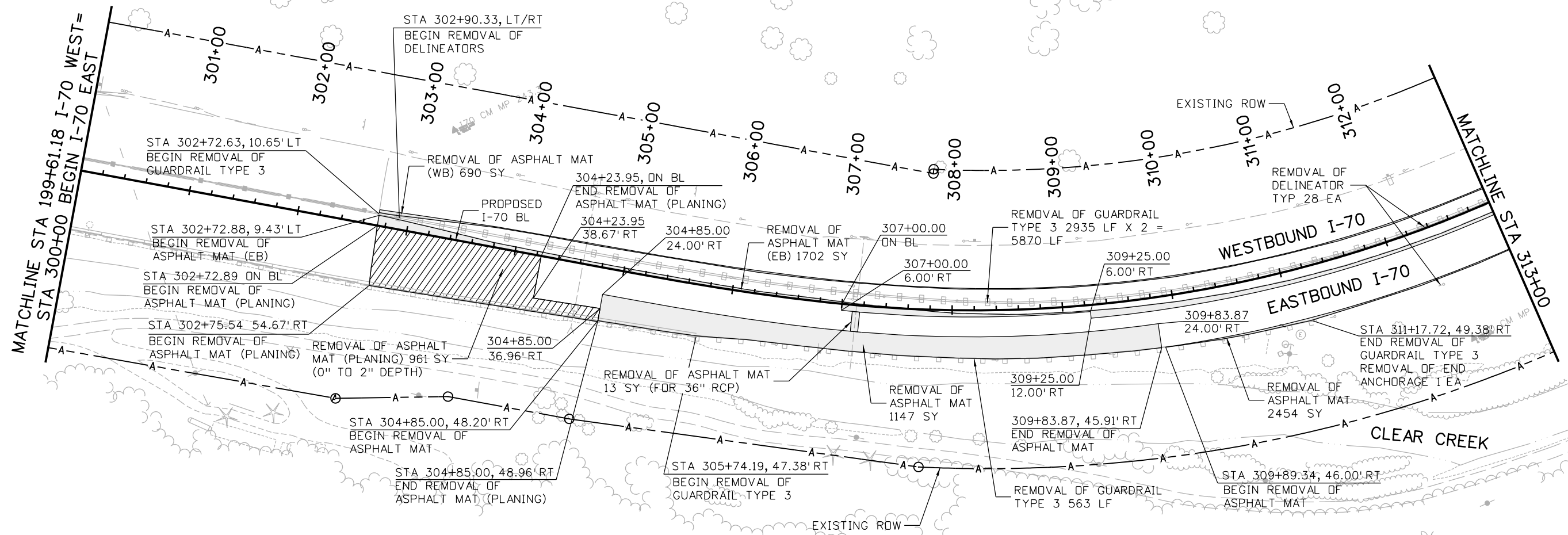
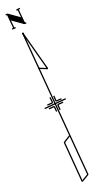
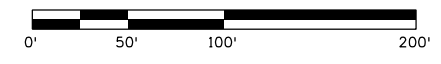
 425 A Corporate Circle
 Golden, CO 80401
 Phone: 720-497-6918 FAX: 720-497-6901
 Region 1 CRC

As Constructed
 No Revisions:
 Revised:
 Void:

**EASTBOUND I-70
 REMOVAL PLAN
 STA 186+00 TO 199+61.18**
 Designer: E. Marsh
 Detailer: J. Gellner
 Subset: Removals
 Structure Numbers
 Subset Sheets: 6 of 11

Project No./Code
 IM 0703-391
 19036
 Sheet Number 55

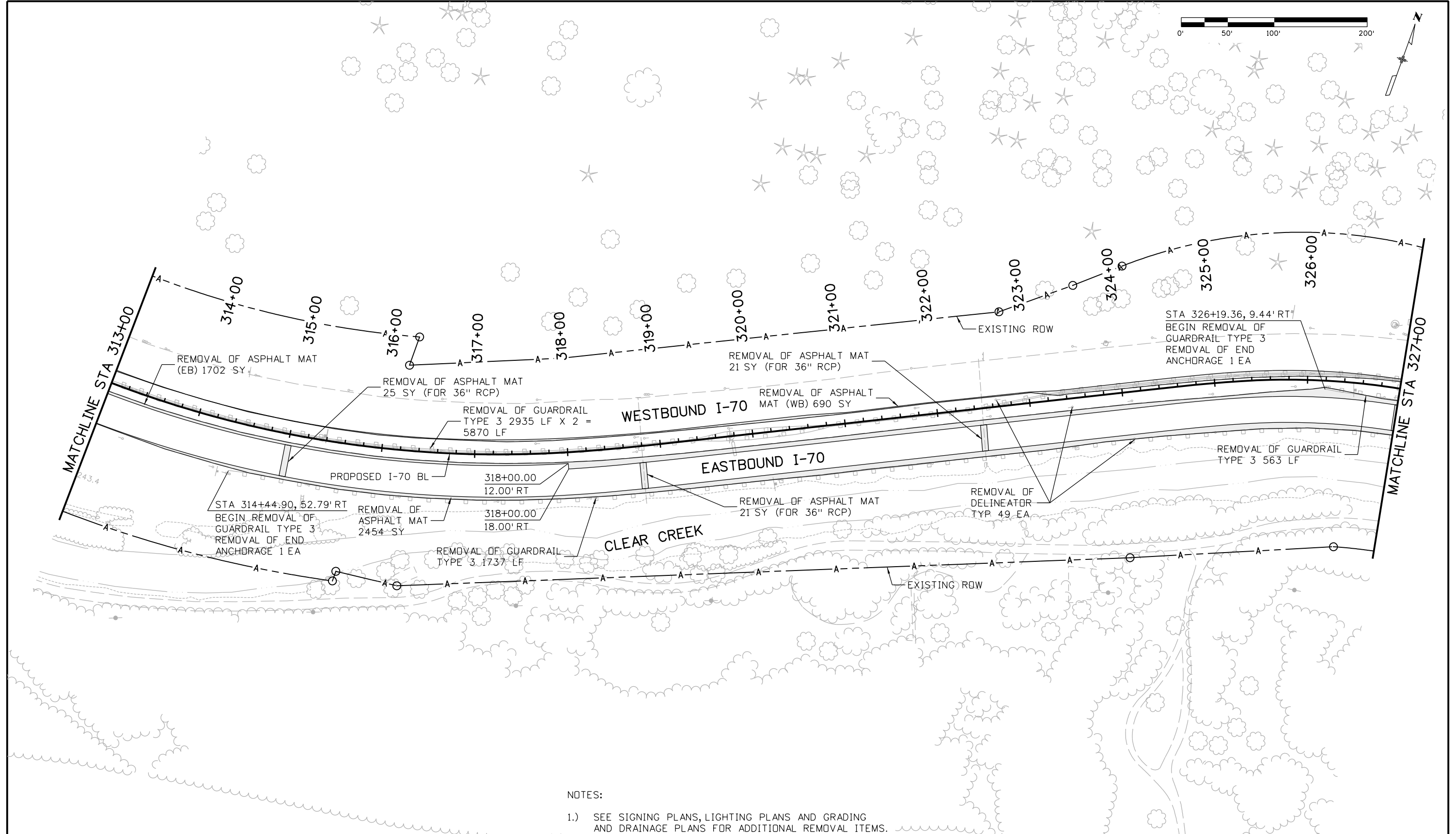
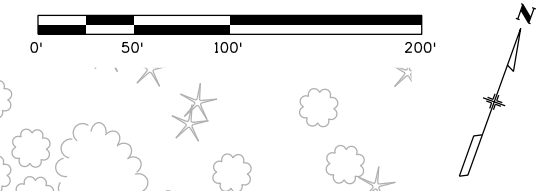
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NOTES:
 1.) SEE SIGNING PLANS, LIGHTING PLANS AND GRADING AND DRAINAGE PLANS FOR ADDITIONAL REMOVAL ITEMS.

Print Date: 3/8/2013		Sheet Revisions			Colorado Department of Transportation			As Constructed		EASTBOUND I-70 REMOVAL PLAN STA 300+00 TO 313+00			Project No./Code			
File Name: 18832DES_CP2_RMVPlan007.dgn		Date:	Comments	Init.	 425 A Corporate Circle Golden, CO 80401 Phone: 720-497-6918 FAX: 720-497-6901 Region 1 CRC			No Revisions:		Designer: E. Marsh Detailer: J. Gellner Subset: Removals			IM 0703-391			
Horiz. Scale: 1:100 Vert. Scale: NA								Revised:					Structure Numbers		19036	
ATKINS 4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276								Void:					Subset Sheets: 7 of 11		Sheet Number 56	

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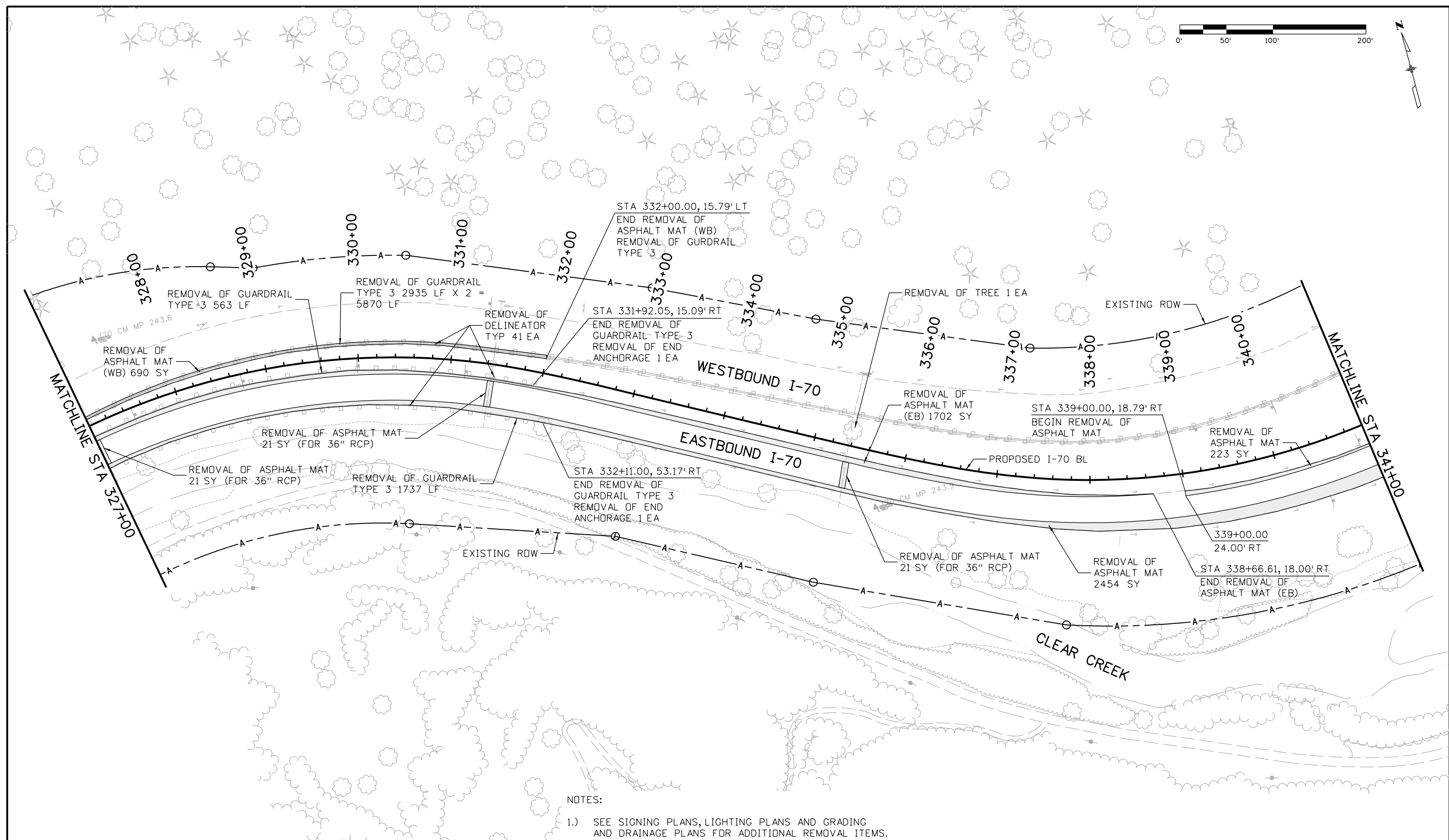
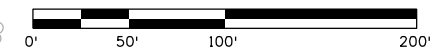


NOTES:

- 1.) SEE SIGNING PLANS, LIGHTING PLANS AND GRADING AND DRAINAGE PLANS FOR ADDITIONAL REMOVAL ITEMS.

Print Date: 3/8/2013		Sheet Revisions			Colorado Department of Transportation			As Constructed		EASTBOUND I-70 REMOVAL PLAN STA 313+00 TO 327+00			Project No./Code			
File Name: 18832DES_CP2_RMVPlan008.dgn		Date:	Comments	Init.	 425 A Corporate Circle Golden, CO 80401 Phone: 720-497-6918 FAX: 720-497-6901 Region 1			No Revisions:		Designer: E. Marsh Detailer: J. Gellner Subset: Removals			IM 0703-391			
Horiz. Scale: 1:100 Vert. Scale: NA								Revised:					Structure Numbers		19036	
ATKINS 4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276								Void:					Subset Sheets: 8 of 11		Sheet Number 57	

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NOTES:

- 1.) SEE SIGNING PLANS, LIGHTING PLANS AND GRADING AND DRAINAGE PLANS FOR ADDITIONAL REMOVAL ITEMS.

Print Date: 3/8/2013
 File Name: 18832DES_CP2_RMVPlan009.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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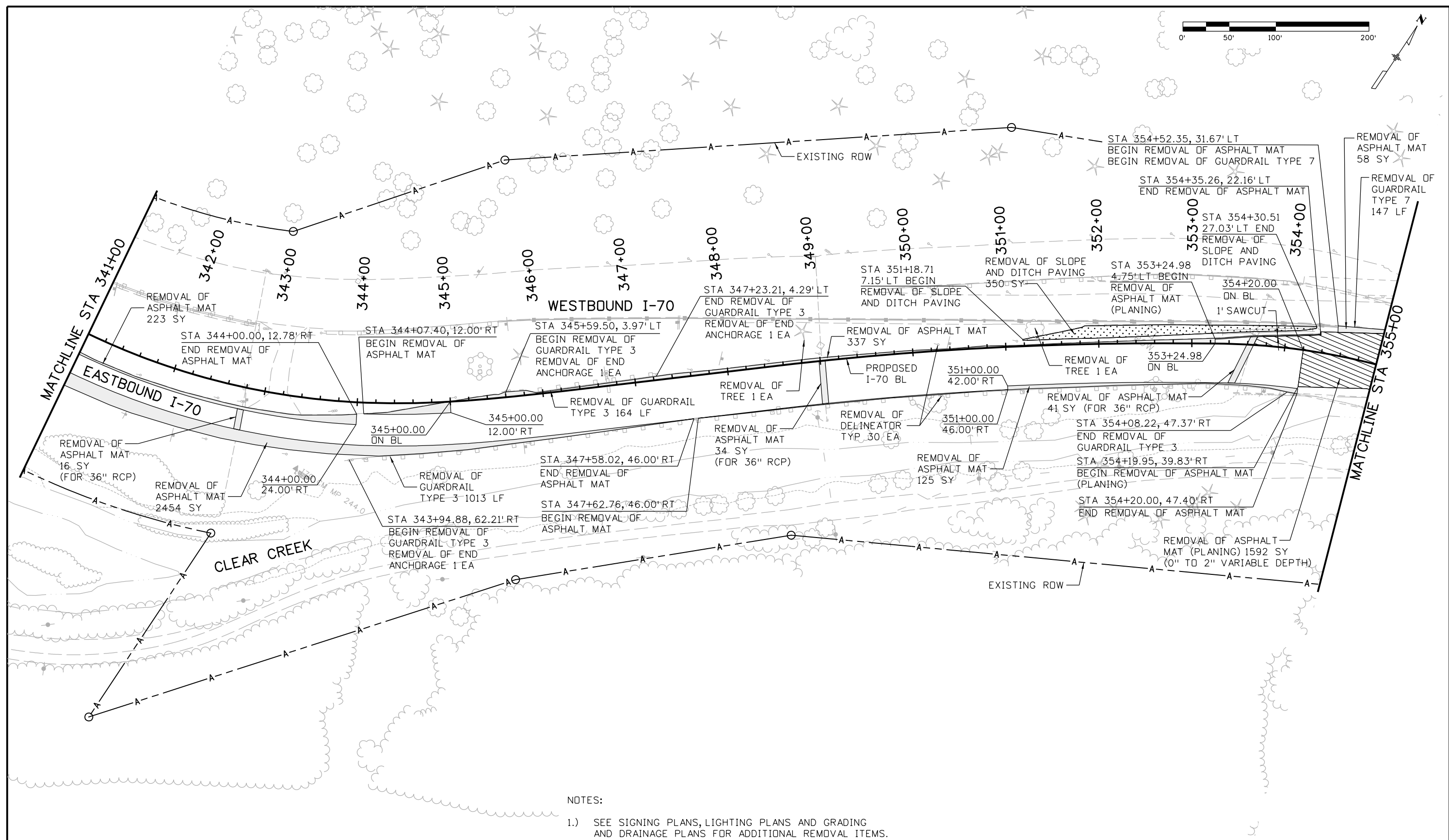
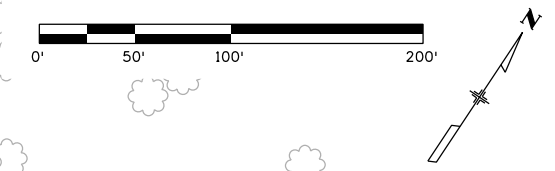
As Constructed
No Revisions:
Revised:
Void:

**EASTBOUND I-70
 REMOVAL PLAN
 STA 327+00 TO 341+00**

Designer:	E. Marsh	Structure Numbers	
Detailer:	J. Gellner	Subset Sheets:	9 of 11
Subset:	Removals		

Project No./Code
IM 0703-391
19036
Sheet Number 58

17543 12:27:24 PM c:\pw...work\pbl\pbl\common\dms26924\18832DES_CP2_RMVPlan009.dgn



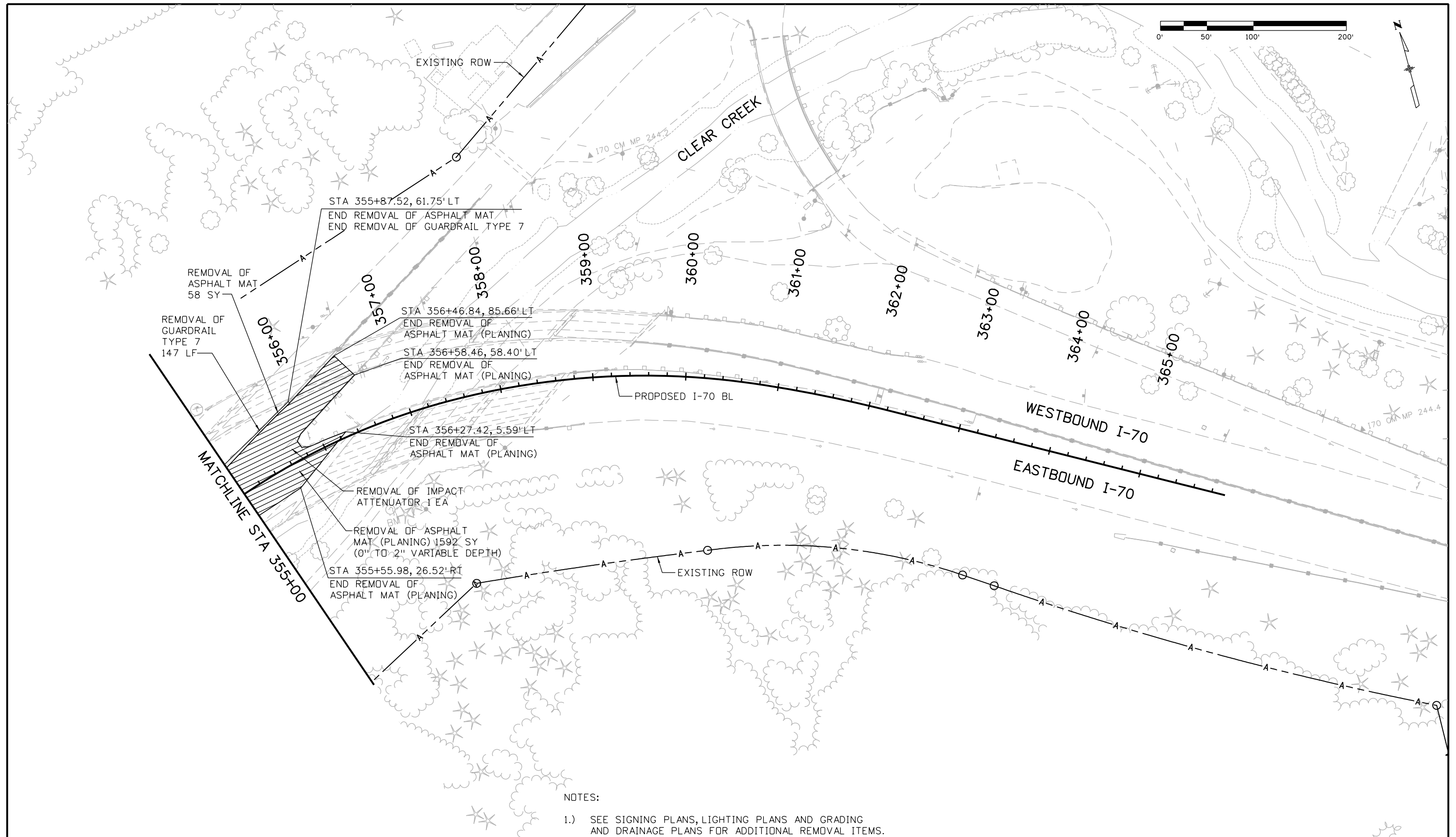
NOTES:

- 1.) SEE SIGNING PLANS, LIGHTING PLANS AND GRADING AND DRAINAGE PLANS FOR ADDITIONAL REMOVAL ITEMS.

Print Date: 3/8/2013		Sheet Revisions			Colorado Department of Transportation			As Constructed		EASTBOUND I-70 REMOVAL PLAN STA 341+00 TO 355+00			Project No./Code			
File Name: 18832DES_CP2_RMVPlan010.dgn		Date:	Comments	Init.	 425 A Corporate Circle Golden, CO 80401 Phone: 720-497-6918 FAX: 720-497-6901 Region 1			No Revisions:		Designer: E. Marsh Detailer: J. Gellner Subset: Removals			IM 0703-391			
Horiz. Scale: 1:100 Vert. Scale: NA								Revised:					Structure Numbers		19036	
ATKINS 4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276								Void:					Subset Sheets: 10 of 11		Sheet Number 59	

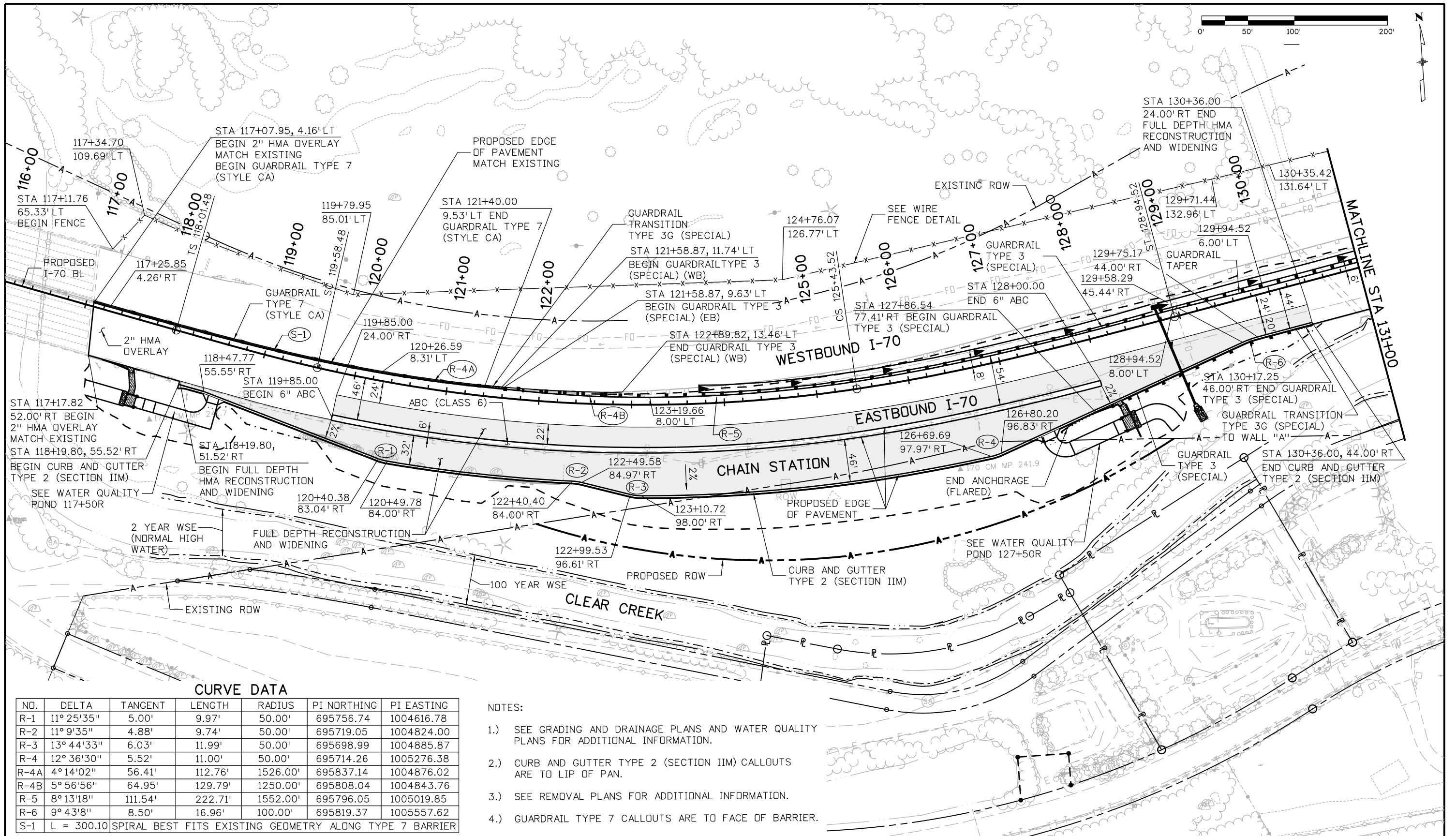
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17543 12:27:43 PM c:\pw...work\pbbjpw\1\18832DES_CP2_RMVPan011.dgn



NOTES:
 1.) SEE SIGNING PLANS, LIGHTING PLANS AND GRADING AND DRAINAGE PLANS FOR ADDITIONAL REMOVAL ITEMS.

Print Date: 3/8/2013		Sheet Revisions		Colorado Department of Transportation		As Constructed		EASTBOUND I-70 REMOVAL PLAN		Project No./Code	
File Name: 18832DES_CP2_RMVPan011.dgn		Date:	Comments	Init.	425 A Corporate Circle Golden, CO 80401 Phone: 720-497-6918 FAX: 720-497-6901		No Revisions:		STA 355+00 TO 365+96.69		IM 0703-391
Horiz. Scale: 1:100 Vert. Scale: NA							Revised:		Designer: E. Marsh	Structure Numbers	19036
 4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276					Region 1		Void:		Detailer: J. Gellner	Subset Sheets: 11 of 11	Sheet Number 60



CURVE DATA

NO.	DELTA	TANGENT	LENGTH	RADIUS	PI NORTHING	PI EASTING
R-1	11° 25' 35"	5.00'	9.97'	50.00'	695756.74	1004616.78
R-2	11° 9' 35"	4.88'	9.74'	50.00'	695719.05	1004824.00
R-3	13° 44' 33"	6.03'	11.99'	50.00'	695698.99	1004885.87
R-4	12° 36' 30"	5.52'	11.00'	50.00'	695714.26	1005276.38
R-4A	4° 14' 02"	56.41'	112.76'	1526.00'	695837.14	1004876.02
R-4B	5° 56' 56"	64.95'	129.79'	1250.00'	695808.04	1004843.76
R-5	8° 13' 18"	111.54'	222.71'	1552.00'	695796.05	1005019.85
R-6	9° 43' 8"	8.50'	16.96'	100.00'	695819.37	1005557.62
S-1	L = 300.10 SPIRAL BEST FITS EXISTING GEOMETRY ALONG TYPE 7 BARRIER					

NOTES:

- 1.) SEE GRADING AND DRAINAGE PLANS AND WATER QUALITY PLANS FOR ADDITIONAL INFORMATION.
- 2.) CURB AND GUTTER TYPE 2 (SECTION IIM) CALLOUTS ARE TO LIP OF PAN.
- 3.) SEE REMOVAL PLANS FOR ADDITIONAL INFORMATION.
- 4.) GUARDRAIL TYPE 7 CALLOUTS ARE TO FACE OF BARRIER.

Print Date: 3/9/2013
 File Name: 18832DES_CP2_Plan001.dgn
 Horiz. Scale: 1:100 Vert. Scale: NA

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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
 ROADWAY PLAN
 STA 116+00 TO 131+00**

Designer: E. Marsh
 Detailer: J. Gellner
 Subset: Roadway PNP

Structure Numbers
 Subset Sheets: 1 of 26

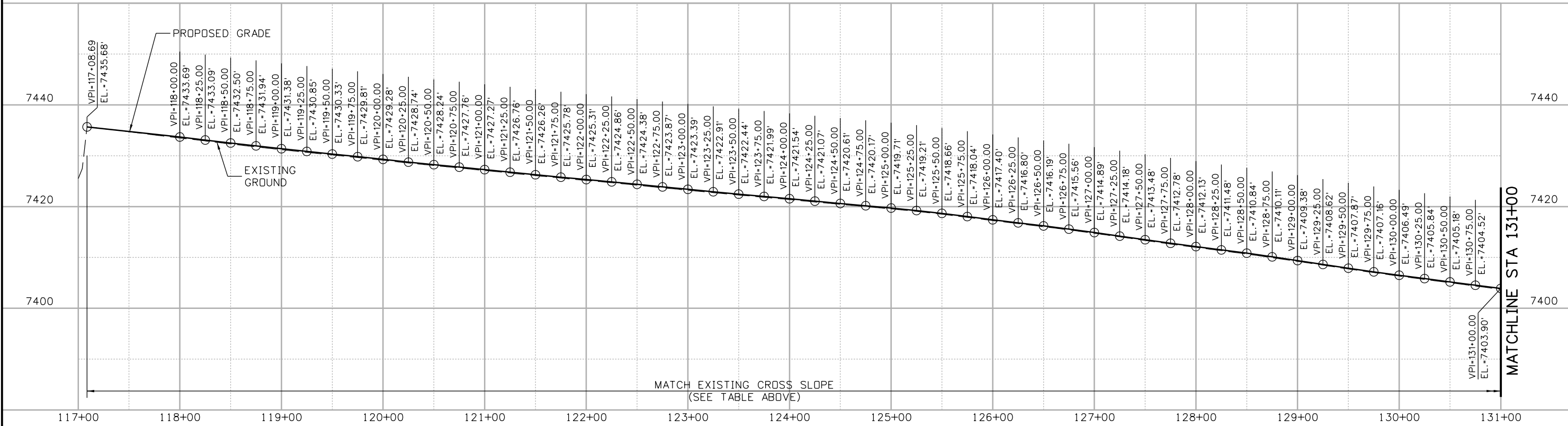
Project No./Code
IM 0703-391
19036
Sheet Number 61

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DESIGN INFORMATION			CONSTRUCTION INFORMATION			
(A)	(B)	(C)	(D)	(E)	(F)	
STATION	ELEV AT EXIST SHLDR STRIPE LT	ELEV AT EXIST SHLDR STRIPE RT	ELEV AT PROP LT EOP	ELEV AT PROP RT EOP	ROADWAY CROSS SLOPE	OFFSET AT PROP RT GRADE BREAK AT CHAIN STATION ENTRANCE/EXIT
117+25	7435.36	7435.28	7435.32	7435.30	-0.03%	
117+50	7434.75	7434.77	7434.77	7434.90	0.24%	
117+75	7434.14	7434.24	7434.21	7434.45	0.42%	
118+00	7433.56	7433.73	7433.65	7434.07	0.74%	
118+25	7432.98	7433.26	7433.03	7433.76	1.21%	
118+50	7432.41	7432.87	7432.39	7433.22*	1.97%	36.71
118+75	7431.86	7432.50	7431.78	7432.97*	2.71%	37.84
119+00	7431.31	7432.12	7431.16	7432.74*	3.46%	39.15
119+25	7430.77	7431.74	7430.56	7432.53*	4.13%	40.73
119+50	7430.24	7431.38	7429.97	7432.39*	4.83%	42.65
119+75	7429.71	7431.01	7429.39	7432.28*	5.48%	44.96
120+00	7429.17	7430.62	7428.79	7432.11	6.14%	
120+25	7428.61	7430.21	7428.18	7431.85	6.76%	
120+50	7428.11	7429.82	7427.62	7431.59	7.28%	
120+75	7427.62	7429.39	7427.10	7431.21	7.51%	
121+00	7427.12	7428.92	7426.57	7430.80	7.67%	
121+25	7426.61	7428.45	7426.03	7430.36	7.82%	
121+50	7426.11	7427.94	7425.51	7429.86	7.82%	
121+75	7425.62	7427.45	7425.03	7429.37	7.80%	
122+00	7425.16	7426.97	7424.61	7428.86	7.72%	
122+25	7424.71	7426.53	7424.19	7428.42	7.74%	
122+50	7424.25	7426.05	7423.74	7427.92	7.70%	
122+75	7423.75	7425.57	7423.23	7427.45	7.79%	
123+00	7423.28	7425.09	7422.77	7426.97	7.77%	
123+25	7422.78	7424.60	7422.29	7426.50	7.79%	
123+50	7422.29	7424.09	7421.82	7426.01	7.76%	
123+75	7421.80	7423.61	7421.37	7425.55	7.74%	

DESIGN INFORMATION			CONSTRUCTION INFORMATION			
(A)	(B)	(C)	(D)	(E)	(F)	
STATION	ELEV AT EXIST SHLDR STRIPE LT	ELEV AT EXIST SHLDR STRIPE RT	ELEV AT PROP LT EOP	ELEV AT PROP RT EOP	ROADWAY CROSS SLOPE	OFFSET AT PROP RT GRADE BREAK AT CHAIN STATION ENTRANCE/EXIT
124+00	7421.30	7423.07	7420.94	7425.00	7.51%	
124+25	7420.80	7422.54	7420.48	7424.48	7.42%	
124+50	7420.30	7422.02	7420.02	7423.99	7.35%	
124+75	7419.83	7421.46	7419.61	7423.37	6.97%	
125+00	7419.36	7420.85	7419.19	7422.66	6.42%	
125+25	7418.85	7420.25	7418.73	7421.97	5.99%	
125+50	7418.28	7419.59	7418.21	7421.26	5.64%	
125+75	7417.65	7418.90	7417.61	7420.51	5.37%	
126+00	7417.01	7418.18	7417.00	7419.71	5.03%	
126+25	7416.42	7417.44	7416.45	7418.81	4.38%	
126+50	7415.84	7416.70	7415.90	7417.87	3.65%	
126+75	7415.24	7415.93	7415.33	7416.90	2.91%	
127+00	7414.59	7415.15	7414.70	7415.98	2.37%	
127+25	7413.90	7414.37	7414.02	7415.09	1.98%	
127+50	7413.22	7413.59	7413.35	7414.21	1.59%	
127+75	7412.53	7412.85	7412.67	7413.40	1.34%	
128+00	7411.92	7412.08	7412.07	7412.44	0.68%	
128+25	7411.31	7411.31	7411.48	7411.48*	0.00%	43.55
128+50	7410.71	7410.54	7410.90	7410.54*	-0.72%	41.19
128+75	7410.01	7409.73	7410.21	7409.65*	-1.20%	38.89
129+00	7409.31	7408.86	7409.53	7408.69*	-1.89%	36.61
129+25	7408.56	7408.05	7408.77	7407.85*	-2.14%	36.00
129+50	7407.80	7407.32	7408.01	7406.93	-2.01%	
129+75	7407.08	7406.61	7407.29	7406.30	-1.96%	
130+00	7406.40	7405.97	7406.60	7405.69	-1.83%	
130+25	7405.75	7405.32	7405.94	7405.06	-1.76%	
130+50	7405.09	7404.65	7405.29	7404.35	-1.81%	
130+75	7404.43	7404.02	7404.63	7403.74	-1.70%	
131+00	7403.80	7403.41	7404.00	7403.16	-1.62%	

* ELEVATIONS ARE LOCATED AT PROP GRADE BREAK RT AT CHAIN STATION ENTRANCE/EXIT



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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**

As Constructed
 No Revisions:
 Revised:
 Void:

**EASTBOUND I-70
 ROADWAY PROFILE
 STA 117+00 TO 131+00**

Designer: E. Marsh
 Detailer: J. Gellner
 Subset: Roadway PNP

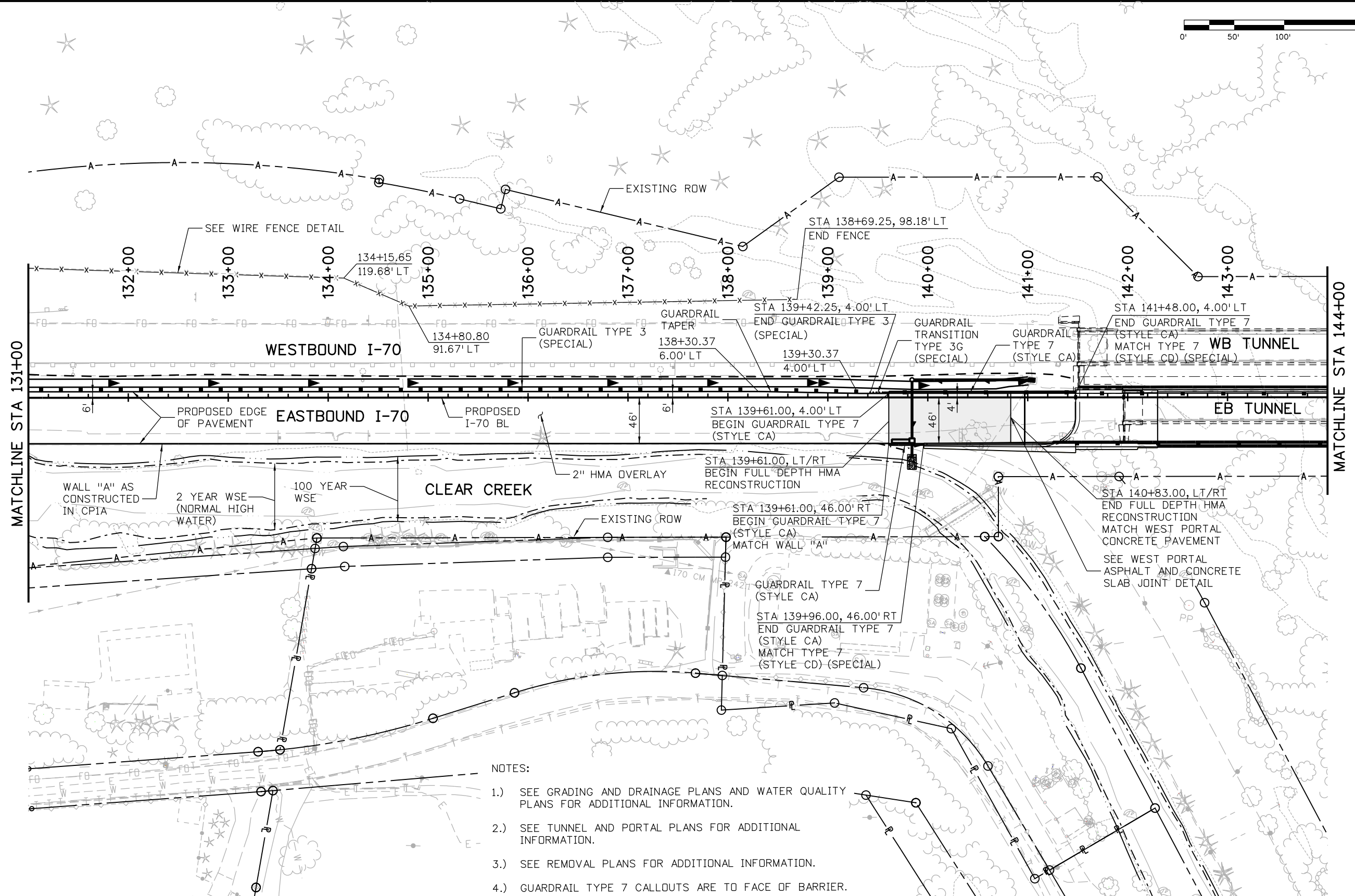
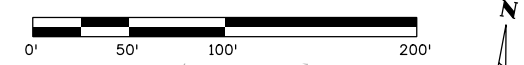
Structure Numbers
 Subset Sheets: 2 of 26

Project No./Code
 IM 0703-391

19036

Sheet Number **62**

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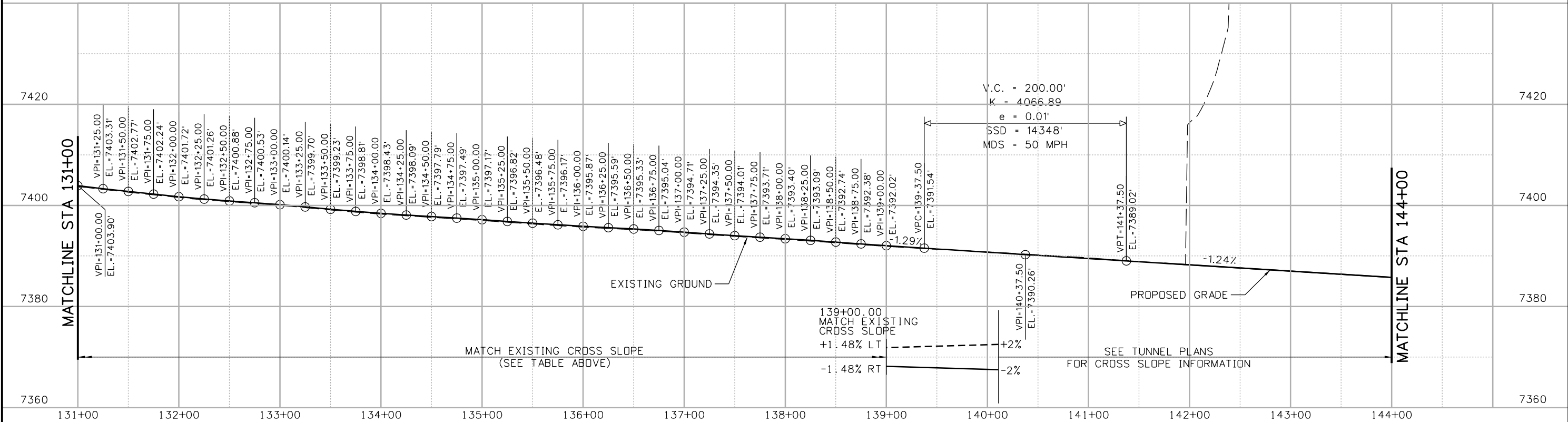
- NOTES:
- 1.) SEE GRADING AND DRAINAGE PLANS AND WATER QUALITY PLANS FOR ADDITIONAL INFORMATION.
 - 2.) SEE TUNNEL AND PORTAL PLANS FOR ADDITIONAL INFORMATION.
 - 3.) SEE REMOVAL PLANS FOR ADDITIONAL INFORMATION.
 - 4.) GUARDRAIL TYPE 7 CALLOUTS ARE TO FACE OF BARRIER.

Print Date: 3/9/2013		Sheet Revisions			Colorado Department of Transportation				As Constructed		EASTBOUND I-70 ROADWAY PLAN STA 131+00 TO 144+00		Project No./Code			
File Name: 18832DES_CP2_Plan002.dgn		Date:	Comments:	Init.	 425 A Corporate Circle Golden, CO 80401 Phone: 720-497-6918 FAX: 720-497-6901				No Revisions:		Designer: E. Marsh		IM 0703-391			
Horiz. Scale: 1:100 Vert. Scale: NA									Revised:		Detailer: J. Gellner		Structure Numbers		19036	
 4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276					Region 1				Void:		Subset: Roadway PNP		Subset Sheets: 3 of 26		Sheet Number 63	
					CRC											

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DESIGN INFORMATION			CONSTRUCTION INFORMATION		
STATION	(A) ELEV AT EXIST SHLDR STRIPE LT	(B) ELEV AT EXIST SHLDR STRIPE RT	(C) ELEV AT PROP LT EOP	(D) ELEV AT PROP RT EOP	(E) ROADWAY CROSS SLOPE
131+25	7403.21	7402.81	7403.41	7402.55	-1.64%
131+50	7402.68	7402.21	7402.88	7401.88	-1.93%
131+75	7402.16	7401.66	7402.36	7401.28	-2.07%
132+00	7401.63	7401.17	7401.83	7400.84	-1.92%
132+25	7401.16	7400.72	7401.37	7400.41	-1.85%
132+50	7400.79	7400.34	7400.99	7400.02	-1.86%
132+75	7400.42	7400.07	7400.61	7399.86	-1.45%
133+00	7400.03	7399.69	7400.23	7399.49	-1.42%
133+25	7399.58	7399.30	7399.77	7399.17	-1.15%
133+50	7399.10	7398.90	7399.28	7398.85	-0.83%
133+75	7398.67	7398.51	7398.85	7398.49	-0.69%
134+00	7398.29	7398.12	7398.47	7398.11	-0.70%
134+25	7397.97	7397.73	7398.15	7397.64	-0.98%
134+50	7397.67	7397.41	7397.86	7397.30	-1.07%
134+75	7397.37	7397.07	7397.56	7396.92	-1.23%
135+00	7397.05	7396.75	7397.24	7396.59	-1.24%

DESIGN INFORMATION			CONSTRUCTION INFORMATION		
STATION	(A) ELEV AT EXIST SHLDR STRIPE LT	(B) ELEV AT EXIST SHLDR STRIPE RT	(C) ELEV AT PROP LT EOP	(D) ELEV AT PROP RT EOP	(E) ROADWAY CROSS SLOPE
135+25	7396.70	7396.44	7396.89	7396.32	-1.10%
135+50	7396.36	7396.11	7396.55	7396.00	-1.06%
135+75	7396.05	7395.76	7396.24	7395.62	-1.19%
136+00	7395.75	7395.44	7395.94	7395.27	-1.29%
136+25	7395.48	7395.18	7395.67	7395.03	-1.23%
136+50	7395.22	7394.91	7395.41	7394.74	-1.30%
136+75	7394.93	7394.62	7395.12	7394.45	-1.29%
137+00	7394.59	7394.28	7394.78	7394.12	-1.28%
137+25	7394.24	7393.95	7394.43	7393.80	-1.20%
137+50	7393.89	7393.60	7394.09	7393.45	-1.22%
137+75	7393.60	7393.25	7393.80	7393.03	-1.47%
138+00	7393.29	7392.95	7393.49	7392.76	-1.40%
138+25	7392.98	7392.62	7393.17	7392.41	-1.47%
138+50	7392.64	7392.26	7392.83	7392.01	-1.59%
138+75	7392.28	7391.88	7392.46	7391.61	-1.66%
139+00	7391.92	7391.56	7392.09	7391.34	-1.48%
139+25	7391.63	7391.27	7391.77	7390.96	-1.60%
139+50	7391.37	7390.97	7391.45	7390.59	-1.72%
139+75	7391.15	7390.71	7391.17	7390.18	-1.83%
140+00	7390.88	7390.46	7390.86	7389.82	-1.95%
140+25	7390.57	7390.21	7390.55	7389.48	-2.00%
140+50	7390.27	7389.97	7390.23	7389.16	-2.00%
140+75	7389.97	7389.65	7389.92	7388.85	-2.00%
140+97	7389.51	7389.03	7389.64	7388.57	-2.00%



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 Region 1 CRC

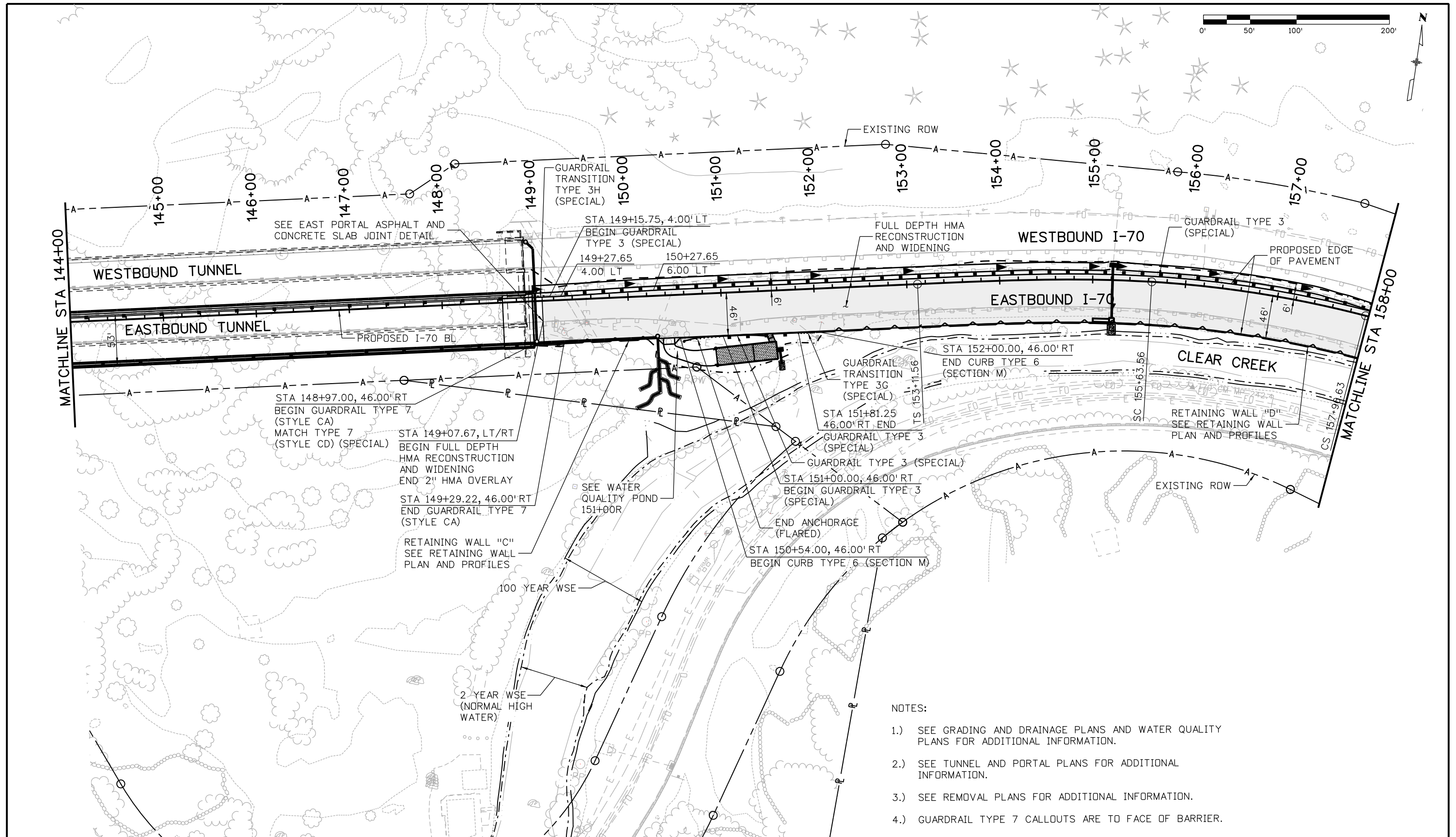
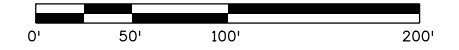
As Constructed
 No Revisions:
 Revised:
 Void:

**EASTBOUND I-70
ROADWAY PROFILE
STA 131+00 TO 144+00**


Designer: E. Marsh
 Detailer: J. Gellner
 Subset: Roadway PNP

Structure Numbers
 Subset Sheets: 4 of 26

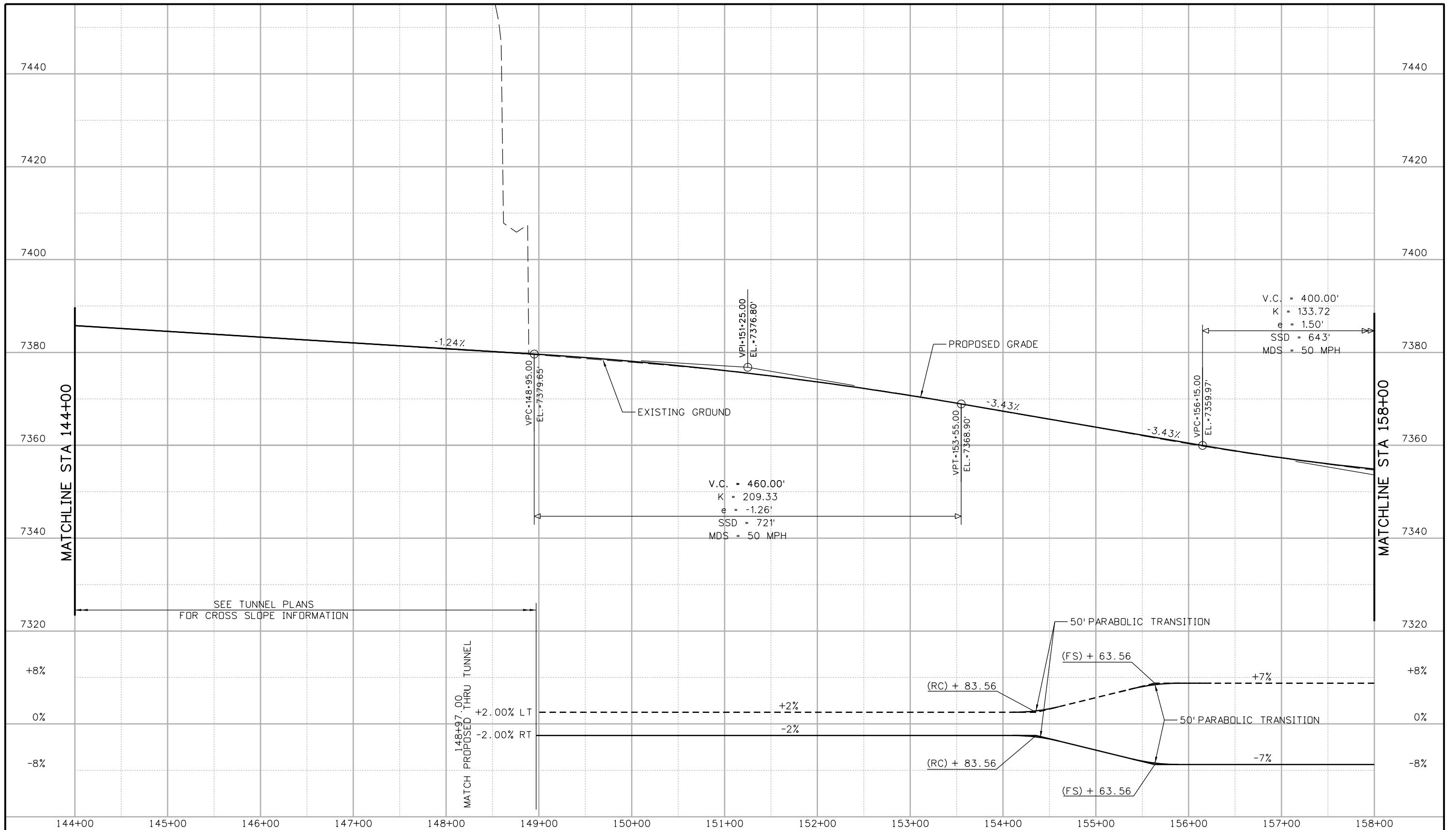
Project No./Code
 IM 0703-391
 19036
 Sheet Number 64



- NOTES:
- 1.) SEE GRADING AND DRAINAGE PLANS AND WATER QUALITY PLANS FOR ADDITIONAL INFORMATION.
 - 2.) SEE TUNNEL AND PORTAL PLANS FOR ADDITIONAL INFORMATION.
 - 3.) SEE REMOVAL PLANS FOR ADDITIONAL INFORMATION.
 - 4.) GUARDRAIL TYPE 7 CALLOUTS ARE TO FACE OF BARRIER.

Print Date: 3/9/2013		Sheet Revisions		Colorado Department of Transportation		As Constructed		EASTBOUND I-70 ROADWAY PLAN STA 144+00 TO 158+00		Project No./Code		
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Horiz. Scale: 1:100 Vert. Scale: NA							Revised:				Structure Numbers	
 4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276				Region 1		CRC		Subset Sheets: 5 of 26		Sheet Number 65		

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 Phone: (303) 221-7275 Fax: (303) 221-7276

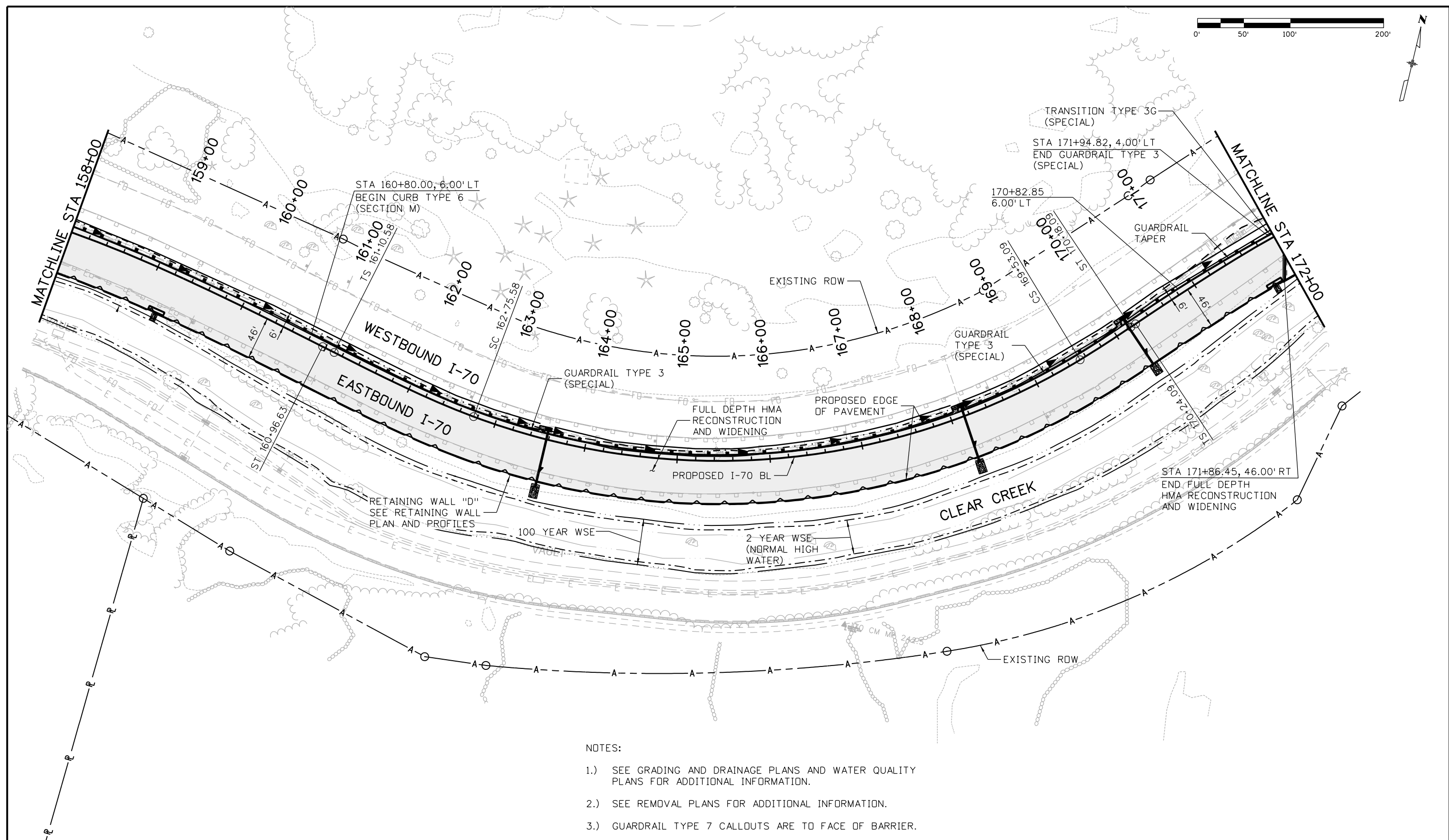
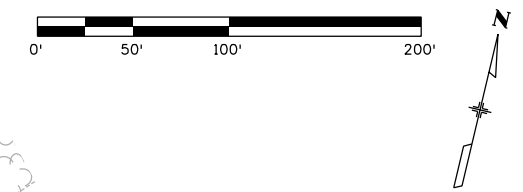
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Date:	Comments	Init.

Colorado Department of Transportation
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Region 1 **CRC**

As Constructed
 No Revisions:
 Revised:
 Void:

**EASTBOUND I-70
 ROADWAY PROFILE
 STA 144+00 TO 158+00**
 Designer: E. Marsh
 Detailer: J. Gellner
 Subset: Roadway PNP
 Structure Numbers
 Subset Sheets: 6 of 26

Project No./Code
 IM 0703-391
 19036
 Sheet Number **66**



NOTES:

- 1.) SEE GRADING AND DRAINAGE PLANS AND WATER QUALITY PLANS FOR ADDITIONAL INFORMATION.
- 2.) SEE REMOVAL PLANS FOR ADDITIONAL INFORMATION.
- 3.) GUARDRAIL TYPE 7 CALLOUTS ARE TO FACE OF BARRIER.

Print Date: 3/8/2013
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Date:	Comments	Init.

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Region 1 **CRC**

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 No Revisions:
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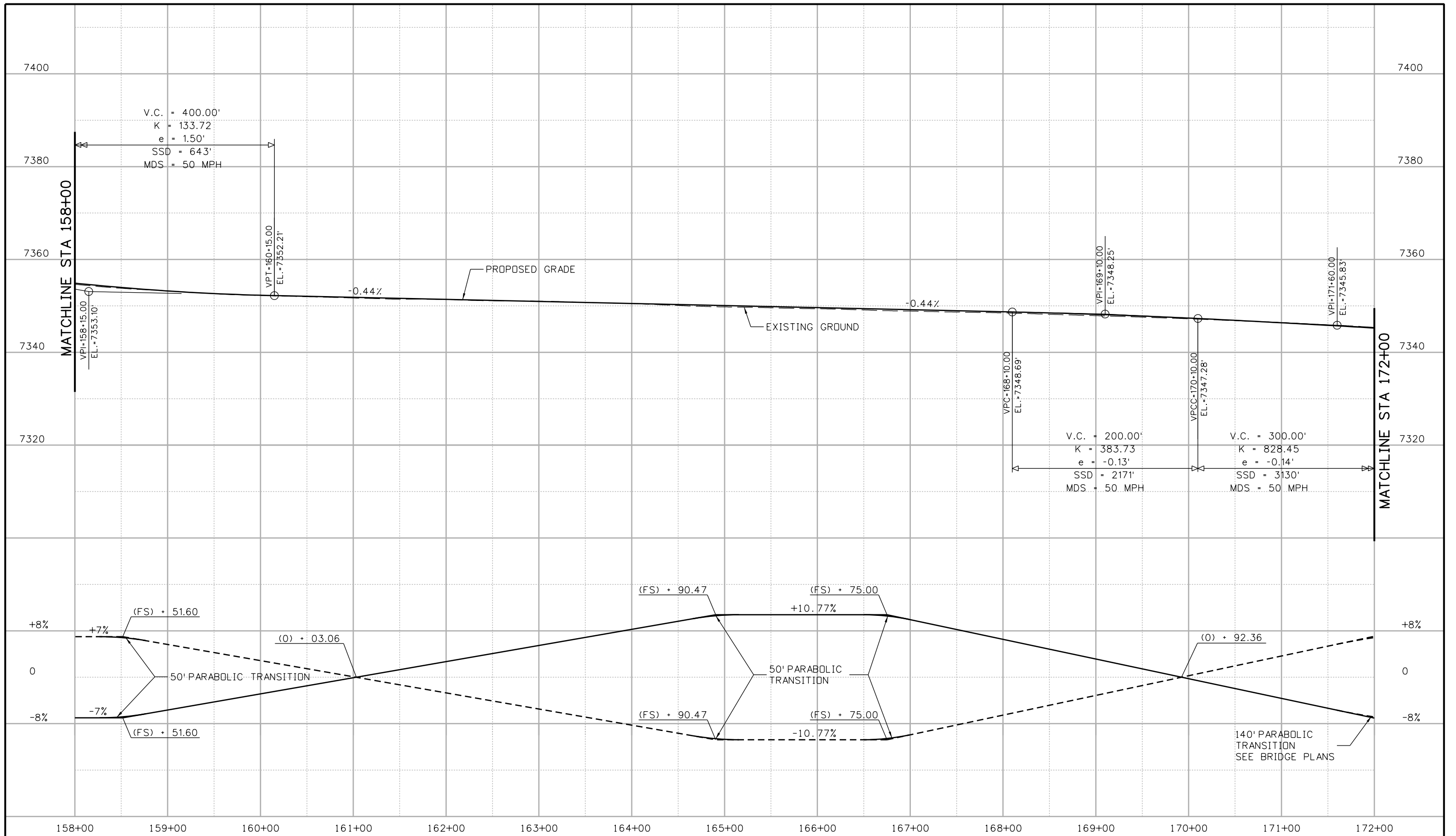
**EASTBOUND I-70
 ROADWAY PLAN
 STA 158+00 TO 172+00**

Designer: E. Marsh
 Detailer: J. Gellner
 Subset: Roadway PNP

Structure Numbers
 Subset Sheets: 7 of 26

Project No./Code
 IM 0703-391
 19036
 Sheet Number 67

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 Phone: 720-497-6918 FAX: 720-497-6901
Region 1 **CRC**

As Constructed
 No Revisions:
 Revised:
 Void:

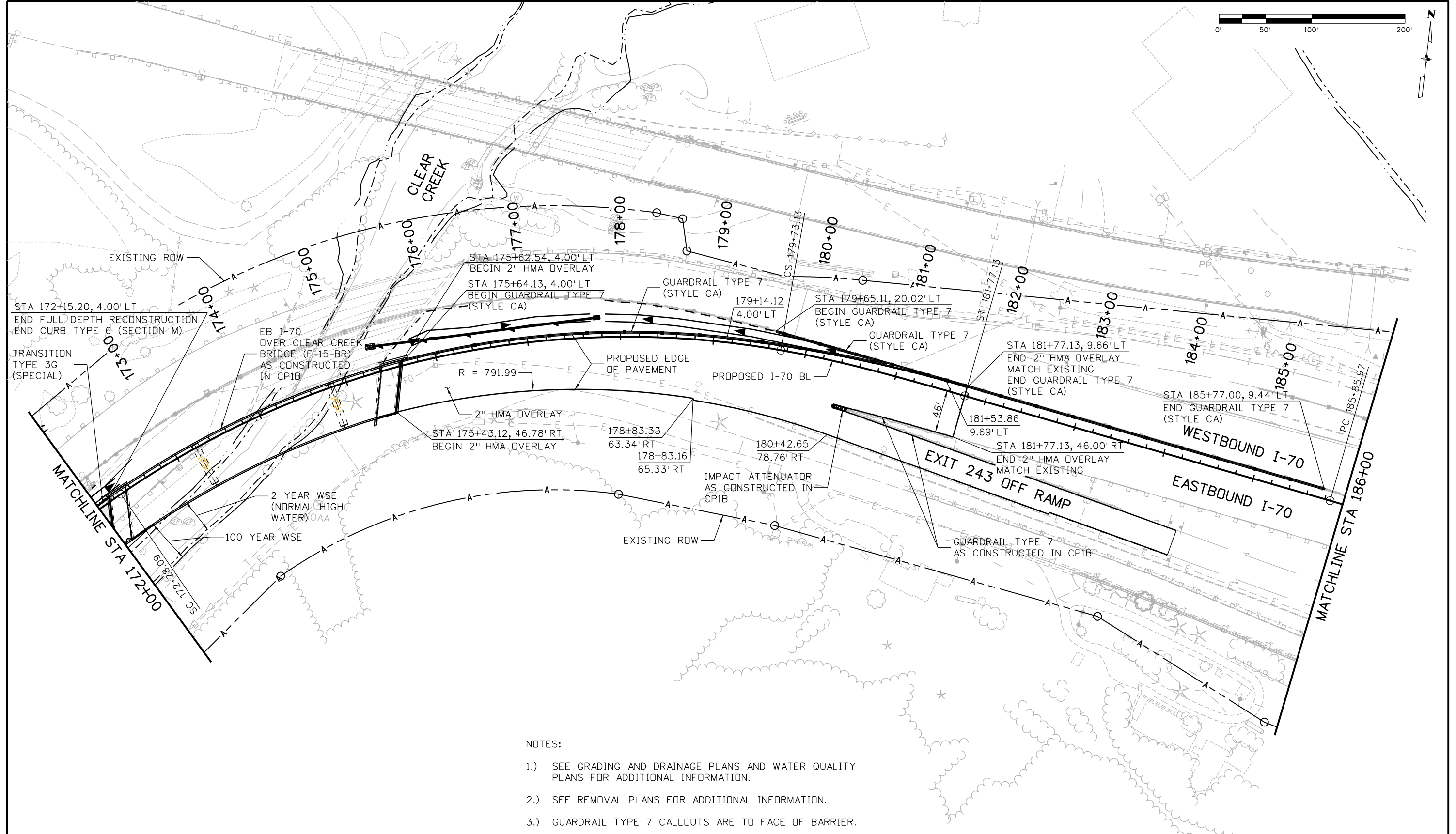
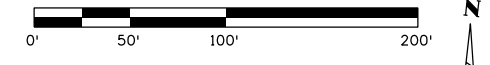
**EASTBOUND I-70
 ROADWAY PROFILE
 STA 158+00 TO 172+00**

Designer: E. Marsh
 Detailer: J. Gellner
 Subset: Roadway PNP

Structure Numbers
 Subset Sheets: 8 of 26

Project No./Code
 IM 0703-391
 19036
 Sheet Number **68**

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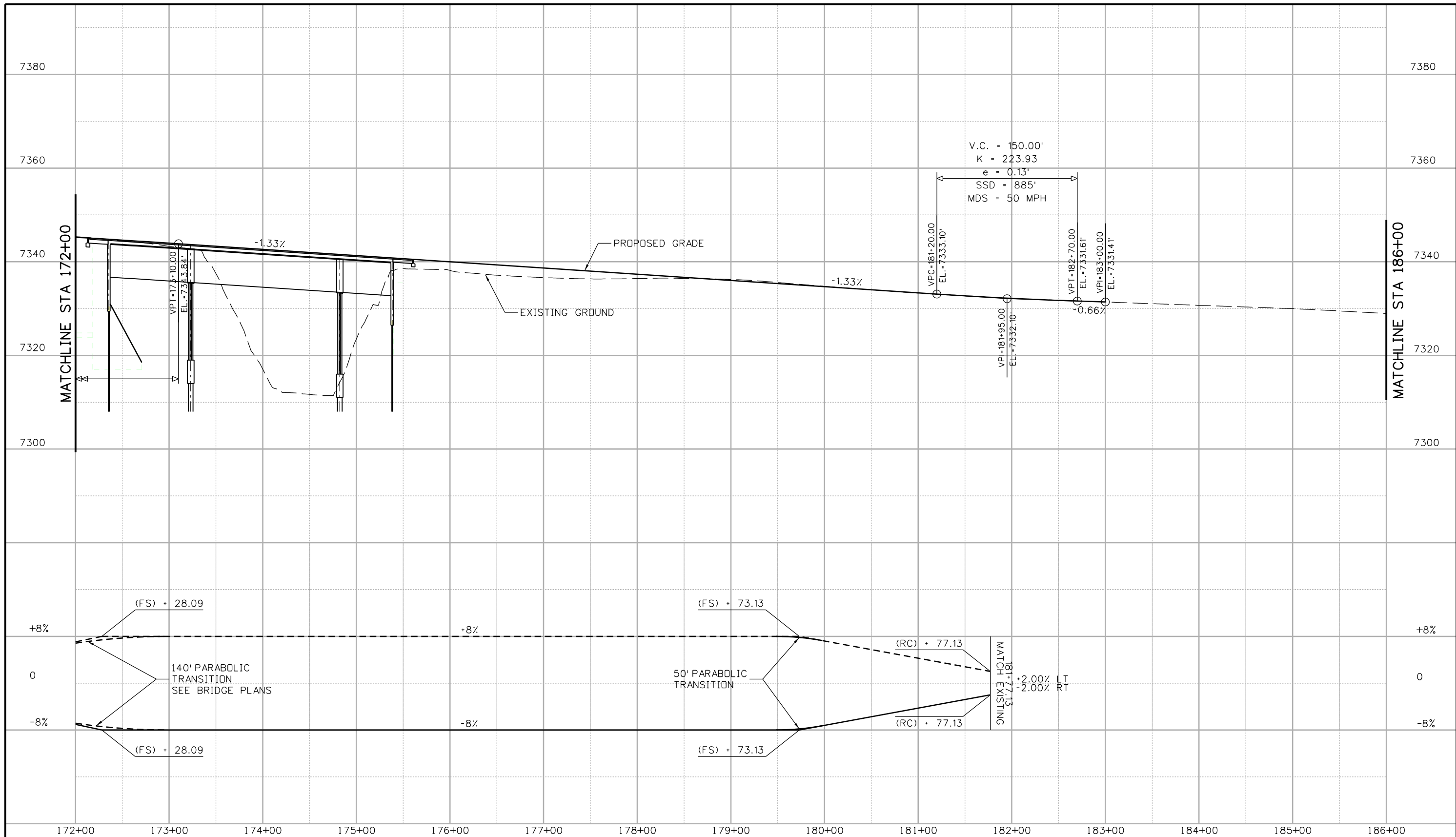


- NOTES:
- 1.) SEE GRADING AND DRAINAGE PLANS AND WATER QUALITY PLANS FOR ADDITIONAL INFORMATION.
 - 2.) SEE REMOVAL PLANS FOR ADDITIONAL INFORMATION.
 - 3.) GUARDRAIL TYPE 7 CALLOUTS ARE TO FACE OF BARRIER.

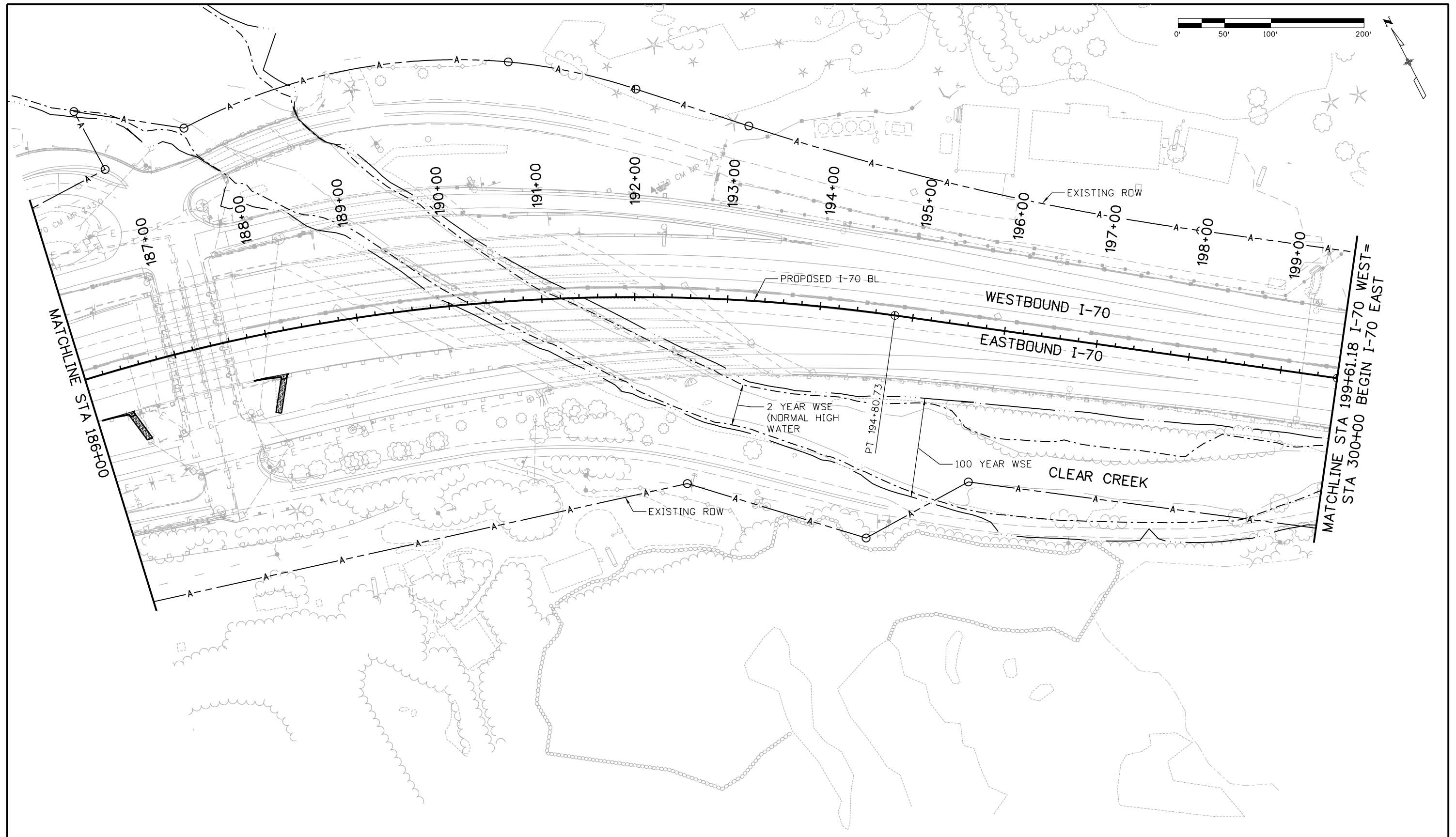
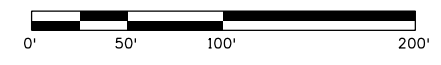
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File Name: 18832DES_CP2_Plan005.dgn	Date:	Comments:	Init.	 425 A Corporate Circle Golden, CO 80401 Phone: 720-497-6918 FAX: 720-497-6901		No Revisions:		Designer: E. Marsh Detailer: J. Gellner Subset: Roadway PNP		IM 0703-391	
Horiz. Scale: 1:100 Vert. Scale: NA						Revised:				Structure Numbers	
ATKINS 4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276				Region 1		CRC		Subset Sheets: 9 of 26		Sheet Number 69	

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17543 12:11:28 PM c:\pw_work\pbs\pw\common\dms26924\18832DES_CP2_Prof005.dgn



Print Date: 3/8/2013 File Name: 18832DES_CP2_Prof005.dgn Horiz. Scale: 1:100 Vert. Scale: 1"=20' ATKINS 4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276	Sheet Revisions <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> <tr><td> </td><td> </td><td> </td></tr> </tbody> </table>	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:	EASTBOUND I-70 ROADWAY PROFILE STA 172+00 TO 186+00 Designer: E. Marsh Detailer: J. Gellner Subset: Roadway PNP	Project No./Code IM 0703-391 19036 Sheet Number 70
Date:	Comments	Init.																		



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Print Date: 3/8/2013
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Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation

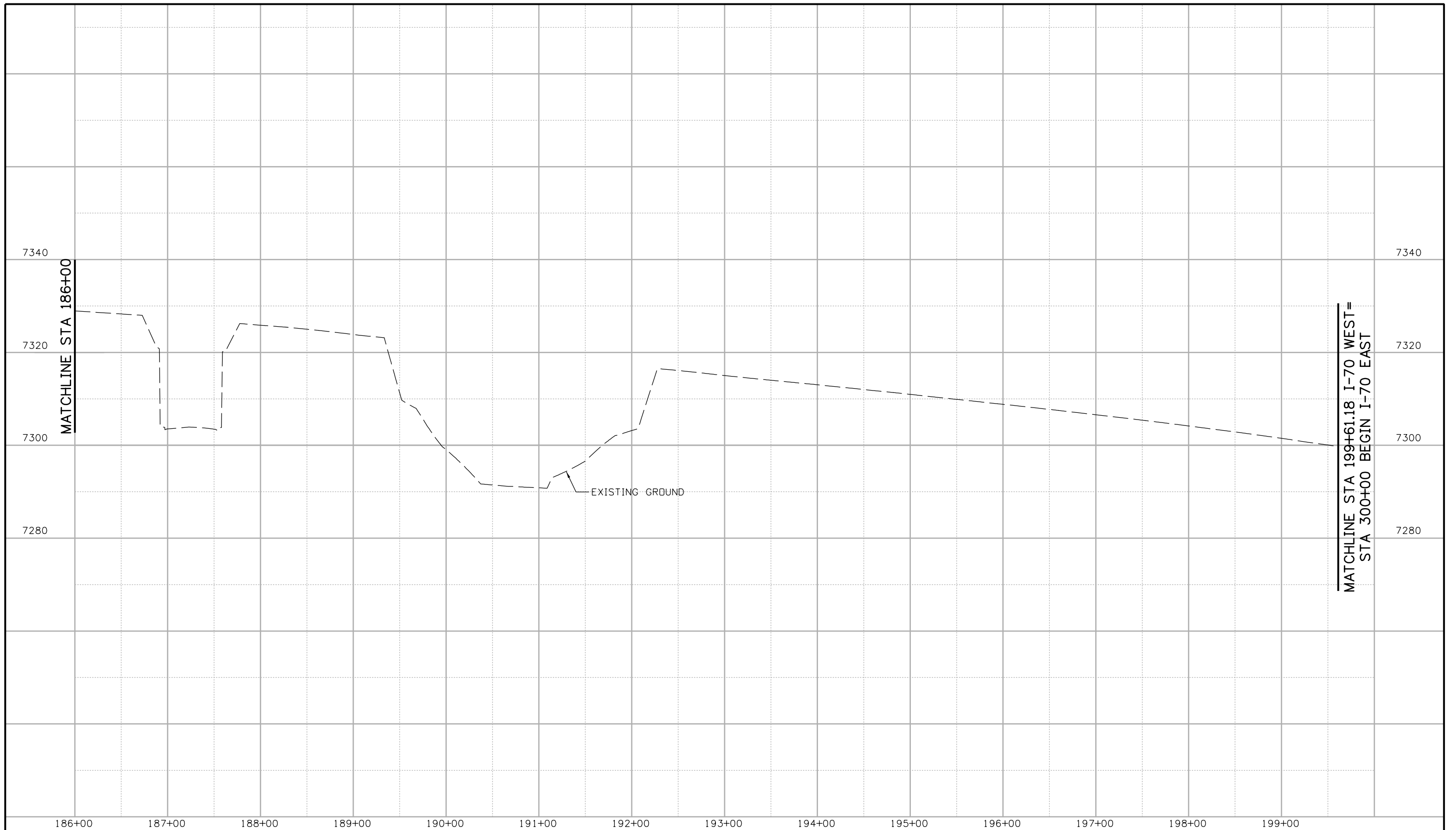
 425 A Corporate Circle
 Golden, CO 80401
 Phone: 720-497-6918 FAX: 720-497-6901
Region 1 **CRC**

As Constructed
 No Revisions:
 Revised:
 Void:

**EASTBOUND I-70
 ROADWAY PLAN
 STA 186+00 TO 199+61.18**
 Designer: E. Marsh
 Detailer: J. Gellner
 Subset: Roadway PNP
 Structure Numbers
 Subset Sheets: 11 of 26


Project No./Code
 IM 0703-391
 19036
 Sheet Number 71

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Print Date: 3/8/2013
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Sheet Revisions		
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**

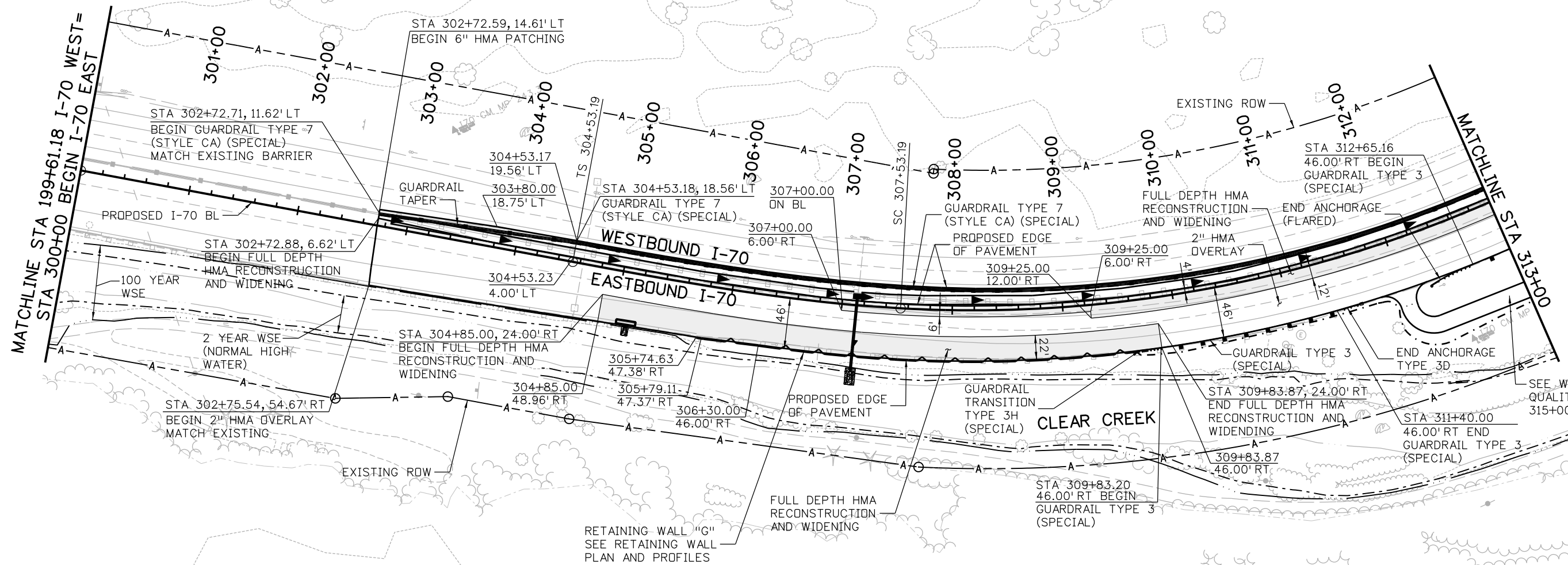
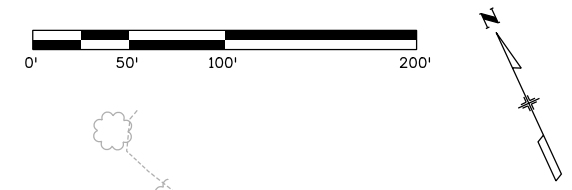
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**EASTBOUND I-70
 ROADWAY PROFILE
 STA 186+00 TO 199+61.18**

Designer: E. Marsh
 Detailer: J. Gellner
 Subset: Roadway PNP

Structure Numbers
 Subset Sheets: 12 of 26

Project No./Code
 IM 0703-391
 19036
 Sheet Number **72**



- NOTES:
- 1.) SEE GRADING AND DRAINAGE PLANS AND WATER QUALITY PLANS FOR ADDITIONAL INFORMATION.
 - 2.) SEE REMOVAL PLANS FOR ADDITIONAL INFORMATION.
 - 3.) GUARDRAIL TYPE 7 CALLOUTS ARE TO FACE OF BARRIER.

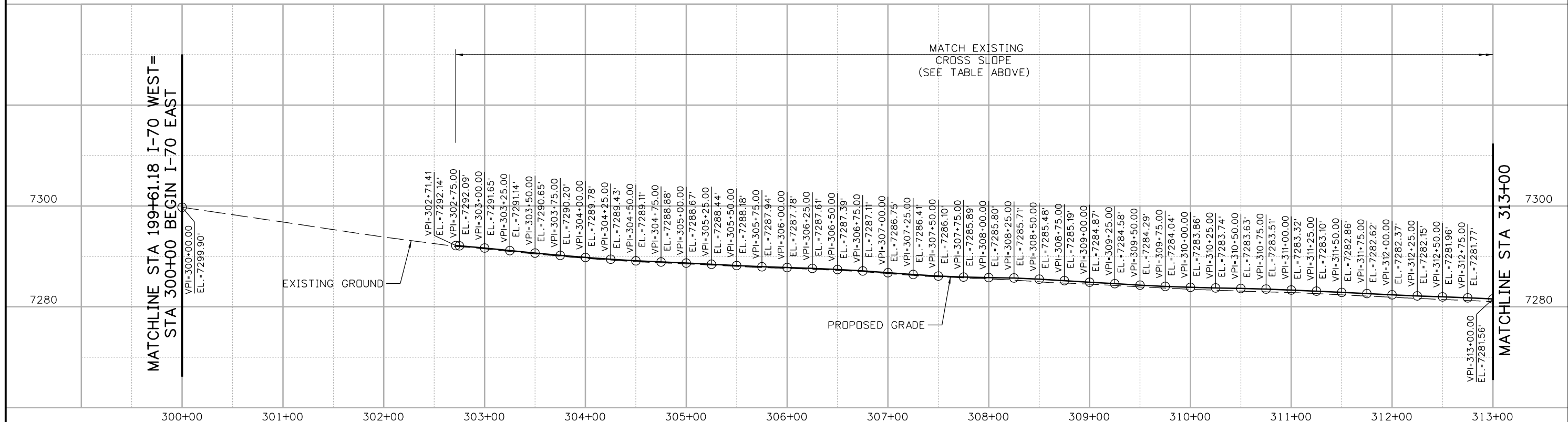
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Date:	Comments	Init.															

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DESIGN INFORMATION			CONSTRUCTION INFORMATION		
	(A)	(B)	(C)	(D)	(E)
STATION	SAWCUT ELEV	EXIST SHLDR STRIPE (RT) ELEV	ELEV AT PROP LT EOP	ELEV AT PROP RT EOP	ROADWAY CROSS SLOPE
303+00	7291.49	7290.74	7291.78	7290.50	-2.14%
303+25	7290.97	7290.25	7291.25	7289.98	-2.17%
303+50	7290.48	7289.76	7290.76	7289.47	-2.24%
303+75	7290.03	7289.30	7290.29	7288.98	-2.32%
304+00	7289.61	7288.92	7289.87	7288.61	-2.27%
304+25	7289.26	7288.59	7289.52	7288.27	-2.28%
304+50	7288.94	7288.30	7289.20	7288.00	-2.23%
304+75	7288.72	7288.02	7288.98	7287.66	-2.49%
305+00	7288.50	7287.82	7288.77	7287.45	-2.52%
305+25	7288.27	7287.78	7288.51	7287.55	-1.85%
305+50	7288.01	7287.78	7288.22	7287.75	-0.90%
305+75	7287.77	7287.77	7287.94	7287.93	-0.02%
306+00	7287.62	7287.67	7287.78	7287.88	0.20%
306+25	7287.44	7287.61	7287.58	7287.92	0.67%
306+50	7287.22	7287.55	7287.33	7288.01	1.35%
306+75	7286.94	7287.35	7287.04	7287.86	1.64%
307+00	7286.71	7287.14	7286.66	7287.77	2.21%
307+25	7286.41	7287.01	7286.28	7287.80	3.02%
307+50	7286.16	7286.94	7285.94	7287.86	3.84%
307+75	7285.98	7286.88	7285.72	7287.84	4.22%

DESIGN INFORMATION			CONSTRUCTION INFORMATION		
	(A)	(B)	(C)	(D)	(E)
STATION	SAWCUT ELEV	EXIST SHLDR STRIPE (RT) ELEV	ELEV AT PROP LT EOP	ELEV AT PROP RT EOP	ROADWAY CROSS SLOPE
308+00	7285.88	7286.81	7285.63	7287.71	4.17%
308+25	7285.79	7286.73	7285.55	7287.56	4.01%
308+50	7285.56	7286.61	7285.31	7287.43	4.25%
308+75	7285.29	7286.44	7285.01	7287.26	4.52%
309+00	7284.99	7286.23	7284.68	7287.05	4.73%
309+25	7284.72	7285.99	7284.39	7286.79	4.80%
309+50	7284.71	7285.76	7284.09	7286.55	4.93%
309+75	7284.46	7285.52	7283.85	7286.29	4.89%
310+00	7284.26	7285.29	7283.68	7286.02	4.68%
310+25	7284.09	7285.06	7283.57	7285.73	4.32%
310+50	7283.94	7284.83	7283.47	7285.43	3.91%
310+75	7283.77	7284.62	7283.37	7285.16	3.58%
311+00	7283.58	7284.43	7283.18	7284.95	3.55%
311+25	7283.37	7284.25	7282.95	7284.77	3.64%
311+50	7283.14	7284.07	7282.70	7284.61	3.81%
311+75	7282.92	7283.89	7282.46	7284.42	3.92%
312+00	7282.7	7283.71	7282.21	7284.25	4.07%
312+25	7282.49	7283.53	7281.99	7284.06	4.15%
312+50	7282.29	7283.34	7281.80	7283.87	4.15%
312+75	7282.1	7283.14	7281.60	7283.68	4.15%
313+00	7281.9	7282.95	7281.40	7283.48	4.16%



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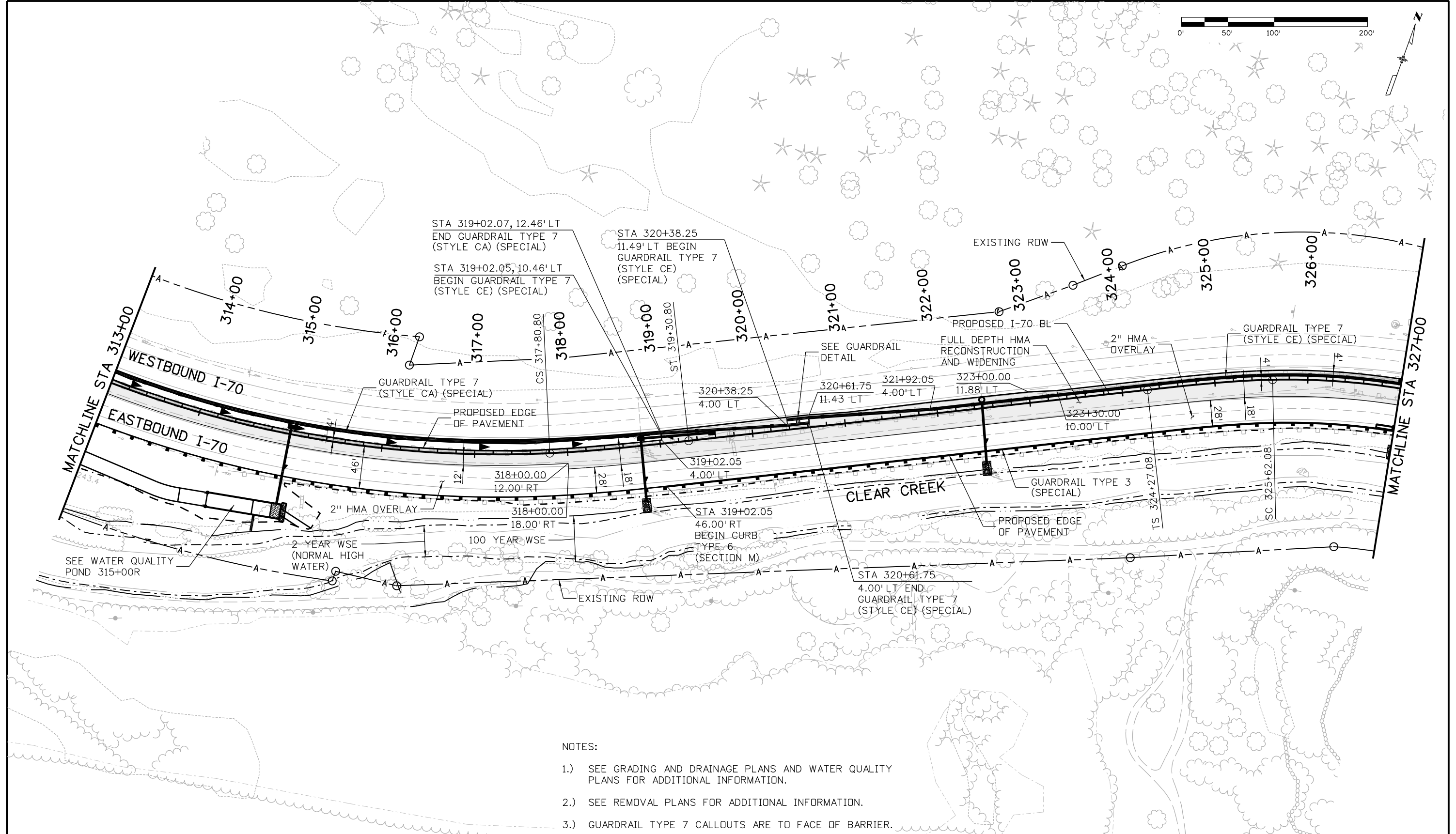
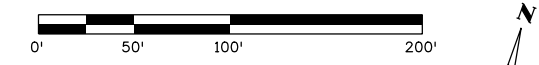
Sheet Revisions		
Date:	Comments	Init.

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 ROADWAY PROFILE STA 300+00 TO 313+00	
No Revisions:	Designer: E. Marsh	Structure Numbers
Revised:	Detailer: J. Gellner	Subset Sheets: 14 of 26
Void:	Subset: Roadway PNP	

Project No./Code
IM 0703-391
19036
Sheet Number 74



- NOTES:
- 1.) SEE GRADING AND DRAINAGE PLANS AND WATER QUALITY PLANS FOR ADDITIONAL INFORMATION.
 - 2.) SEE REMOVAL PLANS FOR ADDITIONAL INFORMATION.
 - 3.) GUARDRAIL TYPE 7 CALLOUTS ARE TO FACE OF BARRIER.

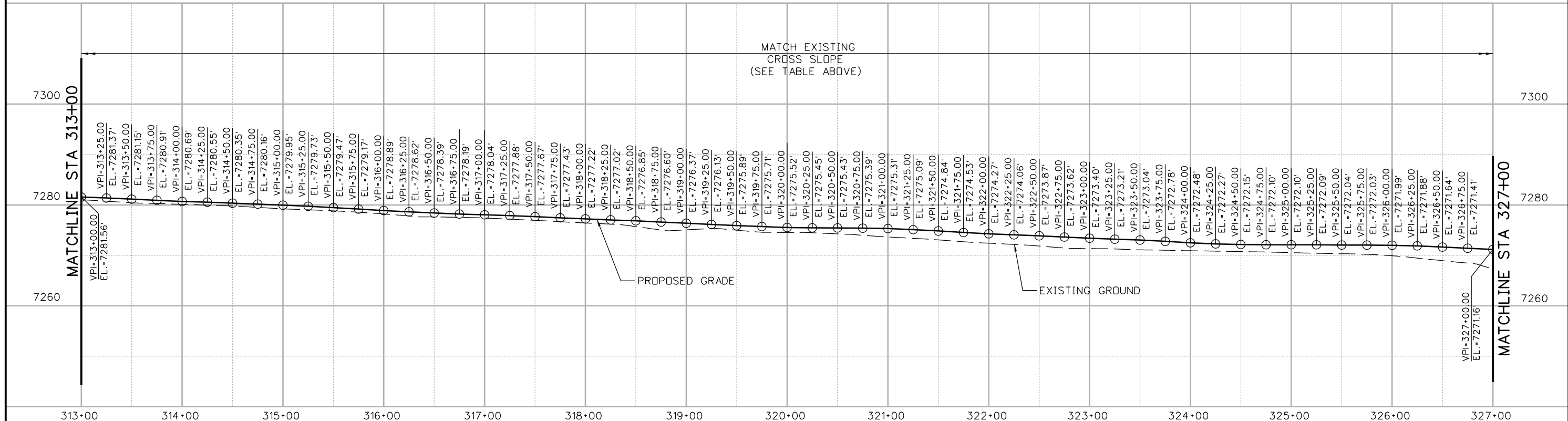
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File Name: 18832DES_CP2_Plan008.dgn		Date:	Comments	Init.	 425 A Corporate Circle Golden, CO 80401 Phone: 720-497-6918 FAX: 720-497-6901		No Revisions:		Designer: E. Marsh Detailer: J. Gellner Subset: Roadway PNP		IM 0703-391			
Horiz. Scale: 1:100 Vert. Scale: NA							Revised:				Structure Numbers		19036	
 4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276							Void:				Subset Sheets: 15 of 26		Sheet Number 75	
		 Region 1		 CRC										

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DESIGN INFORMATION			CONSTRUCTION INFORMATION		
	(A)	(B)	(C)	(D)	(E)
STATION	SAWCUT ELEV	EXIST SHLDR STRIPE (RT) ELEV	ELEV AT PROP LT EOP	ELEV AT PROP RT EOP	ROADWAY CROSS SLOPE
313+25	7281.7	7282.75	7281.21	7283.27	4.13%
313+50	7281.48	7282.54	7280.98	7283.06	4.16%
313+75	7281.25	7282.32	7280.74	7282.85	4.23%
314+00	7281.03	7282.11	7280.52	7282.64	4.24%
314+25	7280.87	7281.89	7280.39	7282.40	4.03%
314+50	7280.66	7281.66	7280.19	7282.18	3.97%
314+75	7280.46	7281.44	7280.00	7281.94	3.88%
315+00	7280.24	7281.21	7279.80	7281.72	3.84%
315+25	7280.02	7280.98	7279.58	7281.49	3.83%
315+50	7279.78	7280.76	7279.31	7281.28	3.95%
315+75	7279.51	7280.54	7279.01	7281.10	4.18%
316+00	7279.25	7280.33	7278.71	7280.91	4.39%
316+25	7279	7280.13	7278.44	7280.73	4.57%
316+50	7278.78	7279.93	7278.20	7280.53	4.65%
316+75	7278.57	7279.72	7278.00	7280.30	4.59%
317+00	7278.39	7279.48	7277.87	7280.01	4.30%
317+25	7278.19	7279.2	7277.72	7279.69	3.94%
317+50	7277.94	7278.88	7277.53	7279.33	3.59%
317+75	7277.66	7278.52	7277.30	7278.93	3.25%
318+00	7277.39	7278.15	7277.11	7278.50	2.78%
318+25	7277.25	7277.71	7276.94	7278.02	2.16%
318+50	7276.95	7277.27	7276.79	7277.52	1.45%

DESIGN INFORMATION			CONSTRUCTION INFORMATION		
	(A)	(B)	(C)	(D)	(E)
STATION	SAWCUT ELEV	EXIST SHLDR STRIPE (RT) ELEV	ELEV AT PROP LT EOP	ELEV AT PROP RT EOP	ROADWAY CROSS SLOPE
318+75	7276.62	7276.85	7276.56	7277.06	1.00%
319+00	7276.31	7276.43	7276.34	7276.62	0.54%
319+25	7276.02	7276.08	7276.09	7276.26	0.29%
319+50	7275.74	7275.76	7275.88	7275.93	0.09%
319+75	7275.52	7275.48	7275.73	7275.64	-0.17%
320+00	7275.32	7275.26	7275.54	7275.41	-0.23%
320+25	7275.17	7275.03	7275.49	7275.17	-0.61%
320+50	7275.06	7274.79	7275.48	7274.92	-1.12%
320+75	7274.94	7274.56	7275.53	7274.67	-1.57%
321+00	7274.79	7274.33	7275.46	7274.42	-1.93%
321+25	7274.59	7274.15	7275.21	7274.24	-1.84%
321+50	7274.36	7273.95	7274.93	7274.05	-1.70%
321+75	7274.1	7273.75	7274.60	7273.86	-1.46%
322+00	7273.86	7273.55	7274.32	7273.66	-1.31%
322+25	7273.66	7273.36	7274.11	7273.47	-1.29%
322+50	7273.47	7273.16	7273.92	7273.27	-1.32%
322+75	7273.24	7272.96	7273.67	7273.07	-1.20%
323+00	7273.03	7272.76	7273.45	7272.88	-1.14%
323+25	7272.83	7272.55	7273.25	7272.66	-1.19%
323+50	7272.64	7272.34	7273.09	7272.44	-1.29%
323+75	7272.37	7272.05	7272.83	7272.15	-1.36%
324+00	7272.05	7271.7	7272.54	7271.79	-1.50%
324+25	7271.76	7271.3	7272.35	7271.38	-1.94%

DESIGN INFORMATION			CONSTRUCTION INFORMATION		
	(A)	(B)	(C)	(D)	(E)
STATION	SAWCUT ELEV	EXIST SHLDR STRIPE (RT) ELEV	ELEV AT PROP LT EOP	ELEV AT PROP RT EOP	ROADWAY CROSS SLOPE
324+50	7271.52	7270.86	7272.26	7270.92	-2.67%
324+75	7271.28	7270.37	7272.24	7270.41	-3.66%
325+00	7271.09	7269.89	7272.29	7269.92	-4.74%
325+25	7270.88	7269.41	7272.32	7269.43	-5.78%
325+50	7270.65	7268.92	7272.31	7268.91	-6.81%
325+75	7270.44	7268.45	7272.34	7268.41	-7.87%
326+00	7270.26	7268.09	7272.34	7268.00	-8.69%
326+25	7270.07	7267.82	7272.25	7267.68	-9.15%
326+50	7269.81	7267.57	7272.01	7267.39	-9.25%
326+75	7269.55	7267.31	7271.79	7267.09	-9.38%
327+00	7269.29	7267.06	7271.54	7266.81	-9.46%



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Region 1 CRC

As Constructed	
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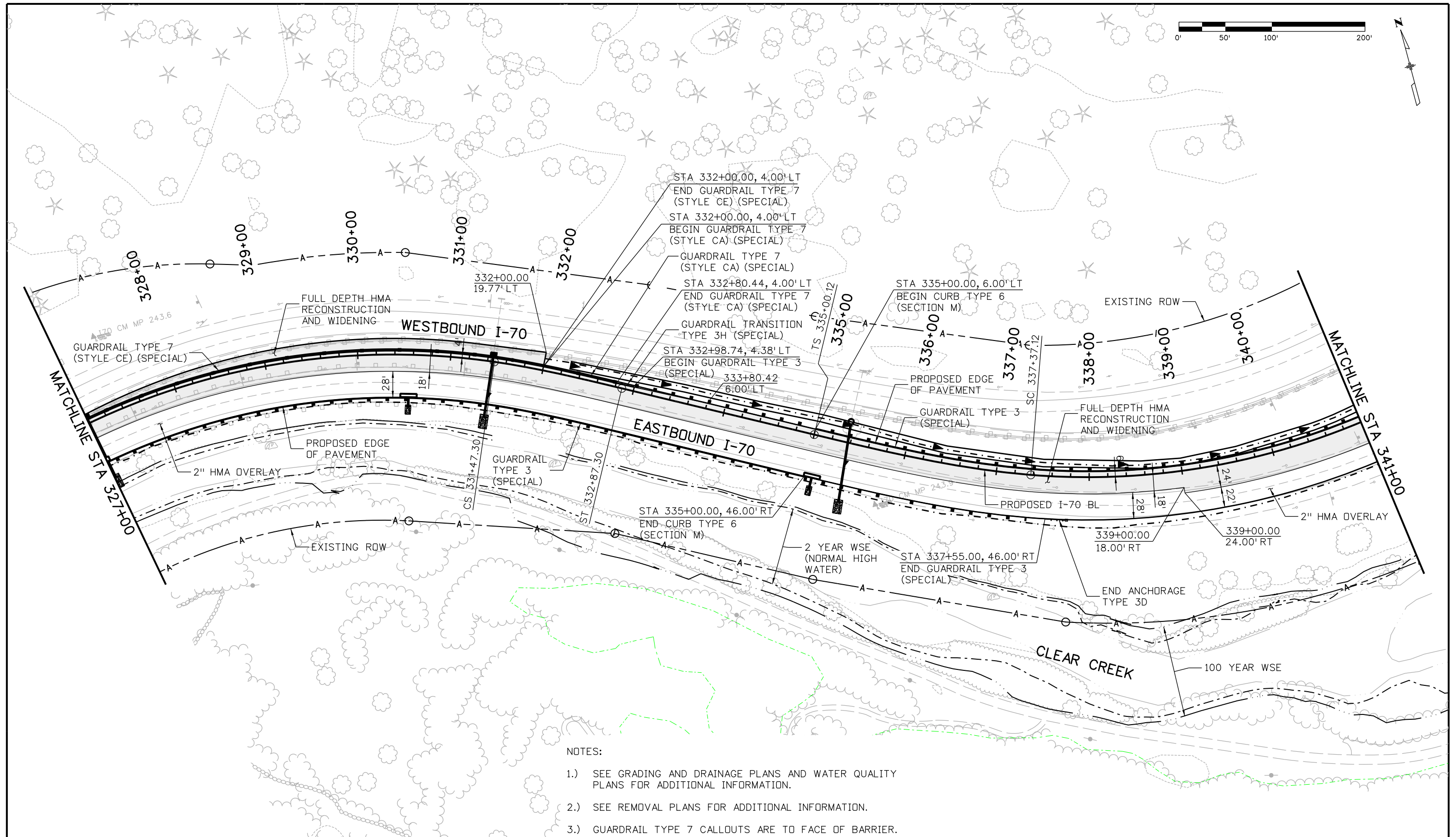
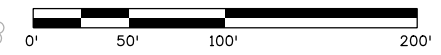
Designer:	E. Marsh	Structure Numbers	
Detailer:	J. Gellner		
Subset:	Roadway PNP	Subset Sheets:	16 of 26

Project No./Code
 IM 0703-391

19036

Sheet Number **76**

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NOTES:

- 1.) SEE GRADING AND DRAINAGE PLANS AND WATER QUALITY PLANS FOR ADDITIONAL INFORMATION.
- 2.) SEE REMOVAL PLANS FOR ADDITIONAL INFORMATION.
- 3.) GUARDRAIL TYPE 7 CALLOUTS ARE TO FACE OF BARRIER.

Print Date: 3/9/2013
 File Name: 18832DES_CP2_Plan009.dgn
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Region 1 **CRC**

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Revised:
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**EASTBOUND I-70
 ROADWAY PLAN
 STA 327+00 TO 341+00**

Designer: E. Marsh	Structure Numbers
Detailer: J. Gellner	
Subset: Roadway PNP	Subset Sheets: 17 of 26

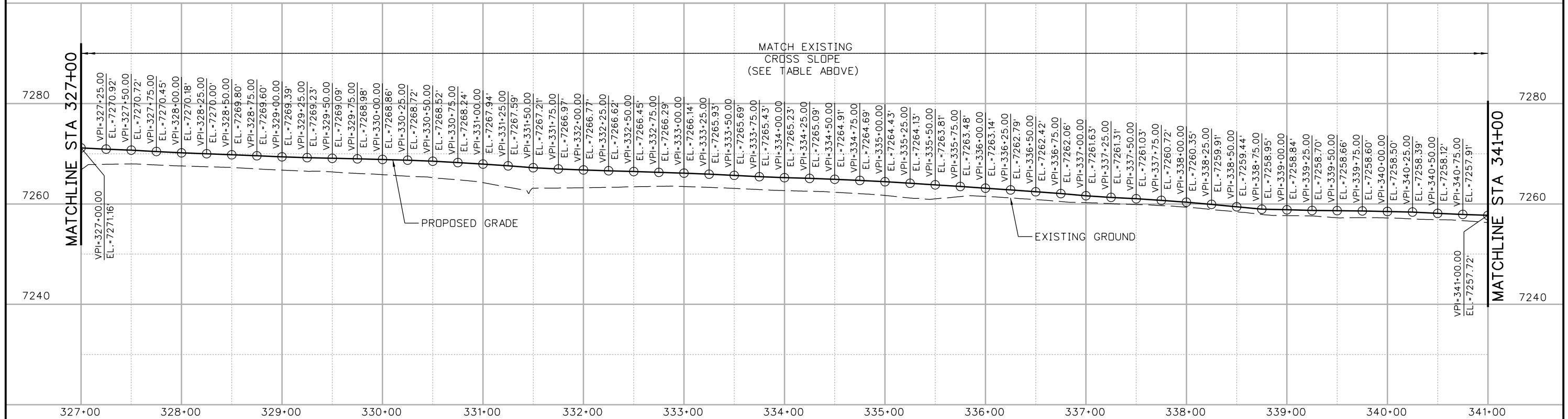
Project No./Code
IM 0703-391
19036
Sheet Number 77

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DESIGN INFORMATION			CONSTRUCTION INFORMATION		
	(A)	(B)	(C)	(D)	(E)
STATION	SAWCUT ELEV	EXIST SHLDR STRIPE (RT) ELEV	ELEV AT PROP LT EOP	ELEV AT PROP RT EOP	ROADWAY CROSS SLOPE
327+25	7269.05	7266.82	7271.30	7266.55	-9.49%
327+50	7268.81	7266.59	7271.10	7266.27	-9.66%
327+75	7268.55	7266.35	7270.83	7266.03	-9.60%
328+00	7268.31	7266.15	7270.56	7265.81	-9.50%
328+25	7268.12	7265.97	7270.38	7265.62	-9.52%
328+50	7267.92	7265.77	7270.18	7265.42	-9.52%
328+75	7267.73	7265.58	7269.98	7265.23	-9.50%
329+00	7267.54	7265.41	7269.76	7265.08	-9.36%
329+25	7267.38	7265.25	7269.60	7264.94	-9.33%
329+50	7267.24	7265.09	7269.47	7264.79	-9.35%
329+75	7267.12	7264.94	7269.36	7264.64	-9.44%
330+00	7266.99	7264.76	7269.25	7264.48	-9.53%
330+25	7266.84	7264.57	7269.10	7264.34	-9.52%
330+50	7266.66	7264.38	7268.89	7264.21	-9.36%
330+75	7266.5	7264.33	7268.59	7264.22	-8.75%
331+00	7266.35	7264.36	7268.26	7264.32	-7.89%
331+25	7266.18	7264.45	7267.86	7264.45	-6.83%
331+50	7266.03	7264.54	7267.44	7264.58	-5.73%
331+75	7265.92	7264.64	7267.17	7264.69	-4.96%
332+00	7265.83	7264.74	7266.94	7264.79	-4.31%
332+25	7265.78	7264.85	7266.76	7264.89	-3.75%
332+50	7265.72	7264.94	7266.58	7264.99	-3.19%

DESIGN INFORMATION			CONSTRUCTION INFORMATION		
	(A)	(B)	(C)	(D)	(E)
STATION	SAWCUT ELEV	EXIST SHLDR STRIPE (RT) ELEV	ELEV AT PROP LT EOP	ELEV AT PROP RT EOP	ROADWAY CROSS SLOPE
332+75	7265.63	7264.98	7266.40	7265.03	-2.74%
333+00	7265.51	7264.9	7266.29	7264.95	-2.57%
333+25	7265.32	7264.76	7266.07	7264.81	-2.44%
333+50	7265.1	7264.55	7265.83	7264.60	-2.37%
333+75	7264.86	7264.34	7265.57	7264.39	-2.25%
334+00	7264.65	7264.13	7265.37	7264.18	-2.30%
334+25	7264.48	7263.92	7265.24	7263.96	-2.46%
334+50	7264.32	7263.78	7265.05	7263.82	-2.37%
334+75	7264.16	7263.7	7264.81	7263.76	-2.01%
335+00	7264	7263.66	7264.51	7263.75	-1.48%
335+25	7263.83	7263.67	7264.17	7263.79	-0.73%
335+50	7263.67	7263.7	7263.80	7263.87	0.14%
335+75	7263.51	7263.74	7263.42	7263.98	1.08%
336+00	7263.36	7263.82	7263.01	7264.14	2.17%
336+25	7263.22	7263.91	7262.59	7264.31	3.30%
336+50	7263.07	7264	7262.15	7264.48	4.47%
336+75	7262.9	7264.08	7261.72	7264.64	5.62%
337+00	7262.69	7264.17	7261.21	7264.81	6.92%
337+25	7262.55	7264.27	7260.82	7264.94	7.91%
337+50	7262.41	7264.36	7260.51	7265.01	8.65%
337+75	7262.2	7264.35	7260.17	7264.94	9.18%
338+00	7261.89	7264.2	7259.79	7264.70	9.46%
338+25	7261.51	7264.03	7259.32	7264.45	9.87%

DESIGN INFORMATION			CONSTRUCTION INFORMATION		
	(A)	(B)	(C)	(D)	(E)
STATION	SAWCUT ELEV	EXIST SHLDR STRIPE (RT) ELEV	ELEV AT PROP LT EOP	ELEV AT PROP RT EOP	ROADWAY CROSS SLOPE
338+50	7261.13	7263.85	7258.82	7264.20	10.34%
338+75	7260.74	7263.67	7258.29	7263.96	10.90%
339+00	7260.62	7263.5	7258.20	7263.75	10.67%
339+25	7261.06	7263.34	7258.07	7263.54	10.54%
339+50	7260.94	7263.17	7258.06	7263.32	10.12%
339+75	7260.8	7263.01	7258.01	7263.10	9.78%
340+00	7260.65	7262.86	7257.92	7262.90	9.57%
340+25	7260.49	7262.71	7257.83	7262.68	9.34%
340+50	7260.28	7262.59	7257.54	7262.55	9.63%
340+75	7260.08	7262.42	7257.33	7262.36	9.68%
341+00	7259.88	7262.24	7257.15	7262.16	9.65%



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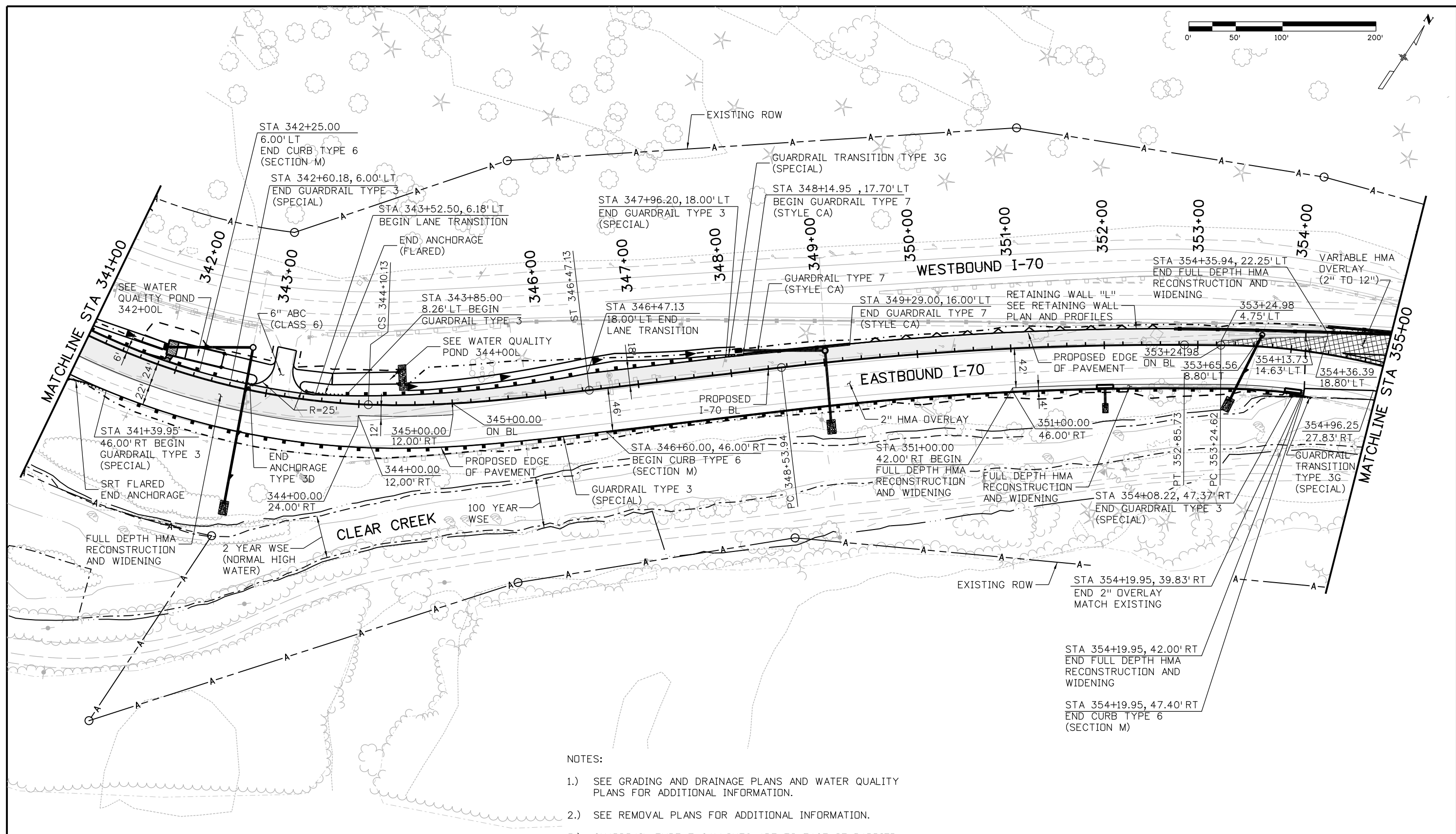
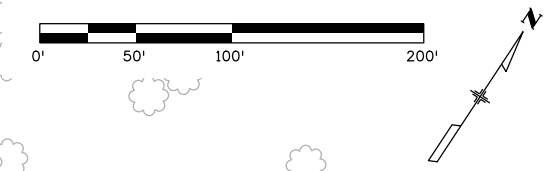
Sheet Revisions		
Date:	Comments	Init.

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 425 A Corporate Circle
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Region 1 **CRC**

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 No Revisions:
 Revised:
 Void:

**EASTBOUND I-70
 ROADWAY PROFILE
 STA 327+00 TO 341+00**
 Designer: E. Marsh
 Detailer: J. Gellner
 Subset: Roadway PNP
 Structure Numbers
 Subset Sheets: 18 of 26

Project No./Code
 IM 0703-391
 19036
 Sheet Number **78**



- NOTES:
- 1.) SEE GRADING AND DRAINAGE PLANS AND WATER QUALITY PLANS FOR ADDITIONAL INFORMATION.
 - 2.) SEE REMOVAL PLANS FOR ADDITIONAL INFORMATION.
 - 3.) GUARDRAIL TYPE 7 CALLOUTS ARE TO FACE OF BARRIER.

Print Date: 3/11/2013
 File Name: 18832DES_CP2_Plan010.dgn
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Region 1 CRC

As Constructed

No Revisions:

Revised:

Void:

**EASTBOUND I-70
 ROADWAY PLAN
 STA 341+00 TO 355+00**

Designer: E. Marsh
 Detailer: J. Gellner
 Subset: Roadway PNP

Structure Numbers
 Subset Sheets: 19 of 26

Project No./Code

IM 0703-391

19036

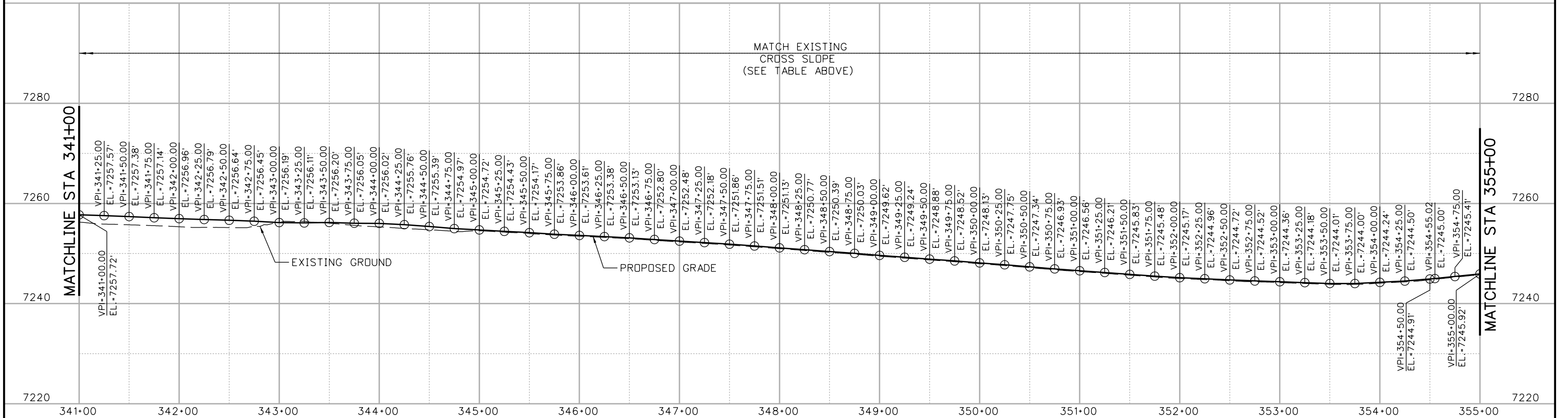
Sheet Number 79

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DESIGN INFORMATION			CONSTRUCTION INFORMATION		
	(A)	(B)	(C)	(D)	(E)
STATION	SAWCUT ELEV	EXIST SHLDR STRIPE (RT) ELEV	ELEV AT PROP LT EOP	ELEV AT PROP RT EOP	ROADWAY CROSS SLOPE
341+25	7259.71	7262.06	7257.00	7261.97	9.56%
341+50	7259.52	7261.88	7256.80	7261.80	9.61%
341+75	7259.32	7261.69	7256.56	7261.64	9.78%
342+00	7259.15	7261.5	7256.37	7261.49	9.85%
342+25	7259	7261.32	7256.19	7261.36	9.94%
342+50	7258.83	7261.12	7256.05	7261.20	9.90%
342+75	7258.64	7260.87	7255.86	7260.99	9.87%
343+00	7258.38	7260.6	7255.59	7260.75	9.92%
343+25	7258.18	7260.27	7255.54	7260.42	9.36%
343+50	7258.04	7259.9	7255.70	7260.03	8.31%
343+75	7257.79	7259.53	7255.44	7259.71	7.96%
344+00	7256.72	7259.1	7255.37	7259.35	7.24%
344+25	7256.41	7258.61	7255.07	7258.92	6.89%
344+50	7256.03	7258.1	7254.66	7258.48	6.73%
344+75	7255.57	7257.47	7254.24	7257.92	6.41%
345+00	7254.55	7256.8	7254.05	7257.27	5.56%
345+25	7254.26	7256.14	7253.82	7256.63	4.80%
345+50	7254.01	7255.51	7253.65	7255.98	3.94%
345+75	7253.69	7254.89	7253.42	7255.31	3.15%
346+00	7253.45	7254.29	7253.28	7254.63	2.22%
346+25	7253.21	7253.69	7253.17	7253.96	1.26%
346+50	7252.97	7253.1	7253.07	7253.30	0.37%

DESIGN INFORMATION			CONSTRUCTION INFORMATION		
	(A)	(B)	(C)	(D)	(E)
STATION	SAWCUT ELEV	EXIST SHLDR STRIPE (RT) ELEV	ELEV AT PROP LT EOP	ELEV AT PROP RT EOP	ROADWAY CROSS SLOPE
346+75	7252.63	7252.52	7252.86	7252.66	-0.31%
347+00	7252.31	7251.94	7252.66	7252.03	-0.98%
347+25	7252.01	7251.46	7252.44	7251.51	-1.47%
347+50	7251.7	7250.99	7252.19	7251.01	-1.85%
347+75	7251.34	7250.62	7251.85	7250.63	-1.90%
348+00	7250.97	7250.22	7251.49	7250.23	-1.96%
348+25	7250.6	7249.76	7251.24	7249.75	-2.20%
348+50	7250.22	7249.27	7250.91	7249.25	-2.49%
348+75	7249.87	7248.79	7250.59	7248.75	-2.78%
349+00	7249.46	7248.3	7250.21	7248.26	-2.96%
349+25	7249.08	7247.8	7249.90	7247.74	-3.26%
349+50	7248.72	7247.3	7249.51	7247.22	-3.62%
349+75	7248.36	7246.81	7249.21	7246.71	-3.95%
350+00	7247.96	7246.35	7248.84	7246.24	-4.11%
350+25	7247.59	7245.9	7248.50	7245.77	-4.31%
350+50	7247.18	7245.43	7248.11	7245.28	-4.47%
350+75	7246.76	7244.95	7247.73	7244.78	-4.66%
351+00	7246.39	7244.55	7247.39	7244.36	-4.78%
351+25	7246.04	7244.22	7247.03	7244.01	-4.77%
351+50	7245.67	7243.93	7246.63	7243.72	-4.59%
351+75	7245.32	7243.66	7246.26	7243.43	-4.47%
352+00	7245	7243.4	7245.93	7243.16	-4.37%
352+25	7244.79	7243.07	7245.78	7242.79	-4.72%

DESIGN INFORMATION			CONSTRUCTION INFORMATION		
	(A)	(B)	(C)	(D)	(E)
STATION	SAWCUT ELEV	EXIST SHLDR STRIPE (RT) ELEV	ELEV AT PROP LT EOP	ELEV AT PROP RT EOP	ROADWAY CROSS SLOPE
352+50	7244.56	7242.65	7245.64	7242.28	-5.31%
352+75	7244.36	7242.26	7245.53	7241.83	-5.84%
353+00	7244.2	7241.9	7245.53	7241.36	-6.58%
353+25	7244.02	7241.58	7245.42	7241.01	-6.90%
353+50	7243.84	7241.33	7245.27	7240.75	-7.08%
353+75	7243.83	7241.18	7245.41	7240.54	-7.54%
354+00	7244.08	7241.18	7245.89	7240.45	-8.21%



Print Date: 3/8/2013
 File Name: I8832DES_CP2_Prof010.dgn
 Horiz. Scale: 1:100 Vert. Scale: 1"=20'

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Date:	Comments	Init.

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DOT 425 A Corporate Circle
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Region 1 **CRC**

As Constructed

No Revisions:

Revised:

Void:

**EASTBOUND I-70
 ROADWAY PROFILE
 STA 341+00 TO 355+00**

Designer: E. Marsh
 Detailer: J. Gellner
 Subset: Roadway PNP

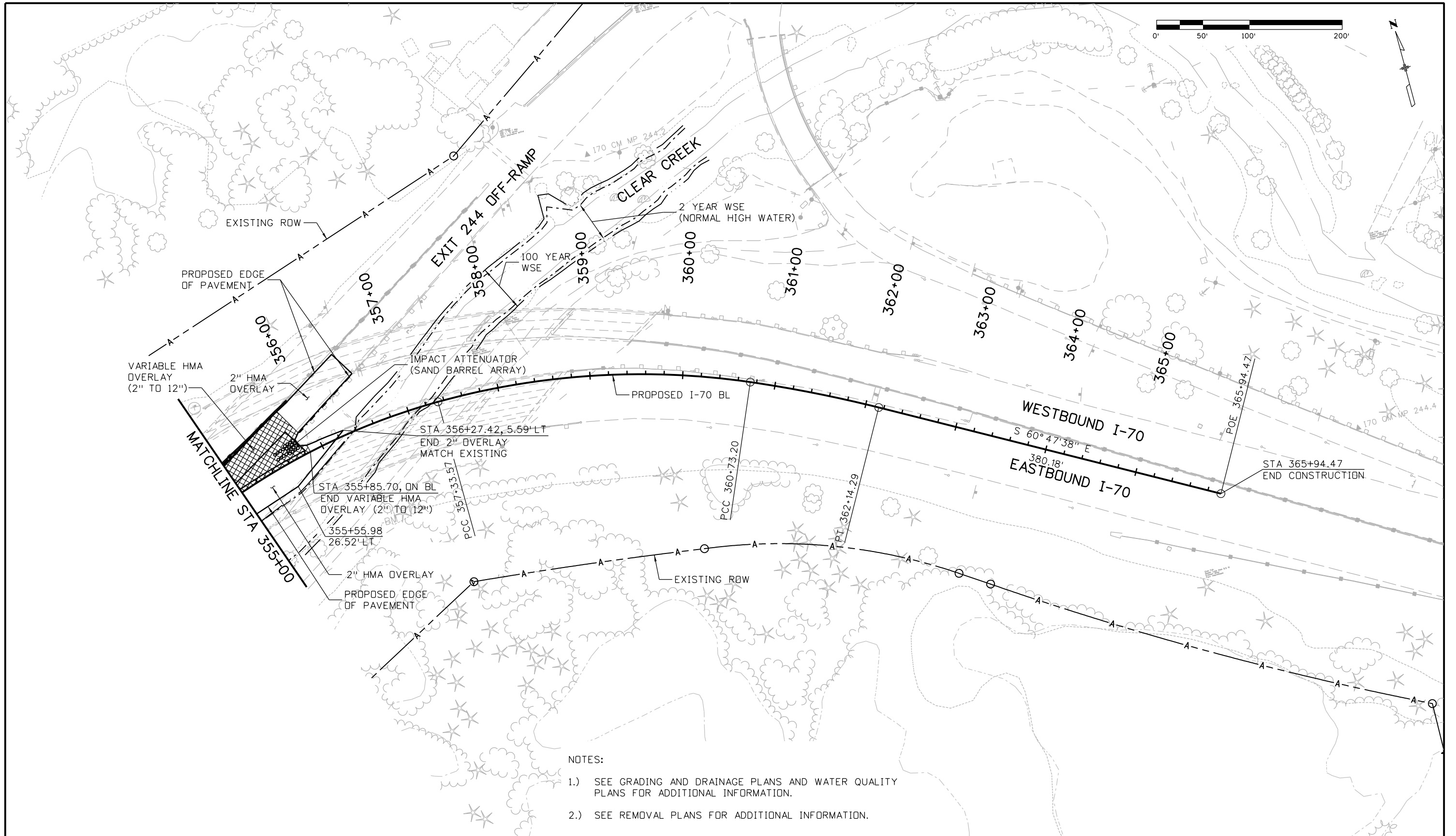
Structure Numbers
 Subset Sheets: 20 of 26

Project No./Code

IM 0703-391

19036

Sheet Number 80



NOTES:

- 1.) SEE GRADING AND DRAINAGE PLANS AND WATER QUALITY PLANS FOR ADDITIONAL INFORMATION.
- 2.) SEE REMOVAL PLANS FOR ADDITIONAL INFORMATION.

Print Date: 3/8/2013
 File Name: 18832DES_CP2_Plan011.dgn
 Horiz. Scale: 1:100 Vert. Scale: NA

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Region 1 CRC

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No Revisions:	
Revised:	
Void:	

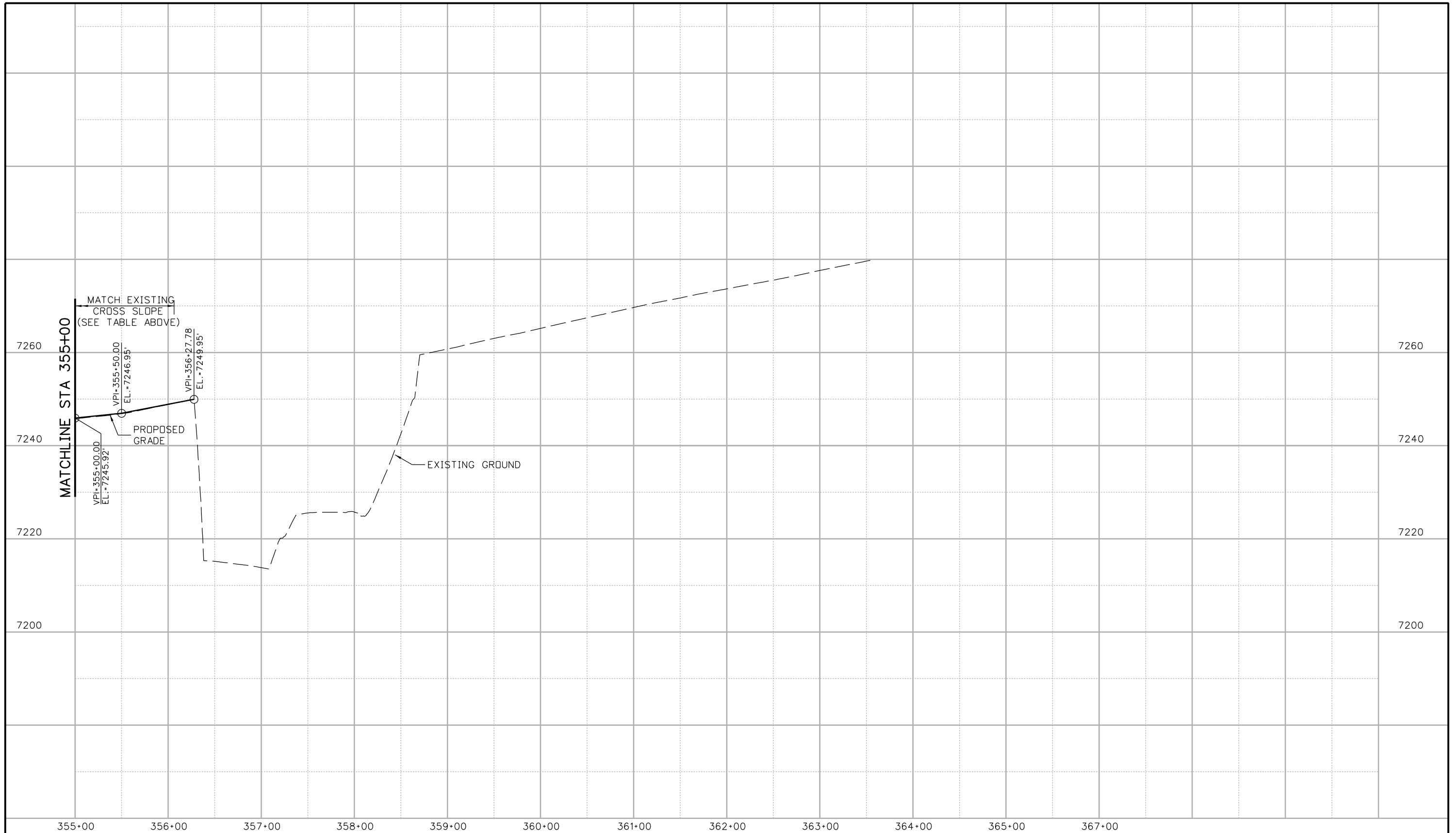
**EASTBOUND I-70
 ROADWAY PLAN
 STA 355+00 TO 365+94.47**

Designer:	E. Marsh	Structure Numbers	
Detailer:	J. Gellner	Subset Sheets:	21 of 26
Subset:	Roadway PNP		

Project No./Code	IM 0703-391
	19036
Sheet Number	81

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17543 12:13:49 PM c:\pw_work\pwsjpw\common\dms26924\18832DES_CP2_Prof011.dgn



Print Date: 3/8/2013
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Date:	Comments	Init.

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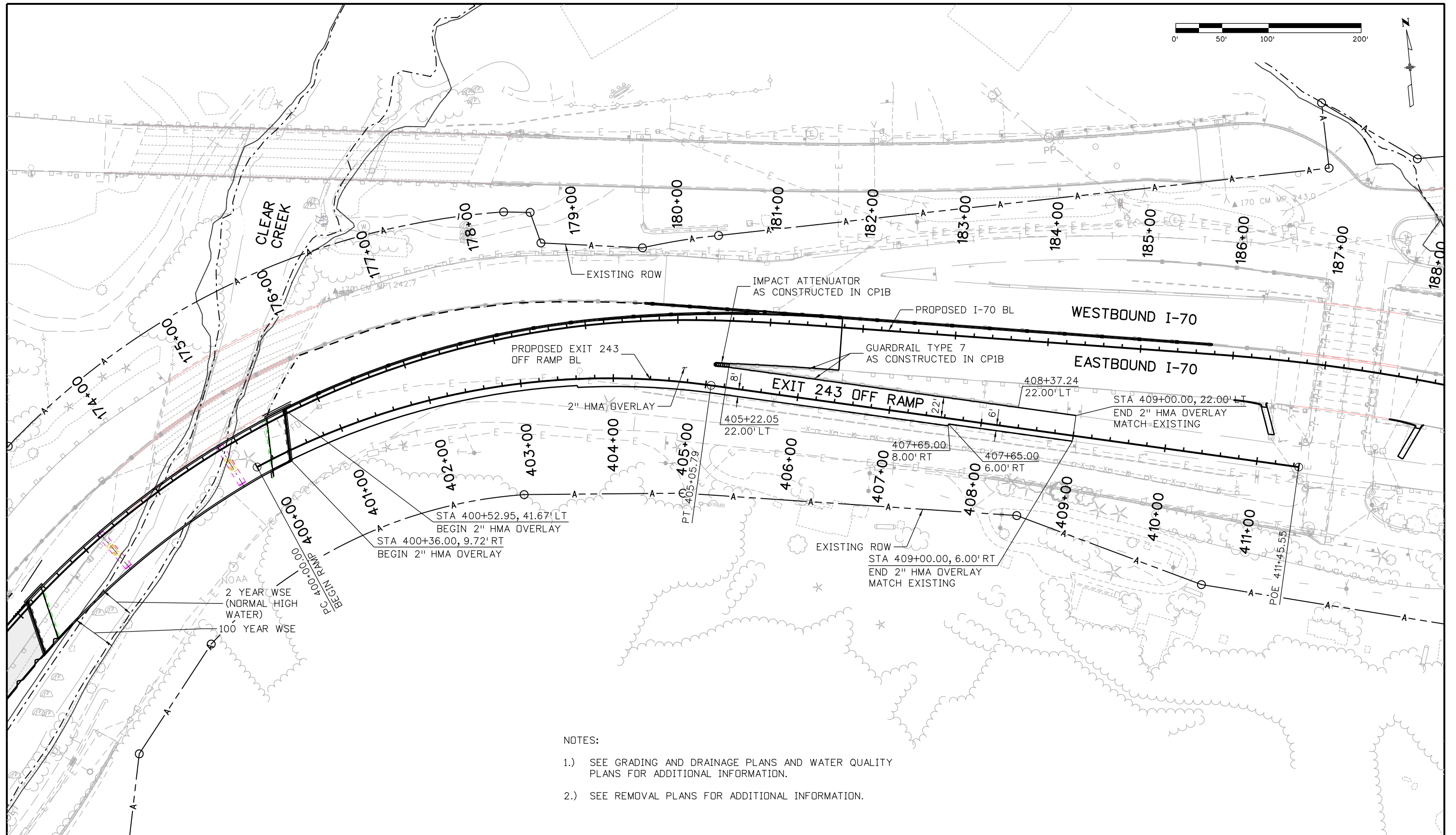
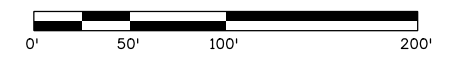
As Constructed
 No Revisions:
 Revised:
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**EASTBOUND I-70
 ROADWAY PROFILE
 STA 355+00 TO 356+27.78**

Designer: E. Marsh
 Detailer: J. Gellner
 Subset: Roadway PNP

Structure Numbers
 Subset Sheets: 22 of 26

Project No./Code
 IM 0703-391
 19036
 Sheet Number **82**



NOTES:

- 1.) SEE GRADING AND DRAINAGE PLANS AND WATER QUALITY PLANS FOR ADDITIONAL INFORMATION.
- 2.) SEE REMOVAL PLANS FOR ADDITIONAL INFORMATION.

Print Date: 3/11/2013

File Name: 18832DES_CP2_Plan012.dgn

Horiz. Scale: 1:100

Vert. Scale:



Sheet Revisions

Date:	Comments	Init.

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Region 1

CRC

As Constructed

No Revisions:

Revised:

Void:

EXIT 243 OFF RAMP
ROADWAY PLAN
STA 400+00 TO 409+00

Designer:	E. Marsh	Structure Numbers	
Detailer:	J. Gellner		
Subset:	Roadway PNP	Subset Sheets:	23 of 26

Project No./Code

IM 0703-391

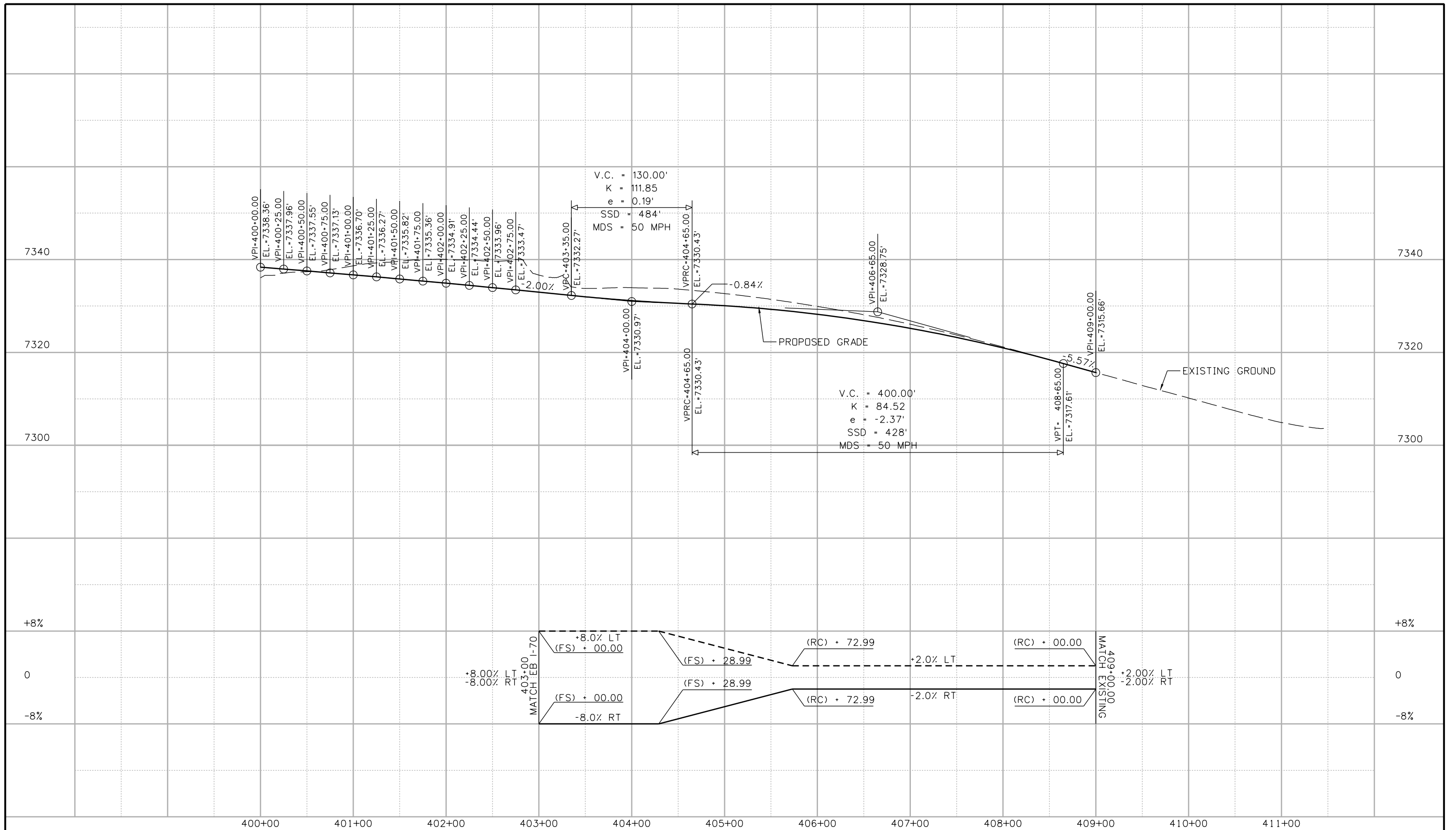
19036

Sheet Number 83

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Print Date: 3/8/2013
 File Name: 18832DES_CP2_Prof012.dgn
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Date:	Comments	Init.

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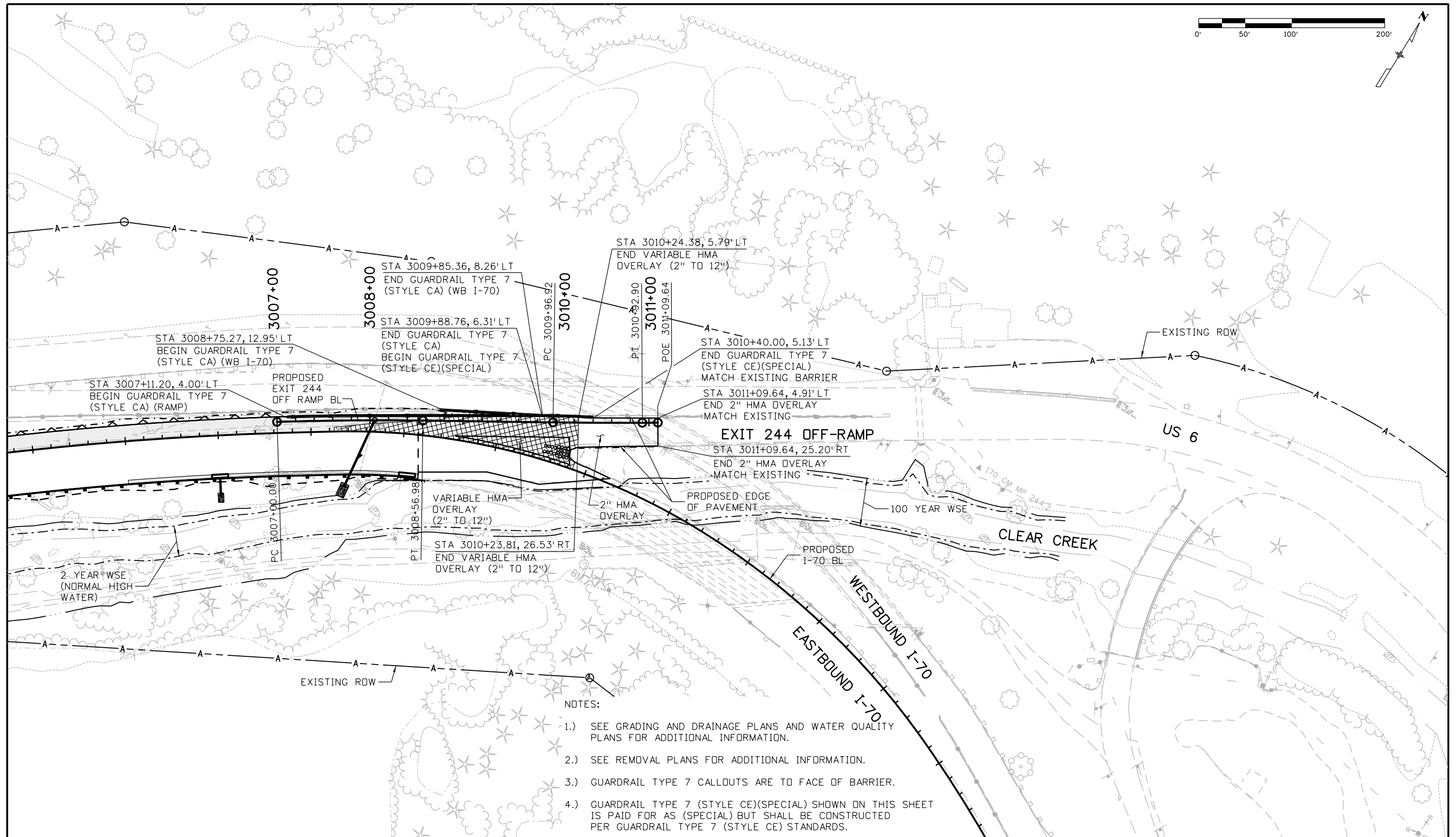
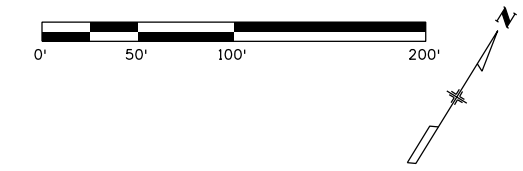
As Constructed
No Revisions:
Revised:
Void:

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

Designer: E. Marsh
 Detailer: J. Gellner
 Subset: Roadway PNP

Structure Numbers
 Subset Sheets: 24 of 26

Project No./Code
IM 0703-391
19036
Sheet Number 84




NOTES:

- 1.) SEE GRADING AND DRAINAGE PLANS AND WATER QUALITY PLANS FOR ADDITIONAL INFORMATION.
- 2.) SEE REMOVAL PLANS FOR ADDITIONAL INFORMATION.
- 3.) GUARDRAIL TYPE 7 CALLOUTS ARE TO FACE OF BARRIER.
- 4.) GUARDRAIL TYPE 7 (STYLE CE)(SPECIAL) SHOWN ON THIS SHEET IS PAID FOR AS (SPECIAL) BUT SHALL BE CONSTRUCTED PER GUARDRAIL TYPE 7 (STYLE CE) STANDARDS.

Print Date: 3/8/2013
 File Name: 18832DES_CP2_Plan013.dgn
 Horiz. Scale: 1:100 Vert. Scale:
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Date:	Comments	Init.

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Revised:
Void:

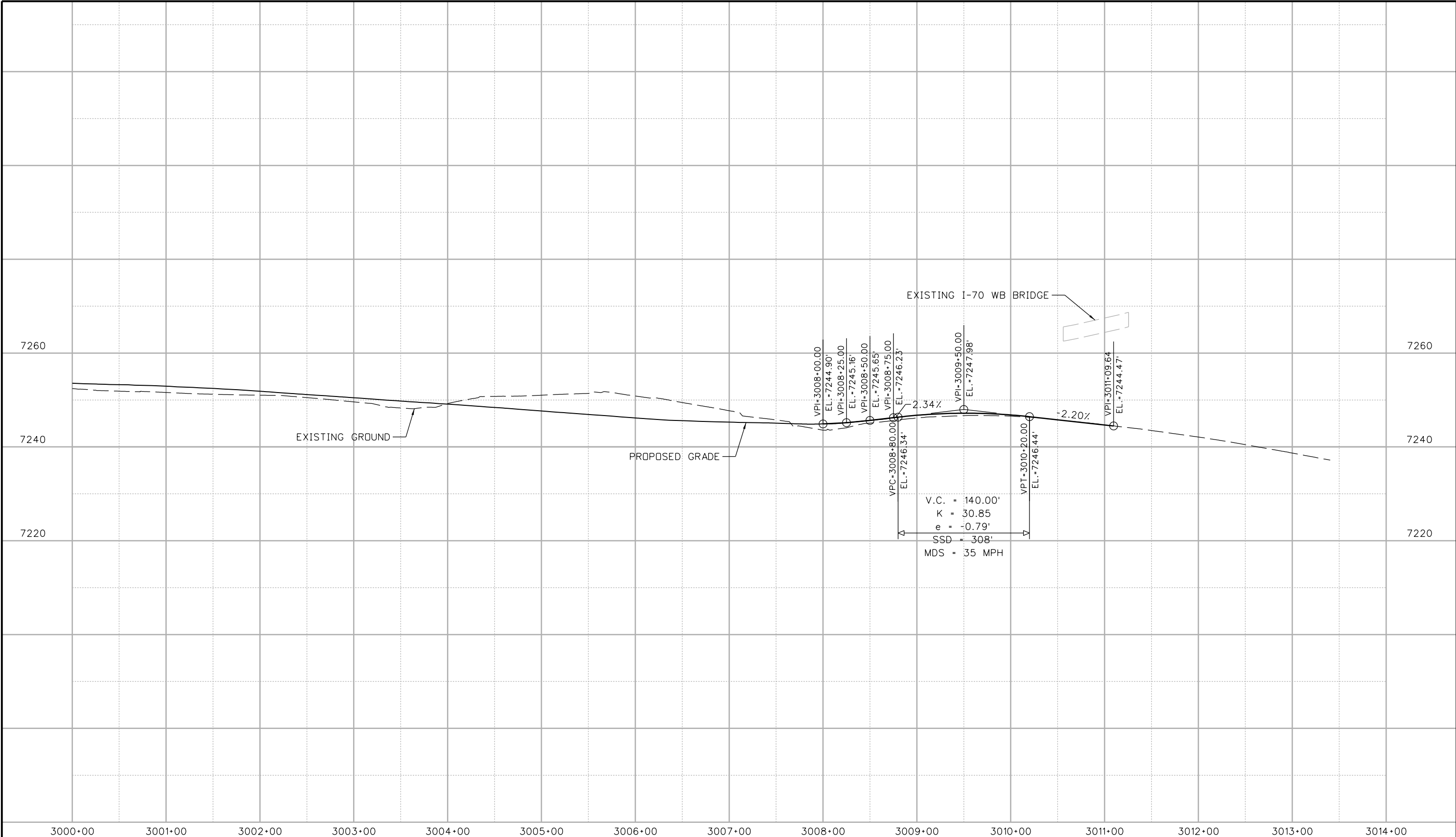
**EXIT 244 OFF RAMP
 ROADWAY PLAN
 STA 3007+00 TO 3011+09.64**

Designer: E. Marsh	Structure Numbers
Detailer: J. Gellner	
Subset: Roadway PNP	Subset Sheets: 25 of 26

Project No./Code
IM 0703-391
19036
Sheet Number 85

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Print Date: 3/8/2013
 File Name: 18832DES_CP2_Prof013.dgn
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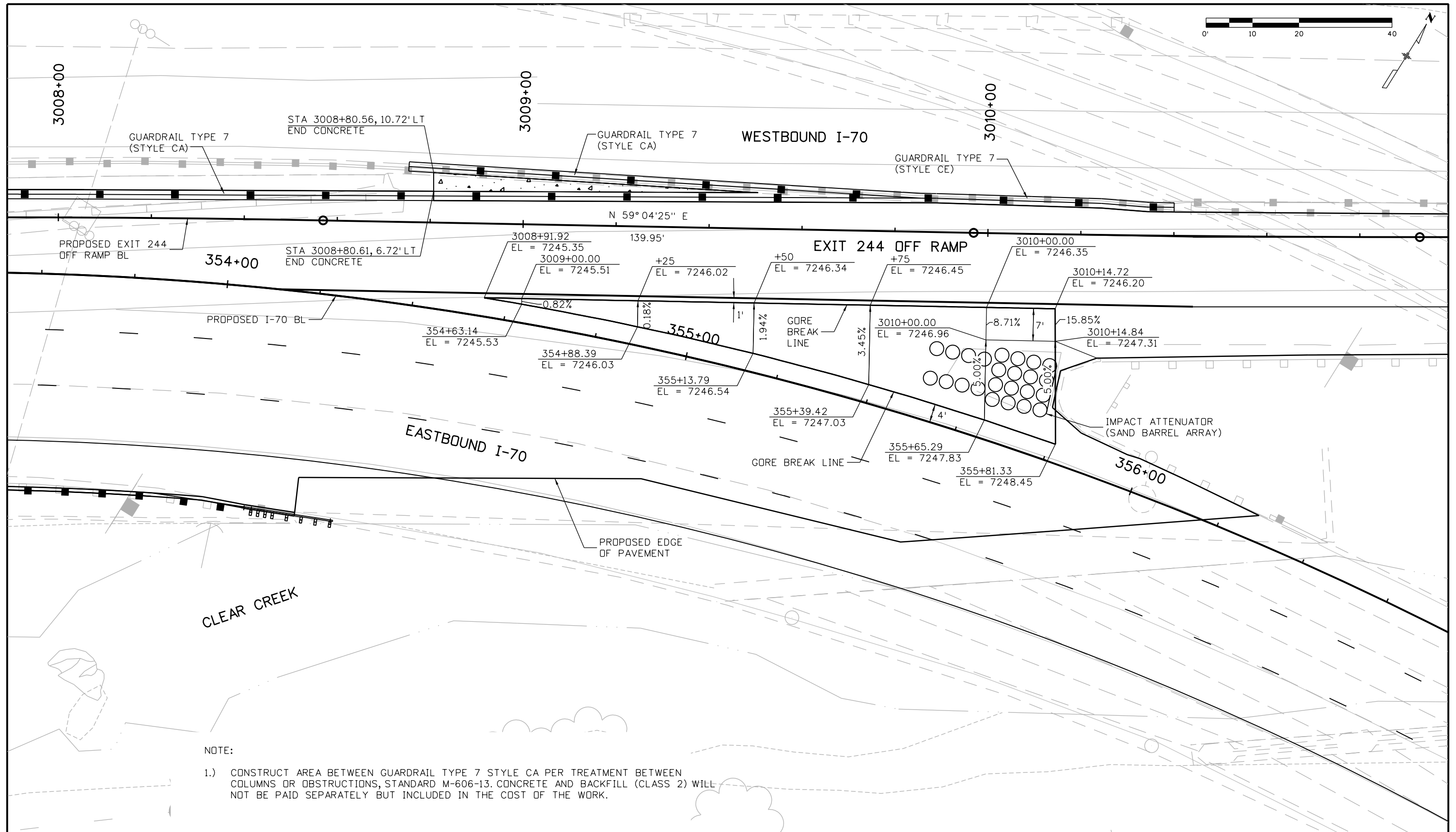
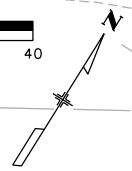
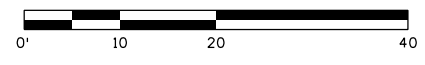
Sheet Revisions		
Date:	Comments	Init.

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Region 1 **CRC**

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 No Revisions:
 Revised:
 Void:

**EXIT 244 OFF RAMP
 ROADWAY PROFILE
 STA 3007+00 TO 3011+09.64**
 Designer: E. Marsh
 Detailer: J. Gellner
 Subset: Roadway PNP
 Structure Numbers
 Subset Sheets: 26 of 26

Project No./Code
 IM 0703-391
 19036
 Sheet Number **86**



NOTE:

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

Print Date: 3/8/2013
 File Name: 18832DES_CP2_GoreDt1001.dgn
 Horiz. Scale: 1:20 Vert. Scale:
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Date:	Comments	Init.

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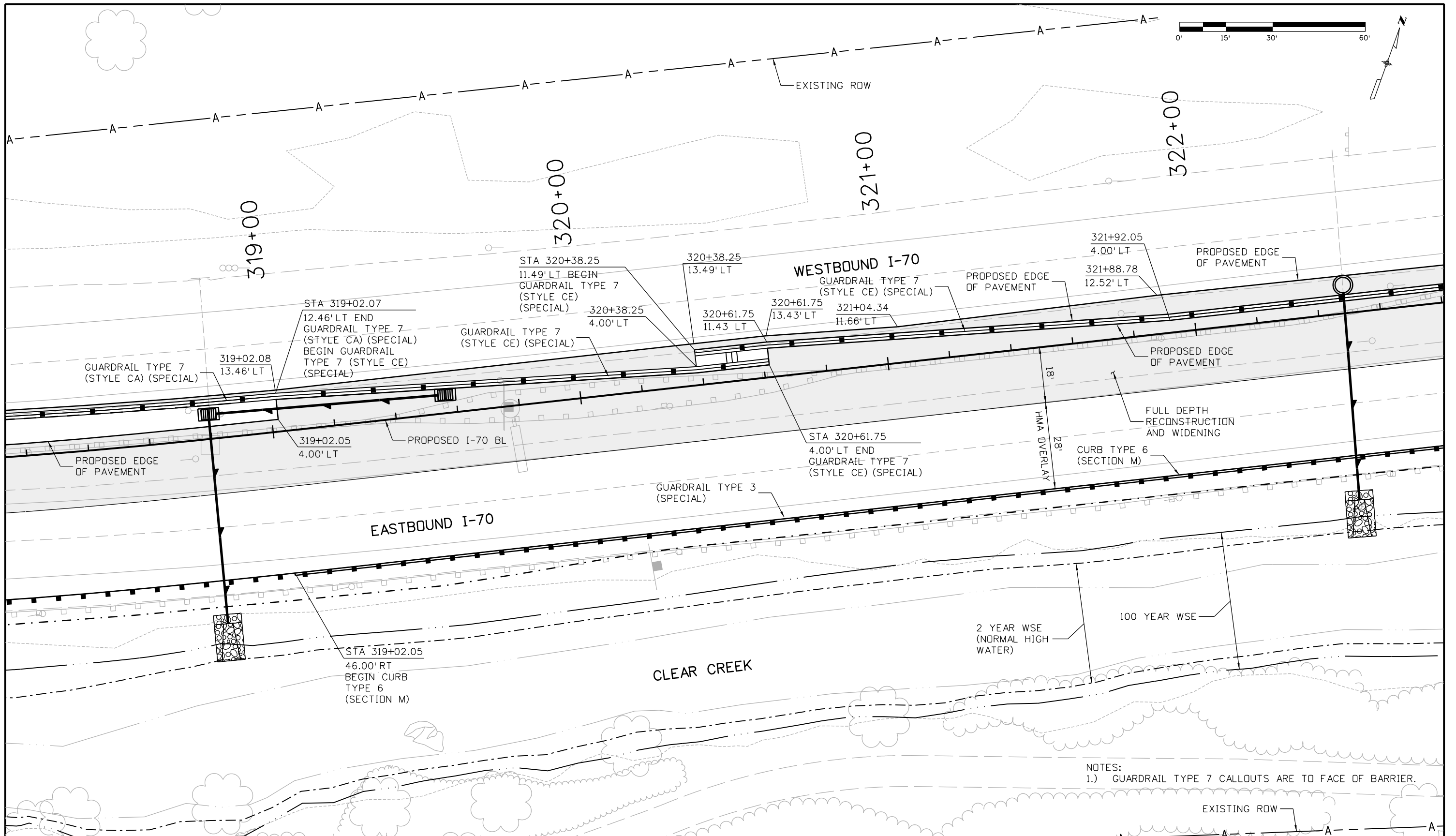
 425 A Corporate Circle
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 Region 1 CRC

As Constructed
No Revisions:
Revised:
Void:

EASTBOUND I-70 AT EXIT 244 OFF RAMP GORE DETAIL		
Designer:	E. Marsh	Structure Numbers
Detailer:	J. Gellner	
Subset:	Gore Detail	Subset Sheets: 1 of 1

Project No./Code
IM 0703-391
19036
Sheet Number 87

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NOTES:
 1.) GUARDRAIL TYPE 7 CALLOUTS ARE TO FACE OF BARRIER.

Print Date: 3/8/2013
 File Name: 18832DES_CP2_RDdetail001.dgn
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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
 ROADWAY GUARDRAIL
 DETAIL**

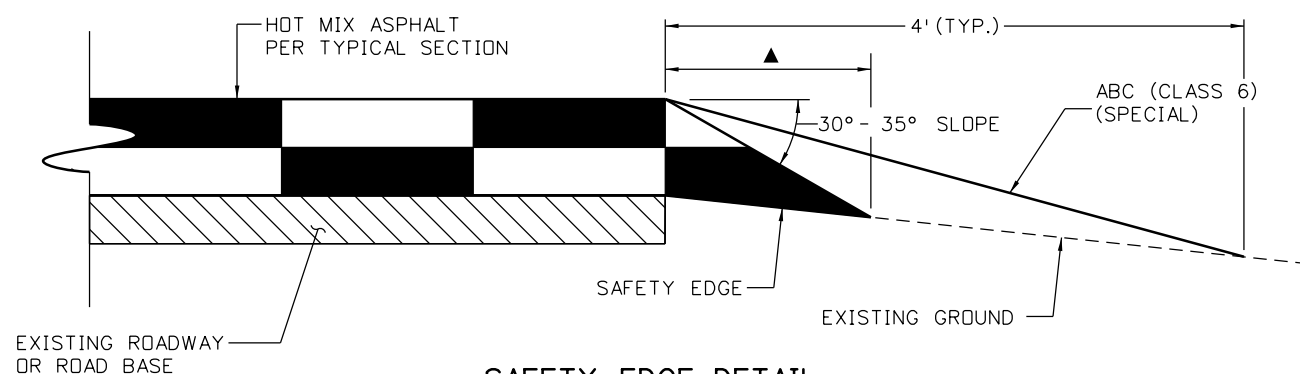
Designer: E. Marsh	Structure Numbers
Detailer: J. Gellner	
Subset: Guardrail Detail	Subset Sheets: 1 of 1

Project No./Code
IM 0703-391
19036
Sheet Number 88

17543 12:14:53 PM c:\pwwork\jbs\jw\common\dms\26924\18832DES_CP2_RDdetail001.dgn

SAFETY EDGE LOCATIONS

EASTBOUND I-70	
STA 302+72.88 TO STA 319+02.05	- LEFT
STA 337+78.00 TO STA 341+39.95	- RIGHT
EXIT 243 OFF RAMP	
STA 407+65.00 TO STA 409+00.00	- RIGHT
STA 408+37.24 TO STA 409+00.00	- LEFT
EXIT 244 OFF RAMP	
STA 3010+23.81 TO STA 3011+09.64	- RIGHT



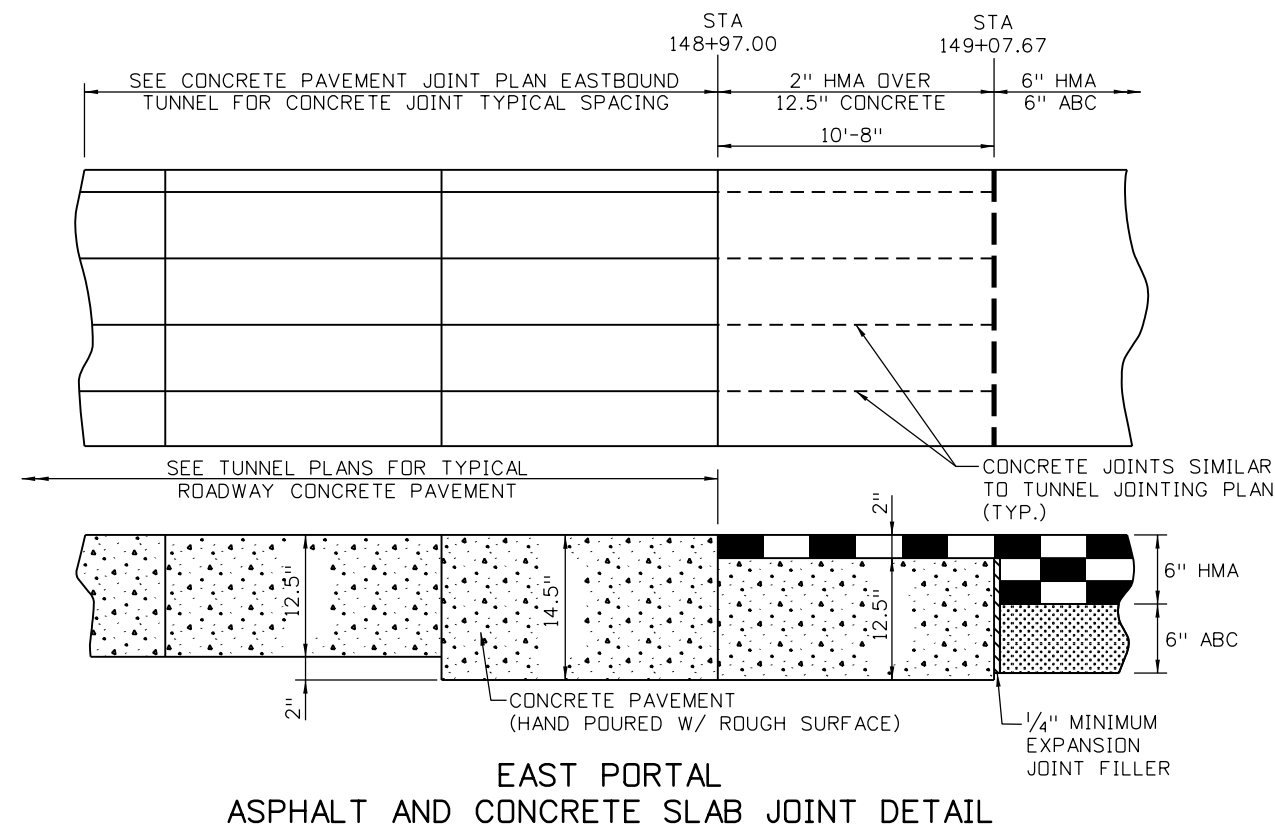
SAFETY EDGE DETAIL

LEGEND

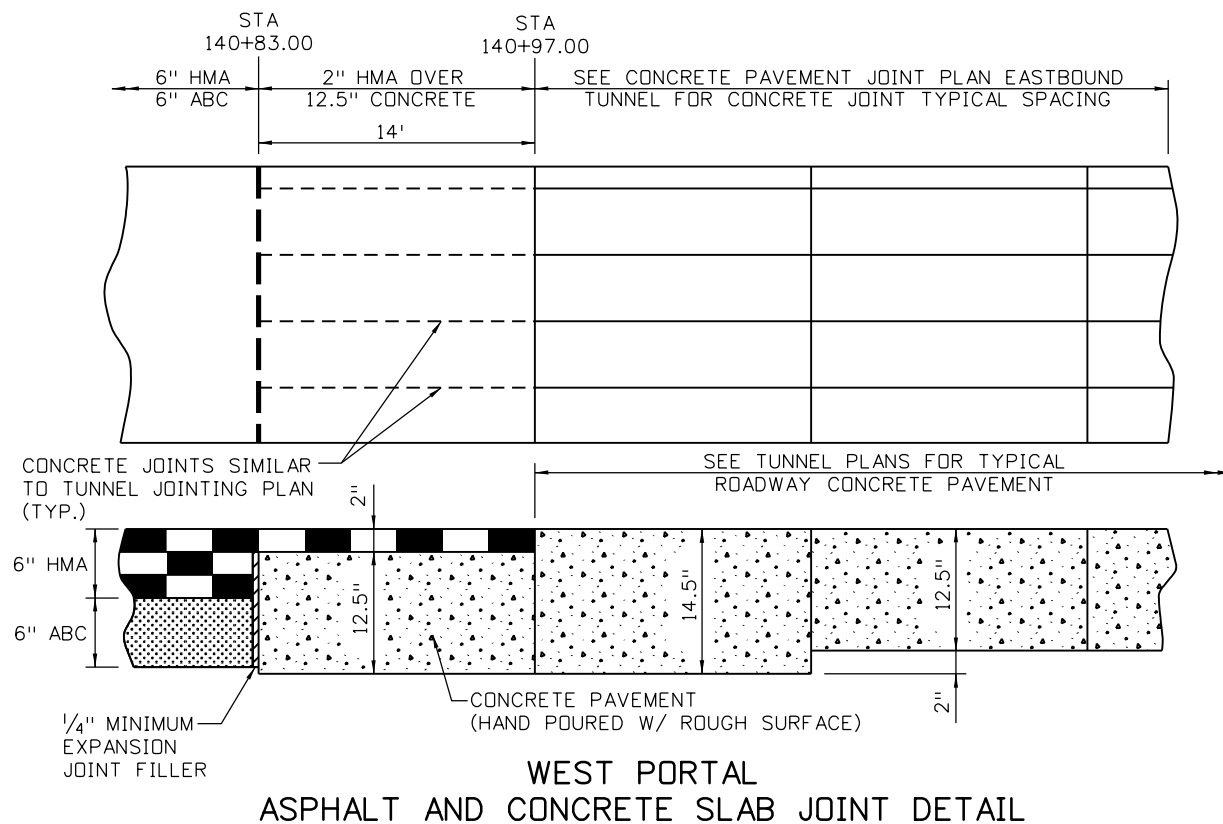
▲ - SAFETY EDGE WITH A 30°-35° SLOPE AND SHOULDER MATERIAL (SEE SAFETY EDGE DETAILS).

GENERAL NOTES

1. THE SAFETY EDGE WILL BE CONSTRUCTED AS PART OF THE ROADWAY PAVEMENT. A SHOULDER WEDGE DEVICE WILL BE ADDED TO THE SCREED OF THE PAVING MACHINE.
2. THE CONTRACTOR MAY USE A SHOULDER WEDGE MAKER OR A SIMILAR DEVICE THAT PRODUCES THE SAME COMPACTION RESULTS.
3. SHORT SECTIONS OF HANDWORK WILL BE ALLOWED WHEN NECESSARY FOR TRANSITIONS AND TURNOUTS.
4. SITE PREPARATION AND ADDITIONAL EARTHWORK REQUIRED TO CONSTRUCT THE SAFETY EDGE WILL NOT PAID FOR SEPARATELY BUT SHALL BE INCLUDED IN THE WORK.



EAST PORTAL ASPHALT AND CONCRETE SLAB JOINT DETAIL



WEST PORTAL ASPHALT AND CONCRETE SLAB JOINT DETAIL

Print Date: 3/8/2013
 File Name: 18832DES_CP2_MiscDtl01.dgn
 Horiz. Scale: 1:1 Vert. Scale:
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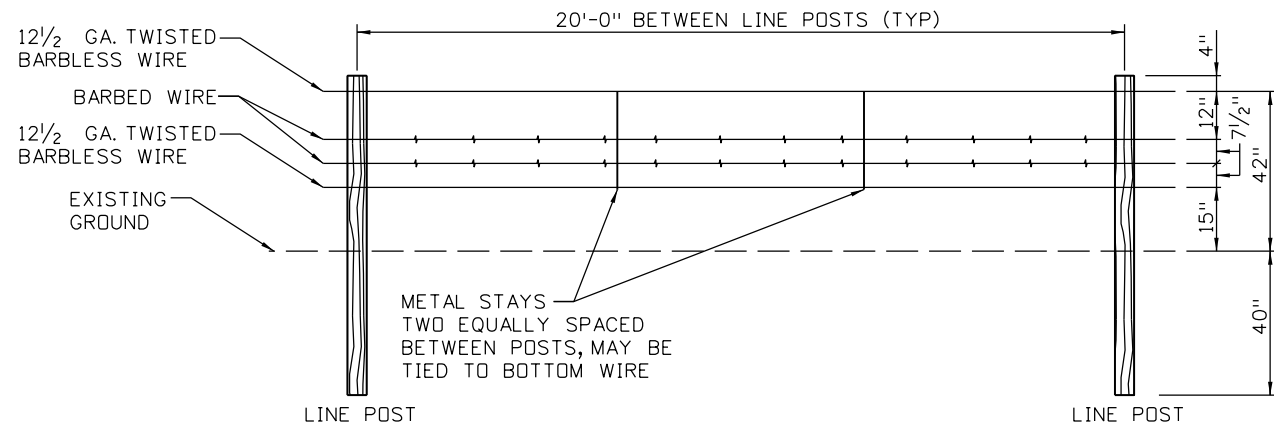
Sheet Revisions		
Date:	Comments	Init.

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Region 1 **CRC**

As Constructed	EASTBOUND I-70 MISCELLANEOUS DETAILS		Project No./Code
No Revisions:			IM 0703-391
Revised:	Designer: E. Marsh	Structure Numbers	19036
Void:	Detailer: B. Riley	Subset Sheets: 1 of 2	Sheet Number 89
	Subset: Misc Detail		

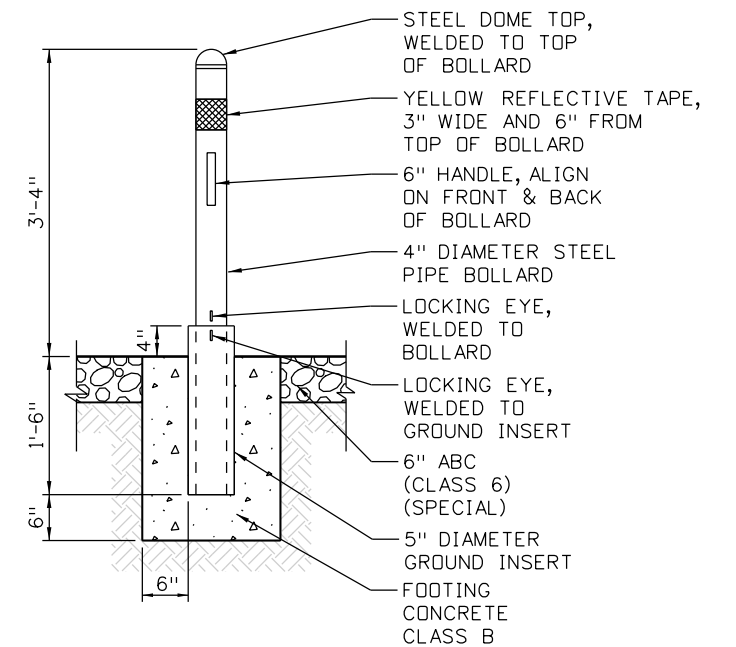
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NOTES:

1. SEE STANDARD PLAN M-607-1 FOR ADDITIONAL INFORMATION.

WIRE FENCE DETAIL



REMOVABLE BOLLARD

NOTES:

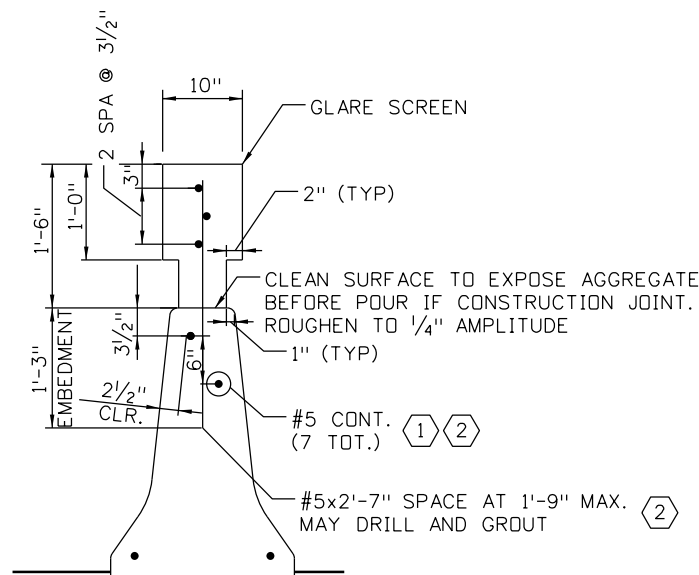
1. ALIGN REMOVABLE BOLLARD PIPE & GROUND INSERT SO EYES ARE LOCATED AT BACK AND FRONT OF BOLLARD, NOT STICKING OUT INTO TRAVEL WAY.
2. ALL METAL SHALL BE GALVANIZED PAINT, ONE COAT METAL PRIMER AND TWO COATS OF DARK BROWN, EQUIVALENT TO FEDERAL STANDARD 595B COLOR NO. 20059.
3. ALL ITEMS TO COMPLETE THE CONSTRUCTION OF THE REMOVABLE BOLLARD SHALL BE INCIDENTAL AND INCLUDED IN THE PAY ITEM "BOLLARD", PAY ITEM NO. "622-00270".

KEYNOTES:


- 1 SPLICES SHALL BE STAGGERED 3'-5" MINIMUM AND SHALL BE EITHER MECHANICAL CONNECTED OR 3'-5" LAPS.
- 2 BARS SHALL BE EPOXY COATED.

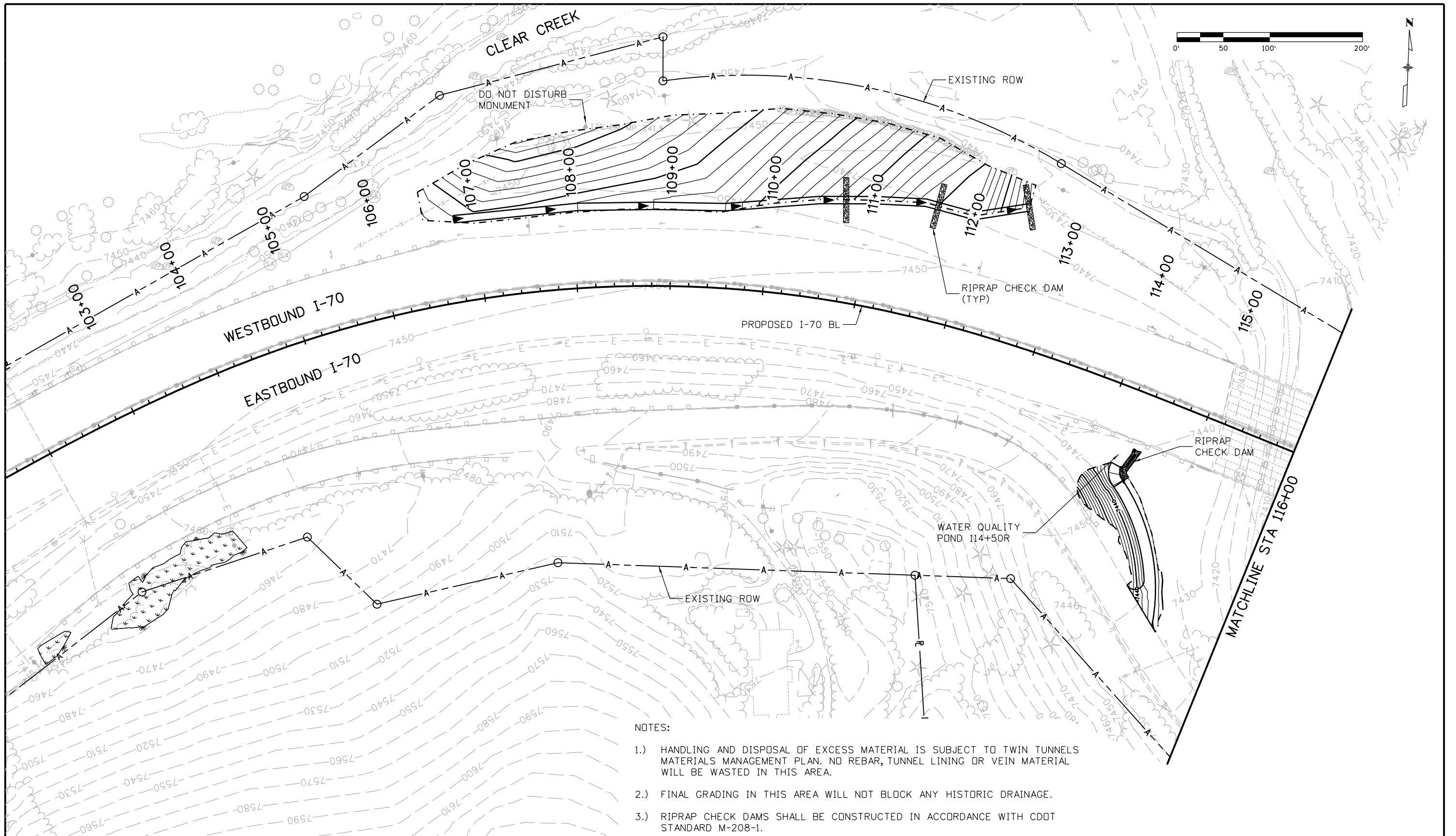
NOTES:

1. THIS DETAIL IS ONLY INTENDED TO PROVIDE NECESSARY DETAILS AND DIMENSIONS TO CONSTRUCT THE NON-STANDARD GLARE SCREEN THAT IS INTEGRAL TO THE TOP OF THE TYPE 7 GUARDRAIL.
2. DETAILS AND DIMENSIONS NOT SHOWN FOR GUARDRAIL TYPE 7 (STYLE CA) OR (STYLE CE) SHALL BE IN ACCORDANCE WITH M-606-13.
3. A COLORED STRUCTURAL CONCRETE COATING FINISH WILL BE REQUIRED ON ALL CONCRETE SURFACES EXCEPT THE BOTTOM SURFACE. THE COLOR SHALL BE BEIGE, EQUIVALENT TO FEDERAL STANDARD 595B COLOR NO. 30372.



MEDIAN GLARE SCREEN DETAIL WITH GUARDRAIL TYPE 7 (STYLE CA) OR (STYLE CE)

Print Date: 3/8/2013	Sheet Revisions			Colorado Department of Transportation			As Constructed		EASTBOUND I-70 MISCELLANEOUS DETAILS		Project No./Code	
File Name: 18832DES_CP2_MiscDtl02.dgn	Date:	Comments	Init.	 425 A Corporate Circle Golden, CO 80401 Phone: 720-497-6918 FAX: 720-497-6901 Region 1 CRC			No Revisions:		Designer: E. Marsh Detailer: B. Riley		IM 0703-391	
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							Void:		Subset: Misc Detail		Subset Sheets: 2 of 2	




NOTES:

- 1.) HANDLING AND DISPOSAL OF EXCESS MATERIAL IS SUBJECT TO TWIN TUNNELS MATERIALS MANAGEMENT PLAN. NO REBAR, TUNNEL LINING OR VEIN MATERIAL WILL BE WASTED IN THIS AREA.
- 2.) FINAL GRADING IN THIS AREA WILL NOT BLOCK ANY HISTORIC DRAINAGE.
- 3.) RIPRAP CHECK DAMS SHALL BE CONSTRUCTED IN ACCORDANCE WITH CDOT STANDARD M-208-1.

Print Date: 3/8/2013
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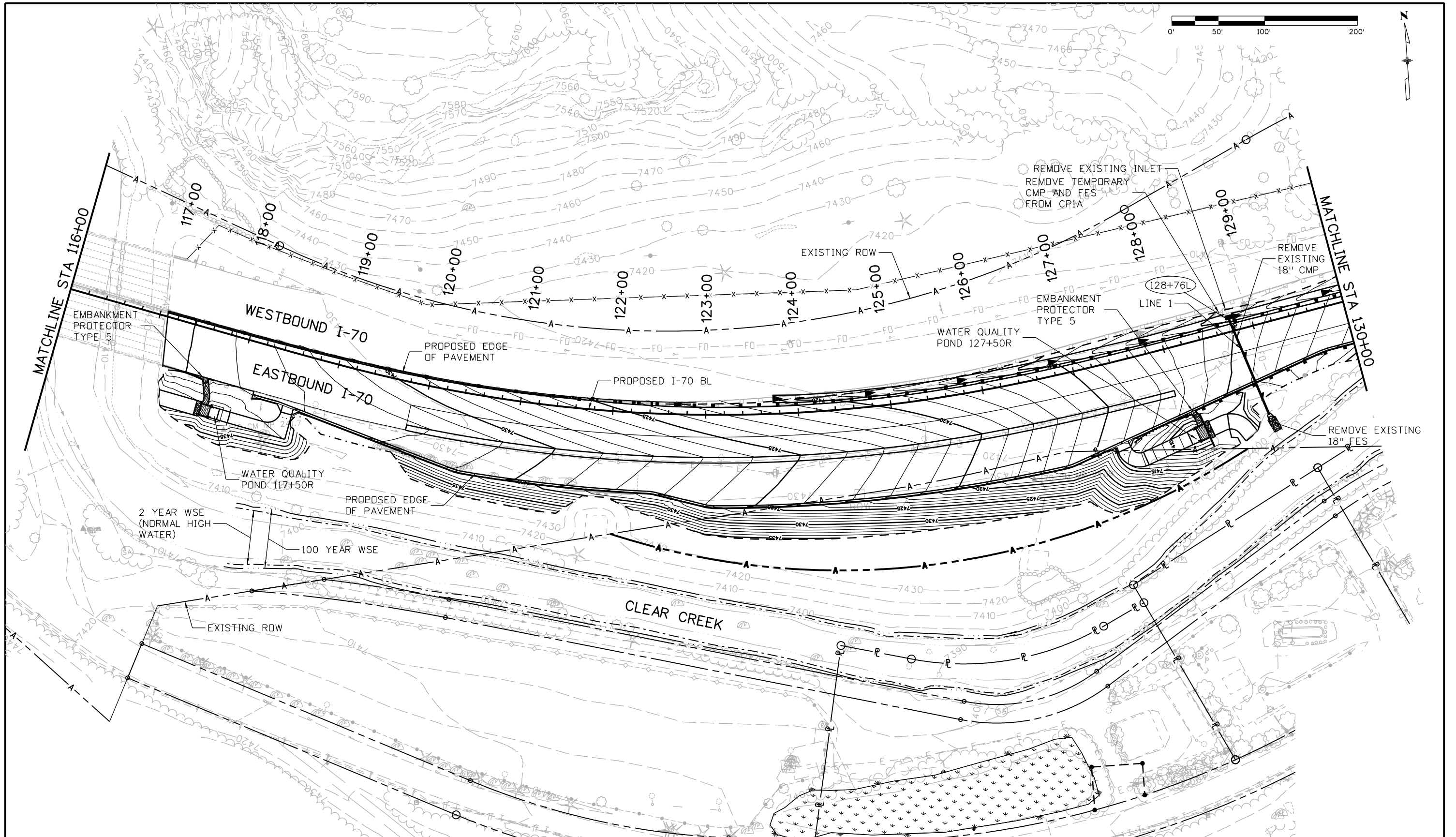
As Constructed
 No Revisions:
 Revised:
 Void:

**EASTBOUND I-70
 GRADING AND DRAINAGE PLAN
 STA 102+00 TO 116+00**

Designer: A. Finseth	Structure Numbers
Detailer: J. Gellner	
Subset: Drainage Plan	Subset Sheets: 1 of 13

Project No./Code
 IM 0703-391
 19036
 Sheet Number 91

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Print Date: 3/8/2013

File Name: 18832HYDR_CP2_Plan003.dgn

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Date:	Comments	Init.

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Region 1

CRC

As Constructed

No Revisions:

Revised:

Void:

**EASTBOUND I-70
GRADING AND DRAINAGE PLAN
STA 116+00 TO 130+00**

Designer:	A. Finseth	Structure Numbers	
Detailer:	J. Gellner	Subset Sheets:	2 of 13
Subset:	Drainage Plan		

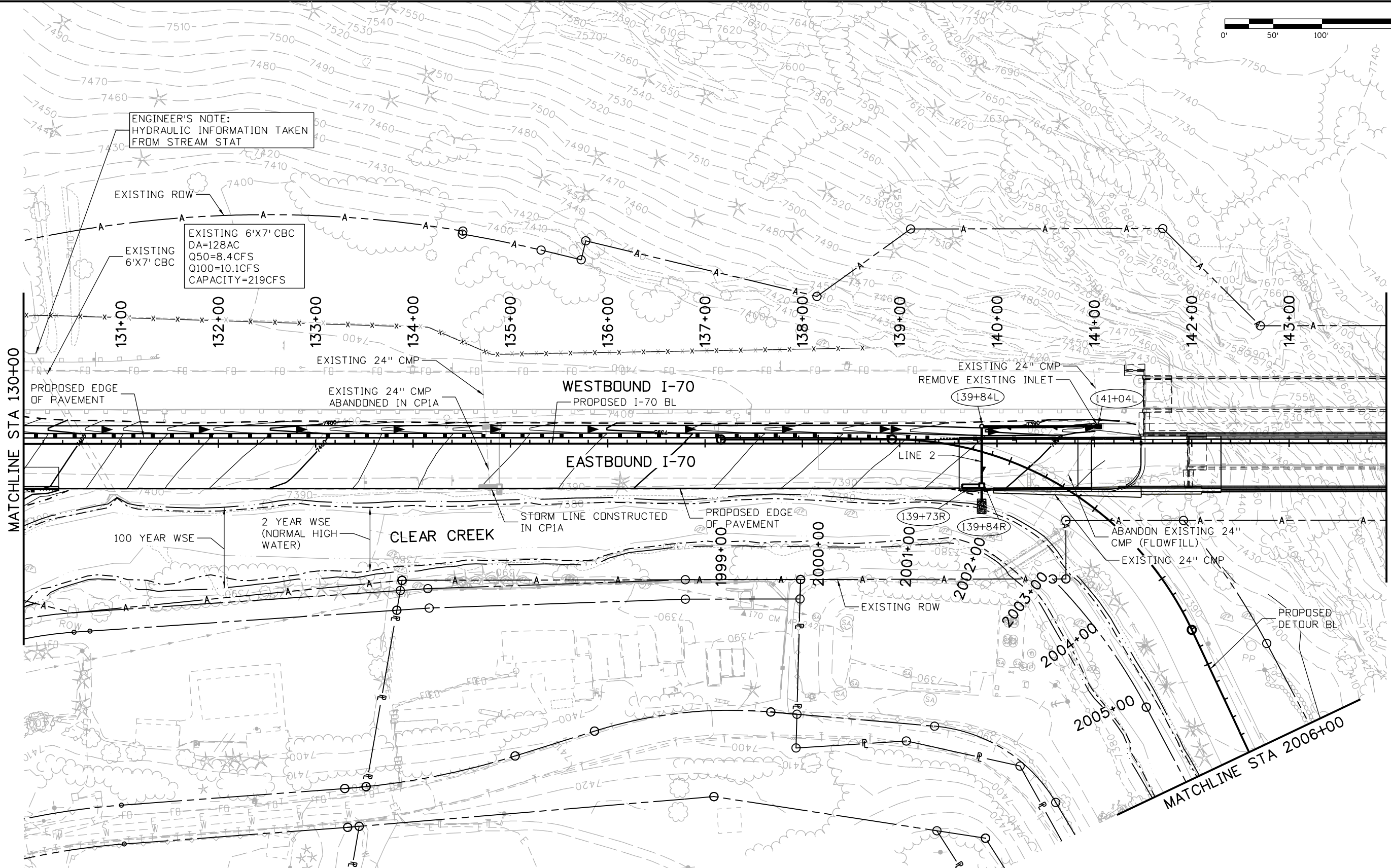
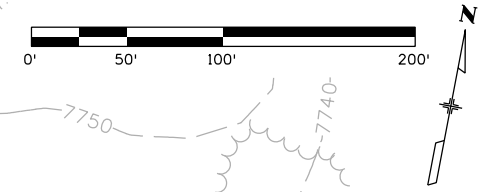
Project No./Code

IM 0703-391

19036

Sheet Number 92

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Print Date: 3/8/2013
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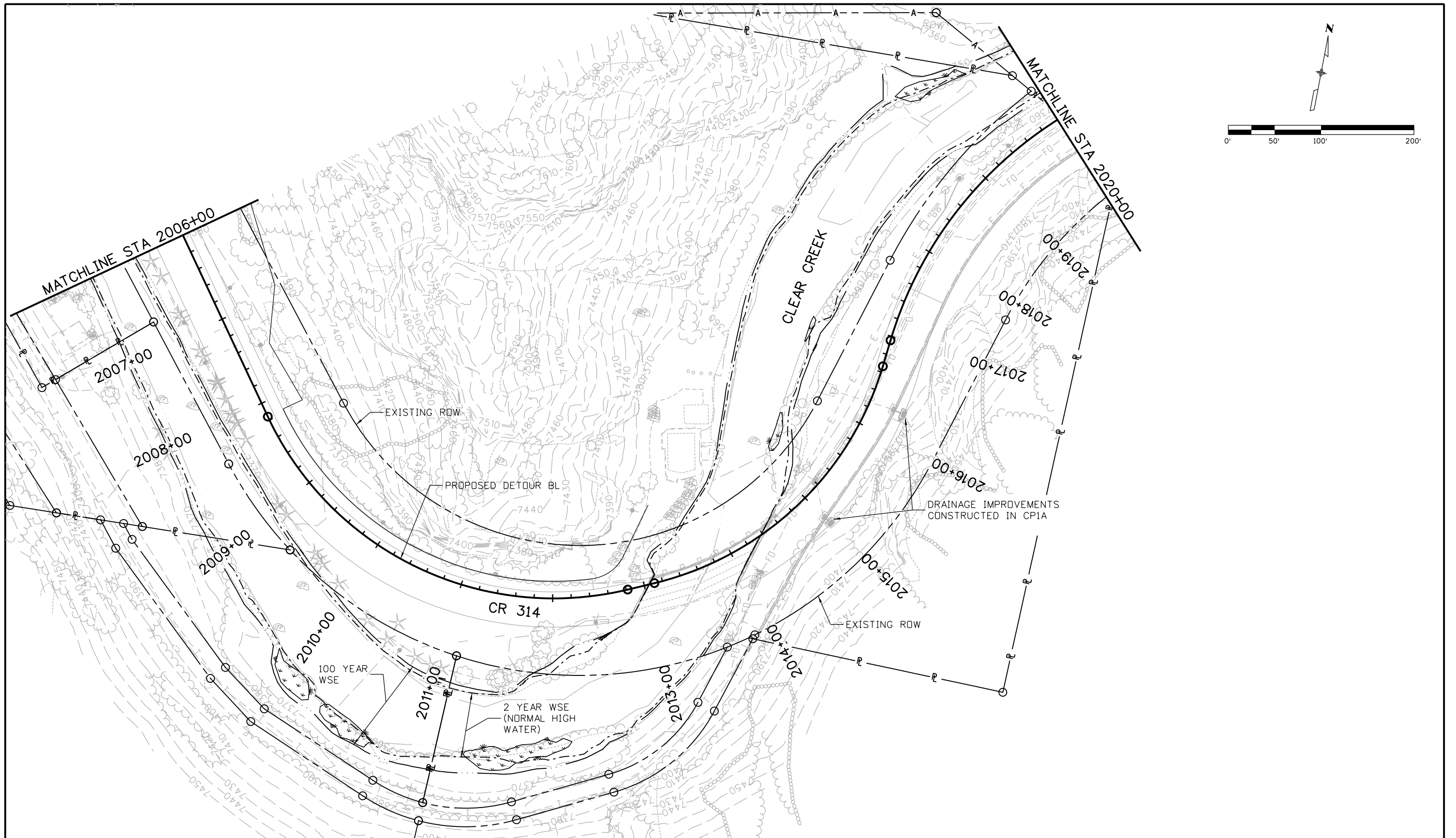
EASTBOUND I-70
 GRADING AND DRAINAGE PLAN
 STA 130+00 TO 144+00

Designer: A. Finseth
 Detailer: J. Gellner
 Subset: Drainage Plan

Structure Numbers
 Subset Sheets: 3 of 13

Project No./Code
 IM 0703-391
 19036
 Sheet Number 93

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Print Date: 3/8/2013
 File Name: 18832HYDR_CP2_Plan004A.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

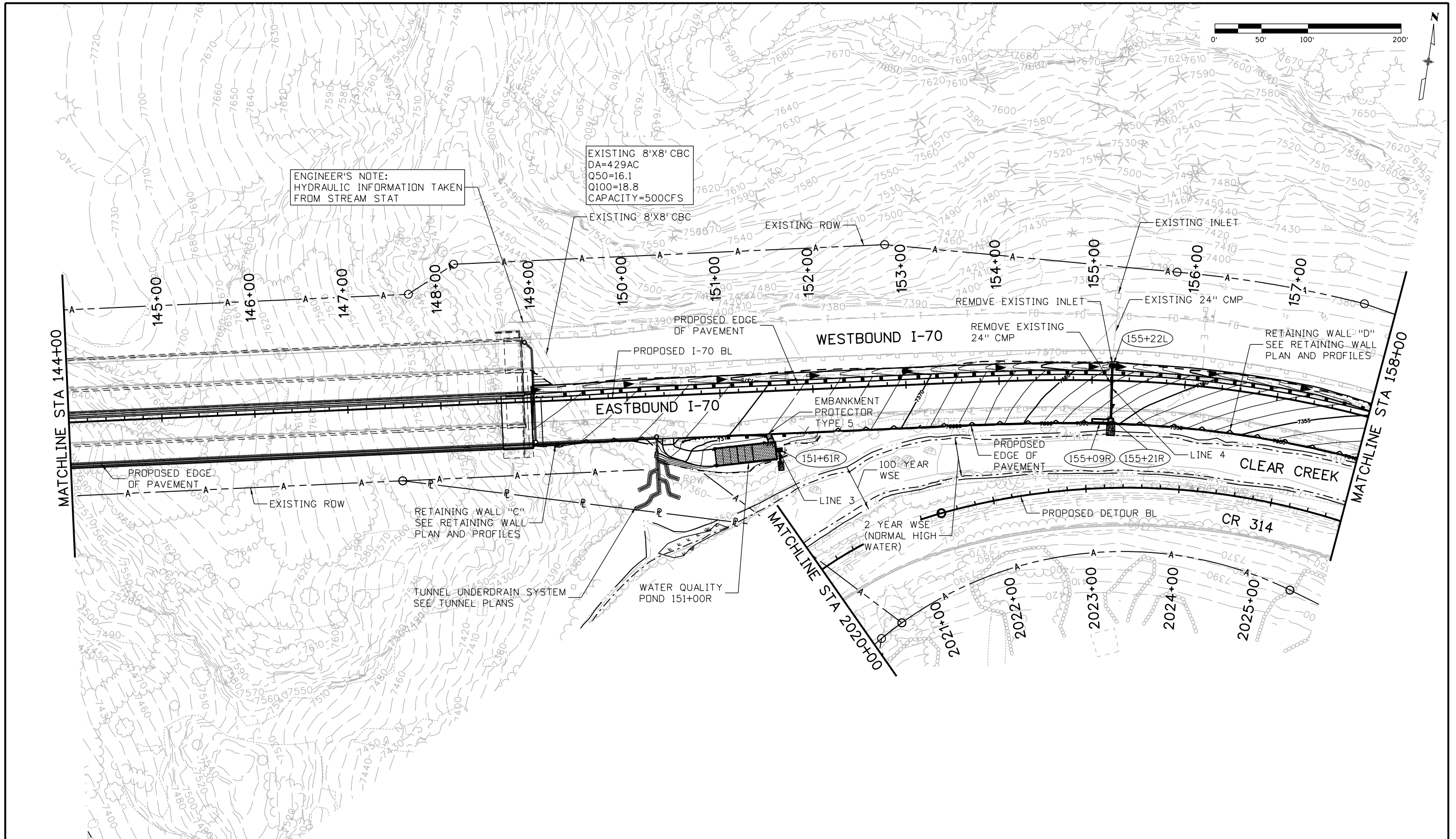
 425 A Corporate Circle
 Golden, CO 80401
 Phone: 720-497-6918 FAX: 720-497-6901
 Region 1 CRC

As Constructed
 No Revisions:
 Revised:
 Void:

EASTBOUND I-70
 GRADING AND DRAINAGE PLAN
 STA 2006+00 TO 2020+00
 Designer: A. Finseth
 Detailer: J. Gellner
 Subset: Drainage Plan
 Structure Numbers
 Subset Sheets: 4 of 13

Project No./Code
 IM 0703-391
 19036
 Sheet Number 94

17543 9:26:26 AM c:\pw_work\pbes\pwi\common\dms26969\18832HYDR_CP2_Plan004A.dgn




ENGINEER'S NOTE:
HYDRAULIC INFORMATION TAKEN
FROM STREAM STAT

EXISTING 8'X8' CBC
DA=429AC
Q50=16.1
Q100=18.8
CAPACITY=500CFS

Print Date: 3/8/2013
File Name: 18832HYDR_CP2_Plan005.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.

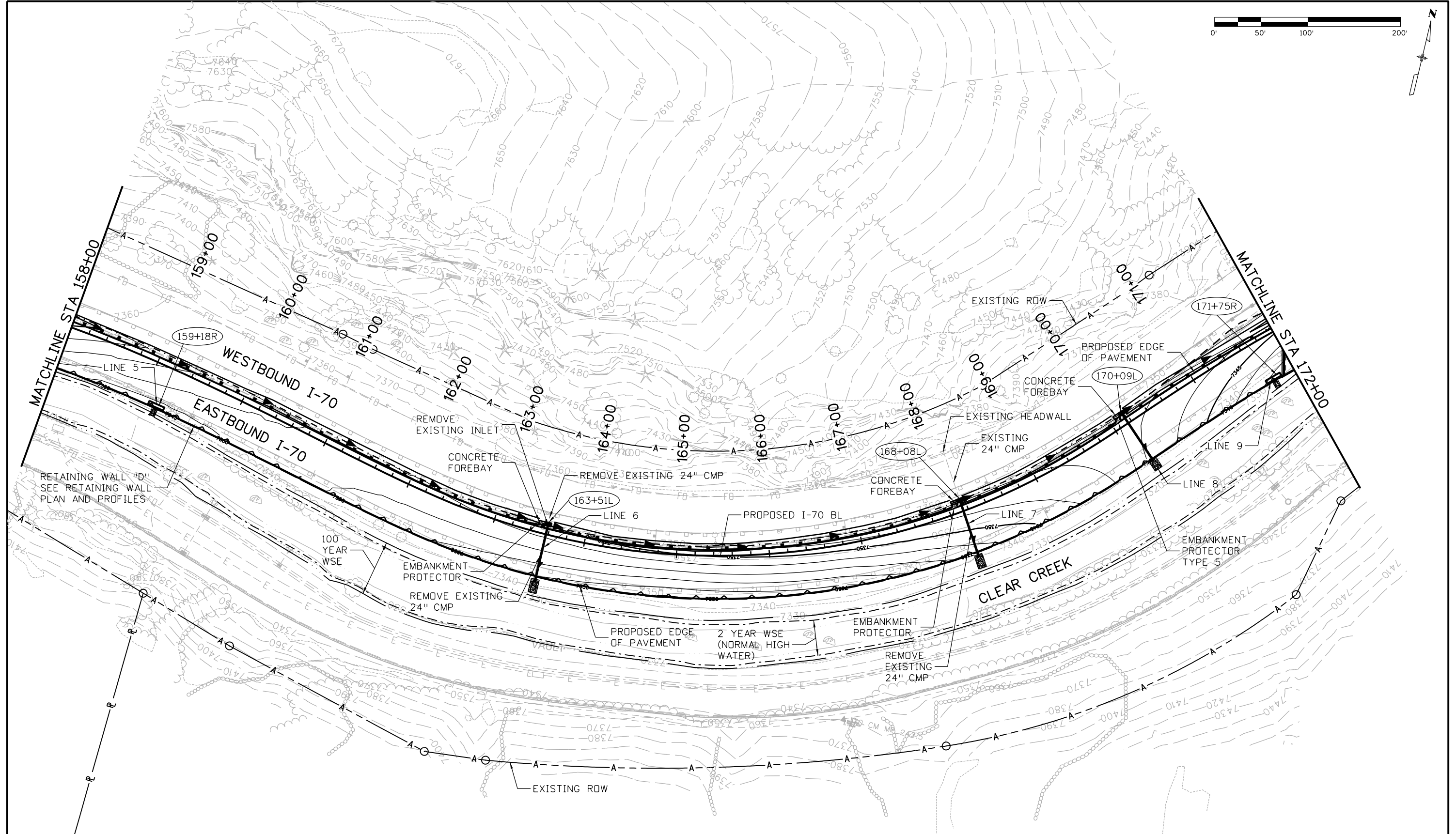
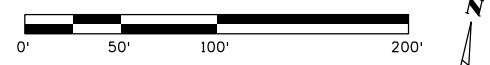
Colorado Department of Transportation
 425 A Corporate Circle
 Golden, CO 80401
 Phone: 720-497-6918 FAX: 720-497-6901
 Region 1 CRC

As Constructed
 No Revisions:
 Revised:
 Void:

**EASTBOUND I-70
 GRADING AND DRAINAGE PLAN
 STA 144+00 TO 158+00**
 Designer: A. Finseth
 Detailer: J. Gellner
 Subset: Drainage Plan
 Structure Numbers
 Subset Sheets: 5 of 13

Project No./Code
 IM 0703-391
 19036
 Sheet Number 95

17543 9:26:40 AM c:\pw_work\pbs\pw\common\dms26969\18832HYDR_CP2_Plan005.dgn



Print Date: 3/8/2013
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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

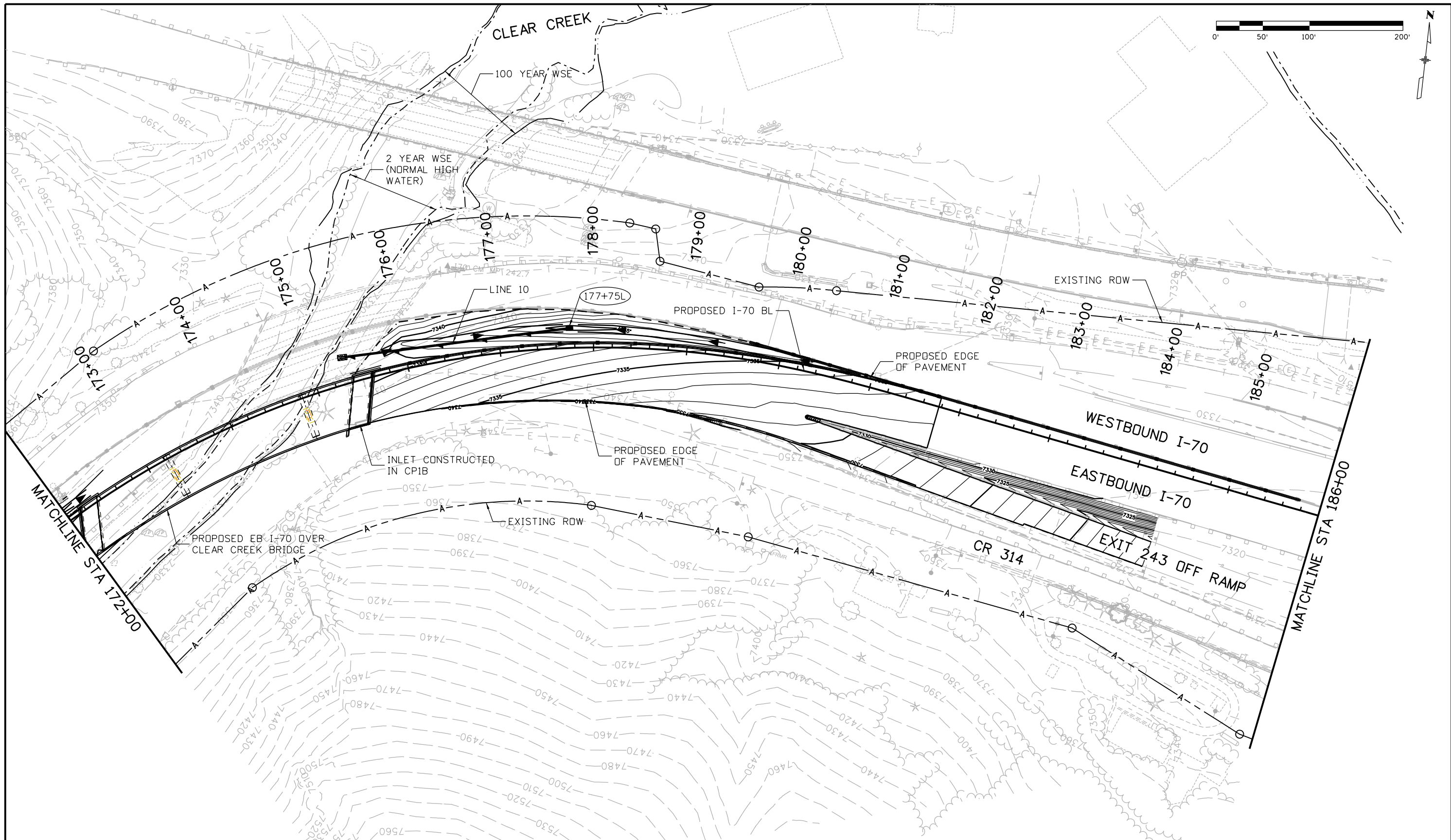
 425 A Corporate Circle
 Golden, CO 80401
 Phone: 720-497-6918 FAX: 720-497-6901
 Region 1 CRC

As Constructed
No Revisions:
Revised:
Void:

EASTBOUND I-70 GRADING AND DRAINAGE PLAN STA 158+00 TO 172+00		
Designer:	A. Finseth	Structure Numbers
Detailer:	J. Gellner	
Subset:	Drainage Plan	Subset Sheets: 6 of 13

Project No./Code
IM 0703-391
19036
Sheet Number 96

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 Phone: (303) 221-7275 Fax: (303) 221-7276

Sheet Revisions		
Date:	Comments	Init.

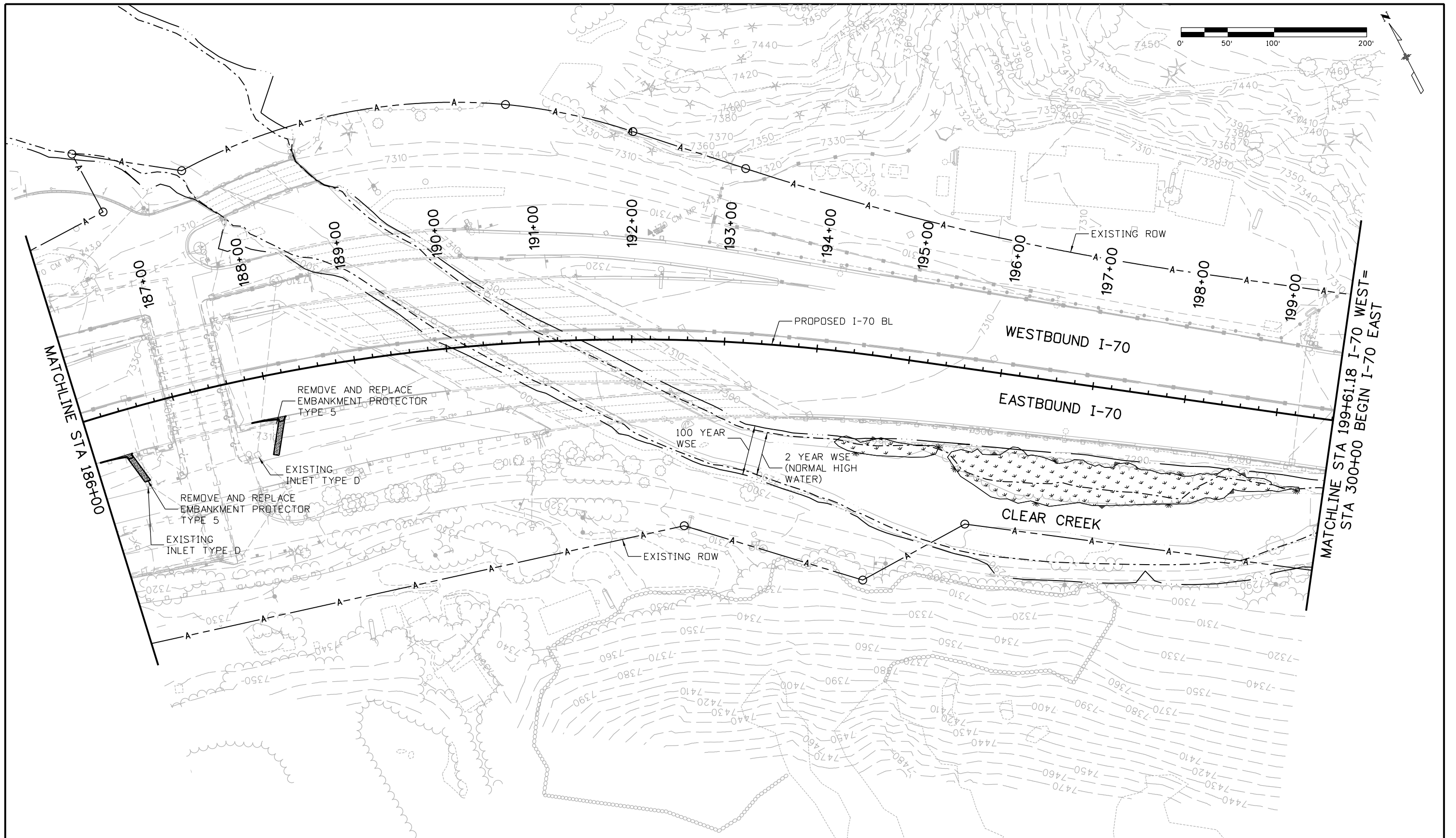
Colorado Department of Transportation
 425 A Corporate Circle
 Golden, CO 80401
 Phone: 720-497-6918 FAX: 720-497-6901
Region 1 CRC

As Constructed
 No Revisions:
 Revised:
 Void:

**EASTBOUND I-70
 GRADING AND DRAINAGE PLAN
 STA 172+00 TO 186+00**
 Designer: A. Finseth
 Detailer: J. Gellner
 Subset: Drainage Plan
 Structure Numbers
 Subset Sheets: 7 of 13

Project No./Code
 IM 0703-391
 19036
 Sheet Number 97

17543 9:27:07 AM c:\pw_work\pbs\pw\common\dms26969\18832HYDR_CP2_Plan007.dgn




Print Date: 3/8/2013
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 Horiz. Scale: 1:100 Vert. Scale: 1"=20'

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Sheet Revisions		
Date:	Comments	Init.

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Region 1 CRC

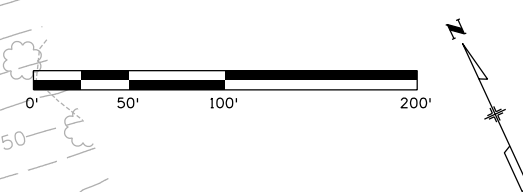
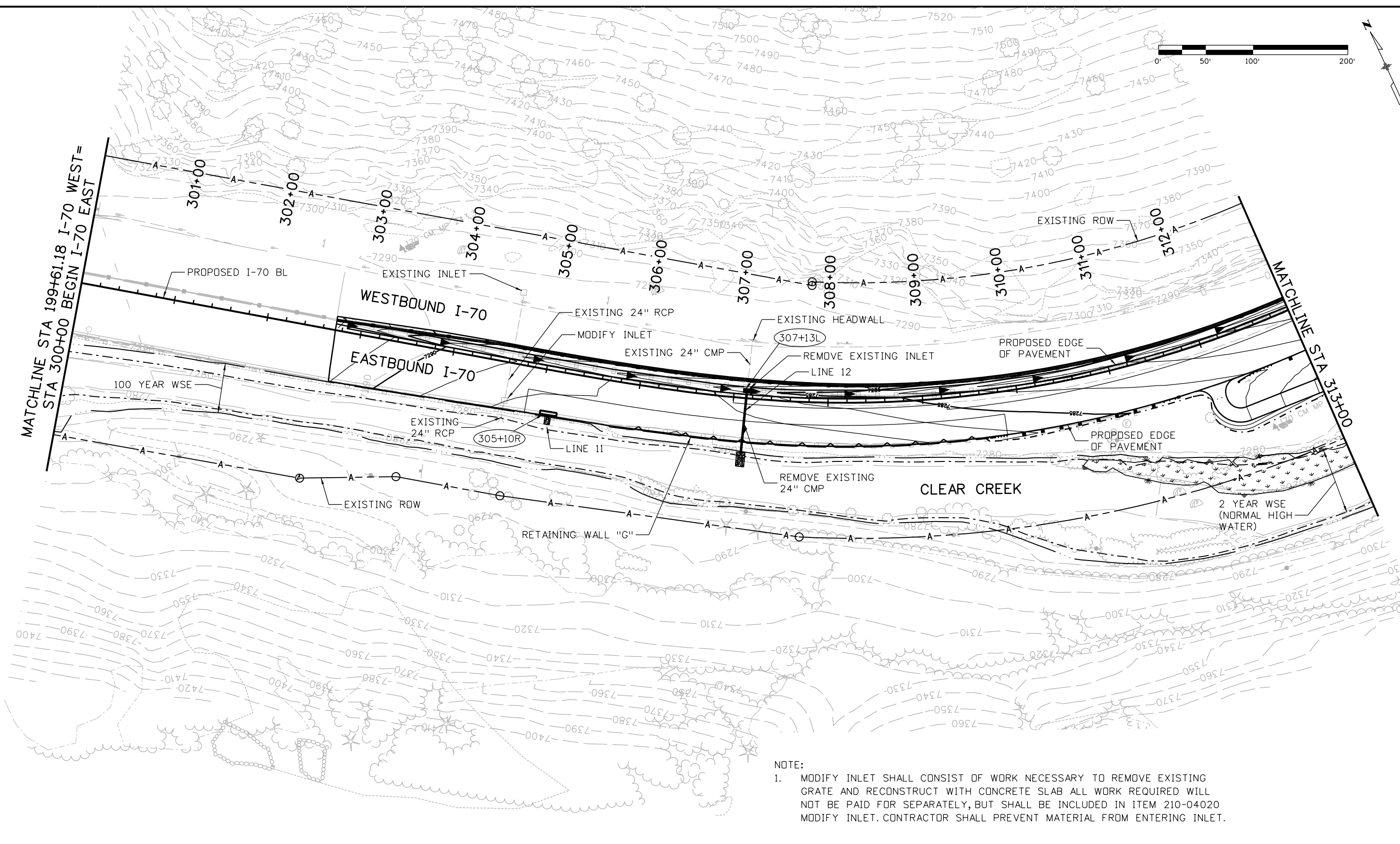
As Constructed
No Revisions:
Revised:
Void:

**EASTBOUND I-70
 GRADING AND DRAINAGE PLAN
 STA 186+00 TO 199+61.18**

Designer:	A. Finseth	Structure Numbers	
Detailer:	J. Gellner	Subset Sheets:	8 of 13
Subset:	Drainage Plan		

Project No./Code
IM 0703-391
19036
Sheet Number 98

17543 9:27:21 AM c:\pw_work\pbis\pwl\comon\dms26969\18832HYDR_CP2_Plan008.dgn



NOTE:
 1. MODIFY INLET SHALL CONSIST OF WORK NECESSARY TO REMOVE EXISTING GRATE AND RECONSTRUCT WITH CONCRETE SLAB ALL WORK REQUIRED WILL NOT BE PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN ITEM 210-04020 MODIFY INLET. CONTRACTOR SHALL PREVENT MATERIAL FROM ENTERING INLET.

Print Date: 3/8/2013
 File Name: 18832HYDR_CP2_Plan009.dgn
 Horiz. Scale: 1:100 Vert. Scale: 1"=20'
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

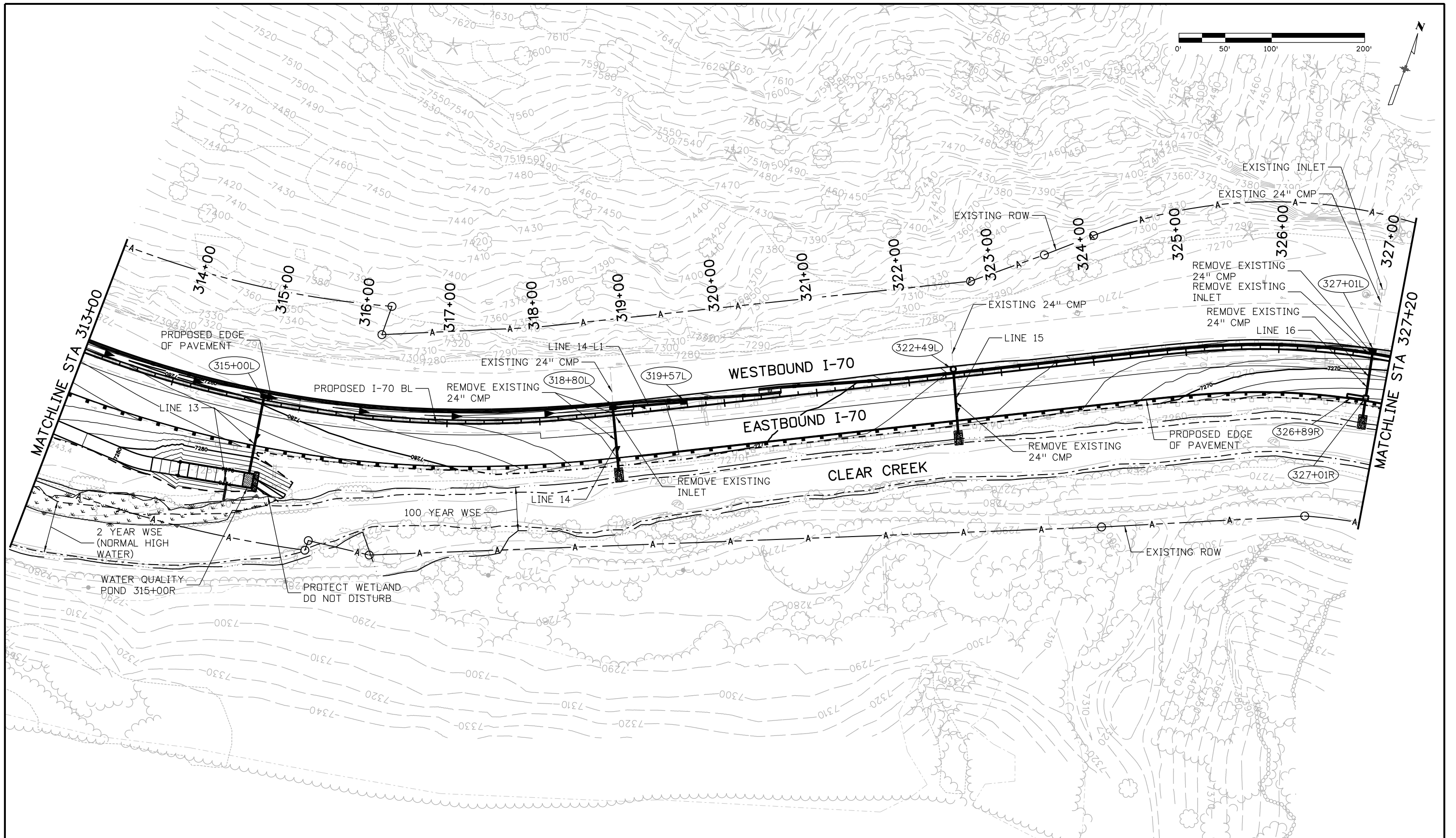
 425 A Corporate Circle
 Golden, CO 80401
 Phone: 720-497-6918 FAX: 720-497-6901
 Region 1 CRC

As Constructed
 No Revisions:
 Revised:
 Void:

**EASTBOUND I-70
 GRADING AND DRAINAGE PLAN
 STA 300+00 TO 313+00**
 Designer: A. Finseth
 Detailer: J. Gellner
 Subset: Drainage Plan
 Structure Numbers
 Subset Sheets: 9 of 13


Project No./Code
 IM 0703-391
 19036
 Sheet Number 99

17543 9:27:34 AM c:\pw_work\pbs\jpw\common\dms26969\18832HYDR_CP2_Plan009.dgn



Print Date: 3/8/2013
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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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Region 1 **CRC**

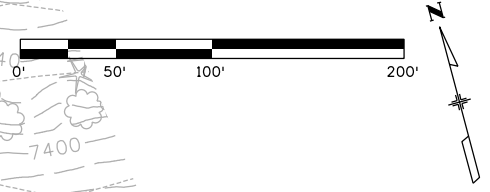
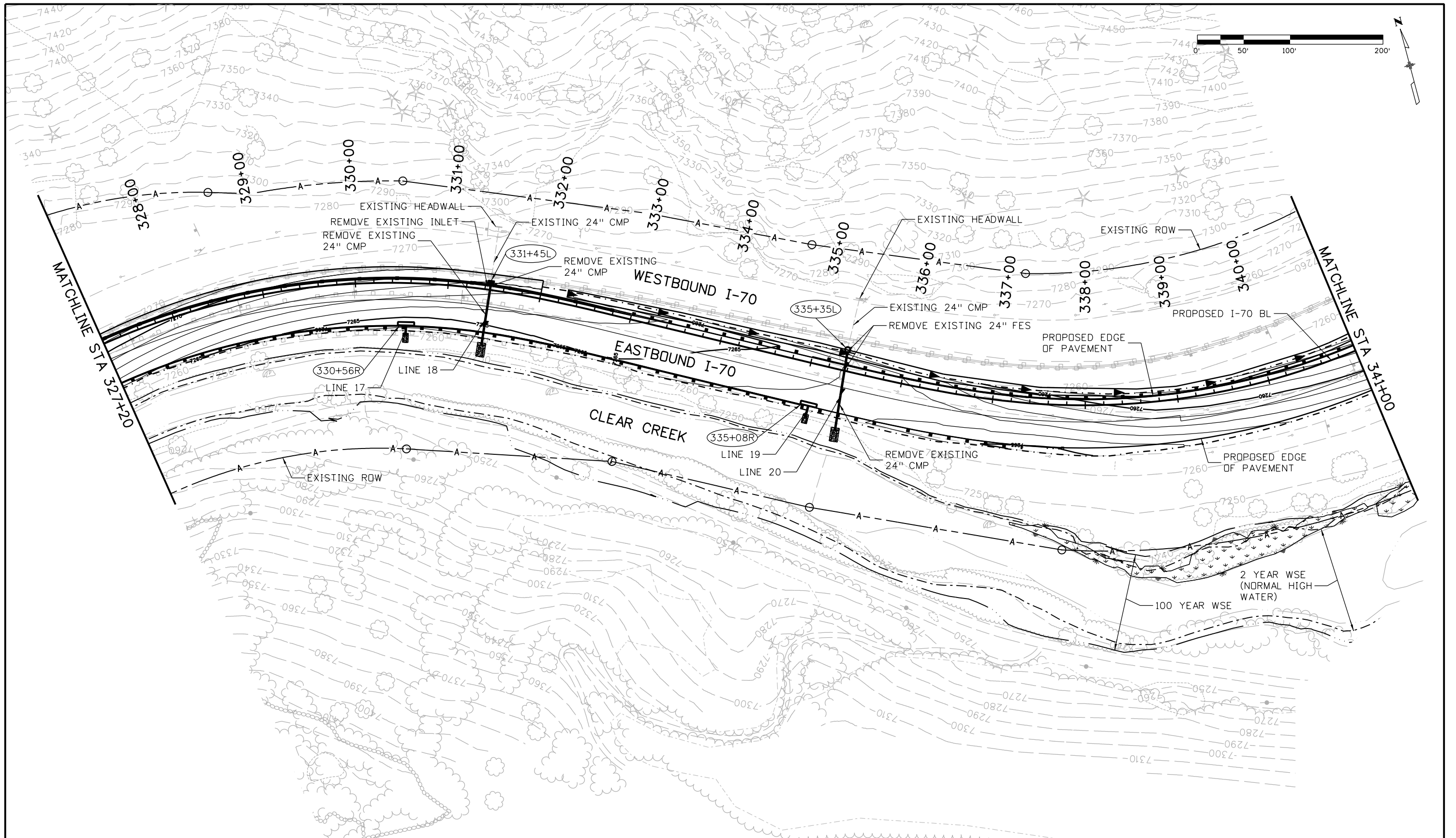
As Constructed
 No Revisions:
 Revised:
 Void:

**EASTBOUND I-70
 GRADING AND DRAINAGE PLAN
 STA 313+00 TO 327+20**

Designer:	A. Finseth	Structure Numbers	
Detailer:	J. Gellner	Subset Sheets:	10 of 13
Subset:	Drainage Plan		

Project No./Code
 IM 0703-391
 19036
 Sheet Number 100

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Print Date: 3/8/2013
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 Horiz. Scale: 1:100 Vert. Scale: 1"=20'

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Sheet Revisions		
Date:	Comments	Init.

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Region 1 CRC

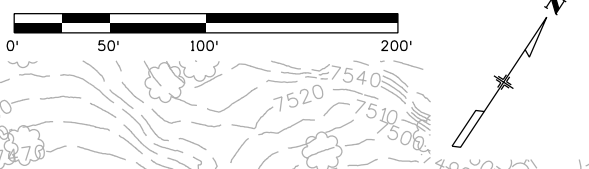
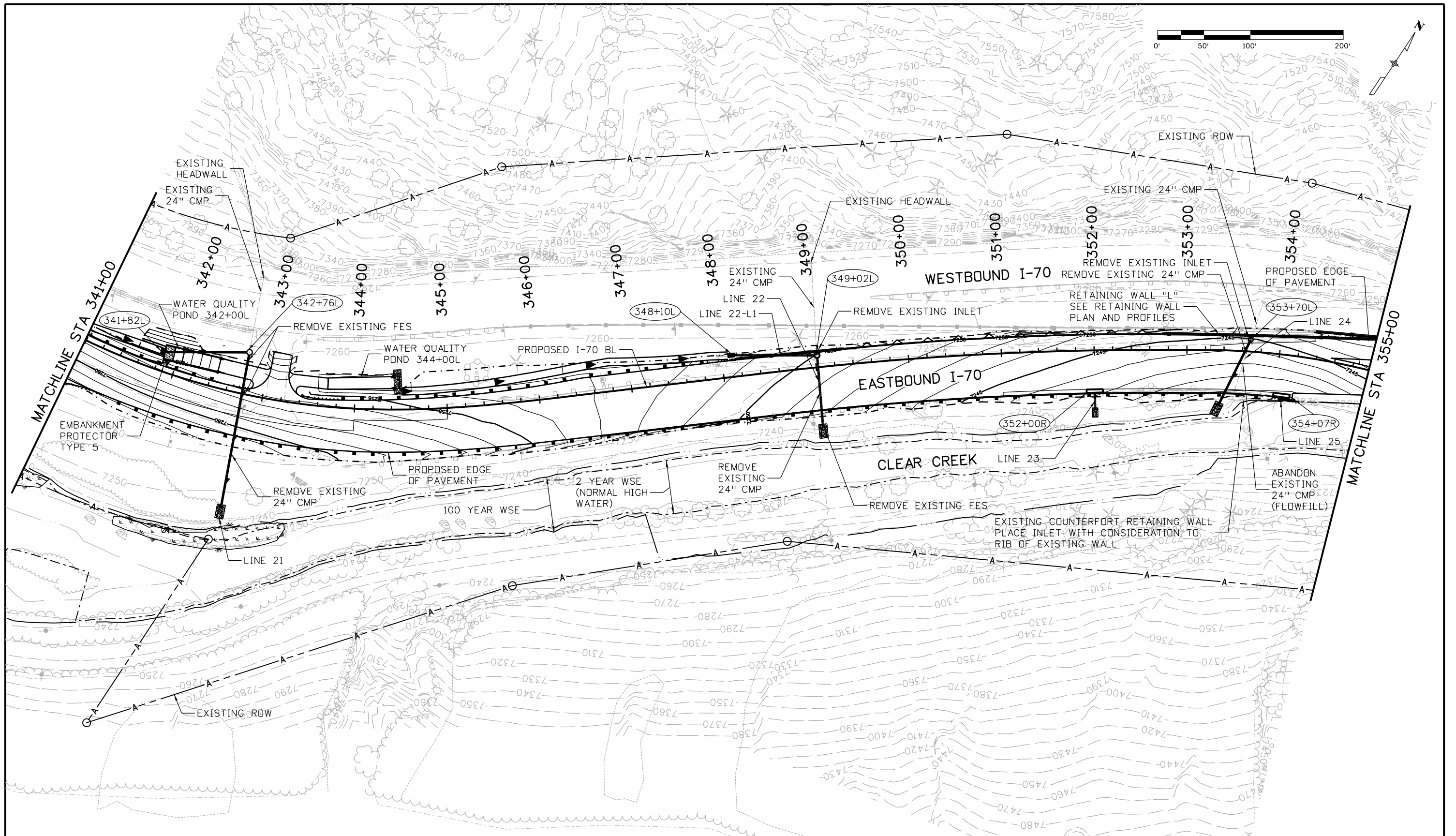
As Constructed
No Revisions:
Revised:
Void:

**EASTBOUND I-70
 GRADING AND DRAINAGE PLAN
 STA 327+20 TO 341+00**

Designer: A. Finseth	Structure Numbers
Detailer: J. Gellner	
Subset: Drainage Plan	Subset Sheets: 11 of 13

Project No./Code
IM 0703-391
19036
Sheet Number 101

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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



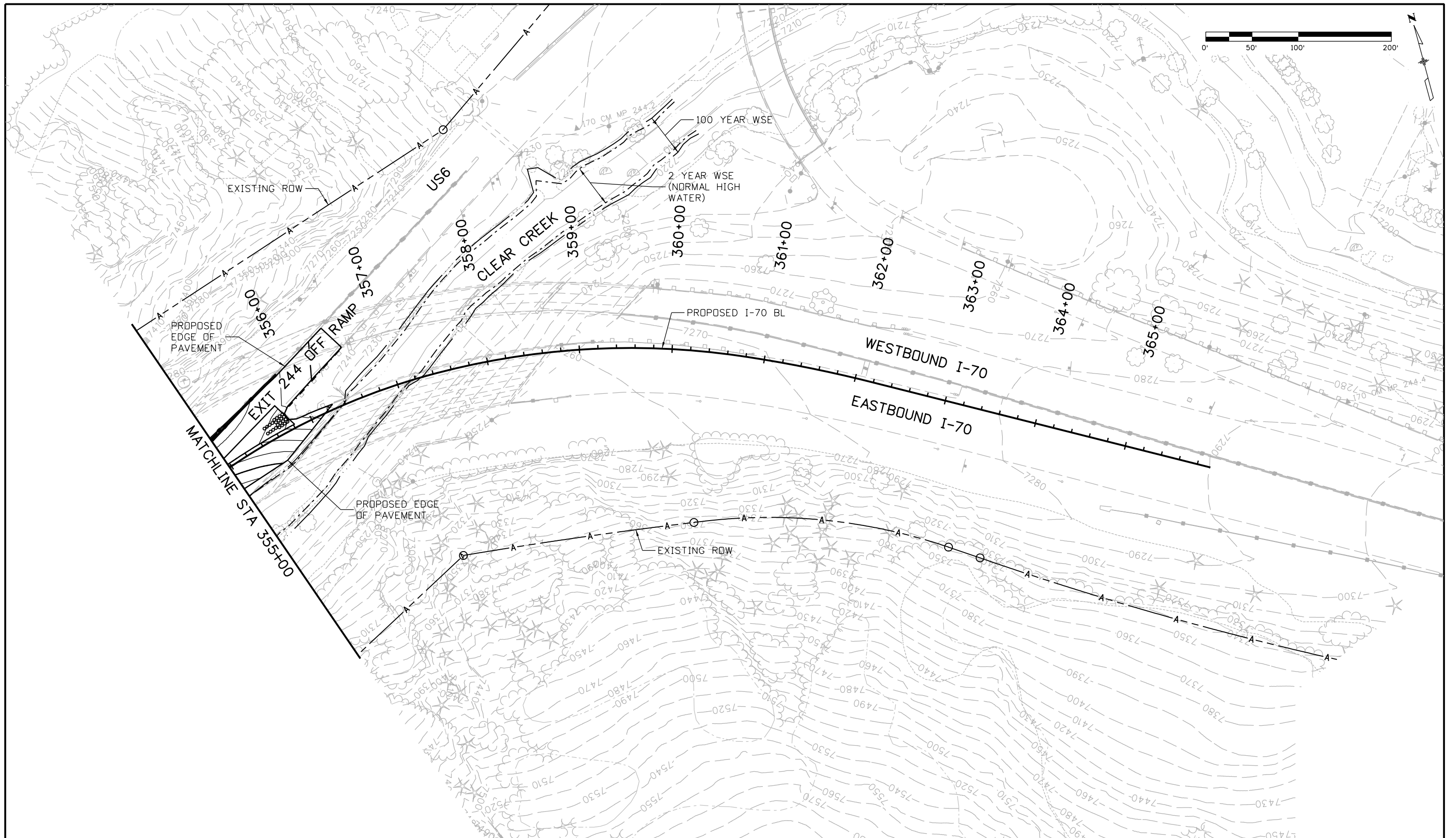
425 A Corporate Circle
Golden, CO 80401
Phone: 720-497-6918 FAX: 720-497-6901

Region 1 CRC

As Constructed
No Revisions:
Revised:
Void:

EASTBOUND I-70 GRADING AND DRAINAGE PLAN STA 341+00 TO 355+00		
Designer:	A. Finseth	Structure Numbers
Detailer:	J. Gellner	
Subset:	Drainage Plan	Subset Sheets: 12 of 13

Project No./Code
IM 0703-391
19036
Sheet Number 102



Print Date: 3/8/2013
 File Name: 18832HYDR_CP2_Plan013.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.

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 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:

**EASTBOUND I-70
 GRADING AND DRAINAGE PLAN
 STA 355+00 TO 365+96.69**

Designer: A. Finseth
 Detailer: J. Gellner
 Subset: Drainage Plan

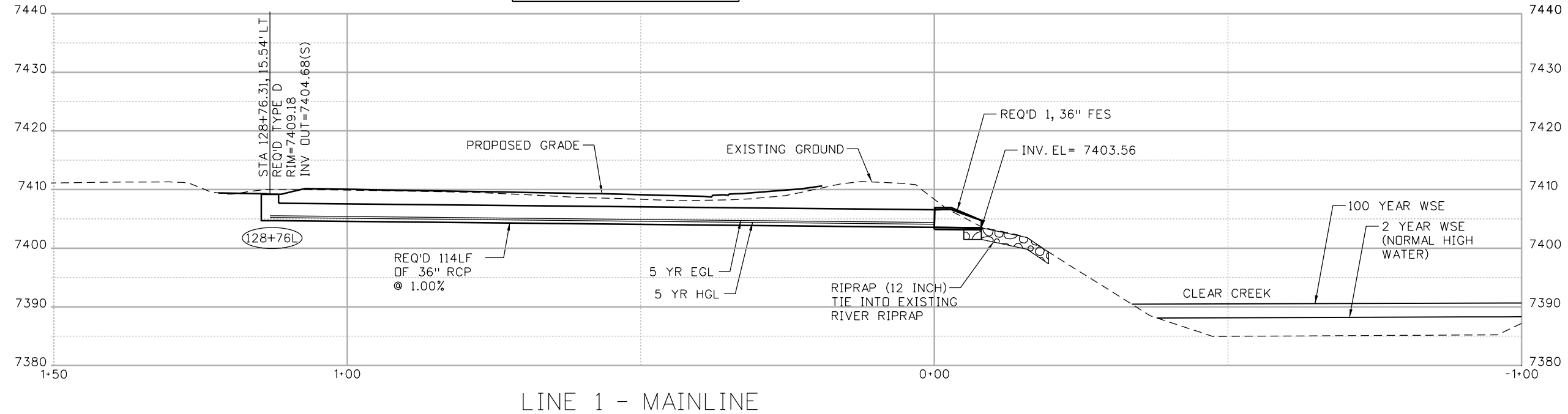
Structure Numbers
 Subset Sheets: 13 of 13

Project No./Code
 IM 0703-391
 19036
 Sheet Number 103

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17543 9:15:41 AM c:\pw_work\work\pds\pds\18832HYDR_CP2_Xsec001.dgn

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D.A. = 1.61 AC	
Q ₅ = 2.59 CFS, V ₅ = 5 FPS	
Q ₁₀₀ = 4.70 CFS, V ₁₀₀ = 5 FPS	



Print Date: 3/8/2013	
File Name: 18832HYDR_CP2_Xsec001.dgn	
Horiz. Scale: 1:20	Vert. Scale: 1"=20'
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

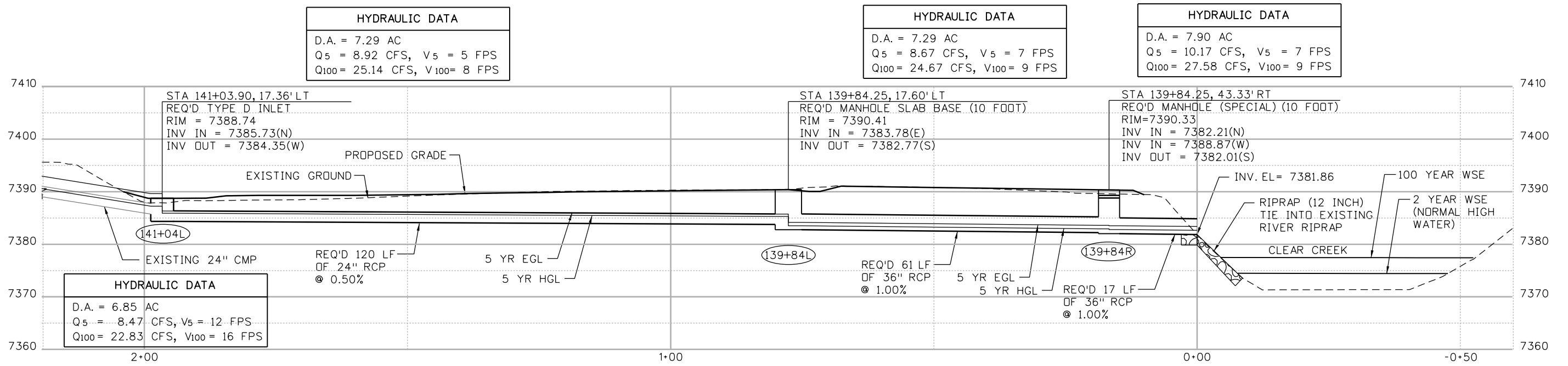
425 A Corporate Circle
Golden, CO 80401
Phone: 720-497-6918 FAX: 720-497-6901

Region 1 CRC

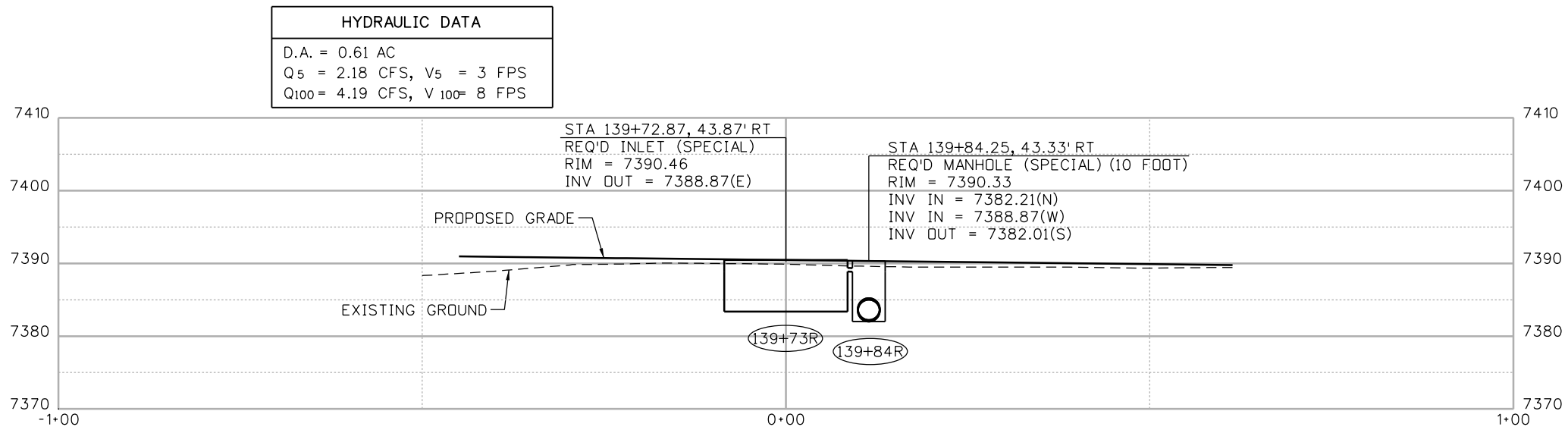
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Revised:	
Void:	

STORM SEWER PROFILES			
Designer:	A. Finseth	Structure Numbers	
Detailer:	B. Gaines		
Subset:	Drainage Prof	Subset Sheets: 1 of 18	

Project No./Code	
IM 0703-391	
19036	
Sheet Number	104



LINE 2 - MAINLINE



LINE 2-L1 - MAINLINE

Print Date: 3/8/2013
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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
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 Region 1 **CRC**

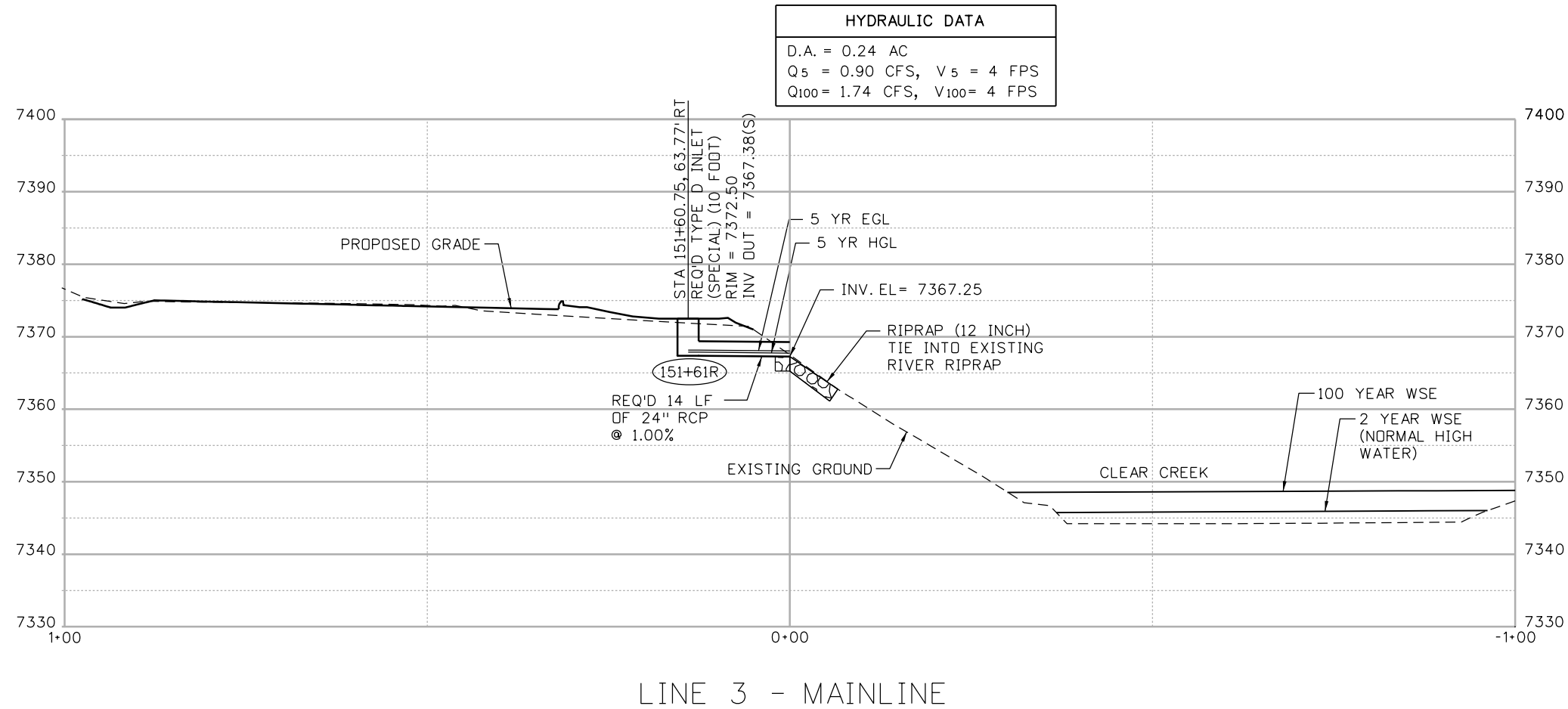
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 Revised:
 Void:

STORM SEWER PROFILES			
Designer:	A. Finseth	Structure	
Detailer:	B. Gaines	Numbers	
Subset:	Drainage Prof	Subset Sheets:	2 of 18

Project No./Code
 IM 0703-391
 19036
 Sheet Number 105

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17543 9:15:57 AM c:\pw_work\pbes\pbes\work\pbes\pbes\18832HYDR_CP2_Xsec003.dgn



HYDRAULIC DATA	
D.A.	= 0.24 AC
Q ₅	= 0.90 CFS, V ₅ = 4 FPS
Q ₁₀₀	= 1.74 CFS, V ₁₀₀ = 4 FPS

Print Date: 3/8/2013
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 Horiz. Scale: 1:20 Vert. Scale: 1"=20'

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

Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation

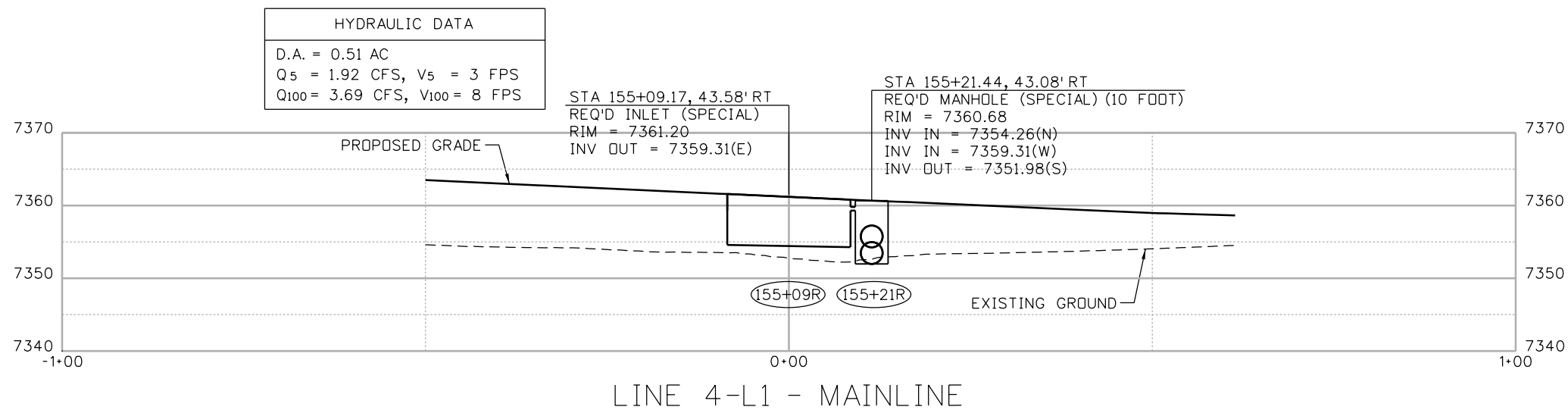
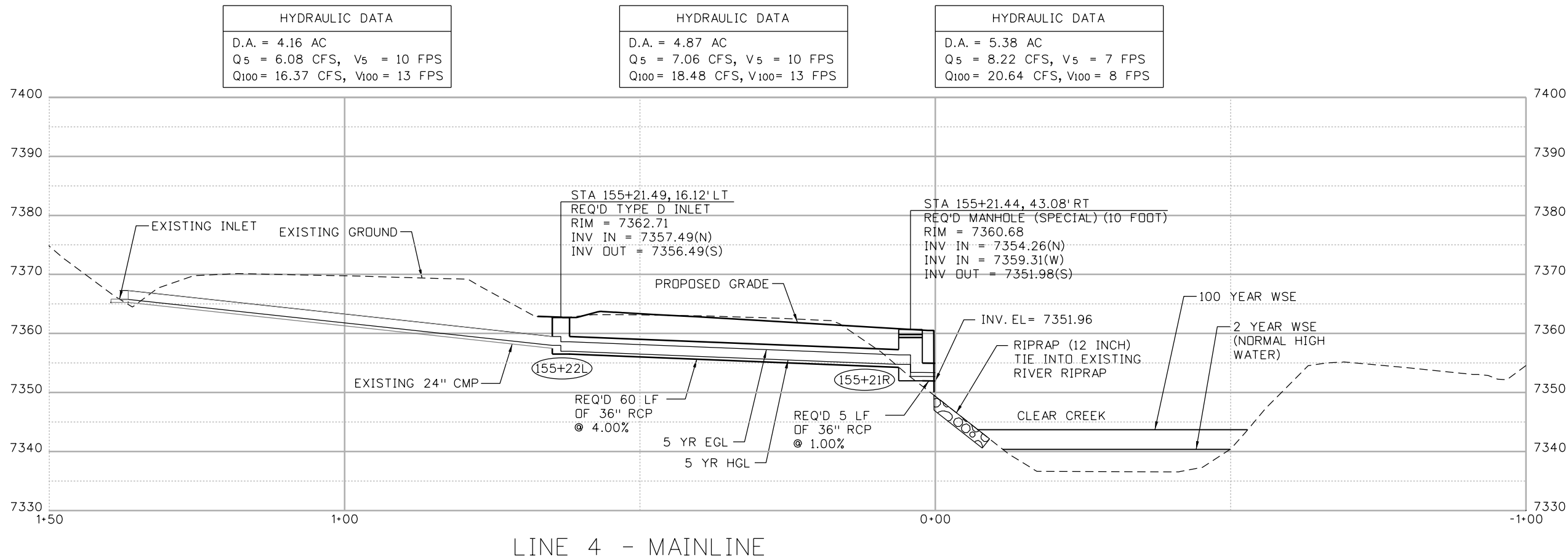
DOT 425 A Corporate Circle
 Golden, CO 80401
 Phone: 720-497-6918 FAX: 720-497-6901

Region 1 **CRC**

As Constructed
No Revisions:
Revised:
Void:

STORM SEWER PROFILES		
Designer:	A. Finseth	Structure Numbers
Detailer:	B. Gaines	
Subset:	Drainage Prof	Subset Sheets: 3 of 18

Project No./Code
IM 0703-391
19036
Sheet Number 106



Print Date: 3/8/2013
 File Name: 18832HYDR_CP2_Xsec004.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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Region 1 CRC

As Constructed

No Revisions:
 Revised:
 Void:

STORM SEWER PROFILES

Designer: A. Finseth
 Detailer: B. Gaines
 Subset: Drainage Prof

Structure Numbers
 Subset Sheets: 4 of 18

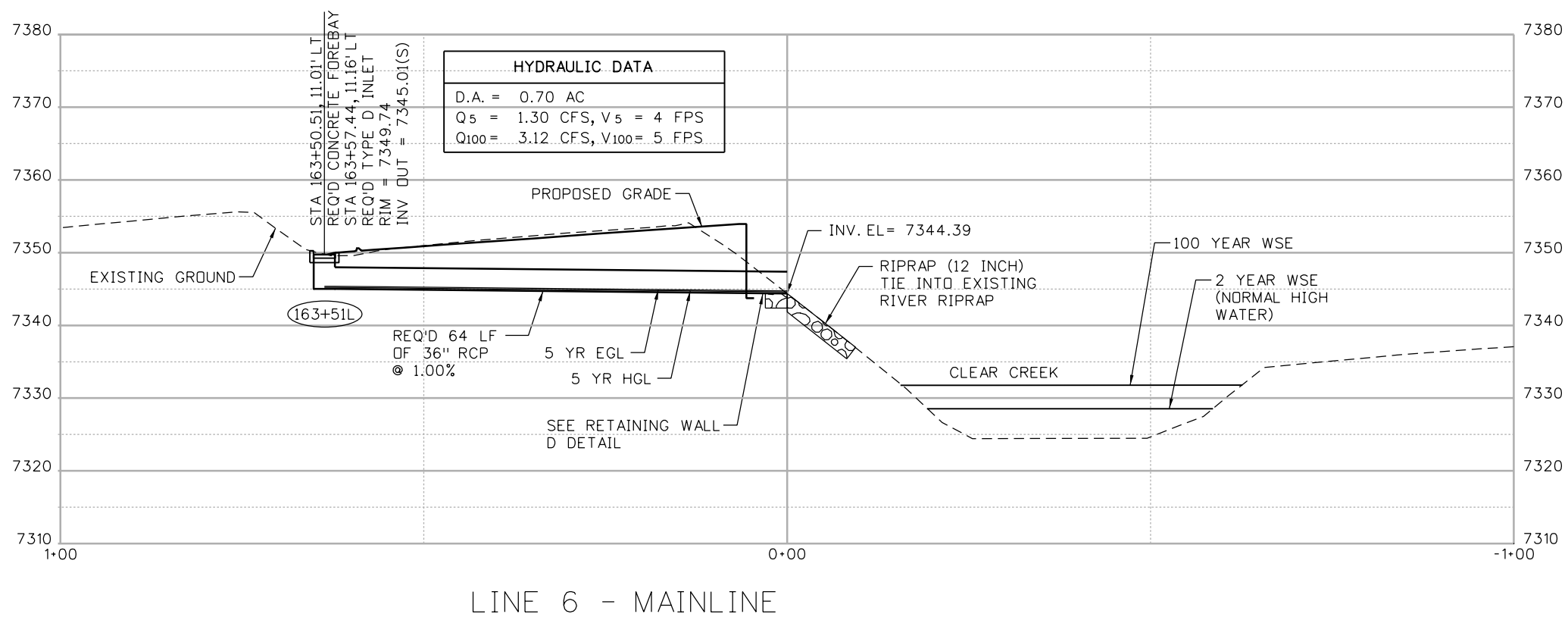
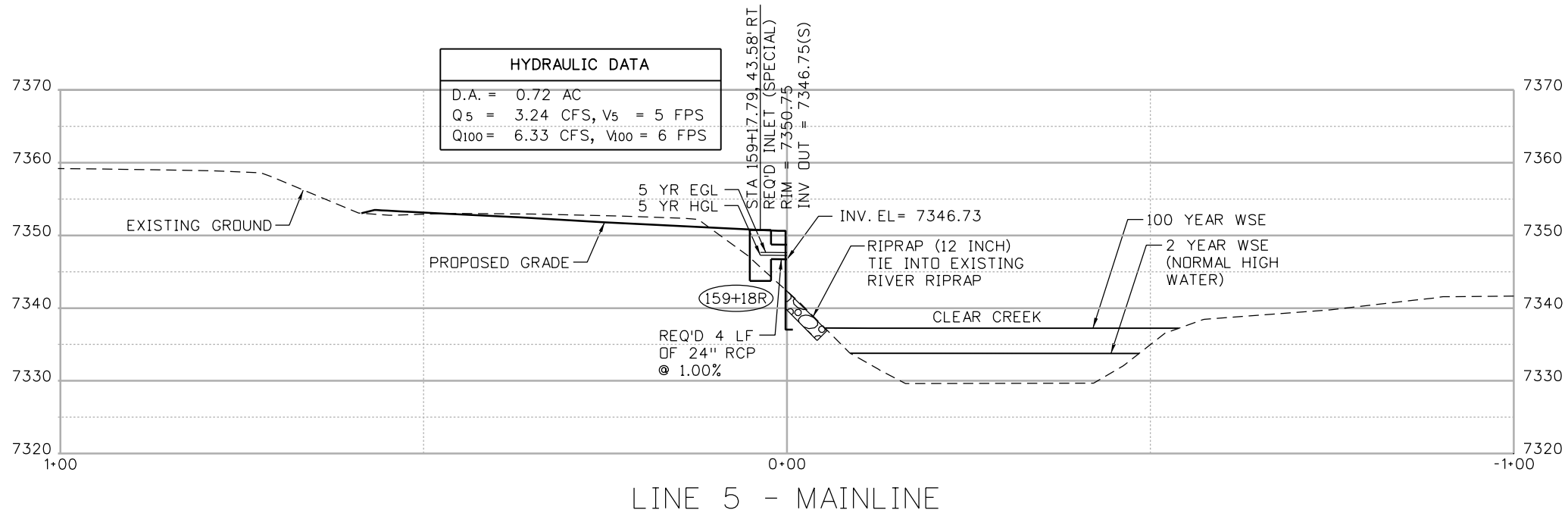
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IM 0703-391

19036

Sheet Number 107

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

Region 1 **CRC**

As Constructed
No Revisions:
Revised:
Void:

STORM SEWER PROFILES		
Designer:	A. Finseth	Structure Numbers
Detailer:	B. Gaines	
Subset:	Drainage Prof	Subset Sheets: 5 of 18

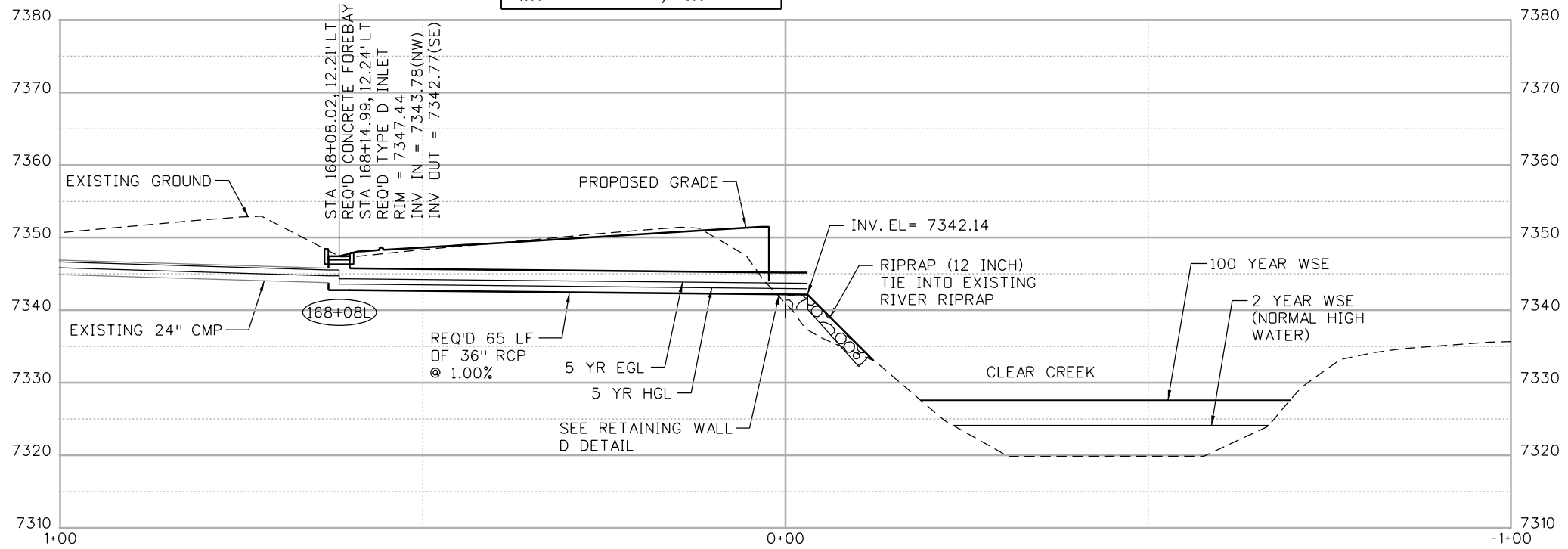
Project No./Code
IM 0703-391
19036
Sheet Number 108

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HYDRAULIC DATA
D.A. = 10.00 AC
Q ₅ = 10.53 CFS, V ₅ = 7 FPS
Q ₁₀₀ = 27.08 CFS, V ₁₀₀ = 9 FPS

HYDRAULIC DATA
D.A. = 10.72 AC
Q ₅ = 12.17 CFS, V ₅ = 7 FPS
Q ₁₀₀ = 30.85 CFS, V ₁₀₀ = 9 FPS



LINE 7 - MAINLINE

Print Date: 3/8/2013
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ATKINS 4601 DTC Boulevard, Suite 700
 Denver, CO 80237
 Phone: (303) 221-7275 Fax: (303) 221-7276

Sheet Revisions		
Date:	Comments	Init.

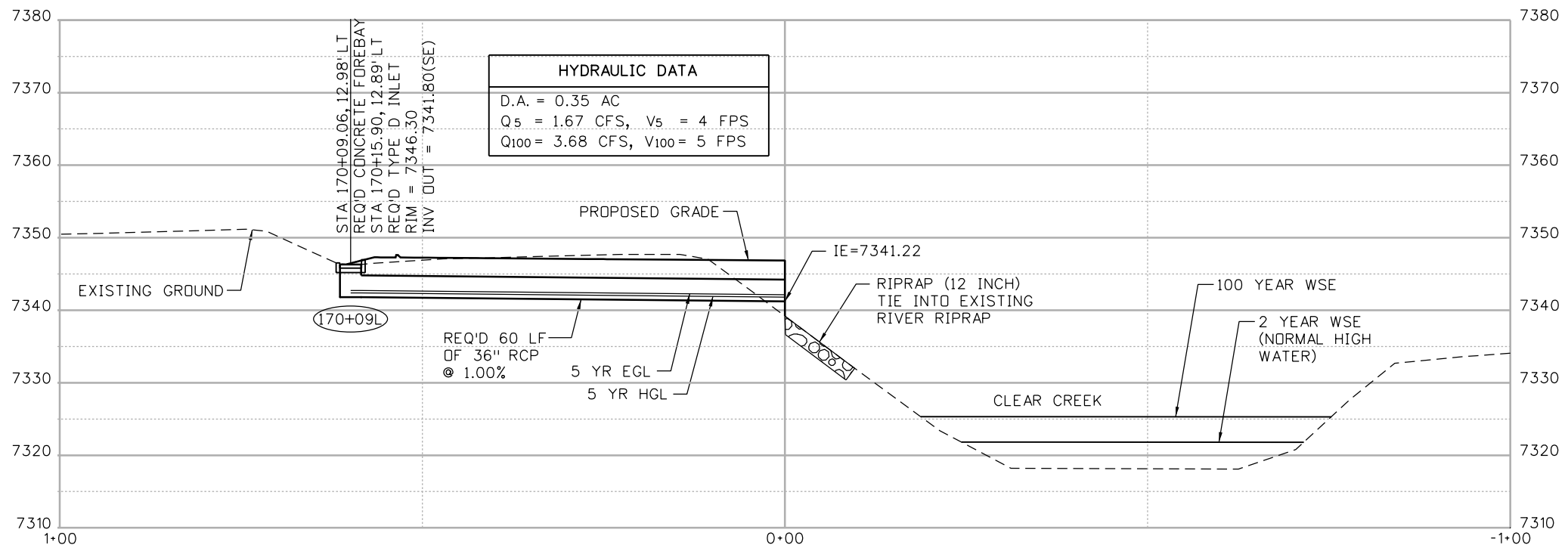
Colorado Department of Transportation

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

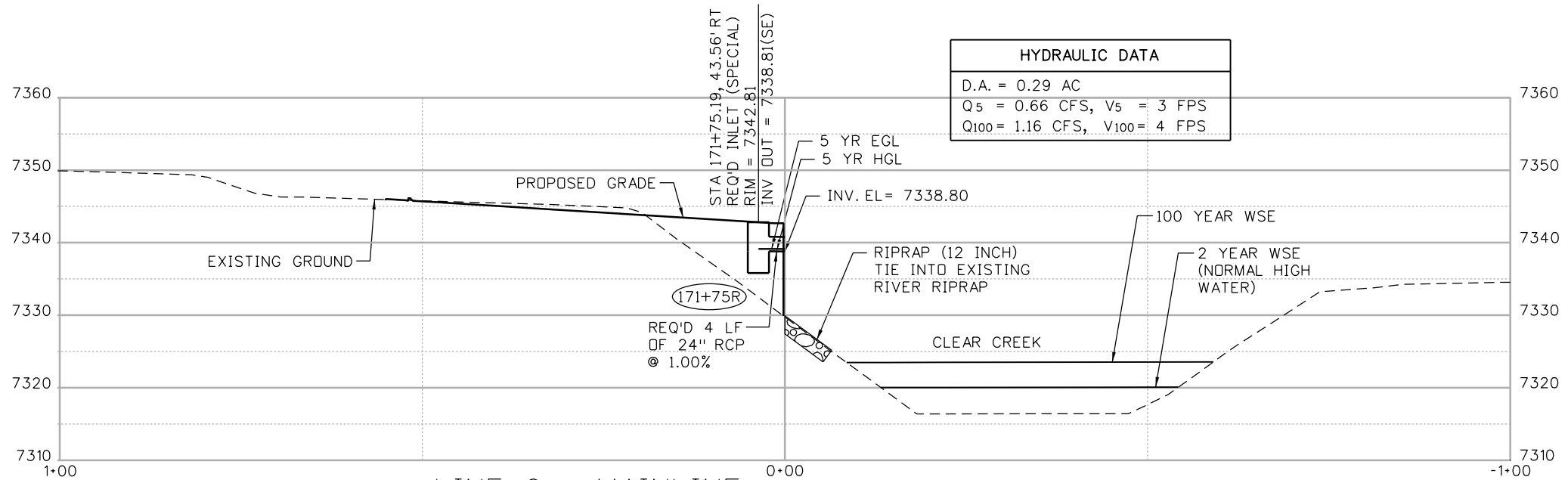
As Constructed
No Revisions:
Revised:
Void:

STORM SEWER PROFILES		
Designer: A. Finseth	Structure Numbers	
Detailer: B. Gaines		
Subset: Drainage Prof	Subset Sheets: 6 of 18	

Project No./Code
IM 0703-391
19036
Sheet Number 109



LINE 8 - MAINLINE



LINE 9 - MAINLINE

Print Date: 3/8/2013
 File Name: 18832HYDR_CP2_Xsec007.dgn
 Horiz. Scale: 1:20 Vert. Scale: 1"=20'
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 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

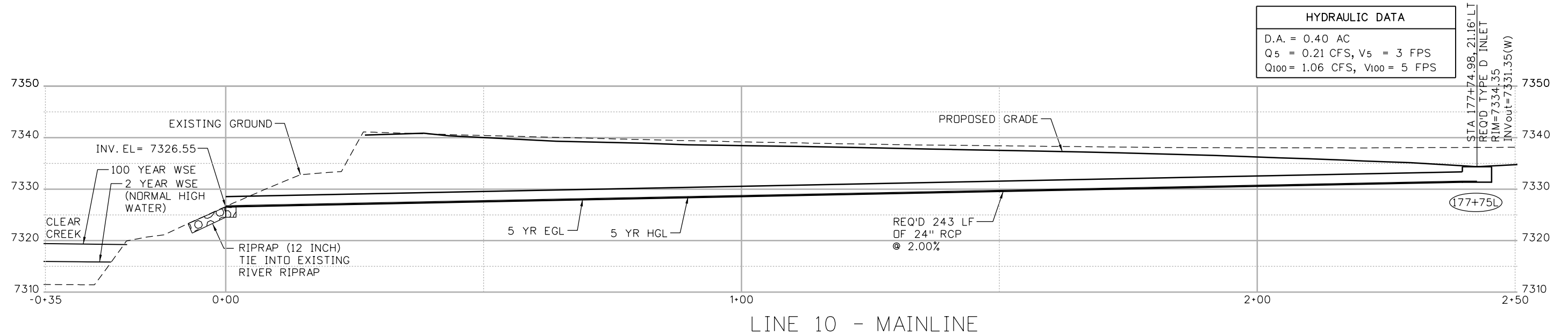
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STORM SEWER PROFILES			
Designer:	A. Finseth	Structure Numbers	
Detailer:	B. Gaines		
Subset:	Drainage Prof	Subset Sheets: 7 of 18	

Project No./Code
 IM 0703-391
 19036
 Sheet Number 110

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17543 9:16:41 AM c:\pw_work\pbbjpw\common\dms26969\18832HYDR_CP2_Xsec008.dgn



HYDRAULIC DATA	
D.A. = 0.40 AC	
Q5 = 0.21 CFS, V5 = 3 FPS	
Q100 = 1.06 CFS, V100 = 5 FPS	

STA 177+74.98, 21.16' LT
 REQ'D TYPE D INLET
 RIM=7334.35
 INV Out=7331.35(W)

(177+75L)

LINE 10 - MAINLINE

Print Date: 3/8/2013
 File Name: 18832HYDR_CP2_Xsec008.dgn
 Horiz. Scale: 1:20 Vert. Scale: 1"=20'

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

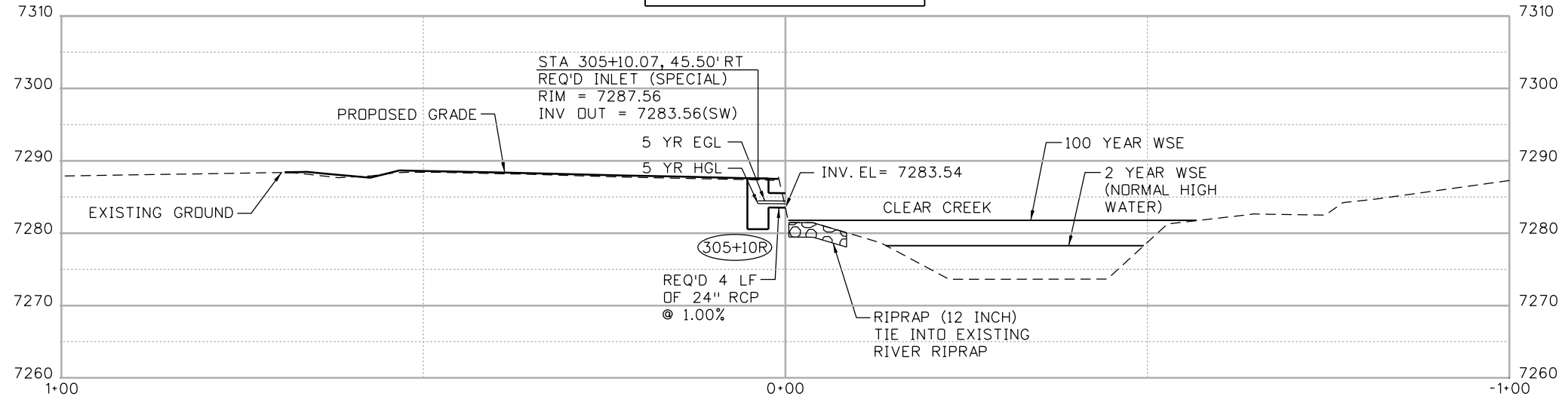
Region 1 CRC

As Constructed
No Revisions:
Revised:
Void:

STORM SEWER PROFILES		
Designer: A. Finseth	Structure Numbers	
Detailer: B. Gaines		
Subset: Drainage Prof	Subset Sheets: 8 of 18	

Project No./Code
IM 0703-391
19036
Sheet Number 111

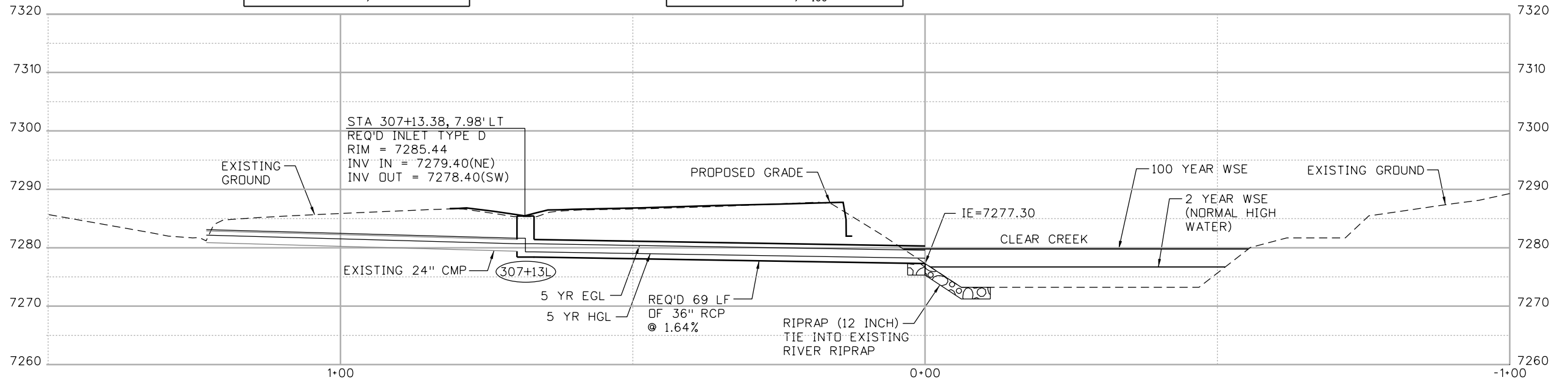
HYDRAULIC DATA	
D.A. =	0.87 AC
Q ₅ =	3.21 CFS, V ₅ = 5 FPS
Q ₁₀₀ =	6.18 CFS, V ₁₀₀ = 6 FPS



LINE 11 - MAINLINE

HYDRAULIC DATA	
D.A. =	14.73 AC
Q ₅ =	16.43 CFS, V ₅ = 8 FPS
Q ₁₀₀ =	44.94 CFS, V ₁₀₀ = 14 FPS

HYDRAULIC DATA	
D.A. =	15.89 AC
Q ₅ =	16.86 CFS, V ₅ = 9 FPS
Q ₁₀₀ =	46.09 CFS, V ₁₀₀ = 12 FPS



LINE 12 - MAINLINE

Print Date: 3/8/2013
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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

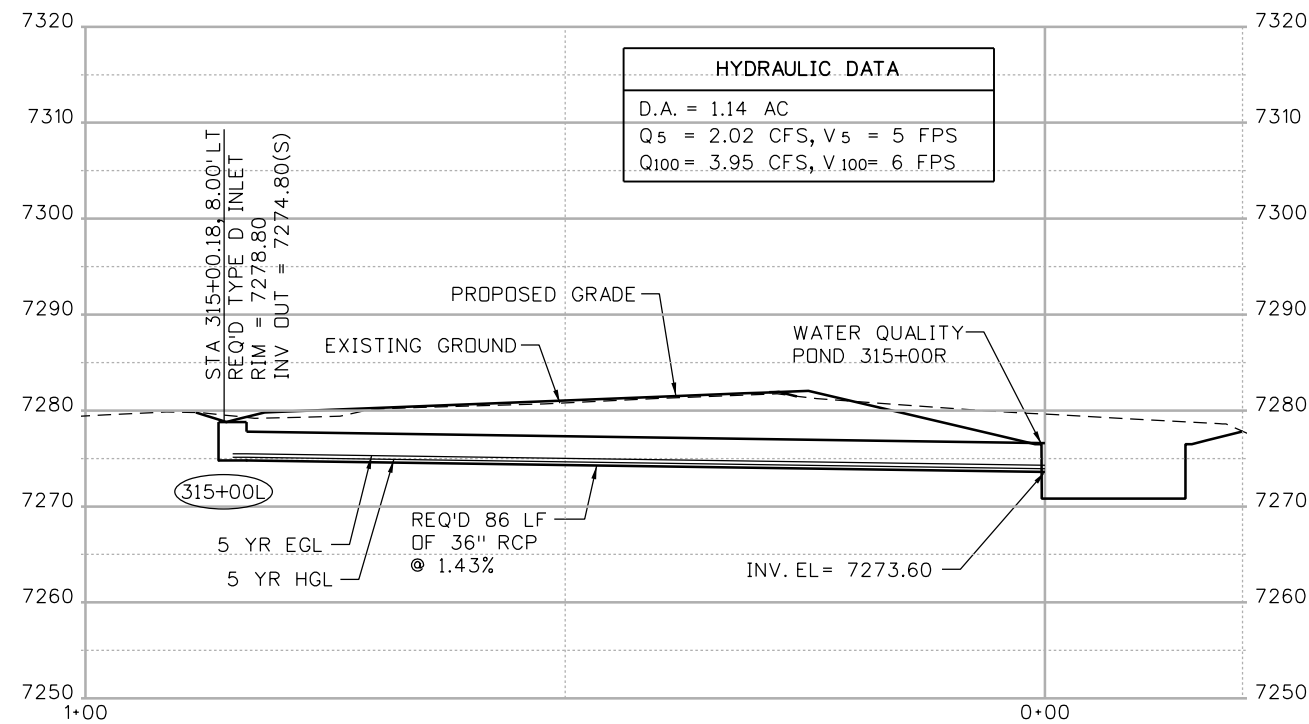
 425 A Corporate Circle
 Golden, CO 80401
 Phone: 720-497-6918 FAX: 720-497-6901
Region 1 **CRC**

As Constructed	
No Revisions:	
Revised:	
Void:	

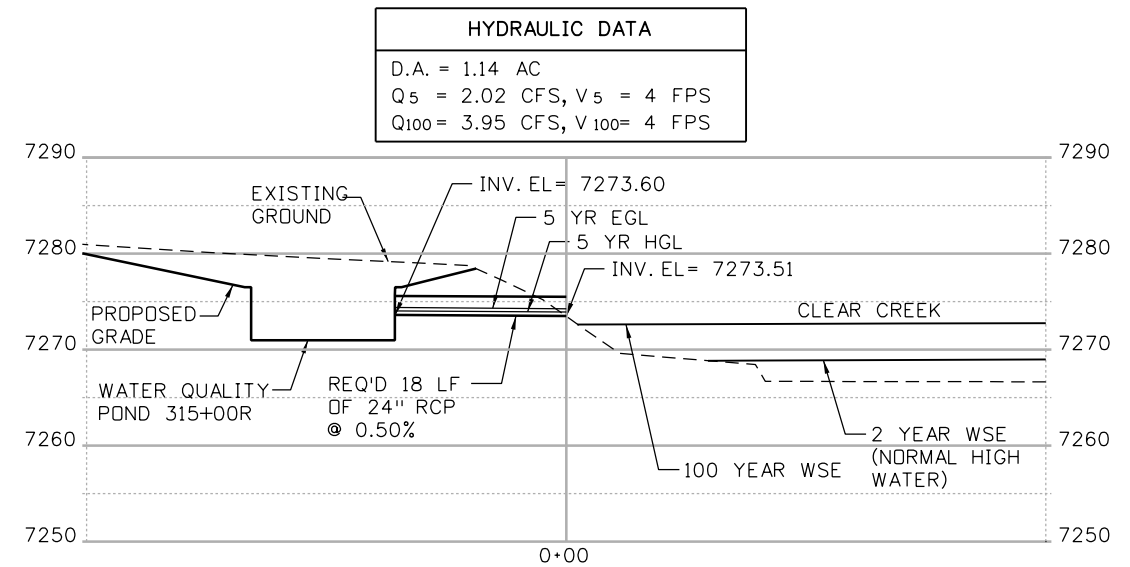
STORM SEWER PROFILES			
Designer:	A. Finseth	Structure Numbers	
Detailer:	B. Gaines		
Subset:	Drainage Prof	Subset Sheets:	9 of 18

Project No./Code	
IM	0703-391
	19036
Sheet Number	112

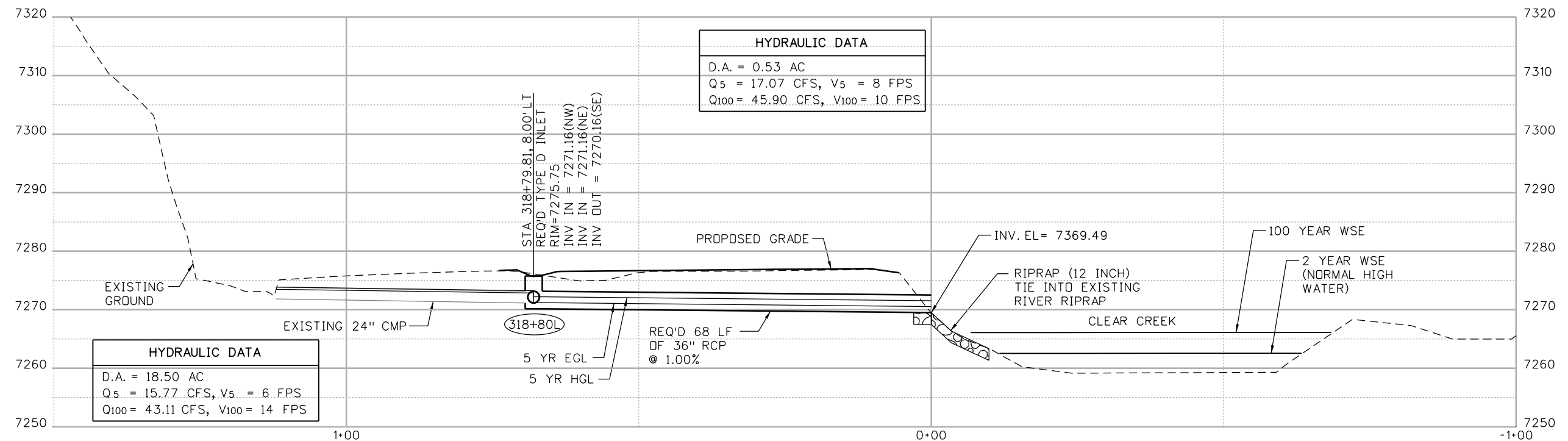
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LINE 13 - MAINLINE



LINE 13 - POND OUTFALL



LINE 14 - MAINLINE

Print Date: 3/8/2013
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 Horiz. Scale: 1:20 Vert. Scale: 1"=20'
ATKINS 4601 DTC Boulevard, Suite 700
 Denver, CO 80237
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Sheet Revisions		
Date:	Comments	Init.

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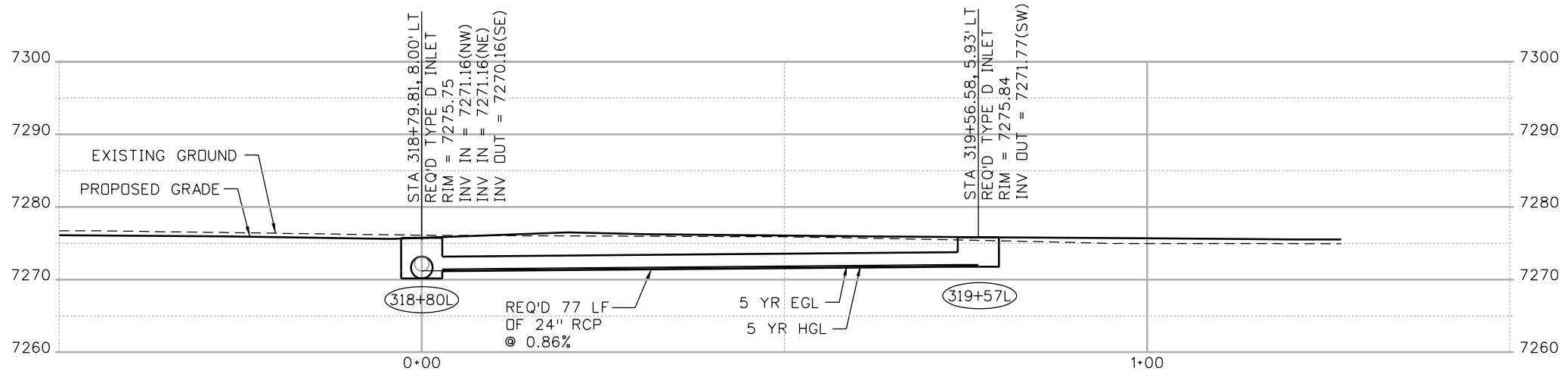
 425 A Corporate Circle
 Golden, CO 80401
 Phone: 720-497-6918 FAX: 720-497-6901
Region 1 **CRC**

As Constructed
 No Revisions:
 Revised:
 Void:

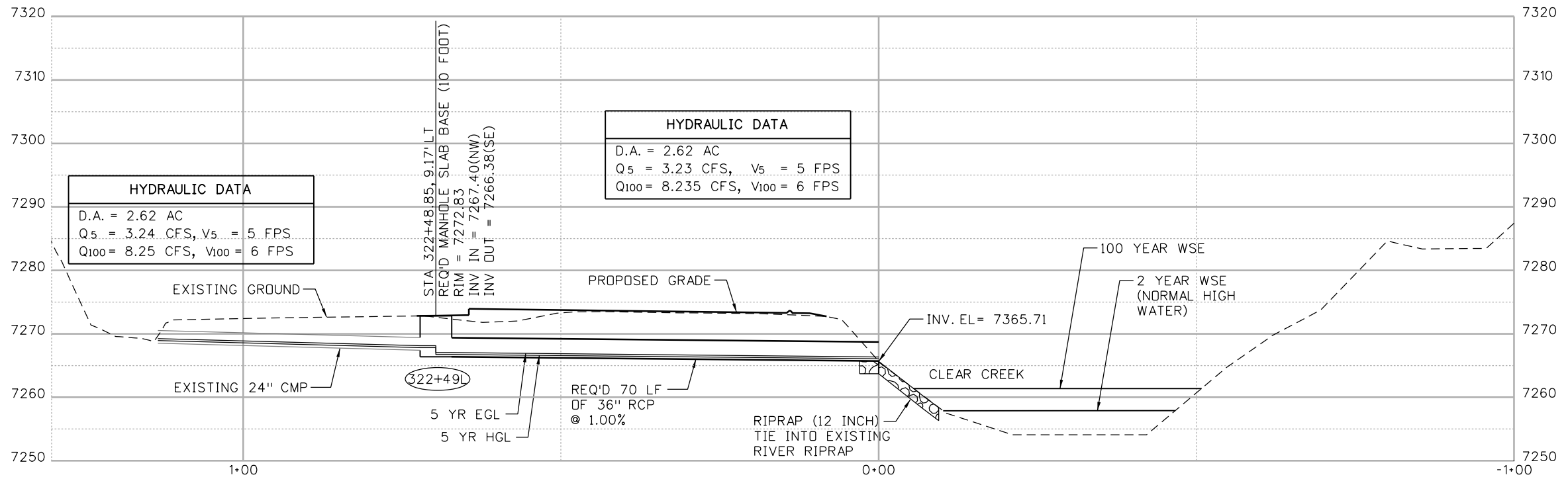
STORM SEWER PROFILES
 Designer: A. Finseth
 Detailer: B. Gaines
 Subset: Drainage Prof
 Structure Numbers
 Subset Sheets: 10 of 18

Project No./Code
 IM 0703-391
 19036
 Sheet Number 113

17543 9:16:56 AM c:\pw_work\pbs\pwl\comon\dms26969\18832HYDR_CP2_Xsec010.dgn



LINE 14-L1 - MAINLINE



LINE 15 - MAINLINE

Print Date: 3/8/2013
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 Horiz. Scale: 1:20 Vert. Scale: 1"=20'
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 Denver, CO 80237
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Sheet Revisions		
Date:	Comments	Init.

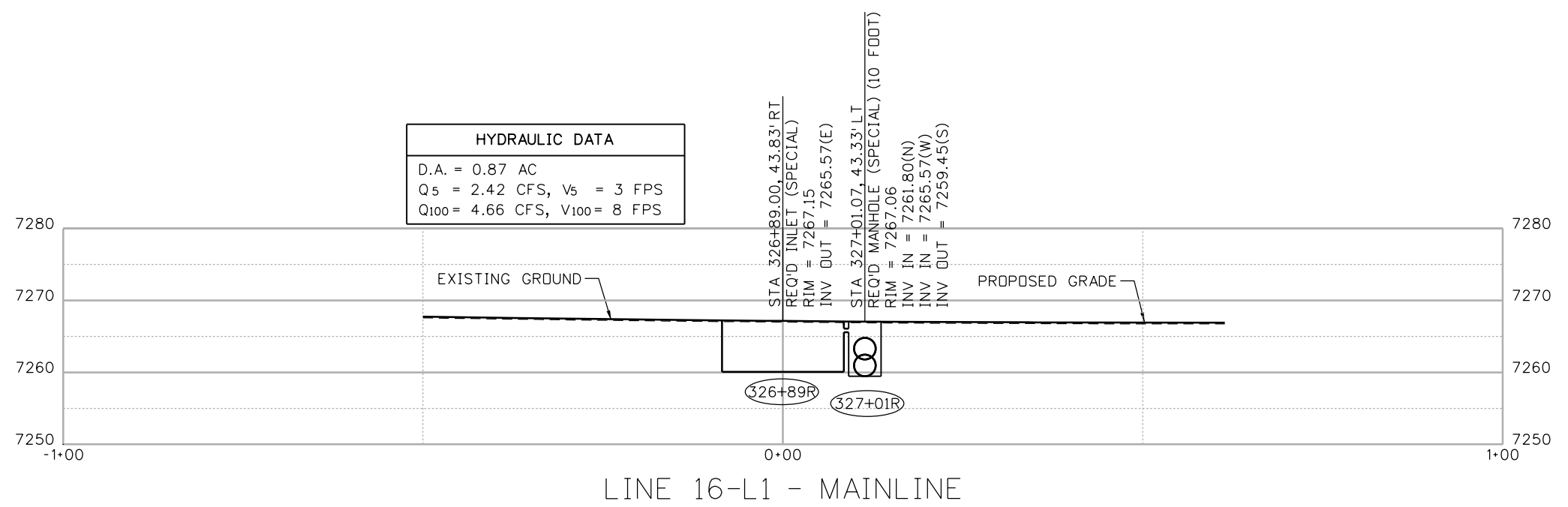
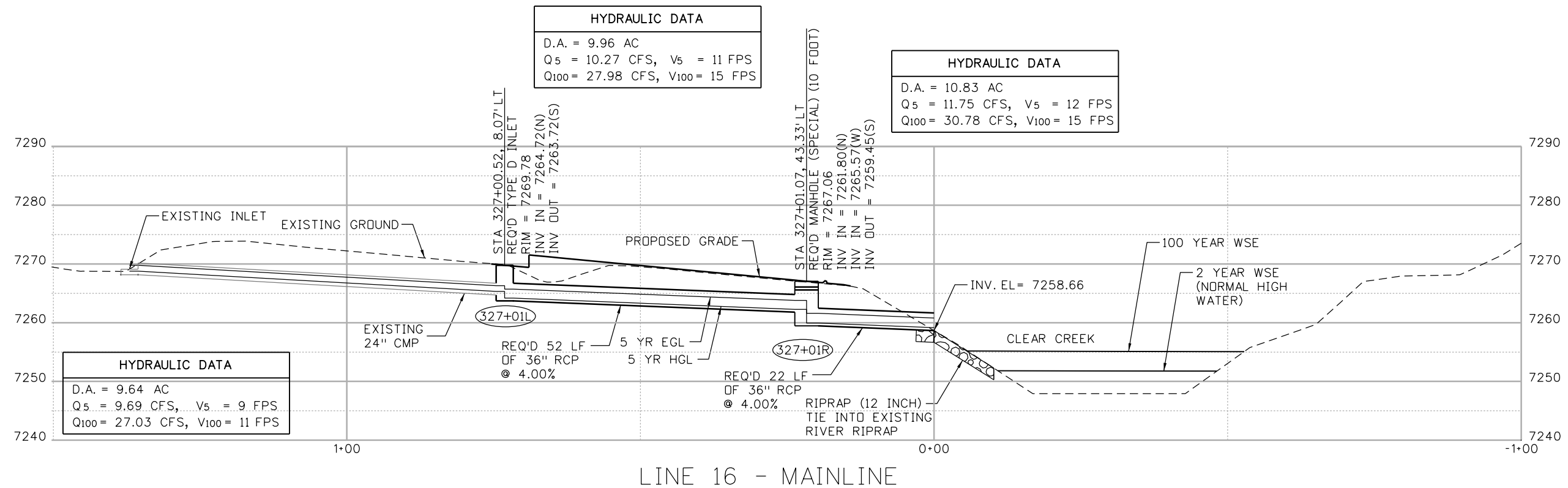
Colorado Department of Transportation
 425 A Corporate Circle
 Golden, CO 80401
 Phone: 720-497-6918 FAX: 720-497-6901
Region 1 **CRC**

As Constructed
 No Revisions:
 Revised:
 Void:

STORM SEWER PROFILES
 Designer: A. Finseth
 Detailer: B. Gaines
 Subset: Drainage Prof
 Structure Numbers
 Subset Sheets: 11 of 18

Project No./Code
 IM 0703-391
 19036
 Sheet Number 114

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Print Date: 3/8/2013
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Date:	Comments	Init.

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Region 1 **CRC**

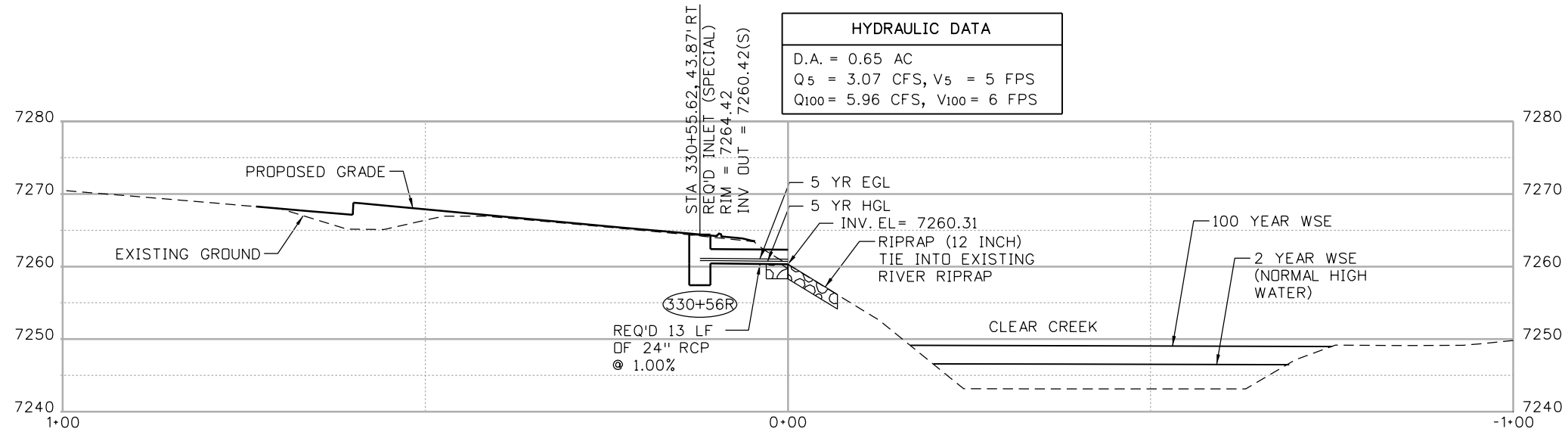
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STORM SEWER PROFILES

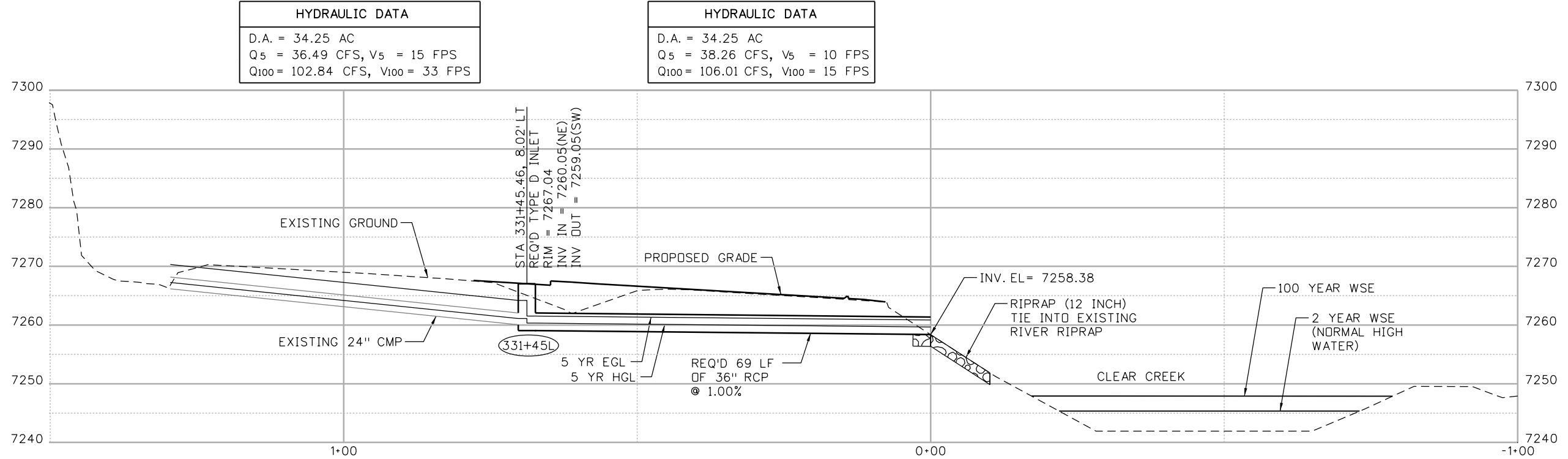
Designer:	A. Finseth	Structure Numbers	
Detailer:	B. Gaines	Subset Sheets:	12 of 18
Subset:	Drainage Prof		

Project No./Code
 IM 0703-391
 19036
 Sheet Number 115

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LINE 17 - MAINLINE



LINE 18 - MAINLINE

Print Date: 3/8/2013
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 Denver, CO 80237
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Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation

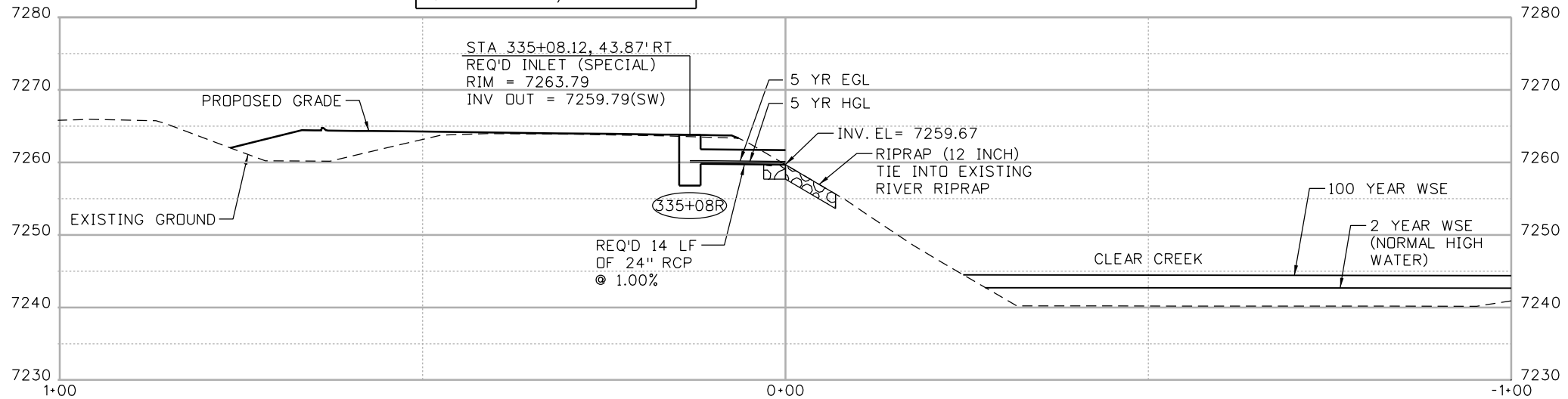
 425 A Corporate Circle
 Golden, CO 80401
 Phone: 720-497-6918 FAX: 720-497-6901
Region 1 **CRC**

As Constructed
 No Revisions:
 Revised:
 Void:

STORM SEWER PROFILES		
Designer:	A. Finseth	Structure Numbers
Detailer:	B. Gaines	
Subset:	Drainage Prof	Subset Sheets: 13 of 18

Project No./Code
 IM 0703-391
 19036
 Sheet Number 116

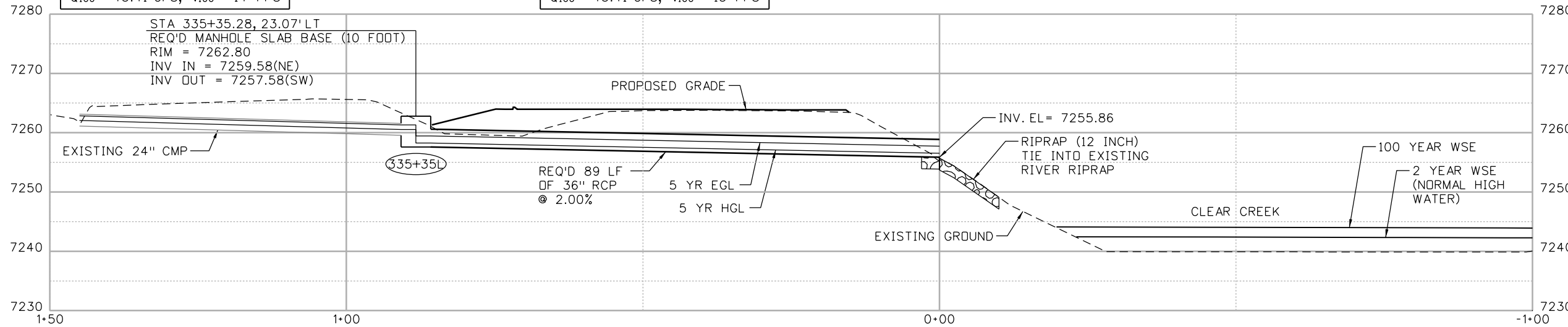
HYDRAULIC DATA
D.A. = 0.35 AC
Q ₅ = 1.32 CFS, V ₅ = 4 FPS
Q ₁₀₀ = 2.53 CFS, V ₁₀₀ = 5 FPS



LINE 19 - MAINLINE

HYDRAULIC DATA
D.A. = 13.00 AC
Q ₅ = 15.83 CFS, V ₅ = 8 FPS
Q ₁₀₀ = 43.41 CFS, V ₁₀₀ = 14 FPS

HYDRAULIC DATA
D.A. = 13.00 AC
Q ₅ = 15.75 CFS, V ₅ = 10 FPS
Q ₁₀₀ = 43.41 CFS, V ₁₀₀ = 13 FPS



LINE 20 - MAINLINE

Print Date: 3/8/2013
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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

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Region 1 **CRC**

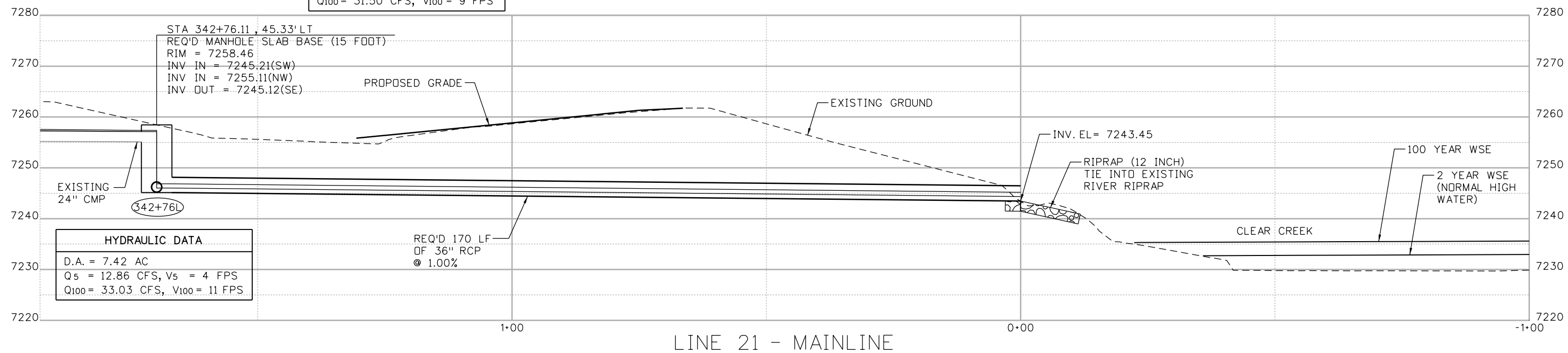
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No Revisions:
Revised:
Void:

STORM SEWER PROFILES		
Designer: A. Finseth	Structure Numbers	
Detailer: B. Gaines		
Subset: Drainage Prof	Subset Sheets: 14 of 18	

Project No./Code
IM 0703-391
19036
Sheet Number 117

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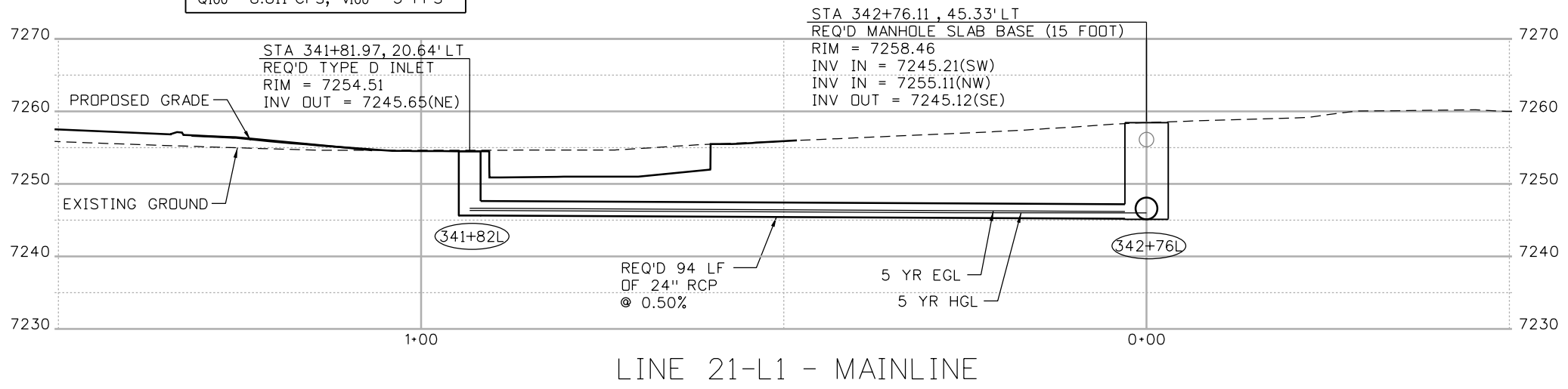
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D.A. = 9.75 AC	
Q ₅ = 12.58 CFS, V ₅ = 7 FPS	
Q ₁₀₀ = 31.50 CFS, V ₁₀₀ = 9 FPS	



HYDRAULIC DATA	
D.A. = 7.42 AC	
Q ₅ = 12.86 CFS, V ₅ = 4 FPS	
Q ₁₀₀ = 33.03 CFS, V ₁₀₀ = 11 FPS	

REQ'D 170 LF
OF 36" RCP
@ 1.00%

HYDRAULIC DATA	
D.A. = 2.33 AC	
Q ₅ = 3.78 CFS, V ₅ = 4 FPS	
Q ₁₀₀ = 8.811 CFS, V ₁₀₀ = 5 FPS	



STA 342+76.11, 45.33' LT
REQ'D MANHOLE SLAB BASE (15 FOOT)
RIM = 7258.46
INV IN = 7245.21(SW)
INV IN = 7255.11(NW)
INV OUT = 7245.12(SE)

STA 341+81.97, 20.64' LT
REQ'D TYPE D INLET
RIM = 7254.51
INV OUT = 7245.65(NE)

REQ'D 94 LF
OF 24" RCP
@ 0.50%

5 YR EGL
5 YR HGL

Print Date: 3/8/2013
File Name: 18832HYDR_CP2_Xsec015.dgn
Horiz. Scale: 1:20 Vert. Scale: 1"=20'

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Sheet Revisions		
Date:	Comments	Init.

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Region 1 **CRC**

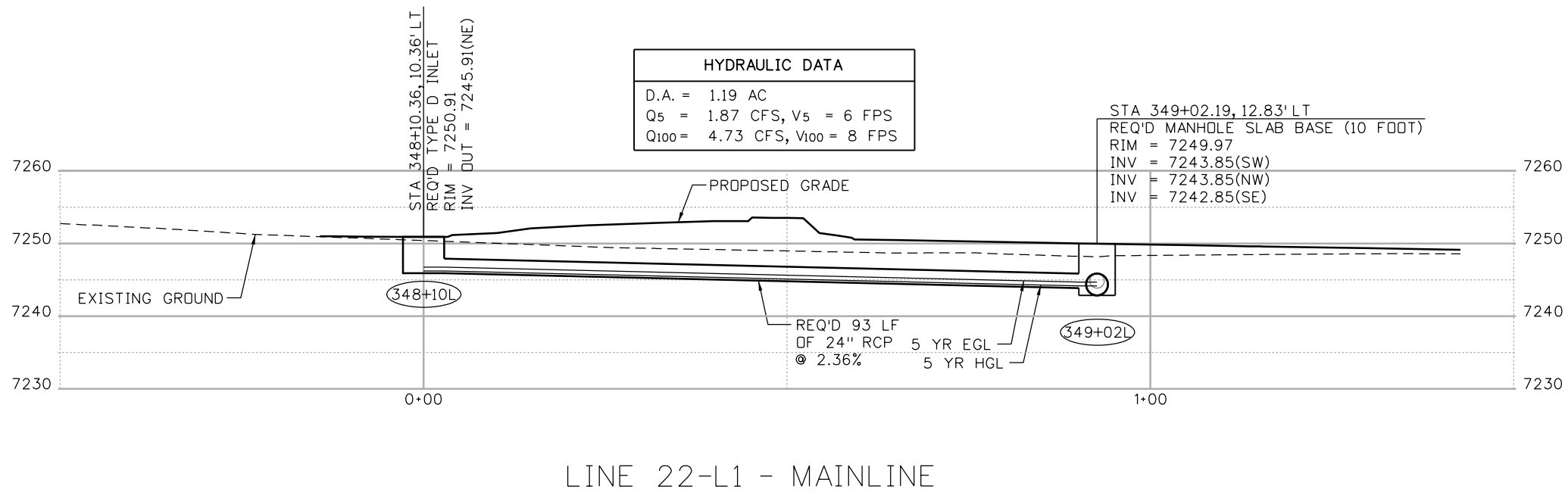
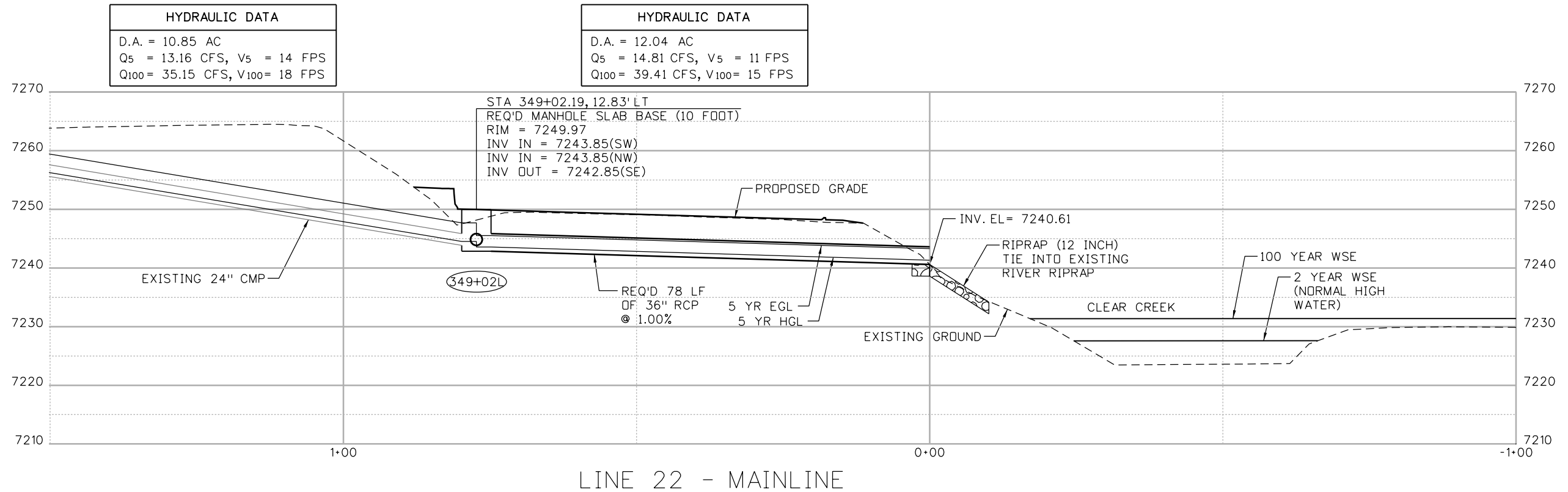
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No Revisions:
Revised:
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STORM SEWER PROFILES		
Designer: A. Finseth	Structure Numbers	
Detailer: B. Gaines		
Subset: Drainage Prof	Subset Sheets: 15 of 18	

Project No./Code	
IM 0703-391	
19036	
Sheet Number	118

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17543 9:17:43 AM c:\pw_work\pbes\pwl\common\dms26969\18832HYDR_CP2_Xsec016.dgn



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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

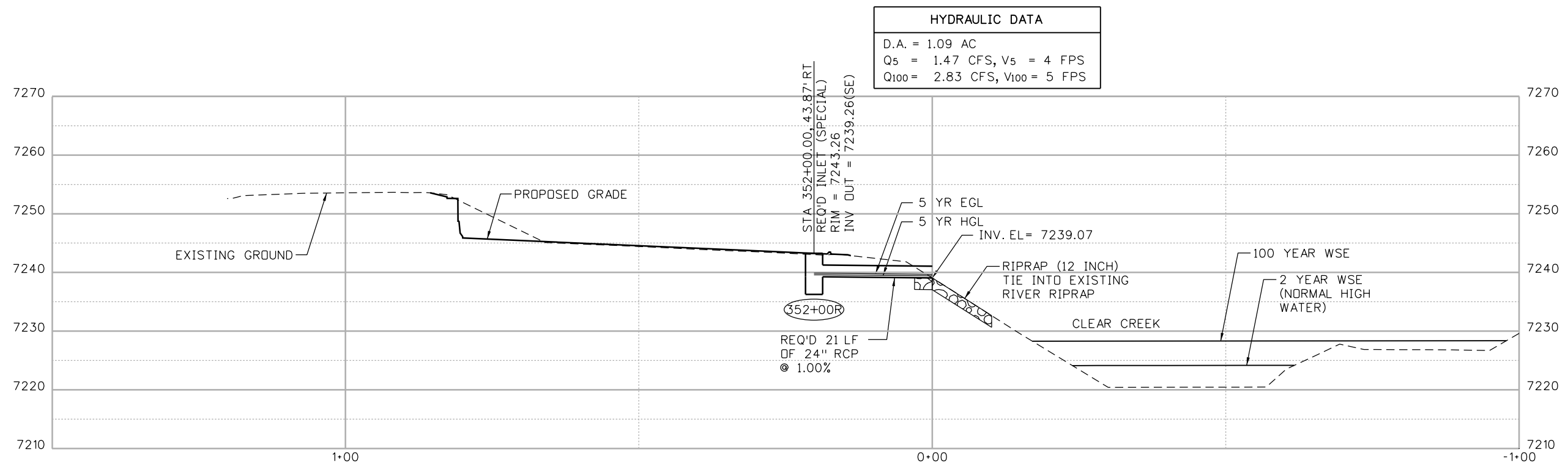
 425 A Corporate Circle
 Golden, CO 80401
 Phone: 720-497-6918 FAX: 720-497-6901
 Region 1 CRC

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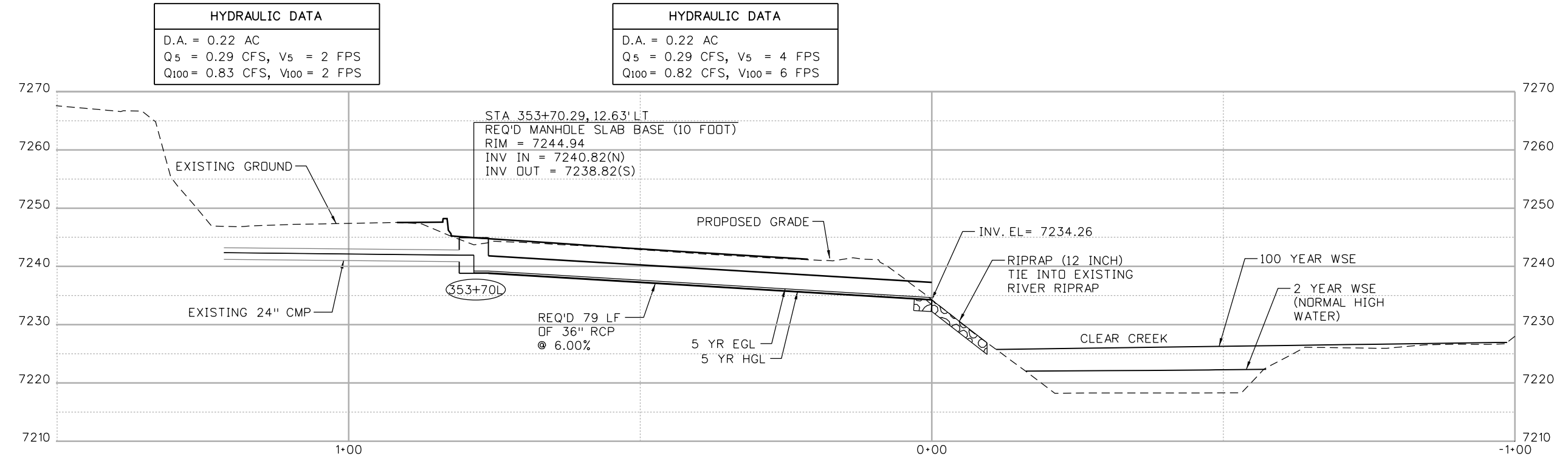
STORM SEWER PROFILES

Designer:	A. Finseth	Structure Numbers	
Detailer:	B. Gaines	Subset Sheets:	16 of 18
Subset:	Drainage Prof		

Project No./Code
 IM 0703-391
 19036
 Sheet Number 119



LINE 23 - MAINLINE



LINE 24 - MAINLINE

HYDRAULIC DATA	
D.A.	= 1.09 AC
Q ₅	= 1.47 CFS, V ₅ = 4 FPS
Q ₁₀₀	= 2.83 CFS, V ₁₀₀ = 5 FPS

HYDRAULIC DATA	
D.A.	= 0.22 AC
Q ₅	= 0.29 CFS, V ₅ = 2 FPS
Q ₁₀₀	= 0.83 CFS, V ₁₀₀ = 2 FPS

HYDRAULIC DATA	
D.A.	= 0.22 AC
Q ₅	= 0.29 CFS, V ₅ = 4 FPS
Q ₁₀₀	= 0.82 CFS, V ₁₀₀ = 6 FPS

Print Date: 3/8/2013
 File Name: 18832HYDR_CP2_Xsec017.dgn
 Horiz. Scale: 1:20 Vert. Scale: 1"=20'

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Sheet Revisions		
Date:	Comments	Init.

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

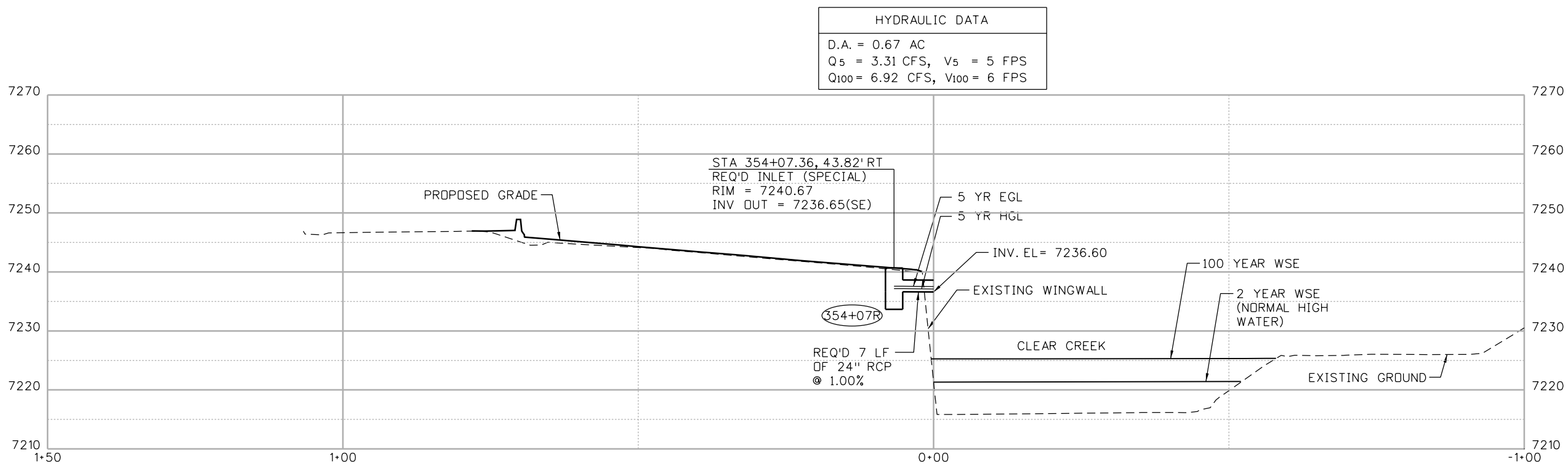
Region 1 **CRC**

As Constructed
No Revisions:
Revised:
Void:

STORM SEWER PROFILES		
Designer:	A. Finseth	Structure Numbers
Detailer:	B. Gaines	
Subset:	Drainage Prof	Subset Sheets: 17 of 18

Project No./Code
IM 0703-391
19036
Sheet Number 120

17543 9:17:50 AM c:\pw_work\pws\pwl\work\pws\pwl\18832HYDR_CP2_Xsec017.dgn



LINE 25 - MAINLINE

Print Date: 3/8/2013
 File Name: 18832HYDR_CP2_Xsec018.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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Region 1 **CRC**

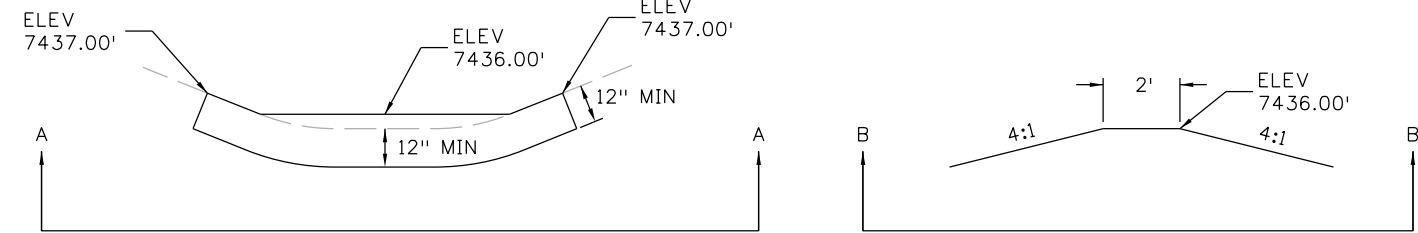
As Constructed
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STORM SEWER PROFILES
 Designer: A. Finseth
 Detailer: B. Gaines
 Subset: Drainage Prof
 Structure Numbers
 Subset Sheets: 18 of 18

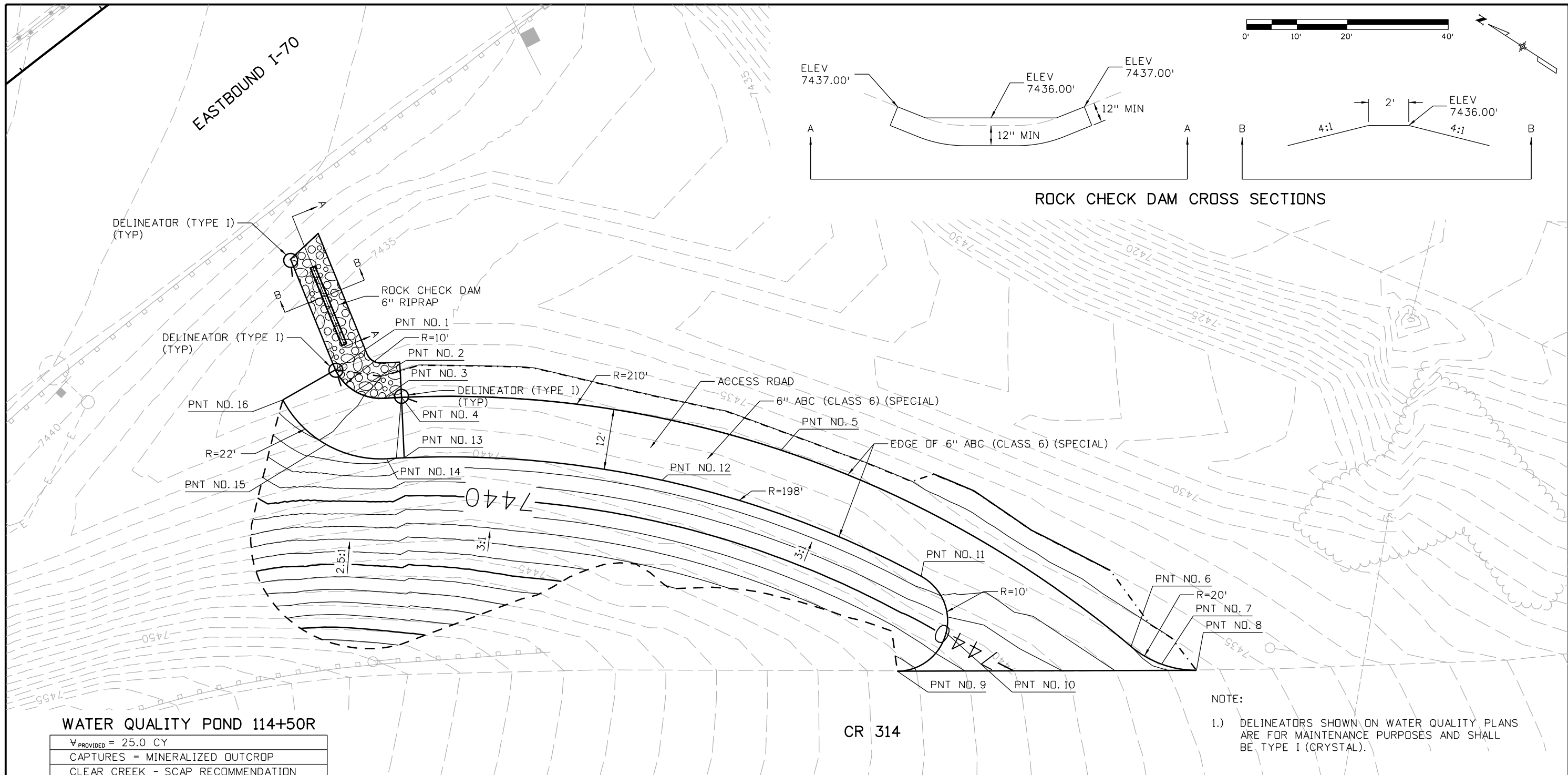
Project No./Code
 IM 0703-391
 19036
 Sheet Number 121

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EASTBOUND I-70



ROCK CHECK DAM CROSS SECTIONS



WATER QUALITY POND 114+50R

∇ PROVIDED = 25.0 CY
CAPTURES = MINERALIZED OUTCROP
CLEAR CREEK - SCAP RECOMMENDATION

POINT DATA

PNT. NO.	NORTHING	EASTING	ELEVATION	DESCRIPTION
1	695958.46	1004030.92	7,435.00	PC, R=10'
2	695952.86	1004029.48	7,435.74	MID POINT, R=10'
3	695947.41	1004031.38	7,436.47	PT, R=10'
4	695944.50	1004033.49	7,437.00	GRADE BREAK
5	695875.65	1004065.75	7,437.00	MID POINT, R=210'
6	695796.27	1004070.96	7,437.00	PC, R=20'

POINT DATA

PNT. NO.	NORTHING	EASTING	ELEVATION	DESCRIPTION
7	695789.27	1004071.32	7,436.72	MID POINT, R=20'
8	695782.82	1004074.07	7,436.45	PT, R=20'
9	695832.46	1004041.59	7,442.39	PC, R=10'
10	695828.48	1004053.21	7,439.82	MID POINT, R=10'
11	695838.76	1004059.93	7,437.24	PT, R=10'
12	695892.23	1004047.90	7,437.24	MID POINT, R=198'

POINT DATA

PNT. NO.	NORTHING	EASTING	ELEVATION	DESCRIPTION
13	695937.52	1004023.74	7,437.24	GRADE BREAK
14	695940.35	1004021.68	7,436.71	PC, R=22'
15	695951.96	1004017.51	7,436.08	MID POINT, R=22'
16	695963.98	1004020.25	7,435.45	PT, R=22'

NOTE:

- DELINEATORS SHOWN ON WATER QUALITY PLANS ARE FOR MAINTENANCE PURPOSES AND SHALL BE TYPE I (CRYSTAL).

CR 314

Print Date: 3/8/2013

File Name: 18832HYDR_CP2_Pond001.dgn

Horiz. Scale: 1:20

Vert. Scale:

Sheet Revisions

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:

**EASTBOUND I-70
WATER QUALITY POND 114+50R
PLAN**

Designer:	D. Friesen	Structure Numbers	
Detailer:	D. Friesen		
Subset:	Water Quality	Subset Sheets: 1 of 8	

Project No./Code

IM 0703-391

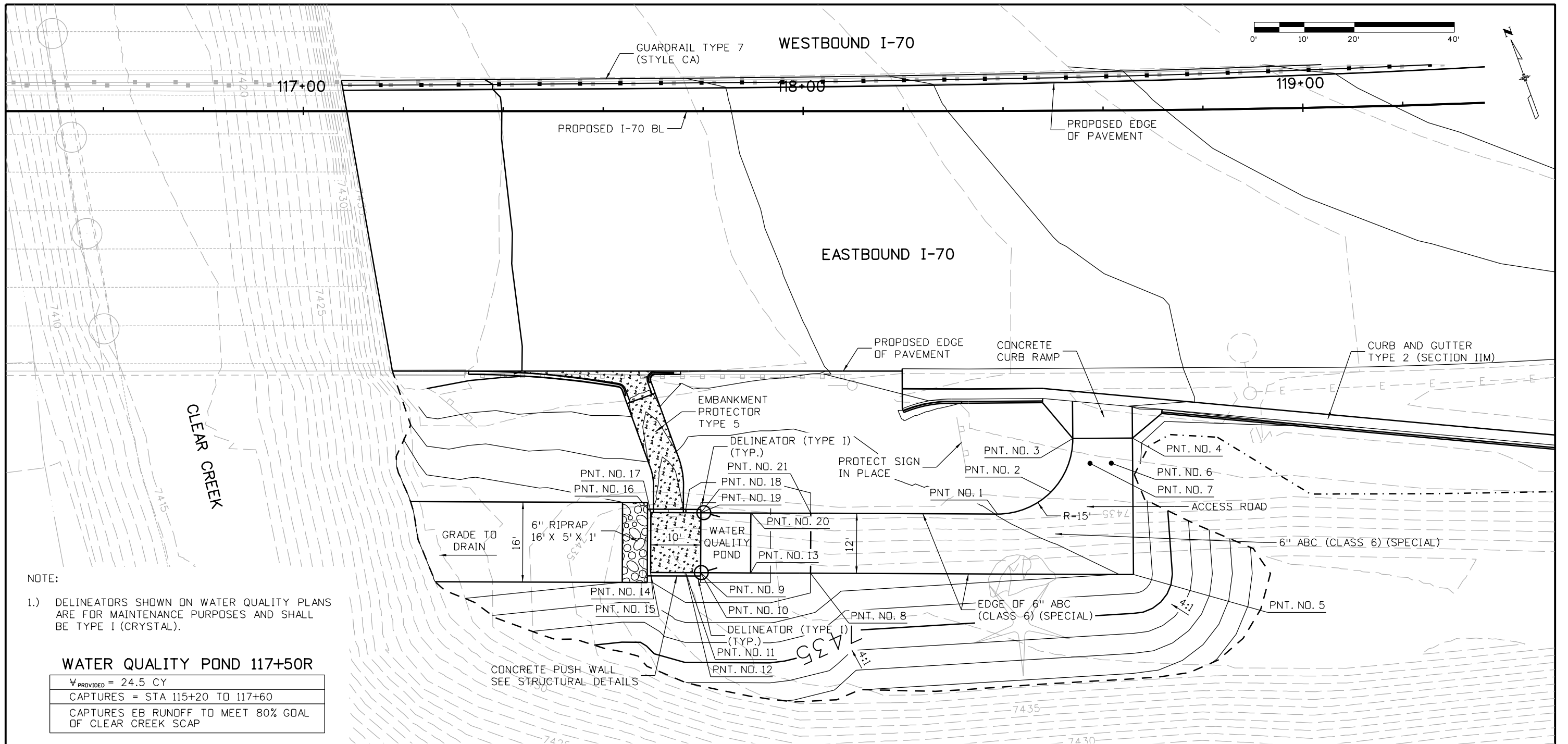
19036

Sheet Number 122

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Denver, CO 80237
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NOTE:
 1.) DELINEATORS SHOWN ON WATER QUALITY PLANS ARE FOR MAINTENANCE PURPOSES AND SHALL BE TYPE I (CRYSTAL).

WATER QUALITY POND 117+50R

∇ PROVIDED = 24.5 CY
CAPTURES = STA 115+20 TO 117+60
CAPTURES EB RUNOFF TO MEET 80% GOAL OF CLEAR CREEK SCAP

POINT DATA

PNT. NO.	NORTHING	EASTING	ELEVATION	DESCRIPTION
1	695824.28	1004412.88	7,433.02	PC, R=15'
2	695824.76	1004424.43	7,433.34	MID POINT, R=15'
3	695833.31	1004432.21	7,433.66	PT, R=15', CONC. CURB RAMP
4	695829.30	1004443.46	7,433.49	CONCRETE CURB RAMP
5	695803.58	1004434.29	7,433.05	PI, 6" ABC
6	695826.02	1004437.76	N/A	REMOVABLE BOLLARD
7	695827.46	1004433.74	N/A	REMOVABLE BOLLARD
8	695825.96	1004373.68	7,432.00	PI, 6" ABC

POINT DATA


PNT. NO.	NORTHING	EASTING	ELEVATION	DESCRIPTION
9	695833.59	1004353.05	7,430.50	BOT. INSIDE COR. PUSH WALL
10	695833.59	1004353.05	7,431.00	TOP INSIDE COR. PUSH WALL
11	695834.63	1004350.23	7,430.50	BOT. INSIDE EDGE PUSH WALL
12	695834.63	1004350.23	7,432.00	TOP INSIDE EDGE PUSH WALL
13	695830.12	1004362.43	7,430.50	PI, 6" ABC
14	695837.05	1004343.66	7,430.50	BOT. INSIDE COR. PUSH WALL
15	695837.05	1004343.66	7,432.00	TOP INSIDE COR. PUSH WALL
16	695848.31	1004347.82	7,430.50	BOT. INSIDE COR. PUSH WALL

POINT DATA

PNT. NO.	NORTHING	EASTING	ELEVATION	DESCRIPTION
17	695848.31	1004347.82	7,432.00	TOP INSIDE COR. PUSH WALL
18	695844.84	1004357.20	7,430.50	BOT. INSIDE COR. PUSH WALL
19	695844.84	1004357.20	7,431.00	TOP INSIDE COR. PUSH WALL
20	695841.38	1004366.58	7,430.50	PI, 6" ABC
21	695837.22	1004377.84	7,432.00	PI, 6" ABC

Print Date: 3/8/2013
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Sheet Revisions		
Date:	Comments	Init.

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 Golden, CO 80401
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Region 1 **CRC**

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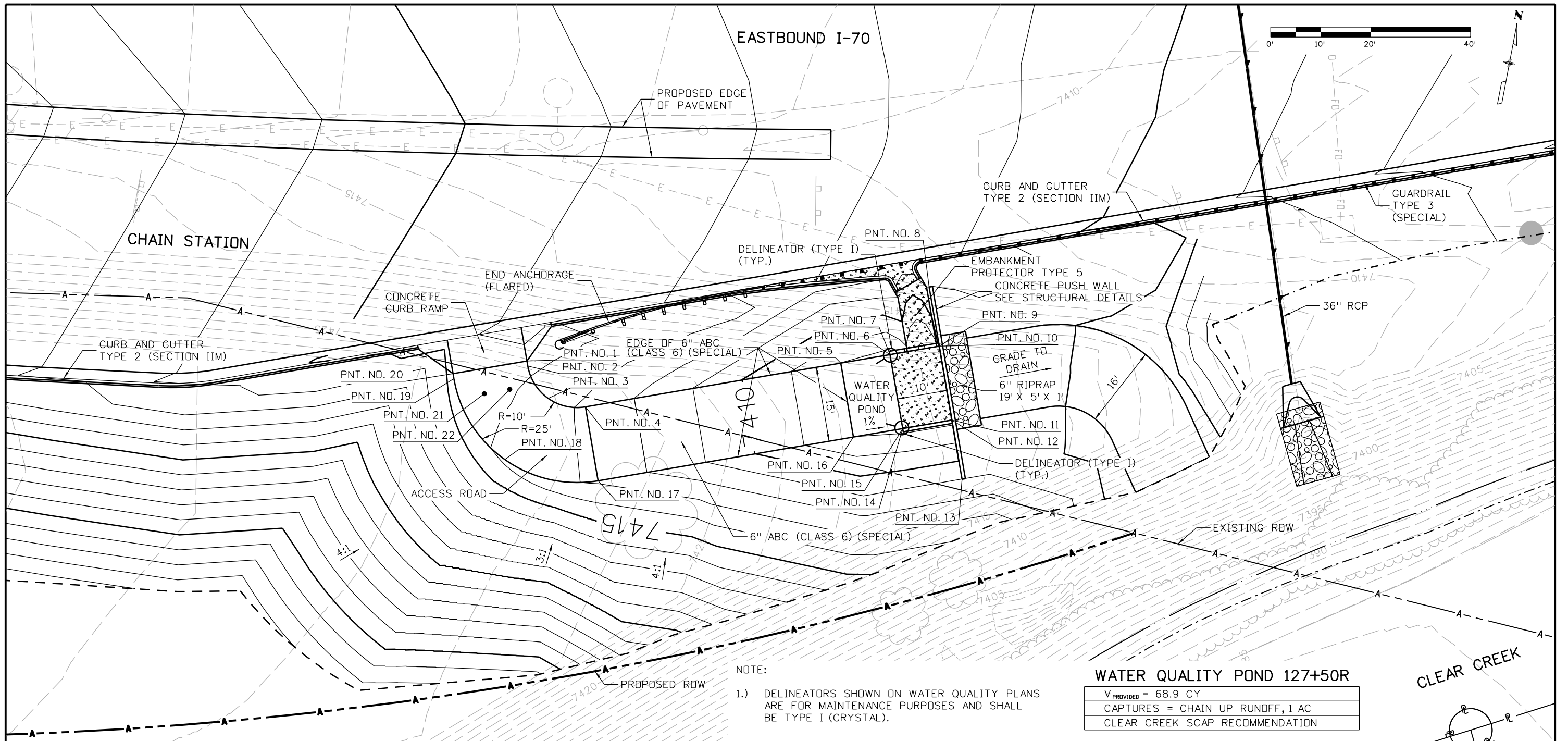
**EASTBOUND I-70
 WATER QUALITY POND 117+50R
 PLAN**

Designer: D. Friesen
 Detailer: D. Friesen
 Subset: Water Quality

Structure Numbers
 Subset Sheets: 2 of 8

Project No./Code
IM 0703-391
19036
Sheet Number 123

17543 8:54:01 AM c:\pw_work\pbls\pbl1\common\dms26969\18832HYDR_CP2_Pond002.dgn



NOTE:
 1.) DELINEATORS SHOWN ON WATER QUALITY PLANS ARE FOR MAINTENANCE PURPOSES AND SHALL BE TYPE I (CRYSTAL).

WATER QUALITY POND 127+50R
 V_{PROVIDED} = 68.9 CY
 CAPTURES = CHAIN UP RUNOFF, 1 AC
 CLEAR CREEK SCAP RECOMMENDATION

POINT DATA

PNT. NO.	NORTHING	EASTING	ELEVATION	DESCRIPTION
1	695729.63	1005342.74	7,414.24	CONCRETE CURB RAMP
2	695728.70	1005343.09	7,414.16	PC, R=10'
3	695723.10	1005348.31	7,413.50	MID POINT, R=10'
4	695722.83	1005355.95	7,412.84	PT, R=10'
5	695740.97	1005404.50	7,408.00	PI, 6" ABC
6	695744.47	1005413.87	7,408.90	TOP INSIDE EDGE PUSH WALL
7	695744.47	1005413.87	7,407.90	BOT. INSIDE COR. PUSH WALL

POINT DATA

PNT. NO.	NORTHING	EASTING	ELEVATION	DESCRIPTION
8	695759.22	1005419.03	7,411.00	TOP INSIDE EDGE PUSH WALL
9	695747.97	1005423.23	7,407.90	BOT. INSIDE COR. PUSH WALL
10	695747.97	1005423.23	7,410.40	TOP INSIDE COR. PUSH WALL
11	695733.92	1005428.48	7,407.90	BOT. INSIDE EDGE PUSH WALL
12	695733.92	1005428.48	7,410.40	TOP INSIDE EDGE PUSH WALL
13	695722.68	1005432.68	7,411.00	TOP INSIDE EDGE PUSH WALL
14	695730.42	1005419.12	7,407.90	BOT. INSIDE COR. PUSH WALL

POINT DATA

PNT. NO.	NORTHING	EASTING	ELEVATION	DESCRIPTION
15	695730.42	1005419.12	7,407.90	TOP INSIDE COR. PUSH WALL
16	695726.92	1005409.75	7,408.00	PI, 6" ABC
17	695708.78	1005361.21	7,412.84	PC, R=25'
18	695709.45	1005342.08	7,413.81	MID POINT, R=25'
19	695723.45	1005329.04	7,414.66	PT, R=25'
20	695724.38	1005328.69	7,414.69	CONCRETE CURB RAMP
21	695721.62	1005335.58	N/A	REMOVABLE BOLLARD
22	695723.43	1005340.43	N/A	REMOVABLE BOLLARD

Print Date: 3/8/2013
 File Name: 18832HYDR_CP2_Pond003.dgn
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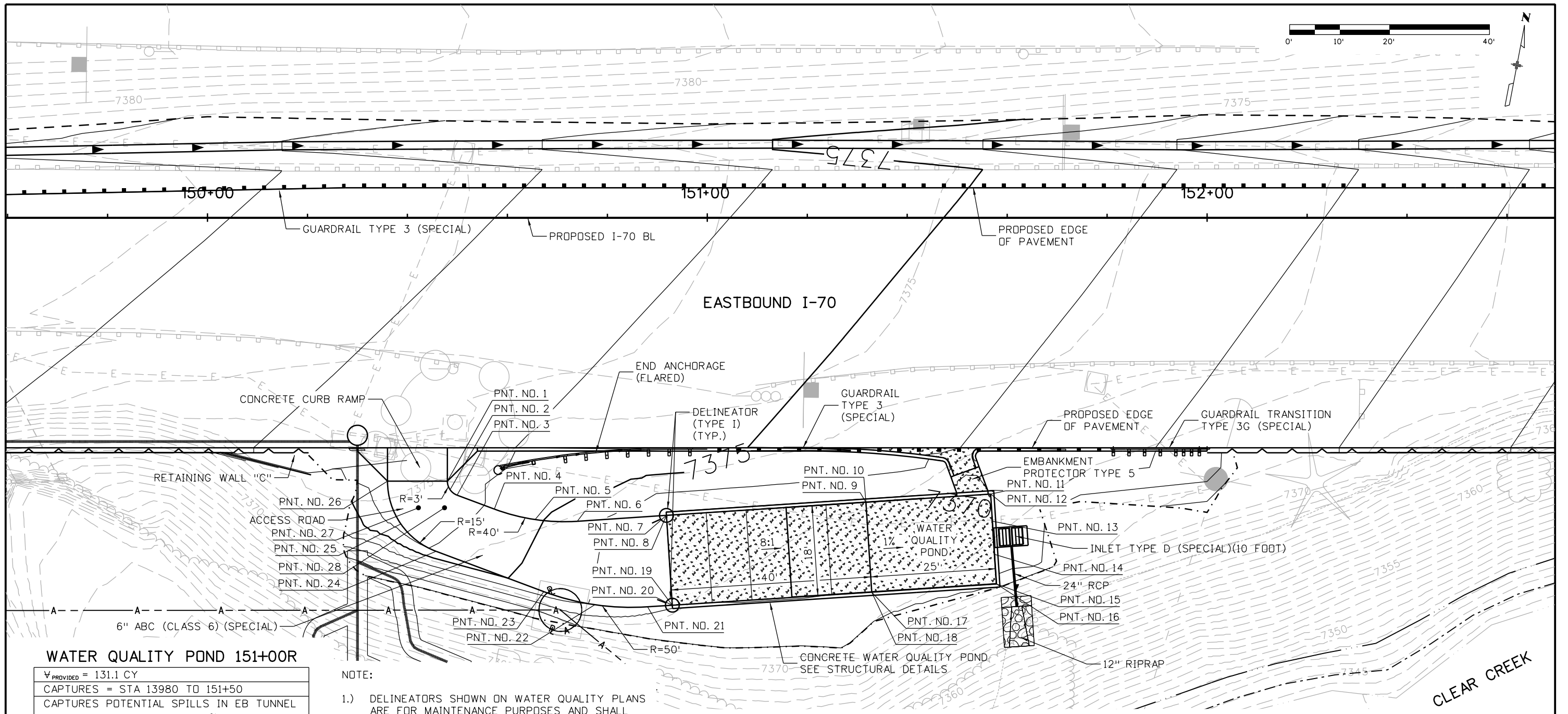
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Region 1 **CRC**

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 No Revisions:
 Revised:
 Void:

EASTBOUND I-70
WATER QUALITY POND 127+50R
PLAN
 Designer: D. Friesen
 Detailer: D. Friesen
 Subset: Water Quality
 Structure Numbers
 Subset Sheets: 3 of 8

Project No./Code
 IM 0703-391
 19036
 Sheet Number 124

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WATER QUALITY POND 151+00R

$V_{PROVIDED} = 131.1 \text{ CY}$
 CAPTURES = STA 13980 TO 151+50
 CAPTURES POTENTIAL SPILLS IN EB TUNNEL AND EB RUNOFF TO MEET 80% GOAL OF SCAP

NOTE:

- 1.) DELINEATORS SHOWN ON WATER QUALITY PLANS ARE FOR MAINTENANCE PURPOSES AND SHALL BE TYPE I (CRYSTAL).

POINT DATA

PNT. NO.	NORTHING	EASTING	ELEVATION	DESCRIPTION
1	696199.93	1007603.88	7,376.77	CONC. CURB RAMP, PC, R=3'
2	696198.35	1007604.73	7,376.62	MID POINT, R=3'
3	696197.53	1007606.32	7,376.47	PT, R=3'
4	696196.20	1007614.14	7,375.83	PC, R=40'
5	696195.66	1007622.56	7,375.14	MID POINT, R=40'
6	696196.90	1007630.91	7,374.45	PT, R=40'
7	696201.39	1007648.22	7,373.00	TOP INSIDE COR. PUSH WALL
8	696201.39	1007648.22	7,373.00	BOT. INSIDE COR. PUSH WALL
9	696211.42	1007686.94	7,373.00	TOP INSIDE EDGE PUSH WALL

POINT DATA

PNT. NO.	NORTHING	EASTING	ELEVATION	DESCRIPTION
10	696211.42	1007686.94	7,368.00	BOT. INSIDE EDGE PUSH WALL
11	696217.69	1007711.14	7,373.00	TOP INSIDE COR. PUSH WALL
12	696217.69	1007711.14	7,367.75	BOT. INSIDE COR. PUSH WALL
13	696212.44	1007712.50	7,372.50	TOP INSIDE EDGE PUSH WALL
14	696205.99	1007714.17	7,372.50	TOP INSIDE EDGE PUSH WALL
15	696200.26	1007715.65	7,373.00	TOP INSIDE COR. PUSH WALL
16	696200.26	1007715.65	7,367.75	BOT. INSIDE COR. PUSH WALL
17	696193.99	1007691.45	7,373.00	TOP INSIDE EDGE PUSH WALL
18	696193.99	1007691.45	7,368.00	BOT. INSIDE EDGE PUSH WALL

POINT DATA

PNT. NO.	NORTHING	EASTING	ELEVATION	DESCRIPTION
19	696183.96	1007652.73	7,373.00	TOP INSIDE COR. PUSH WALL
20	696183.96	1007652.73	7,373.00	BOT. INSIDE COR. PUSH WALL
21	696182.72	1007647.92	7,373.30	PC, R=50'
22	696181.16	1007637.50	7,373.92	MID POINT, R=50'
23	696181.83	1007626.96	7,374.55	PT, R=50'
24	696185.70	1007604.30	7,375.92	PC, R=15'
25	696189.78	1007596.32	7,376.46	MID POINT, R=15'
26	696197.69	1007592.09	7,377.01	CONC. CURB RAMP, PT, R=15'
27	696193.61	1007599.18	N/A	REMOVABLE BOLLARD
28	696194.58	1007604.31	N/A	REMOVABLE BOLLARD

Print Date: 3/8/2013
 File Name: 18832HYDR_CP2_Pond004.dgn
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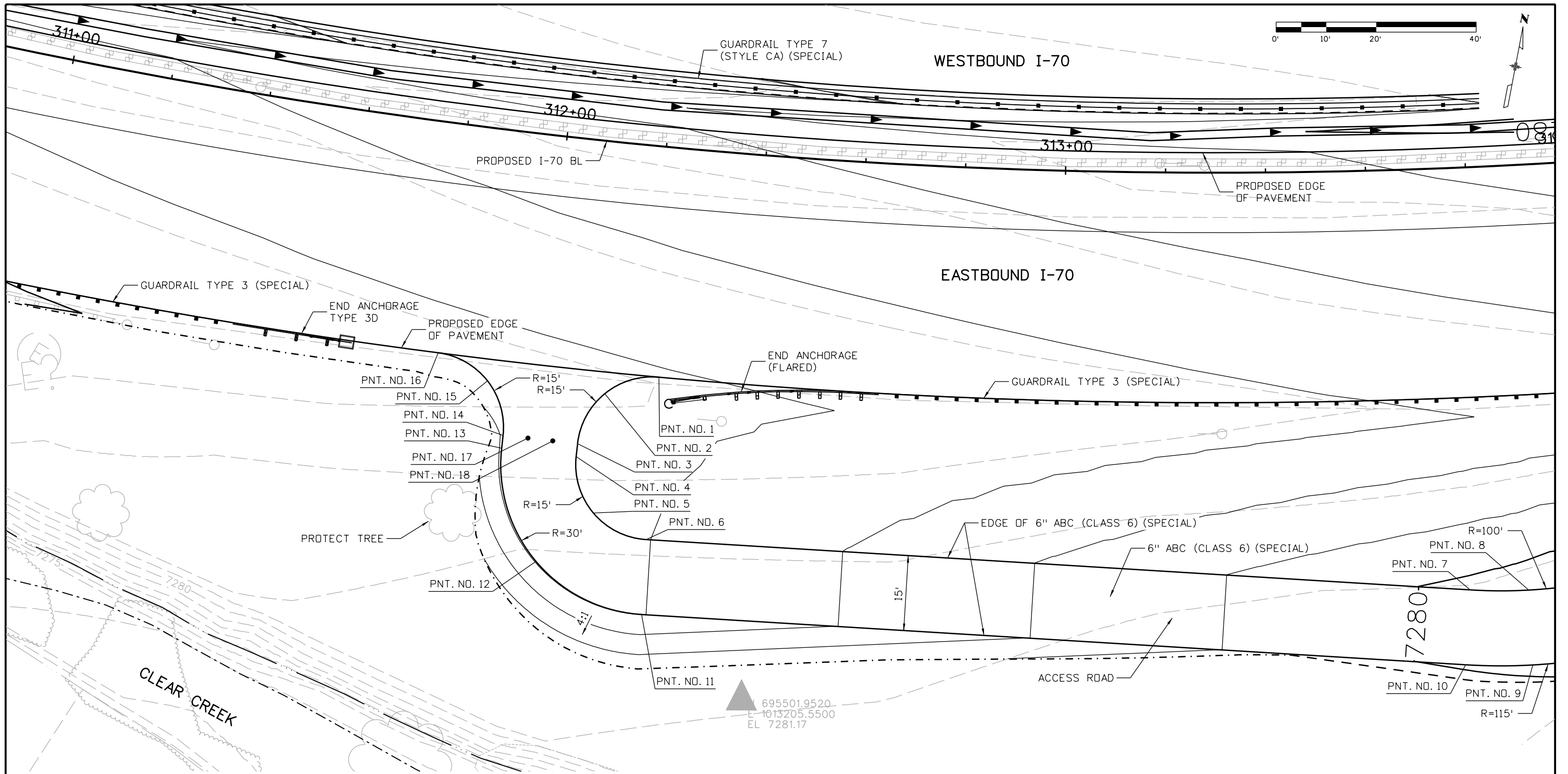
EASTBOUND I-70
WATER QUALITY POND 151+00R
PLAN

Designer: D. Friesen
 Detailer: D. Friesen
 Subset: Water Quality

Structure Numbers
 Subset Sheets: 4 of 8

Project No./Code
 IM 0703-391
 19036
 Sheet Number 125

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POINT DATA

PNT. NO.	NORTHING	EASTING	ELEVATION	DESCRIPTION
1	695566.41	1013188.66	7,284.09	PC, R=15'
2	695563.03	1013177.82	7,284.10	MID POINT, R=15'
3	695553.02	1013172.45	7,284.11	PT, R=15'
4	695550.44	1013172.18	7,284.10	PC, R=15'
5	695539.15	1013175.68	7,284.06	MID POINT, R=15'
6	695533.90	1013186.27	7,284.02	PT, R=15'

POINT DATA

PNT. NO.	NORTHING	EASTING	ELEVATION	DESCRIPTION
7	695524.79	1013351.21	7,279.73	PC, R=100'
8	695524.83	1013362.92	7,279.40	MID POINT, R=100'
9	695509.86	1013363.85	7,279.40	MID POINT, R=115'
10	695509.81	1013350.38	7,279.73	PT, R=115'
11	695518.92	1013185.45	7,284.02	PC, R=30'
12	695529.42	1013164.27	7,284.06	MID POINT, R=30'

POINT DATA

PNT. NO.	NORTHING	EASTING	ELEVATION	DESCRIPTION
13	695552.00	1013157.26	7,284.10	PT, R=30'
14	695554.58	1013157.53	7,284.13	PC, R=15'
15	695565.48	1013154.36	7,284.26	MID POINT, R=15'
16	695571.03	1013144.45	7,284.40	PT, R=15'
17	695554.06	1013162.51	N/A	REMOVABLE BOLLARD
18	695553.54	1013167.48	N/A	REMOVABLE BOLLARD

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 File Name: 18832HYDR_CP2_Pond005.dgn
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Date:	Comments	Init.

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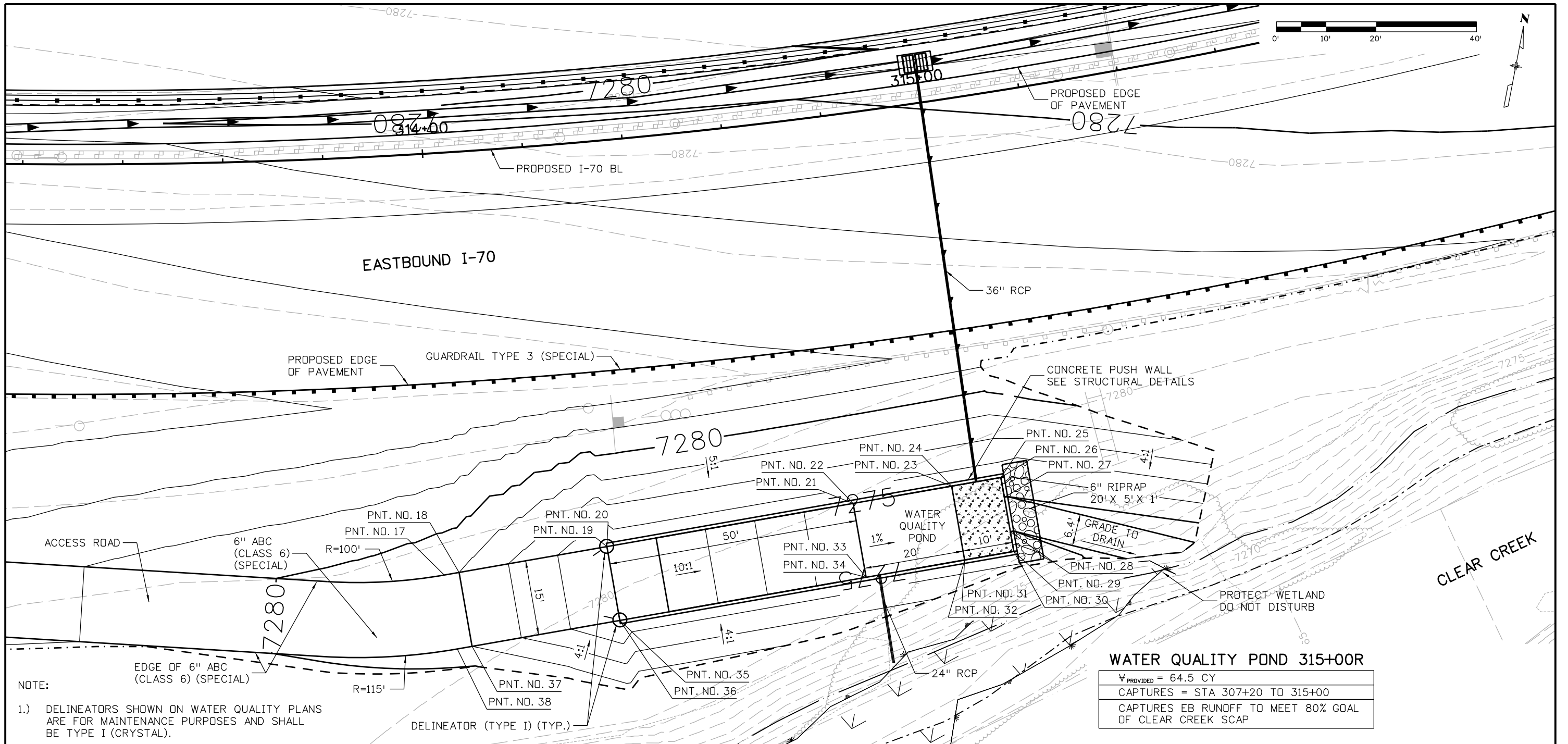
As Constructed
No Revisions:
Revised:
Void:

**EASTBOUND I-70
 WATER QUALITY POND 315+00R
 PLAN**

Designer: D. Friesen	Structure Numbers
Detailer: D. Friesen	
Subset: Water Quality	Subset Sheets: 5 of 8

Project No./Code
IM 0703-391
19036
Sheet Number 126

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NOTE:
 1.) DELINEATORS SHOWN ON WATER QUALITY PLANS ARE FOR MAINTENANCE PURPOSES AND SHALL BE TYPE I (CRYSTAL).

WATER QUALITY POND 315+00R

∇ _{PROVIDED} = 64.5 CY
CAPTURES = STA 307+20 TO 315+00
CAPTURES EB RUNOFF TO MEET 80% GOAL OF CLEAR CREEK SCAP

POINT DATA

PNT. NO.	NORTHING	EASTING	ELEVATION	DESCRIPTION
17	695526.24	1013374.55	7,279.08	PT, R=100'
18	695526.76	1013377.51	7,279.00	PI, 6" ABC
19	695532.12	1013407.03	7,276.50	TOP INSIDE COR. PUSH WALL
20	695532.12	1013407.03	7,276.00	BOT. INSIDE COR. PUSH WALL
21	695541.03	1013456.23	7,276.50	TOP INSIDE EDGE PUSH WALL
22	695541.03	1013456.23	7,271.00	BOT. INSIDE EDGE PUSH WALL
23	695544.60	1013475.91	7,276.50	TOP INSIDE EDGE PUSH WALL

POINT DATA

PNT. NO.	NORTHING	EASTING	ELEVATION	DESCRIPTION
24	695544.60	1013475.91	7,270.80	BOT. INSIDE EDGE PUSH WALL
25	695546.38	1013485.75	7,276.50	TOP INSIDE COR. PUSH WALL
26	695546.38	1013485.75	7,270.80	BOT. INSIDE COR. PUSH WALL
27	695542.45	1013486.46	7,275.00	TOP INSIDE EDGE PUSH WALL
28	695535.56	1013487.71	7,275.00	TOP INSIDE EDGE PUSH WALL
29	695531.62	1013488.43	7,276.50	TOP INSIDE COR. PUSH WALL
30	695531.62	1013488.43	7,270.80	BOT. INSIDE COR. PUSH WALL

POINT DATA

PNT. NO.	NORTHING	EASTING	ELEVATION	DESCRIPTION
31	695529.84	1013478.59	7,276.50	TOP INSIDE EDGE PUSH WALL
32	695529.84	1013478.59	7,270.80	BOT. INSIDE EDGE PUSH WALL
33	695526.27	1013458.91	7,276.50	TOP INSIDE EDGE PUSH WALL
34	695526.27	1013458.91	7,271.00	BOT. INSIDE EDGE PUSH WALL
35	695517.36	1013409.71	7,276.50	TOP INSIDE COR. PUSH WALL
36	695517.36	1013409.71	7,276.00	BOT. INSIDE COR. PUSH WALL
37	695512.02	1013380.19	7,279.00	PI, 6" ABC
38	695511.48	1013377.22	7,279.08	PC, R=115'

Print Date: 3/8/2013
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Date:	Comments	Init.

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Region 1 **CRC**

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 Revised:
 Void:

**EASTBOUND I-70
 WATER QUALITY POND 315+00R
 PLAN**

Designer: D. Friesen
 Detailer: D. Friesen
 Subset: Water Quality

Structure Numbers
 Subset Sheets: 6 of 8

Project No./Code
 IM 0703-391
 19036
 Sheet Number 127

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POINT DATA

PNT. NO.	NORTHING	EASTING	ELEVATION	DESCRIPTION
1	695770.36	1016035.08	7,255.50	TOP INSIDE COR. PUSH WALL
2	695770.36	1016035.08	7,255.00	BOT. INSIDE COR. PUSH WALL
3	695756.77	1015997.46	7,255.50	TOP INSIDE EDGE PUSH WALL
4	695756.77	1015997.46	7,251.00	BOT. INSIDE EDGE PUSH WALL
5	695753.37	1015988.06	7,255.50	TOP INSIDE EDGE PUSH WALL
6	695753.37	1015988.06	7,251.00	BOT. INSIDE EDGE PUSH WALL
7	695749.97	1015978.66	7,255.50	TOP INSIDE COR. PUSH WALL
8	695749.97	1015978.66	7,250.90	BOT. INSIDE COR. PUSH WALL

POINT DATA

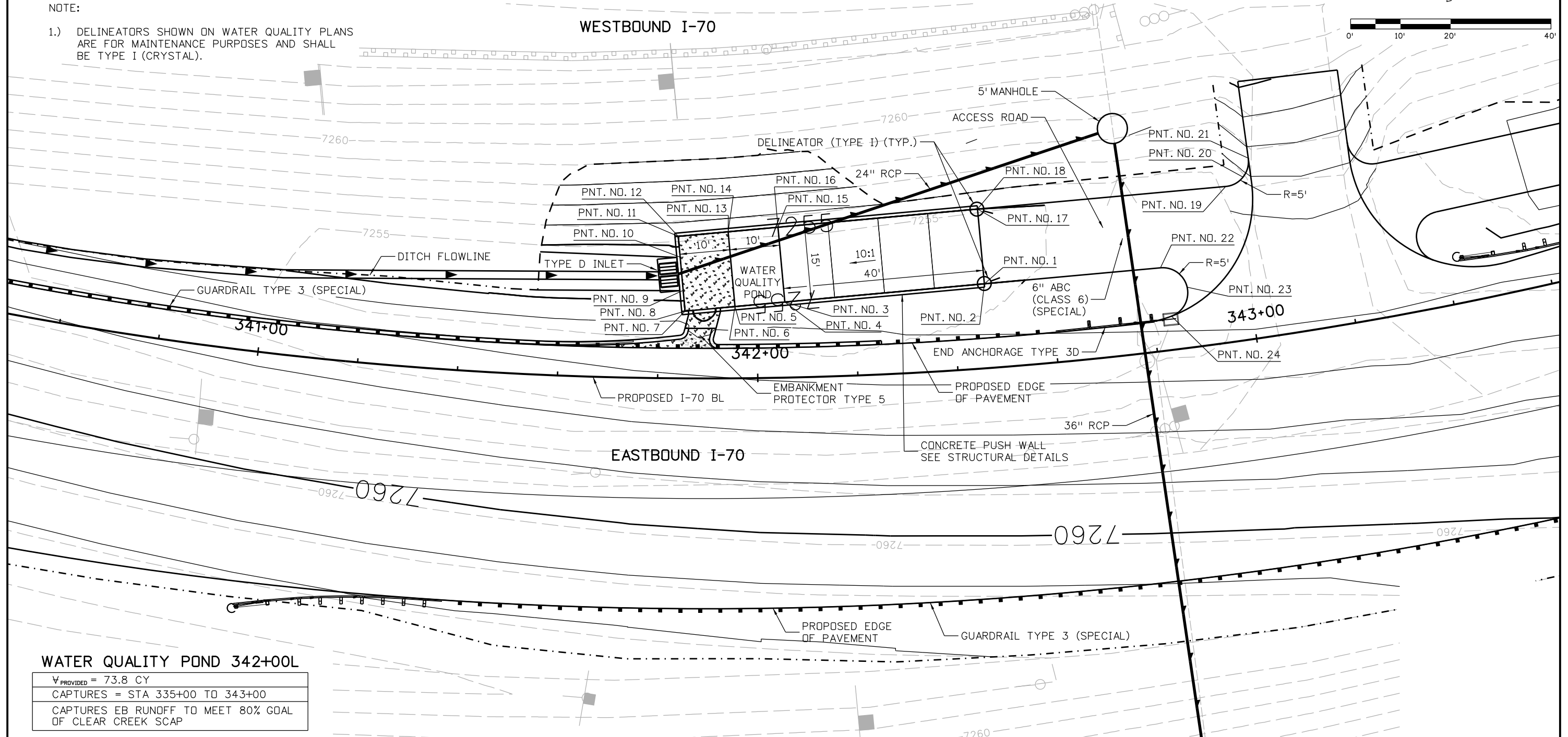
PNT. NO.	NORTHING	EASTING	ELEVATION	DESCRIPTION
9	695753.89	1015977.24	7,254.50	TOP INSIDE EDGE PUSH WALL
10	695760.15	1015974.97	7,254.50	TOP INSIDE EDGE PUSH WALL
11	695764.07	1015973.56	7,255.50	TOP INSIDE COR. PUSH WALL
12	695764.07	1015973.56	7,250.90	BOT. INSIDE COR. PUSH WALL
13	695767.47	1015982.96	7,255.50	TOP INSIDE EDGE PUSH WALL
14	695767.47	1015982.96	7,251.00	BOT. INSIDE EDGE PUSH WALL
15	695770.87	1015992.36	7,255.50	TOP INSIDE EDGE PUSH WALL
16	695770.87	1015992.36	7,251.00	BOT. INSIDE EDGE PUSH WALL

POINT DATA

PNT. NO.	NORTHING	EASTING	ELEVATION	DESCRIPTION
17	695784.47	1016029.98	7,255.50	TOP INSIDE COR. PUSH WALL
18	695784.47	1016029.98	7,255.00	BOT. INSIDE COR. PUSH WALL
19	695801.39	1016076.77	EXIST. GROUND	PC, R=5'
20	695804.07	1016079.65	7,256.78	MID POINT, R=5'
21	695808.00	1016079.69	7,257.60	PT, R=5'
22	695782.37	1016068.29	EXIST. GROUND	PT, R=5'
23	695779.98	1016074.42	7,255.54	MID POINT, R=5'
24	695773.58	1016072.87	7,255.78	PC, R=5'

NOTE:

- 1.) DELINEATORS SHOWN ON WATER QUALITY PLANS ARE FOR MAINTENANCE PURPOSES AND SHALL BE TYPE I (CRYSTAL).



WATER QUALITY POND 342+00L
 V_{PROVIDED} = 73.8 CY
 CAPTURES = STA 335+00 TO 343+00
 CAPTURES EB RUNOFF TO MEET 80% GOAL OF CLEAR CREEK SCAP

Print Date: 3/8/2013	Sheet Revisions			Colorado Department of Transportation		As Constructed		EASTBOUND I-70		Project No./Code	
File Name: 18832HYDR_CP2_Pond007.dgn	Date:	Comments	Init.	 425 A Corporate Circle Golden, CO 80401 Phone: 720-497-6918 FAX: 720-497-6901		No Revisions: Revised: Void:		WATER QUALITY POND 342+00L PLAN		IM 0703-391 19036	
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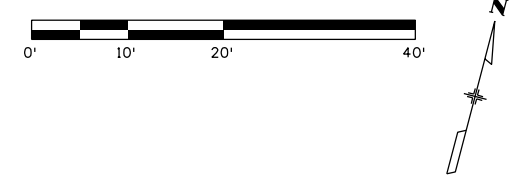
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1	695803.33	1016131.07	7,255.29	SPOT ELEVATION
2	695820.10	1016144.33	7,253.00	SPOT ELEVATION
3	695860.28	1016203.68	7,252.30	BOT. OF CHECK DAM
4	695861.95	1016205.92	7,253.00	TOP OF CHECK DAM
5	695863.74	1016208.33	7,253.00	TOP OF CHECK DAM
6	695872.31	1016198.22	7,253.00	TOP OF CHECK DAM
7	695874.10	1016200.62	7,253.00	TOP OF CHECK DAM
8	695870.64	1016195.97	7,252.30	BOT. OF CHECK DAM

POINT DATA

PNT. NO.	NORTHING	EASTING	ELEVATION	DESCRIPTION
9	695830.55	1016138.07	7,253.00	SPOT ELEVATION
10	695825.95	1016117.51	7,255.00	SPOT ELEVATION
11	695816.06	1016098.00	7,257.59	PC, R=5'
12	695813.28	1016100.89	7,256.80	MID POINT, R=5'
13	695813.52	1016104.89	EXIST. GROUND	PT, R=5'
14	695807.10	1016118.71	EXIST. GROUND	PC, R=5'
15	695801.65	1016116.09	7,255.64	MID POINT, R=5'
16	695797.66	1016120.64	7,255.68	PT, R=5'

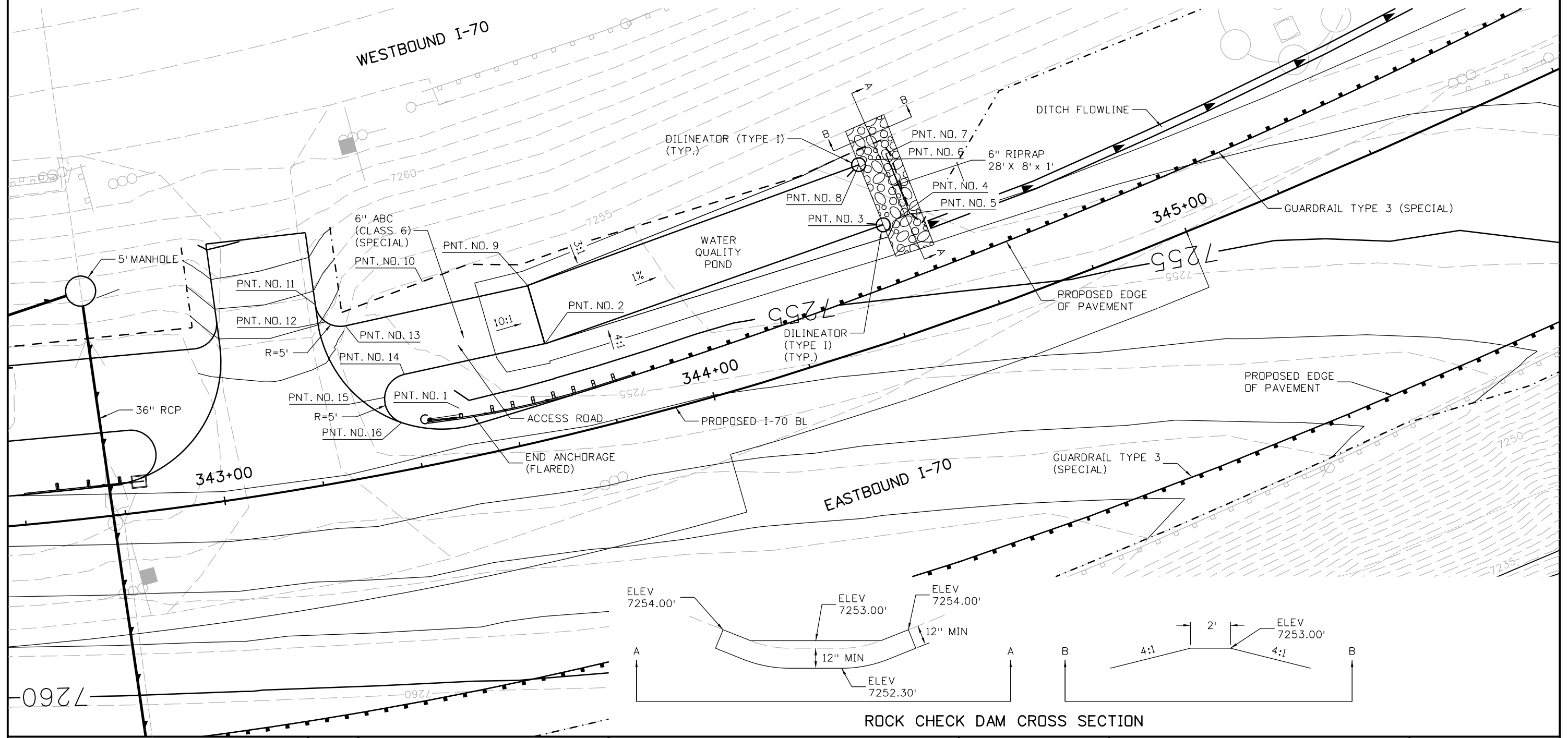
WATER QUALITY POND 344+00L

▽ PROVIDED = 15.5 CY
CAPTURES = STA 343+00 TO 344+40
CAPTURES EB RUNOFF TO MEET 80% GOAL OF CLEAR CREEK SCAP

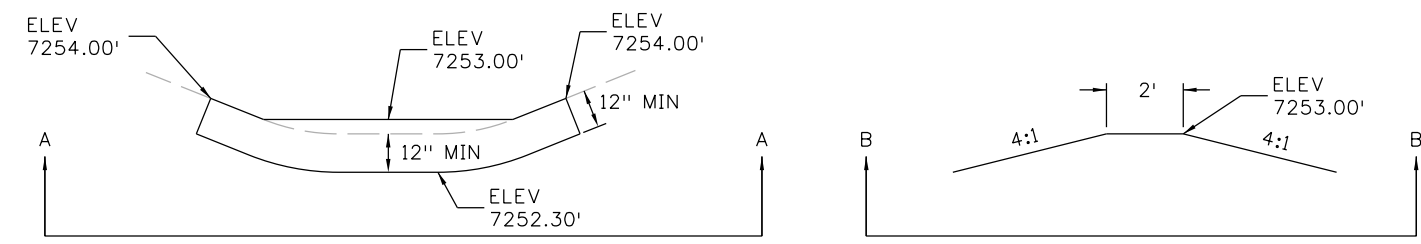


NOTE:


1.) DELINEATORS SHOWN ON WATER QUALITY PLANS ARE FOR MAINTENANCE PURPOSES AND SHALL BE TYPE I (CRYSTAL).



ROCK CHECK DAM CROSS SECTION



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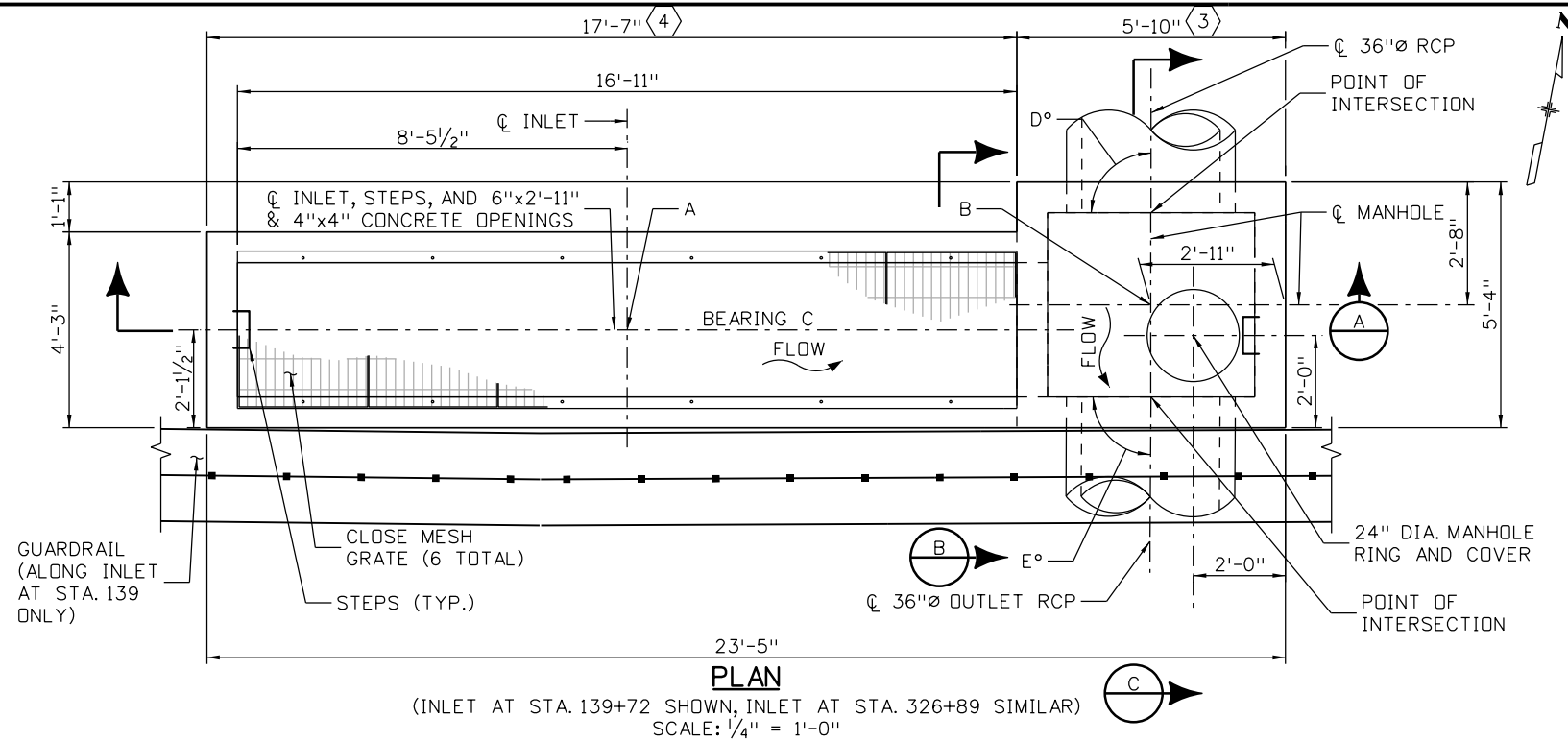
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Region 1 CRC

As Constructed	EASTBOUND I-70 WATER QUALITY POND 344+00L PLAN	
No Revisions:	Designer: D. Friesen	Structure Numbers
Revised:	Detailer: D. Friesen	
Void:	Subset: Water Quality	Subset Sheets: 8 of 8

Project No./Code
IM 0703-391
19036
Sheet Number 129

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KEYNOTES

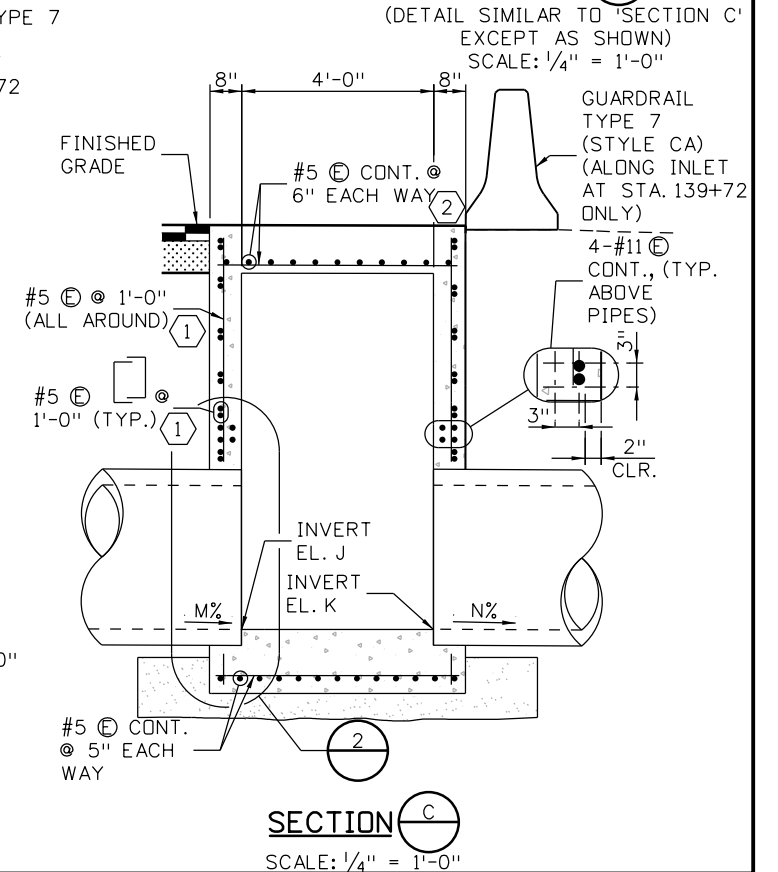
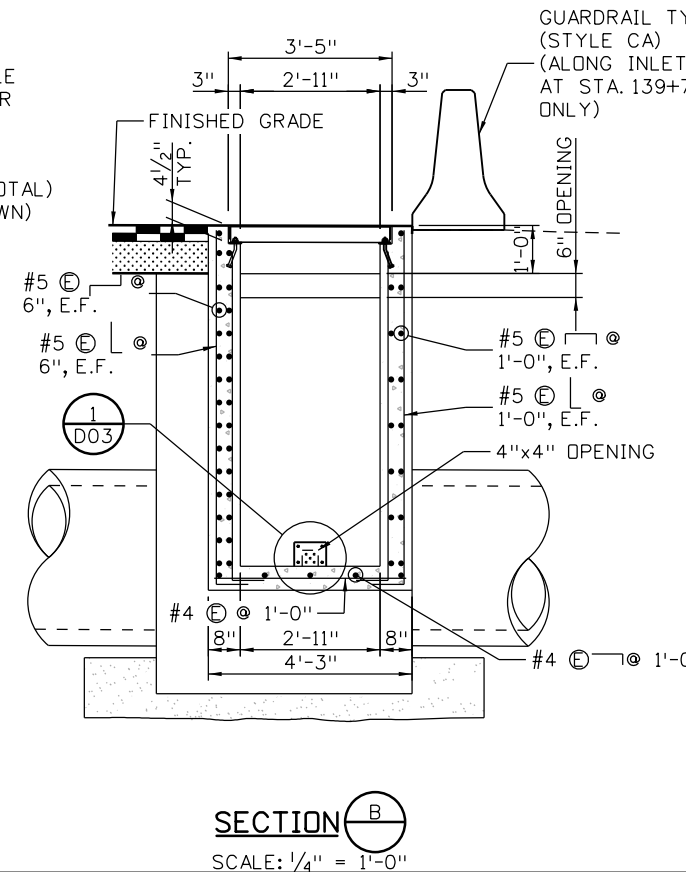
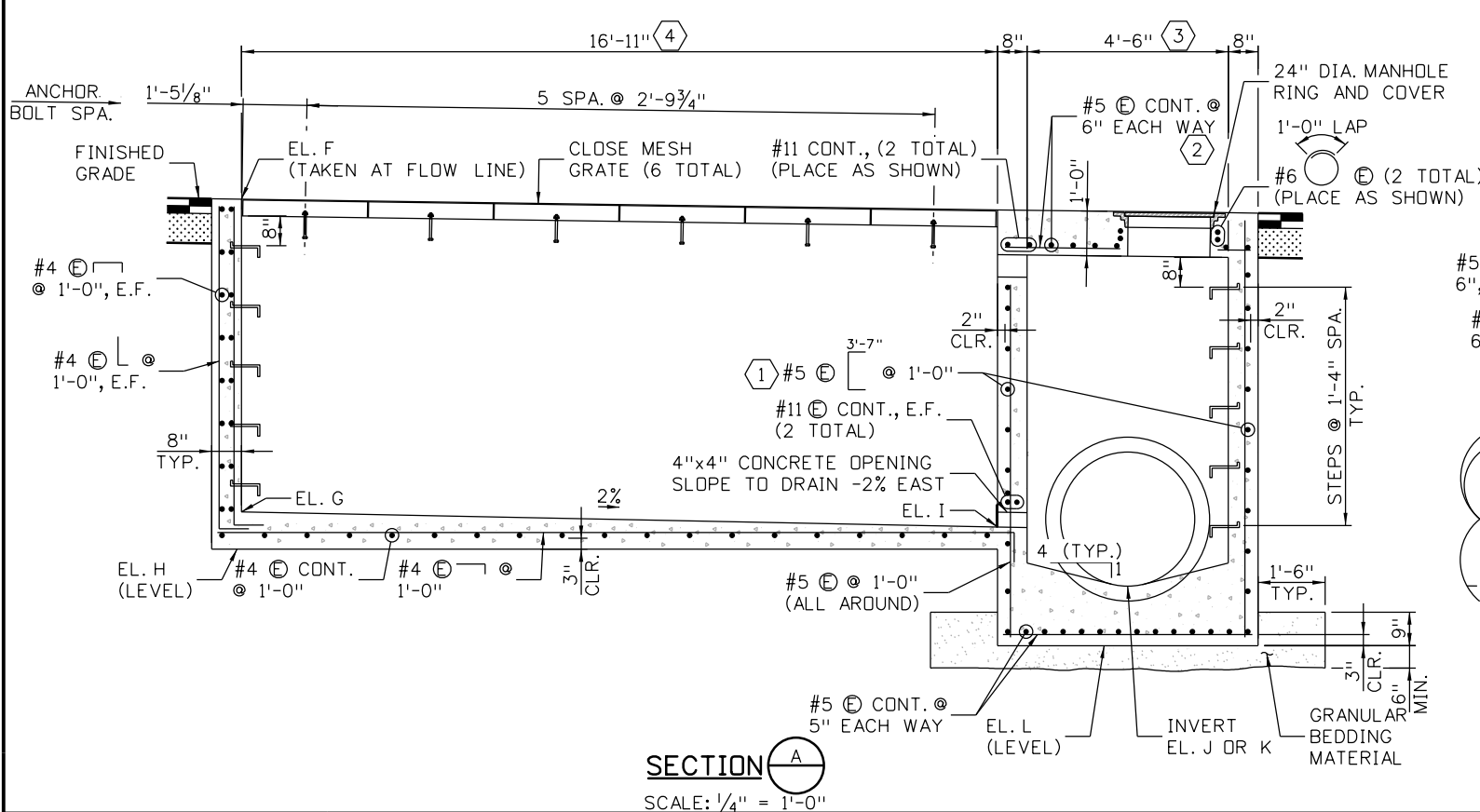
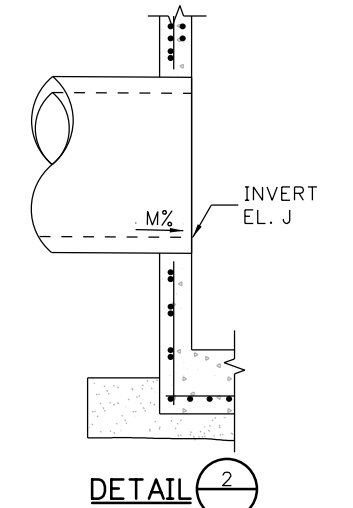
- ① CUT BARS AS NEEDED TO CLEAR PIPES AND CONCRETE OPENINGS.
- ② CUT BARS AS NEEDED TO CLEAR MANHOLE.
- ③ PAID FOR AS MANHOLE (SPECIAL).
- ④ PAID FOR AS INLET (SPECIAL).

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. FOR MANHOLE RING AND COVER DETAILS, SEE M-604-12.
- 4. STEPS SHALL CONFORM TO AASHTO M 199.
- 5. THE SLOPE OF THE MANHOLE COVER AND GRATES SHALL MATCH THE ROADWAY PROFILE AND CROSS SLOPE.
- 6. PROVIDE WATERTIGHT JOINTS AROUND PIPES.
- 7. SEE DRAINAGE TABS FOR PAYMENT ITEMS.

VARIABLE TABLE

		INLET AT STA. 139+72	INLET AT STA. 326+89
I-70 CL STATION AND OFFSET	A	STA. 139+72.87, 43.87' RT.	STA. 326+89.00, 43.83' RT.
	B	STA. 139+84.25, 43.33' RT.	STA. 327+01.07, 43.33' RT.
BEARING	C	N 79° 13' 34" E	N 79° 13' 34" E
ANGLES	D	90° 00' 00"	89° 38' 16"
	E	89° 39' 07"	90° 21' 44"
ELEVATIONS	F	7390.46	7267.23
	G	7384.20	7260.90
	H	7383.37	7260.07
	I	7383.87	7260.57
	J	7382.21	7261.80
	K	7382.01	7259.45
	L	7381.68	7258.12
	SLOPE %	M	1.0%
	N	1.0%	4.0%



Design	Checked By	Design	Checked By

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Print Date: 3/7/2013	0000
File Name: 18832DES_CP2InletDet01.dgn	
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Date:	Comments	Init.

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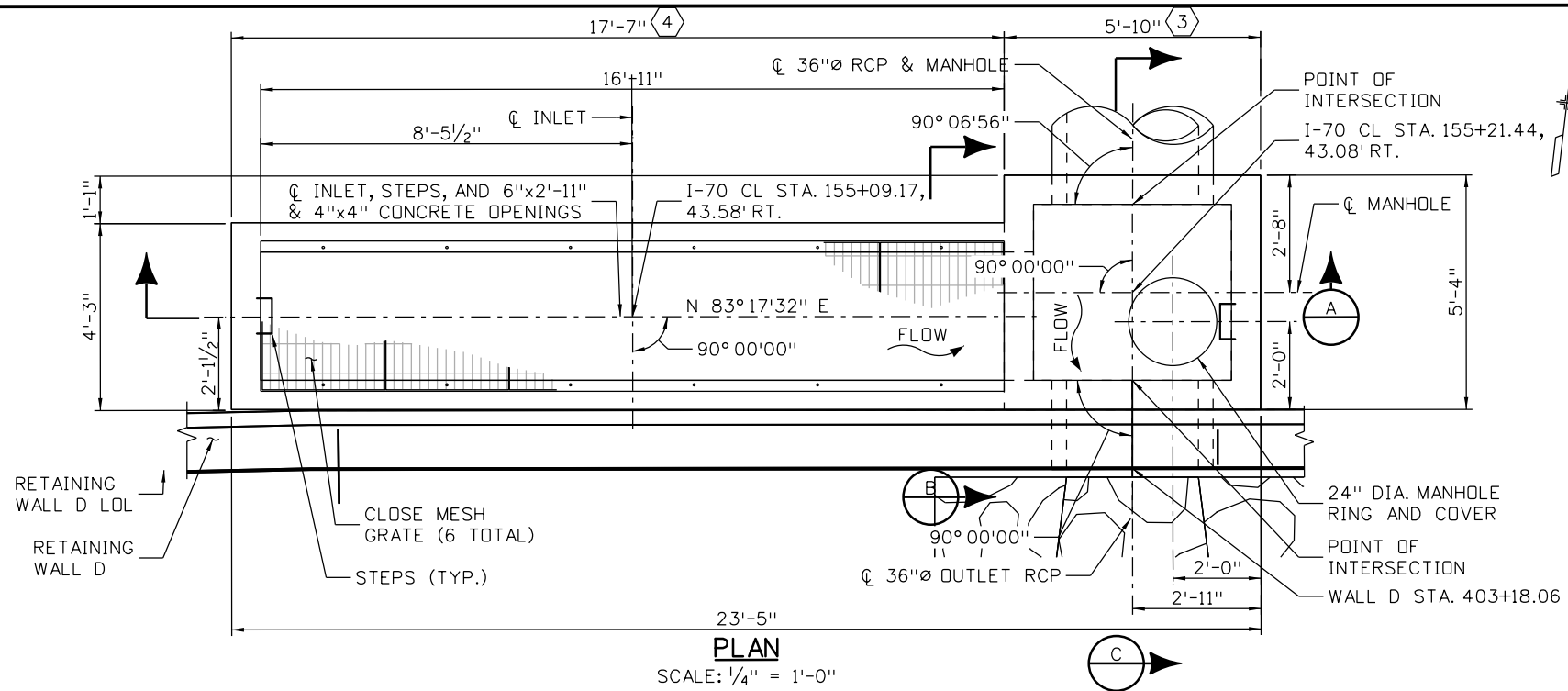
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Phone: 720-497-6918 FAX: 720-497-6901

Region 1 CRC

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No Revisions:
Revised:
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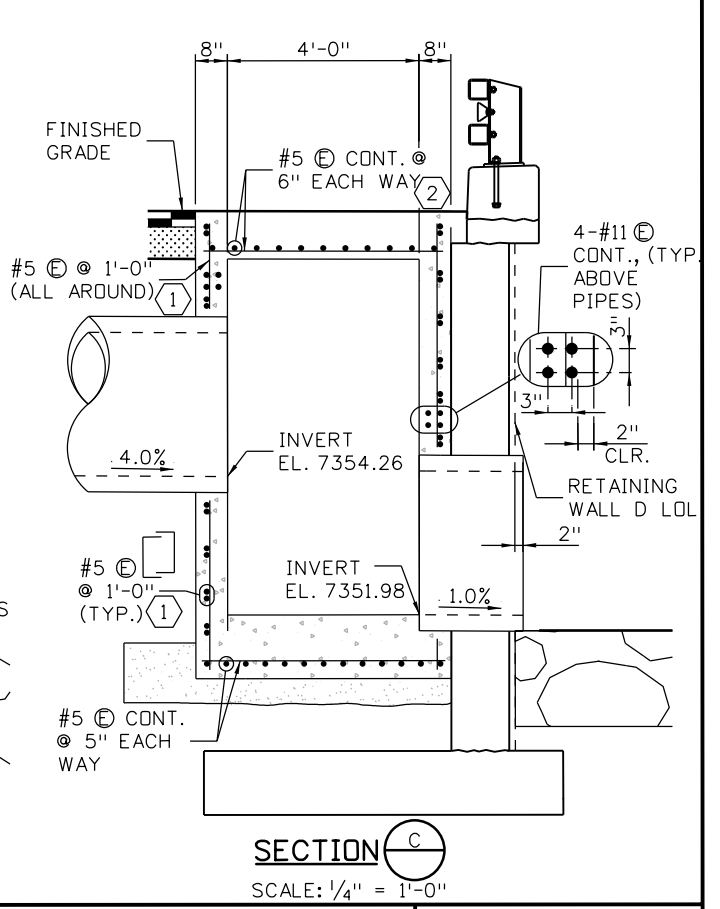
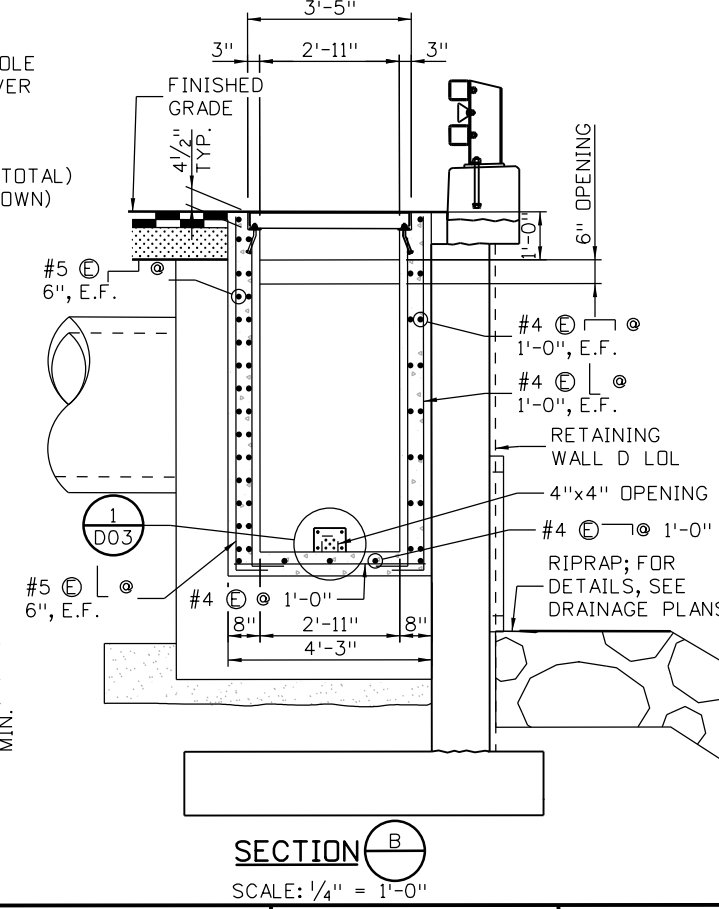
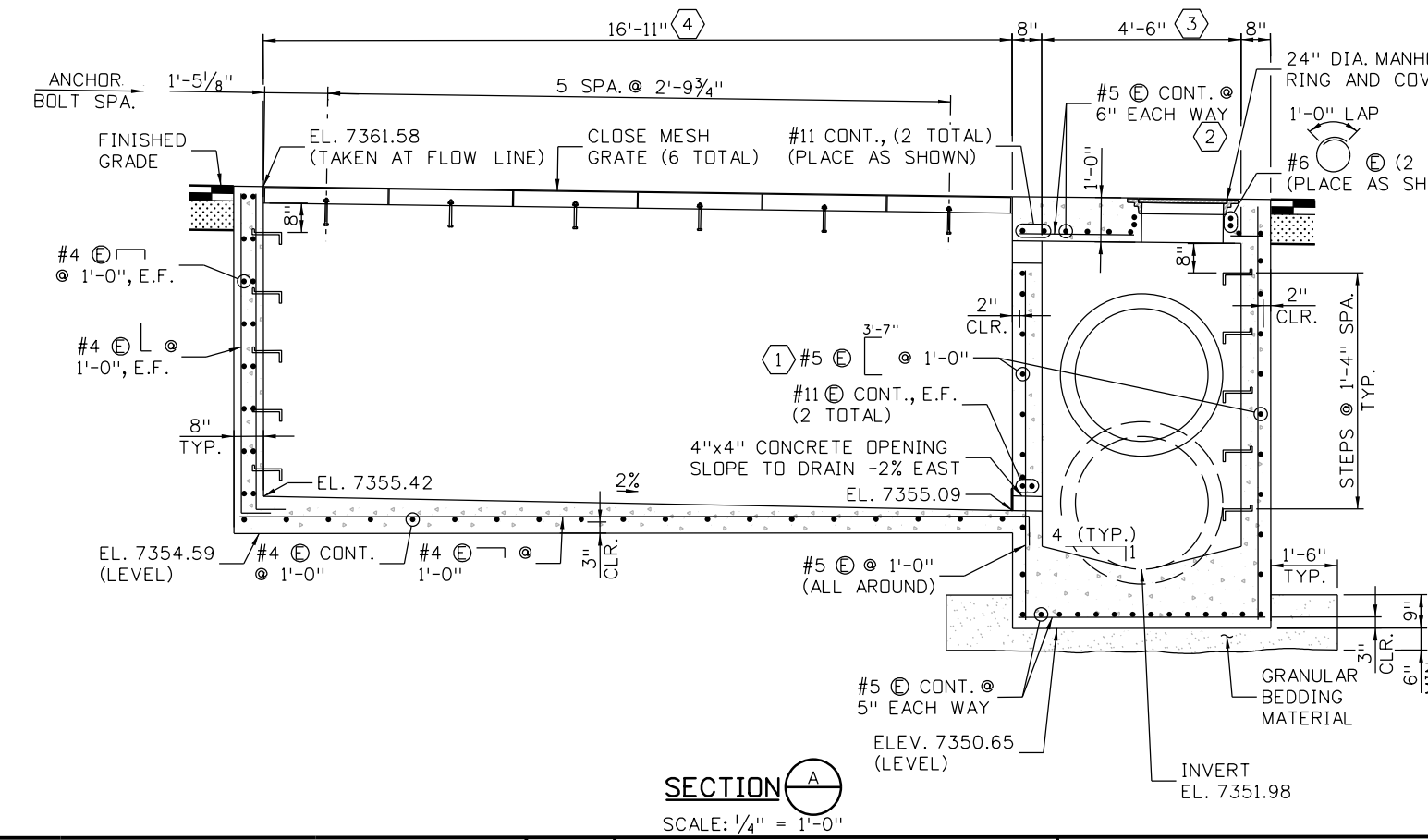
DRAINAGE DETAILS WATER QUALITY STRUCTURE (SHEET 1 OF 7)	
Designer: P. FERNANDEZ	Structure Numbers
Detailer: E. SCHAWO	
Sheet Subset: DRNDTL	Subset Sheets: D01 of 23

Project No./Code	IM 0703-391
	19036
Sheet Number	130



- KEYNOTES**
- ① CUT BARS AS NEEDED TO CLEAR PIPES AND CONCRETE OPENINGS.
 - ② CUT BARS AS NEEDED TO CLEAR MANHOLE.
 - ③ PAID FOR AS MANHOLE (SPECIAL).
 - ④ PAID FOR AS INLET (SPECIAL).

- 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. FOR MANHOLE RING AND COVER DETAILS, SEE M-604-12.
 4. STEPS SHALL CONFORM TO AASHTO M 199.
 5. THE SLOPE OF THE MANHOLE COVER AND GRATES SHALL MATCH THE ROADWAY PROFILE AND CROSS SLOPE.
 6. PROVIDE WATERTIGHT JOINTS AROUND PIPES.
 7. SEE DRAINAGE TABS FOR PAYMENT ITEMS.



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

Print Date: 3/7/2013
 File Name: 18832DES_CP2InletDet02.dgn
 Horiz. Scale: As Noted Vert. Scale: As Noted

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Sheet Revisions		
Date:	Comments	Init.

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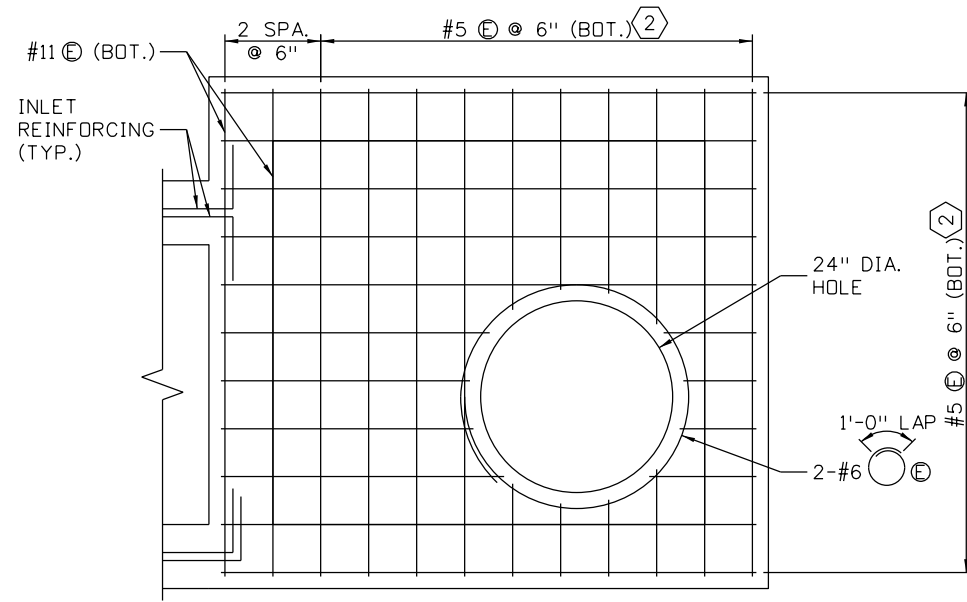
DRAINAGE DETAILS
WATER QUALITY STRUCTURE
(SHEET 2 OF 7)

Designer: P. FERNANDEZ
 Detailer: E. SCHAWO

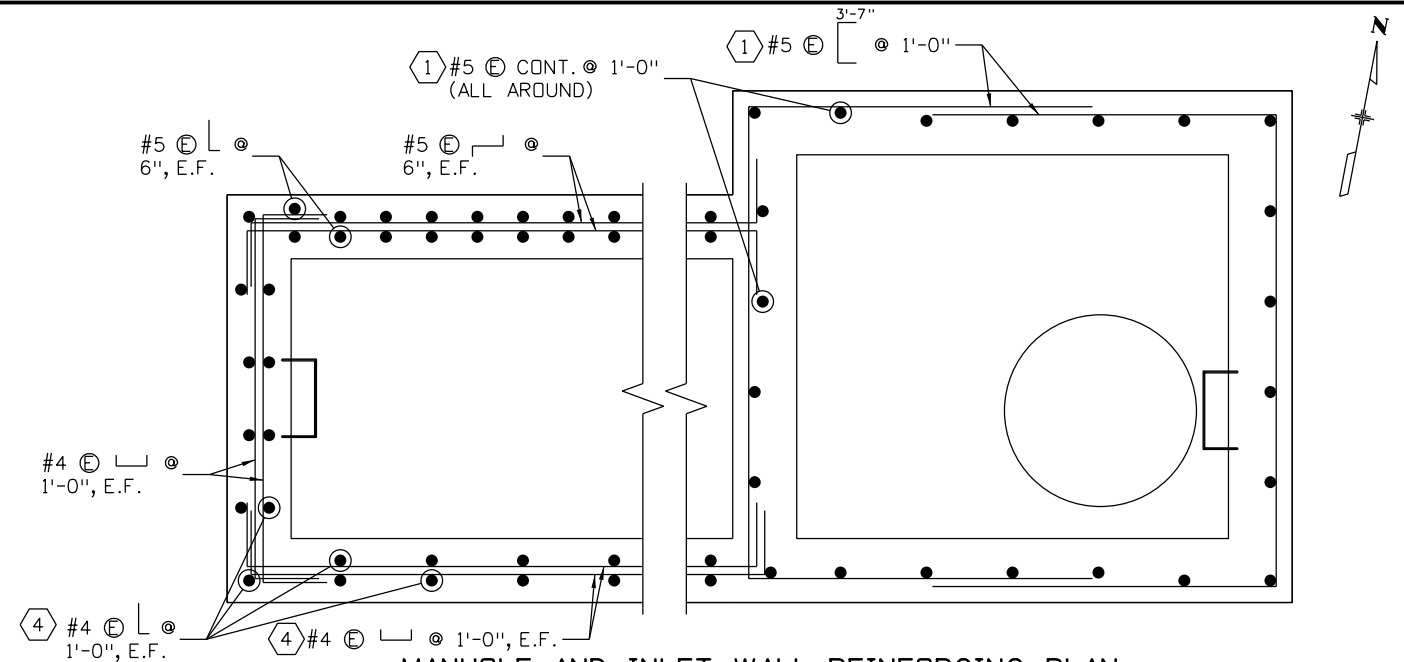
Structure Numbers
 Sheet Subset: DRNDTL
 Subset Sheets: D02 of 23

Project No./Code
 IM 0703-391
 19036
 Sheet Number 131

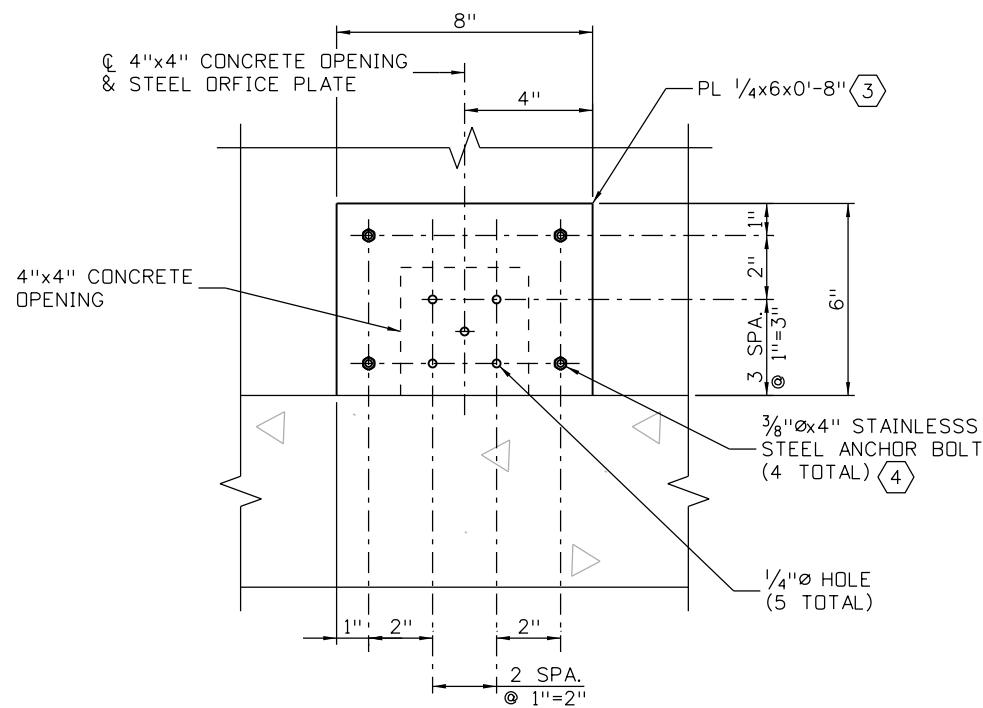
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MANHOLE TOP SLAB REINFORCING PLAN
SCALE: 1/2" = 1'-0"



MANHOLE AND INLET WALL REINFORCING PLAN
SCALE: 1/2" = 1'-0"



DETAIL (D01, D02)
SCALE: 2" = 1'-0"

SUMMARY OF QUANTITIES (FOR INFORMATION ONLY)

DESCRIPTION	UNIT	MANHOLE	INLET
CONCRETE CLASS B	CY	4.0	8.6
REINFORCING STEEL (EPOXY COATED)	LB.	1111	1876
GRANULAR BEDDING MATERIAL	CY	2.0	
STRUCTURAL STEEL	LB.	285	815

KEYNOTES

- ① CUT BARS AS NEEDED TO CLEAR PIPES AND CONCRETE OPENINGS.
- ② CUT BARS AS NEEDED TO CLEAR MANHOLE.
- ③ GALVANIZE PLATE AFTER FABRICATION. PROVIDE A GASKET BETWEEN PLATE AND CONCRETE.
- ④ BOLTS SHALL BE PLACED IN 1/2" DIAMETER HOLES WITH STAINLESS STEEL WASHERS, LOCKWASHERS, AND NUTS.
- ⑤ #5 BARS SHALL BE USED AT INLET AT STATIONS 139+72.88 AND 326+89.01.

NOTES:

- 1. CONCRETE SHALL BE CLASS B CONCRETE.
- 2. FOR ADDITIONAL CLOSE MESH GRATE DETAILS, SEE M-604-11.
- 3. FOR ADDITIONAL MANHOLE NOTES, SEE M-604-20.
- 4. STEEL ORFICE PLATE, GASKET, AND ANCHOR BOLTS SHALL BE PAID FOR UNDER ITEM NO. 604, INLET TYPE D (SPECIAL).

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

Print Date: 3/7/2013
 File Name: 18832DES_CP2InletDet03.dgn
 Horiz. Scale: As Noted Vert. Scale: As Noted

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Date:	Comments	Init.

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Revised:
Void:

**DRAINAGE DETAILS
 WATER QUALITY STRUCTURE
 (SHEET 3 OF 7)**

Designer: P. FERNANDEZ
 Detailer: E. SCHAWO

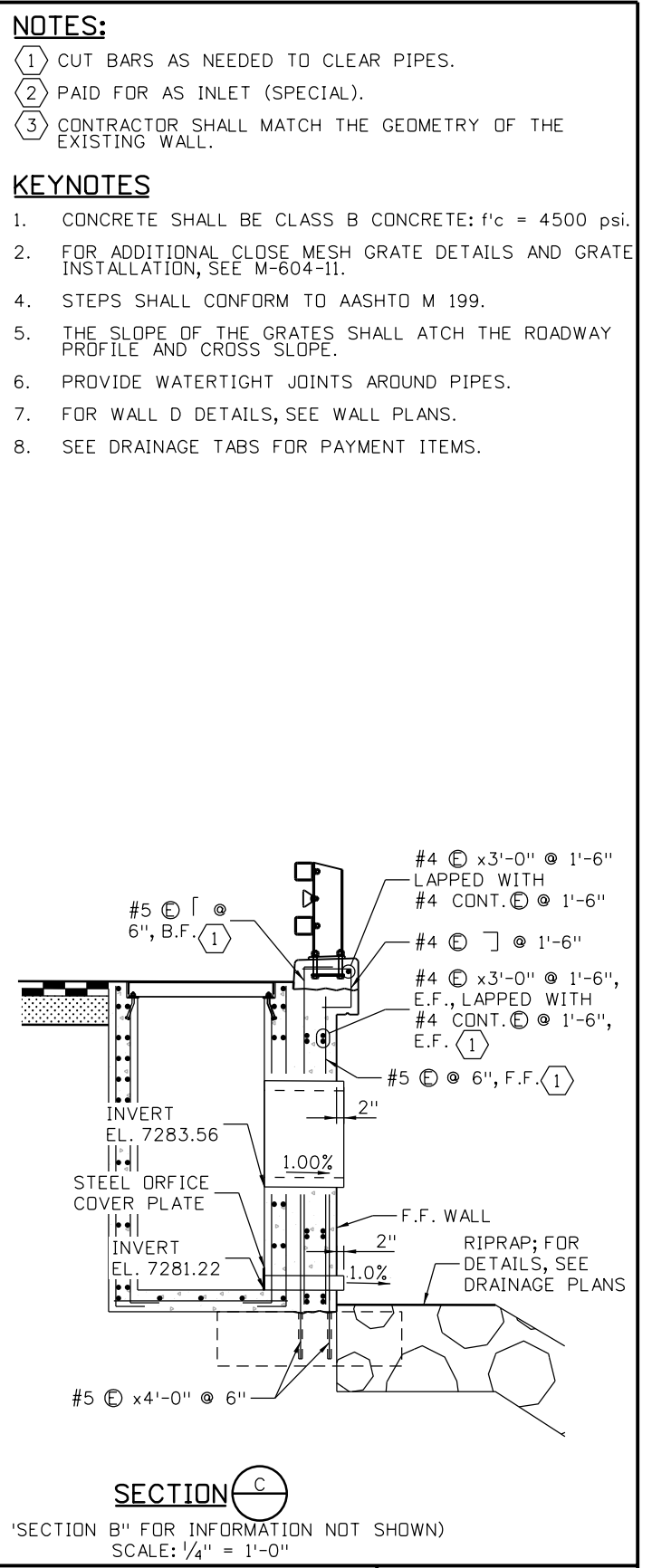
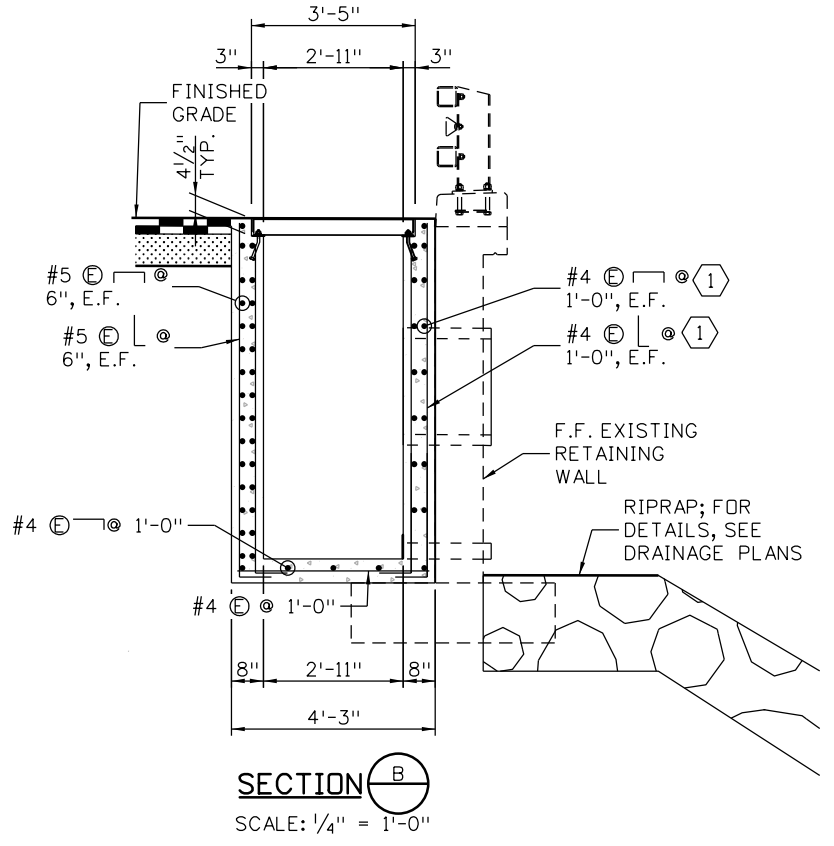
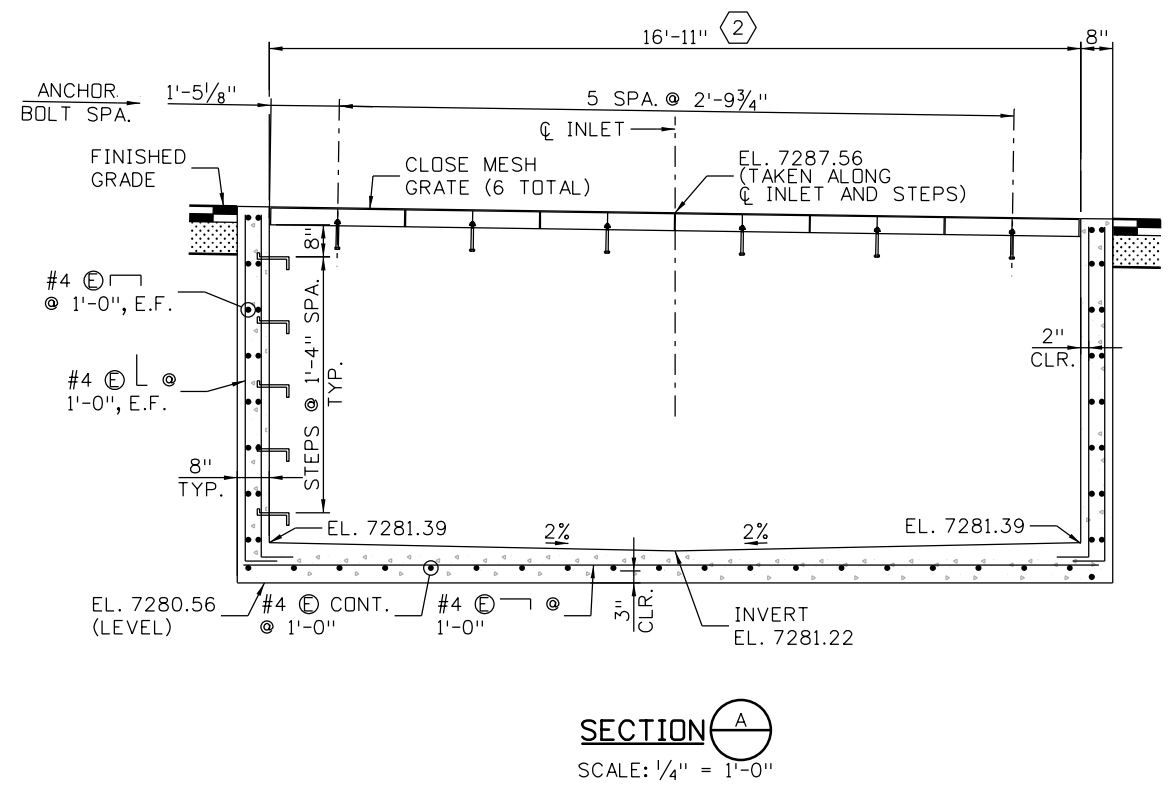
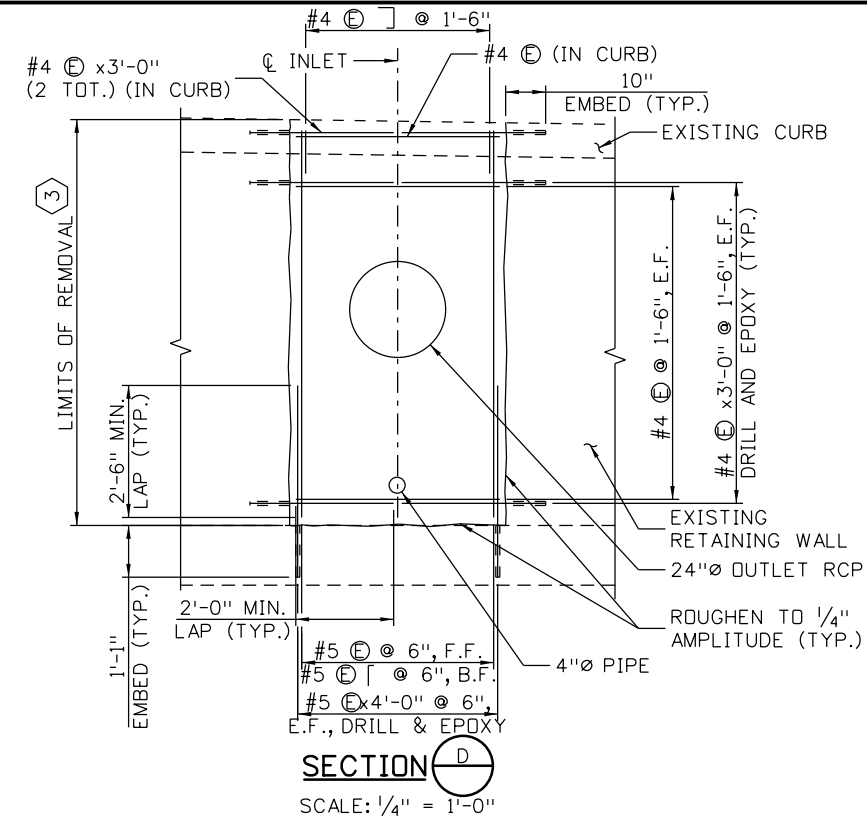
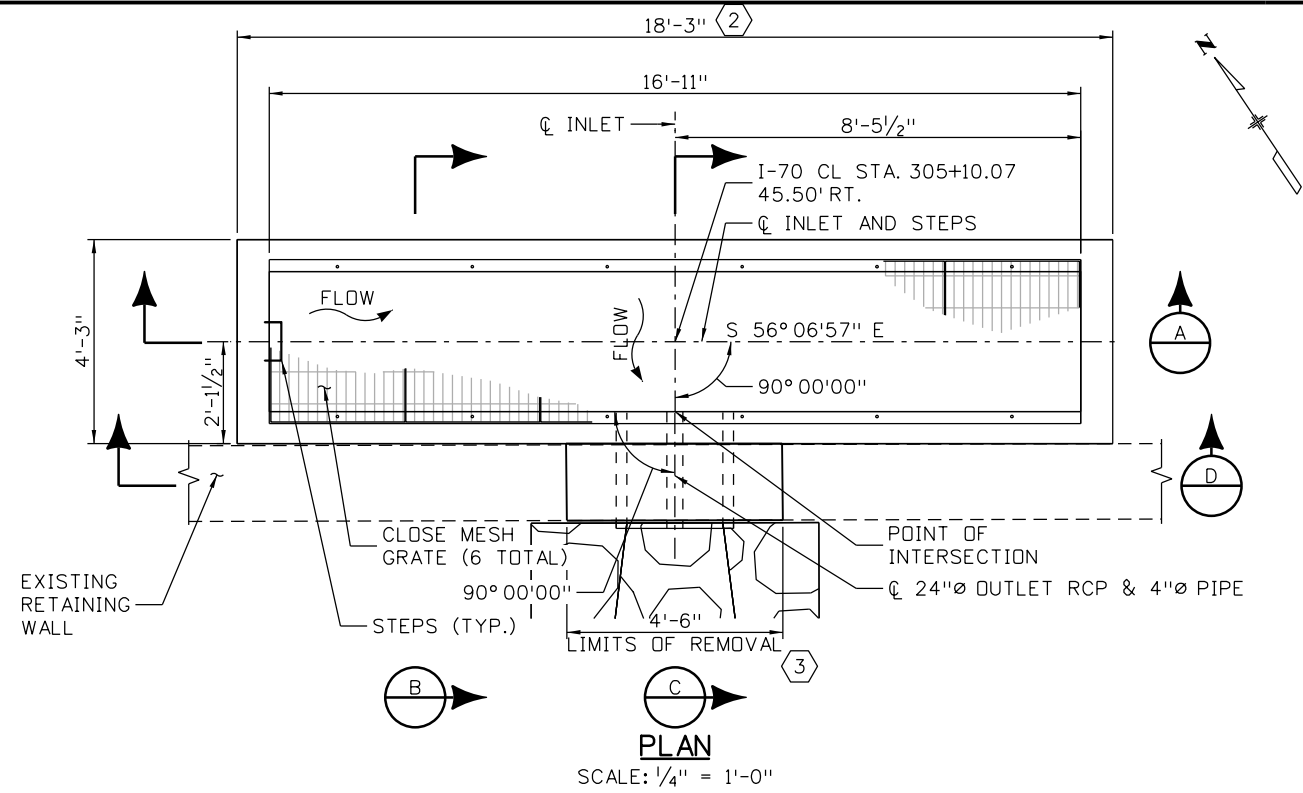
Structure Numbers
 Sheet Subset: DRNDTL Subset Sheets: D03 of 23

Project No./Code
IM 0703-391
19036
Sheet Number 132

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18026 11:10:10 AM c:\pwwork\work\pbs\pwwork\common\dms26956\18832DES_CP2InletDet05.dgn

Design		Detail		Quantity	
INITIAL	DATE	INITIAL	DATE	INITIAL	DATE



- NOTES:**
- CUT BARS AS NEEDED TO CLEAR PIPES.
 - PAID FOR AS INLET (SPECIAL).
 - CONTRACTOR SHALL MATCH THE GEOMETRY OF THE EXISTING WALL.

- KEYNOTES**
- CONCRETE SHALL BE CLASS B CONCRETE: f'c = 4500 psi.
 - FOR ADDITIONAL CLOSE MESH GRATE DETAILS AND GRATE INSTALLATION, SEE M-604-11.
 - STEPS SHALL CONFORM TO AASHTO M 199.
 - THE SLOPE OF THE GRATES SHALL MATCH THE ROADWAY PROFILE AND CROSS SLOPE.
 - PROVIDE WATERTIGHT JOINTS AROUND PIPES.
 - FOR WALL D DETAILS, SEE WALL PLANS.
 - SEE DRAINAGE TABS FOR PAYMENT ITEMS.

Print Date: 3/7/2013
File Name: 18832DES_CP2InletDet05.dgn
Horiz. Scale: As Noted Vert. Scale: As Noted

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Date:	Comments	Init.

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DRAINAGE DETAILS
WATER QUALITY STRUCTURE
(SHEET 5 OF 7)

Designer: P. FERNANDEZ	Structure Numbers
Detailer: E. SCHAWO	Subset Sheets: D05 of 23
Sheet Subset: DRNDTL	

Project No./Code
IM 0703-391
19036
Sheet Number 134

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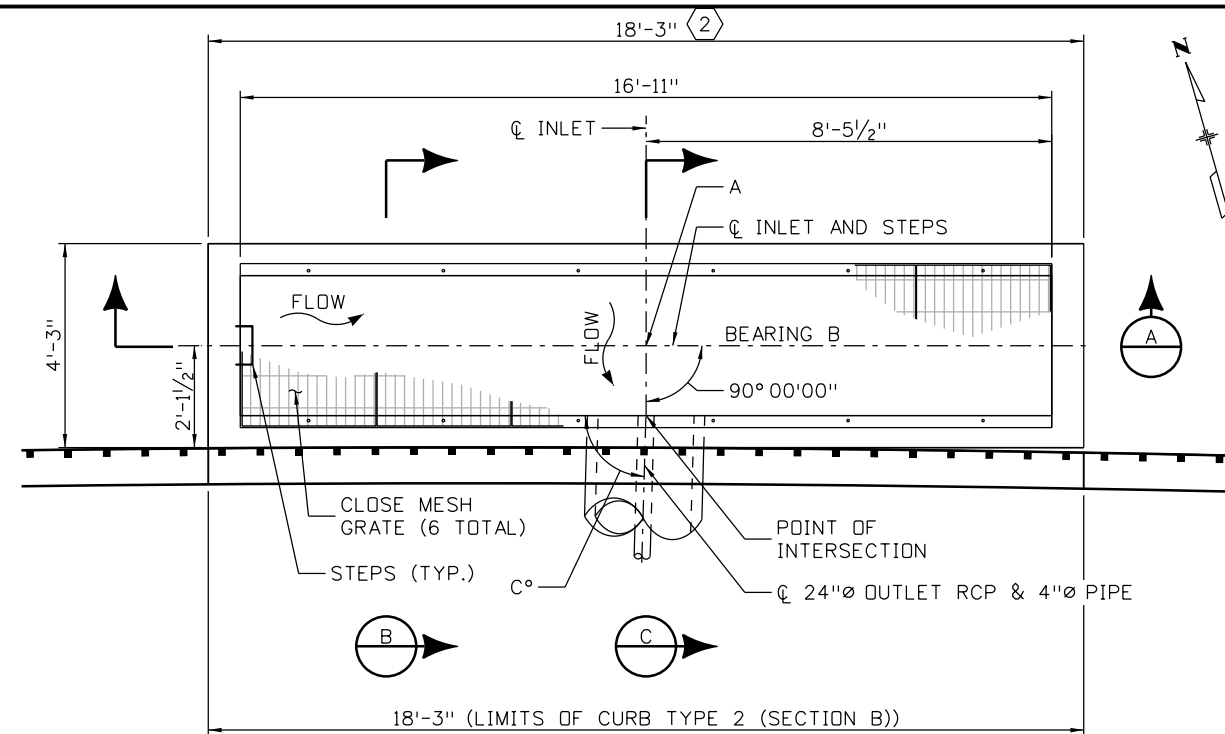
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		STA. 330+55.62 43.87' RT.	STA. 335+08.12 43.87' RT.	STA. 352+00.00 43.87' RT.	STA. 354+07.36 43.82' RT.
BEARING	B	S 74° 03' 55" E	S 61° 38' 22" E	N 55° 18' 27" E	N 63° 50' 07" E
ANGLE	C	88° 22' 37"	89° 14' 48"	89° 34' 49"	89° 50' 24"
ELEVATIONS	D	7264.42	7263.79	7243.26	7240.65
	E	7258.25	7257.62	7237.09	7234.48
	F	7257.42	7256.75	7236.26	7233.65
	G	7258.09	7257.45	7236.93	7234.32
SLOPE %	H	7260.42	7259.79	7239.26	7236.65
	I	1.00%	1.00%	1.00%	1.00%
	J	1.00%	1.00%	1.00%	1.00%

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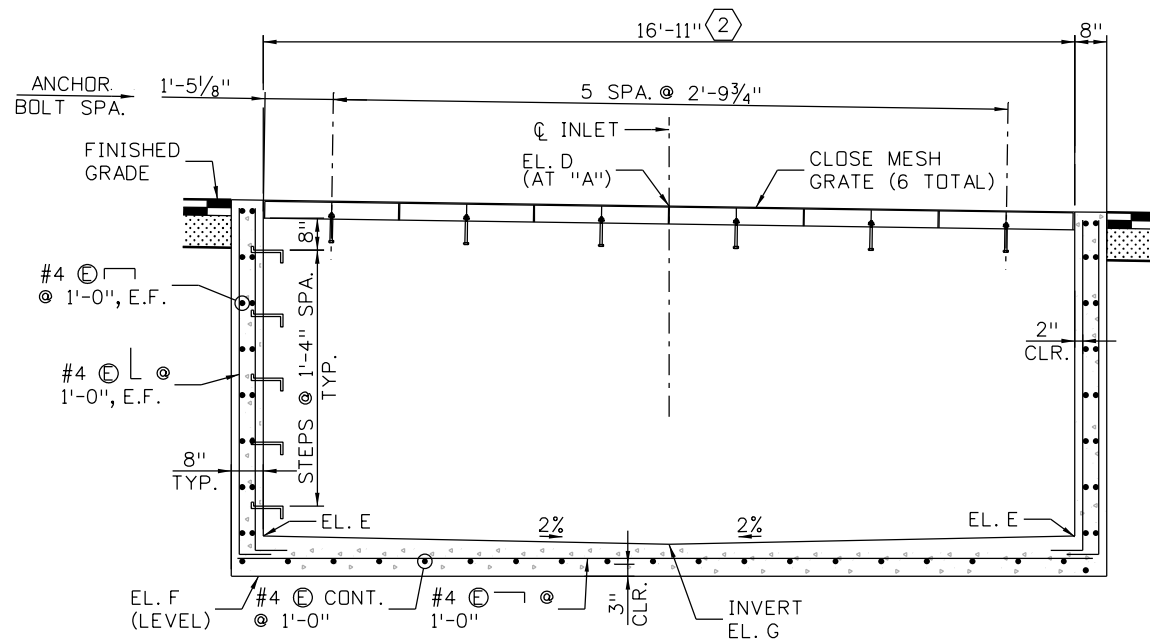
- ① CUT BARS AS NEEDED TO CLEAR PIPES.
- ② PAID FOR AS INLET (SPECIAL).

KEYNOTES

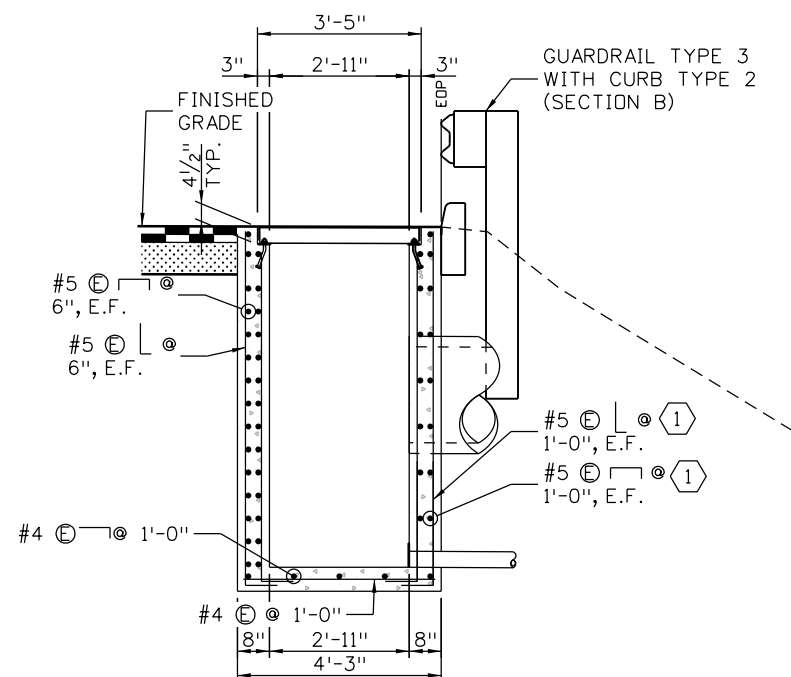
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- 2. FOR ADDITIONAL CLOSE MESH GRATE DETAILS AND GRATE INSTALLATION, SEE M-604-11.
- 4. STEPS SHALL CONFORM TO AASHTO M 199.
- 5. THE SLOPE OF THE GRATES SHALL MATCH THE ROADWAY PROFILE AND CROSS SLOPE.
- 6. PROVIDE WATERTIGHT JOINTS AROUND PIPES.
- 7. SEE DRAINAGE TABS FOR PAYMENT ITEMS.



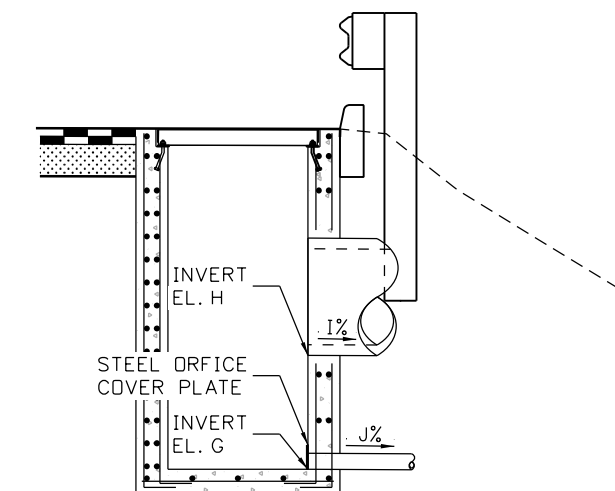
PLAN
SCALE: 1/4" = 1'-0"



SECTION A
SCALE: 1/4" = 1'-0"



SECTION B
SCALE: 1/4" = 1'-0"



SECTION C
(SEE 'SECTION B' FOR INFORMATION NOT SHOWN)
SCALE: 1/4" = 1'-0"

Print Date: 3/7/2013
File Name: 18832DES_CP2InletDet06.dgn
Horiz. Scale: As Noted Vert. Scale: As Noted

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Sheet Revisions		
Date:	Comments	Init.

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**DRAINAGE DETAILS
WATER QUALITY STRUCTURE
(SHEET 6 OF 7)**

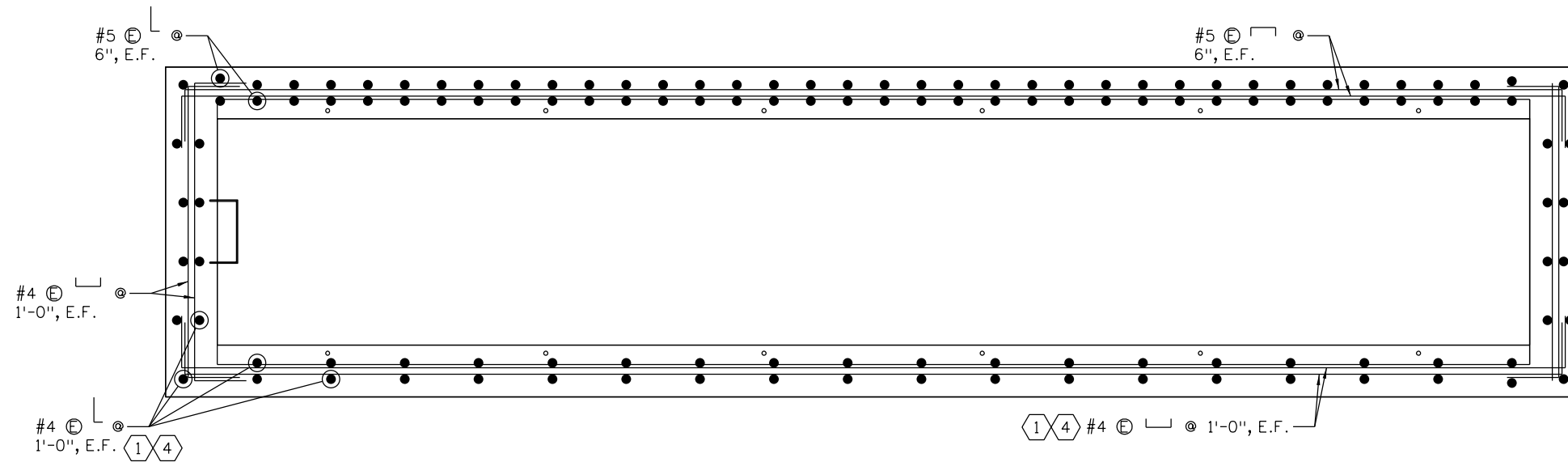
Designer: P. FERNANDEZ
Detailer: E. SCHAWO
Sheet Subset: DRNDTL

Structure Numbers
Subset Sheets: D06 of 23

Project No./Code
IM 0703-391
19036
Sheet Number 135

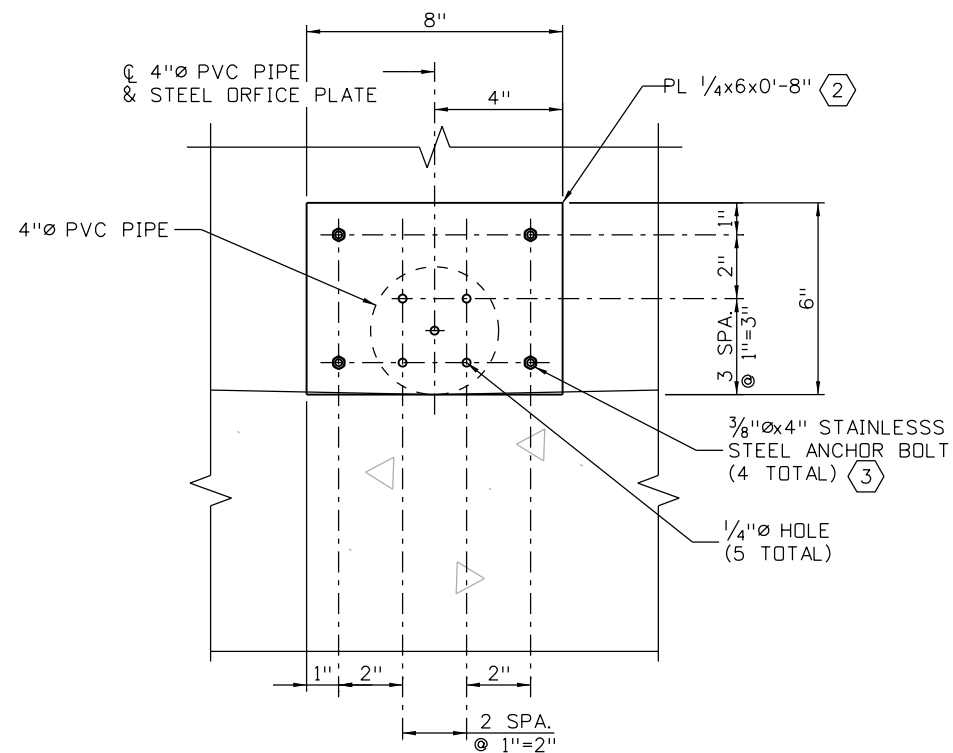
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Design		Detail		Quantity	
INITIAL	DATE	INITIAL	DATE	INITIAL	DATE
SA	12-12	ERS	12-12		
Designed By	Checked By	Detailed By	Checked By	Quantity By	Checked By



INLET WALL REINFORCING PLAN

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



STEEL ORFICE PLATE

SCALE: 2" = 1'-0"

SUMMARY OF QUANTITIES (FOR INFORMATION ONLY)

DESCRIPTION	UNIT	MANHOLE	INLET
CONCRETE CLASS B	CY	4.0	8.6
REINFORCING STEEL (EPOXY COATED)	LB.	1111	1876
GRANULAR BEDDING MATERIAL	CY	2.0	
STRUCTURAL STEEL	LB.	285	815

KEYNOTES

- 1 CUT BARS AS NEEDED TO CLEAR PIPES AND CONCRETE OPENINGS.
- 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, LOCKWASHERS, AND NUTS.
- 4 #5 BARS SHALL BE USED AT INLET AT STATIONS 330+55.63, 335+08.12, 352+00.00, AND 354+07.35.

NOTES:

- 1. CONCRETE SHALL BE CLASS B CONCRETE.
- 2. FOR ADDITIONAL CLOSE MESH GRATE DETAILS, SEE M-604-11.
- 3. FOR ADDITIONAL MANHOLE NOTES, SEE M-604-20.
- 4. STEEL ORFICE PLATE, GASKET, AND ANCHOR BOLTS SHALL BE PAID FOR UNDER ITEM NO. 604, INLET TYPE D (SPECIAL).

Print Date: 3/7/2013
 File Name: 18832DES_CP2InletDet07.dgn
 Horiz. Scale: As Noted Vert. Scale: As Noted

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Sheet Revisions			
Date:	Comments	Init.	

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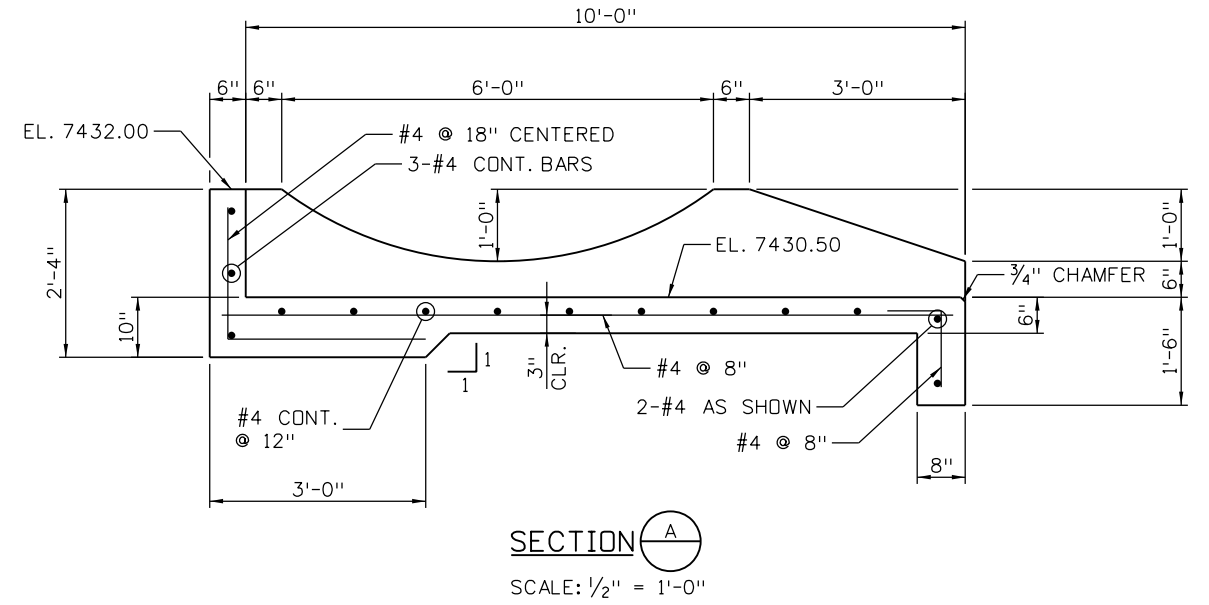
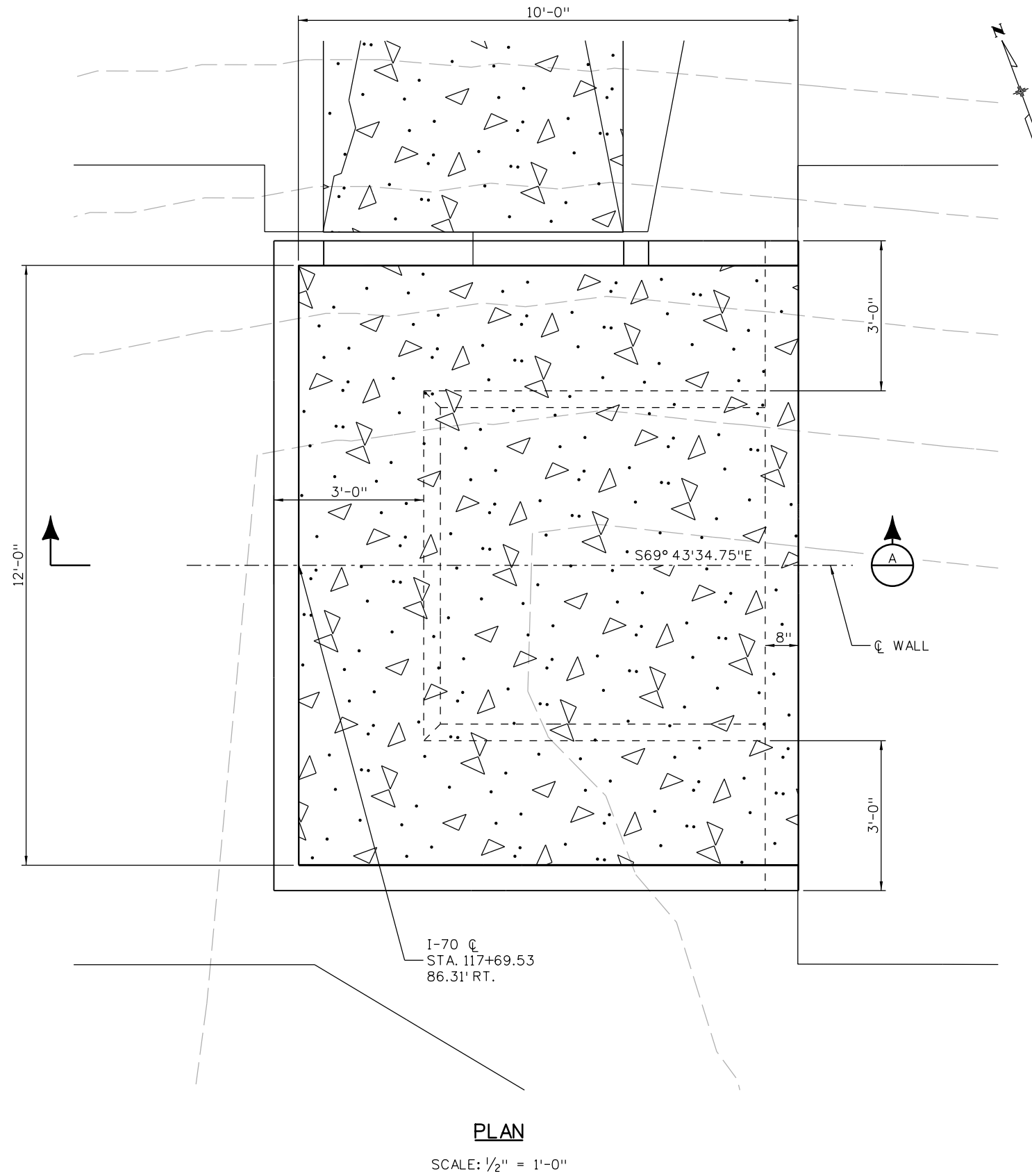
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No Revisions:
Revised:
Void:

DRAINAGE DETAILS WATER QUALITY STRUCTURE (SHEET 7 OF 7)		
Designer: P. FERNANDEZ	Structure Numbers	
Detailer: E. SCHAWO	Subset Sheets: DRNDTL	Subset Sheets: D07 of 23

Project No./Code	
IM 0703-391	
19036	
Sheet Number	136

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INITIAL	DATE	INITIAL	DATE	INITIAL	DATE
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Designed By	Checked By	Detailed By	Checked By	Quantities By	Checked By



- NOTES:**
1. CONCRETE SHALL BE CLASS B CONCRETE:
f'c = 4500 psi.
 2. ALL REINFORCING STEEL SHALL BE EPOXY COATED.
 3. ALL REINFORCING STEEL SHALL HAVE A MINIMUM CONCRETE COVER OF 2 INCHES UNLESS NOTED OTHERWISE.
 4. EXCAVATION AND BACKFILL SHALL BE AS PER STANDARD M-206-1.

Print Date: 3/7/2013	0000
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Horiz. Scale: 1:2.66667 Vert. Scale: 1:2.66667	
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Sheet Revisions		
Date:	Comments	Init.

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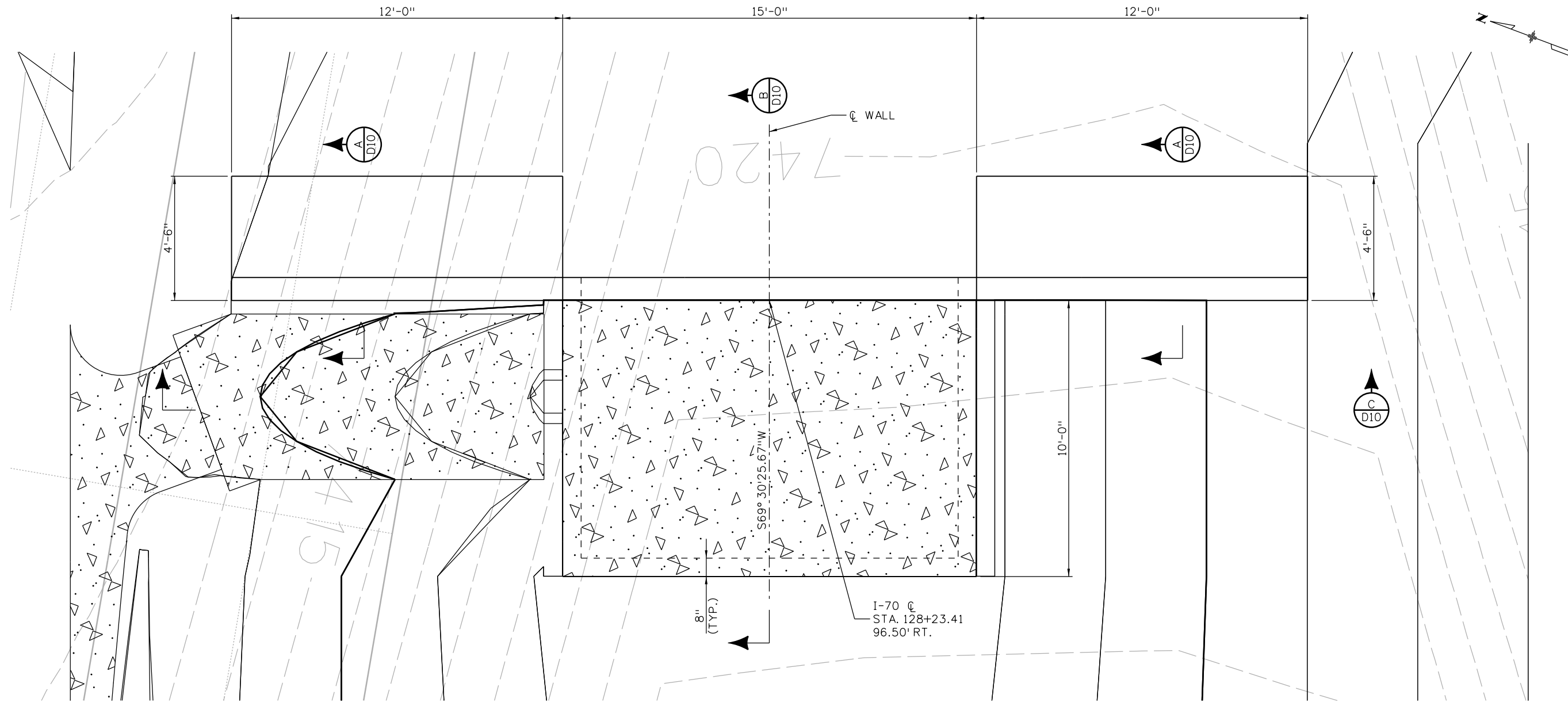
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Revised:
Void:

DRAINAGE DETAILS PUSH WALL AT STA. 117+69.53		
Designer: P. PENAFIEL	Structure Numbers	
Detailer: E. SCHAWO		
Sheet Subset: DRNDTL	Subset Sheets: D08 of 23	

Project No./Code
IM 0703-391
19036
Sheet Number 137



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

NOTES:

1. CONCRETE SHALL BE CLASS B CONCRETE: f'c = 4500 psi.
2. ALL REINFORCING STEEL SHALL BE EPOXY COATED.
3. ALL REINFORCING STEEL SHALL HAVE A MINIMUM CONCRETE COVER OF 2 INCHES UNLESS NOTED OTHERWISE.
4. EXCAVATION AND BACKFILL SHALL BE AS PER STANDARD M-206-1.

Design		Detail		Quantities	
INITIAL	DATE	INITIAL	DATE	INITIAL	DATE
Designed By	12-12	Detailed By	ERS	Quantity By	12-12
Checked By		Checked By		Checked By	

Print Date: 3/7/2013
 File Name: 18832DES_HydWall128Det01.dgn
 Horiz. Scale: 1:4 Vert. Scale: 1:4

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Sheet Revisions		
Date:	Comments	Init.

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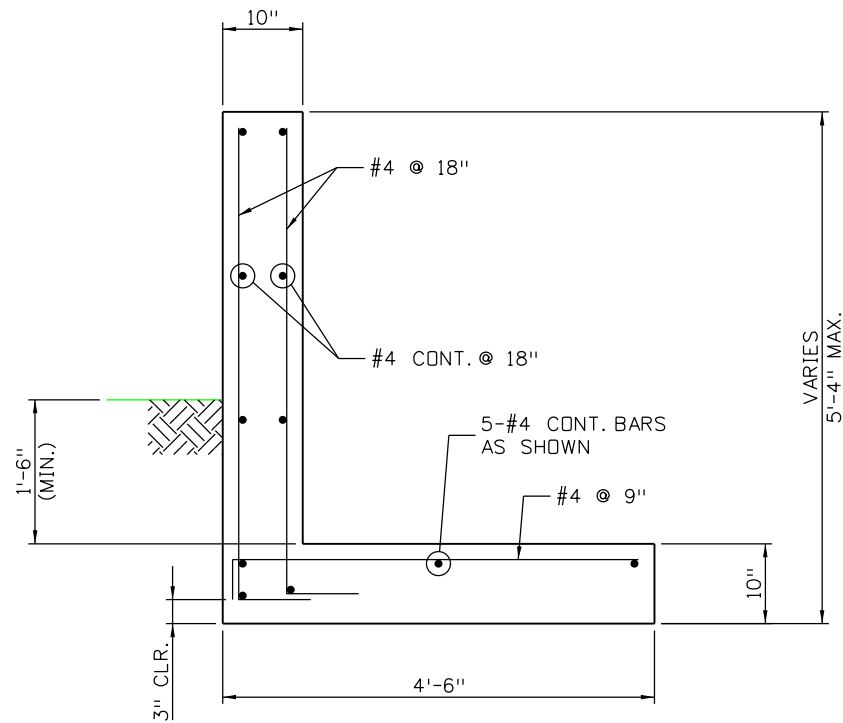
**DRAINAGE DETAILS
 PUSH WALL AT STA. 128+22.88
 (SHEET 1 OF 2)**

Designer: P. PENAFIEL
 Detailer: E. SCHAWO
 Sheet Subset: DRNDTL

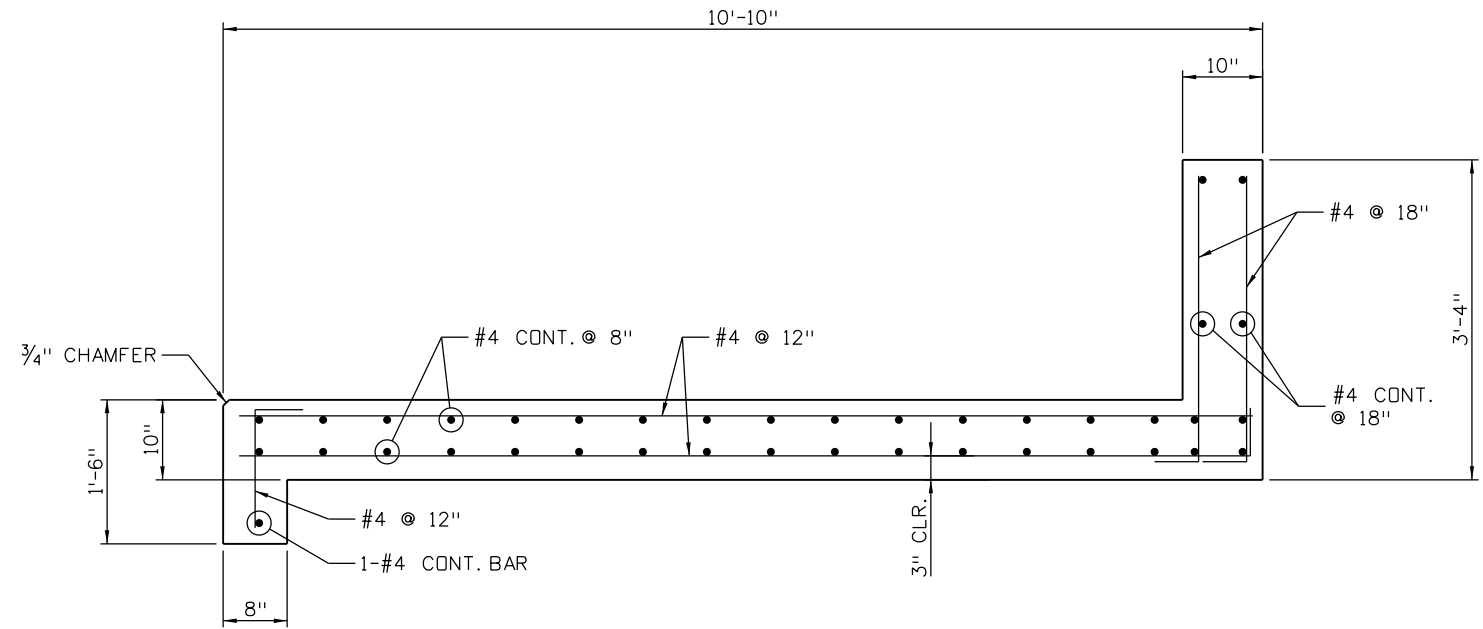
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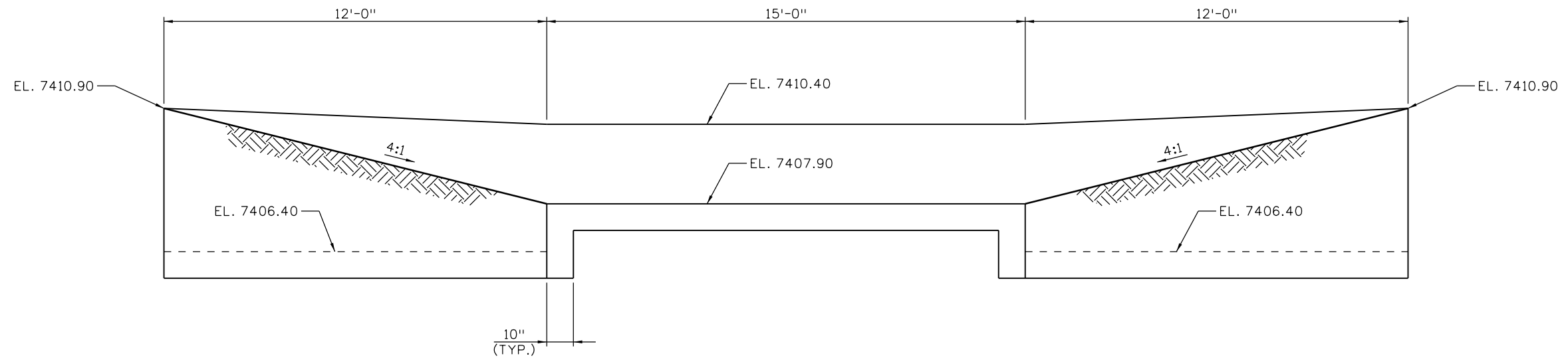
IM 0703-391
 19036
 Sheet Number 138



SECTION A
D09
SCALE: 1/2" = 1'-0"



SECTION B
D09
SCALE: 1/2" = 1'-0"



SECTION C
D09
SCALE: 1/4" = 1'-0"

Design		Detail		Quantities	
INITIAL	DATE	INITIAL	DATE	INITIAL	DATE
PP	12-12	ERS	12-12		
Designed By	Checked By	Detailed By	Checked By	Quantities By	Checked By

Print Date: 3/7/2013
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 Horiz. Scale: 1:4 Vert. Scale: 1:4

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DRAINAGE DETAILS
PUSH WALL AT STA. 128+22.88
(SHEET 2 OF 2)

Designer: P. PENAFIEL
 Detailer: E. SCHAWO

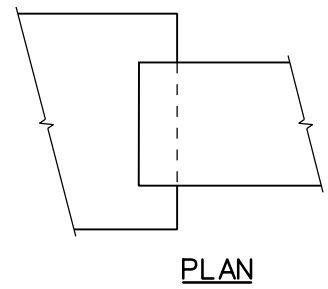
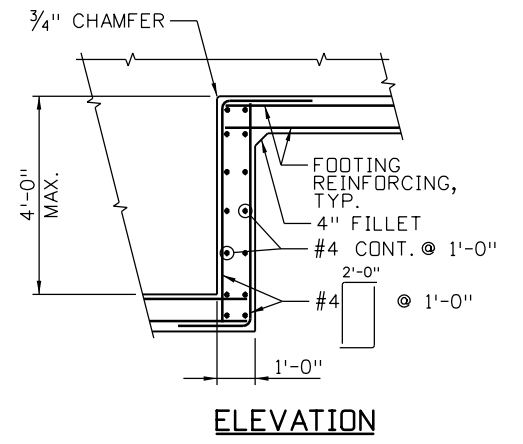
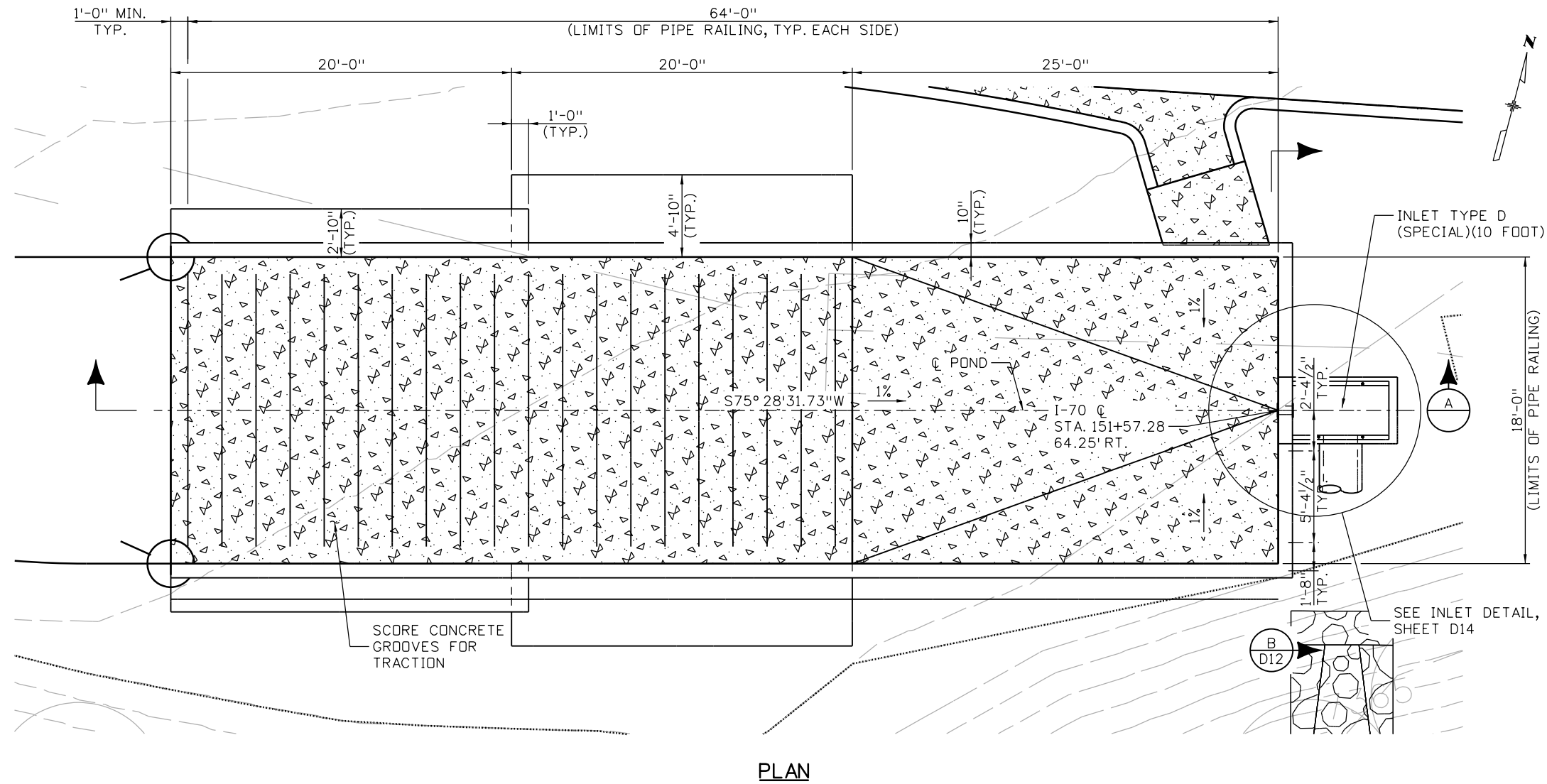
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Project No./Code
IM 0703-391
19036
Sheet Number 139

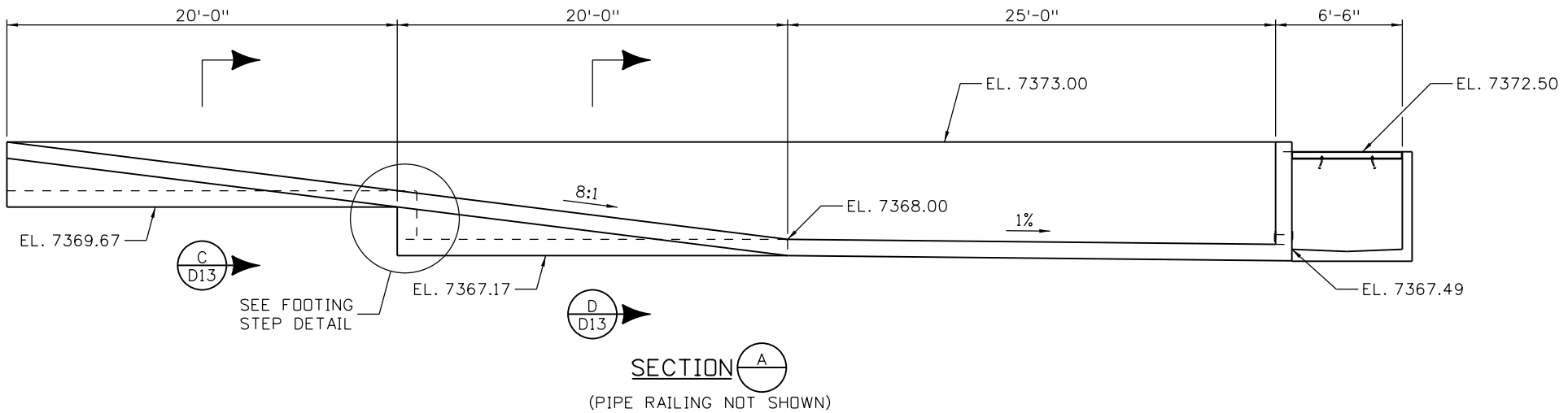
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Design		Detail		Quantities	
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PP	12-12	ERS	12-12		
Designed By	Checked By	Detailed By	Checked By	Quantities By	Checked By



FOOTING STEP DETAIL
NO SCALE



- NOTES:**
1. CONCRETE SHALL BE CLASS B CONCRETE: f'c = 4500 psi.
 2. ALL REINFORCING STEEL SHALL BE EPOXY COATED.
 3. ALL REINFORCING STEEL SHALL HAVE A MINIMUM CONCRETE COVER OF 2 INCHES UNLESS NOTED OTHERWISE.
 4. EXCAVATION AND BACKFILL SHALL BE AS PER STANDARD M-206-1.

Print Date: 3/7/2013

File Name: 18832DES_ConcPond152Det01.dgn

Horiz. Scale: 1:8 Vert. Scale: 1:8

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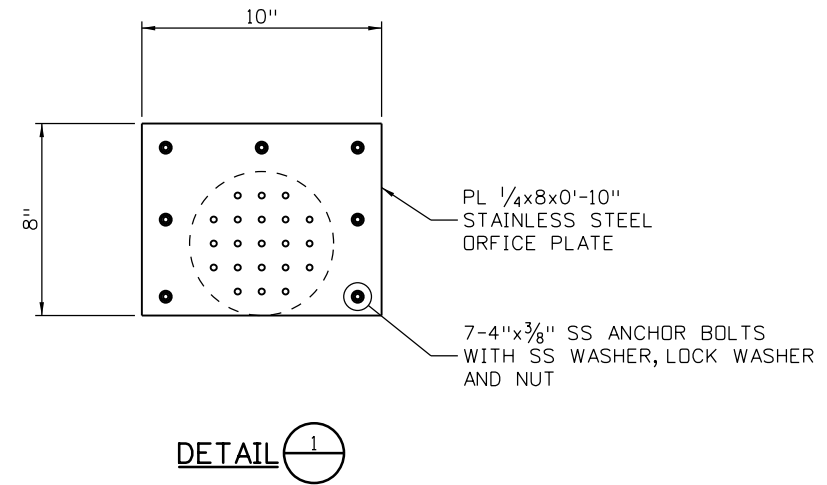
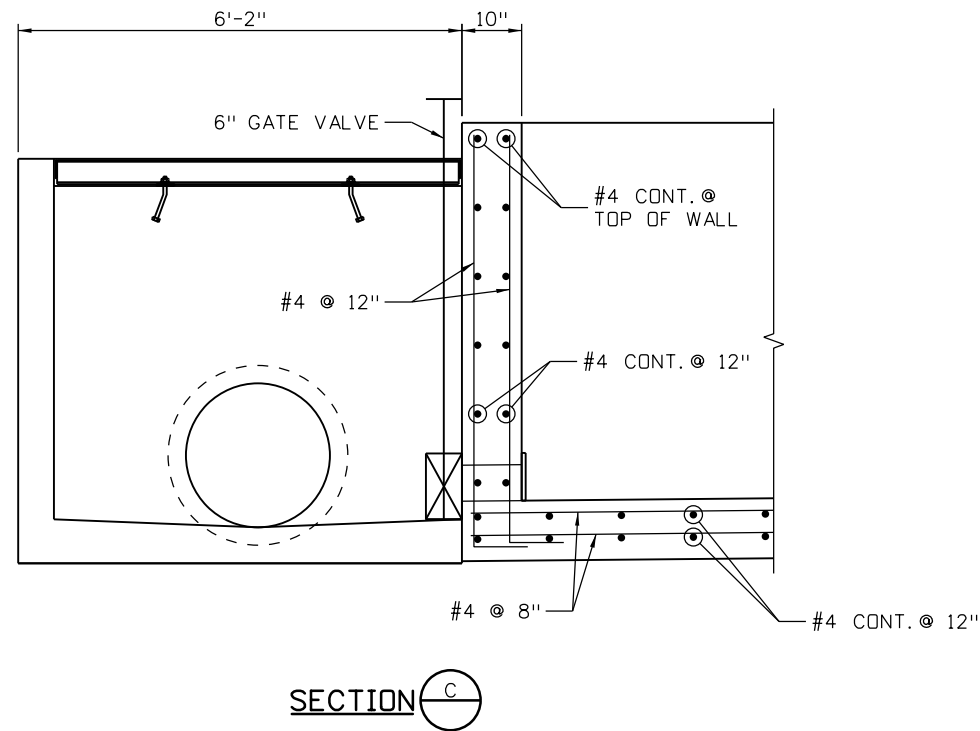
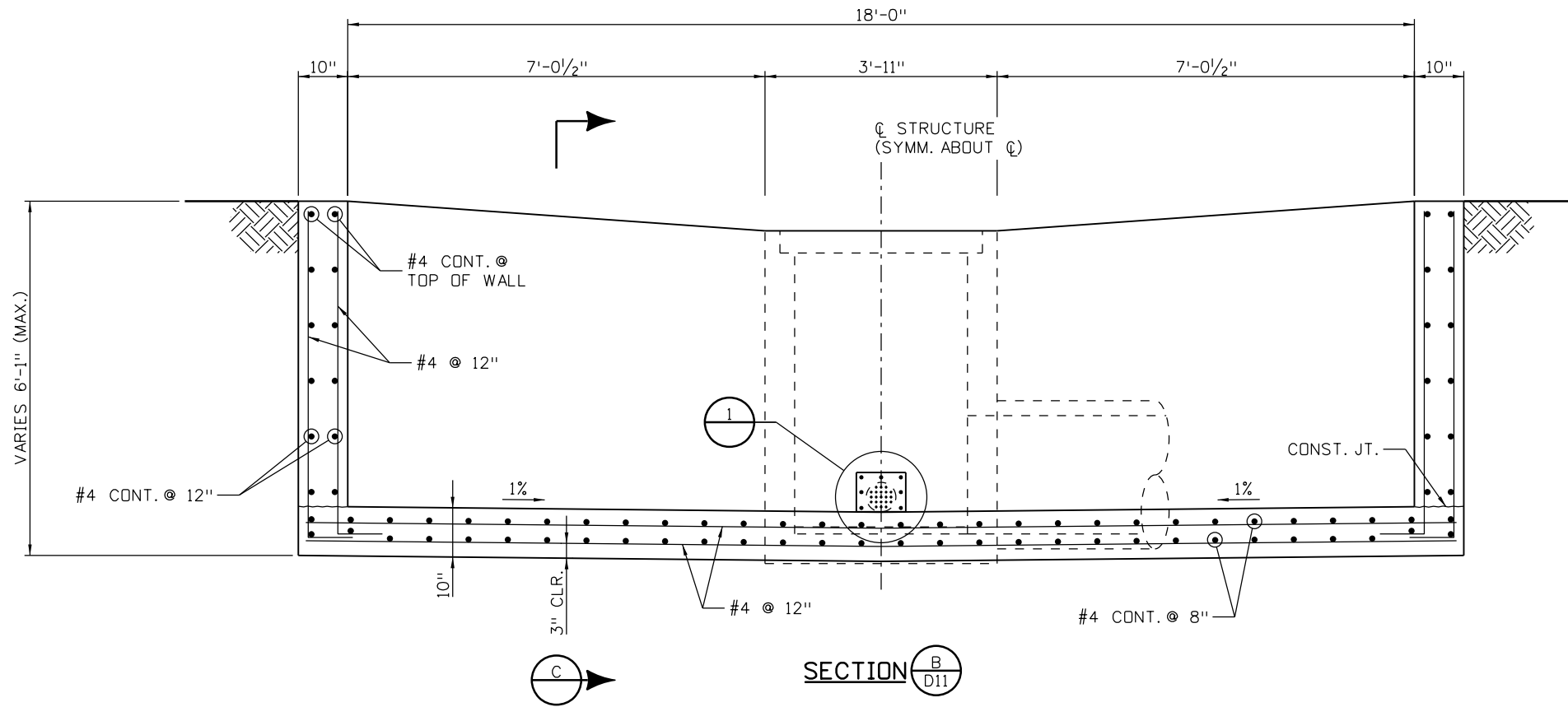
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Designer: P. PENAFIEL	Structure Numbers
Detailer: E. SCHAWO	Subset Sheets: D11 of 23
Sheet Subset: DRNDTL	

Project No./Code
IM 0703-391
19036
Sheet Number 140

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INITIAL	DATE	INITIAL	DATE	INITIAL	DATE
PP	12-12	ERS	12-12		
Designed By	Checked By	Designed By	Checked By	Quantities By	Checked By



NOTES:

1. STEEL ORFICE PLATE AND ANCHOR BOLTS SHALL BE PAID FOR UNDER ITEM NO. 604, INLET TYPE D (SPECIAL).

Print Date: 3/7/2013
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No Revisions:
Revised:
Void:

DRAINAGE DETAILS
POND AT STA. 151+57.28
(SHEET 2 OF 4)

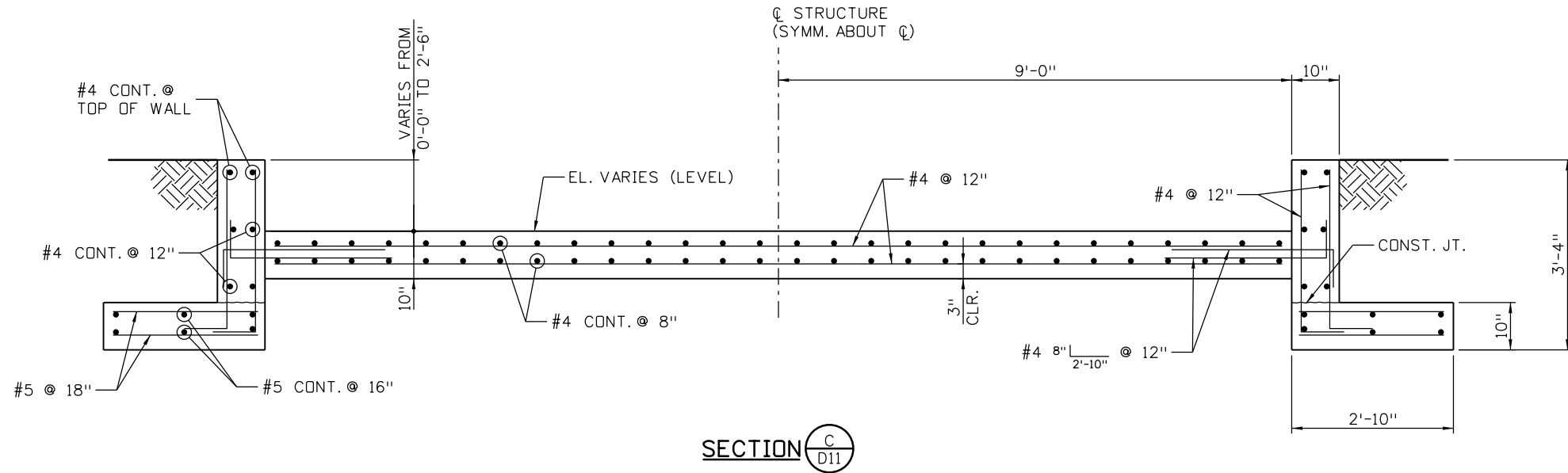
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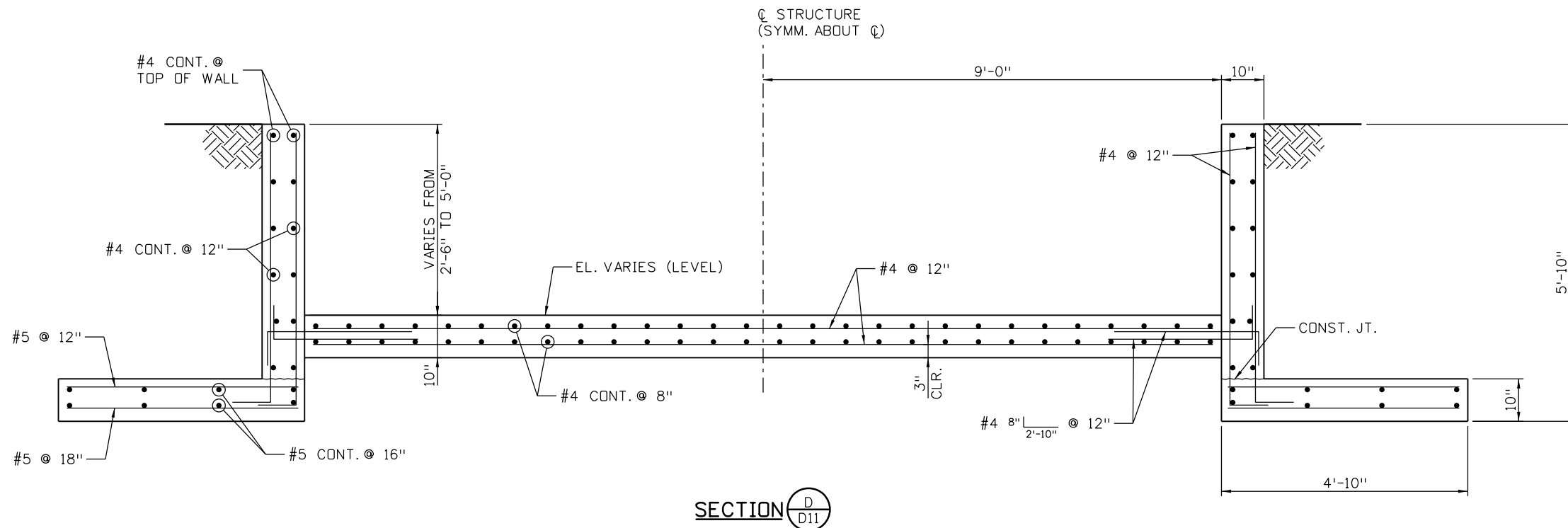
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SECTION C/D11



SECTION D/D11

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Date:	Comments	Init.

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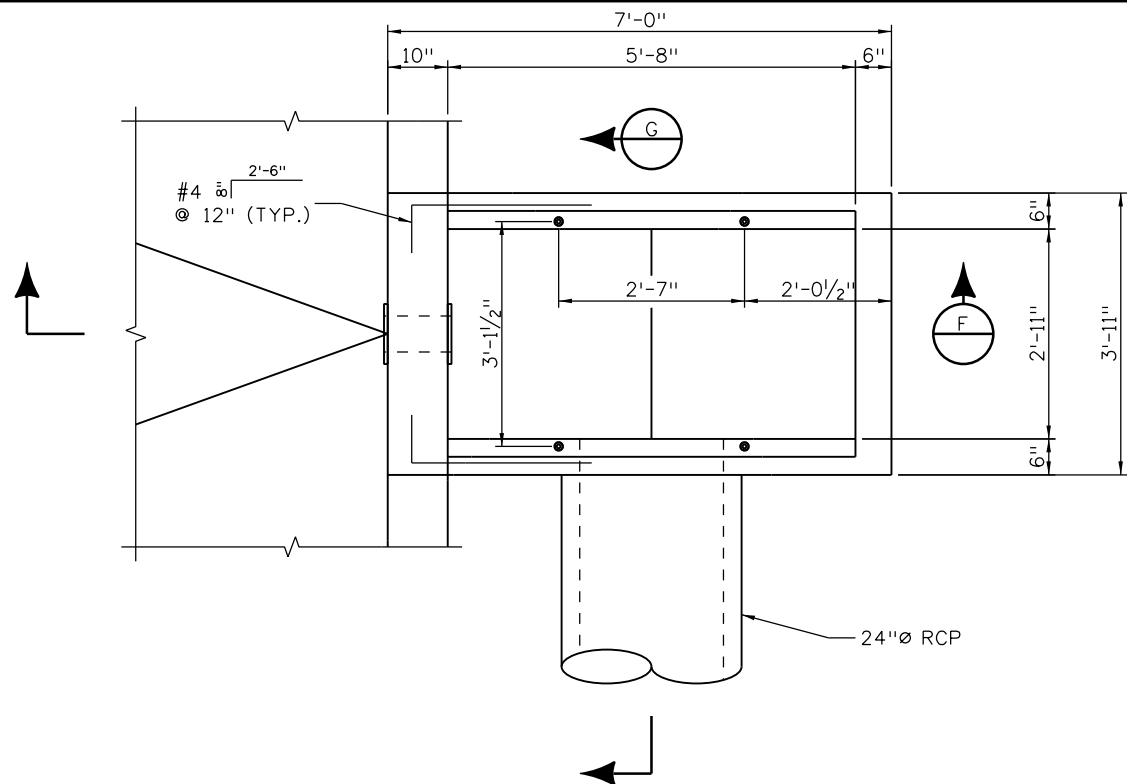
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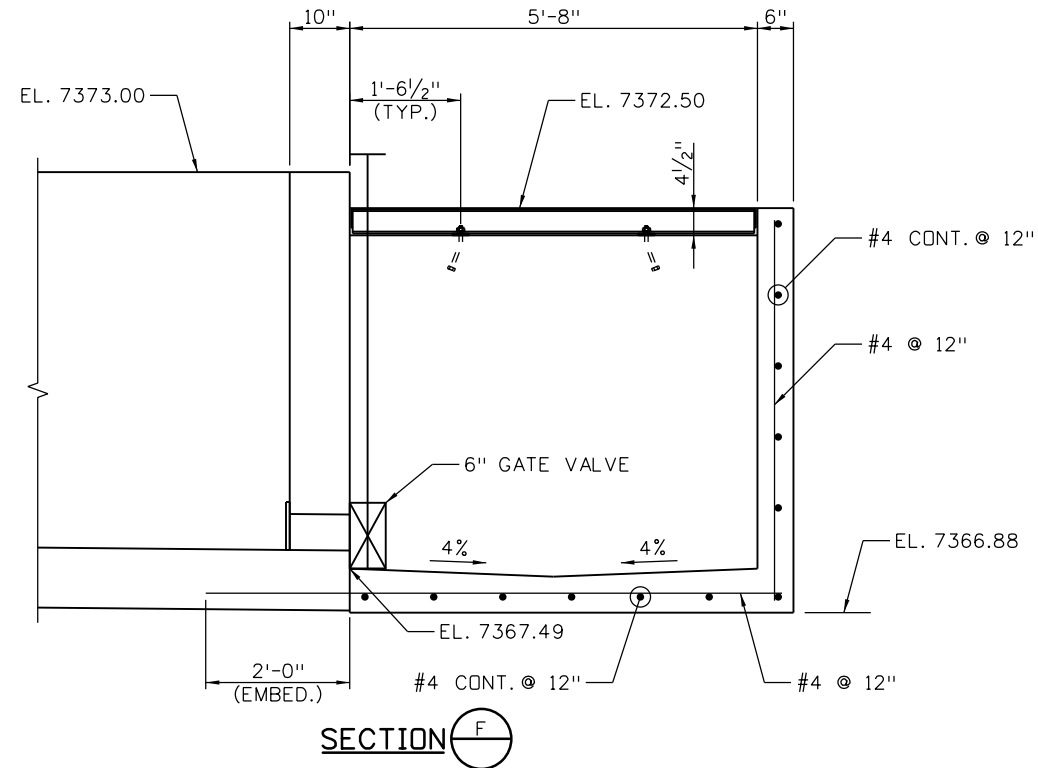
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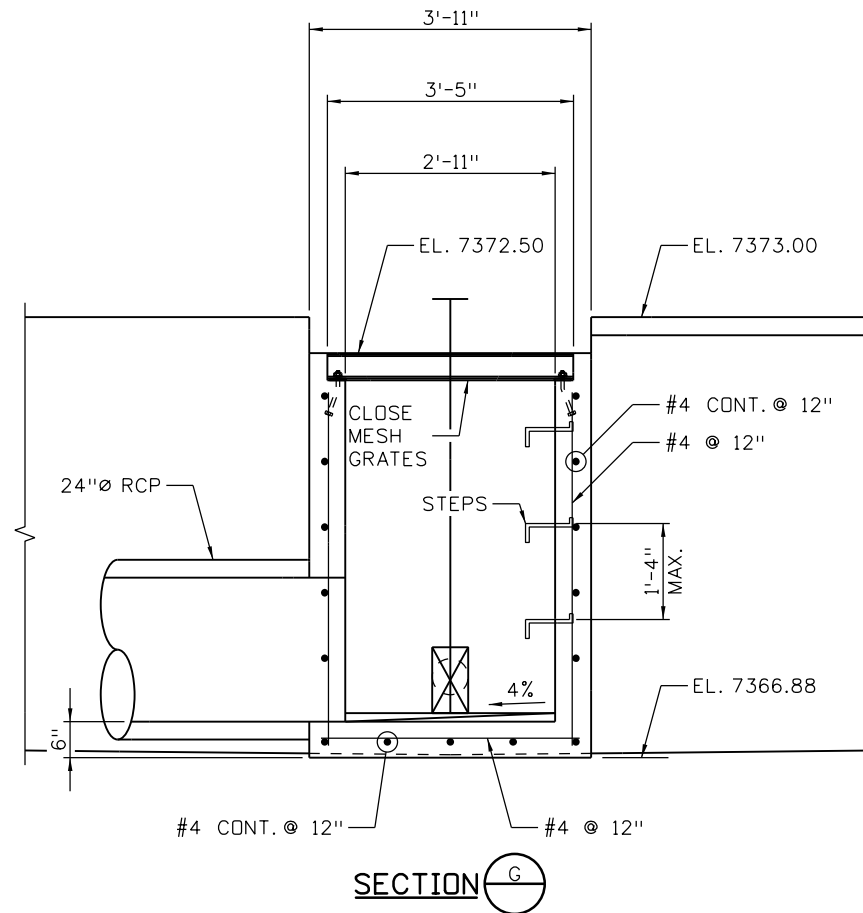
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Designed By	Checked By	Detailed By	Checked By	Quantities By	Checked By



INLET DETAIL SHOWING ANCHOR BOLT LAYOUT



SECTION F-F



SECTION G-G

NOTES:

- 6 INCH GATE VALVE SHALL BE CORROSION AND ABRASION RESISTANT STAINLESS STEEL. YOKE SHALL EXTEND ABOVE CLOSE MESH GRATE. MODIFY CLOSE MESH GRATE TO ACCOMMODATE.

Print Date: 3/7/2013
 File Name: 18832DES_ConcPond152Det04.dgn
 Horiz. Scale: 1:2.66667 Vert. Scale: 1:2.66667
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Date:	Comments	Init.

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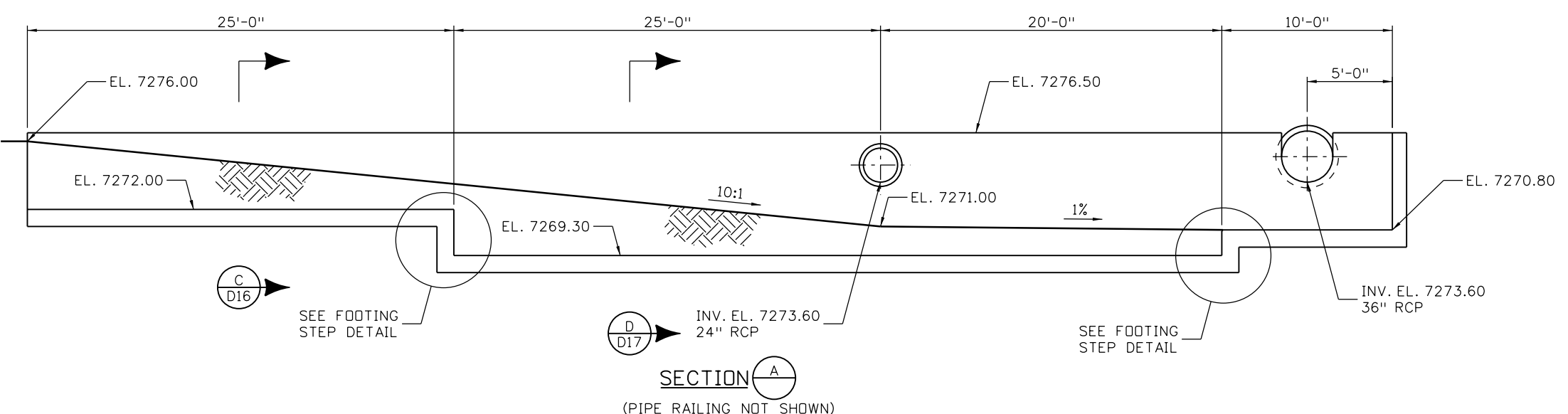
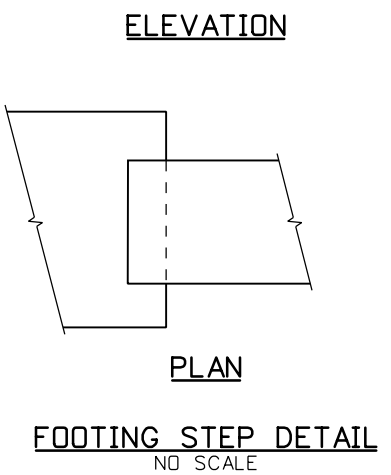
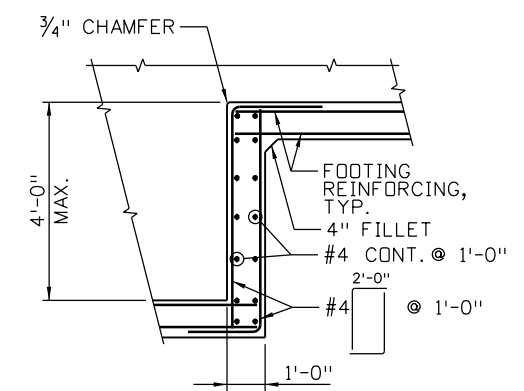
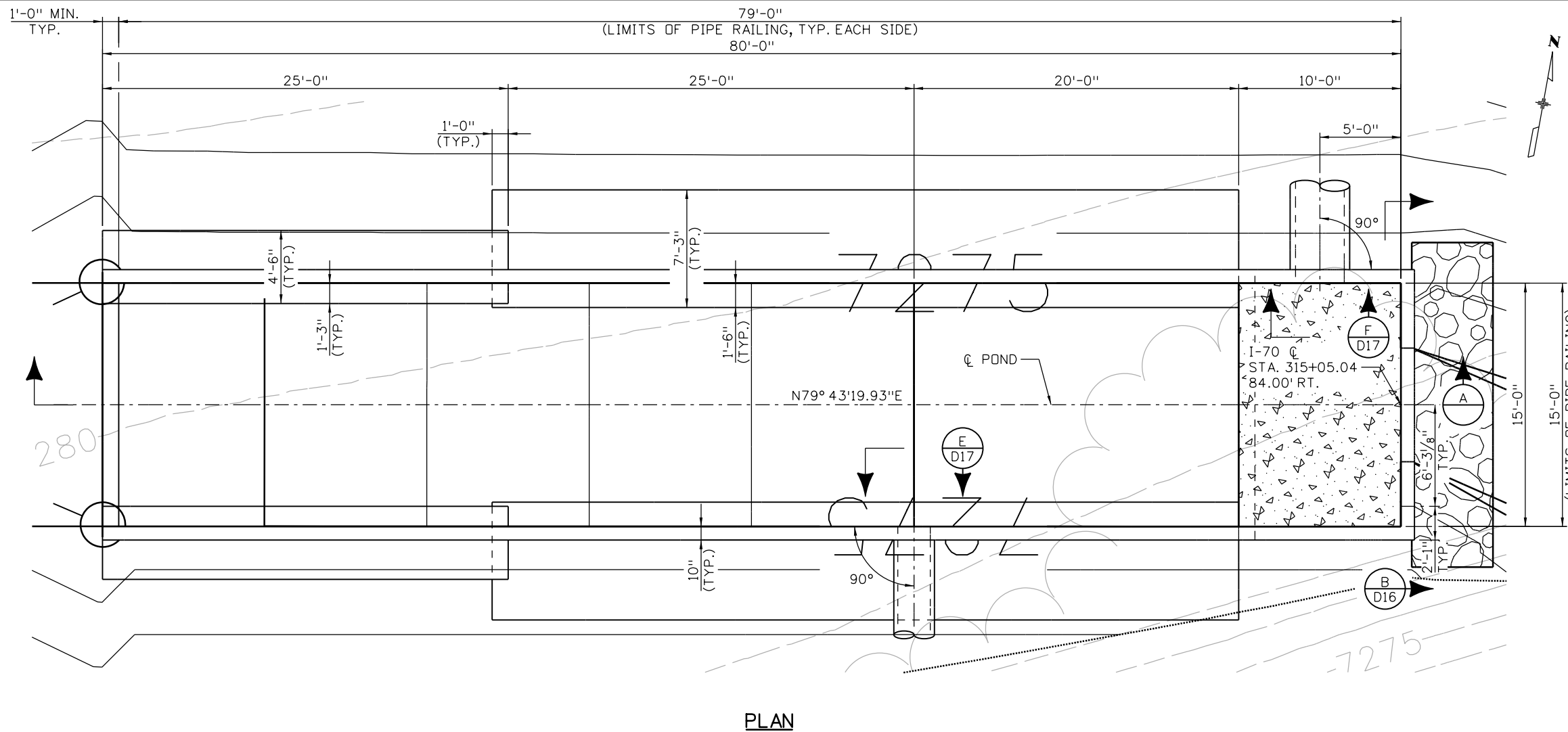
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DRAINAGE DETAILS
POND AT STA. 151+57.28
(SHEET 4 OF 4)

Designer: P. PENAFIEL Structure Numbers: _____
 Detailer: E. SCHAWO Subset Sheets: D14 of 23
 Sheet Subset: DRNDTL

Project No./Code
IM 0703-391
19036
Sheet Number 143



- NOTES:**
1. CONCRETE SHALL BE CLASS B CONCRETE: f'c = 4500 psi.
 2. ALL REINFORCING STEEL SHALL BE EPOXY COATED.
 3. ALL REINFORCING STEEL SHALL HAVE A MINIMUM CONCRETE COVER OF 2 INCHES UNLESS NOTED OTHERWISE.
 4. EXCAVATION AND BACKFILL SHALL BE AS PER STANDARD M-206-1.

Design		Detail		Quantity	
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PP	12-12	ERS	12-12		
Checked By		Checked By		Checked By	

Print Date: 3/7/2013
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 Horiz. Scale: 1:8 Vert. Scale: 1:8
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DRAINAGE DETAILS
POND AT STA. 315+05.04
(SHEET 1 OF 3)

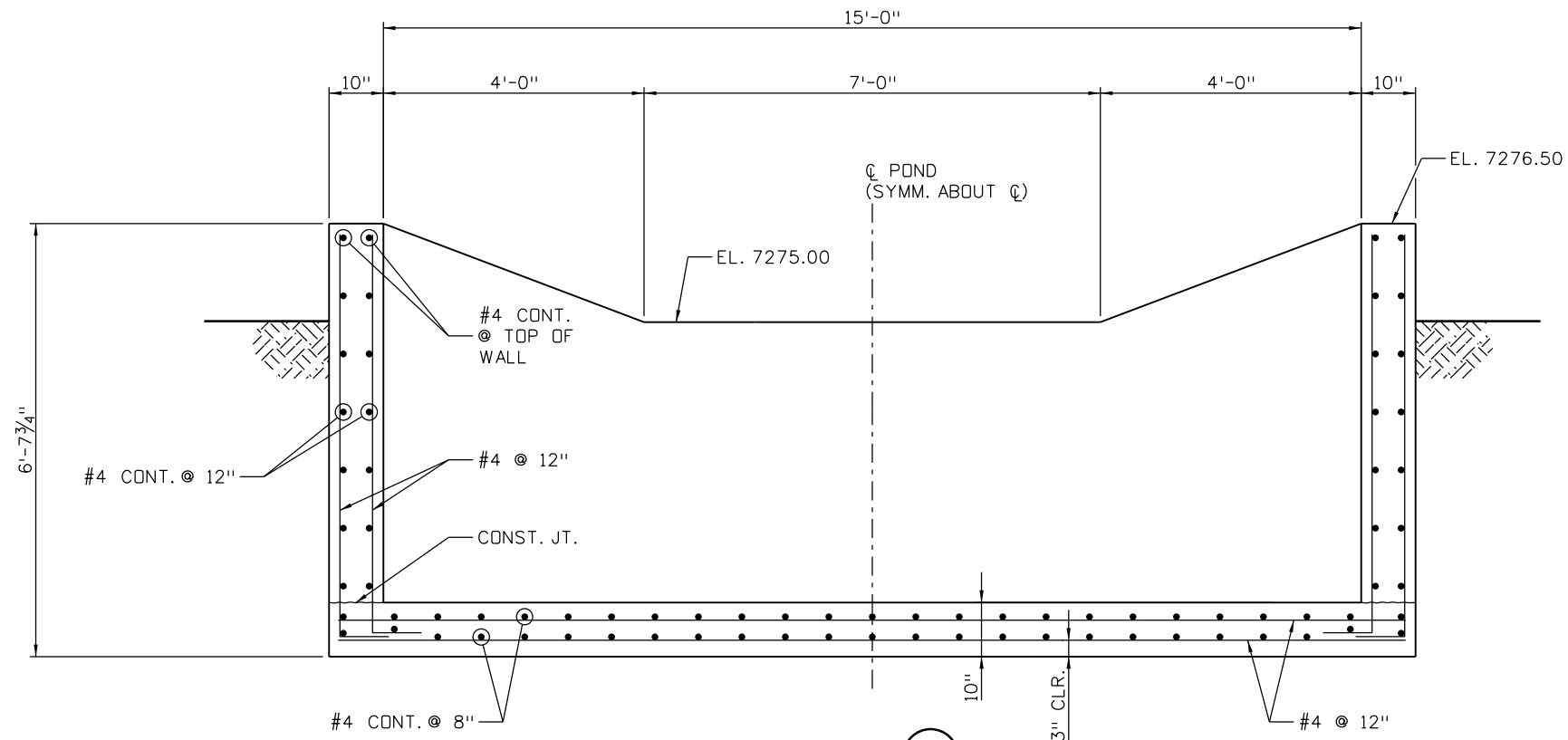
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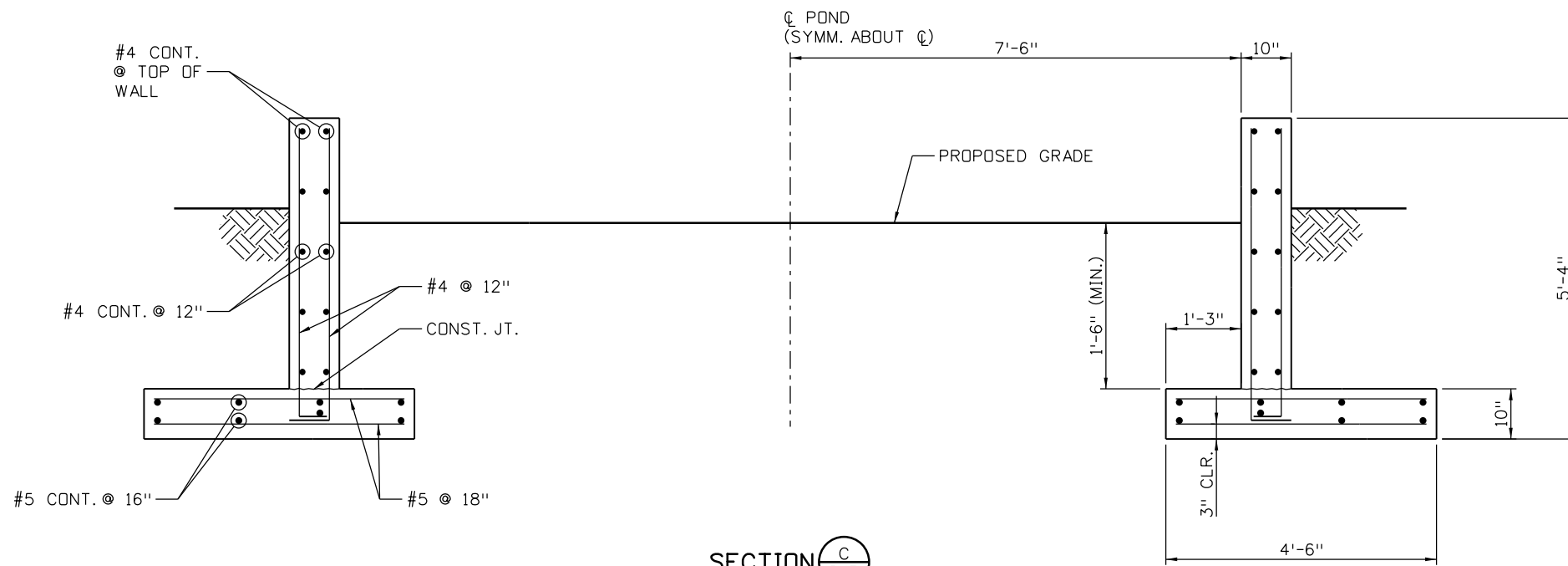
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SECTION **B**
D15

SCALE: 3/8" = 1'-0"



SECTION **C**
D15

SCALE: 3/8" = 1'-0"

Design		Detail		Quantities	
INITIAL	DATE	INITIAL	DATE	INITIAL	DATE
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Print Date: 3/7/2013
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DRAINAGE DETAILS
POND AT STA. 315+05.04
(SHEET 2 OF 3)

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 Detailer: E. SCHAWO
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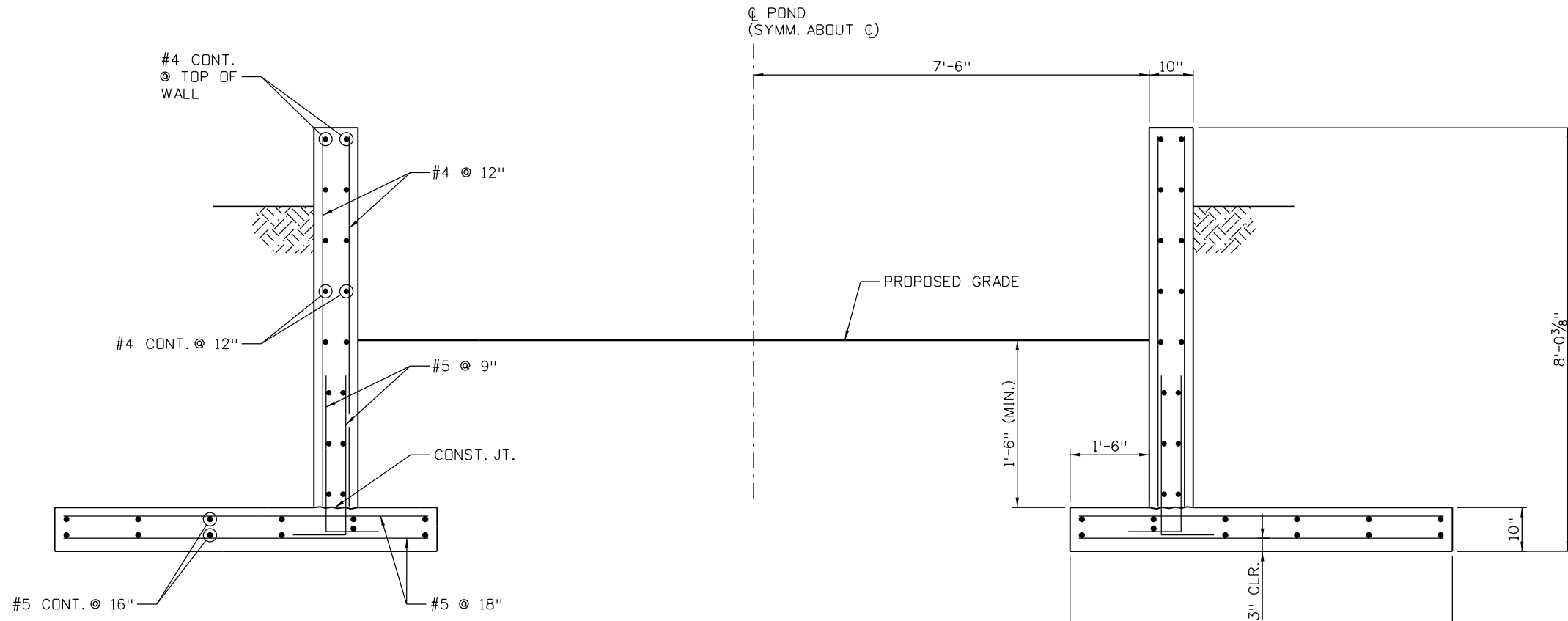
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Sheet Number 145

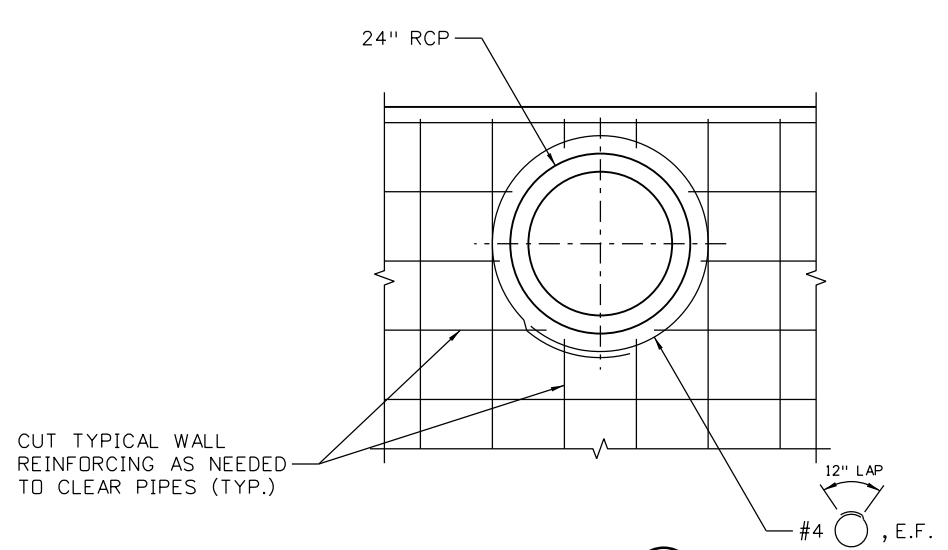
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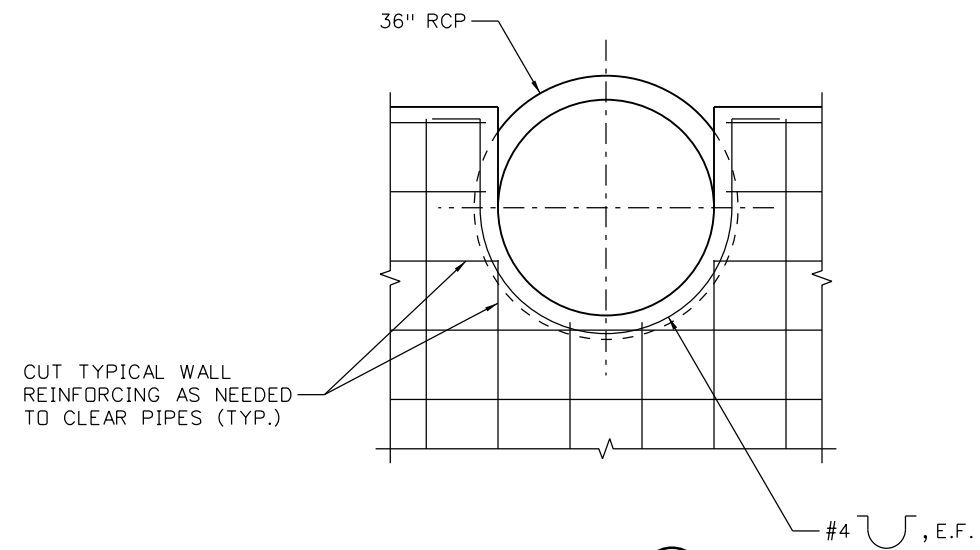
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SECTION D
D15
SCALE: 3/8" = 1'-0"



SECTION E
D15
SCALE: 3/8" = 1'-0"



SECTION F
D15
SCALE: 3/8" = 1'-0"

Print Date: 3/7/2013	
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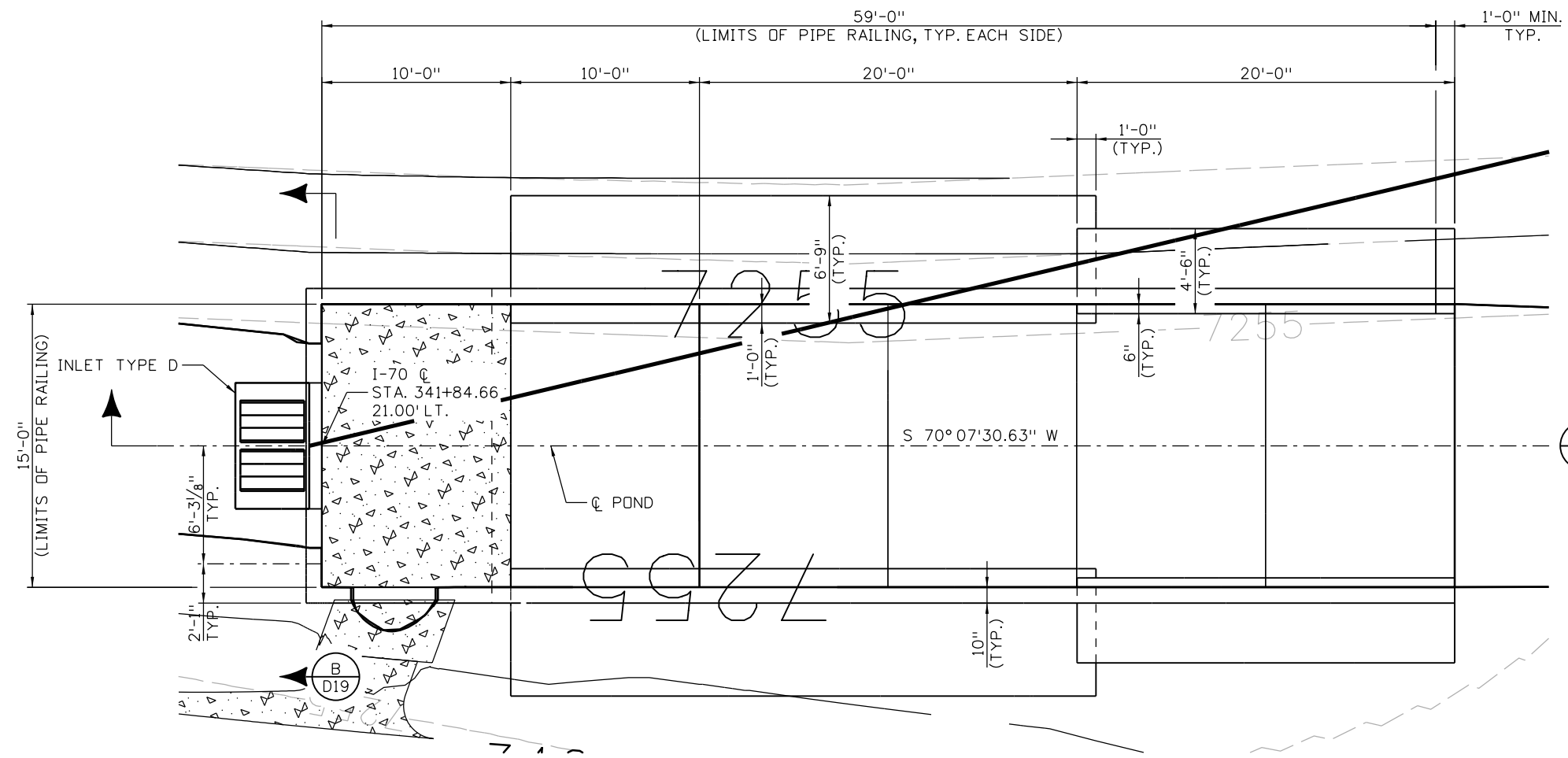
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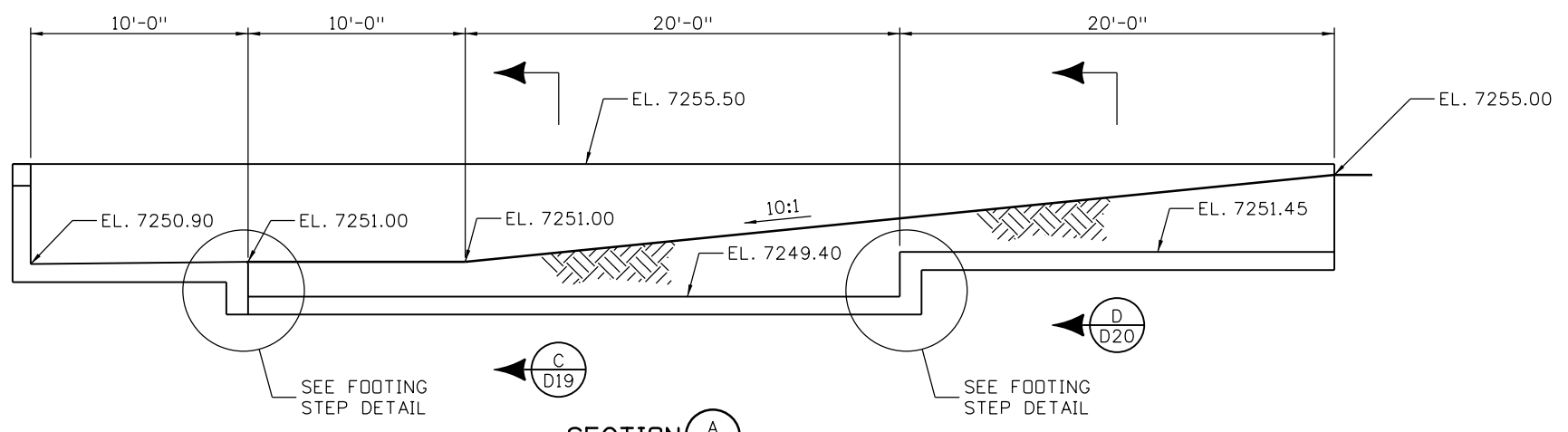
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Sheet Number 146

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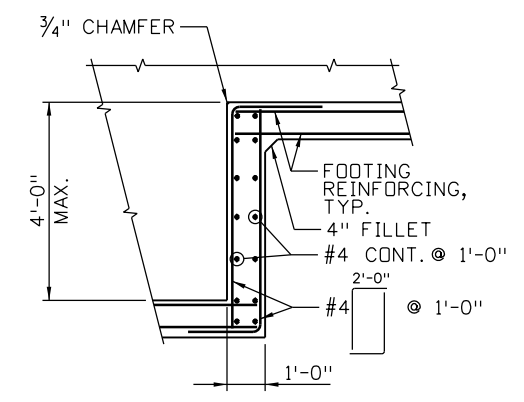
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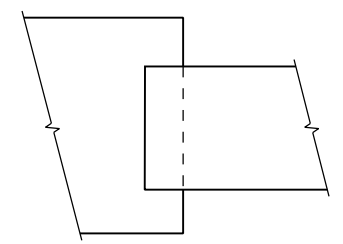
PLAN
SCALE: 1/8" = 1'-0"



SECTION A-A
(PIPE RAILING NOT SHOWN)
SCALE: 1/8" = 1'-0"



ELEVATION



PLAN

FOOTING STEP DETAIL
NO SCALE

NOTES:

1. CONCRETE SHALL BE CLASS B
CONCRETE: f'c = 4500 psi.
2. ALL REINFORCING STEEL SHALL BE EPOXY COATED.
3. ALL REINFORCING STEEL SHALL HAVE A MINIMUM CONCRETE COVER OF 2 INCHES UNLESS NOTED OTHERWISE.
4. EXCAVATION AND BACKFILL SHALL BE AS PER STANDARD M-206-1.

Print Date: 3/7/2013
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 Horiz. Scale: AS NOTED Vert. Scale: AS NOTED

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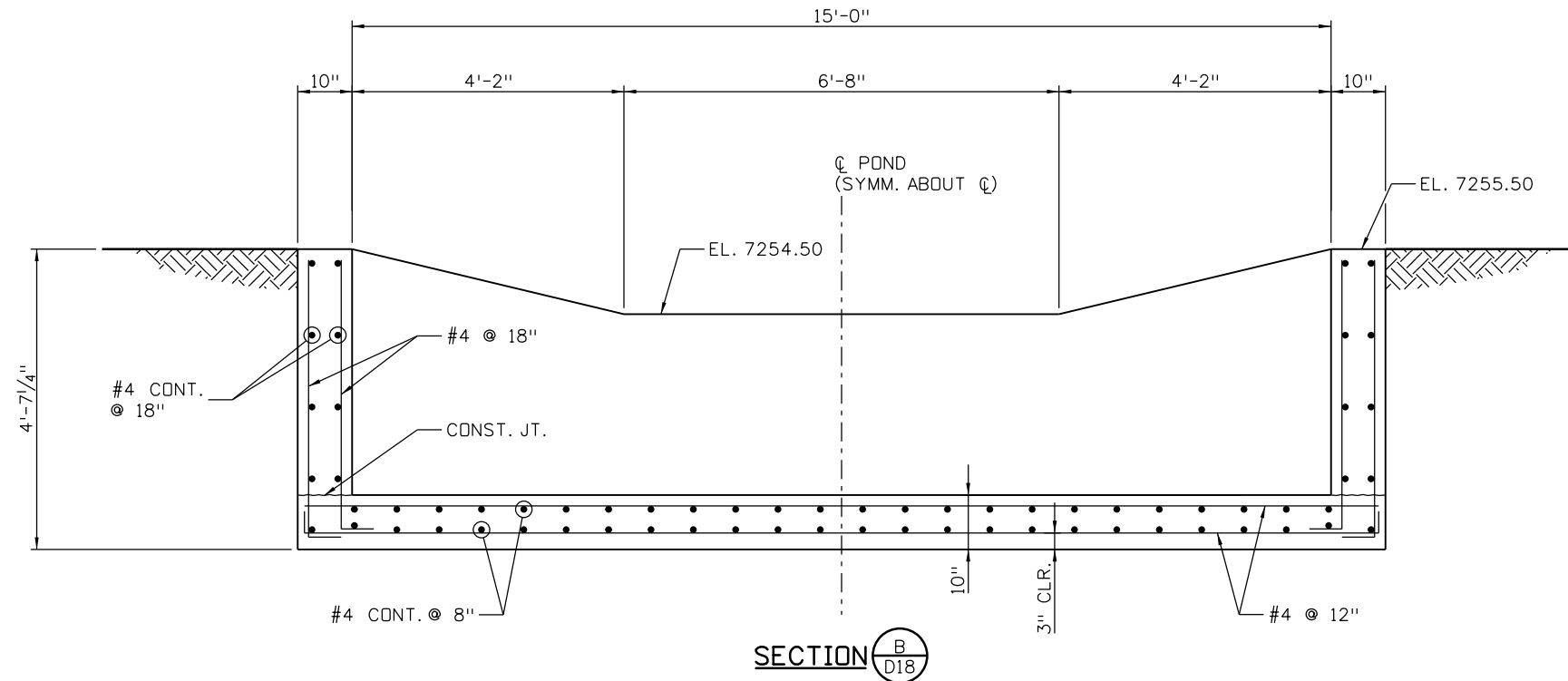
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POND AT STA. 341+84.66
(SHEET 1 OF 3)

Designer: P. PENAFIEL
 Detailer: E. SCHAWO
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Project No./Code
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19036
Sheet Number 147

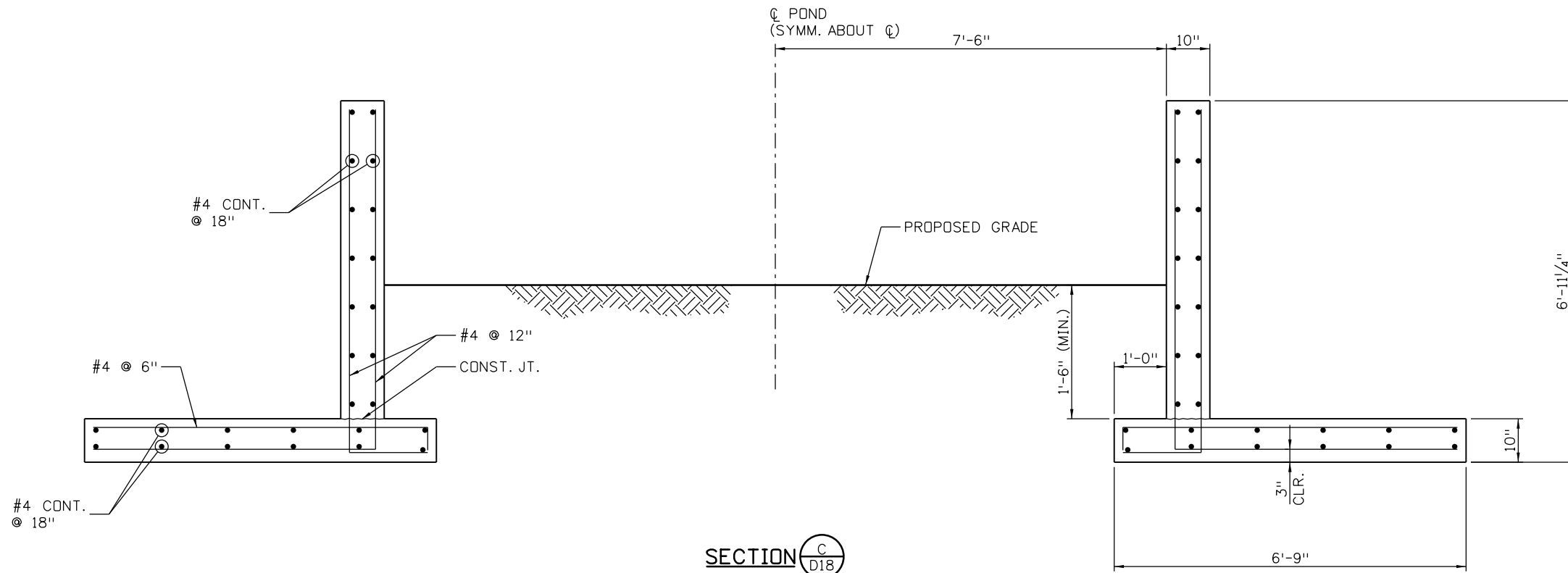
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Designed By	Checked By	Detailed By	Checked By	Quantities By	Checked By



SECTION $\frac{B}{D18}$

SCALE: $\frac{3}{8}$ " = 1'-0"



SECTION $\frac{C}{D18}$

SCALE: $\frac{3}{8}$ " = 1'-0"

Print Date: 3/7/2013

File Name: 18832DES_ConcPond342Det02.dgn

Horiz. Scale: AS NOTED Vert. Scale: AS NOTED

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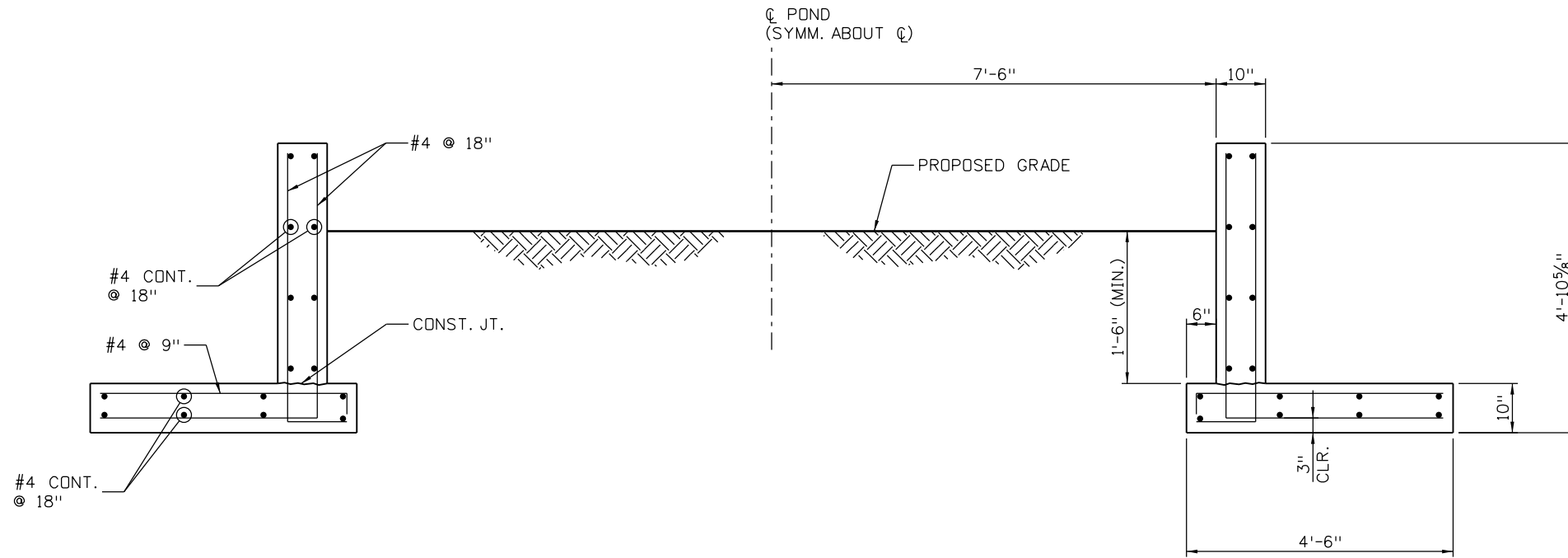
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Sheet Number 148

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SECTION $\frac{D}{D18}$

SCALE: $\frac{3}{8}'' = 1'-0''$

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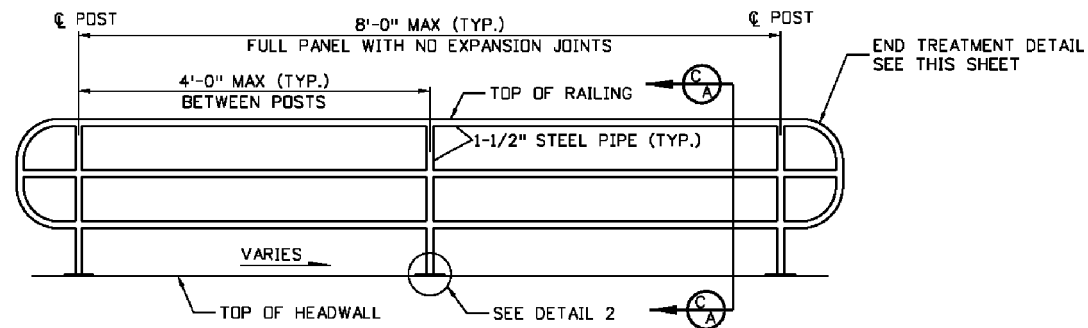
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Region 1 CRC

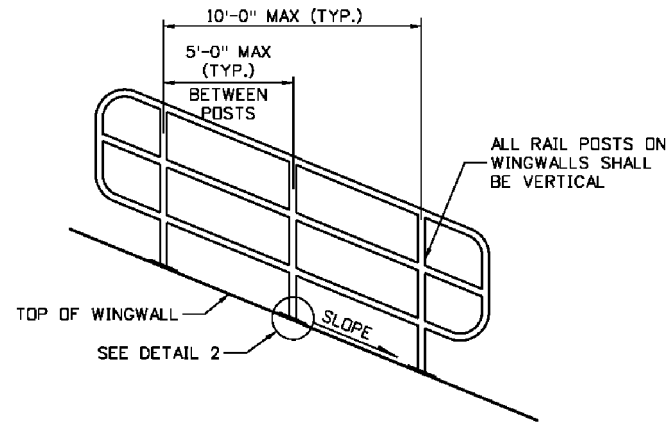
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Detailer: E. SCHAWO		
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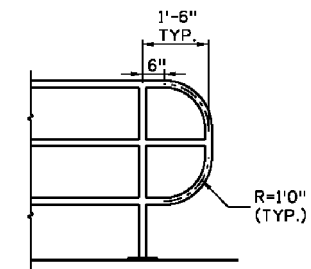
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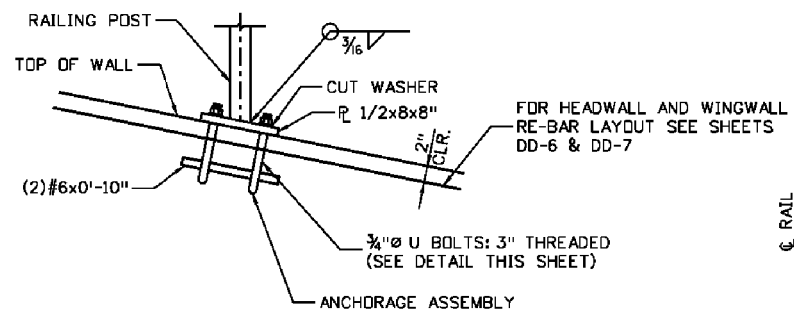
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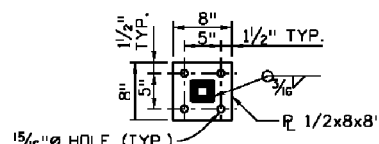
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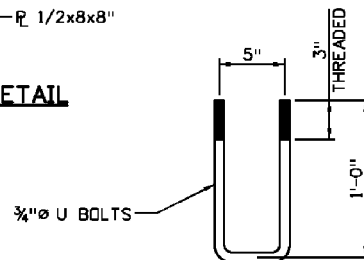
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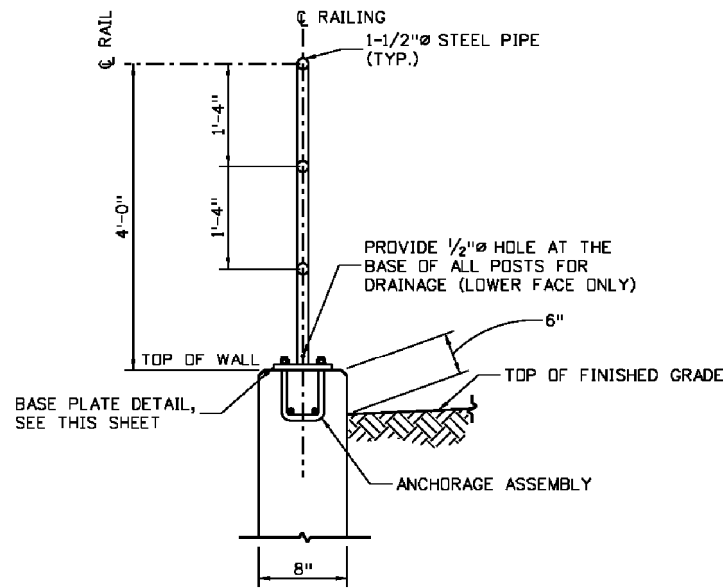
DETAIL 2 ANCHORAGE DETAIL
N.T.S.



BASE PLATE DETAIL
N.T.S.



U BOLT DETAIL
N.T.S.



SECTION C-A
N.T.S.

NOTES:

1. ALL PIPE SHALL BE 1 1/2" NOMINAL DIAMETER, SCH. 40 STEEL CONFORMING TO THE REQUIREMENTS IN ASTM A53 GRADE B STEEL (fy=35 ksi), AND ALL PLATES, BOLTS AND NUTS SHALL MEET THE REQUIREMENTS IN AASHTO M270 FOR GRADE 36 ksi STEEL.
2. ALL STEEL SHALL BE PAINTED AFTER FABRICATION IN ACCORDANCE WITH SECTION 509 OF CDDT STANDARD SPECIFICATION.
3. RAILINGS, ANCHORAGE ASSEMBLIES AND ALL PLATES, BOLTS, AND NUTS SHALL BE PAID FOR AS ITEM 514 PIPE RAILING.
4. PIPE RAILING SHALL BE PAINTED WITH A TWO-COAT INORGANIC ZINC POLYURETHANE PAINT SYSTEM AS SPECIFIED IN SECTION 708.03 AND SHALL HAVE A MINIMUM DRY FILM THICKNESS OF 4.0 MILS. THE TOP COAT SHALL BE A COLOR MATCHING FEDERAL STANDARD 595B COLOR NO. 17000-BLACK.
5. ANCHORAGE ASSEMBLY (PLATES, BOLTS & NUTS) SHALL BE GALVANIZED AFTER FABRICATION.
6. THE CONTRACTOR SHALL FIELD-MEASURE THE WINGWALLS AND BASE PLATE LOCATIONS PRIOR TO FABRICATION OF PIPE RAILING TO VERIFY DIMENSION REQUIREMENTS.
7. ALL RAILING SHALL BE PAINTED FOREST BROWN.

Design	Quantity	Initial	Date
Designed By	Checked By	Checked By	Checked By
Checked By	Checked By	Checked By	Checked By

Print Date: 3/7/2013
 File Name: 18832DES_PipeRail01.dgn
 Horiz. Scale: 1:40 Vert. Scale:
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Sheet Revisions		
Date:	Comments	Init.

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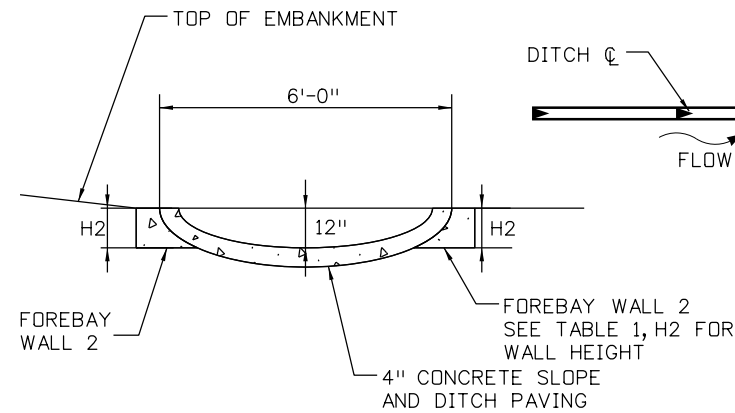
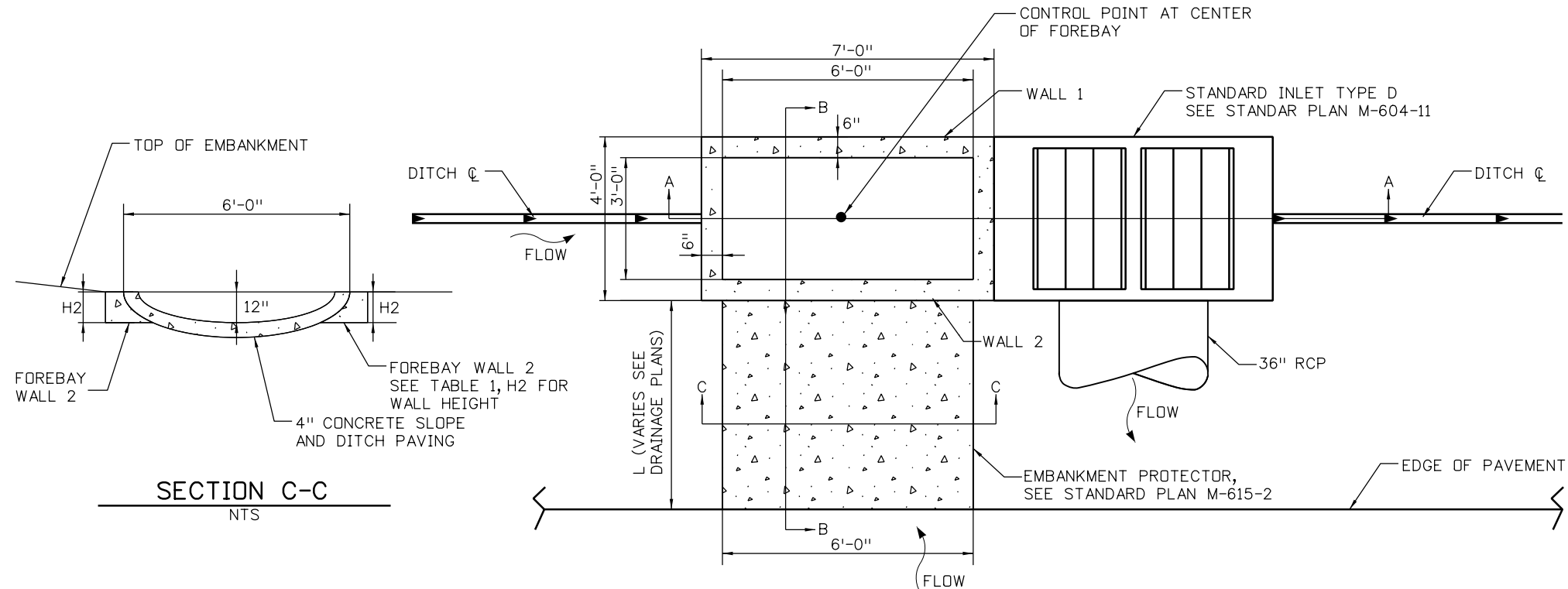
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 Region 1 CRC

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DRAINAGE DETAILS PIPE RAILING		
Designer:	S. ABRAHAM	Structure Numbers
Detailer:	E. SCHAWO	
Sheet Subset:	DRNDTL	Subset Sheets: D21 of 23

Project No./Code
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19036
Sheet Number 150

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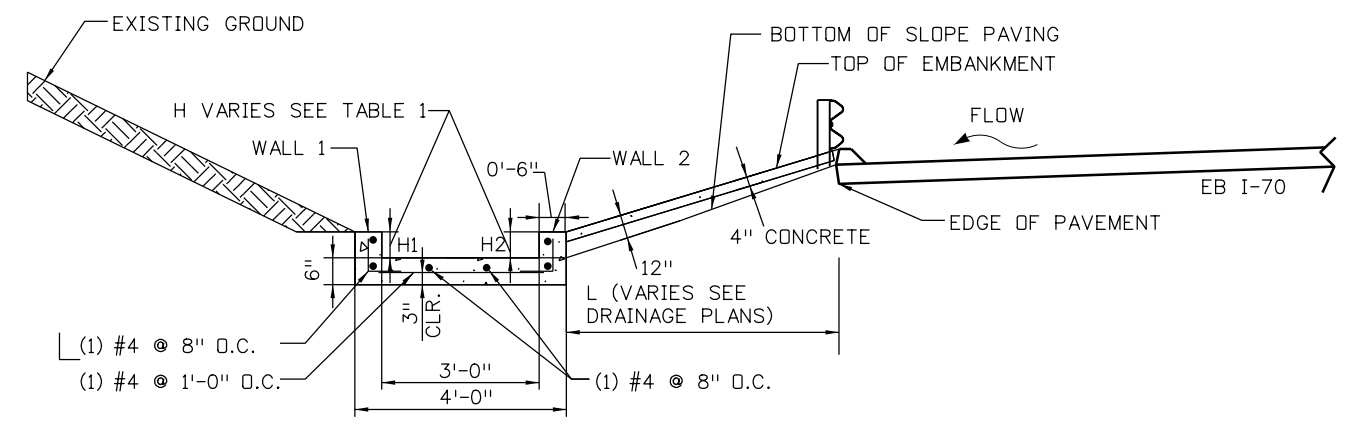
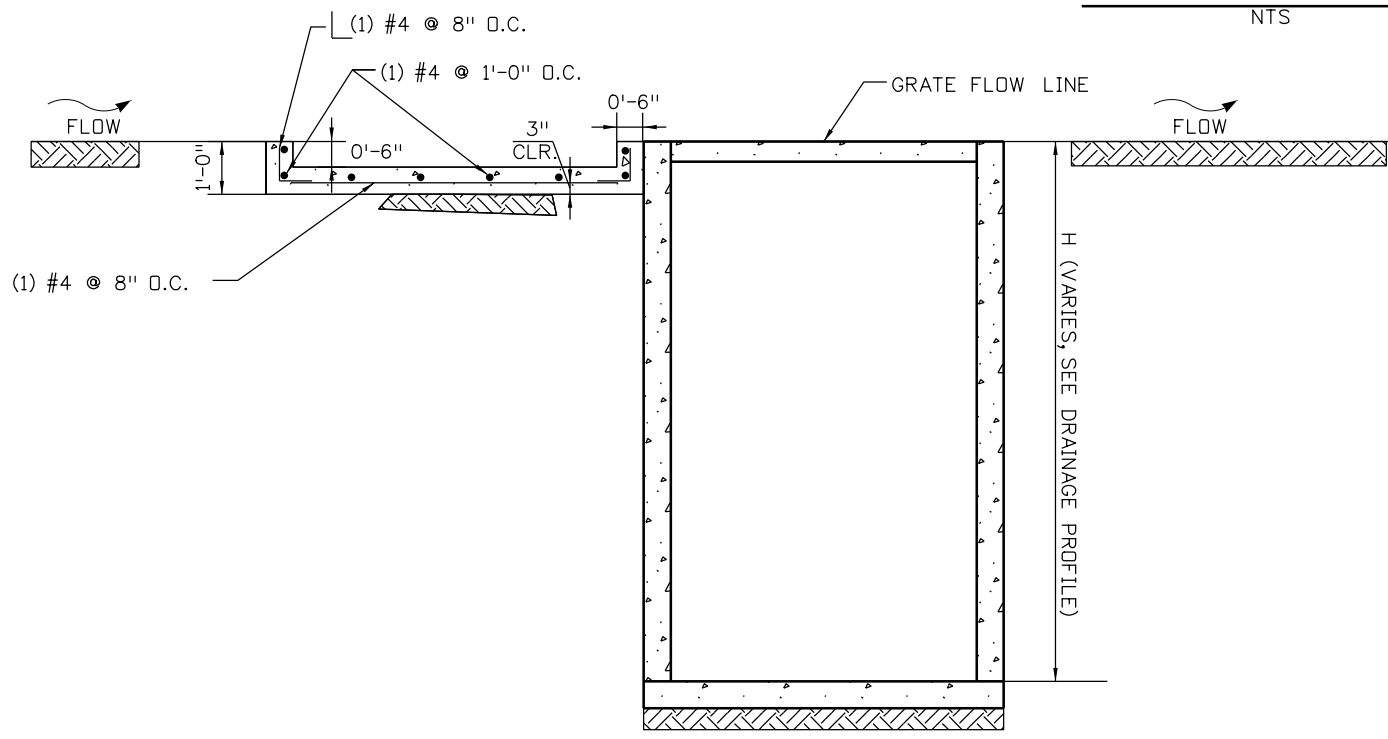


PLAN VIEW
NTS

- NOTES:**
1. LENGTH OF EMBANKMENT PROTECTOR VARIES, SEE PLANS.
 2. H VARIES ON WALL 1 AND 2 OF CONCRETE FOREBAY. MATCH TOP OF WALL AND EMBANKMENT. SEE TABLE 1 FOR DIMENSIONS.
 3. CONCRETE SHALL BE CLASS B CONCRETE: $f'_c=4500$ psi.
 4. ALL REINFORCING STEEL SHALL BE EPOXY COATED.
 5. ALL REINFORCING STEEL SHALL HAVE A MINIMUM CONCRETE COVER OF 2 INCHES UNLESS NOTED OTHERWISE.
 6. EXCAVATION AND BACKFILL SHALL BE AS PER STANDARD M-206-1.

TABLE 1

STATION	H1 (FT)	H2 (FT)
163+57.44, 11.16' LT	1.03	0.82
168+14.99, 12.24' LT	1.53	1.00
170+15.90, 12.89' LT	0.73	1.18

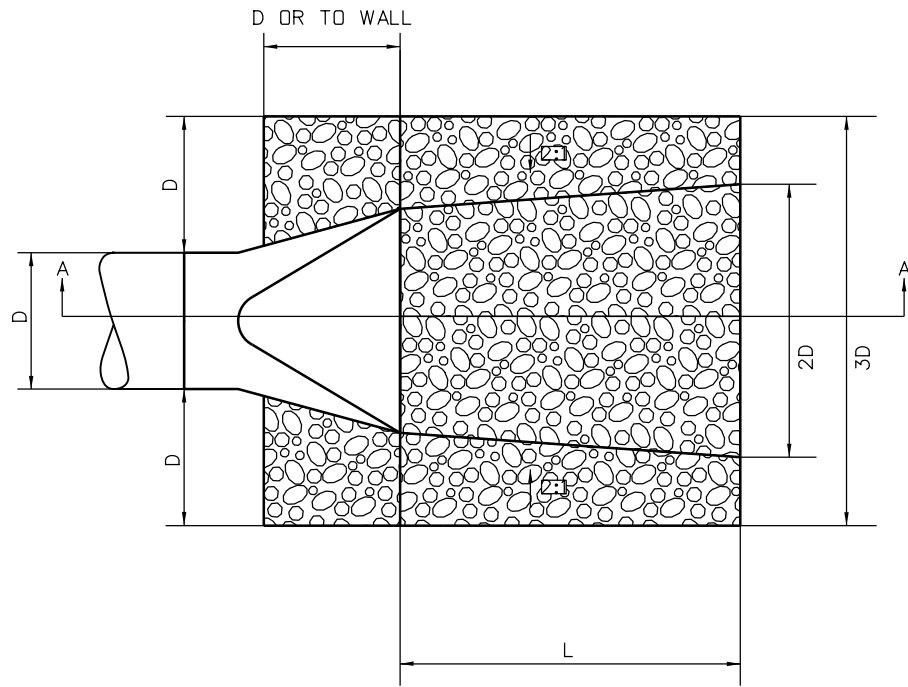


SECTION B-B
NTS

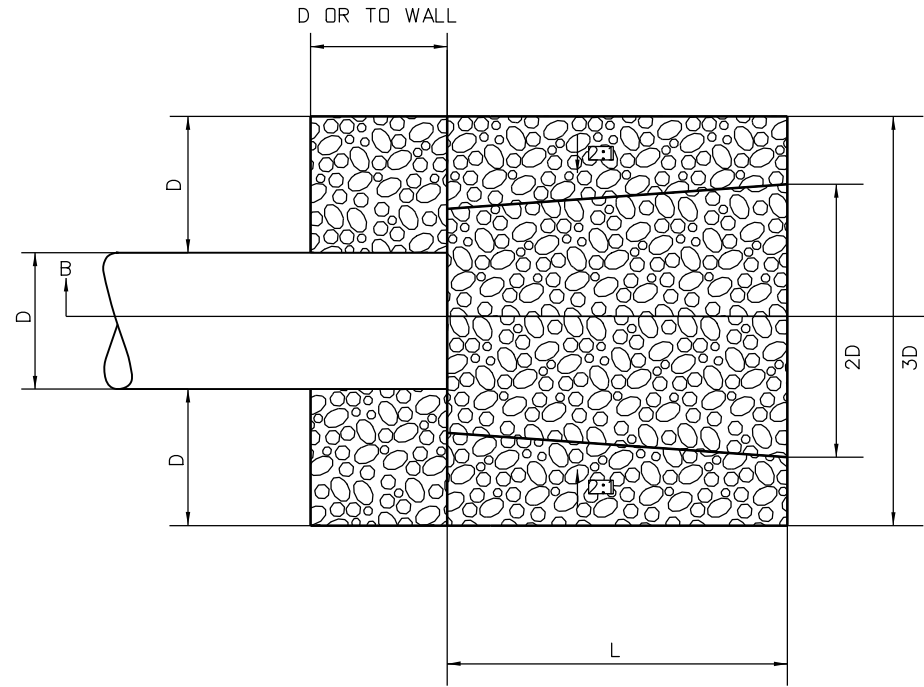
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NTS

Print Date: 3/7/2013		Sheet Revisions				As Constructed No Revisions: Revised: Void:	DRAINAGE DETAILS WATER QUALITY STRUCTURE CONCRETE FOREBAY			Project No./Code IM 0703-391 19036 Sheet Number 151
File Name: 18832HYD_CP2_Forebay01.dgn		Date:	Comments:	Init.			Designer: J. HOLLON Detailer: K. WILSON Subset: DRNDTL	Structure Numbers Subset Sheets: D22 of 23		
Horiz. Scale: 1:1 Vert. Scale:					425 A Corporate Circle Golden, CO 80401 Phone: 720-497-6918 FAX: 720-497-6901					
	4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276				Region 1	CRC				

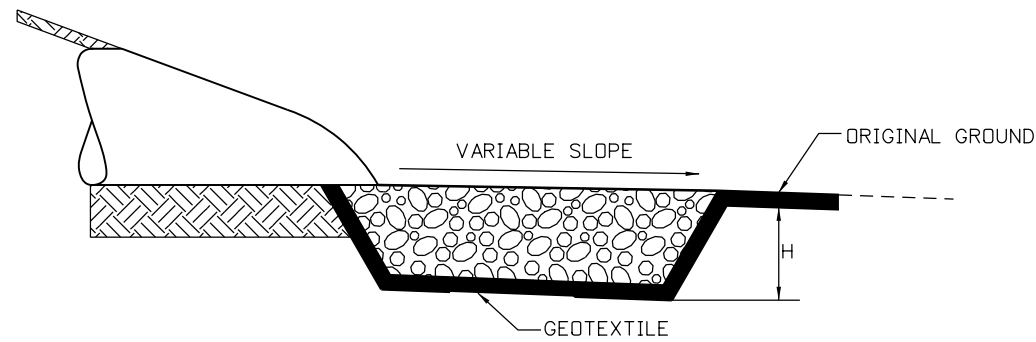
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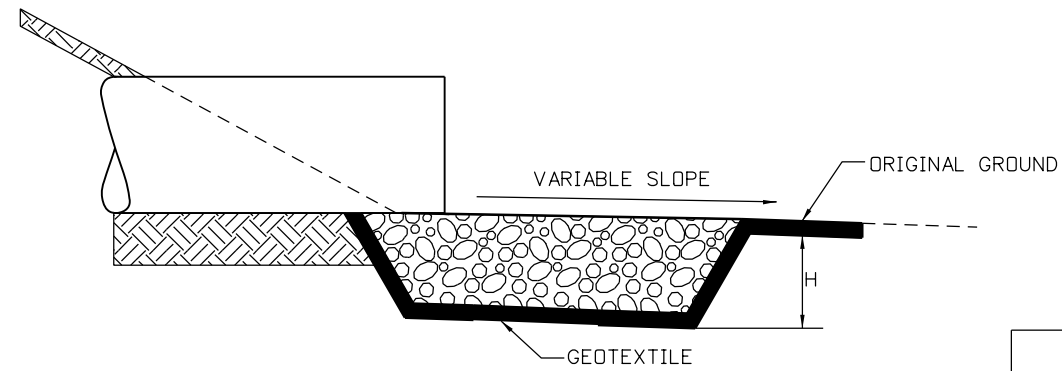
PLAN VIEW



PLAN VIEW



SECTION A-A
CULVERT WITH END SECTION



SECTION B-B
CULVERT WITHOUT STANDARD END SECTION

TABLE 2

RIPRAP PROTECTION DIMENSIONS	CULVERT WITH END SECTION		CULVERT WITHOUT STANDARD END SECTION
	36" RCP	24" RCP	36" RCP
WIDTH AT END OF CULVERT/ FES	9'	6'	9'
WIDTH AT END OF APRON	9'	6'	9'
LENGTH	12'	8'	12'
DEPTH	24"	24"	24"

NOTES:

1. D50=12", DEPTH(H)=2XD50

Print Date: 3/7/2013
 File Name: 18832HYD_CP2_Riprap01.dgn
 Horiz. Scale: 1:1 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:

**DRAINAGE DETAILS
RIPRAP**

Designer:	J. HOLLON	Structure Numbers	
Detailer:	K. WILSON	Subset Sheets:	DRNDTL
Subset:	DRNDTL	Subset Sheets:	D23 of 23

Project No./Code
 IM 0703-391
 19036
 Sheet Number 152

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CODES AND STANDARDS

AMERICAN CONCRETE INSTITUTE (ACI) ACI 318 BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE.

COLORADO DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION.

AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC) SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS.

AMERICAN WELDING SOCIETY (AWS) D1.1 STRUCTURAL WELDING CODE - STEEL.

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO) LRFD BRIDGE DESIGN SPECIFICATIONS.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

US ARMY CORPS OF ENGINEERS, 1997 ENGINEER MANUAL EM 1110-2-2901, TUNNELS AND SHAFTS IN ROCK

AMERICAN SOCIETY OF CIVIL ENGINEERS, (ASCE) MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES

MATERIALS FOR TUNNEL FINAL LINING

CLASS D CAST-IN-PLACE CONCRETE (UNLESS NOTED OTHERWISE): f'c = 4,500 PSI

MUD SLAB (UNLESS NOTED OTHERWISE): f'c = 2,000 PSI

REINFORCING STEEL: fy = 60,000 PSI

FORMATION DRAIN PIPE: SCHEDULE 40 PVC

CONCRETE

CONCRETE SHALL NOT BE POURED UNTIL ALL REQUIRED DOWELS, PIPE SLEEVES, EMBEDDED, PIPES, CONDUITS, GROUNDING EQUIPMENT, GEOTEXTILES, WATERSTOPS, AND MISCELLANEOUS STEEL, WHICH ARE TO BE SET IN CONCRETE ARE IN PLACE. CONTRACTOR SHALL COORDINATE WORK WITH THE DRAWINGS AND SPECIFICATIONS OF OTHER DISCIPLINES FOR EMBEDMENTS AND PENETRATIONS.

CONSTRUCTION JOINTS SHALL BE THOROUGHLY CLEANED AND REMOVE LAITENANCE FROM ALL SURFACES. ROUGHEN SURFACES TO ± 1/4" AMPLITUDE AND PREPARE SURFACE TO SATURATED DRY BEFORE PROCEEDING WITH NEXT PLACEMENT. KEEP WET FOR FOUR HOURS.

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.

CLEAR COVER TO BARS ON THE EXTRADOS SHALL BE 3 INCHES. CLEAR COVER TO BARS ON THE INTRADOS SHALL BE 2 INCHES.

REINFORCING BARS IN THE TUNNEL LINER SHALL BE LOCATED PRIOR TO DRILLING HOLES FOR LIGHTING SYSTEM AND OTHER EMBEDMENTS AND PENETRATIONS.

A COLORED STRUCTURAL CONCRETE COATING FINISH WILL BE REQUIRED ON TUNNEL WALLS, AS SHOWN ON THE PLANS. THE COLOR SHALL BE WHITE, EQUIVALENT TO FEDERAL STANDARD 595B COLOR NO. 17925.

MATERIALS FOR INITIAL SUPPORT OF EXCAVATION

ROCK DOWELS: ASTM A615 OR ASTM A706 GRADE 75 REINFORCING BARS
ASTM A572 GR 50 ENDPLATES
RESIN OR CEMENT GROUT

WELDED WIRE FABRIC ASTM A185 OR ASTM A496

STEEL CHANNELS & STEEL SETS ASTM A36 OR ASTM A572 GR 50

MINE STRAPS ASTM A569

SPILES ASTM A615 OR ASTM A706 GR 60

FIBER REINFORCED SHOTCRETE f'c = 5,000 PSI (28 DAY STRENGTH)

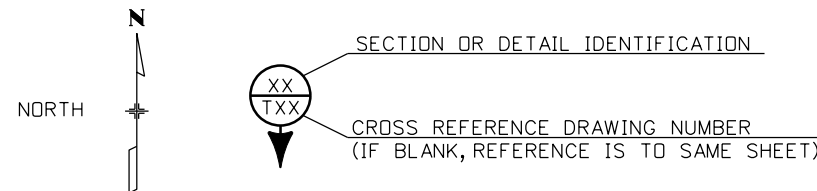
ALL ELEMENT OF INITIAL GROUND SUPPORT SYSTEM PLACED TO STABILIZE EXCAVATION ARE CONSIDERED TEMPORARY.

ABBREVIATIONS

ADD'L = ADDITIONAL
AH. = AHEAD
@ = SPACED AT
B.F. = BACK FACE
BK = BACK
B = BASELINE
BOT. = BOTTOM
BRG. = BEARING
C = CENTERLINE
C.I.P. = CAST IN PLACE
CLR. = CLEAR
CONC. = CONCRETE
CONN. = CONNECTION
CONT. = CONTINUOUS
CJ = CONSTRUCTION JOINT
CU. = CUBIC
CY = CUBIC YARD
DIAG. DIAGONAL
Ø = DIAMETER
DIA. = DIAMETER
DN = DOWN
DWG. = DRAWING
EA = EACH
E.F. = EACH FACE
EL. = ELEVATION
EQ. = EQUAL
EXP. = EXPANSION
FIN = FINISH
F.F. = FRONT FACE
FRS = FIBER REINFORCED SHOTCRETE
FT. = FEET
FTG = FOOTING
GALV. = GALVANIZED
HORIZ. = HORIZONTAL
HCL = HORIZONTAL CONTROL LINE
HWY = HIGHWAY
IN. = INCH

LB = POUND
LIN. = LINEAR
LF = LINEAR FEET
LT = LEFT
MAX. = MAXIMUM
MIN. = MINIMUM
NIC = NOT IN CONTRACT
PCF = POUNDS PER CUBIC FOOT
PGL = PROFILE GRADE LINE
PL = PLATE
PROJ. = PROJECT
PSF = POUNDS PER SQUARE FOOT
PSI = POUNDS PER SQUARE INCH
REINF. = REINFORCING
ROW = RIGHT OF WAY
RT = RIGHT
SECT = SECTION
SPA. = SPACES
SPECS = SPECIFICATIONS
SIM = SIMILAR
STA. = STATION
STD = STANDARD
SY = SQUARE YARD
T&B TOP AND BOTTOM
T.D.C. = TOP OF CONCRETE
TYP. = TYPICAL
UDN = UNLESS OTHERWISE NOTED
VERT = VERTICAL
VC = VERTICAL CURVE
VIF = VERIFY IN FIELD
WP = WORK POINT
W/D = WITHOUT
WWF = WELDED WIRE FABRIC
YD. = YARD

SYMBOLS



INDEX OF DRAWINGS

- T1 GENERAL NOTES
- T2 SUMMARY OF QUANTITIES
- T3 GENERAL ARRANGEMENT
- T4 GROUND CLASS BOUNDARIES
- T5 ROCK CLASSIFICATION TERMS (1 OF 2)
- T6 ROCK CLASSIFICATION TERMS (2 OF 2)
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- T8 EXCAVATION SEQUENCE DIAGRAM
- T9 WEST PORTAL STABILIZATION
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- T11 GROUND CLASS TT1
- T12 GROUND CLASS TT2
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- T14 GROUND CLASS TT3
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- T18 INSTRUMENTATION
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- T23 REINFORCEMENT DETAILS

LEGEND

- CONCRETE
- AGGREGATE BASE
- LEAN CONCRETE FILL
- SOIL, ROCK OR EARTH
- WELDED WIRE FABRIC REINFORCING STEEL
- GEOTEXTILES DRAIN PANEL
- SHOTCRETE
- EXCAVATION LINE
- DESIGN LINE
- CENTER LINE
- SPRING LINE

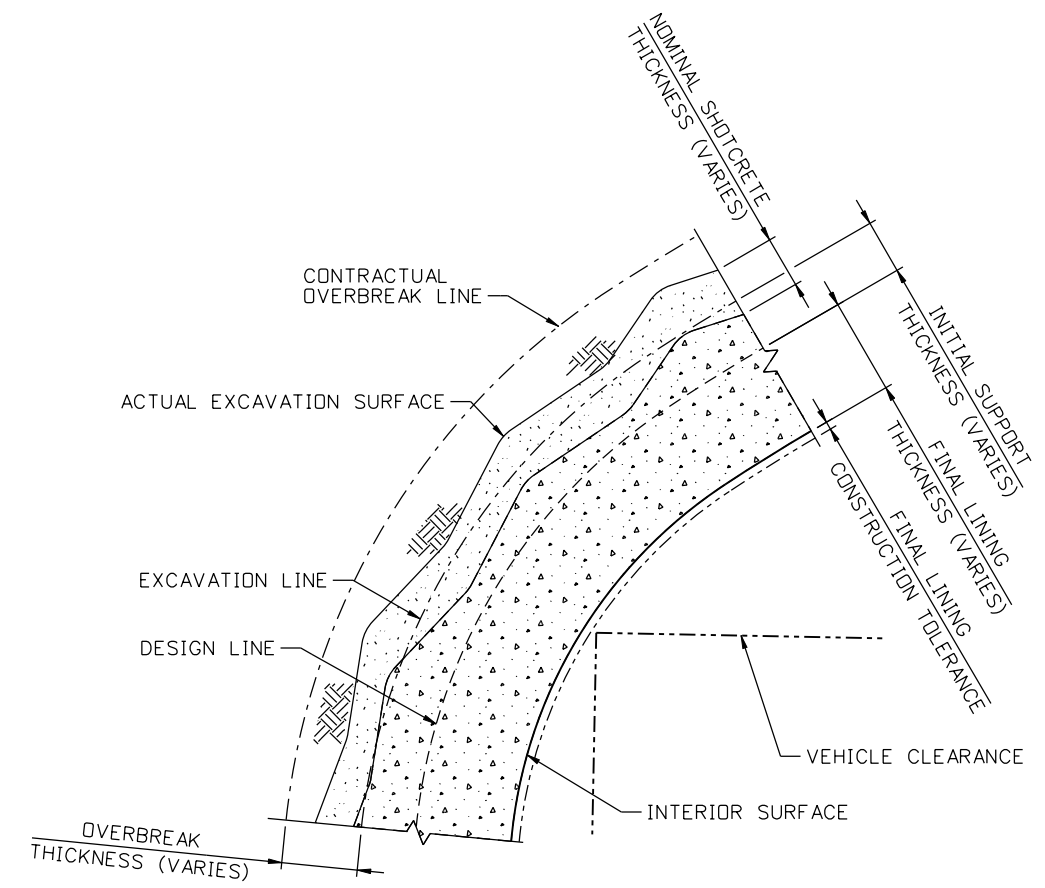
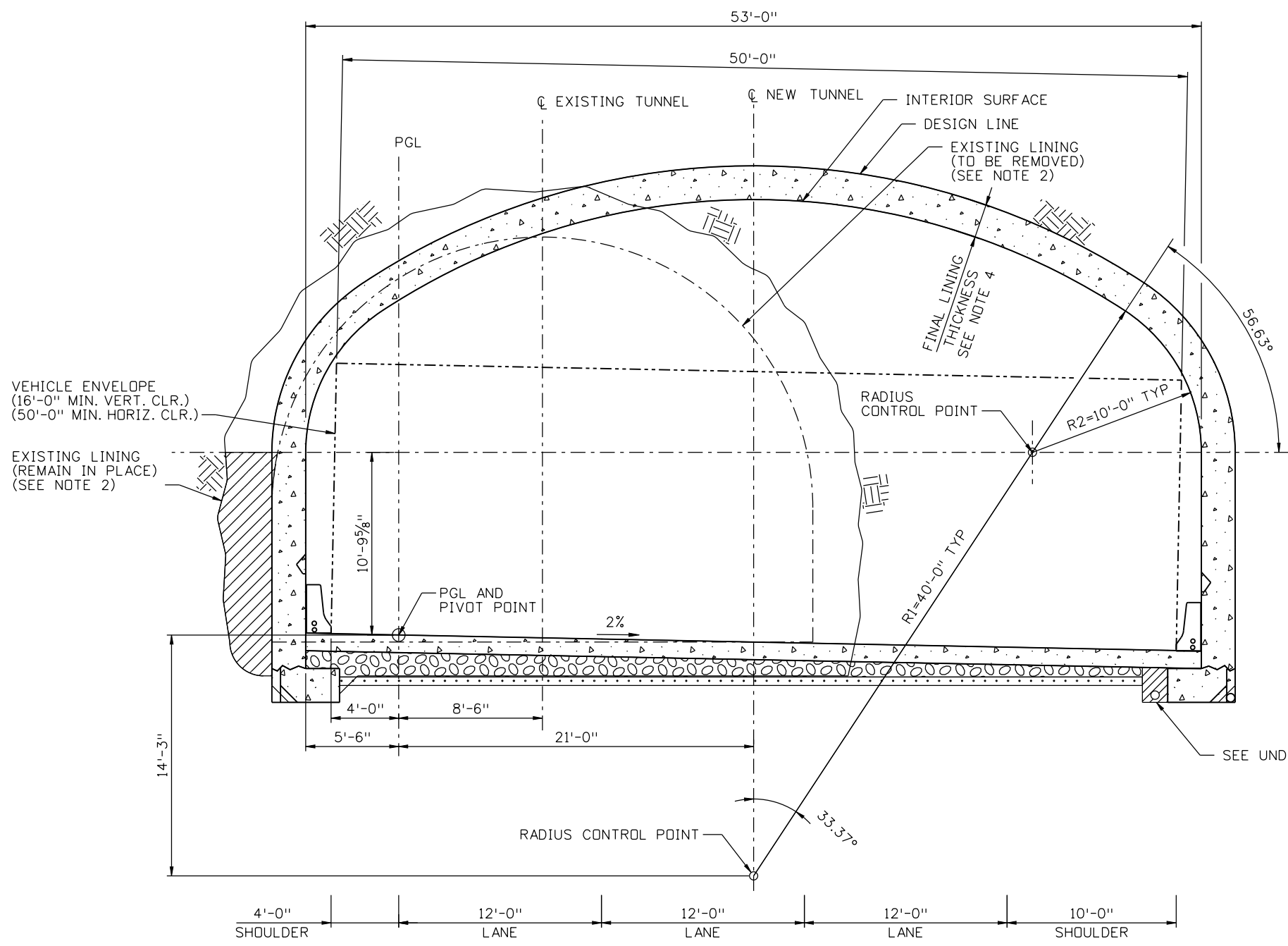
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CHECKED BY	MEF	NA	02/13
DESIGNED BY	DATE	INITIAL	DATE
DESIGNED BY	02/13	NA	02/13
CHECKED BY	MEF	NA	02/13
DESIGNED BY	DATE	INITIAL	DATE
DESIGNED BY	02/13	NA	02/13
CHECKED BY	MEF	NA	02/13

Print Date: 3/8/2013	Sheet Revisions			Colorado Department of Transportation	As Constructed	I-70 TWIN TUNNELS EASTBOUND TUNNEL WIDENING GENERAL NOTES		Project No./Code
File Name: 19036 GENERAL NOTES.dgn	Date:	Comments	Init.	425 A Corporate Circle Golden, CO 80401 Phone: 720-497-6918 FAX: 720-497-6901 Region 1	No Revisions:	Designer: D. ABRAHAMAS		IM 0703-391
Horiz. Scale: Vert. Scale:					Revised:	Detailer: D. GATTSHALL		19036
Unit Information Unit Leader Initials					Void:	Subset: TUNNEL CP2		Sheet Number 153
				CRC	Structure Numbers STR F-17-BD		Subset Sheets: T1 of 23	

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Revision Dates (Preliminary Stage Only)	

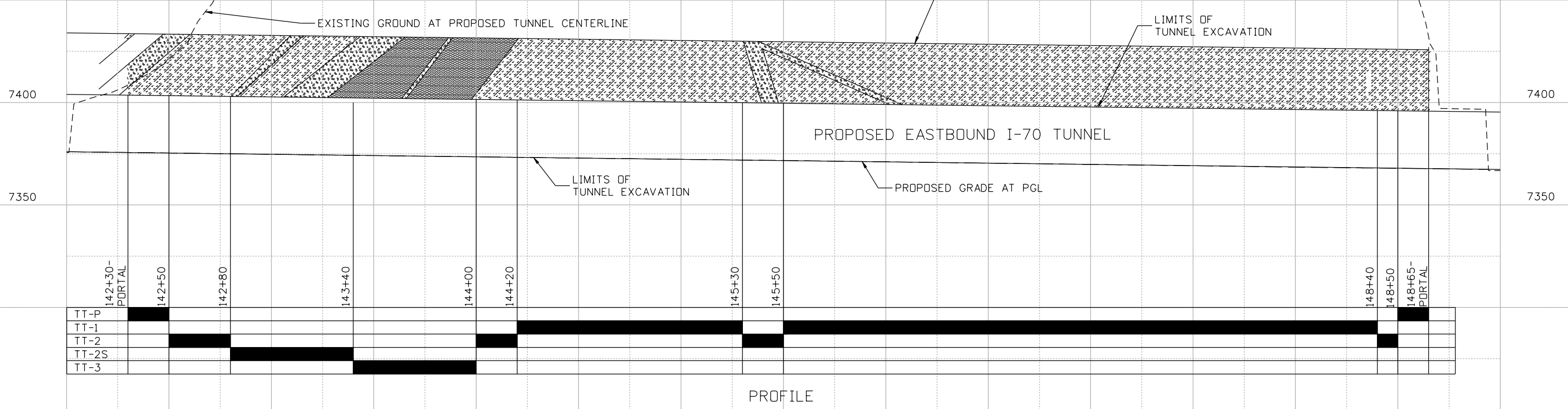
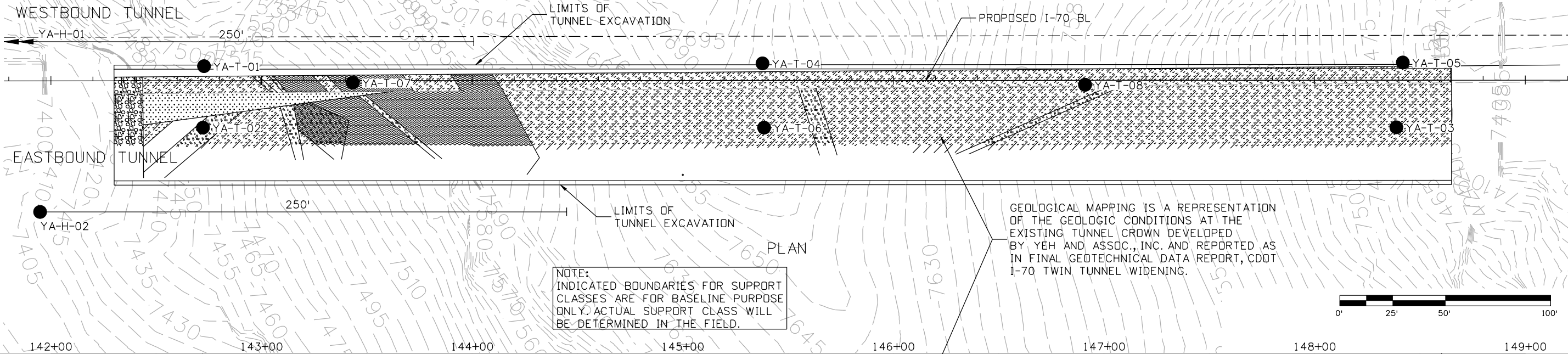
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DATE	INITIAL	DATE	INITIAL
02/13	DPA	02/13	LA
02/13	MEF	02/13	DPA



- NOTE:**
1. TUNNEL AXIS AND SIDEWALLS TO REMAIN VERTICAL. ROADWAY SURFACE AND ENVELOPE CONFORM TO 2% CROSS-SLOPE
 2. EXISTING LINING SHOWN FOR REFERENCE ONLY. FOR LIMITS OF DEMOLITION SEE EXCAVATION AND GROUND SUPPORT DRAWINGS.
 3. SEE REFERENCE AS-BUILTS DRAWINGS FOR PROJECT I-70 - 3 (2) 251.
 4. FINAL LINING VARIES, SEE REINFORCING DETAILS.

Print Date: 3/8/2013	Sheet Revisions		Colorado Department of Transportation	As Constructed	I-70 TWIN TUNNELS EASTBOUND TUNNEL WIDENING GENERAL ARRANGEMENT		Project No./Code	
File Name: 19036 GENERAL ARRANGEMENT.dgn	Date:	Comments:					Init.	IM 0703-391
Horiz. Scale:	Unit Information		 425 A Corporate Circle Golden, CO 80401 Phone: 720-497-6918 FAX: 720-497-6901 Region 1	No Revisions:	Designer: D. ABRAHAM	Structure STR F-17-B0	19036	
Unit Leader Initials	Unit Information						Revised:	Detailer: D. GATTSHALL
				Void:	Subset: TUNNEL CP2			

LEGEND:



Revision Dates	
	(Preliminary Stage Only)

Design		Detail		Quantities	
DATE	INITIAL	DATE	INITIAL	DATE	INITIAL
02/13	MEF	02/13	JG	02/13	LA
Checked By		Checked By		Checked By	

Print Date: 3/8/2013
 File Name: 19036_PlanProfile_Geology.dgn
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 Unit Information Unit Leader Initials

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Region 1 CRC

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I-70 TWIN TUNNELS
 EXCAVATION AND GROUND SUPPORT
 GROUND CLASS BOUNDARIES

Designer: C. FISCHER Structure Numbers
 Detailer: J. GONZALES
 Subset: TUNNEL CP2 Subset Sheets: T4 of 23

Project No./Code	IM 0703-391
	19036
Sheet Number	156

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ROCK WEATHERING CONDITION

GRADE	CONDITION	TERM	TYPICAL GEOTECHNICAL SITE INVESTIGATION METHODS		DESCRIPTION
			DRILLING	SAMPLING	
1	ROCK-LIKE	FRESH	CORE	CORE	NO VISIBLE SIGN OF WEATHERING. NO DISCOLORATION OF THE ROCK MATERIAL VISIBLE ON MAJOR DISCONTINUITY SURFACES.
		UNWEATHERED	CORE	CORE	NO VISIBLE SIGN OF ROCK MATERIAL WEATHERING. PERHAPS SLIGHT DISCOLORATION ON MAJOR DISCONTINUITY SURFACES.
		SLIGHTLY WEATHERED	CORE	CORE	DISCOLORATION INDICATES WEATHERING OF ROCK MATERIAL AND DISCONTINUITY SURFACES. ALL THE ROCK MATERIAL MAY BE DISCOLORED BY WEATHERING AND MAY BE SOMEWHAT WEAKER EXTERNALLY THAN ITS FRESH CONDITION
		MODERATELY WEATHERED	CORE	CORE	MATRIX OF ROCK-LIKE AND SOIL-LIKE MATERIAL. LESS THAN HALF OF THE ROCK MATERIAL MATRIX IS WEATHERED TO A SOIL. FRESH OR DISCOLORED ROCK IS PRESENT EITHER AS A CONTINUOUS FRAMEWORK OR AS CORESTONES IN THE ROCK MATERIAL MATRIX.
		HIGHLY WEATHERED	CORE (ROLLER BIT INEFFECTIVE)	CORE	MORE THAN HALF OF THE ROCK MATERIAL MATRIX IS WEATHERED TO A SOIL. FRESH OR DISCOLORED ROCK IS PRESENT EITHER AS A DISCONTINUOUS FRAMEWORK OR AS CORESTONES.
5	SOIL-LIKE	COMPLETELY WEATHERED	CORE OR ROLLER BIT	CORE (DRIVE SAMPLE INEFFECTIVE)	ALL ROCK MATERIAL IS WEATHERED TO SOIL. THE ORIGINAL ROCK MASS STRUCTURE AND MATERIAL FABRIC IS STILL LARGELY INTACT, HOWEVER.
		DISINTEGRATED	CORE OR ROLLER BIT	DRIVE SAMPLE OR CORE	THE ROCK IS WEATHERED TO THE CONDITION OF A SOIL IN WHICH THE ORIGINAL ROCK MASS STRUCTURE IS LOST, BUT THE MATERIAL FABRIC IS STILL INTACT. THE MATERIAL IS FRIABLE, BUT THE MINERAL GRAINS ARE NOT DECOMPOSED.
		DECOMPOSED	ROLLER BIT	DRIVE SAMPLE (CORING INEFFECTIVE)	THE ROCK IS WEATHERED TO THE CONDITION OF A SOIL IN WHICH THE ORIGINAL MATERIAL FABRIC IS STILL INTACT. THE MATERIAL IS HIGHLY FRIABLE, WITH SOME OR ALL OF THE MINERAL GRAINS DECOMPOSED.
		RESIDUAL	ROLLER BIT	DRIVE SAMPLE	ALL ROCK MATERIAL IS CONVERTED TO SOIL. THE ORIGINAL ROCK MASS STRUCTURE AND MATERIAL FABRIC ARE LOST. DEPOSITS HAVE TYPICALLY EXPANDED CONSIDERABLY FROM THE ORIGINAL ROCK VOLUME, BUT HAVE NOT BEEN TRANSPORTED FAR FROM ORIGINAL ROCK LOCATION.

ROCK JOINT FILLING STRENGTH CLASSIFICATION

THE STRENGTH OF ANY FILLING MATERIALS ALONG DISCONTINUITY SURFACES IS ASSESSED IN ACCORDANCE WITH THE FOLLOWING DESCRIPTIONS AND GRADES

GRADE	STRENGTH DESIGNATION	FIELD IDENTIFICATION	APPROXIMATE UNCONFINED COMPRESSION STRENGTH (KIPS/SQ.FT)
S1	VERY SOFT CLAY	EXTRUDED BETWEEN FINGERS WHEN SQUEEZED.	0.5
S2	SOFT CLAY	MOLDED BY LIGHT FINGER PRESSURE.	0.5 TO 1.0
S3	FIRM CLAY	MOLDED BY STRONG FINGER PRESSURE.	1.0 TO 2.0
S4	STIFF CLAY	READILY INDENTED BY THUMB, BUT PENETRATED BY THUMB ONLY WITH GREAT EFFORT.	2.0 TO 5.0
S5	VERY STIFF CLAY	READILY INDENTED BY THUMBNAIL.	5.0 TO 10.0
S6	HARD CLAY	INDENTED WITH DIFFICULTY BY THUMBNAIL.	>10.0

GRADES S1 TO S6 APPLY TO COHESIVE, GENERALLY SLOW DRAINING SOILS (E.G. CLAYS, SILTY CLAYS, AND COMBINATIONS OF SILTS WITH SAND). IF NON-COHESIVE FILLINGS ARE IDENTIFIED, QUALITATIVE DESCRIPTION IS GENERALLY PROVIDED FOR EACH (E.G. FINE SAND). STRENGTH OF DISCONTINUITIES WITHOUT FILLING MATERIALS WILL GENERALLY BE CHARACTERIZED BY GRADES R0-R6 (ROCK) WHILE S1-S6 (CLAY) WILL GENERALLY APPLY TO FILLED DISCONTINUITIES.

ROCK STRENGTH CLASSIFICATION

GRADE	STRENGTH	FIELD IDENTIFICATION	APPROXIMATE UNCONFINED COMPRESSION STRENGTH (LBS/SQ.IN)
R0	EXTREMELY WEAK ROCK	READILY BREAKABLE BY HAND PRESSURE. CRUMBLES UNDER LIGHT BLOW OF GEOLOGICAL HAMMER. EASILY RAKED BY GEOLOGICAL HAMMER PICK.	40 TO 150
R1	VERY WEAK ROCK	CRUMBLES UNDER FIRM BLOW OF GEOLOGICAL HAMMER OR MODERATE HAND PRESSURE. CAN BE RAKED WITH GEOLOGICAL HAMMER PICK.	150 TO 700
R2	WEAK ROCK	BREAKS WITH LIGHT BLOW OF GEOLOGICAL HAMMER OR STRONG HAND PRESSURE.	700 TO 4,000
R3	MEDIUM STRONG ROCK	BREAKS WITH FIRM BLOW OF GEOLOGICAL HAMMER.	4,000 TO 7,000
R4	STRONG ROCK	SPECIMEN REQUIRES MORE THAN ONE FIRM BLOW OF GEOLOGICAL HAMMER TO BREAK IT.	7,000 TO 15,000
R5	VERY STRONG ROCK	SPECIMEN REQUIRES MANY FIRM BLOWS OF GEOLOGICAL HAMMER TO BREAK.	15,000 TO 36,000
R6	EXTREMELY STRONG ROCK	SPECIMEN CAN ONLY BE CHIPPED WITH GEOLOGICAL HAMMER.	>36,000

ROCK HARDNESS

ROCK HARDNESS DESIGNATION	FIELD IDENTIFICATION
VERY SOFT	INDENTED BY THUMBNAIL
SOFT	CAN BE SCRATCHED WITH THUMBNAIL OR READILY PEELED WITH A POCKET KNIFE. READILY INDENTED BY FIRM BLOWS GEOLOGICAL HAMMER'S BLUNT END.
MODERATELY HARD	CAN BE PEELED BY A POCKET KNIFE WITH DIFFICULTY, SHALLOW INDENTATIONS MADE BY FIRM BLOW WITH POINT OF GEOLOGICAL HAMMER.
MEDIUM HARD	CANNOT BE SCRAPED OR PEELED WITH A POCKET KNIFE. BREAKS WHEN STRUCK WITH FIRM BLOWS BY BLUNT END OF GEOLOGICAL HAMMER.
HARD	DIFFICULT TO SCRATCH WITH EDGE OF A POCKET KNIFE. CHIPS WHEN STRUCK WITH FIRM BLOWS BY BLUNT END OF GEOLOGICAL HAMMER.
VERY HARD	DIFFICULT TO SCRATCH WITH POINT OF A POCKET KNIFE. MAY SPARK WHEN STRUCK WITH GEOLOGICAL HAMMER.
EXTREMELY HARD	PRODUCES ONLY SMALL CHIPS AND FREQUENTLY SPARKS WHEN STRUCK BY FIRM BLOWS WITH PICK OF GEOLOGICAL HAMMER. CANNOT BE SCRATCHED WITH POCKET KNIFE.

ROCK GRAIN TEXTURE

GRAIN DESIGNATION	CONDITION
FINE	GRAIN PARTICLES NOT VISIBLE TO JUST BARELY VISIBLE WITH NAKED EYE.
MEDIUM	GRAIN SIZE BARELY TO EASILY VISIBLE WITH THE NAKED EYE; UP TO 1/8 INCH.
COARSE	GRAIN SIZE 1/8 INCH OR GREATER

Design	Checked By	CGF	SK	DATE	02/13
Detail	Checked By	CGF	CGF	DATE	02/13
Quantities	Checked By	CGF	NA	DATE	02/13
(Preliminary Stage Only)					

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 Unit Information Unit Leader Initials

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Date:	Comments	Init.

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Region 1 CRC

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Void:

**I-70 TWIN TUNNELS
 EXCAVATION AND GROUND SUPPORT
 ROCK CLASSIFICATION TERMS (1 OF 2)**

Designer: C. FISCHER Structure STR F-17-BD
 Detailer: D. GATTSHALL Numbers
 Subset: TUNNEL CP2 Subset Sheets: T5 of 23

Project No./Code
IM 0703-391
19036
Sheet Number 157

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Detail	DATE	INITIAL	DEG	DFG	02/13	02/13
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Quantities	DATE	INITIAL	NA	NA	02/13	02/13
Quantities	02/13	02/13	Checked By	Checked By	Checked By	Checked By
Revision Dates	(Preliminary Stage Only)					

JOINT ALTERATION, Ja

JOINT CATEGORY	JOINT CONDITION (CONTACT SURFACE ALTERATION)		JOINT ALTERATION FACTOR Ja
	DESCRIPTION	CONDITION	
DIRECT CONTACT BETWEEN SURFACES (JOINT COATING LESS THAN 1/8" THICK)	A. TIGHTLY HEALED	TIGHTLY HEALED, HARD, NON-SOFTENING, IMPERMEABLE FILLING	0.75
	B. UNALTERED	UNALTERED JOINT SURFACES, SURFACE STAINING ONLY	1.0
	C. SLIGHTLY ALTERED	SLIGHTLY ALTERED JOINT WALLS. NON-SOFTENING MINERAL COATINGS, SANDY PARTICLES, CLAY FREE DISINTEGRATED ROCK ETC.	2.0
	D. COATED	SILTY OR SANDY CLAY COATINGS, SMALL CLAY FRACTION (NON-SOFTENING)	3.0
	E. CLAY COATED	SOFTENING OR LOW FRICTION CLAY MINERAL COATINGS, IE. KAOLINITE, MICA, CHLORITE, ETC.	4.0
NO DIRECT CONTACT BETWEEN SURFACES (JOINT COATING LESS THAN 1/4" THICK)	F. INFILLED	SANDY PARTICLES, CLAY-FREE DISINTEGRATED ROCK ETC.	4.0
	G. CLAY FILLED	STRONGLY OVERCONSOLIDATED, SOFTENING, CLAY MINERAL FILLINGS	6.0
	H. SOFT CLAY FILLED	MEDIUM OR LOW OVERCONSOLIDATION, SOFTENING, CLAY MINERAL FILLINGS	8.0
NO DIRECT CONTACT BETWEEN SURFACES (JOINT COATING LESS THAN 1/4" THICK)	L. CRUSHED ZONE	CRUSHED ROCK AND CLAY (SEE ITEMS G, H, AND J FOR DESCRIPTION OF CLAY CONDITION)	6.0, 8.0 OR 8.0-12.0
	N. DECOMPOSED ZONE	ZONES OR BANDS OF SILTY-OR SANDY CLAY, SMALL CLAY FRACTION (NON-SOFTENING)	5.0
	O. CLAY ZONE	THICK CONTINUOUS ZONES OR BANDS OF CLAY (SEE ITEMS G, H, AND J FOR DESCRIPTION OF CLAY CONDITION)	10.0, 13.0 OR 13.0-20.0

JOINT ROUGHNESS, Jr

DISCONTINUITY CATEGORY	DISCONTINUITY CONDITION (CONTACT SURFACE ROUGHNESS)	JOINT ROUGHNESS FACTOR Jr
DIRECT CONTACT BETWEEN SURFACES	DISCONTINUOUS JOINTS	4
	ROUGH OR IRREGULAR, UNDULATING	3
	SMOOTH, UNDULATING	2
	SLICKENSIDED, UNDULATING	1.5
	ROUGH OR IRREGULAR, PLANAR	1.5
	SMOOTH, PLANAR	1.0
NO DIRECT CONTACT BETWEEN SURFACES	CLAY MINERAL ZONE PREVENTING ROCK WALL CONTACT	1.0 (NOMINAL)
	SANDY, GRAVELLY, OR CRUSHED ZONE PREVENTING WALL CONTACT	1.0 (NOMINAL)

ROCK DISCONTINUITY CLASSIFICATIONS

ROCK FRACTURE SPACING		ROCK LAYERING	
DESCRIPTION	SPACING	DESCRIPTION	SPACING
EXTREMELY CLOSE OR CRUSHED	< 3/4 INCHES	LAMINATED	< 1/2 INCHES
VERY CLOSE	3/4 TO 2 1/2 INCHES	VERY THIN	1/2 TO 2 INCHES
CLOSE	2 1/2 TO 8 INCHES	THIN	2 INCHES TO 1 FEET
MODERATE	8 INCHES TO 2 FEET	MEDIUM	1 TO 3 FEET
WIDE	2 TO 6 FEET	THICK	3 TO 10 FEET
VERY WIDE	6 TO 20 FEET	MASSIVE	> 10 FEET
NOTE: FRACTURES REFER TO NATURAL BREAKAGES INCLUDING JOINTS, SHEAR ZONES, AND FAULT LINES. FRACTURE SPACING RANGE DESIGNATIONS BASED ON ISRM GUIDELINES.		NOTE: LAYERING REFERS TO NATURAL ROCK FORMATION FEATURES SUCH AS FOLIATION, SEAMS, BANDING, OR BEDDING.	

ROCK CORE CONTINUITY

DESCRIPTION	AVERAGE LENGTH OF PIECES
SOUND	> 8 INCHES
SLIGHTLY FRACTURED	4 TO 8 INCHES
MODERATELY FRACTURED	1 TO 4 INCHES
EXTREMELY FRACTURED	< 1 INCH
NOTE: ROCK CORE CONTINUITY REFERS TO A GENERAL DESCRIPTIVE TERM DESCRIBING THE OVERALL DEGREE OF FRACTURING CONDITION OF EACH ROCK CORE RUN.	

SURFACE PLANARITY

DESIGNATION	CONDITION
PLANAR	A FLAT SURFACE
STEPPE	A SURFACE WITH ASPERITIES OR STEPS.
WAVY	A MODERATE UNDULATING SURFACE; CURVED, SMOOTHLY UNEVEN.

ROCK QUALITY DESIGNATION, RQD

RQD PERCENT	ROCK QUALITY
< 25	VERY POOR
25-50	POOR
50-75	FAIR
75-90	GOOD
90-100	EXCELLENT

ROCK CLASSIFICATION NOTES:

- CORE RECOVERY:** CORE RECOVERY IS EXPRESSED IN TWO WAYS. FIRST, AS THE SIMPLE NET LENGTH OF CORE RECOVERED IN INCHES. SECONDLY, AS THE RATIO OF THE LENGTH OF NET CORE RECOVERED TO THE OVERALL LENGTH OF THE CORE RUN, EXPRESSED AS A PERCENTAGE. CORE RECOVERY IS GENERALLY DETERMINED SEPARATELY FOR EACH SEPARATE CORING RUN.
- RQD:** RQD (ROCK QUALITY DESIGNATION) IS A GENERAL INDEX OF ROCK CORE CONDITION FOR ENGINEERING PURPOSES. RQD IS EXPRESSED AS A MODIFIED CORE RECOVERY PERCENTAGE IN WHICH ONLY THE SUM OF THE LENGTHS OF PIECES OF UNWEATHERED OR SLIGHTLY WEATHERED CORE OVER 4 INCHES LONG IS DIVIDED BY THE OVERALL LENGTH OF THE CORE RUN. THE AVERAGE LENGTH OF CORE PIECES IS USED WHERE END FRACTURES ARE NOT PERPENDICULAR TO THE CORE AXIS (I.E. WHERE ENDS OF CORE PIECES ARE SLANTED, BY MEASURING TO THE MIDDLE OF THE BREAK). FRESH CORE FRACTURES CREATED BY MECHANICAL BREAKAGE DURING DRILLING AND/OR HANDLING OF THE CORE ARE IGNORED IN COMPUTING RQD. RQD IS GENERALLY DETERMINED SEPARATELY FOR EACH SEPARATE CORE RUN.
- CALCULATION OF Q-VALUES:** Q-VALUES ARE TO BE CALCULATED USING THE METHODOLOGY AND PRINCIPLES OUTLINED IN THE REFERENCE PAPER: ENGINEERING CLASSIFICATION OF ROCK MASSES FOR THE DESIGN OF TUNNEL SUPPORT IN ROCK MECHANICS, 6(4) BY BARTON, N.R., LIEN, R., AND LUNDE, J., 1974

Print Date: 3/8/2013

File Name: 19036 RDCK CLASSIFICATION TERMS (2 OF 2).dgn

Horiz. Scale: Vert. Scale:

Unit Information Unit Leader Initials



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:

Revised:

Void:

I-70 TWIN TUNNELS EXCAVATION AND GROUND SUPPORT ROCK CLASSIFICATION TERMS (2 OF 2)

Designer: C. FISCHER	Structure Numbers	STR F-17-BD
Detailer: D. GATTSHALL	Subset Sheets:	T6 of 23
Subset: TUNNEL CP2		

Project No./Code

IM 0703-391

19036

Sheet Number 158

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Design		Detail		Quantities	
Designed By	Checked By	Designed By	Checked By	Designed By	Checked By
MEF	SK	LA	SK	LA	SK
DATE	DATE	DATE	DATE	DATE	DATE
02/13	02/13	02/13	02/13	02/13	02/13
Revision Dates		Revision Dates (Preliminary Stage Only)			

GROUND CLASS	TYPICAL ROCK CHARACTERISTICS	EMPIRICAL ROCK MASS CLASSIFICATION Q CLASS	GROUND BEHAVIOR	ROCK REINFORCEMENT						MAXIMUM ROUND LENGTH	SURFACE SUPPORT		
				SUPPORT ELEMENT	TYPE	LENGTH (FT)	TRANSVERSE SPACING	LONGITUDINAL SPACING	INSTALLATION		SUPPORT ELEMENT	TYPE	INSTALLATION
TT1	TYPICALLY FRESH INTACT DARK GRAY GNEISS WITH A JOINT/FRACTURE SPACING IN EXCESS OF 6 FEET. JOINTS/FRACTURES ARE VERY WIDELY SPACED, WITH VERY WIDELY SPACED CLUSTERS OF VERY CLOSELY TO CLOSELY SPACED FRACTURES. SLICKENSIDED FRACTURES ARE RARE. MINERALIZATION ALONG JOINTS/FRACTURES IS RARE AND FEW IN-FILLED JOINTS/FRACTURES ARE OBSERVED. JOINT SURFACES RANGE FROM PLANAR, ROUGH AND IRREGULAR, UNDULATING, SMOOTH; TO UNDULATING, ROUGH OR IRREGULAR.	EXC. GOOD TO FAIR	STRUCTURALLY CONTROLLED BLOCK INSTABILITY	ARCH DOWELS	#9 GRADE 75 THREAD BAR	16	5 FT	5 FT	PLACED WITH WWF	15 FT MAX	WELDED WIRE FABRIC	6" X 6" W4.0 X W4.0	CONTINUOUS COVERAGE ABOVE SPRINGLINE AFTER EACH HEADING EXCAVATION
				SIDEWALL DOWELS	#9 GRADE 75 THREAD BAR	12	5 FT	5 FT	WITH ADVANCING HEADINGS. MAINTAIN TO WITHIN 5 FT OF FACE				
				PILLAR DOWELS	#9 GRADE 75 THREAD BAR	16	N/A	5 FT	PLACED THROUGH REMAINING LINING. TENSIONED.				
TT2	TYPICALLY SLIGHTLY WEATHERED GRAY GNEISS AND LIGHT GRAY TO WHITE PEGMATITE WITH A JOINT SPACING FROM 2 TO 6 FEET. SHEAR/FAULT PLANES, JOINT/FRACTURE WEATHERING, AND ALTERATION PRODUCTS ARE TYPICAL FOR THIS ROCK CLASS. OPEN, IN-FILLED AND SLICKENSIDED FRACTURES ARE PRESENT. OBSERVED SHEAR/FAULT PLANES MAY CONTAIN DISINTEGRATED ROCK BETWEEN ROCK SURFACES, WITH A THICKNESS OF ALTERATION PRODUCTS GENERALLY LESS THAN 6 INCHES. THE ROCK MASS CONTAINS DISTINCT SUB-DOMAINS OF LOWER QUALITY ROCK CHARACTERIZED BY CLUSTERS OF VERY CLOSELY TO CLOSELY SPACED FRACTURES AND PERSISTENT IN-FILLED FRACTURES.	POOR TO VERY POOR	SLOW RAVELING	ARCH DOWELS	#9 GRADE 75 THREAD BAR	16	4 FT	5 FT	PLACED THROUGH FIRST LAYER SHOTCRETE	10 FT MAX	FIRST LAYER SHOTCRETE	FRS	MIN 3" THICK ON EXCAVATION BOUNDARY AFTER EACH HEADING EXCAVATION
				SIDEWALL DOWELS	#9 GRADE 75 THREAD BAR	12	4 FT	5 FT	--				
				PILLAR DOWELS	#9 GRADE 75 THREAD BAR	16	--	5 FT	PLACED THROUGH REMAINING LINING. TENSIONED.		SECOND LAYER SHOTCRETE	FRS	MIN 3" THICK AFTER DOWELS
				PILLAR BOLTS (TT2S)	#11 GR 150 EPOXY COATED	25	--	--	INSTALLED THROUGH LINING IN PRIOR CONTRACT (PKG 1B)				
TT2S MIXED FACE TT3/TT2	TT3 GROUND ON THE NORTHERN SIDE AND TT2 ON THE SOUTHERN SIDE			TT3 ROCK REINFORCEMENT IN HEADING I AND TT2 ROCK REINFORCEMENT IN HEADING II						5 FT MAX IN HEADING I 10 FT MAX IN HEADING II	TT3 SURFACE SUPPORT IN HEADING I AND TT2 SURFACE SUPPORT IN HEADING II		
TT3	TYPICALLY MODERATELY WEATHERED LIGHT GRAY PEGMATITE AND DARK GRAY GNEISS WITH A JOINT/FRACTURE SPACING OF LESS THAN 2 FEET, OR MULTIPLE AND RANDOM JOINT/FRACTURE SETS WITH SMOOTH OR SLICKENSIDED SURFACES, IRRESPECTIVE OF JOINT/FRACTURE SPACING, OR MULTIPLE ZONES OF BRECCIATED AND HEAVILY FRACTURED ROCK WITH CLAY OR DISINTEGRATED BETWEEN ROCK SURFACES, OR ONE OR MORE SHEAR/FAULT PLANES WITH A FILLING THICKNESS GREATER THAN 6 INCHES.	EXT. POOR TO EXC. POOR	FAST RAVELING/CAVING	ARCH DOWELS	#9 GRADE 75 THREAD BAR	16	4 FT	4 FT	PLACED THROUGH FIRST LAYER SHOTCRETE AND CHANNEL	5 FT MAX	FIRST LAYER SHOTCRETE	FRS	MIN 4" THICK ON EXCAVATION BOUNDARY AFTER EACH HEADING EXCAVATION
				SIDEWALL DOWELS	#9 GRADE 75 THREAD BAR	16	4 FT	4 FT	--				
				PILLAR BOLTS	#11 GR 150 EPDXY COATED	25	--	--	INSTALLED THROUGH LINING IN PRIOR CONTRACT (1B)		STEEL CHANNEL	MC12x50	PLACE AFTER FIRST LAYER SHOTCRETE. DOWELS PLACED THROUGH CHANNEL.
				SPILING	#9 GRADE 60 REBAR	14	2 FT	8 FT	INSTALLED AHEAD OF TT3 HEADING				
TTP - WEST	TYPICALLY SLIGHTLY WEATHERED MODERATELY TO EXTREMELY FRACTURED GNEISS. ROCK COVER IS THINNER TO THE SOUTH.	EXT POOR	RAVELING	SPILING	#11 GRADE 60 REBAR	20	AS INDICATED IN SHEETS T9 & T10		INSTALLED BEFORE EXCAVATION THROUGH SHORCRETE BROW	5 FT MAX	FIRST LAYER SHOTCRETE	FRS	MIN 4" THICK ON EXCAVATION BOUNDARY AFTER EXCAVATION
TTP - EAST	TYPICALLY DARK GRAY-WHITE TO DARK GRAY-BLACK MODERATELY FRACTURED GNEISS WITH A CLOSE JOINT SPACING. JOINT SURFACE IS TYPICALLY PLANAR, SMOOTH.	GOOD TO FAIR	STRUCTURALLY CONTROLLED BLOCK INSTABILITY	PILLAR BOLTS	#9 GRADE 75 THREAD BAR	16	--	5 FT	PLACED THROUGH REMAINING LINING. TENSIONED.		STEELSET	W12x65	AS INDICATED ON SHEETS T9, T10, & T17 BEFORE SECOND LAYER SHOTCRETE
ALL CLASSES	--			SPOT BOLTS	SPLIT SET, SWELLEX OR RESIN ANCHOR	10	--	--	AS REQUIRED TO ANCHOR MINESTRAPS OR LOCALIZED LOOSE BLOCKS. AS DETERMINED BY CONTRACTOR	--	SMOOTHING SHOTCRETE	PLAIN	USE TO FILL OVERBREAK AND FOR SMOOTHING WHERE CONTINUOUS GEOCOMPOSITE DRAINAGE LAYER SPECIFIED.
											MINE STRAPS	SEE DETAIL	AS REQUIRED TO SUPPORT LOOSE BLOCKS. AS DETERMINED BY CONTRACTOR
											FLASH-CRETE	FRS	

NOTES:

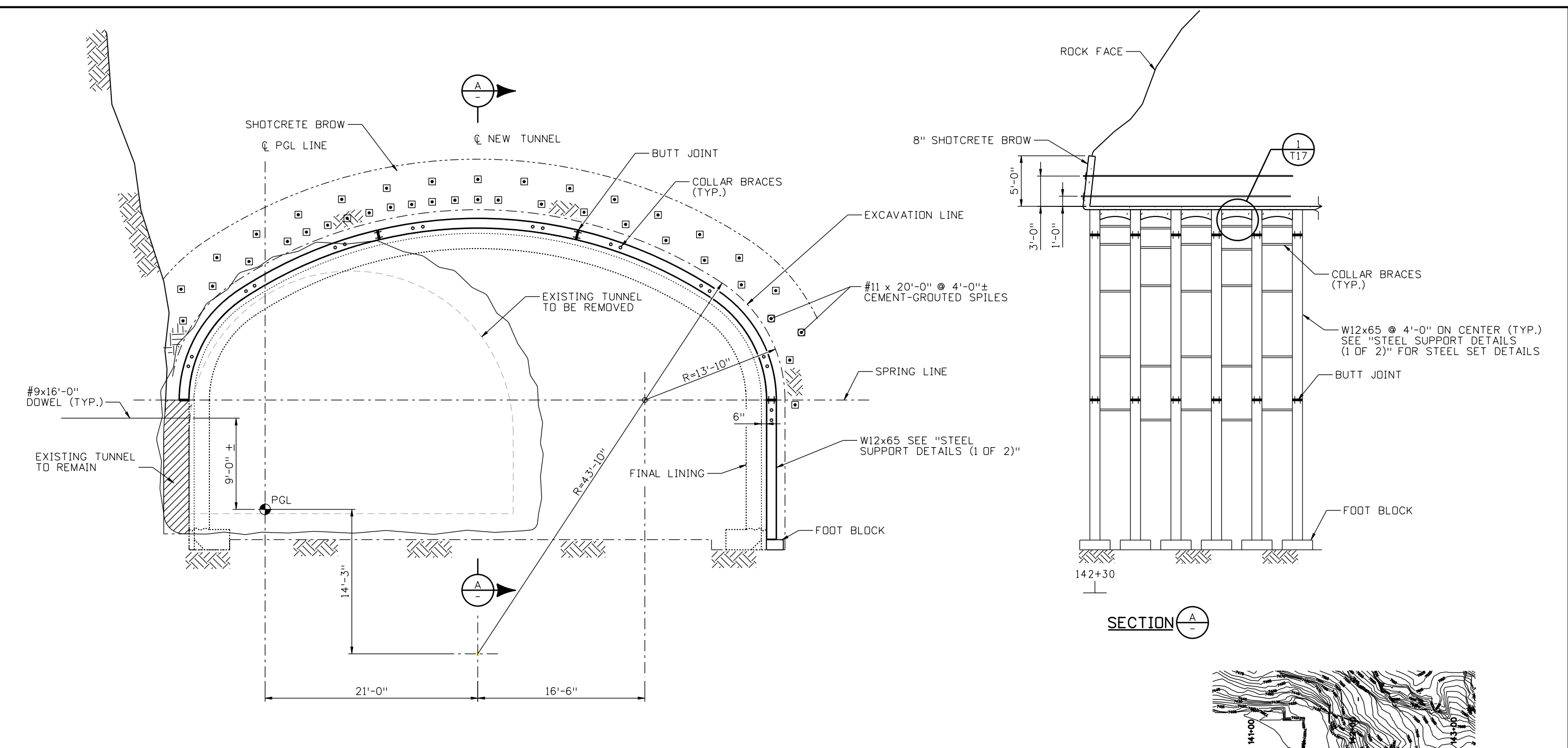
- SEE GEOTECHNICAL DATA REPORT FOR DETAILS OF ROCK MASS TYPES AND BEHAVIORS; AND FOR DEFINITIONS OF TERMS USED FOR ROCK MASS DESCRIPTIONS AND BEHAVIORS.
- SUPPORT CATEGORY SELECTION TO BE BASED ON ROCK MASS CONDITIONS OBSERVED, OR ANTICIPATED.

Print Date: 3/8/2013	Sheet Revisions			Colorado Department of Transportation		As Constructed		I-70 TWIN TUNNELS EXCAVATION AND GROUND SUPPORT GROUND CLASSIFICATION & INITIAL SUPPORT		Project No./Code	
File Name: 19036 GROUND CLASS & INITIAL SUPPORT.dgn	Date:	Comments	Init.	425 A Corporate Circle Golden, CO 80401 Phone: 720-497-6918 FAX: 720-497-6901		No Revisions:		Designer: M. FOWLER Structure STR F-17-B0		IM 0703-391	
Horiz. Scale: Vert. Scale:				Region 1		Revised:		Detailer: D. GATTSHALL		19036	
Unit Information Unit Leader Initials				CRC		Void:		Subset: TUNNEL CP2		Sheet Number 159	
ATKINS PARSONS BRINCKERHOFF								Subset Sheets: T7 of 23			

G:\atkins\work\pbes\p1\common\dms28696\19036 WEST PORTAL STABILIZATION.dgn

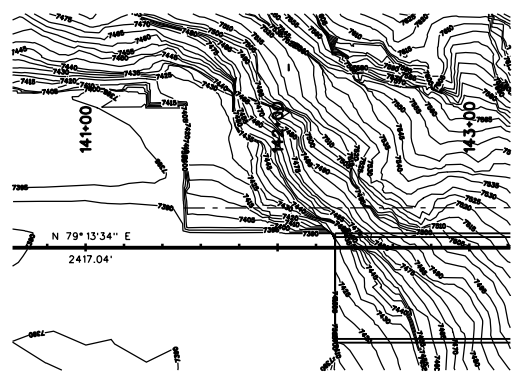
Revision Dates		Quantities	

Design		Detail		Check	
DATE	INITIAL	DATE	INITIAL	DATE	INITIAL
02/13	MEF	02/13	DEG	02/13	LA
02/13	SK	02/13	PFG	02/13	MEF



WEST PORTAL STABILIZATION
DEVELOPED ELEVATION

SECTION A-A



PORTAL PLAN

NOTES:

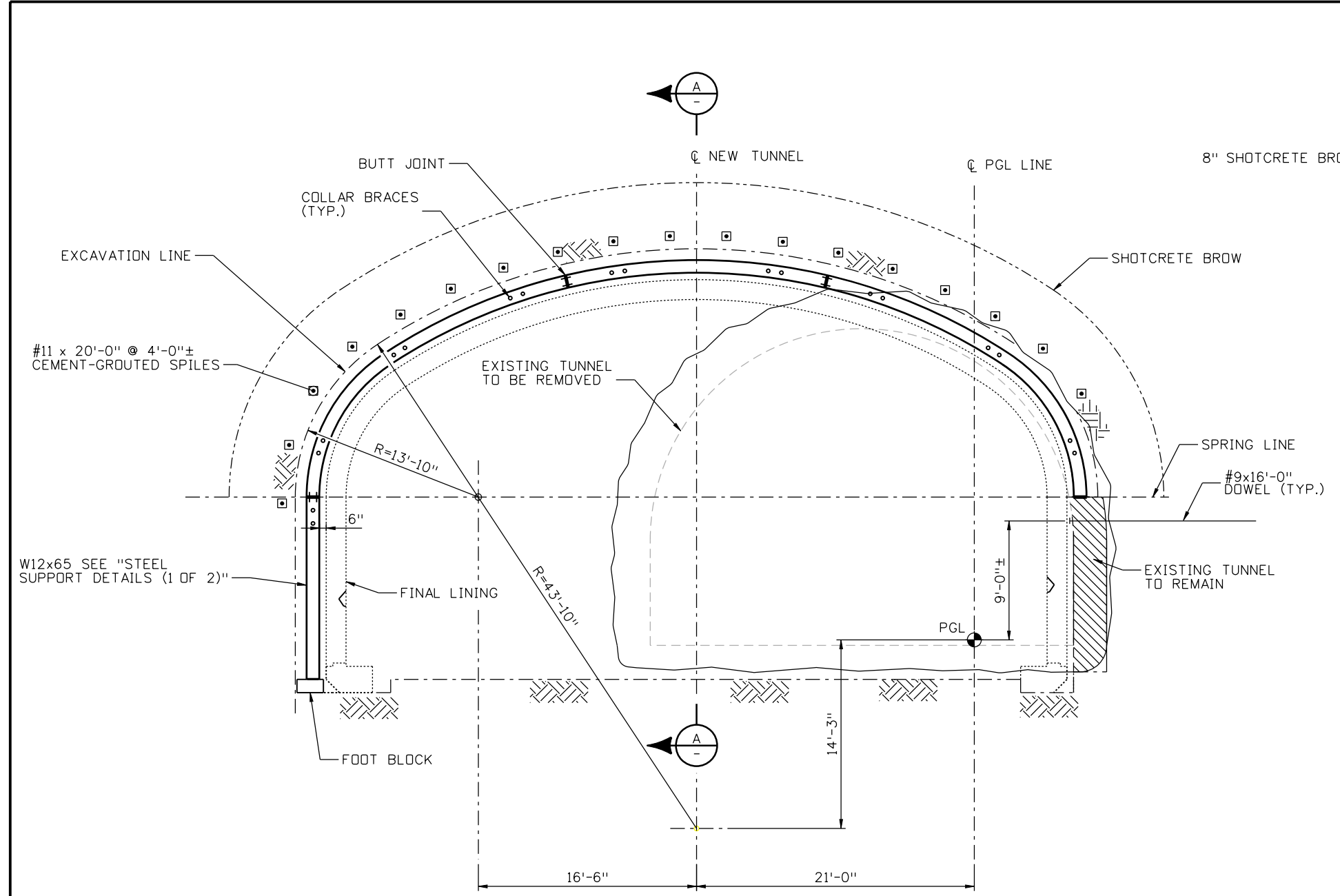
- DESIGN FOR WEST PORTAL USING STEEL SETS, SPILES AND SHOTCRETE ASSUMES SETS ARE CONTINUOUSLY BLOCKED AGAINST COMPETENT GROUND ALONG FULL PERIMETER. WHERE SURFACE STABILIZATION AND SUPPORT MEASURES PERFORMED IN PREPARATION FOR TUNNELING RESULT IN A SKEWED FACE RELATIVE TO TUNNEL AXIS, EXPOSED PORTIONS OF STEEL SETS SHALL BE LAGGED AND BACKFILLED WITH NECESSARY MEASURES TAKEN TO STABILIZE POST AGAINST INWARD MOVEMENT.
- WHERE HIGHLY WEATHERED, SOIL-LIKE CONDITIONS ARE ENCOUNTERED IN FACE, MULTIPLE SMALLER HEADINGS SUPPORTED WITH SHOTCRETE MAY BE REQUIRED.

Print Date: 3/8/2013		Sheet Revisions		Colorado Department of Transportation		As Constructed		I-70 TWIN TUNNELS EXCAVATION AND GROUND SUPPORT WEST PORTAL STABILIZATION		Project No./Code	
File Name: 19036 WEST PORTAL STABILIZATION.dgn		Date:	Comments	Init.	425 A Corporate Circle Golden, CO 80401 Phone: 720-497-6918 FAX: 720-497-6901		No Revisions:		IM 0703-391		
Horiz. Scale: Vert. Scale:					Region 1		Revised:		19036		
Unit Information Unit Leader Initials					CRC		Void:		Sheet Number 161		
ATKINS PARSONS BRINCKERHOFF								Designer: M. FOWLER		Structure STR F-17-B0	
								Detailer: D. GATTSHALL		Subset Sheets: T9 of 23	
								Subset: TUNNEL CP2			

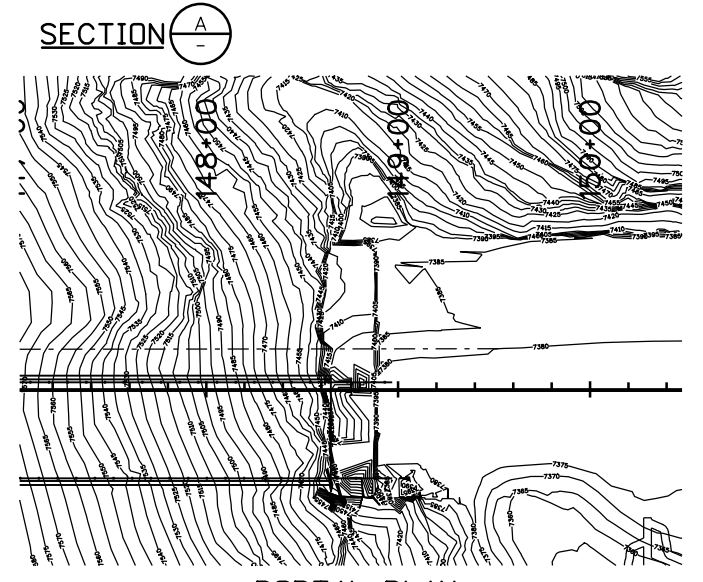
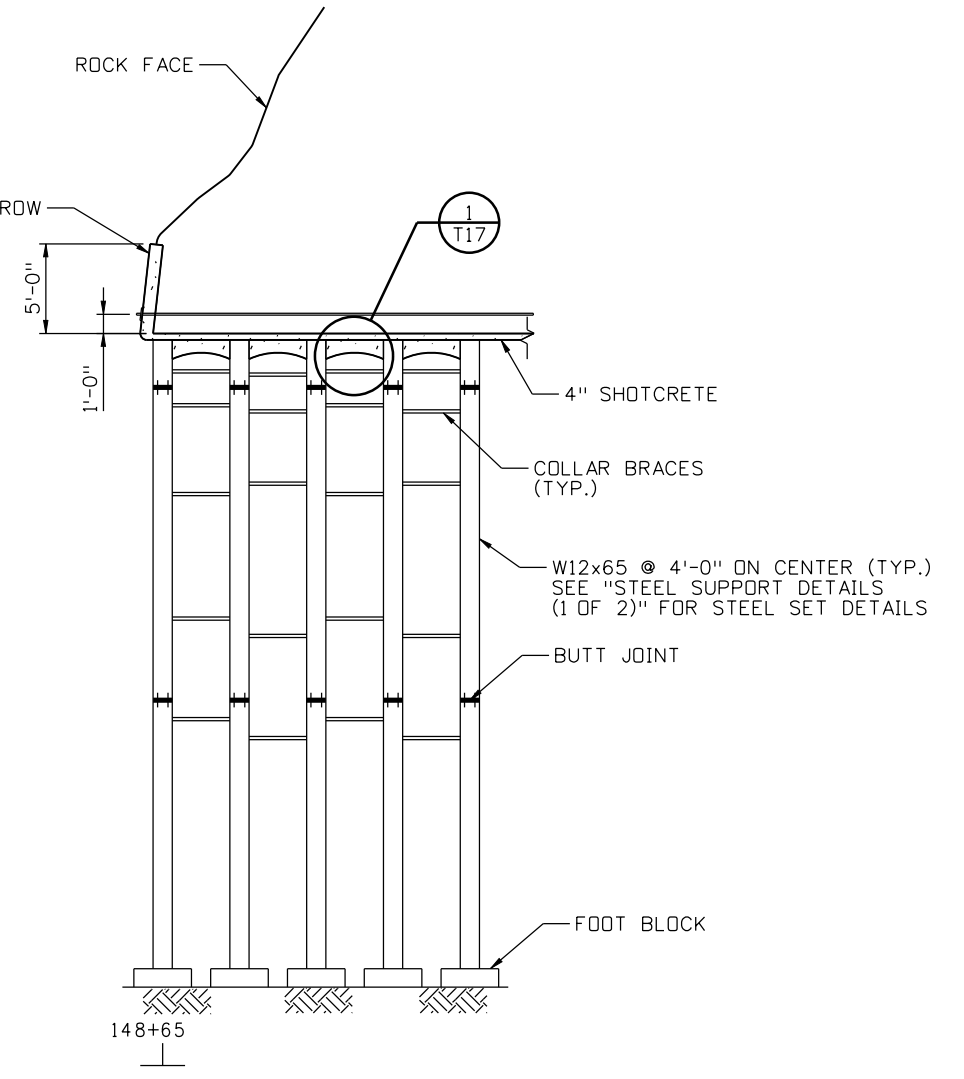
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Revision Dates (Preliminary Stage Only)	

Design		Detail		Quantities	
DATE	INITIAL	DATE	INITIAL	DATE	INITIAL
02/13	MEF	02/13	DEG	02/13	LA
02/13	SK	02/13	PFG	02/13	MEF



EAST PORTAL STABILIZATION
DEVELOPED ELEVATION



PORTAL PLAN

Print Date: 3/8/2013
 File Name: 19036 EAST PORTAL STABILIZATION.dgn
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Sheet Revisions		
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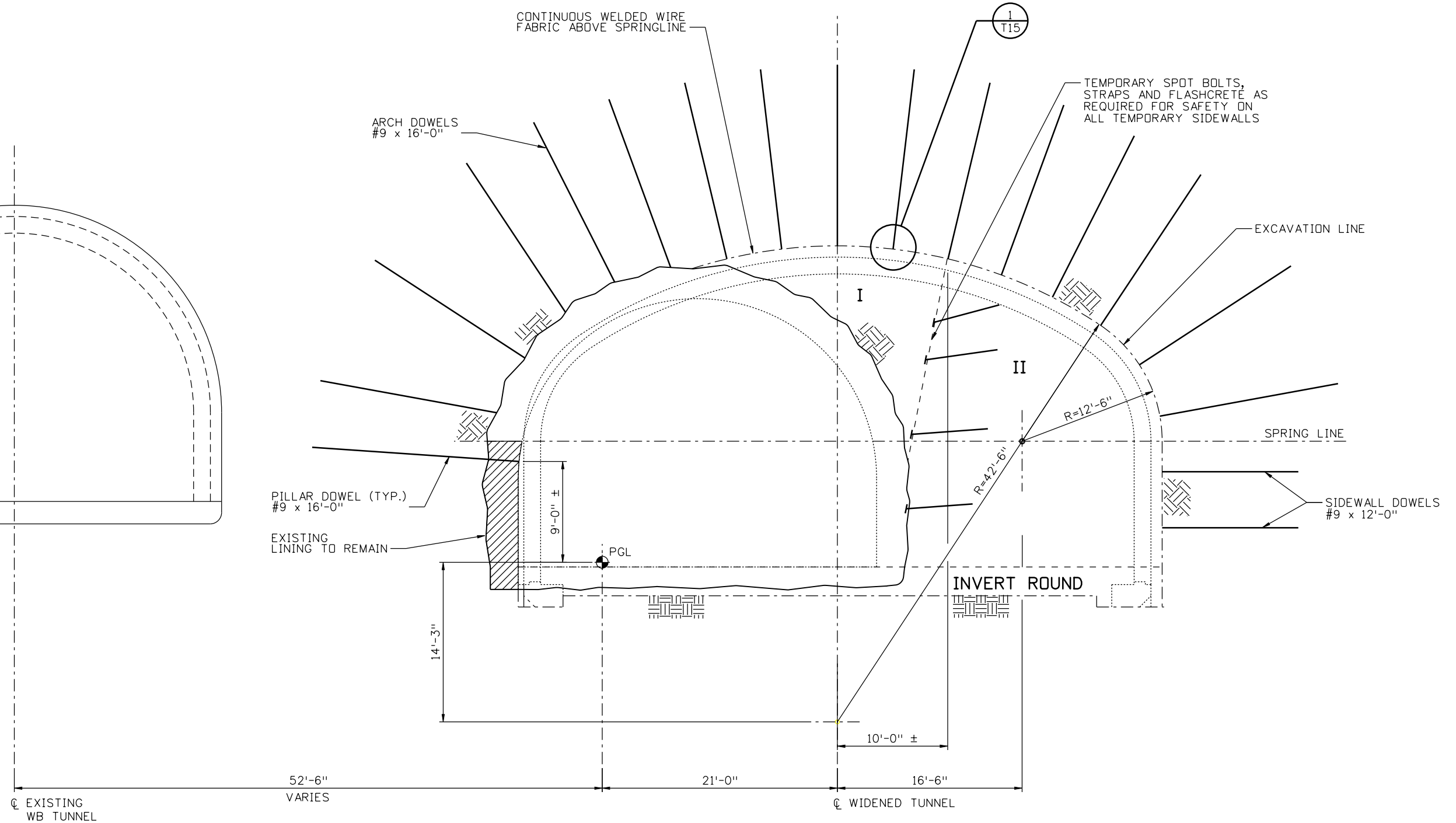
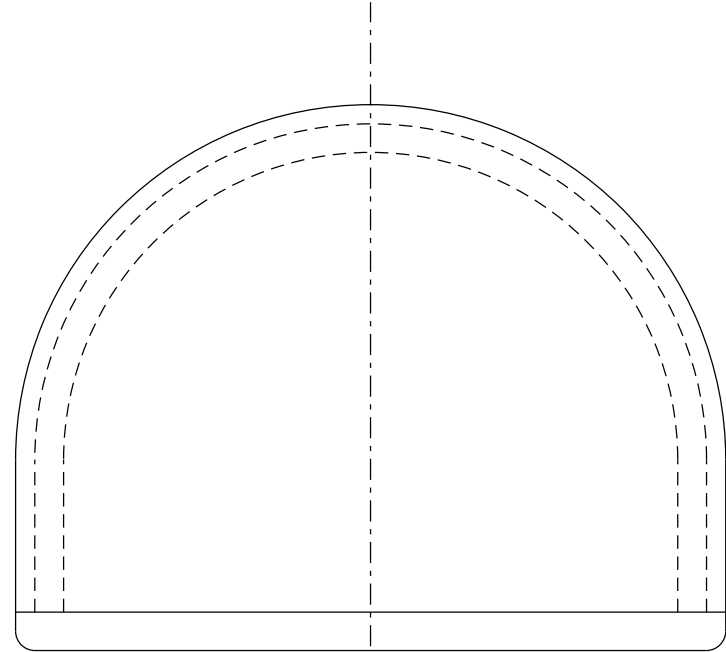
I-70 TWIN TUNNELS EXCAVATION AND GROUND SUPPORT EAST PORTAL STABILIZATION	
Designer: M. FOWLER	Structure STR F-17-BD
Detailer: D. GATTSHALL	Numbers
Subset: TUNNEL CP2	Subset Sheets: T10 of 23

Project No./Code
IM 0703-391
19036
Sheet Number 162

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Revision Dates		(Preliminary Stage Only)	
NO.	DATE	BY	CHKD.

Design		Detail		Quantities	
INITIAL	DATE	INITIAL	DATE	INITIAL	DATE
MEF	02/13	LA	02/13	LA	02/13
SK	02/13	DETAILED BY	02/13	SK	02/13
		CHECKED BY			



TYPICAL SECTION-GROUND CLASS TT1

Print Date: 3/8/2013
 File Name: 19036 GROUND CLASS PLAN FOR TT1.dgn
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I-70 TWIN TUNNELS
 EXCAVATION AND GROUND SUPPORT
 GROUND CLASS TT1

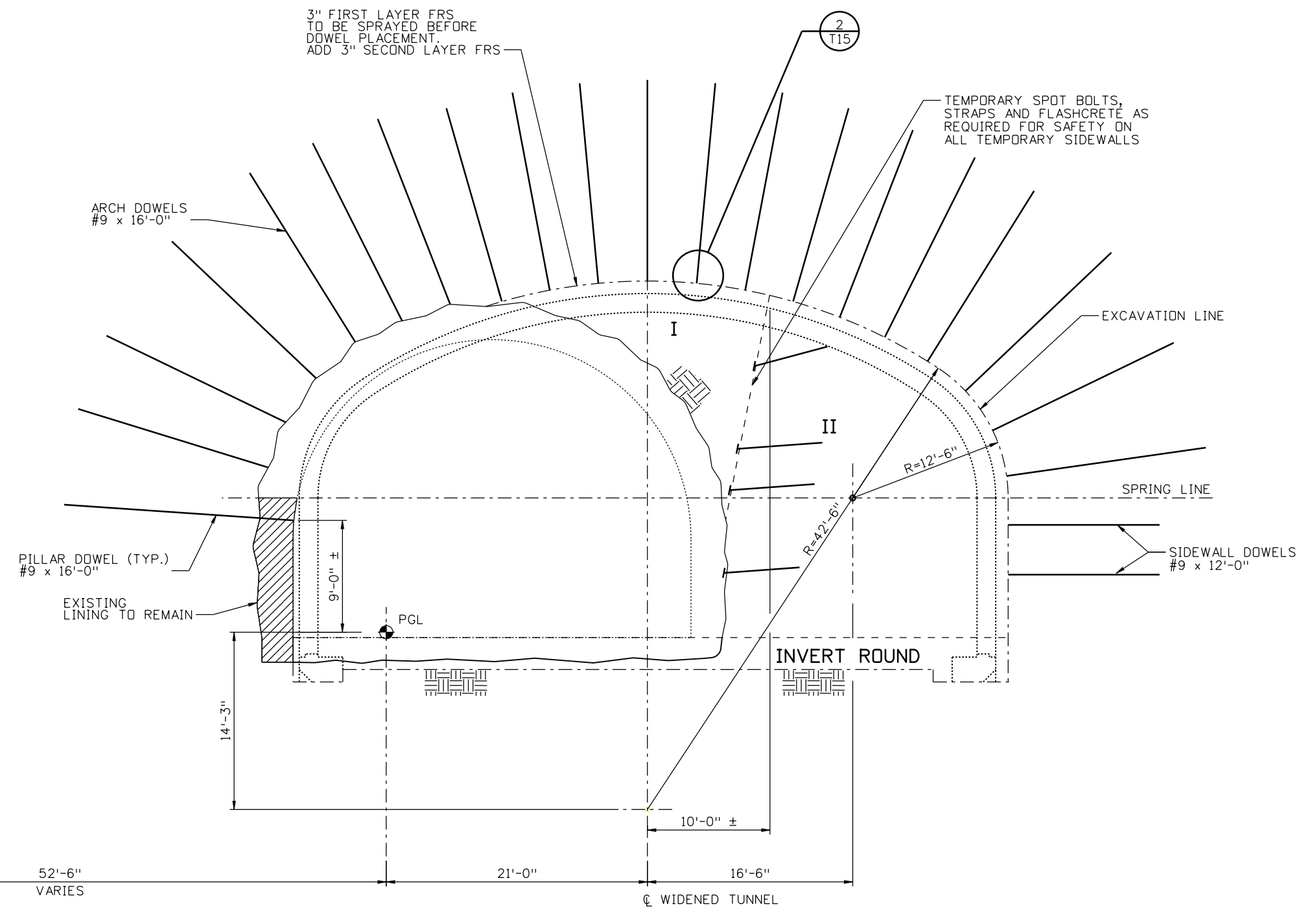
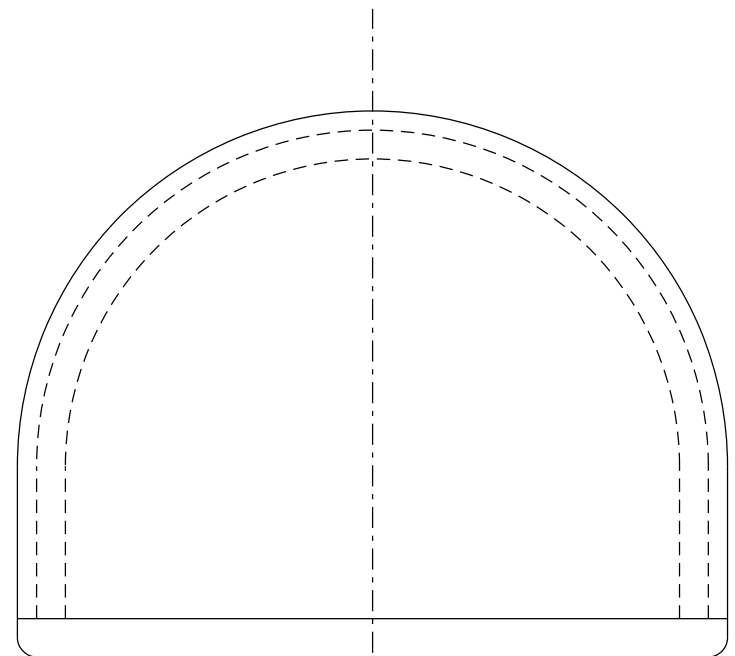
Designer: M. FOWLER Structure STR F-17-BD
 Detailer: D. GATTSHALL Numbers
 Subset: TUNNEL CP2 Subset Sheets: T11 of 23

Project No./Code
IM 0703-391
19036
Sheet Number 163

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Revision Dates	(Preliminary Stage Only)

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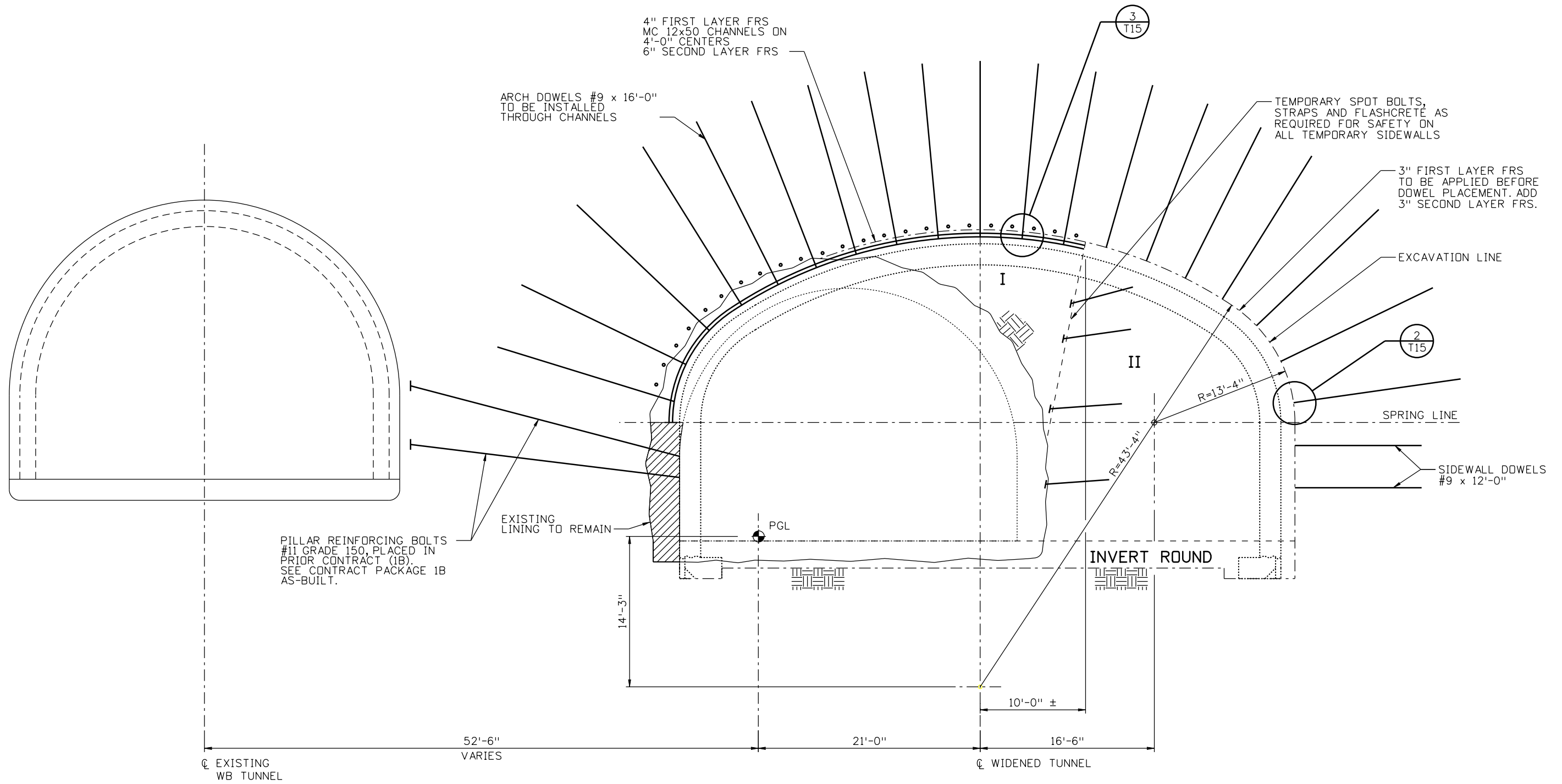
TYPICAL SECTION-GROUND CLASS TT2

Print Date: 3/8/2013		Sheet Revisions		Colorado Department of Transportation		As Constructed		I-70 TWIN TUNNELS EXCAVATION AND GROUND SUPPORT GROUND CLASS TT2		Project No./Code	
File Name: 19036 GROUND CLASS PLAN FOR TT2.dgn		Date:	Comments	Init.	425 A Corporate Circle Golden, CO 80401 Phone: 720-497-6918 FAX: 720-497-6901		No Revisions:		IM 0703-391		
Horiz. Scale: Vert. Scale:					Region 1		Revised:		19036		
Unit Information Unit Leader Initials					CRC		Void:		Sheet Number 164		
ATKINS PARSONS BRINCKERHOFF								Designer: M. FOWLER Structure STR F-17-B0			
								Detailer: D. GATTSHALL Structure Numbers			
								Subset: TUNNEL CP2 Subset Sheets: T12 of 23			

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Revision Dates	(Preliminary Stage Only)

Design		Detail		Quantities	
DATE	INITIAL	DATE	INITIAL	DATE	INITIAL
02/13	MEF	02/13	DEG	02/13	LA
	SK		PFG		SK



TYPICAL SECTION-GROUND CLASS TT2S

NOTE:
1. SEE STEEL SUPPORT DETAILS (1 OF 2) FOR STEEL CHANNEL DETAILS.

Print Date: 3/8/2013
 File Name: 19036 GROUND CLASS PLAN FOR TT2S.dgn
 Horiz. Scale: Vert. Scale:
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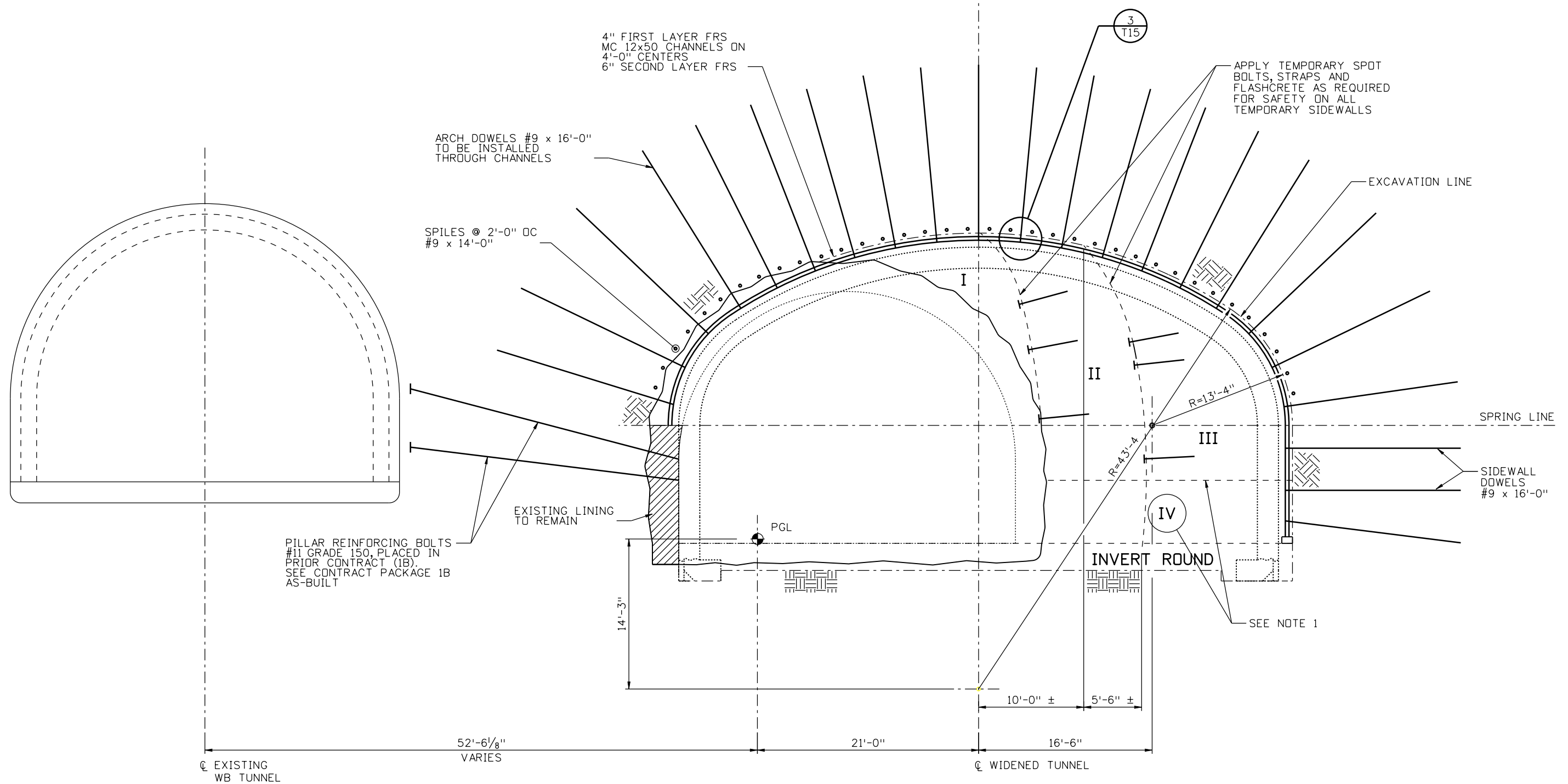
I-70 TWIN TUNNELS EXCAVATION AND GROUND SUPPORT GROUND CLASS TT2S		
Designer: M. FOWLER	Structure Numbers	STR F-17-BD
Detailer: D. GATTSHALL		
Subset: TUNNEL CP2	Subset Sheets:	T13 of 23

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19036
Sheet Number 165

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Revision Dates		Quantities	
DATE	INITIAL	DATE	INITIAL
02/13	LA	02/13	LA
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Design		Detail		Quantity	
DATE	INITIAL	DATE	INITIAL	DATE	INITIAL
02/13	MEF	02/13	DEG	02/13	LA
02/13	SK	02/13	PFG	02/13	SK



TYPICAL SECTION-GROUND CLASS TT3

NOTE:

1. BENCH IV IS REQUIRED IF EXCAVATION FACE OR SIDEWALL IS DETERMINED UNSTABLE BY CONTRACTOR IN CONSULTATION WITH THE FIELD ENGINEER.

Print Date: 3/8/2013
 File Name: 19036 GROUND CLASS PLAN FOR TT3.dgn
 Horiz. Scale: Vert. Scale:
 Unit Information Unit Leader Initials

ATKINS **PARSONS BRINCKERHOFF**

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I-70 TWIN TUNNELS
 EXCAVATION AND GROUND SUPPORT
 GROUND CLASS TT3

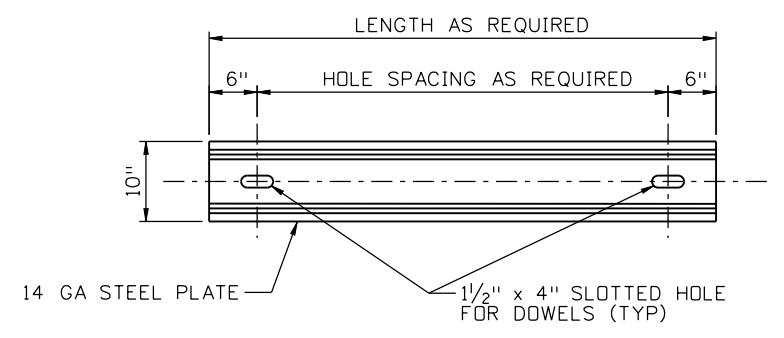
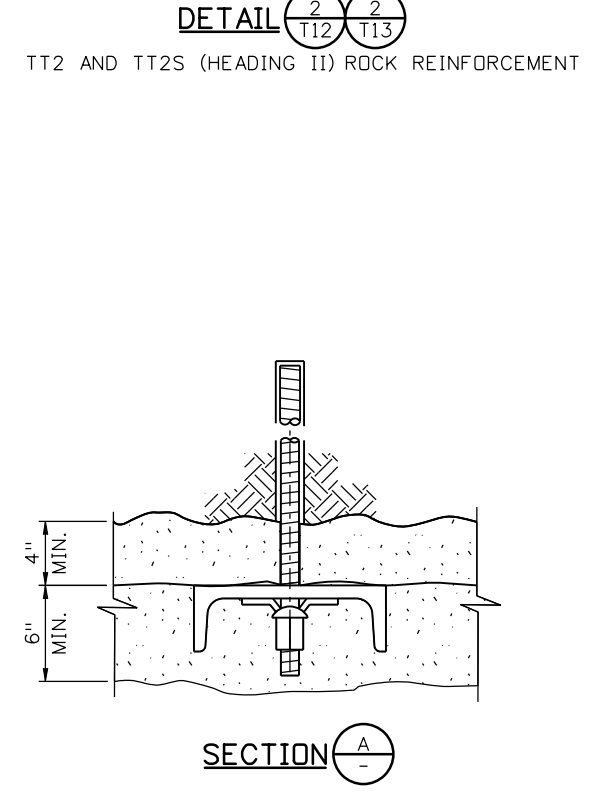
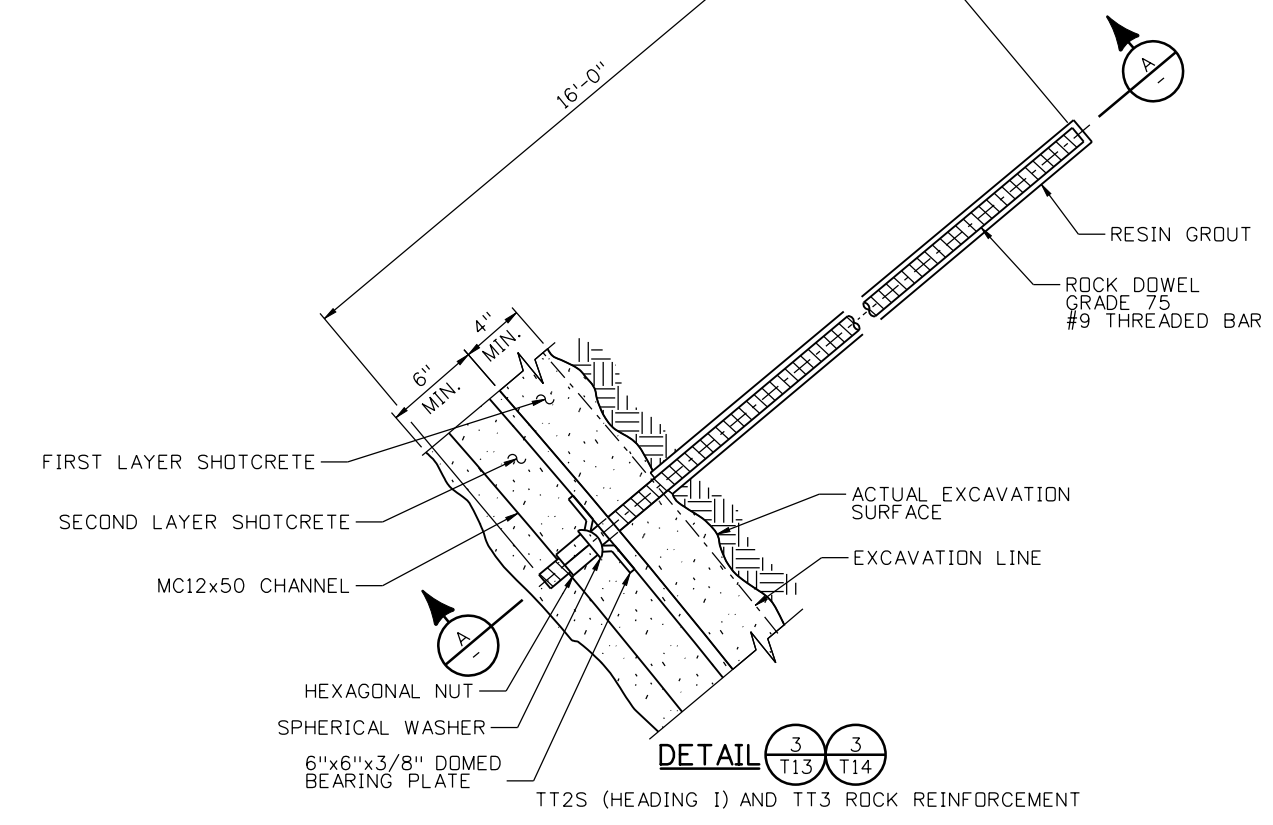
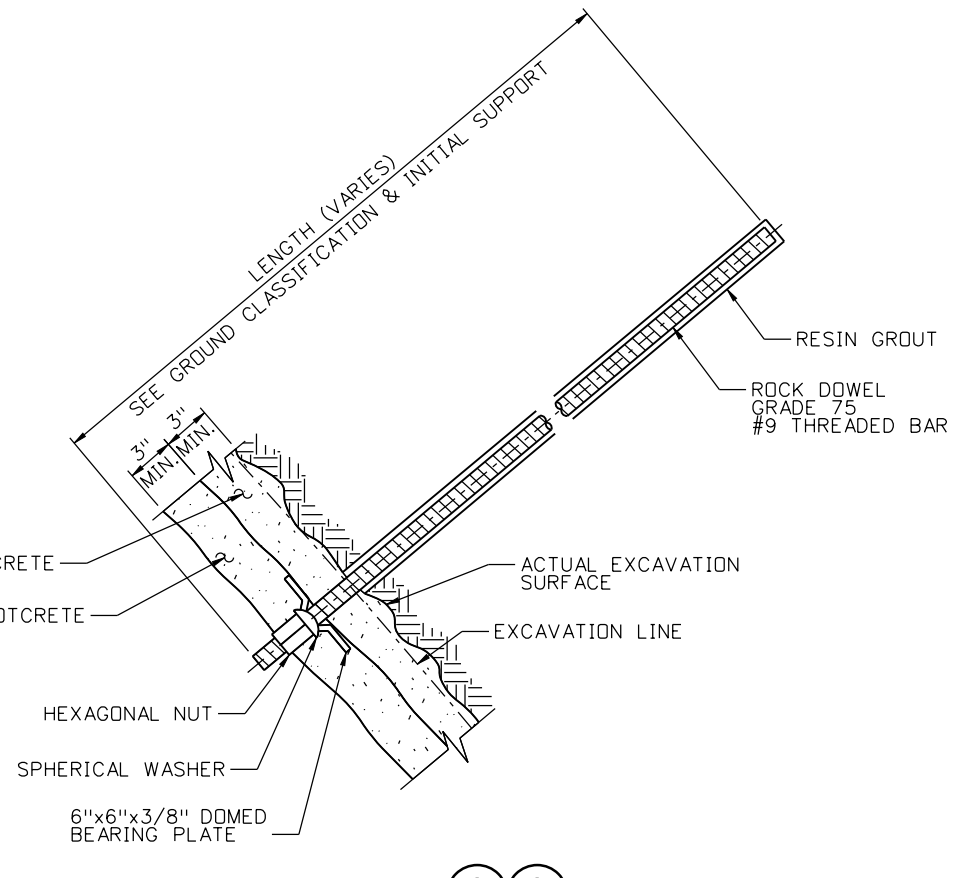
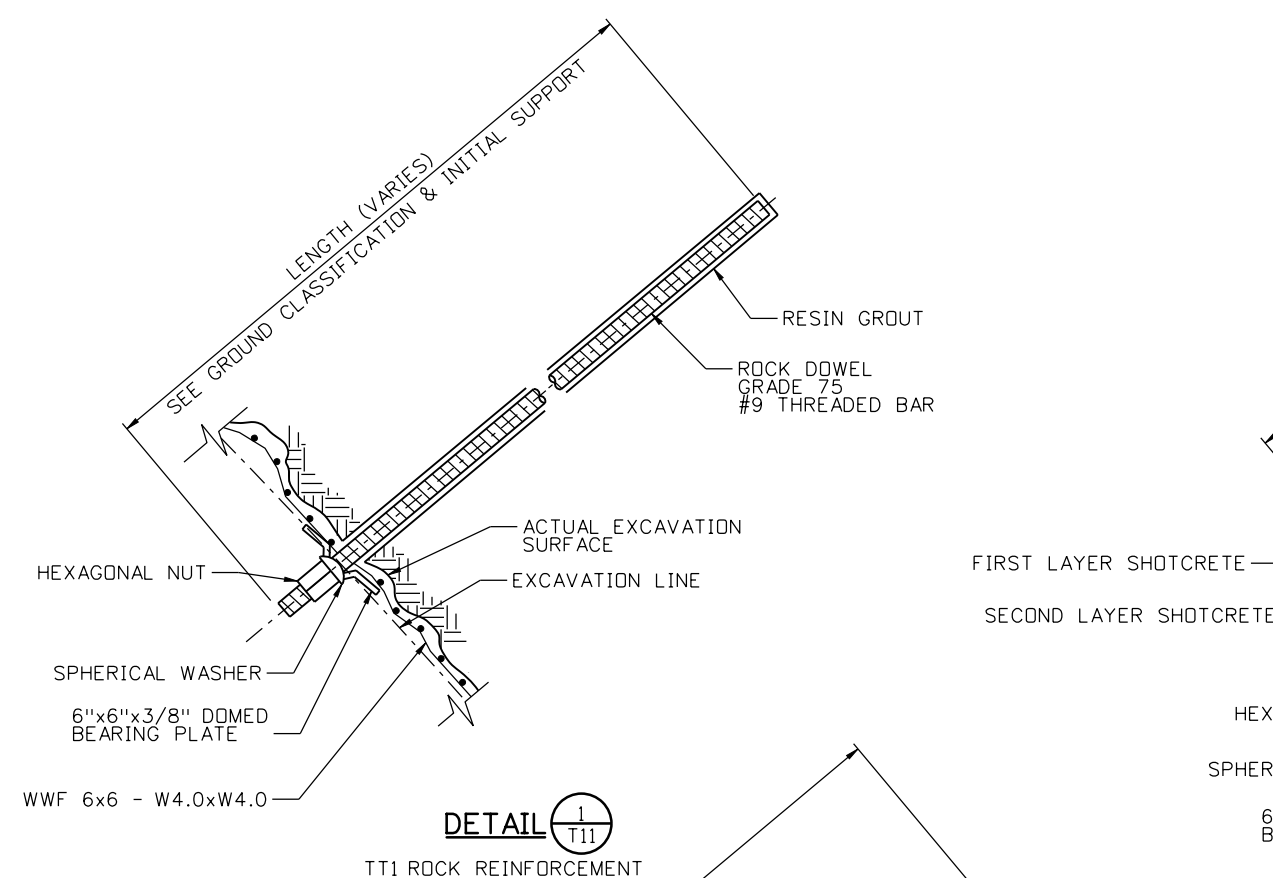
Designer: M. FOWLER Structure STR F-17-BD
 Detailer: D. GATTSHALL Numbers
 Subset: TUNNEL CP2 Subset Sheets: T14 of 23

Project No./Code
IM 0703-391
19036
Sheet Number 166

G:\atkins\work\pbes\p1\work\pbes\p1\19036 ROCK REINFORCEMENT DETAILS.dgn

Revision Dates (Preliminary Stage Only)	

Design		Detail		Quantities	
INITIAL	DATE	INITIAL	DATE	INITIAL	DATE
SK	02/13	DEG	02/13	LA	02/13
Checked By		Checked By		Checked By	
MEF	02/13	PFG	02/13	SK	02/13



NOTE:
1. BOREHOLE DIAMETERS FOR DOWEL/BOLT INSTALLATION SHALL BE PER MANUFACTURER'S RECOMMENDATIONS.

Print Date: 3/8/2013
File Name: 19036 ROCK REINFORCEMENT DETAILS.dgn
Horiz. Scale: Vert. Scale:
Unit Information Unit Leader Initials

ATKINS **PARSONS BRINCKERHOFF**

Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation

DOT
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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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No Revisions:
Revised:
Void:

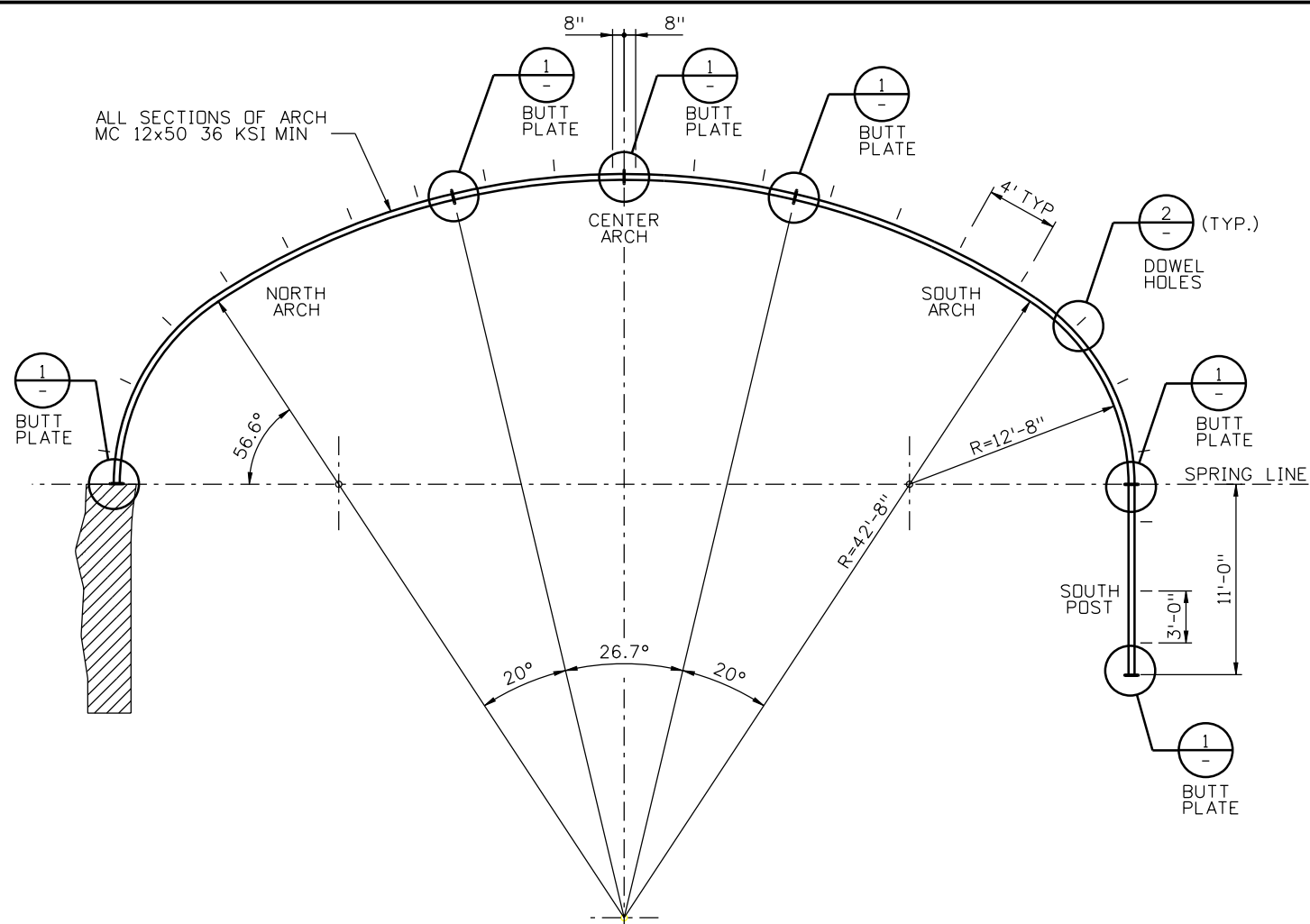
I-70 TWIN TUNNELS EXCAVATION AND GROUND SUPPORT ROCK REINFORCEMENT DETAILS	
Designer: S. KIM	Structure STR F-17-B0
Detailer: D. GATTSHALL	Numbers
Subset: TUNNEL CP2	Subset Sheets: T15 of 23

Project No./Code	IM 0703-391
	19036
Sheet Number	167

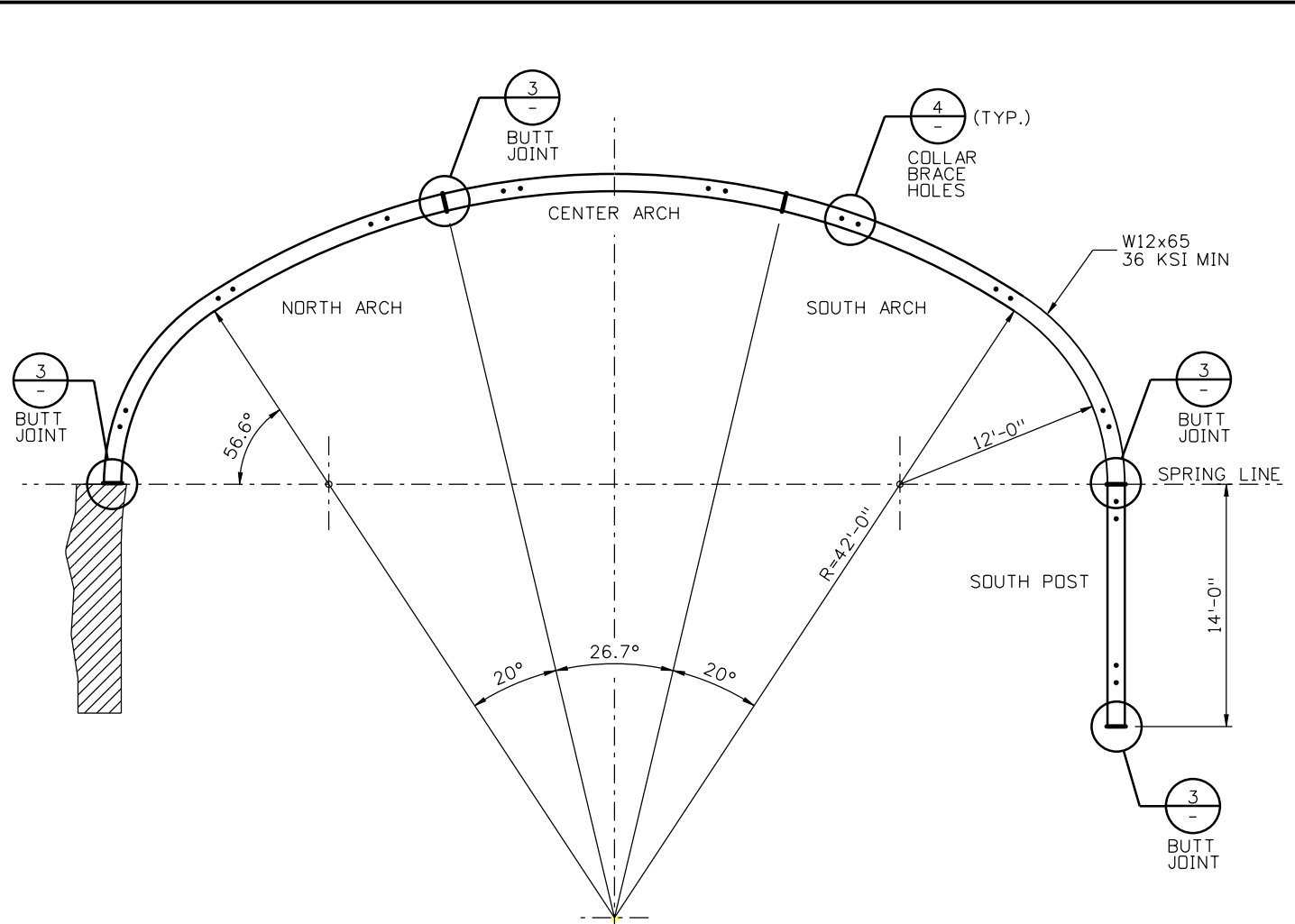
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Revision Dates (Preliminary Stage Only)	

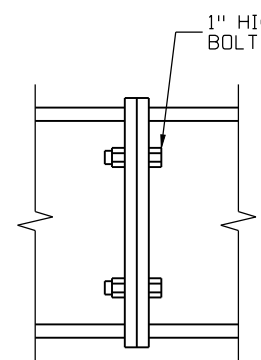
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02/13	SK	02/13	MEF
02/13		02/13	
02/13		02/13	



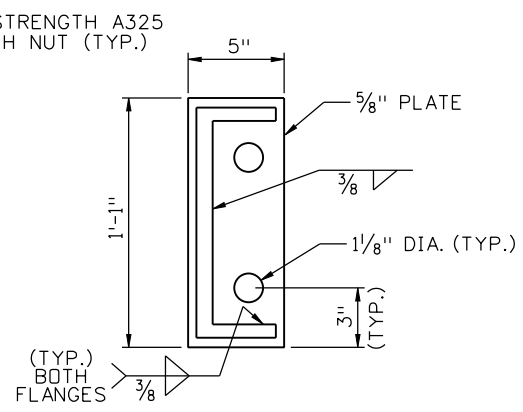
STEEL CHANNEL GEOMETRY AND DIMENSIONS



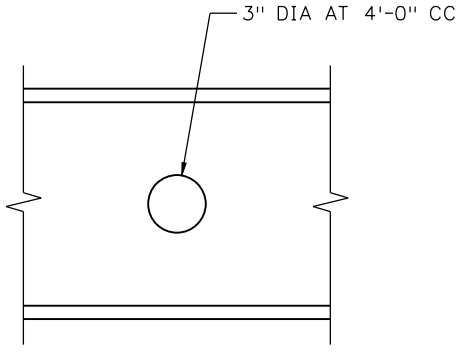
PORTAL STEEL SET GEOMETRY AND DIMENSIONS



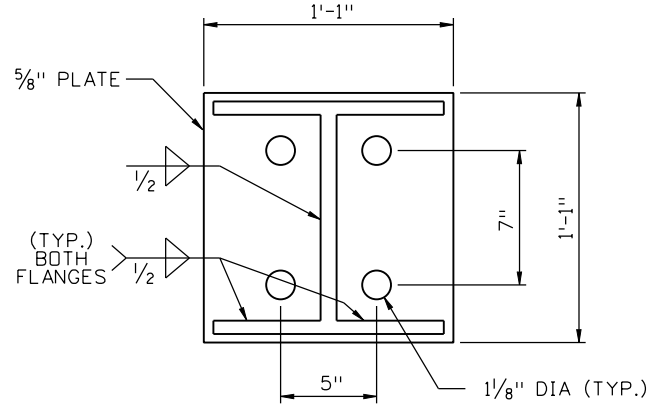
DETAIL 1
BUTT PLATE



DETAIL 2
TYPICAL DOWEL HOLE



DETAIL 3
BUTT JOINT



DETAIL 4
COLLAR BRACE HOLES

Print Date: 3/8/2013	Unit Information
File Name: 19036 STEEL SUPPORT DETAILS (1 of 2).dgn	Unit Leader Initials
Horiz. Scale:	
Vert. Scale:	

Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation



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Void:

I-70 TWIN TUNNELS EXCAVATION AND GROUND SUPPORT STEEL SUPPORT DETAILS (1 OF 2)	
Designer: M. FOWLER	Structure STR F-17-BD
Detailer: D. GATTSHALL	Numbers
Subset: TUNNEL CP2	Subset Sheets: T16 of 23

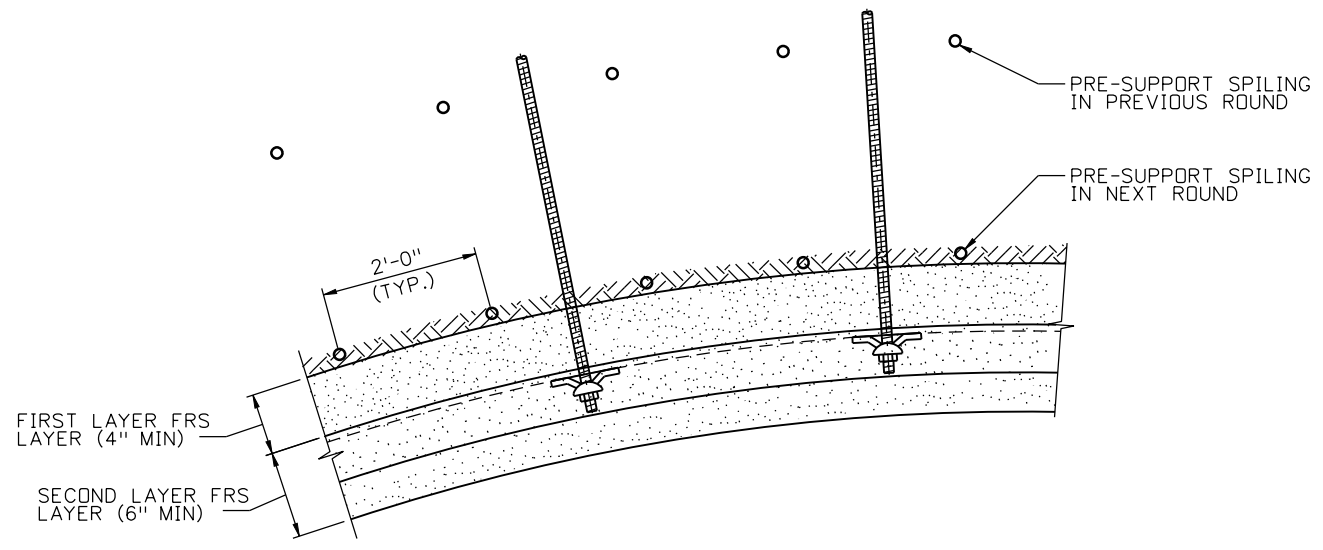
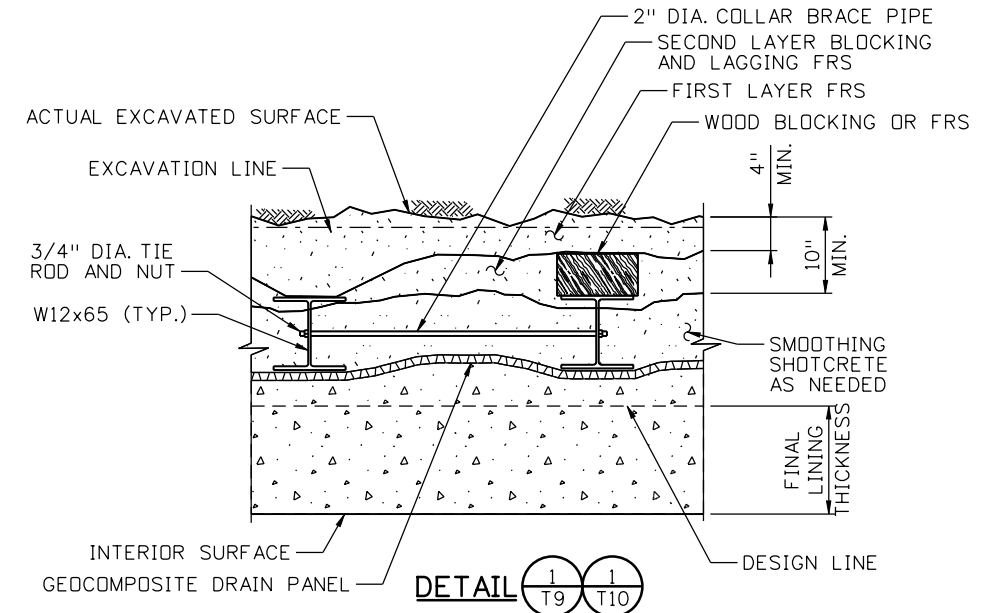
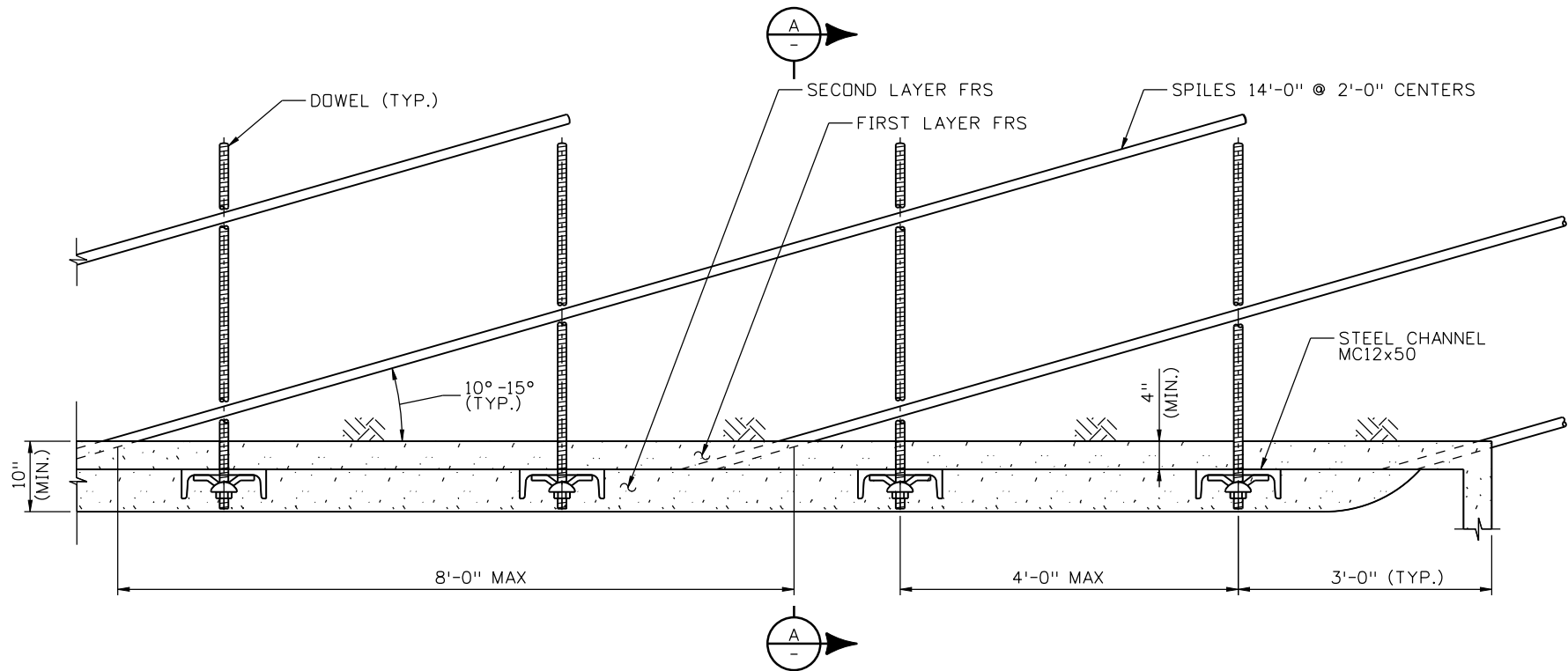
Project No./Code
IM 0703-391
19036
Sheet Number 168



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Revision Dates (Preliminary Stage Only)	

Design		Quantities	
DATE	INITIAL	DATE	INITIAL
02/13	MEF	02/13	LA
Checked By	SK	Checked By	SK



SECTION A-A

C-CHANNEL AND SPILING

NOTES:

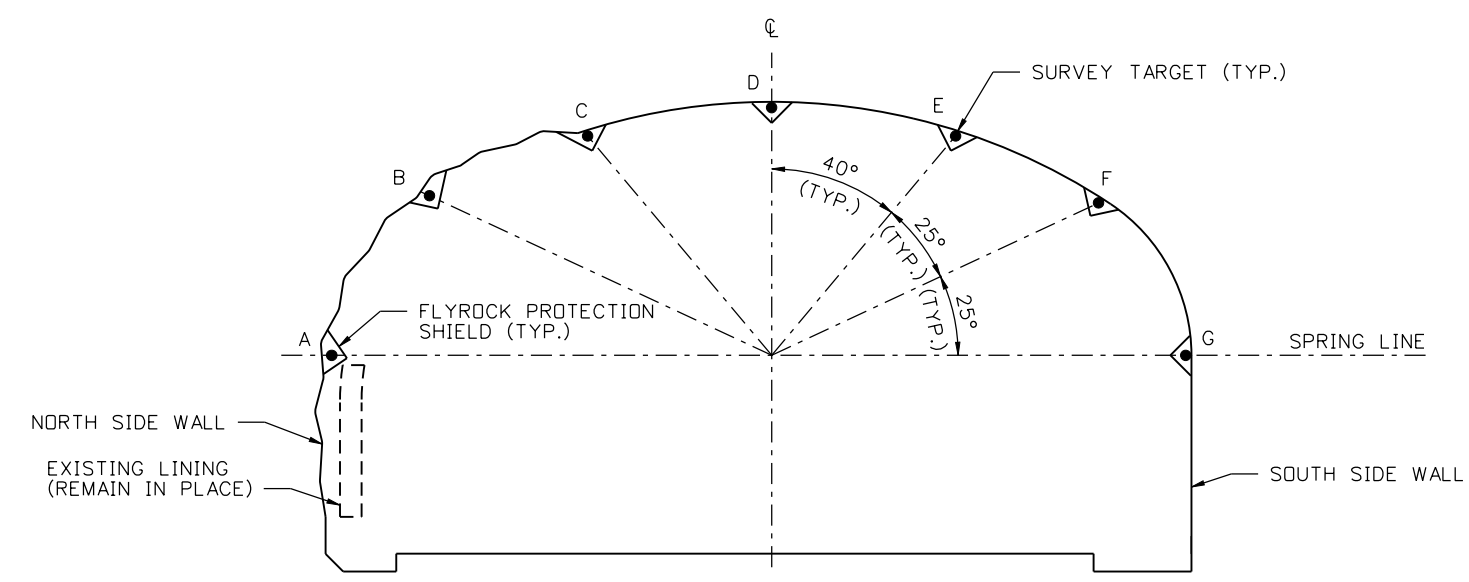
1. SELF DRILLING GROUTED SPILING MAY BE USED.
2. APPLY SMOOTHING SHOTCRETE TO MEET GENERAL SMOOTHNESS CRITERIA AS REQUIRED, WHERE GEOCOMPOSITE PANELS ARE INDICATED. SEE GROUNDWATER CONTROL SYSTEM, GEOCOMPOSITE PANEL DETAILS, AND MISCELLANEOUS DETAILS.
3. FOR REQUIREMENTS OF SUBSTRATE FOR GEOCOMPOSITE DRAIN PANELS, SEE "TUNNEL FINAL LINING-GEOCOMPOSITE PANEL DETAILS".

Print Date: 3/8/2013	Sheet Revisions			Colorado Department of Transportation		As Constructed		I-70 TWIN TUNNELS EXCAVATION AND GROUND SUPPORT STEEL SUPPORT DETAILS (2 OF 2)		Project No./Code	
File Name: 19036 STEEL SUPPRT DETAILS (2 OF 2).dgn	Date:	Comments:	Init.	425 A Corporate Circle Golden, CO 80401 Phone: 720-497-6918 FAX: 720-497-6901		No Revisions:		IM 0703-391			
Horiz. Scale: Vert. Scale:				Region 1		Revised:		Designer: M. FOWLER		Structure STR F-17-BD	
Unit Information Unit Leader Initials				CRC		Void:		Detailer: D. GATTSHALL		19036	
ATKINS PARSONS BRINCKERHOFF								Subset: TUNNEL CP2		Sheet Number 169	
								Subset Sheets: T17 of 23			

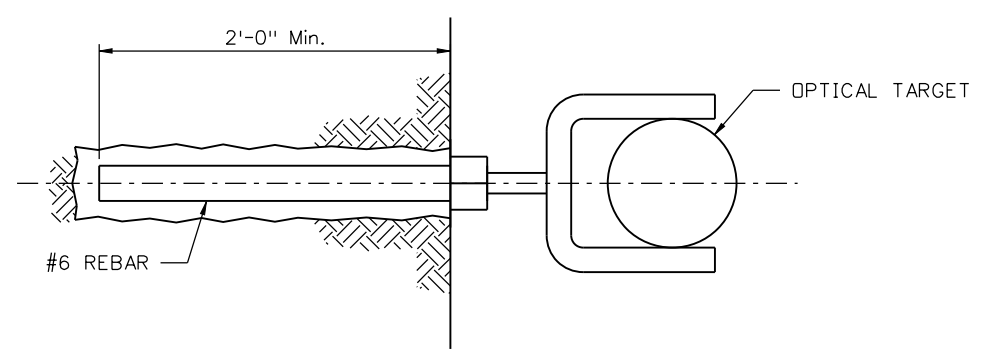
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Revision Dates (Preliminary Stage Only)	

Design		Detail		Quantities	
Designed By	DATE	INITIAL	DATE	INITIAL	DATE
MEF	02/13	DEG	02/13	LA	02/13
Checked By	DATE	Checked By	DATE	Checked By	DATE
SK	02/13	PFQ	02/13	SK	02/13



EB TUNNEL INSTRUMENTATION



OPTICAL SURVEY TARGET DETAIL

STATION	SURVEY TARGET SCHEDULE						
	TARGET ARRAY						
	A	B	C	D	E	F	G
142+40			o		o		
142+60		o	o		o	o	
142+80	o		o		o		o
143+00		o	o	o		o	
143+20	o		o	o			o
143+40	o		o		o		o
143+60	o		o	o	o		o
143+80	o		o	o	o		o
144+00	o		o		o		o
144+50			o		o		
145+00			o		o		
145+50		o		o		o	
146+00			o		o		
146+50			o		o		
147+00			o		o		
147+50			o		o		
148+00			o		o		
148+50	o		o		o		o
148+60				o			

NOTES:

- CONTRACTOR SHALL PROVIDE A TOTAL OF 58 SURVEY TARGETS AT LOCATIONS AS INDICATED IN THE SCHEDULE.
- CONTRACTOR TO PROVIDE STEEL PLATE SHIELD TO PROTECT PRISMS FROM BLAST FLYROCK DAMAGE.
- ALLOW 6 ADDITIONAL SURVEY TARGETS TO BE INSTALLED AS DIRECTED.
- DO NOT REMOVE, DEMOLISH, COVER OR RENDER SURVEY TARGETS INACCESSIBLE AT ANY TIME WITHOUT PRIOR APPROVAL OR DIRECTION BY THE ENGINEER.
- FOR INITIAL READINGS AND FREQUENCY OF READINGS, SEE SPECIFICATION SECTION 211C INSTRUMENTATION.

Print Date: 3/8/2013
 File Name: 19036 INSTRUMENTATION.dgn
 Horiz. Scale: Vert. Scale:
 Unit Information Unit Leader Initials

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Sheet Revisions		
Date:	Comments	Init.

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Void:

**I-70 TWIN TUNNELS
 EXCAVATION AND GROUND SUPPORT
 INSTRUMENTATION**

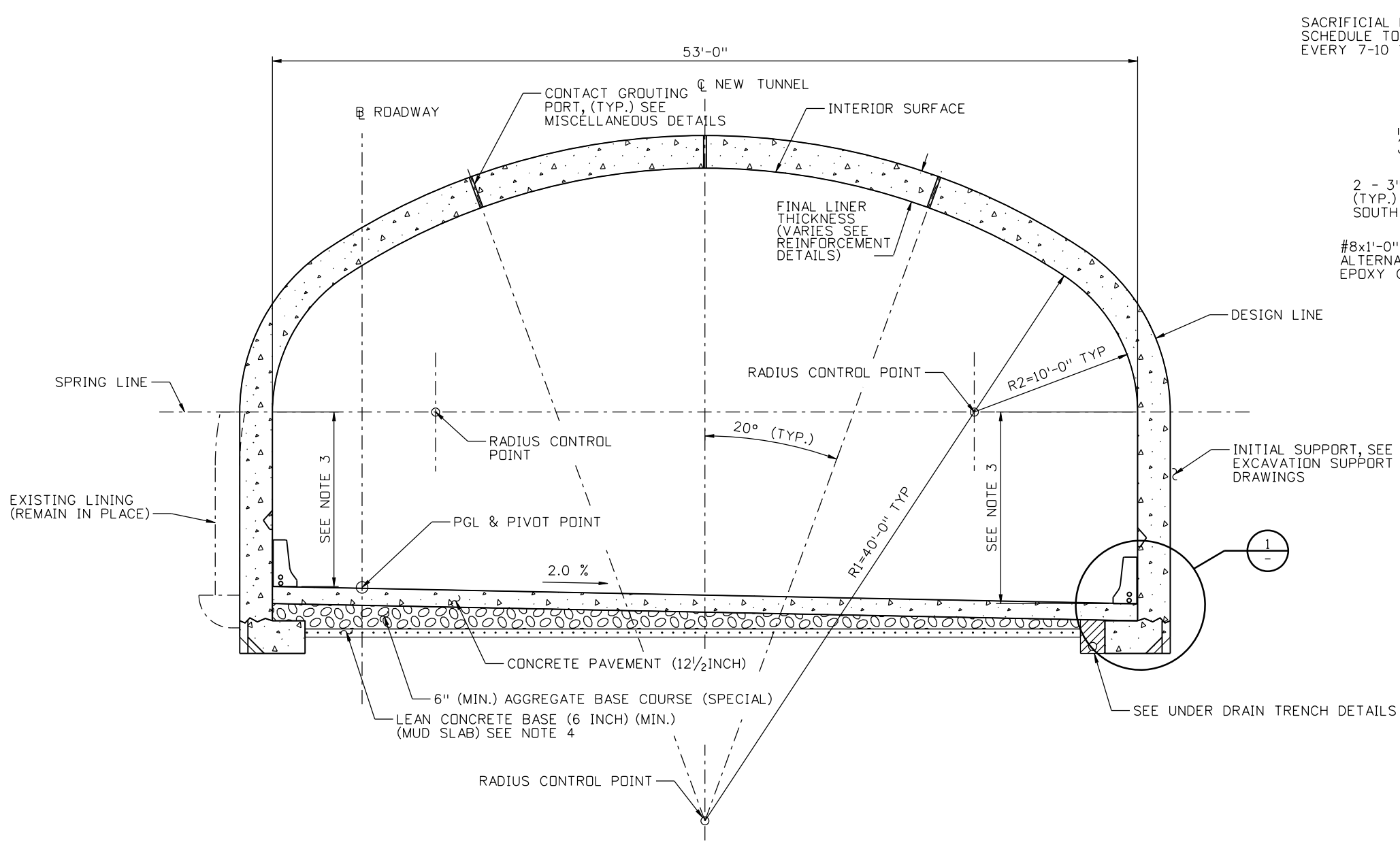
Designer: M. FOWLER Structure STR F-17-BD
 Detailer: D. GATTSHALL Numbers
 Subset: TUNNEL CP2 Subset Sheets: T18 of 23

Project No./Code
IM 0703-391
19036
Sheet Number 170

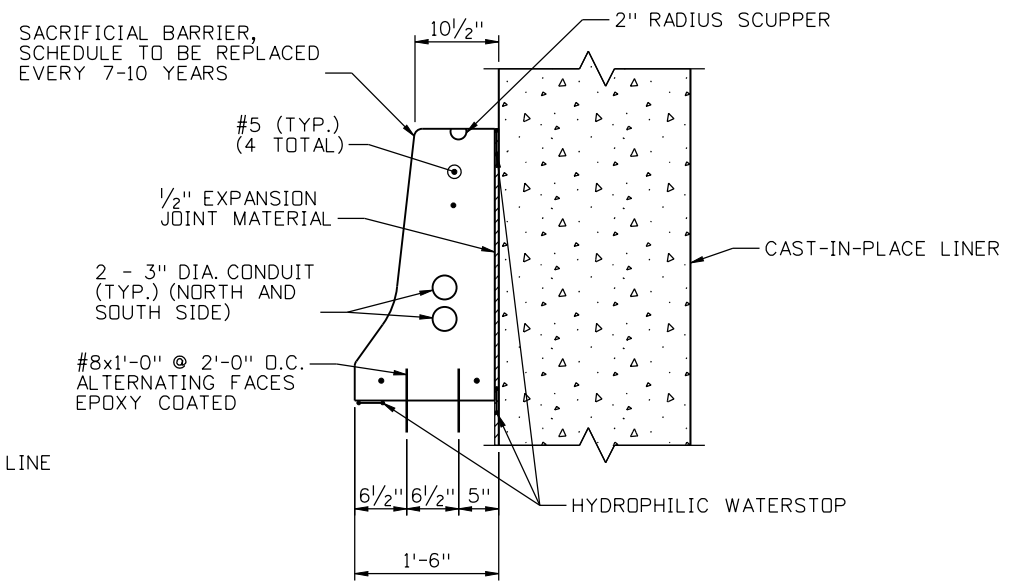
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Revision Dates (Preliminary Stage Only)	

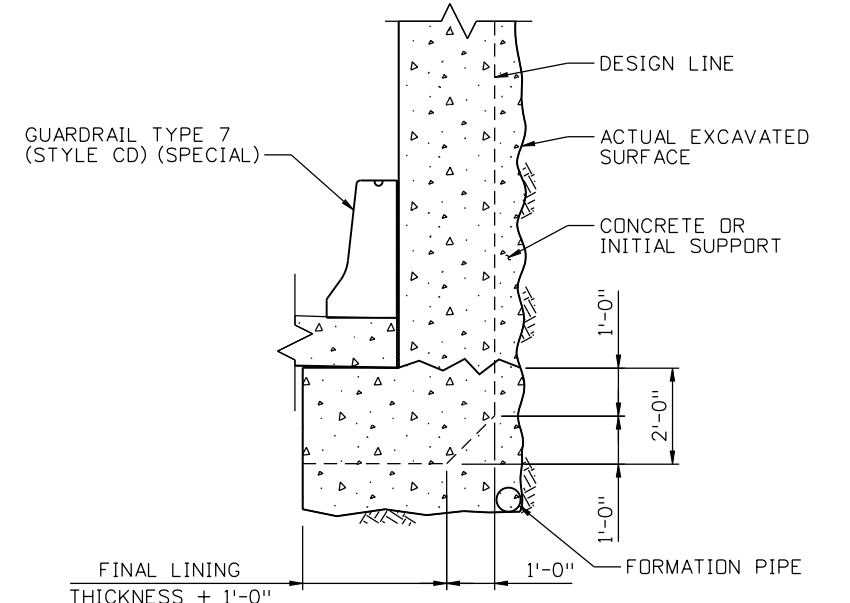
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DPA	02/13	DEG	02/13	LA	02/13
MEF	03/13	PFG	02/13	DPA	02/13
Designed By	Checked By	Detailed By	Checked By	Quantities By	Checked By



TUNNEL GEOMETRICS



BARRIER DETAIL



DETAIL 1

NOTES:

- TUNNEL LINING WALLS TO BE SET VERTICAL AND SYMMETRIC.
- ROADWAY CROSS SLOPE TO BE ACHIEVED WITH FINAL PAVEMENT SLAB.
- LIMITS OF STRUCTURAL CONCRETE COATING (WHITE) EQUIVALENT TO FEDERAL STANDARD 5958 COLOR NO. 17925.
- LEAN CONCRETE MUD SLAB TO BE FULLY PERFORATED AT LOCATIONS DETERMINED IN THE FIELD BY ENGINEER PRIOR TO PLACEMENT OF AGGREGATE BASE COARSE.

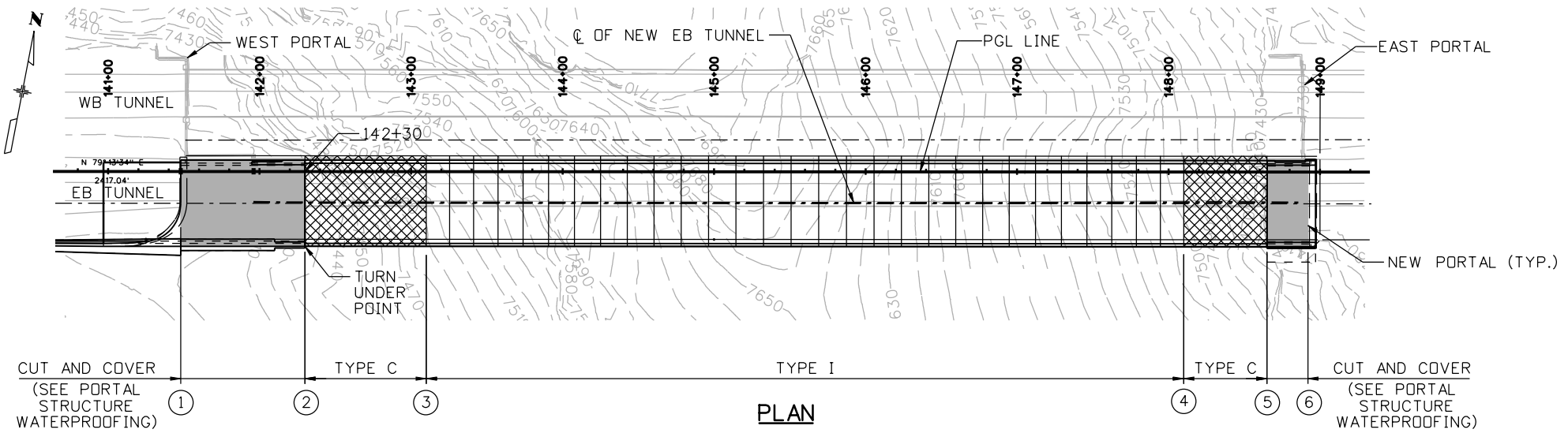
Print Date: 3/8/2013	Sheet Revisions			Colorado Department of Transportation	As Constructed	I-70 TWIN TUNNELS		Project No./Code
File Name: 19036 STRUCTURAL SECTION.dgn	Date:	Comments	Init.			TUNNEL FINAL LINING		
Horiz. Scale:				425 A Corporate Circle Golden, CO 80401 Phone: 720-497-6918 FAX: 720-497-6901	No Revisions:	STRUCTURAL SECTION		19036
Unit Information					Revised:	Designer: D. ABRAHAMS	Structure	
Unit Leader Initials				Region 1	Void:	Detailer: D. GATTSHALL	Subset Sheets: T19 of 23	Sheet Number 171
		CRC			Subset: TUNNEL CP2			

LEGEND

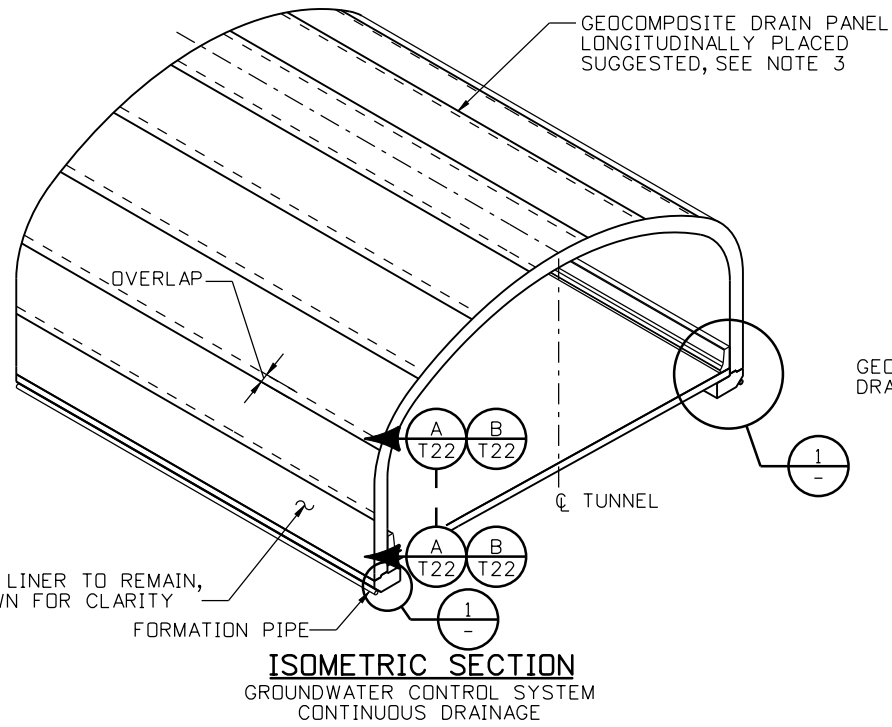
①	141+48
②	142+30
③	143+10
④	148+10
⑤	148+65
⑥	148+97

TYPE C: CONTINUOUS DRAINAGE OVERLAPPING PANELS

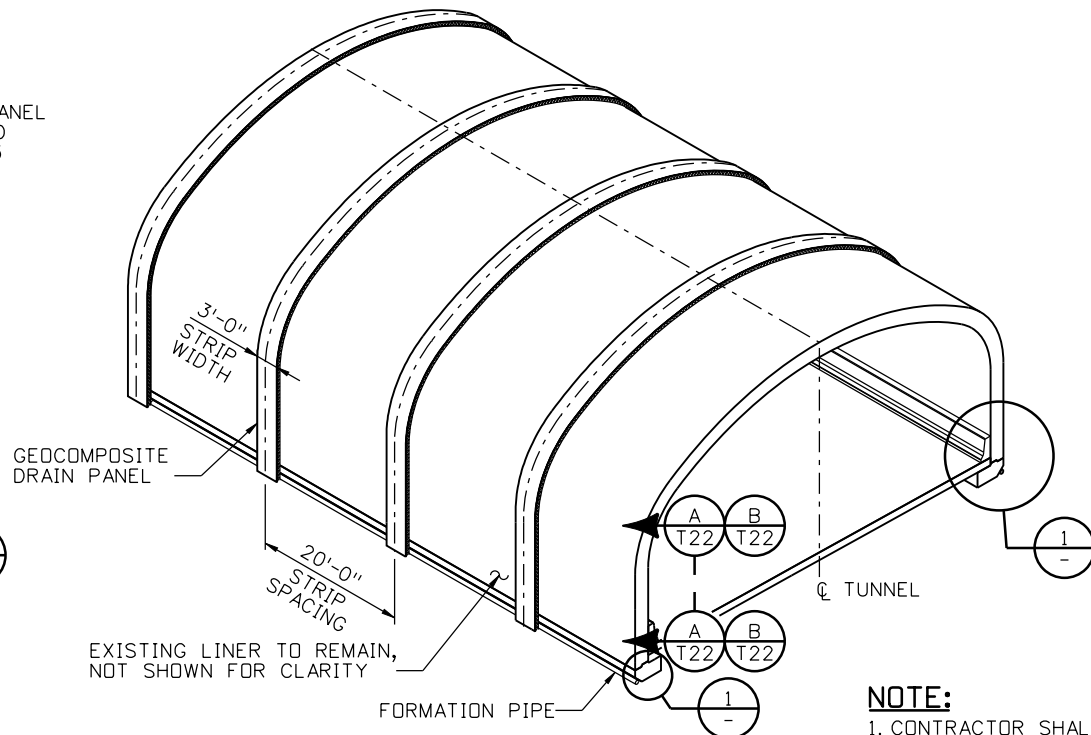
TYPE I: INTERMITTENT DRAIN PANELS (STRIPS) SEE NOTE 2.



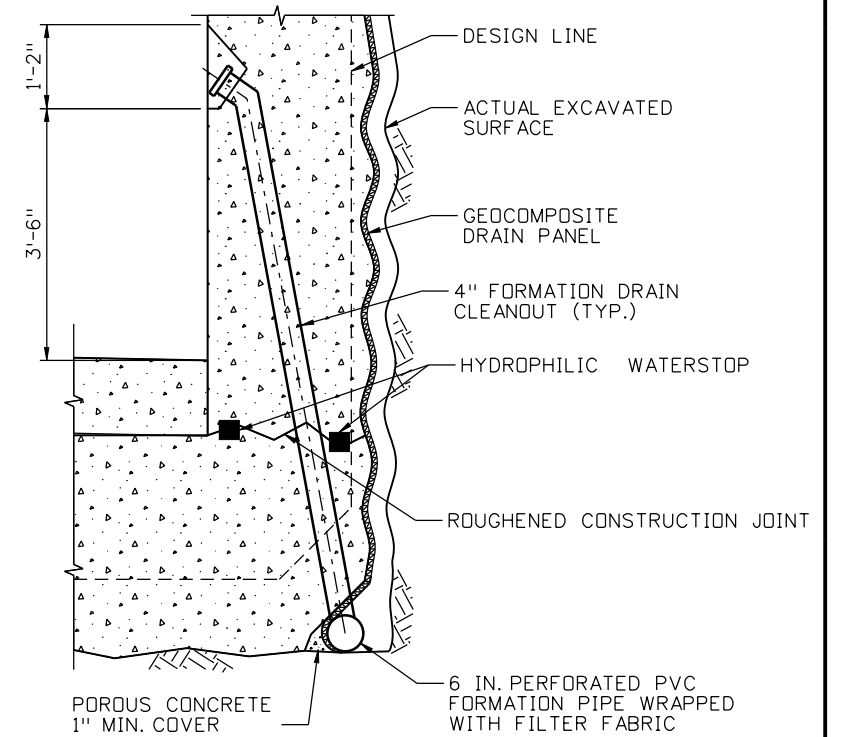
PLAN



ISOMETRIC SECTION
GROUNDWATER CONTROL SYSTEM
CONTINUOUS DRAINAGE



ISOMETRIC SECTION
INTERMITTENT DRAIN PANELS



DETAIL 1

NOTE:

- CONTRACTOR SHALL ALLOW 275 SY OF GEOCOMPOSITE DRAIN PANEL FOR PLACEMENT IN TYPE I AS DIRECTED BY ENGINEER TO TREAT DISCRETE WATER BEARING ZONE (OR POTENTIALLY DURING RUNOFF SEASON) EXPOSED DURING EXCAVATION.
- INTERMITTENT DRAIN PANEL WIDTH AND SPACING MAY BE CHANGED FROM WHAT IS SHOWN, HOWEVER SIMILAR DISTRIBUTION MUST BE MAINTAINED AND MINIMUM SPACING OF 15' AND MAXIMUM SPACING OF 30' IS REQUIRED.
- THE LONGITUDINAL PLACEMENT OF THE GEOCOMPOSITE DRAIN PANEL IN THE CONTINUOUS ZONE IS RECOMMENDED. IF THIS ORIENTATION IS CHOSEN THE MASTIC ADHESIVE OR PRIMER MAY BE APPLIED INTERMITTENTLY OVER A QUARTER OF THE OVERALL SEAM LENGTH AND AS FIELD DIRECTED BY THE ENGINEER. FASTENERS WILL STILL BE REQUIRED.

Revision Dates (Preliminary Stage Only)	

Design		Detail		Quantities	
DATE	INITIAL	DATE	INITIAL	DATE	INITIAL
02/13	DPA	02/13	DEG	02/13	LA
03/13	MEF	02/13	PFG	02/13	DPA

Print Date: 3/8/2013
 File Name: 19036 GROUNDWATER CONTROL SYSTEM.dgn
 Horiz. Scale: Vert. Scale:
 Unit Information Unit Leader Initials

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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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Revised:
Void:

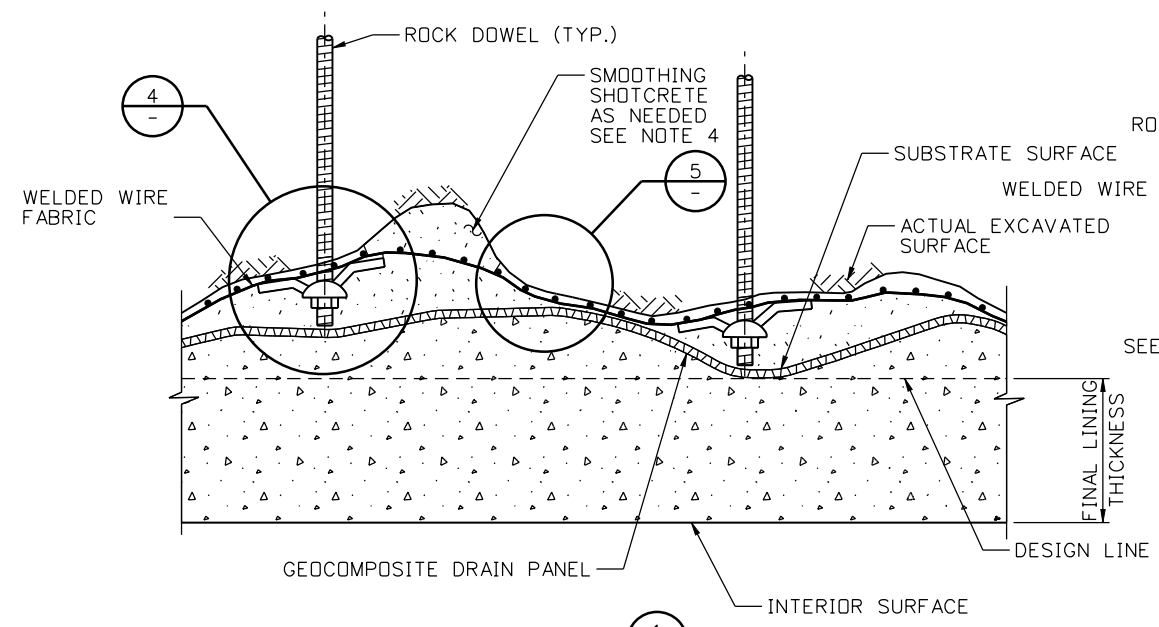
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Designer: D. ABRAHAMS	Structure	STR F-17-B0
Detailer: D. GATTSHALL	Numbers	
Subset: TUNNEL CP2	Subset Sheets:	T20 of 23

Project No./Code
IM 0703-391
19036
Sheet Number 172

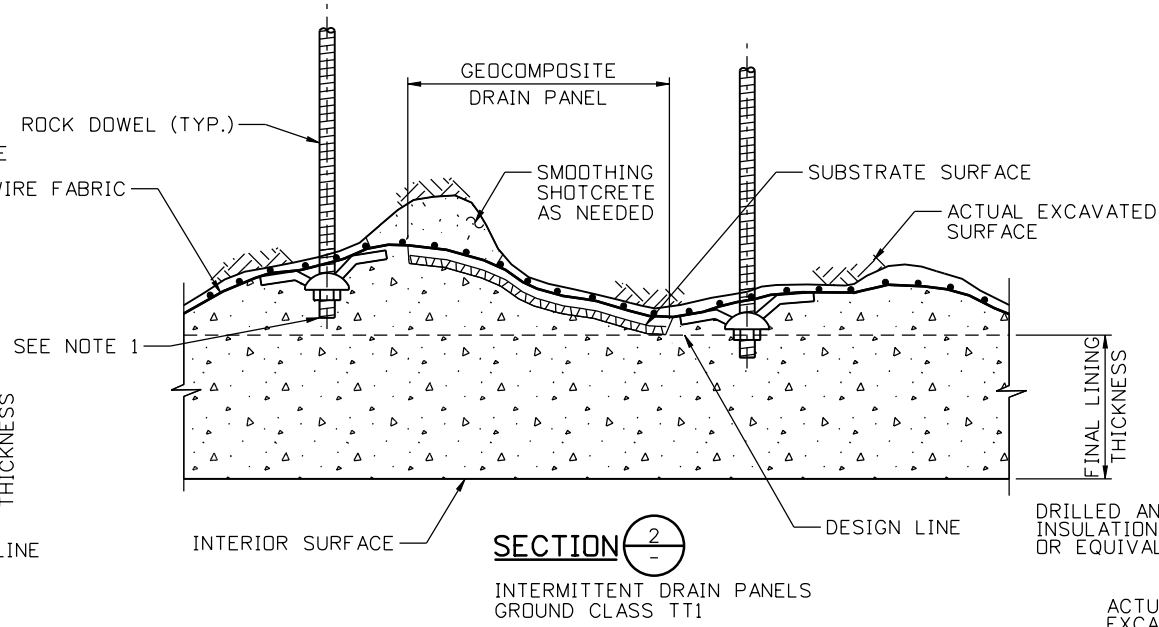
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Revision Dates (Preliminary Stage Only)	

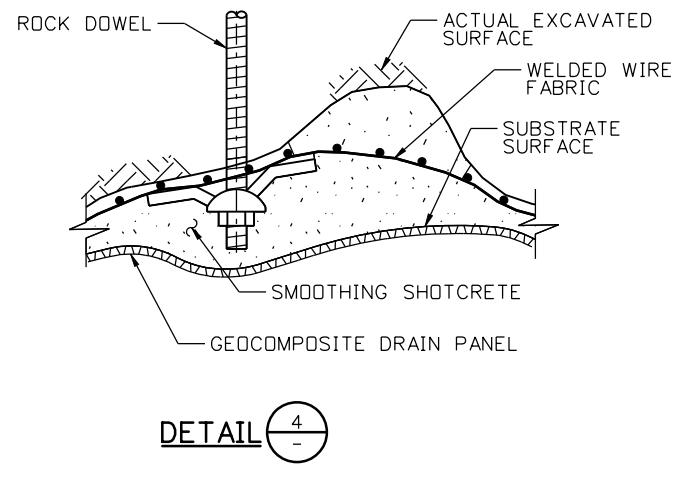
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Checked By	MEF	Checked By	DPA
	03/13		



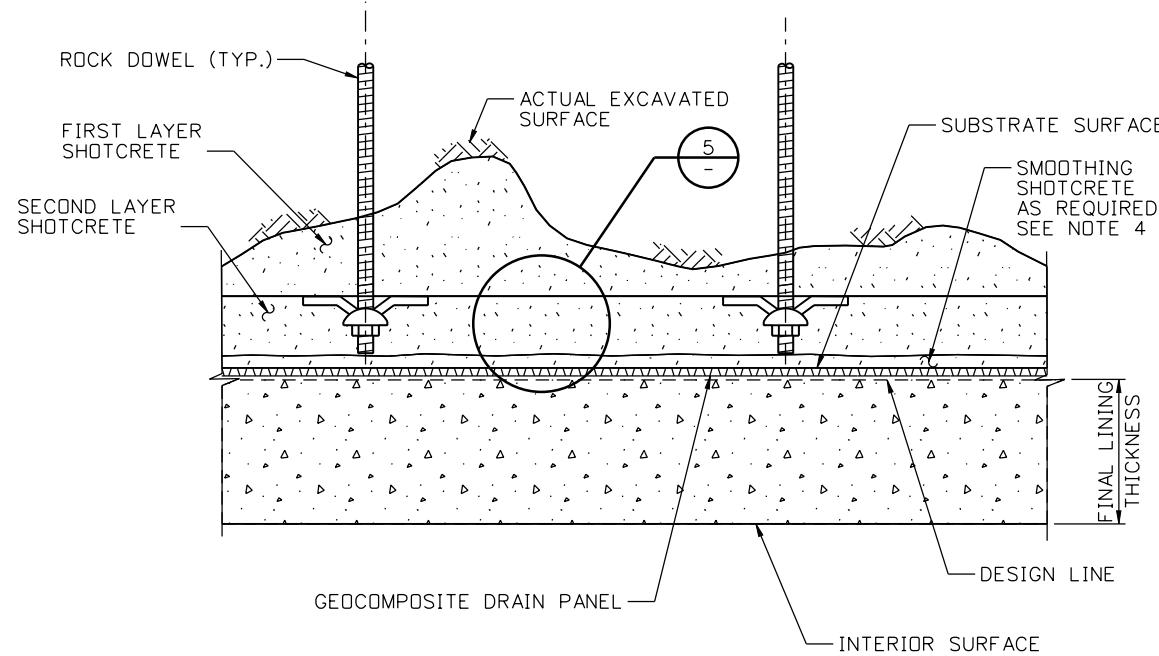
DETAIL 1
CONTINUOUS DRAIN PANELS
GROUND CLASS TT1



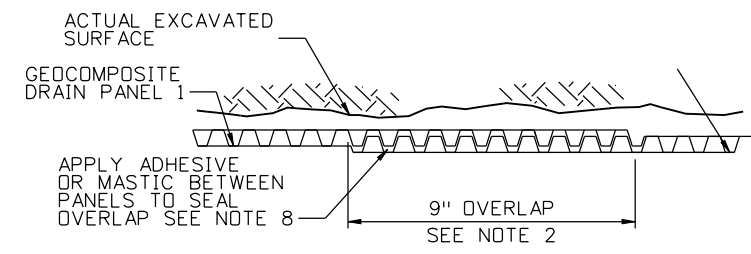
SECTION 2
INTERMITTENT DRAIN PANELS
GROUND CLASS TT1



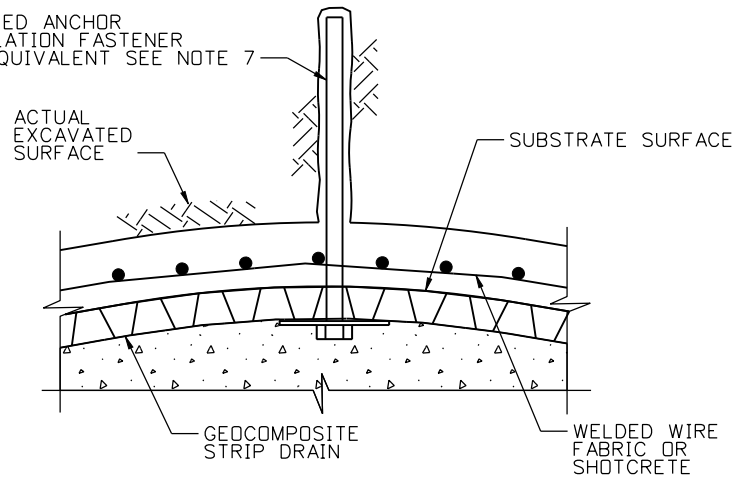
DETAIL 4



DETAIL 3
CONTINUOUS DRAIN PANELS
GROUND CLASS TT2
GROUND CLASS TT3



DETAIL 5



GECCOMPOSITE FASTENING

NOTES:

1. END OF BARE STEEL, ROCK DOWEL, MAY EXTEND INTO DESIGN LINE UP TO 6".
2. DIMPLES SHALL BE INTERLOCKED TO SUPPORT THE SEAM AND FASTENED AT 18" TO 24" INTERVALS. APPLY MASTIC OR ADHESIVE TO SEAL ALL OVERLAPS.
3. NOT USED
4. DIRECT CONTACT BETWEEN THE GECCOMPOSITE DRAIN AND THE INITIAL STEEL ROCK SUPPORT IS NOT PERMITTED.
5. THE SUBSTRATE SMOOTHNESS CRITERIA, AS SHOWN ON THE MISCELLANEOUS DETAILS, SHALL APPLY TO ALL SUBSTRATE CONDITIONS WHICH REQUIRE GECCOMPOSITE DRAIN APPLICATIONS. PLAIN SHOTCRETE SMOOTHING LAYER SHALL BE APPLIED AS REQUIRED.
6. WHERE CONTINUOUS GECCOMPOSITE DRAINS OVERLAP, THE PANEL WITH HIGHER ELEVATION SHALL BE FASTENED TO SUBSTRATE FIRST TO DIRECT WATER TO OUTSIDE OF SEAM.
7. THE DISTANCE OF FASTENER SEPARATION FOR NON-OVERLAP AREAS WILL DIFFER BASED ON RADIUS CONTOUR OF THE LID AS WELL AS WHETHER IT IS ROCK OR SHOTCRETE AS THE SUBSTRATE SURFACE TO ANCHOR AGAINST. A 24" TO 36" SEPARATION SHALL BE PROVIDED AS LONG AS THE DRAIN MAT ARE NOT DRIDDING THE RADIUS OF THE SUBSTRATE.
8. FASTENER SEPARATION FOR NON-OVERLAP AREAS WILL VARY BASED ON THE SUBSTRATE MATERIAL AND SMOOTHNESS. A 24" TO 48" FASTENING SEPARATION SHALL BE PROVIDED OR AS DIRECTED BY THE MANUFACTURER.

Print Date: 3/8/2013
 File Name: 19036 GECCOMPOSITE PANEL DETAILS.dgn
 Horiz. Scale: Vert. Scale:
 Unit Information Unit Leader Initials

ATKINS **PARSONS BRINCKERHOFF**

Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation

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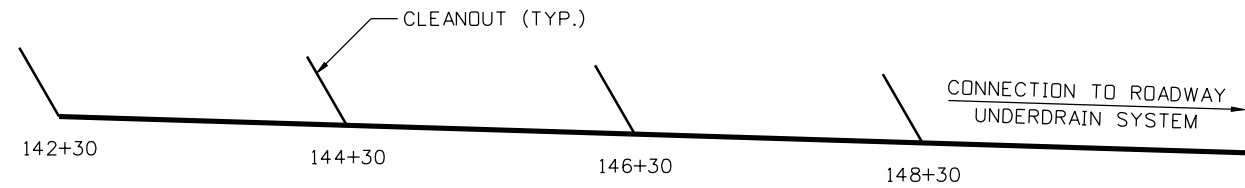
425 A Corporate Circle
 Golden, CO 80401
 Phone: 720-497-6918 FAX: 720-497-6901

Region 1 CRC

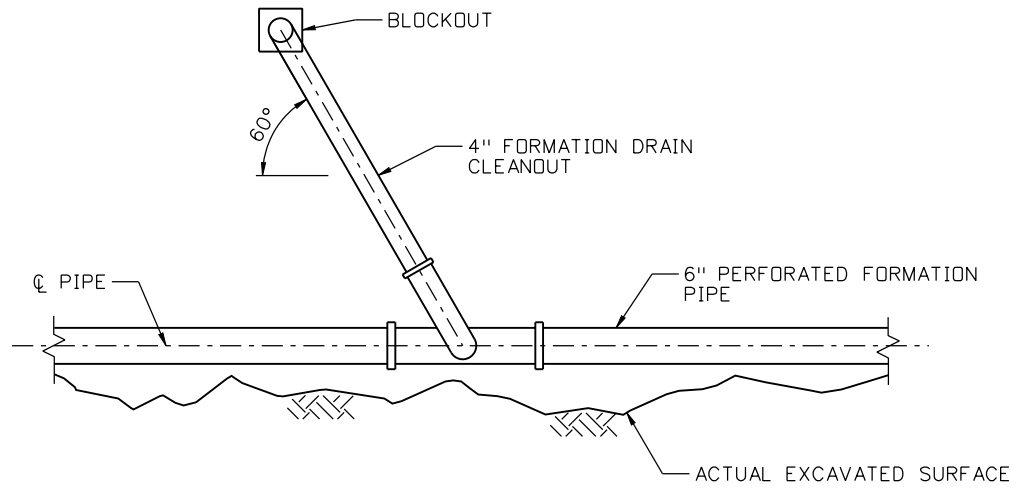
As Constructed
No Revisions:
Revised:
Void:

I-70 TWIN TUNNELS TUNNEL FINAL LINING GECCOMPOSITE PANEL DETAILS		
Designer: D. ABRAHAMS	Structure Numbers	STR F-17-B0
Detailer: D. GATTSHALL	Subset Sheets:	T21 of 23
Subset: TUNNEL CP2		

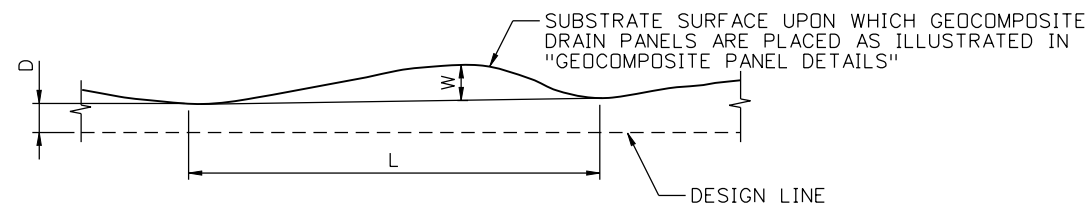
Project No./Code
IM 0703-391
19036
Sheet Number 173



CLEANOUT PIPE SPACING
(NORTH AND SOUTH FOOTINGS)



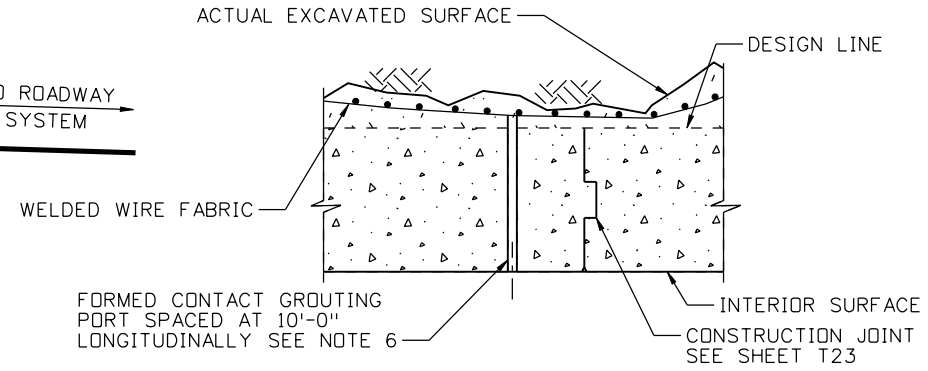
CLEANOUT LONGITUDINAL ELEVATION



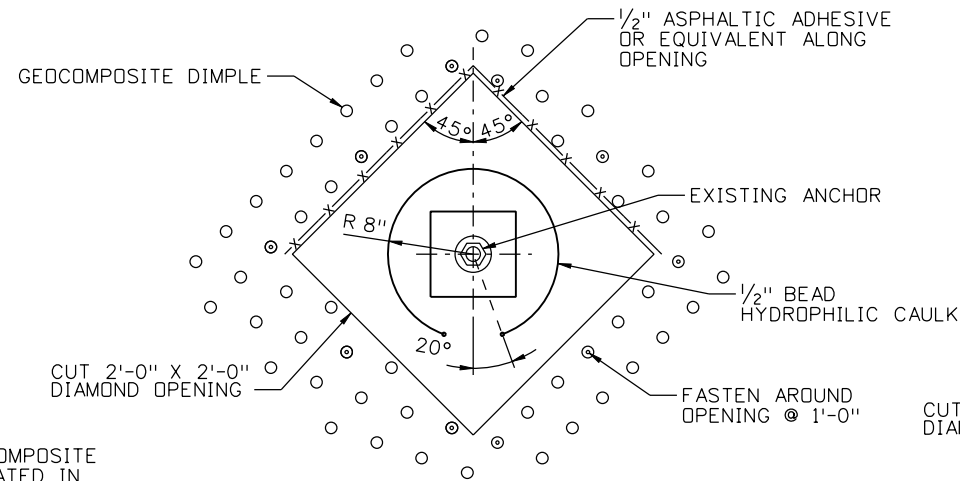
D = DEVIATION FROM DESIGN LINE (IN)
W = WAVINESS OF SUBSTRATE SURFACE (IN)
L = DISTANCE BETWEEN TWO CRESTS (IN)

CRITERIA:
D ≥ 1"
W ≤ 3"
W < L/8

SUBSTRATE SMOOTHNESS CRITERIA

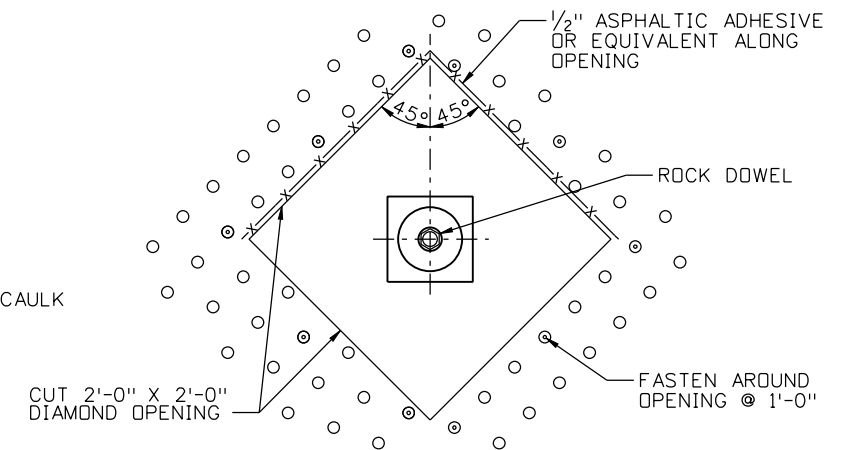


CONTACT GROUTING LONGITUDINAL SECTION
(INITIAL SUPPORT NOT SHOWN FOR CLARITY)
SEE NOTE 1



SECTION A
T20

AT EXISTING LINER/EXISTING PERMANENT ROCK ANCHOR



SECTION B
T20

AT EXISTING LINER/PILLAR DOWEL

LEGEND:

ASPHALTIC ADHESIVE -x-x-x-

NOTE:

1. PORT MUST EXTEND TO CONTACT WITH ROCK, GEOCOMPOSITE, OR INITIAL SUPPORT LAYER.

Revision Dates (Preliminary Stage Only)	

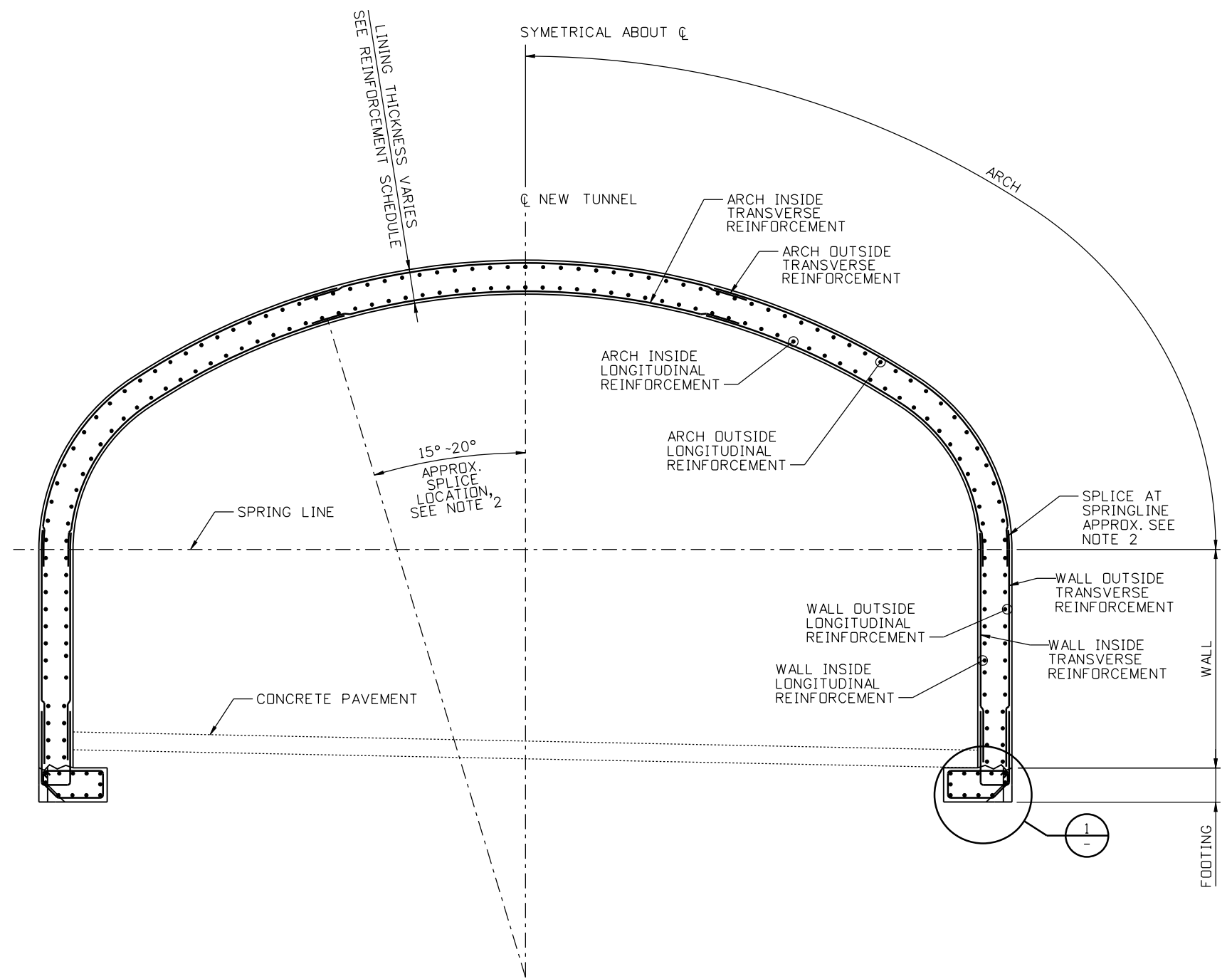
Design		Quantities	
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DPA	MEF	LA	02/13
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Print Date: 3/8/2013	Sheet Revisions			Colorado Department of Transportation	As Constructed	I-70 TWIN TUNNELS		Project No./Code
File Name: 19036 MISCELLANEOUS DETAILS.dgn	Date:	Comments	Init.			TUNNEL FINAL LINING		
Horiz. Scale: Vert. Scale:				425 A Corporate Circle Golden, CO 80401 Phone: 720-497-6918 FAX: 720-497-6901	No Revisions:	MISCELLANEOUS DETAILS		19036
Unit Information Unit Leader Initials					Revised:	Designer: D. ABRAHAMS	Structure	
ATKINS PARSONS BRINCKERHOFF				Region 1	Void:	Detailer: D. GATTSHALL	Structure Numbers	174
				CRC		Subset: TUNNEL CP2	Subset Sheets: T22 of 23	Sheet Number

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Revision Dates (Preliminary Stage Only)	

Design		Detail		Quantities	
INITIAL	DATE	INITIAL	DATE	INITIAL	DATE
DPA	02/13	DEG	02/13	LA	02/13
MEF	03/13	PFG	02/13	DPA	02/13
Designed By	Checked By	Designed By	Checked By	Checked By	Checked By

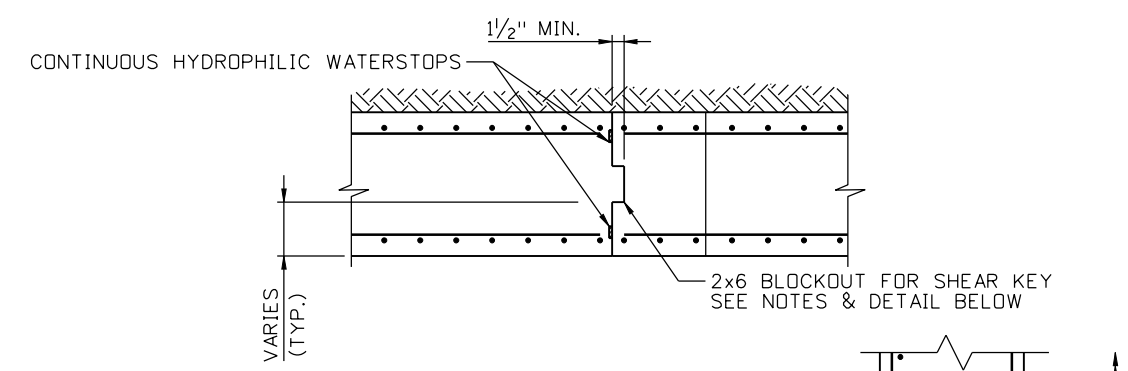


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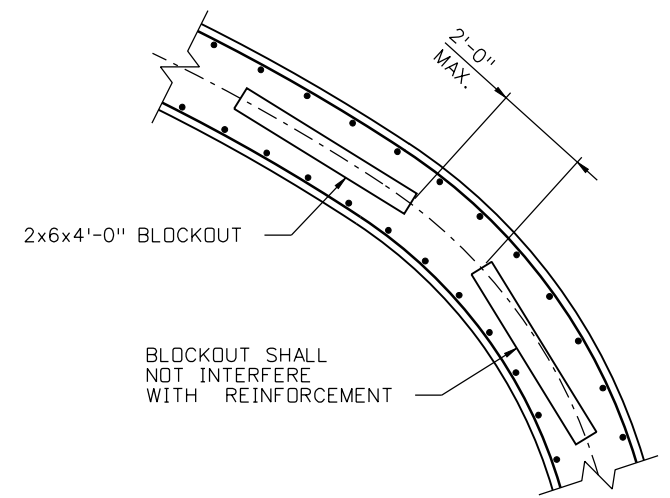
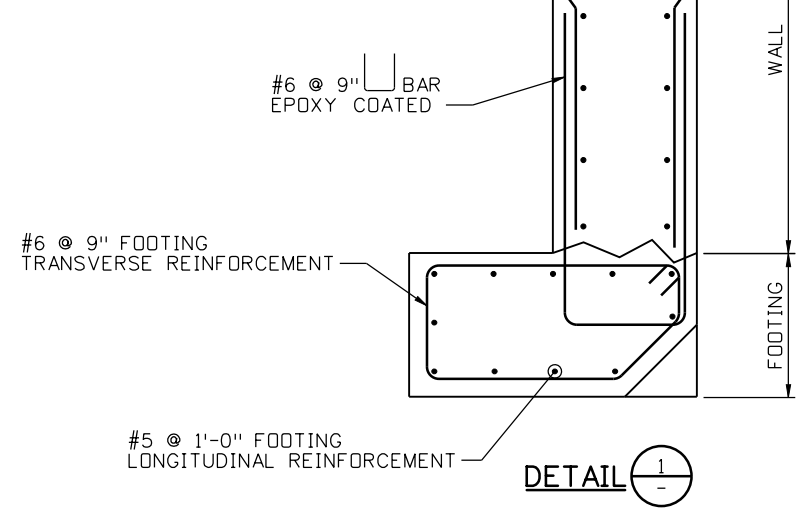
REINFORCEMENT SCHEDULE					
INITIAL SUPPORT CLASS		TT1, TT2 & TTP		TT2S & TT3	
FINAL LINING THICKNESS (IN.)		18		24	
		ARCH	WALL	ARCH	WALL
INSIDE	TRANSVERSE	#9 @ 9"	#7 @ 9"	#9 @ 6"	#7 @ 6"
	LONGITUDINAL	#5 @ 12"	#5 @ 12"	#6 @ 12"	#6 @ 12"
OUTSIDE	TRANSVERSE	#9 @ 9"	#7 @ 9"	#9 @ 6"	#7 @ 6"
	LONGITUDINAL	#5 @ 12"	#5 @ 12"	#6 @ 12"	#6 @ 12"

NOTES:

1. ALL FOOTING REINFORCEMENT AND INSIDE FACE OF WALL AND ARCH REINFORCEMENT SHALL BE EPOXY COATED.
2. STAGGER SPLICE LOCATIONS A MINIMUM 1'-0" APART.
3. POLYPROPYLENE FIBERS SHALL ONLY BE INCLUDED IN THE WALL AND THE ARCH CONCRETE.



CIRCUMFERENTIAL SECTION CONSTRUCTION JOINT (AT WALL AND ARCH)



SHEAR KEY DETAIL

DRAWING IS SCHEMATIC, EQUIVALENT SPACING OF BLOCKOUTS SHALL BE PROVIDED.

Print Date: 3/8/2013
 File Name: 19036 REINFORCEMENT DETAILS.dgn
 Horiz. Scale: Vert. Scale:
 Unit Information Unit Leader Initials

ATKINS **PARSONS BRINCKERHOFF**

Sheet Revisions		
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:
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Void:

I-70 TWIN TUNNELS TUNNEL FINAL LINING REINFORCEMENT DETAILS		
Designer: D. ABRAHAMS	Structure Numbers	STR F-17-BD
Detailer: D. GATTSHALL	Subset Sheets:	T23 of 23

Project No./Code
IM 0703-391
19036
Sheet Number 175

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, AS SHOWN ON THE PLANS, ON EXPOSED CONCRETE SURFACES. THE COLORS SHALL BE BEIGE AND WHITE, EQUIVALENT TO FEDERAL STANDARD 595B COLOR NOS. 30372 AND 27780 RESPECTIVELY.

THE FINAL FINISH FOR THE SURFACES OF THE TYPE 7 BRIDGE RAIL AND CURBS SHALL BE CLASS 2. ALL OTHER EXPOSED CONCRETE SURFACES SHALL RECEIVE A CLASS 1 FINAL FINISH TO ONE FOOT BELOW THE GROUND LINE.

GRADE 60 REINFORCING STEEL IS REQUIRED.

ALL REINFORCING STEEL SHALL BE EPOXY COATED UNLESS OTHERWISE NOTED.

Ⓝ DENOTES NON COATED REINFORCING STEEL.

THE FOLLOWING TABLE GIVES THE MINIMUM CLASS B (STAGGERED) 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 CLASS B (STAGGERED) 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 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 STRUCTURE DURING CONSTRUCTION.

B.F. = BACK FACE	F.F. = FRONT FACE	D.C. = ON CENTER	SPA. = SPACED
BOT. = BOTTOM	GALV. = GALVANIZED	PGL = PROFILE GRADE	STA. = STATION
CLR. = CLEAR	JT. = JOINT	LINE	STD. = STANDARD
CONST. = CONSTRUCTION	LCL = LAYOUT LINE	PROJ. = PROJECTION	STR. = STRUCTURE
CONT. = CONTINUOUS	LT. = LEFT	R = RADIUS	TOT. = TOTAL
E.F. = EACH FACE	MAX. = MAXIMUM	REINF. = REINFORCING	TYP. = TYPICAL
EL. = ELEVATION	MIN. = MINIMUM	RT. = RIGHT	W.P. = WORKING
EQ. = EQUALLY	NO. = NUMBER	SHLDR. = SHOULDER	POINT
EXP. = EXPANSION	NOM. = NOMINAL	SHT. = SHEET	

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

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 THERE TO. 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.

① ← DENOTES KEYNOTE REFERENCE

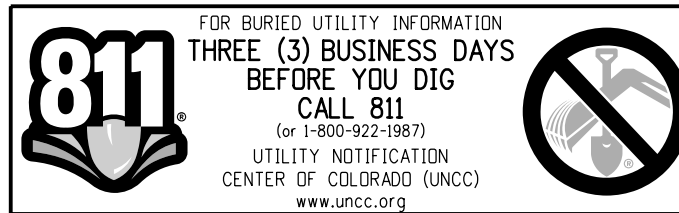
CROSS REFERENCE DRAWING NUMBER
(IF BLANK, REFERENCE IS TO SAME SHEET)

SECTION OR DETAIL IDENTIFICATION

DESIGN DATA

AASHTO, SIXTH EDITION LRFD WITH CURRENT INTERIMS
 DESIGN METHOD: LOAD AND RESISTANCE FACTOR DESIGN
 REINFORCED CONCRETE:

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



INDEX OF DRAWINGS

- P01 GENERAL INFORMATION
- P02 WEST PORTAL GENERAL LAYOUT
- P03 WEST PORTAL SOUTH ELEVATION
- P04 EAST PORTAL GENERAL LAYOUT
- P05 TYPICAL SECTION
- P06 FOUNDATION LAYOUT
- P07 EXCAVATION AND REMOVAL DETAILS
- P08 PORTAL FOOTING EXCAVATION AND BACKFILL
- P09 WEST PORTAL PILLAR REINFORCEMENT DETAILS
- P10 ELLIPSE AND BROW GEOMETRY
- P11 PORTAL DETAILS (SHEET 1 OF 3)
- P12 PORTAL DETAILS (SHEET 2 OF 3)
- P13 PORTAL DETAILS (SHEET 3 OF 3)
- P14 WEST PORTAL SOUTH WALL DETAILS
- P15 DRAINAGE DETAILS

BRIDGE DESCRIPTION

82'-0"(WEST) AND 32'-0"(EAST) REINFORCED CONCRETE PORTAL FRAMES SUPPORTED BY SPREAD FOOTINGS GENERALLY FOUNDED ON BEDROCK.

SUMMARY OF QUANTITIES

ITEM NO.	DESCRIPTION	UNIT	WEST PORTAL	EAST PORTAL	TOTAL
202	REMOVAL OF PORTIONS OF PRESENT STRUCTURE	EA	1	1	2
203	ROCK EXCAVATION	CY	200	44	244
206	STRUCTURE EXCAVATION	CY	2400	700	3100
206	STRUCTURE BACKFILL (CLASS 2)	CY	230	53	283
210	MODIFICATIONS TO EXISTING PORTALS	EA	1	1	2
211	PILLAR #9 x 16 FT, GRADE 75 DOWEL, CEMENT OR RESIN GROUTED	EA	14		14
304	AGGREGATE BASE COURSE (SPECIAL)	TON	488	118	606
309	LEAN CONCRETE BASE (6 INCH)	SY	721	174	895
412	CONCRETE PAVEMENT (12 1/2 INCH)	SY	795	188	983
515	CONCRETE SEALER	SY	1110	350	1460
601	FINAL LINING CONCRETE (PORTALS)	CY	800	274	1074
601	CONCRETE CLASS D (WALL)	CY	110		110
601	STRUCTURAL CONCRETE COATING	SY	184	56	240
601	STRUCTURAL CONCRETE STAIN (SPECIAL)	SY	681	474	1155
602	REINFORCING STEEL (EPOXY COATED)	LB	190820	51600	242420
605	GEOCOMPOSITE DRAIN WITH PIPE	SY	1120	10	1130
606	GUARDRAIL TYPE 7 (STYLE CD) (SPECIAL)	LF	316	64	380
613	2 INCH ELECTRICAL CONDUIT (PLASTIC)	LF	316	64	380
613	3 INCH ELECTRICAL CONDUIT (PLASTIC)	LF	316	64	380

KEYNOTES:

- ① INCLUDES EXISTING TUNNEL LINER BEYOND PROPOSED TURN-UNDER POINTS.
- ② INCLUDES EXISTING WESTBOUND EAST AND WEST PORTALS.

West Portal Wall Near: Idaho Springs Sec. 32 Township T3S Range R72W	Sta. 140+96.00 to Sta. 141+11.00
West Portal Near: Idaho Springs Sec. 32 Township T3S Range R72W	Sta. 141+11.00 to Sta. 142+30.00
East Portal Near: Idaho Springs Sec. 32 Township T3S Range R72W	Sta. 148+65.00 to Sta. 148+97.00

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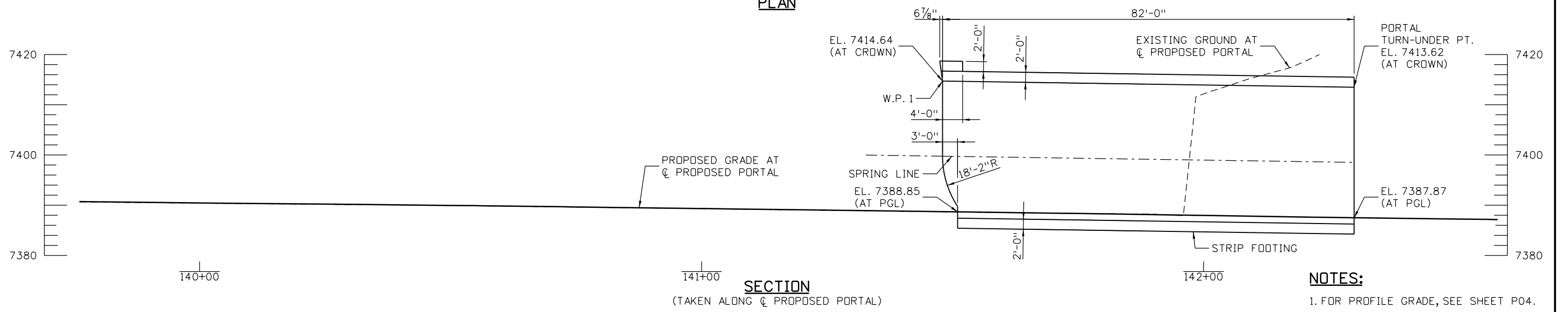
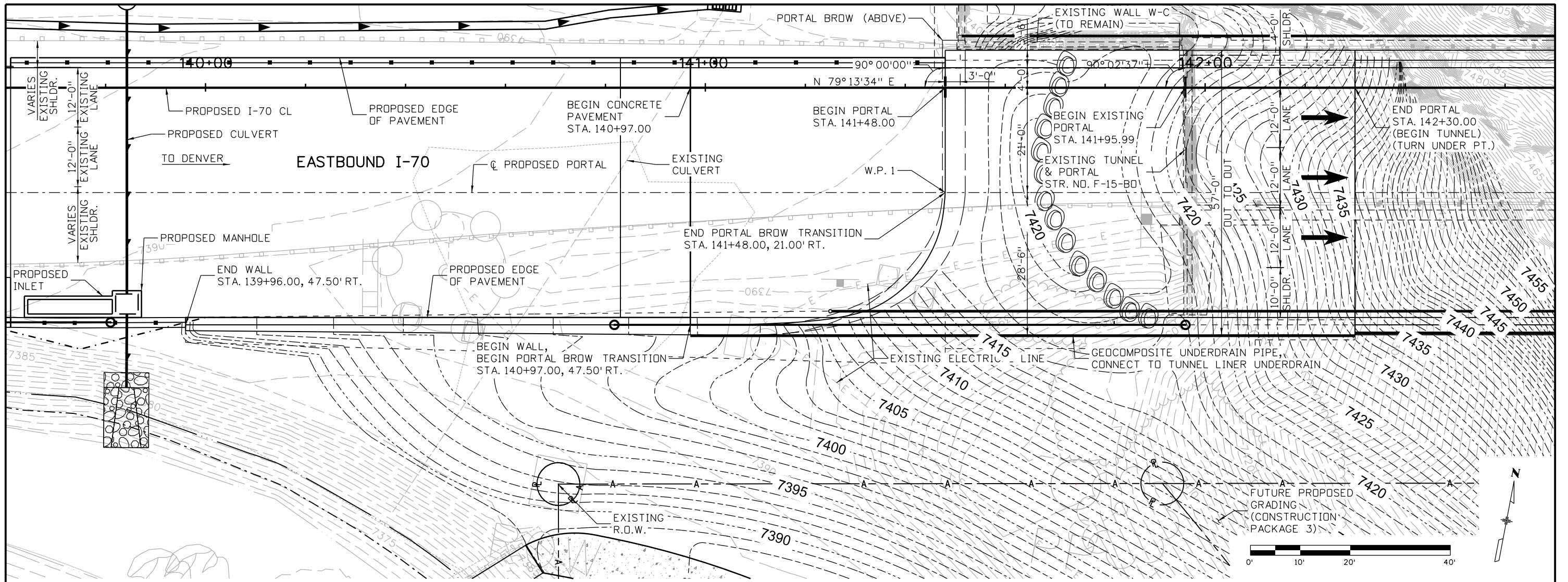
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Designer:	K. Saindon	Structure Numbers	F-15-B0
Detailer:	E. Schawo	Sheet Subset:	PORTALS
Subset Sheets: P01 of 15		Sheet Number	176

Project No./Code	IM 0703-391
Sheet Number	176

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Designed By	09-12	Detailed By	ERS	10-12	Checked By
Checked By		Checked By		Checked By	



NOTES:
1. FOR PROFILE GRADE, SEE SHEET P04.

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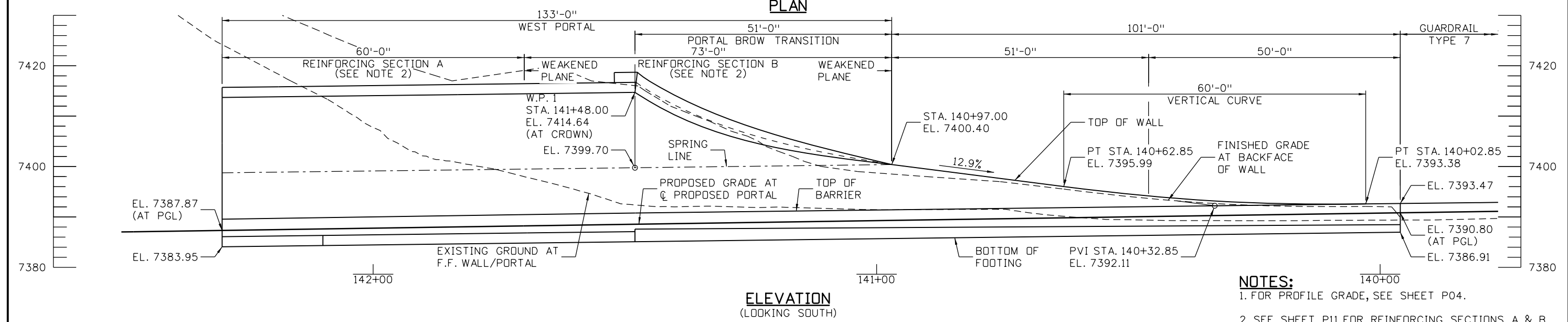
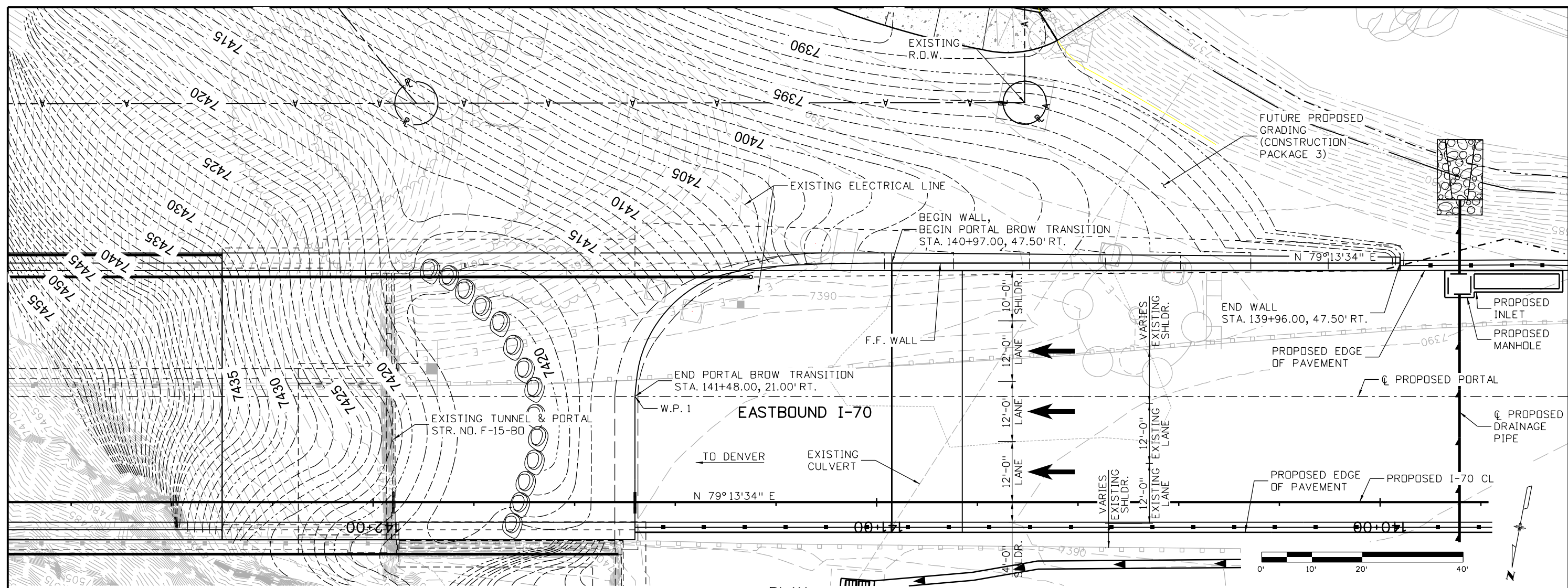
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Detailer:	E. Schawo	Subset Sheets:	P02 of 15
Sheet Subset:	PORTALS		

Project No./Code	
IM 0703-391	
19036	
Sheet Number	177

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Checked By	01-13	Checked By	01-13	Checked By	02-13



NOTES:
 1. FOR PROFILE GRADE, SEE SHEET P04.
 2. SEE SHEET P11 FOR REINFORCING SECTIONS A & B.

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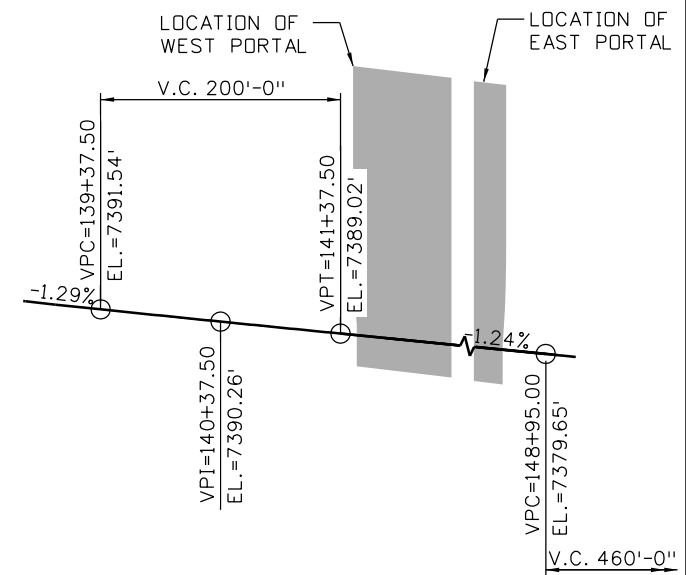
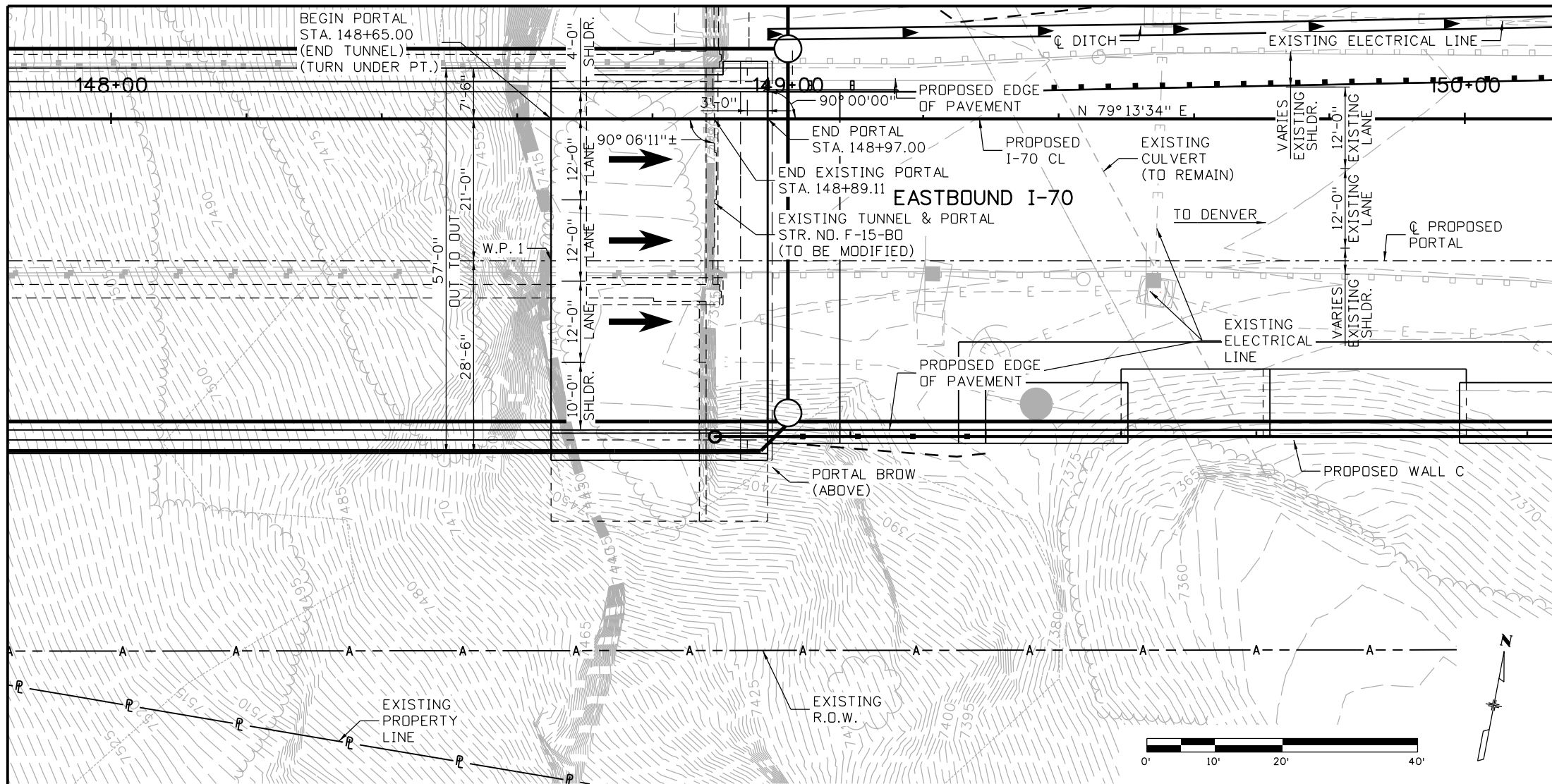
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Detailer:	E. Schawo	Subset Sheets:	P03 of 15

Project No./Code
 IM 0703-391
 19036
 Sheet Number 178



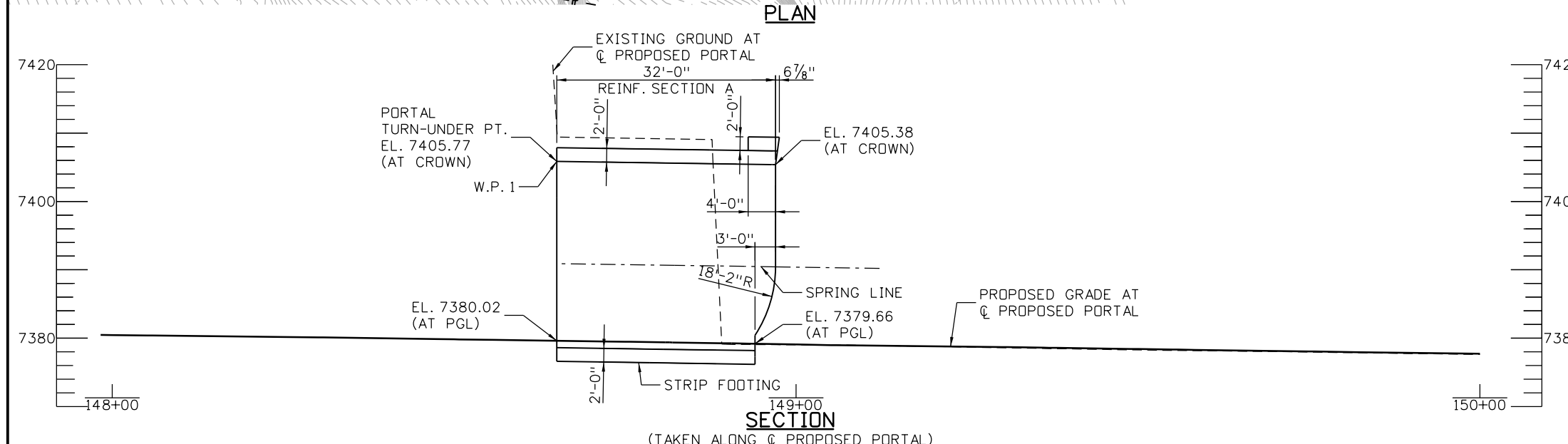
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PROFILE GRADE
(TAKEN ALONG PROPOSED I-70 CL)
NO SCALE

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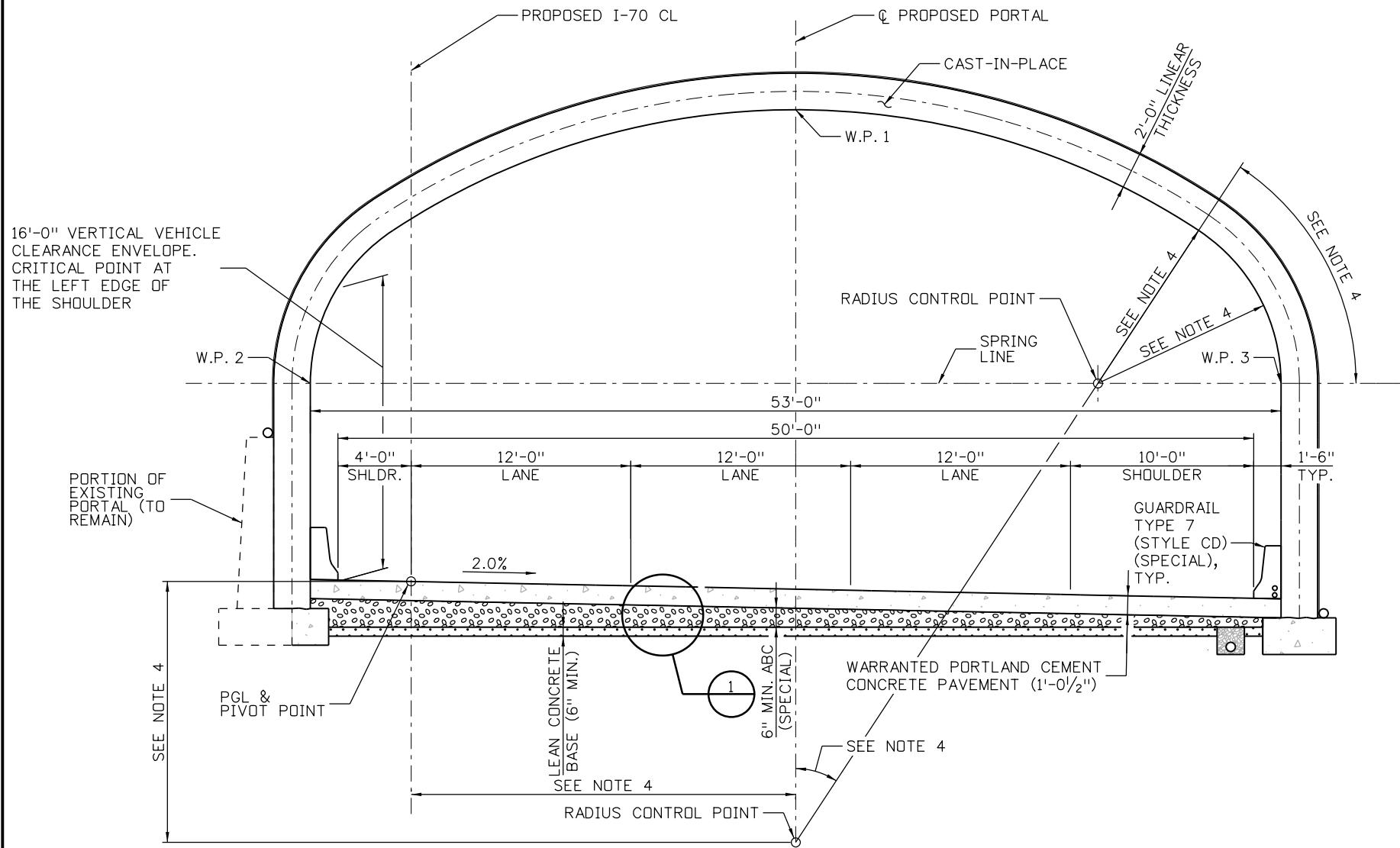


NOTES:
1. FOR SECTION A REINFORCING, SEE SHEET P11.

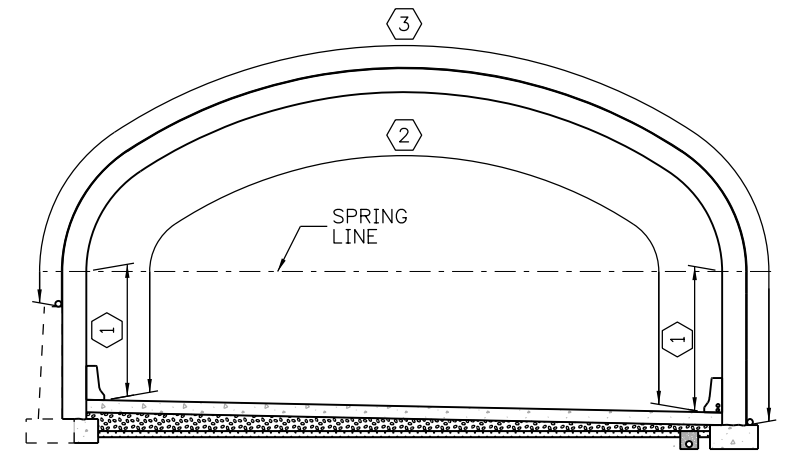
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Horiz. Scale: 1:20 Vert. Scale: 1:20					Revised:		Detailer: E. Schawo		19036	
Staff Bridge Branch - Unit 0221 STW				Region 1	Void:		Sheet Subset: PORTALS		Subset Sheets: P04 of 15	
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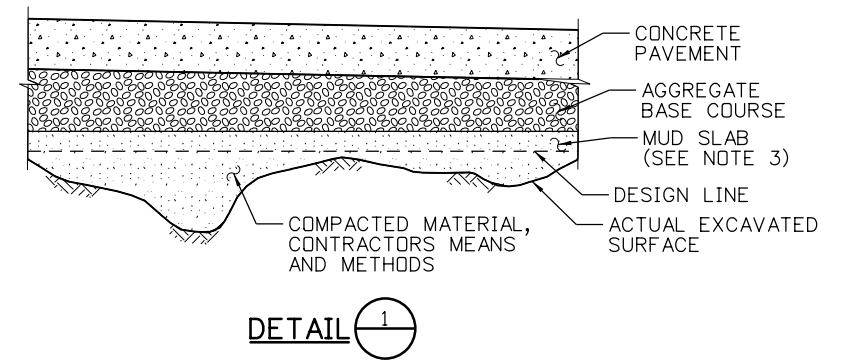
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Designed By	09-12	Detailed By	10-12	Quantities By	
Checked By		Checked By		Checked By	



TYPICAL SECTION
(LOOKING AHEAD STATION)
(WEST PORTAL SHOWN, EAST PORTAL SIMILAR EXCEPT AS NOTED)
SCALE: 1/8" = 1'-0"



COLOR COATING AND STAIN DIAGRAM
(LOOKING AHEAD STATION)
SCALE: 1/16" = 1'-0"



DETAIL 1

KEYNOTES:

- ① LIMITS OF STRUCTURAL CONCRETE COATING (WHITE), EQUIVALENT TO FEDERAL STANDARD 595B COLOR NO. 27780.
- ② LIMITS OF STRUCTURAL CONCRETE STAIN (BEIGE), EQUIVALENT TO FEDERAL STANDARD 595B COLOR NO. 30372, FROM STATIONS 139+96.00 TO 141+58.00 TO AND STATIONS 148+87.00 TO 148+97.00.
- ③ LIMITS OF CONCRETE SEALER.


NOTES:

- 1. ROADWAY CROSS SLOPE TO BE ACHIEVED WITH FINAL CONCRETE PAVEMENT SLAB.
- 2. REFER TO TUNNEL PLANS FOR DETAILS AT BARRIER AND CONDUIT.
- 3. LEAN CONCRETE MUD SLAB TO BE FRACTURED AT LOCATIONS DETERMINED IN THE FIELD BY THE ENGINEER PRIOR TO PLACEMENT OF AGGREGATE BASE COURSE.
- 4. REFER TO TUNNEL PLANS FOR EXACT DIMENSIONING.

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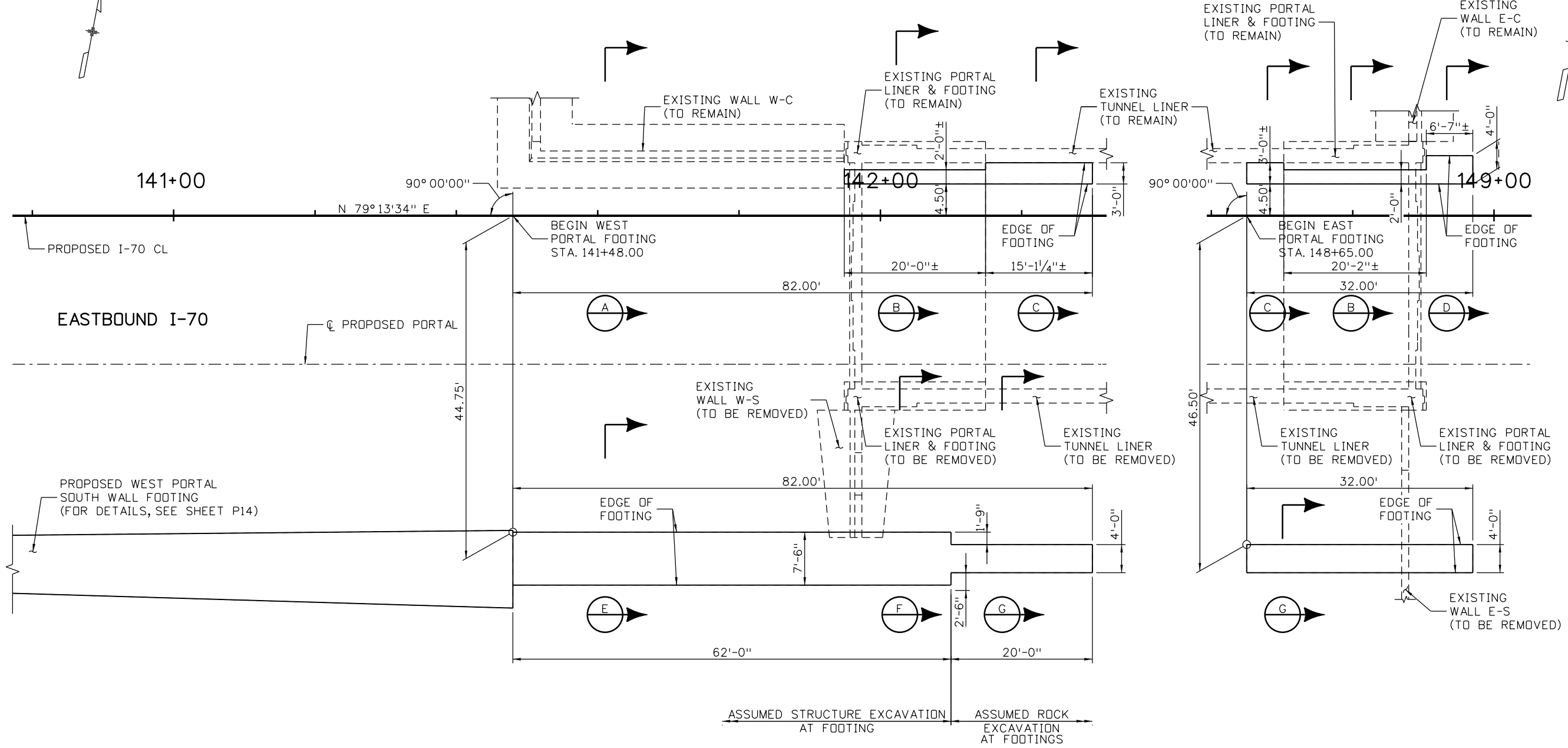
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TUNNEL PORTALS TYPICAL SECTION			
Designer:	K. Saindon	Structure	F-15-B0
Detailer:	E. Schawo	Numbers	
Sheet Subset:	PORTALS	Subset Sheets:	P05 of 15

Project No./Code
IM 0703-391
19036
Sheet Number 180



WEST PORTAL
EAST PORTAL
FOUNDATION LAYOUT

- NOTES:**
1. FOR EXCAVATION SECTIONS "B" THROUGH "G", SEE SHEET P08.
 2. FOR REINFORCING SECTIONS "A" THROUGH "G", SEE SHEET P12.

Design		Detail		Quantities	
INITIAL	DATE	INITIAL	DATE	INITIAL	DATE
Designed By	09-12	Detailed By	10-12	Quantities By	
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TUNNEL PORTALS FOUNDATION LAYOUT			
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Detailer:	E. Schawo	Subset Sheets:	P06 of 15
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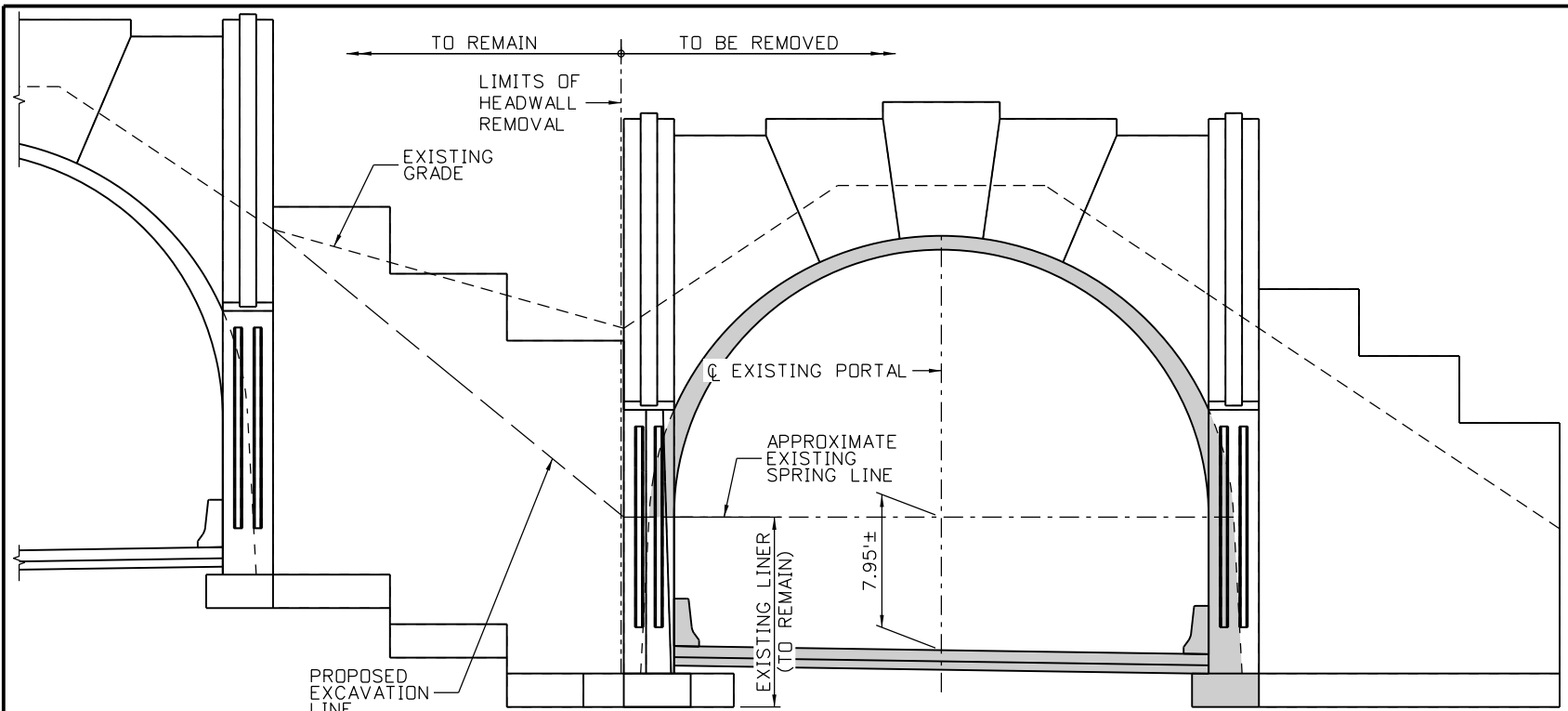
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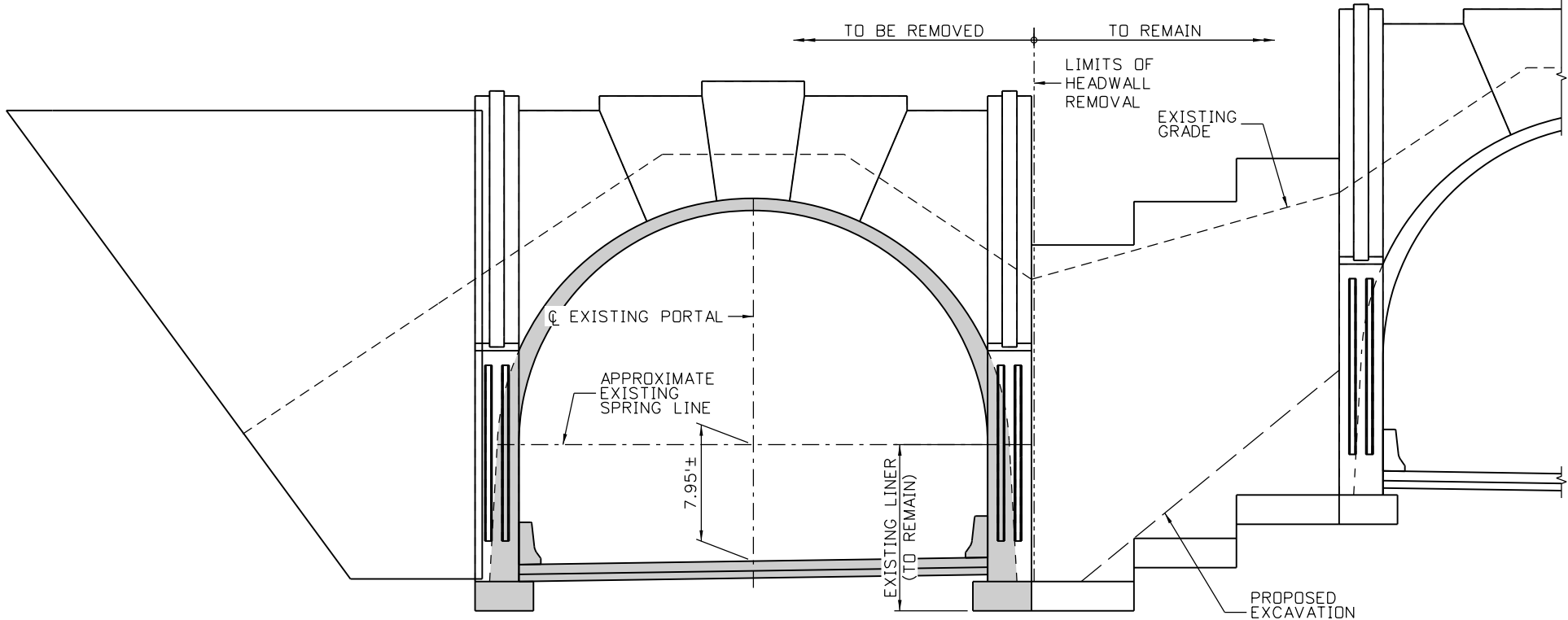
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WEST PORTAL ELEVATION
(LOOKING AHEAD STATION)
SCALE: 1/8" = 1'-0"



EAST PORTAL ELEVATION
(LOOKING BACK STATION)
SCALE: 1/8" = 1'-0"

LEGEND:

INDICATES PORTION OF EXISTING PORTAL LINING AND FOOTING TO BE REMOVED.

NOTES:

- CONTRACTOR'S DEMOLITION ACTIVITIES SHALL COMPLY WITH THE LATEST VERSION OF THE "TWIN TUNNELS WIDENING ROADWAY AND LANE CLOSURE STRATEGY".

Design		Detail		Quantities	
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Checked By		Checked By		Checked By	

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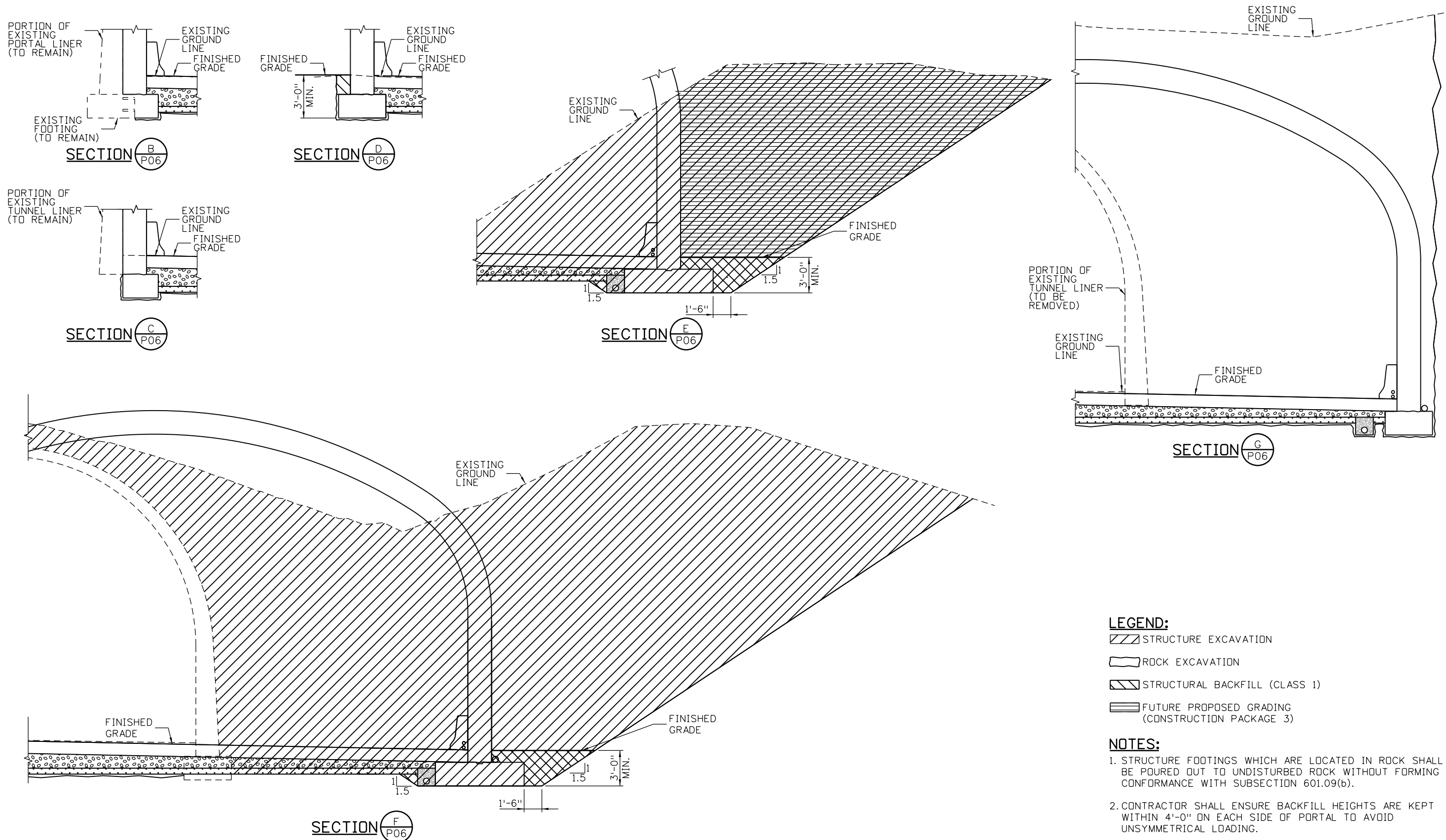
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Detailer:	E. Schawo	Subset Sheets:	P07 of 15
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Project No./Code	IM 0703-391
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Sheet Number	182

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Design		Detail		Quantities	
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Designed By	RCS/MG	11-12	11-12	Checked By	
Checked By		Checked By		Checked By	



- LEGEND:**
- STRUCTURE EXCAVATION
 - ROCK EXCAVATION
 - STRUCTURAL BACKFILL (CLASS 1)
 - FUTURE PROPOSED GRADING (CONSTRUCTION PACKAGE 3)
- NOTES:**
1. STRUCTURE FOOTINGS WHICH ARE LOCATED IN ROCK SHALL BE POURED OUT TO UNDISTURBED ROCK WITHOUT FORMING IN CONFORMANCE WITH SUBSECTION 601.09(b).
 2. CONTRACTOR SHALL ENSURE BACKFILL HEIGHTS ARE KEPT WITHIN 4'-0" ON EACH SIDE OF PORTAL TO AVOID UNSYMMETRICAL LOADING.

Print Date: 3/7/2013

File Name: 18832BRDG_Portal_FtgExcav01.dgn

Horiz. Scale: AS NOTED Vert. Scale: AS NOTED

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Date:	Comments	Init.

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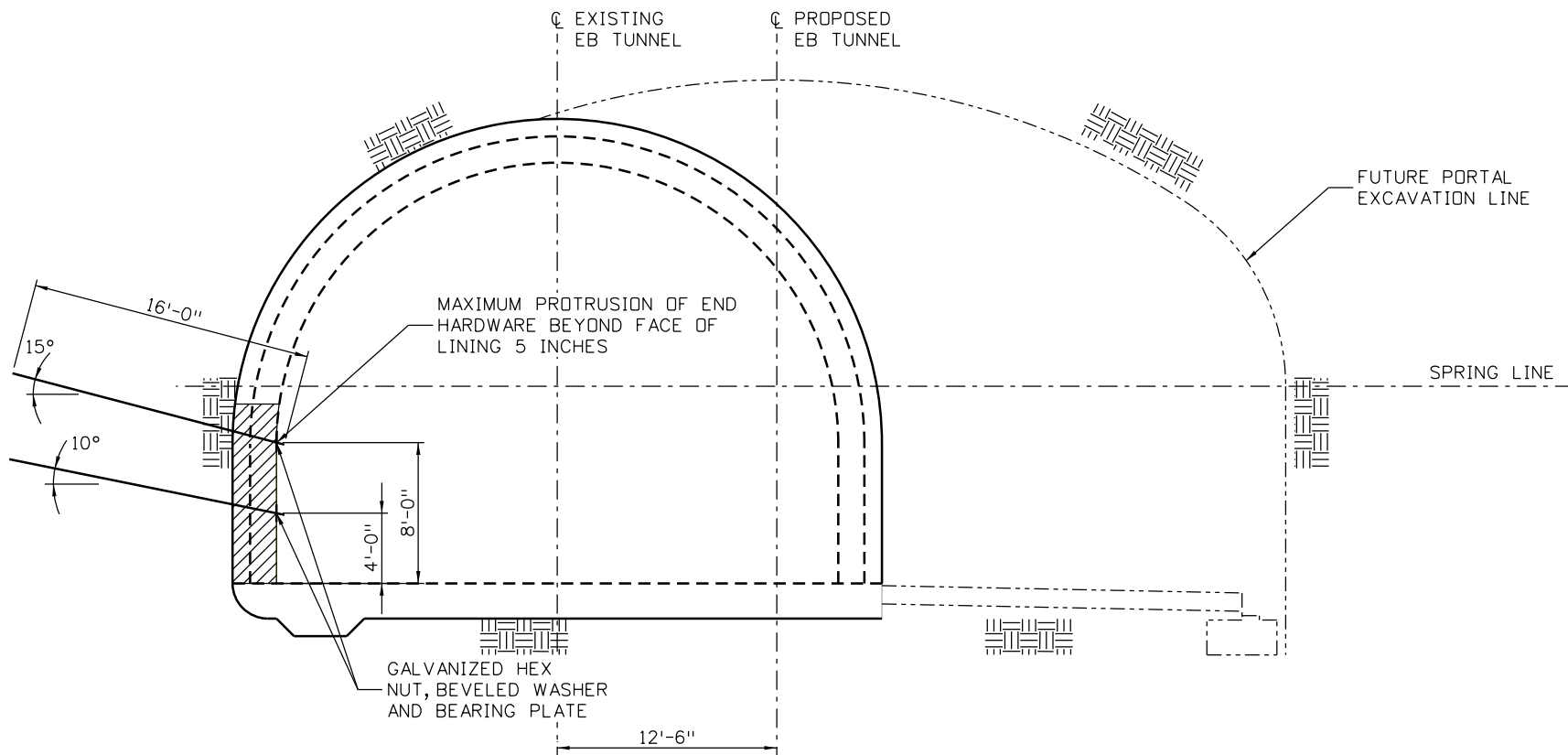
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Region 1 CRC

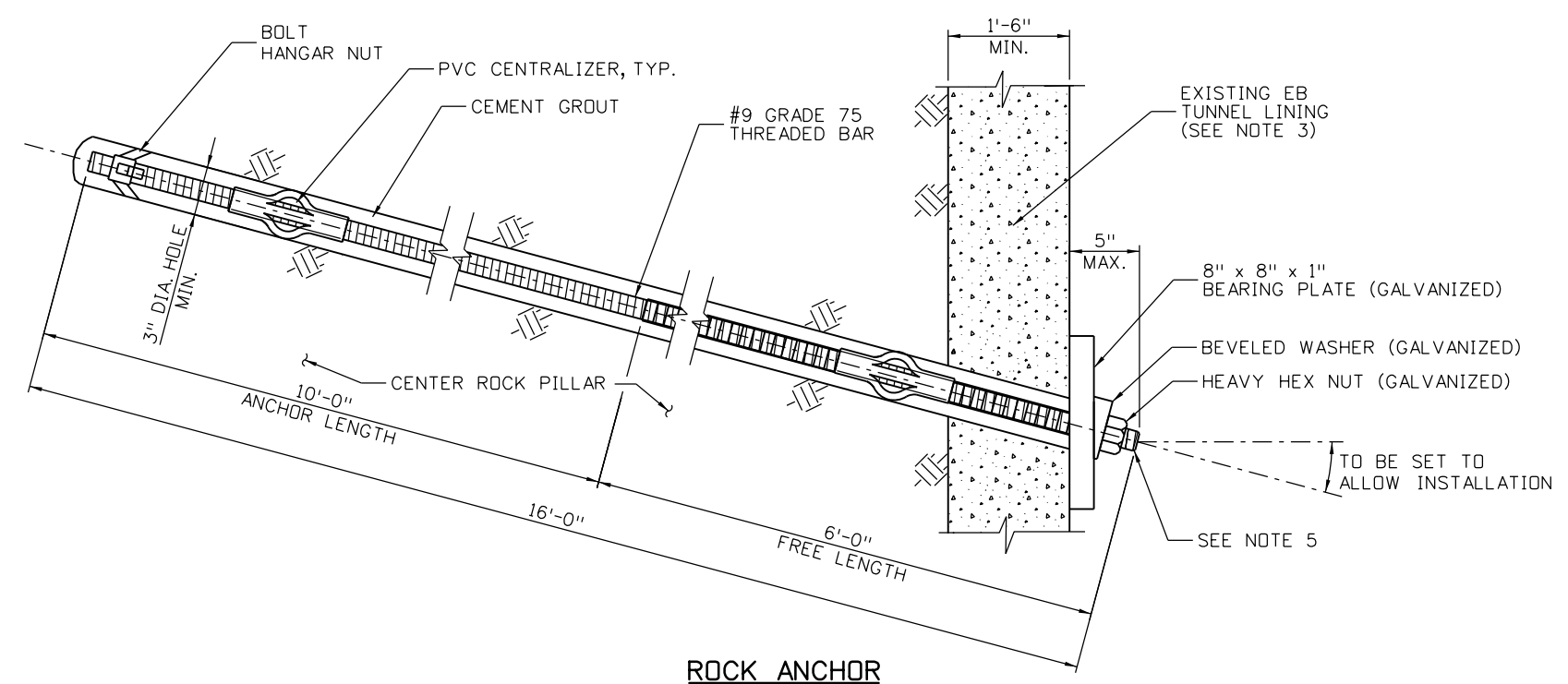
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Revised:
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TUNNEL PORTALS PORTAL FOOTING EXCAVATION AND BACKFILL			
Designer:	K. Saindon	Structure	F-15-B0
Detailer:	E. Schawo	Numbers	
Sheet Subset:	PORTALS	Subset Sheets:	P08 of 15

Project No./Code
IM 0703-391
19036
Sheet Number 183



PRE-INSTALLED ROCK ANCHORS IN PILLAR
(LOOKING AHEAD STATION AT WEST PORTAL)



ROCK ANCHOR
(CEMENT GROUT SHOWN)

ROCK ANCHOR SCHEDULE		
ANCHOR ID		LOCATION (STA.)
WPA-U-01	WPA-L-01	148+98
WPA-U-02	WPA-L-02	142+03
WPA-U-03	WPA-L-03	142+08
WPA-U-04	WPA-L-04	142+13
WPA-U-05	WPA-L-05	142+18
WPA-U-06	WPA-L-06	142+23
WPA-U-07	WPA-L-07	142+28

TABULATION OF QUANTITIES			
ITEM	DESCRIPTION	UNIT	QTY
211	PILLAR #9x16 FT, GRADE 75 DOWEL, CEMENT OR RESIN GROUTED	EA	14

- NOTES:**
- UTILIZE PROBE HOLES TO CONFIRM ANCHOR LOCATION IS CLEAR OF STEEL.
 - DRILLED HOLES MAY ENCOUNTER STEEL ELEMENTS EMBEDDED IN THE LINING AND ROCK INCLUDING STEEL RIBS, STEEL ANGLES USED AS COLLAR BRACES BETWEEN RIBS, AND ROCK BOLTS. SEE REFERENCE AS-BUILT DRAWINGS FOR PROJECT I-70-3(2)251. AS BUILT SHEET 2 INDICATES 10" X 8" WF 39 LB/FT STEEL SETS ON 4FT CENTERS WITH 4" ANGLE SPREADERS AT 6' MAX SPACING.
LONGITUDINAL REINFORCEMENT #5 @ 18"
TRANSVERSE REINFORCEMENT #6 @ 8"
 - EXISTING STEEL SETS AND REINFORCEMENT NOT SHOWN. CONTRACTOR MAY ADJUST DOWEL LOCATION TO AVOID STEEL.
 - TENSION NUT TO 15 KIP AFTER ANCHOR LENGTH IS ACTIVE.
 - GALVANIZE ALL EXPOSED END HARDWARE.
 - HOLE DIAMETER AND ANCHOR LENGTH MAY BE ADJUSTED FOR RESIN GROUT.

Design		Detail		Quantity	
DATE	INITIAL	DATE	INITIAL	DATE	INITIAL
02-13	KCS	02-13	ERS	02-13	ERS
Checked By		Checked By		Checked By	

Print Date: 3/8/2013
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 Horiz. Scale: NONE Vert. Scale: NONE
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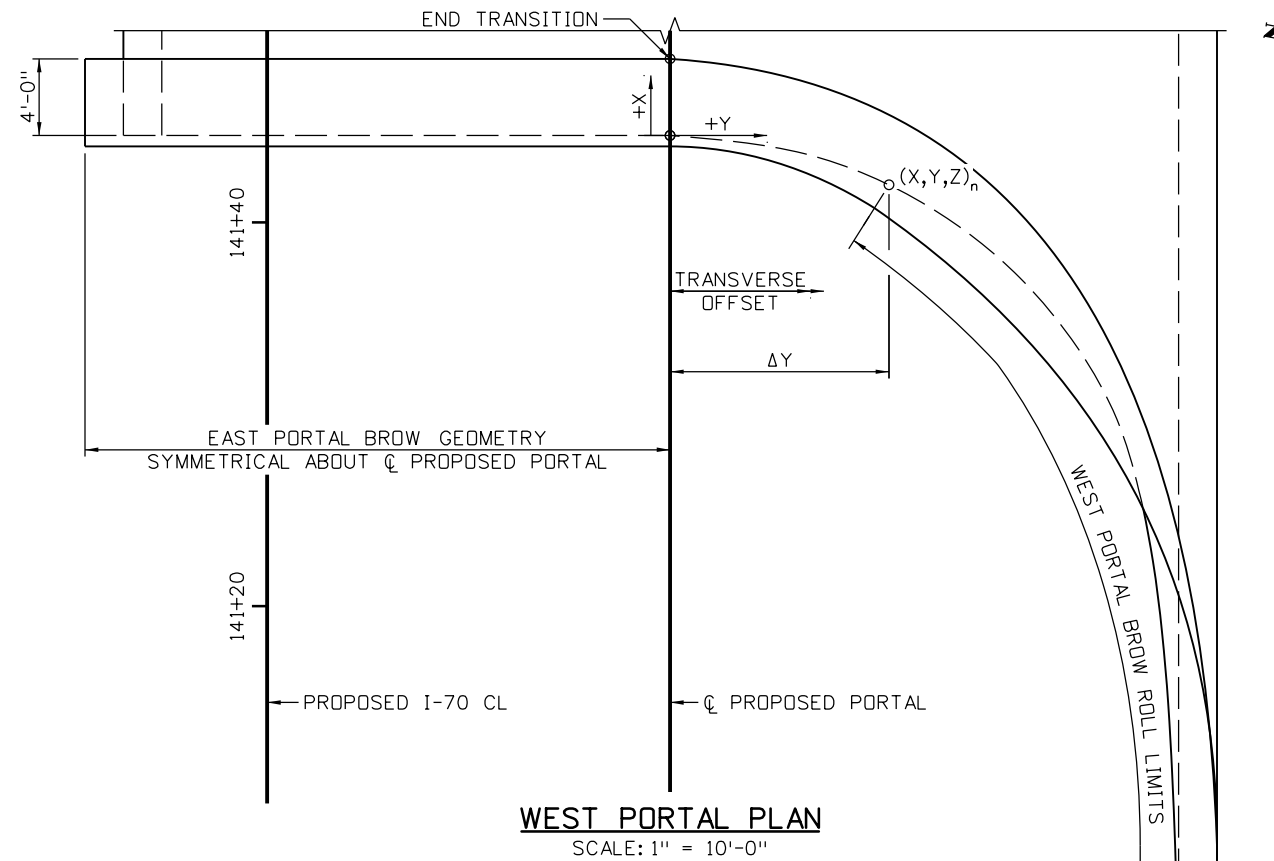
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No Revisions:	Designer: K. Saindon	Structure Numbers: F-15-B0
Revised:	Detailer: E. Schawo	
Void:	Sheet Subset: PORTALS	Subset Sheets: P09 of 15

Project No./Code
IM 0703-391
19036
Sheet Number 184

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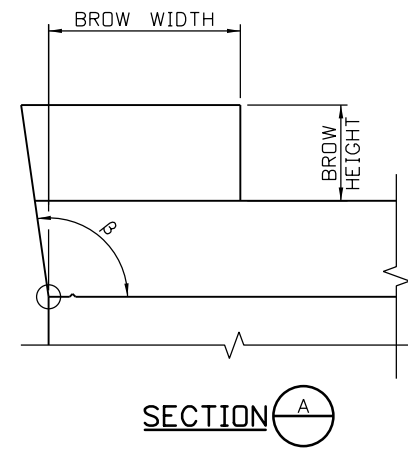
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INITIAL	DATE	INITIAL	DATE	INITIAL	DATE
Designed By	KCS	11-12	Checked By	Checked By	
Checked By			Checked By	Checked By	



WEST PORTAL PLAN
SCALE: 1" = 10'-0"

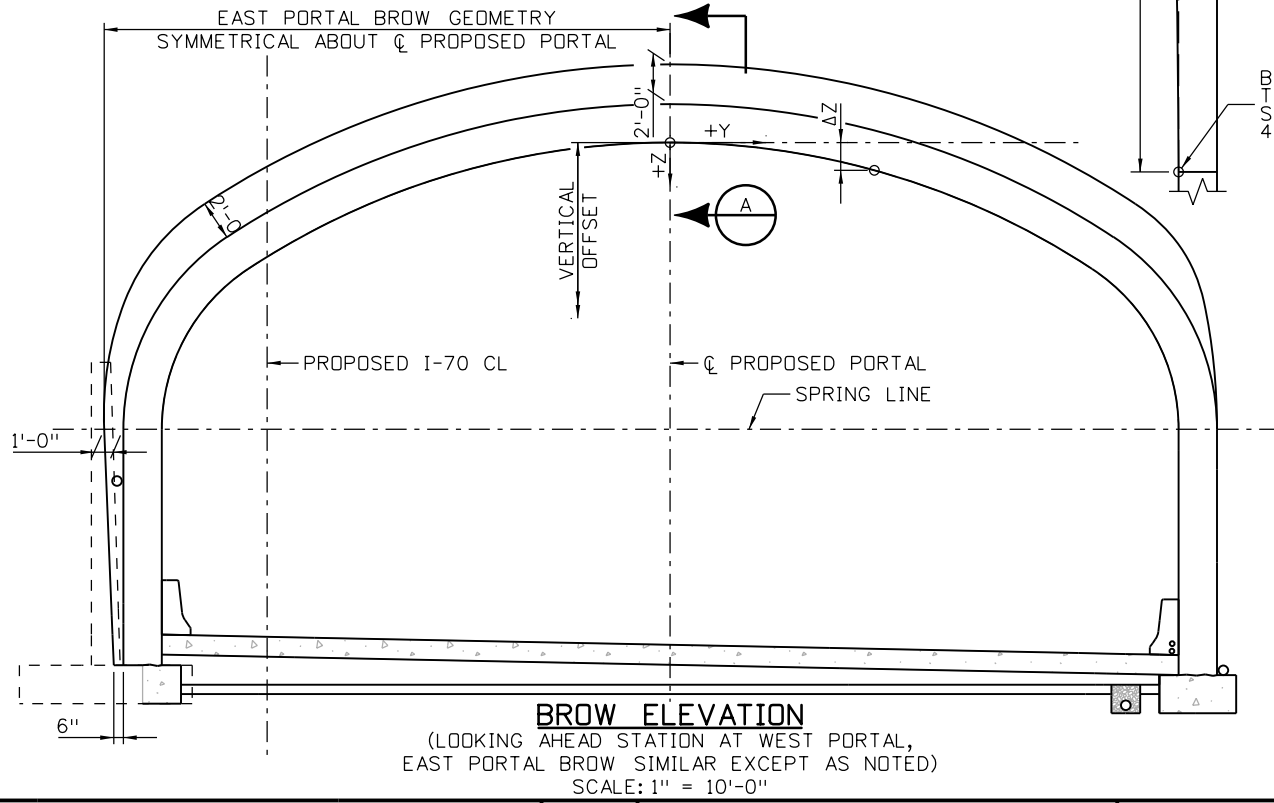
SPIRAL AND BROW TRANSITION GEOMETRY

STATION	TRANSVERSE OFFSET (FT)	VERTICAL OFFSET (FT)	ΔX	ΔY	ΔZ	SEGMENT LENGTH (FT)	CUMULATIVE LENGTH (FT)	Δβ (DEGREE)	β (DEGREE)	BROW HEIGHT (FT)	BROW WIDTH (FT)
140+97.00	26.500	14.945	0.000	0.000	0.000	0.000	0	0	0	0.00	0.00
141+00.50	26.482	14.496	3.500	-0.018	-0.449	3.529	3.53	5.13	5.13	0.00	0.00
141+04.00	26.453	14.034	3.500	-0.029	-0.462	3.530	7.06	5.13	10.25	0.00	0.00
141+07.50	26.400	13.544	3.500	-0.053	-0.490	3.535	10.59	5.13	15.39	0.25	0.00
141+11.00	26.312	13.013	3.500	-0.088	-0.531	3.541	14.13	5.14	20.53	0.50	0.00
141+14.70	26.167	12.385	3.700	-0.145	-0.628	3.756	17.89	5.46	25.99	0.75	0.25
141+18.40	25.954	11.685	3.700	-0.213	-0.700	3.772	21.66	5.48	31.47	1.00	1.00
141+22.10	25.634	10.875	3.700	-0.320	-0.810	3.801	25.46	5.52	36.99	1.25	1.50
141+25.80	25.160	9.945	3.700	-0.474	-0.930	3.844	29.31	5.58	42.57	1.50	2.00
141+29.50	24.432	8.855	3.700	-0.728	-1.090	3.925	33.23	5.70	48.27	1.75	2.50
141+33.20	23.281	7.595	3.700	-1.151	-1.260	4.075	37.31	5.92	54.19	2.00	3.00
141+36.90	21.256	6.115	3.700	-2.025	-1.480	4.470	41.78	6.49	60.69	2.00	3.50
141+40.60	18.209	4.385	3.700	-3.047	-1.730	5.096	46.87	7.40	68.09	2.00	4.00
141+44.30	13.479	2.335	3.700	-4.730	-2.050	6.346	53.22	9.22	77.31	2.00	4.00
141+47.04	7.044	0.625	2.739	-6.435	-1.710	7.200	60.42	10.46	87.76	2.00	4.00
141+48.00	0.000	0.000	0.961	-7.044	-0.625	7.137	67.56	10.37	98.13	2.00	4.00



SECTION A

BEGIN TRANSITION
STA. 140+97.00,
47.50' RT.




BROW ELEVATION
(LOOKING AHEAD STATION AT WEST PORTAL,
EAST PORTAL BROW SIMILAR EXCEPT AS NOTED)
SCALE: 1" = 10'-0"

NOTES:

1. PORTAL-TO-WALL TRANSITION GEOMETRY IS INTENDED AS A SMOOTH FLOWING CURVE WITH GENTLE TRANSITIONS FOR ROLL ANGLE, BROW HEIGHT, AND BROW WIDTH. THE NUMBER OF DISCRETE POINTS SHOWN IN THE TABLE SHALL BE CONSIDERED THE MINIMUM CONTRACTOR SHALL USE FOR MEETING THE STATED INTENT WHEN FORMING THE TRANSITION. ADDITIONAL POINTS ARE ACCEPTABLE AND ENCOURAGED.

Print Date: 3/7/2013
 File Name: 18832BRDG_Portal_EllipseGeom01.dgn
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Date:	Comments	Init.

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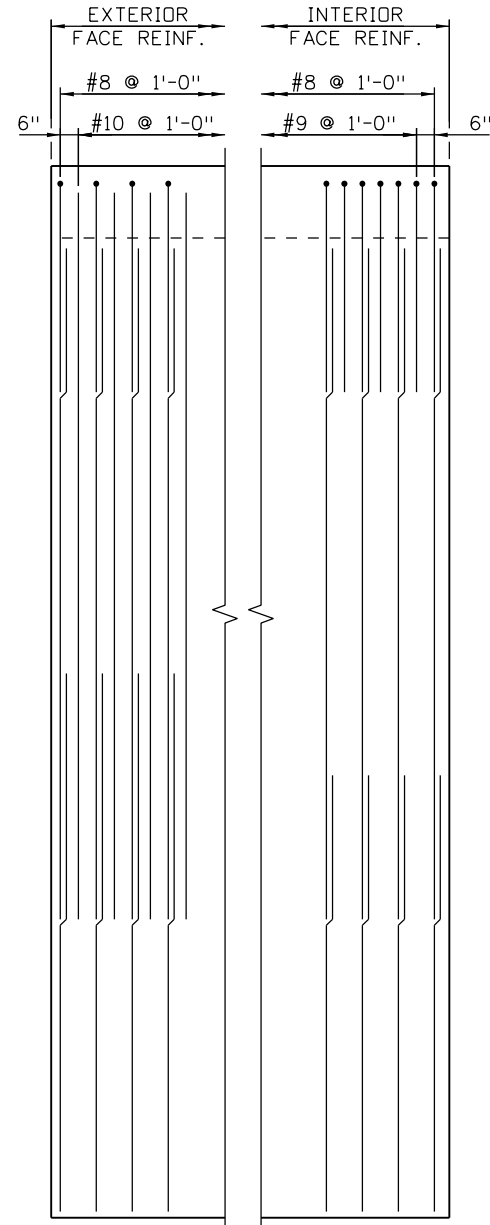
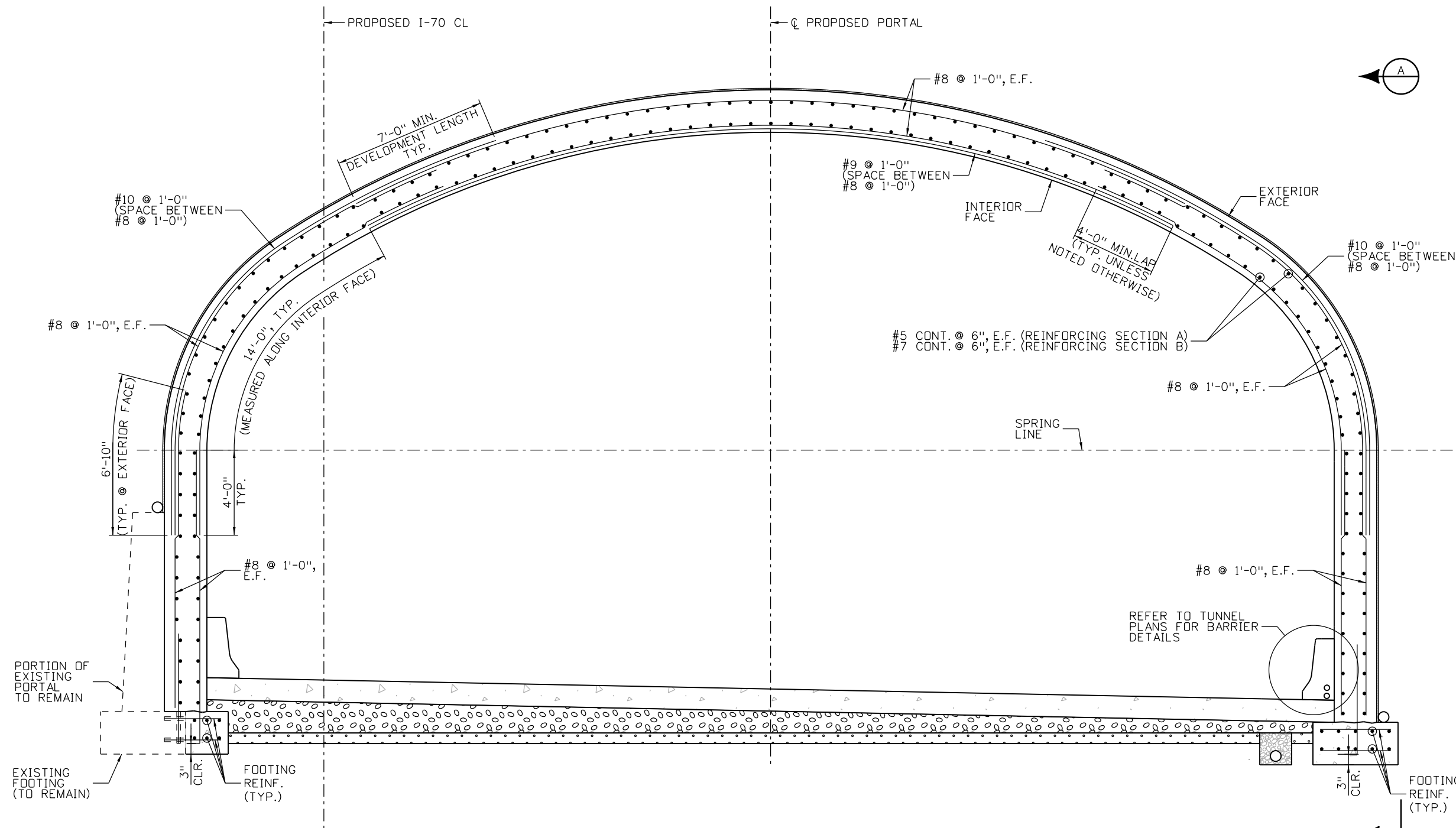
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Designer:	K. Saindon	Structure Numbers	F-15-B0
Detailer:	E. Schawo	Sheet Subset:	PORTALS
Subset Sheets: P10 of 15			

Project No./Code
IM 0703-391
19036
Sheet Number 185

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INITIAL	DATE	INITIAL	DATE	INITIAL	DATE
Designed By	KCS/MG	11-12	Checked By	Checked By	KCS/MG
Checked By			Checked By	Checked By	



TYPICAL REINFORCING SECTION
 (LOOKING AHEAD STATION)
 (WEST PORTAL AT EXISTING PORTAL SHOWN, EAST PORTAL SIMILAR)
 SCALE: 3/16" = 1'-0"

- NOTES:**
- REINFORCING STEEL SHALL HAVE A MINIMUM CONCRETE COVER OF 2 INCHES UNLESS NOTED OTHERWISE.
 - FOR FOOTING REINFORCING, SEE SHEET P12.
 - FOR DRAINAGE DETAILS, SEE SHEET P15.
 - CUT WALL AND ARCH REINFORCING AT PORTAL BROW TRANSITION AS REQUIRED.

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Date:	Comments	Init.

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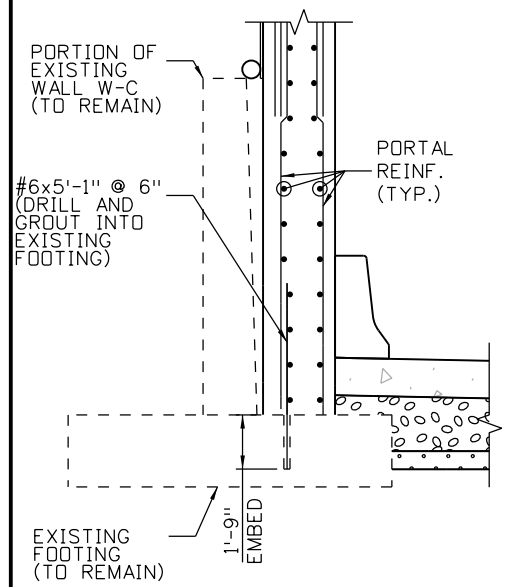
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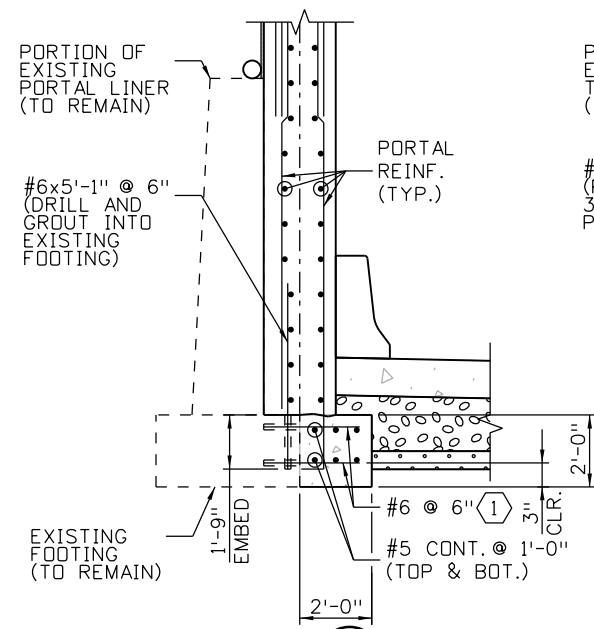
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Designer: K.Saindon/M.Guo	Structure Numbers: F-15-B0
Detailer: E. Schawo	
Sheet Subset: PORTALS	Subset Sheets: P11 of 15

Project No./Code	IM 0703-391
	19036
Sheet Number	186



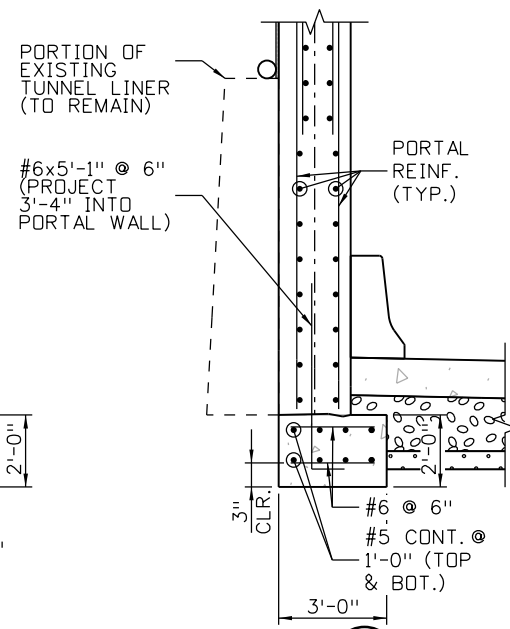
SECTION A
P06

(PORTAL FOOTING AT EXISTING WALL W-C, WEST PORTAL ONLY)
SCALE: 3/16" = 1'-0"



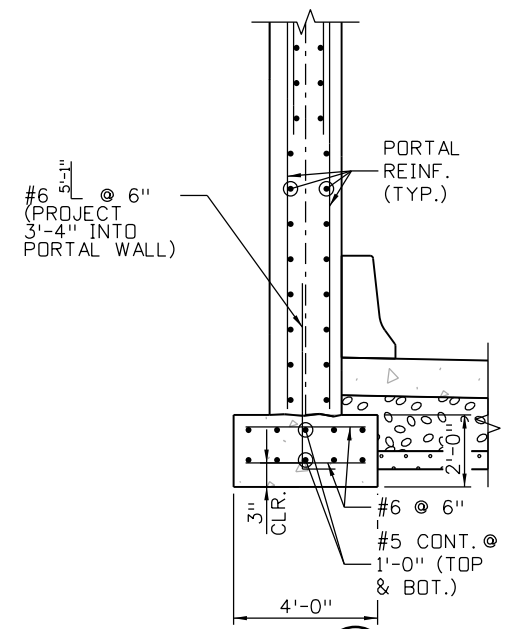
SECTION B
P06

(PORTAL FOOTING AT EXISTING PORTAL)
SCALE: 3/16" = 1'-0"



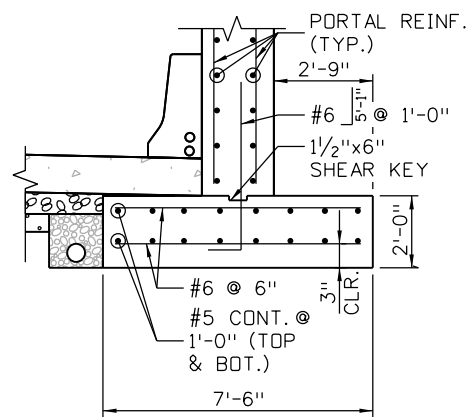
SECTION C
P06

(PORTAL FOOTING AT EXISTING TUNNEL)
SCALE: 3/16" = 1'-0"



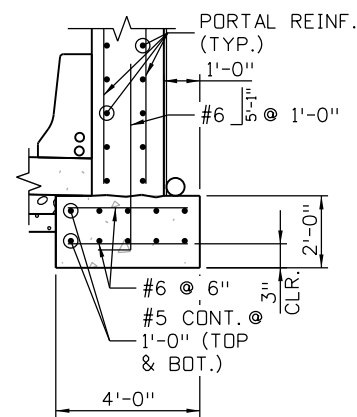
SECTION D
P06

(PORTAL FOOTING AT PROPOSED EAST PORTAL)
SCALE: 3/16" = 1'-0"



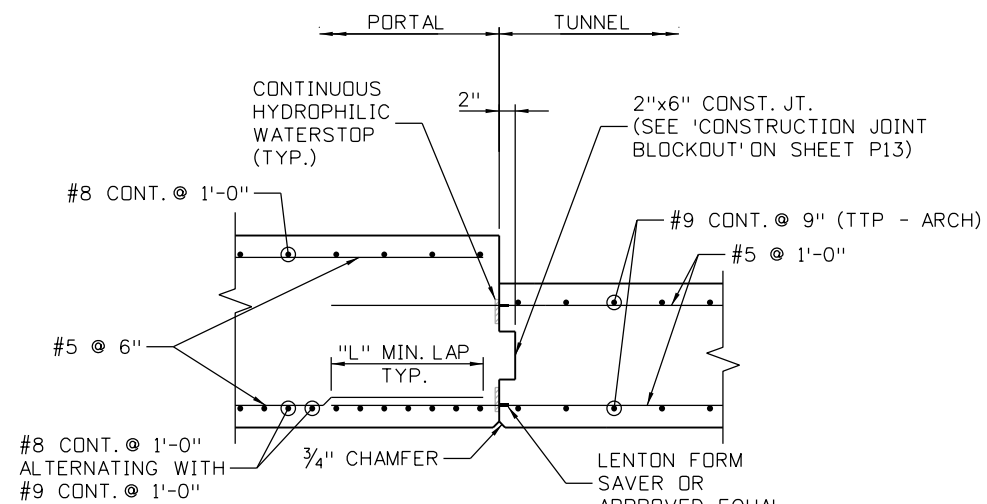
SECTION E
P06

SCALE: 3/16" = 1'-0"



SECTION F
P06

SCALE: 3/16" = 1'-0"



PORTAL TO TUNNEL CONNECTION

SCALE: 1" = 1'-0"

"L" = 1'-9" FOR #5 BLACK TUNNEL REINFORCING.
= 3'-2" FOR CLASS C SPLICE LENGTH FOR EPOXY COATED #5 REINFORCING.

KEYNOTES:

① DRILL AND GROUT 1'-0" INTO EXISTING FOOTING.

NOTES:

- REINFORCING STEEL SHALL HAVE A MINIMUM CONCRETE COVER OF 2 INCHES UNLESS NOTED OTHERWISE.
- POLYPROPYLENE FIBERS SHALL ONLY BE INCLUDED IN THE WALL AND ARCH CONCRETE.

Design	INITIAL	DATE	Quantity	INITIAL	DATE
Designed By	RCS/MG	11-12	Checked By		
Checked By			Checked By		

Print Date: 3/7/2013
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Date:	Comments	Init.

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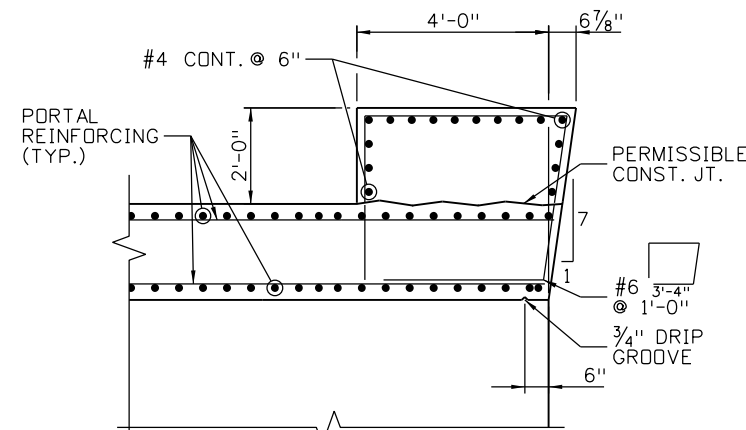
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Detailer:	E. Schawo	Numbers	
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Project No./Code
IM 0703-391
19036
Sheet Number 187

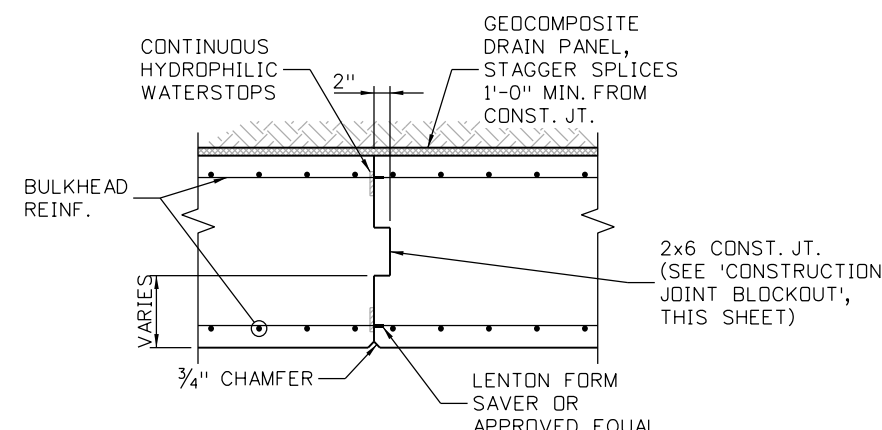
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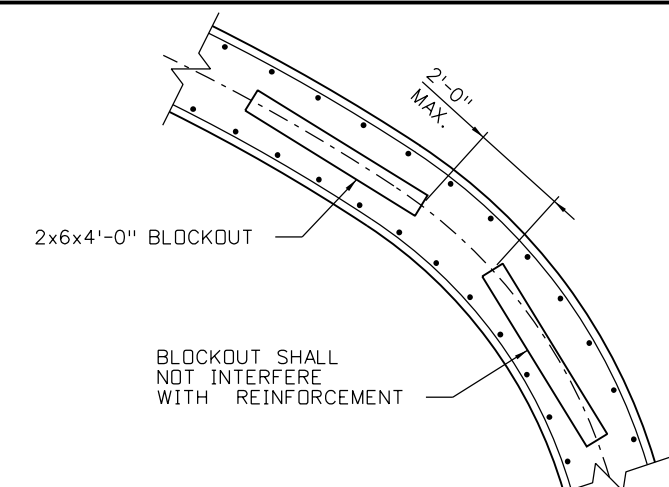
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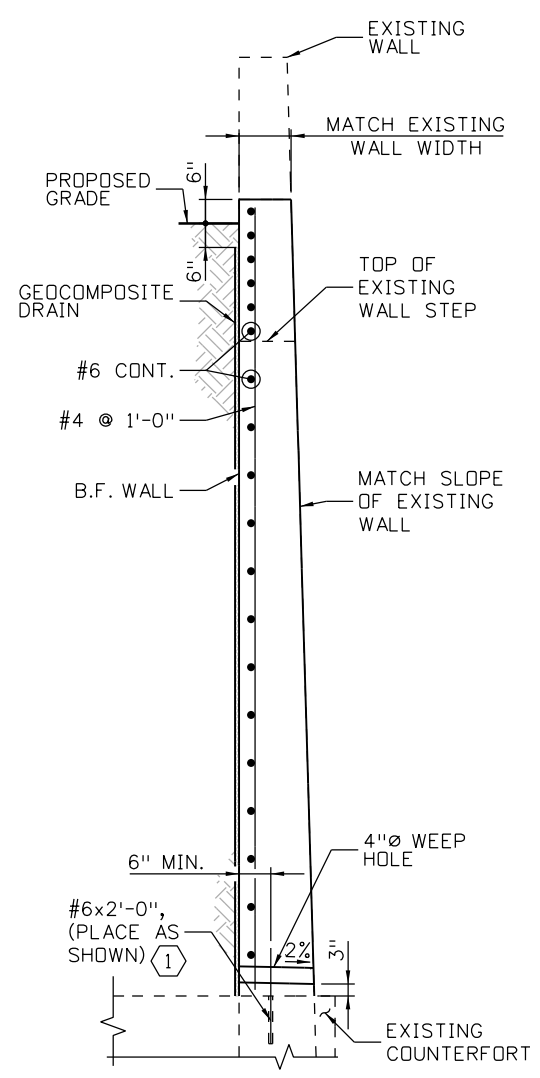
PORTAL BROW DETAIL
SCALE: 1/4" = 1'-0"



CIRCUMFERENTIAL SECTION CONSTRUCTION JOINT
(AT WALL AND ARCH)
SCALE: 1" = 1'-0"

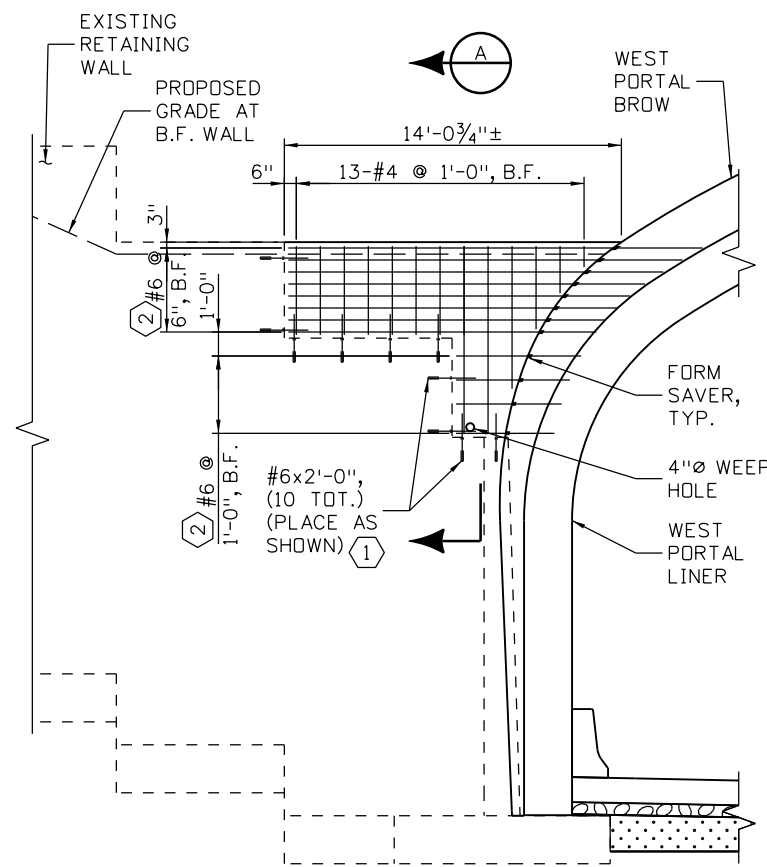


CONSTRUCTION JOINT BLOCKOUT
DRAWING IS SCHEMATIC, EQUIVALENT SPACING OF BLOCKOUTS SHALL BE PROVIDED.
NO SCALE

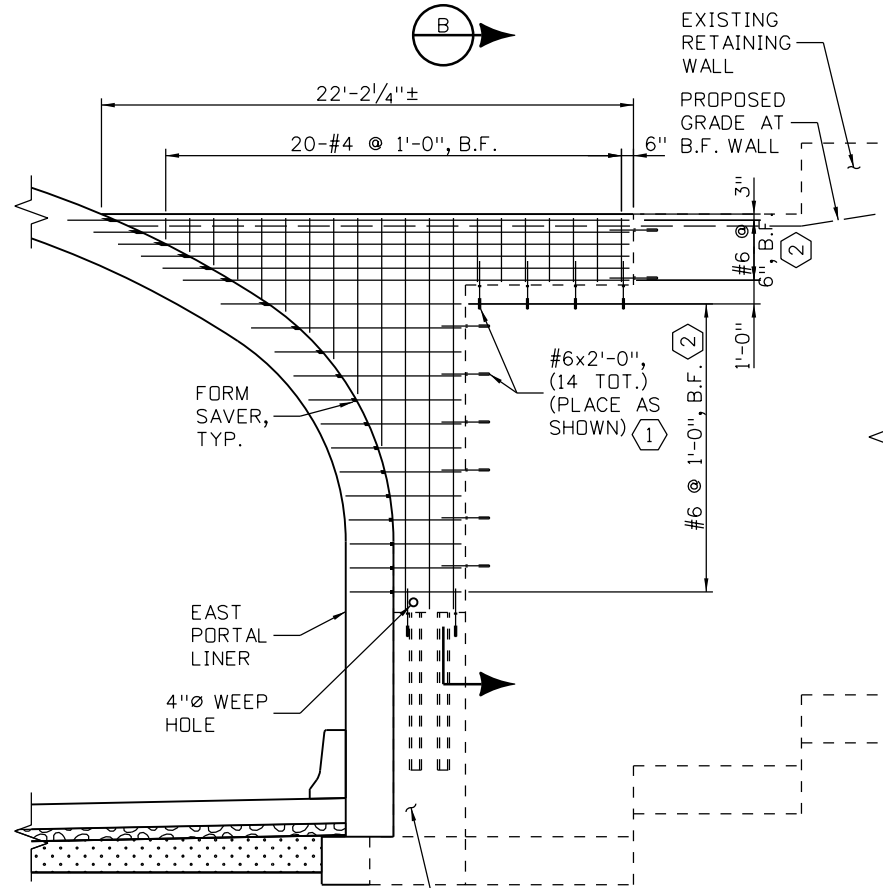


SECTION A
SCALE: 1/4" = 1'-0"

SECTION B
SCALE: 1/4" = 1'-0"



WEST PORTAL RETAINING WALL DETAIL
(LOOKING AHEAD STATION)
SCALE: 1/8" = 1'-0"



EAST PORTAL RETAINING WALL DETAIL
(LOOKING BACK STATION)
SCALE: 1/8" = 1'-0"

KEYNOTES:

- ① DRILL AND GROUT 1'-0" MIN. INTO EXISTING WALL.
- ② PROJECT 2'-0" INTO PORTAL BROW OR LINER AS SHOWN.

NOTES:

1. REINFORCING STEEL SHALL HAVE A MINIMUM CONCRETE COVER OF 2 INCHES UNLESS NOTED OTHERWISE.
2. POLYPROPYLENE FIBERS SHALL ONLY BE INCLUDED IN THE WALL AND THE ARCH CONCRETE.

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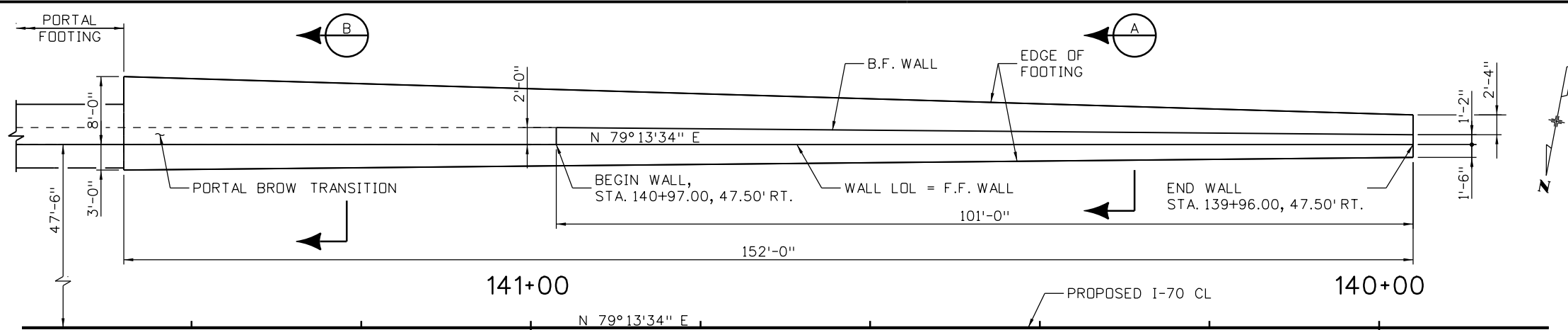
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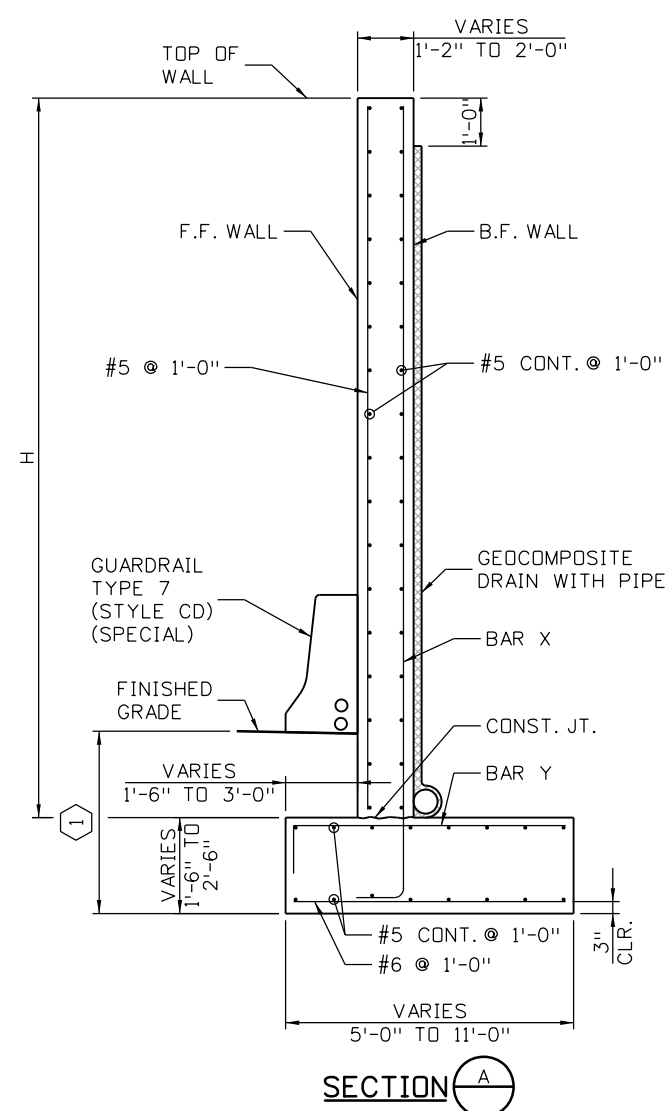
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Designer:	M. Guo	Structure Numbers	F-15-B0
Detailer:	E. Schawo	Subset Sheets:	P13 of 15
Sheet Subset:	PORTALS		

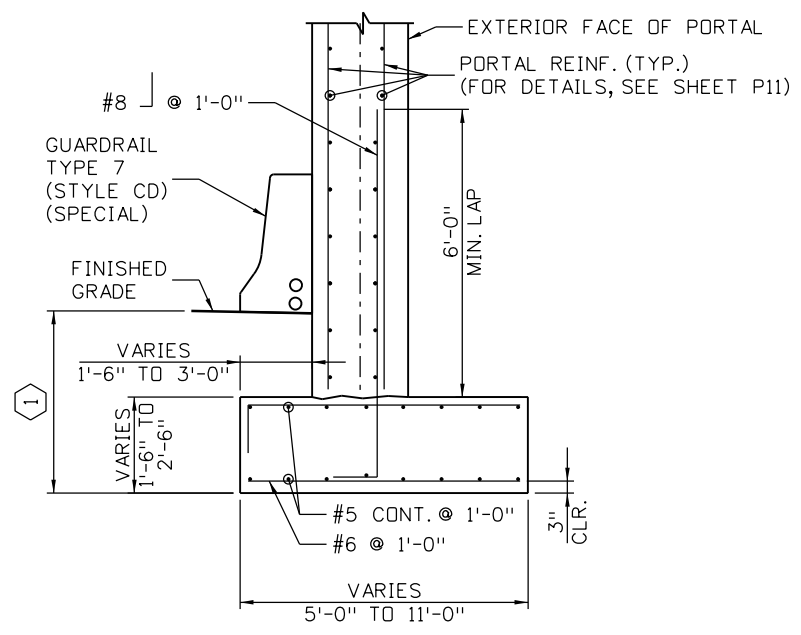
Project No./Code	
IM 0703-391	19036
Sheet Number	188



WALL FOOTING PLAN



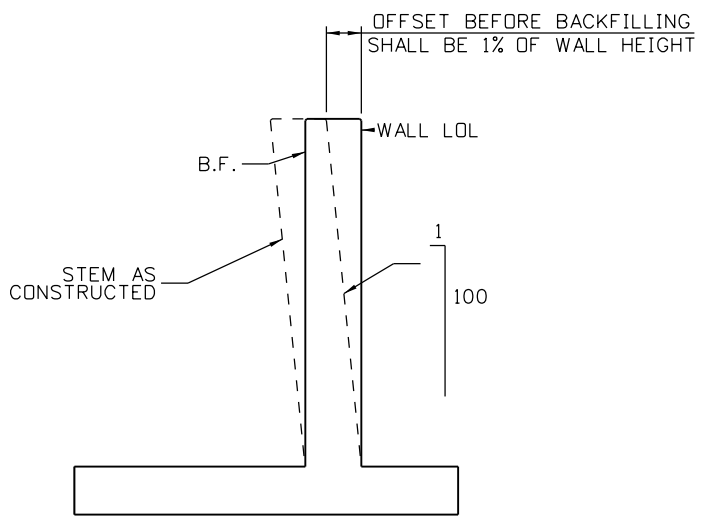
SECTION A



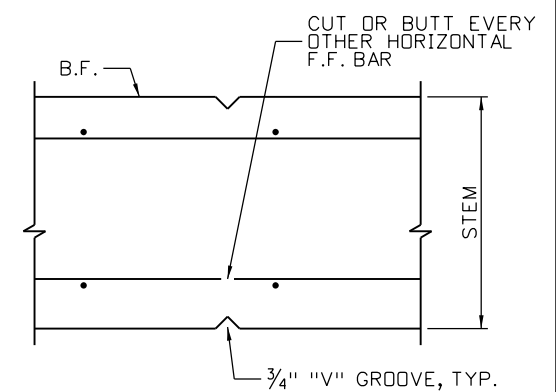
SECTION B

WEST PORTAL WALL VARIABLE TABLE

WALL STATION RANGE	DESIGN HEIGHT H (FT)	REBAR (X)	REBAR (Y)
139+96.00 TO 140+38.00	10.00	#6 @ 1'-0"	#6 @ 1'-0"
140+38.00 TO 140+90.00	15.00	#6 @ 9"	#6 @ 9"
140+90.00 TO 141+21.00	N/A	N/A	#6 @ 6"
141+21.00 TO 141+48.00	N/A	N/A	#8 @ 6"



WALL OFFSETS



WEAKENED PLANE

KEYNOTES

1 3'-0" FOR FOOTING FOUNDED ON SOIL. IF COMPETENT BEDROCK IS ENCOUNTERED, THIS DIMENSION MAY BE REDUCED AND FOOTING PLACED ON COMPETENT BEDROCK.

NOTES:

- MATERIALS AND WORK NECESSARY FOR FABRICATION AND INSTALLATION OF WATERSTOP AND EXPANSION MATERIAL SHALL NOT BE MEASURED AND PAID FOR, BUT SHALL BE INCLUDED IN ITEM 601, CONCRETE CLASS D (WALL).
- FOR WEAKENED PLANE SPACING AND LOCATION, SEE SHEET P03.
- FOR GUARDRAIL TYPE 7 (STYLE CD) (SPECIAL), SEE TUNNEL PLANS.
- FOR GEOTEXTILE DRAIN WITH PIPE DETAILS, SEE STD. PLAN M-605-1.
- COMPETENT BEDROCK ASSUMED AT STATION 142+10 AND ABOVE. CONTRACTOR SHALL FIELD VERIFY ACTUAL BEDROCK LOCATION PRIOR TO FABRICATION AND REPORT ANY DISCREPANCY TO THE ENGINEER.

Design	Checked By	DATE	MG	12-12

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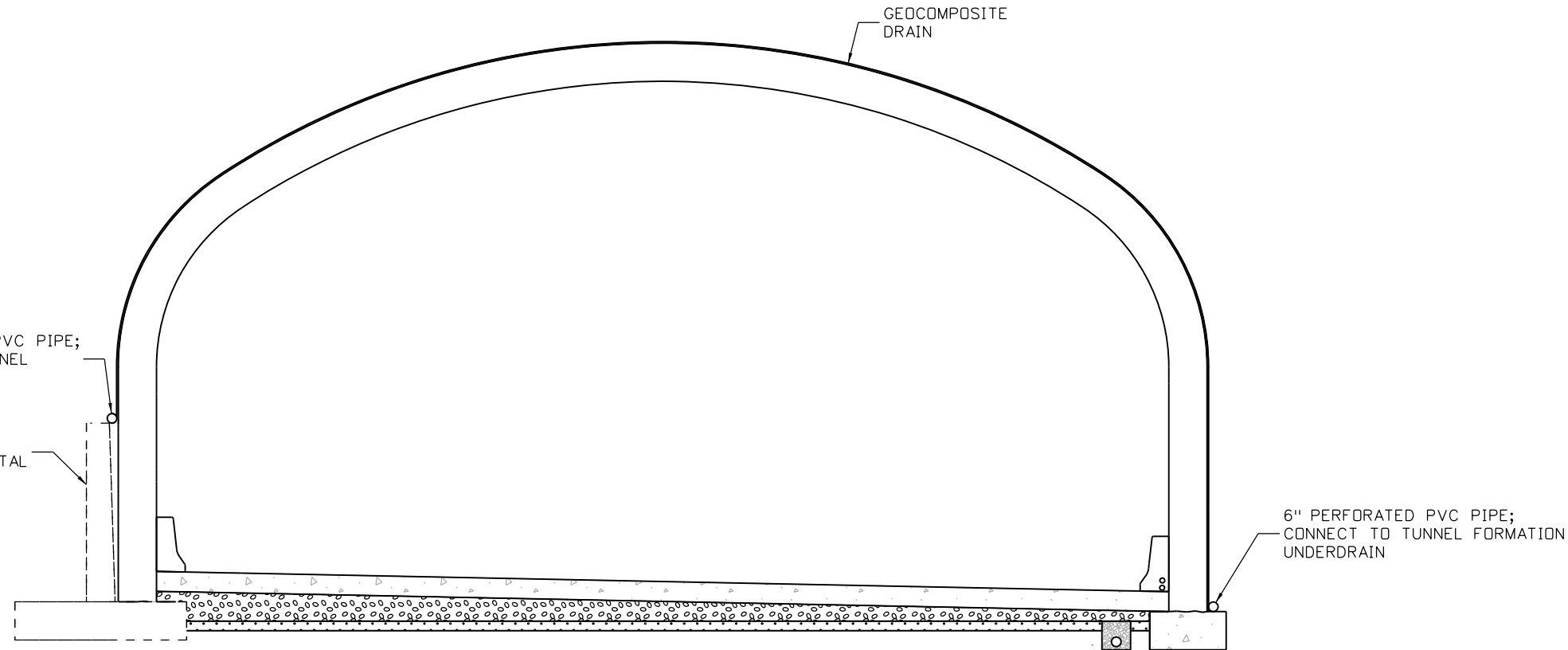
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TUNNEL PORTALS WEST PORTAL SOUTH WALL DETAILS			
Designer:	M. GUO	Structure	F-15-B0
Detailer:	E. SCHAWO	Numbers	
Sheet Subset:	PORTALS	Subset Sheets:	P14 of 15

Project No./Code
IM 0703-391
19036
Sheet Number 189



TYPICAL DRAINAGE SECTION

(LOOKING AHEAD STATION)
SCALE: 1/8" = 1'-0"

NOTES:


- SEAMS IN GEOCOMPOSITE DRAIN SHALL BE STAGGERED LONGITUDINALLY FROM WEAKENED PLANES AND/OR CONTRACTION JOINTS IN PORTAL CONCRETE SECTION.
- FOR ADDITIONAL DRAINAGE INFORMATION, SEE TUNNEL PLANS.

Design		Detail		Quantities	
INITIAL	DATE	INITIAL	DATE	INITIAL	DATE
Designed By	12-12	Detailed By	12-12	Quantities By	
Checked By		Checked By		Checked By	

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

Region 1 CRC

As Constructed
No Revisions:
Revised:
Void:

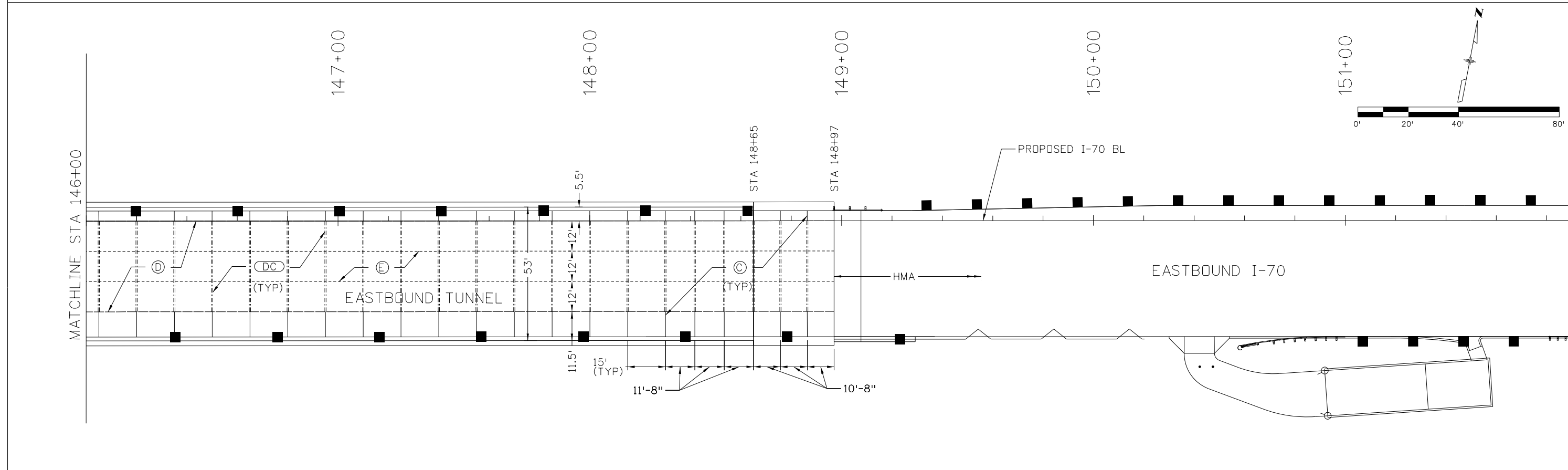
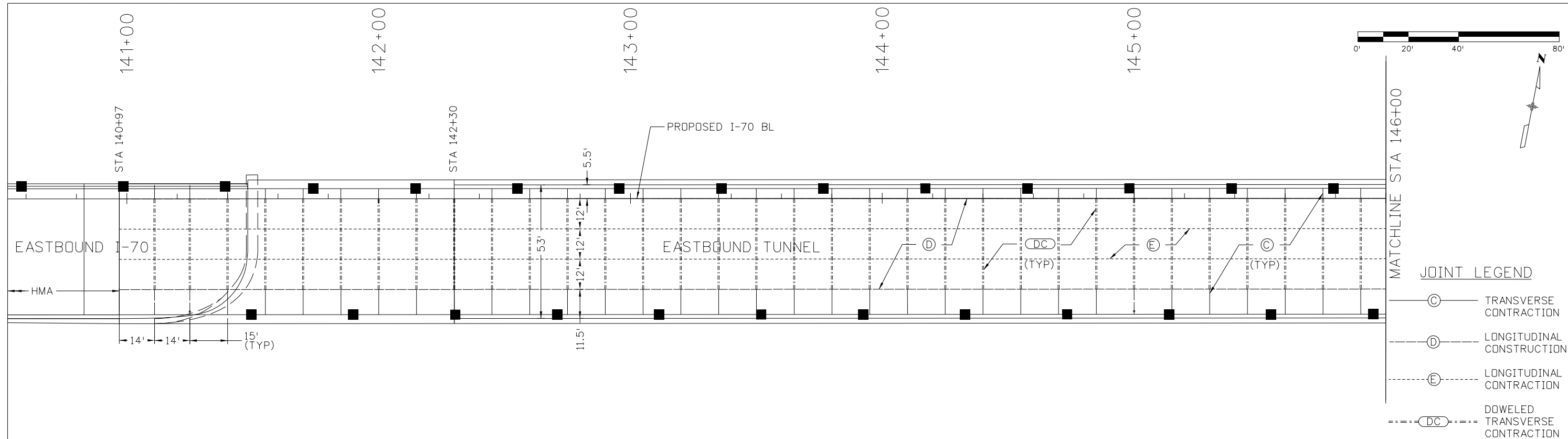
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Designer:	K. Saindon	Structure Numbers	F-15-B0
Detailer:	E. Schawo	Sheet Subset:	PORTALS
Sheet Subset: PORTALS		Subset Sheets:	P15 of 15

Project No./Code
IM 0703-391
19036
Sheet Number 190

c:\pw_work\pbesjpw1\common\dms28696\19036_CPJ_Plan_01.dgn

Design		Detail		Quantities	
DATE	INITIAL	DATE	INITIAL	DATE	INITIAL
02/13		02/13		02/13	
Designed By		Detailed By		Quantities By	
Checked By		Checked By		Checked By	

Revision Dates	
	(Preliminary Stage Only)



Print Date: 3/7/2013
 File Name: 19036_CPJ_Plan_01.dgn
 Horiz. Scale: Vert. Scale: N/A
 Unit Information Unit Leader Initials

ATKINS **PARSONS BRINCKERHOFF**

Sheet Revisions		
Date:	Comments	Init.

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

I-70 TWIN TUNNELS
 CONCRETE PAVEMENT JOINT PLAN
 EASTBOUND TUNNEL

Designer:	LMN	Structure Numbers	
Detailer:	JMG	Subset Sheets:	CP 1 of 1
Subset:	TUNNEL DRN CP2		

Project No./Code	IM 0703-391
	19036
Sheet Number	191

GonzalesJ 11:54:16 AM c:\pw...work\pbesjpw\...common\dms28696\19036_Underdrain and Drainage Tabulation.dgn

Revision Dates	(Preliminary Stage Only)
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Design	INITIAL	DATE	Designed By	Checked By
Detail	INITIAL	DATE	Detailed By	Checked By
Quantities	INITIAL	DATE	Quantities By	Checked By

TABULATION OF TUNNEL UNDERDRAIN AND DRAINFIELD QUANTITIES

STATION	TO	STATION	SIDE	● REMOVAL OF MANHOLE EACH	REMOVAL OF PIPE LIN FT	8 INCH PLASTIC PIPE LIN FT	8 INCH FLEXIBLE PIPE LIN FT	6 INCH PERF PIPE UNDERDRAIN (SPECIAL) LIN FT	MANHOLE (SPECIAL) EACH	VALVE BOX (SPECIAL) EACH	■ FOR INFORMATION ONLY					REMARKS	
											STRUCTURE EXCAVATION CU YD	STRUCTURE BACKFILL (CLASS 1) CU YD	STRUCTURE BACKFILL (CLASS 2) CU YD	STRUCTURE BACKFILL (SPECIAL) CU YD	FILTER MATERIAL (CLASS A) CU YD		EMBANKMENT MATERIAL CU YD
141+25			RT							1							
141+25	TO	145+00	RT					375					29				
141+95	TO	149+35	RT		740											EXIST EB UNDERDRAIN, PLUG HOLE AT EXIST CBC	
145+00			RT							1							
145+00	TO	149+00	RT					400					31				
148+93	TO	149+03	LT	1	10				1		9	6				MH U1, PLUG HOLE AT EXIST CBC	
149+00			LT			57					17	1	4		12	LATERAL A	
149+00			LT						1		9	6				MH U2	
149+00			RT			47					10	1	3		6	LATERAL A	
149+00			RT						1		10	7				MH U3	
149+00	TO	150+30	RT			125					27	2	9		16		
150+30			RT						1		13	9				MH U4	
150+30			RT			27					8	1	2		6		
150+30			RT				150				45			26	17	DRAINFIELD PIPE (30 FT + 4 @ 30 FT)	
TOTALS				1	750	256	150	775	4	2	148	33	18	60	26	57	

NOTES

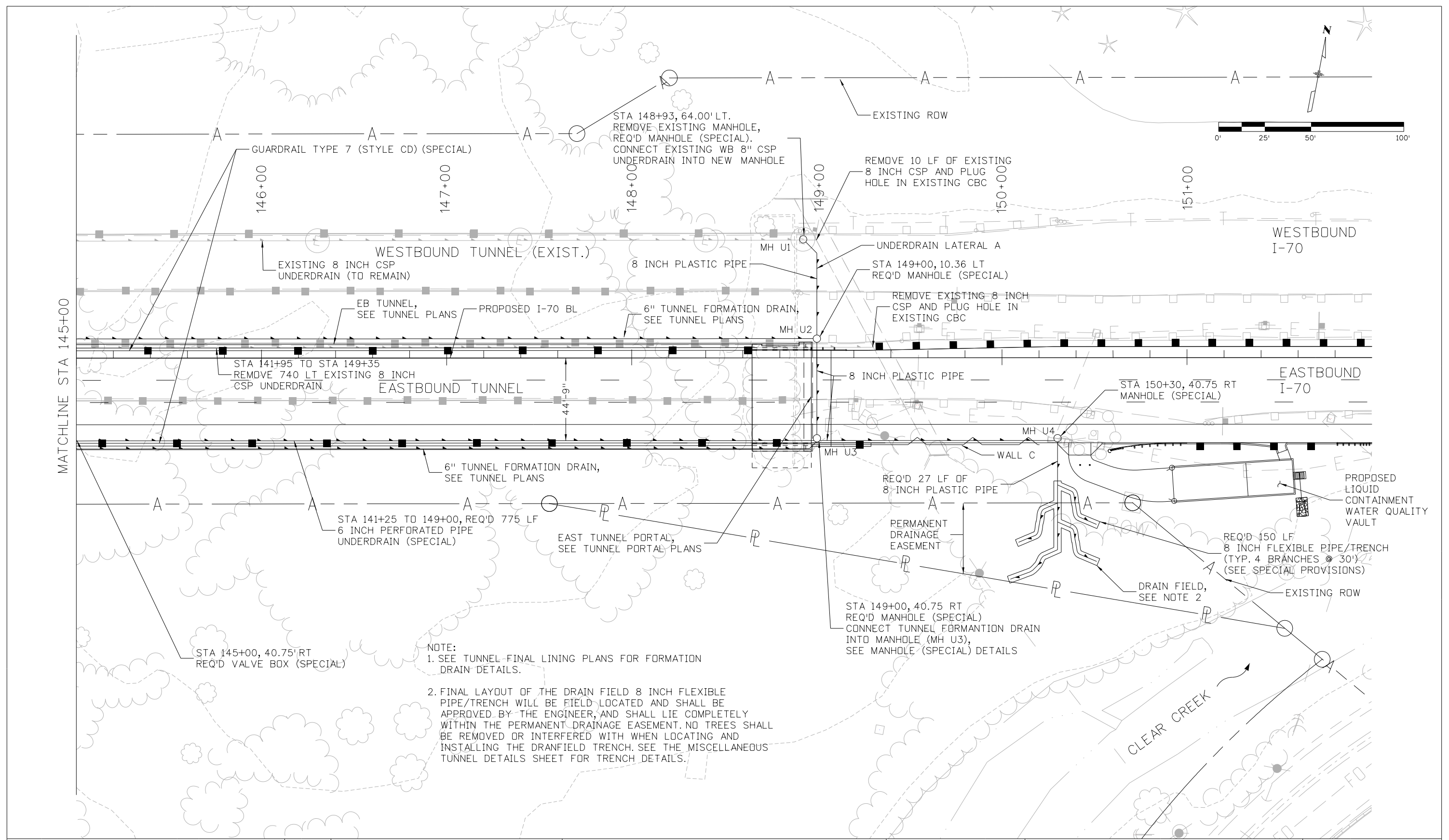
- : THERE ARE 4 MANHOLES IN THE EASTBOUND TUNNEL THAT ARE PART OF THE EXISTING UNDERDRAIN SYSTEM AND WILL BE REMOVED WITH THE INVERT EXCAVATION/REMOVAL OF PIPE.
- : ITEMS NOT MEASURED FOR PAYMENT - FOR INFORMATION ONLY

Print Date: 2/7/2013	Sheet Revisions			Colorado Department of Transportation		As Constructed		I-70 TWIN TUNNELS TABULATION OF TUNNEL UNDERDRAIN QUANTITIES			Project No./Code			
File Name: 19036_Underdrain and Drainage Tabulation.dgn	Date:	Comments	Init.	 425 A Corporate Circle Golden, CO 80401 Phone: 720-497-6918 FAX: 720-497-6901 Region 1		No Revisions:		Designer: LMN Detailer: JMG Subset: TUNNEL DRN CP2			IM 0703-391			
Horiz. Scale: N/A Vert. Scale: N/A						Revised:					Structure Numbers		19036	
Unit Information Unit Leader Initials						Void:					Subset Sheets: UD 1 of 7		Sheet Number 192	
 														

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Revision Dates		Quantities	

Design		Detail		Quantities	



Print Date: 2/26/2013
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ATKINS **PARSONS BRINCKERHOFF**

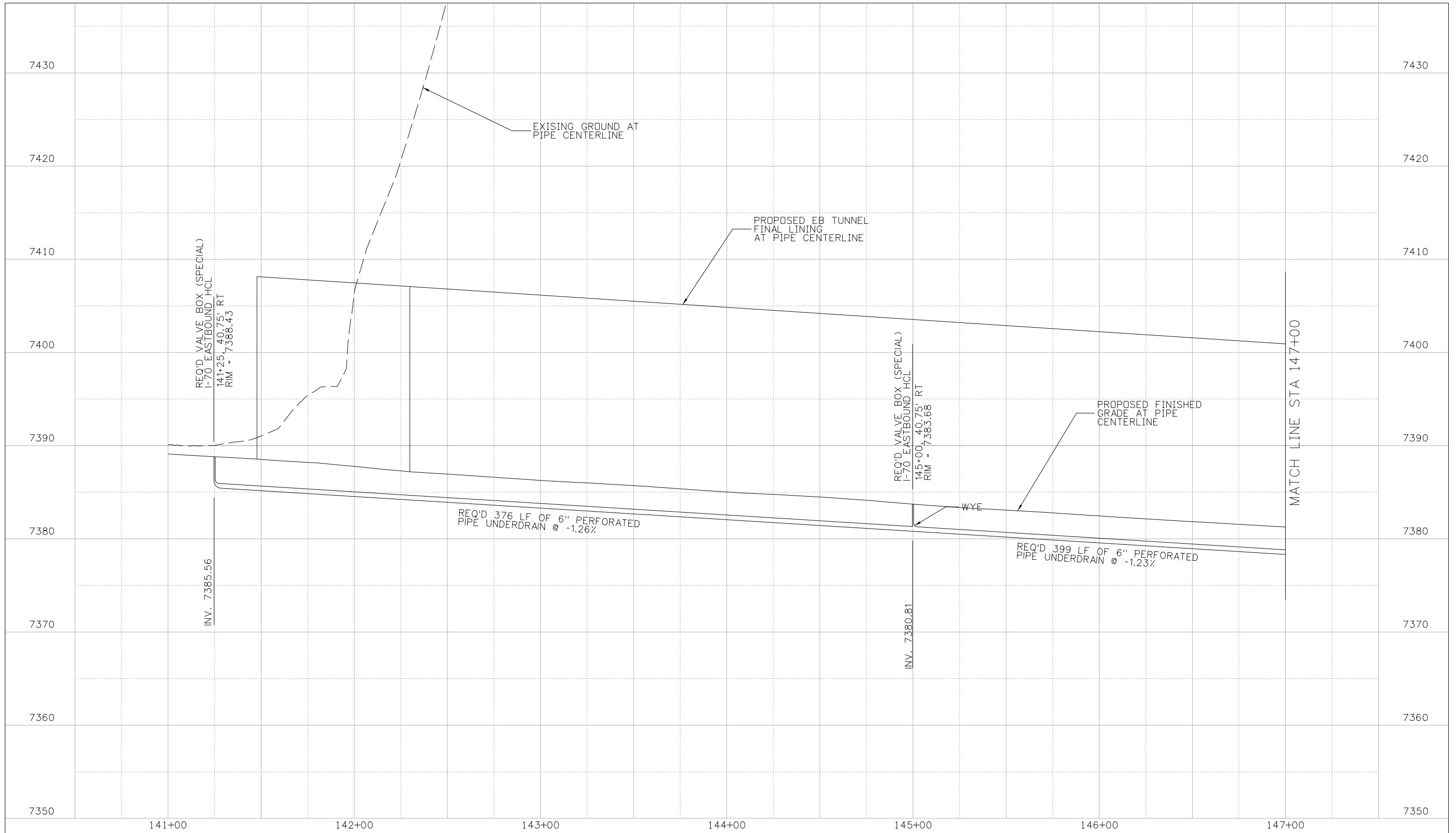
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Date:	Comments	Init.

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:

I-70 TWIN TUNNELS UNDERDRAIN PLAN	
Designer: WJW/LMN	Structure Numbers
Detailer: JMG	
Subset: TUNNEL DRN CP2	Subset Sheets: UD 3 of 7

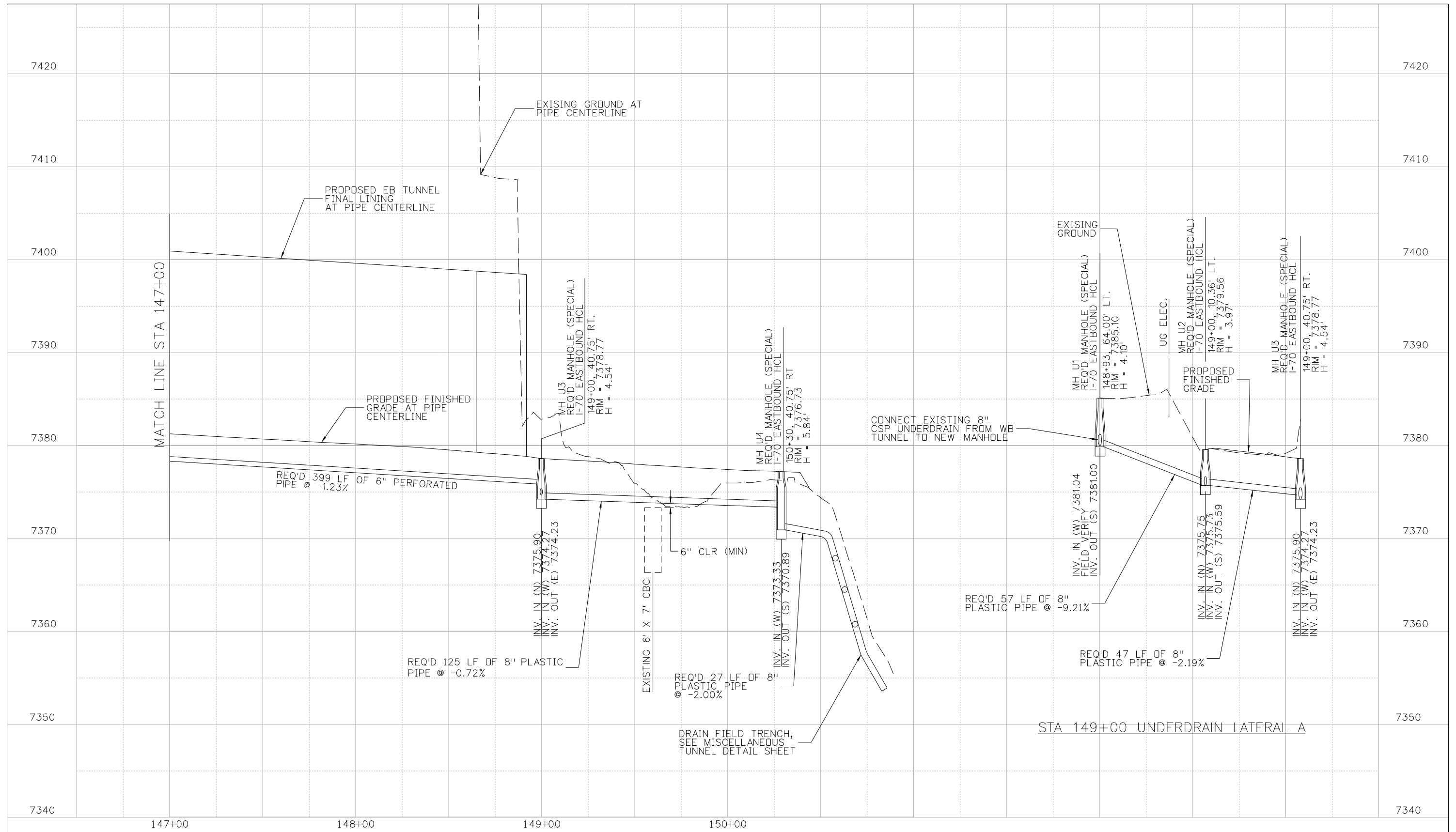
Project No./Code	IM 0703-391
	19036
Sheet Number	194



Print Date: 3/1/2013		Sheet Revisions		Colorado Department of Transportation		As Constructed		I-70 TWIN TUNNELS UNDERDRAIN PROFILE		Project No./Code	
File Name: 19036_RTDS_Profile_01.dgn		Date:	Comments	Init.	425 A Corporate Circle Golden, CO 80401 Phone: 720-497-6918 FAX: 720-497-6901		No Revisions:		IM 0703-391		
Horiz. Scale: 1"=50' Vert. Scale: 1"=10'					Region 1		Revised:		19036		
4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276					CRC		Void:		Sheet Number 195		
					Designer: WJW/LMN Detailer: JMG Subset: TUNNEL DRN CP2 Subset Sheets: UD 4 of 7						

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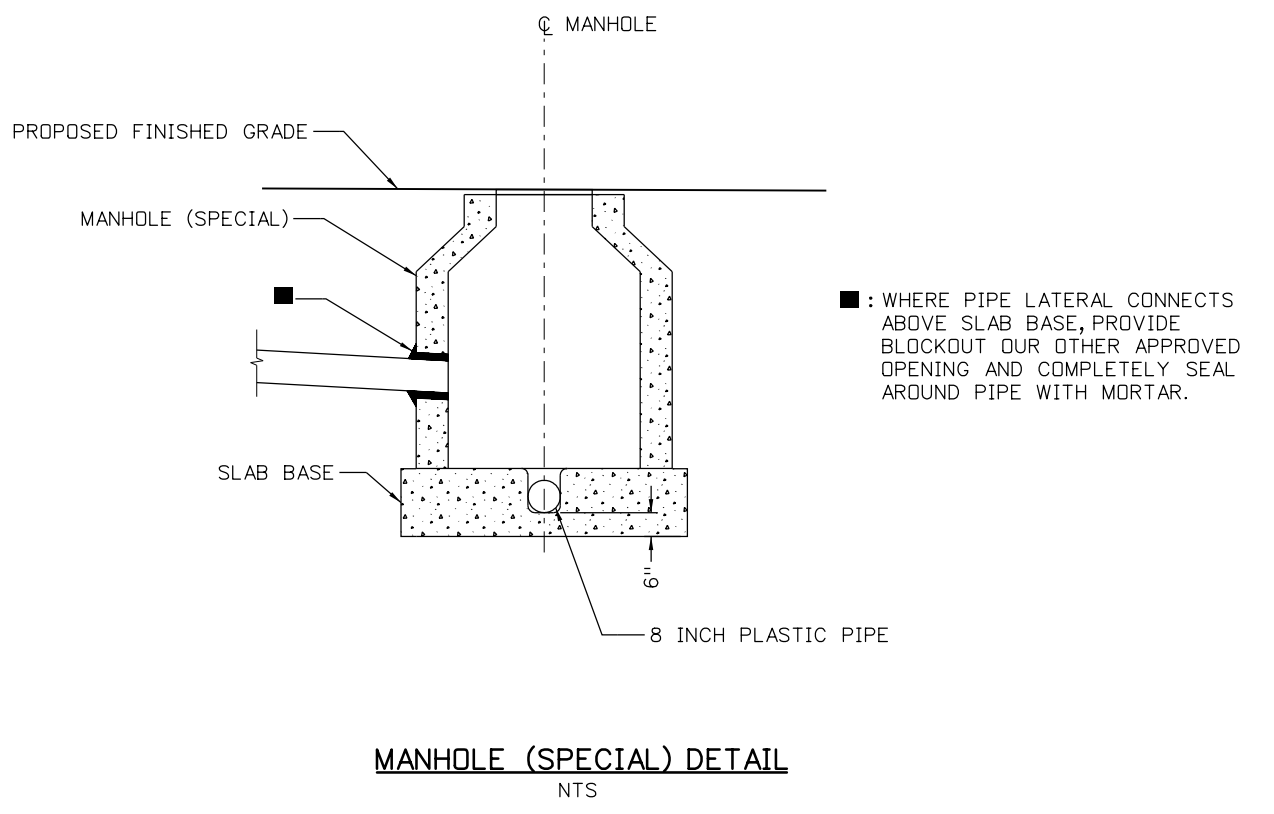
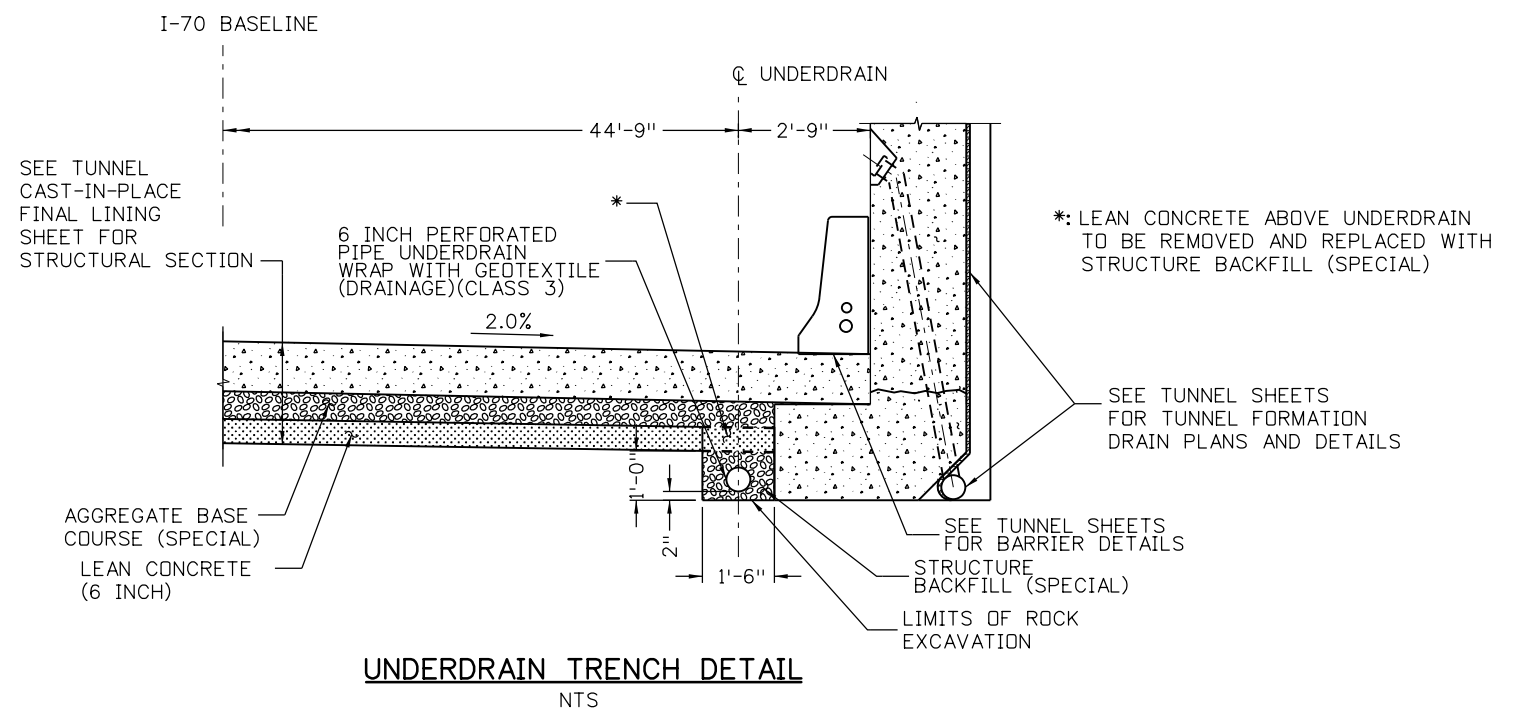
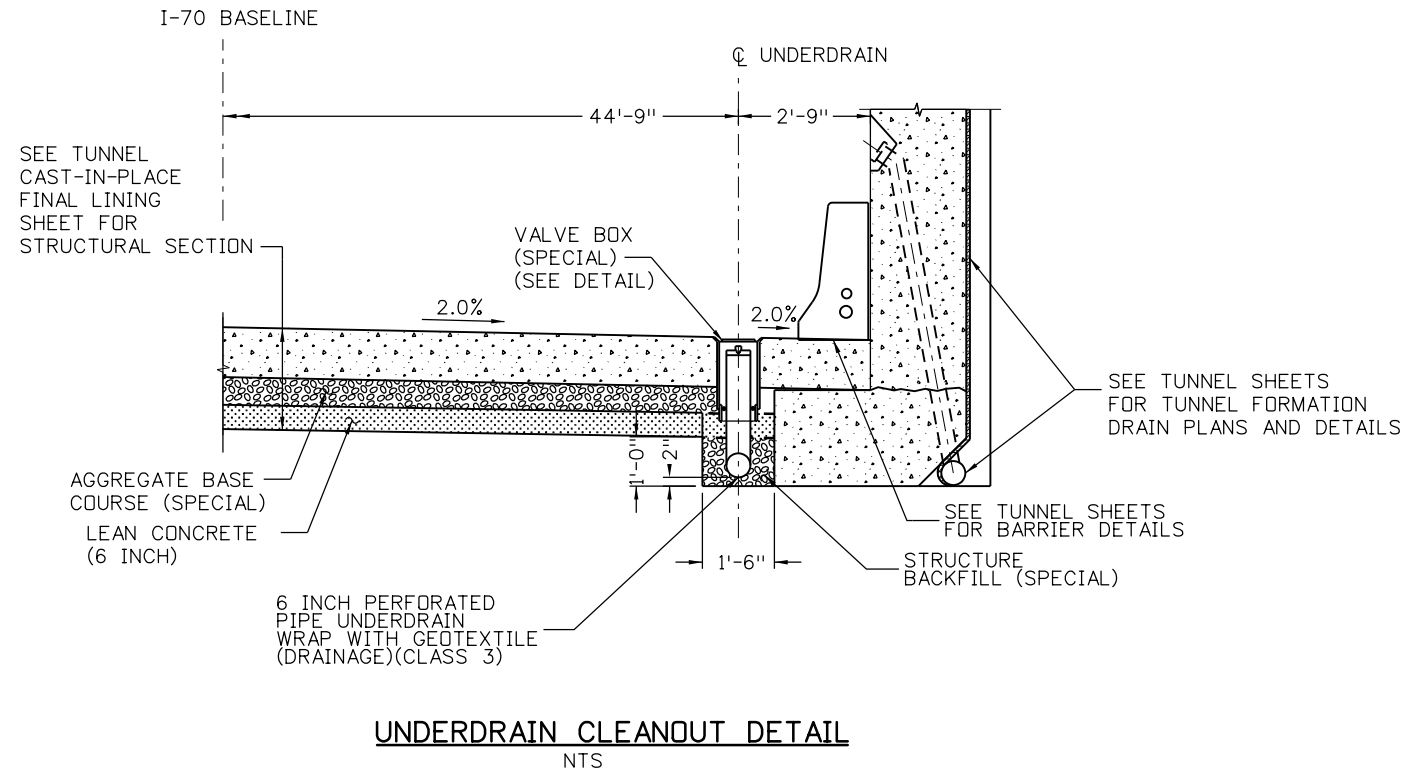
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Print Date: 3/1/2013		Sheet Revisions		Colorado Department of Transportation		As Constructed		I-70 TWIN TUNNELS UNDERDRAIN PROFILE		Project No./Code	
File Name: 19036_RTDS_Profile_02.dgn		Date:	Comments	Init.	No Revisions:		Designer: WJW/LMN		IM 0703-391		
Horiz. Scale: 1"=50' Vert. Scale: 1"=10'					Revised:		Detailer: JMG		19036		
4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276					Void:		Subset: TUNNEL DRN CP2		Sheet Number 196		
					425 A Corporate Circle Golden, CO 80401 Phone: 720-497-6918 FAX: 720-497-6901 Region 1 CRC		Structure Numbers Subset Sheets: UD 5 of 7				

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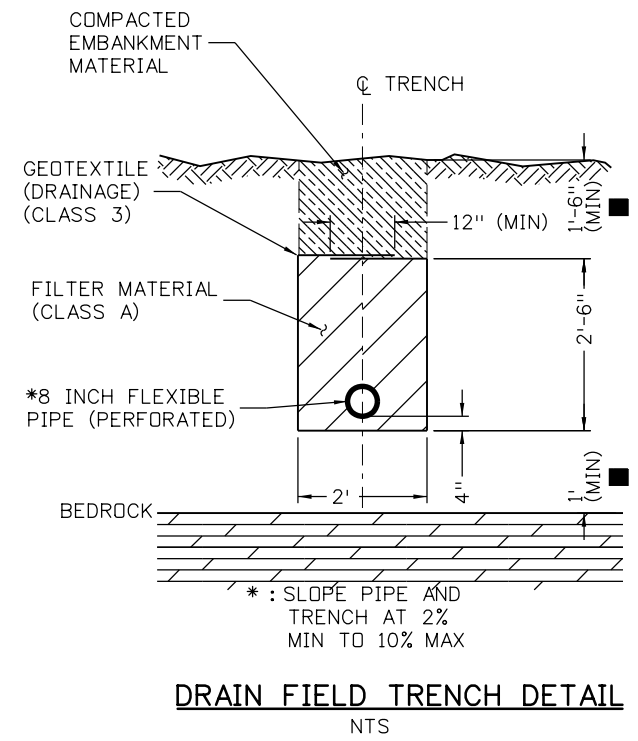
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Checked By	DATE	INITIAL	DATE
Detailed By	DATE	INITIAL	DATE
Checked By	DATE	INITIAL	DATE



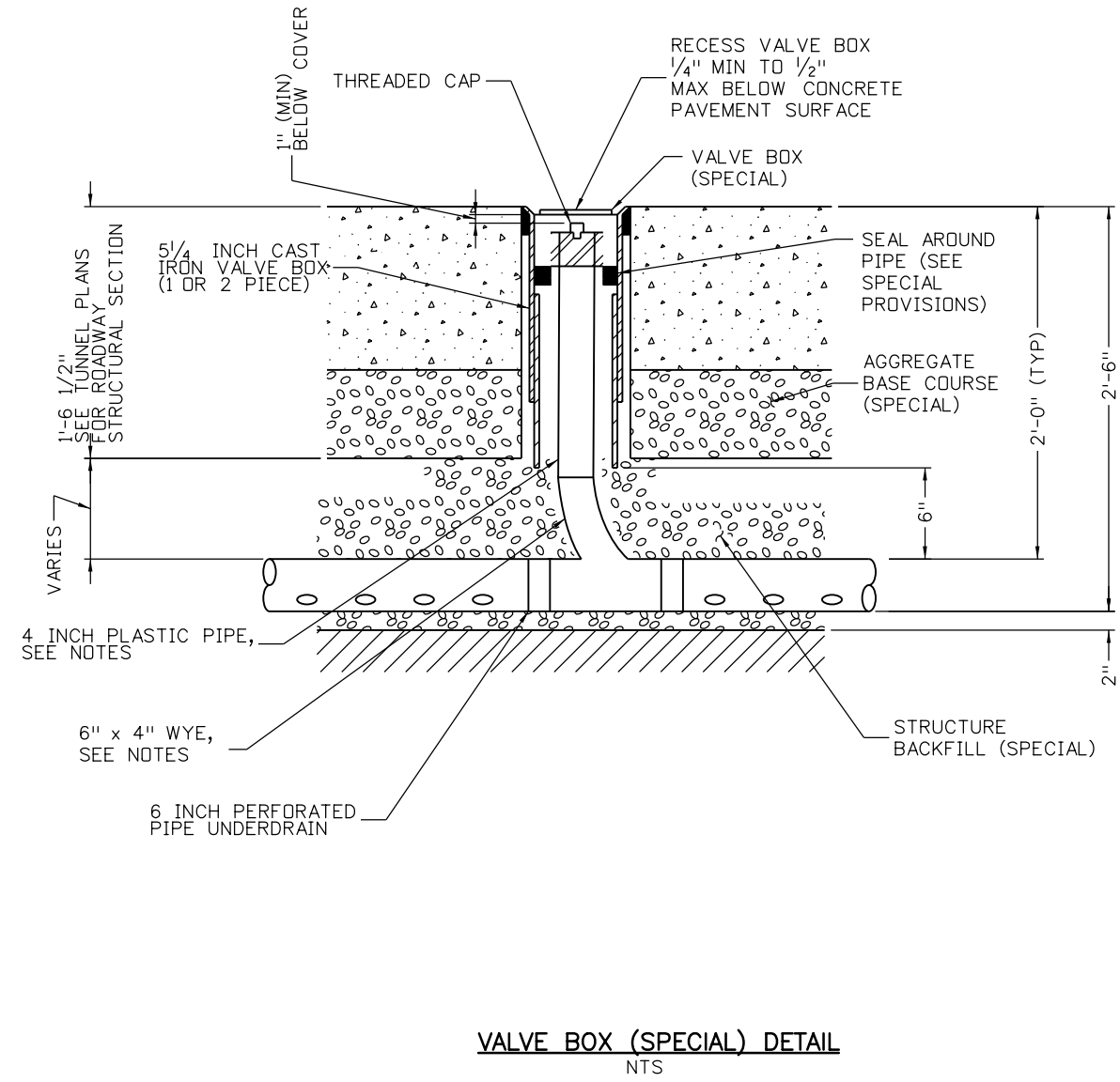
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Horiz. Scale: N/A				Region 1		Revised:	Detailer: JMG		19036	
Unit Information				CRC		Void:	Subset: TUNNEL CP2		Sheet Number 197	
ATKINS PARSONS BRINCKERHOFF							Structure Numbers			
							Subset Sheets: UD 6 of 7			

NOTES:

1. VALVE BOX LID TO HAVE C.O. STAMPED ON IT.
2. 4 INCH PLASTIC PIPE AND WYE WILL NOT BE PAID FOR SEPARATELY, BUT ARE INCLUDED IN THE COST OF THE VALVE BOX (SPECIAL).



- NOTES:
- IF MINIMUM DISTANCES CANNOT BE ACHIEVED, PLACE PIPE AS DIRECTED BY THE ENGINEER.



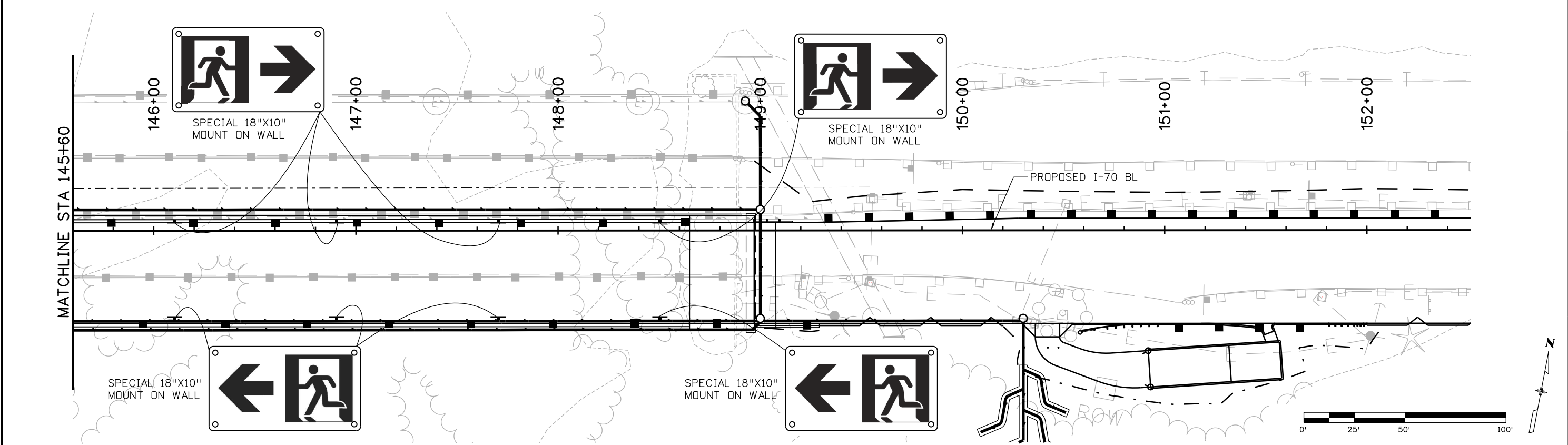
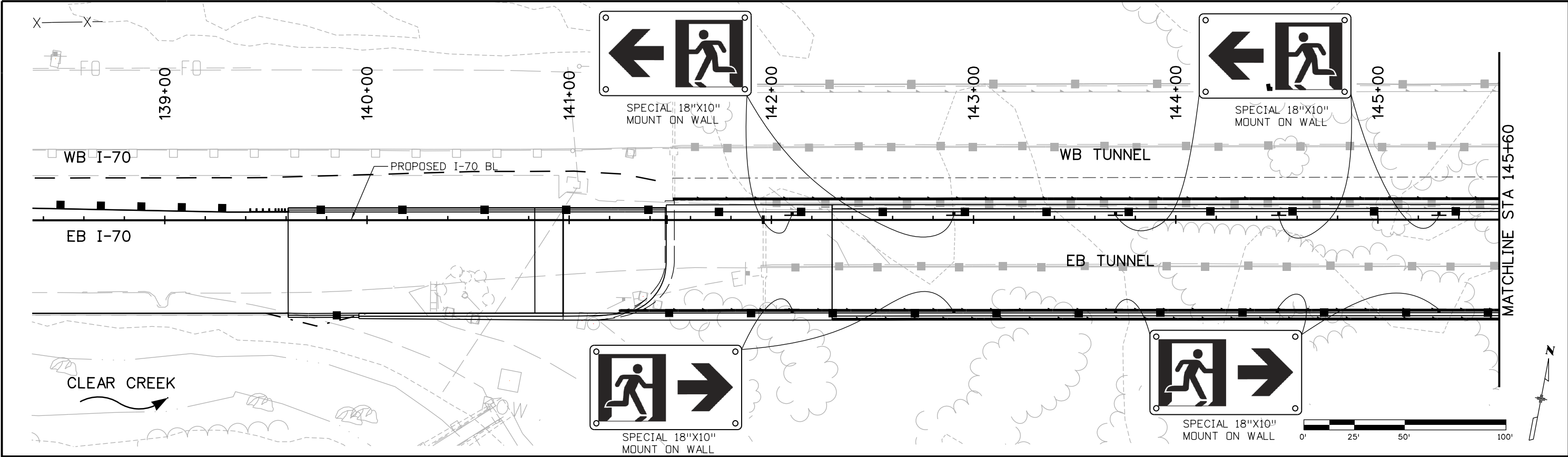
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INITIAL	DATE	INITIAL	DATE
Designed By		Checked By	
Designed By		Checked By	

Print Date: 2/8/2013		Sheet Revisions			Colorado Department of Transportation			As Constructed		I-70 TWIN TUNNELS MISCELLANEOUS TUNNEL DETAILS			Project No./Code		
File Name: 19036_RTDS_Detail_02.dgn		Date:	Comments	Init.	425 A Corporate Circle Golden, CO 80401 Phone: 720-497-6918 FAX: 720-497-6901			No Revisions:		IM 0703-391					
Horiz. Scale: N/A Vert. Scale: N/A					Region 1			Revised:		Designer: WJW/LMN		Structure Numbers		19036	
Unit Information Unit Leader Initials					CRC			Void:		Detailer: JMG		Subset: TUNNEL CP2		Subset Sheets: UD 7 of 7	
ATKINS PARSONS BRINCKERHOFF														Sheet Number 198	

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Revision Dates (Preliminary Stage Only)	

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Checked By					



Print Date: 2/14/2013
 File Name: 19036_TunnelSign_Plan_01.dgn
 Horiz. Scale: 1" = 50' Vert. Scale: 1" = 10'
 Unit Information Unit Leader Initials

ATKINS **PARSONS BRINCKERHOFF**

Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation
 Region 1 CRC

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

As Constructed
No Revisions:
Revised:
Void:

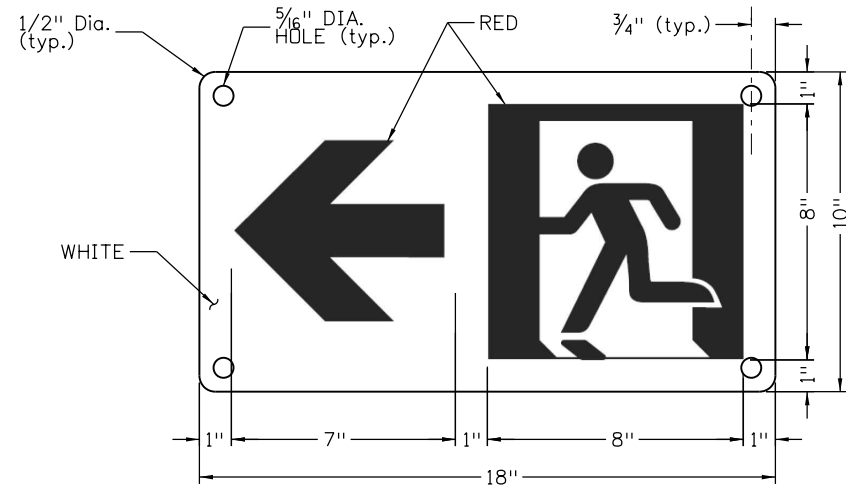
I-70 TWIN TUNNELS TUNNEL SIGNING PLAN			
Designer:	WJW	Structure Numbers	
Detailer:	JMG		
Subset: TUNNEL CP2		Subset Sheets: TS 1 of 2	

Project No./Code	
IM 0703-391	
19036	
Sheet Number	199

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Revision Dates	(Preliminary Stage Only)
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Design	INITIAL	DATE	Designed By	Checked By
Detail	INITIAL	DATE	Detailed By	Checked By
Quantities	INITIAL	DATE	Quantities By	Checked By



F3 EMERGENCY EXIT SIGN (LEFT)

NTS

LEFT DIRECTION SHOWN
(RIGHT DIRECTION OPPOSITE)

TABULATION OF SIGNS

STATION	SIDE	SIGN CODE	SIGN PANEL SIZE		BACKGROUND COLOR	SIGN PANEL CLASS 1		REMARKS
			W(in)	H(in)		EMERGENCY EXIT, W/ DIRECTION (WALL MOUNT)	SF	
142+10	LT	SPECIAL	18	10	WHITE	1.3		LEFT DIRECTION
142+10	RT	SPECIAL	18	10	WHITE	1.3		RIGHT DIRECTION
142+90	LT	SPECIAL	18	10	WHITE	1.3		LEFT DIRECTION
142+90	RT	SPECIAL	18	10	WHITE	1.3		RIGHT DIRECTION
143+70	LT	SPECIAL	18	10	WHITE	1.3		LEFT DIRECTION
143+70	RT	SPECIAL	18	10	WHITE	1.3		RIGHT DIRECTION
144+50	LT	SPECIAL	18	10	WHITE	1.3		LEFT DIRECTION
144+50	RT	SPECIAL	18	10	WHITE	1.3		RIGHT DIRECTION
145+30	LT	SPECIAL	18	10	WHITE	1.3		LEFT DIRECTION
145+30	RT	SPECIAL	18	10	WHITE	1.3		RIGHT DIRECTION
146+10	LT	SPECIAL	18	10	WHITE	1.3		RIGHT DIRECTION
146+10	RT	SPECIAL	18	10	WHITE	1.3		LEFT DIRECTION
146+90	LT	SPECIAL	18	10	WHITE	1.3		RIGHT DIRECTION
146+90	RT	SPECIAL	18	10	WHITE	1.3		LEFT DIRECTION
147+70	LT	SPECIAL	18	10	WHITE	1.3		RIGHT DIRECTION
147+70	RT	SPECIAL	18	10	WHITE	1.3		LEFT DIRECTION
148+50	LT	SPECIAL	18	10	WHITE	1.3		RIGHT DIRECTION
148+50	RT	SPECIAL	18	10	WHITE	1.3		LEFT DIRECTION
TOTALS						24.0		

Print Date: 2/14/2013 N/A
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 Unit Information Unit Leader Initials

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Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation
 425 A Corporate Circle
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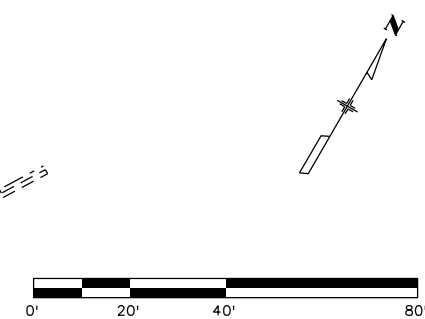
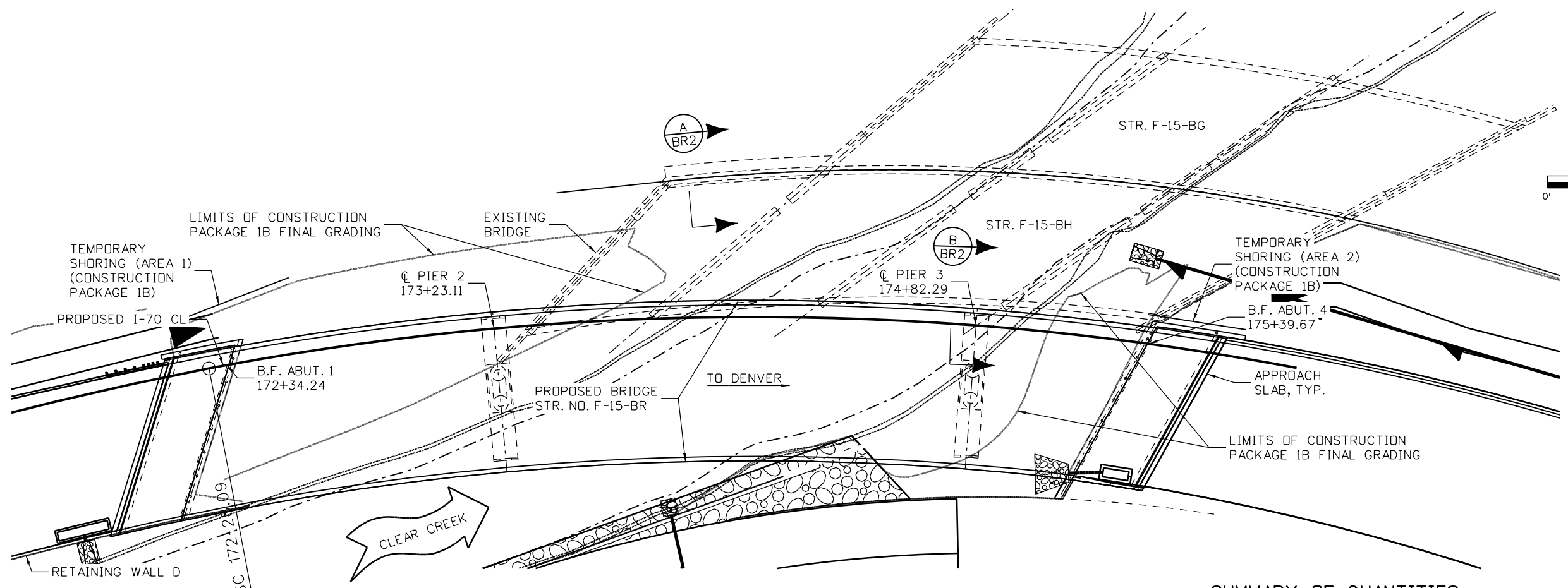
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Revised:
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**I-70 TWIN TUNNELS
TUNNEL SIGNING DETAILS**

Designer: WJW
 Detailer: JMG
 Subset: TUNNEL CP2

Structure Numbers
 Subset Sheets: TS 2 of 2

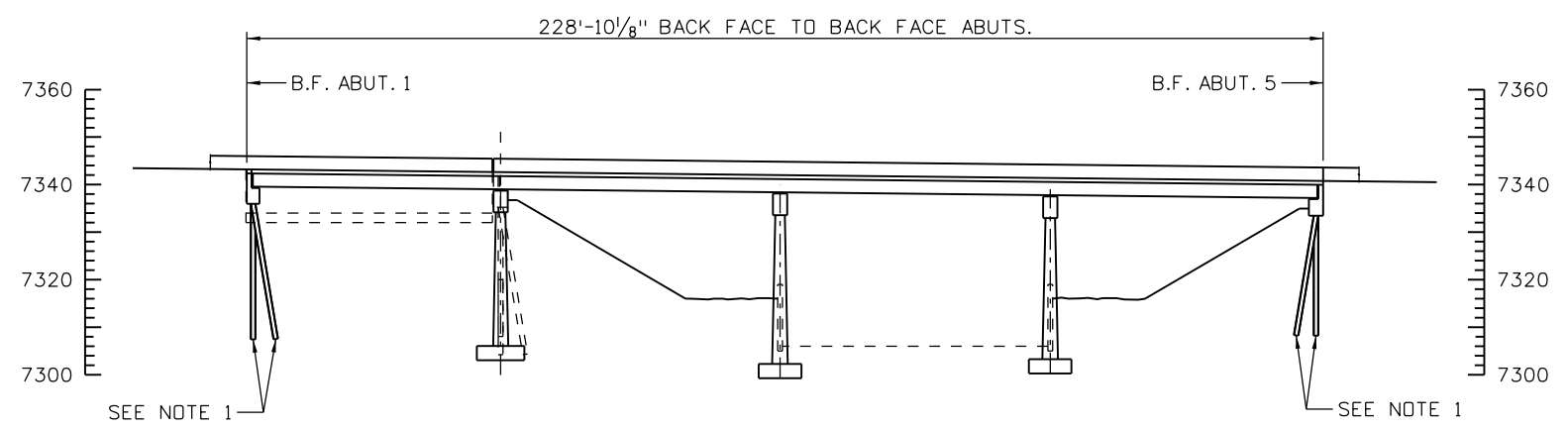
Project No./Code	IM 0703-391
	19036
Sheet Number	200



PLAN

SUMMARY OF QUANTITIES

ITEM NO.	DESCRIPTION	UNIT	TOTAL
202	REMOVAL OF BRIDGE	EA	1
601	MODIFICATIONS TO EXISTING BRIDGE	LS	1



SECTION

NOTE:

- ABUT. 1 AND ABUT. 5 - STR. F-15-BH, CUT OFF PILES 2' BELOW FINISH GRADE.

Design		Detail		Quantities	
INITIAL	DATE	INITIAL	DATE	INITIAL	DATE
Designed By	MM/YY	Detailed By	MM/YY	Quantities By	MM/YY
Checked By		Checked By		Checked By	

Print Date: 3/8/2013
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 Horiz. Scale: 1:40 Vert. Scale: 1:40
 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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Colorado Department of Transportation

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

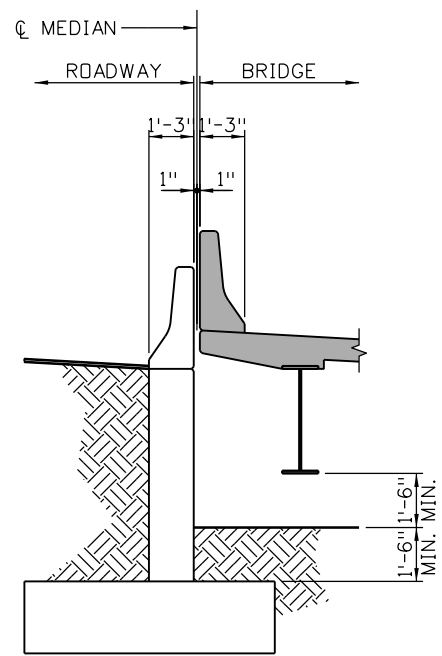
Region 1 CRC

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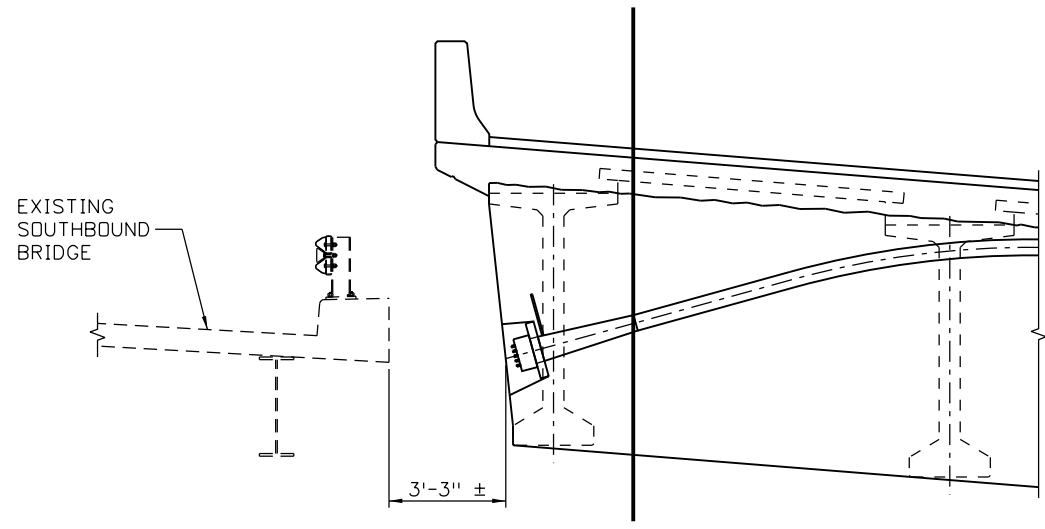
EB 170 OVER CLEAR CREEK BRIDGE EXISTING BRIDGE REMOVAL			
Designer:	K. Saindon	Structure Numbers	F-15-BH
Detailer:	E. Schawo	Sheet Subset:	REMOVAL
		Subset Sheets:	BR1 of 4

Project No./Code	
IM	0703-391
	19036
Sheet Number	201

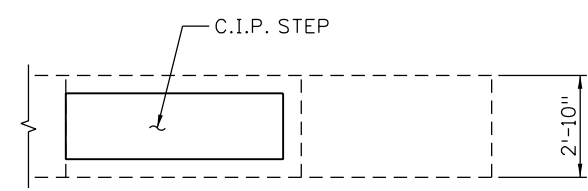
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SECTION A
BR1
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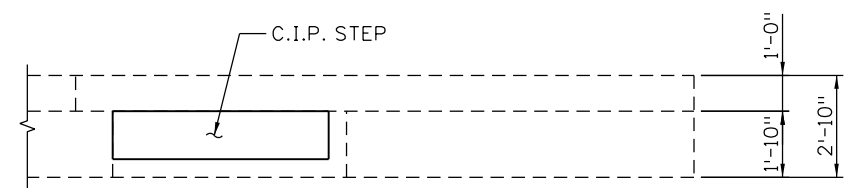


SECTION B
BR1
(SHOWING RELATIONSHIP OF PROPOSED BRIDGE F-15-BR TO EXISTING BRIDGE F-15-BH)

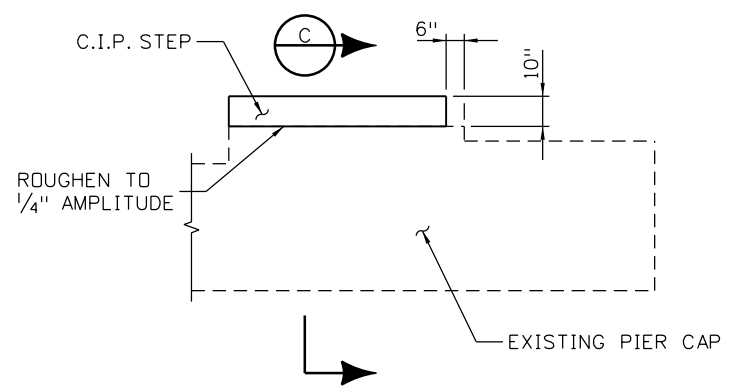


PLAN

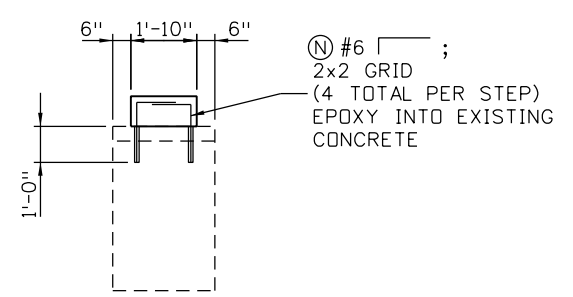
NOTE:
USE AN EPOXY BONDER ALONG ALL INTERFACES OF NEW CONCRETE AND EXISTING CONCRETE FOR C.I.P. STEPS.



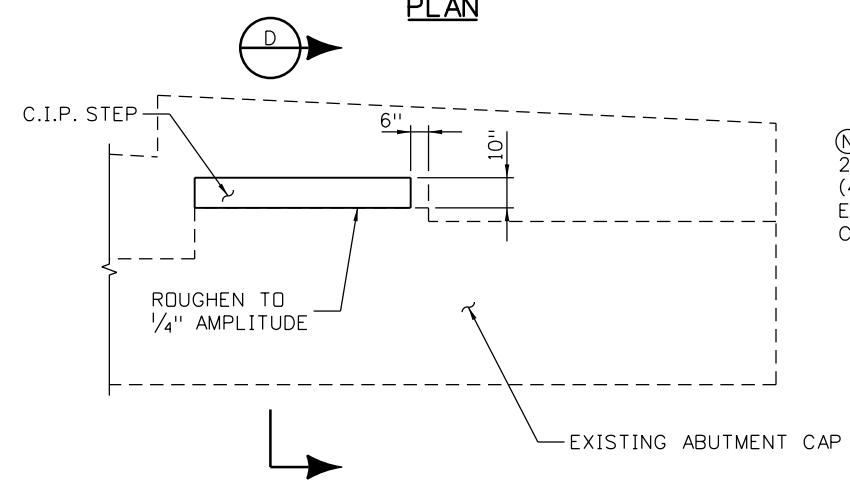
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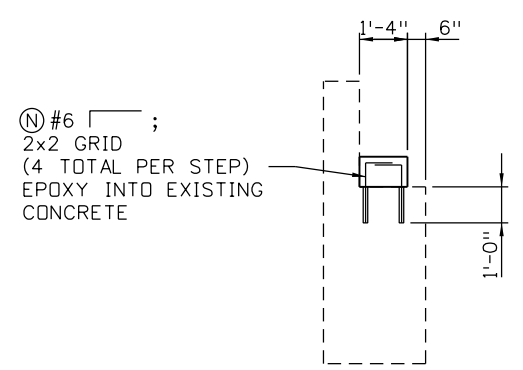
ELEVATION
EXISTING PIER CAP MODIFICATIONS
(PAYMENT UNDER "MODIFICATIONS TO EXISTING BRIDGE")



SECTION C



ELEVATION
EXISTING ABUTMENT CAP MODIFICATIONS
(PAYMENT UNDER "MODIFICATIONS TO EXISTING BRIDGE")



SECTION D

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

Print Date: 3/8/2013	0000
File Name: 18832BRDG_Exist_Removal_Det01.dgn	
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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



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

Region 1 CRC

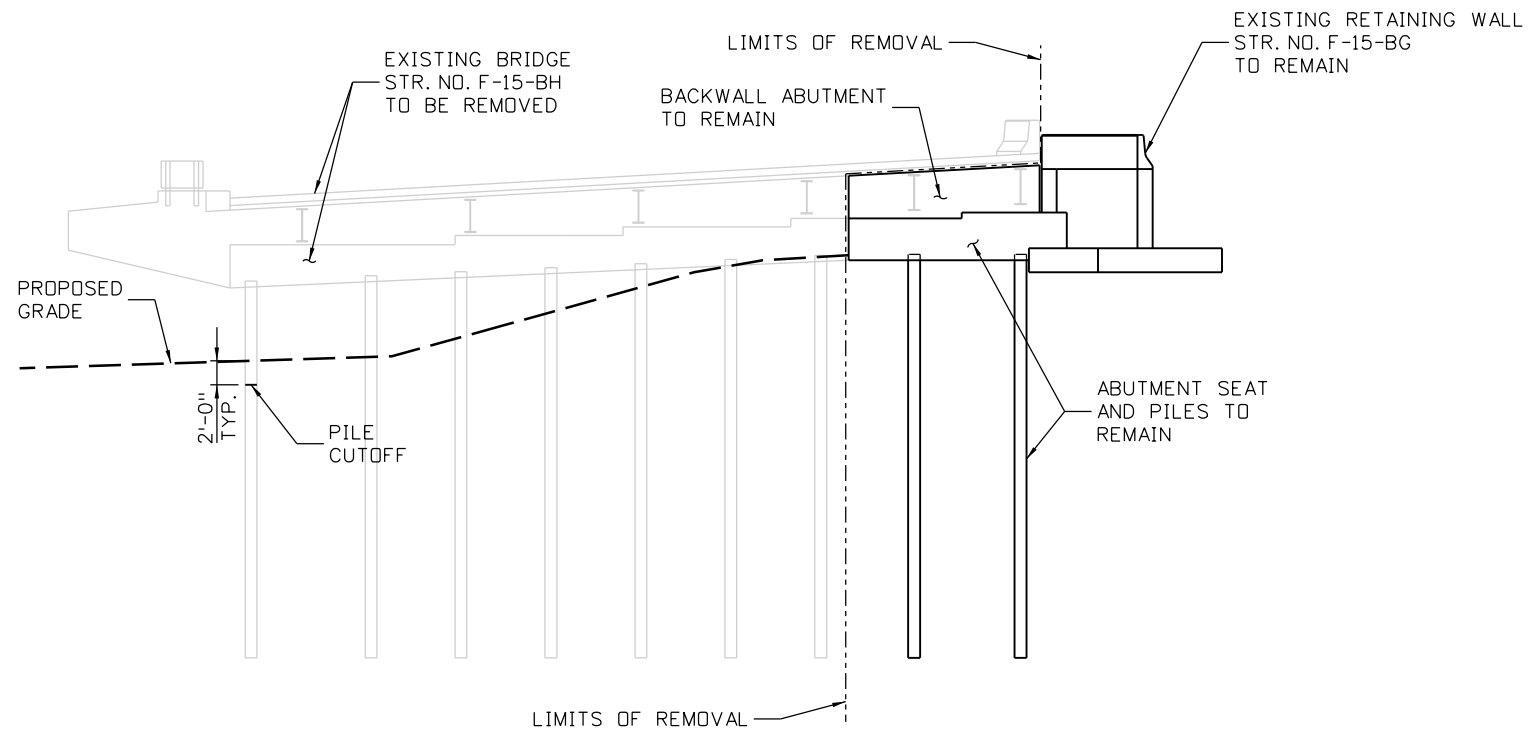
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No Revisions:	Designer: K. Saindon	Structure Numbers: F-15-BH
Revised:	Detailer: E. Schawo	
Void:	Sheet Subset: REMOVAL	Subset Sheets: BR2 of 4

Project No./Code
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19036
Sheet Number 202

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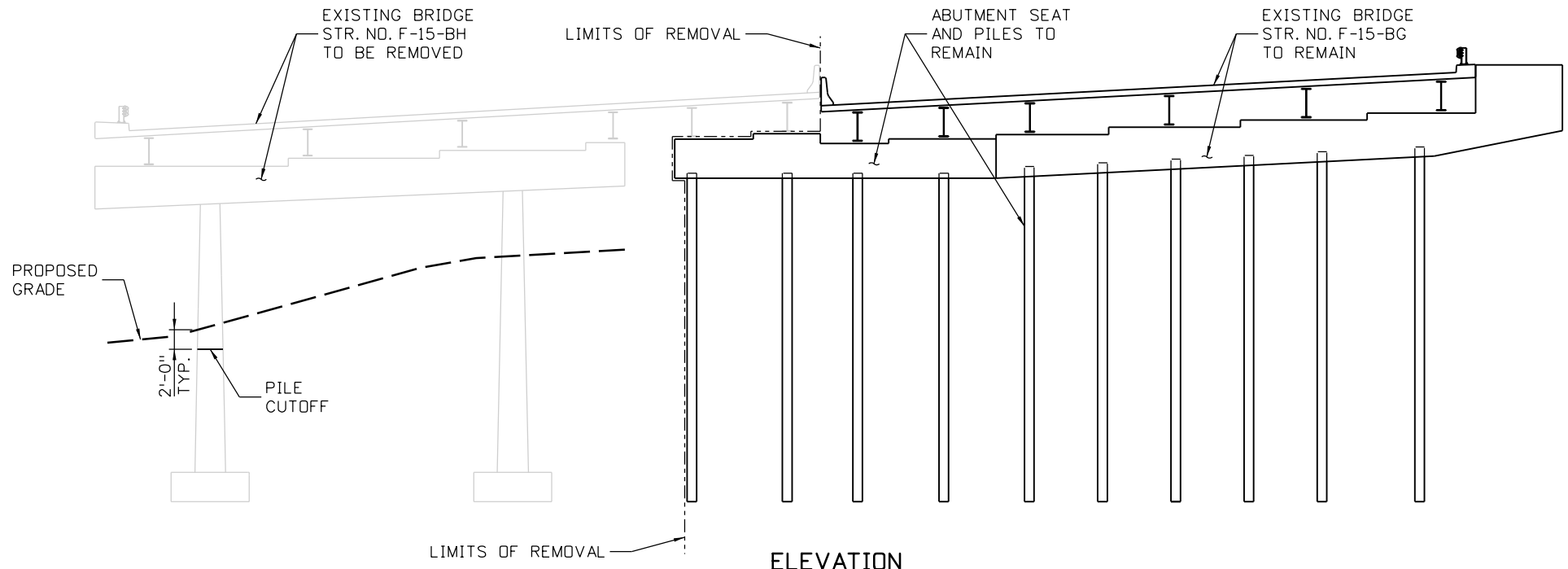
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Designed By	MM/YY	Detailed By		Quantities By	
Checked By		Checked By		Checked By	



ELEVATION

(AT @ ABUTMENT 1 STR. F-15-BH, LOOKING BACK STATION)



ELEVATION

(AT @ PIER 2 STR. F-15-BH, LOOKING BACK STATION)

NOTES:

1. CONTRACTOR SHALL NOT PLACE SURCHARGE LOADS (E.G. CRANES) WITHIN 25' OF EXISTING PIERS UNLESS STABILITY OF EXISTING PIERS HAS BEEN VALIDATED BY A SUITABLE ENGINEERING ANALYSIS.
2. CONTRACTOR'S DEMOLITION ACTIVITIES SHALL COMPLY WITH THE LATEST VERSION OF THE "TWIN TUNNELS WIDENING ROADWAY AND LANE CLOSURE STRATEGY".

Print Date: 3/8/2013
 File Name: 18832BRDG_Exist_Removeal_Det02.dgn
 Horiz. Scale: 1:16 Vert. Scale:
 Staff Bridge Branch - Unit 0221 STW
ATKINS 4601 DTC Boulevard, Suite 700
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 Phone: (303) 221-7275 Fax: (303) 221-7276

Sheet Revisions		
Date:	Comments	Init.

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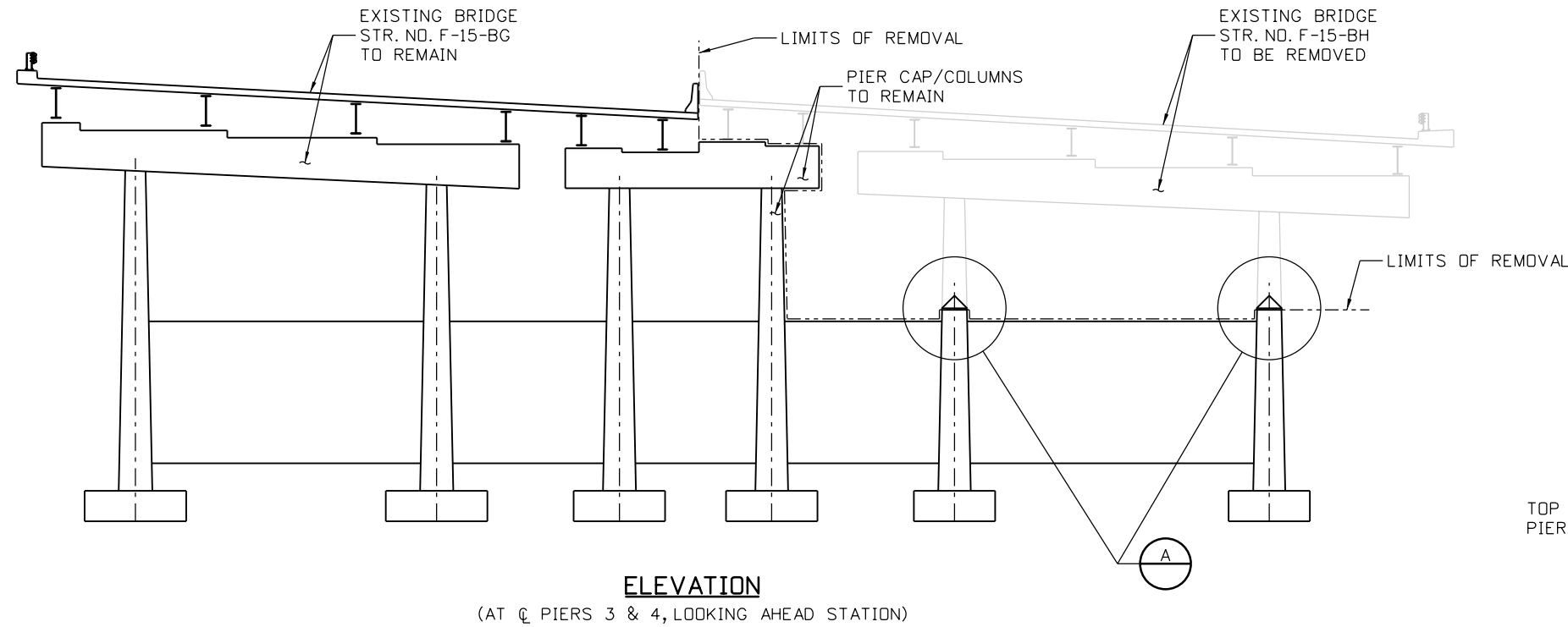
 425 A Corporate Circle
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 Region 1 CRC

As Constructed
No Revisions:
Revised:
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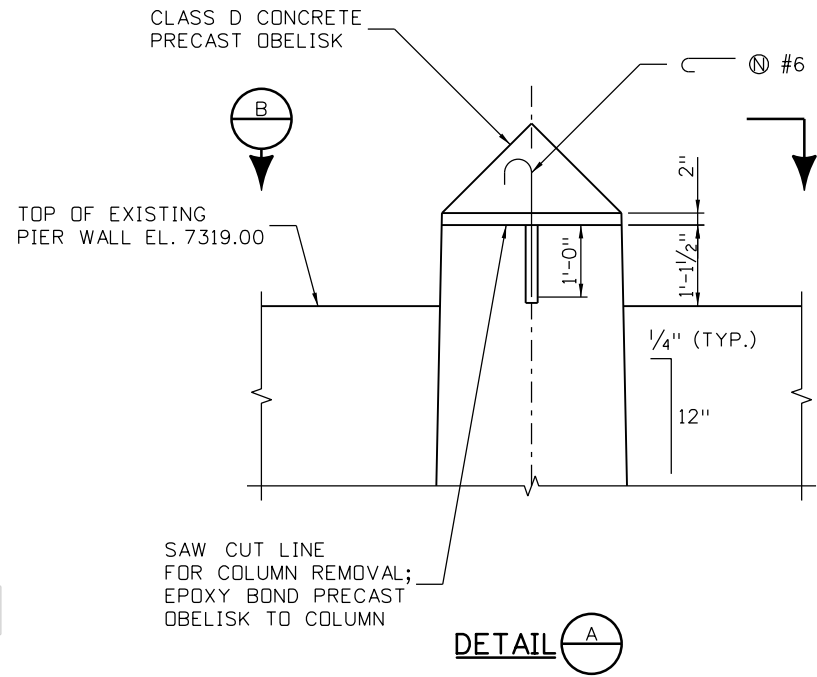
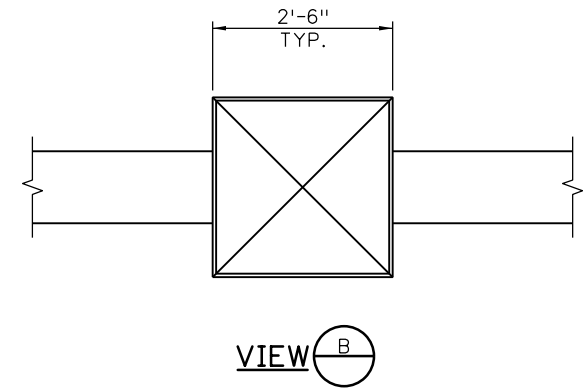
**EB 170 OVER CLEAR CREEK BRIDGE
 BRIDGE REMOVAL DETAILS
 (SHEET 2 OF 3)**

Designer:	K. Saindon	Structure	F-15-BH
Detailer:	E. Schawo	Numbers	
Sheet Subset:	REMOVAL	Subset Sheets:	BR3 of 4

Project No./Code
IM 0703-391
19036
Sheet Number 203

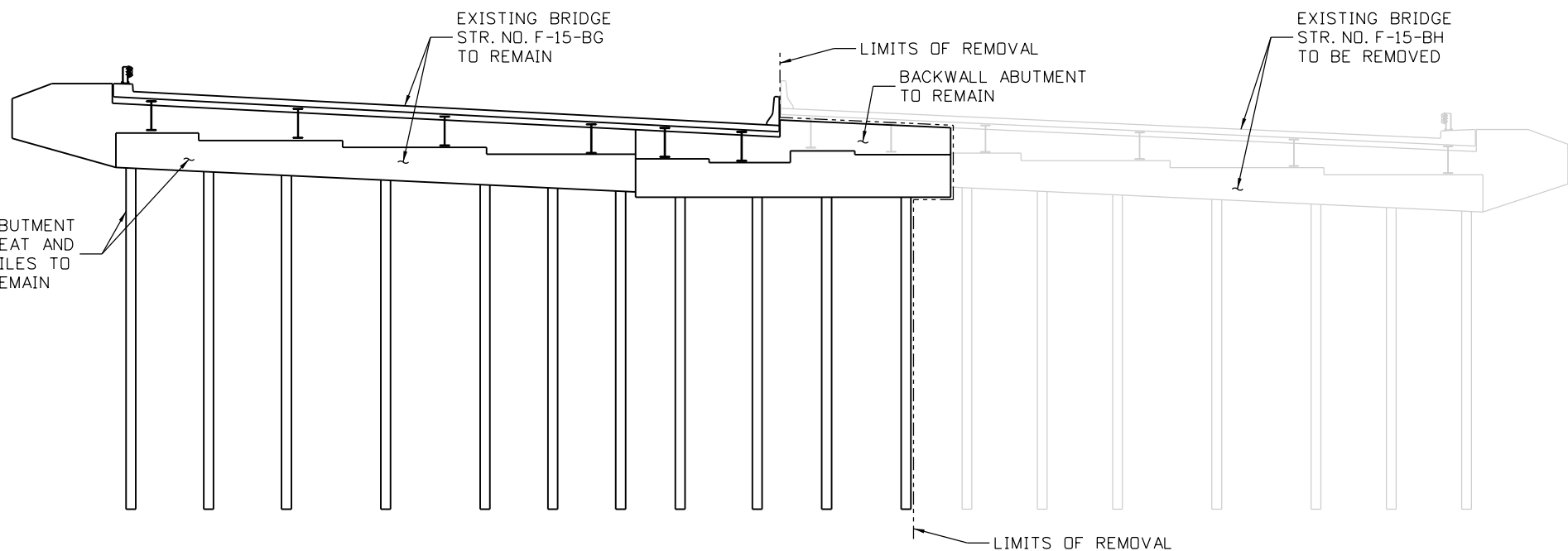


ELEVATION
(AT ϕ PIERS 3 & 4, LOOKING AHEAD STATION)



EXISTING PIER COLUMN MODIFICATIONS
(PAYMENT UNDER "MODIFICATIONS TO EXISTING BRIDGE")

- NOTES:**
1. CONTRACTOR SHALL NOT PLACE SURCHARGE LOADS (E.G. CRANES) WITHIN 25' OF EXISTING PIERS UNLESS STABILITY OF EXISTING PIERS HAS BEEN VALIDATED BY A SUITABLE ENGINEERING ANALYSIS.
 2. CONTRACTOR'S DEMOLITION ACTIVITIES SHALL COMPLY WITH THE LATEST VERSION OF THE "TWIN TUNNELS WIDENING ROADWAY AND LANE CLOSURE STRATEGY".



ELEVATION
(AT ϕ ABUTMENT 5, LOOKING AHEAD STATIONS)

Design		Detail		Quantity	
INITIAL	DATE	INITIAL	DATE	INITIAL	DATE
Designed By	MM/YY	Detailed By		Checked By	
Checked By	xxx	Checked By		Checked By	

Print Date: 3/8/2013
 File Name: 18832BRDG_Exist_Removeal_Det03.dgn
 Horiz. Scale: 1:16 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.

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Region 1 **CRC**

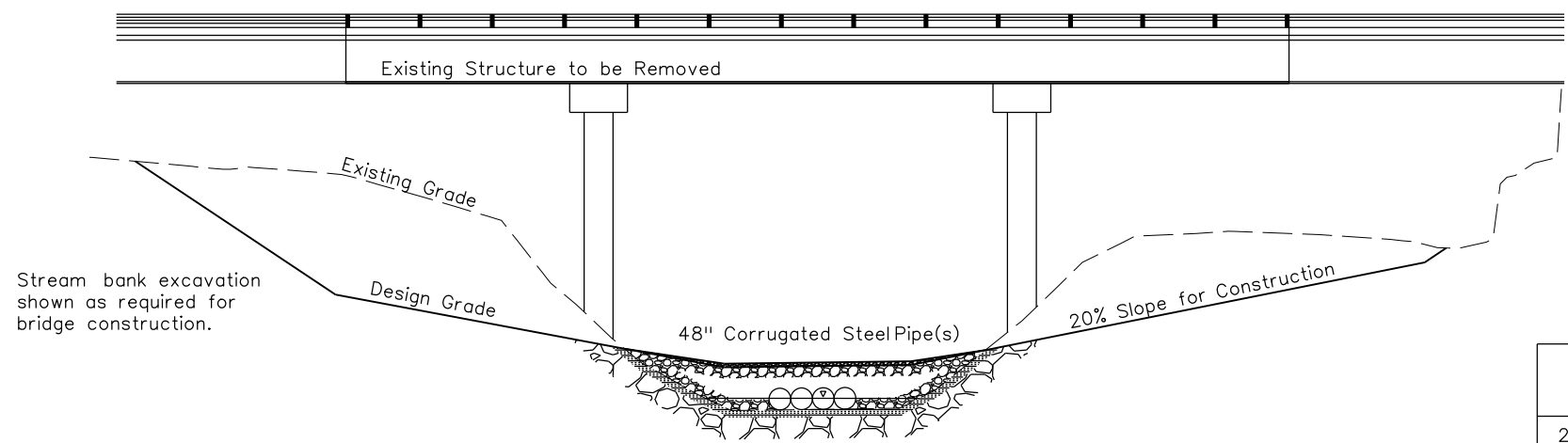
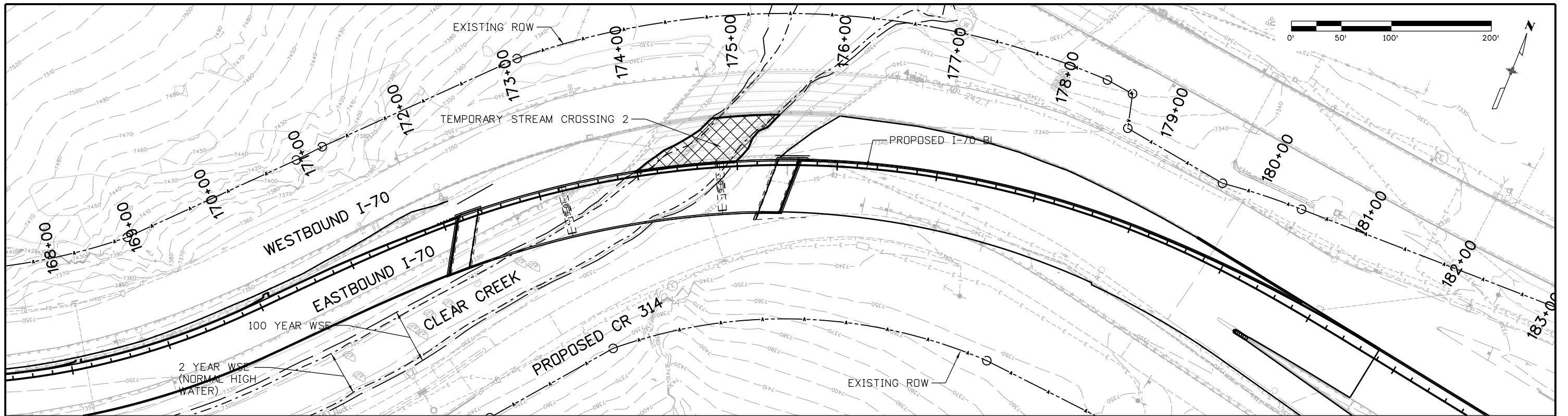
As Constructed
No Revisions:
Revised:
Void:

**EB 170 OVER CLEAR CREEK BRIDGE
 BRIDGE REMOVAL DETAILS
 (SHEET 3 OF 3)**

Designer:	K. Saindon	Structure Numbers	F-15-BH
Detailer:	E. Schawo		
Sheet Subset:	REMOVAL	Subset Sheets:	BR4 of 4

Project No./Code
IM 0703-391
19036
Sheet Number 204

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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
		TEMPORARY STREAM CROSSING 2
206-00510	FILTER MATERIAL (CLASS A)	600 SY
506-00206	RIPRAP (6 INCH)	33 CY
506-00212	RIPRAP (12 INCH)	466 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: 3/8/2013

File Name: 18832DES_CP2_Creek_Plan001.dgn

Horiz. Scale: 1:100

Vert. Scale:



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 I-70
TEMPORARY STREAM CROSSING**

Designer:	Kraemer	Structure Numbers	
Detailer:	J. Gellner		
Subset:	Kraemer	Subset Sheets: 1 of 1	

Project No./Code

IM 0703-391

19036

Sheet Number 205

GENERAL NOTES

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

STRUCTURE BACKFILL CLASS 1 FRICTION ANGLE SHALL BE VERIFIED PER CDOT FIELD MATERIALS MANUAL (AASHTO T-236) AT FREQUENCY OF ONE TEST PER SOURCE. VERIFICATION TEST SHALL NOT BE PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN ITEM 206, STRUCTURAL BACKFILL (CLASS 1).

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 STRUCTURE 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.

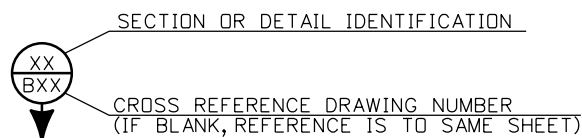
ABBREVIATIONS:

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

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.



① ← DENOTES KEYNOTE REFERENCE

DESIGN DATA

AASHTO, 2012 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

REINFORCED CONCRETE:

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

MAX. 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 = 1/2 γ (DH)² Kα
= EFFECTIVE UNIT WT. OF EARTH
DH = DESIGN HEIGHT
Kα = ACTIVE LATERAL EARTH PRESSURE COEFFICIENT (SECTION 3.11.5.3, AASHTO SIXTH EDITION)

INDEX OF DRAWINGS

W01	RETAINING WALLS C, D, G, & L GENERAL INFORMATION
W02	RETAINING WALLS C, D, G, & L SUMMARY OF QUANTITIES
W03	RETAINING WALL C STA 300+40 TO 301+31
W04	RETAINING WALL C TYPICAL SECTION
W05	RETAINING WALL D STA 400+00 TO 402+60
W06	RETAINING WALL D STA 402+00 TO 405+40
W07	RETAINING WALL D STA 405+40 TO 408+20
W08	RETAINING WALL D STA 408+20 TO 411+00
W09	RETAINING WALL D STA 411+00 TO 413+80
W10	RETAINING WALL D STA 413+80 TO 416+60
W11	RETAINING WALL D STA 416+60 TO 419+40
W12	RETAINING WALL D STA 419+40 TO 420+57.55
W13	RETAINING WALL D TOP OF WALL PROFILE GRADE
W14	RETAINING WALL D TYPICAL SECTION (SHEET 1 OF 2)
W15	RETAINING WALL D TYPICAL SECTION (SHEET 2 OF 2)
W16	RETAINING WALL G STA 700+00 TO 702+20
W17	RETAINING WALL G STA 702+20 TO 704+03.59
W18	RETAINING WALL G TYPICAL SECTION
W19	RETAINING WALLS C, D, AND G MISCELLANEOUS DETAILS
W20	RETAINING WALLS C, D, AND G BRIDGE RAIL TYPE 10M (SHEET 1 OF 2)
W21	RETAINING WALLS C, D, AND G BRIDGE RAIL TYPE 10M (SHEET 2 OF 2)
W22	RETAINING WALLS A & C BRIDGE RAIL TRANSITION
W23	EXISTING BOX CULVERT MODIFICATION DETAILS
W24	RETAINING WALL L GROUND NAIL WALL GENERAL NOTES
W25	RETAINING WALL L STA 800+16 TO 802+80 GROUND NAIL DIAGRAM
W26	RETAINING WALL L STA 802+80 TO 804+00 GROUND NAIL DIAGRAM
W27	RETAINING WALL L GROUND NAIL WALL TYPICAL SECTION
W28	RETAINING WALL L GROUND NAIL WALL DETAILS (SHEET 1 OF 2)
W29	RETAINING WALL L GROUND NAIL WALL DETAILS (SHEET 2 OF 2)
W30	RETAINING WALL L FASCIA AND COPING DETAILS (SHEET 1 OF 5)
W31	RETAINING WALL L FASCIA AND COPING DETAILS (SHEET 2 OF 5)
W32	RETAINING WALL L FASCIA AND COPING DETAILS (SHEET 3 OF 5)
W33	RETAINING WALL L FASCIA AND COPING DETAILS (SHEET 4 OF 5)
W34	RETAINING WALL L FASCIA AND COPING DETAILS (SHEET 5 OF 5)

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SA/PP	12-12	ERS	12-12	SA/PP	12-12
JL/KTZ	12-12	JL/KTZ	12-12	WZ/SA	12-12
Designed By	Checked By	Designed By	Checked By	Quantities By	Checked By

Print Date: 3/7/2013	Sheet Revisions			Colorado Department of Transportation		As Constructed		RETAINING WALLS C, D, G, & L GENERAL INFORMATION		Project No./Code			
File Name: 18832DES_WallD_GenInfo01.dgn	Date:	Comments	Init.	425 A Corporate Circle Golden, CO 80401 Phone: 720-497-6918 FAX: 720-497-6901		No Revisions:		Designer: S. ABRAHAM Detailer: E. SCHAWO Sheet Subset: WALL		IM 0703-391			
Horiz. Scale: NONE Vert. Scale: NONE						Revised:				Structure Numbers		19036	
Staff Bridge Branch - Unit 0221 STW						Void:				Subset Sheets: WALL		Sheet Number 206	
ATKINS 4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276				Region 1		CRC							

SUMMARY OF QUANTITIES

ITEM NO.	DESCRIPTION	UNIT	WALL C	WALL D	WALL G	WALL L	EXISTING CBC	TOTAL
202	REMOVAL OF SLOPE AND DITCH PAVING	SY				350		350
206	STRUCTURE EXCAVATION	CY	735	25868	1675			28278
206	STRUCTURE BACKFILL (CLASS 1)	CY	603	23052	970			24625
206	STRUCTURE BACKFILL (CLASS 2)	CY	55		224			279
206	SHORING (AREA 1)	LS	1					1
206	SHORING (AREA 2)	LS		1				1
210	RELAY RIPRAP	CY		1315				1315
420	GEOMEMBRANE	SY				193		193
504	GROUND NAIL (10 FOOT)	EA				38		38
504	GROUND NAIL (15 FOOT)	EA				77		77
507	CONCRETE SLOPE AND DITCH PAVING (REINFORCED)	CY				36		36
601	CONCRETE CLASS D (WALL)	CY	80	2650	250	94		3074
601	CONCRETE (PATCHING)	SF					45	45
601	STRUCTURAL CONCRETE COATING	SY	120	3297	357	490		4264
602	REINFORCING STEEL	LB	12750	460850	31758			505358
602	REINFORCING STEEL (EPOXY COATED)	LB	599	13500	2645	5843		22587
605	6 INCH PERFORATED PIPE UNDERDRAIN	LF				335		335
605	GEOCOMPOSITE DRAIN WITHOUT PIPE	SY	32	1377				1409
606	GUARDRAIL TYPE 7 (STYLE CD)	LF				334		334
606	BRIDGE RAIL TYPE 10M	LF	91	2018	404			2513
609	GUTTER (SPECIAL)	LF				400		400
613	3 INCH ELECTRICAL CONDUIT	LF			808			808
641	SHOTCRETE	SY				220		220

KEYNOTES:

- ① 1 INCH ELECTRICAL CONDUIT (WALL D) QUANTITY IS NOT INCLUDED IN THE WALL QUANTITY SUMMARY. SEE LIGHTING TABULATION FOR PAYMENT QUANTITY.
- ② SHORING (AREA 1) IS FOR MAINTAINING TUNNEL ACCESS WHILE CONSTRUCTING RETAINING WALL C.
- ③ SHORING (AREA 2) IS FOR MAINTAINING CONSTRUCTION ACCESS \rightarrow ABOVE EXCAVATION FOR RETAINING WALL D.
- ④ STRUCTURE EXCAVATION ASSOCIATED WITH WALL L IS NOT QUANTIFIED SEPARATELY BUT INCLUDED IN THE UNCLASSIFIED EXCAVATION QUANTITY.

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Design		Detail		Quantities	
Designed By	Checked By	INITIAL	DATE	INITIAL	DATE
SA	JL	SA	11-12	SA	11-12
Checked By		Checked By		Checked By	

Print Date: 3/7/2013
 File Name: 18832DES_WallD_GenInfo02.dgn
 Horiz. Scale: NONE Vert. Scale: NONE
 Staff Bridge Branch - Unit 0221 STW

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Date:	Comments	Init.

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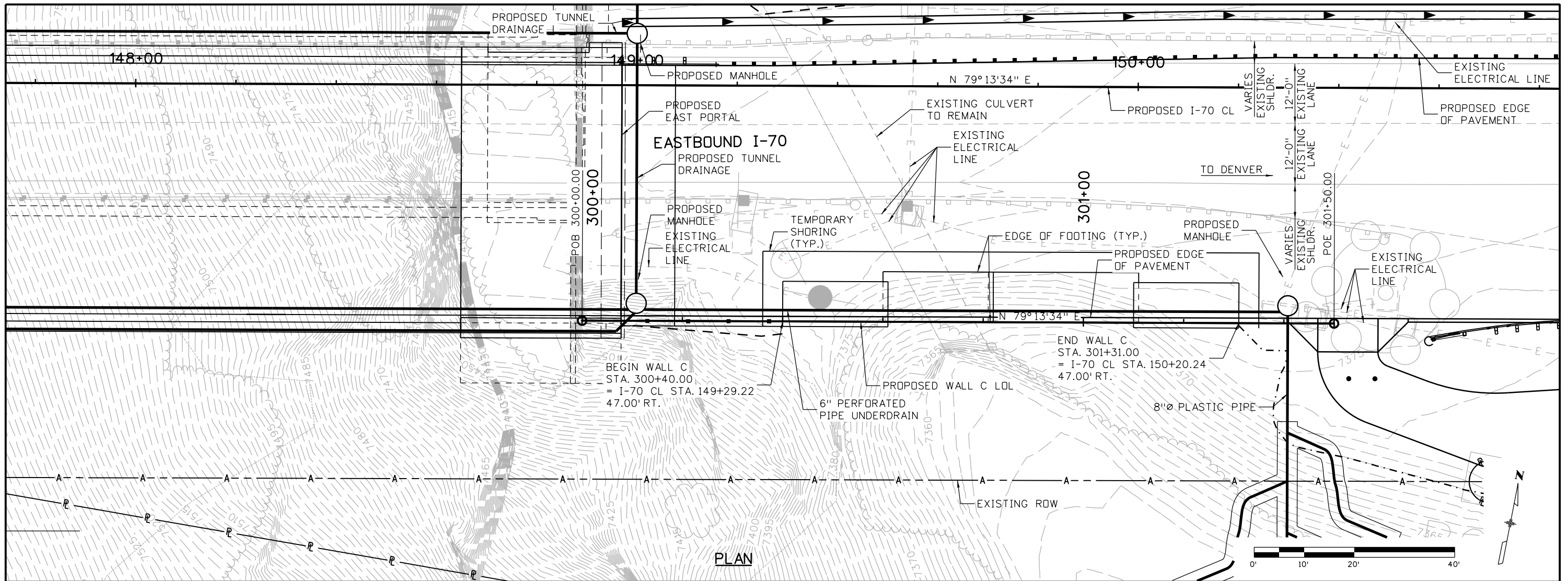
RETAINING WALLS C, D, G, & L
 SUMMARY OF QUANTITIES

Designer: S. ABRAHAM
 Detailer: E. SCHAWO
 Sheet Subset: WALL
 Structure Numbers: MULTIPLE
 Subset Sheets: W02 of 34

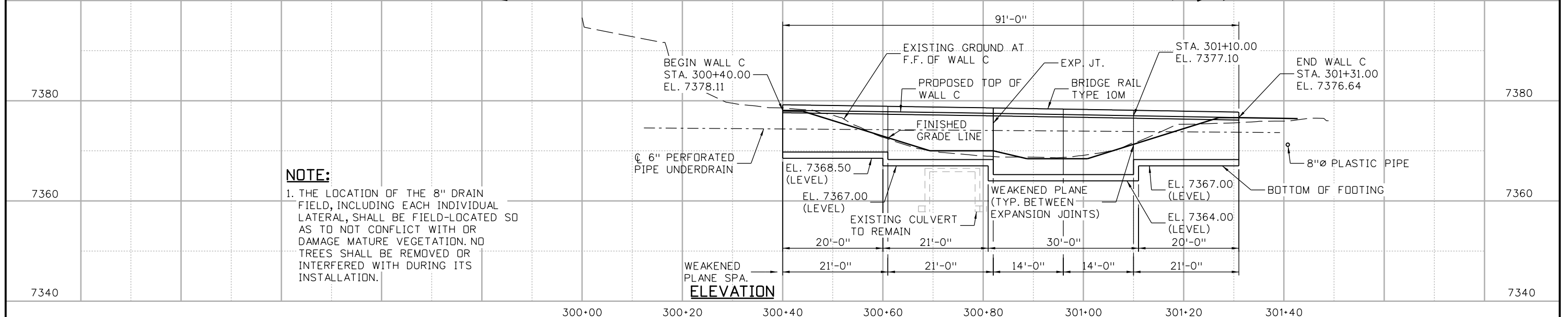
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 19036
 Sheet Number 207

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SA	JL	ERS	12-12	ERS	12-12	SA	12-12
SA	JL	SA	12-12	SA	12-12	SA	12-12



PLAN



ELEVATION

Print Date: 3/7/2013
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 Staff Bridge Branch - Unit 0221 STW

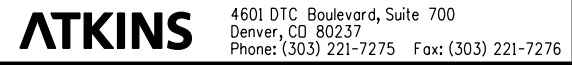
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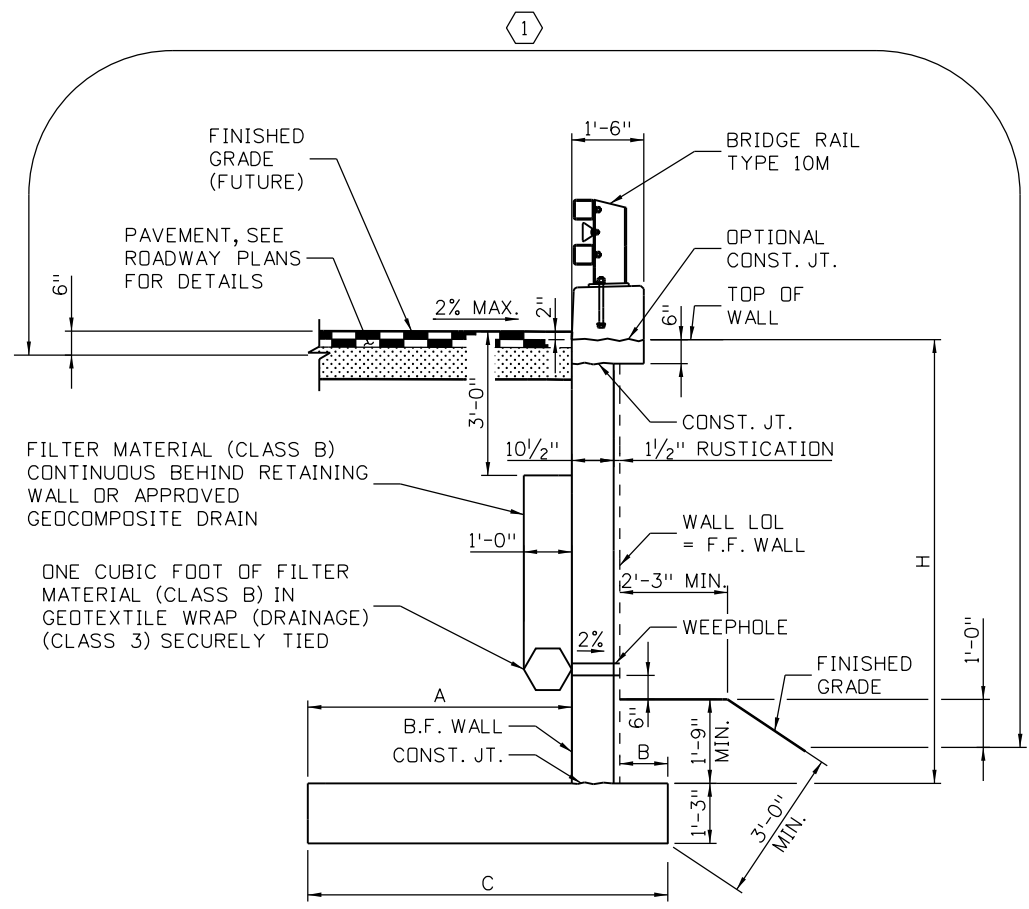
Colorado Department of Transportation
 425 A Corporate Circle
 Golden, CO 80401
 Phone: 720-497-6918 FAX: 720-497-6901
 Region 1 CRC

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 No Revisions:
 Revised:
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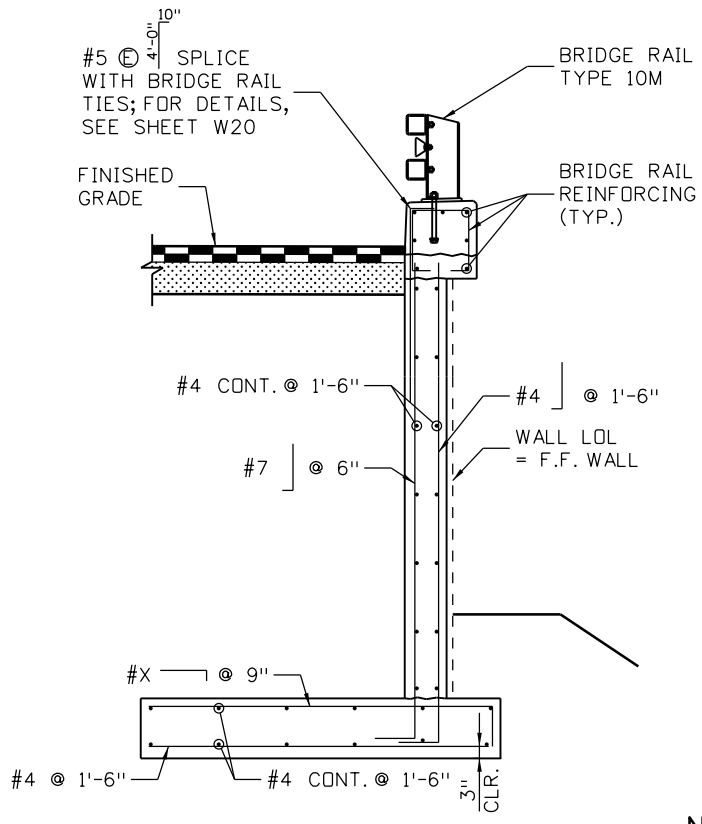
RETAINING WALL C
 STA 300+40.00 TO 301+31.00
 Designer: S. ABRAHAM
 Detailer: E. SCHAWO
 Sheet Subset: WALL
 Structure Numbers: WALL-F-15-BC
 Subset Sheets: W03 of 34

Project No./Code
 IM 0703-391
 19036
 Sheet Number 208





TYPICAL SECTION



TYPICAL REINFORCING SECTION

WALL C VARIABLE TABLE

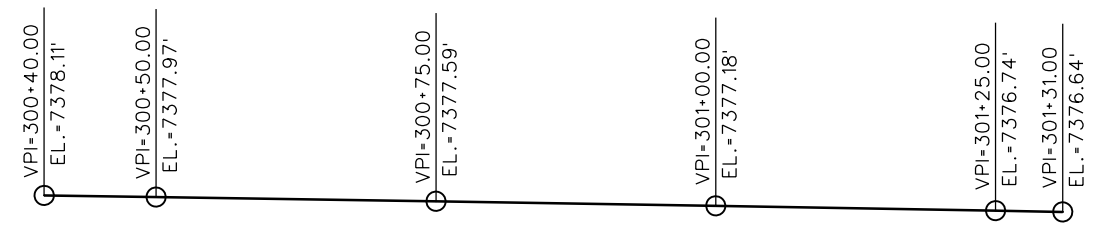
WALL C STATION RANGE	DESIGN HEIGHT H (FT)	A (FT)	B (FT)	C (FT)	REBAR (X)
300+40.00 TO 300+60.00 AND 301+11.00 TO 301+31.00	9.50	7.0	1.0	9.0	#7
300+60.00 TO 301+11.00	12.50	9.0	0.0	10.0	#8

KEYNOTES

① LIMITS OF STRUCTURAL CONCRETE COATING.

NOTES:

1. CONCRETE SHALL BE CONCRETE CLASS D (WALL).
2. WEEPHOLES SHALL BE 3"Ø PVC PIPE.
3. FOR BRIDGE RAIL TYPE 10M DETAILS, SEE SHEETS W20 & W21.
4. FOR BOULDER DETAILS AT THE FRONT FACE OF WALL, SEE BOULDER INSTALLATION PLAN DETAILS.
5. FILTER MATERIAL (CLASS B) OR GEOCOMPOSITE DRAIN, GEOTEXTILE WRAP CLASS 3, AND WEEPHOLES SHALL BE INCLUDED IN ITEM 605, GEOCOMPOSITE DRAIN WITHOUT PIPE.
6. RUSTICATION SHALL BE LINER 131, COLORADO RANDOM REVEAL PATTERN BY SCOTT SYSTEM OR APPROVED EQUAL.
7. MINIMUM FROST DEPTH IS NOT REQUIRED WHERE THE FOOTING IS AT THE TOP OF EXISTING CBC.



TOP OF WALL PROFILE GRADE

Design		Detail		Quantities	
DATE	INITIAL	DATE	INITIAL	DATE	INITIAL
12-12	SA	12-12	ERS	12-12	SA
12-12	JL	12-12	JL	12-12	WZ
Designed By	Checked By	Designed By	Checked By	Quantities By	Checked By

Print Date: 3/7/2013
 File Name: 18832DES_WallC_TypSec01.dgn
 Horiz. Scale: 1:4 Vert. Scale: 1:4
 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.

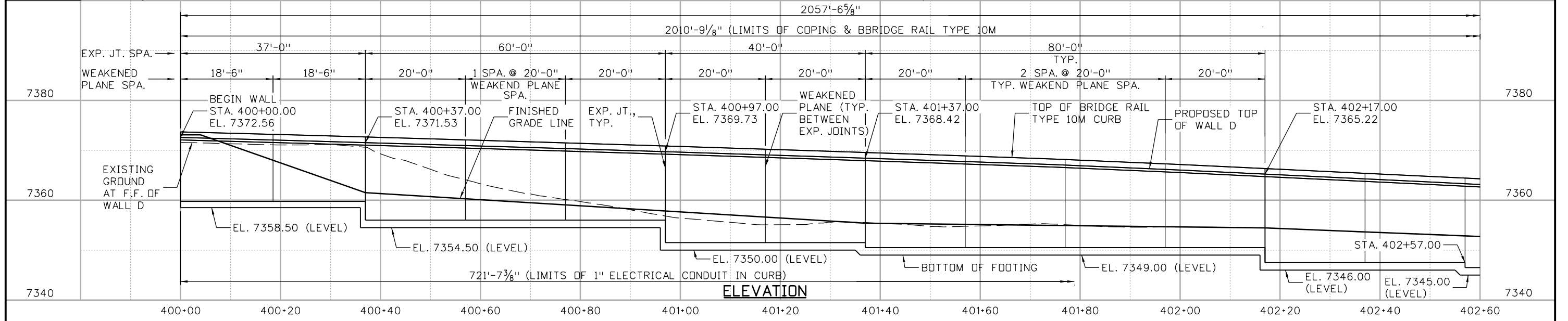
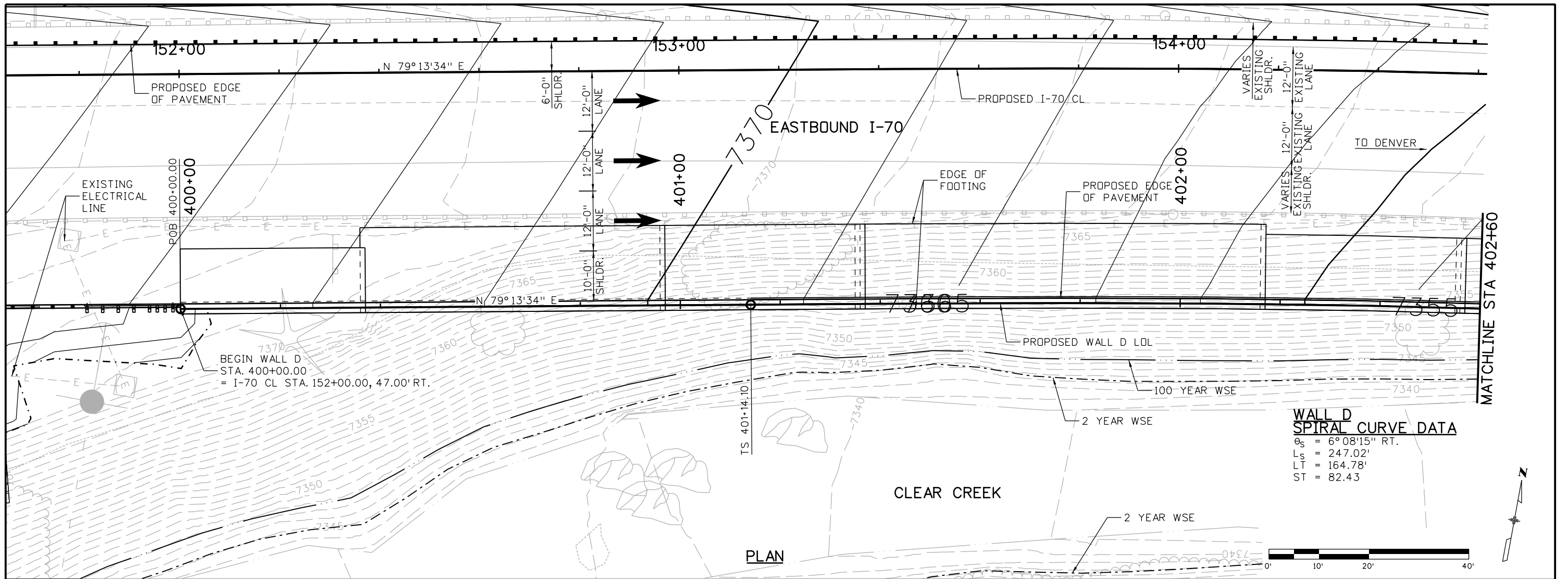
Colorado Department of Transportation
 425 A Corporate Circle
 Golden, CO 80401
 Phone: 720-497-6918 FAX: 720-497-6901
 Region 1 CRC

As Constructed
No Revisions:
Revised:
Void:

RETAINING WALL C TYPICAL SECTION			
Designer:	S. ABRAHAM	Structure	WALL-F-15-BC
Detailer:	E. SCHAWO	Numbers	
Sheet Subset:	WALL	Subset Sheets:	W04 of 34

Project No./Code
IM 0703-391
19036
Sheet Number 209

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Design		Detail		Quantities	
DATE	INITIAL	DATE	INITIAL	DATE	INITIAL
12-12	PF	12-12	PF	12-12	PF
12-12	JL	12-12	JL	12-12	WZ
12-12	Checked By	12-12	Checked By	12-12	Checked By

Print Date: 3/7/2013
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 Horiz. Scale: 1:20 Vert. Scale: 1:20
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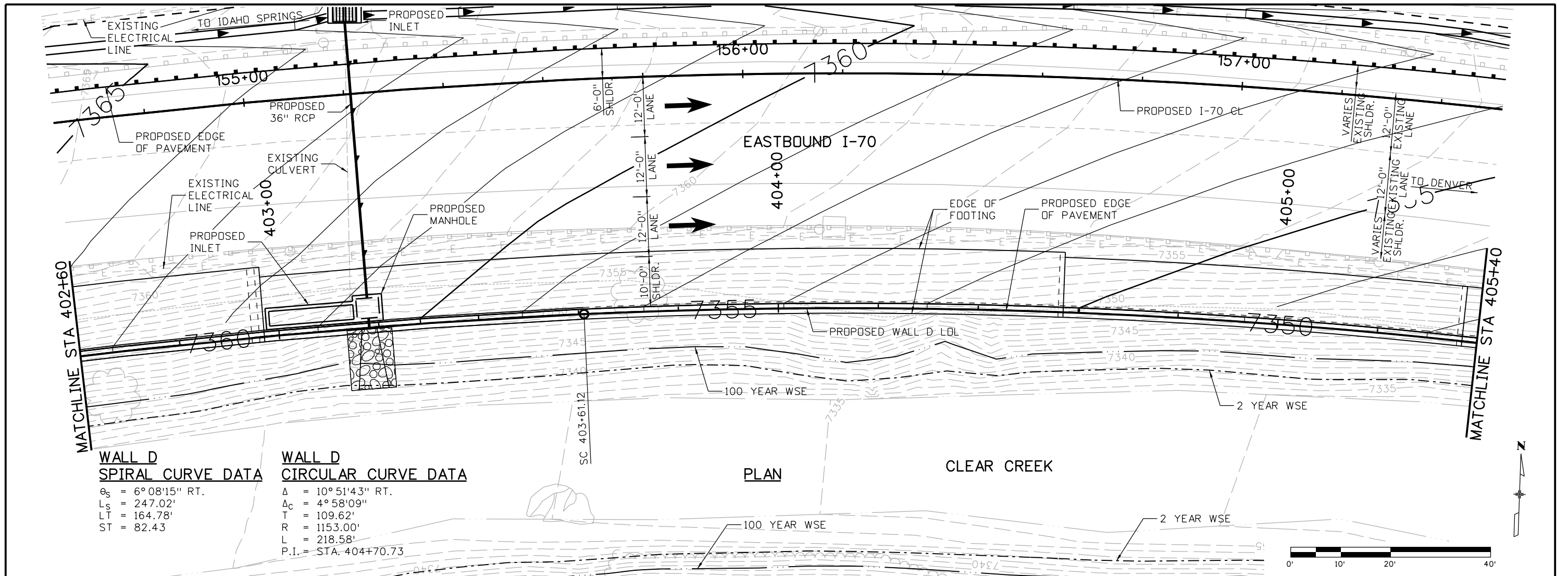
RETAINING WALL D
 STA 400+00 TO 402+60

Designer: P. FERNANDEZ
 Detailer: E. SCHAWO
 Sheet Subset: WALL

Structure Numbers
 WALL-F-15-BD
 Subset Sheets: W05 of 34

Project No./Code
 IM 0703-391
 19036
 Sheet Number 210

18026 10:04:09 AM c:\pwworking\pws\jpw\1\common\dms26956\18832DES_WallD_PnP001.dgn



**WALL D
SPIRAL CURVE DATA**

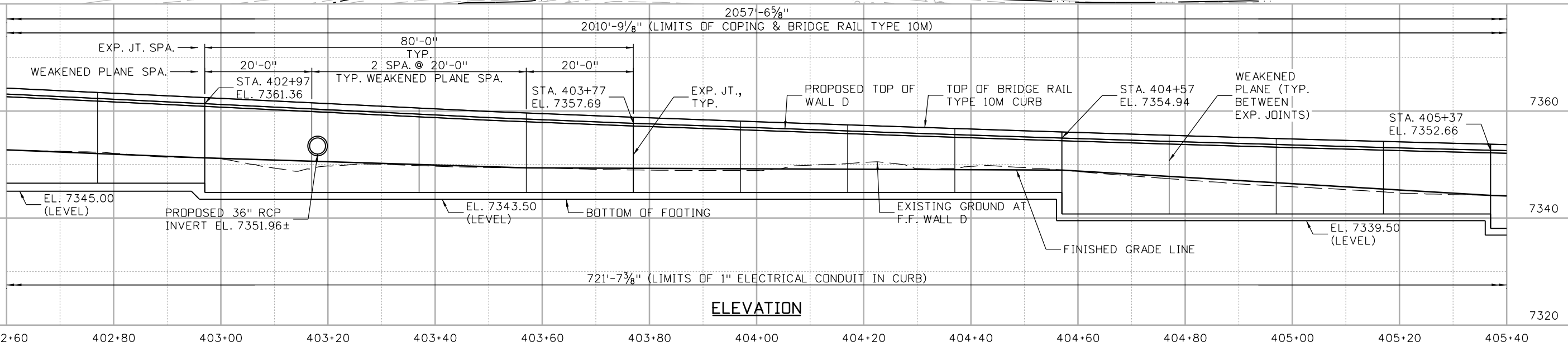
$\theta_s = 6^\circ 08' 15''$ RT.
 $L_s = 247.02'$
 $LT = 164.78'$
 $ST = 82.43'$

**WALL D
CIRCULAR CURVE DATA**

$\Delta = 10^\circ 51' 43''$ RT.
 $\Delta_c = 4^\circ 58' 09''$
 $T = 109.62'$
 $R = 1153.00'$
 $L = 218.58'$
 $P.I. = STA. 404+70.73$

PLAN

CLEAR CREEK



ELEVATION

Design		Detail		Quantities	
DATE	INITIAL	DATE	INITIAL	DATE	INITIAL
12-12	PF	12-12	PF	12-12	PF
12-12	JL	12-12	JL	12-12	WZ
12-12	Checked By	12-12	Checked By	12-12	Checked By
12-12	Designed By	12-12	Designed By	12-12	Designed By

Print Date: 3/7/2013
 File Name: 18832DES_WallD_PnP002.dgn
 Horiz. Scale: 1:20 Vert. Scale: 1:20
 Staff Bridge Branch - Unit 0221 STW

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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:

**RETAINING WALL D
STA 402+60 TO 405+40**

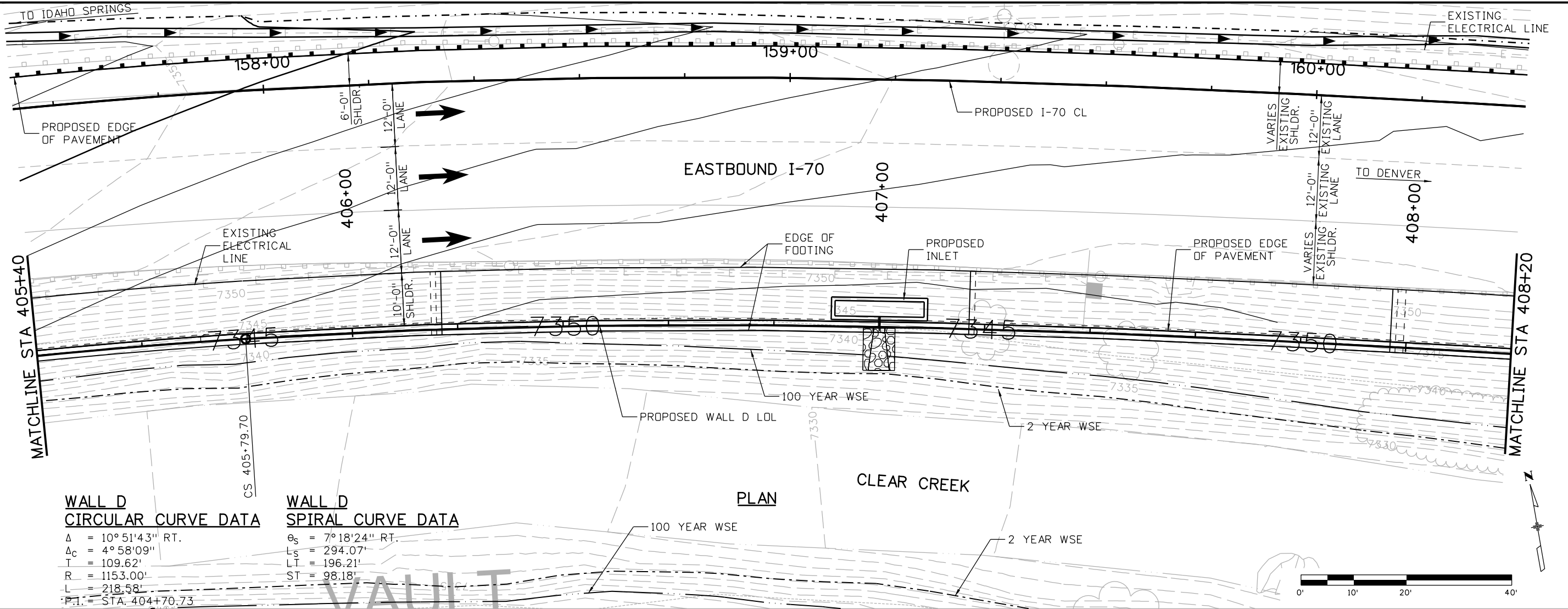
Designer: P. FERNANDEZ
 Detailer: E. SCHAWO

Structure Numbers: WALL-F-15-BD
 Subset Sheets: W06 of 34

Project No./Code
IM 0703-391
19036
Sheet Number 211

18026 10:04:50 AM c:\pw-work\pops\jwl\common\dms26956\18832DES_WallD_PnP002.dgn

Design		Detail		Quantity	
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12-12	JL	12-12	JL	12-12	PZ
12-12	JL	12-12	JL	12-12	PZ
12-12	JL	12-12	JL	12-12	PZ
12-12	JL	12-12	JL	12-12	PZ



**WALL D
CIRCULAR CURVE DATA**
 $\Delta = 10^\circ 51'43''$ RT.
 $\Delta_c = 4^\circ 58'09''$
 $T = 109.62'$
 $R = 1153.00'$
 $L = 218.58'$
 $P.I. = STA. 404+70.73$

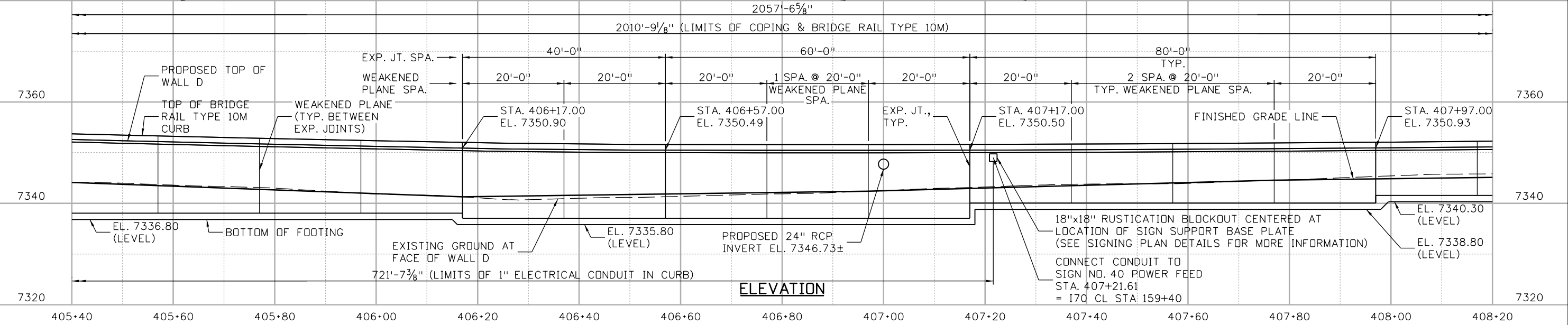
**WALL D
SPIRAL CURVE DATA**
 $\theta_s = 7^\circ 18'24''$ RT.
 $L_s = 294.07'$
 $L.T. = 196.21'$
 $ST = 98.18'$

PLAN

CLEAR CREEK

100 YEAR WSE

2 YEAR WSE



ELEVATION

Print Date: 3/7/2013

File Name: 18832DES_WallD_Pn003.dgn

Horiz. Scale: 1:20

Vert. Scale: 1:20

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:

**RETAINING WALL D
 STA 405+40 TO 408+20**

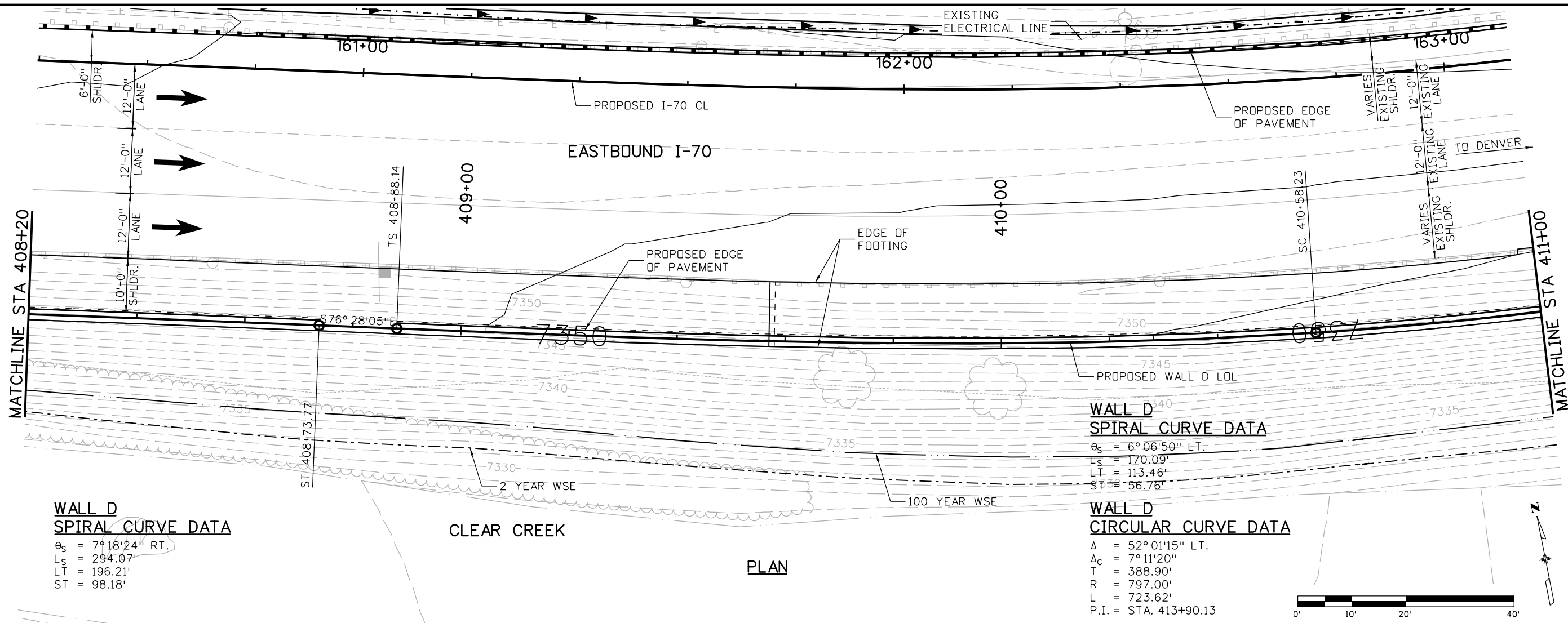
Designer: P. FERNANDEZ	Structure Numbers
Detailer: E. SCHAWO	
Sheet Subset: WALL	Subset Sheets: W07 of 34

Project No./Code

IM 0703-391
19036
Sheet Number 212

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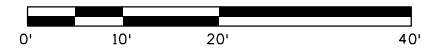
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DATE	INITIAL	DATE	INITIAL	DATE	INITIAL
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12-12	JL	12-12	JL	12-12	WZ
12-12	Checked By	12-12	Checked By	12-12	Checked By



WALL D SPIRAL CURVE DATA
 $\theta_s = 7^\circ 18' 24''$ RT.
 $L_s = 294.07'$
 $LT = 196.21'$
 $ST = 98.18'$

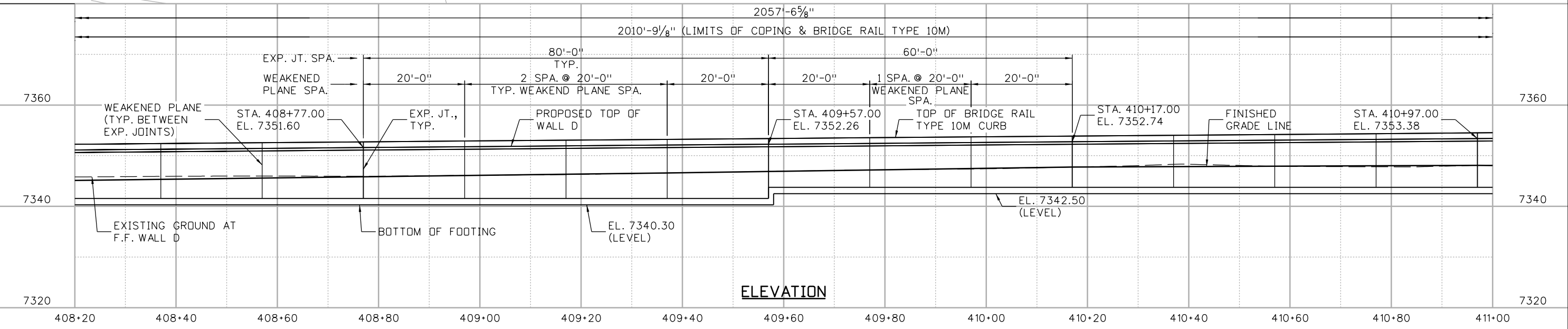
WALL D SPIRAL CURVE DATA
 $\theta_s = 6^\circ 06' 50''$ LT.
 $L_s = 170.09'$
 $LT = 113.46'$
 $ST = 56.76'$

WALL D CIRCULAR CURVE DATA
 $\Delta = 52^\circ 01' 15''$ LT.
 $\Delta_c = 7^\circ 11' 20''$
 $T = 388.90'$
 $R = 797.00'$
 $L = 723.62'$
 $P.I. = STA. 413+90.13$



PLAN

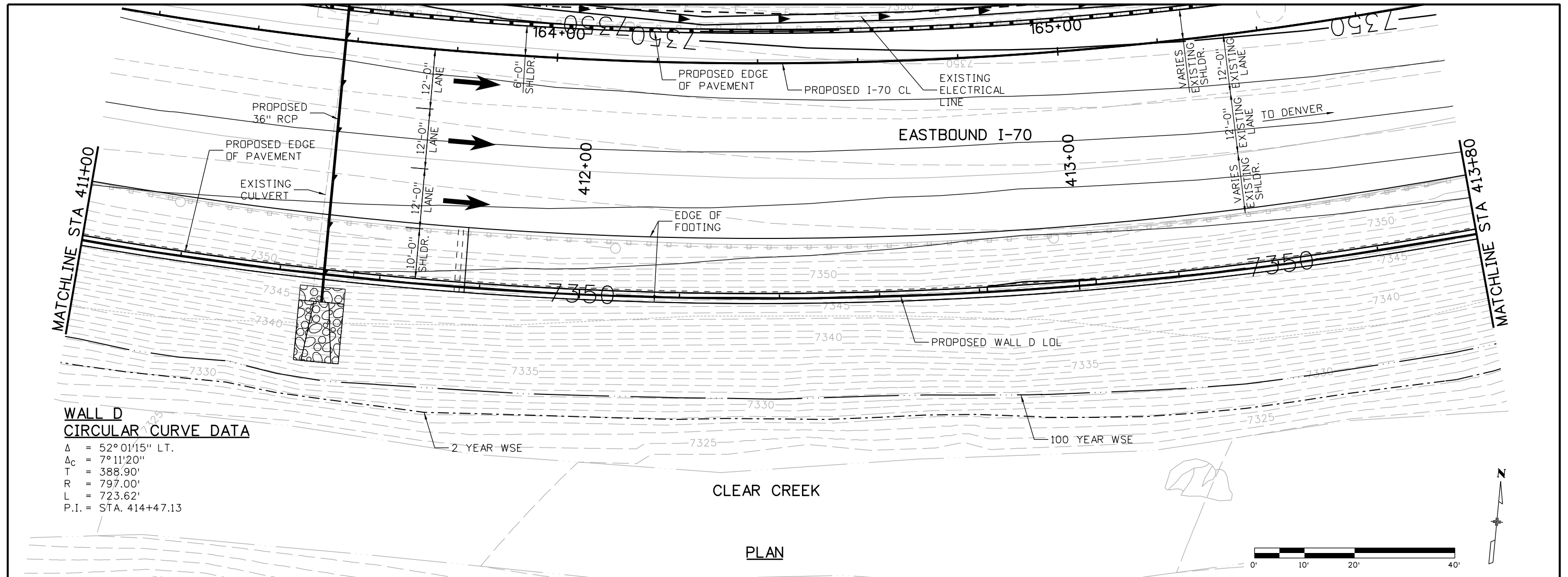
ELEVATION



Print Date: 3/7/2013		Sheet Revisions		Colorado Department of Transportation		As Constructed		RETAINING WALL D STA 408+20 TO 411+00		Project No./Code		
File Name: 18832DES_WallD_PnPO04.dgn		Date:	Comments	Init.	No Revisions:				IM 0703-391			
Horiz. Scale: 1:20 Vert. Scale: 1:20					Revised:		Designer: P. FERNANDEZ		Structure Numbers			
Staff Bridge Branch - Unit 0221 STW					Void:		Detailer: E. SCHAWO		19036			
ATKINS 4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276					Region 1		Sheet Subset: WALL		Subset Sheets: W08 of 34		Sheet Number 213	
					CRC							

18026 10:06:56 AM c:\pwwork\jbs\jw\1\common\dms26956\18832DES_WallD_PnPO05.dgn

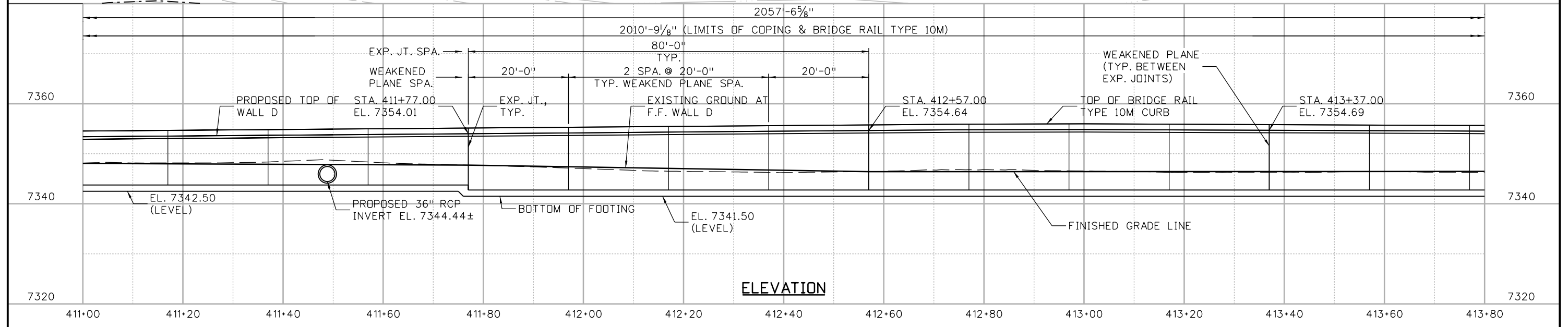
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DATE	INITIAL	DATE	INITIAL	DATE	INITIAL
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12-12	JL	12-12	JL	12-12	WZ
12-12	PF	12-12	PF	12-12	WZ
12-12	JL	12-12	JL	12-12	WZ



**WALL D
CIRCULAR CURVE DATA**

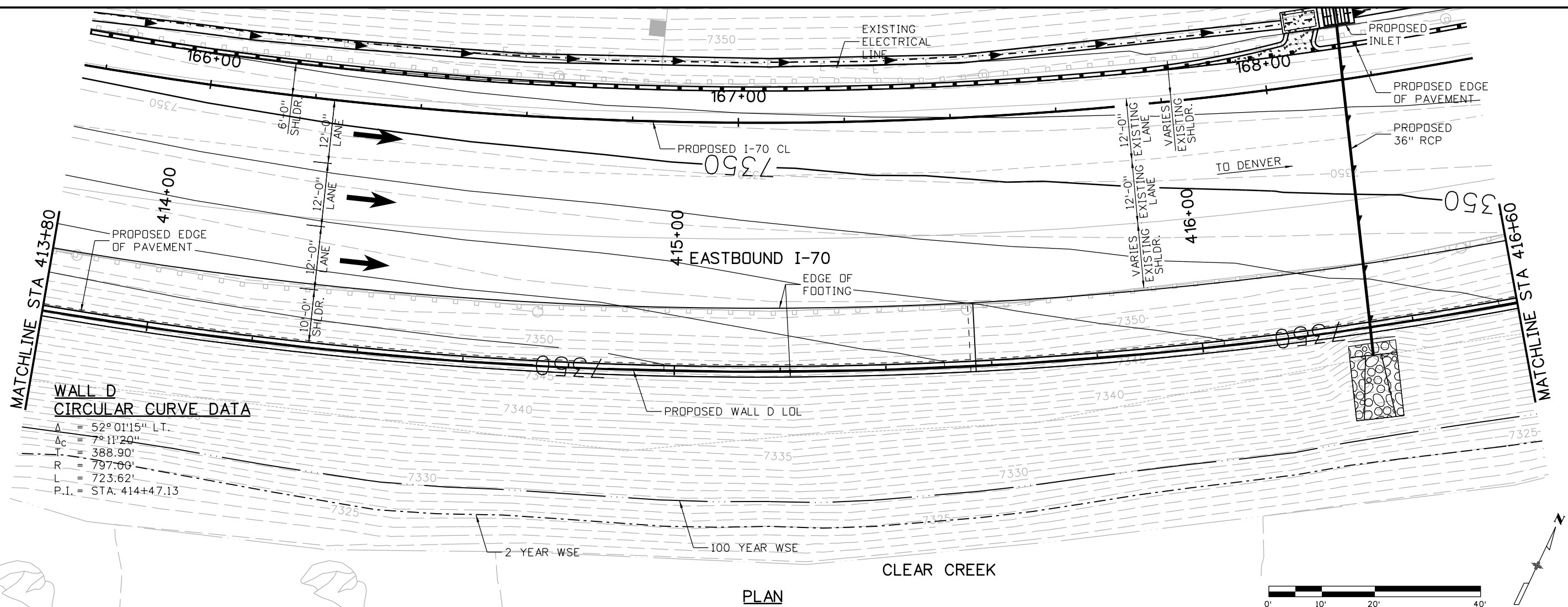
Δ = 52° 01' 15" LT.
 Δ_c = 7° 11' 20"
 T = 388.90'
 R = 797.00'
 L = 723.62'
 P.I. = STA. 414+47.13

PLAN



ELEVATION

Print Date: 3/7/2013	Sheet Revisions		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:	RETAINING WALL D STA 411+00 TO 413+80		Project No./Code IM 0703-391 19036 Sheet Number 214
File Name: 18832DES_WallD_PnPO05.dgn	Date:	Comments:			Init.	Designer: P. FERNANDEZ Detailer: E. SCHAWO Sheet Subset: WALL	
Horiz. Scale: 1:20 Staff Bridge Branch - Unit 0221 ATKINS 4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276	Vert. Scale: 1:20 STW		CRC				

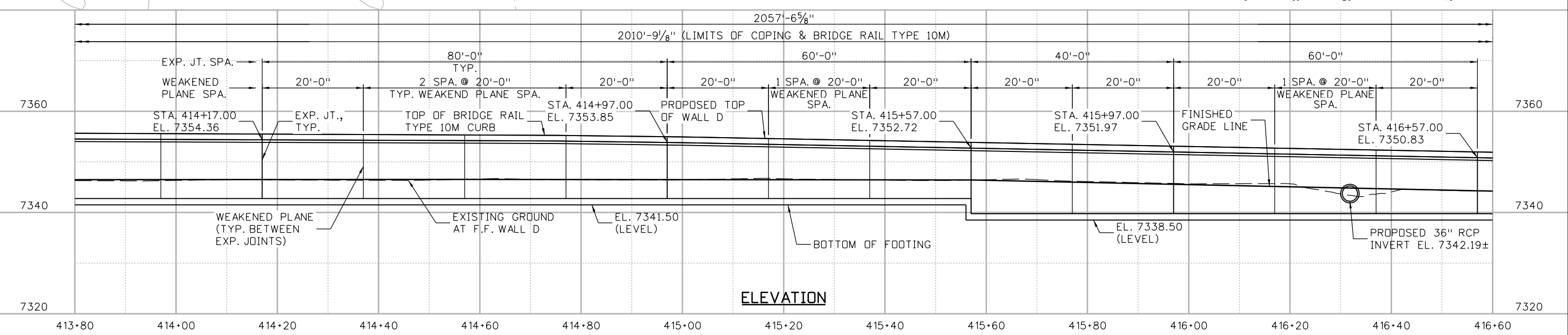
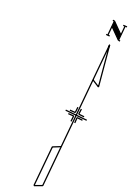
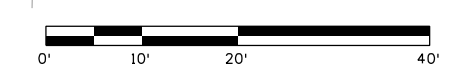


**WALL D
CIRCULAR CURVE DATA**

Δ = 52° 01' 15" LT.
 Δc = 7° 11' 20"
 T = 388.90'
 R = 797.00'
 L = 723.62'
 P.I. = STA. 414+47.13

PLAN

CLEAR CREEK



ELEVATION

Design		Detail		Quantities	
DATE	INITIAL	DATE	INITIAL	DATE	INITIAL
12-12	PF	12-12	PF	12-12	PF
12-12	JL	12-12	JL	12-12	WZ
12-12	PF	12-12	PF	12-12	WZ
12-12	JL	12-12	JL	12-12	WZ

Print Date: 3/7/2013
 File Name: 18832DES_WallD_PnPO06.dgn
 Horiz. Scale: 1:20 Vert. Scale: 1:20
 Staff Bridge Branch - Unit 0221 STW

Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation

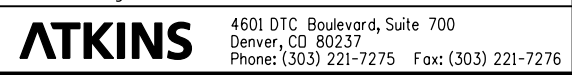
 425 A Corporate Circle
 Golden, CO 80401
 Phone: 720-497-6918 FAX: 720-497-6901
 Region 1 CRC

As Constructed
 No Revisions:
 Revised:
 Void:

**RETAINING WALL D
STA 413+80 TO 416+60**

Designer:	P. FERNANDEZ	Structure Numbers	WALL-F-15-BD
Detailer:	E. SCHAWO	Subset Sheets:	W10 of 34

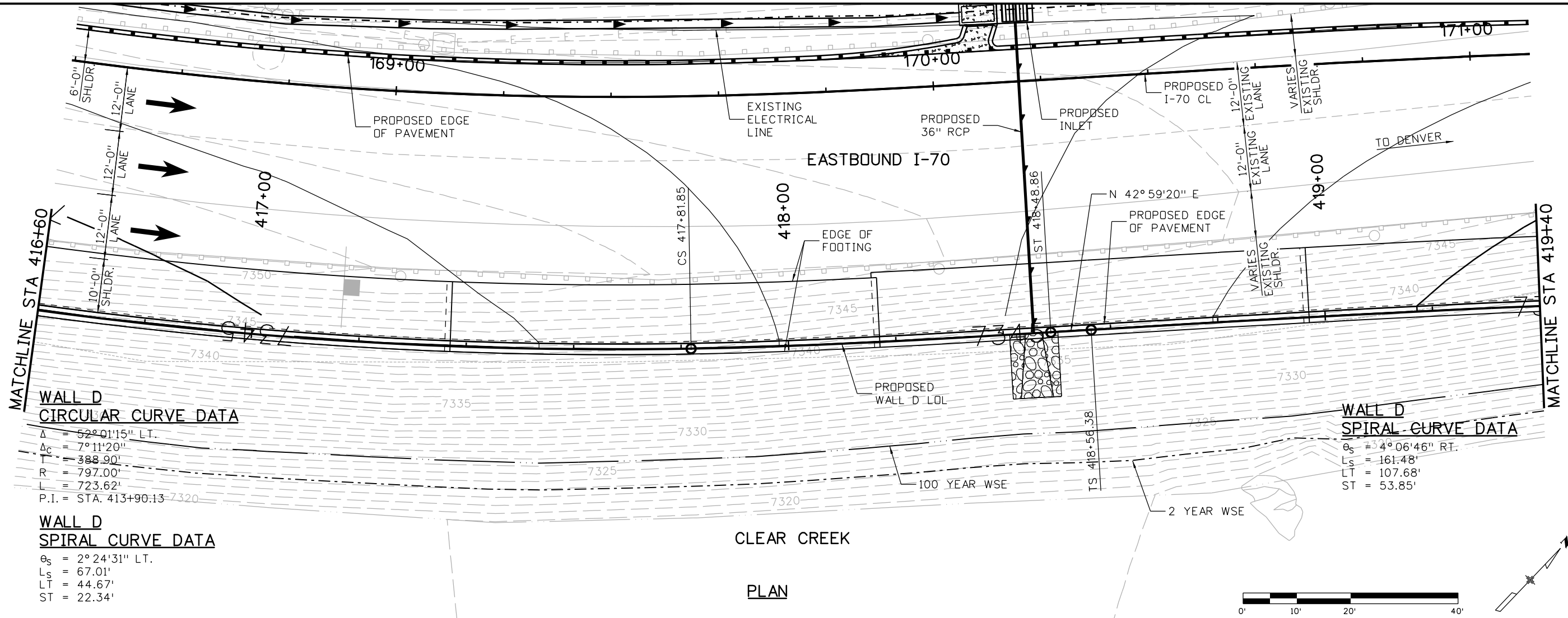
Project No./Code
 IM 0703-391
 19036
 Sheet Number 215



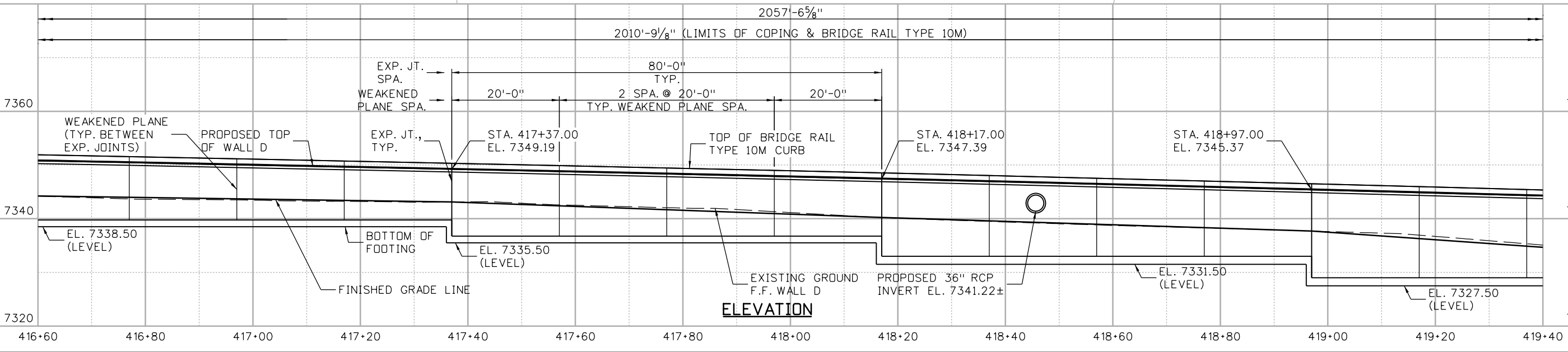
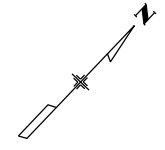
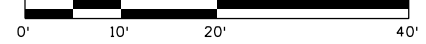
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18026 10:08:22 AM c:\pwwork\pjs\jw\1\common\dms26956\18832DES_WallD_Pn007.dgn

Design		Detail		Quantities	
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12-12	JL	12-12	JL	12-12	WZ
12-12	PF	12-12	PF	12-12	PF
12-12	JL	12-12	JL	12-12	WZ



PLAN



Print Date: 3/7/2013
File Name: 18832DES_WallD_Pn007.dgn
Horiz. Scale: 1:20 Vert. Scale: 1:20
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Date:	Comments	Init.

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Region 1 CRC

As Constructed

No Revisions:
Revised:
Void:

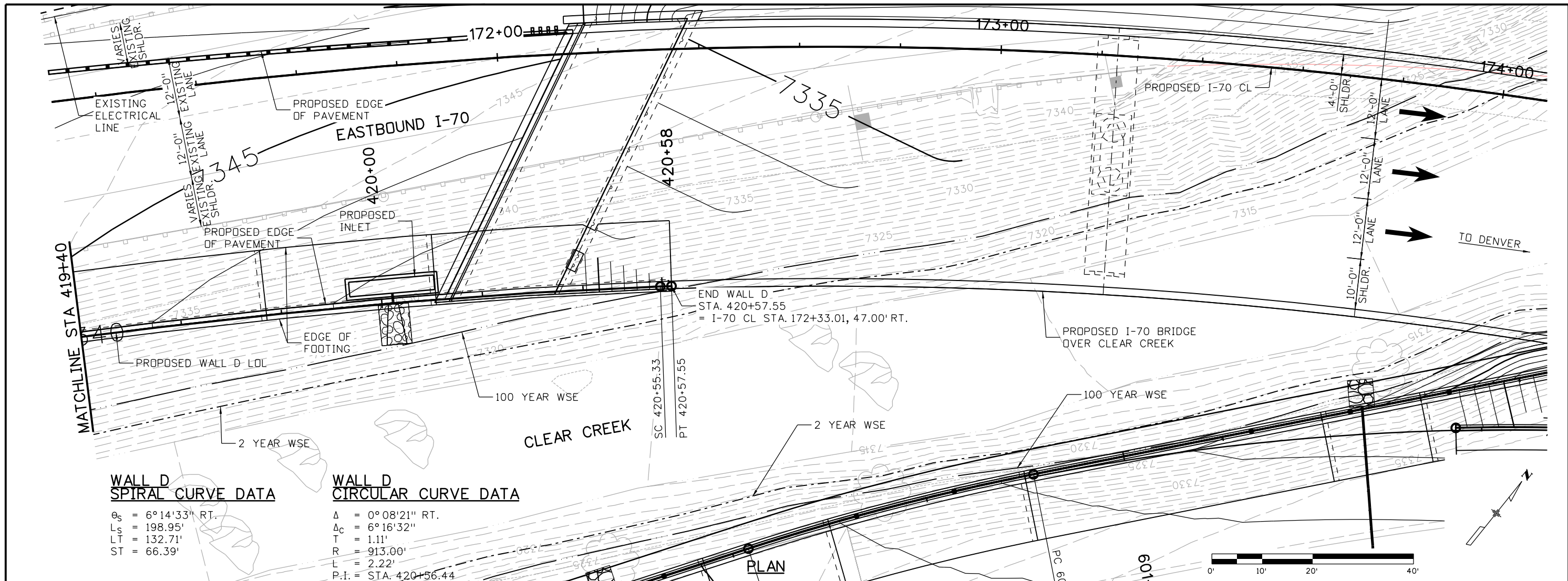
**RETAINING WALL D
STA 416+60 TO 419+40**

Designer: P. FERNANDEZ
Detailer: E. SCHAWO
Sheet Subset: WALL

Structure Numbers: WALL-F-15-BD
Subset Sheets: W11 of 34

Project No./Code

IM 0703-391
19036
Sheet Number 216



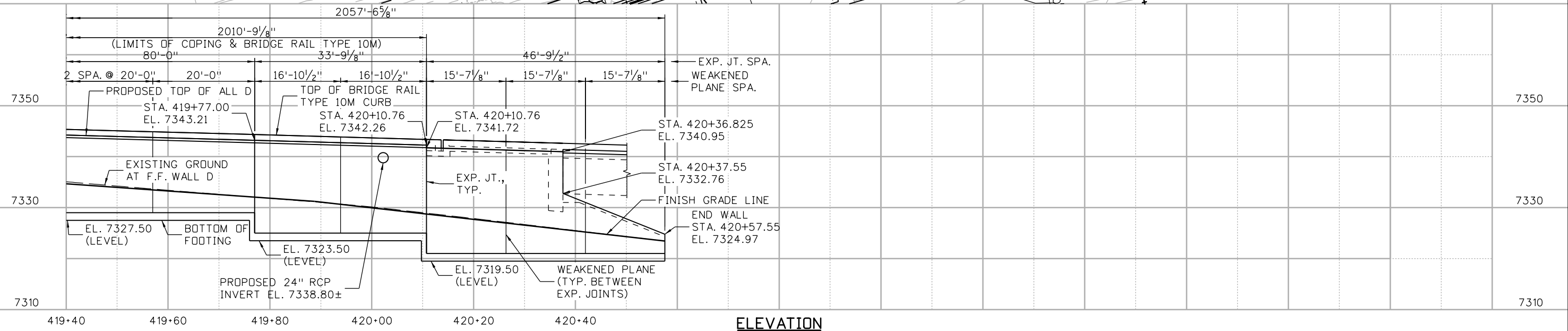
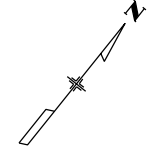
WALL D SPIRAL CURVE DATA

$\theta_s = 6^\circ 14' 33''$ RT.
 $L_s = 198.95'$
 $LT = 132.71'$
 $ST = 66.39'$

WALL D CIRCULAR CURVE DATA

$\Delta = 0^\circ 08' 21''$ RT.
 $\Delta_c = 6^\circ 16' 32''$
 $T = 1.11'$
 $R = 913.00'$
 $L = 2.22'$
 $P.I. = STA. 420+56.44$

PLAN



ELEVATION

Design		Detail		Quantities	
DATE	INITIAL	DATE	INITIAL	DATE	INITIAL
12-12	PF	12-12	PF	12-12	PF
12-12	WZ	12-12	WZ	12-12	WZ

Print Date: 3/7/2013
 File Name: 18832DES_WallD_PnP008.dgn
 Horiz. Scale: 1:20 Vert. Scale: 1:20
 Staff Bridge Branch - Unit 0221 STW


Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation
 425 A Corporate Circle
 Golden, CO 80401
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 Region 1 CRC

As Constructed
 No Revisions:
 Revised:
 Void:

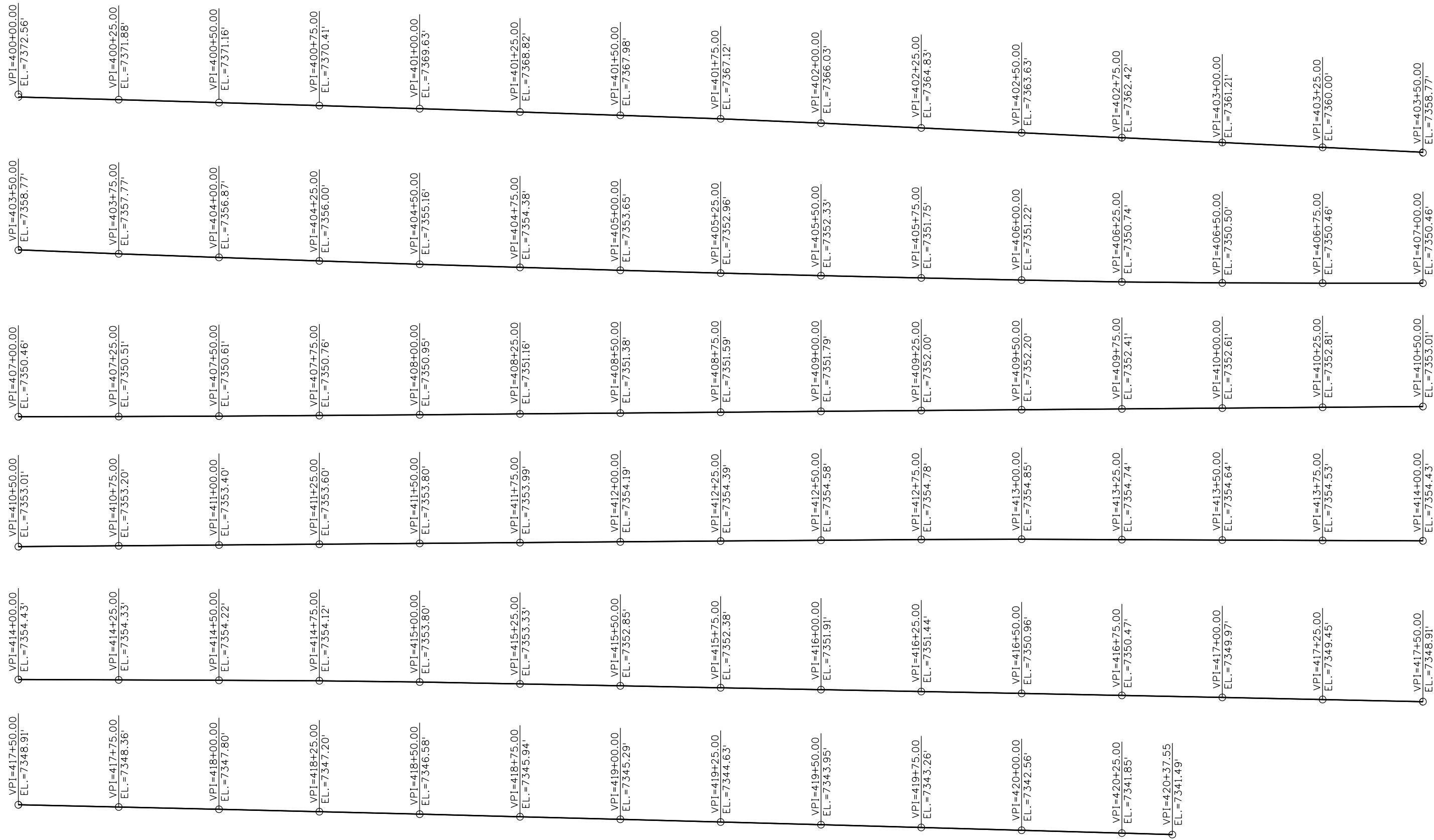
RETAINING WALL D
STA 419+40 TO 420+57.55
 Designer: P. FERNANDEZ
 Detailer: E. SCHAWO
 Sheet Subset: WALL

Project No./Code
 IM 0703-391
 19036
 Sheet Number 217

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

18026 1:59:41 PM c:\pw_work\p08\p08\18832DES\18832DES_WallD_PnP008.dgn

Design		Detail		Quantities	
INITIAL	DATE	INITIAL	DATE	INITIAL	DATE
PF	12-12	ERS	12-12	PF	12-12
Checked By	Checked By	Checked By	Checked By	Checked By	Checked By
JL	12-12	JL	12-12	WZ	12-12



Print Date: 3/7/2013
 File Name: 18832DES_WallD_ProfGrade01.dgn
 Horiz. Scale: 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:
Revised:
Void:

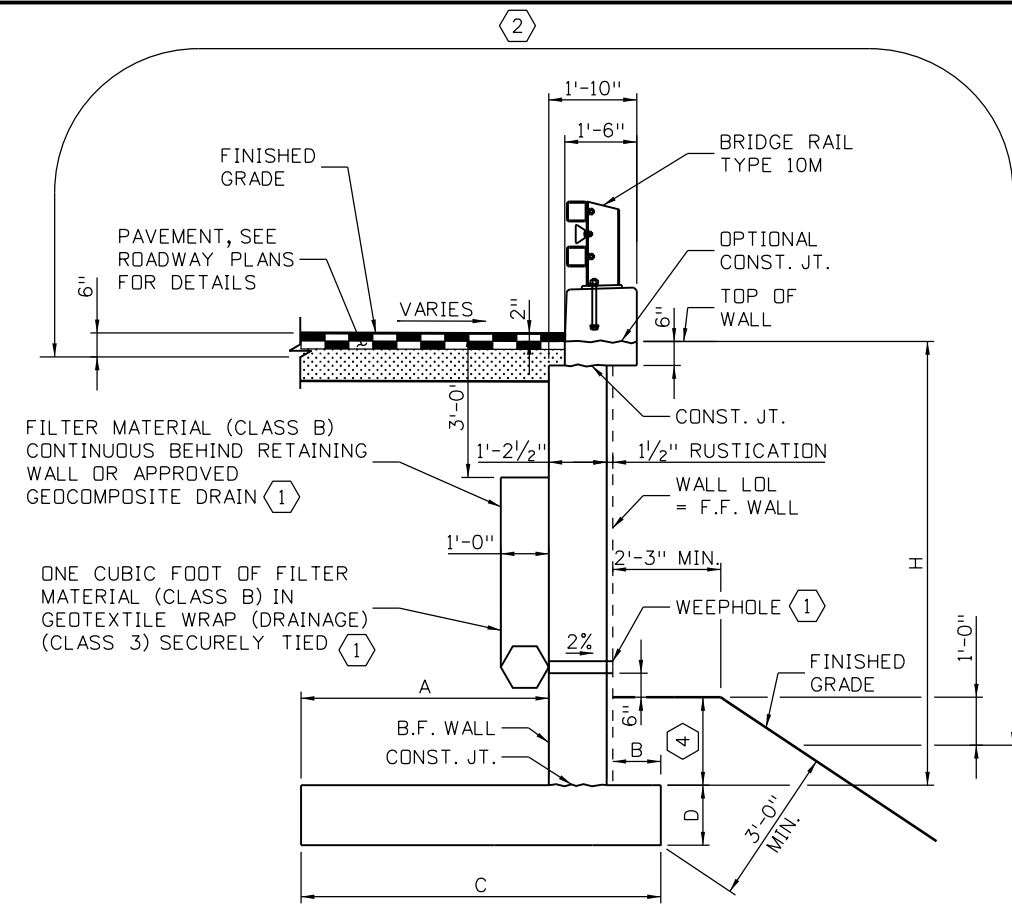
RETAINING WALL D
 TOP OF WALL PROFILE GRADE

Designer: P. FERNANDEZ	Structure Numbers	WALL-F-15-BD
Detailer: E. SCHAWO	Subset Sheets:	W13 of 34

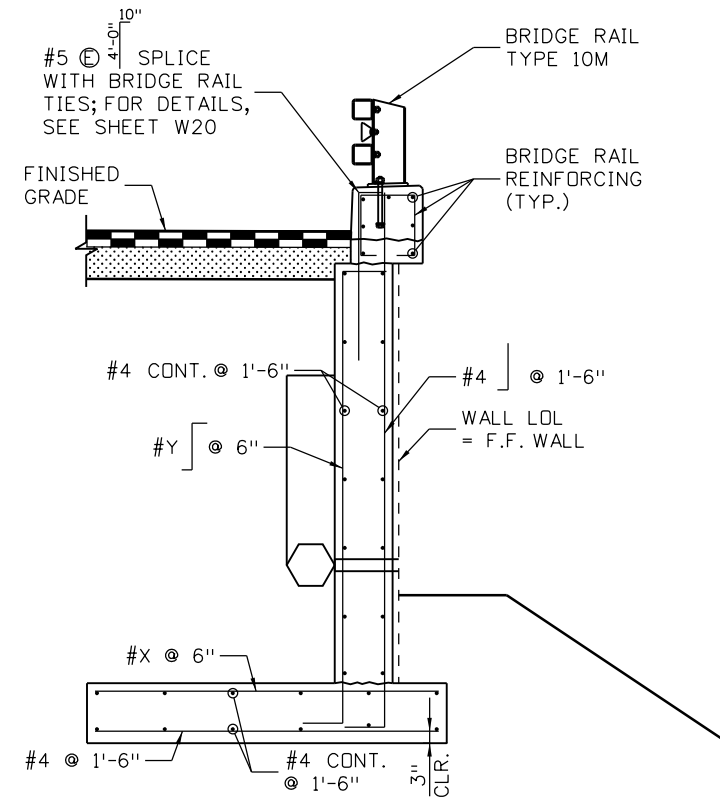
Project No./Code
IM 0703-391
19036
Sheet Number 218

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Design		Detail		Quantities	
DATE	INITIAL	DATE	INITIAL	DATE	INITIAL
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Checked By	Checked By	Checked By	Checked By	Checked By	Checked By
JL	JL	JL	JL	WZ	WZ

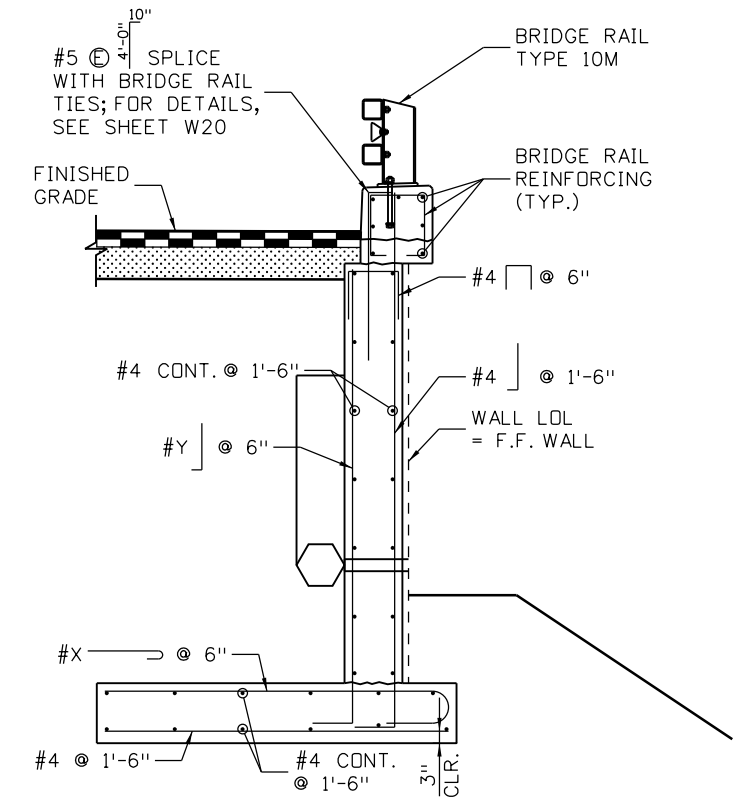


TYPICAL SECTION



TYPICAL REINFORCING SECTION

(APPLIES TO LOCATIONS DENOTED BY **)



TYPICAL REINFORCING SECTION

(APPLIES TO LOCATIONS DENOTED BY *)

WALL D VARIABLE TABLE

		WALL D						
WALL D STATION RANGE	DESIGN HEIGHT H (FT)	A (FT)	B (FT)	C (FT)	D (FT)	REBAR (X)	REBAR (Y)	
** 400+00.00 TO 400+37.00	13.50	10.7	1.0	13.0	1.25	#7	#7	
* 400+37.00 TO 402+17.00	18.30	14.7	1.0	17.0	1.50	#8	#8	
* 402+17.00 TO 402+97.00	18.30	12.7	1.0	15.0	1.50	#8	#8	
** 402+97.00 TO 404+57.00	16.79	10.7	1.0	13.0	1.25	#7	#7	
** 404+57.00 TO 410+97.00	14.60	9.7	1.0	12.0	1.25	#7	#7	

WALL D VARIABLE TABLE (CONT.)

		WALL D						
WALL D STATION RANGE	DESIGN HEIGHT H (FT)	A (FT)	B (FT)	C (FT)	D (FT)	REBAR (X)	REBAR (Y)	
** 410+97.00 TO 418+17.00	13.00	10.7	1.0	13.0	1.25	#7	#7	
* 418+17.00 TO 420+10.76	18.40	11.7	1.0	14.0	1.50	#8	#8	
(3) 420+10.76 TO 420+37.55	20.70	11.7	1.0	14.0	1.50	#8	#8	
420+37.55 TO 420+57.55	12.00	11.7	1.0	14.0	1.50	#7	#7	

KEYNOTES

- (1) FILTER MATERIAL (CLASS B), GEOCOMPOSITE DRAIN, GEOTEXTILE WRAP, AND WEEPHOLES SHALL BE OMITTED AT ABUTMENT, INLETS, AND MANHOLES.
- (2) LIMITS OF STRUCTURAL CONCRETE COATING.
- (3) ADDITIONAL REINFORCING REQUIRED AT SLEEPER SLAB, SEE DETAILS ON SHEET W15.
- (4) 1'-6" MINIMUM WHEN "D" IS 1.50', 1'-9" MINIMUM WHEN "D" IS 1.25'.

NOTES:

1. CONCRETE SHALL BE CONCRETE CLASS D (WALL).
2. WEEPHOLES SHALL BE 3"Ø PVC PIPE.
3. FOR BRIDGE RAIL TYPE 10M DETAILS, SEE SHEETS W20 & W21.
4. FOR INLET DETAILS, SEE DRAINAGE PLANS.
5. FOR BOULDER DETAILS AT THE FRONT FACE OF WALL, SEE BOULDER INSTALLATION PLAN DETAILS.
6. FILTER MATERIAL (CLASS B) OR GEOCOMPOSITE DRAIN, GEOTEXTILE WRAP CLASS 3, AND WEEPHOLES SHALL BE INCLUDED IN ITEM 605, GEOCOMPOSITE DRAIN WITHOUT PIPE.
7. RUSTICATION SHALL BE LINER 131, COLORADO RANDOM REVEAL PATTERN BY SCOTT SYSTEM OR APPROVED EQUAL.

Print Date: 3/7/2013
 File Name: 18832DES_WallD_TypSec01.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

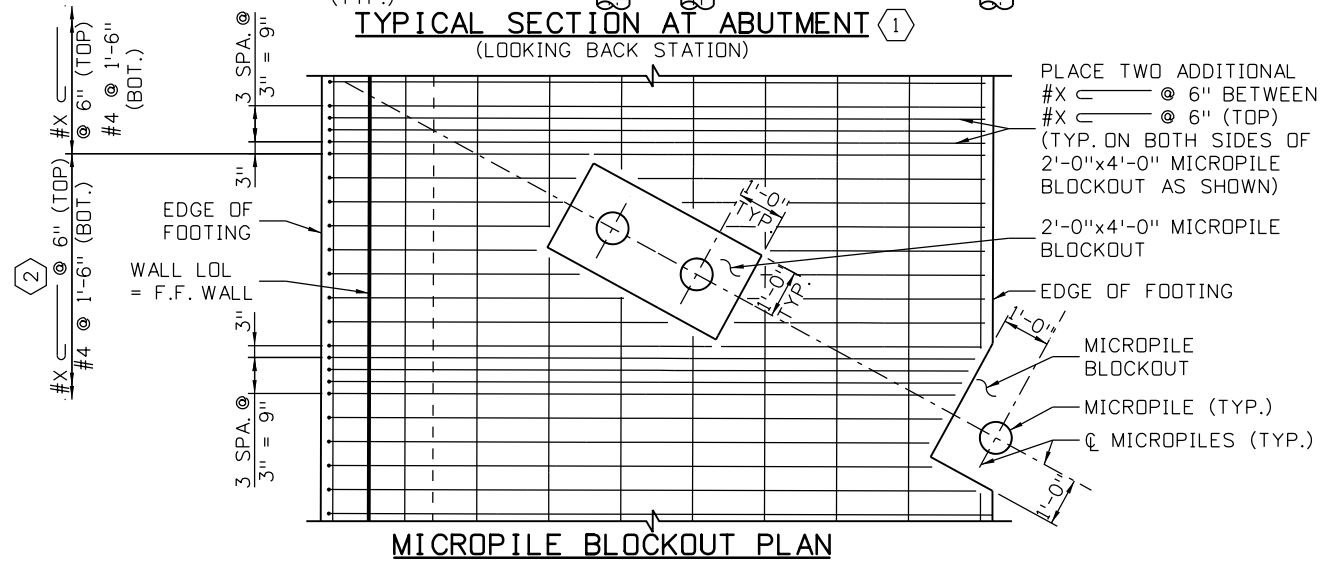
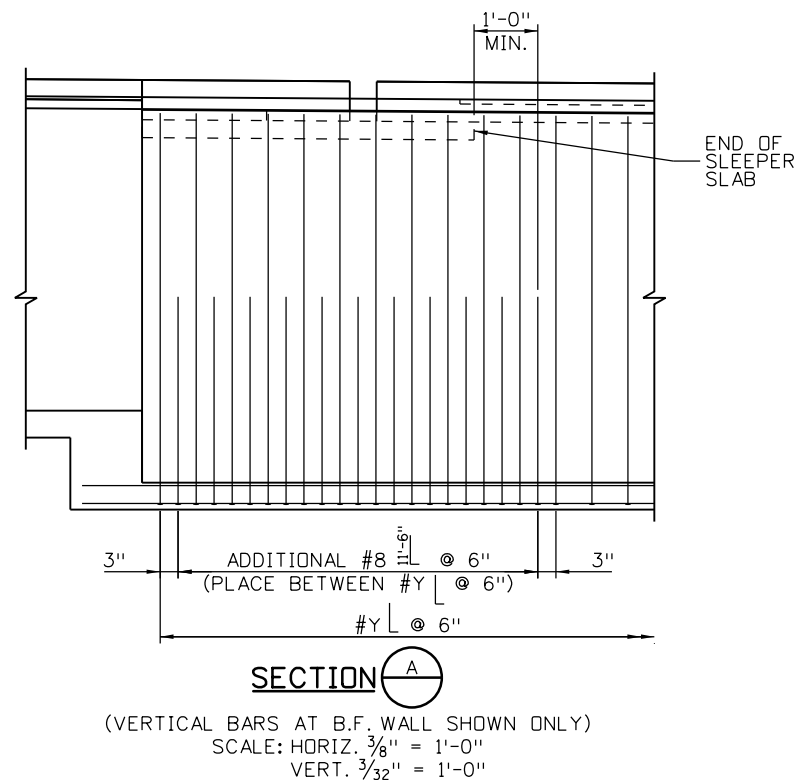
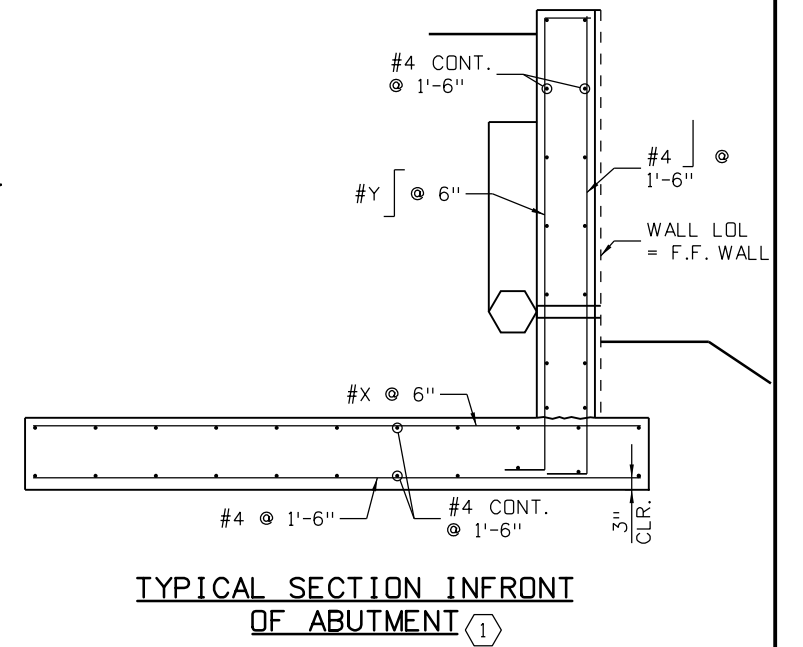
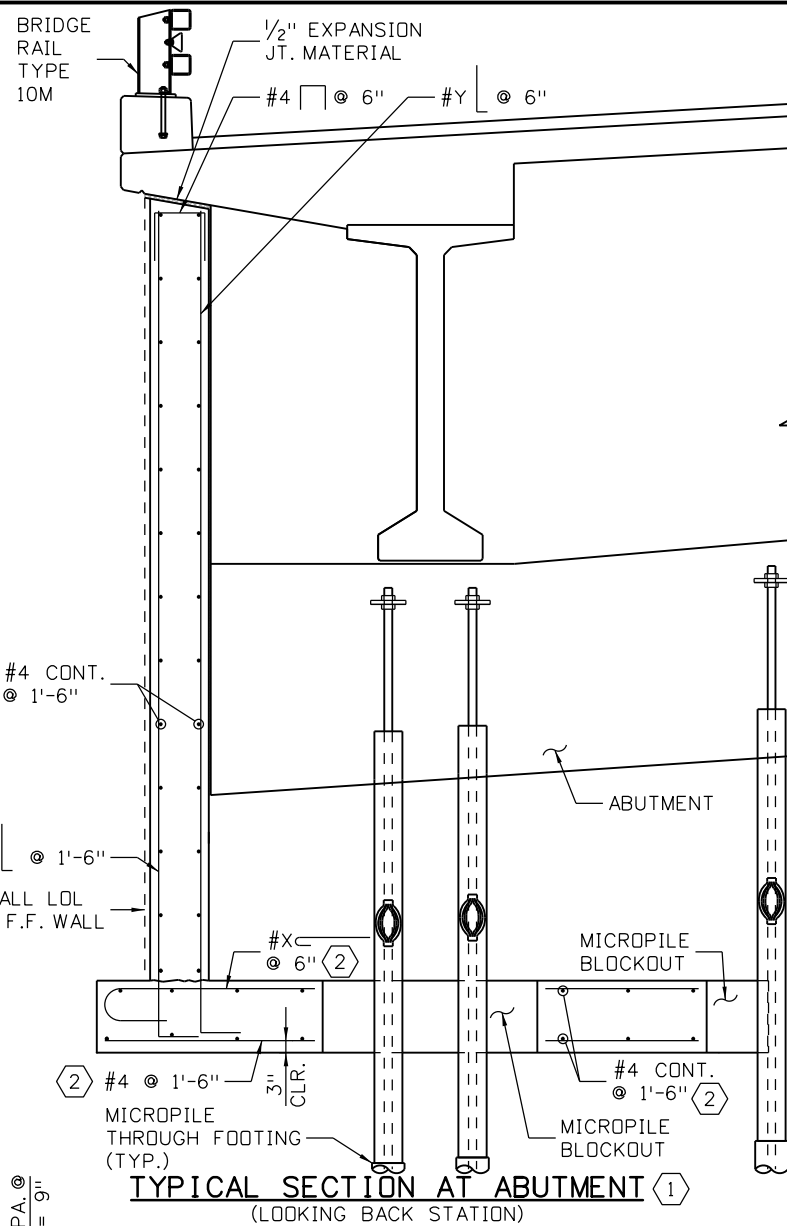
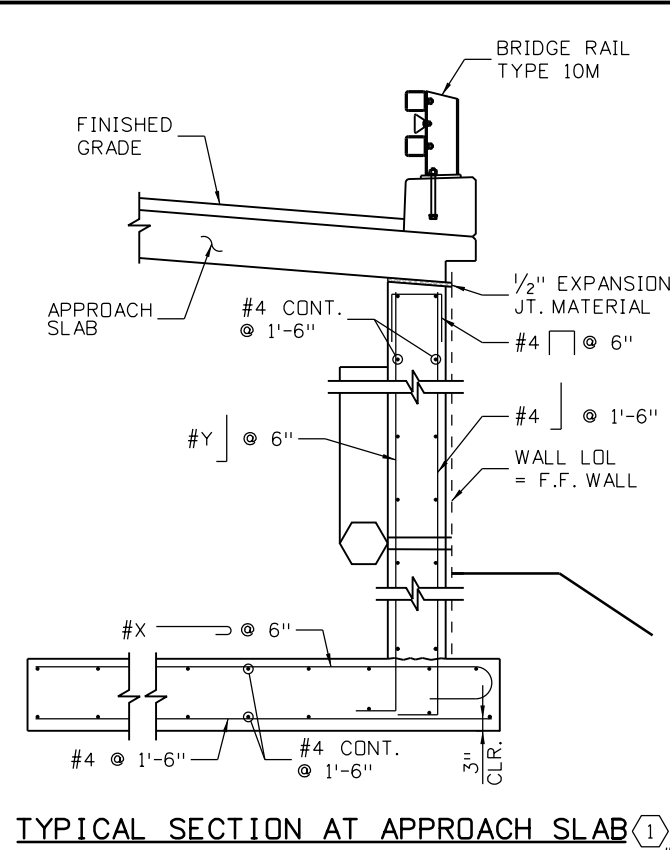
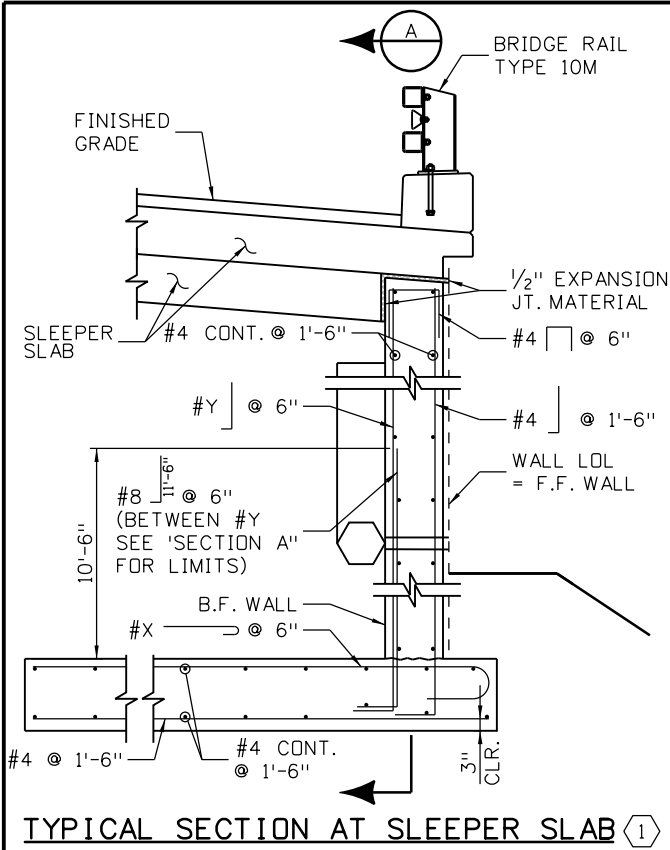
Region 1 CRC

As Constructed	No Revisions:		RETAINING WALL D TYPICAL SECTION (SHEET 1 OF 2)	Project No./Code
	Revised:			IM 0703-391
	Void:			19036
				Sheet Number 219
		Designer: P. FERNANDEZ	Structure Numbers	WALL-F-15-BD
		Detailer: E. SCHAWO	Subset Sheets: W14 of 34	

18026 10:11:10 AM c:\pwwork\pjs\p1\common\dms26956\18832DES_WallD_TypSec02.dgn

Design		Detail		Quantities	
DATE	INITIAL	DATE	INITIAL	DATE	INITIAL
12-12	PF	12-12	ERS	12-12	SA
12-12	JL	12-12	JL	12-12	WZ

12-12



PLACE TWO ADDITIONAL #X @ 6" BETWEEN #X @ 6" (TOP) (TYP. ON BOTH SIDES OF 2'-0"x4'-0" MICROPILE BLOCKOUT AS SHOWN)

2'-0"x4'-0" MICROPILE BLOCKOUT

EDGE OF FOOTING

MICROPILE BLOCKOUT

MICROPILE (TYP.)

∅ MICROPILES (TYP.)

KEYNOTES

① FOR ADDITIONAL INFORMATION, SEE "WALL D VARIABLE TABLE" AND "TYPICAL REINFORCING SECTIONS" ON SHEET W14.

② CUT REINFORCING AROUND BLOCKOUTS AS NEEDED TO MAINTAIN 2 INCH CLEARANCE.

NOTES:

1. SEE BRIDGE PLANS FOR MORE INFORMATION.

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Date:	Comments	Init.

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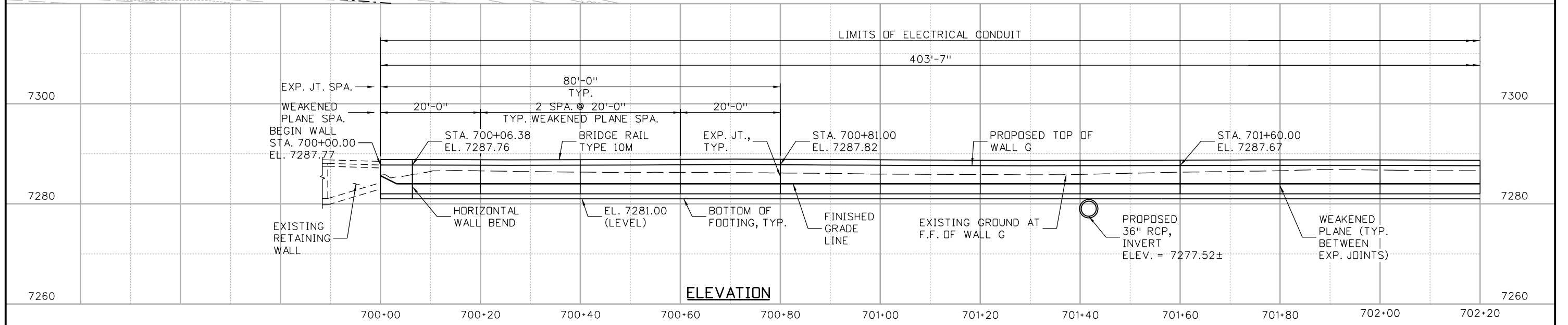
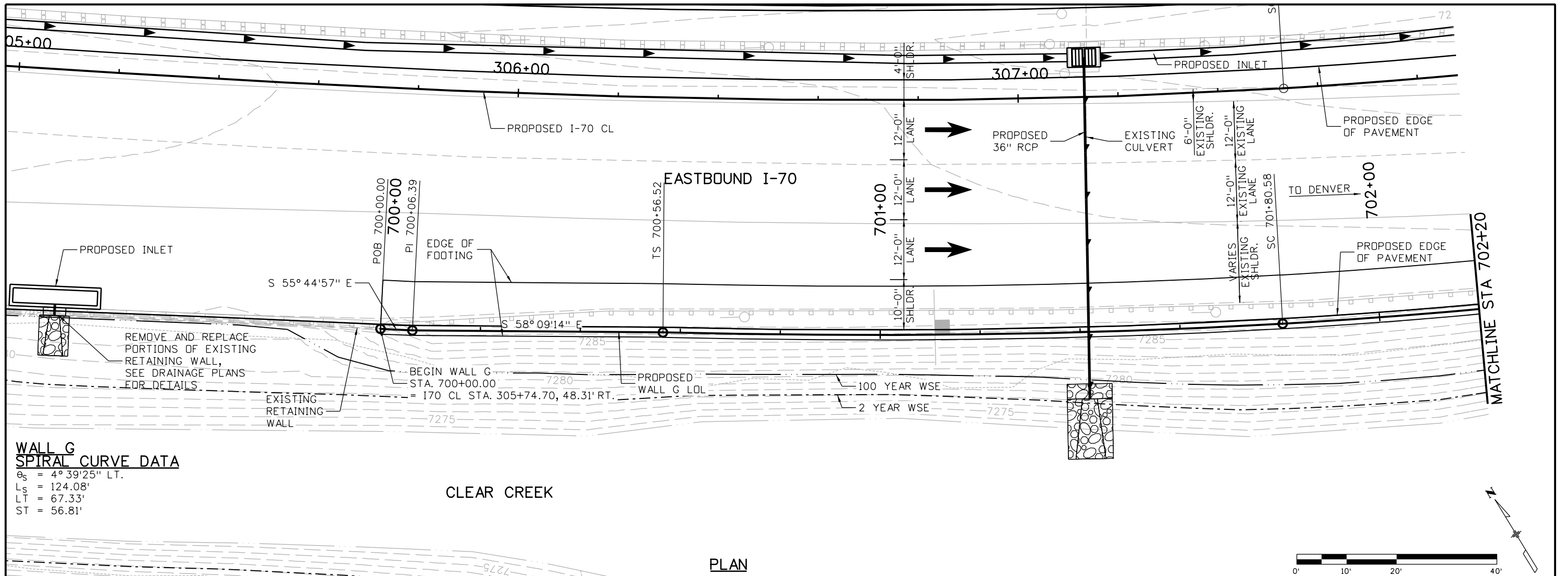
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Phone: 720-497-6918 FAX: 720-497-6901

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No Revisions:
Revised:
Void:

RETAINING WALL D TYPICAL SECTION (SHEET 2 OF 2)		
Designer: P. FERNANDEZ	Structure Numbers	WALL-F-15-BD
Detailer: E. SCHAWO		
Sheet Subset: WALL	Subset Sheets: W15 of 34	

Project No./Code
IM 0703-391
19036
Sheet Number 220



Design		Detail		Quantities	
DATE	INITIAL	DATE	INITIAL	DATE	INITIAL
12-12	PF	12-12	PF	12-12	PF
12-12	KTZ	12-12	KTZ	12-12	SA
12-12	Checked By	12-12	Checked By	12-12	Checked By

Print Date: 3/7/2013
 File Name: 18832DES_WallG_Pn001.dgn
 Horiz. Scale: 1:20 Vert. Scale: 1:20
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 Revised:
 Void:

RETAINING WALL G
STA 700+00 TO 702+20

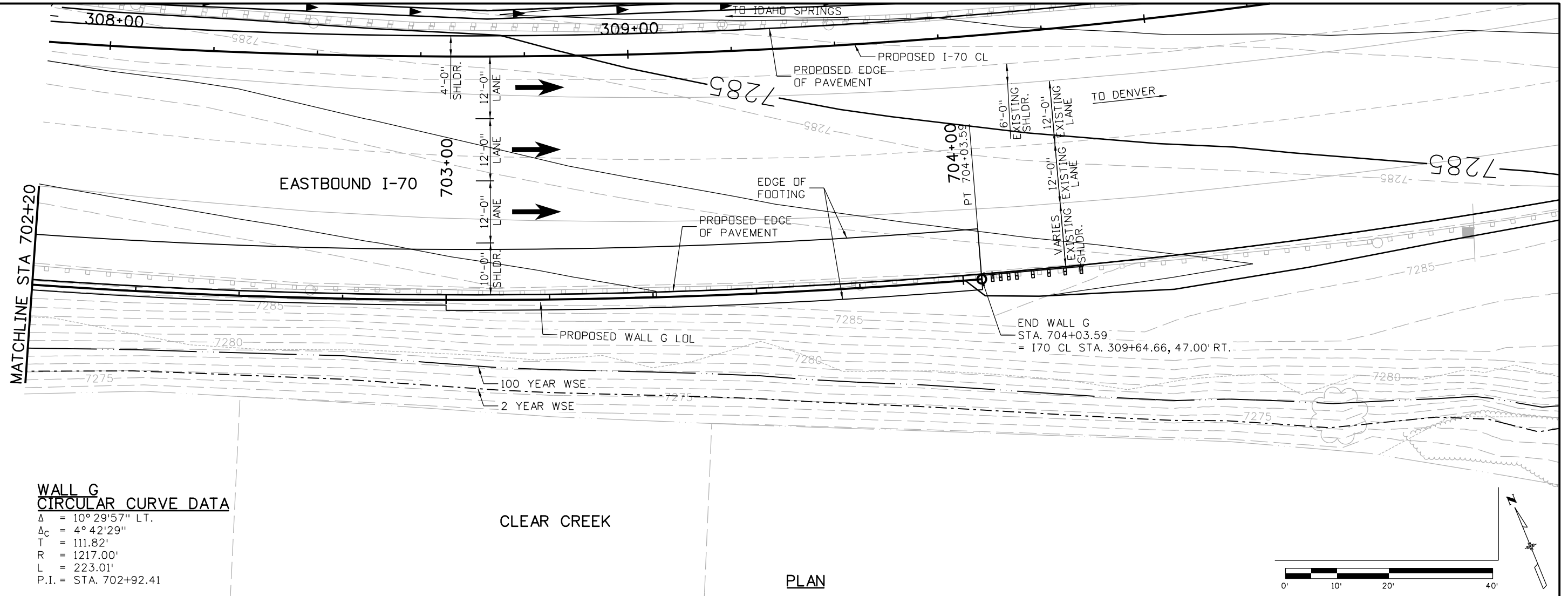
Designer: P. FERNANDEZ
 Detailer: E. SCHAWO
 Sheet Subset: WALL

Structure Numbers: WALL-F-15-BB
 Subset Sheets: W16 of 34

Project No./Code

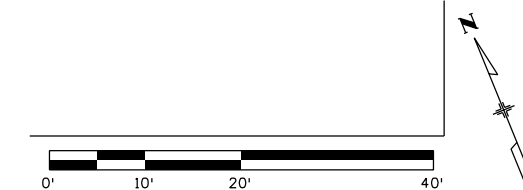
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 19036
 Sheet Number 221

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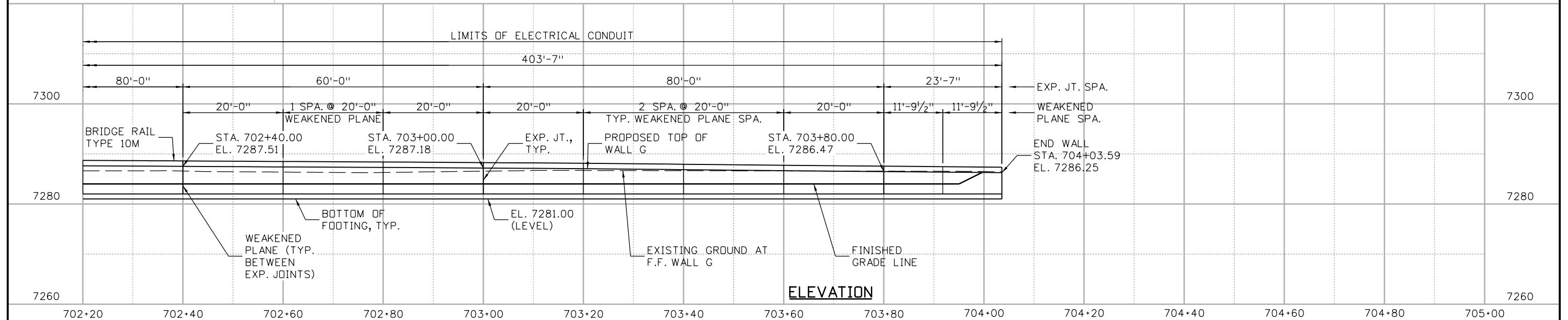


**WALL G
CIRCULAR CURVE DATA**

Δ = 10° 29' 57" LT.
 Δ_c = 4° 42' 29"
 T = 111.82'
 R = 1217.00'
 L = 223.01'
 P.I. = STA. 702+92.41



PLAN



ELEVATION

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12-12	KTZ	12-12	KTZ	12-12	KTZ
Designed By	Checked By	Detailed By	Checked By	Quantities By	Checked By

Print Date: 3/7/2013
 File Name: 18832DES_WallG_PnP002.dgn
 Horiz. Scale: 1:20 Vert. Scale: 1:20
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Sheet Revisions		
Date:	Comments	Init.

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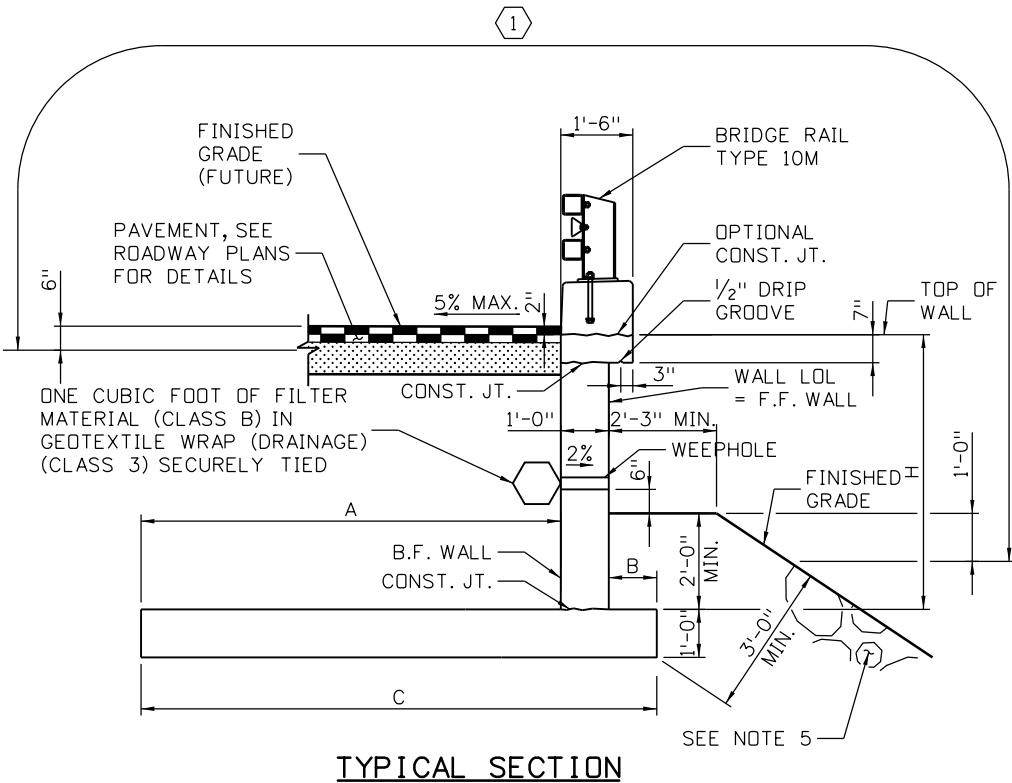
**RETAINING WALL G
STA 702+20 TO 704+03.59**

Designer: P. FERNANDEZ
 Detailer: E. SCHAWO
 Sheet Subset: WALL

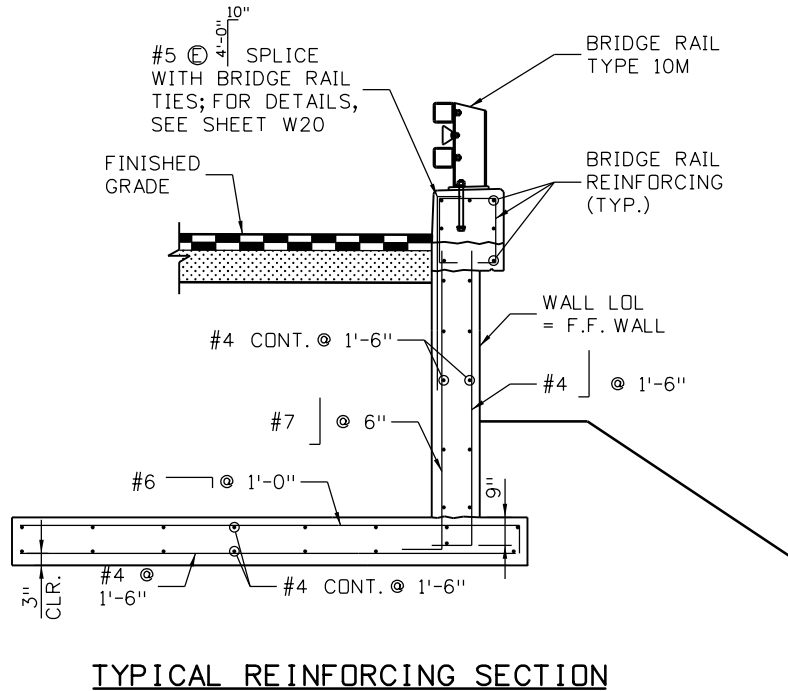
Project No./Code
IM 0703-391
19036
Sheet Number 222

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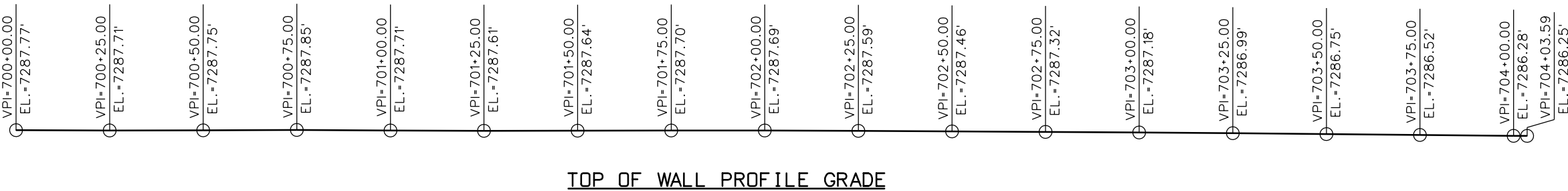
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DESIGNED BY	DATE	INITIAL	DATE	INITIAL	DATE
Checked By	12-12	PF	12-12	PF	12-12
Checked By	12-12	KTZ	12-12	KTZ	12-12



TYPICAL SECTION



TYPICAL REINFORCING SECTION



TOP OF WALL PROFILE GRADE

WALL G VARIABLE TABLE

WALL G STATION RANGE	DESIGN HEIGHT H (FT)	A (FT)	B (FT)	C (FT)
700+00.00 TO 703+00.00	6.00	8.75	1.0	10.75
703+00.00 TO 704+03.59	5.00	8.75	2.0	11.75

KEYNOTES

1 LIMITS OF STRUCTURAL CONCRETE COATING.

NOTES:

1. CONCRETE SHALL BE CONCRETE CLASS D (WALL).
2. WEEPHOLES SHALL BE 3"Ø PVC PIPE.
3. FOR BRIDGE RAIL TYPE 10M DETAILS, SEE SHEETS W20 & W21.
4. FOR BOULDER DETAILS AT THE FRONT FACE OF WALL, SEE BOULDER INSTALLATION PLAN DETAILS.
5. FILTER MATERIAL (CLASS B) OR GEOTEXTILE DRAIN, GEOTEXTILE WRAP CLASS 3, AND WEEPHOLES SHALL BE INCLUDED IN ITEM 601, CONCRETE CLASS D (WALL).

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File Name: 18832DES_WallG_TypSec01.dgn
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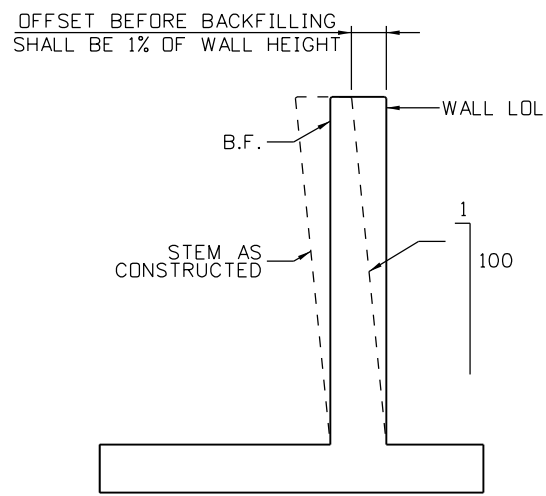
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Date:	Comments	Init.

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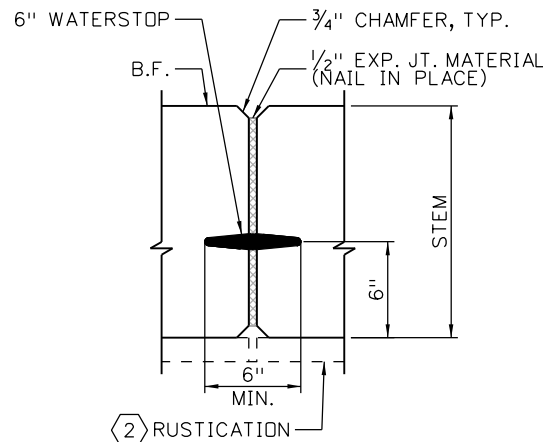
As Constructed
No Revisions:
Revised:
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Designer: P. FERNANDEZ	Structure Numbers	WALL-F-15-BB
Detailer: E. SCHAWO	Subset Sheets:	W18 of 34

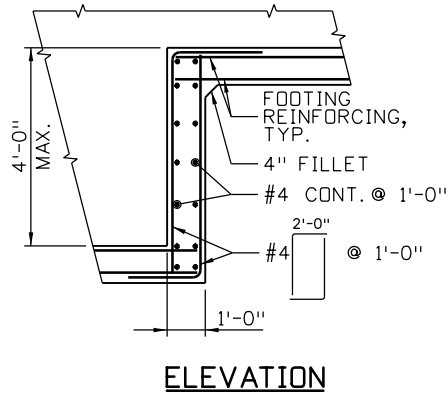
Project No./Code
IM 0703-391
19036
Sheet Number 223



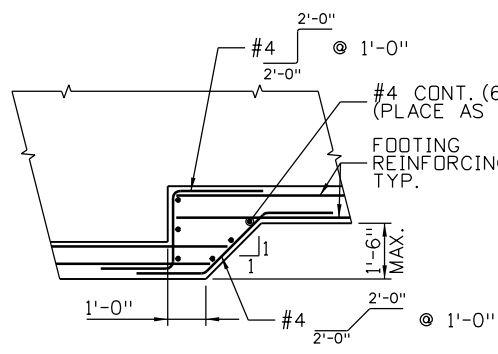
WALL OFFSETS



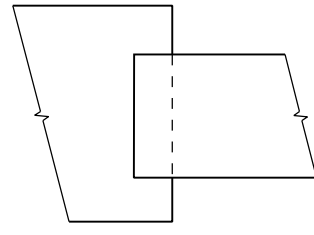
EXPANSION JOINT
JOINTS IN STEM ONLY



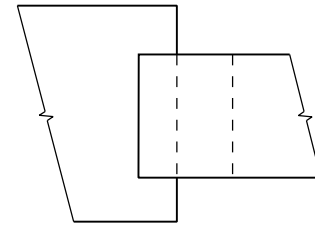
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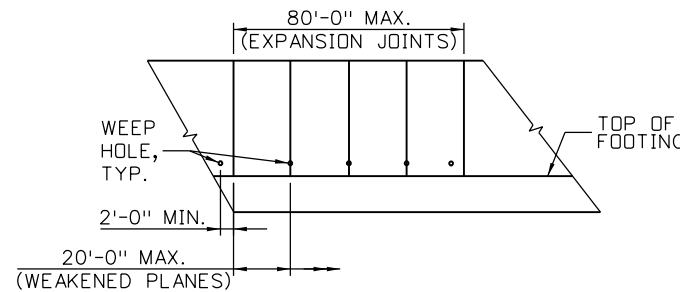
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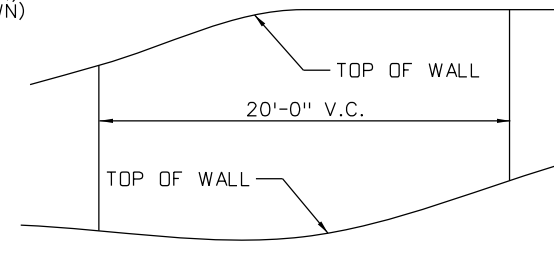
PLAN FOOTING STEP



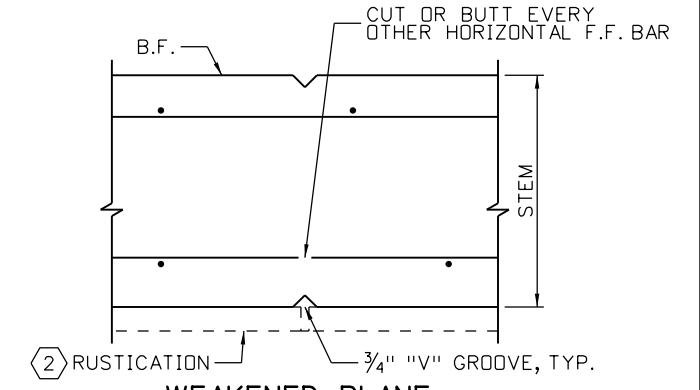
PLAN FOOTING STEP (1)



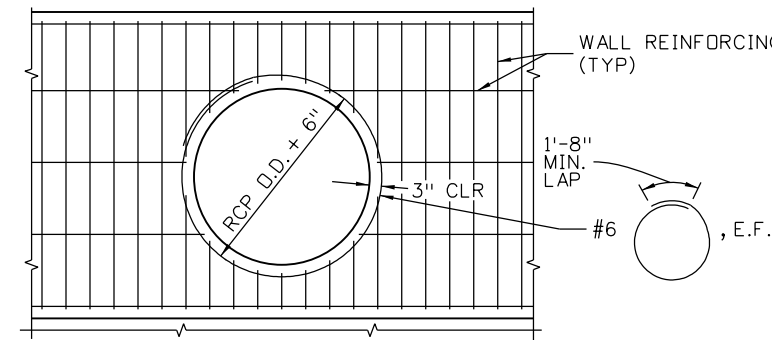
WALL EXPANSION JOINTS AND WEAKENED PLANES
DO NOT EXTEND JOINTS THROUGH FOOTING.



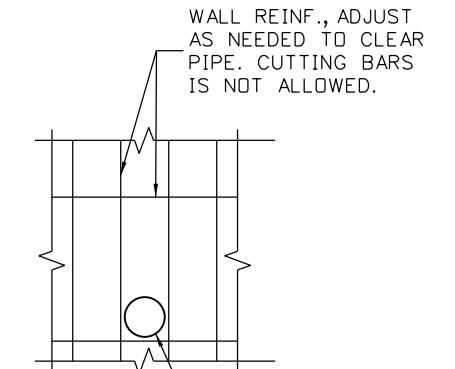
TOP OF WALL SLOPE CHANGE



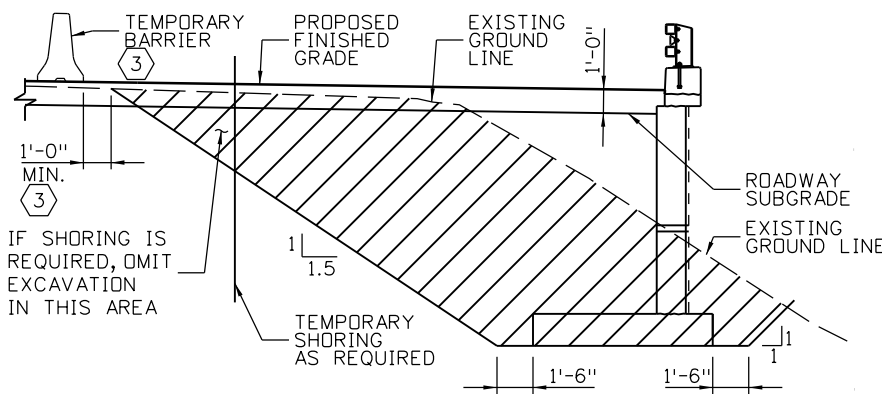
WEAKENED PLANE



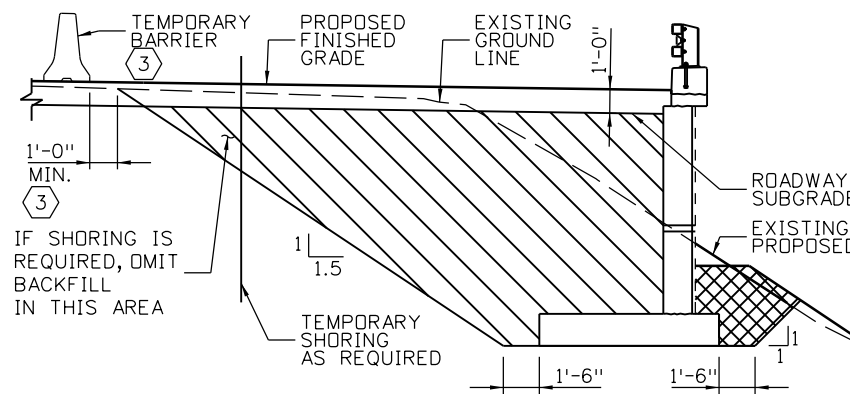
TYPICAL REINFORCING DETAIL AT PIPE OPENING
(PROVIDE WATERTIGHT JOINTS AROUND PIPES)



TYPICAL REINFORCING DETAIL AT ORIFICE PIPE
(PROVIDE WATERTIGHT JOINTS AROUND PIPES)



EXCAVATION TYPICAL SECTION
(WALL D SHOWN, WALLS C & G SIMILAR)



BACKFILL TYPICAL SECTION
(WALL D SHOWN, WALLS C & G SIMILAR)

LEGEND:

- STRUCTURE EXCAVATION
- STRUCTURAL BACKFILL (CLASS 1)
- STRUCTURAL BACKFILL (CLASS 2) AT WALLS C & G; RELAY RIPRAP AT WALL D

KEYNOTES

- (1) FOR STEPS WITH A DIFFERENCE IN ELEVATION NOT GREATER THAN 1'-6".
- (2) RUSTICATION LOCATED AT WALLS C AND D ONLY.
- (3) TEMPORARY BARRIER REQUIRED AT WALL C ONLY.

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). WEEPHOLES SHALL BE 3" DIA. PVC PIPE.
2. FOR EXPANSION JOINT AND WEAKEND PLANE SPACING AND LOCATION, SEE WALL LAYOUTS.
3. FOR BRIDGE RAIL TYPE 10M DETAILS, SEE SHEETS W20 AND W21.
4. FOR GEOCOMPOSITE DRAIN WITHOUT PIPE DETAILS, SEE STD. PLAN M-605-1.
5. FOR ROADWAY PROFILES, SEE ROADWAY PLANS.

Design	Checked By	DATE	Initial	Quantity	Checked By	DATE	Initial
Designed By	PF	12-12	PF	12-12	Checked By	SA	12-12
Checked By	KTZ	12-12	KTZ	12-12	Checked By	SA	12-12

Print Date: 3/7/2013
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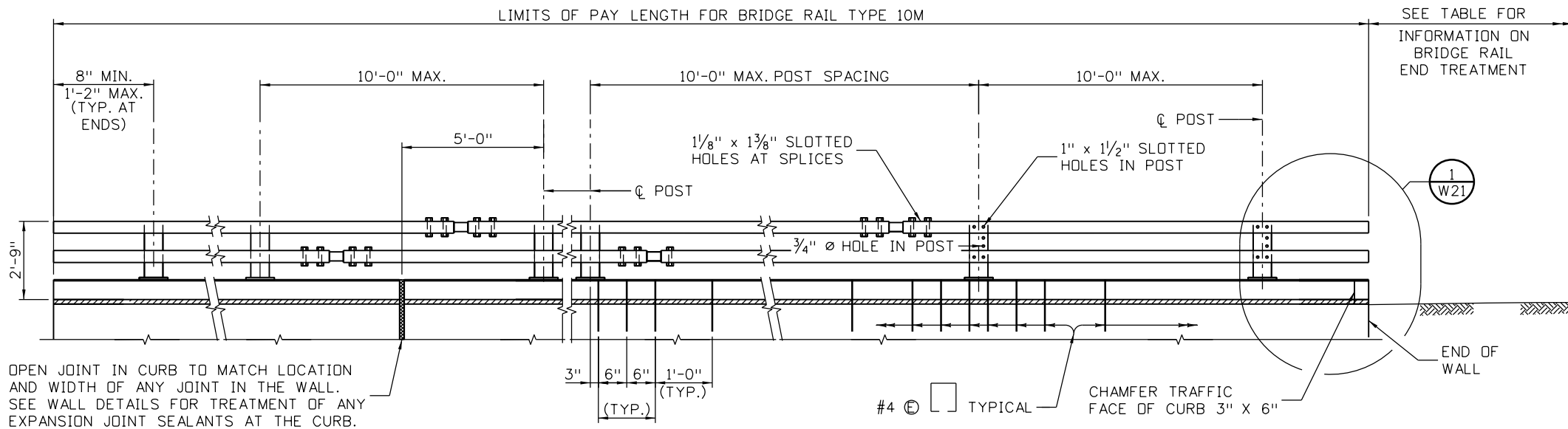
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Date:	Comments	Init.

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RETAINING WALLS C, D, & G MISCELLANEOUS DETAILS			
Designer:	S. ABRAHAM	Structure Numbers	MULTIPLE
Detailer:	E. SCHAWO	Sheet Subset:	WALL
Subst Sheets:		W19 of 34	

Project No./Code
IM 0703-391
19036
Sheet Number 224



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

SEE TABLE FOR INFORMATION ON BRIDGE RAIL END TREATMENT

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. EXPOSED SURFACES OF POSTS, TUBES AND BASE PLATES SHALL BE PAINTED IN ACCORDANCE WITH SECTION 509. TOP COAT SHALL BE DARK BROWN EQUIVALENT TO FEDERAL STANDARD 595B COLOR NO 20059.

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 START TO END OF THE RAIL.

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 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.

RAIL AND CURB ARE DESIGNED FOR TL-4 LOADING.

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 SHEET W21.

KEYNOTES:

(1) TWO 3"Ø ELECTRICAL CONDUIT AT WALL G, ONE 1"Ø ELECTRICAL CONDUIT AT WALL D.

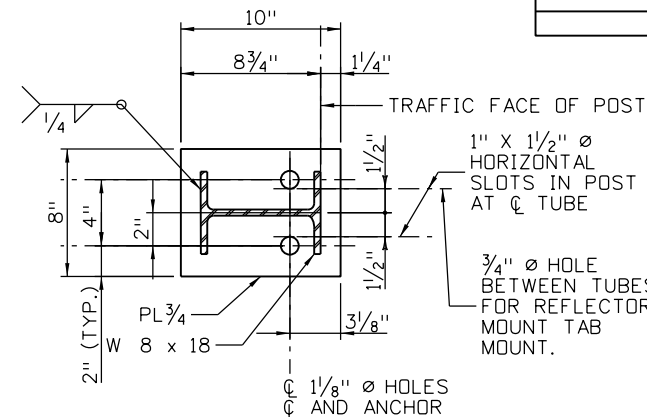
INFORMATION ONLY

DESCRIPTION	UNIT	PER LIN. FT.
STRUCTURAL STEEL (GALVANIZED)	LB.	45.1
CONCRETE CLASS D (BRIDGE)	CU.YD.	.06
REINFORCING STEEL (EPOXY COATED)	LB.	8.5

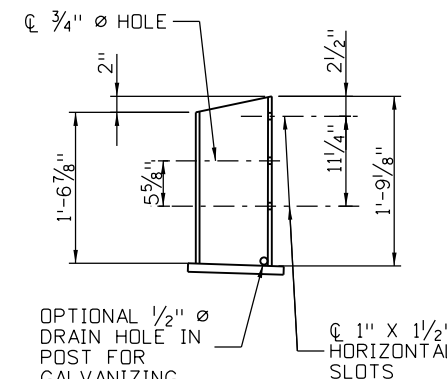
BRIDGE RAIL END TREATMENT

TERMINATION TYPE	LOCATIONS
NO TRANSITION OR SPLICE	END WALL C AND G
GUARDRAIL TYPE 3G TRANSITION	BEGIN WALLS A AND D
BRIDGE RAIL TRANSITION	SEE SHEET B22 FOR LOCATIONS
SPLICE TO EXISTING RAIL	BEGIN WALL G, END WALL D

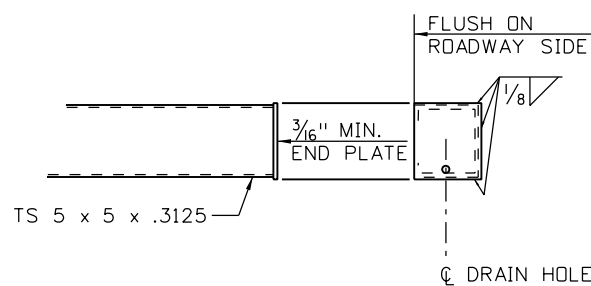
ELEVATION - BRIDGE RAIL



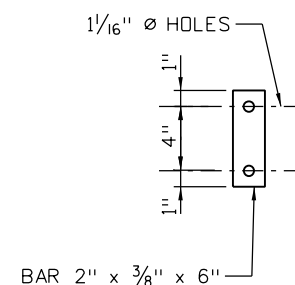
PLAN - POST DETAIL



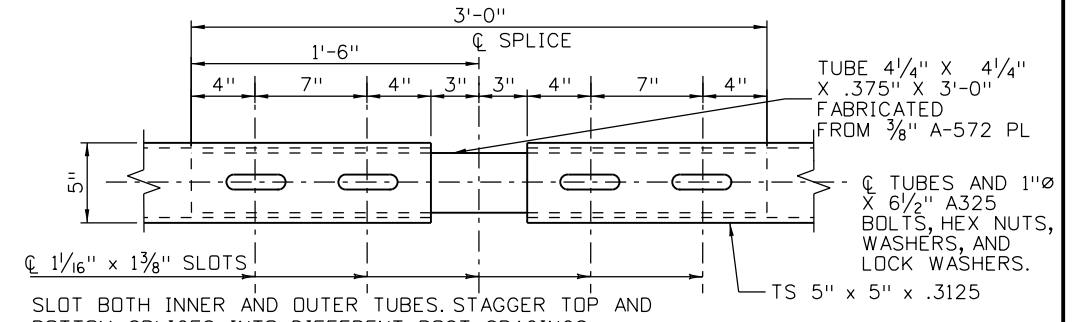
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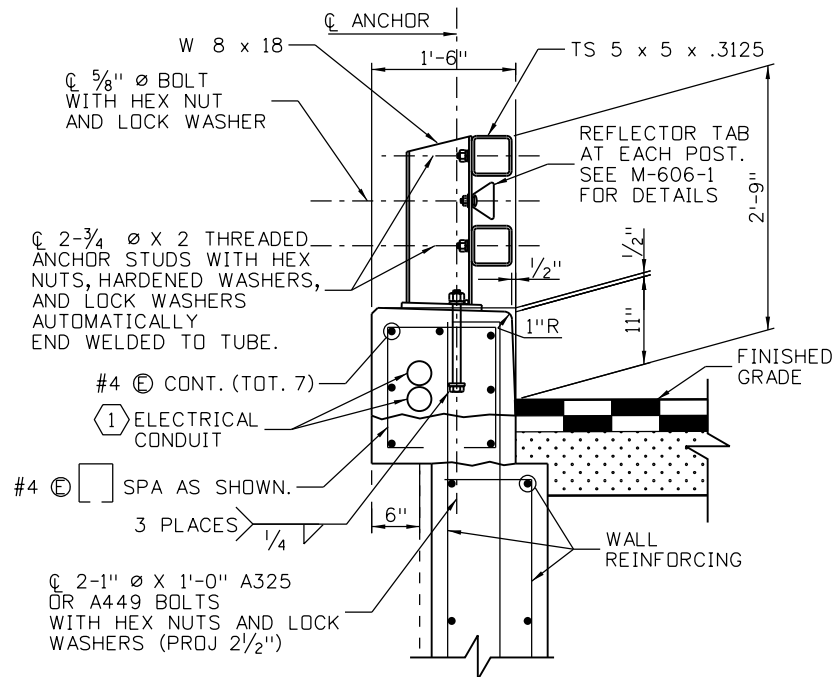
END PLATE DETAIL



ANCHOR DETAIL



PLAN - TUBE SPLICE



SECTION

(WALL D SHOWN, WALLS C & G SIMILAR)

Design	Detail	Quantities	INITIAL	DATE
Designed By	Checked By	SA	11-12	11-12
Checked By	Checked By	JL	11-12	11-12

Print Date: 3/7/2013
 File Name: 18832DES_WallD_BRail10M01.dgn
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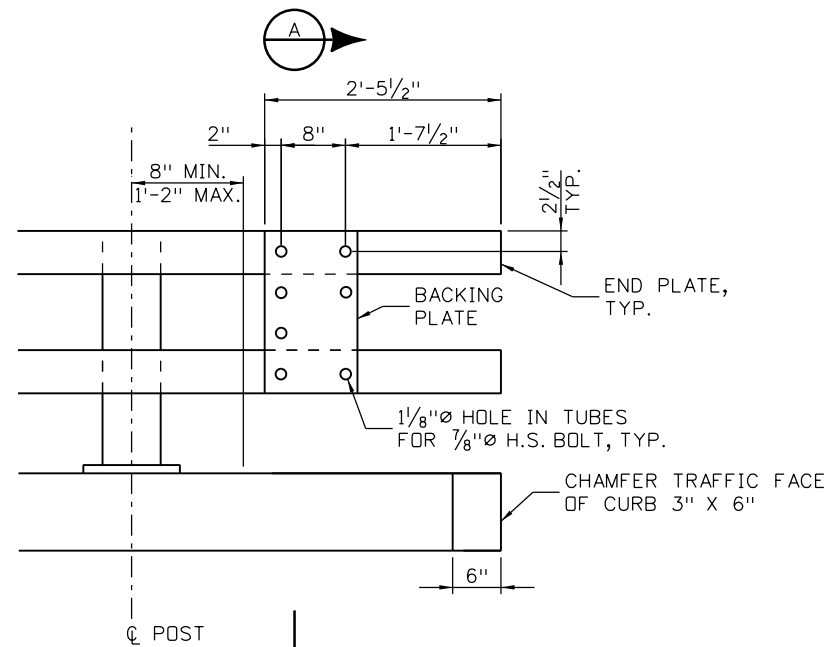
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No Revisions:
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RETAINING WALLS C, D, & G BRIDGE RAIL TYPE 10M (SHEET 1 OF 2)			
Designer:	S. ABRAHAM	Structure	MULTIPLE
Detailer:	E. SCHAWO	Numbers	
Sheet Subset:	WALL	Subset Sheets:	W20 of 34

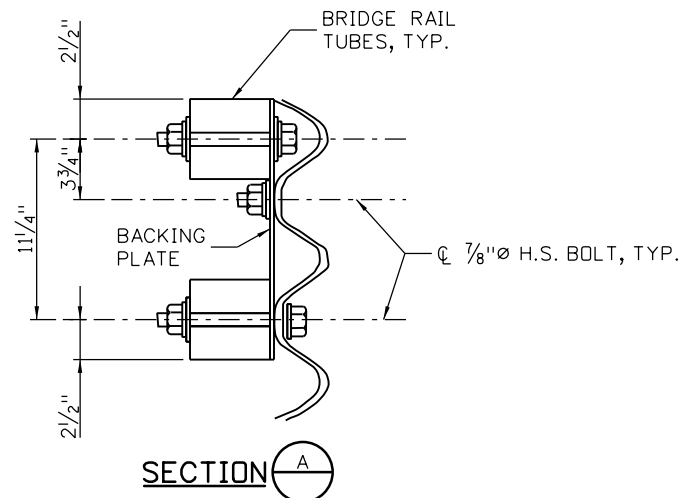
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19036
Sheet Number 225

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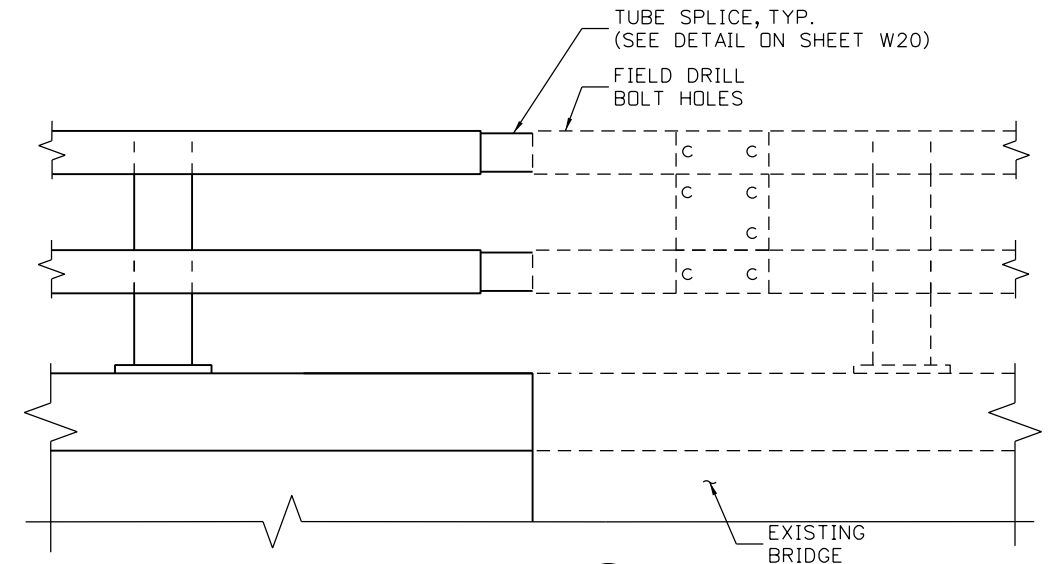
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12-12	CL	12-12	CL	12-12	CL



RAIL TUBE DETAILS
(THREE BEAM NOT SHOWN)

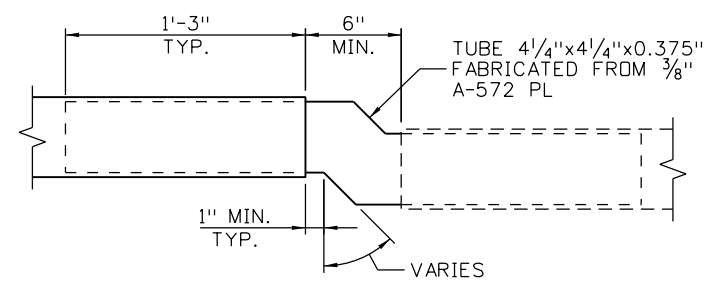


SECTION A



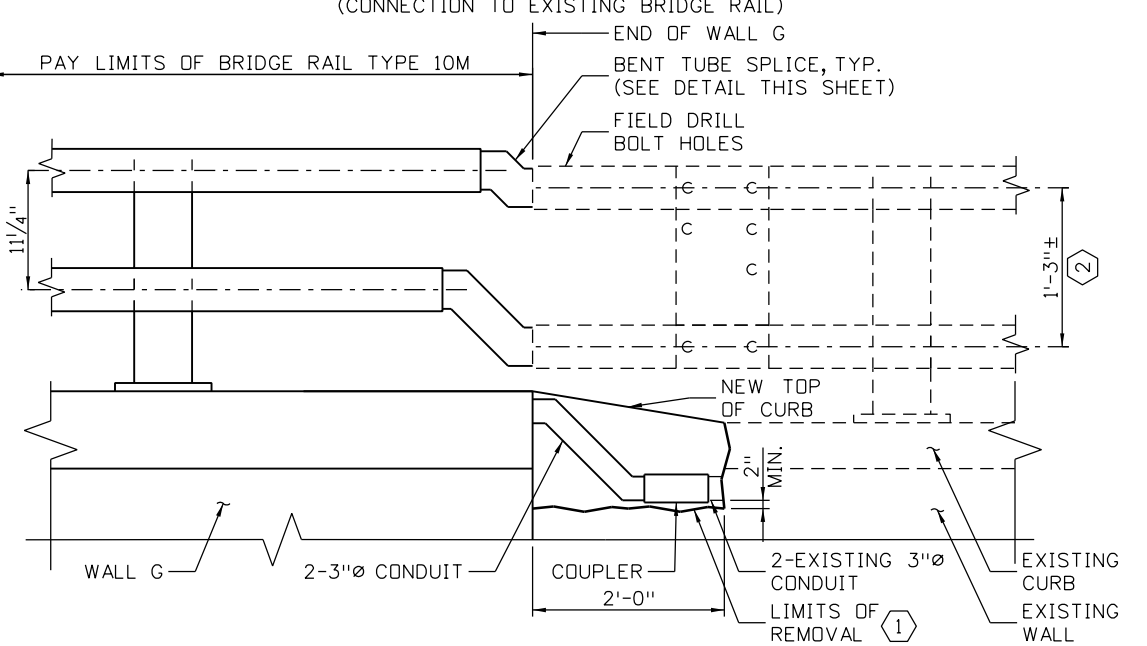
DETAIL 1
W20

(CONNECTION TO EXISTING BRIDGE RAIL)



BENT TUBE SPLICE DETAIL

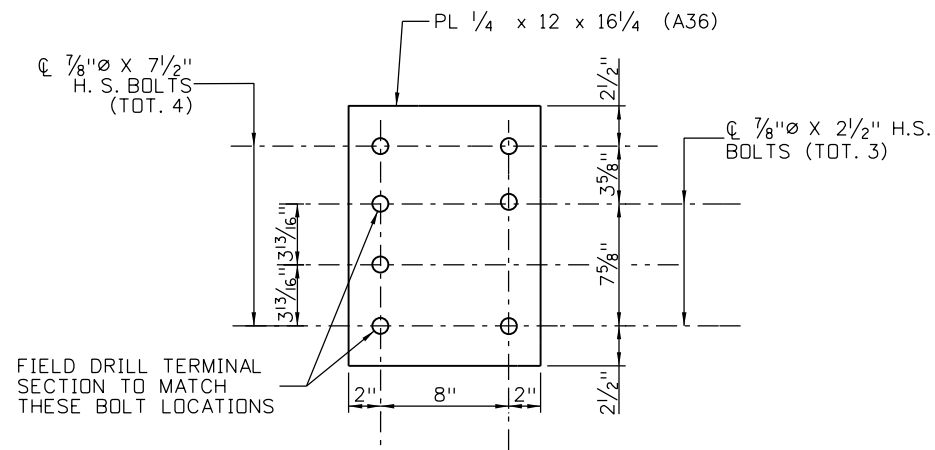
(SEE "PLAN - TUBE SPLICE" FOR BOLT HOLE LOCATIONS)



WALL G TO EXISTING WALL CONNECTION DETAIL

KEYNOTES:

- ① CURB REMOVAL, REPLACEMENT, SPLICE, AND EXPANSION COUPLER SHOWN ON THIS SHEET SHALL NOT BE PAID FOR SEPARATELY BUT SHALL BE INCLUDED IN ITEM NO. 618, BRIDGE RAIL TYPE 10M.
- ② CONTRACTOR HAS TO VERIFY SITE AND MAKE MODIFICATIONS PRIOR TO FABRICATION.



BACKING PLATE

HOLES ARE 1/8\"/>

Print Date: 3/7/2013	
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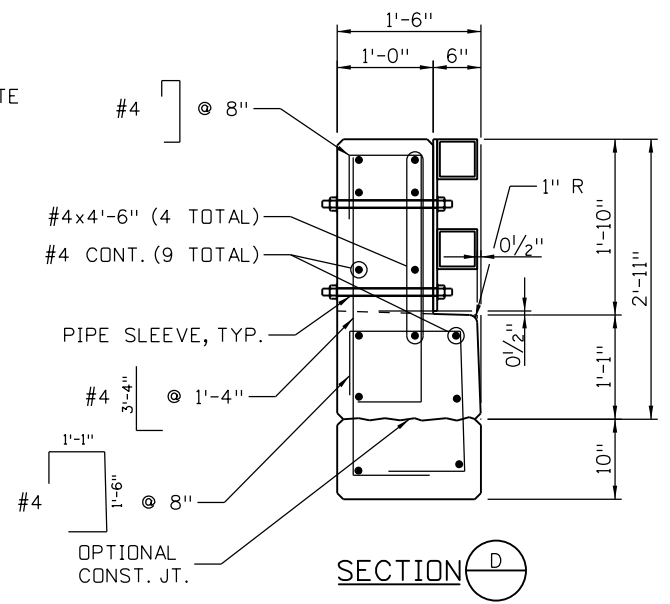
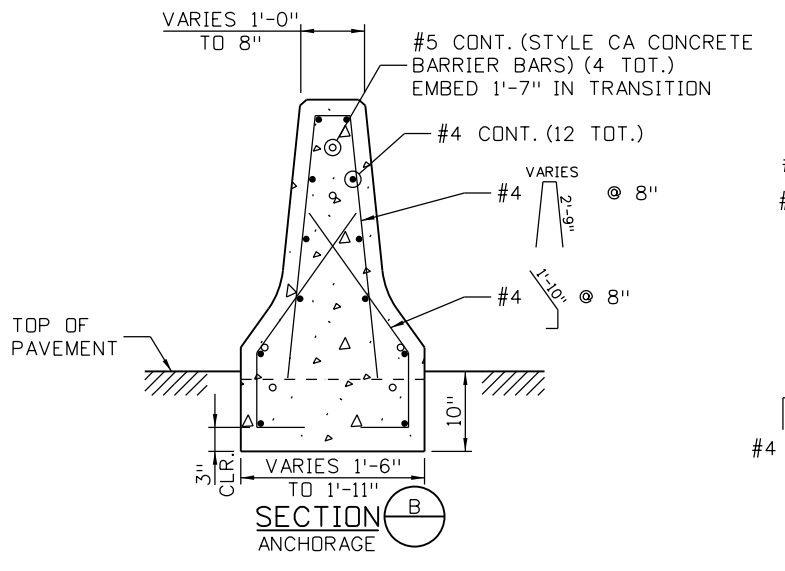
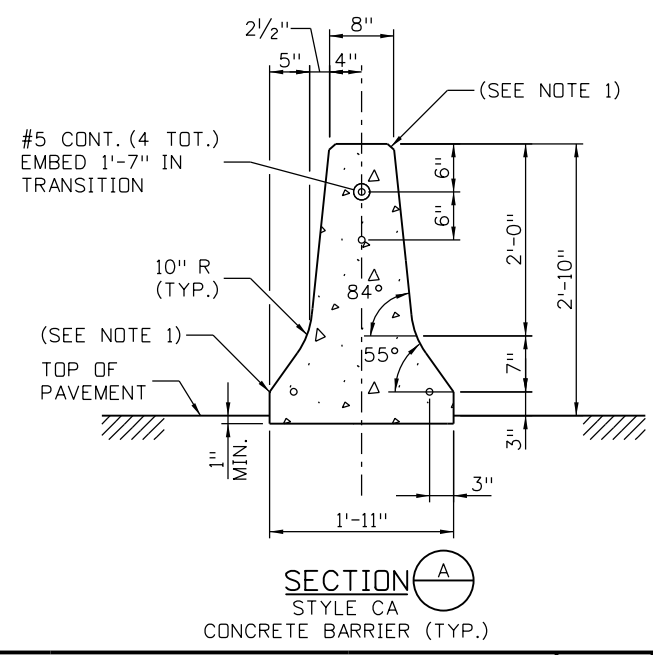
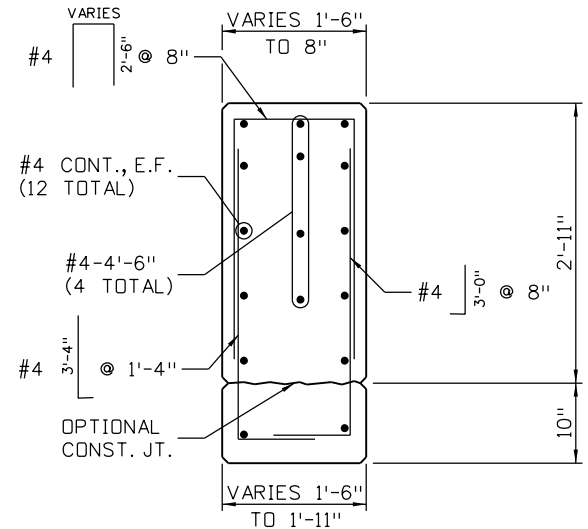
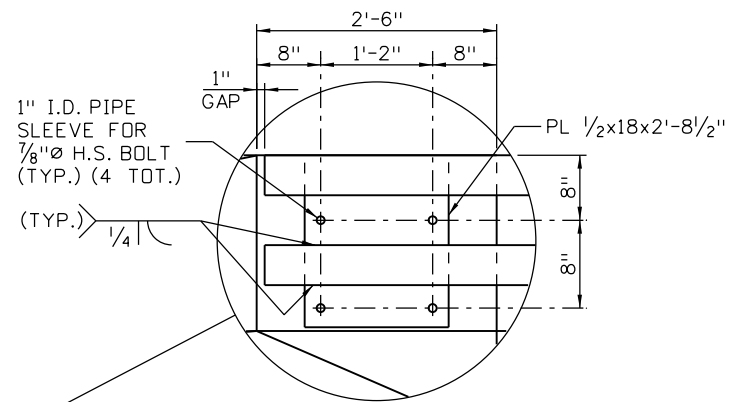
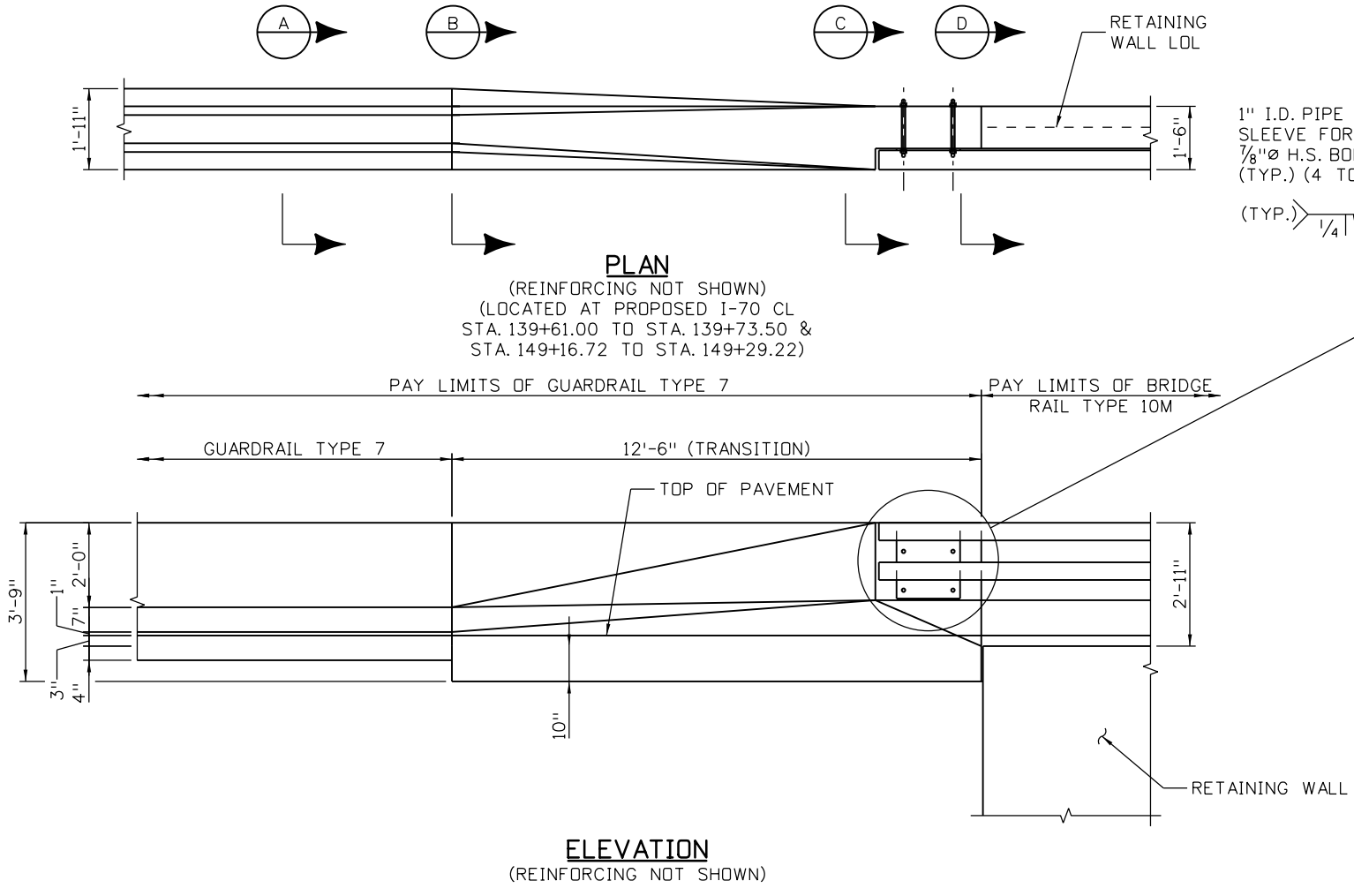
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RETAINING WALLS C, D, & G BRIDGE RAIL TYPE 10M (SHEET 2 OF 2)			
Designer: S. ABRAHAM	Structure	MULTIPLE	
Detailer: E. SCHAWO	Numbers		
Sheet Subset: WALL	Subset Sheets: W21 of 34		

Project No./Code
IM 0703-391
19036
Sheet Number 226

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INITIAL	DATE	INITIAL	DATE	INITIAL	DATE
SA/PF	12-12	ERS	12-12	SA/PF	12-12
JL/KTZ	12-12	JL/KTZ	12-12	WZ/SA	12-12
Designed By	Checked By	Designed By	Checked By	Quantities By	Checked By



- NOTES:**
- ALL EDGES SHALL BE ROUNDED WITH A 1 IN. RADIUS EXCEPT AS SHOWN
 - BARRIER MAY BE CAST-IN-PLACE, SLIP FORMED OR PRECAST (SEE STANDARD PLAN M-606-14).
 - BARRIER FOUNDATION SHALL BE PAVEMENT, OR COMPACTED AGGREGATE BASE, OR EMBANKMENT MATERIAL.
 - CONSTRUCTION JOINTS SHALL BE USED ON ALL BARRIER TYPES SHOWN, AT THE END OF THE DAY'S POUR OR AFTER ANY INTERRUPTION LONGER THAN 30 MINUTES. ALL CONSTRUCTION JOINTS SHALL BE THOROUGHLY CLEANED BEFORE FRESH CONCRETE IS POURED.
 - REINFORCING STEEL SHALL BE GRADE 60 EPOXY COATED DEFORMED BARS. CONTINUOUS LONGITUDINAL REINFORCEMENT MAY BE SUBSTITUTED WITH WIRE STRAND WITH MINIMUM ULTIMATE TENSILE STRENGTH OF 28,000 LBS. AND CLASS C GALVANIZING ACCORDING TO ASTM A 603.
 - CONCRETE SHALL BE CLASS D.
 - EPOXY COATED LONGITUDINAL REBAR SHALL HAVE A MINIMUM LAP SPLICE OF 38 IN. WIRE STRAND LONGITUDINAL REINFORCEMENT SHALL BE BUTT WELDED OR MECHANICALLY SPLICED TO MAINTAIN 100% OF THE MINIMUM REQUIRED TENSILE STRENGTH.
 - ALL INCIDENTAL WORK AND MATERIAL SUCH AS ANCHORS, BOLTS, PINS, JOINT MATERIAL, EXCAVATION FOR BASE CONTINUOUS LONGITUDINAL REINFORCEMENT, SHALL BE INCLUDED IN THE COST OF GUARDRAIL.
 - RETROREFLECTORIZATION IS REQUIRED ON ALL BARRIER TYPES. SEE BARRIER RETROREFLECTOR NOTES ON STANDARD PLAN S-612-1.

Print Date: 3/7/2013

File Name: 18832BRDG_BRailTrans01.dgn

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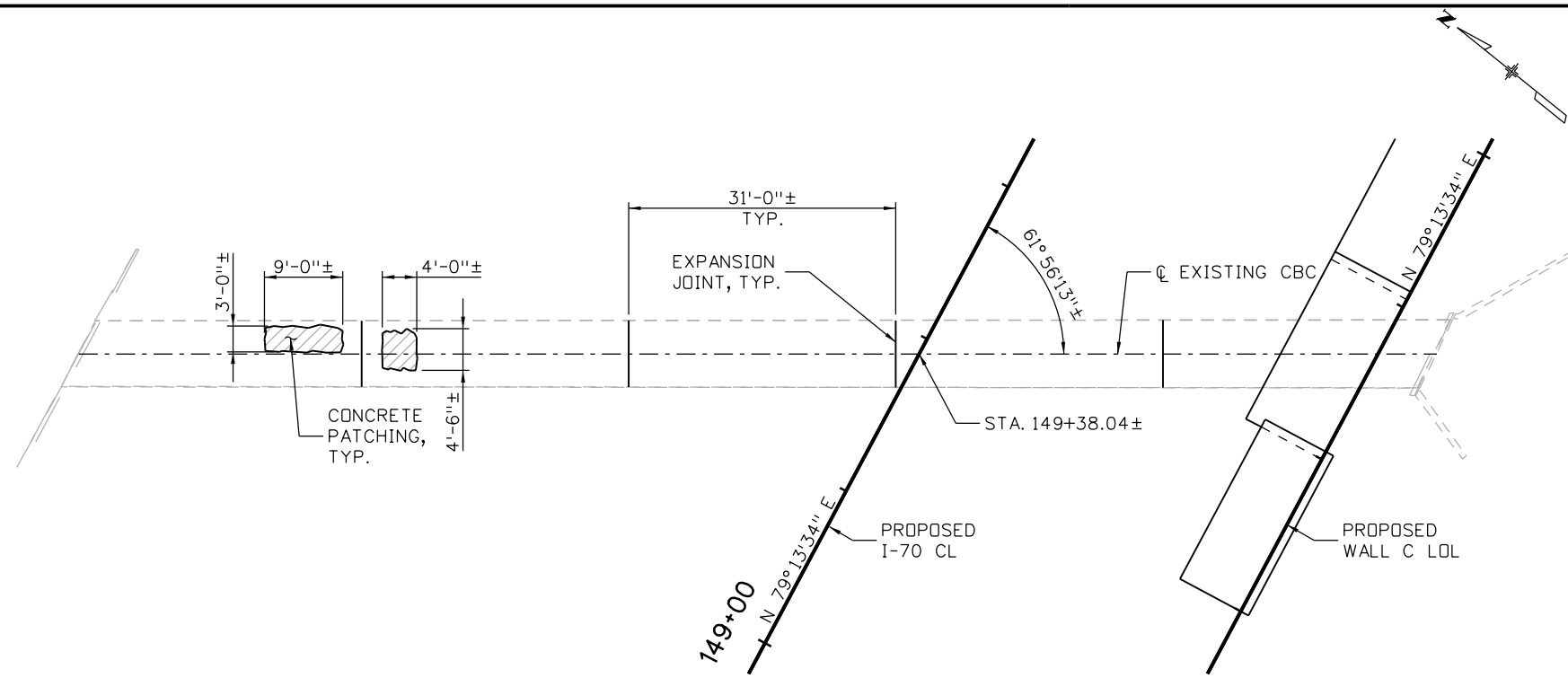
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Designer:	S. ABRAHAM	Structure	MULTIPLE
Detailer:	E. SCHAWO	Numbers	
Sheet Subset:	WALL	Subset Sheets:	W22 of 34

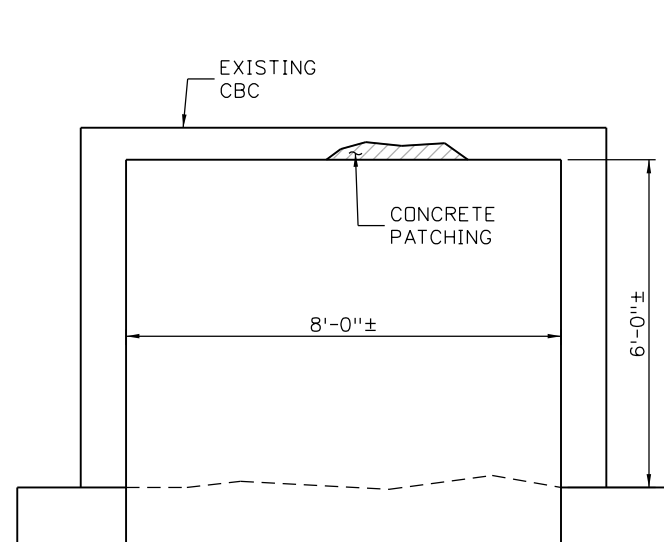
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19036
Sheet Number 227

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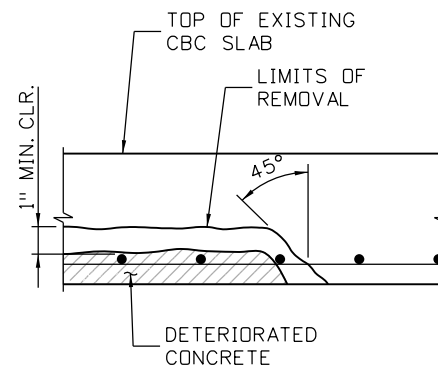
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JL/KTZ	12-12	JL/KTZ	12-12	WZ/SA	12-12
Designed By	Checked By	Designed By	Checked By	Quantities By	Checked By



PLAN



TYPICAL SECTION



REMOVAL DETAIL


NOTES:

- ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE COLORADO DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION AND AS NOTED IN THE DRAWINGS.
- REMOVAL OPERATIONS SHALL BE COORDINATED WITH THE ENGINEER AND PERFORMED IN A MANNER AS REQUIRED TO INSURE THE STRUCTURAL INTEGRITY OF THE STRUCTURE.
- STATIONS, ELEVATIONS, AND DIMENSIONS CONTAINED IN THESE PLANS ARE CALCULATED FROM THE FIELD VISIT. THESE STATIONS, ELEVATIONS, AND DIMENSIONS MAY REQUIRE ADJUSTMENT TO MATCH THE EXISTING STRUCTURE. THE CONTRACTOR SHALL VERIFY ALL DEPENDENT DIMENSIONS IN THE FIELD BEFORE ORDERING OR FABRICATING ANY MATERIAL.
- CONCRETE (PATCHING) SHALL BE NON-SHRINK, CEMENTITIOUS MATERIAL SUITABLE FOR CONCRETE SEALER AND PATCHING VERTICAL SUPPORTS AND WALLS. THE MINIMUM UNCONFINED COMPRESSIVE STRENGTH FOR THE REPAIR CONCRETE SHALL BE 4500 psi. THE MATERIAL TO BE USED SHALL BE AN APPROVED MATERIAL AS PER THE CDOT APPROVED PRODUCTS LIST FOR CONCRETE REPAIR PATCHING RAPID SET, VERTICAL AND OVERHEAD APPLICATIONS. THE MATERIAL SHALL BE PLACED IN ACCORDANCE WITH THE MANUFACTURE RECOMMENDATIONS. THE REPAIR CONCRETE AND REPAIR METHOD PROPOSED BY THE CONTRACTOR SHALL BE APPROVED BY THE ENGINEER PRIOR TO BEGINNING THE WORK. PAYMENT FOR THE REPAIR CONCRETE SHALL BE BY SQUARE FOOT UNDER ITEM NO. 601, CONCRETE (PATCHING). CONTRACTOR SHALL SUBMIT SCHEDULE AND METHODS STATEMENT PER 108.03 FOR THE ENGINEER'S APPROVAL BEFORE STARTING WORK.
- PNEUMATIC HAMMERS HEAVIER THAN NOMINAL 15 LB. CLASS WILL NOT BE PERMITTED IN THE DESIGNATED REMOVAL. PNEUMATIC HAMMERS AND CHIPPING TOOLS SHALL NOT BE OPERATED AT AN ANGLE EXCEEDING 60° RELATIVE TO THE SURVEY OF THE SLAB. SUCH TOOLS MAY BE STARTED IN THE VERTICAL POSITION, BUT MUST BE IMMEDIATELY TILTED TO 60° OPERATING ANGLE.
- CARE SHALL BE TAKEN IN REMOVING CONCRETE FROM AROUND STRUCTURAL STEEL ELEMENTS AND REINFORCING STEEL TO PREVENT DAMAGE TO THE STEEL.
- PAYMENT FOR CONCRETE PATCHING SHALL BE INCLUDED IN ITEM 601, CONCRETE PATCHING. PAYMENT FOR SANDBLASTING AND CONCRETE SEALER (CALCIUM NITRITE) SHALL BE INCLUDED IN ITEM 601, CONCRETE PATCHING.
- LIMITS OF CONCRETE REMOVAL BASED ON PERIMETER OF DELAMINATED OR SPALLED CONCRETE. DETERIORATED CONCRETE SHALL BE REMOVED TO A MINIMUM OF 1" INTO SOUND CONCRETE.
- LIMITS OF CONCRETE DELAMINATION AND REMOVAL SHALL BE MARKED ON CONCRETE AND APPROVED BY THE ENGINEER PRIOR TO SAW CUTTING OR REMOVAL.
- SAW CUTS SHALL ONLY BE VERTICAL OR HORIZONTAL, NO INCLINED CUTS ARE ALLOWED.
- NEW CONCRETE SHALL BE CLASS DT OR AS DESCRIBED IN PROJECT SPECIAL PROVISIONS.
- SUPPORTS SHALL NOT BE REMOVED UNTIL NEW CONCRETE PATCHING REACHES A COMPRESSIVE STRENGTH OF 3,000 PSI.
- THE CONTRACTOR SHALL SUBMIT A REMOVAL AND PATCHING SEQUENCE TO THE ENGINEER PRIOR TO STARTING REMOVALS. THE SEQUENCE SHALL INDICATE IF TEMPORARY SUPPORT IS REQUIRED TO PRESERVE SLAB STRENGTH DURING PATCHING REPAIRS.
- IF THE CONTRACTOR DETERMINES THAT TEMPORARY SUPPORTS ARE REQUIRED FOR PATCHING, SUPPORT LOCATIONS SHALL BE DESIGNED BY THE CONTRACTOR AND SUBMITTED TO THE ENGINEER FOR APPROVAL.
- REQUIRED SUPPORTS SHALL BE DESIGNED BY THE CONTRACTOR AND SUBMITTED TO THE ENGINEER FOR APPROVAL.
- THESE DETAILS REFLECT THE SCOPE AND THE NATURE OF THE WORK. THEY ARE NOT INTENDED TO REPRESENT THE ACTUAL STRUCTURE.

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EXISTING BOX CULVERT MODIFICATION DETAILS			
Designer:	S. ABRAHAM	Structure Numbers	
Detailer:	E. SCHAWO	Subset Sheets:	W23 of 34
Sheet Subset:	WALL		

Project No./Code
IM 0703-391
19036
Sheet Number 228

GENERAL NOTES

- ALL STEEL SHALL BE EPOXY-COATED OR GALVANIZED UNLESS OTHERWISE NOTED.
- (N) DENOTES NON-COATED REINFORCING STEEL.
- FOR GENERAL NOTES SEE SHEET W01.

GROUND NAIL WALLS

- GROUND NAILS - GRADE 75 THREAD BAR OR EQUIVALENT IN ACCORDANCE WITH ASTM A615 AND EPOXY COATED IN ACCORDANCE WITH ASTM A934 AS SHOWN ON THE DRAWINGS.
FY=75,000 PSI
- GROUT - GROUT MAY BE NEAT-CEMENT OR WITH SAND, WITH TYPE II CEMENT IN ACCORDANCE WITH ASTM C150. WATER-CEMENT RATIO SHOULD BE BETWEEN 0.4 AND 0.6 AND SHOULD DEVELOP THE FOLLOWING STRENGTHS AT THE SPECIFIED CURE PERIODS.
f'c=3,000 PSI MINIMUM PER SPECIFICATIONS
- END HARDWARE - NUTS AND WASHERS SHALL BE IN ACCORDANCE WITH GROUND NAIL MANUFACTURER'S RECOMMENDATIONS. BEARING PLATE SHALL BE IN ACCORDANCE WITH ASTM A36, GRADE 36.
- SHOTCRETE - IN ACCORDANCE WITH CDOT REVISED SECTION 641 AND REVISED SECTION 504.
- UNLESS OTHERWISE NOTED ON THE PLANS, MINIMUM COVER OF SHOTCRETE REINFORCEMENT AND NAIL END HARDWARE SHOULD BE AS FOLLOWS:
FACE EXPOSED TO WEATHER - 2"
FACE EXPOSED TO SOIL - 3"
- WELDED WIRE MESH SHALL BE IN ACCORDANCE WITH ASTM A185.
FY=65,000 PSI
- WALERS AND VERTICAL BEARING BARS SHALL BE IN ACCORDANCE WITH ASTM A615.
FY=60,000 PSI
- STRIP DRAINS CONSIST OF 12" WIDE DIMPLED CORES WRAPPED IN GEOTEXTILE. IN ACCORDANCE WITH CDOT REVISED SECTION 504.
- CENTRALIZERS SHOULD BE PLASTIC AND ATTACHED TO THE NAILS IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

2. FACTORS OF SAFETY

BEARING CAPACITY - FS=2.5
 OVERTURNING - ECCENTRICITY<=B/6
 GLOBAL STABILITY - FS=1.35
 PULLOUT - FS=2.0
 YIELD REDUCTION FACTOR =0.55
 FACING FLEXURE FACTOR =0.67
 FACING PUNCHING FACTOR =0.67
 SITE CLASS "C" ADJUSTED - PGA=0.082
 SEISMIC ZONE 1

GROUND NAIL WALL SPECIAL NOTES

- THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING SLOPE STABILITY ABOVE AND BELOW THE GROUND NAIL WALL DURING CONSTRUCTION.
- THE CONTRACTOR IS RESPONSIBLE FOR FIELD LOCATING ALL NEARBY UTILITIES. CONFLICTING UTILITIES MAY REQUIRE GROUND NAIL WALL REDESIGN, AT ENGINEER'S DISCRETION.
- THE BOND STRENGTHS (Qd) SHOWN ON THE PLANS ARE THE MINIMUM ASSUMED FOR DESIGN.
- GROUND NAIL LENGTHS SHOWN ON THE PLANS ARE THE MINIMUM LENGTHS REQUIRED.
- PRIOR TO BEGINNING EXCAVATION FOR THE GROUND NAIL WALL, THE CONTRACTOR SHALL:
 - SURVEY THE LAYOUT LINE AND TOP OF WALL LINE.
 - CONFIRM THE LINES, GRADES, AND EXCAVATION LIMITS SHOWN ON THE PLANS.
 - THE CONTRACTOR SHALL MODIFY THE PLAN WALL PROFILES USING THE FIELD SURVEY INFORMATION AND SUBMIT TO THE ENGINEER FOR REVIEW AND APPROVAL.

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

GROUND NAIL WALL CONSTRUCTION SEQUENCE

- EXCAVATE ONE LIFT TO A MAXIMUM DEPTH OF SIX (6) FEET. BOULDERS, COBBLES AND/OR BEDROCK MAY BE ENCOUNTERED AT ANY DEPTH OF THE EXCAVATION OR DURING DRILLING. IF SLOUGHING GROUND CONDITIONS ARE ENCOUNTERED, GROUND NAILS SHALL BE DRILLED AND INSTALLED THROUGH A TEMPORARY STABILIZING BERM OR PLACEMENT OF A SACRIFICIAL REINFORCED SHOTCRETE FLASH COAT SHALL BE USED TO TEMPORARILY STABILIZE EXCAVATION PRIOR TO DRILLING GROUND NAILS. CARE SHOULD BE TAKEN DURING EXCAVATION THAT NO GROUND IS LOST FROM BEHIND THE EXISTING SHOTCRETE.
- FOLLOW FHWA GUIDELINES TO DETERMINE GROUND NAIL LOCATIONS. PROVIDE A NAIL LOCATION PLAN TO THE ENGINEER FOR REVIEW. INSTALL GROUND NAILS AT THE SPACINGS AND TO THE LENGTHS SHOWN ON THE PLANS. THE TOP ROW OF GROUND NAILS SHALL BE WITHIN 1.5 FEET OF THE TOP OF THE WALL L. THE BOTTOM ROW OF NAILS SHALL BE WITHIN 2 FEET OF THE BOTTOM OF THE WALL. THE TOLERANCE FOR GROUND NAIL LOCATIONS SHALL BE 6 INCHES. TREMIE THE GROUT FROM THE BOTTOM OF THE HOLE UP.
- INSTALL STRIP DRAINS, WELDED WIRE MESH, WALERS AND VERTICAL BEARING BARS AS SHOWN ON THE DRAWINGS. USE PLASTIC CHAIRS TO HOLD THE WELDED WIRE MESH AWAY FROM THE SOIL AS NECESSARY.
- INSTALL SHOTCRETE TO THE MINIMUM THICKNESS SHOWN ON THE DRAWINGS AND TO ATTAIN THE MINIMUM COVERAGE'S SPECIFIED HEREIN. GIVE SPECIAL ATTENTION TO FILLING THE VOID IN THE BORE HOLE ABOVE THE GROUT LINE. COLD WEATHER PROTECTION MEASURES MAY BE NECESSARY.
- INSTALL THE GROUND NAIL END HARDWARE AFTER THE SHOTCRETE HAS BEEN INSTALLED. WHILE THE SHOTCRETE IS STILL WET, EMBED THE PLATE INTO THE SHOTCRETE SURFACE UNTIL THERE IS NO VOID BEHIND THE PLATE. HAND TIGHTEN THE NUT. APPLY ADDITIONAL SHOTCRETE TO ATTAIN MINIMUM COVERAGE FOR THE GROUND NAIL AND END HARDWARE.
- ONCE THE GROUT AND SHOTCRETE OF THE CURRENT LIFT HAVE ATTAINED 50% OF THEIR SPECIFIC STRENGTHS, REPEAT CONSTRUCTION SEQUENCE TO THE BOTTOM OF THE WALL.
- AT THE BOTTOM LIFT, CONSTRUCT DRAINPIPE, FILTER MATERIAL, AND MANIFOLD GEOCOMPOSITE STRIP DRAINS AS SHOWN ON THE DRAWINGS.

GROUND NAIL WALL L DESIGN PARAMETERS

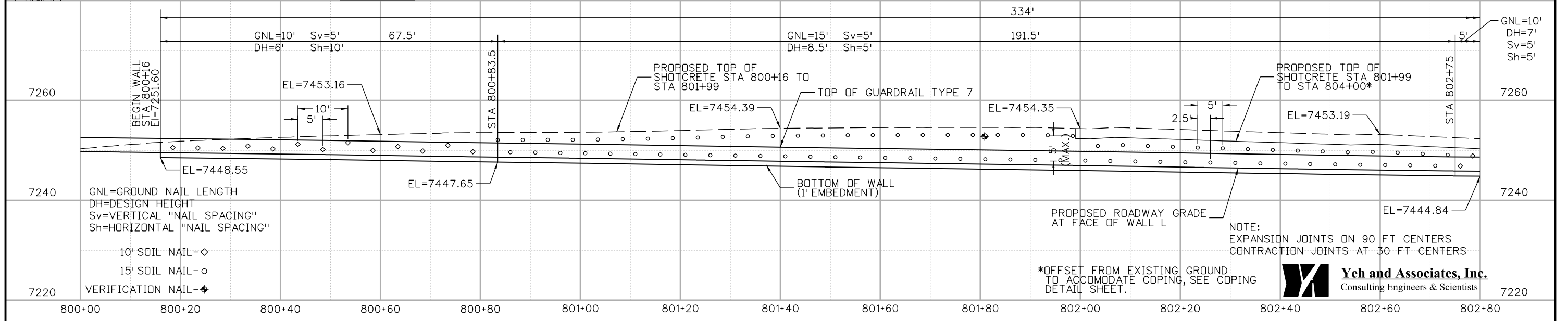
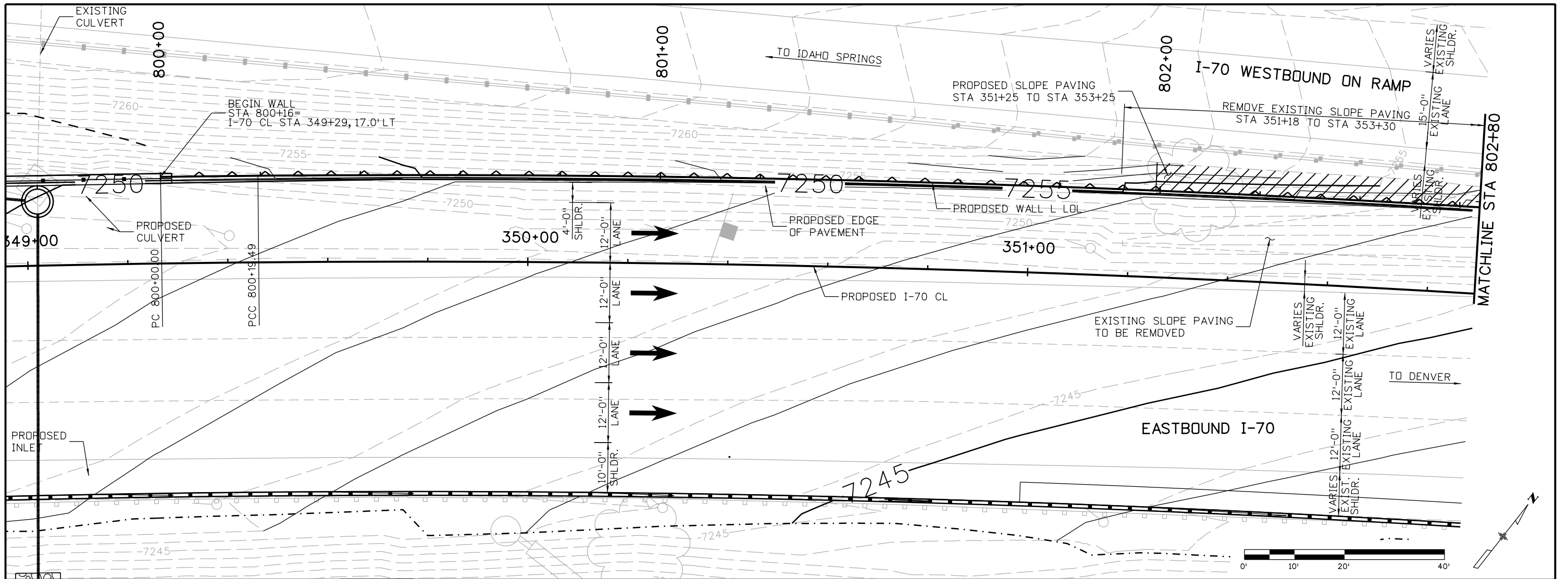
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	ϕ (DEG)	c (PSF)	γ (PCF)	Q_d (lb/ft)		
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BEDROCK	35	2000	140	2600	c	COHESION
					γ	UNIT WEIGHT
					Q_d	DESIGN SHEAR RESISTANCE
						BOND STRESS (ALLOWABLE)

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Print Date: 2/8/2013	Sheet Revisions	Colorado Department of Transportation	As Constructed	RETAINING WALL L GROUND NAIL WALL GENERAL NOTES	Project No./Code
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Horiz. Scale: 1:1 Vert. Scale:		Region 1 CRC	Revised:	Designer: P. MACKLIN Structure: WALL-F-15-XX	19036
Staff Bridge Branch-Unit 0221 STW			Void:	Detailer: M. WALZ Numbers:	Sheet Number 229
ATKINS 4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276				Subset: WALL Subset Sheets: W24 of 34	



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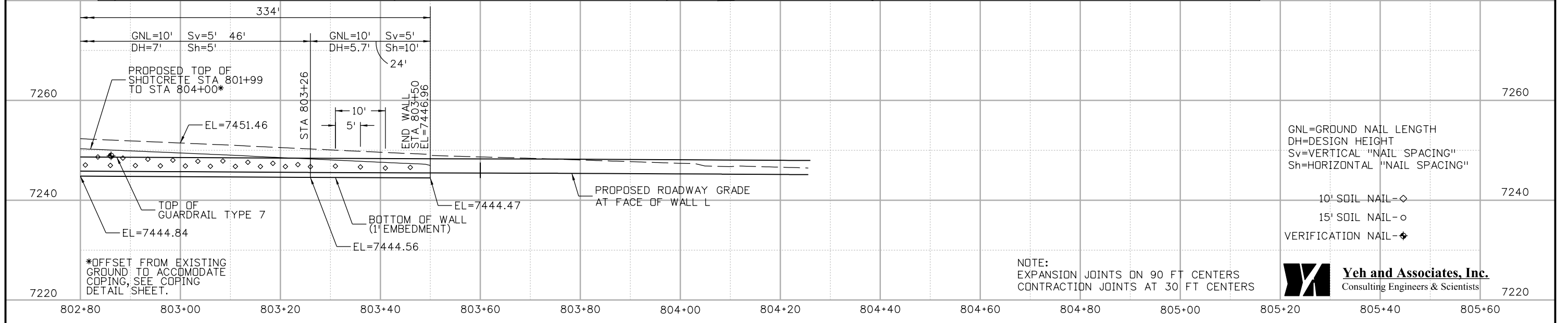
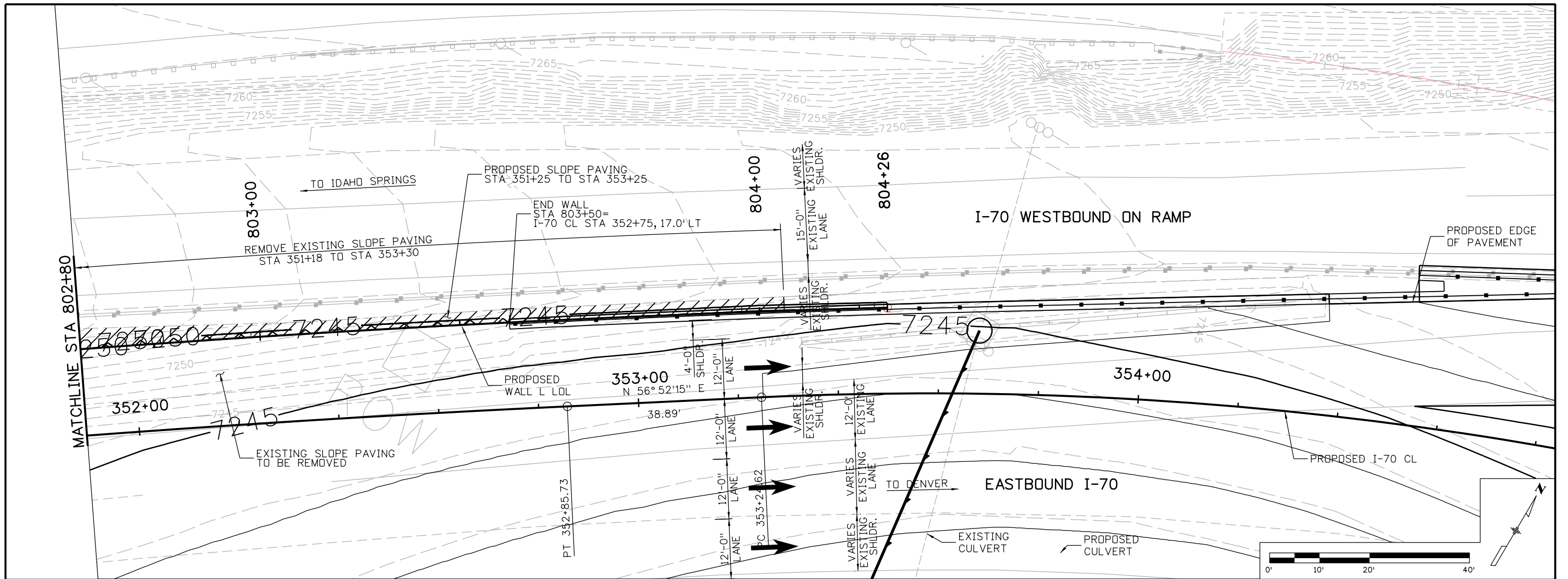
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 STA 800+16 TO 802+80
 GROUND NAIL DIAGRAM
 Designer: P. Macklin
 Detailer: M. Walz
 Sheet Subset: WALL
 Structure Numbers: WALL-F-15-XX
 Subset Sheets: W25 of 34

Project No./Code
 IM 0703-391
 19036
 Sheet Number 230

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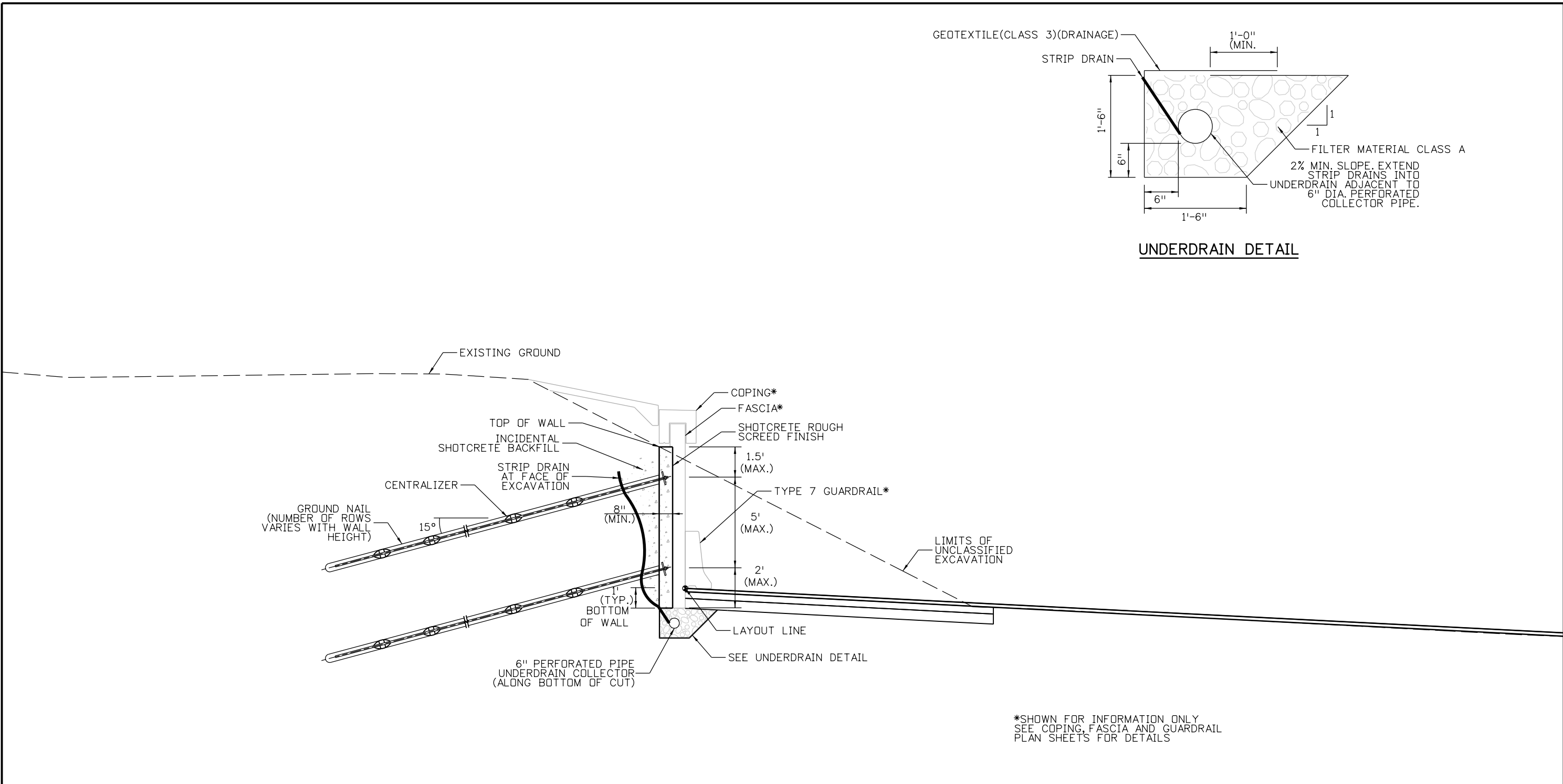
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 Detailer: M. Walz
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Project No./Code
IM 0703-391
19036
Sheet Number 231

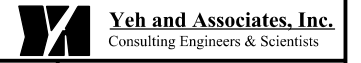
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GROUND NAIL WALL

*SHOWN FOR INFORMATION ONLY
SEE COPING, FASCIA AND GUARDRAIL
PLAN SHEETS FOR DETAILS



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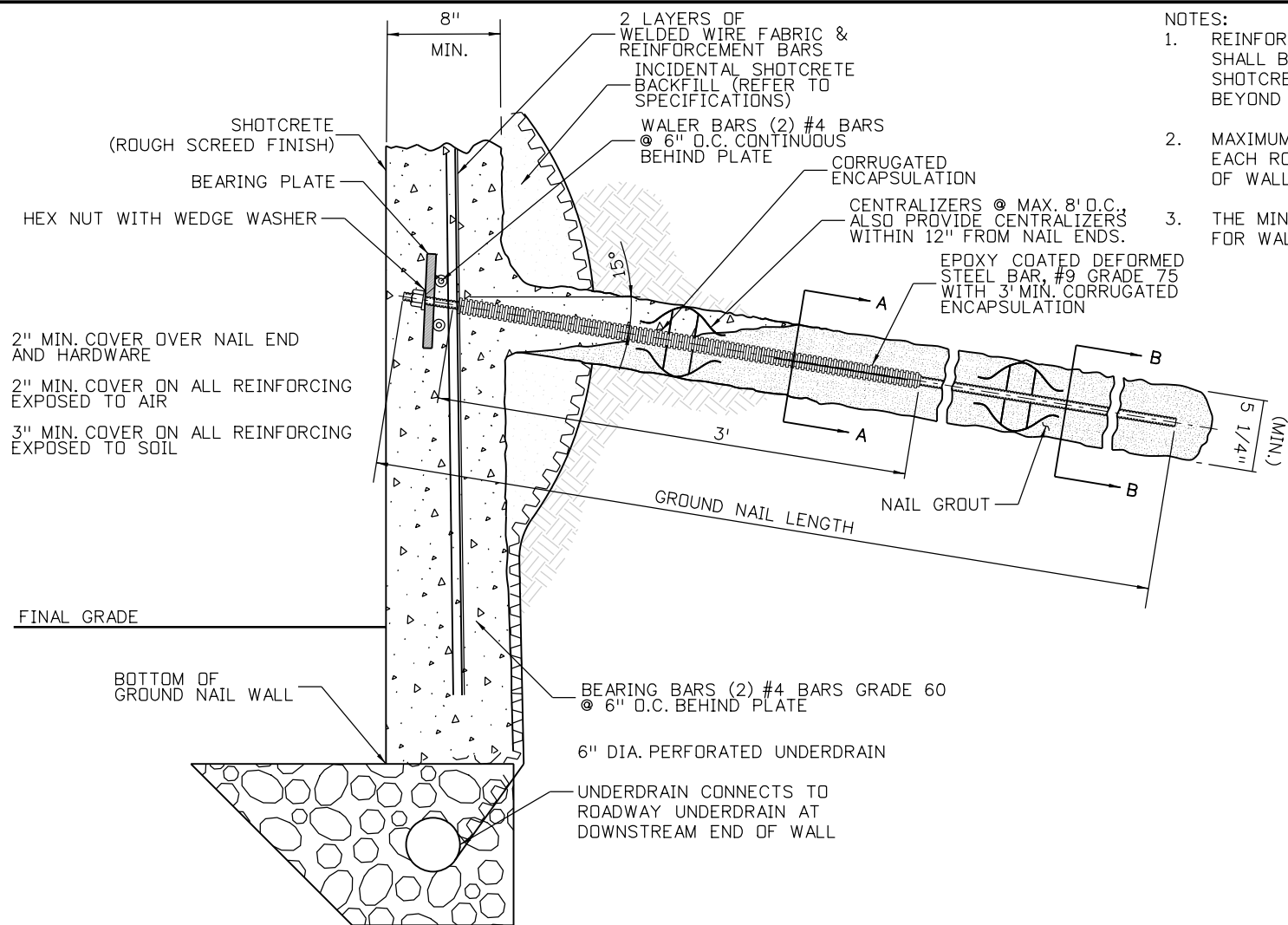
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Detailer:	M. Walz		
Subset:	WALL	Subset Sheets:	W27 of 34

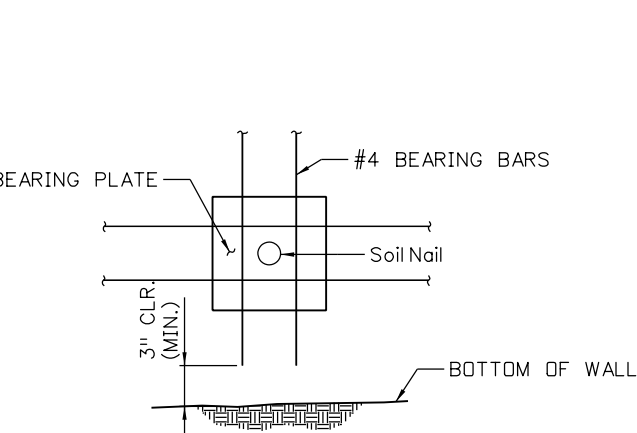
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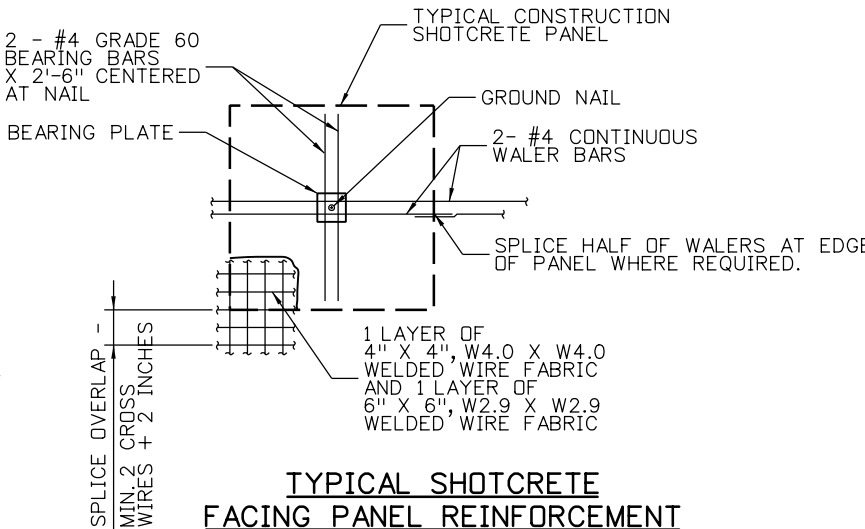
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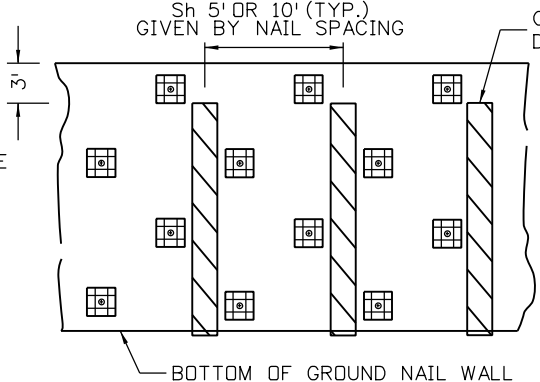
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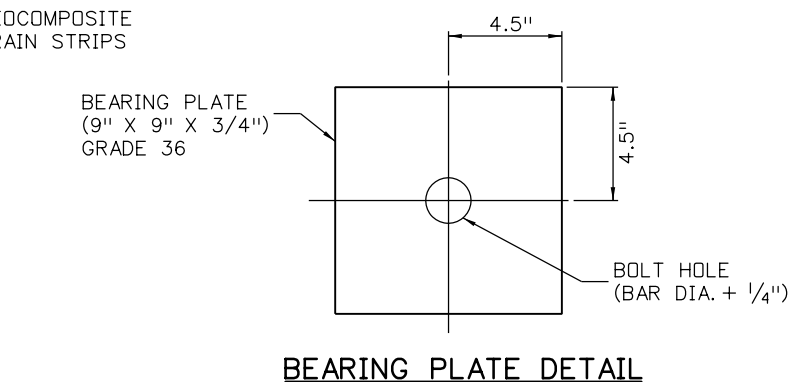
**TYPICAL REINFORCEMENT
BOTTOM ROW OF GROUND NAILS**



**TYPICAL SHOTCRETE
FACING PANEL REINFORCEMENT**

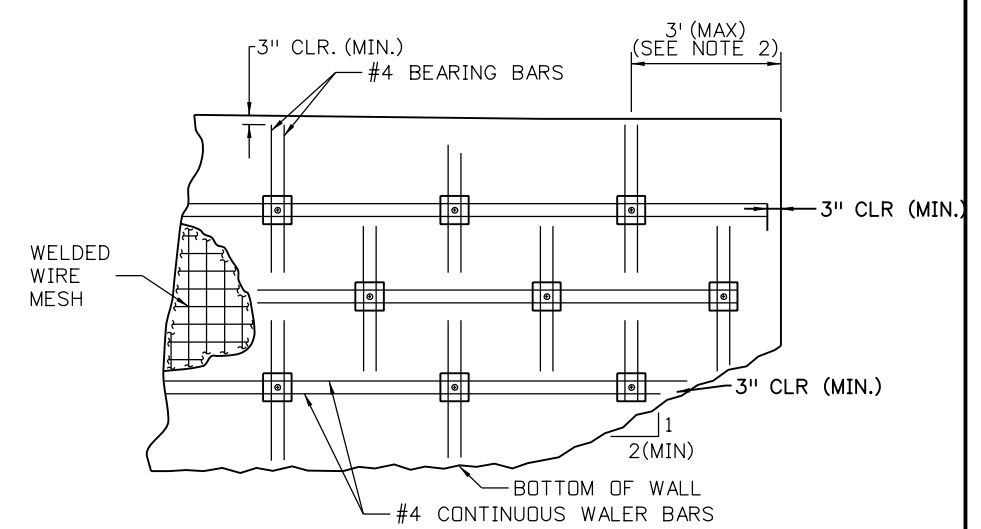


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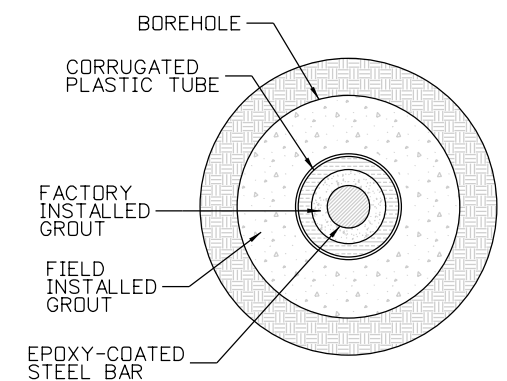


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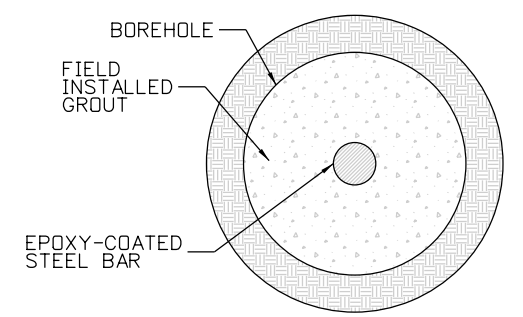
- NOTES:
1. REINFORCEMENT OF THE SHOTCRETE FACING SHALL BE INSTALLED THROUGHOUT THE ENTIRE SHOTCRETE FACING, INCLUDING THE FACING BEYOND THE GROUND NAILS.
 2. MAXIMUM EDGE DISTANCE OF 3 FT FOR EACH ROW OF GROUND NAILS AT END OF WALL.
 3. THE MINIMUM SHOTCRETE THICKNESS IS 8 IN. FOR WALL FACE.



**TYPICAL SHOTCRETE FACING
REINFORCEMENT - END OF WALL (NOTE 1)**



**GROUND NAIL
CROSS SECTION A-A'**



**GROUND NAIL CROSS
SECTION B-B'**

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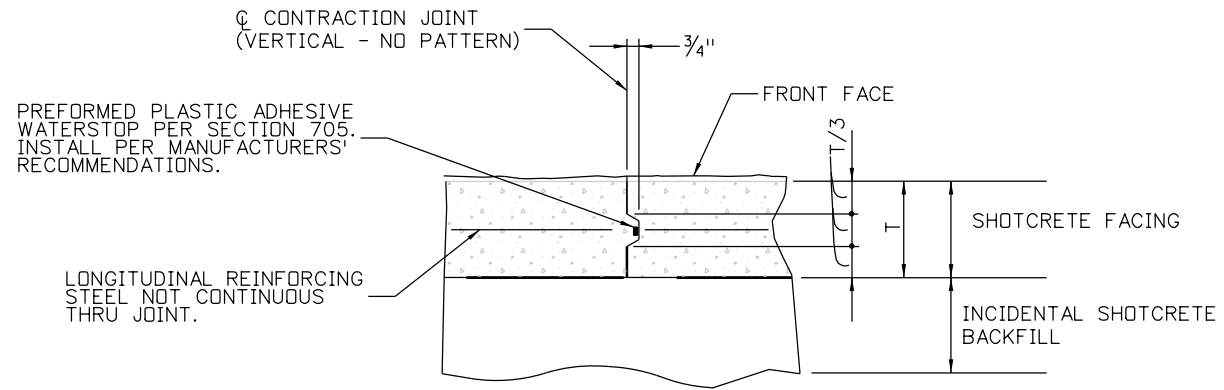
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RETAINING WALL L GROUND NAIL WALL DETAILS (SHEET 1 OF 2)			
Designer:	P. MACKLIN	Structure	WALL-F-15-XX
Detailer:	M. WALZ	Numbers	
Subset:	WALL	Subset Sheets:	W28 of 34

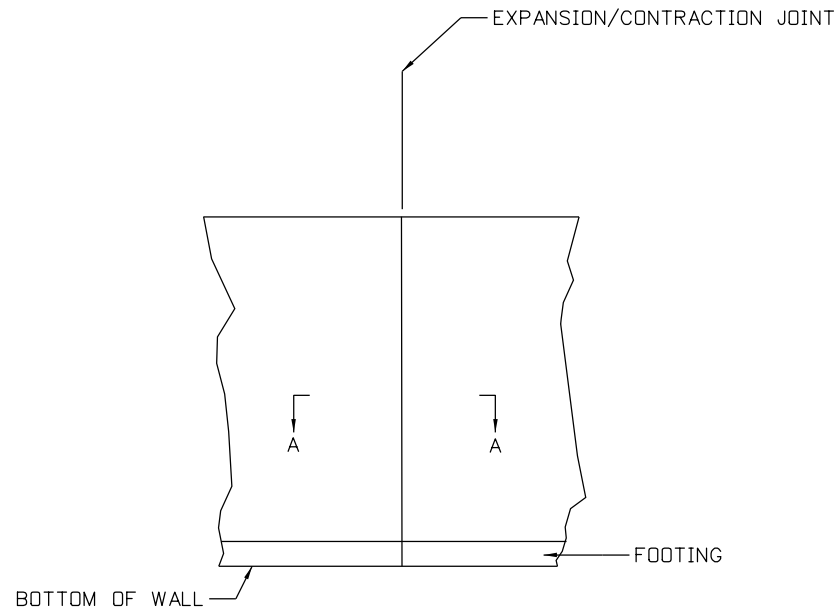
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IM 0703-391
19036
Sheet Number 233

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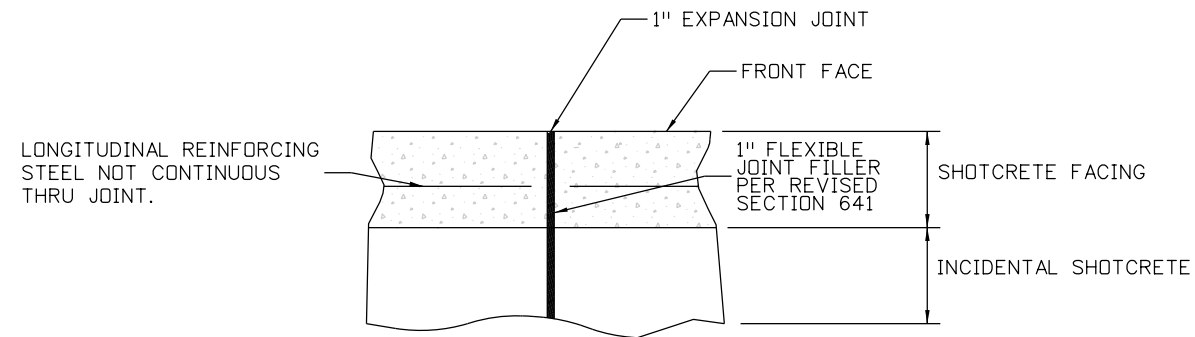
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INITIAL	DATE	INITIAL	DATE	INITIAL	DATE
Desiged By	PRM	10/12	10/12	Quantities By	
Checked By	BPV	10/12	10/12	Checked By	



CONTRACTION JOINT DETAIL
CONTRACTION JOINT EXTENDS FROM TOP OF WALL TO BOTTOM OF WALL (THROUGH FOOTING)



GROUND NAIL WALL EXPANSION JOINT DETAIL



EXPANSION JOINT DETAIL (SECTION A-A)

GROUND NAIL WALLS REQUIRE A PATTERN BE FORMED INTO THE SHOTCRETE FACING AT THE EXPANSION JOINTS.



Print Date: 2/12/2013	0000
File Name: 18832DES_GNW_Details02.dgn	
Horiz. Scale: 1:1 Vert. Scale:	
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Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation

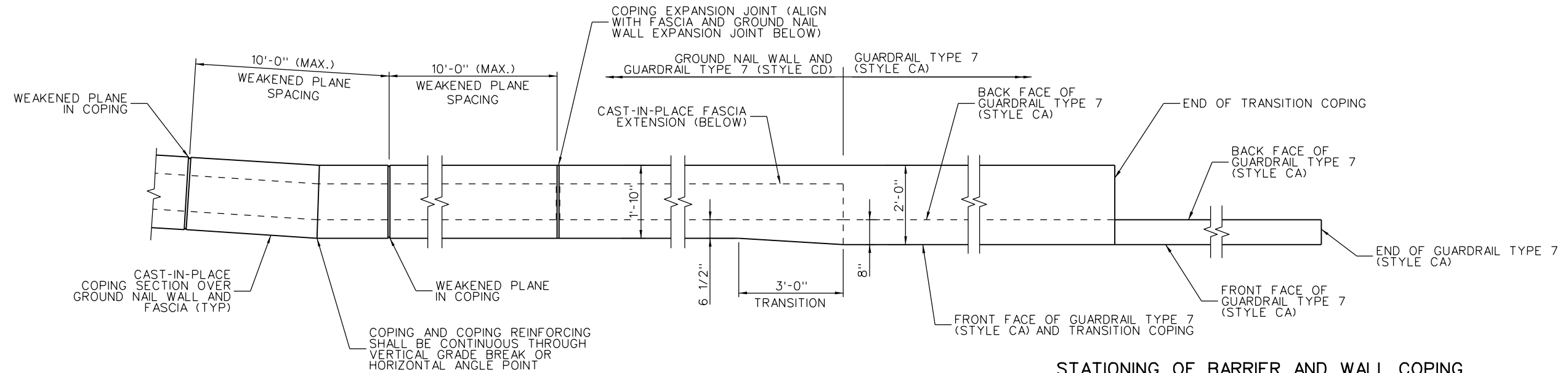
425 A Corporate Circle
Golden, CO 80401
Phone: 720-497-6905 FAX: 720-497-6901

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No Revisions:
Revised:
Void:

RETAINING WALL L GROUND NAIL WALL DETAILS (SHEET 2 OF 2)			
Designer:	P. MACKLIN	Structure Numbers	WALL-F-15-XX
Detailer:	M. WALZ		
Subset:	WALL	Subset Sheets:	W29 of 34

Project No./Code
IM 0703-391
19036
Sheet Number 234

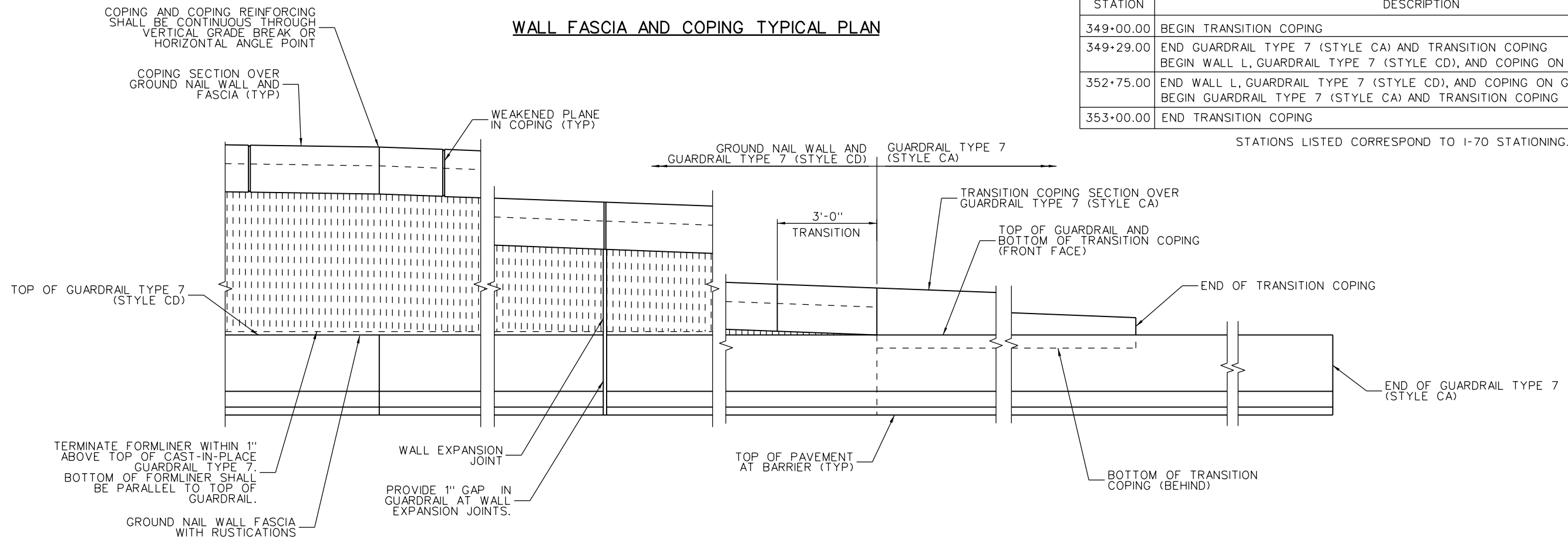


WALL FASCIA AND COPING TYPICAL PLAN

STATIONING OF BARRIER AND WALL COPING

STATION	DESCRIPTION
349+00.00	BEGIN TRANSITION COPING
349+29.00	END GUARDRAIL TYPE 7 (STYLE CA) AND TRANSITION COPING BEGIN WALL L, GUARDRAIL TYPE 7 (STYLE CD), AND COPING ON GROUND NAIL WALL
352+75.00	END WALL L, GUARDRAIL TYPE 7 (STYLE CD), AND COPING ON GROUND NAIL WALL BEGIN GUARDRAIL TYPE 7 (STYLE CA) AND TRANSITION COPING
353+00.00	END TRANSITION COPING

STATIONS LISTED CORRESPOND TO I-70 STATIONING.



WALL FASCIA AND COPING TYPICAL ELEVATION



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

Print Date: 2/24/2013
 File Name: 18832DES_WallL_FasDet01.dgn
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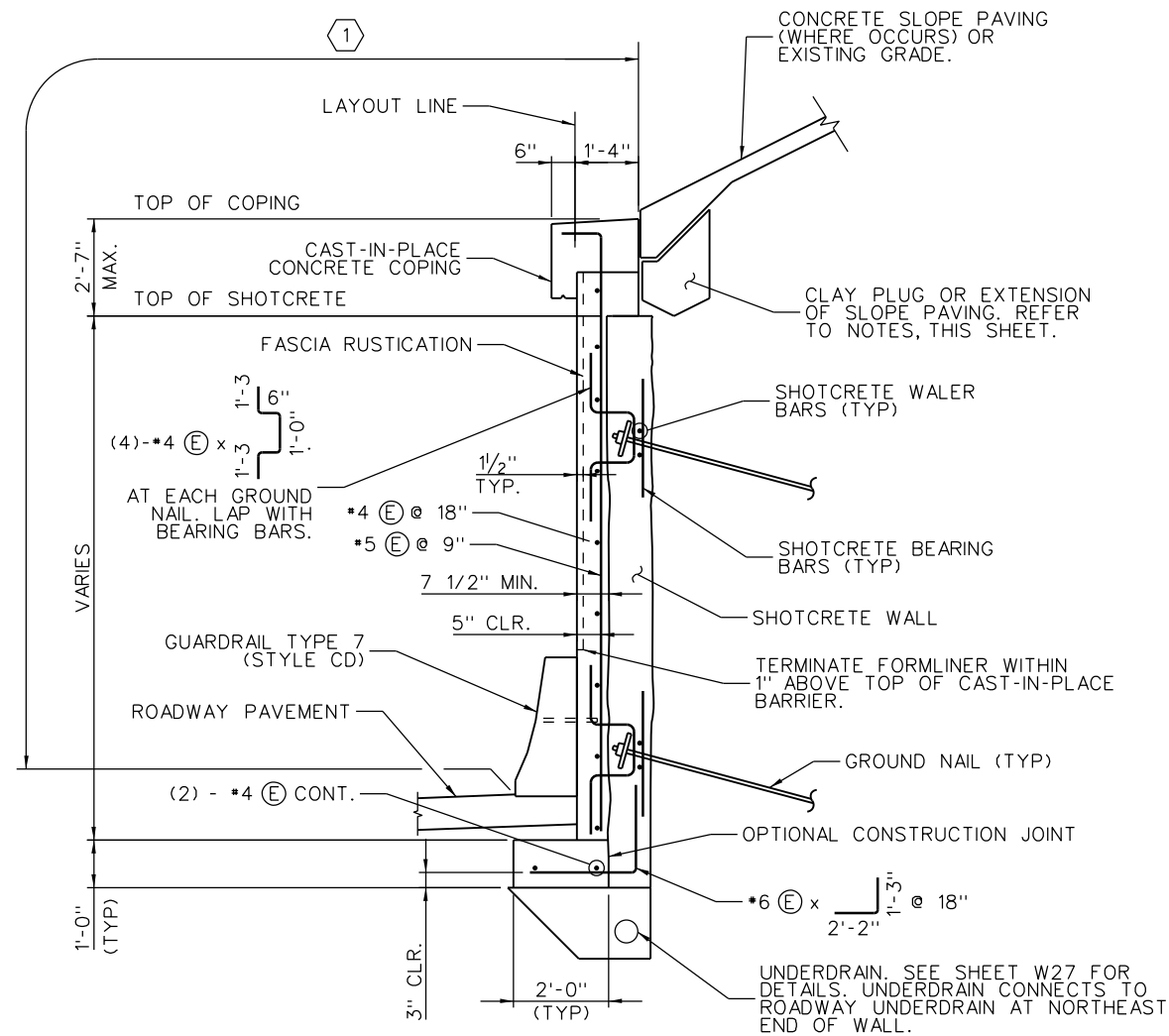
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 Phone: 720-497-6918 FAX: 720-497-6901
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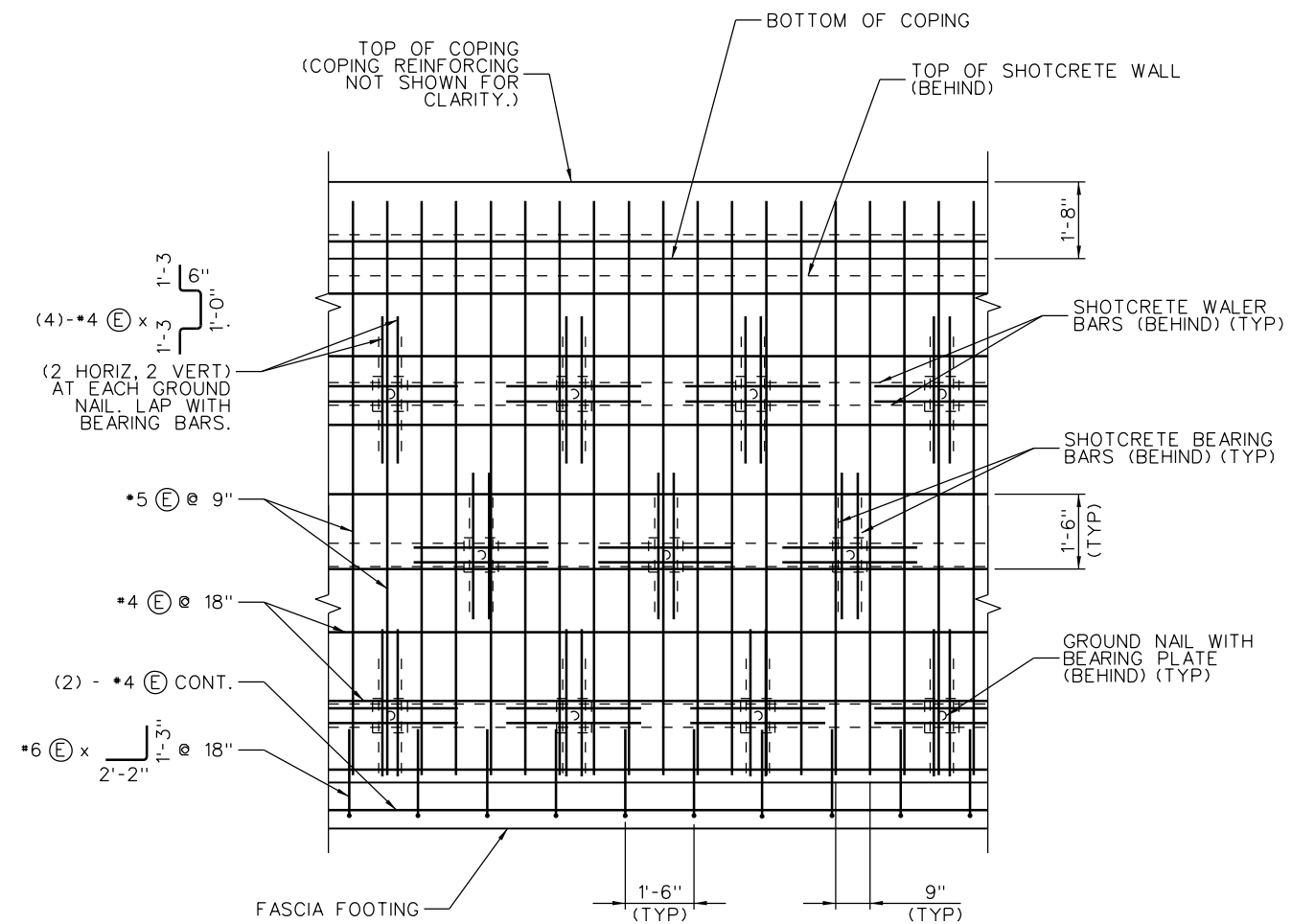
**RETAINING WALL L
 FASCIA AND COPING DETAILS
 (SHEET 1 OF 5)**
 Designer: J. MIGLIACCIO
 Detailer: J. MIGLIACCIO
 Sheet Subset: WALL

Project No./Code
IM 0709-391
19036
Sheet Number 235

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WALL FASCIA AND COPING TYPICAL SECTION



WALL FASCIA REINFORCING ELEVATION

(GUARDRAIL TYPE 7 NOT SHOWN FOR CLARITY.)

NOTES:

- FASCIA, FOOTING AND COPING CONCRETE SHALL BE CONCRETE CLASS D (WALL).
- REFER TO GROUND NAIL WALL SHEETS FOR TOP AND BOTTOM OF GROUND NAIL WALLS AND GROUND NAIL LOCATIONS.
- 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.
- CONCRETE BID ITEM QUANTITIES FOR WALL FASCIA INCLUDE 7 1/2" OF CONCRETE THICKNESS OVER THE FACE AREA DEFINED ON THE WALL ELEVATION.
- FOR GENERAL NOTES, SEE SHEET W01.
- WHERE SLOPE PAVING OCCURS, CLAY PLUG PRISM MAY BE PLACED AS AN EXTENSION OF THE CONCRETE SLOPE PAVING TO THE DIMENSIONS SHOWN. GEOTEXTILE AND ANCHOR PINS MAY BE ELIMINATED ACCORDINGLY. EXTEND SLOPE PAVING WWF REINFORCING INTO EXTENSION.
- 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).
- FOR EXPANSION JOINT AND WEAKEND PLANE SPACING AND LOCATIONS, SEE WALL LAYOUTS.
- RUSTICATION SHALL BE LINER 131, COLORADO RANDOM REVEAL PATTERN BY SCOTT SYSTEM OR APPROVED EQUAL.
- WALL COPING SYSTEM SHALL BE PAID FOR UNDER BID ITEM: CURB & GUTTER (SPECIAL). THIS BID ITEM SHALL INCLUDE ALL FORMWORK, CONCRETE, REINFORCING, AND JOINTS IN WALL COPING.
- AT CONTRACTOR'S OPTION, FASCIA CONNECTION TO SHOTCRETE MAY BE PROVIDED USING A PLATE WITH HEADED STUDS ATTACHED TO GROUND NAILS, IN LIEU OF "U-BARS" SHOWN. CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING STRUCTURAL CALCULATIONS AND DETAILS OF ANY SUCH PROPOSED SUBSTITUTION.

**COPING QUANTITIES: (PER LINEAR FOOT)
(FOR INFORMATION ONLY)**

ITEM NO.	DESCRIPTION	UNIT	QUANTITY
601	CONCRETE CLASS D	C.Y./Ft.	0.081
602	REINFORCING STEEL (EPOXY COATED)	Lb./Ft.	7.9

QUANTITIES LISTED APPLY TO COPING OVER GROUND NAIL WALL.

KEYNOTES:

- ① LIMITS OF STRUCTURAL CONCRETE COATING. SEE SHEET W01 FOR COATING SPECIFICATION.



Design		Detail		Quantities	
DATE	INITIAL	DATE	INITIAL	DATE	INITIAL
12-12	JJM	12-12	JJM	12-12	JJM
12-12	JJM	12-12	JJM	12-12	JJM

Print Date: 2/25/2013
 File Name: 18832DES_WallL_FasDet02.dgn
 Horiz. Scale: NONE Vert. Scale: NONE
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 Phone: (303) 221-7275 Fax: (303) 221-7276

Sheet Revisions		
Date:	Comments	Init.

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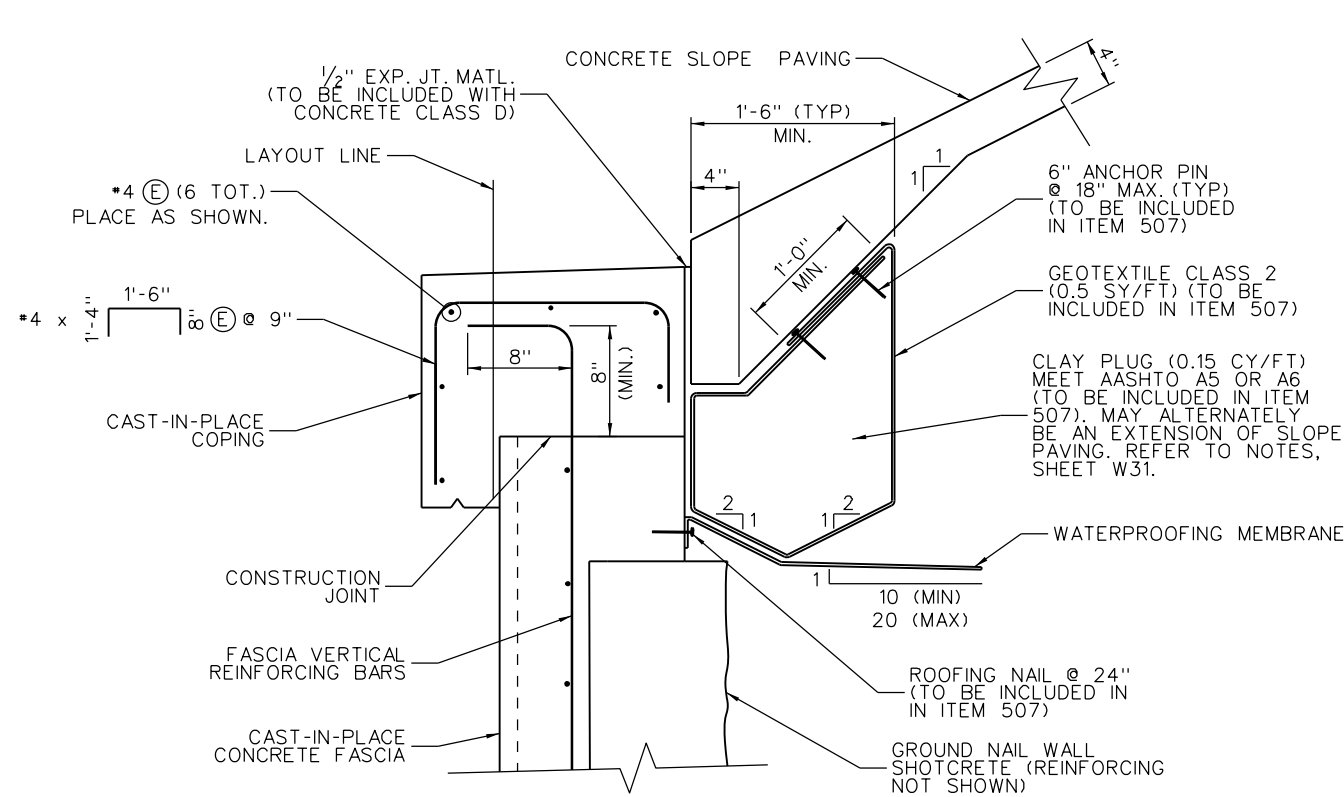
As Constructed
No Revisions:
Revised:
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RETAINING WALL L
 FASCIA AND COPING DETAILS
 (SHEET 2 OF 5)
 Designer: J. MIGLIACCIO
 Detailer: J. MIGLIACCIO
 Sheet Subset: WALL

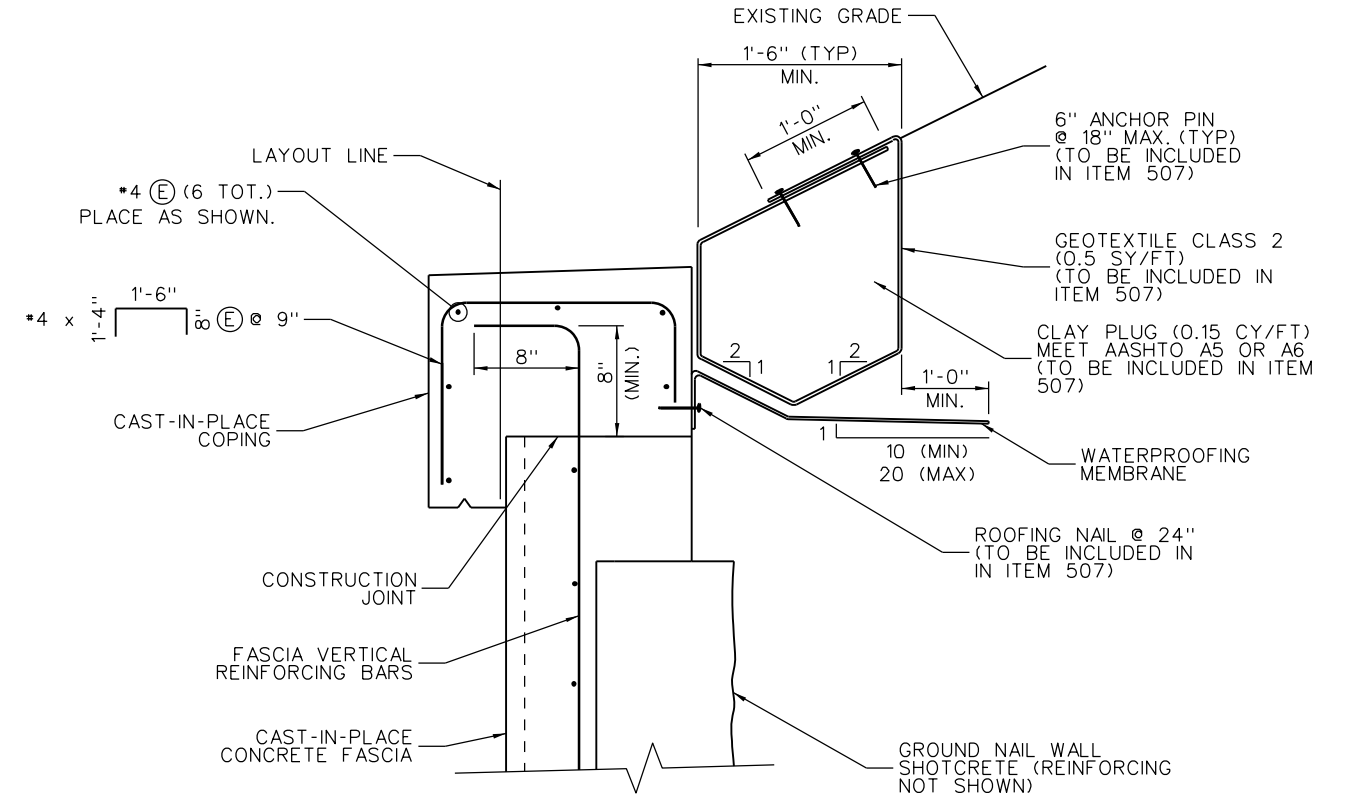
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	19036
Sheet Number	236

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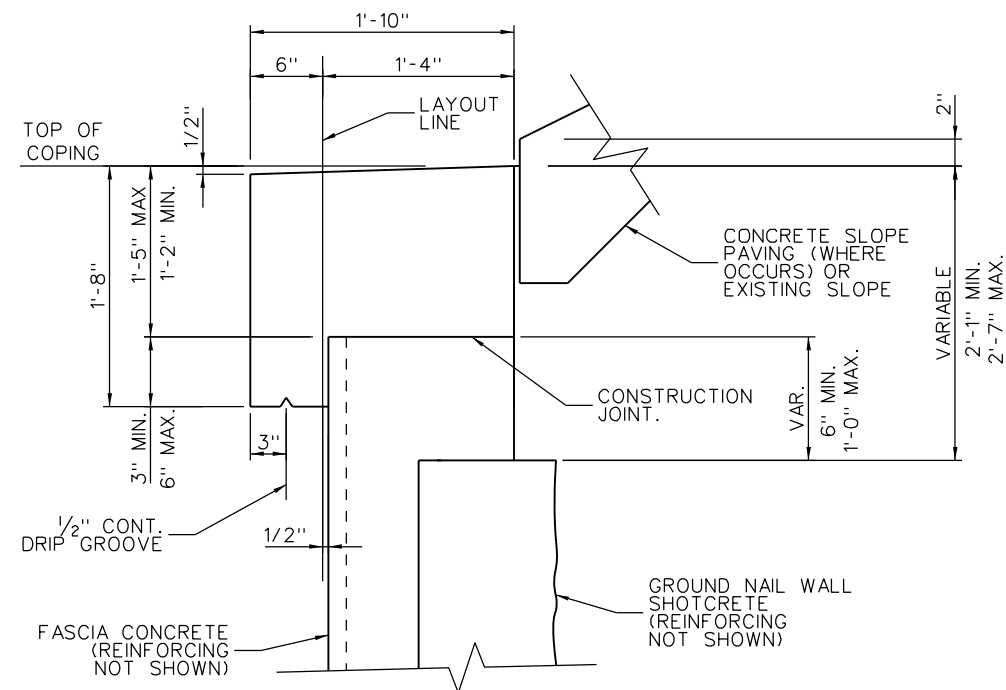
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INITIAL	DATE	INITIAL	DATE	INITIAL	DATE
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Checked By	Checked By	Checked By	Checked By	Checked By	Checked By
JJM	JAZ	JJM	JAZ	JJM	JJM



COPING AND CLAY PLUG SECTION AT GROUND NAIL WALL WITH SLOPE PAVING



COPING AND CLAY PLUG SECTION AT GROUND NAIL WALL WITHOUT SLOPE PAVING



COPING SECTION GEOMETRY AT GROUND NAIL WALL



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Date:	Comments	Init.

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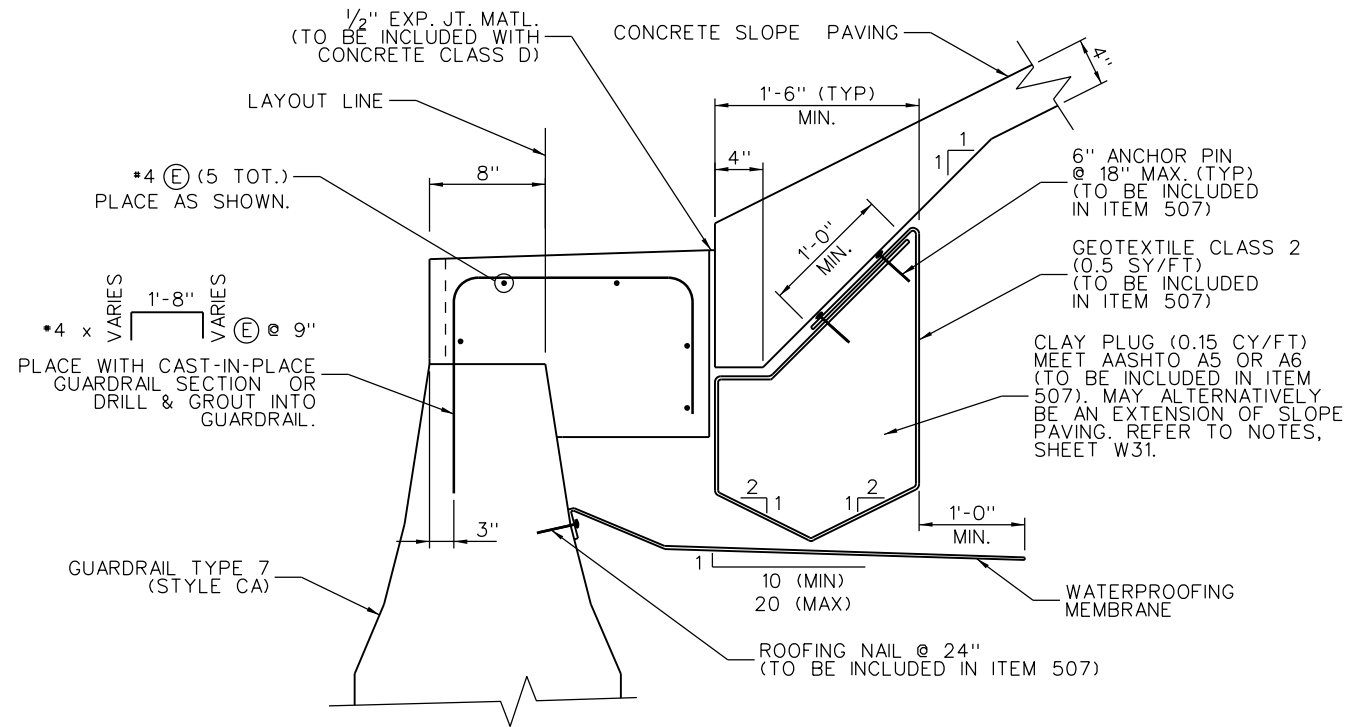
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Region 1 CRC

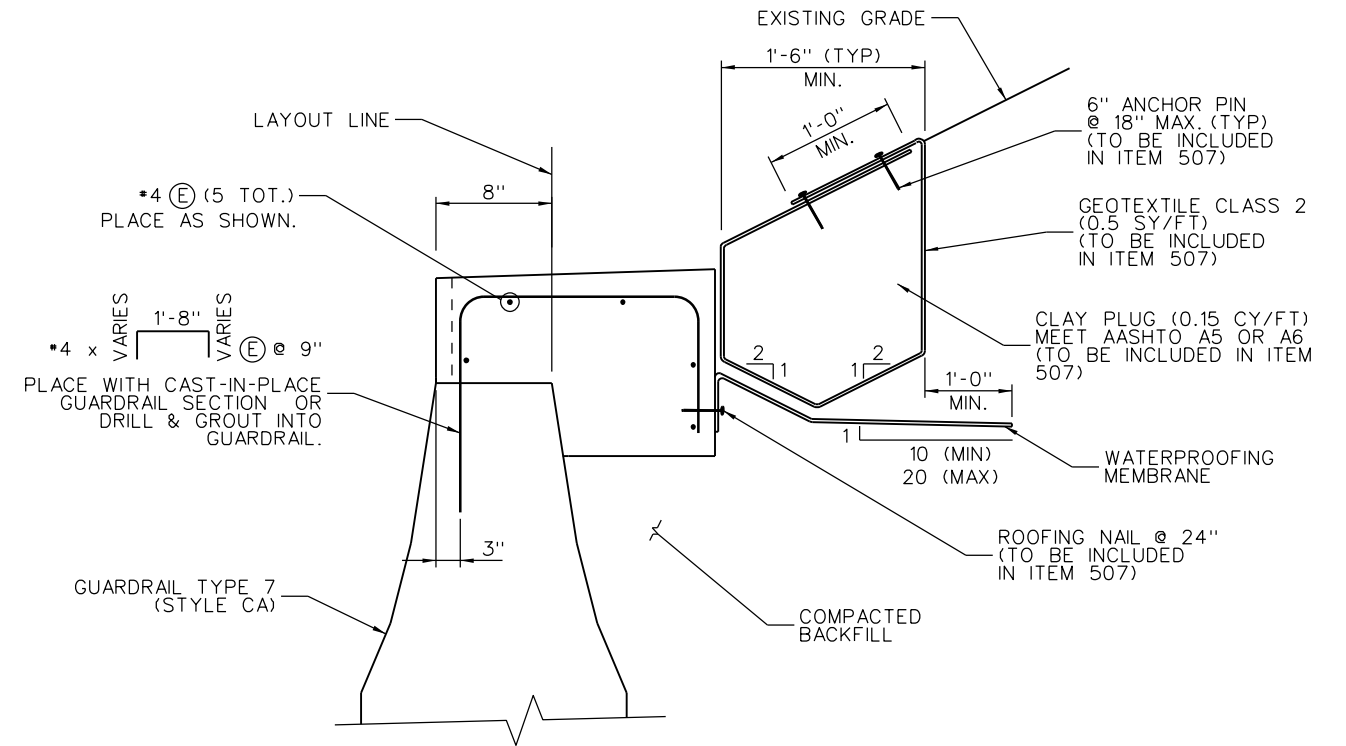
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Revised:
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RETAINING WALL L FASCIA AND COPING DETAILS (SHEET 3 OF 5)			
Designer:	J. MIGLIACCI	Structure	WALL-F-15-BL
Detailer:	J. MIGLIACCI	Numbers	
Sheet Subset:	WALL	Subset Sheets:	W32 of 34

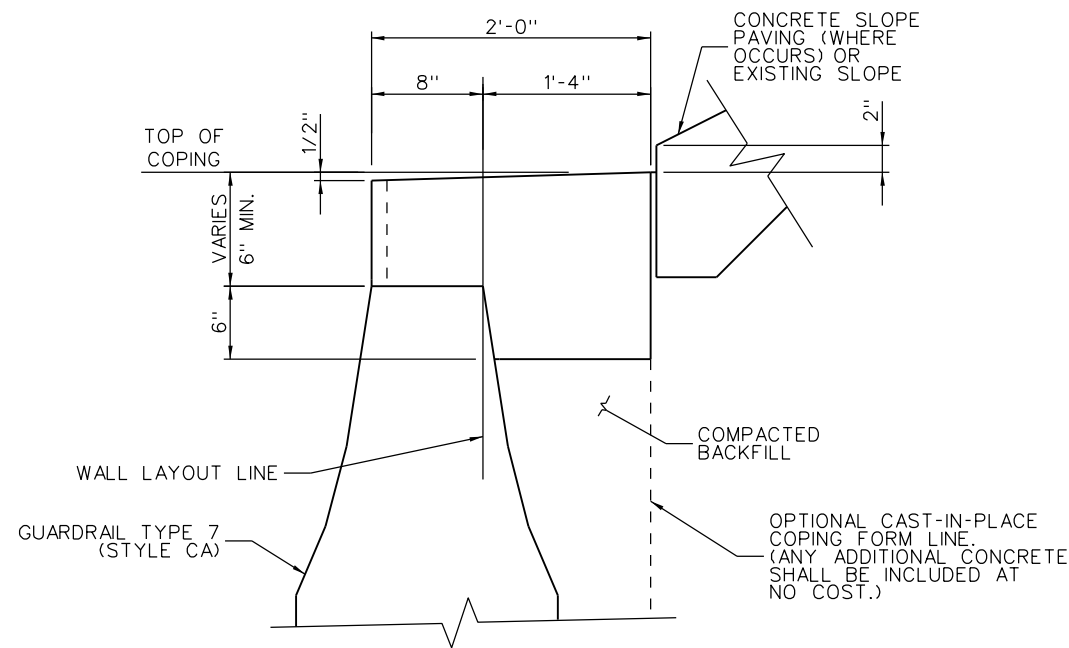
Project No./Code
IM 0709-391
19036
Sheet Number 237



COPING AND CLAY PLUG SECTION AT GUARDRAIL TYPE 7 WITH SLOPE PAVING



COPING AND CLAY PLUG SECTION AT GUARDRAIL TYPE 7 WITHOUT SLOPE PAVING



COPING SECTION GEOMETRY AT GUARDRAIL TYPE 7

Design		Detail		Quantities	
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Checked By	Checked By	Checked By	Checked By	Checked By	Checked By
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Print Date: 2/25/2013	
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Date:	Comments	Init.

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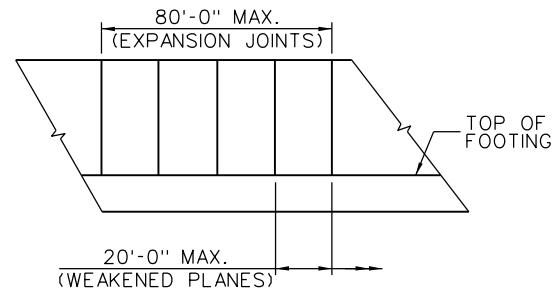
Region 1 CRC

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No Revisions:	
Revised:	
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Detailer:	J. MIGLIACCIO	Numbers	
Sheet Subset:	WALL	Subset Sheets:	W33 of 34

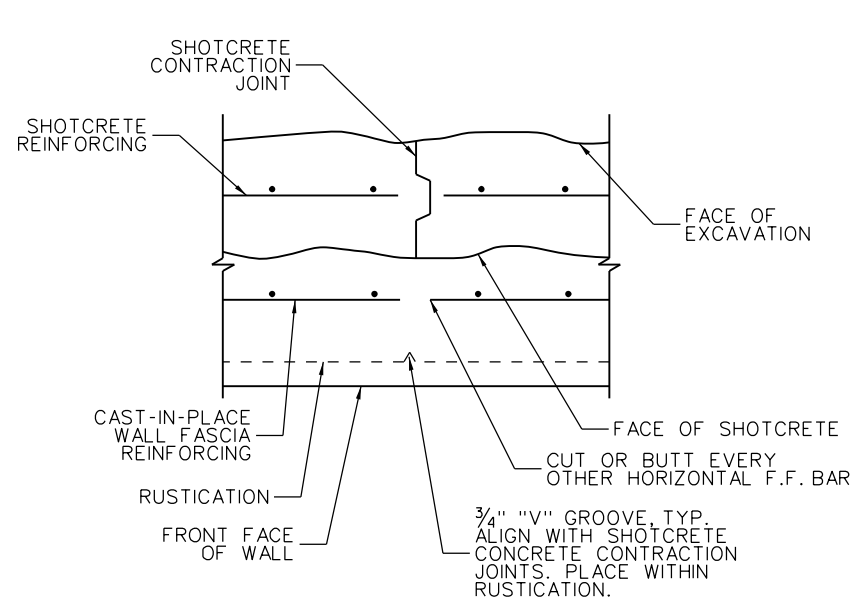
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19036	
Sheet Number	238



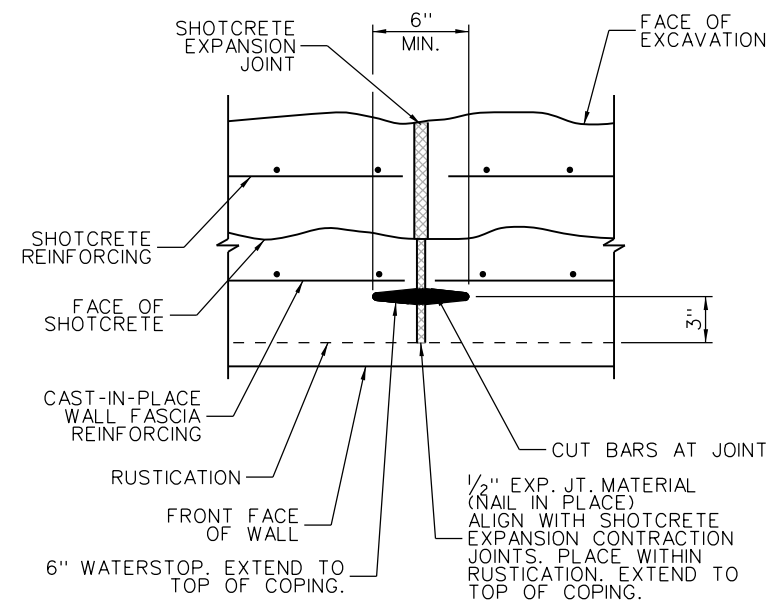


WALL EXPANSION JOINTS AND WEAKENED PLANES

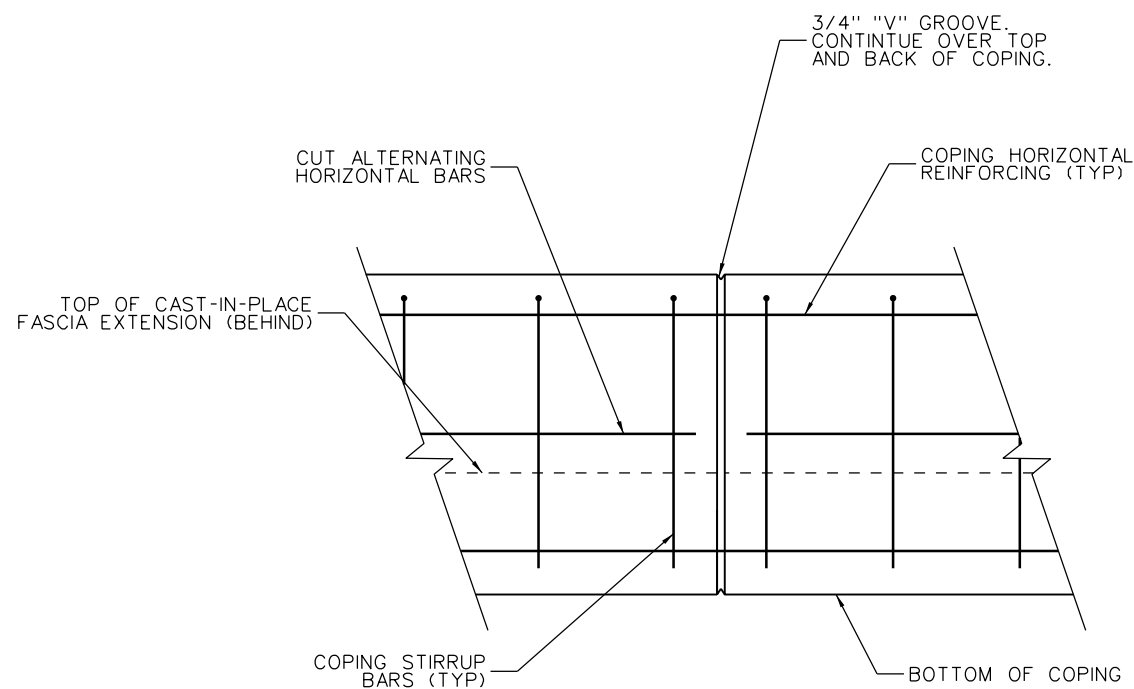
DO NOT EXTEND EXPANSION JOINTS THROUGH FOOTING.



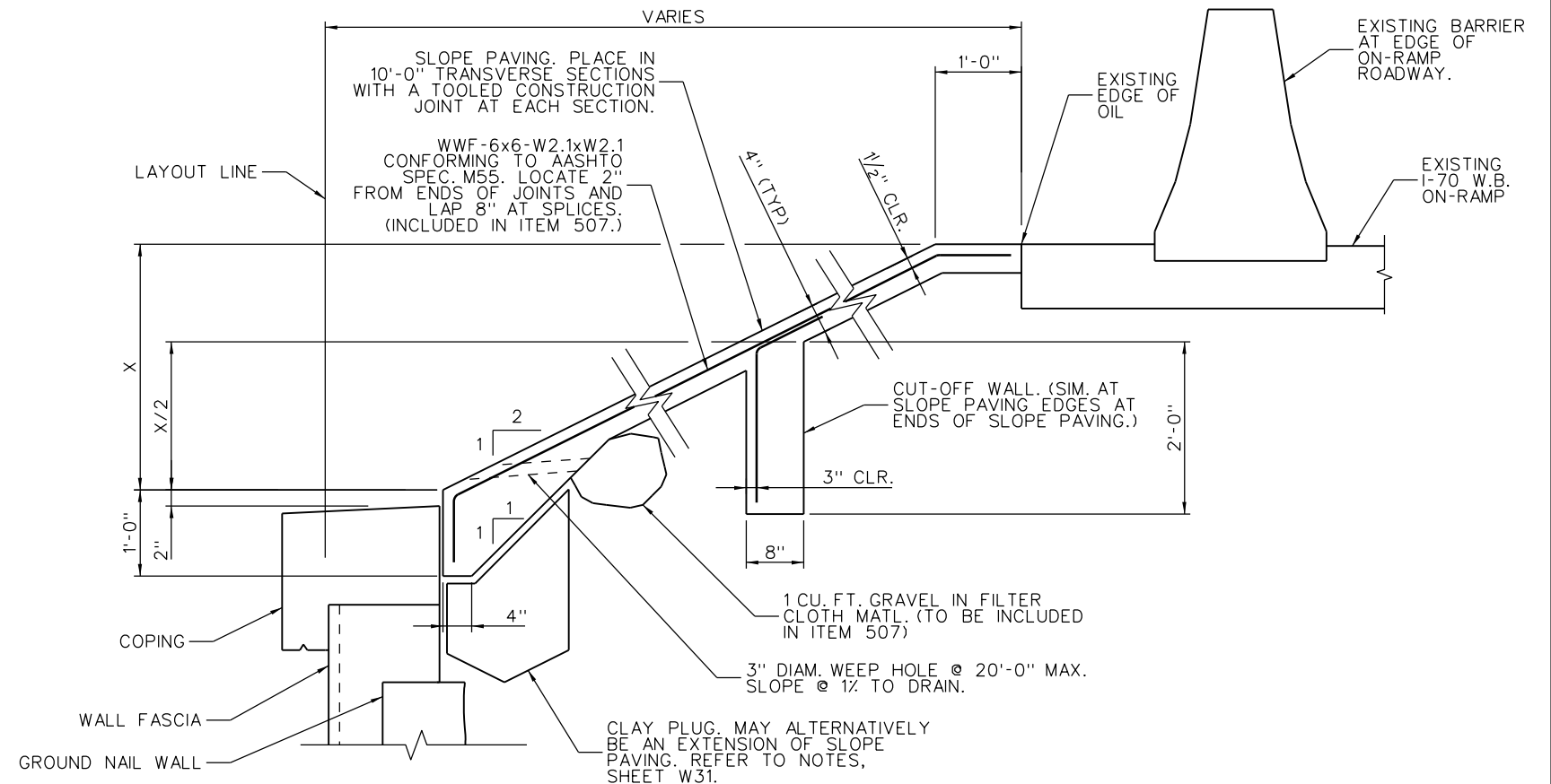
WALL FASCIA WEAKENED PLANE



EXPANSION JOINT



COPING WEAKENED PLANE - ELEVATION



TYPICAL SLOPE PAVING SECTION

Design		Detail		Quantities	
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Checked By	Checked By	Checked By	Checked By	Checked By	Checked By
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Print Date: 2/25/2013
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Revised:	
Void:	

RETAINING WALL L FASCIA AND COPING DETAILS (SHEET 5 OF 5)			
Designer:	J. MIGLIACCIO	Structure Numbers	WALL-F-15-BL
Detailer:	J. MIGLIACCIO	Subset Sheets:	W34 of 34

Project No./Code	IM 0709-391
	19036
Sheet Number	239



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SUMMARY OF LIGHTING QUANTITIES				
PAY ITEM	DESCRIPTION	UNIT	QUANTITY	
202-00700	REMOVAL OF LIGHT STANDARD	EACH	35	(1) HIGHMAST ON EAST SIDE OF TUNNEL (31) TEMP. TIMBER LIGHT STANDARDS
202-00725	REMOVAL OF EXISTING LIGHTING SYSTEM	L S	1	TUNNEL LIGHTING SYSTEM (LUMINAIRES, MOUNTING RACKS, ASSOCIATED HARDWARE, WIRING, CONDUITS, ELECTRICAL ENCLOSURES)
210-00750	RESET LIGHT STANDARD	EACH	10	EXISTING CHAIN STATION AREA LIGHT STANDARDS (9), (1) ROADWAY
210-00765	RESET LIGHTING CONTROL CENTER	L S	1	RELOCATION OF WESTBOUND TUBE LIGHTING CONTROL CENTER (LCC)
613-00100	1 INCH ELECTRICAL CONDUIT	LF	1,300	
613-00200	2 INCH ELECTRICAL CONDUIT	LF	2,836	INCLUDES CONDUIT FOR RELOCATION OF WESTBOUND TUBE LCC
613-00400	4 INCH ELECTRICAL CONDUIT	LF	550	
613-01200	2 INCH ELECTRICAL CONDUIT (PLASTIC)	LF	3,620	
613-04200	2 INCH ELECTRICAL CONDUIT (LIQUIDTIGHT FLEXIBLE METAL)	LF	10	
613-07017	PULL BDX (16"X14"X6")	EACH	79	
613-07025	PULL BDX (24"X24"X14")	EACH	10	
613-07036	PULL BDX (36"X24"X8")	EACH	1	
613-10000	WIRING	L S	1	SEE TABULATION OF WIRING
613-13000	LUMINAIRE (LED)	EACH	51	ROADWAY LED LUMINAIRE, 195 WATTS
613-13100	LUMINAIRE MOUNTING SUPPORT SYSTEM	L S	1	LED LUMINAIRE AND ELECTRICAL TUNNEL MOUNTING SYSTEM
613-13101	LUMINAIRE (LED) (TUNNEL) (133 WATT)	EACH	34	TUNNEL LED LUMINAIRE, TYPE N1 133 WATTS
613-13102	LUMINAIRE (LED) (133 WATT) (FURNISH ONLY)	EACH	2	TUNNEL LED LUMINAIRE, TYPE N1 133 WATTS
613-13103	LUMINAIRE (LED) (TUNNEL) (265 WATT)	EACH	354	TUNNEL LED LUMINAIRE, TYPE D1 265 WATTS
613-13104	LUMINAIRE (LED) (265 WATT) (FURNISH ONLY)	EACH	2	TUNNEL LED LUMINAIRE, TYPE D1 265 WATTS
613-34300	LIGHT STANDARD METAL (30 FOOT)	EACH	5	CHAIN STATION AREA NEW STANDARDS TO MATCH EXISTING STANDARDS (1 ARM)
613-32400	LIGHT STANDARD STEEL (40 FOOT)	EACH	7	NEW POLE WITH BREAKAWAY TRANSFORMER BASE (1 ARM)
613-32405	LIGHT STANDARD STEEL (40 FOOT) (2 ARM)	EACH	10	NEW POLE WITH BREAKAWAY TRANSFORMER BASE (2 ARM)
613-40010	LIGHT STANDARD FOUNDATION	EACH	30	NEW FOUNDATIONS FOR NEW LIGHT STANDARDS
613-50100	LIGHTING CONTROL CENTER	EACH	3	(1) TUNNEL (EAST BOUND), (2) TEMPORARY
613-50325	TUNNEL LIGHTING CONTROL SYSTEM	L S	1	
613-75150	LUMINAIRE METAL HALIDE (150 WATT)	EACH	5	CHAIN STATION AREA NEW; LUMINAIRE TO MATCH EXISTING LUMINAIRES
700-70072	F/A OBTAIN POWER FROM XCEL ENERGY	F A	1	

LIGHTING GENERAL NOTES:

- UNLESS OTHERWISE NOTED, ALL EQUIPMENT SHALL BE MOUNTED IN ACCORDANCE TO THE TYPICAL MOUNTING DETAILS SHOWN ON SHEETS 25-27.
- ALL DRAWINGS ARE SHOWN SCHEMATICALLY FOR EQUIPMENT (LIGHTING AND ELECTRICAL) LOCATIONS. CONTRACTOR SHALL INDICATE FINAL LOCATIONS ON AS-BUILT PLANS.
- RELOCATED AND NEW SPECIAL METAL HALIDE LUMINAIRE'S SHALL BE CONNECTED AND CONTROLLED SEPARATELY FROM HIGHWAY LUMINARIE'S.
- SEE CHAIN STATION LIGHTING AND TYPICAL MOUNTING ON SHEET 18 DETAIL 2.
- REMOVAL OF THE EXISTING LIGHTING CONTROL CENTER AND PAD IS NOT PAID FOR SEPARATELY, BUT IS SUBSIDIARY TO THE LIGHTING CONTROL CENTER (ITEM: 613-50100).
- ALL EXISTING UNUSED FOUNDATIONS SHALL BE REMOVED TO 12" BELOW GRADE. THIS WORK IS NOT PAID FOR SEPARATELY, BUT IS INCLUDED IN THE REMOVAL OF LIGHT STANDARD (ITEM: 202-00700), AND OF RESET LIGHT STANDARD (210-00750).
- REMOVAL OF THE LIGHT STANDARDS INCLUDE THE REMOVAL OF BOTH STEEL AND TIMBER POLES.
- ALL LIGHT POLE STATION LOCATIONS ARE MEASURED FROM THE PROPOSED I-70 BASELINE. UNLESS OTHERWISE NOTED.
- ALL TEMPORARY TIMBER LIGHT STANDARDS SHALL BE REMOVED IN THEIR ENTIRETY AFTER NEW AND RESET LIGHT STANDARDS ARE INSTALLED AND FULLY OPERATIONAL. FOR LOCATIONS, REFER TO REMOVAL TABLE AT RIGHT.
- ROADWAY LIGHTING POLES DEFINED AS EXISTING WITH NEW LED LUMINAIRES SHALL USE THE EXISTING POLE AND ARM (TO REMAIN) WITH NEW LED LUMINAIRES TO REPLACE THE EXISTING HPS LUMINAIRES.

LIGHTING SHEET INDEX	
SHEET NO.	DESCRIPTION
1	LIGHTING, QUANTITIES & GENERAL NOTES
2	LEGEND, SYMBOLS & ABBREVIATIONS
3-17	ROADWAY LIGHTING PLANS
18	ROADWAY LIGHTING DETAILS
19	TUNNEL LIGHTING NOTES & LEGEND
20-24	TUNNEL LIGHTING PLANS - EASTBOUND
25-27	TUNNEL LIGHTING DETAILS
28	LIGHTING CONTROL CENTER
29	ONE-LINE DIAGRAM
30	PANEL SCHEDULE
31	CABLE SCHEDULE
32	CONDUIT AND PULLBOX SCHEDULE

REMOVAL OF TEMPORARY LIGHT POLE LOCATIONS (SEE NOTE 9)		
EB I-70 STA. NO.	SIDE	QUANTITY
138+65	LT	2
139+94	LT	1
140+90	LT	2
EB I-70 DETOUR STA. NO	SIDE	QUANTITY
2002+00	RT	1
2003+60	RT	1
2005+40	RT	1
2007+20	RT	1
2009+00	RT	1
2010+75	RT	1
2012+60	RT	1
2013+95	RT	1
2015+60	LT	1
2017+60	LT	1
2019+40	LT	1
2021+20	LT	1
2023+00	LT	1
2024+80	LT	1
2026+60	LT	1
2028+40	LT	1
2030+40	LT	1
2032+00	LT	1
2033+80	LT	1
2035+60	LT	1
2037+40	LT	1
2039+20	LT	1
2041+00	RT	1
2043+00	RT	1
2044+60	RT	1
2046+10	RT	1

Print Date: 3/7/2013	Sheet Revisions			Colorado Department of Transportation		As Constructed		I-70 TWIN TUNNELS LIGHTING QUANTITIES AND GENERAL NOTES		Project No./Code	
File Name: 19306PHAS_CP2_Detail001.dgn	Date:	Comments	Init.	 425 A Corporate Circle Golden, CO 80401 Phone: 720-497-6918 FAX: 720-497-6901		No Revisions:		Designer: CL Structure Detailer: JMG Numbers		IM 0703-391	
Horiz. Scale: N/A Vert. Scale: N/A						Revised:				Subset: LIGHTING CP 2 Subset Sheets: 1 of 32	
 				Region 1		CRC				Sheet Number 240	

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PLAN SYMBOLS

- A- - -A- EXISTING ROW
- E - - E - CONDUIT CONCEALED, EMBEDDED OR BELOW GRADE
- RP-1001
CONDUIT CONTAINING CIRCUITS. (SEE LEGEND FOR DESCRIPTION)
- Ⓝ JUNCTION BOX
- JUNCTION OR PULL BOX
- Ⓜ PHOTOELECTRIC CONTROL SENSOR
- EXIST. LIGHTING CONTROL CABINET
- NEW LIGHTING CONTROL CABINET
- H NEW HANDHOLE
- LED FIXTURE (TYPE N1 TUNNEL LUMINAIRE) (133 WATT LIGHT EMITTING DIODE) (NIGHT TIME LEVEL)
- ▣ LED FIXTURE (TYPE D1 TUNNEL LUMINAIRE) (350 WATT LIGHT EMITTING DIODE) (DAYLIGHT LEVEL 1)
- ▣ LED FIXTURE (TYPE D1 TUNNEL LUMINAIRE) (350 WATT LIGHT EMITTING DIODE) (DAYLIGHT LEVEL 2)
- EXIST. CONDITION POLE LUMINAIRE HPS (400 WATT)(SINGLE)
- EXIST. CONDITION POLE LUMINAIRE HPS (400 WATT)(DOUBLE)
- NEW POLE LUMINAIRE LED (195 WATT)(SINGLE)(NEW)
- NEW POLE LUMINAIRE LED (195 WATT)(DOUBLE)(NEW)
- RELOCATED 2-ARM SPECIAL LUMINAIRE & POLE (RESET)
- ⊗ NEW 1-ARM SPECIAL LUMINAIRE & POLE (150 WATT METAL HALIDE)(NEW)
- Ⓜ RELOCATED 2-ARM SPECIAL LUMINAIRE & POLE MODIFIED TO 1-ARM(SHORT)(RESET)(MODIFIED)
- Ⓜ EXIST. HIGH MAST POLE (TO BE REMOVED)
- EXIST. POLE WITH NEW LED LUMINAIRES (TO REMAIN) (NEW LED) (195 WATT)
- EXIST. POLE WITH NEW LED LUMINAIRES (TO REMAIN) (NEW LED) (195 WATT)

DIAGRAM SYMBOLS

- 5kVA
10A
30A
FUSE AND CONTROL POWER TRANSFORMER
-NUMBER INDICATES RATING
-NUMBER INDICATES CAPACITY RATING
- 30A
DISCONNECT SWITCH (FUSED)
-NUMBER INDICATES RATING
- Ⓜ DRY-TYPE TRANSFORMER, SINGLE PHASE
- 6 LIGHTING OR POWER PANELBOARD NO. AS INDICATED
- ⊥ NORMALLY OPEN CONTACT
- ≠ NORMALLY CLOSED CONTACT
- Ⓜ CONTROL RELAY
- H
A
HOA SWITCH
- Ⓜ CIRCUIT BREAKER
- UTILITY CONNECTION
- Ⓜ GROUND

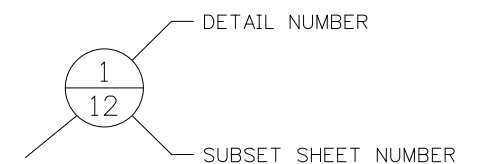
ABBREVIATIONS

- A AMP
- APPROX APPROXIMATELY
- ASSY ASSEMBLY
- AWG AMERICAN WIRE GAUGE
- CB CIRCUIT BREAKER
- C CONDUIT
- CONT CONTRACTOR
- CKT CIRCUIT
- CPT CONTROL POWER TRANSFORMER
- CR CONTROL RELAY
- CT CURRENT TRANSFORMER
- CU COPPER
- DIA DIAMETER
- DWG DRAWING
- E EVEN (NUMBER)
- EB EAST BOUND
- ELEC ELECTRICAL
- EQ ENCL EQUIPMENT ENCLOSURE
- EQUIP EQUIPMENT
- EXIST EXISTING
- FLOUR FLOURESCENT
- GND GROUND
- GRC GALVANIZED RIGID CONDUIT
- HO HIGH OUTPUT
- HOA HAND OFF AUTOMATIC
- HID HIGH INTENSITY DISCHARGE (LUMINAIRE)
- HPS HIGH PRESSURE SODIUM (LUMINAIRE)
- INT INTERIOR ZONE
- KCM THOUSAND CIRCULAR MILLS
- KVA KILOVOLT AMPS
- LAT LATERAL
- LED LIGHT EMITTING DIODE
- LCC LIGHTING CONTROL CABINET
- LONG LONG
- LPS LOW PRESSURE SODIUM
- LT LEFT OF BASELINE (LOOKING AHEAD STATION)
- LTG LIGHTING
- LVL LIGHT LEVEL
- MFGR MANUFACTURER
- MH METAL HALIDE
- MIN MINIMUM
- N NIGHT TIME
- NC NORMALLY CLOSED
- NEMA NATIONAL ELECTRICAL MANUFACTURES ASSOCIATION
- NIC NOT IN CONTRACT
- NO NORMALLY OPEN, NUMBER
- NTS NOT TO SCALE
- O ODD (NUMBER)
- OC ON CENTER
- O.D. OUTER DIAMETER
- P POLE
- PH PHASE
- PNL PANELBOARD
- POS POSITION
- PVC POLYVINYL CHLORIDE
- RGS RIGID GALVANIZED STEEL
- ROW RIGHT OF WAY
- RT RIGHT OF BASELINE (LOOKING AHEAD STATION)
- SEL SW SELECTOR SWITCH
- SO. SOUTH
- SPST SINGLE POLE SINGLE THROW
- SS STAINLESS STEEL
- STA. STATION
- SW SWITCH
- T TRANSFORMER
- TH THRESHOLD ZONE
- THRESH THRESHOLD
- TR1 TRANSITION ZONE 1
- TR2 TRANSITION ZONE 2
- TUN TUNNEL
- TYP. TYPICAL
- V VOLT
- VA VOLT AMPS
- VHO VERY HIGH OUTPUT
- W WATT
- WH WEATHERHEAD
- W/ WITH
- WB WESTBOUND
- XFMR TRANSFORMER

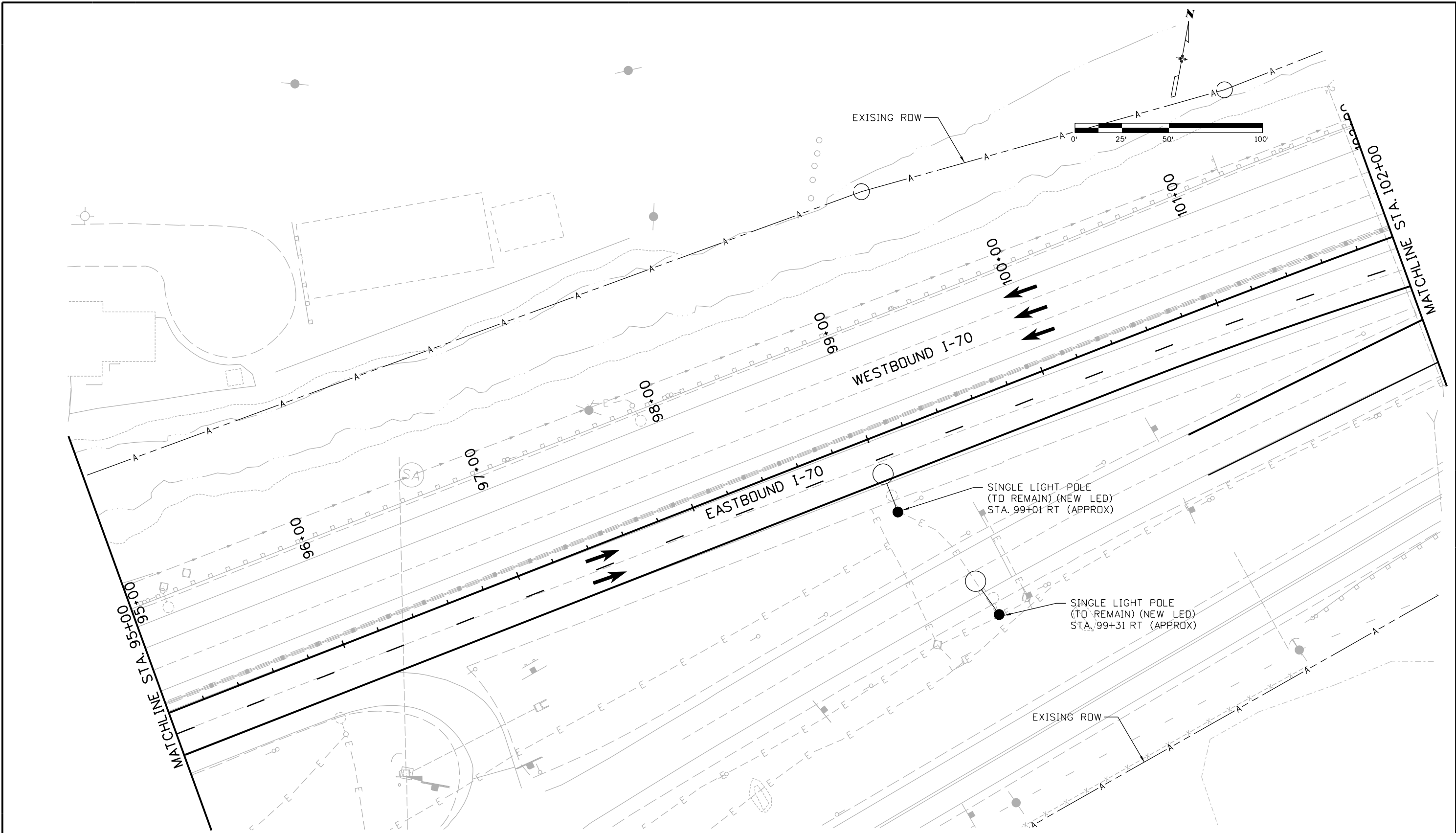
LEGEND

- CP-1001 IDENTIFICATION
- LOCATION
- 1. EB TUNNEL
- 2. EAST PORTAL
- SERVICE CLASS
- P POWER
- DESIGNATOR
- C CABLE
- R RACEWAY
- PB PULLBOX
- LTG LIGHTING PANEL
- ENC ENCLOSURE
- DS DISCONNECT SWITCH
- T TRANSFORMER

DETAIL CALLOUT



Print Date: 2/22/2013		Sheet Revisions	Colorado Department of Transportation	As Constructed	I-70 TWIN TUNNELS LEGEND, SYMBOLS AND ABBREVIATIONS			Project No./Code
File Name: 19306PHAS_CP2_Detail002.dgn		Date: Comments Init.	425 A Corporate Circle Golden, CO 80401 Phone: 720-497-6918 FAX: 720-497-6901	No Revisions:				IM 0703-391
Horiz. Scale: N/A Vert. Scale: N/A			DEPARTMENT OF TRANSPORTATION	Revised:	Designer: CL	Structure		19036
ATKINS PARSONS BRINCKERHOFF			Region 1	Void:	Detailer: JMG	Numbers		Sheet Number 241
			CRC		Subset: LIGHTING CP 2	Subset Sheets:	2 of 32	



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 File Name: 19306PHAS_CP2_Lighting001-a.dgn
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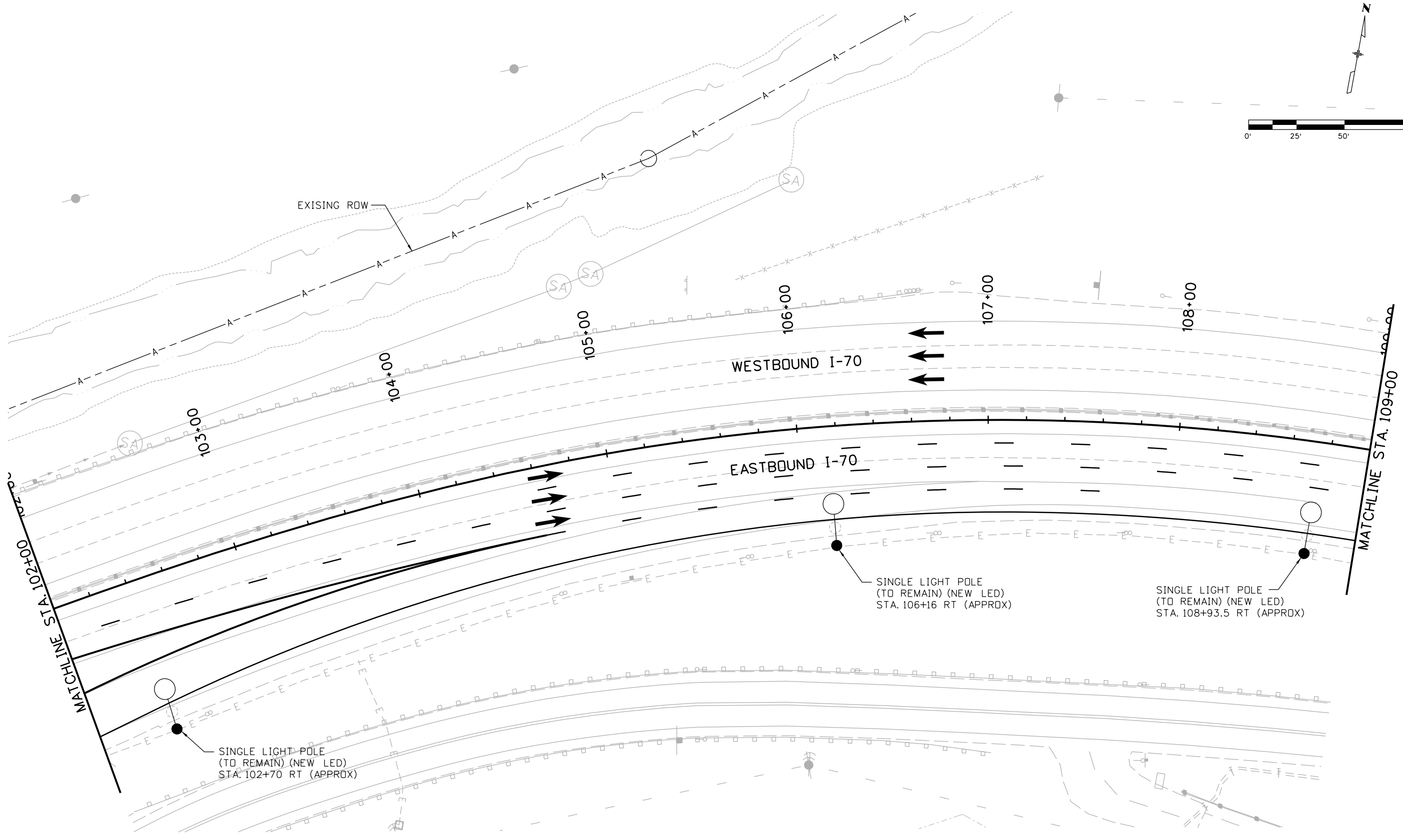
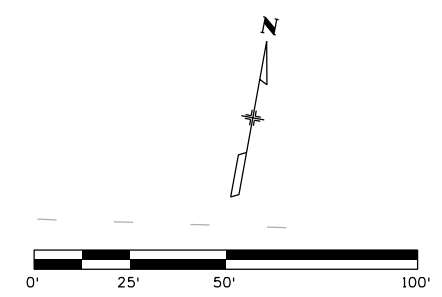
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**I-70 TWIN TUNNELS
 LIGHTING PLAN
 STA. 95+00 TO 102+00**

Designer: CL	Structure Numbers
Detailer: JMG	
Subset: LIGHTING CP 2	Subset Sheets: 3 of 32

Project No./Code
IM 0703-391
19036
Sheet Number 242

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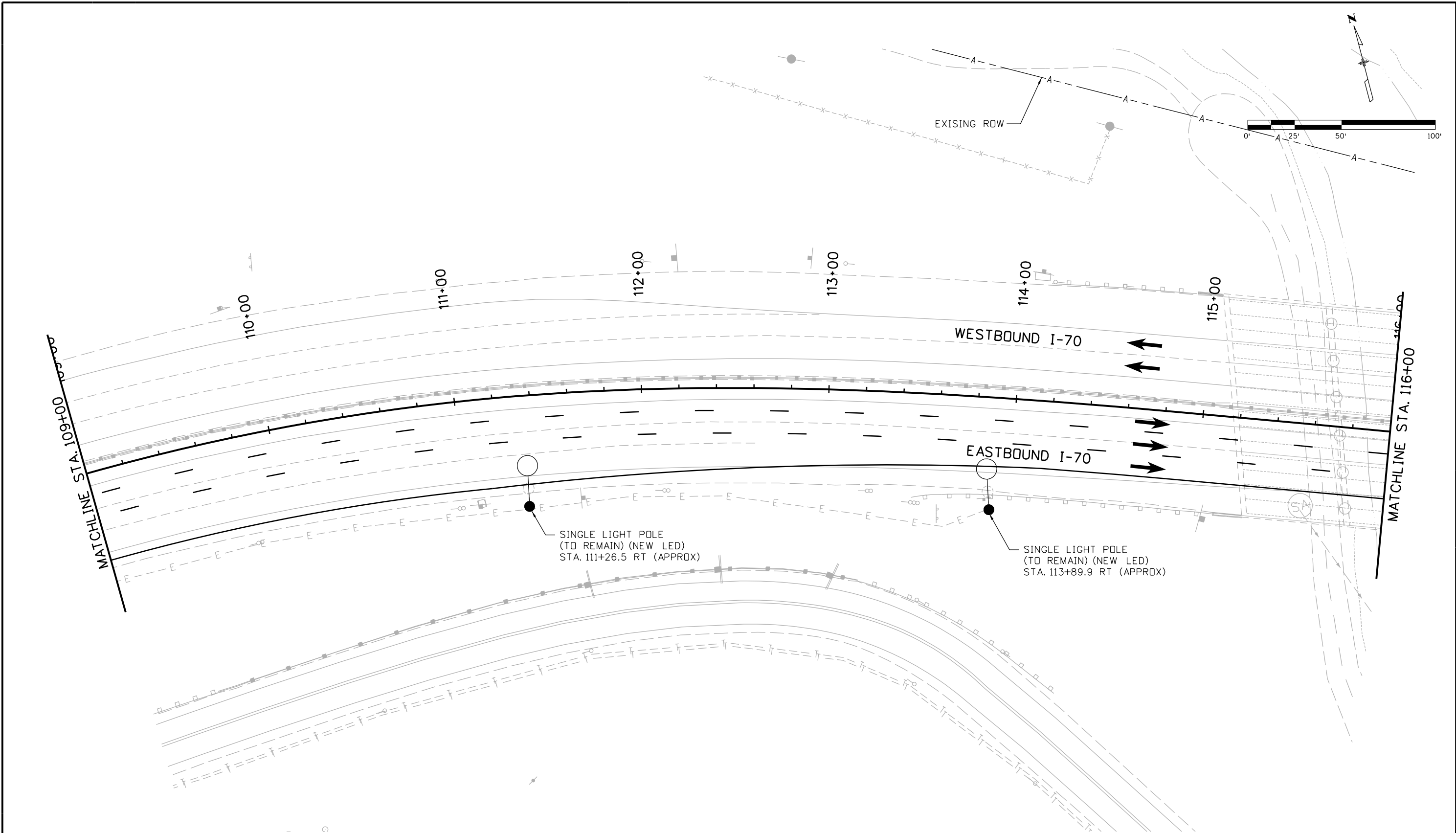
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I-70 TWIN TUNNELS
 LIGHTING PLAN
 STA. 102+00 TO 109+00

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Project No./Code
IM 0703-391
19036
Sheet Number 243

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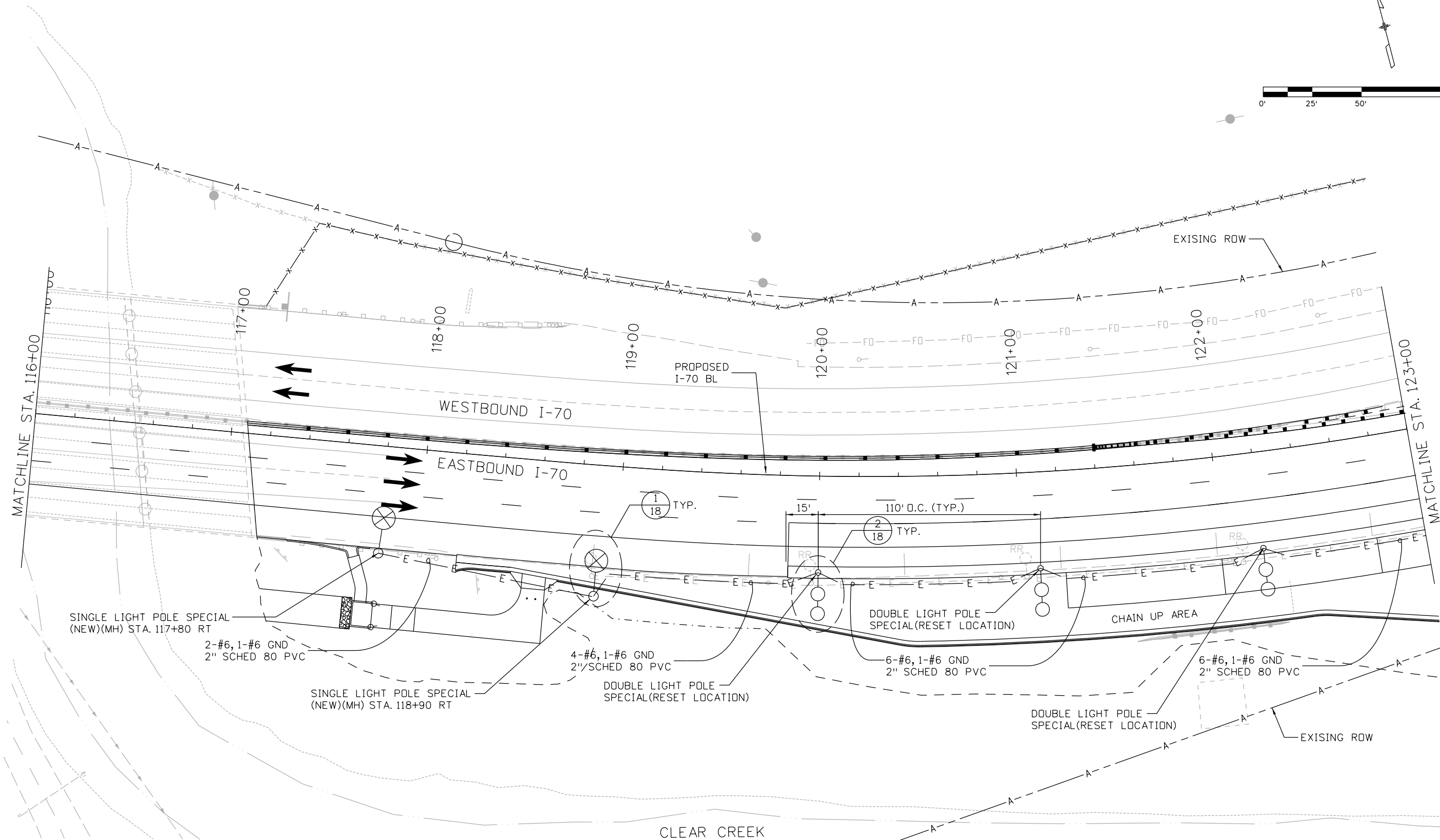
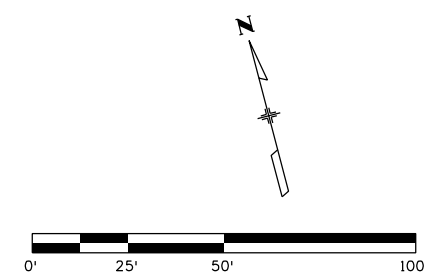
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**I-70 TWIN TUNNELS
 LIGHTING PLAN
 STA. 109+00 TO 116+00**

Designer: CL	Structure Numbers
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I-70 TWIN TUNNELS
 LIGHTING PLAN
 STA. 116+00 TO 123+00

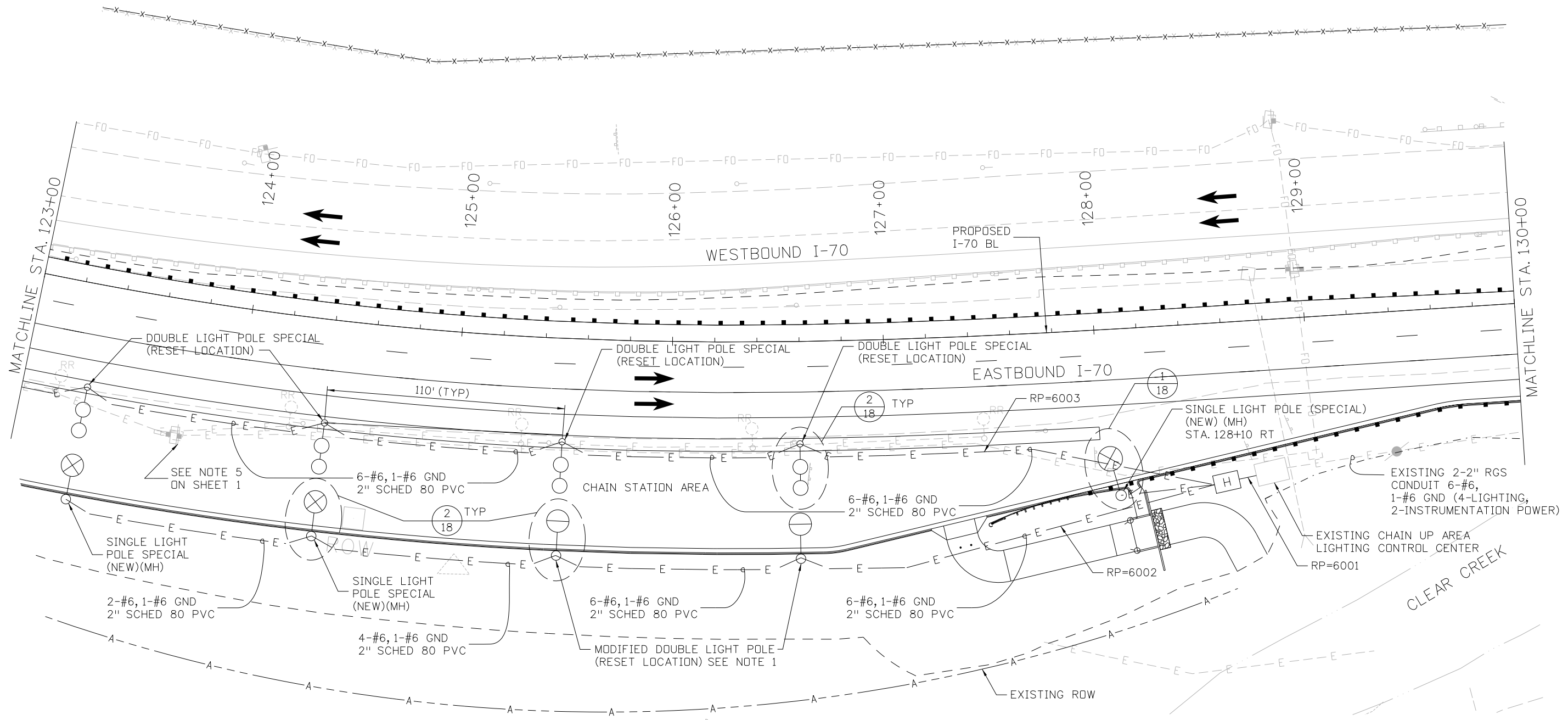
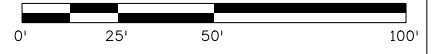
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Project No./Code
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 19036
 Sheet Number 245

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NOTES:

1. MODIFIED DOUBLE LIGHT POLE USES AN EXISTING CHAIN-UP AREA LIGHT POLE ASSEMBLY AND REMOVES THE 23'-0" ARM AND ITS ASSOCIATED FIXTURE, LEAVING ONLY THE SHORTER 1'-0" ARM AND ITS ASSOCIATED FIXTURE. THE ARM AND FIXTURES REMOVED SHALL BE TURNED OVER TO CDOT FOR USE AS SPARES.



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I-70 TWIN TUNNELS
 LIGHTING PLANS
 STA. 123+00 TO 130+00

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Detailer: JMG	
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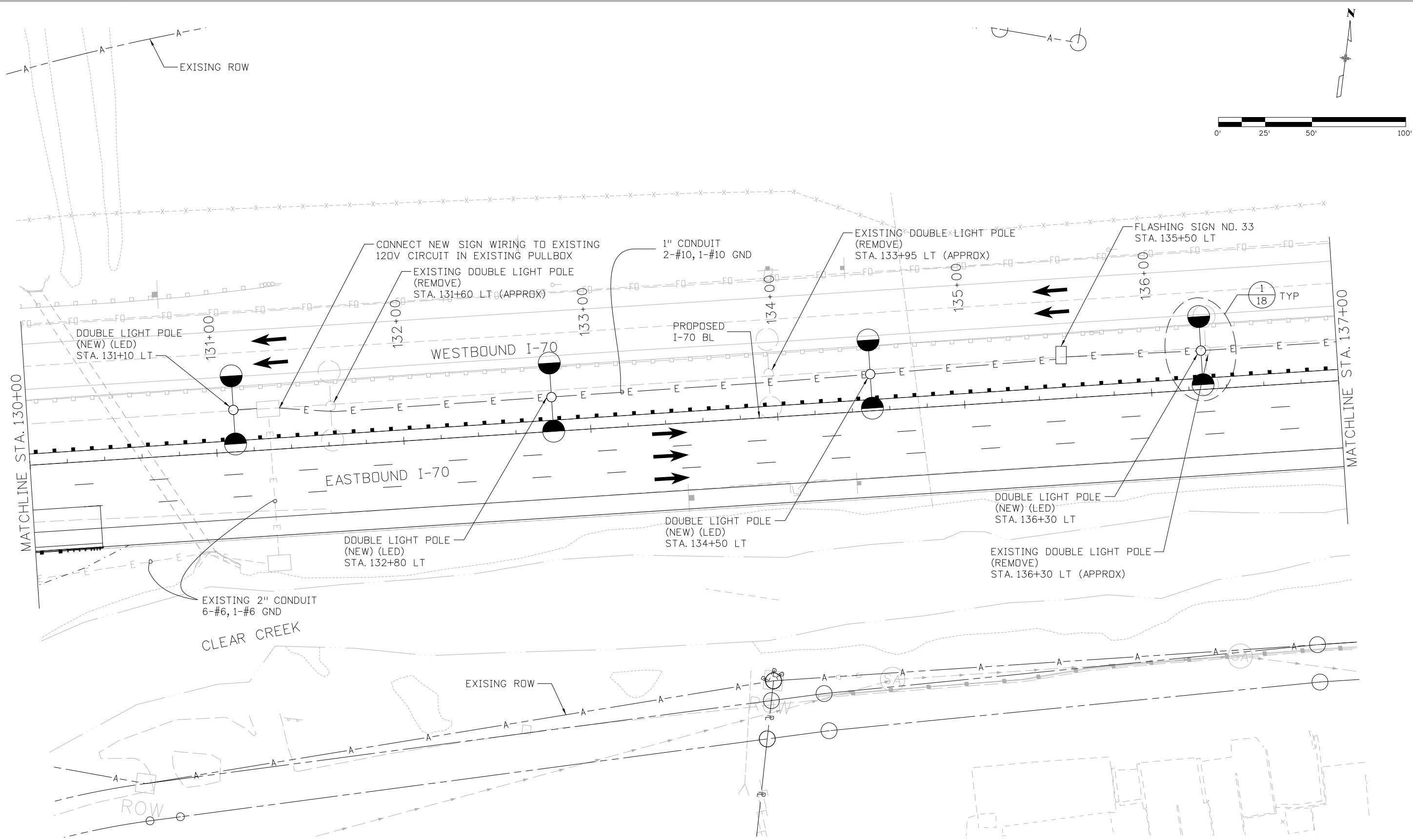
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I-70 TWIN TUNNELS
 LIGHTING PLAN
 STA. 130+00 TO 137+00

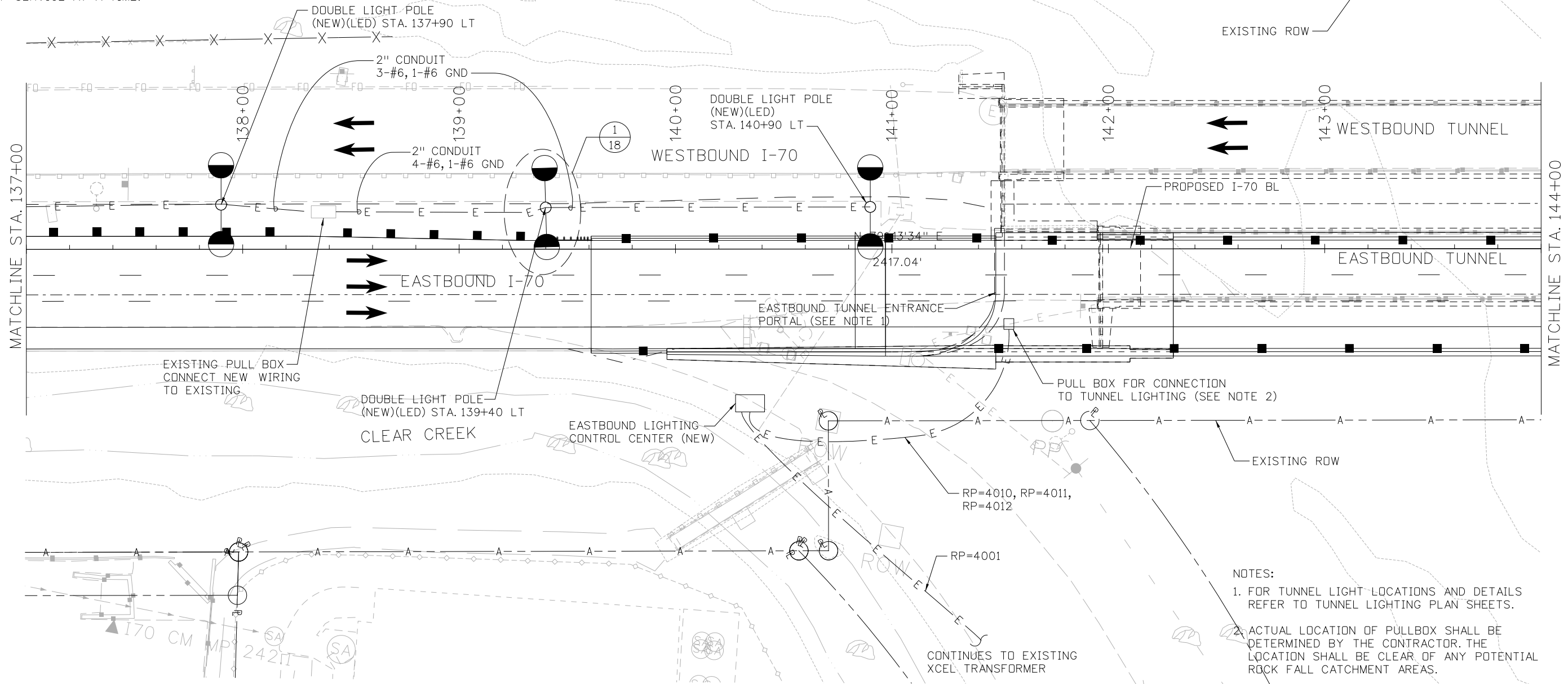
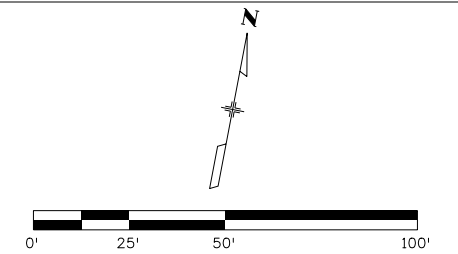
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Project No./Code
IM 0703-391
19036
Sheet Number 247

PROCEDURE FOR CUTOVER OF EASTBOUND TUNNEL LIGHTING CIRCUITS WHEN LCC IS RELOCATED TO PERMANENT LOCATION:

THE FOLLOWING PROCEDURE SHALL BE USED TO PROVIDE FOR THE CUTOVER OF THE LIGHTING SERVED FROM THE WEST PORTAL ELECTRICAL SERVICE FROM THE TEMPORARY LCC LOCATION TO THE PERMANENT LCC LOCATION:

1. CONSTRUCT NEW LCC FOUNDATION AND CONDUITS TO SERVICE POLE.
2. CONSTRUCT NEW CONDUITS FROM NEW LCC LOCATION TO TUNNEL PORTAL. CONNECT CONDUIT TO TUNNEL PORTAL PULLBOX
3. CONSTRUCT TEMPORARY LCC ADJACENT TO EXISTING LCC LOCATION. TEMPORARY LCC SHALL CONSIST OF A WEATHERPROOF PANEL WITH 400 AMPERE, THREE POLE MAIN CIRCUIT BREAKER, 277/480 VOLT, AND (27) 40 AMPERE SINGLE POLE CIRCUIT BREAKERS. CONNECT SERVICE FEEDER TO SUPPLY BOTH PANELS IN PARALLEL.
4. ONE CIRCUIT AT A TIME, TRANSFER LIGHTING CIRCUITS FROM EXISTING LCC TO THE TEMPORARY LCC. COMPLETE TRANSFER OF EACH CIRCUIT BEFORE PROCEEDING WITH THE NEXT CIRCUIT SUCH THAT ONLY ONE CIRCUIT IS OUT OF SERVICE AT A TIME.
5. REMOVE EXISTING LCC AND INSTALL ON NEW FOUNDATION. CONNECT ELECTRIC SERVICE TO SUPPLY BOTH TEMPORARY LCC AND PERMANENT LCC IN PARALLEL.
6. INSTALL WIRES IN NEW CONDUITS TO TUNNEL PORTAL PULLBOX.
7. ONE CIRCUIT AT A TIME, TRANSFER LIGHTING CIRCUITS AT THE TUNNEL PORTAL PULLBOX FROM TEMPORARY LCC TO THE PERMANENT LCC. COMPLETE TRANSFER OF EACH CIRCUIT BEFORE PROCEEDING WITH THE NEXT CIRCUIT SUCH THAT ONLY ONE CIRCUIT IS OUT OF SERVICE AT A TIME.
8. REMOVE THE WIRING FROM THE OUT OF SERVICE CONDUITS AND REMOVE THE TEMPORARY LCC.



- NOTES:
1. FOR TUNNEL LIGHT LOCATIONS AND DETAILS REFER TO TUNNEL LIGHTING PLAN SHEETS.
 2. ACTUAL LOCATION OF PULLBOX SHALL BE DETERMINED BY THE CONTRACTOR. THE LOCATION SHALL BE CLEAR OF ANY POTENTIAL ROCK FALL CATCHMENT AREAS.

Print Date: 2/22/2013
 File Name: 19306PHAS_CP2_Lighting004.dgn
 Horiz. Scale: 1"=50' Vert. Scale: N/A

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I-70 TWIN TUNNELS
 LIGHTING PLAN
 STA 137+00 TO 144+00

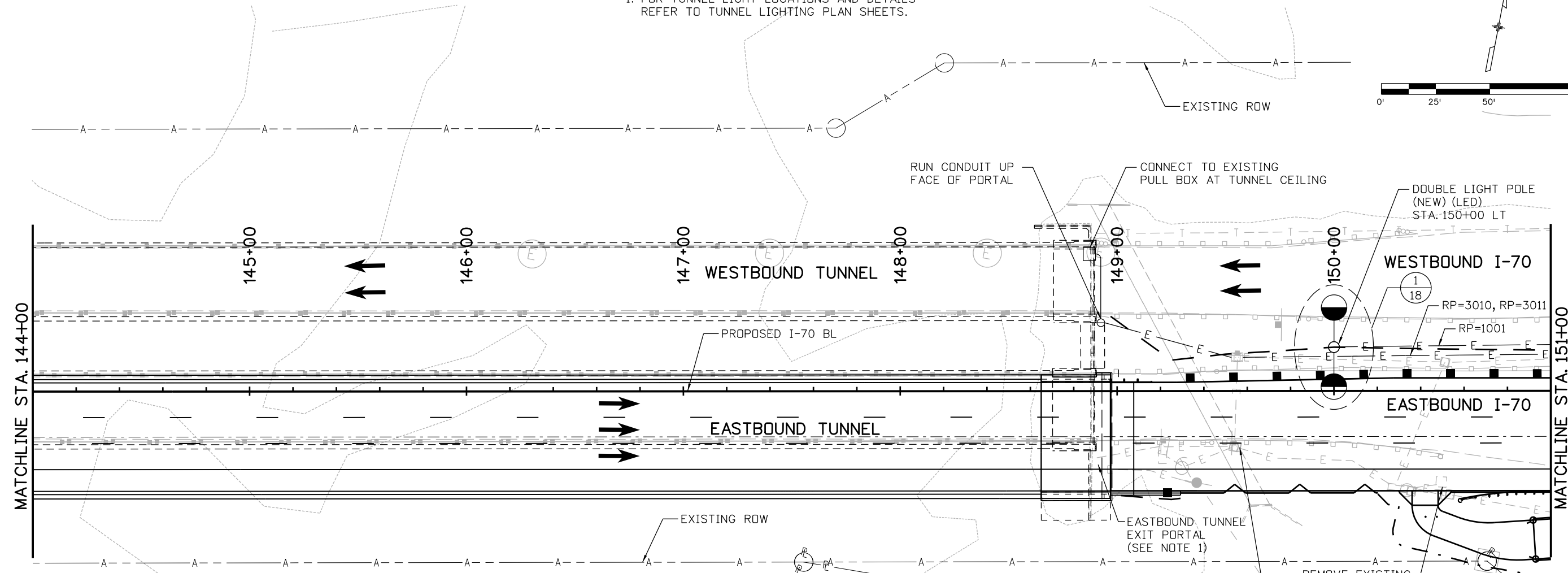
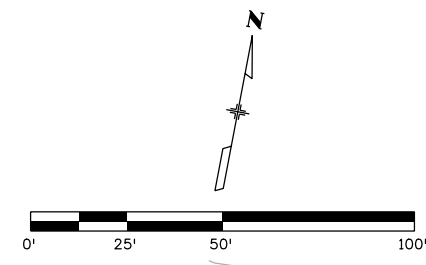
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Structure Numbers
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Project No./Code	IM 0703-391
	19036
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NOTES:
1. FOR TUNNEL LIGHT LOCATIONS AND DETAILS REFER TO TUNNEL LIGHTING PLAN SHEETS.



PROCEDURE FOR CUTOVER OF EXISTING WESTBOUND TUNNEL AND EAST MEDIAN LIGHTING CIRCUIT:

THE FOLLOWING PROCEDURE SHALL BE USED TO PROVIDE FOR THE CUTOVER OF THE EXISTING LIGHTING SERVED FROM THE EAST PORTAL ELECTRICAL SERVICE FROM THE EXISTING LCC LOCATION TO THE EW LCC LOCATION:

1. CONSTRUCT NEW LCC FOUNDATION AND CONDUITS TO SERVICE POLE.
2. CONSTRUCT NEW CONDUITS FROM NEW LCC LOCATION ACROSS EASTBOUND LANE TO MEDIAN AND THEN FROM MEDIAN TO TUNNEL PORTAL. CONNECT CONDUIT TO TUNNEL PORTAL PULLBOX
3. CONSTRUCT CONDUIT CONNECTION TO EXISTING MEDIAN LIGHTING PULLBOX.
4. CONSTRUCT TEMPORARY LCC ADJACENT TO EXISTING LCC LOCATION. TEMPORARY LCC SHALL CONSIST OF A WEATHERPROOF PANEL WITH 225 AMPERE, THREE POLE MAIN CIRCUIT BREAKER, 277/480 VOLT, AND (24) 40 AMPERE SINGLE POLE CIRCUIT BREAKERS. PROVIDE THREE PHOTOCONTROLS WIRED TO CONTROL THE THREE CIRCUITS OF MEDIAN LIGHTING. CONNECT SERVICE FEEDER TO SUPPLY BOTH PANELS IN PARALLEL.
5. ONE CIRCUIT AT A TIME, TRANSFER LIGHTING CIRCUITS FROM EXISTING LCC TO THE TEMPORARY LCC. COMPLETE TRANSFER OF EACH CIRCUIT BEFORE PROCEEDING WITH THE NEXT CIRCUIT SUCH THAT ONLY ONE CIRCUIT IS OUT OF SERVICE AT A TIME.
6. REMOVE EXISTING LCC AND INSTALL ON NEW FOUNDATION. CONNECT ELECTRIC SERVICE TO SUPPLY BOTH TEMPORARY LCC AND PERMANENT LCC IN PARALLEL.
7. INSTALL WIRES IN NEW CONDUITS TO TUNNEL PORTAL PULLBOX.
8. ONE CIRCUIT AT A TIME, TRANSFER LIGHTING CIRCUITS AT THE TUNNEL PORTAL PULLBOX FROM TEMPORARY LCC TO THE PERMANENT LCC. COMPLETE TRANSFER OF EACH CIRCUIT BEFORE PROCEEDING WITH THE NEXT CIRCUIT SUCH THAT ONLY ONE CIRCUIT IS OUT OF SERVICE AT A TIME.
9. REMOVE THE WIRING FROM THE OUT OF SERVICE CONDUITS AND REMOVE THE TEMPORARY LCC.

REMOVE EXISTING HIGHMAST POLE STA. 151+90 RT

STA. 149+60 RT REMOVE EXISTING WESTBOUND LIGHTING CONTROL CABINET, METER AND MAIN SWITCH RESET TO STA. 151+90 RT (SEE PROCEDURE, THIS SHEET)

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I-70 TWIN TUNNELS
LIGHTING PLAN
STA 144+00 TO 151+00

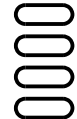
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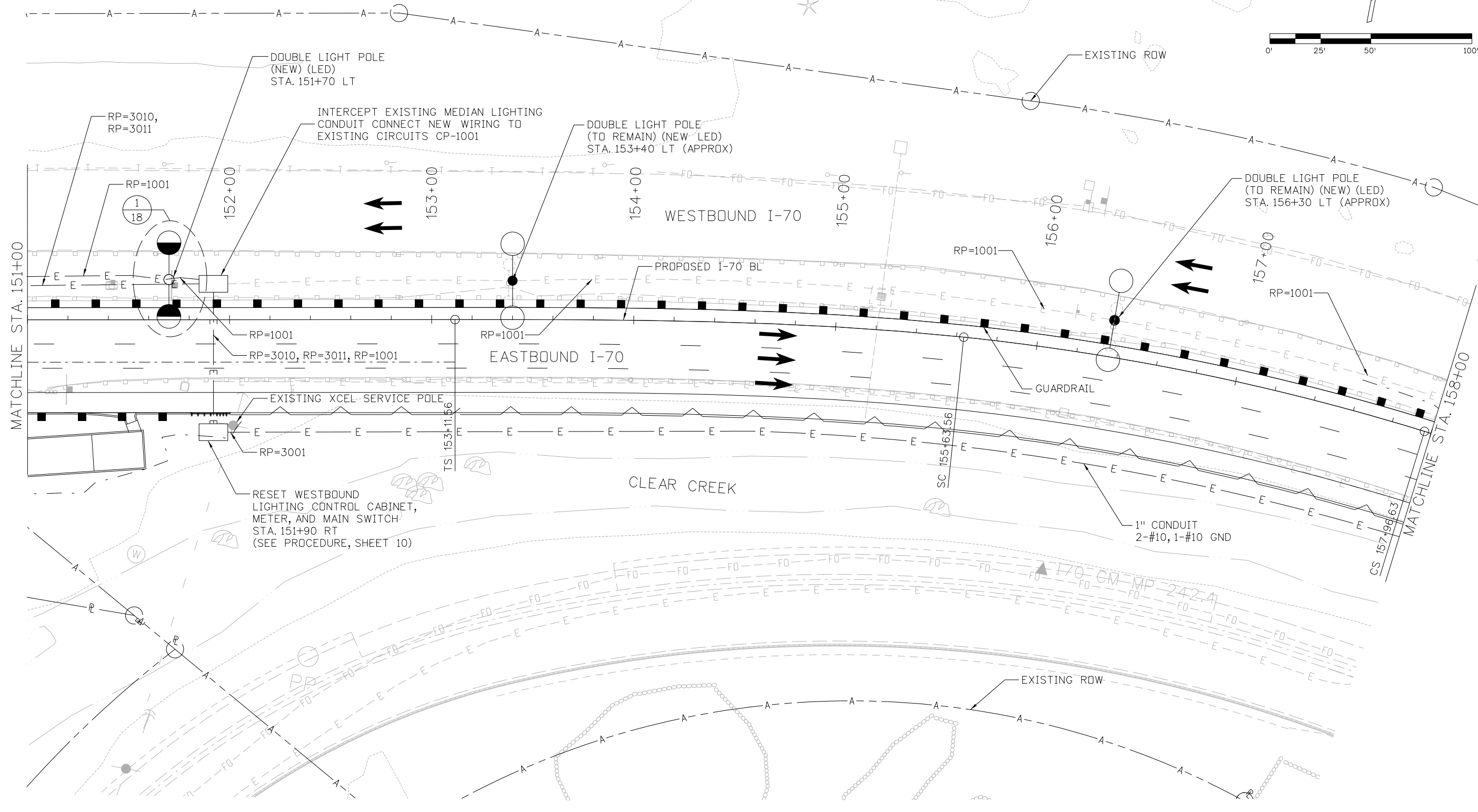
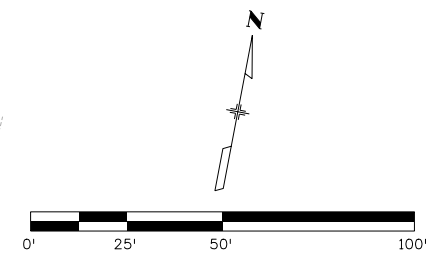
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I-70 TWIN TUNNELS
 LIGHTING PLAN
 STA 151+00 TO 158+00

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Detailer: JMG	
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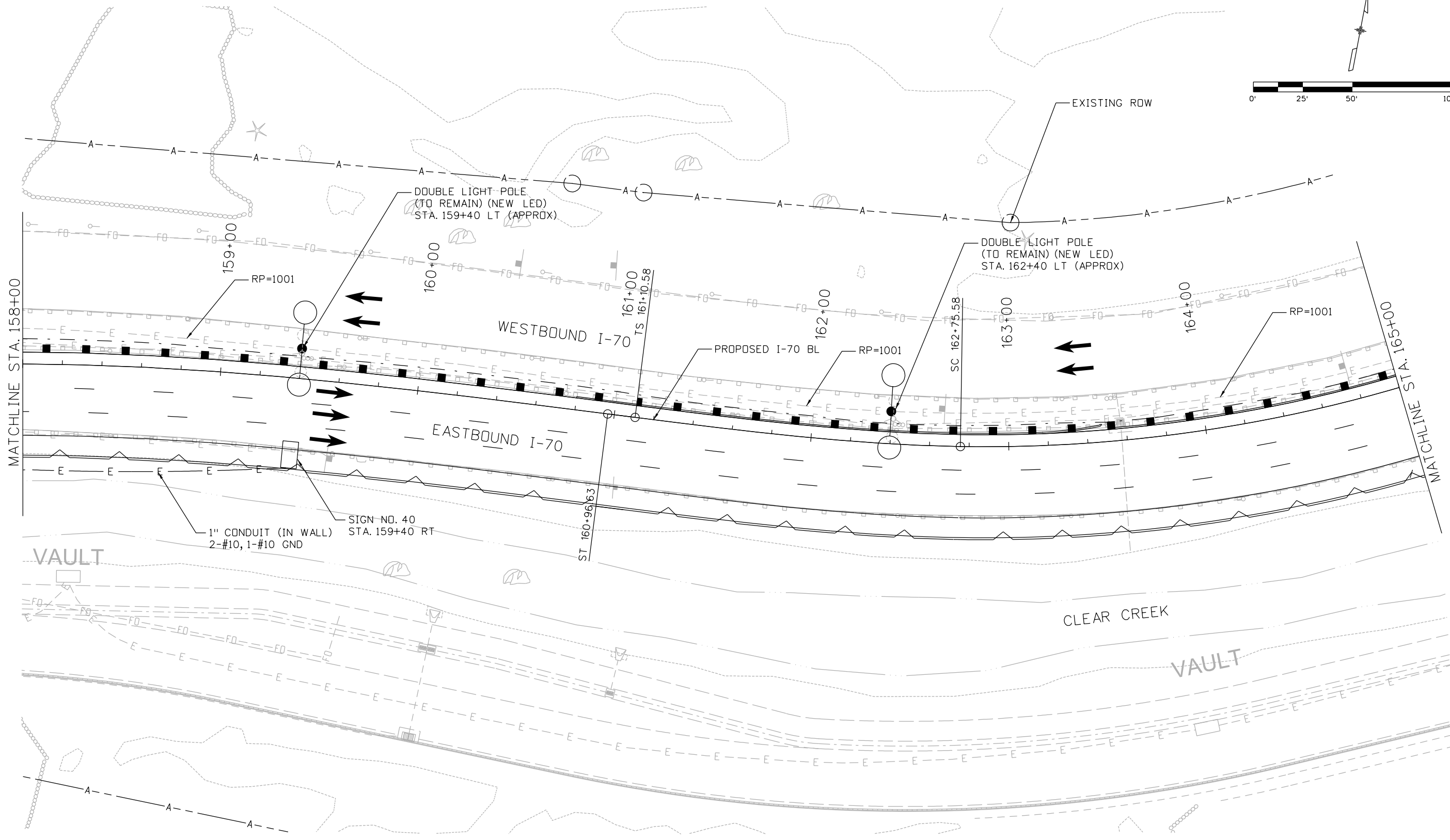
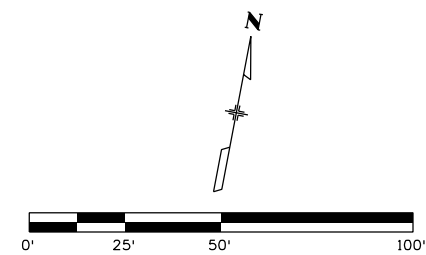
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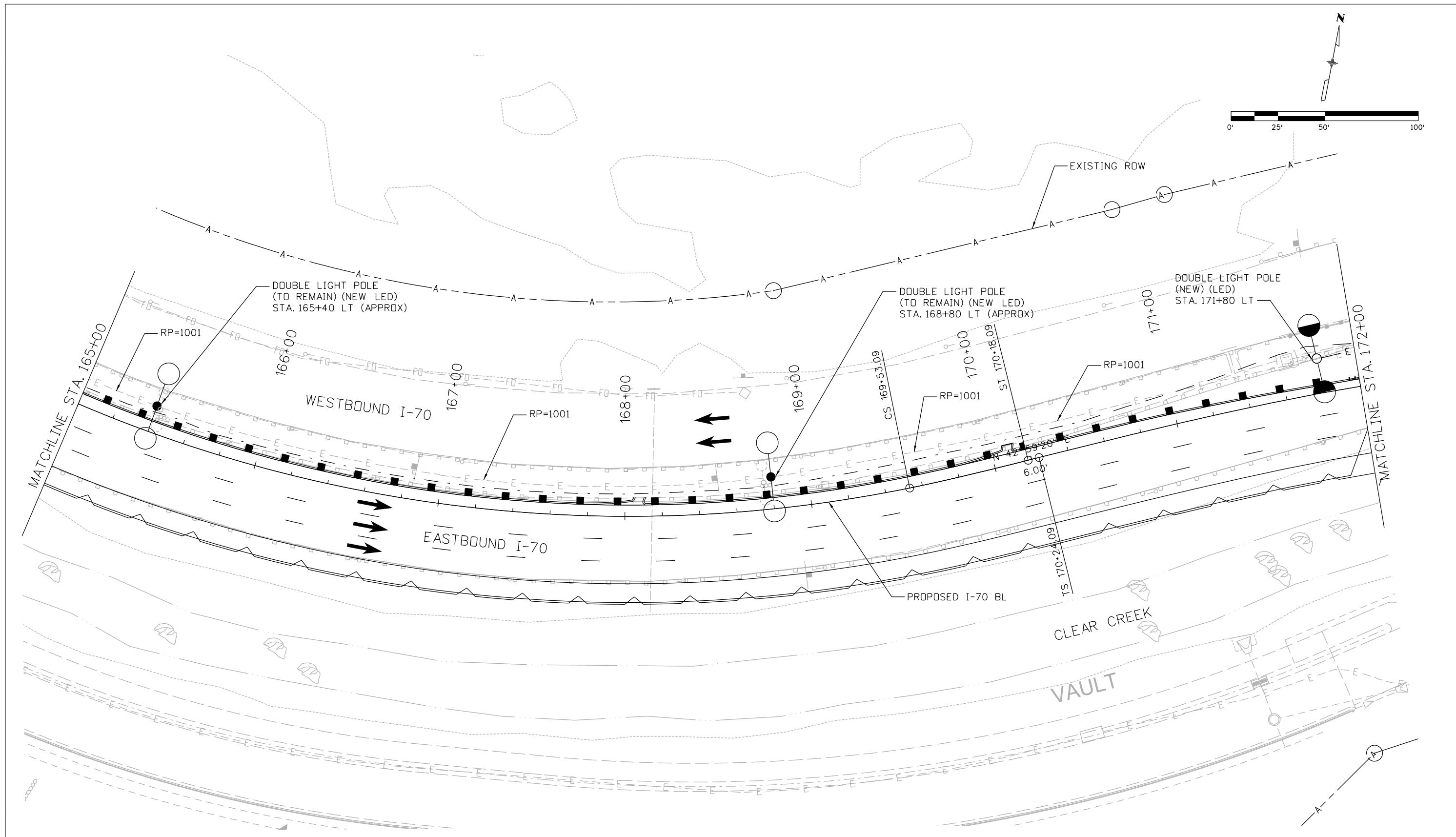
I-70 TWIN TUNNELS
 LIGHTING PLAN
 STA 158+00 TO 165+00

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Subset: LIGHTING CP2	Subset Sheets: 12 of 32

Project No./Code
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19036
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I-70 TWIN TUNNELS
 LIGHTING PLAN
 STA 165+00 TO 172+00

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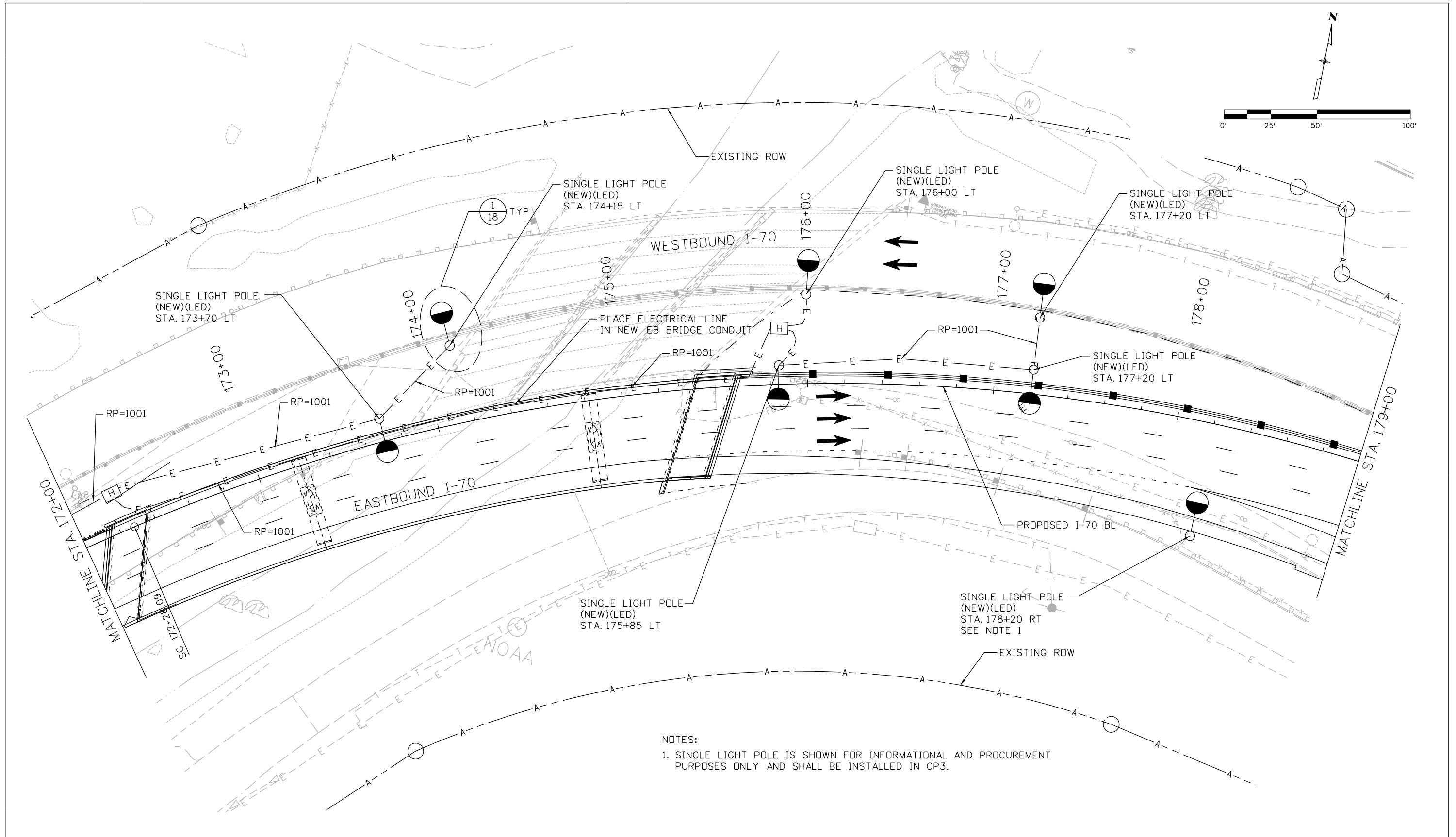
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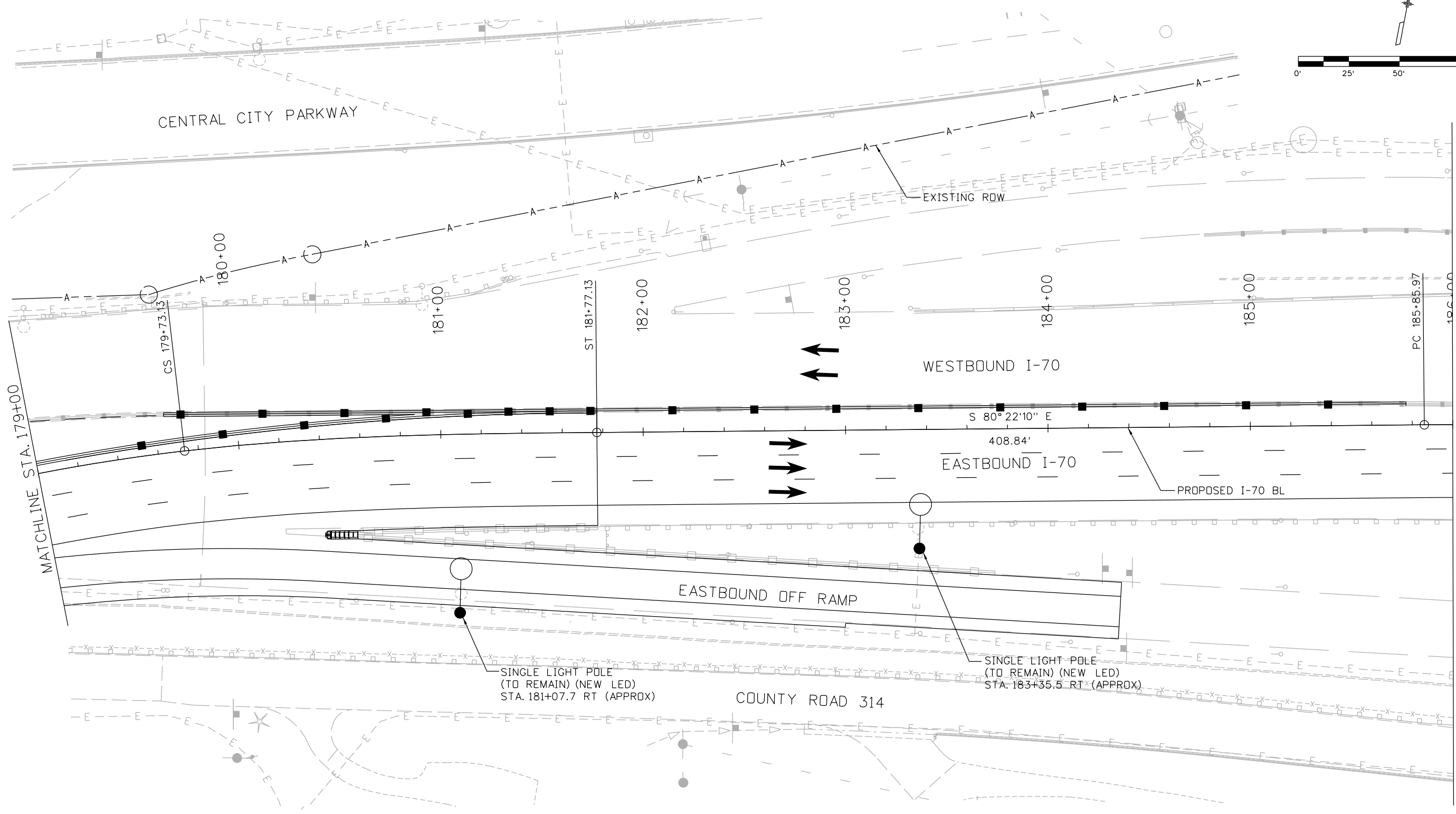
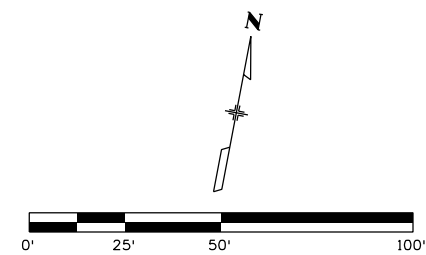
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NOTES:
 1. SINGLE LIGHT POLE IS SHOWN FOR INFORMATIONAL AND PROCUREMENT PURPOSES ONLY AND SHALL BE INSTALLED IN CP3.

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Region 1 CRC

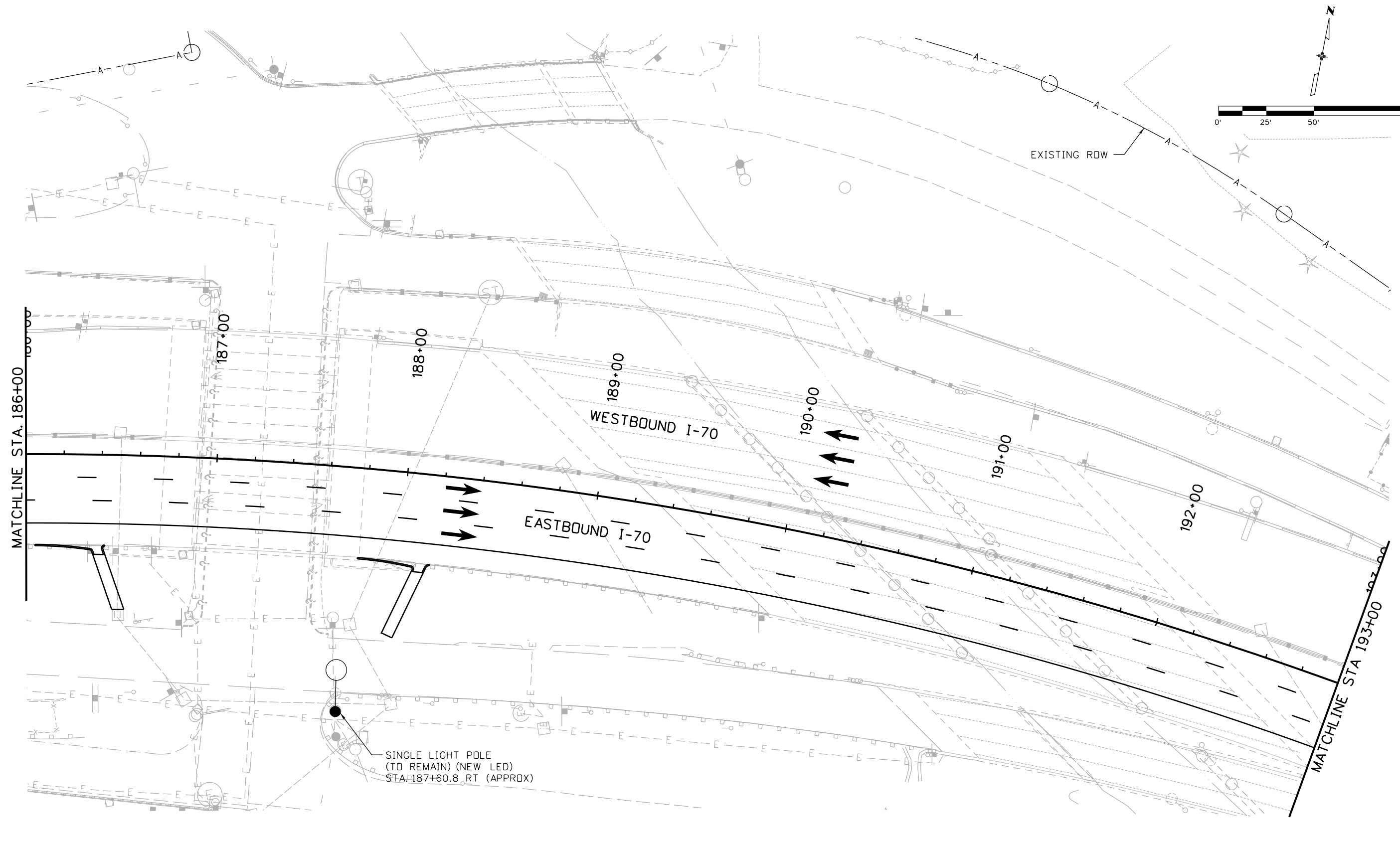
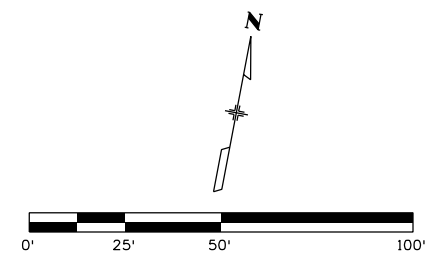
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No Revisions:
Revised:
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I-70 TWIN TUNNELS
 LIGHTING PLAN
 STA 179+00 TO 186+00

Designer: CL	Structure Numbers
Detailer: JMG	
Subset: LIGHTING CP2	Subset Sheets: 15 of 32

Project No./Code
IM 0703-391
19036
Sheet Number 254

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Print Date: 2/7/2013
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Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation
 425 A Corporate Circle
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Region 1 **CRC**

As Constructed
 No Revisions:
 Revised:
 Void:

I-70 TWIN TUNNELS LIGHTING PLAN
STA 186+00 TO 193+00

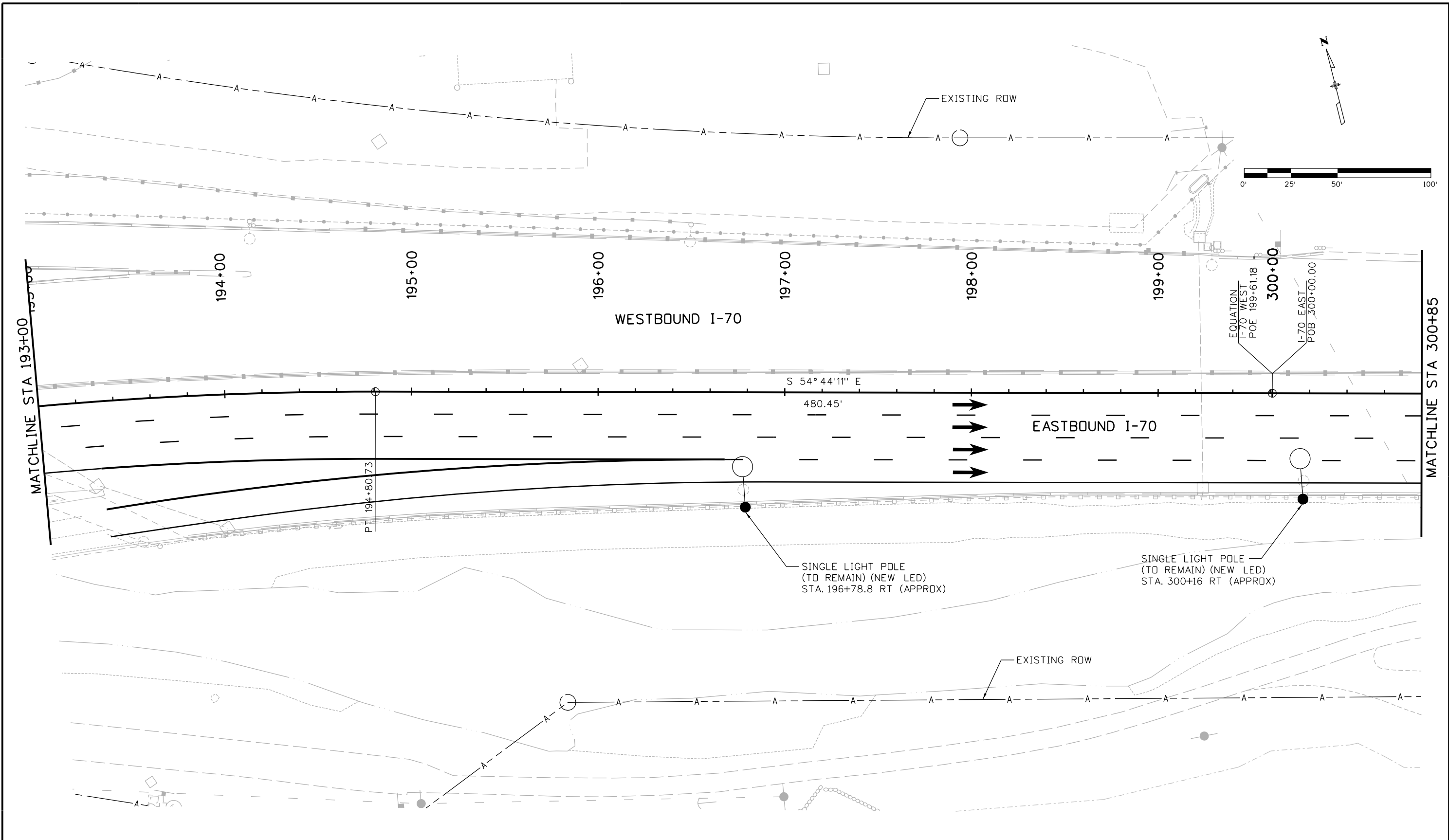
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Structure Numbers
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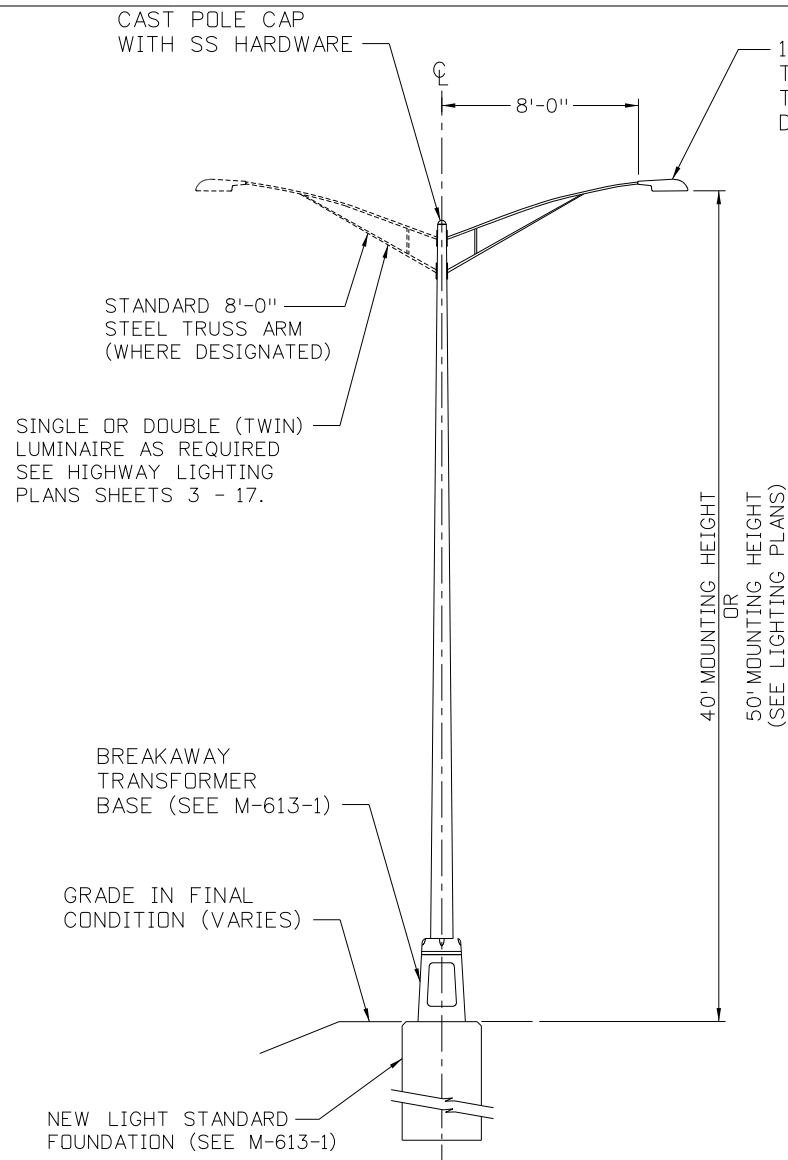
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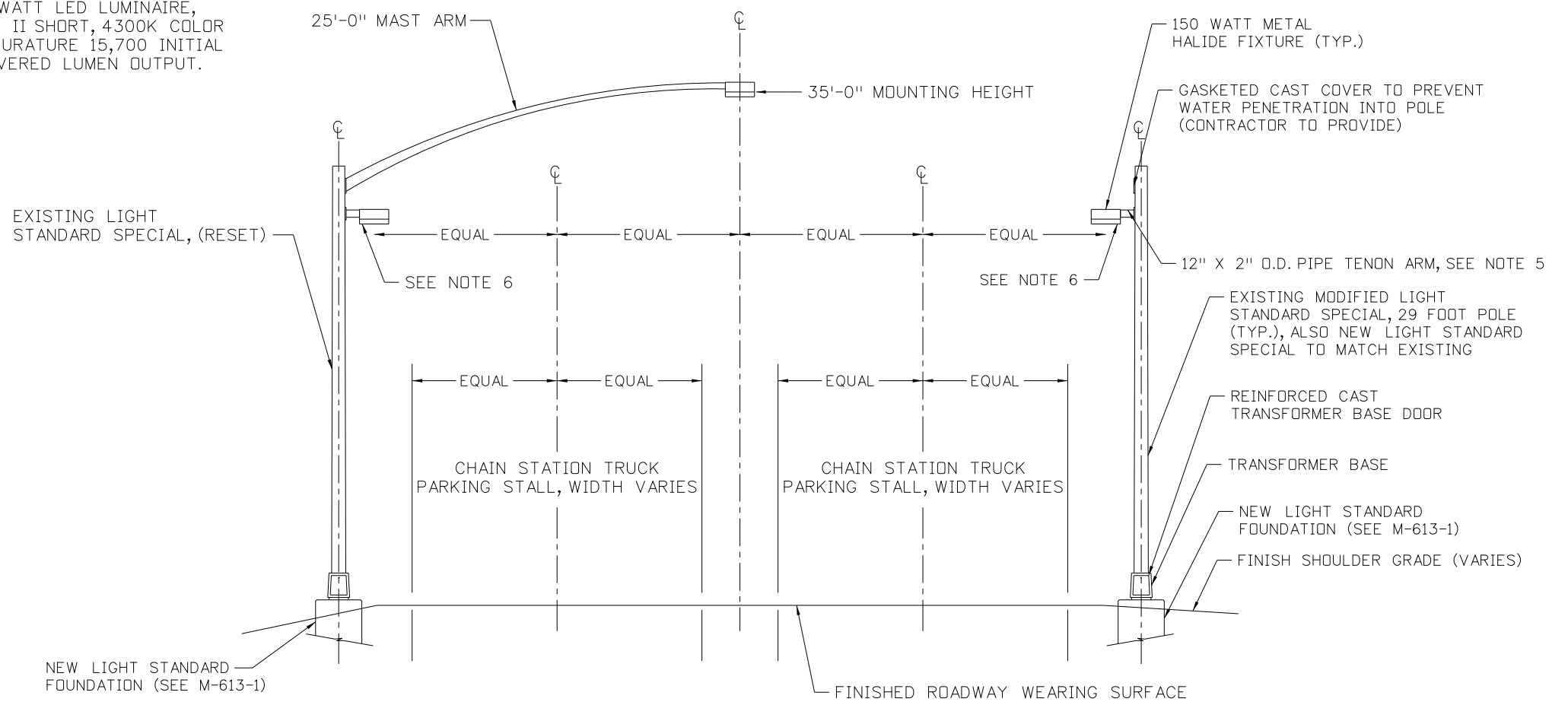
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File Name: 19306PHAS_CP2_Lighting010-b.dgn											IM 0703-391	
Horiz. Scale: 1"=50' Vert. Scale: N/A		 				Designer: CL Detailer: JMG Subset: LIGHTING CP2		Structure Numbers		19036		
						Subset Sheets: 17 of 32		Sheet Number		256		



1
—
TYPICAL HIGHWAY LED LIGHT STANDARD
NTS

DETAIL 1 NOTES:

- SEE STANDARD PLAN M-613-1 FOR POLE AND FOUNDATIONS DETAILS.
- SERVICE ENTRANCE CONDUCTORS SHALL BE CONTINUOUS WITHOUT SPLICES THROUGH PULLBOXES.
- CONTRACTOR TO COORDINATE WITH XCEL ENERGY FOR SERVICE CONNECTIONS.
- PROVIDE MINIMUM OF 4 TAMPERPROOF BOLTS FOR EACH PULLBOX COVER AND PROVIDE 2 INSTALLATION TOOLS FOR ABOVE BOLTS STORED IN ENCLOSURE.
- POLE ASSEMBLY SHALL BE SUPPLIED IN SUFFICIENT LENGTH TO ACCOMMODATE LUMINAIRE MOUNTING HEIGHT.
- ALL NEW ROADWAY LIGHTING POLES SHALL HAVE A FINISH COLOR EQUAL TO FEDERAL STANDARDS 595C NUMBER 20059. THIS INCLUDES POLES, ARM, AND FIXTURES.



2
—
TYPICAL CHAIN STATION LIGHTING EXISTING TWIN HEAD ASSEMBLY,
MODIFIED SINGLE HEAD ASSEMBLIES & NEW SINGLE HEAD ASSEMBLIES
NTS

DETAIL 2 NOTES:

- SEE STANDARD PLAN M-613-1 FOR POLE AND FOUNDATIONS DETAILS.
- LIGHT STANDARD SETBACKS WILL VARY WITH SITE CONDITIONS.
- TWIN LIGHT STANDARD ASSEMBLIES ARE INTENDED TO HAVE THE MAST ARM LUMINAIRE CENTERED BETWEEN THE TWO TRUCK PARKING STALLS.
- MODIFIED SINGLE HEAD ASSEMBLIES SHALL HAVE A COVER LOCATED WHERE THE MAST ARM CONNECTION TO THE POLE WAS MADE. THE COVER SHALL BE APPROPRIATELY GASKETED TO PREVENT WATER PENETRATION INTO THE POLE.
- NEW SINGLE HEAD ASSEMBLIES SHALL COMPLETELY MATCH THE EXISTING CDOT CHAIN STATION LIGHTING STANDARDS. CONTRACTOR SHALL USE EXISTING CDOT AS BUILT DRAWINGS AND FIELD INSPECTION PRIOR TO PROCUREMENT OF ANY LIGHTING MATERIALS AND THEIR RELATED PRODUCTS.
- PROVIDE LUMINAIRE WITH HORIZONTAL SLIP FITTER ON NEW POLE TO MATCH THE EXISTING.
- LUMINAIRE OPTICS SHALL BE AIMED TOWARD CENTER OF TRUCK PARKING STALL.
- ALL NEW CHAIN STATION POLES, ARMS, AND FIXTURES SHALL HAVE A FINISH COLOR EQUAL TO FEDERAL STANDARD 595A, NUMBER 30117.

Print Date: 2/22/2013
 File Name: 19306PHAS_CP2_Detail006.dgn
 Horiz. Scale: AS SHOWN Vert. Scale: N/A

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Region 1 CRC

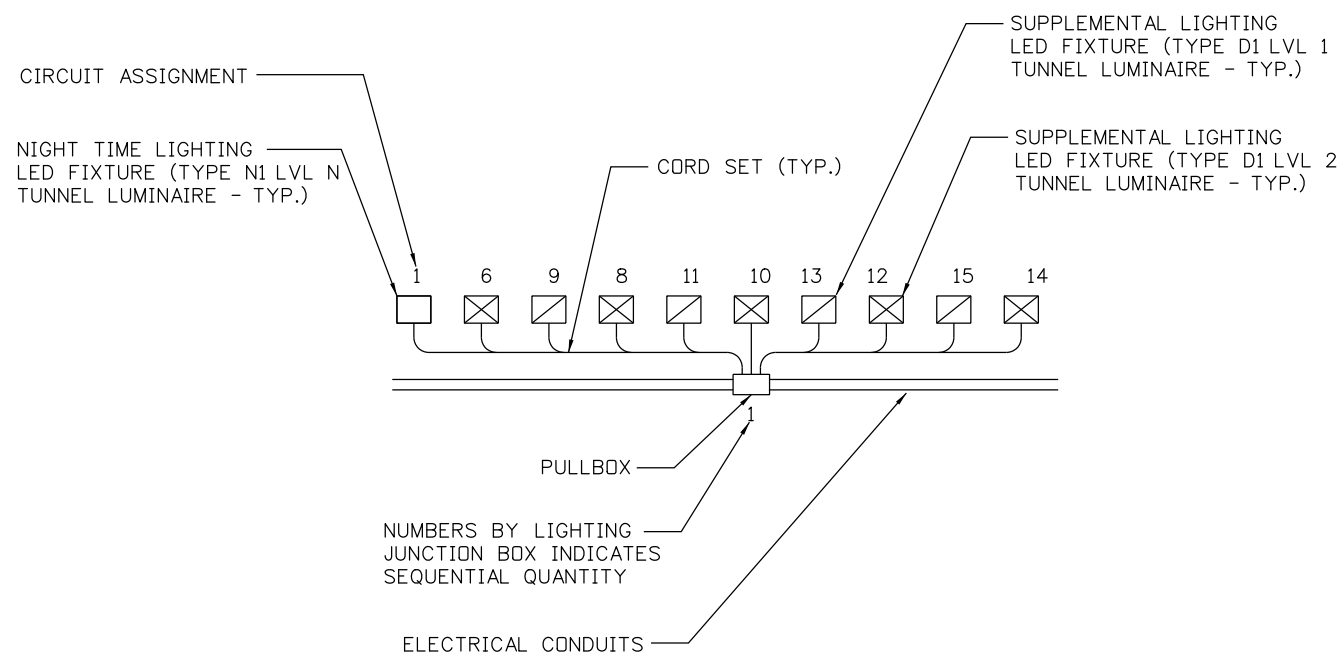
As Constructed	I-70 TWIN TUNNELS ROADWAY LIGHTING DETAILS		Project No./Code
No Revisions:			IM 0703-391
Revised:	Designer: CL	Structure Numbers	19036
Void:	Detailer: JMG	Subset Sheets: 18 of 32	Sheet Number 257

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TUNNEL LIGHTING NOTES

1. SEE SHEET 1 AND 2 FOR GENERAL NOTES, ABBREVIATIONS, AND SYMBOLS.
2. FOR ELECTRICAL NOTES, SEE SHEET 1.
3. CONTRACTOR TO NOTIFY ENGINEER ON ANY DISCREPANCIES PRIOR TO CONTINUING WITH WORK.
4. THE CONTRACTOR SHALL COORDINATE TUNNEL LIGHTING POWER FEED LOCATIONS WITH XCEL ENERGY.
5. ALL CONNECTIONS BETWEEN THE LIGHTING JUNCTION BOX AND FIXTURE ARE TO BE WATERTIGHT AND UL LISTED FOR WET LOCATIONS (DIRECT SPRAY).
6. ALL MOUNTING CHANNEL (STRUT) SHALL BE 1 5/8" X 1 5/8" 12 GAUGE 316 STAINLESS STEEL WITH 9/16" X 1 1/8" SLOTTED HOLES.
7. UNLESS OTHERWISE NOTED, ALL MOUNTING CHANNELS, BRACKETS, HARDWARE (BOLTS, NUTS, WASHERS), AND SHIMS SHALL BE 316 STAINLESS STEEL.
8. ALL MOUNTING ANCHORS FOR THE LED LUMINAIRE MOUNTING SUPPORT SYSTEM AND JUNCTION (PULLBOX/ELECTRICAL) BOXES SHALL BE 1/2" X 6" LG STAINLESS STEEL MECHANICAL ANCHORS. MINIMUM NUMBER OF ANCHORS PER MOUNTING BRACKET EQUALS 2. MAXIMUM DISTANCE OF MOUNTING POINTS ON A STRUT FROM END OF CHANNEL IS 6 INCHES.
9. WHEN POSITIONING THE NORTHERN ROW OF LUMINAIRES, THE ZERO (0) DEGREE LATERAL PLANE SHALL BE AIMED TOWARD THE NORTH TUNNEL WALL. WHEN POSITIONING THE SOUTHERN ROW OF LUMINAIRES, THE ZERO (0) DEGREE LATERAL PLANE SHALL BE AIMED TOWARD THE SOUTH TUNNEL WALL.
10. IF HAZARDOUS MATERIALS ARE ENCOUNTERED DURING REMOVAL OF THE EXISTING LIGHTING SYSTEM THE CONTRACTOR SHALL FOLLOW THE REQUIREMENTS OF SECTION 250 OF THE STANDARD SPECIFICATIONS.

LED FIXTURE LOCATION TABULATION -INSIDE TUNNEL						
	LUMINAIRE LOCATION		QUANTITIES (UNIT EACH)			
	FROM	TO	D1	N1		
EASTBOUND 1-70	141+50	142+70	80	6		
	142+70	144+30	116	8		
	144+30	145+80	86	8		
	145+80	147+40	58	8		
	147+40	148+90	14	4		
TOTALS			354	34		



TUNNEL LIGHTING LEGEND

Print Date: 2/22/2013		Sheet Revisions			 Colorado Department of Transportation 425 A Corporate Circle Golden, CO 80401 Phone: 720-497-6918 FAX: 720-497-6901 Region 1 CRC	As Constructed		I-70 TWIN TUNNELS TUNNEL LIGHTING NOTES AND LEGEND		Project No./Code	
File Name: 19306PHAS_CP2_Detail005.dgn		Date:	Comments	Init.		No Revisions:			IM 0703-391		
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				Void:	Detailer: JMG		Subset: LIGHTING CP 2		Subset Sheets: 19 of 32	Sheet Number 258	



142+00

TUNNEL WALL (APPROX.)

EASTBOUND PORTAL

EASTBOUND TUNNEL

PROPOSED I-70 BL

PORTAL FACE
STA 141+48
(APPROX)

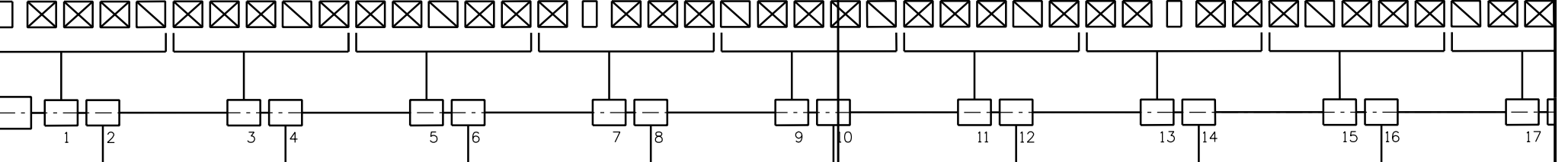
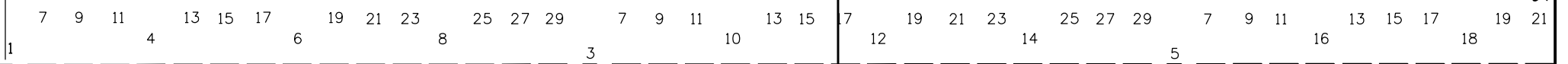
6-TYPE N1
80-TYPE D1
17-PULLBOXES (16"x14"x6")
1-PULLBOXES (24"x24"x14")
1-PULLBOXES (36"x24"x8")

21'-0"

25'-0"

CENTER OF TUNNEL

STA. 142+70



24" x 24" x 14"
PULLBOX
(SEE NOTE 2)

2'-6" TYP.
SPACING

THRESHOLD ZONE 1
START

RP 4010, RP 4011, RP 4012

TUNNEL WALL (APPROX.)

MATCHLINE

CONTINUES TO NEW
EASTBOUND LCC
SEE LIGHTING PLAN SHEET 9

- NOTES:
- REFER TO TUNNEL LIGHTING DETAILS FOR FURTHER INFORMATION SHEETS 25-27
 - ACTUAL PLACEMENT OF PULLBOX IS NOT SHOWN FOR CLARITY. SEE SHEET 9 FOR FURTHER INFORMATION.

Print Date: 2/13/2013
File Name: 19306PHAS_CP2_Lighting011.dgn
Horiz. Scale: N/A Vert. Scale: N/A

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Void:

**I-70 TWIN TUNNELS
TUNNEL LIGHTING PLAN
EASTBOUND**

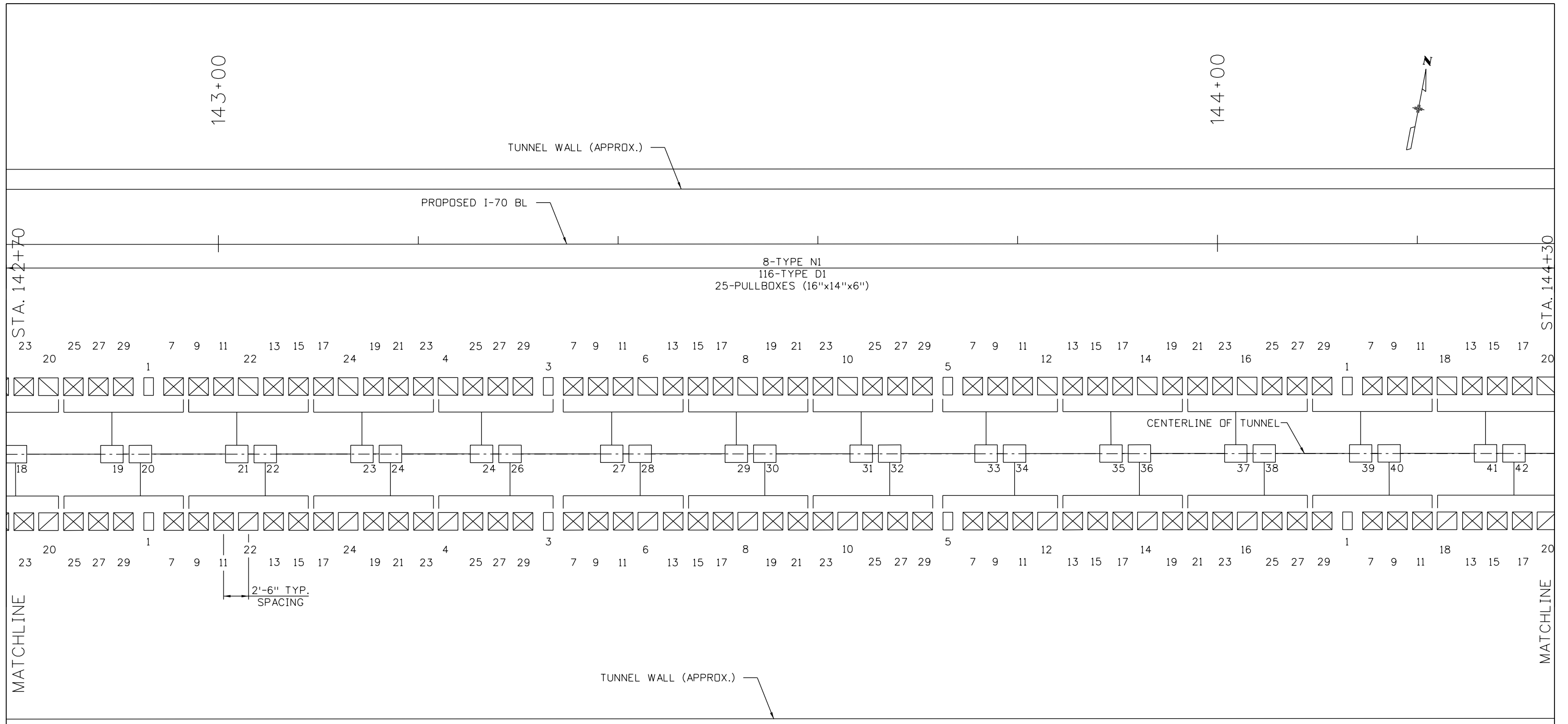
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Project No./Code
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19036
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NOTES:
1. REFER TO TUNNEL LIGHTING DETAILS FOR FURTHER INFORMATION. SHEETS 25-27

Print Date: 2/7/2013
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I-70 TWIN TUNNELS
 TUNNEL LIGHTING PLAN
 EASTBOUND

Designer: CL	Structure Numbers
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Subset: LIGHTING CP2	Subset Sheets: 21 of 32

Project No./Code
IM 0703-391
19036
Sheet Number 260



145+00

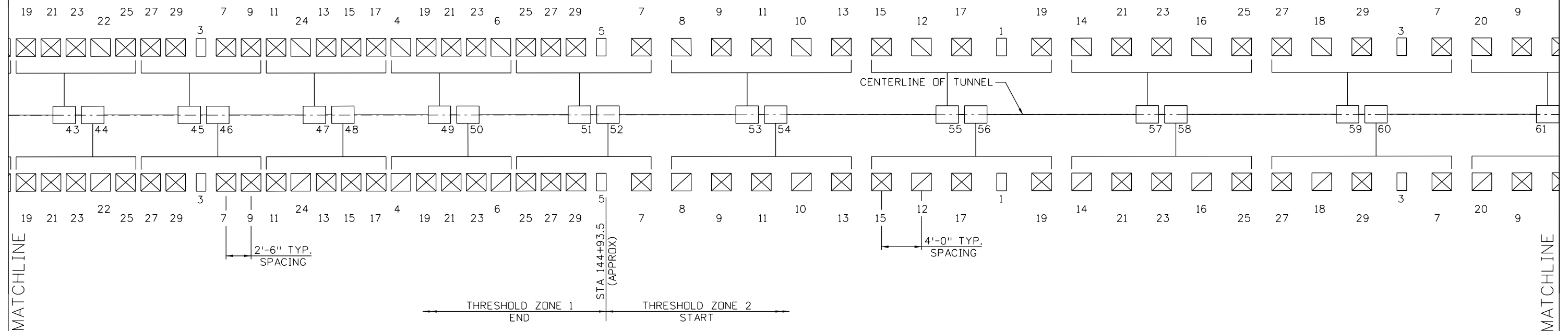
TUNNEL WALL (APPROX.)

PROPOSED I-70 BL

8-TYPE N1
86-TYPE D1
20-PULLBOXES (16"x14"x6")

STA. 144+30

STA. 145+80



MATCHLINE

MATCHLINE

NOTES:
1. REFER TO TUNNEL LIGHTING DETAILS FOR FURTHER INFORMATION. SHEETS 25-27

Print Date: 2/7/2013
 File Name: 19306PHAS_CP2_Lighting013.dgn
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I-70 TWIN TUNNELS TUNNEL LIGHTING PLAN EASTBOUND			
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Detailer:	JMG		
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Project No./Code
IM 0703-391
19036
Sheet Number 261

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146+00

147+00



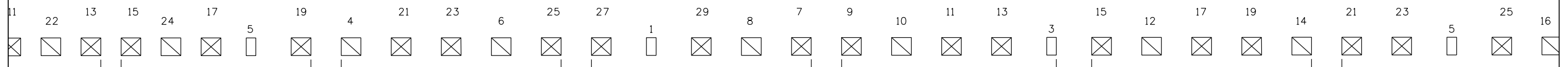
TUNNEL WALL (APPROX.)

PROPOSED I-70 BL

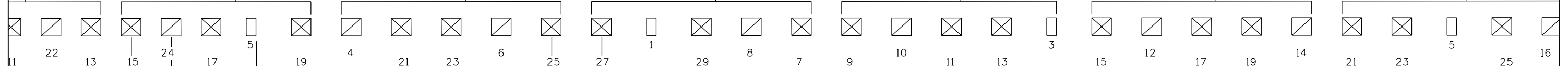
STA. 145+80

STA. 147+40

8-TYPE N1
58-TYPE D1
12-PULLBOXES (16"x14"x6")



CENTERLINE OF TUNNEL



4'-0" TYP. SPACING

5'-0" TYP. SPACING

THRESHOLD ZONE 2
END

TRANSITION ZONE 1
START

STA 146+13.5
(APPROX)

TUNNEL WALL (APPROX.)

MATCHLINE

MATCHLINE

NOTES:
1. REFER TO TUNNEL LIGHTING DETAILS FOR FURTHER INFORMATION. SHEETS 25-27

Print Date: 2/7/2013
File Name: 19306PHAS_CP2_Lighting014.dgn
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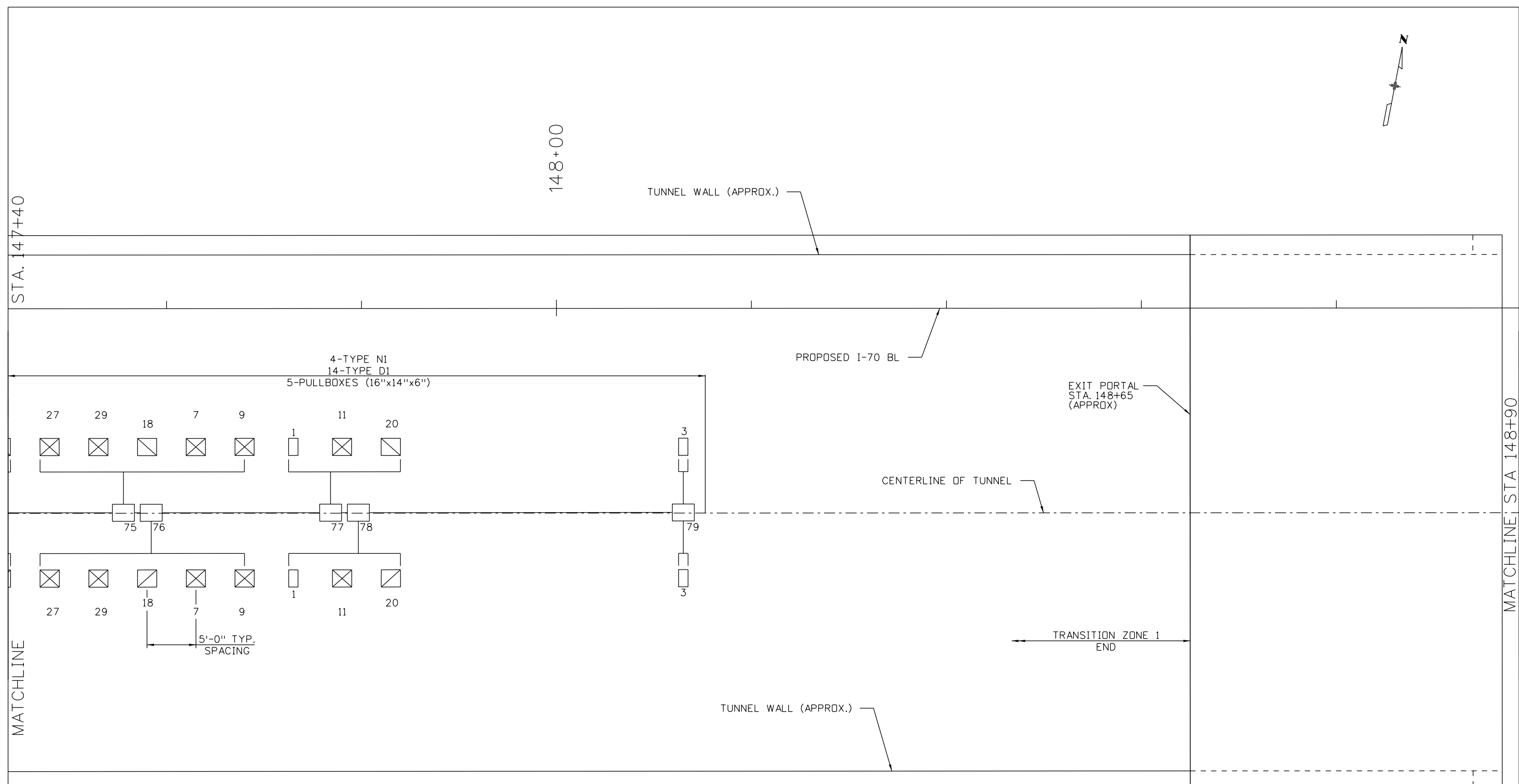
I-70 TWIN TUNNELS
 TUNNEL LIGHTING PLAN
 EASTBOUND

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Project No./Code
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 19036
 Sheet Number 262



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NOTES:
 1. REFER TO TUNNEL LIGHTING DETAILS FOR FURTHER INFORMATION. SHEETS 25-27

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Region 1 CRC

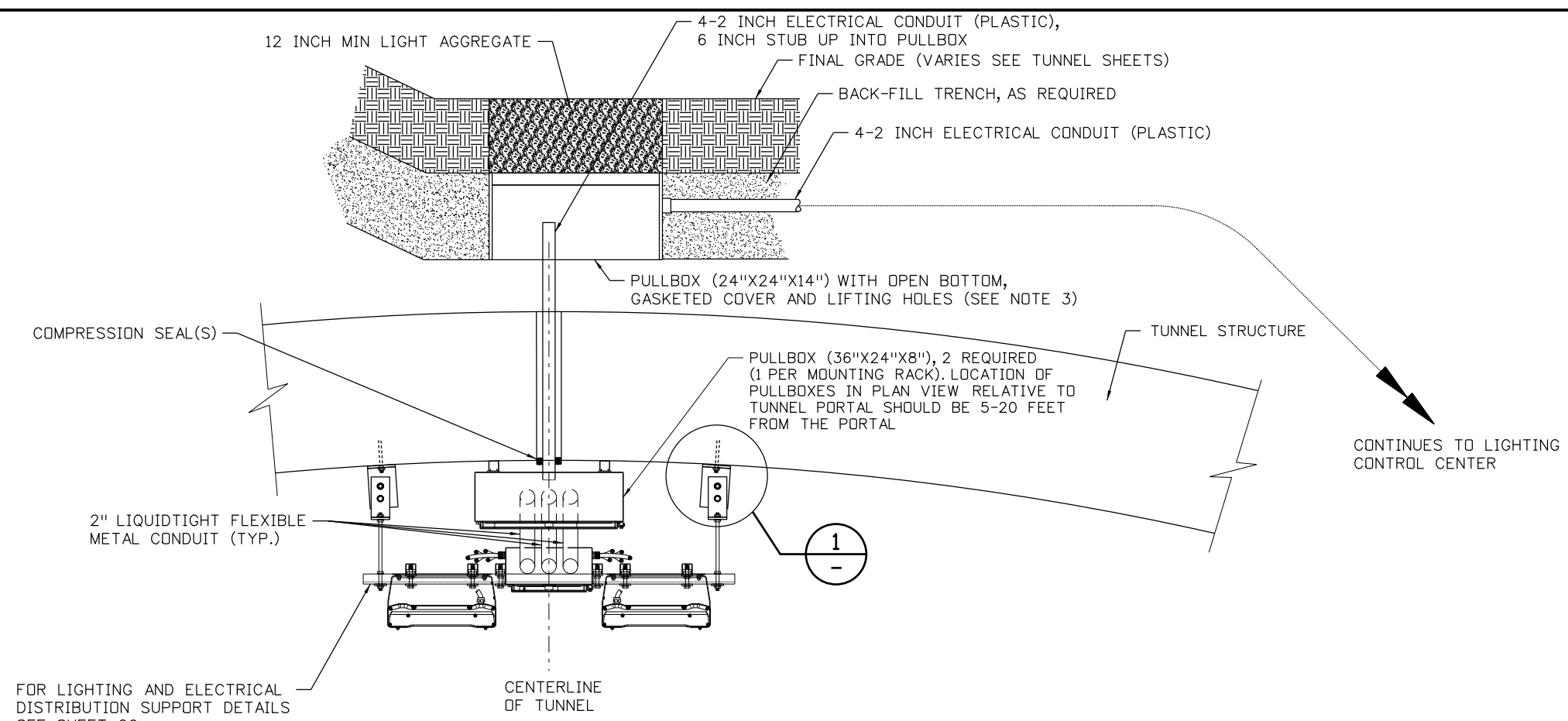
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I-70 TWIN TUNNELS
 TUNNEL LIGHTING PLAN
 EASTBOUND

Designer: CL	Structure Numbers
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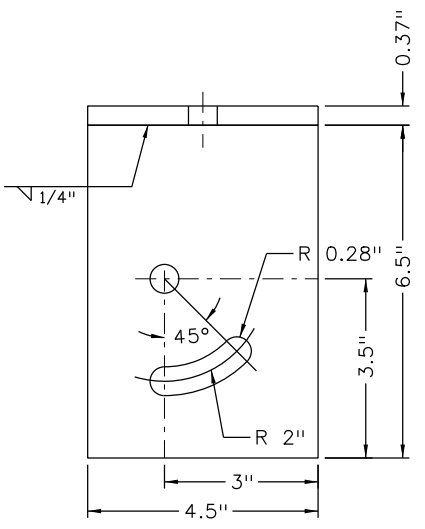
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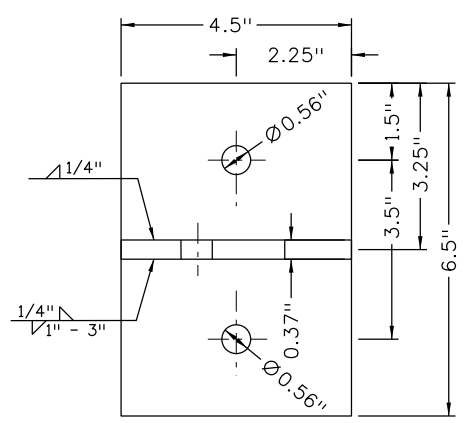


**TYPICAL SECTION SHOWING
CONDUIT PENETRATION INTO TUNNEL**

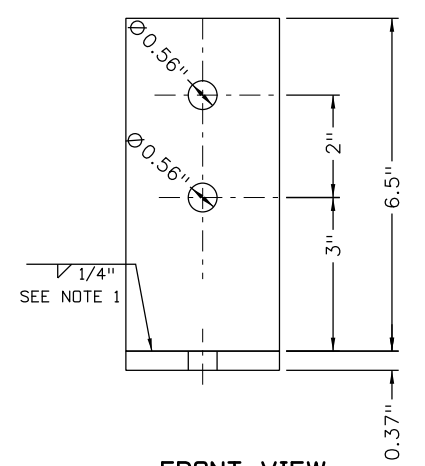
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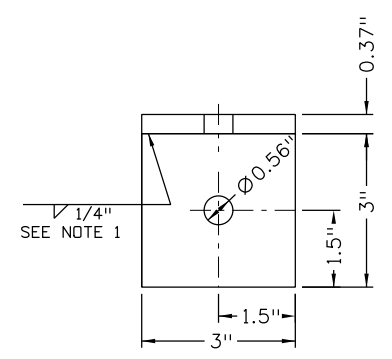
FRONT VIEW



TOP VIEW



FRONT VIEW



TOP VIEW

UPPER MOUNTING BRACKET

LOWER MOUNTING BRACKET

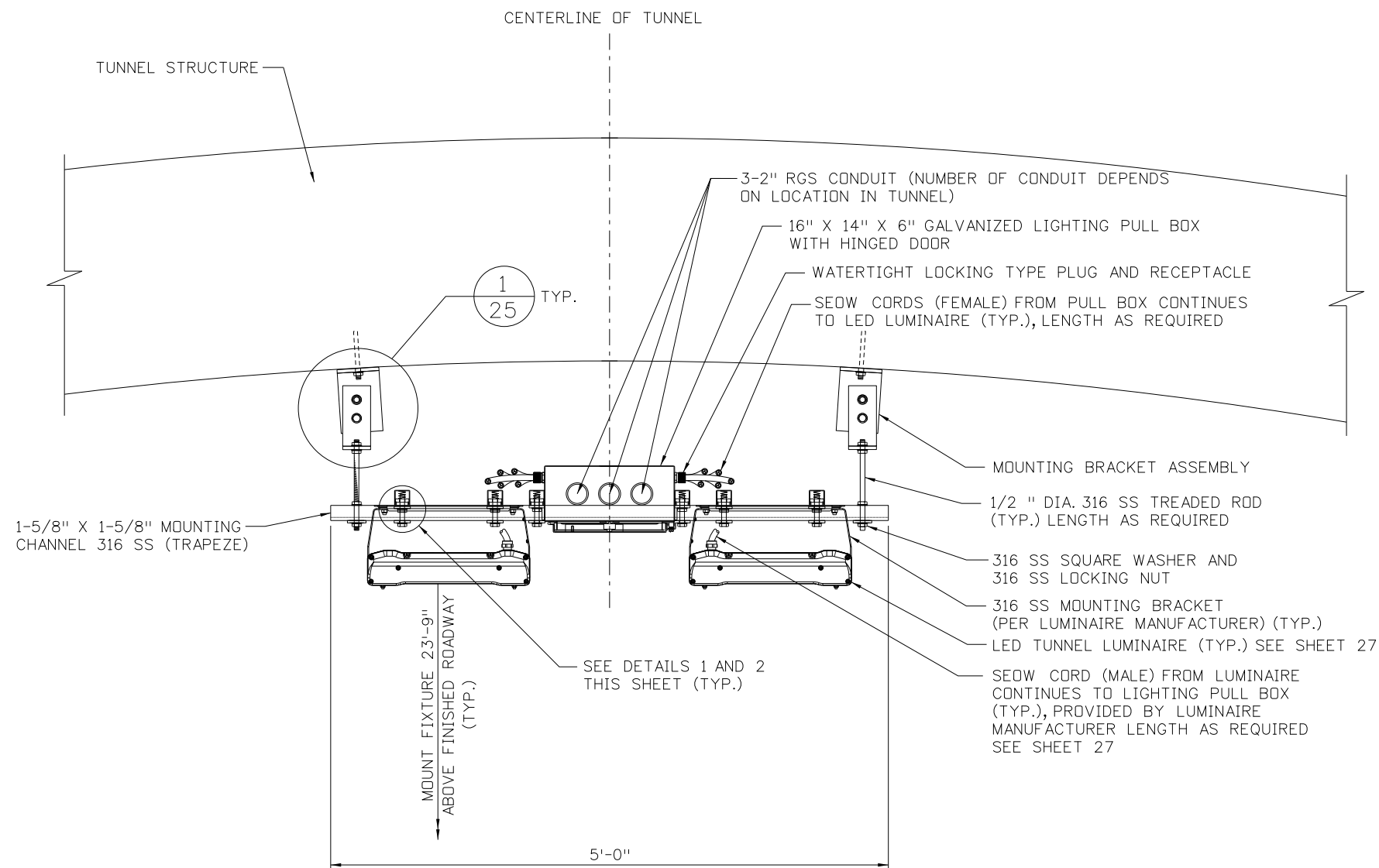
**1
-** **LIGHTING AND ELECTRICAL DISTRIBUTION
RACK MOUNTING BRACKET ASSEMBLY**

NTS

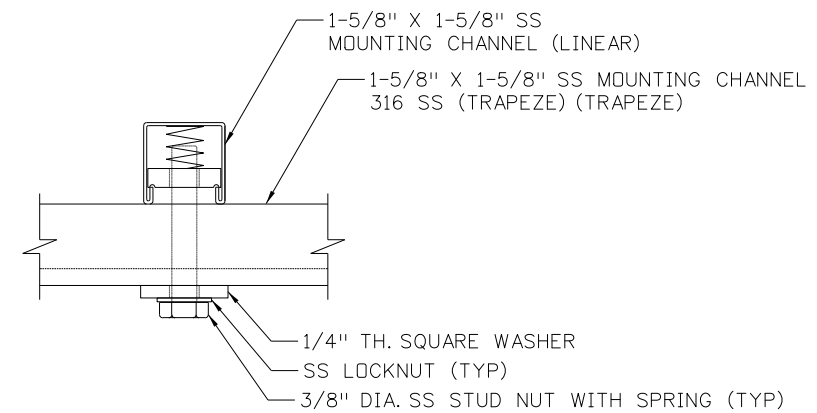
- NOTES:
1. THE LOWER MOUNTING BRACKET CAN EITHER BE BENT OR WELDED AS SHOWN.
 2. CONTRACTOR SHALL PLACE PULLBOX AS REQUIRED TO KEEP IT OUT AND AWAY OF ANY ROCK FALL ZONES.
 3. ACTUAL PLACEMENT OF PULLBOX IS NOT SHOWN FOR CLARITY. SEE SHEET 9 FOR FURTHER INFORMATION.

Print Date: 2/21/2013	Sheet Revisions			Colorado Department of Transportation		As Constructed		I-70 TWIN TUNNELS TUNNEL LIGHTING DETAILS		Project No./Code	
File Name: 19306PHAS_CP2_Detail004.dgn	Date:	Comments	Init.	425 A Corporate Circle Golden, CO 80401 Phone: 720-497-6918 FAX: 720-497-6901		No Revisions:		Designer: CL		IM 0703-391	
Horiz. Scale: N/A Vert. Scale: N/A				Region 1		Revised:		Detailer: JMG		19036	
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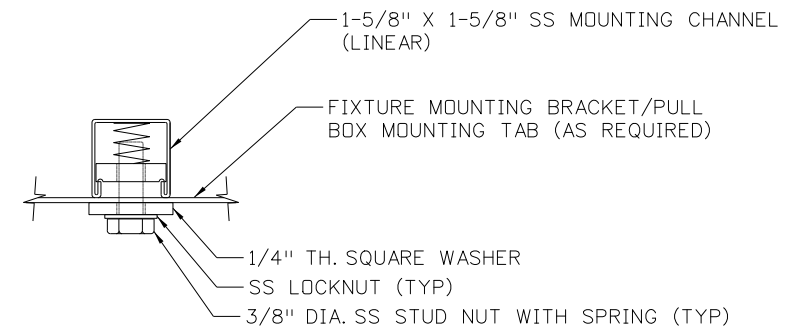
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A-A
 LUMINAIRE AND ELECTRICAL
 MOUNTING DISTRIBUTION RACK
 (TYPICAL SECTION)
 NTS



1
 MOUNTING OF LINEAR CHANNEL
 TO TRAPEZE CHANNEL
 NTS



2
 MOUNTING OF LUMINAIRE AND PULL BOX
 TO LINEAR CHANNEL
 NTS

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 File Name: 19306PHAS_CP2_Detail007.dgn
 Horiz. Scale: N/A Vert. Scale: N/A

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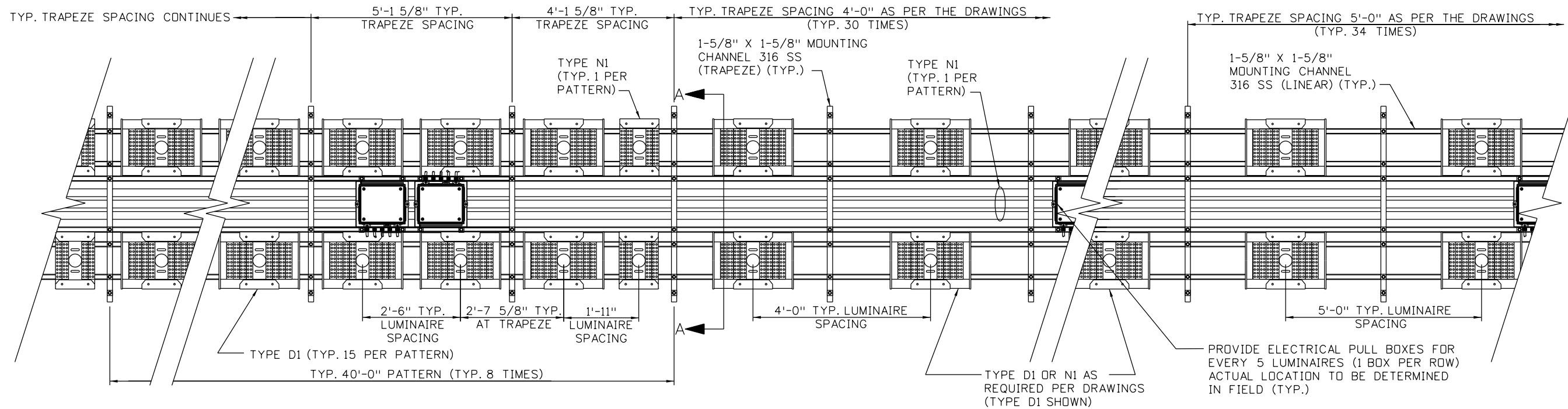
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Designer:	CL	Structure Numbers	
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Project No./Code
IM 0703-391
19036
Sheet Number 265

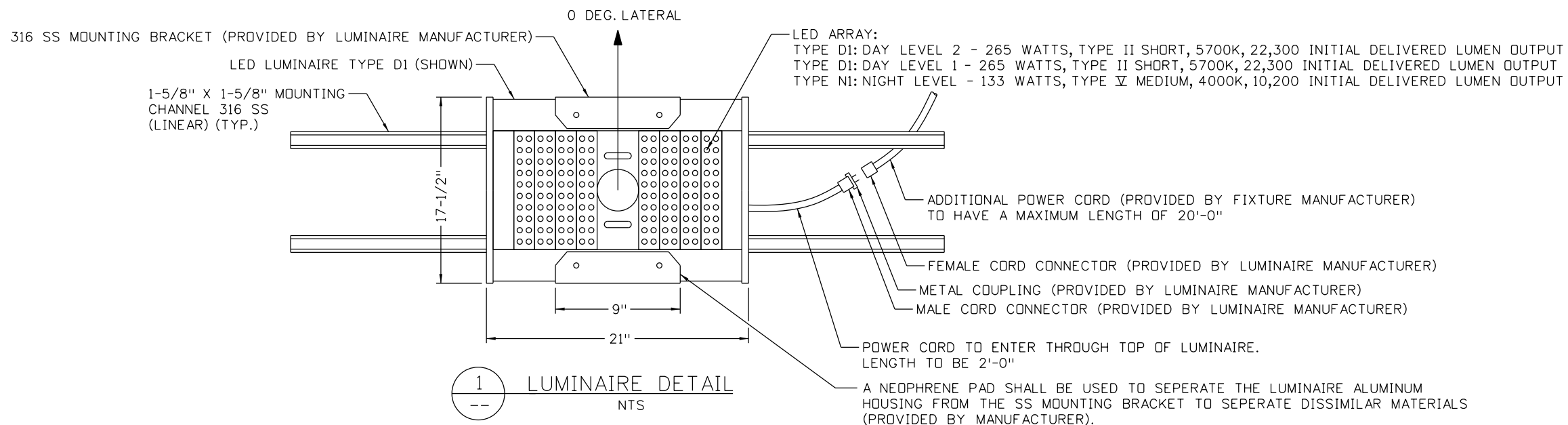
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REFLECTED TUNNEL CEILING VIEW
TYPICAL
NTS

NOTES:

1. REFER TO LEGEND, SYMBOLS, AND ABBREVIATIONS SHEET FOR FURTHER LIGHTING AND ELECTRICAL NOTES.
2. REFER TO TUNNEL LIGHTING NOTES AND LEGEND, SYMBOLS, AND ABBREVIATIONS SHEET FOR FURTHER LIGHTING AND ELECTRICAL NOTES.
3. LUMINAIRE SPACING VARIES, REFER TO TUNNEL LIGHTING PLAN SHEETS.
4. MAXIMUM DEPTH OF LUMINAIRE SHALL BE 8-3/4".



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 File Name: 19306PHAS_CP2_Detail003.dgn
 Horiz. Scale: NTS Vert. Scale: N/A

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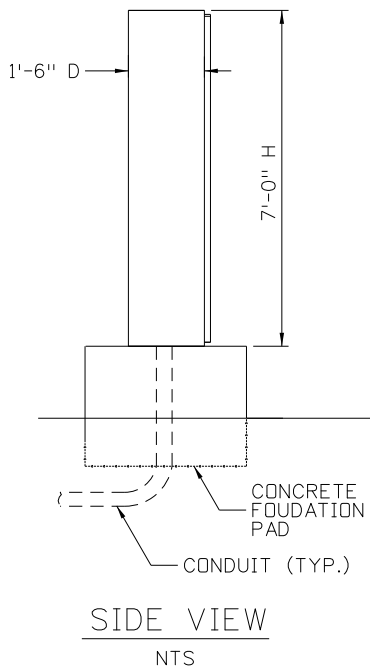
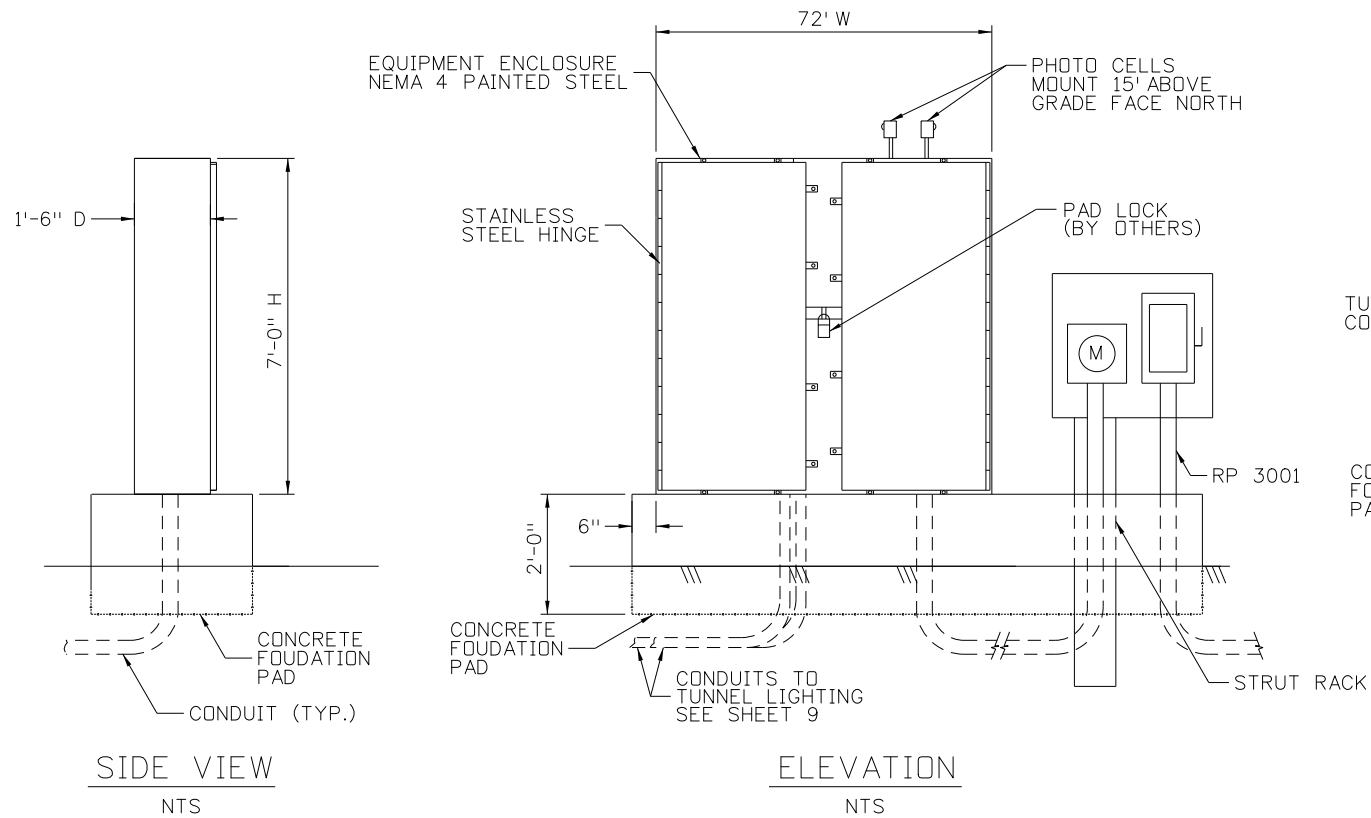
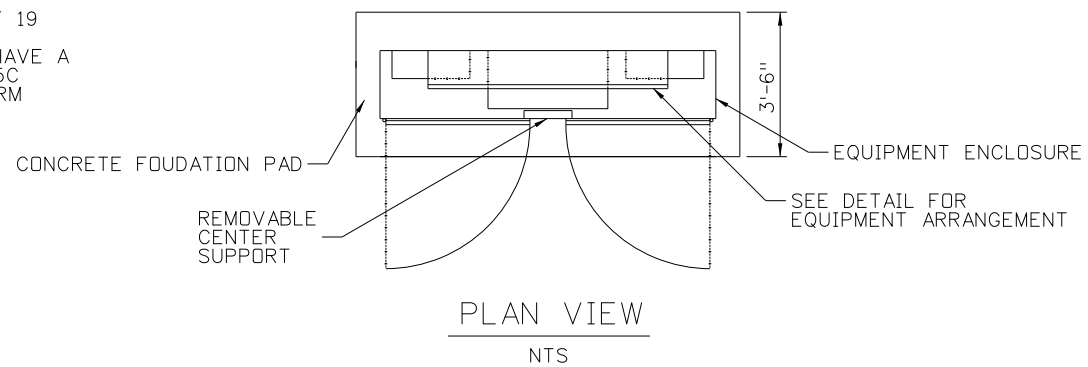
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Project No./Code	IM 0703-391
	19036
Sheet Number	266

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NOTES:

1. FOR DRAWING SYMBOLS, ABBREVIATIONS AND LEGEND, SEE SHEET 2
2. FOR ELECTRICAL AND LIGHTING NOTES, SEE SHEET 19
3. ALL ELECTRICAL EQUIPMENT ENCLOSURES SHALL HAVE A FINISH COLOR EQUAL TO FEDERAL STANDARDS 595C NUMBER 20059. FINISHING PROCESS SHALL CONFORM TO ALL APPLICABLE CDOT STANDARDS.

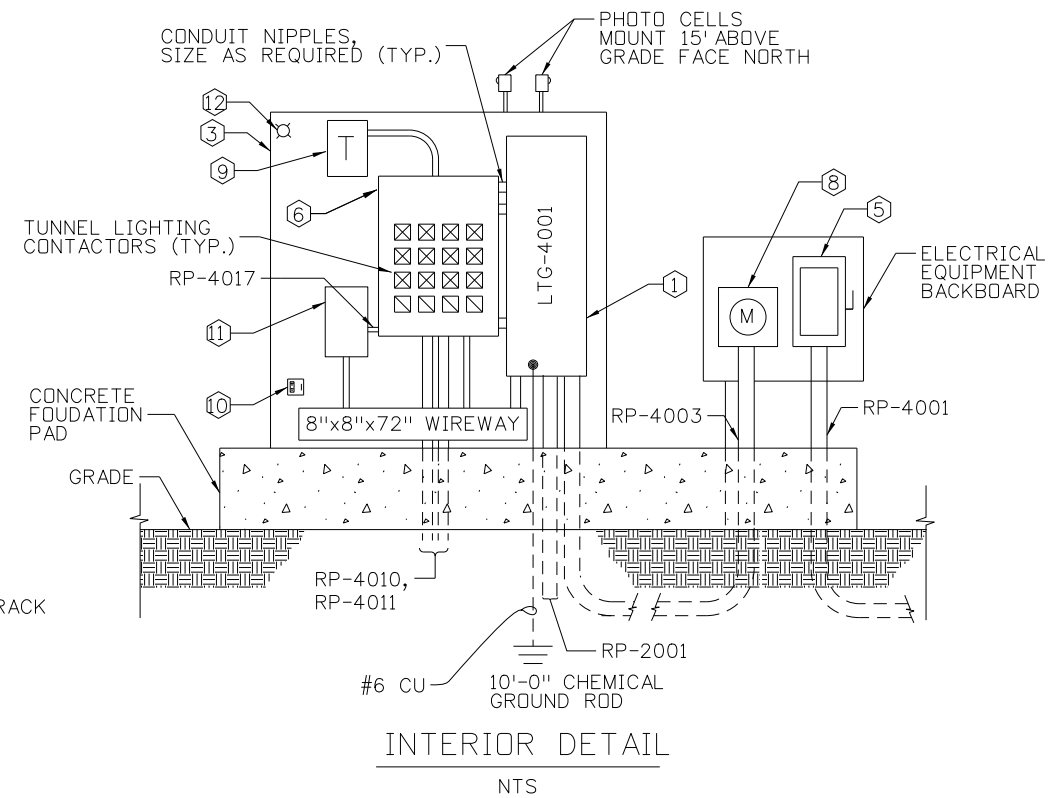


DETAILS: EQUIPMENT ENCLOSURE AT WEST PORTAL
NTS

DETAIL NOTES

1. RACEWAY AND EQUIPMENT WITHIN PARENTHESIS ARE ASSOCIATED WITH THE WEST PORTAL.
2. "*" FOR DETAIL NOTES INDICATE ITEMS PAID FOR UNDER TUNNEL LIGHTING CONTROL SYSTEM

- ① PANELBOARD (400A, 277/480V, 3 PHASE, 4 WIRE)
- ② NOT USED
- *③ EQUIPMENT ENCLOSURE (EQ ENCL) DIMENSIONS ARE APPROXIMATE
- ④ NOT USED
- ⑤ SERVICE DISCONNECT - CIRCUIT BREAKER 300A, 3P
- *⑥ TUNNEL LIGHTING CONTACTOR ENCLOSURE PROVIDE 12, 3 POLE, 40A RATED LIGHTING CONTACTORS (INCLUDING 4 SPARE), MECHANICALLY HELD CONTACTORS
- ⑦ NOT USED
- ⑧ METER BOX AND SOCKET TO BE PROVIDED BY CONTRACTOR FOR UTILITY SUPPLIED METER
- ⑨ CONTROL POWER TRANSFORMER
- *⑩ CONVENIENCE, GFCI RECEPTACLE AND LIGHT SWITCH
- *⑪ NEMA 4 TUNNEL LIGHTING CONTROLLER
- *⑫ CONVENIENCE LIGHT



Print Date: 2/22/2013
 File Name: 19306PHAS_CP2_Detail008.dgn
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ATKINS **PARSONS BRINCKERHOFF**

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Date:	Comments	Init.

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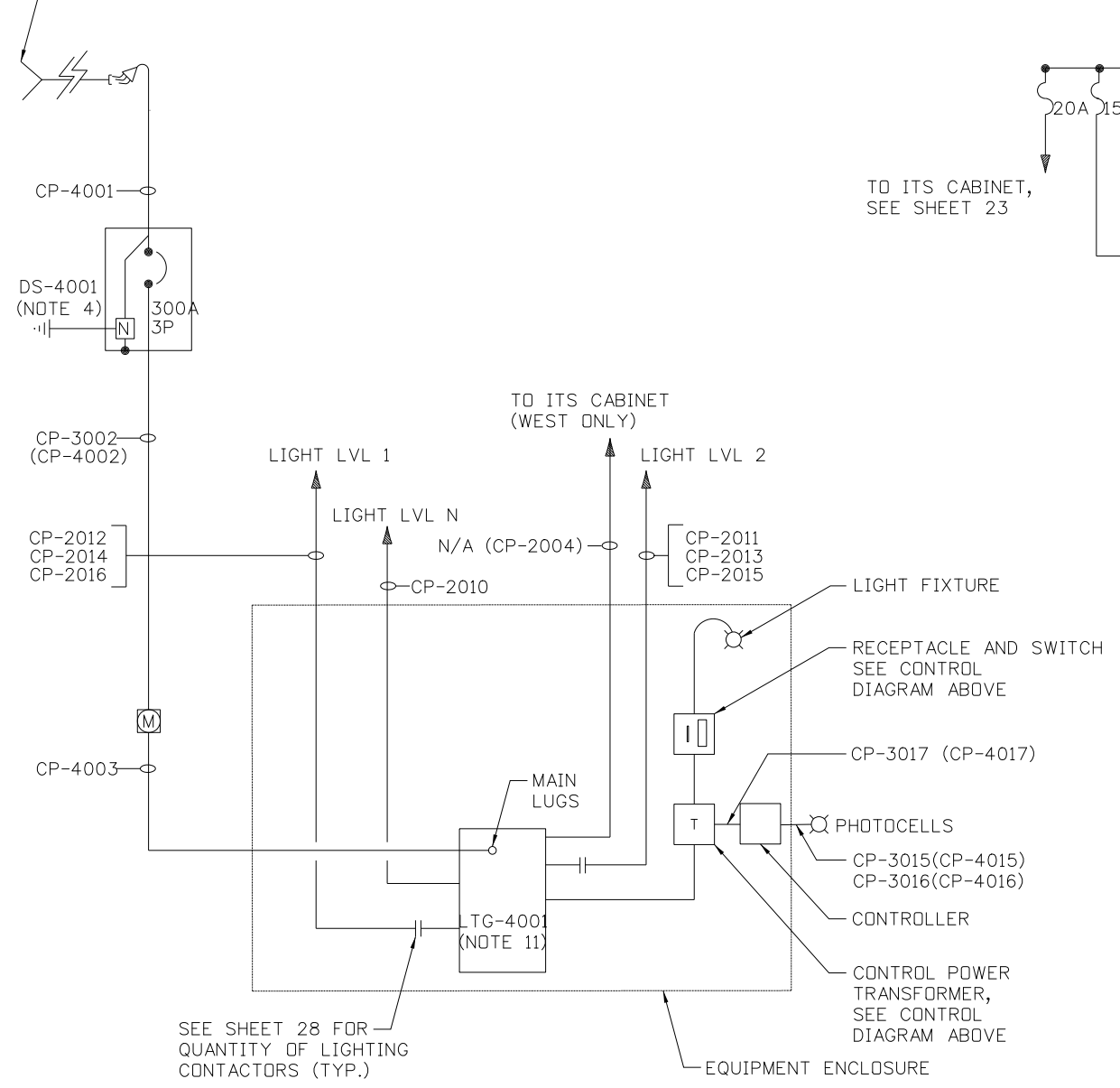
As Constructed	No Revisions:	Revised:	Void:
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I-70 TWIN TUNNELS LIGHTING CONTROL CENTER			
Designer:	CL	Structure Numbers	
Detailer:	JMG		
Subset: LIGHTING CP 2		Subset Sheets: 28 of 32	

Project No./Code	IM 0703-391
	19036
Sheet Number	267

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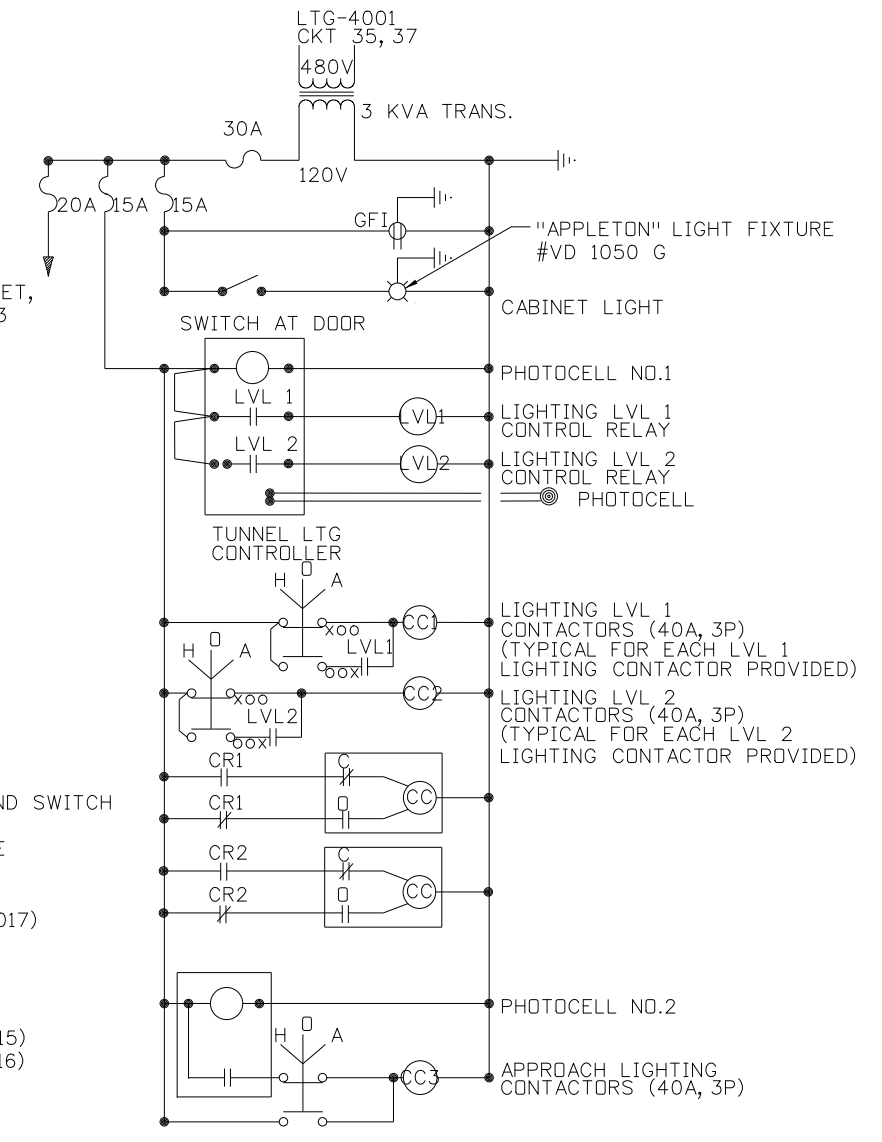
UTILITY CONNECTION, SEE NOTE 10



SEE SHEET 28 FOR QUANTITY OF LIGHTING CONTACTORS (TYP.)

TO ITS CABINET, SEE SHEET 23

TO ITS CABINET (WEST ONLY)



TUNNEL ELECTRICAL NOTES:

1. SEE SHEETS 1 AND 2 FOR GENERAL NOTES, ABBREVIATIONS, AND SYMBOLS.
2. EQUIPMENT SUPPLIED BY XCEL ENERGY. REFER TO SPECIAL PROVISIONS "UTILITIES" FOR ADDITIONAL INFORMATION.
3. NEMA 1 ENCLOSURE MOUNTED IN ENCLOSURE.
4. NEMA 3R ENCLOSURE.
5. CONDUIT AND BOXES ARE SHOWN DIAGRAMMATICALLY.
6. FOR CONDUIT SCHEDULE, SEE SHEET 32.
7. FOR WIRING SCHEDULE, SEE SHEET 31.
8. FOR TUNNEL LIGHTING NOTES, SEE SHEET 19.
9. ALL EMPTY CONDUIT SHALL BE PROVIDED WITH 1/4" PULL ROPE.
10. CONTRACTOR SHALL COORDINATE THE ELECTRIC SERVICE WITH UTILITY.
11. FOR PANEL SCHEDULES, SEE SHEETS 30.
12. SET LIGHT LEVEL 1 (LVL 1) FIXTURES TO TURN ON AND OFF AT 5 FOOT CANDLES.
13. SET LIGHT LEVEL 2 (LVL 2) FIXTURES TO TURN ON AND OFF AT 100 FOOT CANDLES.
14. EQUIPMENT AND CABLES SHOWN IN PARENTHESIS ARE ASSOCIATED WITH THE WEST PORTAL.

Sheet Revisions		
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Revised:
Void:

I-70 TWIN TUNNELS ONE-LINE DIAGRAM			
Designer:	CL	Structure Numbers	
Detailer:	JMG		
Subset:	LIGHTING CP 2	Subset Sheets:	29 of 32

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ELECTRICAL PANELBOARD SCHEDULE - EASTBOUND

DESIGNATION: LTG-4001 SERVICE: 277V/480V, 3PH, 4W MAINS: 400A MAIN LUG NEUTRAL BUS: 400A GROUND BUS: CU										FEEDER ENTRANCE: BOTTOM MOUNTING: SURFACE LOCATION: WEST PORTAL MAIN CIRCUIT BREAKER MIN. INTERRUPTING RATING: 22,000 A BRANCH CIRCUIT BREAKER MIN. INTERRUPTING RATING: 22,000 A									
CKT. NO.	SERVES	CABLE NO.	LOAD (VA)			BREAKER		GND. BUS	BREAKER			LOAD (VA)			CABLE NO.	SERVES	CKT. NO.		
			A*	B*	C*	TRIP	POLE		POLE	TRIP	A*	B*	C*						
1	EB-N1 (LVL N)	-	1596			20	1		1	40	5425			-	EB-D1 (LVL 1)	2			
3	EB-N1 (LVL N)	-		1596		20	1		1	40		5425		-	EB-D1 (LVL 1)	4			
5	EB-N1 (LVL N)	-			1330	20	1		1	40			5425	-	EB-D1 (LVL 1)	6			
7	EB-D1 (LVL 2)	-	5425			40	1		1	40	5425			-	EB-D1 (LVL 1)	8			
9	EB-D1 (LVL 2)	-		5425		40	1		1	40		5425		-	EB-D1 (LVL 1)	10			
11	EB-D1 (LVL 2)	-			5425	40	1		1	40			5425	-	EB-D1 (LVL 1)	12			
13	EB-D1 (LVL 2)	-	5425			40	1		1	40	5425			-	EB-D1 (LVL 1)	14			
15	EB-D1 (LVL 2)	-		5425		40	1		1	40		5425		-	EB-D1 (LVL 1)	16			
17	EB-D1 (LVL 2)	-			5425	40	1		1	40			5425	-	EB-D1 (LVL 1)	18			
19	EB-D1 (LVL 2)	-	5425			40	1		1	40	5425			-	EB-D1 (LVL 1)	20			
21	EB-D1 (LVL 2)	--		5425		40	1		1	40		5425		-	EB-D1 (LVL 1)	22			
23	EB-D1 (LVL 2)	-			5425	40	1		1	40			5425	-	EB-D1 (LVL 1)	24			
25	EB-D1 (LVL 2)	-	5425			20	1		1	20	-			-	SPARE	26			
27	EB-D1 (LVL 2)	-		5425		20	1		1	20				-	SPARE	28			
29	EB-D1 (LVL 2)	-			5425	20	1		1	20				-	SPARE	30			
31	SPARE	-	-			20	1		1	20	-			-	SPARE	32			
33	SPARE	-	-			20	1		1	20				-	SPARE	34			
35	SPARE	-	-			20	1		1	20				-	SPARE	36			
37	CONT. PWR TRANSF.	-	1500		1500	20	1		1	20				-	SPARE	38			
39	SPARE	-	-			20	1		1	20				-	SPARE	40			
41	SPARE	-	-			20	1		1	20				-	SPARE	42			
SUB-TOTAL CONNECTED			24796	23296	24530							21700	21700	21700	SUB-TOTAL CONNECTED				
GND. BUS																			
A SUB-TOTAL CONNECTED (VA): 46996 *B* SUB-TOTAL CONNECTED (VA): 44996 *C* SUB-TOTAL CONNECTED (VA): 46250 TOTAL CONNECTED (VA): 126052																			

ELECTRICAL PANELBOARD SCHEDULE - WESTBOUND

DESIGNATION: LTG-3001 SERVICE: 277V/480V, 3PH, 4W MAINS: 225A MAIN LUG NEUTRAL BUS: 225A GROUND BUS: CU										FEEDER ENTRANCE: BOTTOM MOUNTING: SURFACE LOCATION: EAST PORTAL MAIN CIRCUIT BREAKER MIN. INTERRUPTING RATING: 22,000 A BRANCH CIRCUIT BREAKER MIN. INTERRUPTING RATING: 22,000 A									
CKT. NO.	SERVES	CABLE NO.	LOAD (VA)			BREAKER		GND. BUS	BREAKER			LOAD (VA)			CABLE NO.	SERVES	CKT. NO.		
			A*	B*	C*	TRIP	POLE		POLE	TRIP	A*	B*	C*						
1	WB-M1 (LVL N)	-	1440			20	1		1	40	6482			-	WB-M3 (LVL 2)	2			
3	WB-M1 (LVL N)	-		1440		20	1		1	40		6482		-	WB-M3 (LVL 2)	4			
5	WB-M1 (LVL N)	-			1440	20	1		1	40			5983	-	WB-M3 (LVL 2)	6			
7	WB-M3 (LVL 1)	-	6482			40	1		1	40	5983			-	WB-M3 (LVL 2)	8			
9	WB-M3 (LVL 1)	-		6482		40	1		1	40		5983		-	WB-M3 (LVL 2)	10			
11	WB-M3 (LVL 1)	-			6482	40	1		1	20			5983	-	WB-M3 (LVL 2)	12			
13	WB-M3 (LVL 1)	-	6482			40	1		1	40	5983			-	WB-M3 (LVL 2)	14			
15	WB-M3 (LVL 1)	-		6482		40	1		1	40		5983		-	WB-M3 (LVL 2)	16			
17	WB-M3 (LVL 1)	-			6482	40	1		1	40			5983	-	WB-M3 (LVL 2)	18			
19	WB-M3 (LVL 1)	-	6482			40	1		1	20	2493			-	ROADWAY LIGHT POLES	20			
21	WB-M3 (LVL 1)	-		6482		40	1		1	20		2493		-	ROADWAY LIGHT POLES	22			
23	WB-M3 (LVL 1)	-			6482	40	1		1	20			2493	-	ROADWAY LIGHT POLES	24			
25	SPARE	-	-			20	1		1	20	-			-	SPARE	26			
27	SPARE	-	-			20	1		1	20				-	SPARE	28			
29	SPARE	-	-			20	1		1	20				-	SPARE	30			
31	SPARE	-	-			20	1		1	20				-	SPARE	32			
33	SPARE	-	-			20	1		1	20				-	SPARE	34			
35	SPARE	-	-			20	1		1	20				-	SPARE	36			
37	CONT. PWR TRANSF.	-	1500		1500	20	1		1	20				-	SPARE	38			
39	SPARE	-	-			20	1		1	20				-	SPARE	40			
41	SPARE	-	-			20	1		1	20				-	SPARE	42			
SUB-TOTAL CONNECTED			22386	20886	22386							20941	20941	20442	SUB-TOTAL CONNECTED				
GND. BUS																			
A SUB-TOTAL CONNECTED (VA): 43327 *B* SUB-TOTAL CONNECTED (VA): 41827 *C* SUB-TOTAL CONNECTED (VA): 42828 TOTAL CONNECTED (VA): 127982																			

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Horiz. Scale: N/A Vert. Scale: N/A



Sheet Revisions		
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I-70 TWIN TUNNELS PANEL SCHEDULE			
Designer:	CL	Structure	
Detailer:	JMG	Numbers	
Subset: LIGHTING CP 2	Subset Sheets: 30 of 32		

Project No./Code
IM 0703-391
19036
Sheet Number 269

TABULATION OF WIRING
(FOR INFORMATION ONLY)

LOCATION (APPROXIMATE)			CABLE NO.	FROM	TO	TYPE	SIZE (AWG)	RACEWAYS	LINEAR FEET REQUIRED PER SIZE						REMARKS	
STA	TO STA	STA							#12	#10	#8	#6	#4	#4/0		
EAST PORTAL SERVICE																
			-	UTILITY	T-3001	-	BY UTILITY	-							WIRING PROVIDED BY THE UTILITY	
179+00	RT	179+00	RT	CP-3001	T-3001	DS-3001	XHHW-2	4-1/c #4/0 & 1-1/c -#4 GND	RP-3001				35	140	SERVICE ENTRANCE	
179+00	RT	179+00	RT	CP-3002	DS-3001	METER	XHHW-2	4-1/c #4/0 & 1-1/c -#4 GND	RP-3002				10	40	SERVICE ENTRANCE	
179+00	RT	179+00	RT	CP-3003	METER	LTG-3001	XHHW-2	4-1/c #4/0 & 1-1/c -#4 GND	RP-3003				25	100	SERVICE ENTRANCE	
179+00	RT	179+00	RT	CP-3015	EQ ENCL	PHOTO CELL(S)	XHHW-2	3-1/c #10	RP-3015		105				PHOTO EYE(S)	
179+00	RT	179+00	RT	CP-3016	EQ ENCL	PHOTO CELL(S)	XHHW-2	3-1/c #10	RP-3016		105				PHOTO EYE(S)	
179+00	RT	179+00	RT	CP-3017	EQ ENCL	LTG CONTROLLER	XHHW-2	5-1/c #10	RP-3017		55				LTG CONTROLLER	
149+00	RT	177+20	RT	CP-1001	LTG-3001	EXTERIOR LIGHTS (E)	XHHW-2	4-1/c #6 & 1-1/c #6 GND	RP-1001				15975		CIRCUIT NO. 20, 22 & 24	
178+25	LT	179+00	RT	CP-1010	LTG-3001	TUNNEL FIXTURES (WB)	XHHW-2	4-1/c #6 & 1-1/c #6 GND	RP-3010				1325		CIRCUIT NO. 1, 3 & 5	
178+25	LT	179+00	RT	CP-1011	LTG-3001	TUNNEL FIXTURES (WB)	XHHW-2	4-1/c #6 & 1-1/c #6 GND	RP-3010				1325		CIRCUIT NO. 2, 4 & 6	
178+25	LT	179+00	RT	CP-1012	LTG-3001	TUNNEL FIXTURES (WB)	XHHW-2	4-1/c #6 & 1-1/c #6 GND	RP-3010				1325		CIRCUIT NO. 7, 9 & 11	
178+25	LT	179+00	RT	CP-1013	LTG-3001	TUNNEL FIXTURES (WB)	XHHW-2	4-1/c #6 & 1-1/c #6 GND	RP-3010				1325		CIRCUIT NO. 8, 10 & 12	
178+25	LT	179+00	RT	CP-1014	LTG-3001	TUNNEL FIXTURES (WB)	XHHW-2	4-1/c #6 & 1-1/c #6 GND	RP-3011				1325		CIRCUIT NO. 13, 15 & 17	
178+25	LT	179+00	RT	CP-1015	LTG-3001	TUNNEL FIXTURES (WB)	XHHW-2	4-1/c #6 & 1-1/c #6 GND	RP-3011				1325		CIRCUIT NO. 14, 16 & 18	
178+25	LT	179+00	RT	CP-1016	LTG-3001	TUNNEL FIXTURES (WB)	XHHW-2	4-1/c #6 & 1-1/c #6 GND	RP-3011				1325		CIRCUIT NO. 19, 21 & 23	
151+90	RT	159+40	RT	CP-1020	EQ ENCL	SIGN NO. 40	XHHW-2	2-1/c #10 & 1-1/c #10 GND	RP-3020		2250				120V FROM TRANSFORMER	
WEST PORTAL SERVICE																
		171+00	RT	-	UTILITY	T-4001	-	BY UTILITY	-						WIRING PROVIDED BY THE UTILITY	
171+00	RT	171+00	RT	CP-4001	T-4001	DS-4001	XHHW-2	4-1/c 350 KCMIL & 1-1/c -#4 GND	RP-4001				35	1800	SERVICE ENTRANCE	
171+00	RT	171+00	RT	CP-4002	DS-4001	METER	XHHW-2	4-1/c 350 KCMIL & 1-1/c -#4 GND	RP-4002				10	40	SERVICE ENTRANCE	
171+00	RT	171+00	RT	CP-4003	METER	LTG-4001	XHHW-2	4-1/c 350 KCMIL & 1-1/c -#4 GND	RP-4003				25	100	SERVICE ENTRANCE	
171+00	RT	171+00	RT	CP-4015	EQ ENCL	PHOTO CELL(S)	XHHW-2	3-1/c #10	RP-4015		105				PHOTO EYE(S)	
171+00	RT	171+00	RT	CP-4016	EQ ENCL	PHOTO CELL(S)	XHHW-2	3-1/c #10	RP-4016		105				PHOTO EYE(S)	
171+00	RT	171+00	RT	CP-4017	EQ ENCL	LTG CONTROLLER	XHHW-2	5-1/c #10	RP-4017		55				LTG CONTROLLER	
171+46	RT	178+28	RT	CP-2010	LTG-4001	TUNNEL FIXTURES (EB)	XHHW-2	4-1/c #6 & 1-1/c #6 GND	RP-4010, RP-2002				3400		CIRCUIT NO. 1, 3 & 5	
171+46	RT	178+28	RT	CP-2011	LTG-4001	TUNNEL FIXTURES (EB)	XHHW-2	4-1/c #6 & 1-1/c #6 GND	RP-4010, RP-2002				3250		CIRCUIT NO. 2, 4 & 6	
171+46	RT	178+28	RT	CP-2012	LTG-4001	TUNNEL FIXTURES (EB)	XHHW-2	4-1/c #6 & 1-1/c #6 GND	RP-4010, RP-2002				3250		CIRCUIT NO. 8, 10 & 12	
171+46	RT	178+28	RT	CP-2013	LTG-4001	TUNNEL FIXTURES (EB)	XHHW-2	4-1/c #6 & 1-1/c #6 GND	RP-4011, RP-2003				1750		CIRCUIT NO. 7, 9 & 11	
171+46	RT	178+28	RT	CP-2014	LTG-4001	TUNNEL FIXTURES (EB)	XHHW-2	4-1/c #6 & 1-1/c #6 GND	RP-4011, RP-2003				1750		CIRCUIT NO. 13, 15 & 17	
171+46	RT	178+28	RT	CP-2015	LTG-4001	TUNNEL FIXTURES (EB)	XHHW-2	4-1/c #6 & 1-1/c #6 GND	RP-4011, RP-2003				1750		CIRCUIT NO. 19, 21 & 23	
171+46	RT	178+28	RT	CP-2016	LTG-4001	TUNNEL FIXTURES (EB)	XHHW-2	4-1/c #6 & 1-1/c #6 GND	RP-4012, RP-2004				3250		CIRCUIT NO. 14, 16 & 18	
171+46	RT	178+28	RT	CP-2017	LTG-4001	TUNNEL FIXTURES (EB)	XHHW-2	4-1/c #6 & 1-1/c #6 GND	RP-4012, RP-2004				1750		CIRCUIT NO. 25, 27 & 29	
171+46	RT	178+28	RT	CP-2018	LTG-4001	TUNNEL FIXTURES (EB)	XHHW-2	4-1/c #6 & 1-1/c #6 GND	RP-4011, RP-2004				3250		CIRCUIT NO. 20, 22 & 24	
128+70	RT	128+60	RT	CP-6001	EQ ENCL	PULLBOX	XHHW-2	6-1/c #6 & 1-1/c #6 GND	RP-6001				70		CIRCUIT NO. 2, 4, 6	
128+60	RT	123+30	RT	CP-6002	PULLBOX	CHAIN UP LTE 1	XHHW-2	6-1/c #6 & 1-1/c #6 GND	RP-6002				2520		CIRCUIT NO. 2, 4, 6	
128+60	RT	112+80	RT	CP-6003	PULLBOX	CHAIN UP LTE 2	XHHW-2	6-1/c #6 & 1-1/c #6 GND	RP-6003				6680		CIRCUIT NO. 2, 4, 6	
131+20	RT	135+50	RT	CP-6004	PULLBOX	SIGN NO. 33	XHHW-2	2-1/c #10 & 1-1/c #10 GND	RP-6004		1290					
PROJECT TOTAL											4175		45920	140	280	1940

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As Constructed	I-70 TWIN TUNNELS CABLE SCHEDULE	
No Revisions:	Designer: CL	Structure Numbers
Revised:	Detailer: JMG	Subset: LIGHTING CP 2
Void:	Subset Sheets: 31 of 32	

Project No./Code

IM 0703-391

19036


Sheet Number 270

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TABULATION OF CONDUIT AND PULL BOXES

LOCATION (APPROXIMATE)			CONDUIT SIZE	CONDUIT	FROM (GENERAL)	TO (GENERAL)	NUM	CONDUIT (SIZE AND TYPE)						PULL BOX (36"X24"X8")	PULL BOX (16"X14"X6")	PULL BOX (24"X24"X14")	SERVICE	CABLES	REMARKS
								1"	2"	4"	(PLASTIC)		LQT						
STA	TO STA	STA																	
EAST PORTAL SERVICE																			
-	-	-	-	4 INCH	RP-3001	T-3001 (UTILITY)	DS-3001	1			30						277/480		UTILITY SERVICE
-	-	-	-	4 INCH	RP-3002	DS-3001	UTILITY METER	1			5						277/480		UTILITY METER SERVICE
-	-	-	-	4 INCH	RP-3003	UTILITY METER	LTG-3001	1			20						277/480		UTILITY SERVICE
179+00	RT	178+25	RT	2 INCH	RP-3010	EQ. ENCL	TUNNEL PULLBOX	1		70		190		1		3		277/480	TO TUNNEL LIGHTING
179+00	RT	178+25	RT	2 INCH	RP-3011	EQ. ENCL	TUNNEL PULLBOX	1		70		190						277/480	TO TUNNEL LIGHTING
179+00	RT	179+00	RT	1 INCH	RP-3015	EQ. ENCL	PHOTO CELL(S)	1	30									277/480	PHOTO EYE(S)
179+00	RT	179+00	RT	1 INCH	RP-3016	EQ. ENCL	PHOTO CELL(S)	1	30									277/480	PHOTO EYE(S)
179+00	RT	179+00	RT	2 INCH	RP-3017	LTG CONTACTOR	LTG CONTROLLER	1		6								277/480	
150+00	-	177+20	-	2 INCH	RP-1001	EAST EQUIP ENCL	EXTERIOR LIGHTING (EAST)	1				3190			3			277/480	EXTERIOR LIGHTING
151+90	-	159+40	-	1 INCH	RP-3020	EAST EQUIP ENCL	SIGN NO. 40	1	750									120	SIGN NO. 40
WEST PORTAL SERVICE																			
-	-	-	-	4 INCH	RP-4001	T-4001 (UTILITY)	DS-4001	1			450							277/480	UTILITY SERVICE
-	-	-	-	4 INCH	RP-4002	DS-4001	UTILITY METER	1			5							277/480	UTILITY METER SERVICE
-	-	-	-	4 INCH	RP-4003	UTILITY METER	LTG-4001	1			40							277/480	UTILITY SERVICE
170+00	RT	171+50	RT	2 INCH	RP-4010	EQ. ENCL	TUNNEL PULLBOX	1		130		50	5	1		1		277/480	TO TUNNEL LIGHTING
170+00	RT	171+50	RT	2 INCH	RP-4011	EQ. ENCL	TUNNEL PULLBOX	1		130		50	5					277/480	TO TUNNEL LIGHTING
170+00	RT	171+50	RT	2 INCH	RP-4012	EQ. ENCL	TUNNEL PULLBOX	1		190								277/480	
170+00	RT	170+00	RT	1 INCH	RP-4015	EQ. ENCL	PHOTO CELL(S)	1	30									277/480	PHOTO EYE(S)
170+00	RT	170+00	RT	1 INCH	RP-4016	EQ. ENCL	PHOTO CELL(S)	1	30									277/480	PHOTO EYE(S)
170+00	RT	170+00	RT	2 INCH	RP-4017	LTG CONTACTOR	LTG CONTROLLER	1		6									
163+70	-	171+47	-	2 INCH	RP-2001	WEST EQUIP ENCL	EXTERIOR LIGHTING (WEST)	1				750			3			277/480	EXTERIOR LIGHTING
171+46	-	178+28	-	2 INCH	RP-2002	TUNNEL PULL BOX	E. PORTAL	1		682				79				277/480	EASTBOUND TUNNEL LIGHTING
171+46	-	178+28	-	2 INCH	RP-2003	TUNNEL PULL BOX	149+75	1		610								277/480	EASTBOUND TUNNEL LIGHTING
171+46	-	178+28	-	2 INCH	RP-2004	TUNNEL PULL BOX	147+90	1		320								277/480	EASTBOUND TUNNEL LIGHTING
171+46	-	178+00	-	2 INCH	RP-2005	TUNNEL PULL BOX	E. PORTAL	1		682								277/480	EASTBOUND TUNNEL LIGHTING
171+46	-	178+00	-	2 INCH	RP-2004	EQ ENCL	EXISTING ITS CABINET					30						120	ITS CABINET
128+60		128+50		2 INCH	RP-6001	EQ ENCL	PULL BOX	1				10							CHAIN UP AREA LIGHTING
128+50		123+30		2 INCH	RP-6002	PULL BOX	CHAIN UP LIGHTING 1	1				520							CHAIN UP AREA LIGHTING
128+50		117+80		2 INCH	RP-6003	PULL BOX	CHAIN UP LIGHTING 2	1				1040							CHAIN UP AREA LIGHTING
131+20		135+50		1 INCH	RP-6004	PULL BOX	SIGN NO. 33	1	430										SIGN NO. 33
PROJECT TOTAL								1300	2836	550	6020		10	2	79	10			

Print Date: 2/7/2013
 File Name: 19306PHAS_CP2_Detail010.dgn
 Horiz. Scale: N/A Vert. Scale: N/A



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	I-70 TWIN TUNNELS CONDUIT AND PULL BOX SCHEDULE		Project No./Code
	No Revisions:		IM 0703-391
	Revised:	Designer: CL Detailer: JMG	19036
Void:	Subset: LIGHTING CP 2	Subset Sheets: 32 of 32	Sheet Number 271

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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 ELECTRICAL CONDUIT AND WILL NOT BE PAID SEPARATELY.
2. ALL CONDUIT SHALL BE SCHEDULE 80 HDPE OR PVC, UNLESS OTHERWISE NOTED, AND AT A MINIMUM DEPTH OF 48 INCHES.
3. ALL FIBER OPTIC SPLICING 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. CONTRACTOR SHALL CONTACT JILL SCOTT, CDOT ITS, AT (303) 512-5805 48 HOURS PRIOR TO RELOCATING ANY ITS DEVICE FOR COORDINATION.
9. FIBER TESTING CANNOT COMMENCE UNTIL ALL FIBER WORK FOR THAT SEGMENT IS COMPLETE.
10. SALVAGE ALL EQUIPMENT TO APPROPRIATE AGENCY; CDOT REGION 1 OR CDOT ITS.
11. CONTRACTOR SHALL COIL 50 LF OF EACH FIBER OPTIC CABLE IN PULL BOXES AND MANHOLES.
12. 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.
13. IT IS ESTIMATED THAT 10 HOURS OF PAY ITEM – POTHOLING WILL BE REQUIRED FOR ITS CONSTRUCTION ACTIVITIES.
14. ALL WIRE SIZED SHALL CONFORM TO THE NATIONAL ELECTRIC CODE. WIRING SHALL BE PAID FOR AS LUMP SUM.
15. IT IS ESTIMATED THAT 4 BUFFER TUBE FAN-OUT KITS WILL BE REQUIRED.
16. WHERE IT IS REQUIRED TO CUT EXISTING PAVEMENT, THE CUTTING SHALL BE DONE TO A NEAT WORK LINE TO THE DESIRED DEPTH WITH A PAVEMENT CUTTING SAW OR OTHER METHOD AS APPROVED BY THE CDOT PROJECT ENGINEER. THIS WILL NOT BE PAID FOR SEPARATELY BUT SHALL BE INCLUDED IN THE COST OF THE WORK.
17. ALL POLES AND CABINETS SHALL BE FEDERAL SPECIFICATION 595 COLOR NO 20059.

ABBREVIATIONS

- ATR AUTOMATIC TRAFFIC RECORDER
- AVE AVENUE
- BLVD BOULEVARD
- CCTV CLOSED CIRCUIT TELEVISION
- CDOT COLORADO DEPARTMENT OF TRANSPORTATION
- COMM COMMUNICATIONS
- EA EACH
- 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>	
		CABINET
		CCTV
	- E - - - - E - - - - E - - -	ELECTRICAL CONDUIT
- ITS - - - - ITS - - - - ITS -	- ITS - - - - ITS - - - - ITS -	ITS CONDUIT
	 	PULL BOX
		MVRD
		TTI
		MANHOLE
		GROUND-MOUNT VMS
		SECONDARY SERVICE PEDESTAL



Print Date: 3/8/2013 File Name: 18832TRAF_CP2_ITSLegend01.dgn Horiz. Scale: NDT TD SCALE Vert. Scale:  4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276		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:	ITS GENERAL NOTES AND LEGEND				Project No./Code IM 0703-391 19036 Sheet Number 272
		Designer: JRD Detailer: JRD Subset: ITS	Structure Numbers Subset Sheets: 1 of 23						

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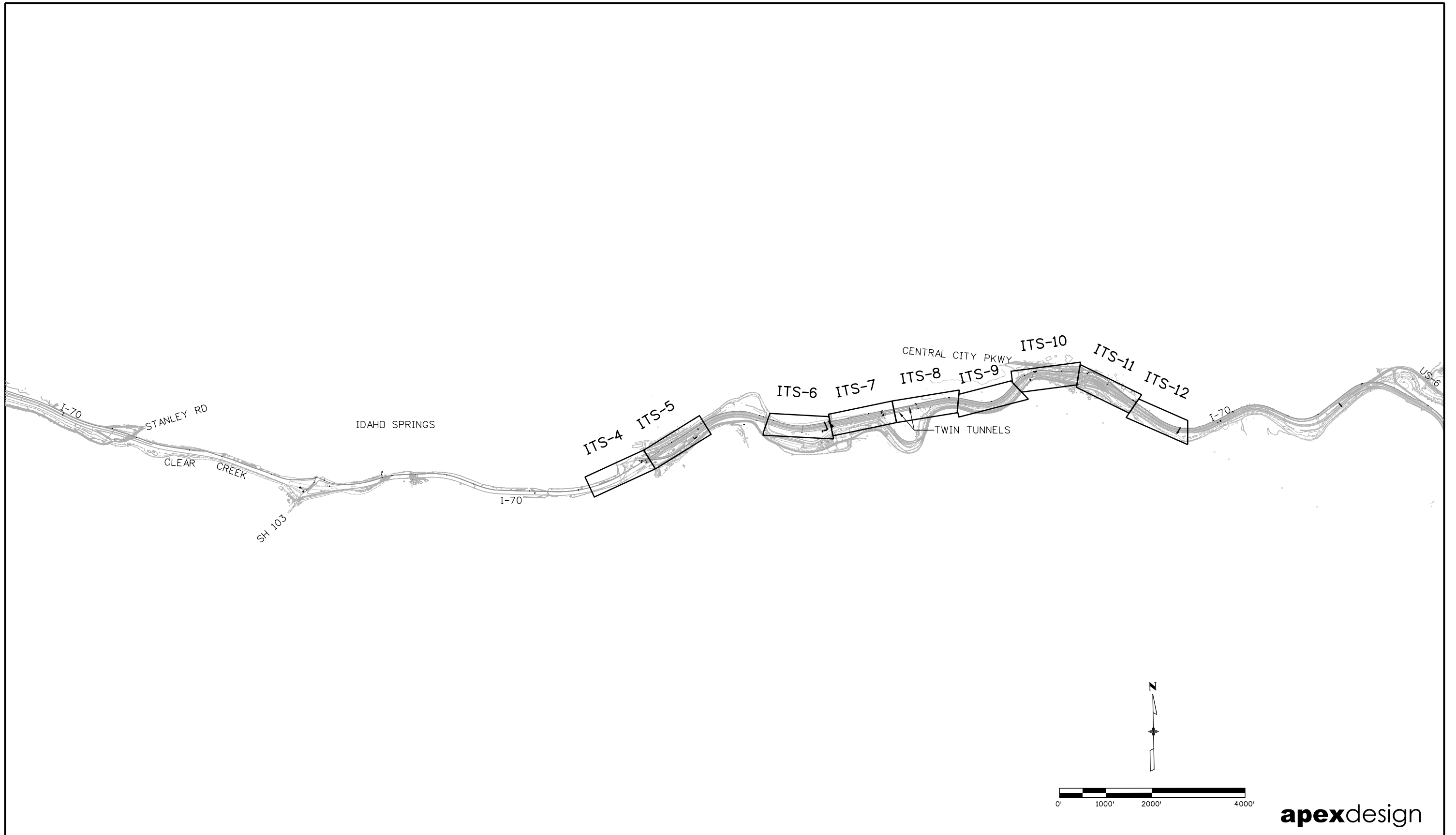
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202-00827	REMOVAL OF PULL BOX	EACH			1							1	
202-00855	REMOVAL OF TRAFFIC SIGNAL CONTROLLER CABINET	EACH					1					1	
203-01597	POTHOLING	HOURL										10	
210-00473	RESET CCTV CAMERAS	EACH							1			1	
210-00476	RESET MICROWAVE VEHICLE RADAR DETECTOR	EACH			1				1			2	
210-00847	RESET TRAVEL TIME INDICATOR	EACH							1			1	
612-00260	LOCATION MARKER (FIBER OPTIC) (DOME)	EACH		1	2	1	1					5	
612-00270	LOCATION MARKER (UTILITY) (FLAT SLAT)	EACH			3	4	2		5			14	
613-00206	2 INCH ELECTRICAL CONDUIT (BORED)	LF			320	130	175		350		270	1,245	
613-01200	2 INCH ELECTRICAL CONDUIT (PLASTIC)	LF		45	325	45	480		940			1,835	
613-04200	2 INCH ELECTRICAL CONDUIT (LIQUIDTIGHT FLEXIBLE METAL)	LF		10	10		10		50			80	
613-07023	PULL BOX (24"X36"X24")	EACH		1	2	1	1					5	
613-07060	PULL BOX (18"X30"X18") (DEEP)	EACH			3	4	2		5			14	
613-10000	WIRING	LS										0.5	
613-32400	LIGHT STANDARD STEEL (40 FOOT)	EACH		1	1		1		1			4	
613-40010	LIGHT STANDARD FOUNDATION	EACH		1	1		1		1			4	
613-50150	SECONDARY SERVICE PEDESTAL	EACH							1			1	
614-72830	COMMUNICATIONS CABINET	EACH			1		1		2			4	
614-72887	MICROWAVE VEHICLE RADAR DETECTOR	EACH		1								1	
614-86007	SERIAL TO IP CONVERTER	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			585	985	275	1,400	1,650	240		5,135	
614-87015	BUFFER TUBE FAN OUT KIT	EACH			3		1					4	
614-87100	AUTOMATIC TRAFFIC RECORDING STATION	EACH				1						1	
614-87320	CLOSED CIRCUIT TELEVISION	EACH			1		1					2	
614-87350	TEST FIBER OPTIC CABLE	LS										1	
614-87661	VIDEO ENCODER	EACH							1			1	
614-87690	ETHERNET SWITCH	EACH		1	1		1		1			4	
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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File Name: 18832TRAF_CP2_ITSSAQ01.dgn		Date:	Comments	Init.			No Revisions:		IM 0703-391			19036	
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ATKINS 4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276							Void:		Detailer: JRD	Subset Sheets: 2 of 23		Sheet Number 273	
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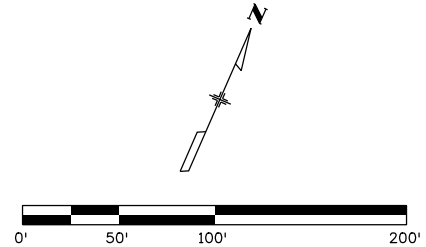
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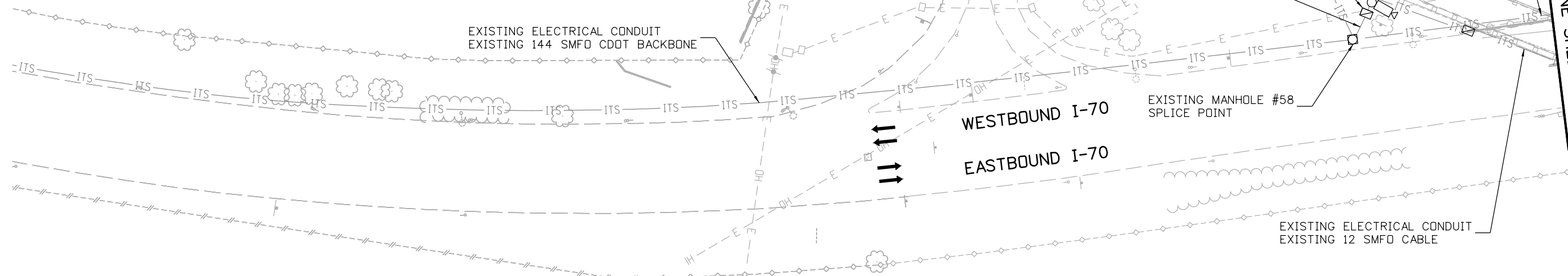


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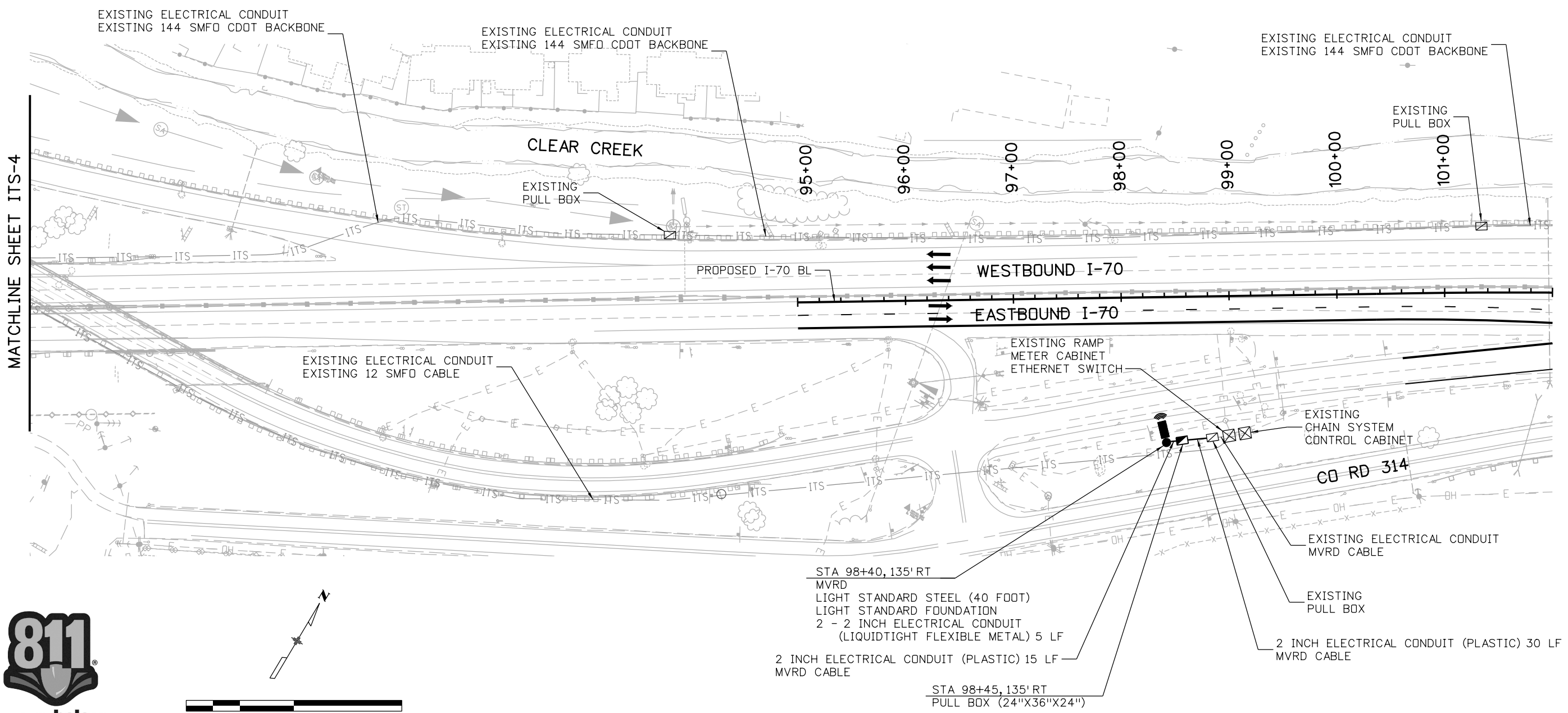
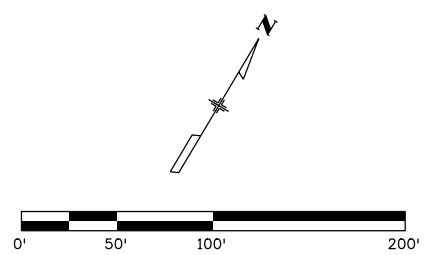


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MATCHLINE SHEET ITS-4



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STA 98+40, 135' RT
MVRD
LIGHT STANDARD STEEL (40 FOOT)
LIGHT STANDARD FOUNDATION
2 - 2 INCH ELECTRICAL CONDUIT
(LIQUIDTIGHT FLEXIBLE METAL) 5 LF
2 INCH ELECTRICAL CONDUIT (PLASTIC) 15 LF
MVRD CABLE

STA 98+45, 135' RT
PULL BOX (24"X36"X24")

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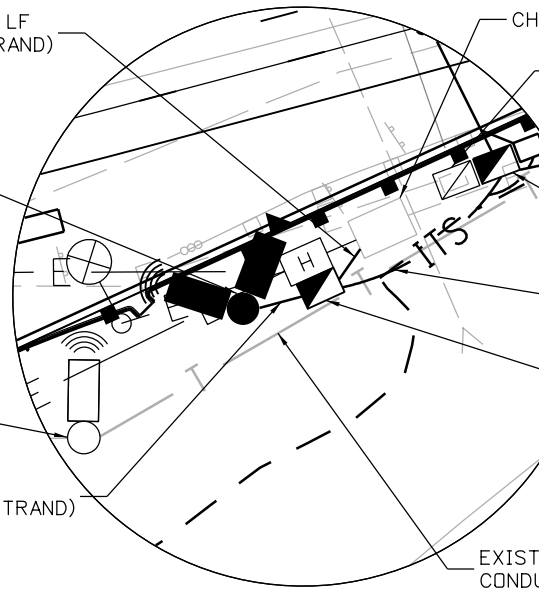
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Horiz. Scale: 1:100 Vert. Scale:						Revised:		Designer: JRD	Structure	19036	
ATKINS 4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276				Region 1 CRC		Void:		Detailer: JRD	Numbers	Sheet Number 276	
								Subset: ITS	Subset Sheets: 5 of 23		

2 INCH ELECTRICAL CONDUIT (PLASTIC) 15 LF
 FIBER OPTIC CABLE (SINGLE MODE) (12 STRAND)
 POWER CONDUCTORS

STA 128+40, 85' RT
 LIGHT STANDARD STEEL (40 FOOT)
 LIGHT STANDARD FOUNDATION
 CCTV
 RESET MVRD
 COMMUNICATIONS CABINET
 FIBER OPTIC TERMINATION PANEL - 6 FIBER
 ETHERNET SWITCH
 CCTV COMPOSITE CABLE
 2 - 2 INCH ELECTRICAL CONDUIT
 (LIQUIDTIGHT FLEXIBLE METAL) 5 LF

EXISTING MVRD TO BE RESET

2 INCH ELECTRICAL CONDUIT (PLASTIC) 15 LF
 2 - FIBER OPTIC CABLES (SINGLE MODE) (12 STRAND)
 POWER CONDUCTORS



DETAIL A

EXISTING ELECTRICAL CONDUIT (ABANDON)

2 - 2 INCH ELECTRICAL CONDUIT (BORED) 70 LF
 FIBER OPTIC CABLE (SINGLE MODE) (12 STRAND)
 TELEPHONE LINE
 POWER CONDUCTORS

2 - 2 INCH ELECTRICAL CONDUIT (BORED) 90 LF
 FIBER OPTIC CABLE (SINGLE MODE) (12 STRAND)
 TELEPHONE LINE
 POWER CONDUCTORS

EXISTING ELECTRICAL CONDUIT
 EXISTING 144 SMFO CDOT BACKBONE
 FIBER OPTIC CABLE (SINGLE MODE) (12 STRAND) 70 LF

2 - 2 INCH ELECTRICAL CONDUIT (PLASTIC) 75 LF
 TELEPHONE LINE
 POWER CONDUCTORS

STA 128+95, 86' LT
 PULL BOX (18"X30"X18")

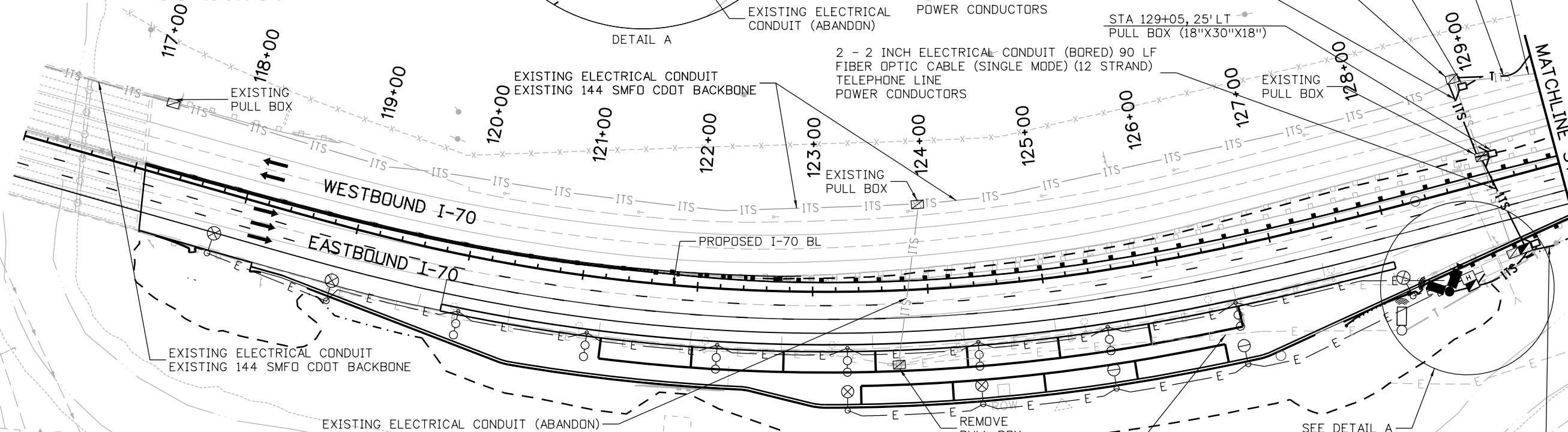
EXISTING PULL BOX

STA 129+05, 25' LT
 PULL BOX (18"X30"X18")

EXISTING PULL BOX

STA 129+00

MATCHLINE STA 129+60



EXISTING ELECTRICAL CONDUIT
 EXISTING 144 SMFO CDOT BACKBONE

EXISTING ELECTRICAL CONDUIT (ABANDON)

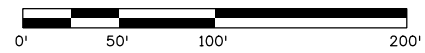
CLEAR CREEK

EXISTING ELECTRICAL CONDUIT (ABANDON)

2 INCH ELECTRICAL CONDUIT (PLASTIC) 25 LF
 TELEPHONE LINE



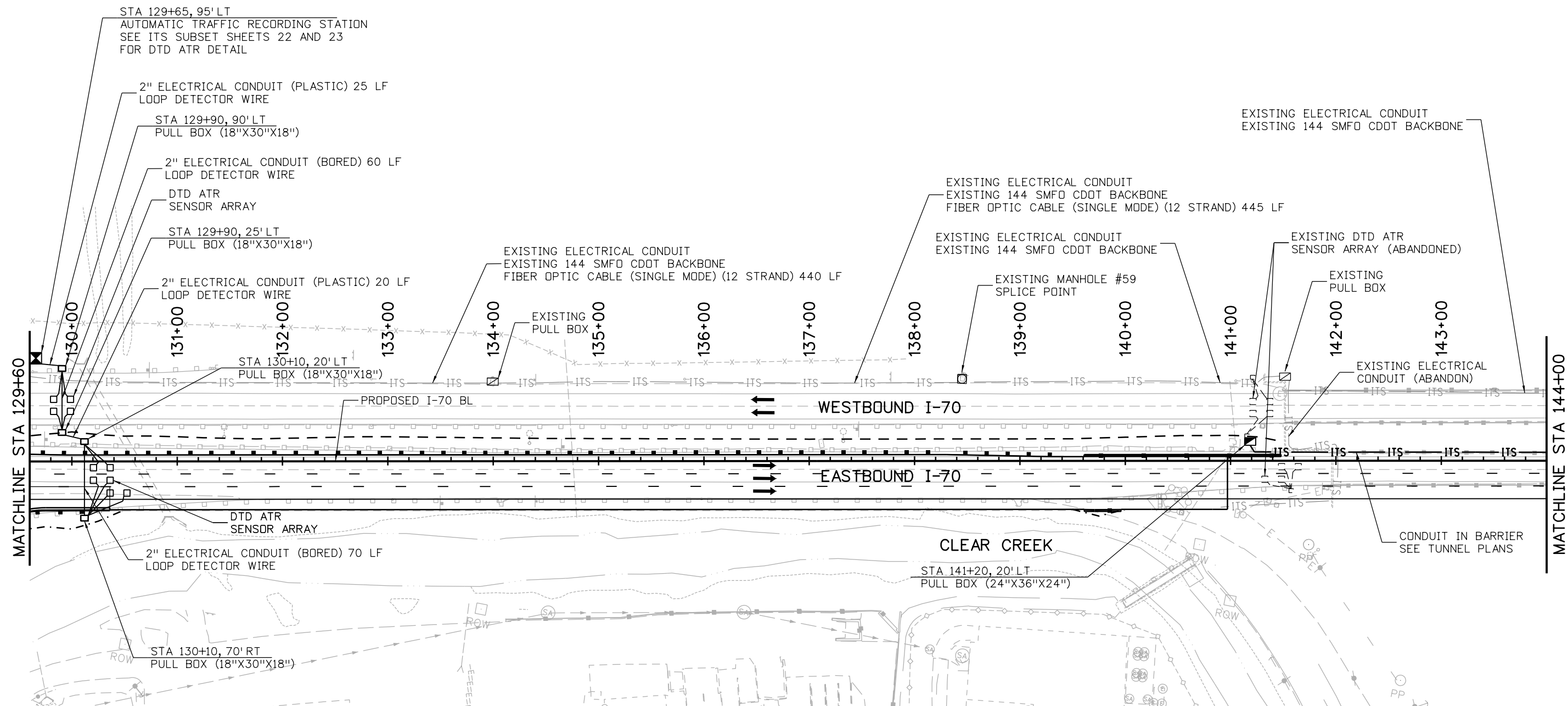
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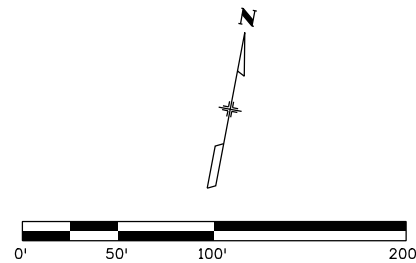
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Region 1 CRC

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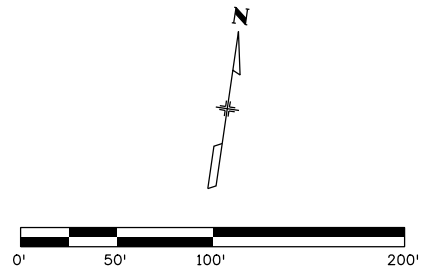
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Project No./Code	
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	19036
Sheet Number	278

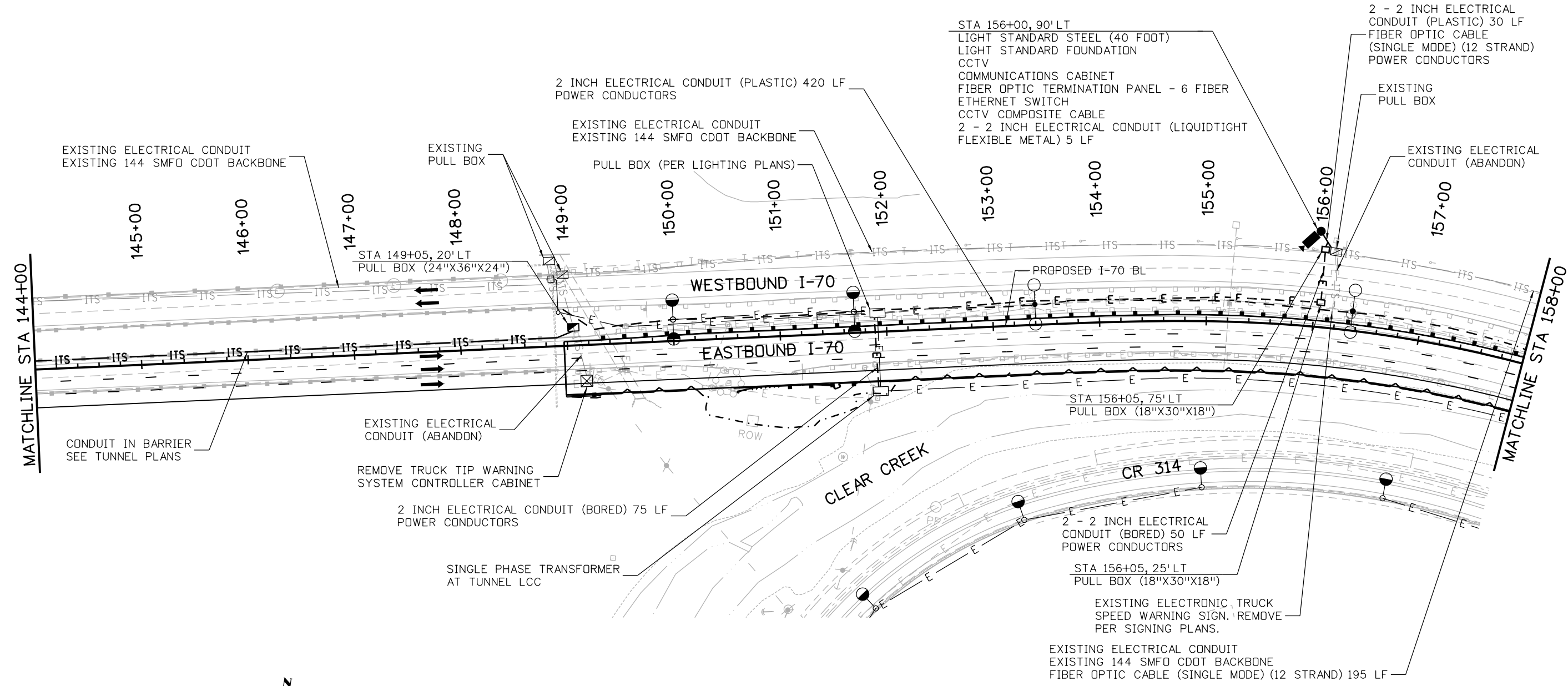
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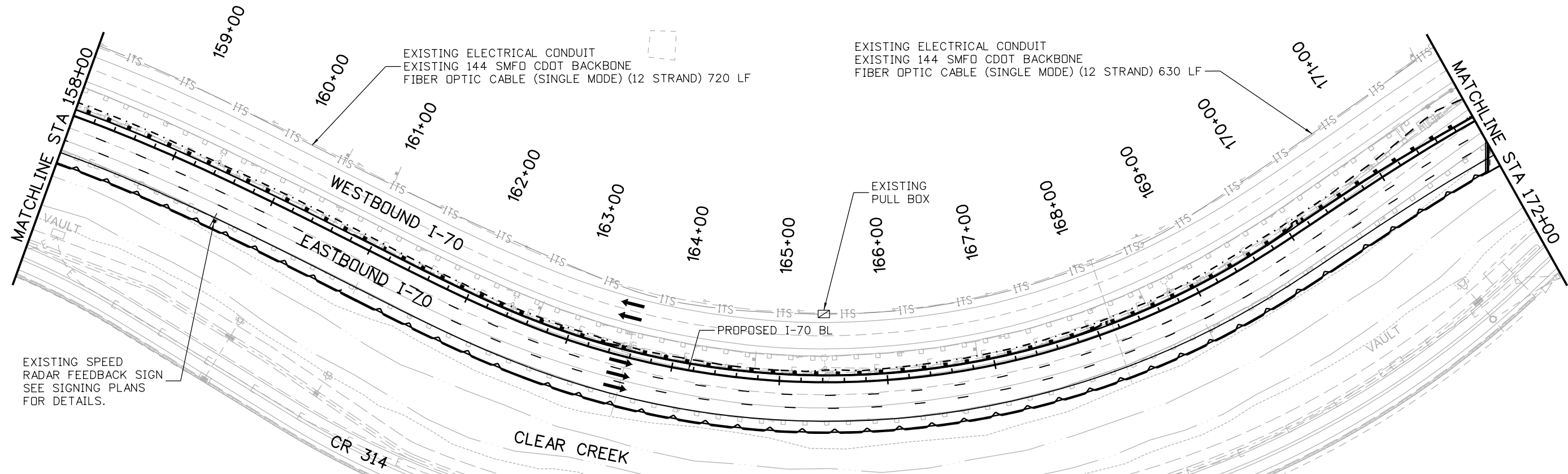
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ITS PLAN STA 144+00 to 158+00			
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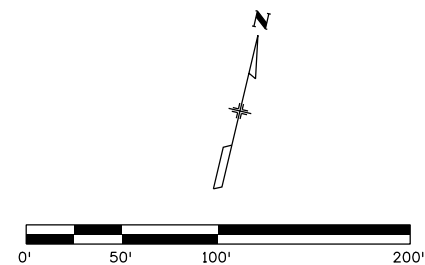
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EXISTING SPEED
RADAR FEEDBACK SIGN
SEE SIGNING PLANS
FOR DETAILS.



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ITS PLAN			
STA 158+00 TO 172+00			
Designer:	JRD	Structure	
Detailer:	JRD	Numbers	
Subset:	ITS	Subset Sheets:	9 of 23

Project No./Code
IM 0703-391
19036
Sheet Number 280

Jason.Duffy 7:47:41 AM c:\pwwork\pws\jpw\common\dms21566\18832TRAF_CP2_ITSPan006.dgn

STA 176+80, 100' LT
 LIGHT STANDARD STEEL (40 FOOT)
 LIGHT STANDARD FOUNDATION
 RESET CCTV
 RESET MVRD
 COMMUNICATIONS CABINET
 ETHERNET SWITCH
 VIDEO ENCODER
 2 - 2 INCH ELECTRICAL CONDUIT (LIQUIDTIGHT FLEXIBLE METAL) 5 LF

2 - 2 INCH ELECTRICAL CONDUIT (PLASTIC) 25 LF
 RE-PULL EXISTING FIBER OPTIC CABLE
 CAT5e ETHERNET CABLE
 POWER CONDUCTORS

STA 176+55, 100' LT
 PULL BOX (18"X30"X18")

EXISTING PULL BOX

EXISTING CCTV TO BE RESET TO STA 176+80, 100' LT
 EXISTING MVRD TO BE RESET TO STA 176+80, 100' LT

2 INCH ELECTRICAL CONDUIT (PLASTIC) 270 LF
 POWER CONDUCTORS

2 INCH ELECTRICAL CONDUIT (PLASTIC) 265 LF
 POWER CONDUCTORS
 2 INCH ELECTRICAL CONDUIT (PLASTIC) 5 LF
 POWER CONDUCTORS
 2 INCH ELECTRICAL CONDUIT (PLASTIC) 10 LF
 POWER CONDUCTORS

STA 184+60, 140' LT
 PULL BOX (18"X30"X18")

2 INCH ELECTRICAL CONDUIT (PLASTIC) 320 LF
 POWER CONDUCTORS

STA 184+65, 145' LT
 SECONDARY SERVICE PEDESTAL

STA 178+90, 85' LT
 PULL BOX (18"X30"X18")

STA 181+40, 90' LT
 PULL BOX (18"X30"X18")

EXISTING PULL BOX

PROPOSED I-70 BL

EXISTING PULL BOX

WESTBOUND I-70
 EASTBOUND I-70

EXISTING ELECTRICAL CONDUIT (ABANDON)

2 - 2 INCH ELECTRICAL CONDUIT (BORED) 175 LF
 CAT5e ETHERNET CABLE
 POWER CONDUCTORS

STA 175+60, 64' RT
 PULL BOX (18"X30"X18")

2 INCH ELECTRICAL CONDUIT (PLASTIC) 20 LF
 CAT5e ETHERNET CABLE
 POWER CONDUCTORS

STA 175+40, 50' RT
 RESET TTI ON SIGN STRUCTURE
 COMMUNICATIONS CABINET
 SERIAL TO IP CONVERTER

2 - 2 INCH ELECTRICAL CONDUIT (LIQUIDTIGHT FLEXIBLE METAL) 20 LF

EXISTING ELECTRICAL CONDUIT
 EXISTING 144 SMFO CDOT BACKBONE
 FIBER OPTIC CABLE (SINGLE MODE) (12 STRAND) 600 LF

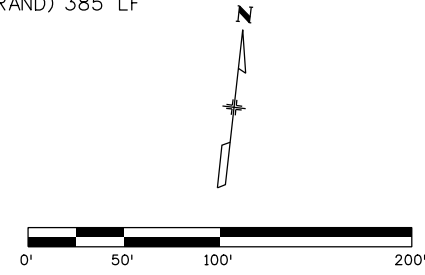
EXISTING ELECTRICAL CONDUIT
 EXISTING 144 SMFO CDOT BACKBONE
 FIBER OPTIC CABLE (SINGLE MODE) (12 STRAND) 215 LF

EXISTING ELECTRICAL CONDUIT
 EXISTING 144 SMFO CDOT BACKBONE
 FIBER OPTIC CABLE (SINGLE MODE) (12 STRAND) 385 LF

EXISTING ELECTRICAL CONDUIT
 EXISTING 144 SMFO CDOT BACKBONE
 FIBER OPTIC CABLE (SINGLE MODE) (12 STRAND) 300 LF



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Sheet Revisions		
Date:	Comments	Init.

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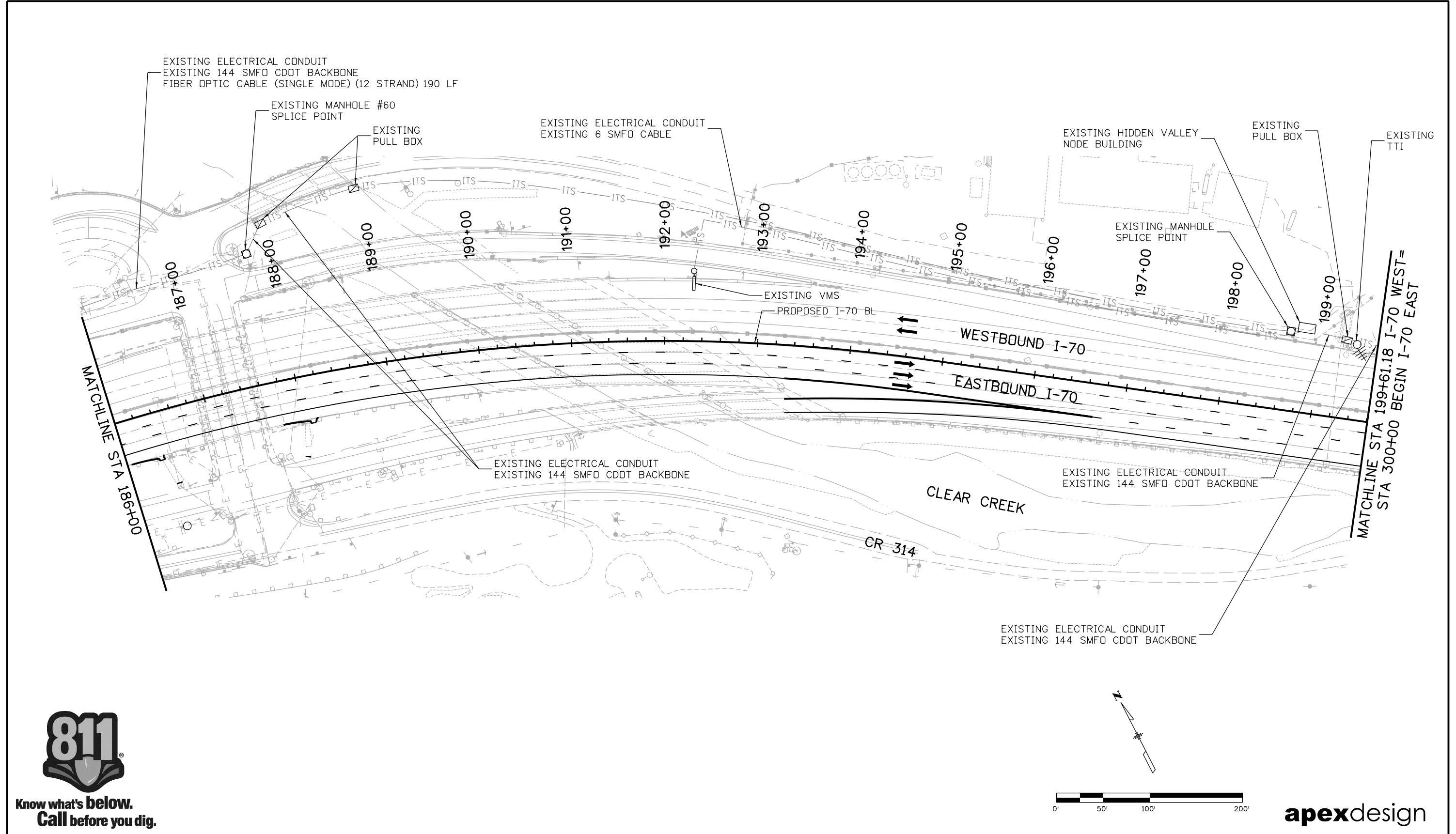
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ITS PLAN STA 172+00 TO 186+00			
Designer:	JRD	Structure Numbers	
Detailer:	JRD	Subset Sheets: 10 of 23	

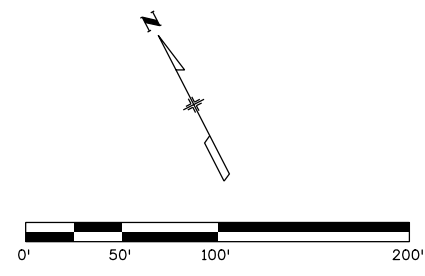
Project No./Code
IM 0703-391
19036
Sheet Number 281

Jason.Duffy 7:47:53 AM c:\pw\work\pbb\jpw\common\dms21566_18832TRAF_CP2_ITSPan007.dgn

Jason.Duffy 7:46:06 AM c:\pw_work\kpb\jw\1\common\dms21566\18832TRAF_CP2_ITSPlan008.dgn



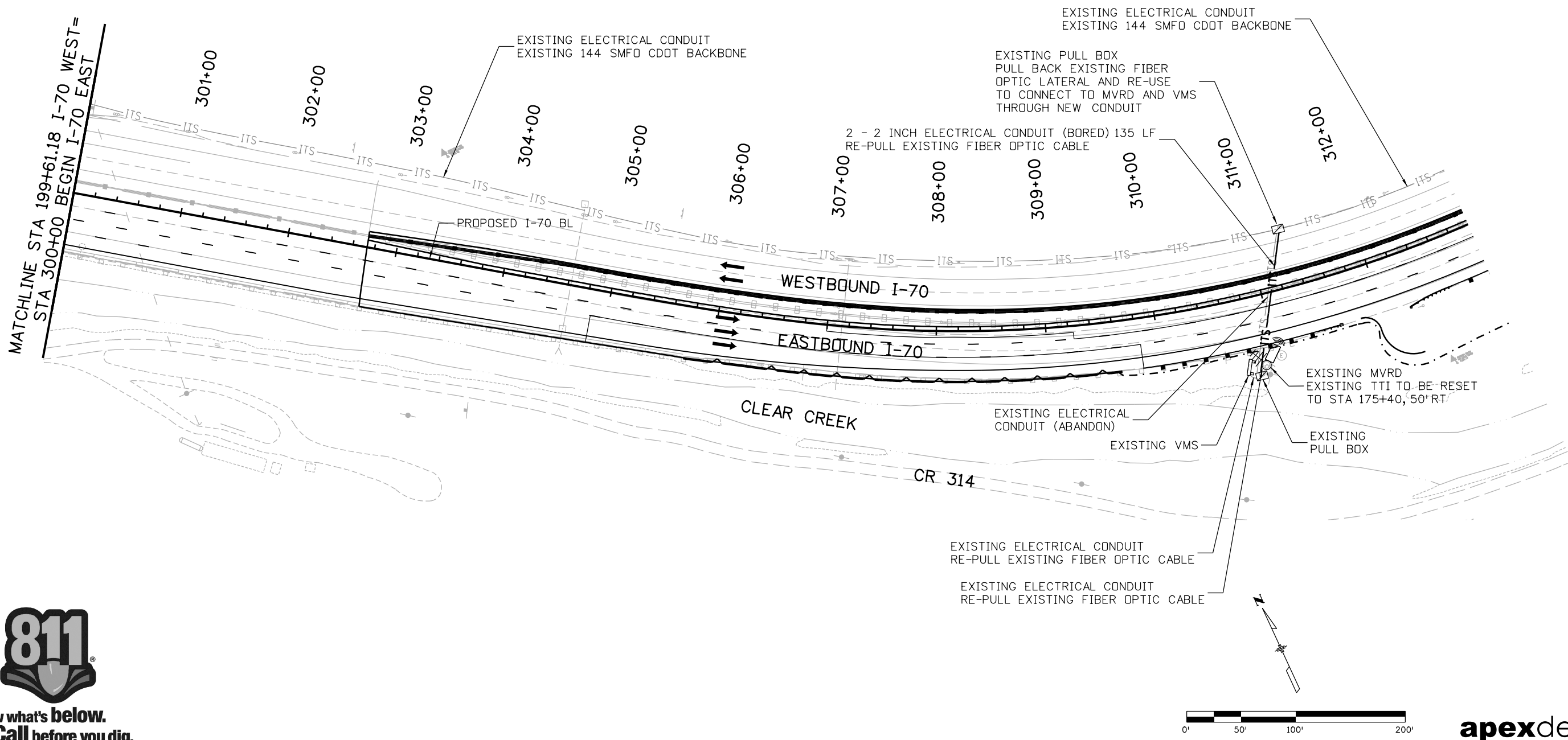
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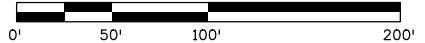
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Print Date: 3/8/2013	0000	Sheet Revisions			Colorado Department of Transportation		As Constructed		ITS PLAN		Project No./Code	
File Name: 18832TRAF_CP2_ITSPlan008.dgn		Date:	Comments	Init.	425 A Corporate Circle Golden, CO 80401 Phone: 720-497-6918 FAX: 720-497-6901		No Revisions:		STA 186+00 TO 199+61.18/300+00.00		IM 0703-391	
Horiz. Scale: 1:100 Vert. Scale:							Region 1 CRC		Revised:		Designer: JRD	Structure Numbers
ATKINS 4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276						Void:		Detailer: JRD	Subset Sheets: 11 of 23	Sheet Number 282		

MATCHLINE STA 199+61.18 I-70 WEST=
STA 300+00 BEGIN I-70 EAST=



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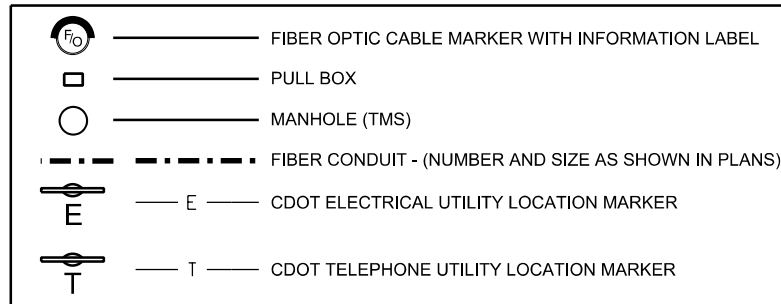
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ITS PLAN			
STA 300+00 TO 313+00			
Designer:	JRD	Structure	
Detailer:	JRD	Numbers	
Subset:	ITS	Subset Sheets:	12 of 23

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Sheet Number 283

Jason.Duffy 7:48:19 AM c:\pwwork\pws\jpw\common\dms21566\18832TRAF_CP2_ITSPan009.dgn

LEGEND



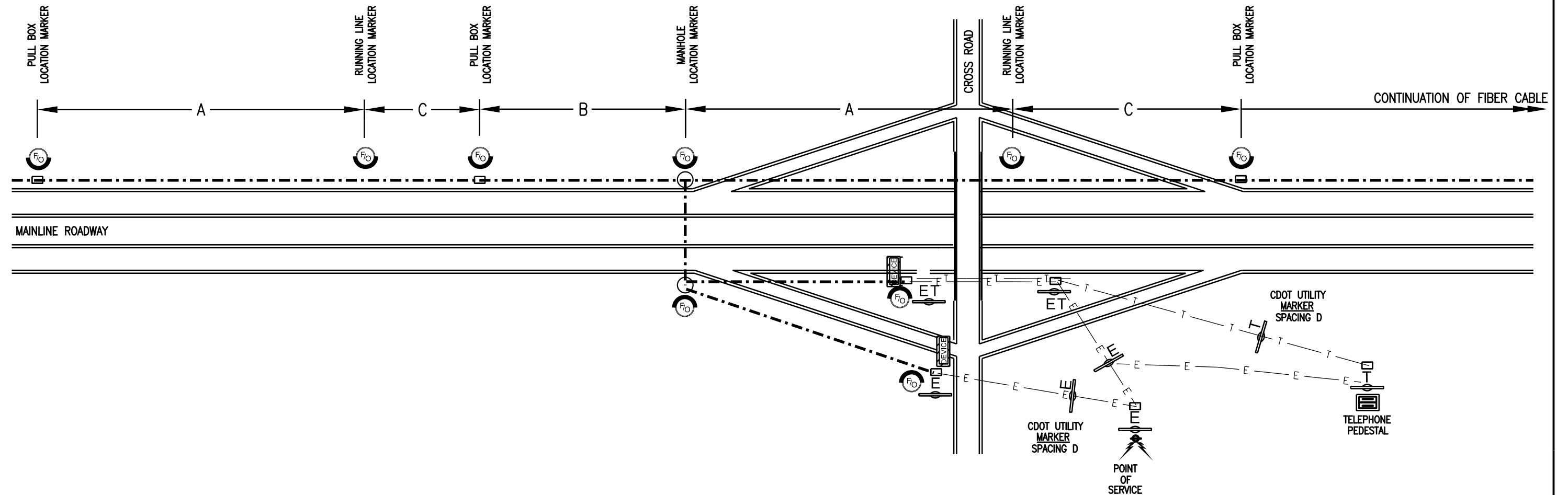
LOCATION MARKER SPACING

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.



Print Date: 3/8/2013
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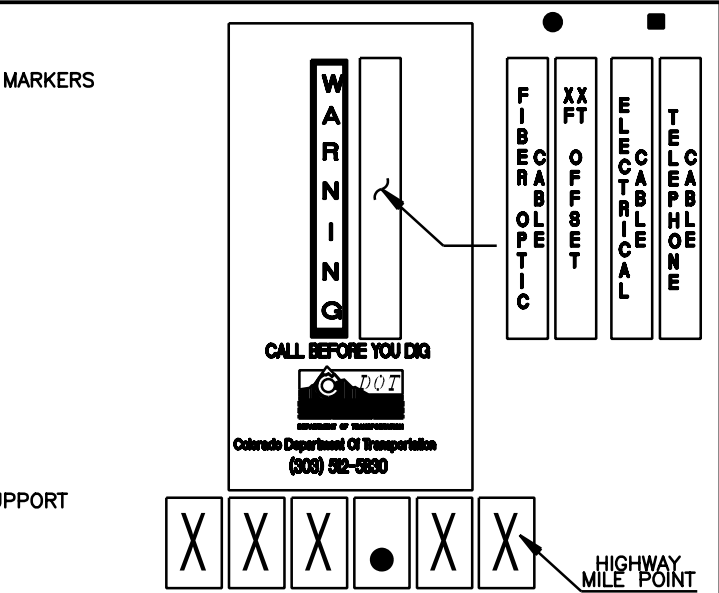
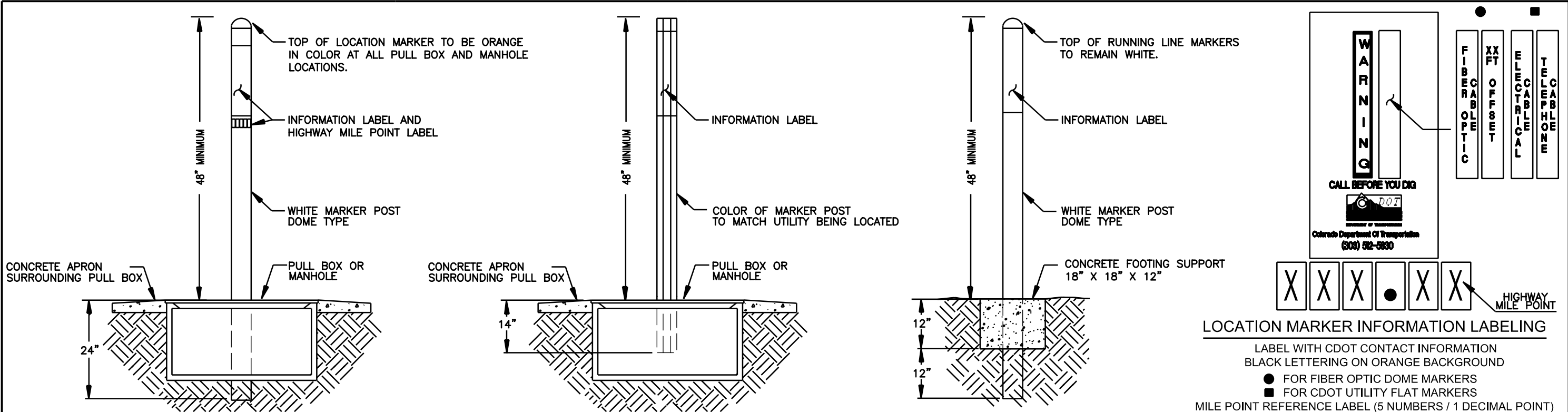
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Date:	Comments	Init.

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FIBER OPTIC AND UTILITY MARKER DETAIL			
Designer:	CDOT	Structure Numbers	
Detailer:	CDOT		
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	19036
Sheet Number	284



LOCATION MARKER INFORMATION LABELING

LABEL WITH CDOT CONTACT INFORMATION
 BLACK LETTERING ON ORANGE BACKGROUND

- FOR FIBER OPTIC DOME MARKERS
- FOR CDOT UTILITY FLAT MARKERS

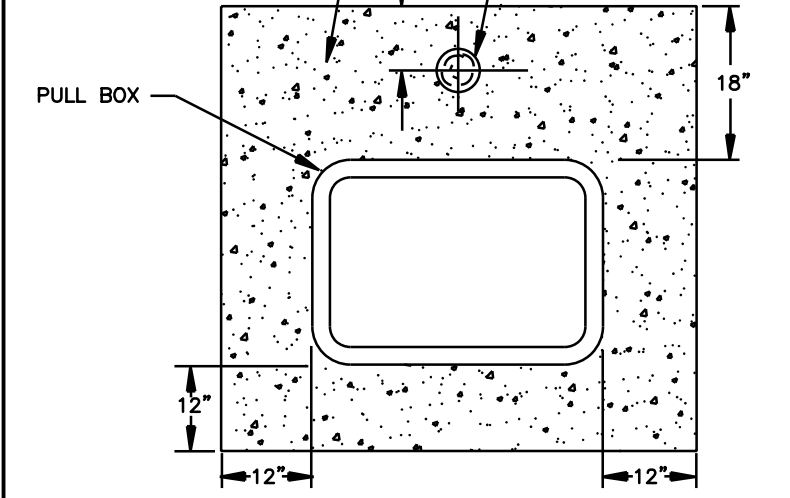
MILE POINT REFERENCE LABEL (5 NUMBERS / 1 DECIMAL POINT)
 MILE POINT DESIGNATION TO BE TO 100TH OF A MILE
 BLACK NUMBERS WITH WHITE BACKGROUND

FIBER OPTIC RUNNING LINE LOCATION MARKER

3" x 6" DOME TYPE POST
 (ITEM - LOCATION MARKER (FIBER OPTIC)(DOME))

CONCRETE APRON SURROUNDING PULL BOX AND CABLE MARKER
 COMPACT SURROUNDING AREA WITH EXCAVATED MATERIAL

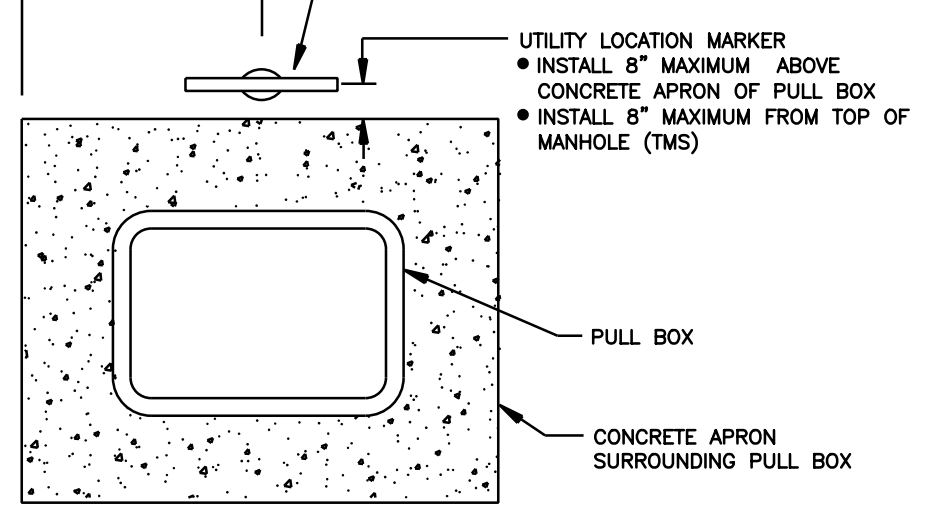
FIBER OPTIC CABLE LOCATION MARKER
 ● INSTALLED 14" FROM TOP OF PULL BOX (IN CONCRETE APRON)
 ● INSTALLED 8" FROM TOP OF MANHOLE (TMS)



PULL BOX AND MANHOLE FIBER OPTIC LOCATION MARKER

3" x 6" DOME TYPE POST
 (ITEM - LOCATION MARKER (FIBER OPTIC)(DOME))

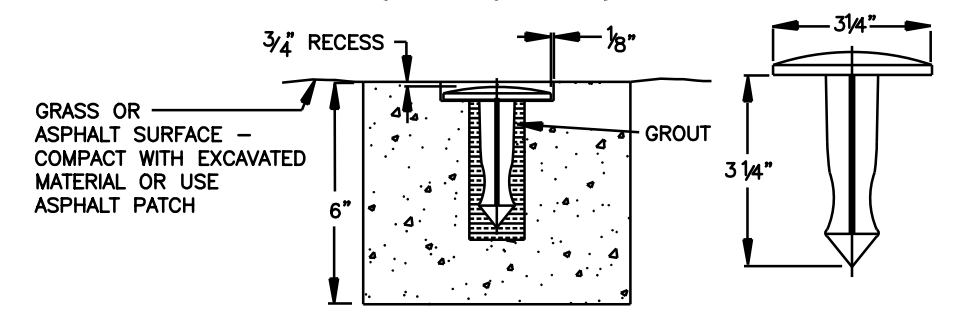
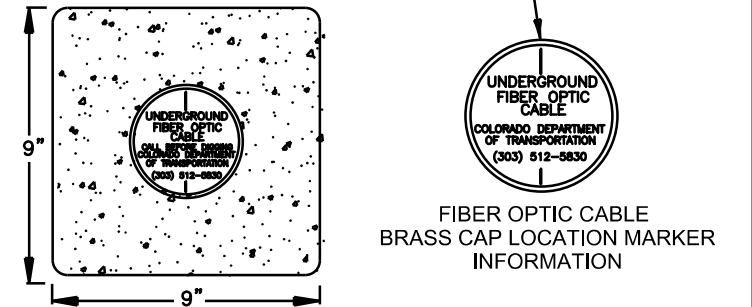
1/2 CONCRETE APRON (PULL BOX)
 CDOT UTILITY LOCATION MARKER



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)

REFERENCE MARKS TO RUN PARALLEL WITH FIBER OPTIC CABLE LINE



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: 3/8/2013
 File Name: CP2_Fiber Marker Sheets 02.dgn
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Region 1 **CRC**

As Constructed	FIBER OPTIC AND UTILITY MARKER DETAIL	
No Revisions:	Designer: CDOT	Structure Numbers
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Void:	Subset: ITS	Subset Sheets: 14 of 23

Project No./Code
IM 0703-391
19036
Sheet Number 285

Jason.Duffy 7:56:05 AM P:\Projects\PI20109 - Twin Tunnels\18832\Traffic\ITS Drawings\CP2_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)

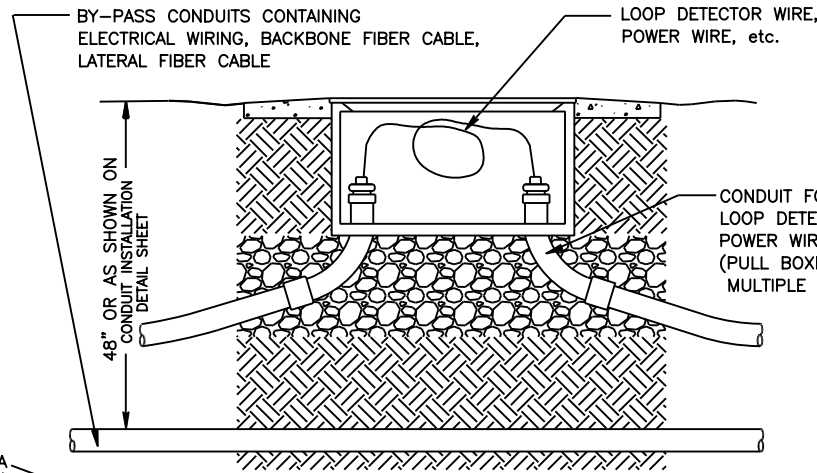
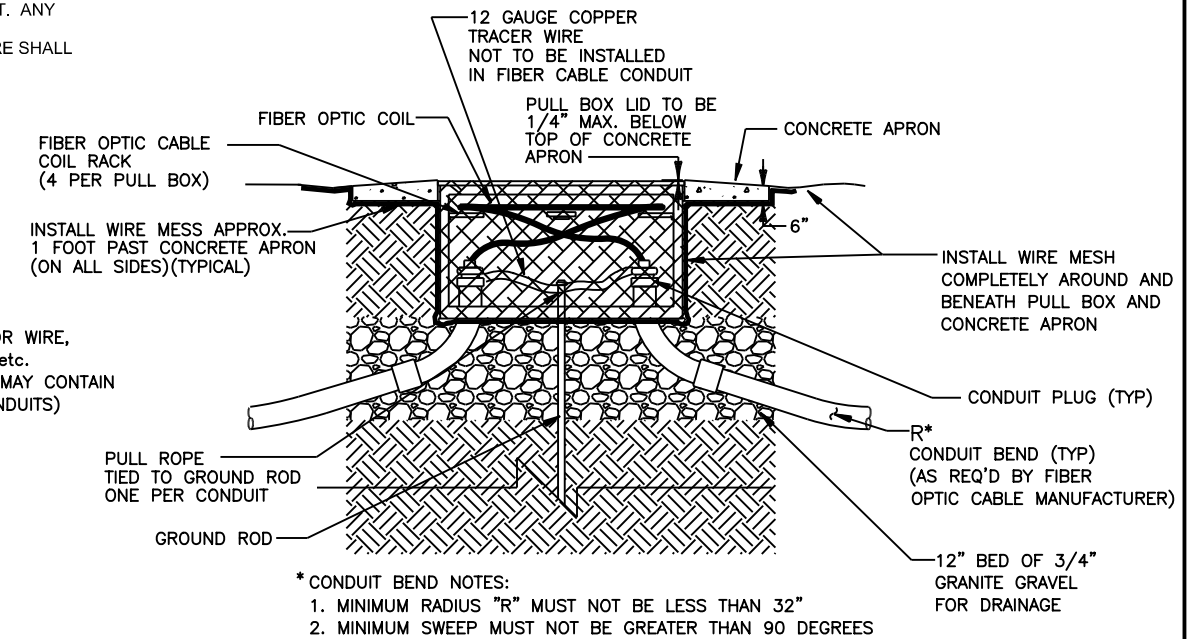
FIBER CABLE LABEL

TO BE ATTACHED TO EACH FIBER OPTIC CABLE LOCATED IN ALL PULL BOX AND ITS MANHOLES

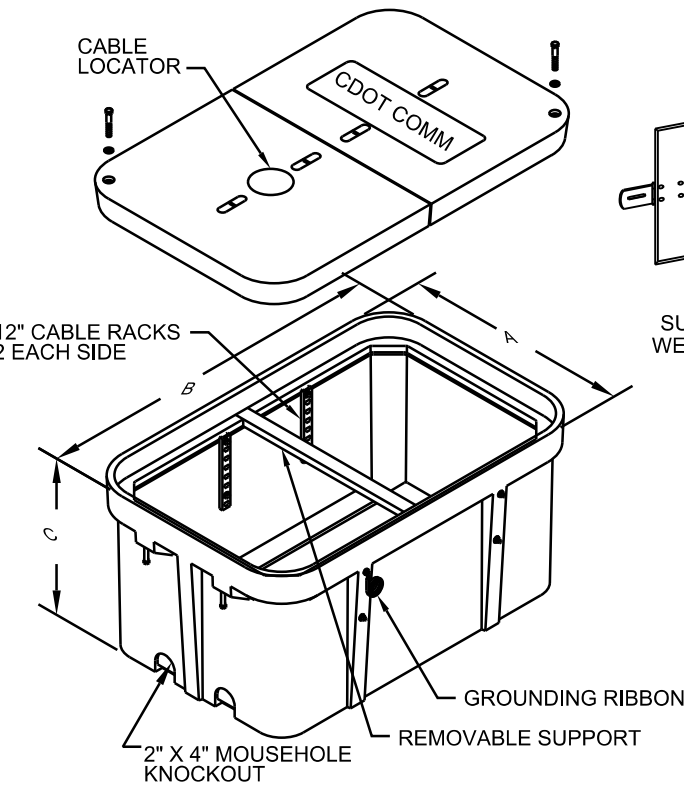
ITS PULL BOX TYPE	MINIMUM DIMENSIONS (Inches)			Knockout Mouse Hole Type
	A	B	C	
PULL BOX - (13" x 24" x 18")	13	24	18	2
PULL BOX - (24" x 36" x 24")	24	36	24	4
PULL BOX - (36" x 40" x 24")	36	40	24	4
PULL BOX - (SURFACE MOUNTED)	24	24	8	NA

PULL BOX NOTES:

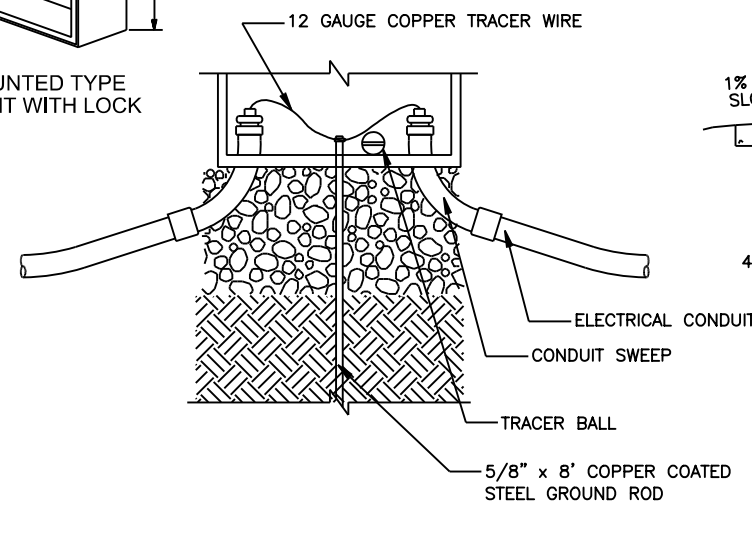
1. CONDUITS DEPICTED ON THIS SHEET ARE REPRESENTATIVE ONLY. EXACT NUMBER OF CONDUITS INSTALLED AND CONDUIT SIZE SHALL BE AS TABULATED AND SHOWN ON THE PLANS.
2. DESIGNATION FOR THE INSTALLTION OF ELECTRICAL WIRING AND FIBER OPTIC CABLE IN THE BACKBONE CONDUIT SYSTEM IS DESCRIBED IN THE PROJECT SPECIFICATIONS.
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.



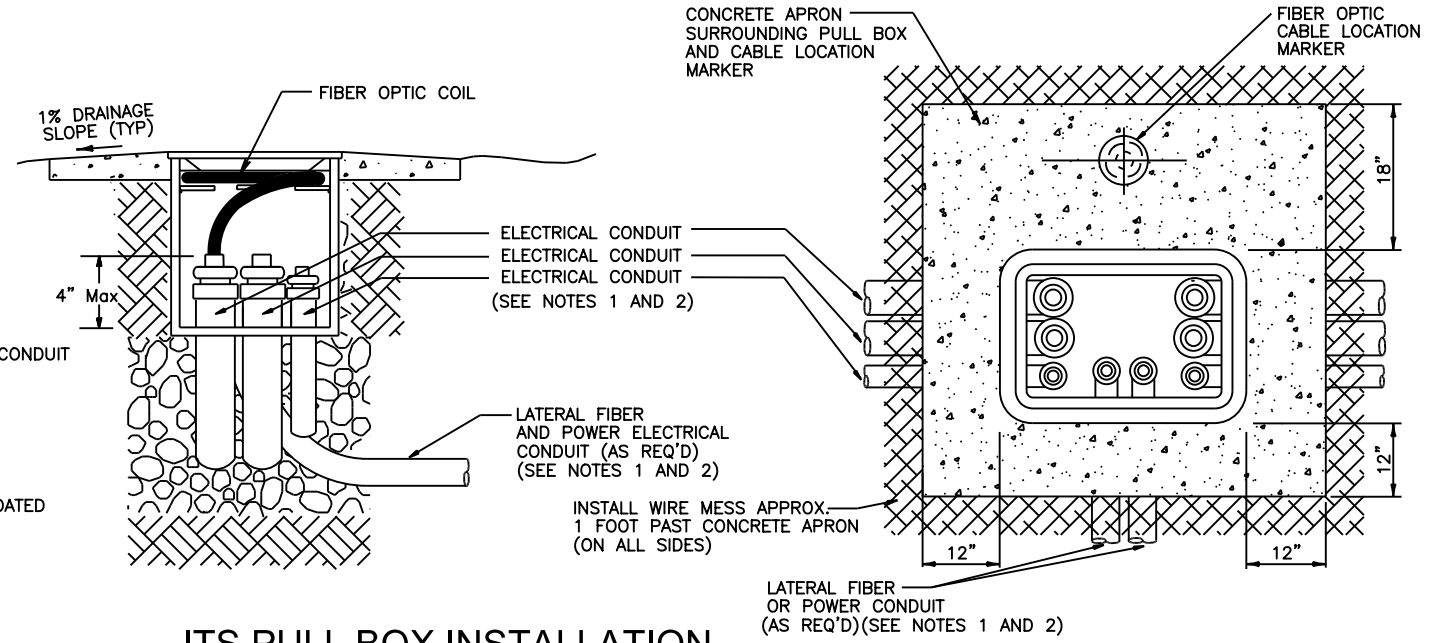
CONDUIT BYPASS DETAIL



2' X 3' BOX (or LARGER)



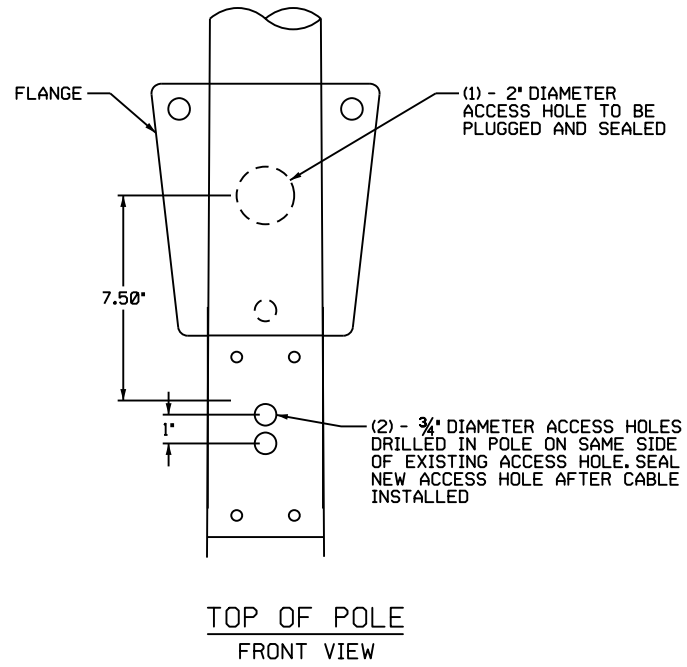
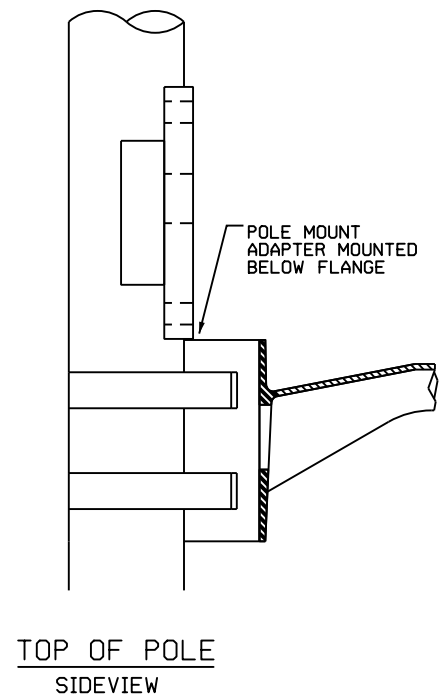
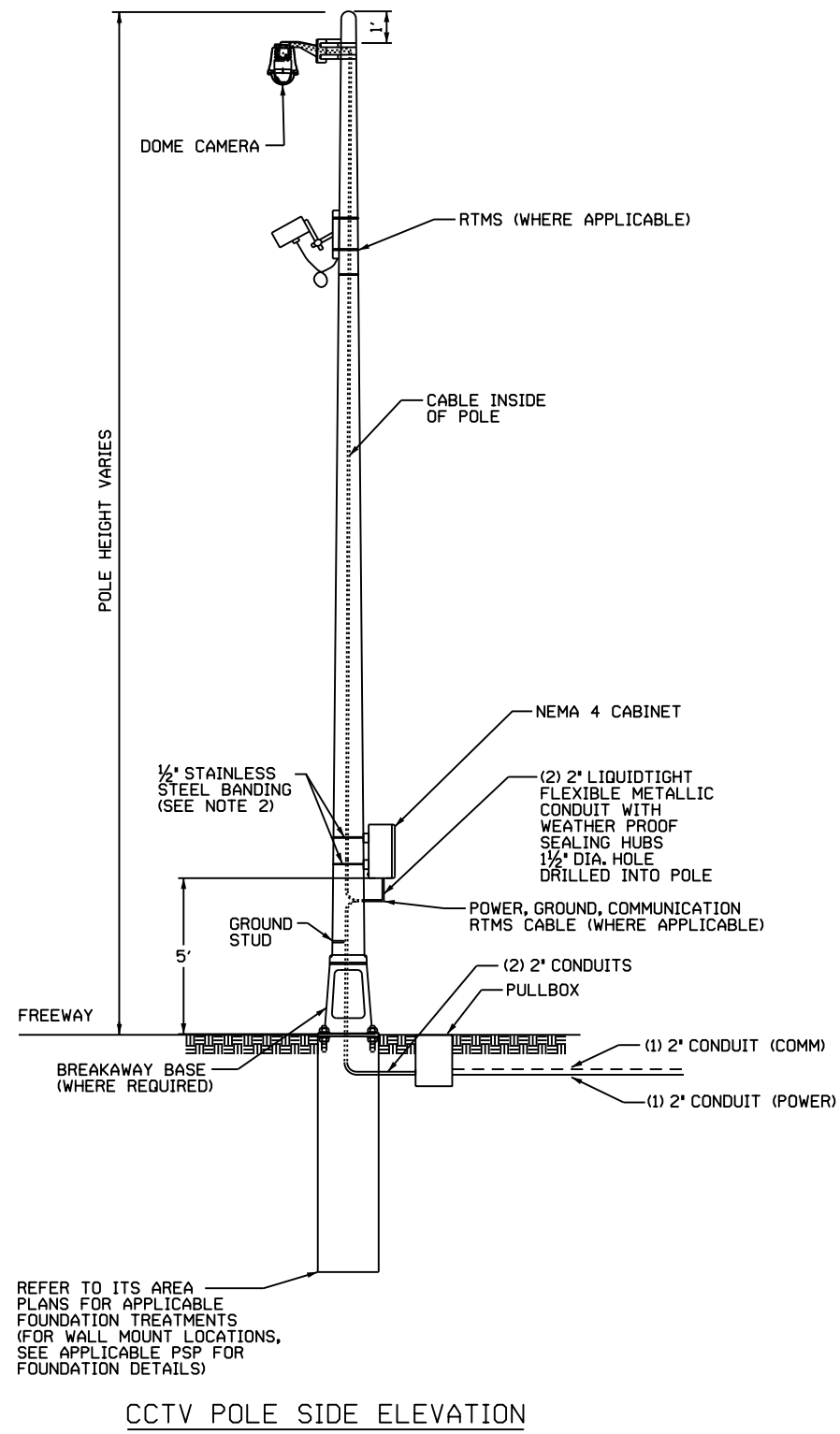
GROUNDING DETAIL



ITS PULL BOX INSTALLATION

Print Date: 3/8/2013	Sheet Revisions			Colorado Department of Transportation	As Constructed	PULL BOX DETAIL		Project No./Code
File Name: CP2_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		IM 0703-391
Horiz. Scale: NTS Vert. Scale:					Revised:	Detailer: CDOT		19036
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				CRC		Subset Sheets: 15 of 23		

Jason.Duffy 7:56:08 AM P:\Projects\PI20109 - Twin Tunnels\18832\Traffic\ITS Drawings\CP2_CCTV Pole.dgn



- 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.
 4. ALL POLES FOR CCTV CAMERAS AND OTHER ITS DEVICES SHALL BE FEDERAL SPECIFICATION 595 COLOR NO 20059.

Print Date: 3/8/2013	
File Name: CP2_CCTV Pole.dgn	
Horiz. Scale: NTS Vert. Scale:	
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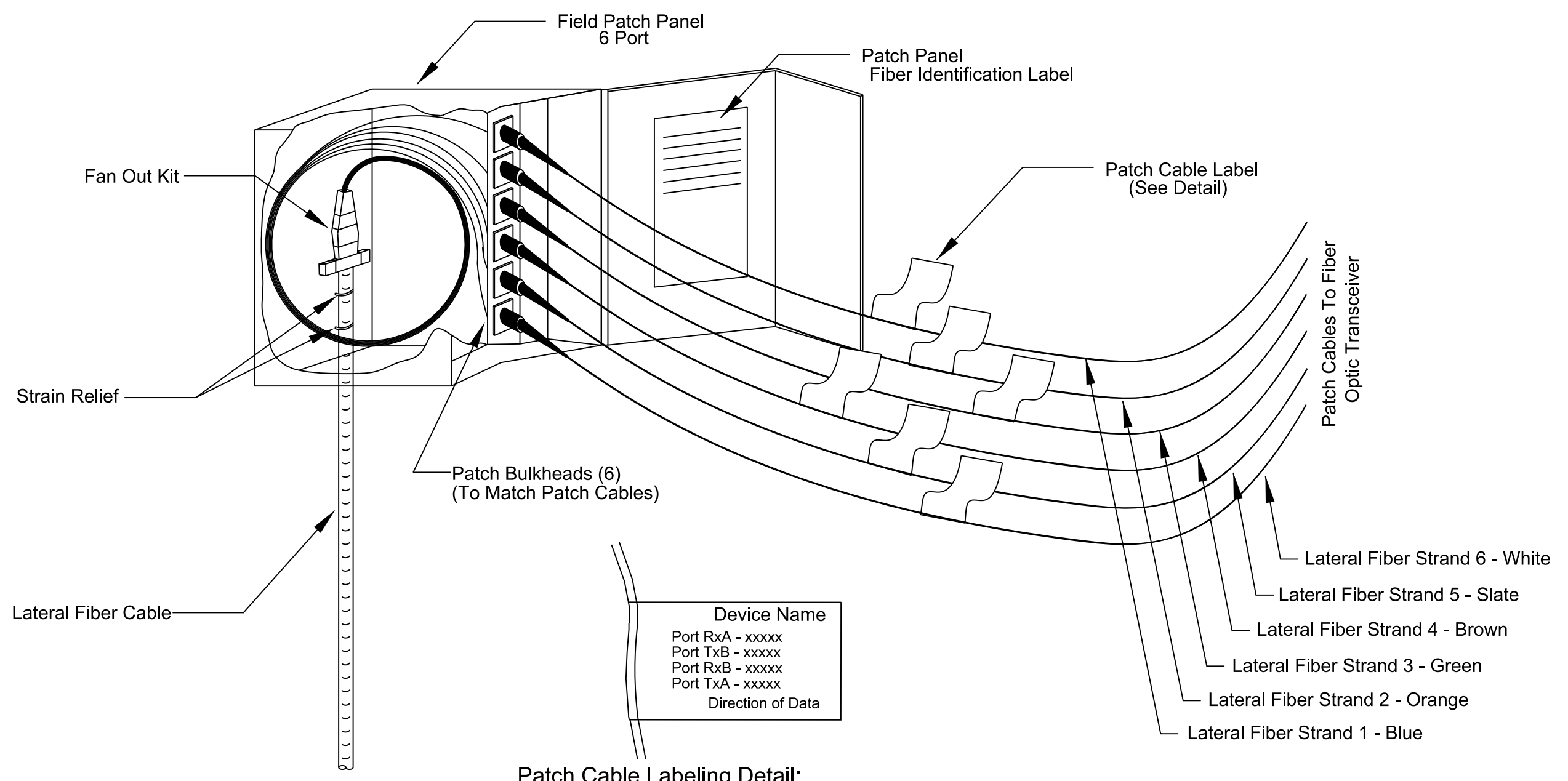
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CCTV POLE DETAIL			
Designer:	CDOT	Structure Numbers	
Detailer:	CDOT		
Subset:	ITS	Subset Sheets: 16 of 23	

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19036
Sheet Number 287



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 7:56:09 AM P:\Projects\PI20109 - Twin Tunnels\18832\Traffic\ITS\Drawings\CP2_6 Termination Field Panel.dgn

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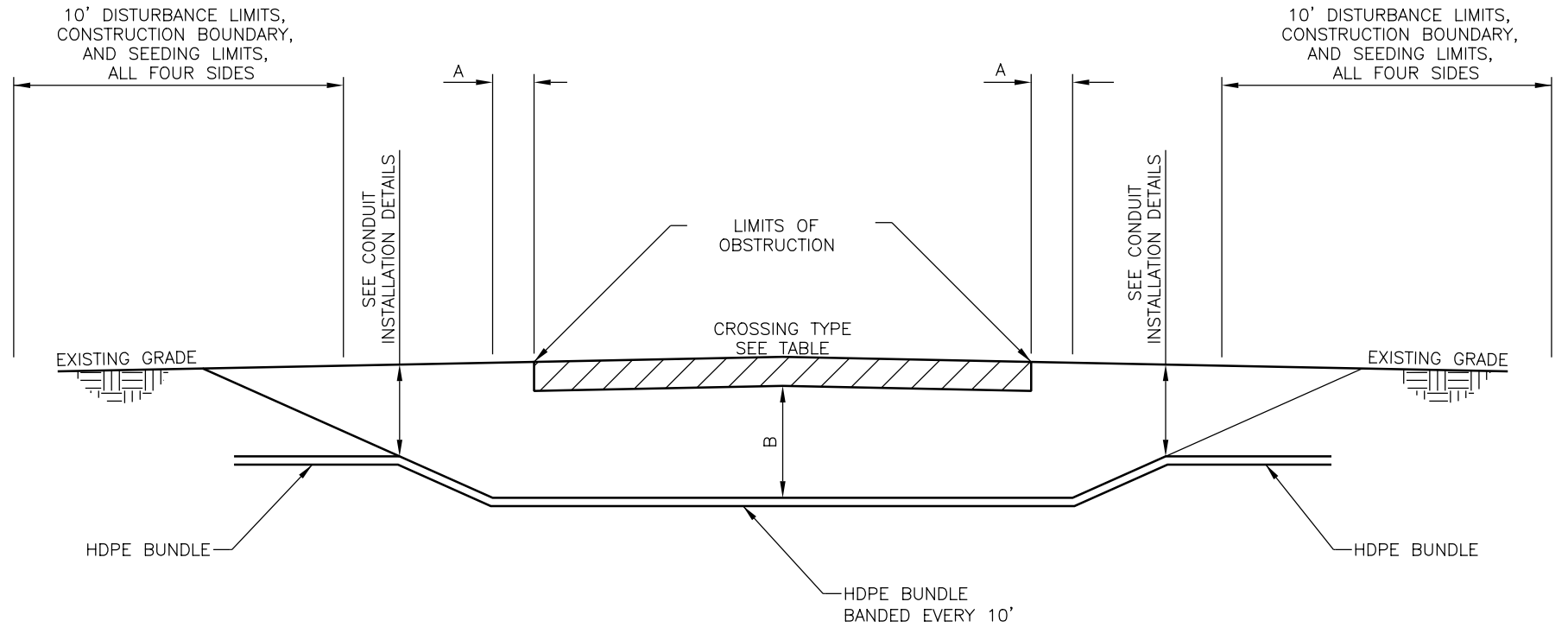
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Subset:	ITS	Subset Sheets: 17 of 23	

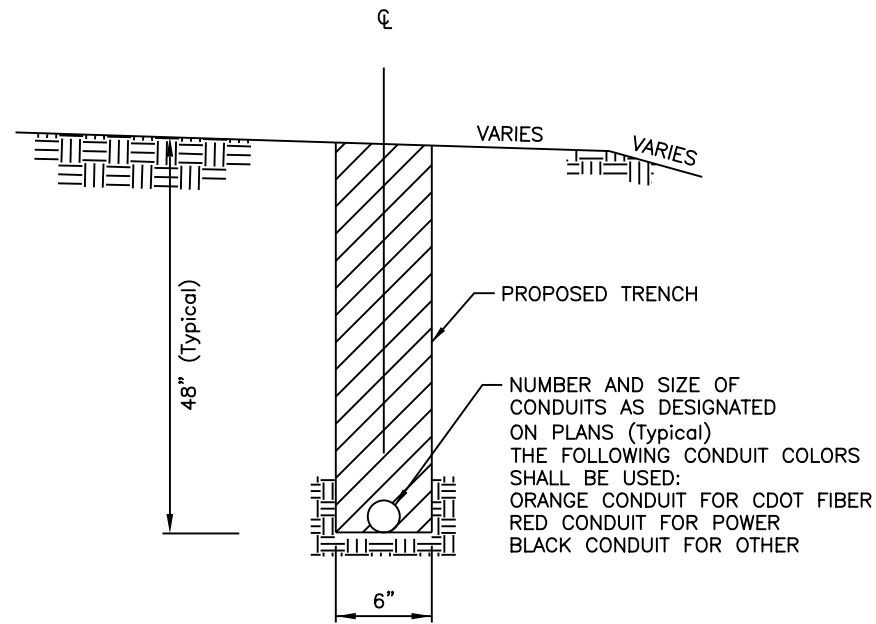
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19036
Sheet Number 288

NOTES:

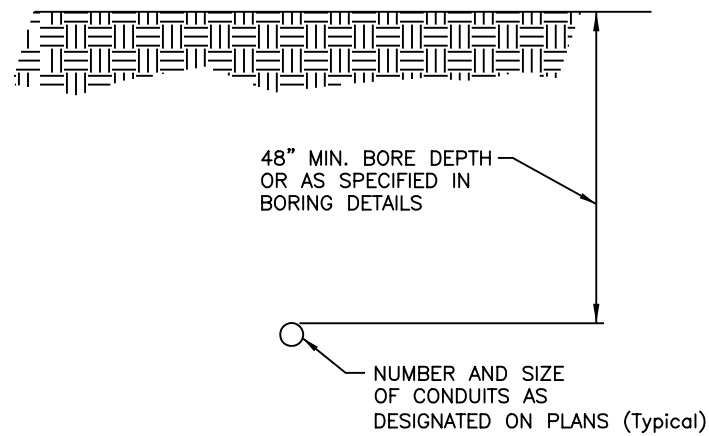
1. CONTRACTOR SHALL CONFORM TO THE APPLICABLE AGENCY REQUIREMENTS AND SPECIFICATION FOR BORE CROSSINGS.
2. EXCAVATIONS AND DISTURBANCE LIMITS REQUIRE SEEDING AND MULCHING.
3. CONTRACTOR SHALL BACKFILL AND REGRADE SITE TO MATCH EXISTING CONDITIONS.
4. CONTRACTOR MUST REPAIR ANY DAMAGE TO PAVEMENT CAUSED 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: 3/8/2013
 File Name: CP2_DetailConduit.dgn
 Horiz. Scale: NTS Vert. Scale:
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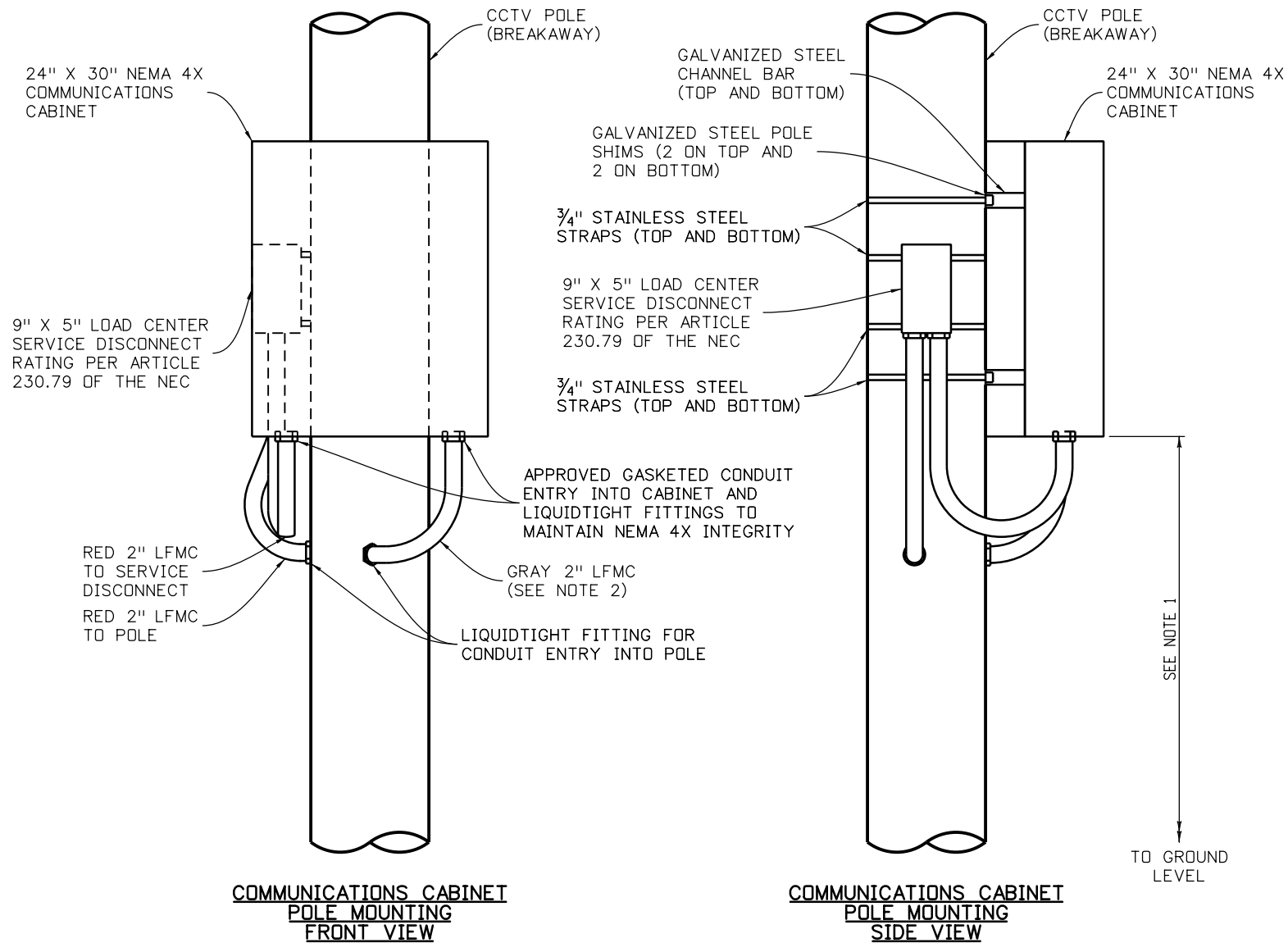
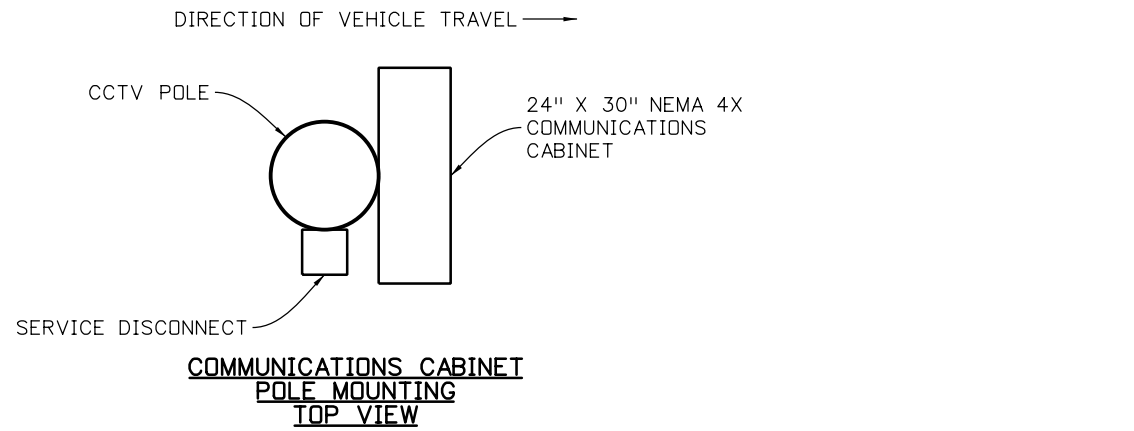
Sheet Revisions		
Date:	Comments	Init.

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Revised:
Void:

CONDUIT INSTALLATION DETAIL			
Designer:	JRD	Structure Numbers	
Detailer:	JRD		
Subset:	ITS	Subset Sheets: 18 of 23	

Project No./Code
IM 0703-391
19036
Sheet Number 289



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.

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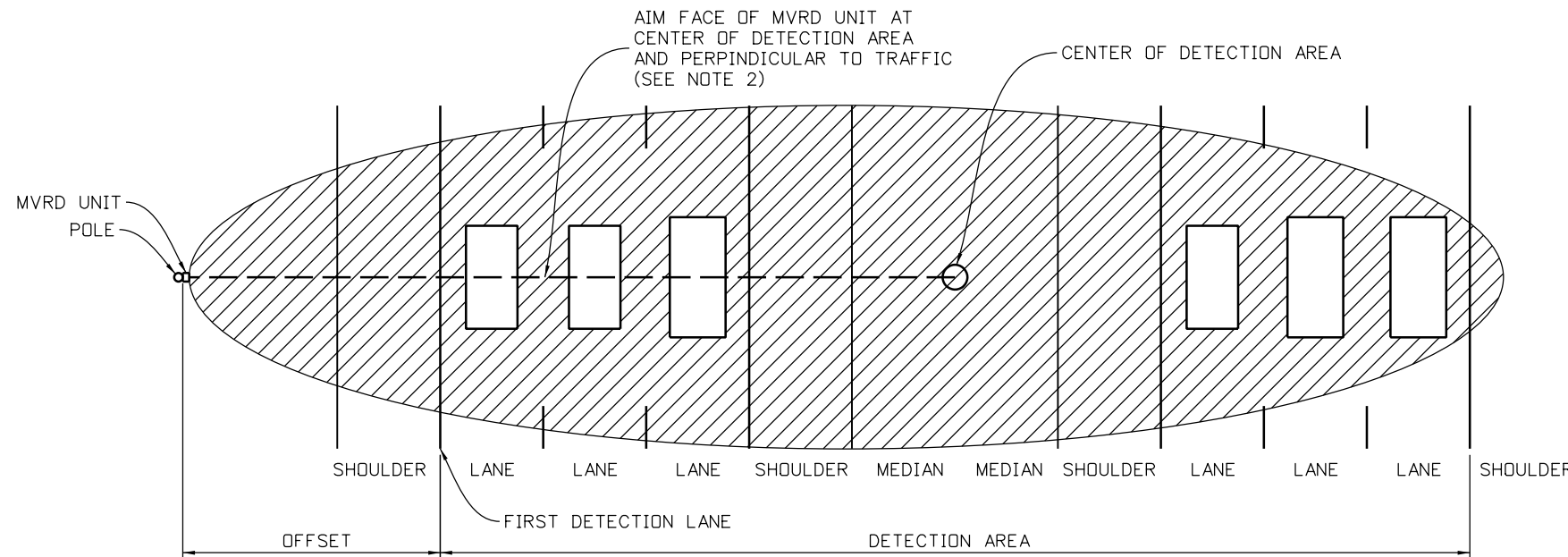
As Constructed
No Revisions:
Revised:
Void:

COMMUNICATIONS CABINET POLE MOUNTING PROJECT STANDARD			
Designer:	CDOT	Structure Numbers	
Detailer:	CDOT		
Subset:	ITS	Subset Sheets: 19 of 23	

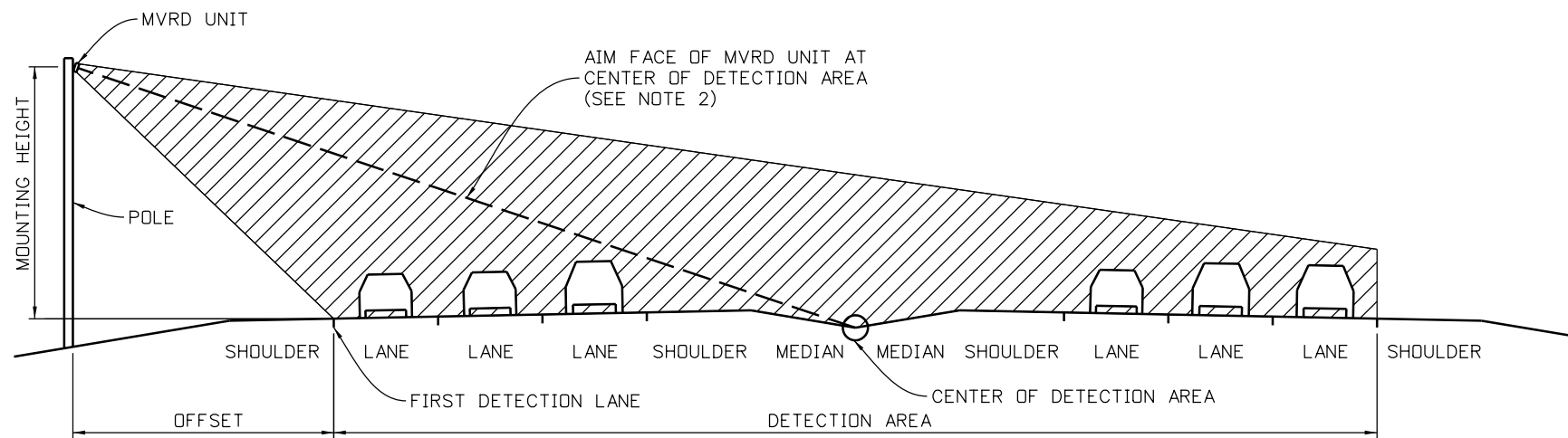
Project No./Code
IM 0703-391
19036
Sheet Number 290

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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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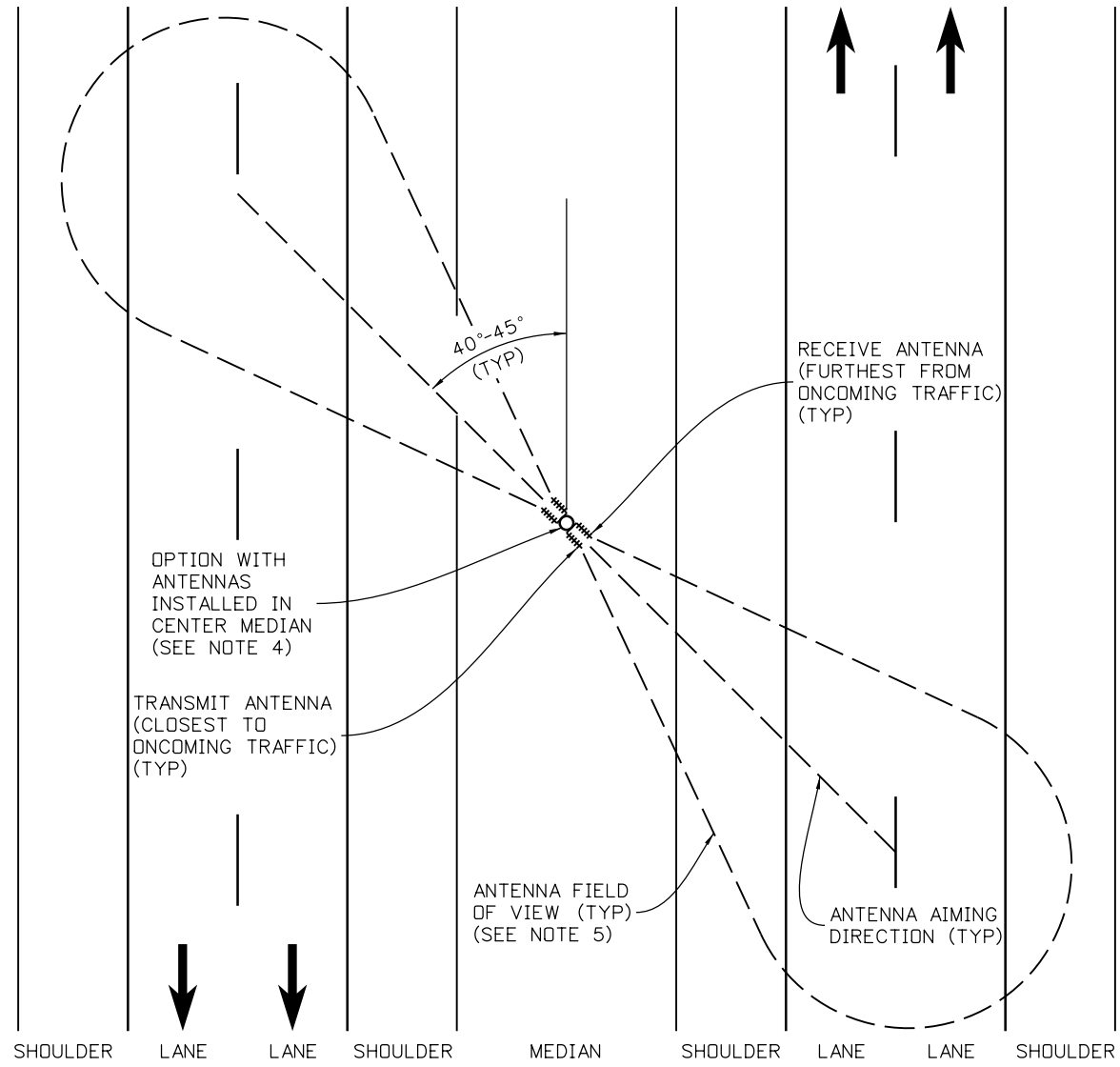
Sheet Revisions		
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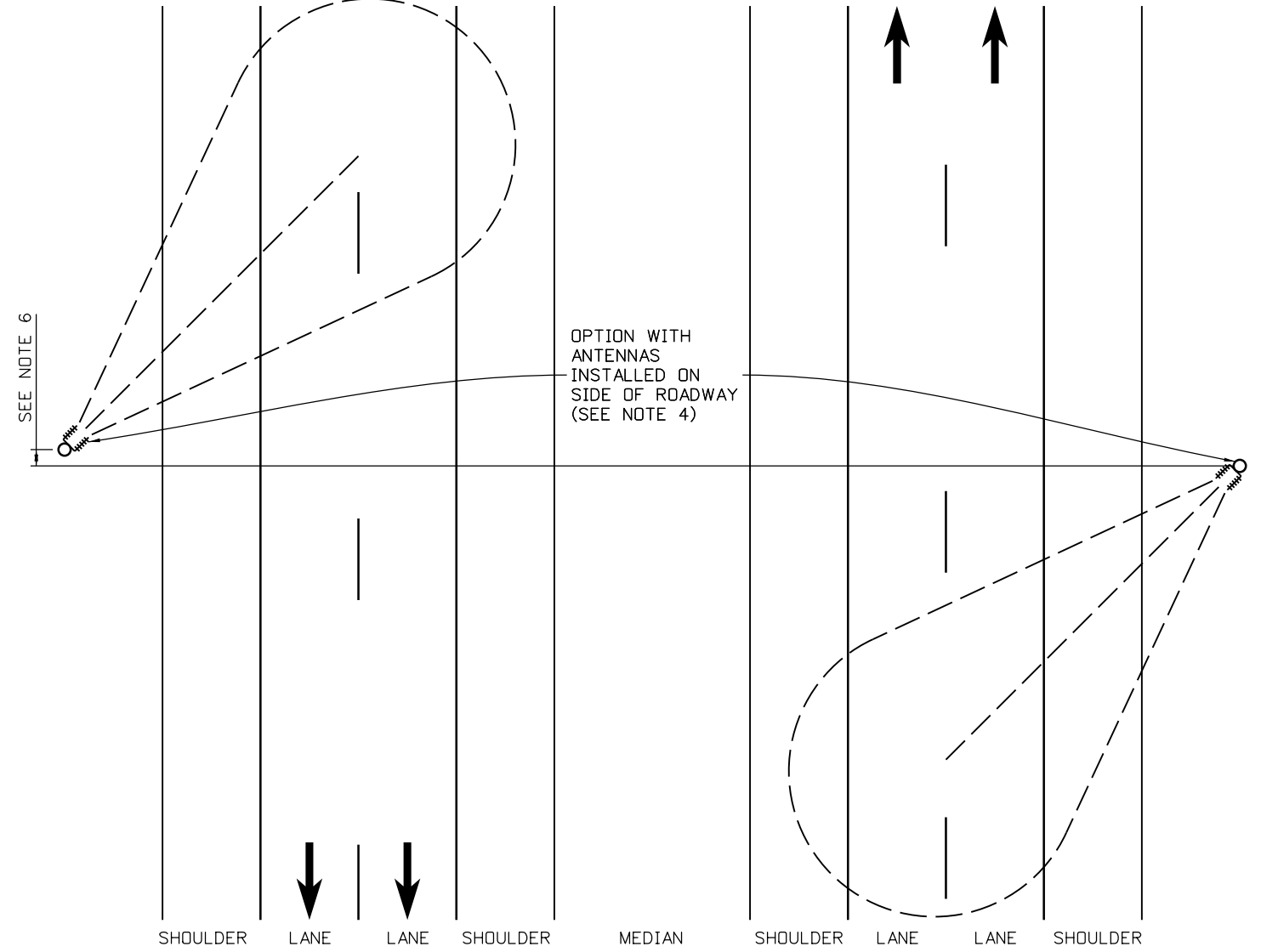
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MVRD INSTALLATION PROJECT STANDARD
 Designer: CDOT
 Detailer: CDOT
 Subset: ITS
 Structure Numbers
 Subset Sheets: 20 of 23

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 IM 0703-391
 19036
 Sheet Number 291



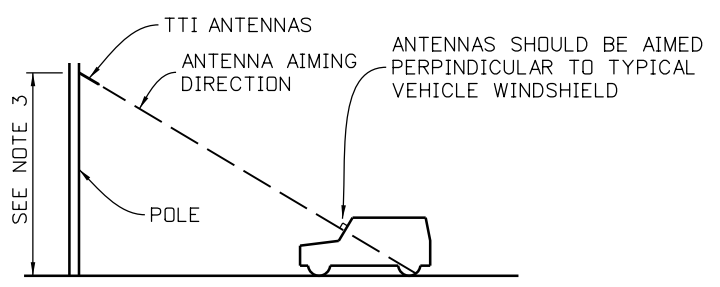
**TTI ANTENNA AIMING-TYPICAL PLAN VIEW
CENTER MEDIAN INSTALLATION**



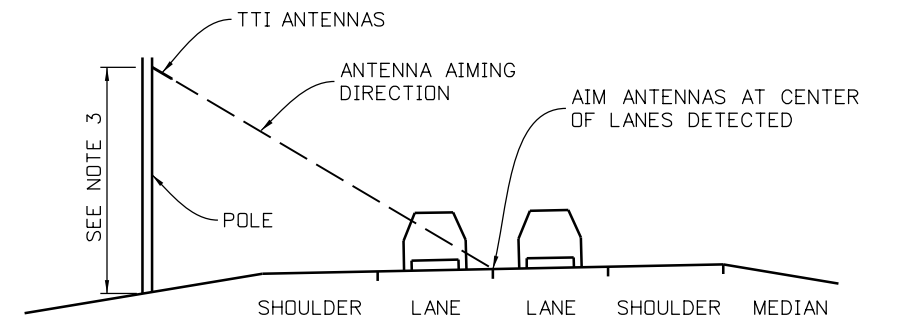
**TTI ANTENNA AIMING-TYPICAL PLAN VIEW
ROADSIDE INSTALLATION**

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.



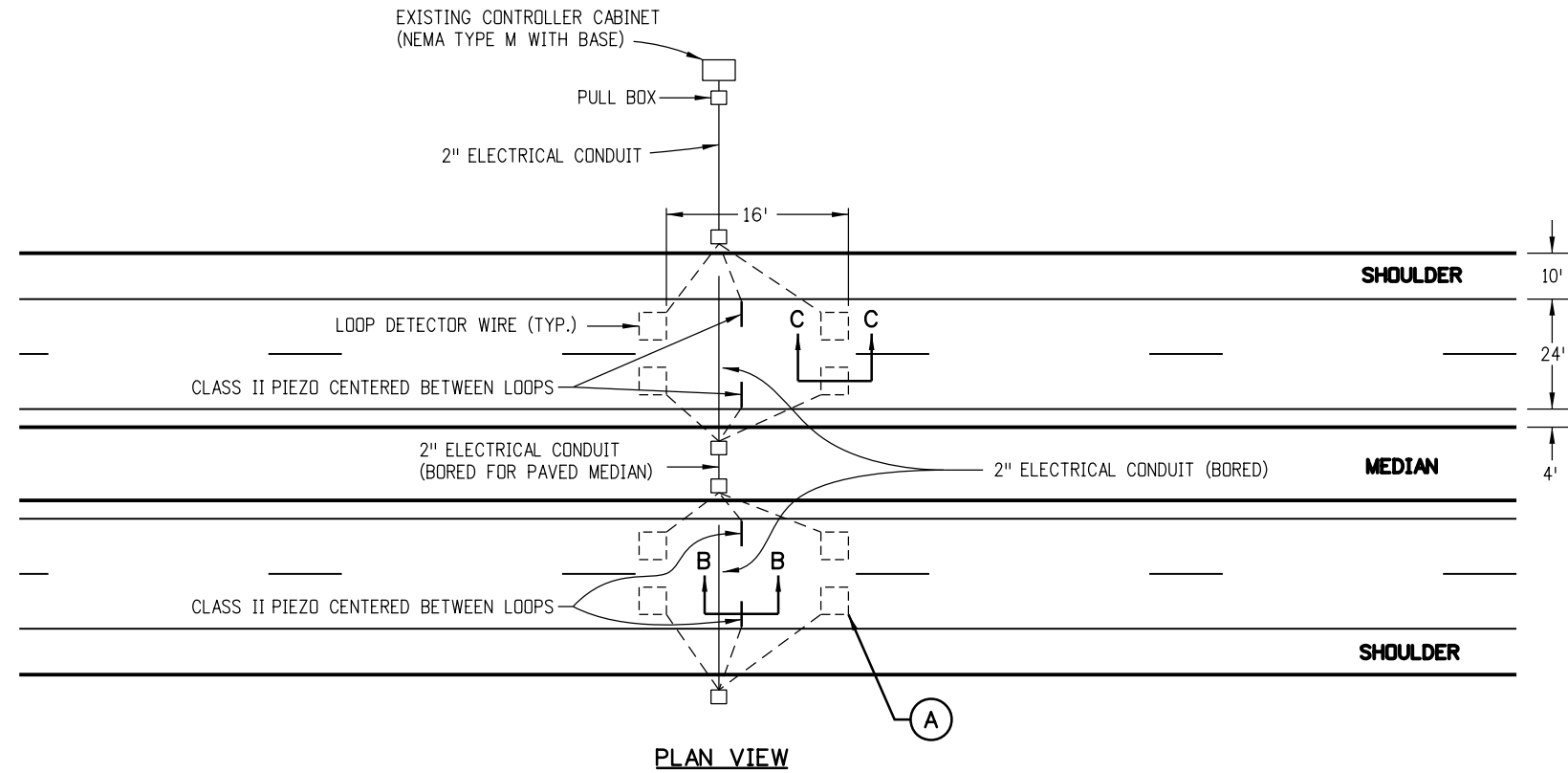
TTI ANTENNA AIMING-TYPICAL PROFILE VIEW



TTI ANTENNA AIMING-TYPICAL SECTION VIEW

Print Date: 3/8/2013	Sheet Revisions	Colorado Department of Transportation	As Constructed	TTI ANTENNA AIMING PROJECT STANDARD	Project No./Code
File Name: CP2_CDDOT Standard-11.dgn	Date: Comments Init.	425 A Corporate Circle Golden, CO 80401 Phone: 720-497-6918 FAX: 720-497-6901	No Revisions:	Designer: CDOT Structure	IM 0703-391
Horiz. Scale: NTS Vert. Scale:			Revised:	Detailer: CDOT Numbers	19036
ATKINS 4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276		Region 1 CRC	Void:	Subset: ITS Subset Sheets: 21 of 23	Sheet Number 292

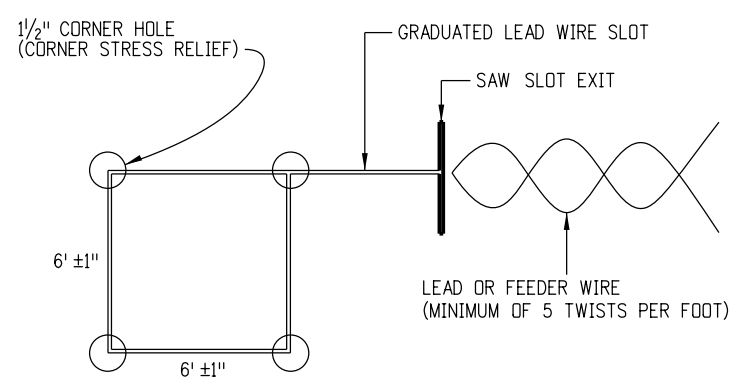
Jason.Duffy 7:56:20 AM P:\Projects\PI20109 - Twin Tunnels\18832\Traffic\ITS Drawings\CP2_CDDOT Standard-11.dgn



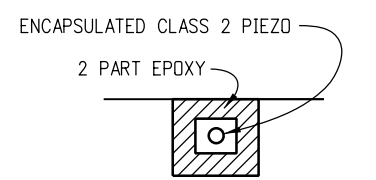
LOOP GEOMETRICS AND INSTALLATION

GENERAL NOTES

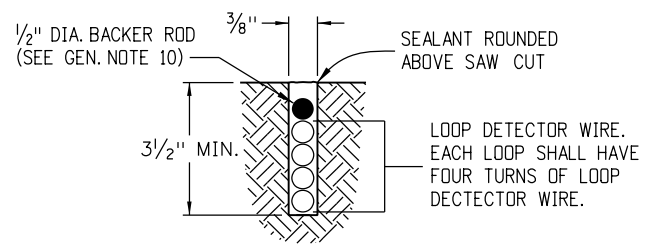
1. ALL DETECTOR LOOPS SHALL MEASURE 6 FT. X 6 FT. (WITHIN 1 INCH TOLERANCE).
2. LOOPS SHALL BE CENTERED IN THE TRAVEL LANE WITH TWO SIDES PARALLEL TO THE LANE STRIPING.
3. ALL LOOP, LOOP LEAD, AND FEEDER WIRE SAW SLOTS SHALL BE CUT TO A MINIMUM DEPTH OF 3/2 INCHES.
4. SLOTS SHALL BE SAWED AFTER PLANING AND BEFORE LAYING OF THE FIRST LIFT OF PAVEMENT WHEN APPLICABLE.
5. ALL LOOP CORNERS SHALL BE ROUNDED USING A 1/2 INCH HOLE DRILLED TO A MINIMUM DEPTH OF 3/2 INCHES.
6. MINIMUM SAW SLOT WIDTH SHALL BE 3/8 INCH.
7. BEFORE INSTALLATION OF THE WIRE, ALL SAW SLOTS SHALL BE CLEANED OF DEBRIS USING WATER AND COMPRESSED AIR. SURFACE AND SLOTS MUST BE ALLOWED TO DRY.
8. ALL LOOPS SHALL BE FOUR TURNS OF THE ABOVE SPECIFIED LOOP WIRE. THE WIRE SHALL BE SEATED IN THE BOTTOM OF THE SAW SLOT.
9. WIRE SPLICES WILL NOT BE PERMITTED IN THE SAW SLOTS. ALL LOOPS SHALL BE CONTINUOUS IN THE PAVEMENT AND TO THE PULL BOX.
10. A BACKER ROD WITH 1/2 INCH DIA. SHALL BE INSTALLED TO INSURE WIRES DO NOT FLOAT TO THE SURFACE DURING GROUTING.
11. ALL SAW SLOTS AND DRILL HOLES SHALL BE SEALED USING A TWO-PART SELF CURING, SELF BONDING WEATHERPROOF EPOXY. EXCESS EPOXY SHALL BE REMOVED TO AVOID UNNECESSARY HIGH SPOTS.
12. PIEZO SENSORS SHALL BE INSTALLED AT THE EXACT MIDPOINT BETWEEN THE LOOPS IN EACH LANE AND TO THE RIGHT OR LEFT SIDE OF THE LINE, CENTERED IN THE WHEEL PATH.
13. PIEZO SENSORS SHALL BE INSTALLED IN COMPLIANCE WITH THE MANUFACTURER'S SPECIFICATIONS, A COPY OF WHICH SHALL BE SUPPLIED TO THE ENGINEER PRIOR TO INSTALLATION.
14. LOOP SETS (TWO LOOPS IN A SERIES) WITHIN A SINGLE LANE SHALL BE SEPARATED BY 10 FEET RESULTING IN A DISTANCE OF 16 FEET FROM LEADING EDGE TO LEADING EDGE (WITHIN 1 INCH TOLERANCE).
15. NO MORE THAN ONE SET OF LOOP LEAD WIRES SHALL BE PLACED IN A SAW SLOT.
16. PULL BOXES MUST CONTAIN AN ADDITIONAL 3 FEET OF LOOP WIRE WHICH ENTERS AND/OR EXITS THE PULL BOX.
17. ALL LOOPS AND LOOP LEADS SHALL BE CLEARLY LABELED IN EACH PULL BOX.
18. MULTIPLE PAIR BELDEN CABLE MAY BE USED IN CONDUIT.
19. COORDINATE INSTALLATION WITH MIKE DELCUPP, CDOT DIVISION OF TRANSPORTATION DEVELOPMENT, AT 303-757-9816. CALL 5 DAYS IN ADVANCE FOR LAYOUT ASSISTANCE.



DETAIL A
LOOP DETECTOR WIRE



SECTION B-B
TYPICAL PIEZO SECTION



SECTION C-C
LOOP DETECTOR WIRE INSTALLATION

Print Date: 3/8/2013
 File Name: CP2_DTD ATR - Sheet 1.dgn
 Horiz. Scale: NTS Vert. Scale:
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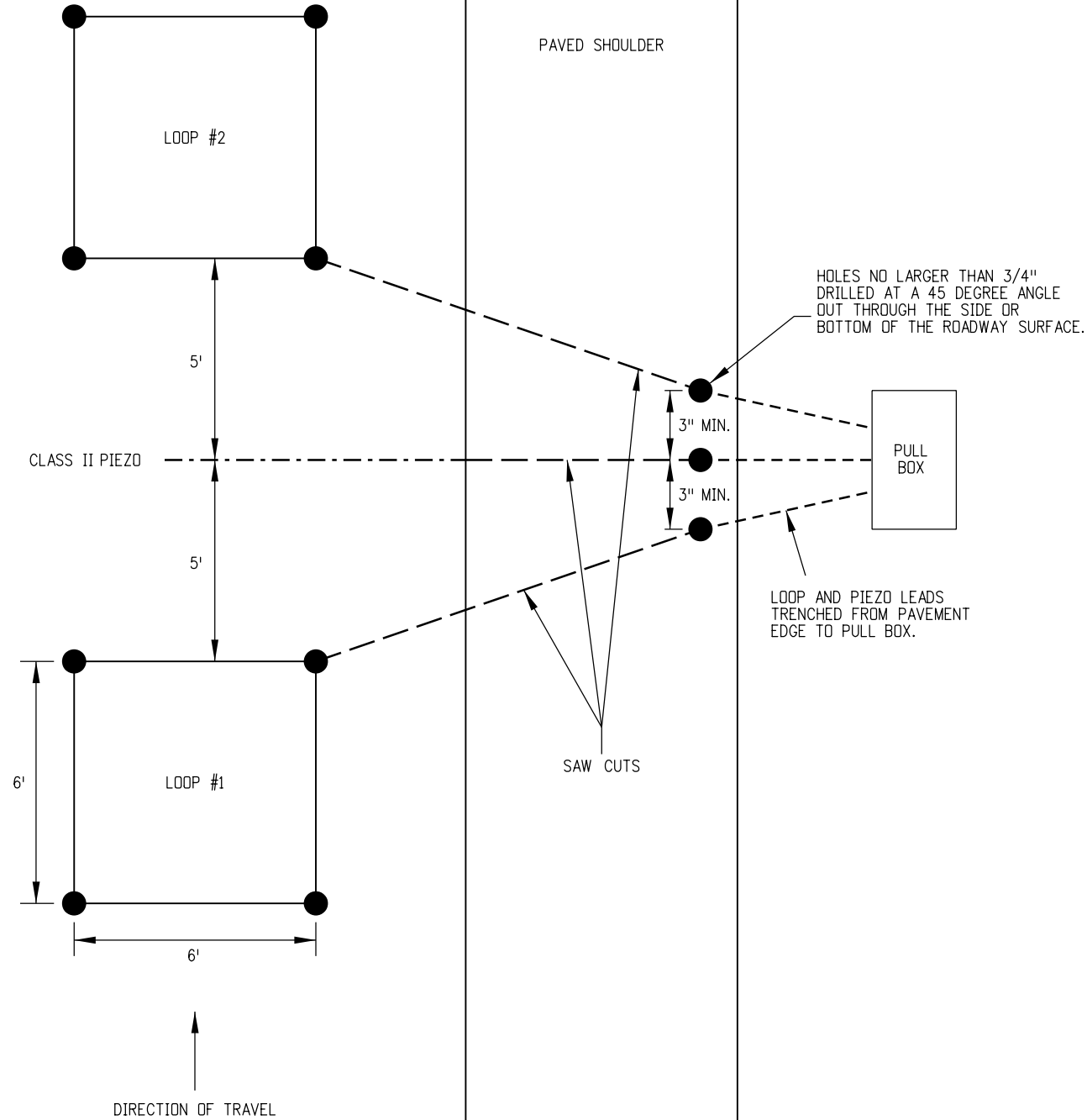
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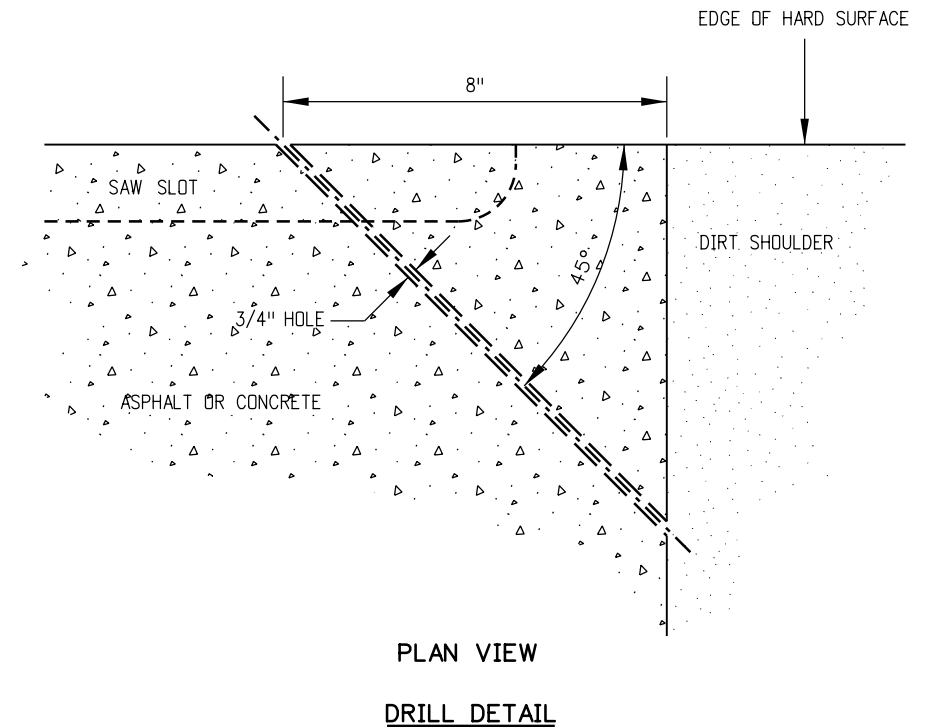
PIEZO LOOP DETECTOR INSTALLATION DETAIL			
Designer:	CDOT	Structure	
Detailer:	CDOT	Numbers	
Subset:	ITS	Subset Sheets:	22 of 23


Project No./Code
 IM 0703-391
 19036
 Sheet Number **293**

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PIEZO PLACEMENT AND SAW CUTTING FOR AN ATR AXLE CLASSIFICATION SITE



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File Name: CP2_DTD ATR - Sheet 2.dgn	
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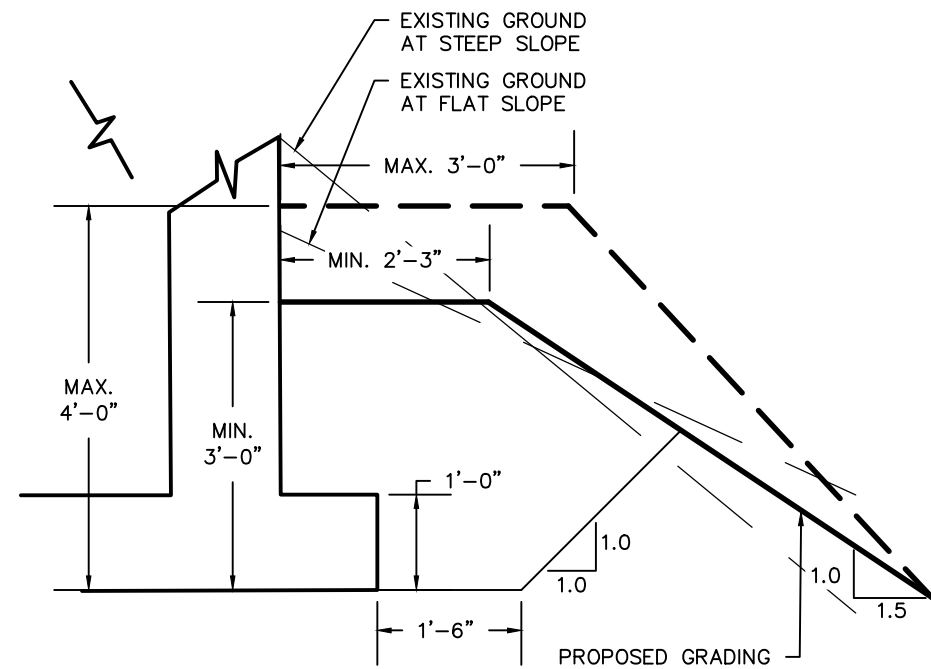
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Designer:	CDDT	Structure Numbers	
Detailer:	CDDT		
Subset:	ITS	Subset Sheets: 23 of 23	

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IM 0703-391
19036
Sheet Number 294

TABULATION OF LANDSCAPING ITEMS

Station		Landscape Boulder For Information Only	Laborer 203-02330	Backhoe (Special) 203-01525	Truck (Dump) 203-01582	Notes
From	To	EA	HR	HR	HR	
148+90	150+20	30		4	6	Wall C - Stockpile Boulders
148+90	150+20			4		Wall C - Pick Boulders
148+90	150+20		12	4		Wall C - Place Boulders
152+00	172+00	448		60	90	Wall D - Stockpile Boulders
152+00	172+00			60		Wall D - Pick Boulders
152+00	172+00		180	60		Wall D - Place Boulders
305+40	309+65	40		6	8	Wall G - Stockpile Boulders
305+40	309+65			4		Wall G - Pick Boulders
305+40	309+65		16	6		Wall G - Place Boulders
Project Totals		518	208	208	104	

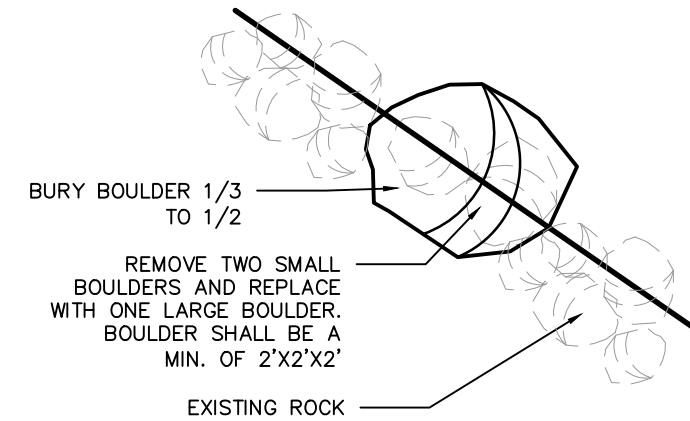
BACKFILL WITH BENCH



NOTES:

1. MIN. DIMENSIONS SHOWN ARE AT THE STEEP SLOPE LOCATION.
2. IT IS ESTIMATED THAT 2 VARIATIONS WILL BE REQUIRED BETWEEN MIN. AND MAX. DEPTH AS SHOWN ON THE DETAIL ABOVE FOR WALL C.
3. IT IS ESTIMATED THAT 8 VARIATIONS WILL BE REQUIRED BETWEEN MIN. AND MAX. DEPTH AS SHOWN ON THE DETAIL ABOVE FOR WALL D.
4. IT IS ESTIMATED THAT 3 VARIATIONS WILL BE REQUIRED BETWEEN MIN. AND MAX. DEPTH AS SHOWN ON THE DETAIL ABOVE FOR WALL G.
5. VARIATION WILL BE CONSTRUCTED WITH LANDSCAPE BOULDERS. CONTRACTOR SHALL COORDINATE WITH THE ENGINEER TO DETERMINE FINAL LOCATION OF THE VARIATIONS.
6. IT IS ESTIMATED THAT PLACEMENT OF 10 BOULDERS WILL BE REQUIRED FOR EACH VARIATION IN WALL C.
7. IT IS ESTIMATED THAT PLACEMENT OF 40 BOULDERS WILL BE REQUIRED FOR EACH VARIATION IN WALL D.
8. IT IS ESTIMATED THAT PLACEMENT OF 8 BOULDERS WILL BE REQUIRED FOR EACH VARIATION IN WALL G.

BOULDER PLACEMENT ON RIPRAP SLOPE



NOTES:

1. BOULDER SHALL BE A MIN. OF 2'X2'X2'. FREQUENCY AND LOCATION OF BOULDERS SHALL BE DISCUSSED IN THE FIELD BETWEEN THE CONTRACTOR AND ENGINEER AT THE TIME OF CONSTRUCTION.
2. IT IS ESTIMATED THAT 10 BOULDERS WILL BE REQUIRED FOR WALL C.
3. IT IS ESTIMATED THAT 128 BOULDERS WILL BE REQUIRED FOR WALL D.
3. IT IS ESTIMATED THAT 16 BOULDERS WILL BE REQUIRED FOR WALL G.

NOTES:

1. SEE RETAINING WALL PLANS FOR LIMITS OF WALLS.

Print Date: 12/11/12			As Constructed No Revisions: Revised: Void:	BOULDER TABULATION AND PLACEMENT DETAILS		Project No./Code IM0703-391 19036 Sheet Number 295
File Name: LANDSCAPE						
Horiz. Scale: As Noted Vert. Scale: As Noted						
Unit Information Unit Leader Initials						
associates inc. 2953 South Peoria Street, Ste 101 Aurora, Colorado 80014 303-770-7201 FAX-770-7132	Colorado Department of Transportation 425 A Corporate Circle Golden, CO 80401 Phone: 720-497-6905 FAX: 720-497-6901 Region 1 CRC	Designer: JKG Detailer: JKG Subset: RDDTL	Structure Numbers Subset Sheets: 1 of 1			

TABULATION OF OVERHEAD SIGNS

SIGN NO.	LOCATION	STATION; OFFSET (Post Locations)	GUIDE SIGN DESCRIPTION	SIGN PANEL SIZE	SIGN PANEL (CLASS III)	STRUCTURE TYPE	STRUCTURE NUMBER	NO. OF POSTS	PIPE POST			SPAN LENGTH FT - IN	CAISSON DEPTH FT	DRILLED CAISSON			REMARKS				
				W' x H'	SF				OUTER DIAMETER INCHES	HEIGHT "H" FT - IN	RADIUS "R" FT			42" DIAM.	48" DIAM.	54" DIAM.					
											(PAY LENGTH) FT										
72	EB I-70	STA 175+40, 50.0' RT.	EXIT 243	9.5 X 2.5	23.8	CANTILEVER	SIGN-F-15-D	1	20	22 - 0	8	26 - 0	18		20.5						
			HIDDEN VALLEY/CENTRAL CITY/(UP ARROW)	12 X 11	126.0																
86A	I-70 Median	STA 320+50, 7.73' LT.	US 6/GOLDEN/LEFT 3/4 MILE	11 X 12	132.0	CANTILEVER	F-15-DE (EXISTING)	1	18	25 (EXISTING)		29 - 0 (EXISTING)	17	17.5			RESET EXISTING CANTILEVER STRUCTURE TO NEW STRUCTURE CAISSON; INSTALL NEW SIGN PANELS				
86B			W1-4																		
86C			W13-1P																		
107	EB I-70	STA 348+80, 21.43' LT	EXIT 244/US 6/GOLDEN/EXIT ONLY	9 x 15	130.5	BRIDGE	SIGN-F-15-C	2	18	LEFT POST = 20 - 6	8	73 - 0	21			24.0	MOUNT SIGN NO'S. 106A, 106B, 109A AND 109B ON SIGN BRIDGE POSTS				
108		STA 348+80 51.57' RT.	I-70 EAST/DENVER	29 x 12	348.0					RIGHT POST = 25 - 6	8		21	22.0							
PROJECT TOTALS														17.5	20.5	46.0					

NOTE: SIGN STRUCTURES DESIGNED FOR 80 MPH WIND SPEED



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File Name: 18832TRAF_SignTabs04.dgn		Date:	Comments	Init.			TABULATION OF OVERHEAD SIGNS			
Horiz. Scale: 1:100 Vert. Scale:							Designer: RRF	Structure Numbers		
ATKINS 4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276				Detailer: SYS	Subset Sheets: TAB-4 of 7					
				Subset: TRAFFIC						

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TABULATION OF PAVEMENT MARKINGS

LOCATION	STATION (APPROXIMATE)	DISTANCE (FT)	JURISDICTION	EPOXY PAVEMENT MARKING LINES - LINEAR FEET										PREFORMED PLASTIC PAVEMENT MARKING LINES - LF				PREFORMED THERMOPLASTIC PAVEMENT MARKING LINES-LF		PREFORMED PLASTIC PAVEMENT MARKING (TYPE III)		
				EDGE		CENTER	CHANNELIZING	LANE	LANE DROP	DOTTED			LANE	CHANNELIZING	DOTTED	PARKING LINES	WORD - SYMBOL	XWALK - STOPLINE				
				WHITE SOLID	YELLOW SOLID	DOUBLE YELLOW SOLID	WHITE SOLID	WHITE BROKEN	WHITE BROKEN	WHITE BROKEN	YELLOW BROKEN	WHITE BROKEN	WHITE BROKEN (TYPE I) (INLAID)	WHITE BROKEN (TYPE II) (CONTRAST)	WHITE SOLID (TYPE I) (INLAID)	WHITE BROKEN (TYPE I)(INLAID)			WHITE SOLID			
				4 INCH	4 INCH	4 INCH	8 INCH	4 INCH	8 INCH	4 INCH	4 INCH	8 INCH	4 INCH	7 INCH	8 INCH	4 INCH	8 INCH	SF	SF			
SHEET ST-11	327+00 to 341+00	1400		1400	1400									2800								
SHEET ST-12	341+00 to 355+00	1400		1400										2800								
	341+00 to 353+80	1280																				
	346+50 to 351+10	570						460														
	351+10 to 355+00 xxx to xxx (Exit Ramp)	390 120													390 120							
SHEET ST-13	355+00 to 357+80	280		280										560								
	355+00 to 355+80	80																				
	355+80 to 357+80	200																				
	xxx to xxx (Exit Ramp)	400																				
	xxx to xxx (Exit Ramp)	105																				
xxx to xxx (Exit Ramp)	290			290																		
TOTAL (LINEAR FEET)(THIS SHEET)				3370	3400	0	0	0	460	0	0	0	6160	0	695	0	0					
TOTAL (SQ.FT.)(THIS SHEET)				1123	1133	0	0	0	61	0	0	0	513	0	463	0	0	0	0			
TOTAL (GALLONS)(THIS SHEET)				11.2	11.3	0.0	0.0	0.0	0.6	0.0	0.0	0.0										
PROJECT TOTALS																						
TOTAL LINEAR FEET				18101	16942	890	0	0	460	0	0	0	32546	0	3200	310	1104					
TOTAL SQUARE FEET				6034	5647	593	0	0	61	0	0		2712	0	2133	34	736					
TOTAL GALLONS				60.3	56.5	5.9	0.0	0.0	0.6	0.0	0.0											



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 Denver, CO 80237
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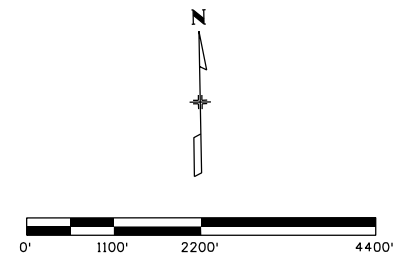
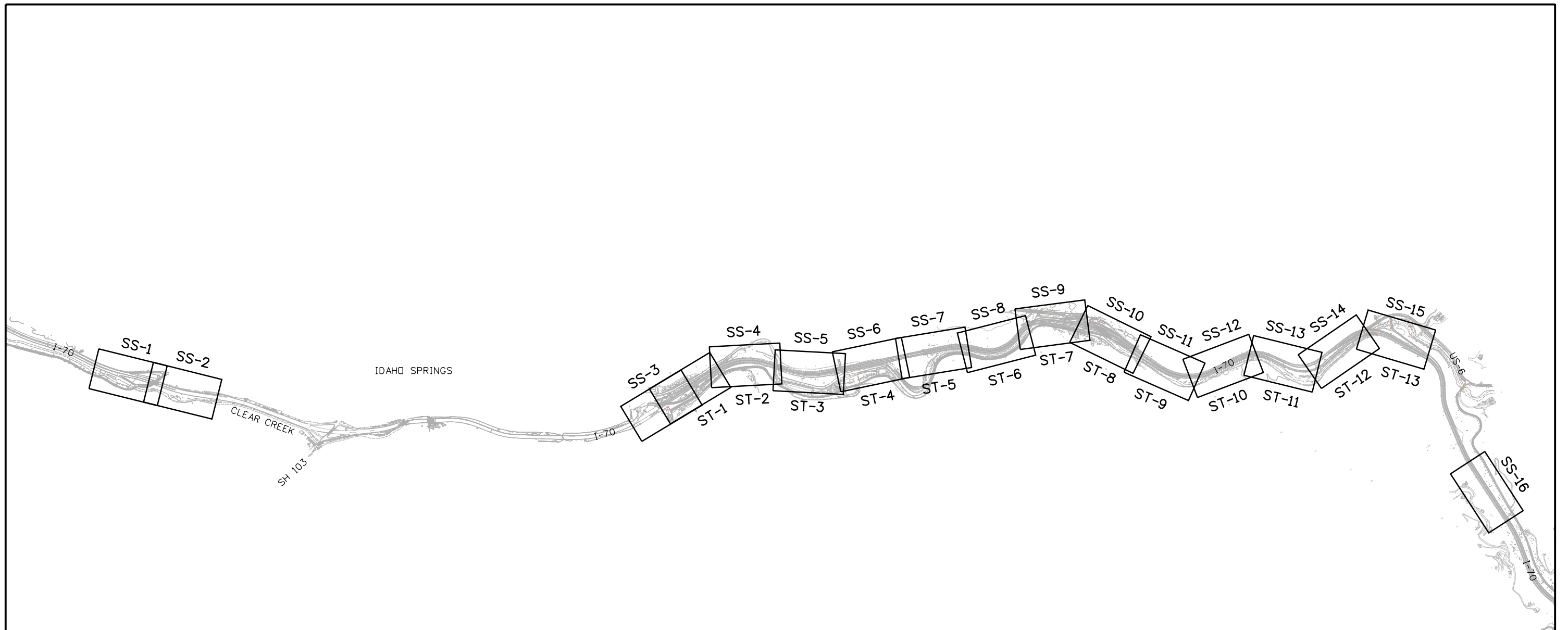
Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation

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

As Constructed	SIGNING PLAN		
No Revisions:	TABULATION OF PAVEMENT MARKINGS		
Revised:	Designer: RRF	Structure	
Void:	Detailer: SYS	Numbers	
	Subset: TRAFFIC	Subset Sheets: TAB-6 of	7

Project No./Code
 IM 0703-391
 19036
 Sheet Number 301

Stan 11:25:17 AM c:\pwwork\work\pbs\jpw\common\dms21566\18832TRAF_SignTabs06.dgn



Print Date: 3/7/2013
 File Name: 18832TRAF_MapkeySht.dgn
 Horiz. Scale: 1:2200 Vert. Scale:
ATKINS 4601 DTC Boulevard, Suite 700
 Denver, CO 80237
 Phone: (303) 221-7275 Fax: (303) 221-7276

Sheet Revisions		
Date:	Comments	Init.

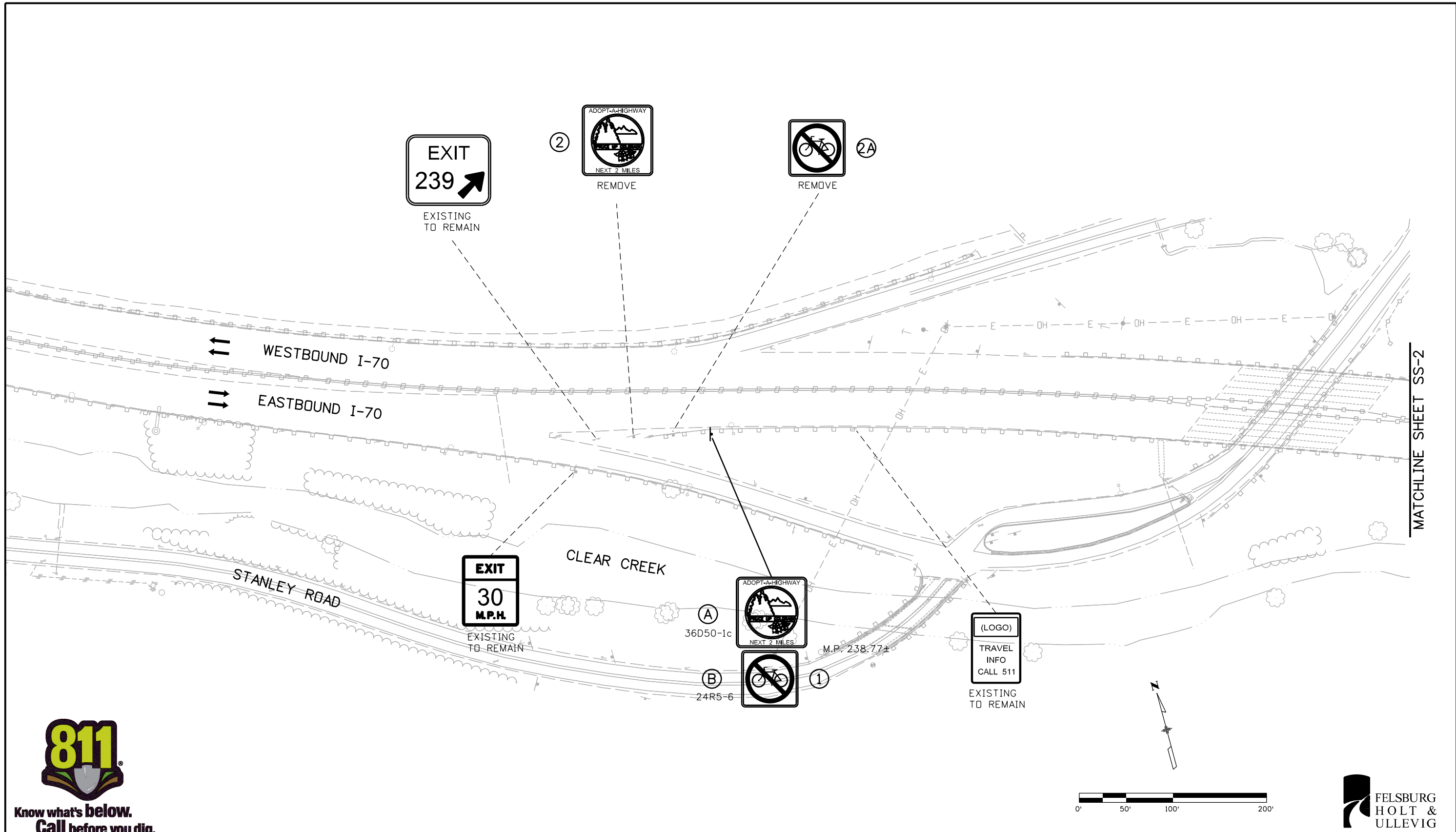
Colorado Department of Transportation
 425 A Corporate Circle
 Golden, CO 80401
 Phone: 720-497-6918 FAX: 720-497-6901
 Region 1 CRC

As Constructed
 No Revisions:
 Revised:
 Void:

SIGNING AND STRIPING MAPKEY			
Designer:	RRF	Structure Numbers	
Detailer:	SYS		
Subset:	TRAFFIC	Subset Sheets: MK-1 of	1

Project No./Code
 IM 0703-391
 19036
 Sheet Number 303

Sun 11:25:33 AM c:\pw_work\pbbjpw\common\dms21566\18832TRAF_MapkeySht.dgn




Know what's below.
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Print Date: 3/7/2013
File Name: 18832TRAF_PlanSS1.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

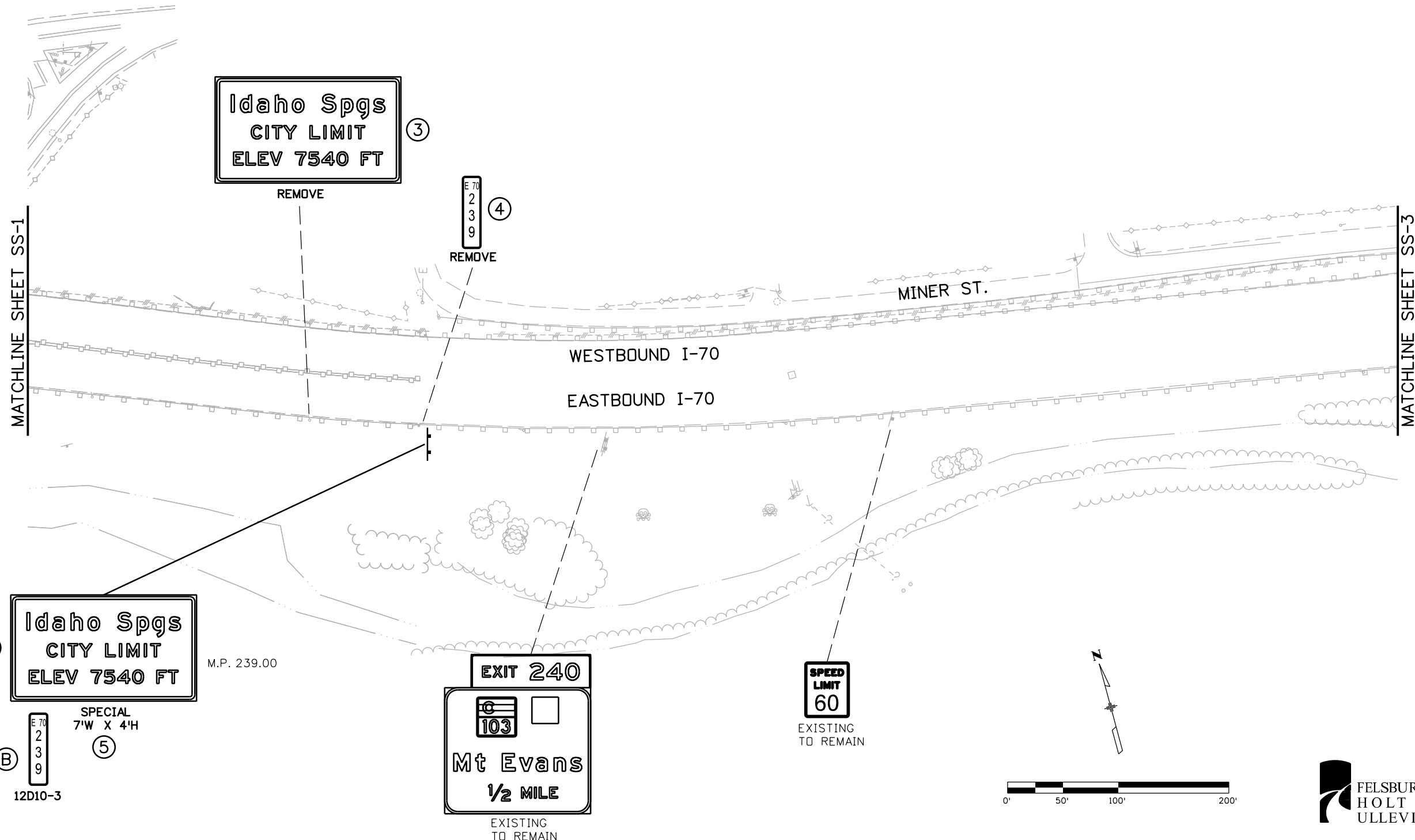
As Constructed
No Revisions:
Revised:
Void:

SIGNING PLAN EB I-70 AT MP 238.75±			
Designer:	RRF	Structure Numbers	
Detailer:	SYS	Subset Sheets: SS-1 of 16	
Subset:	TRAFFIC		

Project No./Code
IM 0703-391
19036
Sheet Number 304


Stan 11:25:44 AM c:\pw\work\pbb\pwwork\common\dms21566\18832TRAF_PlanSS1.dgn

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Print Date: 3/7/2013
 File Name: 18832TRAF_PlanSS2.dgn
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ATKINS 4601 DTC Boulevard, Suite 700
 Denver, CO 80237
 Phone: (303) 221-7275 Fax: (303) 221-7276

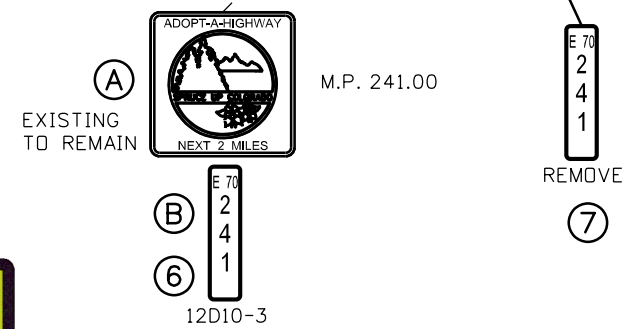
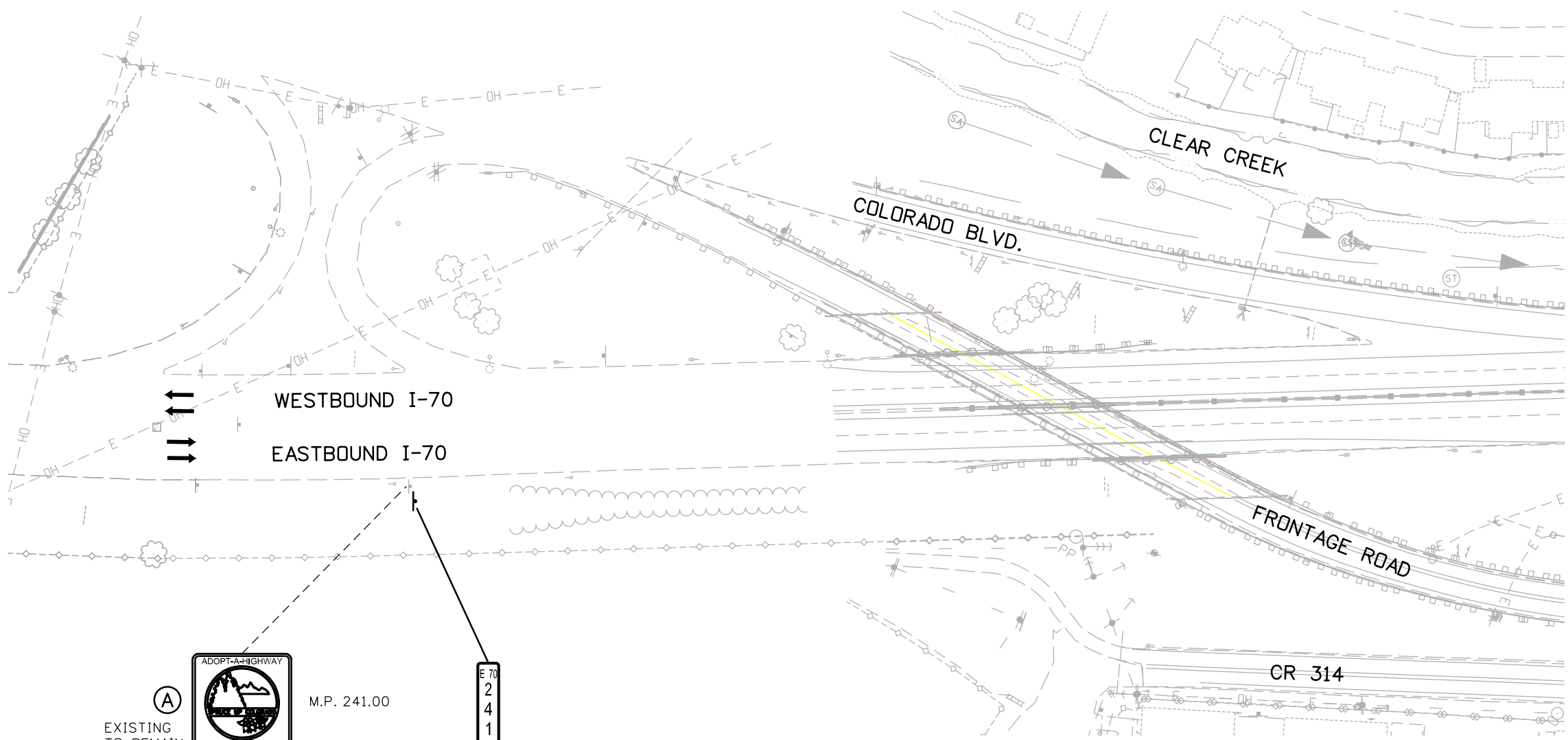
Sheet Revisions		
Date:	Comments	Init.

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

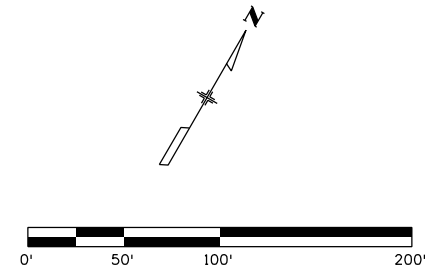
As Constructed
 No Revisions:
 Revised:
 Void:

SIGNING PLAN
EB I-70 AT MP 239.00±
 Designer: RRF Structure Numbers
 Detailer: SYS
 Subset: TRAFFIC Subset Sheets: SS-2 of 16

Project No./Code
 IM 0703-391
 19036
 Sheet Number **305**



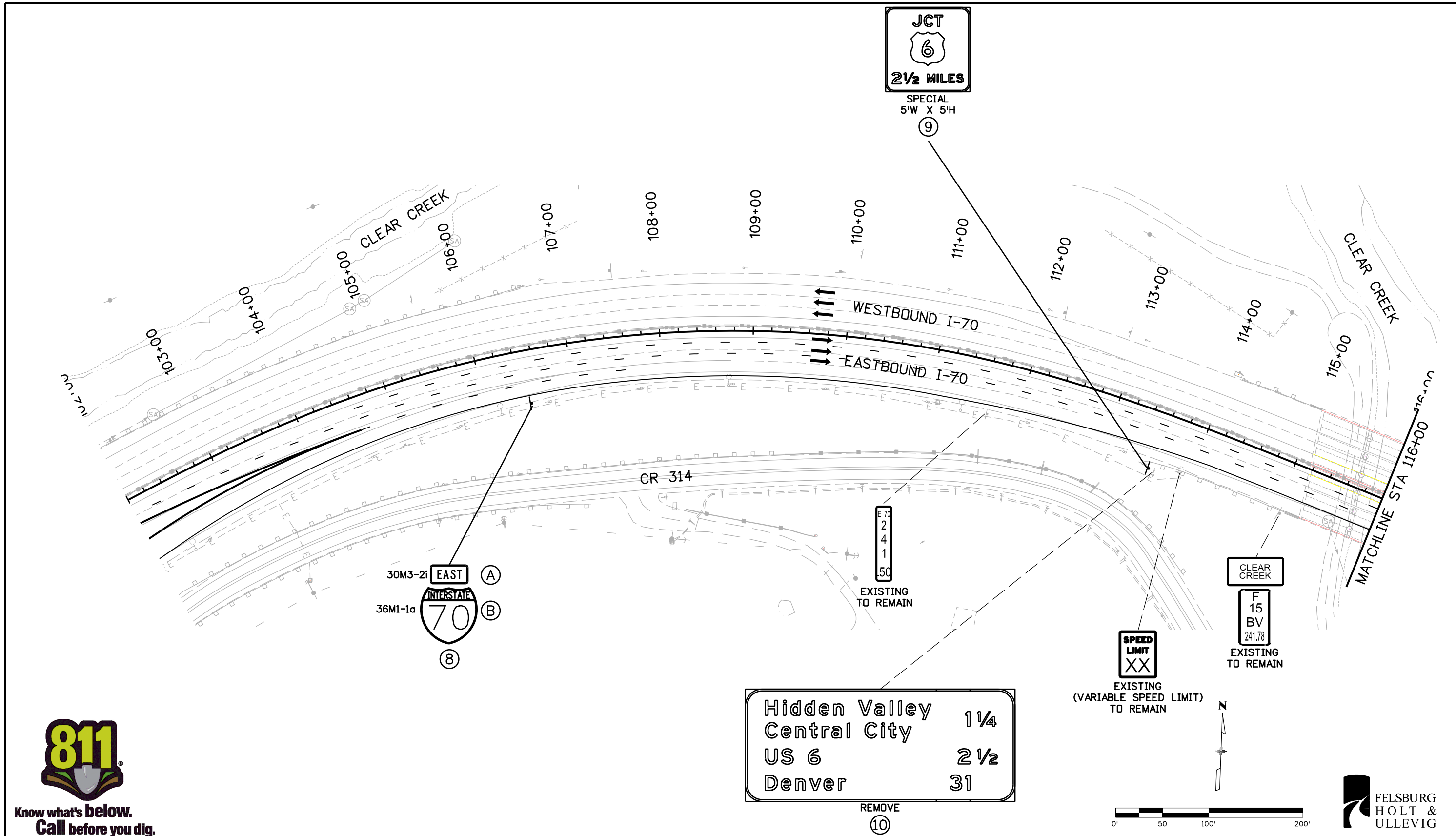
INSTALL NEW MILEPOST SIGN
BELOW ADOPT-A-HIGHWAY SIGN



Print Date: 3/7/2013		Sheet Revisions Date: Comments Init.			Colorado Department of Transportation		As Constructed		SIGNING PLAN EB I-70 AT MP 241.07±		Project No./Code	
File Name: 18832TRAF_Plan022.dgn					Region 1		No Revisions:				Designer: RRF	
Horiz. Scale: 1:100 Vert. Scale:		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		Revised:		Detailer: SYS		19036		
		Region 1		CRC		Void:		Subset: TRAFFIC		Subset Sheets: SS-3 of 16 Sheet Number 306		

Stan 11:26:04 AM c:\pw_work\pbbjpw\common\dms21566\18832TRAF_Plan022.dgn

Stan 11:26:09 AM c:\pw_work\pjs\jw1\comon\dmis21566\18832TRAF_Plan002.dgn



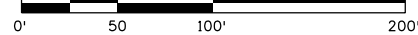
**Know what's below.
Call before you dig.**

Hidden Valley	1 1/4
Central City	
US 6	2 1/2
Denver	31

REMOVE
10

SPEED LIMIT XX
EXISTING (VARIABLE SPEED LIMIT) TO REMAIN

CLEAR CREEK
F 15 BV
241.78
EXISTING TO REMAIN



Print Date: 3/7/2013
File Name: 18832TRAF_Plan002.dgn
Horiz. Scale: 1:100 Vert. Scale:
ATKINS 4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276

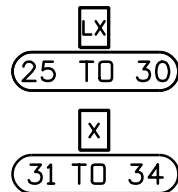
Sheet Revisions		
Date:	Comments	Init.

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

As Constructed
No Revisions:
Revised:
Void:

SIGNING PLAN STA 102+00 TO 116+00			
Designer:	RRF	Structure Numbers	
Detailer:	SYS		
Subset:	TRAFFIC	Subset Sheets: SS-4 of	16

Project No./Code
IM 0703-391
19036
Sheet Number 307



CHAIN STATION LOCATION MARKERS TO BE PLACED ON LIGHT STANDARDS MARKED AS L1 TO L6 AND 1 TO 4. SIGNS SHALL HAVE 6-INCH NUMBERS AND LETTERS CENTERED ON A 8" WIDE BY 12" HIGH PANEL. TEXT SHALL BE BLACK ON A YELLOW BACKGROUND. SIGNS SHALL BE MOUNTED 16' FROM THE BASE OF THE LIGHT STANDARD.

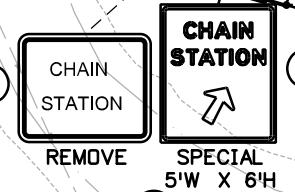
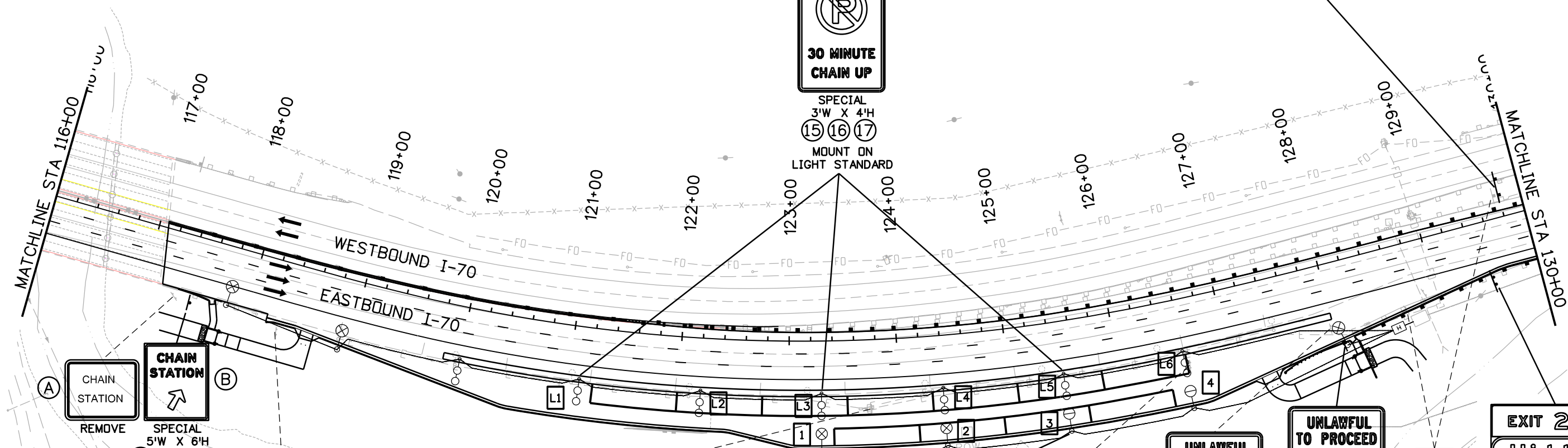


SPECIAL 11'W X 8'H

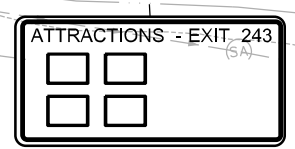
24



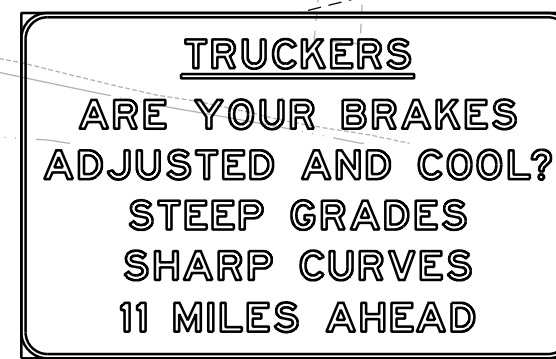
SPECIAL 3'W X 4'H
15 16 17
MOUNT ON LIGHT STANDARD



11



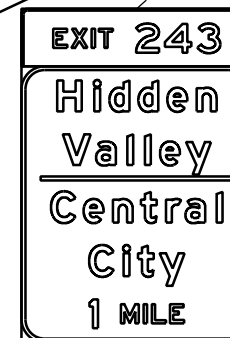
EXISTING TO REMAIN



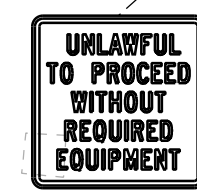
REMOVE
12



SPECIAL 3'W X 4'H
13 14
MOUNT ON LIGHT STANDARD



REMOVE
18



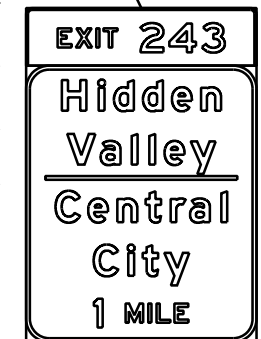
REMOVE
19



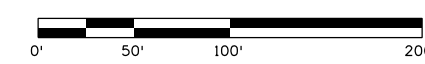
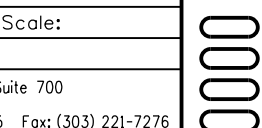
R52-10c
5'W X 5'H
MOUNT ON LIGHT STANDARD
20



REMOVE
21 22



SPECIAL 10'W X 14'H
23



Print Date: 3/7/2013	Sheet Revisions			Colorado Department of Transportation		As Constructed		SIGNING PLAN STA 116+00 TO 130+00		Project No./Code	
File Name: 18832TRAF_Plan003.dgn	Date:	Comments:	Init.	425 A Corporate Circle Golden, CO 80401 Phone: 720-497-6918 FAX: 720-497-6901		No Revisions:		Designer: RRF		IM 0703-391	
Horiz. Scale: 1:100 Vert. Scale:				Region 1		Revised:		Detailer: SYS		19036	
ATKINS 4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276				CRC		Void:		Subset: TRAFFIC		Sheet Number 308	
								Structure Numbers		Subset Sheets: SS-5 of 16	

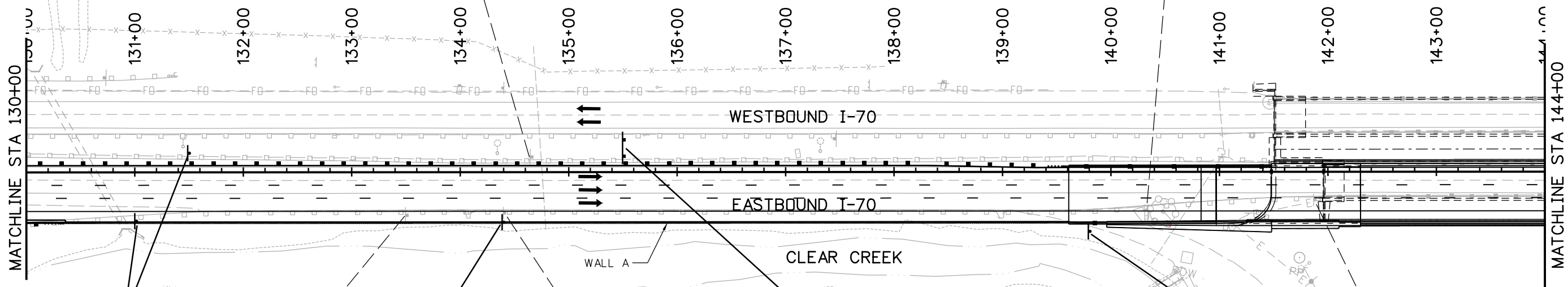
Station 11:26:14 AM c:\pwork\work\pbs\jw\1\common\dms21566\18832TRAF_Plan003.dgn

SEE FIRE SUPPRESSION SYSTEM DRAWINGS FOR TUNNEL SIGNING INFORMATION.

TRUCKERS SHARP CURVES 2000 FT

REMOVE (48)

TUNNEL REMOVE (45)



SPEED LIMIT 55 48R2-1(55)

MOUNT (40) ONTO WALL A; SEE SHEET DT-1 OF 1 FOR ATTACHMENT DETAIL

TUNNEL REMOVE (42)

2 4 2 12D10-3 MOUNT ONTO WALL A; SEE SHEET DT-1 OF 1 FOR ATTACHMENT DETAIL (43)

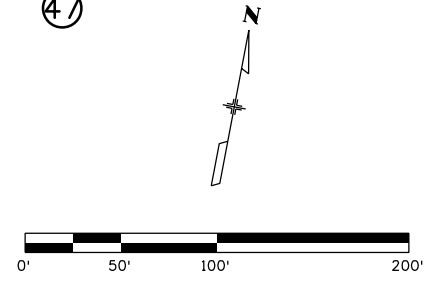
2 4 2 REMOVE (44)

TRUCKERS SHARP CURVES 2500 FT

SPECIAL 11'W X 5'H CONNECT EXISTING FLASHING BEACONS FROM SIGN NO. 48 TO NEW POWER SOURCE; SEE LIGHTING PLAN SHEET 5 OF 27 FOR POWER CONNECTION DETAILS (46)

F 15 BO 242.16 SPECIAL 12"W X 18"H MOUNT ONTO WALL A; SEE SHEET DT-1 OF 1 FOR ATTACHMENT DETAIL (47)

F 15 BO 242.16 REMOVE (49)



Print Date: 3/7/2013	Sheet Revisions			Colorado Department of Transportation	As Constructed	SIGNING PLAN		Project No./Code
File Name: 18832TRAF_Plan004.dgn	Date:	Comments:	Init.	425 A Corporate Circle Golden, CO 80401 Phone: 720-497-6918 FAX: 720-497-6901 Region 1 CRC	No Revisions:	STA 130+00 TO 144+00		IM 0703-391
Horiz. Scale: 1:100 Vert. Scale:					Revised:	Designer: RRF	Structure Numbers	19036
ATKINS 4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276					Void:	Detailer: SYS	Subset Sheets: SS-6 of 16	Sheet Number 309

Station 11:26:21 AM c:\pw_work\pws\pwl\common\dms21566\18832TRAF_Plan004.dgn

MATCHLINE STA 144+00

145+00

146+00

147+00

148+00

149+00

150+00

151+00

152+00

153+00

154+00

155+00

156+00

157+00

MATCHLINE STA 158+00

WESTBOUND I-70

EASTBOUND I-70

CLEAR CREEK

CR 314

SEE FIRE SUPPRESSION SYSTEM DRAWINGS FOR TUNNEL SIGNING INFORMATION.

REMOVE W1-2 SIGN PANEL

NEW SIGN PANEL 48W1-5

TRUCKER REDUCE SPEED
XX M.P.H.
REMOVE 55



50 M.P.H.
53



(A) 48W1-5

50 M.P.H.

50



(B) 30W13-1P

50 M.P.H.

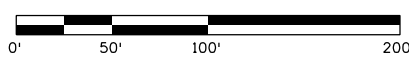
REMOVE 51

EXIT 243
Hidden Valley
Central City
1/2 MILE
SPECIAL 10'W X 14'H

52

EXIT 243
Hidden Valley
Central City
1/2 MILE
REMOVE

54

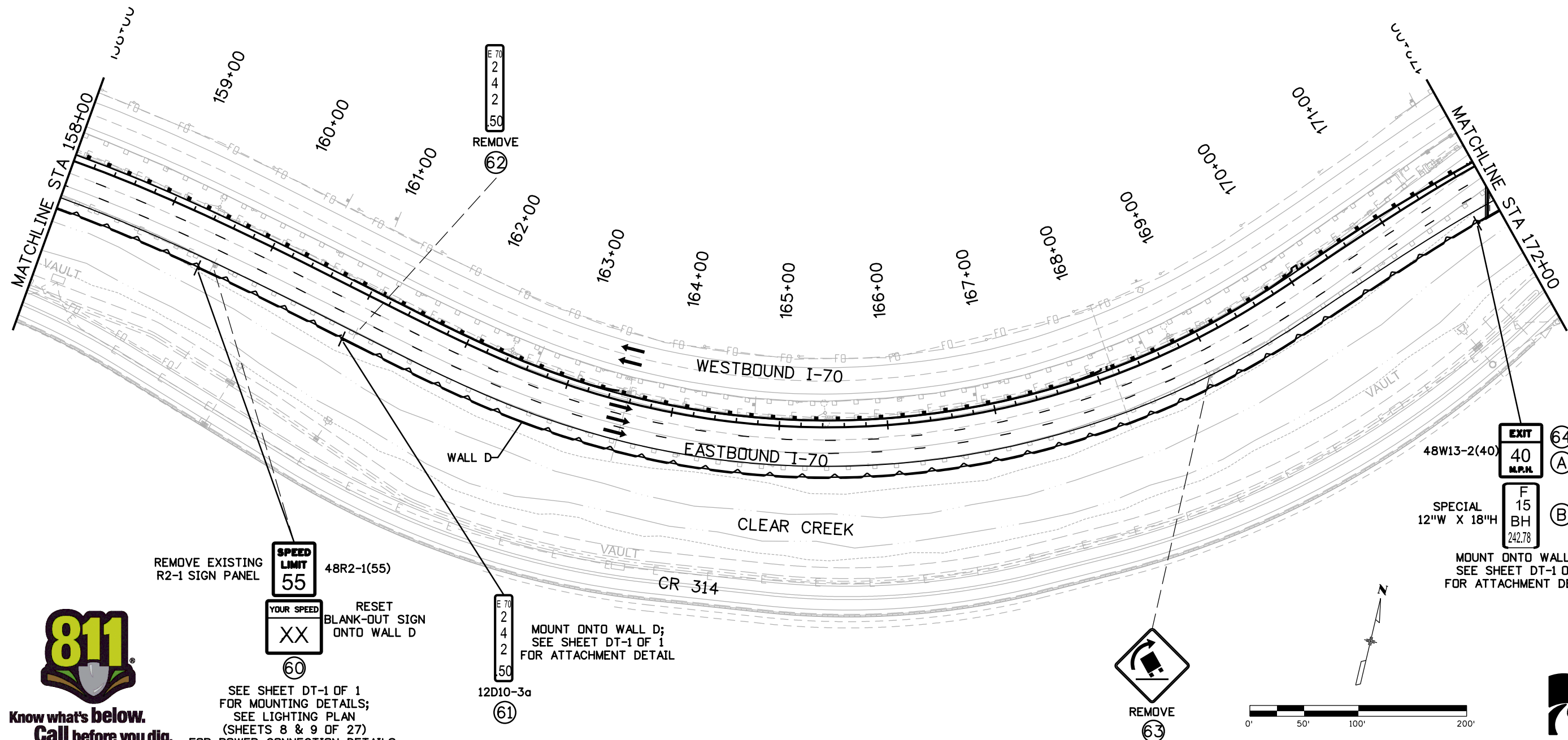


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Print Date: 3/7/2013 File Name: 18832TRAF_Plan005.dgn Horiz. Scale: 1:100 Vert. Scale:		Sheet Revisions Date: Comments Init.			Colorado Department of Transportation 425 A Corporate Circle Golden, CO 80401 Phone: 720-497-6918 FAX: 720-497-6901 Region 1 CRC	As Constructed No Revisions: Revised: Void:	SIGNING PLAN STA 144+00 to 158+00			Project No./Code IM 0703-391 19036 Sheet Number 310
		Designer: RRF Detailer: SYS Subset: TRAFFIC	Structure Numbers	Subset Sheets: SS-7 of 16						

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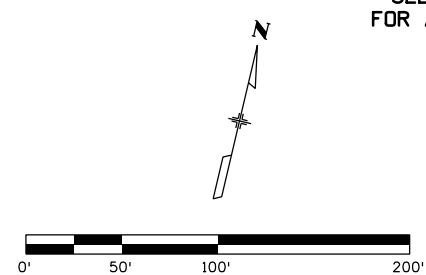


EXIT 64
 48W13-2(40)
40 M.P.H.
A
 SPECIAL
 12"W X 18"H
F 15 BH
 242.78
B
 MOUNT ONTO WALL D;
 SEE SHEET DT-1 OF 1
 FOR ATTACHMENT DETAIL

REMOVE EXISTING
 R2-1 SIGN PANEL
SPEED LIMIT 55
48R2-1(55)
YOUR SPEED XX
60
 RESET
 BLANK-OUT SIGN
 ONTO WALL D
 SEE SHEET DT-1 OF 1
 FOR MOUNTING DETAILS;
 SEE LIGHTING PLAN
 (SHEETS 8 & 9 OF 27)
 FOR POWER CONNECTION DETAILS.

12D10-3a
61
 MOUNT ONTO WALL D;
 SEE SHEET DT-1 OF 1
 FOR ATTACHMENT DETAIL

REMOVE 63



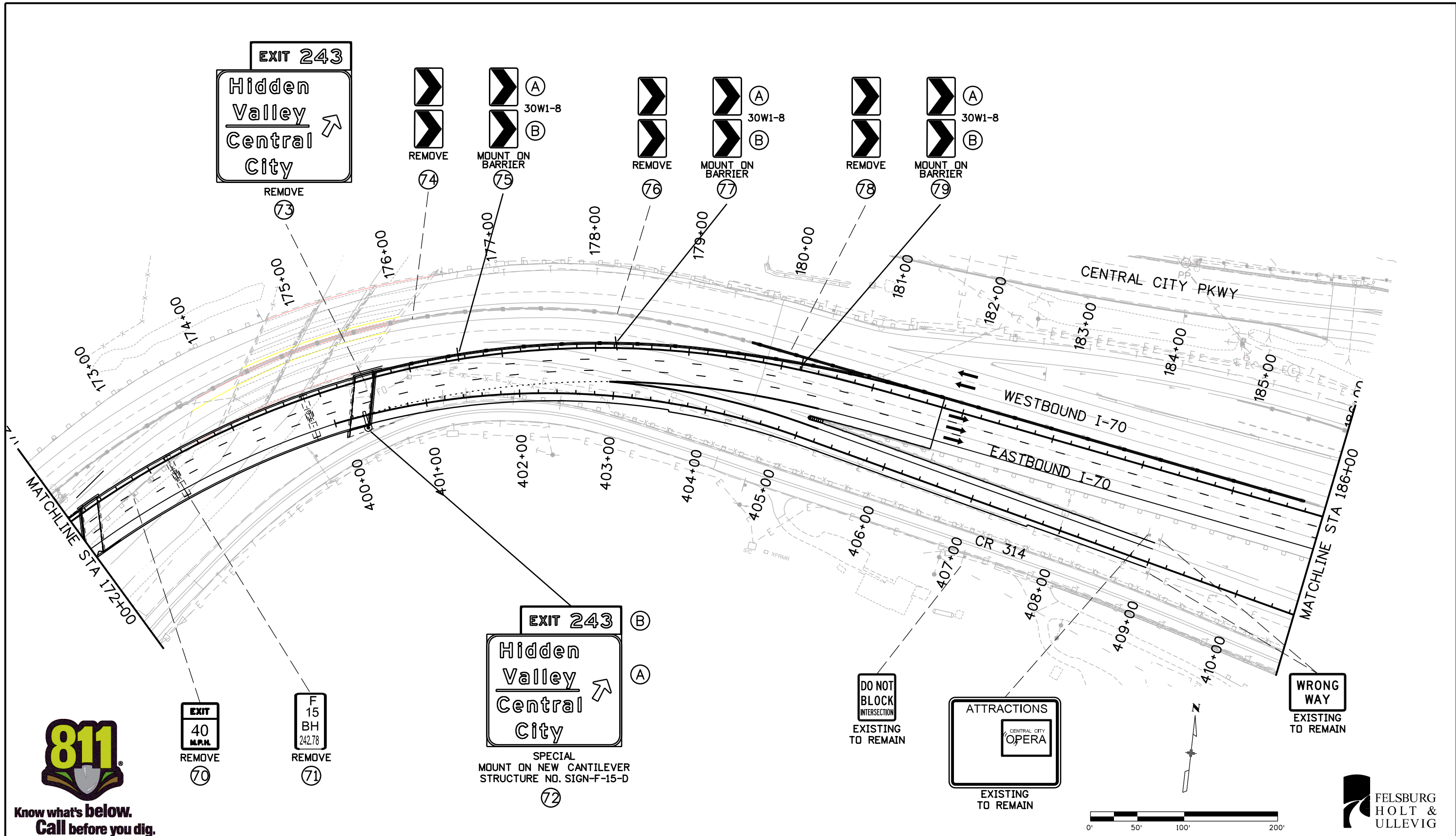
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Print Date: 3/7/2013	Sheet Revisions			Colorado Department of Transportation	As Constructed	SIGNING PLAN		Project No./Code
File Name: 18832TRAF_Plan006.dgn	Date:	Comments	Init.	425 A Corporate Circle Golden, CO 80401 Phone: 720-497-6918 FAX: 720-497-6901 Region 1	No Revisions:	STA 158+00 TO 172+00		IM 0703-391
Horiz. Scale: 1:100 Vert. Scale:					Revised:	Designer: RRF	Structure Numbers	19036
ATKINS 4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276					Void:	Detailer: SYS	Subset Sheets: SS-8 of 16	Sheet Number 311

Stan 11:26:35 AM c:\pw_work\pba\jw\1\common\dms21566\18832TRAF_Plan006.dgn

Stan 11:26:51 AM c:\pw_work\pws\pwl\common\dms21566\18832TRAF_Plan007.dgn



EXIT
40
 M.P.H.
 REMOVE
 70

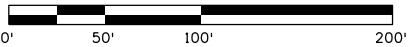
F
 15
 B.H.
 242.78
 REMOVE
 71

EXIT 243
Hidden Valley
Central City
 SPECIAL
 MOUNT ON NEW CANTILEVER
 STRUCTURE NO. SIGN-F-15-D
 72

**DO NOT
 BLOCK
 INTERSECTION**
 EXISTING
 TO REMAIN

ATTRACTIONS
 CENTRAL CITY
 OPERA
 EXISTING
 TO REMAIN

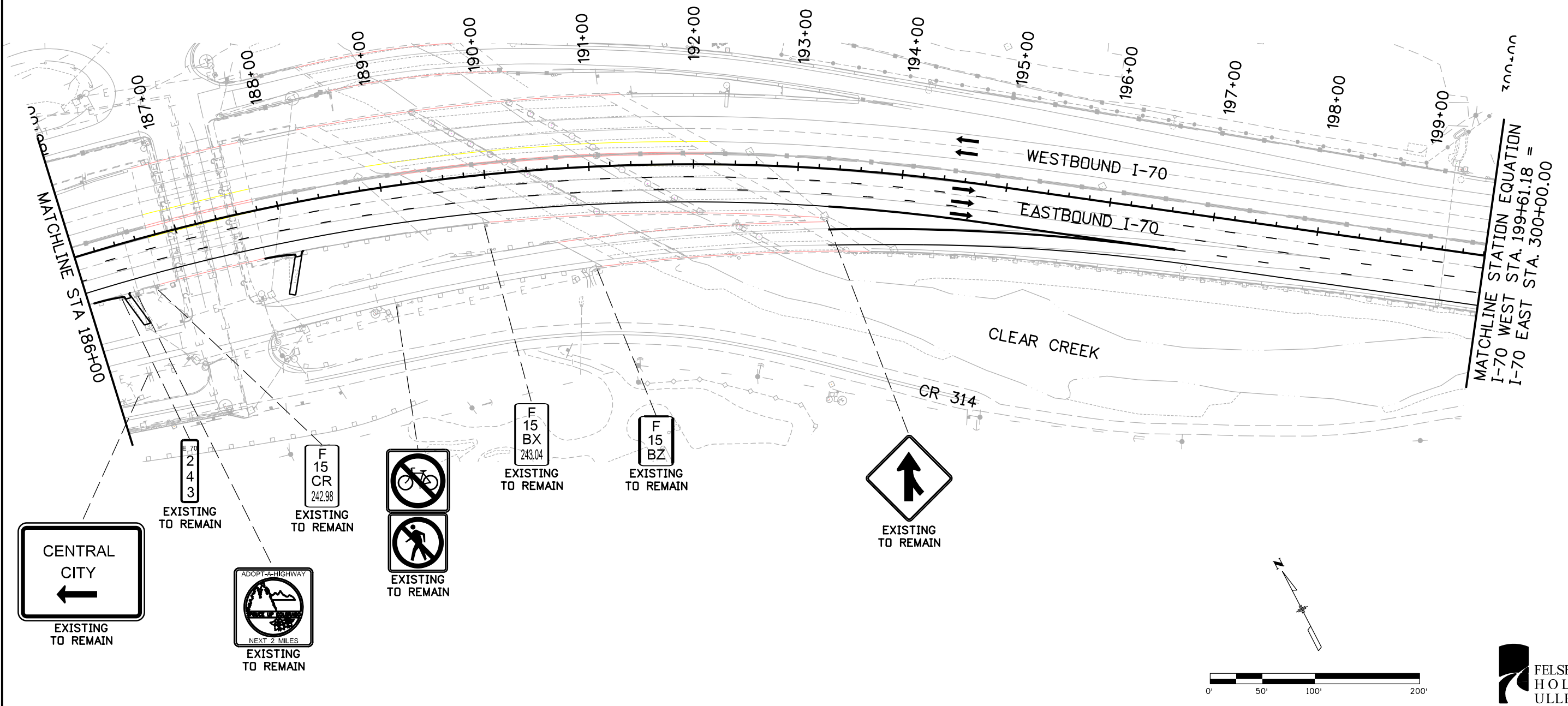
**WRONG
 WAY**
 EXISTING
 TO REMAIN



Print Date: 3/7/2013		Sheet Revisions		Colorado Department of Transportation		As Constructed		SIGNING PLAN		Project No./Code	
File Name: 18832TRAF_Plan007.dgn		Date:	Comments	Init.	425 A Corporate Circle Golden, CO 80401 Phone: 720-497-6918 FAX: 720-497-6901		No Revisions:		STA 172+00 TO 186+00		IM 0703-391
Horiz. Scale: 1:100 Vert. Scale:					Region 1		Revised:		Designer: RRF		19036
ATKINS 4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276					CRC		Void:		Detailer: SYS		Sheet Number 312
0000									Subset: TRAFFIC		Subset Sheets: SS-9 of 16



Know what's below.
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Print Date: 3/7/2013
 File Name: 18832TRAF_Plan008.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.

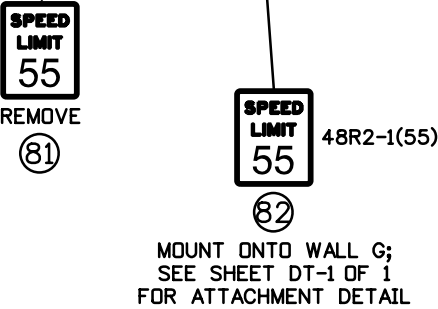
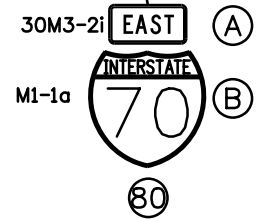
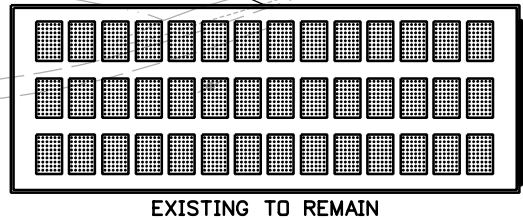
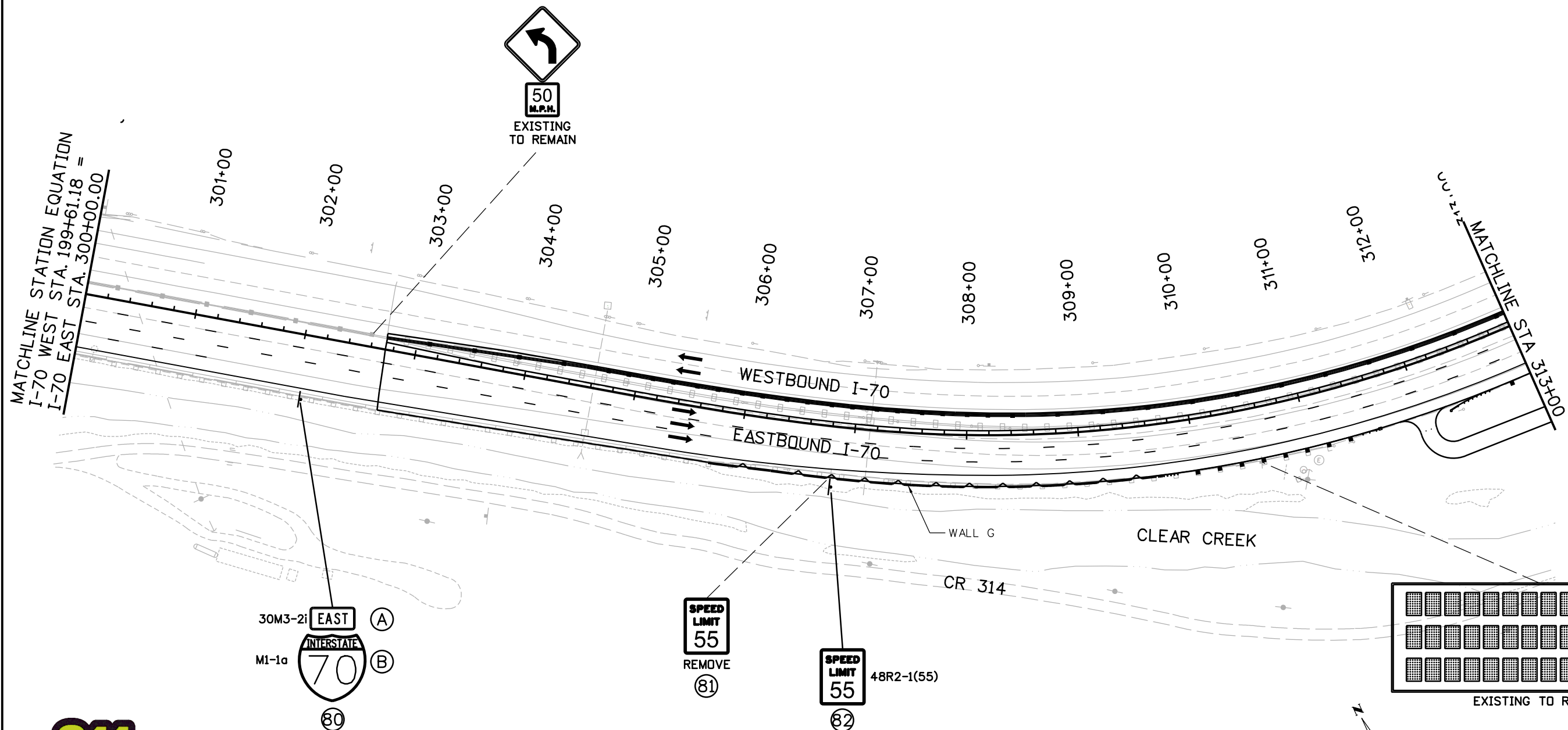
Colorado Department of Transportation
 425 A Corporate Circle
 Golden, CO 80401
 Phone: 720-497-6918 FAX: 720-497-6901
 Region 1 CRC

As Constructed
 No Revisions:
 Revised:
 Void:

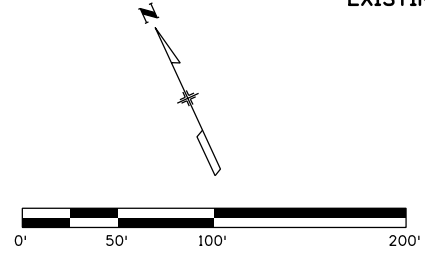
SIGNING PLAN
 STA 186+00 TO 199+61.18
 Designer: RRF Structure
 Detailer: SYS Numbers
 Subset: TRAFFIC Subset Sheets: SS-10 of 16

Project No./Code
 IM 0703-391
 19036
 Sheet Number 313

Stn 11:27:03 AM c:\pw_work\pbbj\jw\common\dms21566\18832TRAF_Plan008.dgn



Know what's below.
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Print Date: 3/7/2013	0000
File Name: 18832TRAF_Plan009.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



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

Region 1 CRC

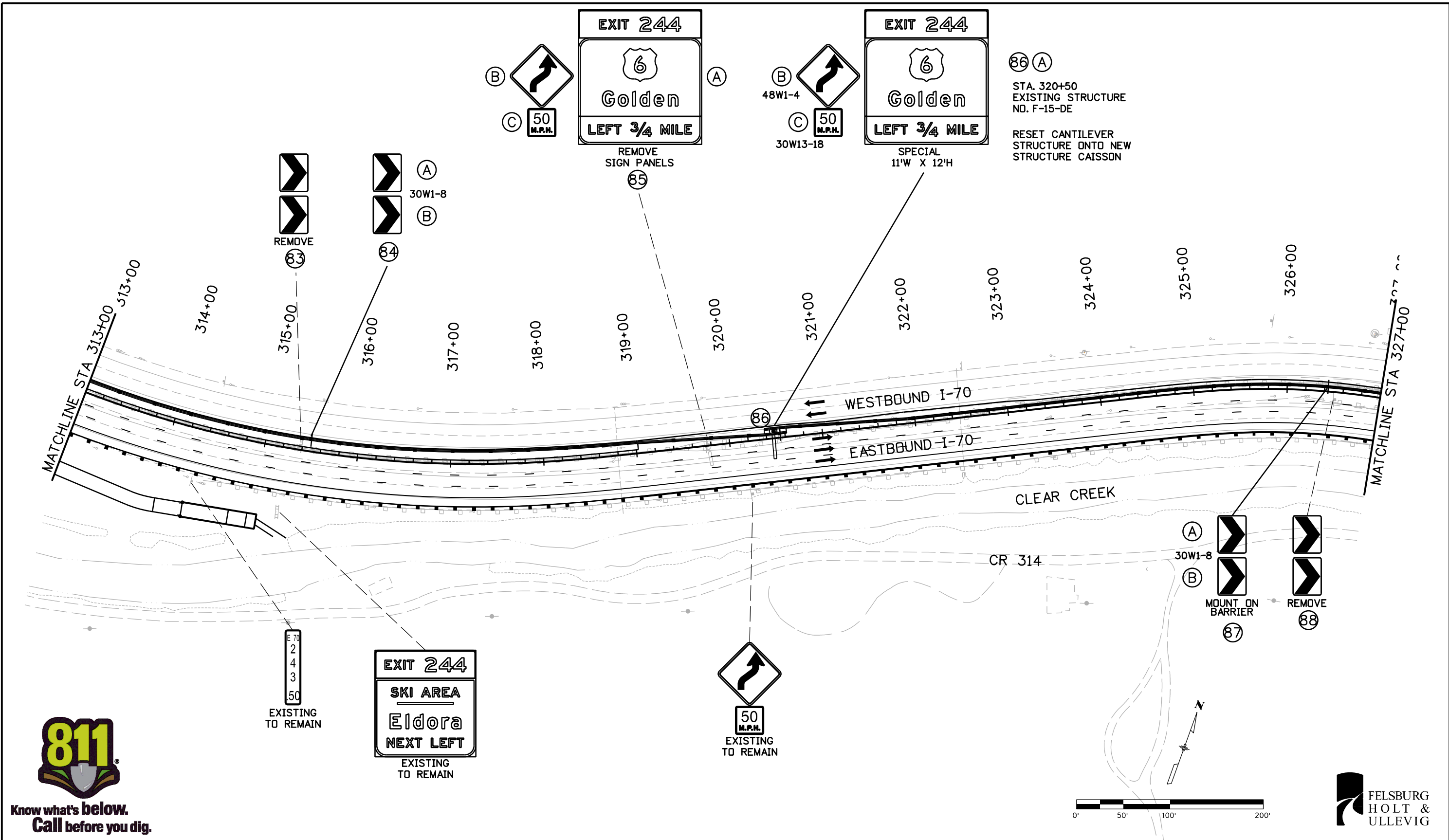
As Constructed
No Revisions:
Revised:
Void:

SIGNING PLAN STA 300+00 TO 313+00			
Designer:	RRF	Structure	
Detailer:	SYS	Numbers	
Subset:	TRAFFIC	Subset Sheets:	SS-11 of 16

Project No./Code
IM 0703-391
19036
Sheet Number 314

Stan 11:27:16 AM c:\pwwork\pbs\jpw\common\dms21566\18832TRAF_Plan009.dgn


Station 11:27:32 AM c:\pw\work\pbb\jpw\common\dms21566\18832TRAF_Plan010.dgn



Print Date: 3/7/2013
 File Name: 18832TRAF_Plan010.dgn
 Horiz. Scale: 1:100 Vert. Scale:

ATKINS 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

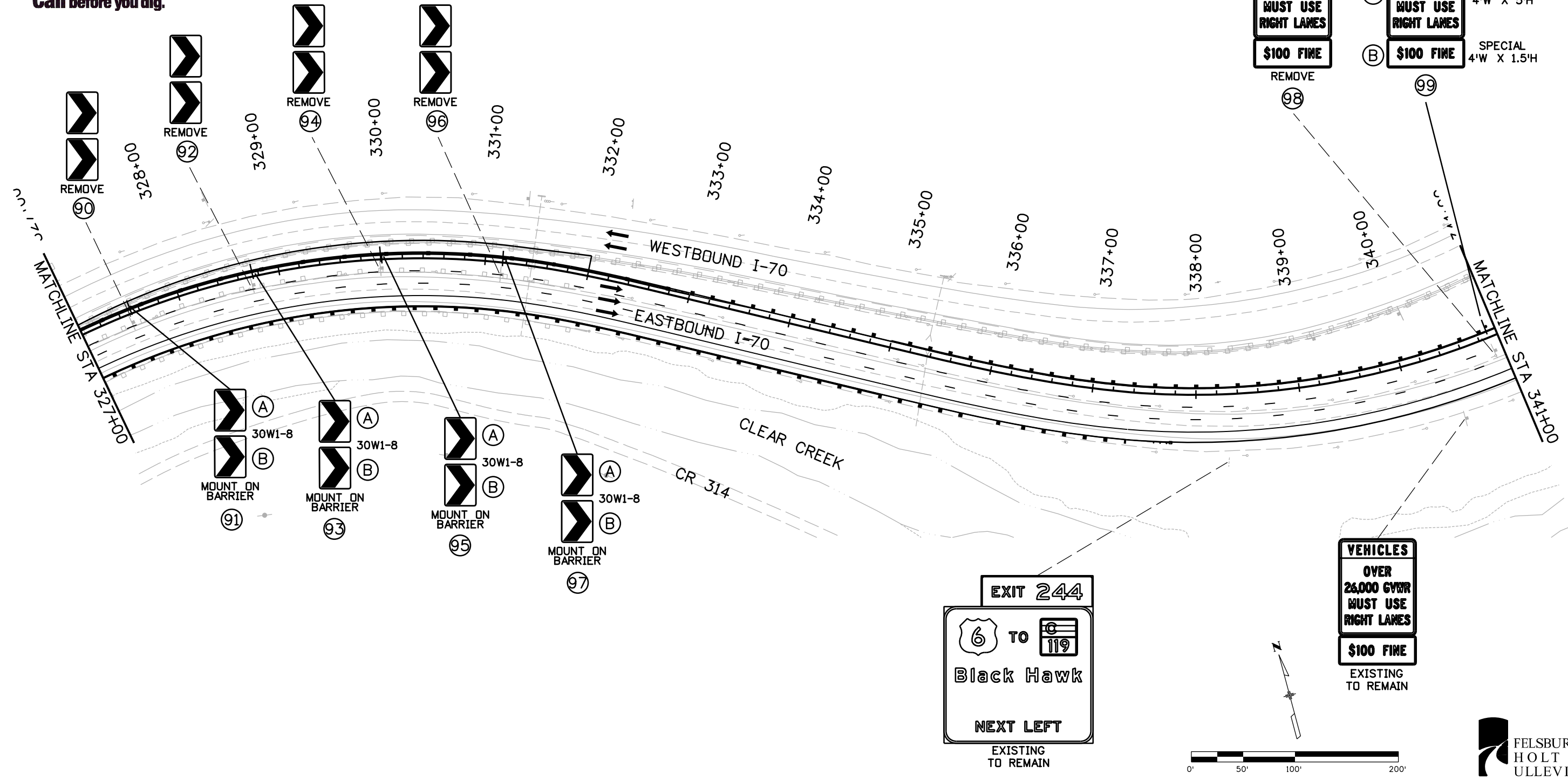
As Constructed
No Revisions:
Revised:
Void:

SIGNING PLAN STA 313+00 TO 327+00			
Designer:	RRF	Structure Numbers	
Detailer:	SYS		
Subset:	TRAFFIC	Subset Sheets:SS-12 of	16

Project No./Code
IM 0703-391
19036
Sheet Number 315



Know what's below.
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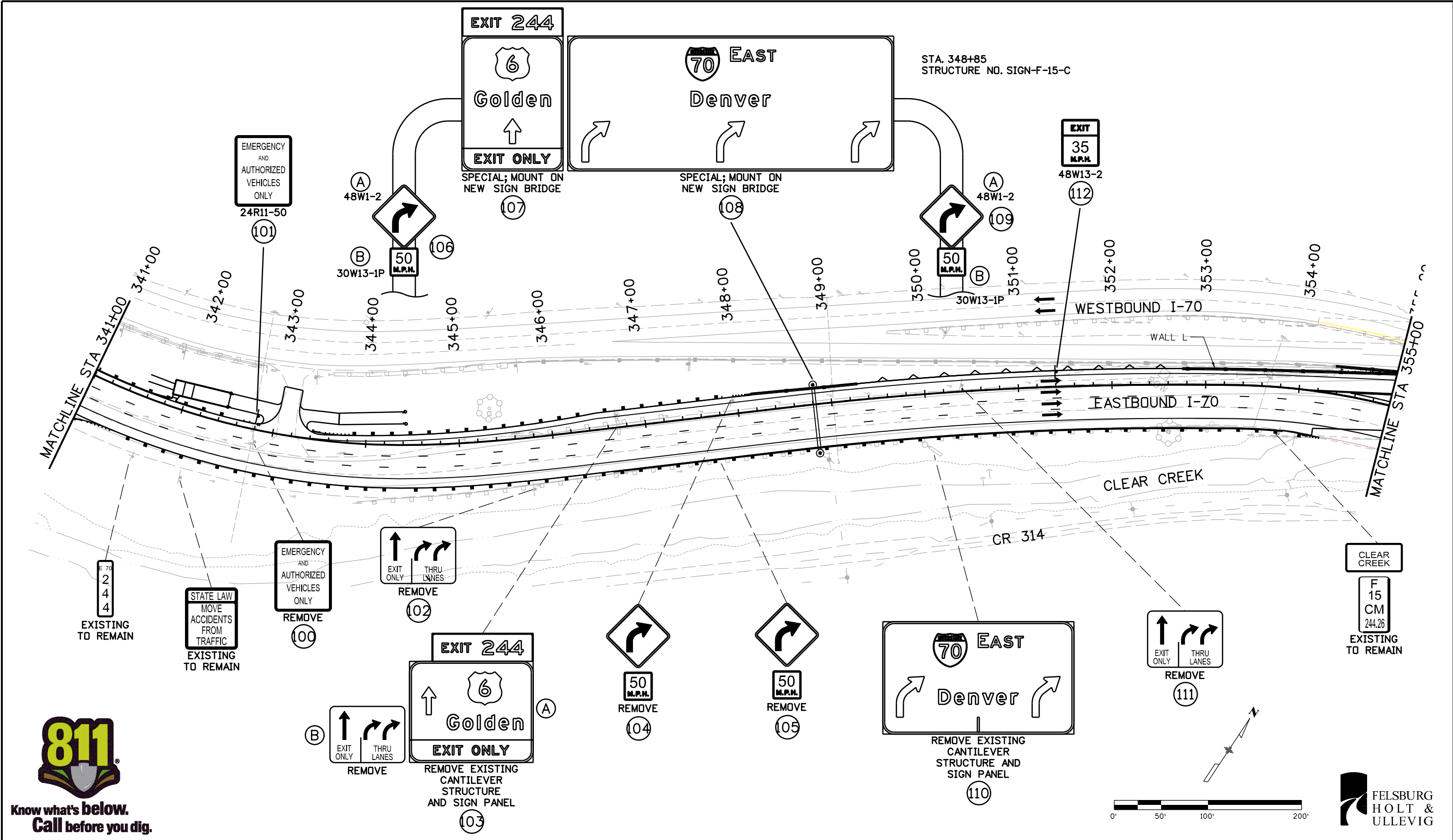
VEHICLES
OVER
26,000 GVWR
MUST USE
RIGHT LANES
\$100 FINE
EXISTING
TO REMAIN

EXIT 244
6 TO 119
Black Hawk
NEXT LEFT
EXISTING
TO REMAIN



Print Date: 3/7/2013 File Name: 18832TRAF_Plan011.dgn Horiz. Scale: 1:100 Vert. Scale:	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:	SIGNING PLAN STA 327+00 TO 341+00		Project No./Code IM 0703-391 19036 Sheet Number 316
	4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276						Designer: RRF Detailer: SYS Subset: TRAFFIC	

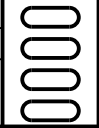
Stan 11:27:45 AM c:\pw\work\pbb\jpw\common\dms21566\18832TRAF_Plan011.dgn



Station 11:28:01 AM c:\pw_work\pbes\pwl\common\dms21566\18832TRAF_Plan012.dgn



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



Print Date: 3/7/2013
File Name: 18832TRAF_Plan012.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
 425 A Corporate Circle
 Golden, CO 80401
 Phone: 720-497-6918 FAX: 720-497-6901
 Region 1 CRC

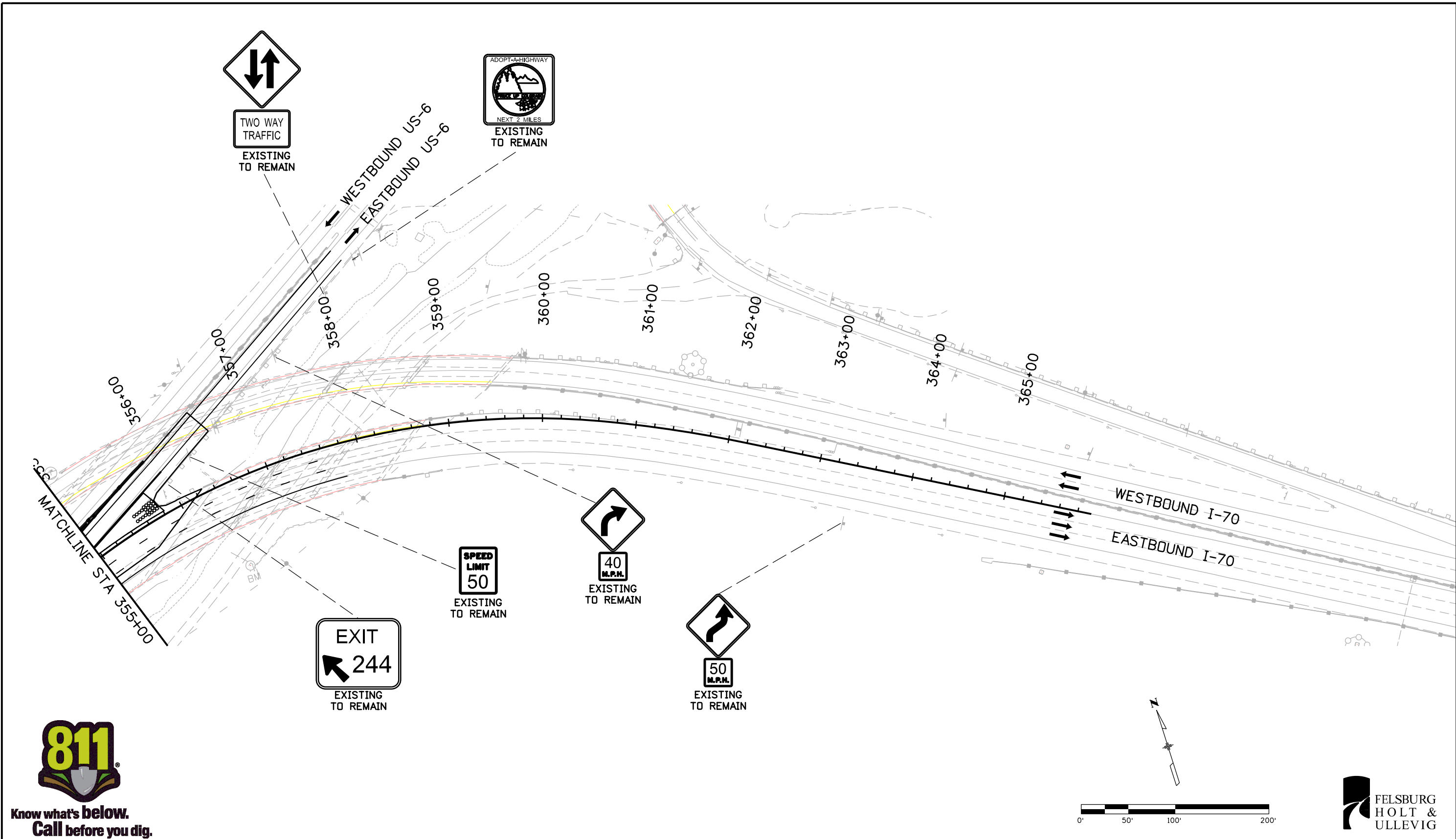
As Constructed
No Revisions:
Revised:
Void:

SIGNING PLAN			
STA 341+00 TO 355+00			
Designer:	RRF	Structure Numbers:	
Detailer:	SYS	Subset Sheets:	SS-14 of 16
Subset:	TRAFFIC		

Project No./Code
IM 0703-391
19036
Sheet Number 317



Stan 11:28:14 AM c:\pw_work\pwsjpw\common\dms21566\18832TRAF_Plan013.dgn



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



Print Date: 3/7/2013	
File Name: 18832TRAF_Plan013.dgn	
Horiz. Scale: 1:100 Vert. Scale:	
4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276	

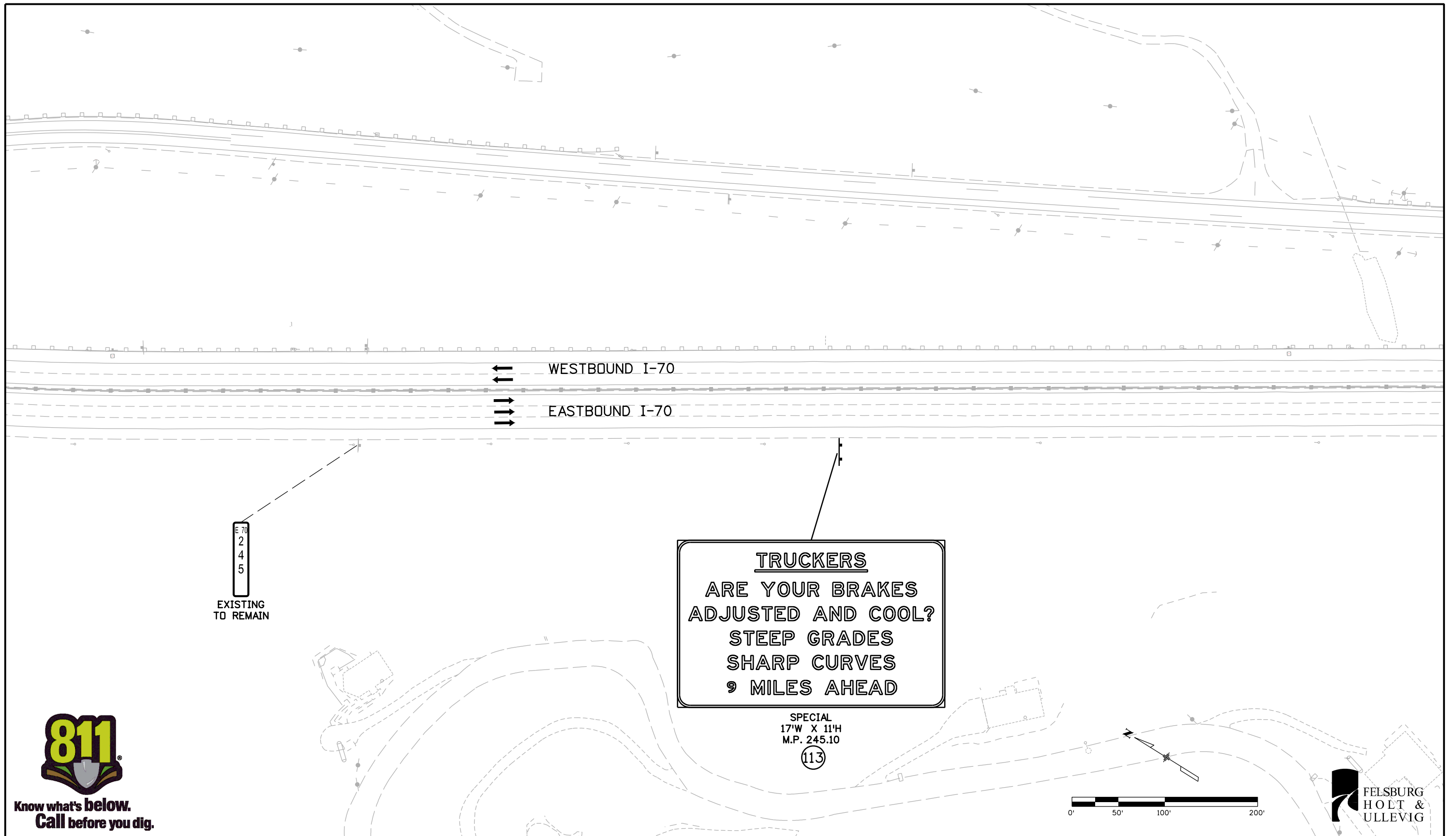
Sheet Revisions		
Date:	Comments	Init.

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:

SIGNING PLAN			
STA 355+00 TO 365+96.69			
Designer:	RRF	Structure	
Detailer:	SYS	Numbers	
Subset:	TRAFFIC	Subset Sheets:SS-15 of	16

Project No./Code
IM 0703-391
19036
Sheet Number 318



Know what's below.
Call before you dig.



Print Date: 3/7/2013
 File Name: 18832TRAF_Plan023.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
 425 A Corporate Circle
 Golden, CO 80401
 Phone: 720-497-6918 FAX: 720-497-6901
 Region 1 CRC

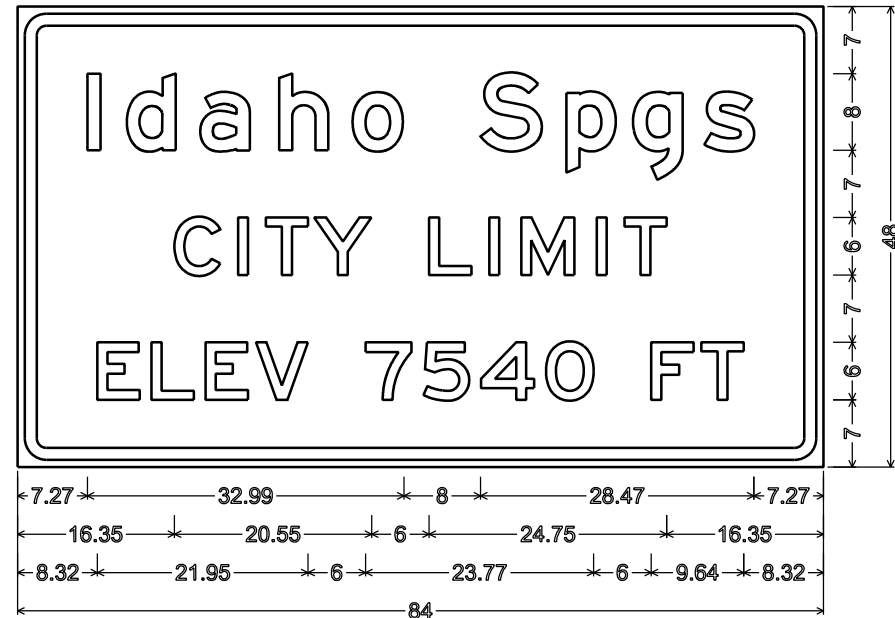
As Constructed
No Revisions:
Revised:
Void:

SIGNING PLAN
 EB I-70 AT MP 245.10±

Designer: RRF	Structure Numbers
Detailer: SYS	
Subset: TRAFFIC	Subset Sheets: SS-16 of 16

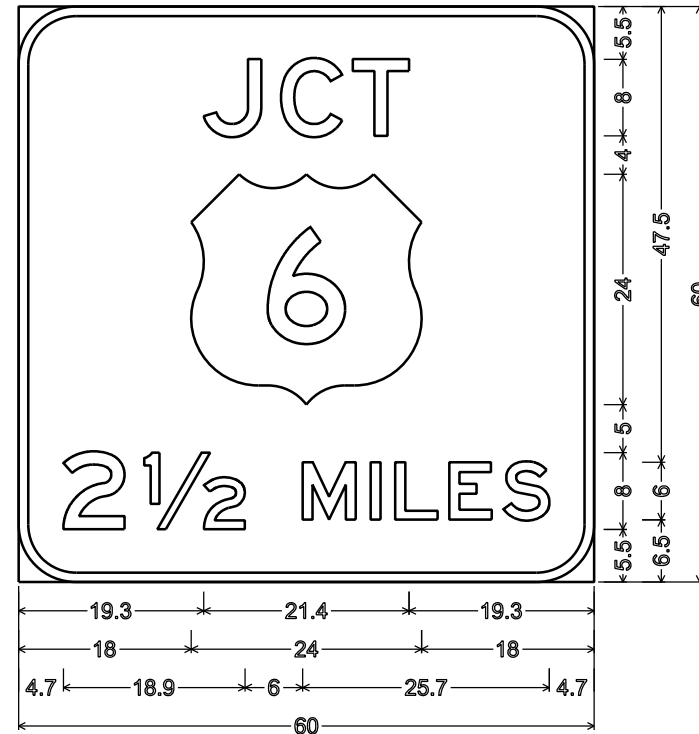
Project No./Code
IM 0703-391
19036
Sheet Number 319

Stan 11:28:24 AM c:\pw\work\pbb\jpw\common\dms21566\18832TRAF_Plan023.dgn



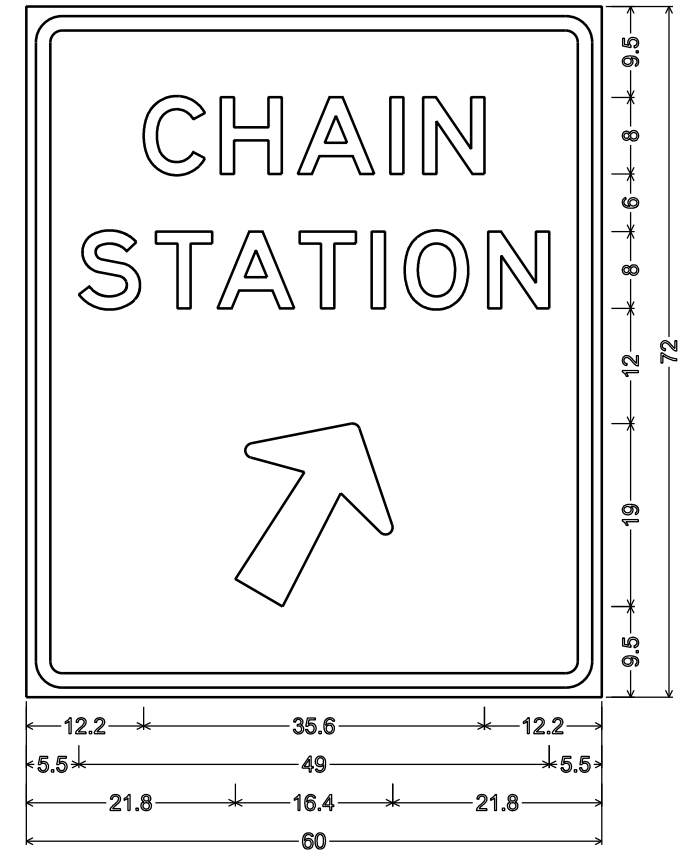
3.00" Radius, 1.25" Border, 0.75" Indent, White on Green;
 "Idaho Spgs" E; "CITY LIMIT" E 150% spacing; "ELEV 7540 FT" E;

SIGN NO. 5



6.0" Radius, 1.0" Border, White on Green;
 "JCT" E; "2 1/2 MILES" E;

SIGN NO. 9



3.8" Radius, 1.5" Border, 1.0" Indent, Black on Yellow;
 "CHAIN" E; "STATION" E; Arrow AR-B2 - 20.3" 60";


SIGN NO. 10



Print Date: 3/7/2013	0000
File Name: 18832TRAF_SignDetails01.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



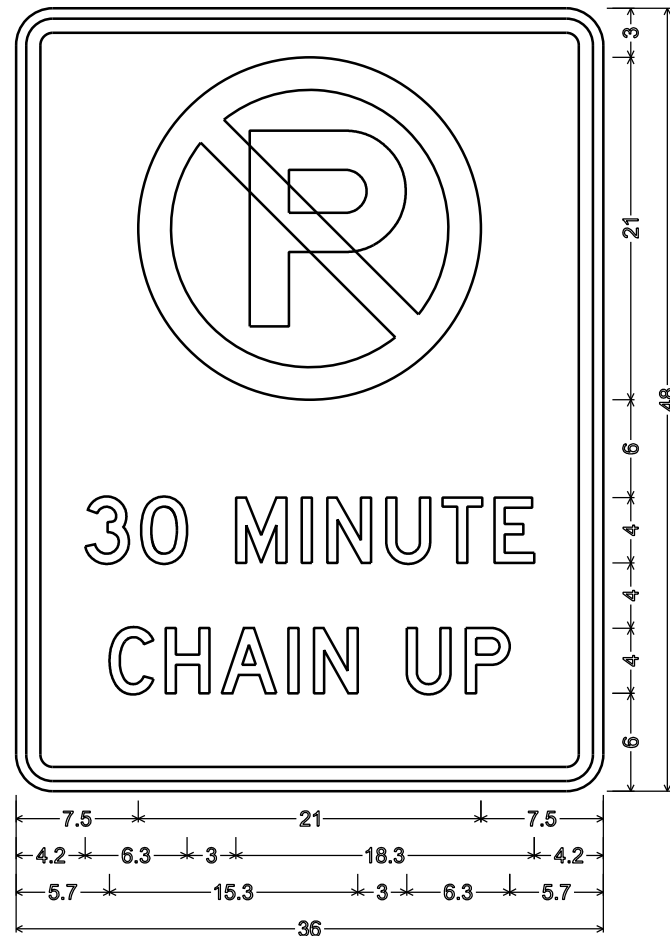
425 A Corporate Circle
Golden, CO 80401
Phone: 720-497-6918 FAX: 720-497-6901

Region 1 CRC

As Constructed
No Revisions:
Revised:
Void:

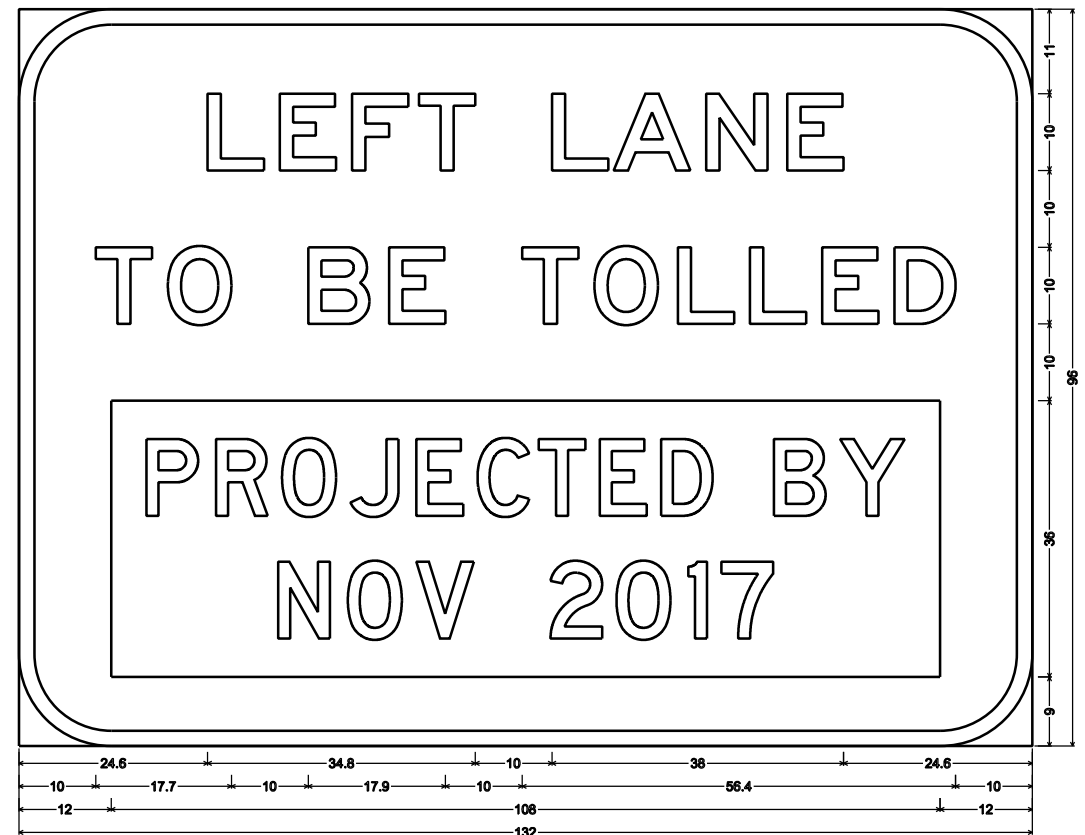
SIGNING PLAN SIGN DETAILS			
Designer:	RRF	Structure	
Detailer:	SYS	Numbers	
Subset:	TRAFFIC	Subset Sheets:	SD-1 of 6

Project No./Code
IM 0703-391
19036
Sheet Number 320



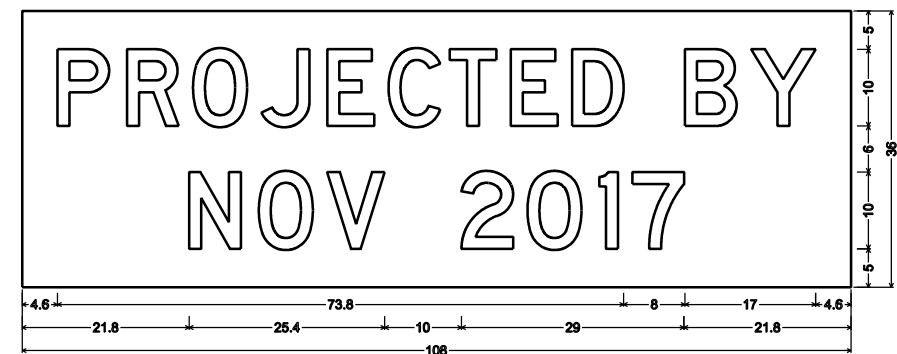
2.3" Radius, 0.9" Border, 0.6" Indent, Black on White;
NO PARKING EXPWY; "30 MINUTE" D; "CHAIN UP" D;

SIGN NOS. 12 TO 16



12.0" Radius, 2.0" Border, White on Blue;
"LEFT LANE" E; "TO BE TOLLED" E; Rectangle Yellow;

SIGN NO. 24A

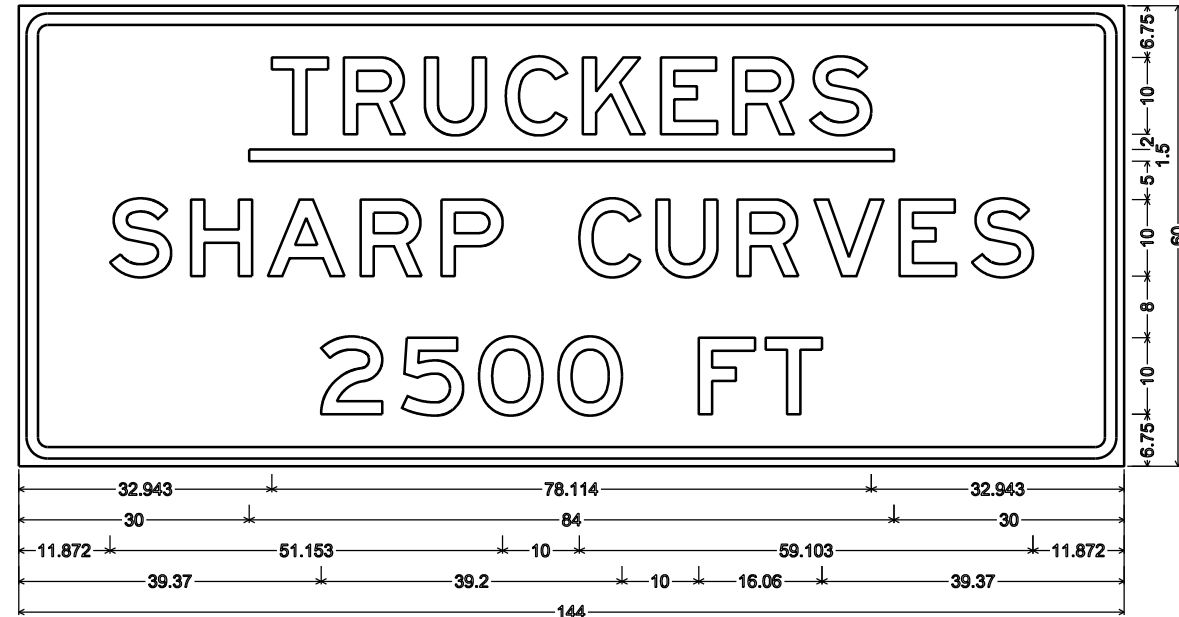


No border, Black on Yellow;
"PROJECTED BY" D; "NOV 2017" D;

SIGN NO. 24B

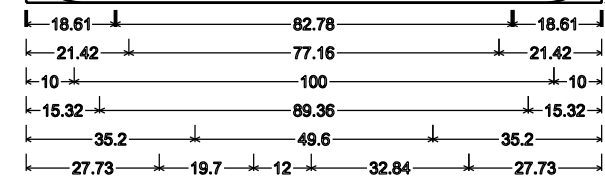
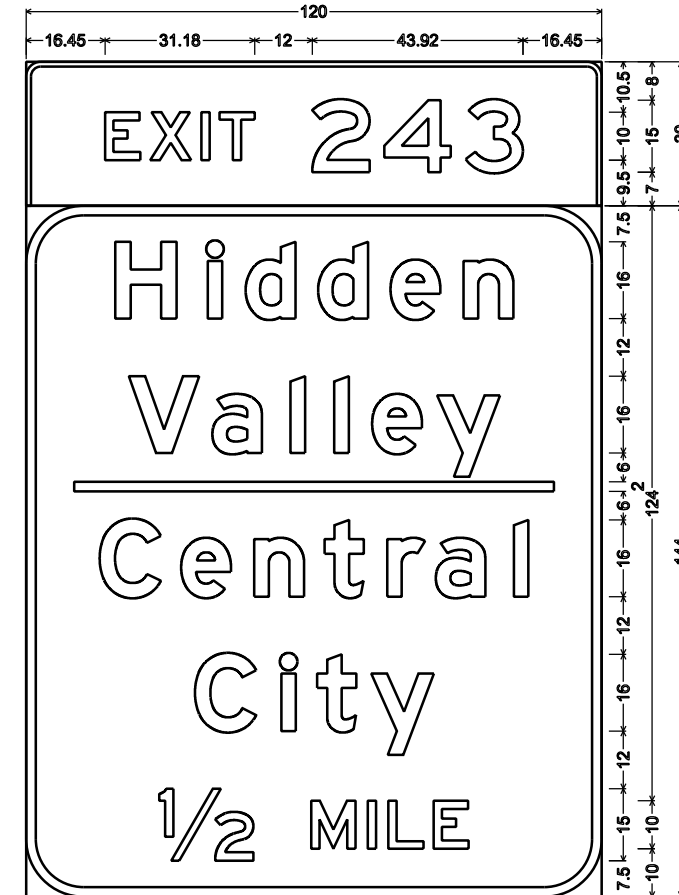


Print Date: 3/7/2013	Sheet Revisions			Colorado Department of Transportation		As Constructed		SIGNING PLAN SIGN DETAILS		Project No./Code			
File Name: 18832TRAF_SignDetails02.dgn	Date:	Comments	Init.	 425 A Corporate Circle Golden, CO 80401 Phone: 720-497-6918 FAX: 720-497-6901		No Revisions:		Designer: RRF Detailer: SYS Subset: TRAFFIC		IM 0703-391			
Horiz. Scale: 1:100 Vert. Scale:						Revised:				Structure Numbers		19036	
ATKINS 4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276						Void:				Subset Sheets: SD-2 of 6		Sheet Number 321	
				Region 1	CRC								



3.750" Radius, 1.500" Border, 1.000" Indent, Black on Yellow;
 "TRUCKERS" E; "SHARP CURVES" E; "2500 FT" E;

SIGN NO. 46

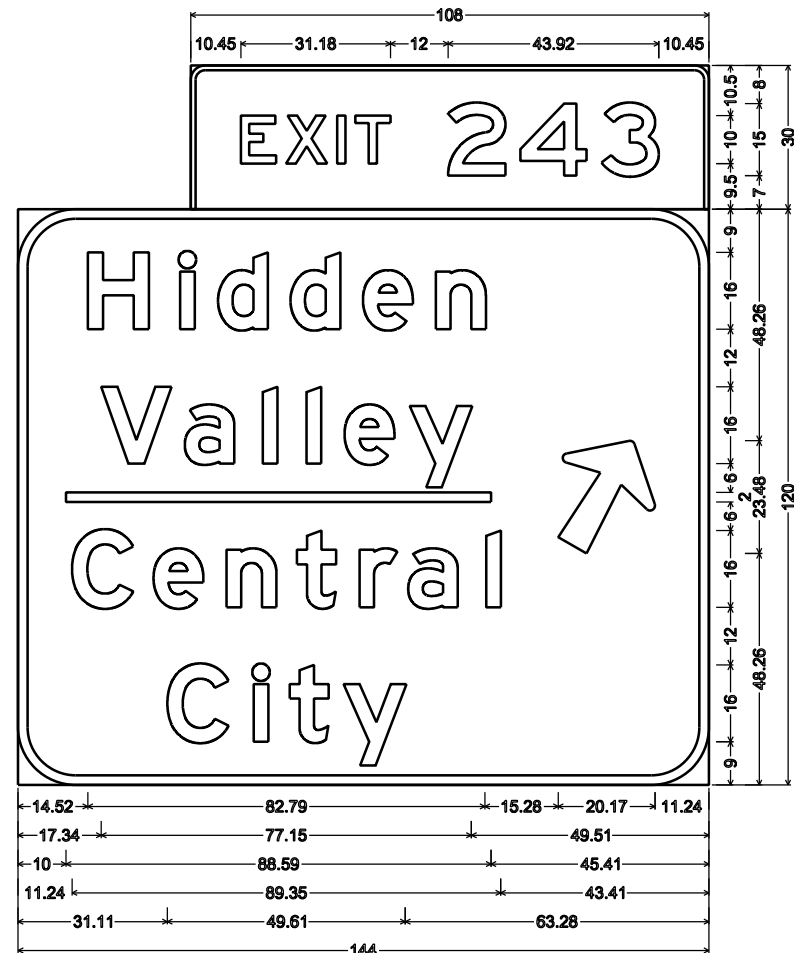


3.00" Radius, 1.00" Border, White on Green;
 "EXIT 243" E;
 12.00" Radius, 2.00" Border, White on Green;
 "Hidden" E Mod; "Valley" E Mod; "Central" E Mod; "City" E Mod;
 "1/2 MILE" E;

SIGN NO. 52

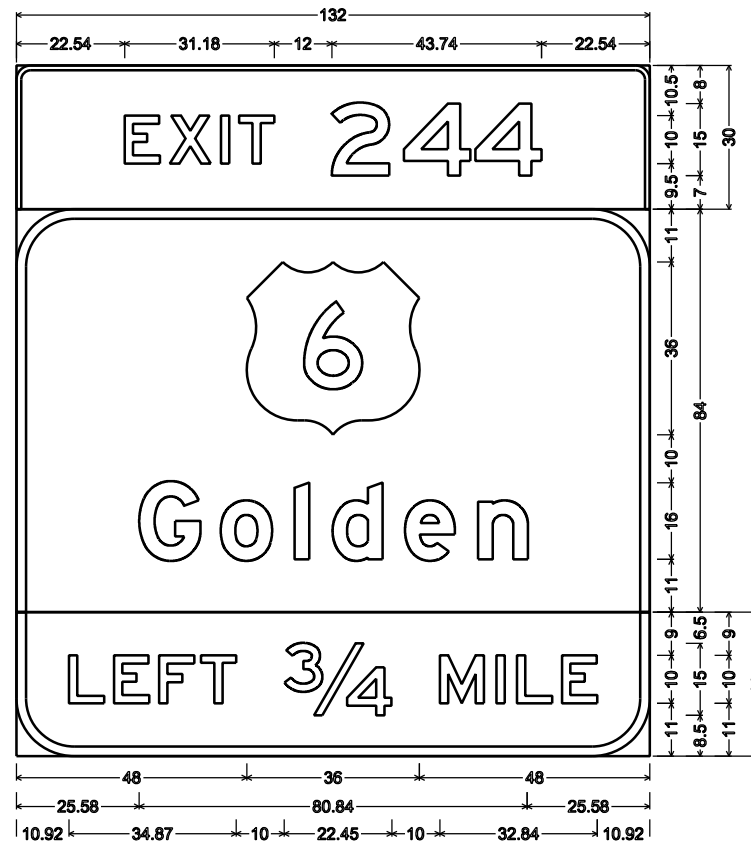


Print Date: 3/7/2013		Sheet Revisions			Colorado Department of Transportation		As Constructed	SIGNING PLAN SIGN DETAILS		Project No./Code
File Name: 18832TRAF_SignDetails03.dgn		Date:	Comments	Init.	425 A Corporate Circle Golden, CO 80401 Phone: 720-497-6918 FAX: 720-497-6901		No Revisions:	Designer: RRF	Structure	IM 0703-391
Horiz. Scale: 1:100 Vert. Scale:					Region 1		Revised:	Detailer: SYS	Numbers	19036
ATKINS 4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276						Void:	Subset: TRAFFIC	Subset Sheets: SD-3 of 6	Sheet Number	322



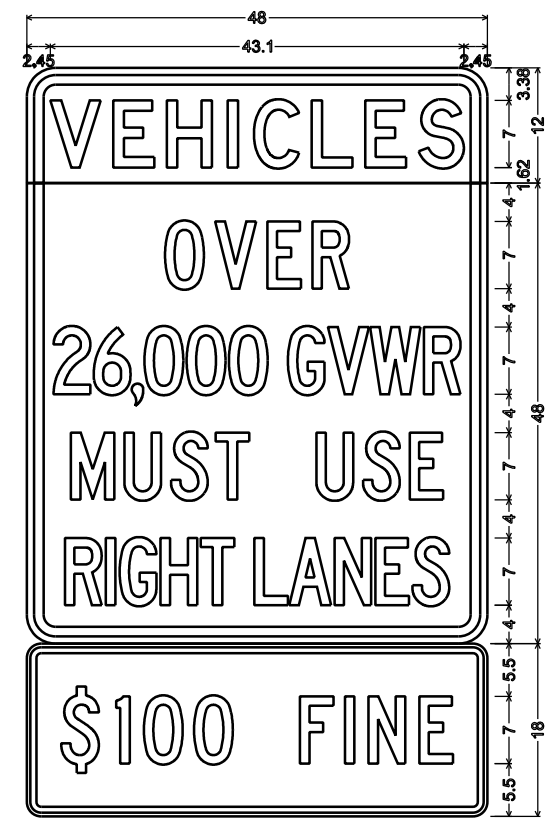
3.00" Radius, 1.00" Border, White on Green;
 "EXIT 243" E;
 12.00" Radius, 2.00" Border, White on Green;
 "Hidden" E Mod; "Valley" E Mod; "Central" E Mod; "City" E Mod;
 Arrow AR-B3 - 25.00" 60";

SIGN NO. 72



3.00" Radius, 1.00" Border, White on Green;
 "EXIT 244" E;
 12.00" Radius, 2.00" Border, White on Green;
 "Golden" E Mod;
 12.00" Radius, 2.00" Border, White on Yellow;
 "LEFT 3/4 MILE" Black E;

SIGN NO. 86



3.00" Radius, 1.00" Border, 0.75" Indent, Black on Yellow;
 "VEHICLES" D;
 3.00" Radius, 1.00" Border, 0.75" Indent, Black on White;
 "OVER" C; "26,000 GVWR" C 30% spacing;
 "MUST USE" C 70% spacing;
 "RIGHT LANES" C 30% spacing;
 1.50" Radius, 0.63" Border, 0.38" Indent, Black on White;
 "\$100 FINE" C;

SIGN NOS. 99A & 99B



Print Date: 3/7/2013	0000
File Name: 18832TRAF_SignDetails04.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



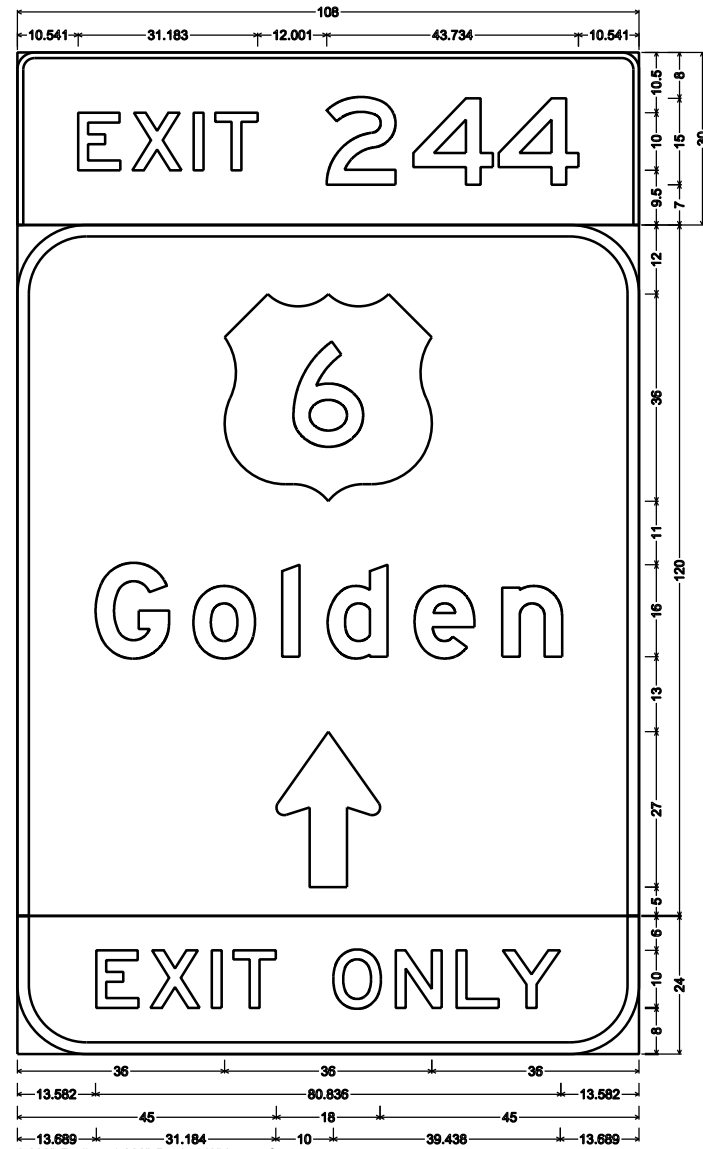
425 A Corporate Circle
Golden, CO 80401
Phone: 720-497-6918 FAX: 720-497-6901

Region 1 CRC

As Constructed
No Revisions:
Revised:
Void:

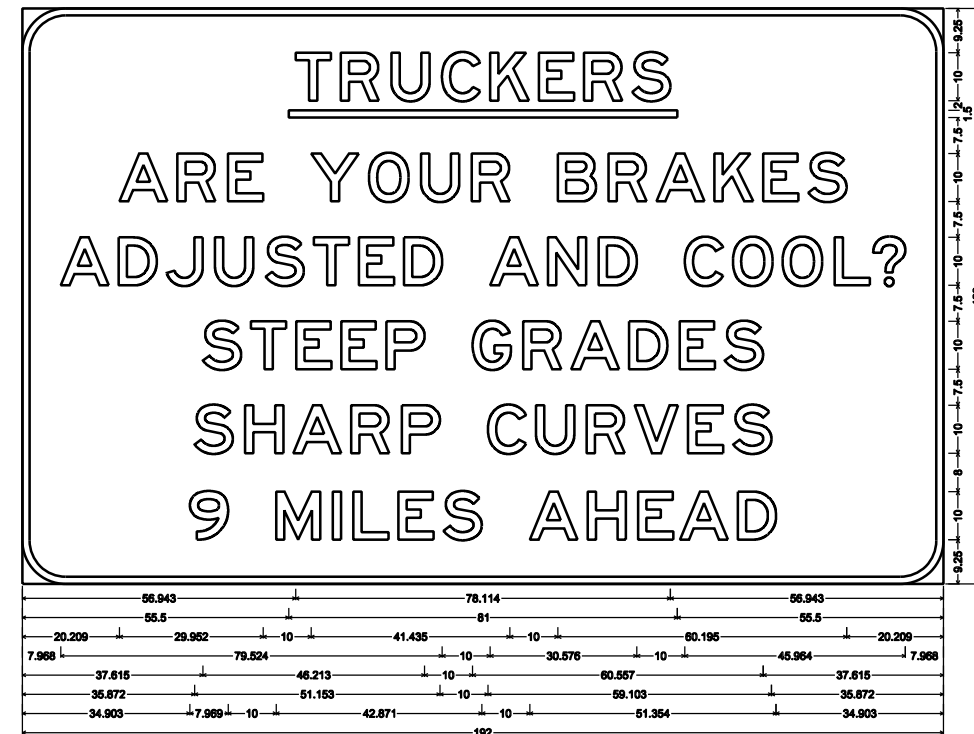
SIGNING PLAN SIGN DETAILS			
Designer:	RRF	Structure	
Detailer:	SYS	Numbers	
Subset:	TRAFFIC	Subset Sheets: SD-4 of	6

Project No./Code
IM 0703-391
19036
Sheet Number 323



3.000" Radius, 1.000" Border, White on Green;
 "EXIT 244" E;
 12.000" Radius, 2.000" Border, White on Green;
 "Golden" E Mod; Standard Arrow Custom 27.000" X 18.000" 90";
 12.000" Radius, 2.000" Border, White on Yellow;
 "EXIT ONLY" Black E;

SIGN NO. 107




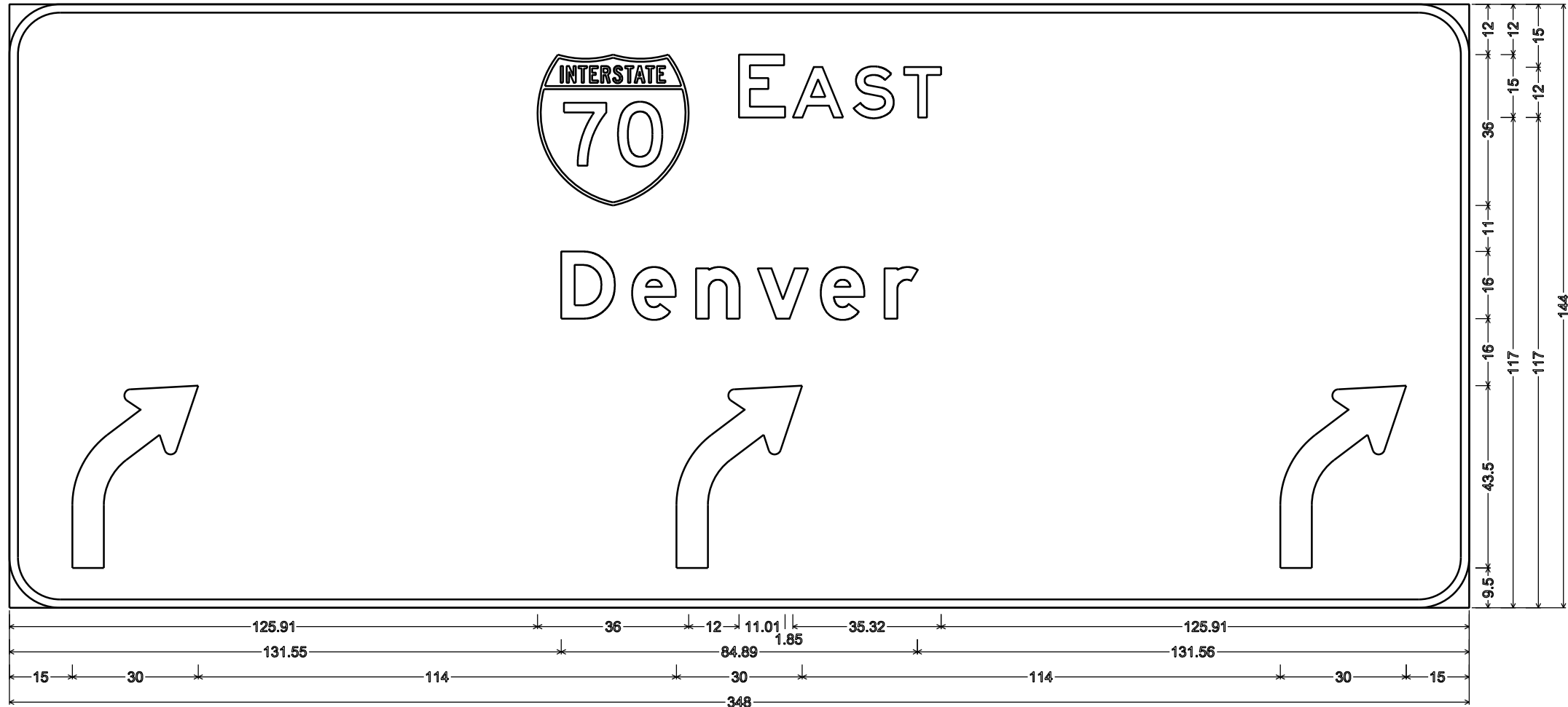
9.000" Radius, 1.500" Border, Black on Yellow;
 "TRUCKERS" E; "ARE YOUR BRAKES" E; "ADJUSTED AND COOL?" E; "STEEP GRADES" E; "SHARP CURVES" E; "9 MILES AHEAD" E;

SIGN NO. 113

Stan 11:29:20 AM c:\pw_work\pjs\jw1\common\dms21566\18832TRAF_SignDetails05.dgn



Print Date: 3/7/2013	Sheet Revisions			Colorado Department of Transportation			As Constructed		SIGNING PLAN SIGN DETAILS			Project No./Code			
File Name: 18832TRAF_SignDetails05.dgn	Date:	Comments	Init.	 425 A Corporate Circle Golden, CO 80401 Phone: 720-497-6918 FAX: 720-497-6901			No Revisions:		Designer: RRF Detailer: SYS Subset: TRAFFIC			IM 0703-391			
Horiz. Scale: 1:100 Vert. Scale:							Revised:					Structure Numbers		19036	
ATKINS 4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276							Void:					Subset Sheets: SD-5 of 6		Sheet Number 324	
				Region 1			CRC								



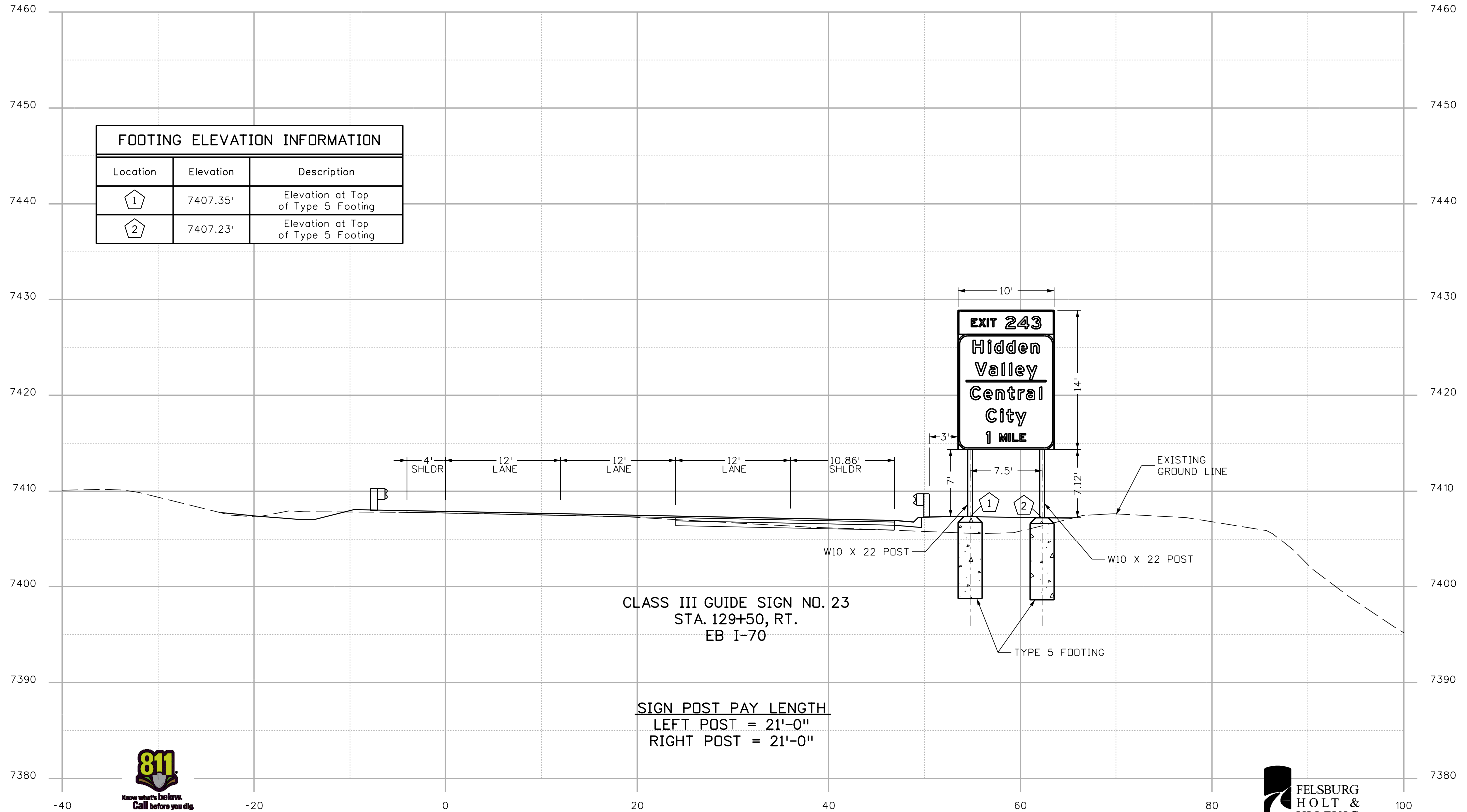
12.00" Radius, 2.00" Border, White on Green;
 EAST E; *Denver* E Mod;

SIGN NO. 108



Stan 11:29:29 AM c:\pw_work\pjs\jrw\common\dms21566\18832TRAF_SignDetails06.dgn

Print Date: 3/7/2013		Sheet Revisions			Colorado Department of Transportation		As Constructed		SIGNING PLAN SIGN DETAILS			Project No./Code	
File Name: 18832TRAF_SignDetails06.dgn		Date:	Comments	Init.	425 A Corporate Circle Golden, CO 80401 Phone: 720-497-6918 FAX: 720-497-6901		No Revisions:		Designer: RRF			IM 0703-391	
Horiz. Scale: 1:100 Vert. Scale:					Region 1		Revised:		Detailer: SYS			19036	
ATKINS 4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276					CRC		Void:		Subset: TRAFFIC			Sheet Number 325 Subset Sheets: SD-6 of 6	



FOOTING ELEVATION INFORMATION		
Location	Elevation	Description
1	7407.35'	Elevation at Top of Type 5 Footing
2	7407.23'	Elevation at Top of Type 5 Footing

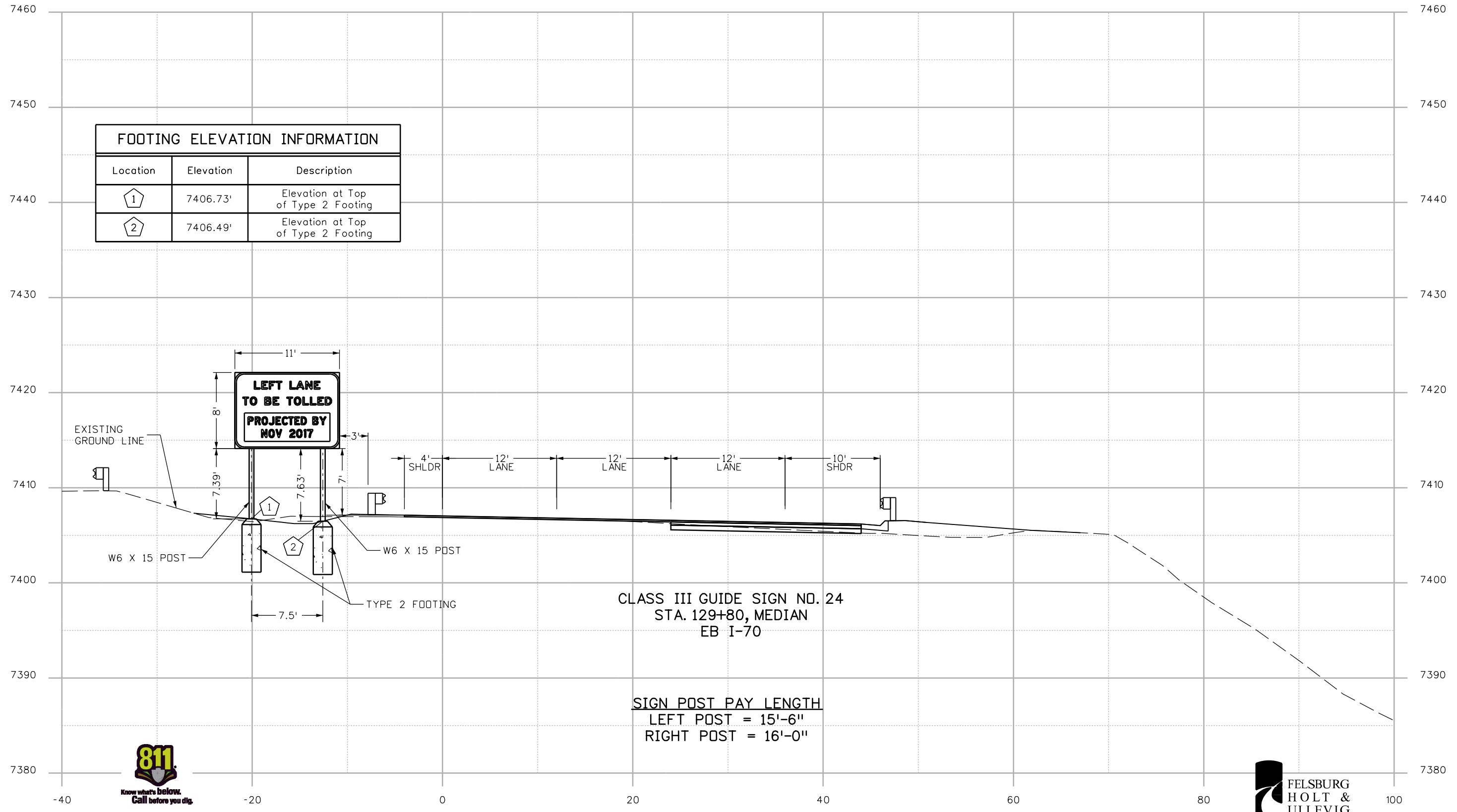
CLASS III GUIDE SIGN NO. 23
 STA. 129+50, RT.
 EB I-70

SIGN POST PAY LENGTH
 LEFT POST = 21'-0"
 RIGHT POST = 21'-0"



Print Date: 3/7/2013 File Name: 18832TRAF_Sign XSec01.dgn Horiz. Scale: 1:10 Vert. Scale: 1:10	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:	SIGN NO. 23 CROSS-SECTION STA. 129+50, RT.		Project No./Code IM 0703-391 19036 Sheet Number 326
	4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276					Designer: RRF Detailer: SYS Subset: TRAFFIC	Structure Numbers: Subset Sheets: CS-1 of 8	

Stan 11:29:43 AM c:\pw_work\pba\jpw\common\dms21566\18832TRAF_Sign XSec01.dgn



FOOTING ELEVATION INFORMATION		
Location	Elevation	Description
①	7406.73'	Elevation at Top of Type 2 Footing
②	7406.49'	Elevation at Top of Type 2 Footing

CLASS III GUIDE SIGN NO. 24
 STA. 129+80, MEDIAN
 EB I-70

SIGN POST PAY LENGTH
 LEFT POST = 15'-6"
 RIGHT POST = 16'-0"



Print Date: 3/7/2013
 File Name: 18832TRAF_Sign XSec02.dgn
 Horiz. Scale: 1:10 Vert. Scale: 1:10

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

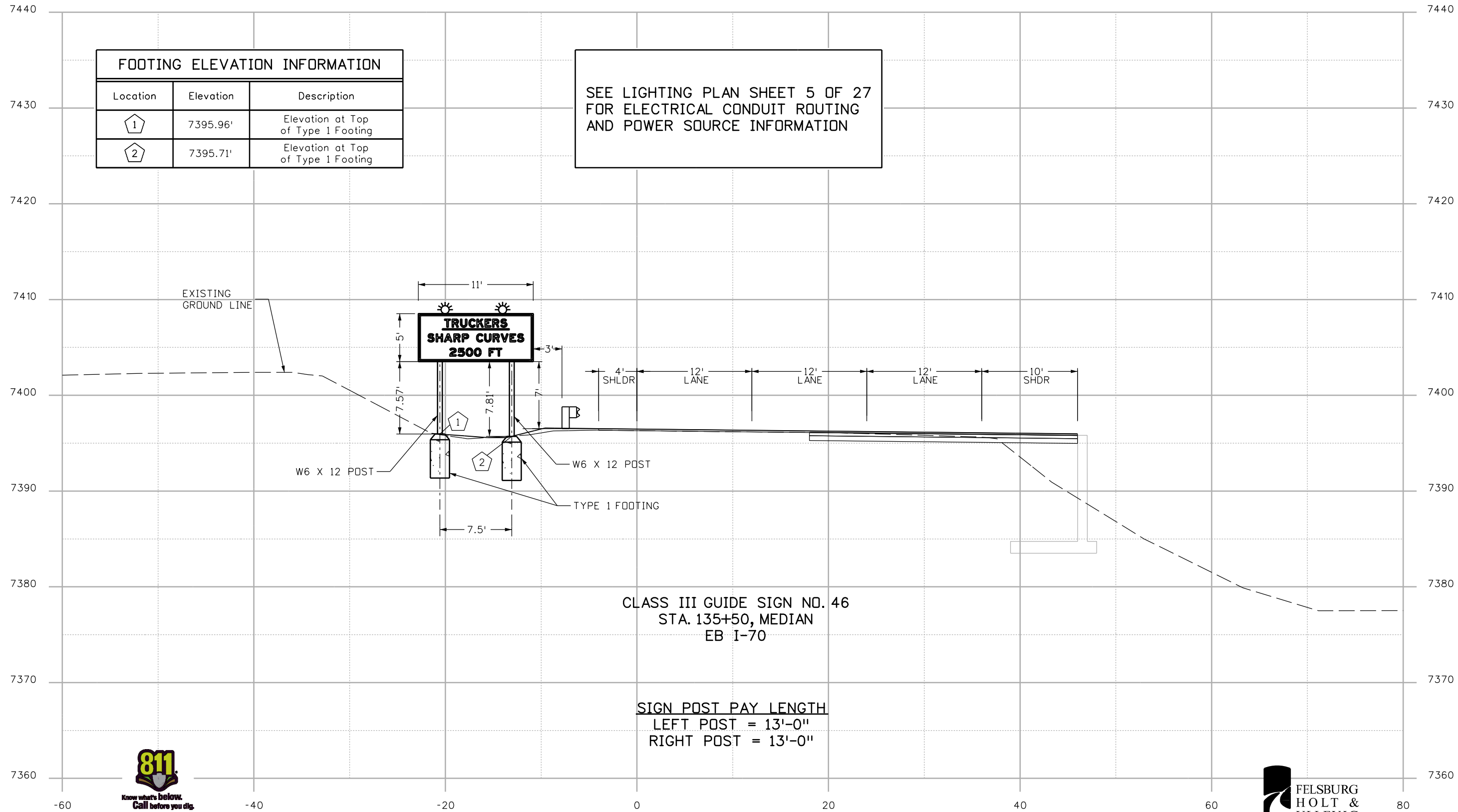
Region 1 CRC

As Constructed
No Revisions:
Revised:
Void:

SIGN NO. 24 CROSS-SECTION STA. 129+80, MEDIAN			
Designer:	RRF	Structure Numbers	
Detailer:	SYS		
Subset:	TRAFFIC	Subset Sheets: CS-2 of	8

Project No./Code	
IM 0703-391	
19036	
Sheet Number	327

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FOOTING ELEVATION INFORMATION		
Location	Elevation	Description
1	7395.96'	Elevation at Top of Type 1 Footing
2	7395.71'	Elevation at Top of Type 1 Footing

SEE LIGHTING PLAN SHEET 5 OF 27 FOR ELECTRICAL CONDUIT ROUTING AND POWER SOURCE INFORMATION

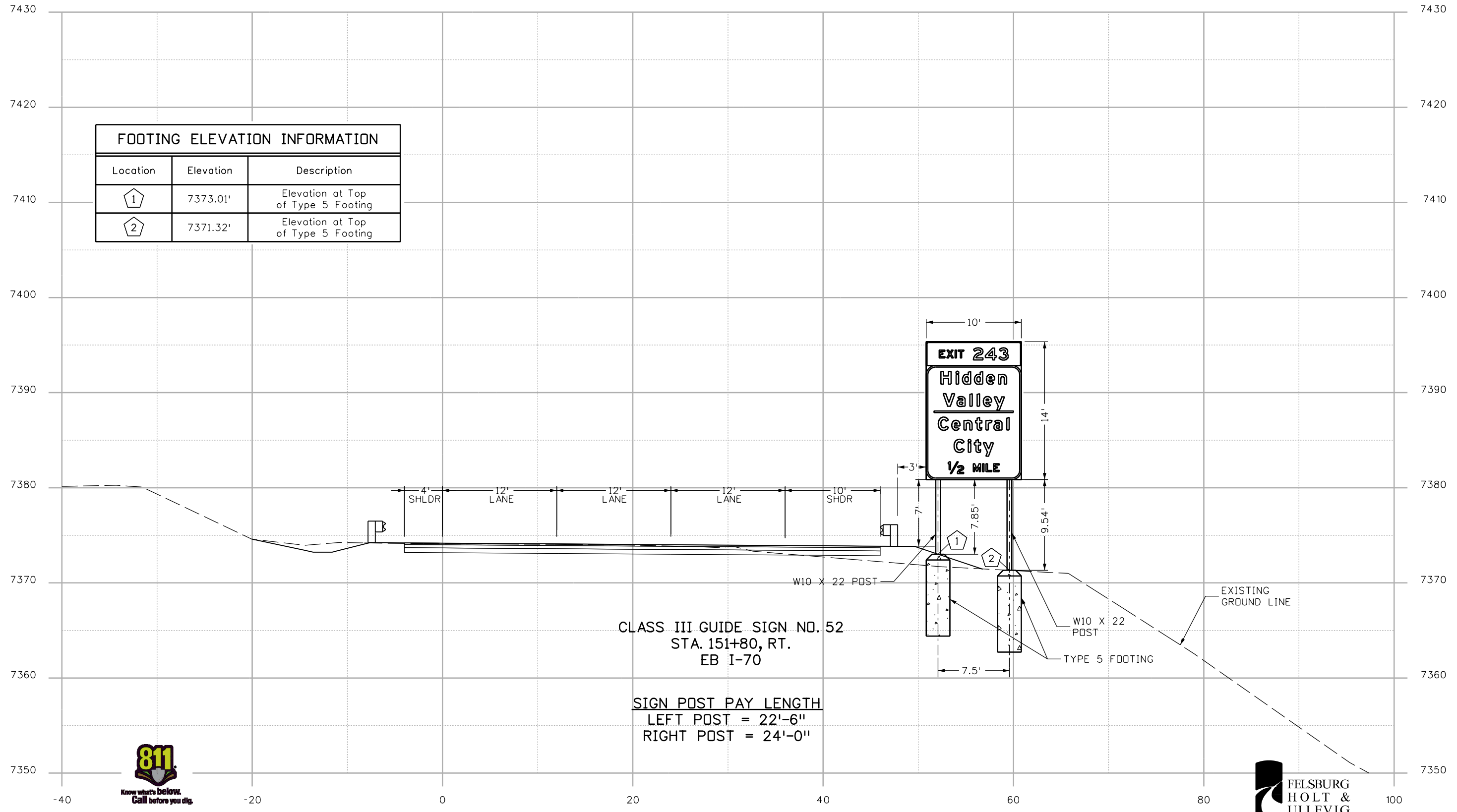
CLASS III GUIDE SIGN NO. 46
 STA. 135+50, MEDIAN
 EB I-70

SIGN POST PAY LENGTH
 LEFT POST = 13'-0"
 RIGHT POST = 13'-0"



Print Date: 3/7/2013		Colorado Department of Transportation	As Constructed	SIGN NO. 46 CROSS-SECTION STA. 135+50, MEDIAN	Project No./Code	
File Name: 18832TRAF_Sign XSec03.dgn		425 A Corporate Circle Golden, CO 80401 Phone: 720-497-6918 FAX: 720-497-6901	No Revisions:		Designer: RRF Detailer: SYS Subset: TRAFFIC	IM 0703-391
Horiz. Scale: 1:10 Vert. Scale: 1:10		Region 1	CRC		Structure Numbers	19036
4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276			Void:	Subset Sheets: CS-3 of 8	Sheet Number 328	

Station 11:30:12 AM c:\pwwork\pwsjpw\common\dms21566\18832TRAF_Sign XSec03.dgn



FOOTING ELEVATION INFORMATION		
Location	Elevation	Description
1	7373.01'	Elevation at Top of Type 5 Footing
2	7371.32'	Elevation at Top of Type 5 Footing

CLASS III GUIDE SIGN NO. 52
 STA. 151+80, RT.
 EB I-70

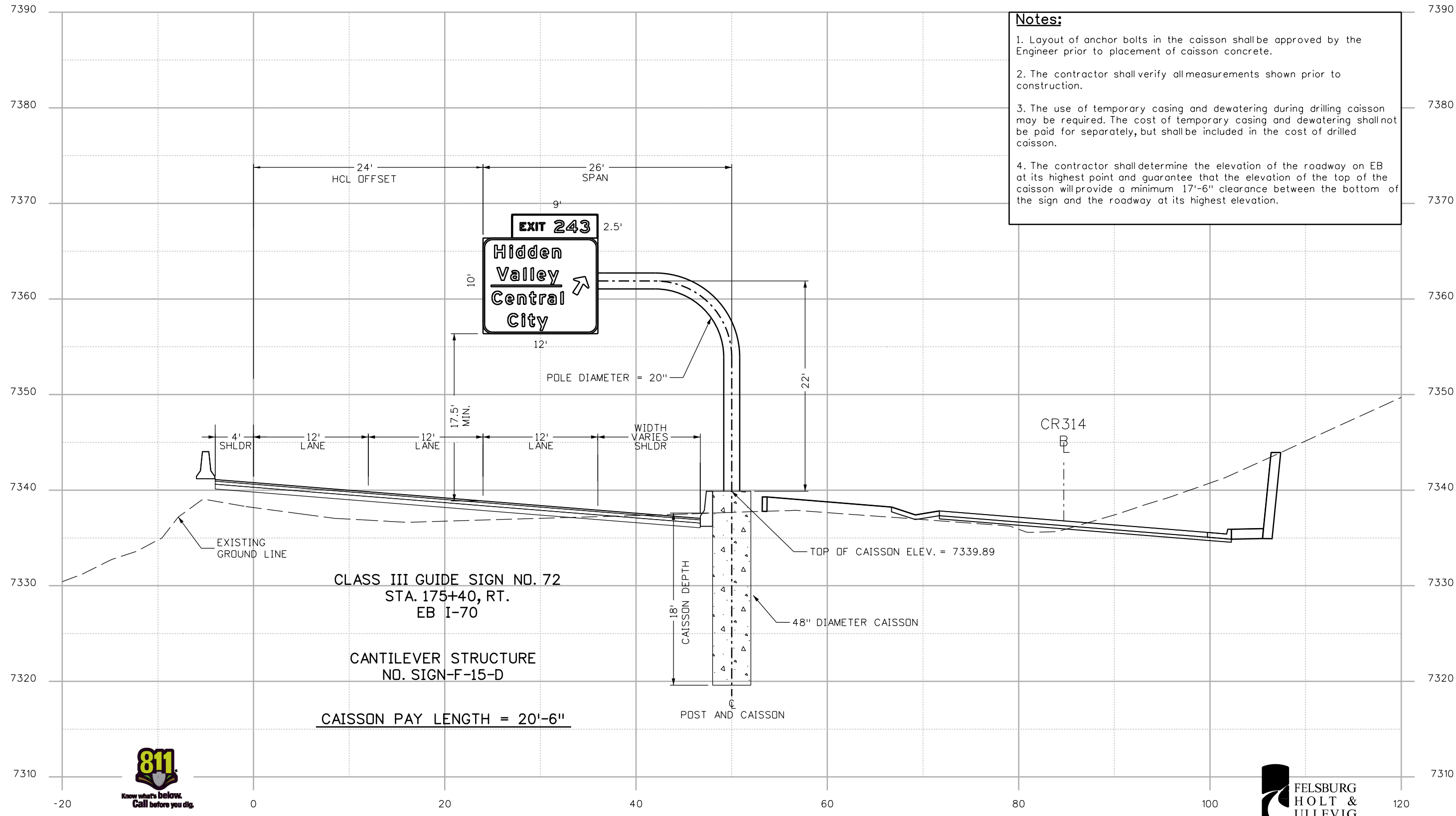
SIGN POST PAY LENGTH
 LEFT POST = 22'-6"
 RIGHT POST = 24'-0"



Print Date: 3/7/2013	Sheet Revisions			Colorado Department of Transportation	As Constructed	SIGN NO. 52 CROSS-SECTION STA. 151+80, RT.		Project No./Code
File Name: 18832TRAF_Sign XSec04.dgn	Date:	Comments	Init.	425 A Corporate Circle Golden, CO 80401 Phone: 720-497-6918 FAX: 720-497-6901 Region 1	No Revisions:	Designer: RRF	Structure Numbers	IM 0703-391
Horiz. Scale: 1:10 Vert. Scale: 1:10					Revised:	Detailer: SYS		19036
					Void:	Subset: TRAFFIC	Subset Sheets: CS-4 of 8	Sheet Number 329
4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276				CRC				

C:\pw\work\pba\jpw\1\common\dms21566\18832TRAF_Sign XSec04.dgn
 11:30:27 AM

- Notes:**
1. Layout of anchor bolts in the caisson shall be approved by the Engineer prior to placement of caisson concrete.
 2. The contractor shall verify all measurements shown prior to construction.
 3. The use of temporary casing and dewatering during drilling caisson may be required. The cost of temporary casing and dewatering shall not be paid for separately, but shall be included in the cost of drilled caisson.
 4. The contractor shall determine the elevation of the roadway on EB at its highest point and guarantee that the elevation of the top of the caisson will provide a minimum 17'-6" clearance between the bottom of the sign and the roadway at its highest elevation.

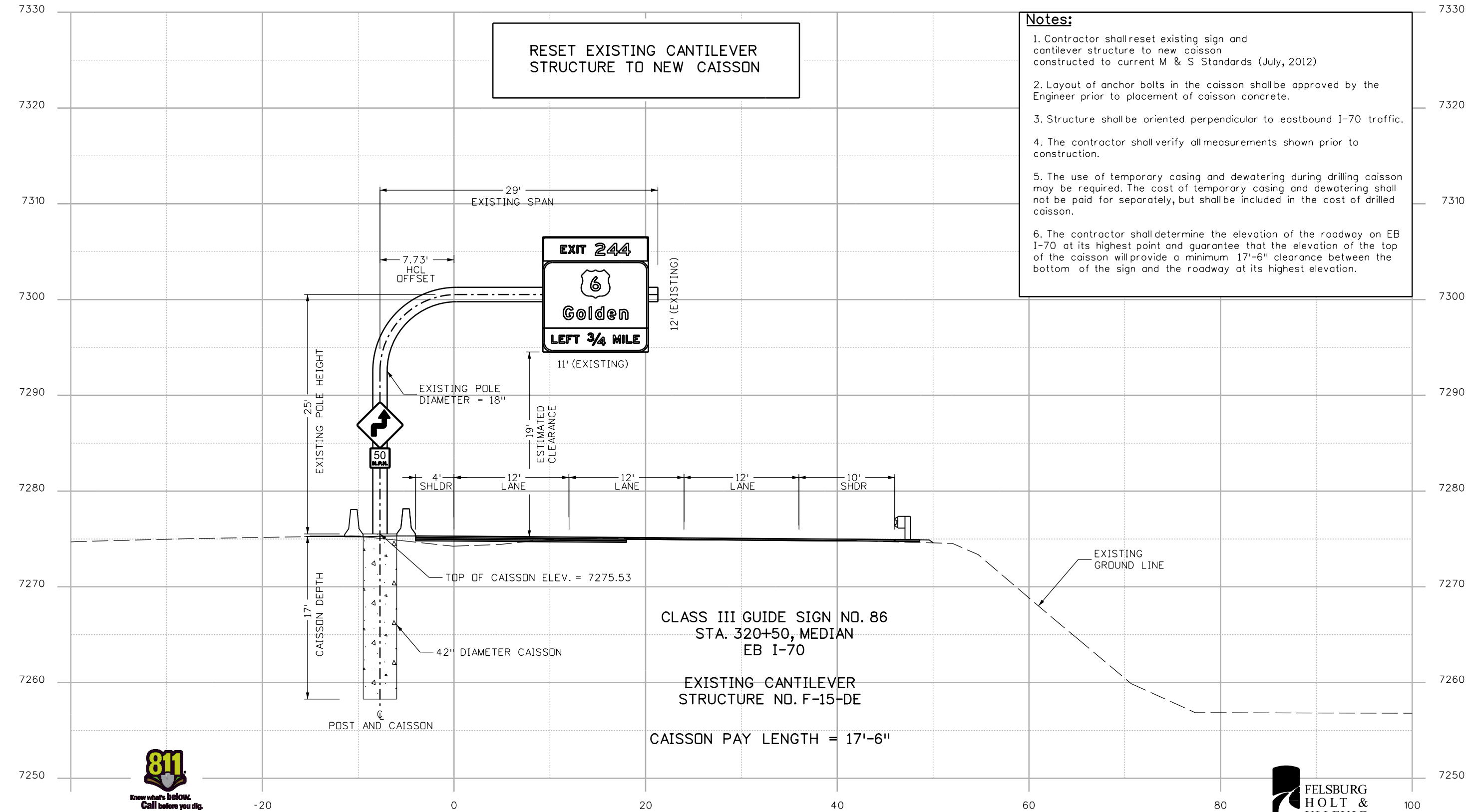


Print Date: 3/7/2013	Sheet Revisions			Colorado Department of Transportation		As Constructed		SIGN NO. 72 CROSS-SECTION STA. 175+40, RT.		Project No./Code			
File Name: 18832TRAF_Sign XSec05.dgn	Date:	Comments	Init.	 425 A Corporate Circle Golden, CO 80401 Phone: 720-497-6918 FAX: 720-497-6901 Region 1		No Revisions:		Designer: RRF Detailer: SYS Subset: TRAFFIC		IM 0703-391			
Horiz. Scale: 1:10 Vert. Scale: 1:10						Revised:				Structure Numbers		19036	
 4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276						Void:				Subset Sheets: CS-5 of 8		Sheet Number 330	

Station 11:30:38 AM c:\pw\work\pba\jpw\common\dms21566\18832TRAF_Sign XSec05.dgn

- Notes:**
1. Contractor shall reset existing sign and cantilever structure to new caisson constructed to current M & S Standards (July, 2012)
 2. Layout of anchor bolts in the caisson shall be approved by the Engineer prior to placement of caisson concrete.
 3. Structure shall be oriented perpendicular to eastbound I-70 traffic.
 4. The contractor shall verify all measurements shown prior to construction.
 5. The use of temporary casing and dewatering during drilling caisson may be required. The cost of temporary casing and dewatering shall not be paid for separately, but shall be included in the cost of drilled caisson.
 6. The contractor shall determine the elevation of the roadway on EB I-70 at its highest point and guarantee that the elevation of the top of the caisson will provide a minimum 17'-6" clearance between the bottom of the sign and the roadway at its highest elevation.

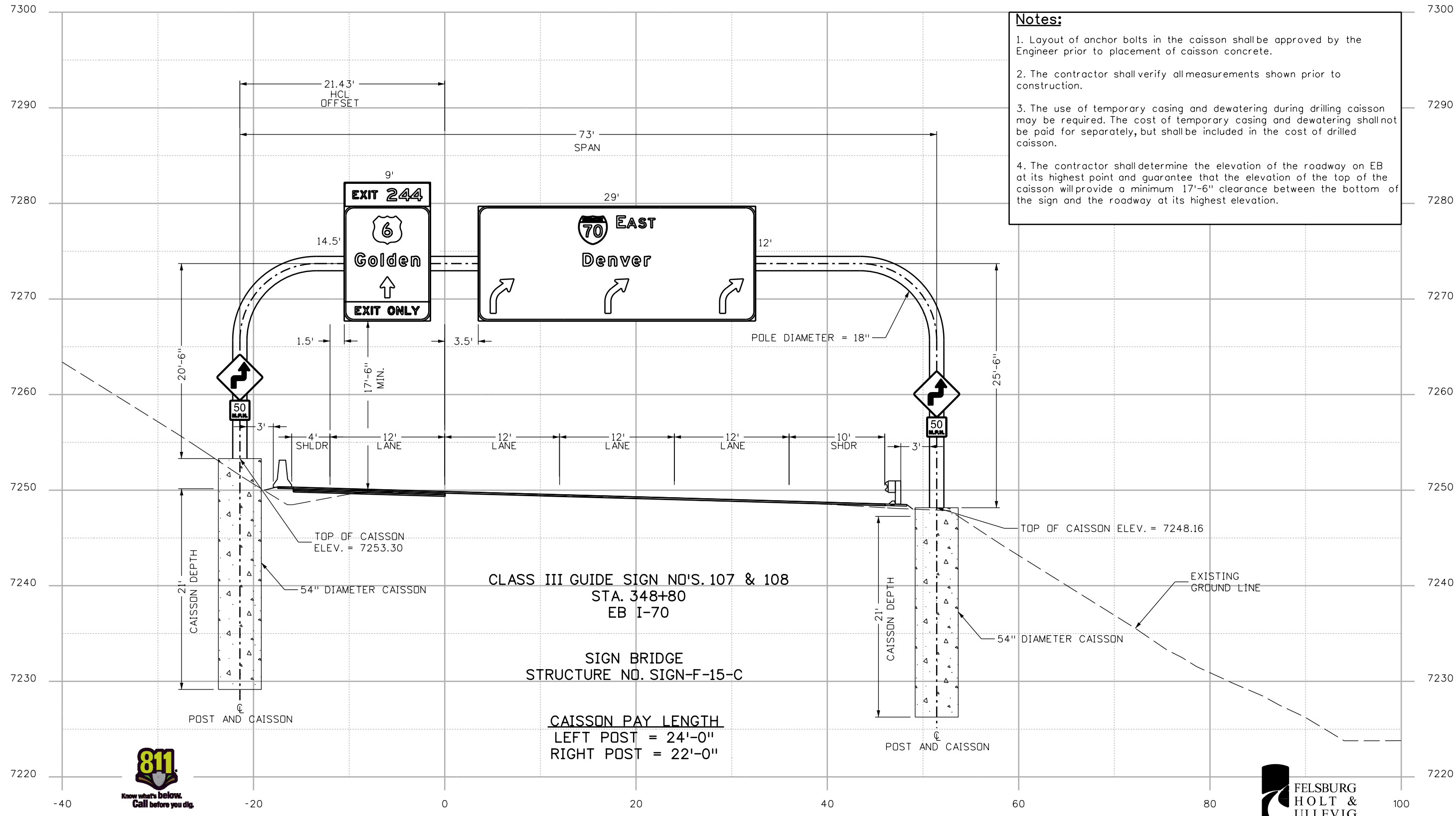
RESET EXISTING CANTILEVER STRUCTURE TO NEW CAISSON



Print Date: 3/7/2013	Sheet Revisions			Colorado Department of Transportation	As Constructed	SIGN NO. 86 CROSS-SECTION STA. 320+50, MEDIAN		Project No./Code
File Name: 18832TRAF_Sign XSec06.dgn	Date:	Comments	Init.	425 A Corporate Circle Golden, CO 80401 Phone: 720-497-6918 FAX: 720-497-6901 Region 1	No Revisions:	Designer: RRF	Structure Numbers	IM 0703-391
Horiz. Scale: 1:10 Vert. Scale: 1:10					Revised:	Detailer: SYS		19036
ATKINS 4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276					Void:	Subset: TRAFFIC	Subset Sheets: CS-6 of 8	Sheet Number 331

Stn 11:30:50 AM c:\pw_work\pba\jpw\common\dms21566\18832TRAF_Sign XSec06.dgn

- Notes:**
1. Layout of anchor bolts in the caisson shall be approved by the Engineer prior to placement of caisson concrete.
 2. The contractor shall verify all measurements shown prior to construction.
 3. The use of temporary casing and dewatering during drilling caisson may be required. The cost of temporary casing and dewatering shall not be paid for separately, but shall be included in the cost of drilled caisson.
 4. The contractor shall determine the elevation of the roadway on EB at its highest point and guarantee that the elevation of the top of the caisson will provide a minimum 17'-6" clearance between the bottom of the sign and the roadway at its highest elevation.

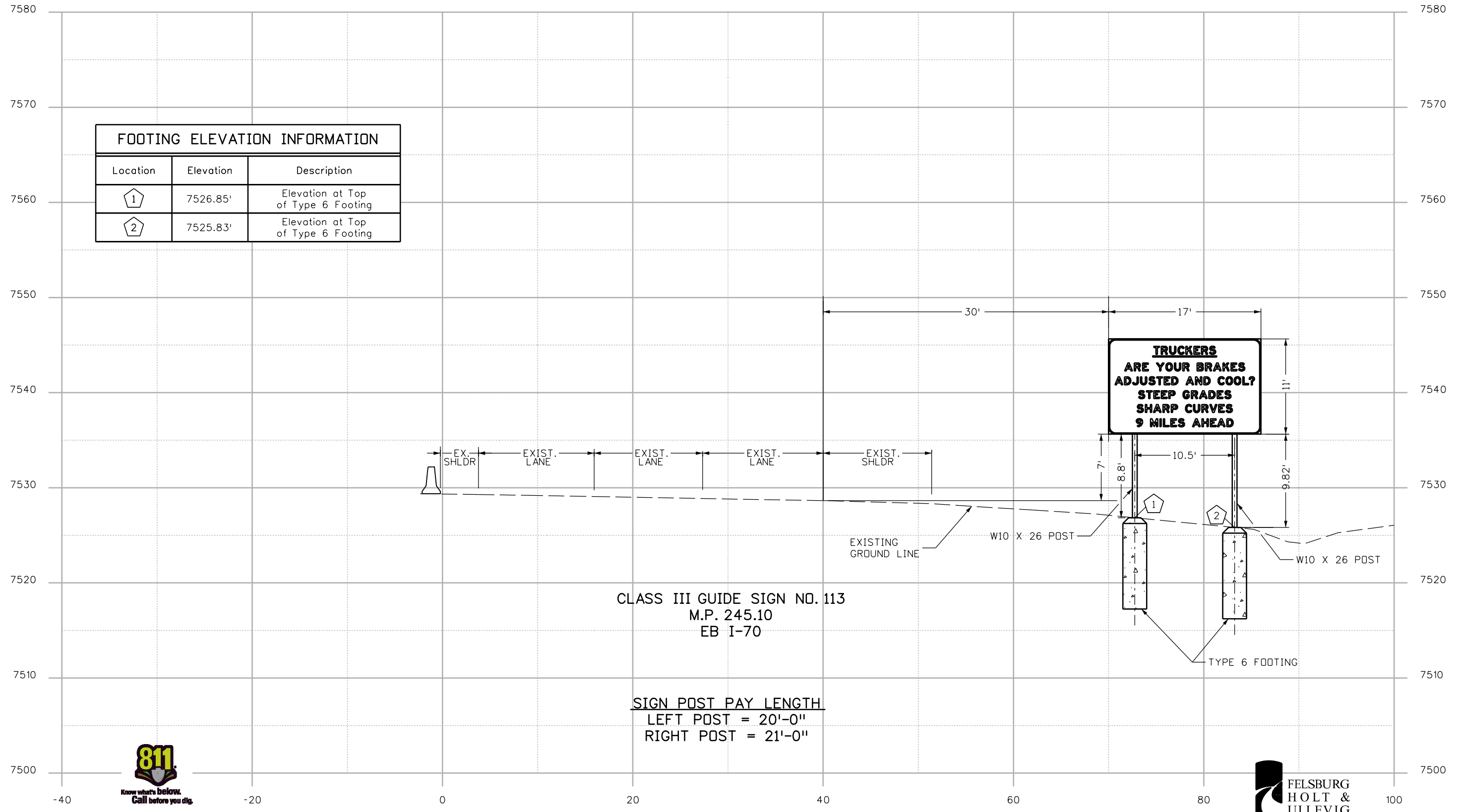


CLASS III GUIDE SIGN NO'S. 107 & 108
 STA. 348+80
 EB I-70
 SIGN BRIDGE
 STRUCTURE NO. SIGN-F-15-C
 CAISSON PAY LENGTH
 LEFT POST = 24'-0"
 RIGHT POST = 22'-0"



Print Date: 3/7/2013		Sheet Revisions			Colorado Department of Transportation			As Constructed		SIGN NO. 107 & 108 CROSS-SECTION STA. 348+85			Project No./Code		
File Name: 18832TRAF_Sign XSec07.dgn		Date:	Comments	Init.	425 A Corporate Circle Golden, CO 80401 Phone: 720-497-6918 FAX: 720-497-6901			No Revisions:		Designer: RRF		Structure Numbers		IM 0703-391	
Horiz. Scale: 1:10 Vert. Scale: 1:10					Region 1			Revised:		Detailer: SYS		19036			
ATKINS 4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276					CRC			Void:		Subset: TRAFFIC		Subset Sheets: CS-7 of 8		Sheet Number 332	

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FOOTING ELEVATION INFORMATION		
Location	Elevation	Description
1	7526.85'	Elevation at Top of Type 6 Footing
2	7525.83'	Elevation at Top of Type 6 Footing

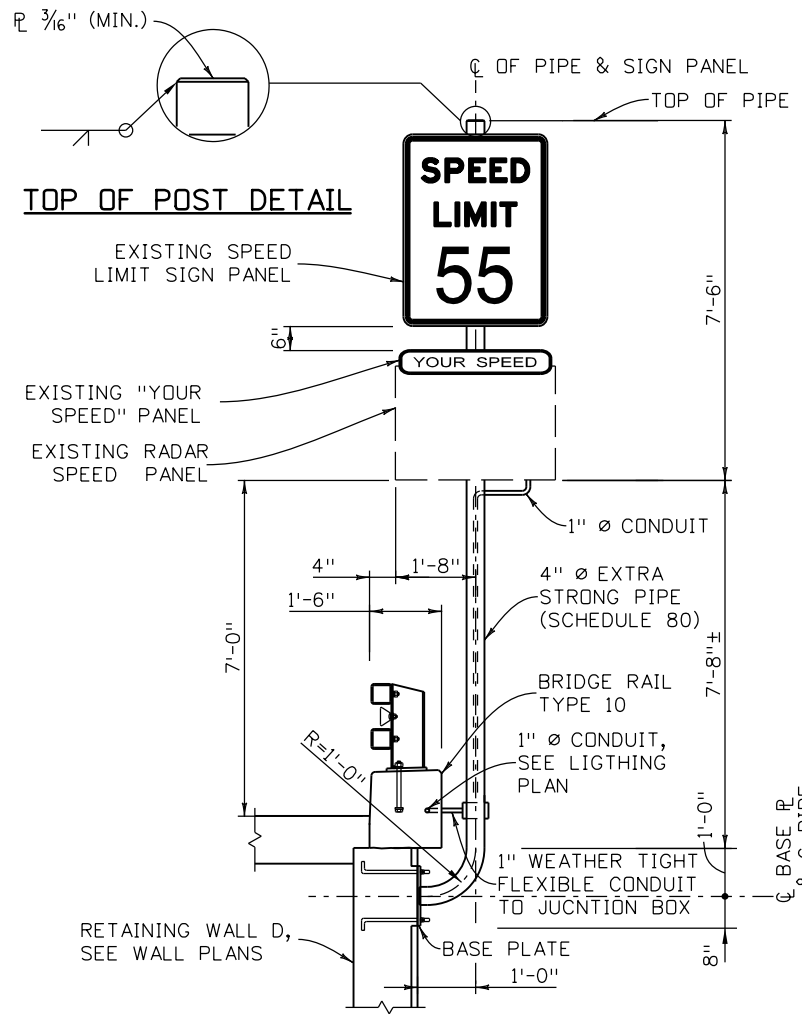
CLASS III GUIDE SIGN NO. 113
M.P. 245.10
EB I-70

SIGN POST PAY LENGTH
LEFT POST = 20'-0"
RIGHT POST = 21'-0"



Print Date: 3/7/2013	Sheet Revisions			Colorado Department of Transportation	As Constructed	SIGN NO. 113 CROSS-SECTION M.P. 245.10		Project No./Code
File Name: 18832TRAF_Sign XSec08.dgn	Date:	Comments	Init.	 425 A Corporate Circle Golden, CO 80401 Phone: 720-497-6918 FAX: 720-497-6901 Region 1 CRC	No Revisions:	Designer: RRF	Structure Numbers	IM 0703-391
Horiz. Scale: 1:10 Vert. Scale: 1:10					Revised:	Detailer: SYS		19036
4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276					Void:	Subset: TRAFFIC	Subset Sheets: CS-8 of 8	Sheet Number 333

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**ELEVATION
SIGN SUPPORT AT RETAINING WALL**

SIGN NO.	STATION	WALL
60	159+40	D

NOTES (APPLY TO BOTH SIGN SUPPORTS):

STRUCTURAL STEEL PIPE SHALL BE ASTM A53, GRADE B, UNLESS NOTED OTHERWISE. ANCHOR BOLTS SHALL (ASTM F1544, GRADE 36, GALVANIZED). ALL OTHER STRUCTURAL STEEL SHALL AASHTO M-183 (ASTM A-36).

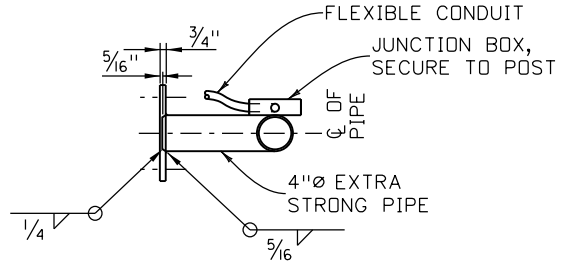
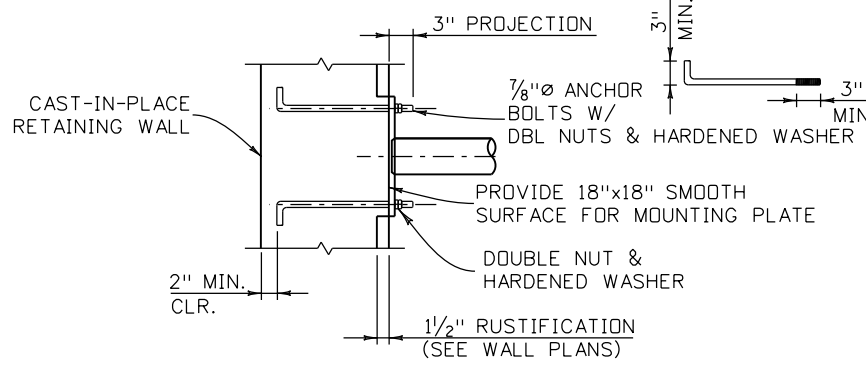
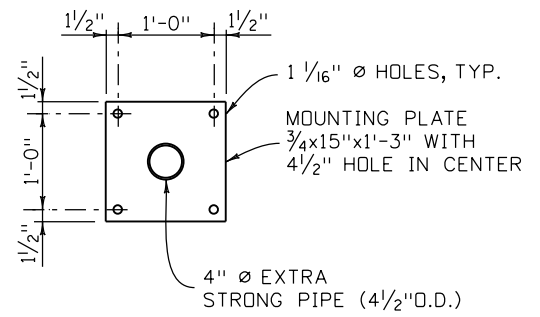
THE SIGN BRACKET ASSEMBLY (MOUNTING PLATE AND PIPE), AND THE ANCHOR BOLT ASSEMBLY SHALL BE GALVANIZED AFTER FABRICATION.

THE SIGN BRACKET VERTICAL PIPE WHICH SUPPORTS THE SIGN PANEL SHALL BE ERECTED PLUMB.

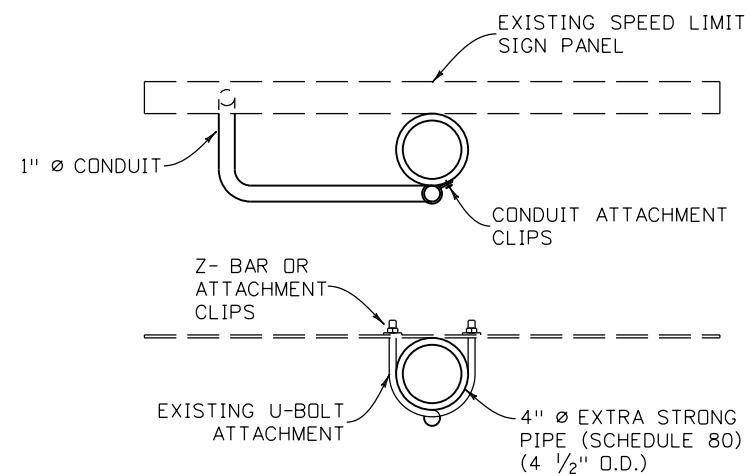
FOR BOTH CLASS I AND CLASS II SIGN PANEL MOUNTING BOLT LOCATIONS ON POSTS, SEE M&S STANDARDS, JULY 2012, STANDARD PLAN NOS. S-614-2, S-614-3, S-614-8, S-614-20, AND S-614-22.

ALL BOLTS, NUTS, AND WASHERS REQUIRED FOR SIGN MOUNTING SHALL BE GALVANIZED.

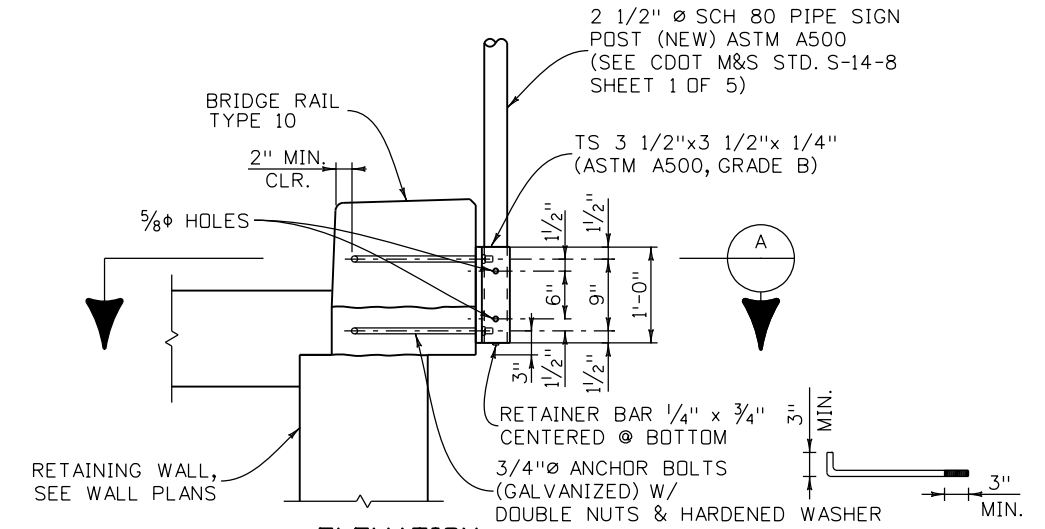
PAYMENT FOR WALL MOUNTED SIGN SUPPORT SHALL BE MADE UNDER ITEM 614 - SIGN POST (SPECIAL), AND IS TABULATED IN THE SIGNING PLANS. COST SHALL INCLUDE ALL ELECTRICAL CONDUIT, AND WIRING CONNECTIONS.



MOUNTING PLATE & ANCHORAGE DETAILS

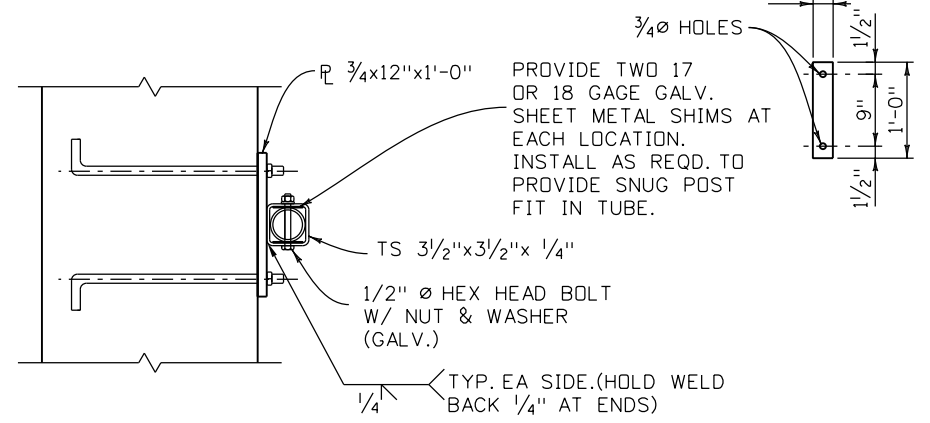
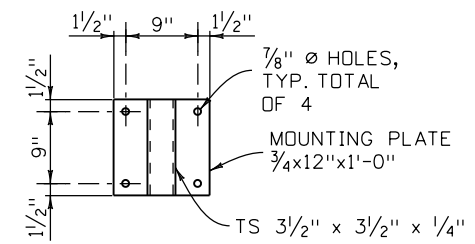


TYPICAL SECTION AT BOLTED CONNECTIONS



**ELEVATION
SIGN SUPPORT AT RETAINING WALLS**

SIGN NO.	STATION	WALL
40	131+00	A
43	134+40	A
47	141+80	A
61	161+00	D
64	171+80	D
82	306+80	G
112	351+40	L



SECTION A



Print Date: 3/7/2013
 File Name: 18832TRAF_WALLMSC01.dgn
 Horiz. Scale: 1:1 Vert. Scale:
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Sheet Revisions		
Date:	Comments	Init.

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 425 A Corporate Circle
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 Region 1 **CRC**

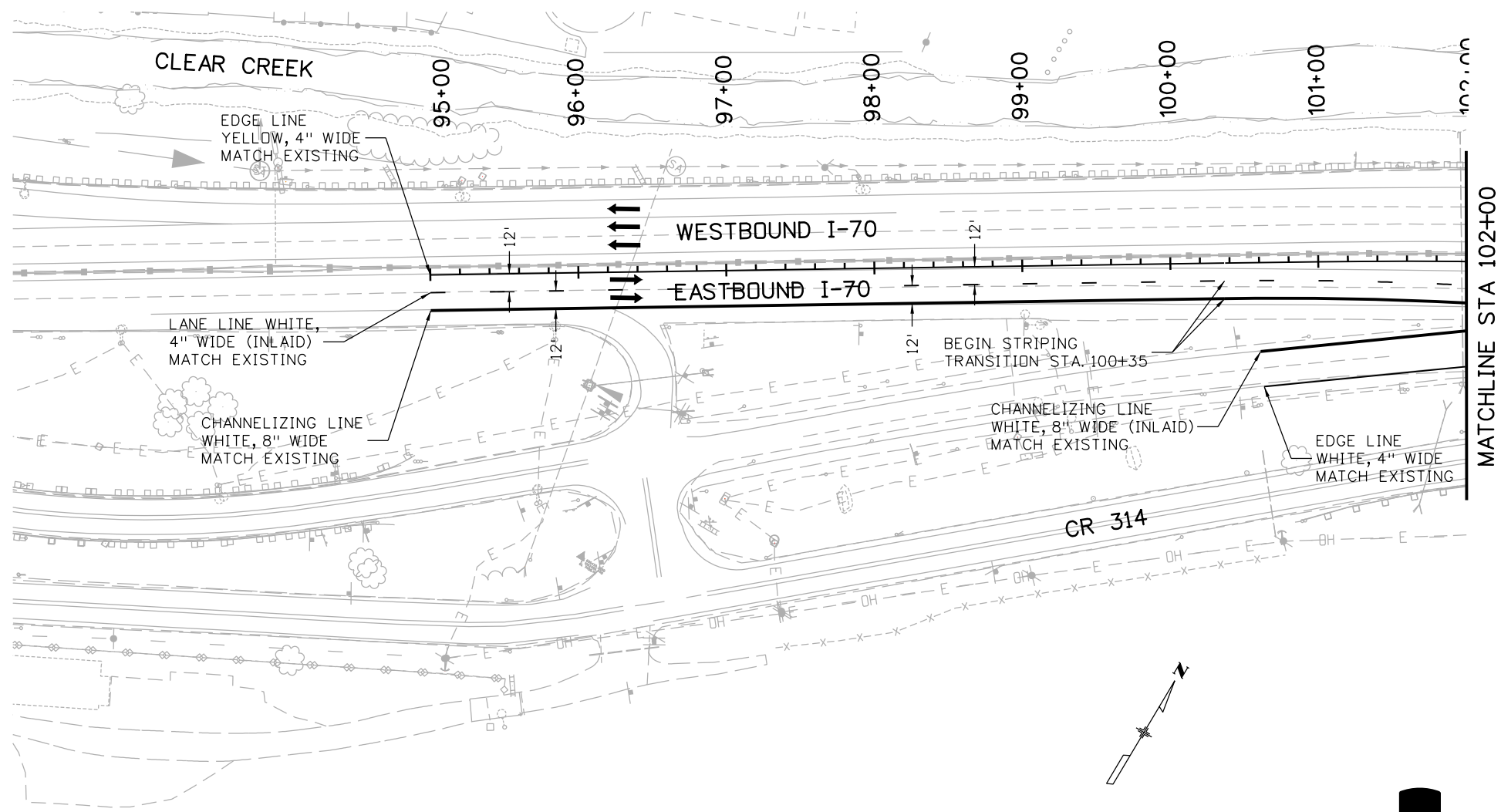
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No Revisions:
Revised:
Void:

SIGN POST DETAILS			
Designer:	GWB	Structure	
Detailer:	VM	Numbers	
Subset:	TRAFFIC	Subset Sheets:	DT-1 of 1

Project No./Code
IM 0703-391
19036
Sheet Number 334

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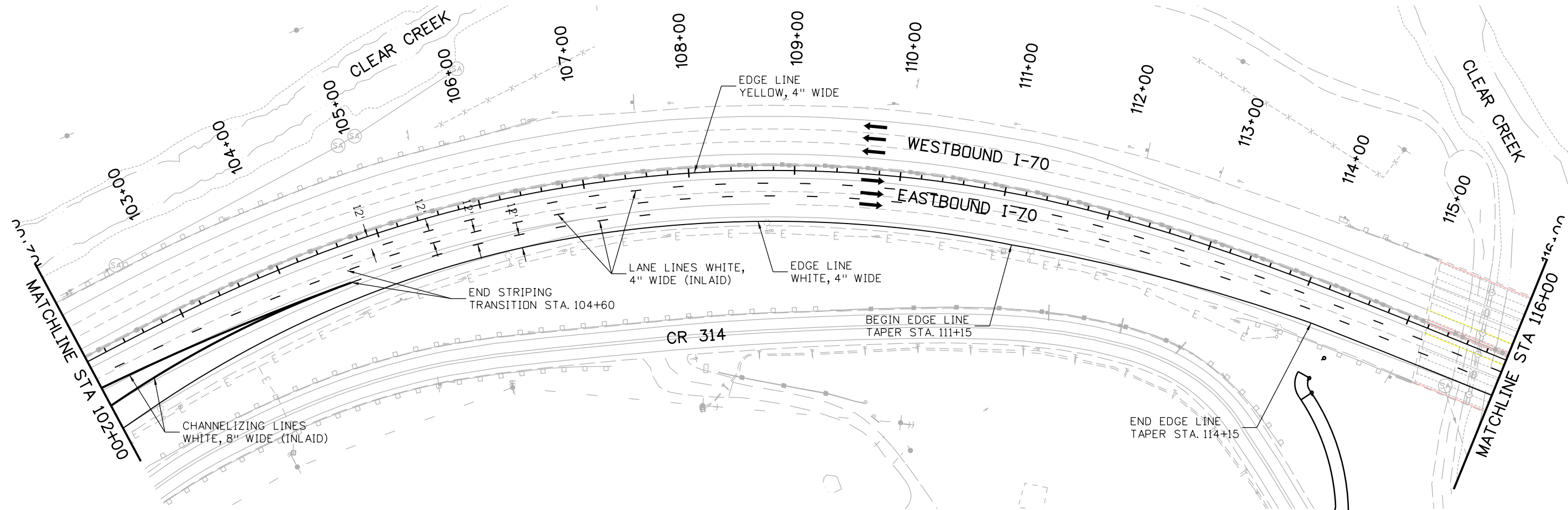
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Date:	Comments	Init.

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

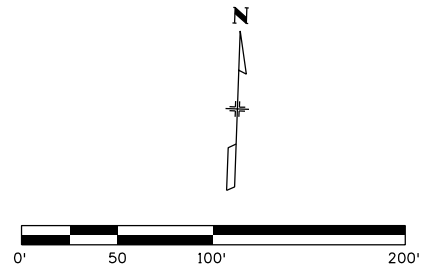
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Revised:
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STRIPING PLAN			
STA 95+00 TO 102+00			
Designer:	RRF	Structure	
Detailer:	SYS	Numbers	
Subset:	TRAFFIC	Subset Sheets:	ST-1 of 13

Project No./Code
IM 0703-391
19036
Sheet Number 335



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Date:	Comments	Init.

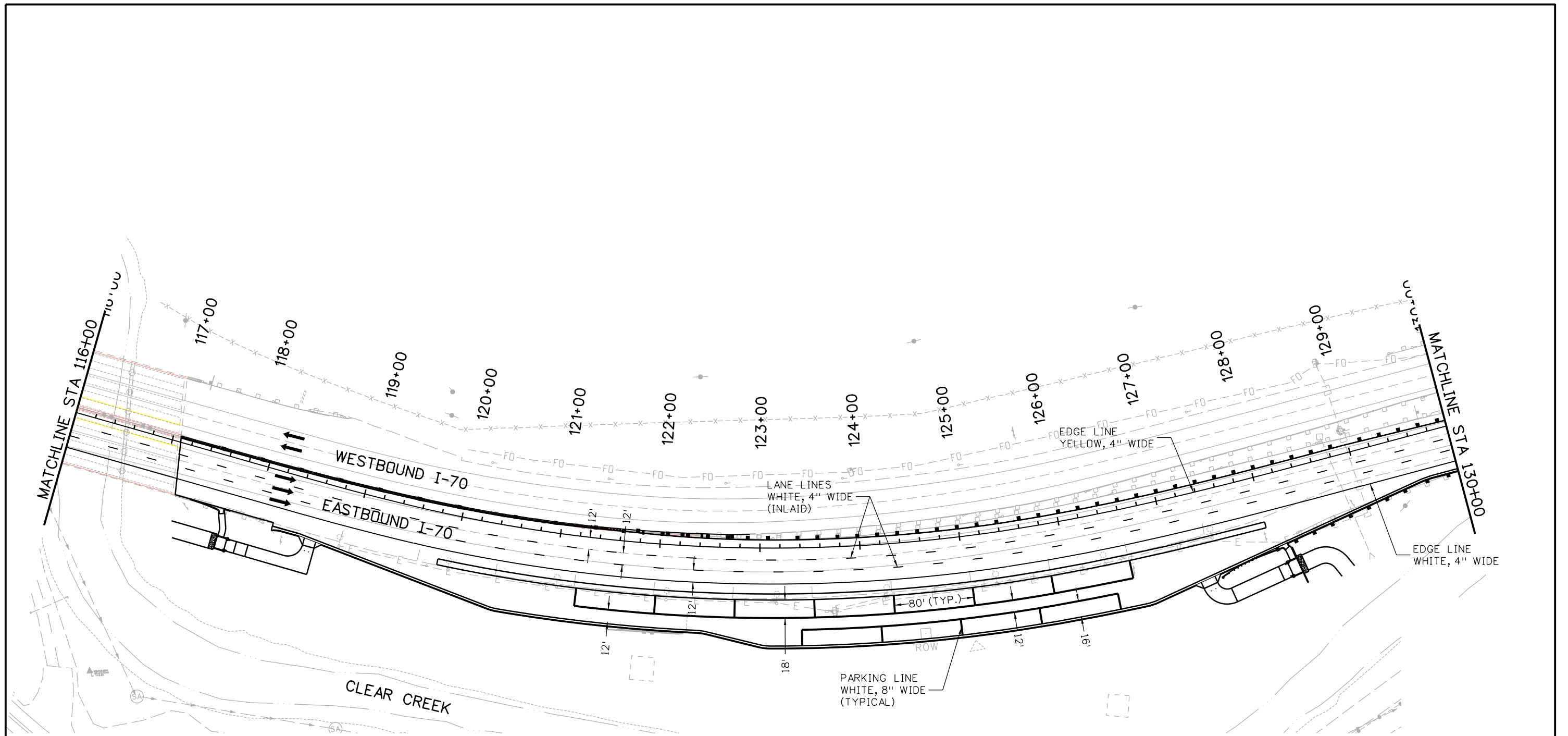
Colorado Department of Transportation
 425 A Corporate Circle
 Golden, CO 80401
 Phone: 720-497-6918 FAX: 720-497-6901
 Region 1 CRC

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No Revisions:
Revised:
Void:

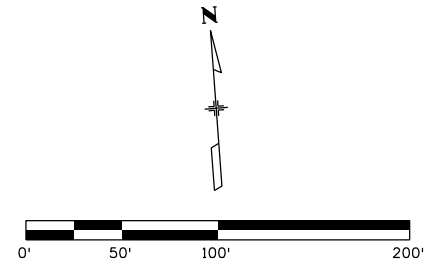
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STA 102+00 TO 116+00			
Designer:	RRF	Structure	
Detailer:	SYS	Numbers	
Subset:	TRAFFIC	Subset Sheets:	ST-2 of 13

Project No./Code
IM 0703-391
19036
Sheet Number 336

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**Know what's below.
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Print Date: 3/7/2013
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Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation
 425 A Corporate Circle
 Golden, CO 80401
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 Region 1 CRC

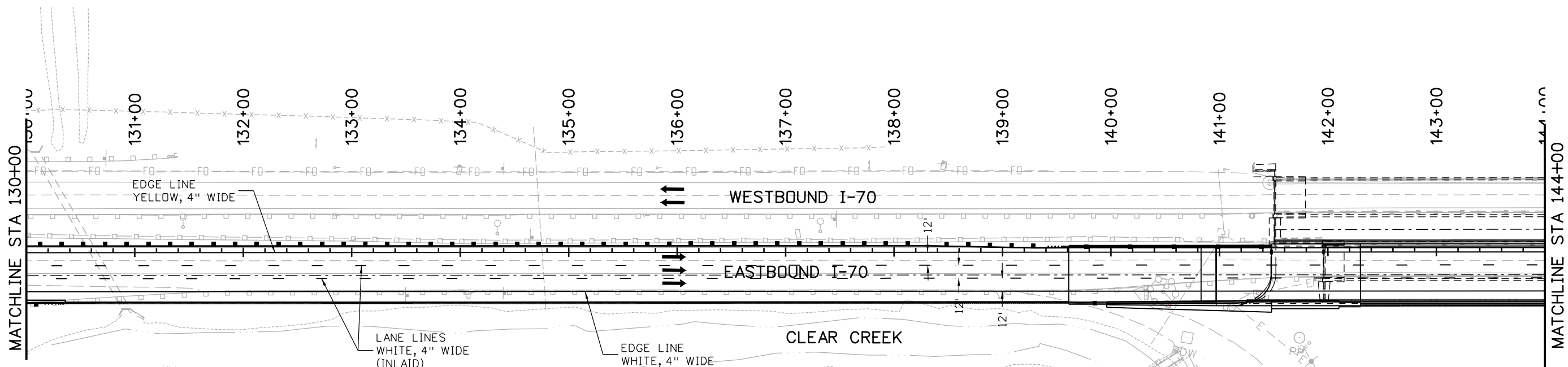
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**STRIPING PLAN
 STA 116+00 TO 130+00**

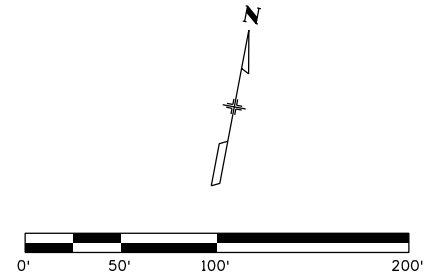
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Detailer: SYS	
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Project No./Code
 IM 0703-391
 19036
 Sheet Number **337**

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 Denver, CO 80237
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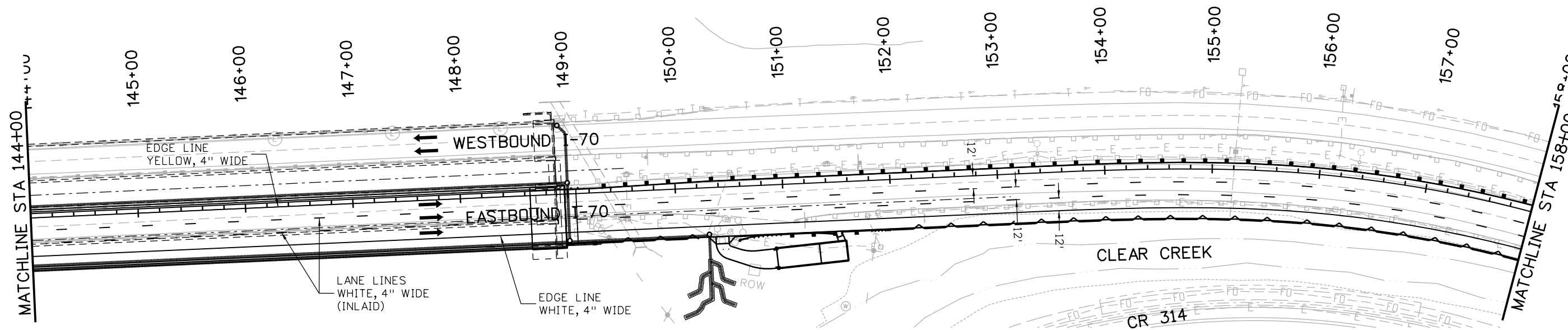
Colorado Department of Transportation
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 Golden, CO 80401
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 Region 1 CRC

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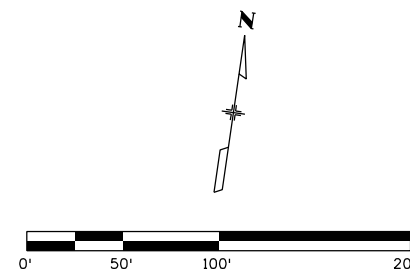
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Designer:	RRF	Structure	
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Project No./Code
IM 0703-391
19036
Sheet Number 338

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Date:	Comments	Init.

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Region 1 CRC

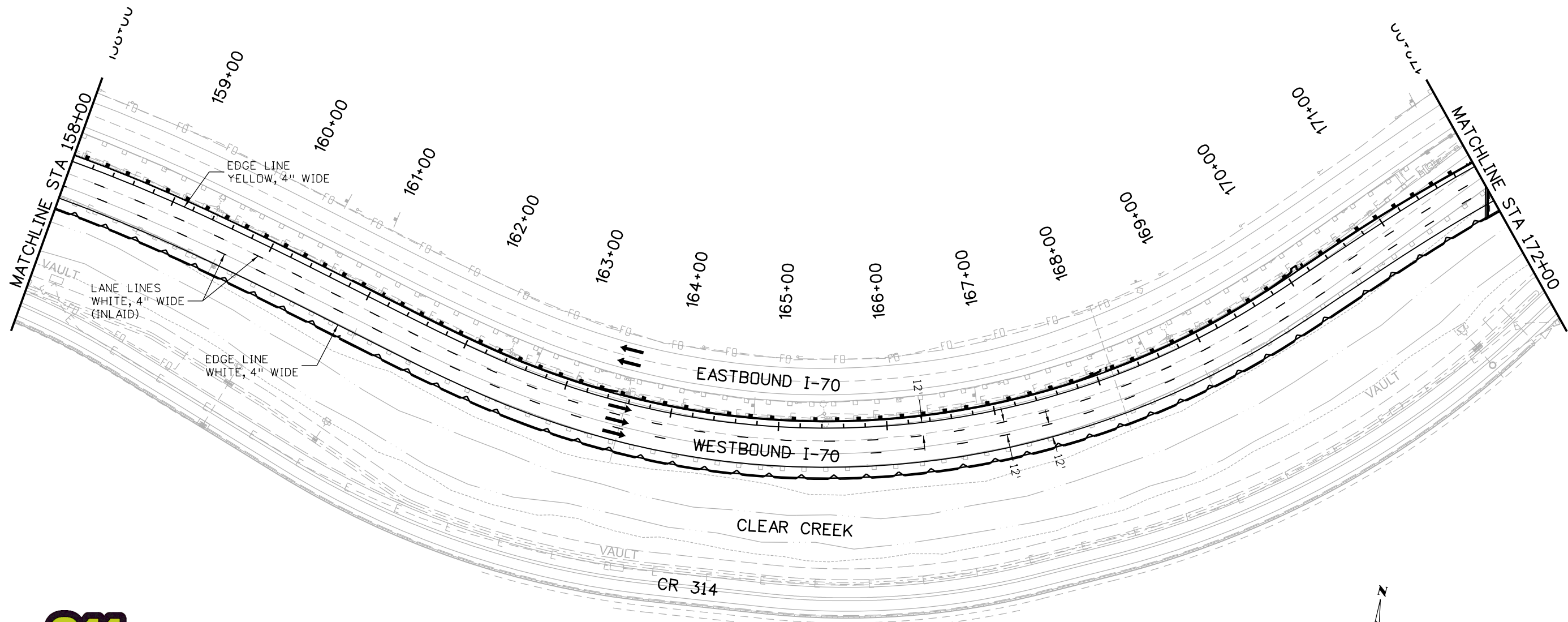
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STRIPING PLAN
STA 144+00 to 158+00

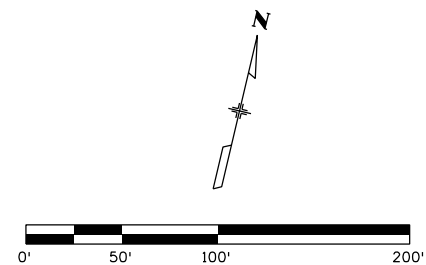
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Project No./Code
IM 0703-391
19036
Sheet Number 339

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Print Date: 3/7/2013
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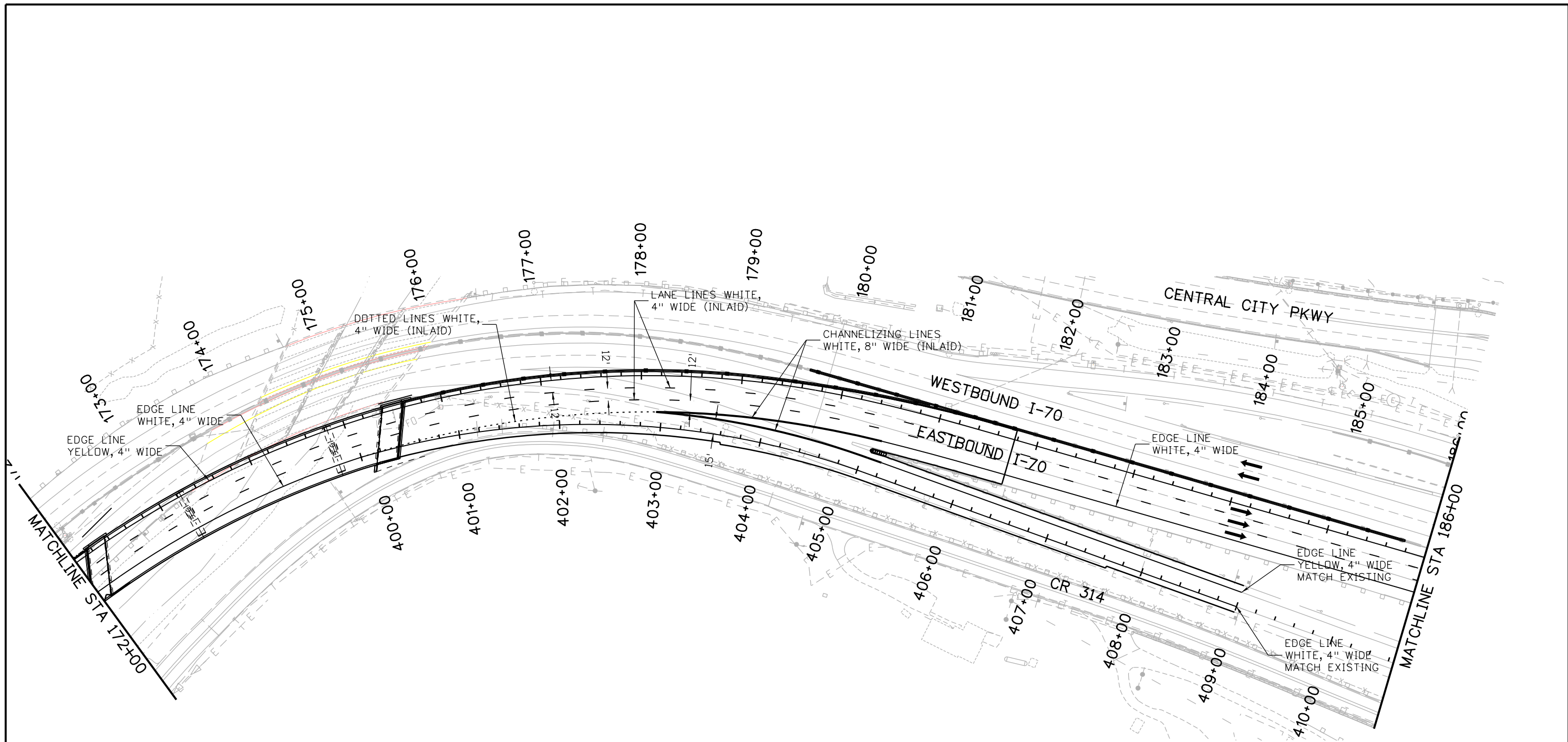
Colorado Department of Transportation
 425 A Corporate Circle
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 Region 1 CRC

As Constructed
 No Revisions:
 Revised:
 Void:

STRIPING PLAN
 STA 158+00 TO 172+00
 Designer: RRF Structure Numbers
 Detailer: SYS
 Subset: TRAFFIC Subset Sheets: ST-6 of 13

Project No./Code
 IM 0703-391
 19036
 Sheet Number 340

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Print Date: 3/7/2013
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Date:	Comments	Init.

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Region 1 CRC

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No Revisions:
Revised:
Void:

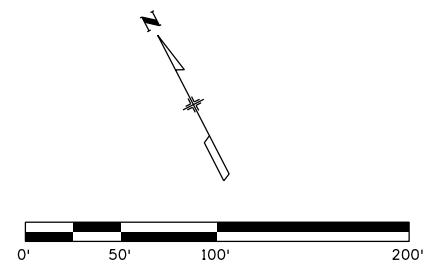
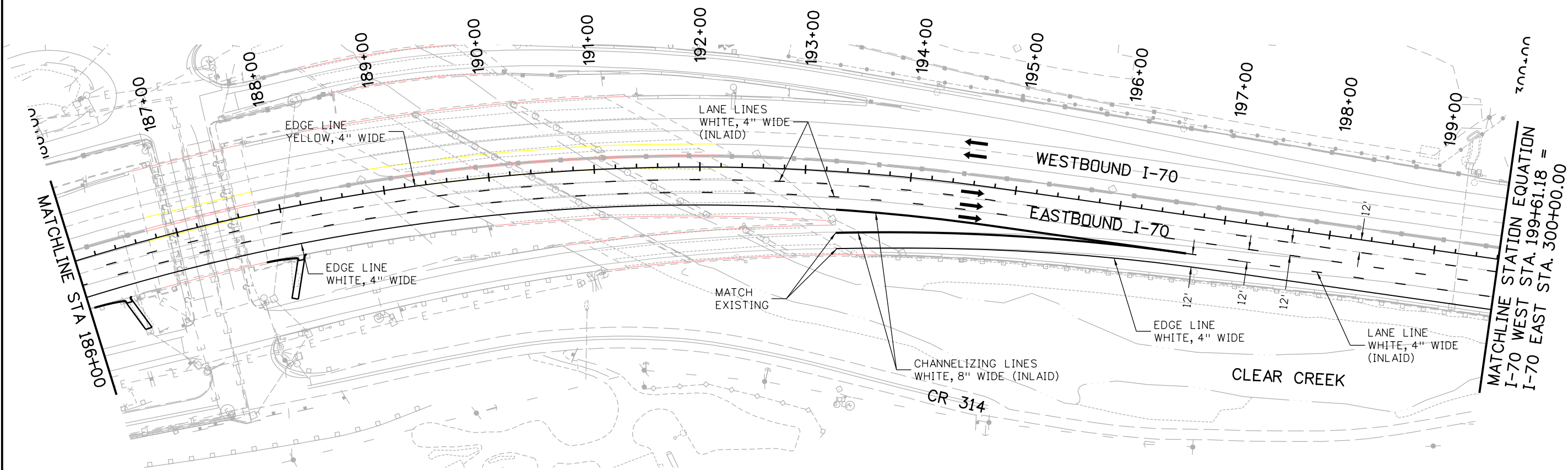
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Designer:	RRF	Structure	
Detailer:	SYS	Numbers	
Subset:	TRAFFIC	Subset Sheets:	ST-7 of 13

Project No./Code
IM 0703-391
19036
Sheet Number 341

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Print Date: 3/7/2013
File Name: 18832TRAF_StripingPlan008.dgn
Horiz. Scale: 1:100 Vert. Scale:
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Denver, CO 80237
Phone: (303) 221-7275 Fax: (303) 221-7276

Sheet Revisions		
Date:	Comments	Init.

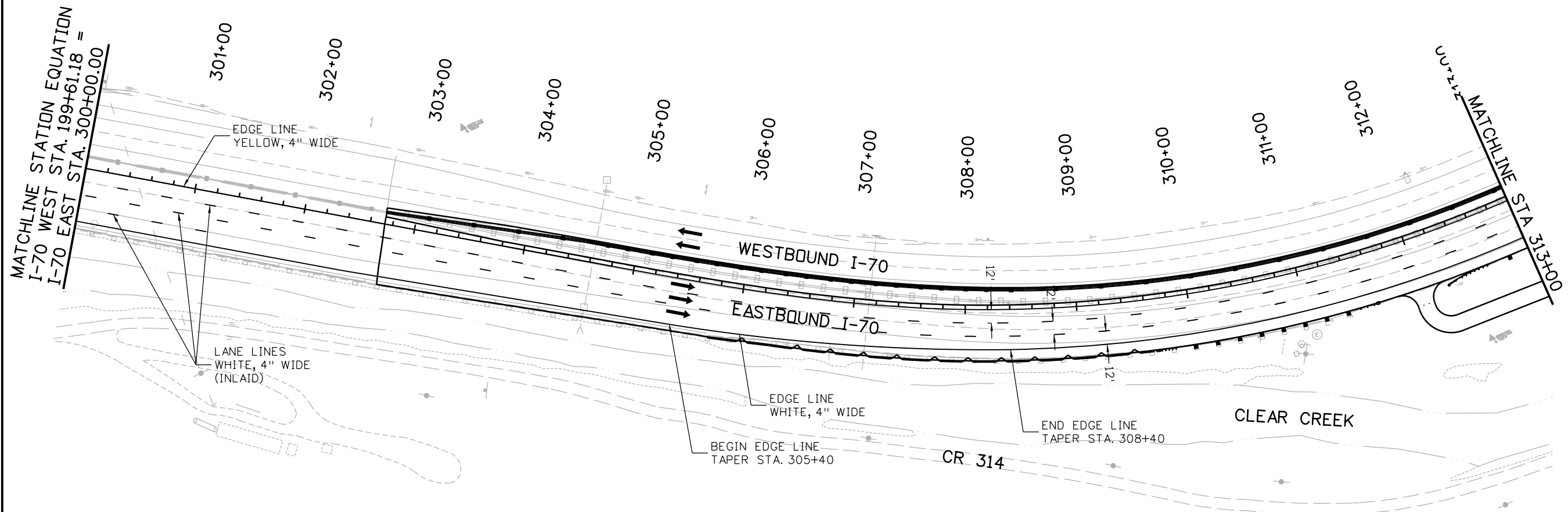
Colorado Department of Transportation
 425 A Corporate Circle
Golden, CO 80401
Phone: 720-497-6918 FAX: 720-497-6901
Region 1 CRC

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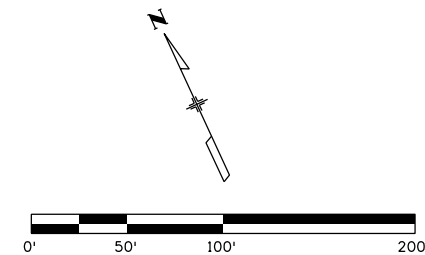
STRIPING PLAN
STA 186+00 TO 199+61.18
Designer: RRF Structure Numbers
Detailer: SYS
Subset: TRAFFIC Subset Sheets: ST-8 of 13

Project No./Code
IM 0703-391
19036
Sheet Number 342

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

Sheet Revisions		
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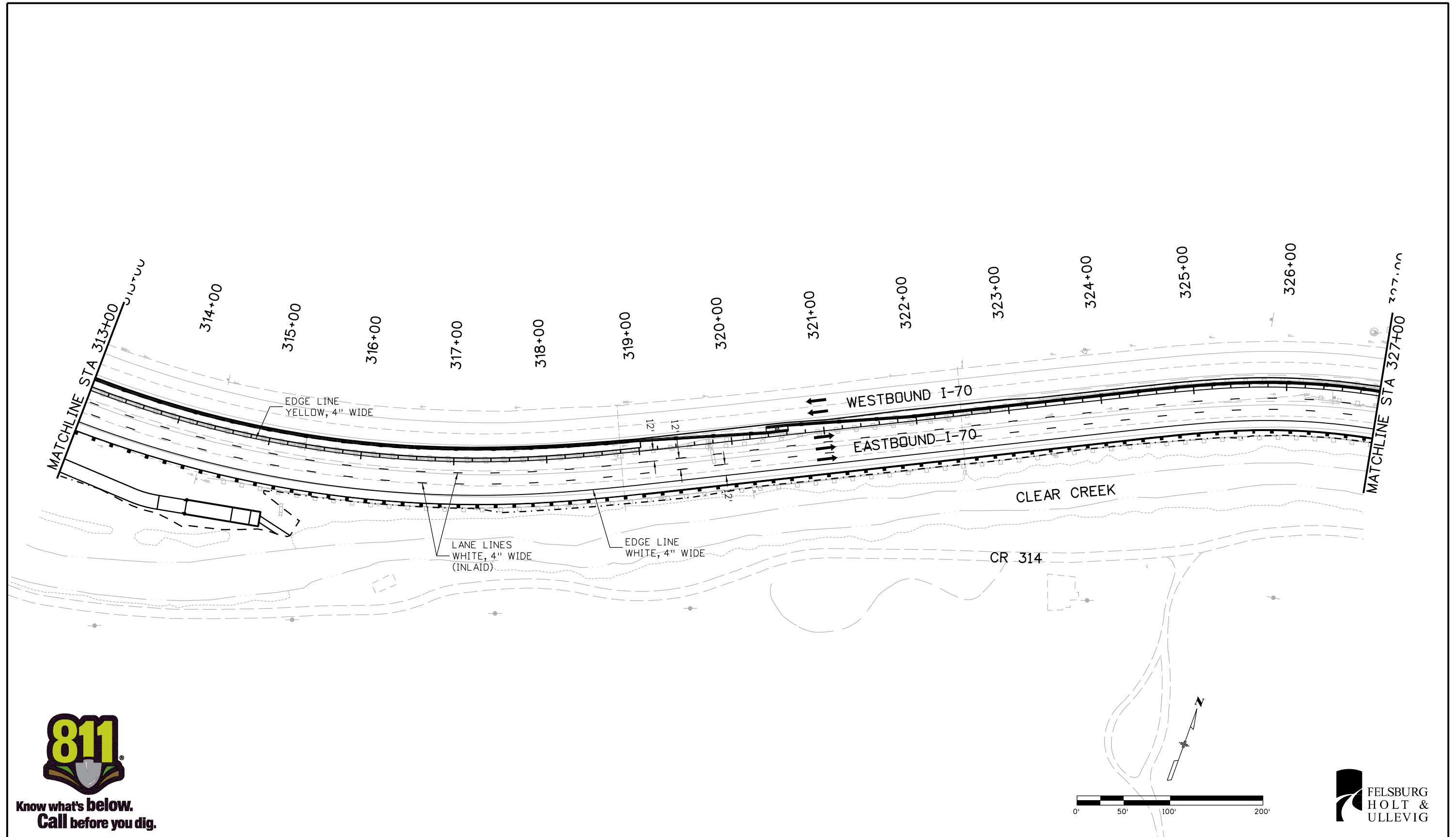
Colorado Department of Transportation
 425 A Corporate Circle
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 Region 1 CRC

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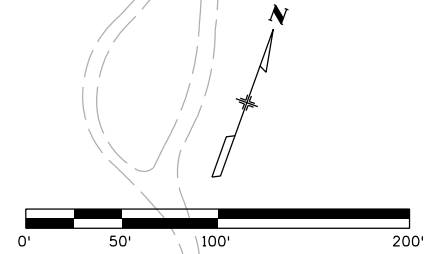
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Designer:	RRF	Structure	
Detailer:	SYS	Numbers	
Subset:	TRAFFIC	Subset Sheets:	ST-9 of 13

Project No./Code
IM 0703-391
19036
Sheet Number 343

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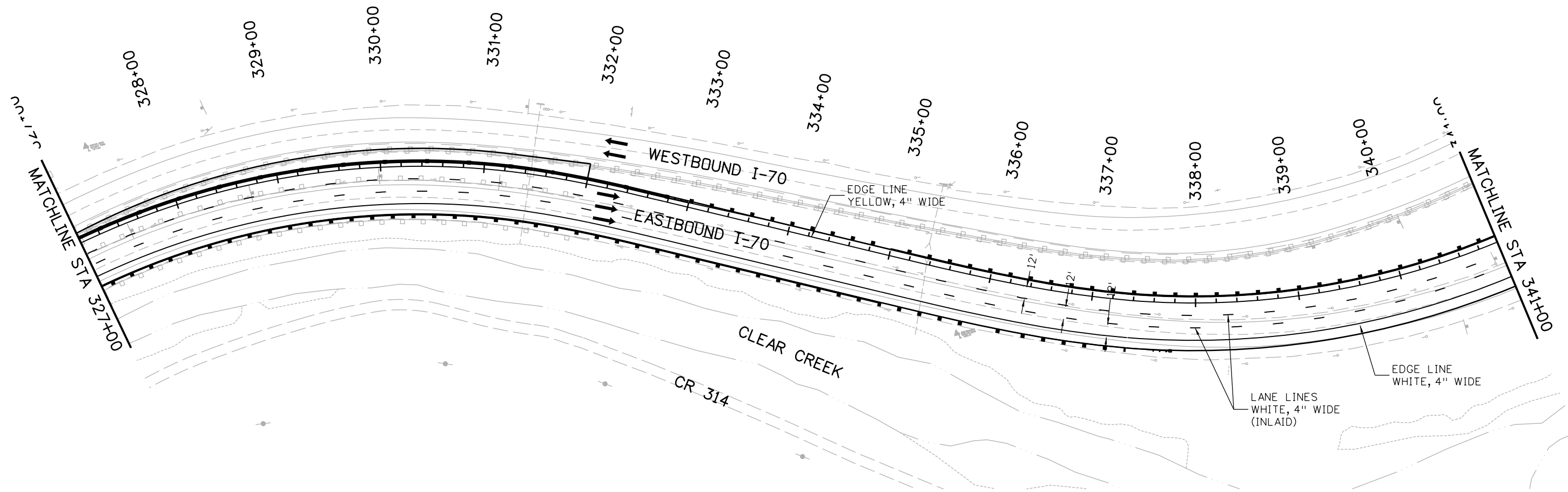


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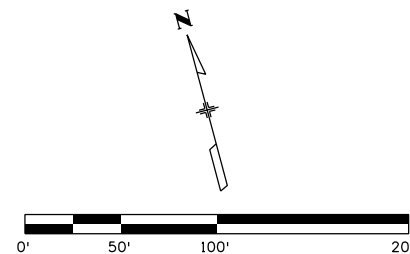


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		Region 1			Revised: Void:		Designer: RRF Structure Numbers Detailer: SYS		19036				
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File Name: 18832TRAF_StripingPlan011.dgn
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Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation



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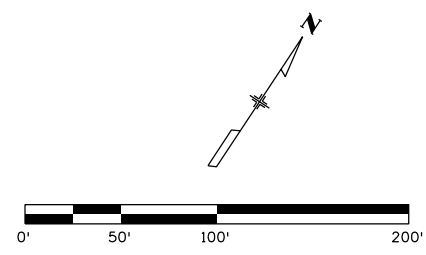
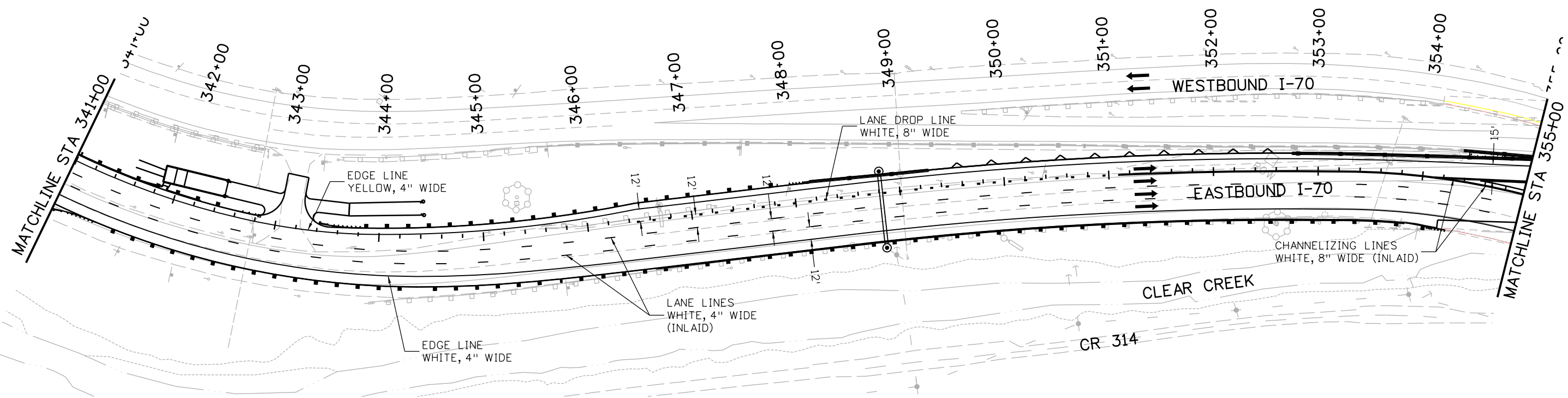
Region 1 CRC

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Revised:
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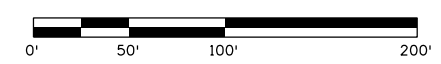
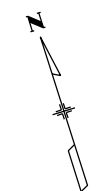
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Project No./Code
IM 0703-391
19036
Sheet Number 345

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Print Date: 3/7/2013 File Name: 18832TRAF_StripingPlan012.dgn Horiz. Scale: 1:100 Vert. Scale:	0000	Sheet Revisions <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.										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:	STRIPING PLAN STA 341+00 TO 355+00 Designer: RRF Detailer: SYS Subset: TRAFFIC	Structure Numbers Subset Sheets: ST-12 of 13	Project No./Code IM 0703-391 19036 Sheet Number 346
Date:	Comments	Init.																	
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Print Date: 3/7/2013 File Name: 18832TRAF_StripingPlan013.dgn Horiz. Scale: 1:100 Vert. Scale:		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:	STRIPING PLAN STA 355+00 TO 365+96.69			Project No./Code IM 0703-391 19036 Sheet Number 347
		4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276	Designer: RRF Detailer: SYS Subset: TRAFFIC	Structure Numbers Subset Sheets: ST-13 of 13						

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SCHEDULE OF CONSTRUCTION TRAFFIC CONTROL DEVICES *

SCHEDULE OF CONSTRUCTION TRAFFIC CONTROL DEVICES - CONT'D



SIGNS					
SIGN CODE	LEGEND	DESCRIPTION	PANEL SIZE		
			A	B	C
			EA	EA	EA
36G20-5p	WORK/ZONE	36" X 24"	56		
48G20-10	XYZ/CONSTRUCTION/ THANKS YOU/555-555-5555	48" X 48"		4	
48G20-11	CDOT ROAD/WORK/MM YY-MM YY/FOR INFORMATION/CALL/XXX-XXX-XXXX	48" X 60"			3
36M1-4	US 6	36" X 36"	8		
36M4-8A	END/DETOUR	36" X 24"	3		
36M4-9L	DETOUR/LEFT ARROW	36" X 24"	2		
36M4-9aL	BIKE SYMB PED SYMB/DETOUR/LEFT ARROW	36" X 24"	2		
36M4-9R	DETOUR/RIGHT ARROW	36" X 24"	1		
36M4-9aR	BIKE SYMB PED SYMB/DETOUR/RIGHT ARROW	36" X 24"	2		
48R2-1(35)	SPEED/LIMIT/35	48" X 60"			12
48R2-1(45)	SPEED/LIMIT/45	48" X 60"			24
48R2-1(55)	SPEED/LIMIT/55	48" X 60"			8
36R2-6p	FINES/DOUBLE	36" X 24"	18		
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"		4	
48R52-6A	BEGIN/FINES/DOUBLE/IN WORK/ZONE	48" X 60"			6
48R52-6B	END/FINES/DOUBLE/IN WORK/ZONE	48" X 60"			4
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"	18		
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"	4		
48W4-2R	LANE ENDS (RIGHT) SYMBOL	48" X 48"		2	
48W4-2L	LANE ENDS (LEFT) SYMBOL	48" X 48"		4	
96W4-50	USE BOTH/LANES DURING/CONSTRUCTION	96" X 60"			2
48W4-51	USE BOTH/LANES TO/MERGE/POINT	48" X 60"		4	
48W4-52	TAKE/TURNS/MERGE/HERE	48" X 60"		4	
48W5-1	ROAD/NARROWS	48" X 48"		2	
48W6-3	TWO-WAY TRAFFIC SYMBOL	48" X 48"		14	
48W7-3a(1)	NEXT/1 MILES	24" X 12"	1		
W11-30	EMERGENCY PULL-OFF AREA	48" X 48"		5	
W13-2(30)	EXIT 30 M.P.H.	36" X 48"		1	
W16-2aP	100 FT	24" X 12"	3		
W16-2aP	400 FT	24" X 12"	1		
W16-2aP	500 FT	24" X 12"	2		
W16-2aP	1500 FT	24" X 12"	2		
W20-1	ROAD WORK AHEAD	48" X 48"		13	
W20-2	DETOUR AHEAD	48" X 48"		1	

SIGNS					
SIGN CODE	LEGEND	DESCRIPTION	PANEL SIZE		
			A	B	C
			EA	EA	EA
48W20-5L	LEFT LANE/CLOSED/ 1/ 2 MILE	48" X 48"		4	
48W21-5	SHOULDER/WORK	48" X 48"		1	
48W21-5aL	LEFT/SHOULDER/CLOSED	48" X 48"		3	
48W3-4	BE PREPARED TO STOP	48" X 48"		28	
48W22-1	BLASTING ZONE AHEAD	48" X 48"		4	
42W22-2	TURN OFF 2-WAY RADIO AND CELL PHONE	42" X 36"		4	
42W22-3	END BLASTING ZONE	42" X 36"		4	
36R4-9	STAY IN LANE	36" X 48"		4	
36R4-2	PASS WITH CARE	36" X 48"		2	
TOTALS				126	121

SCHEDULE OF CONSTRUCTION TRAFFIC CONTROL DEVICES CONT'D

SIGNS					
SIGN CODE	LEGEND	DESCRIPTION	SIZE (SF)	QUANT. (EA)	TOTAL SF
SPECIAL	I-70 SHIELD TUNNEL/EXPANSION/ENGINES OFF/SAVE GAS/THANK YOU	60" X 54"	22.5	6	135
SPECIAL	I-70 SHIELD TUNNEL/EXPANSION AT/IDAHO SPRINGS/PLAN YOUR TRIP/ CALL 511	72" X 54"	27	7	189
SPECIAL	US 6 SHIELD EAST/GOLDEN/LEFT LANE/3/4 MILE	120" X 84"	70	1	70
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	I-70 SHIELD TUNNEL/EXPANSION/AT IDAHO SPRINGS/PLAN YOUR TRIP/ CALL 511	108" X 72"	54	7	378
SPECIAL	ROAD CLOSED/1 MILES AHEAD/LOCAL TRAFFIC ONLY	60" X 30"	12.5	1	13
SPECIAL	TRUCKS/ENTERING/ROADWAY	48" X 48"	16	1	16
SPECIAL	DO NOT/FOLLOW/TRUCKS	48" X 48"	16	3	48
SPECIAL	I-70 FRONTAGE/ROAD CLOSED/LOCAL TRAFFIC ONLY	60" X 30"	12.5	6	75
SPECIAL	SEE BLASTING SIGN (1A) DETAIL ON SUBSET SHEET 29 OF 31	24" X 12"	2	4	8
SPECIAL	SEE BLASTING SIGN (1B) DETAIL ON SUBSET SHEET 29 OF 31	24" X 12"	2	4	8
SPECIAL	SEE BLASTING SIGN (1C) DETAIL ON SUBSET SHEET 29 OF 31	24" X 18"	3	29	87
SPECIAL	SEE BLASTING SIGN (1D) DETAIL ON SUBSET SHEET 29 OF 31	6" X 18"	0.75	29	22
SPECIAL	DETOUR/UP ARROW	60" X 48"	20	3	60
SPECIAL	DETOUR/ANGLED ARROW	60" X 48"	20	2	40
SPECIAL	CR 314 CLOSED/1000 FT AHEAD/TURN AROUND/225LA/HERE	84" X 60"	35	1	35
SPECIAL	BUSINESS/ON CR 314/OPEN/USE EXIT 241	96" X 60"	40	2	80
SPECIAL	BUSINESS ACCESS/OPEN TO/MNT MINI STORAGE/FERRELL GAS/ CLEAR CREAK RAFTING/AGGREGATE IND	54" X 48"	18	1	18
SPECIAL	FRONTAGE ROAD/CLOSED EAST OF/IDAHO SPRINGS/LOCAL TRAFFIC ONLY/BUSINESSES OPEN	120" X 84"	70	3	210
SPECIAL	US 6 EAST/GOLDEN/45LA/LEFT LANE	120" X 72"	60	1	60
SPECIAL	SEE BLASTING SIGN (2) DETAIL ON SUBSET SHEET 29 OF 31	24" X 36"	6	10	60
TOTALS					1752

* ADDITIONAL ITEMS SHOWN IN QUANTITIES BUT NOT IDENTIFIED ON PLAN SHEETS ARE TO BE USED AS DIRECTED BY THE ENGINEER.

Print Date: 3/7/2013		Sheet Revisions			Colorado Department of Transportation			As Constructed		EASTBOUND I-70 CONSTRUCTION PHASING PLAN			Project No./Code	
File Name: I8832PHAS_CP2_TCTab.dgn		Date:	Comments	Init.				No Revisions:		Designer: D.Sprague			IM 0703-391	
Horiz. Scale: 1:1 Vert. Scale:					425 A Corporate Circle Golden, CO 80401 Phone: 720-497-6918 FAX: 720-497-6901			Revised:		Detailer: J. Gellner			19036	
				Region 1			Void:		Subset: Phasing			Subset Sheets: 1 of 31		
				CRC						Sheet Number 348				

TABULATION OF TRAFFIC ENGINEERING ITEMS

ITEM NUMBER	ITEM DESCRIPTION	UNIT	PROJECT TOTAL	REMARKS
202-00250	REMOVAL OF PAVEMENT MARKING	SF	14,770	
202-00810	REMOVAL OF GROUND SIGN	EACH	2	
210-00810	RESET GROUND SIGN	EACH	2	
304-06000	AGGREGATE BASE COURSE (CLASS 6)	TON	113	4" THICKNESS
607-11581	FENCE (TEMPORARY) (SPECIAL)	LF	542	SEE NOTE 1
607-60116	16 FOOT GATE	EACH	1	
607-60212	12 FOOT GATE SINGLE (CHAIN LINK)	EACH	1	SEE NOTE 2
621-00450	DETOUR PAVEMENT	SY	569	4" THICKNESS
627-00001	PAVEMENT MARKING PAINT	GAL	444	SEE NOTE 3
630-00000	FLAGGING	HOURL	7,000	SEE NOTE 4
630-00003	UNIFORM TRAFFIC CONTRDL	HOURL	7,500	
630-00007	TRAFFIC CONTROL INSPECTION	DAY	35	
630-00012	TRAFFIC CONTROL MANAGEMENT	DAY	354	
630-80001	FLASHING BEACON (PORTABLE)	EACH	17	
630-80336	BARRICADE (TYPE 3 M-B) (TEMPORARY)	EACH	4	
630-80341	CONSTRUCTION TRAFFIC SIGN (PANEL SIZE A)	EACH	126	
630-80342	CONSTRUCTION TRAFFIC SIGN (PANEL SIZE B)	EACH	121	
630-80343	CONSTRUCTION TRAFFIC SIGN (PANEL SIZE C)	EACH	61	
630-80344	CONSTRUCTION TRAFFIC SIGN (SPECIAL)	SF	1,752	
630-80355	PORTABLE MESSAGE SIGN PANEL	EACH	18	
630-80358	ADVANCE WARNING FLASHING OR SEQUENCING PANEL (TYPE C)	EACH	2	
630-80360	DRUM CHANNELIZING DEVICE	EACH	100	
630-80363	DRUM CHANNELIZING DEVICE (WITH LIGHT) (FLASHING)	EACH	25	
630-80367	PORTABLE TRAFFIC SPEED MONITOR	EACH	2	SEE NOTE 5
630-80369	PORTABLE VARIABLE SPEED LIMIT SIGN	EACH	7	
630-80370	CONCRETE BARRIER (TEMPORARY)	LF	30,272	SEE NOTE 6
630-80380	TRAFFIC CONE	EACH	200	
630-80384	TUBULAR MARKER	EACH	170	
630-85010	IMPACT ATTENUATOR (TEMPORARY)	EACH	11	SEE NOTE 7
630-85041	MOBILE ATTENUATOR	DAY	300	

NOTES:

1. HEIGHT OF FABRIC SHALL BE 144 INCHES.
2. HEIGHT OF FABRIC SHALL BE 84 INCHES.
3. QUANTITY OF PAVEMENT MARKING PAVEMENT SHOWN REPRESENTS NEW STRIPING WITHIN CONSTRUCTION PACKAGE 2. INITIAL STRIPING PERFORMED IN CONSTRUCTION PACKAGE 1B FOR THE EB I-70 DETOUR IS NOT QUANTIFIED IN THIS TABULATION. QUANTITY INCLUDES THE FOLLOWING MULTIPLE APPLICATIONS:
 - PHASE 1: (3) APPLICATIONS - BEGINNING TO WEST PORTAL AREA
 - PHASE 1: (2) APPLICATIONS - WEST PORTAL AREA THRU HIDDEN VALLEY
 - PHASE 1: (2) APPLICATIONS - EAST OF HIDDEN VALLEY
 - PHASE 2: (2) APPLICATIONS - EAST OF HIDDEN VALLEY ONLY
4. ITEM 630-00000 FLAGGING INCLUDES HOURS FOR ROADWAY FLAGGING AND CLEAR CREEK RAFTING FLAGGING/SPOTTING. THE USE OF SPOTTERS AND/OR FLAGGERS SHALL BE PAID FOR AS FLAGGING. IT IS ESTIMATED THAT 2,300 HOURS WILL BE REQUIRED.
5. PORTABLE TRAFFIC SPEED MONITORING DEVICES TO REMAIN AS PLACED IN CONSTRUCTION PACKAGE 1B.
6. CONCRETE BARRIER (TEMPORARY) QUANTITY INCLUDES 1382 LF REQ'D FROM THE CONSTRUCTION PACKAGE 0 EAST EMERGENCY CROSSOVER.
7. IMPACT ATTENUATOR (TEMPORARY) INCLUDES (5) EACH REQUIRED FROM CONSTRUCTION PACKAGE 0 AT VARIOUS LOCATIONS.
8. ADDITIONAL ITEMS AND QUANTITIES SHOWN IN THE ABOVE TABULATION THAT ARE NOT IDENTIFIED IN PLAN SHEETS SHALL BE USED AS DIRECTED BY THE ENGINEER.

TRAFFIC CONTROL GENERAL NOTES:

1. I-70 SHALL MAINTAIN A CONSTRUCTION WORK ZONE SPEED LIMIT OF 35.
2. ALL TAPERS, DETOURS, ETC. ON I-70 SHALL BE SET USING 35 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. EB I-70 EXIT 244 SHALL REMAIN OPEN DURING DAYTIME HOURS. CLOSURES OF EB I-70 EXIT 244 SHALL ONLY OCCUR DURING NIGHTTIME HOURS.
6. 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-FEET WIDE AT ALL TIMES. MINIMUM SHOULDER WIDTH SHALL BE 2-FEET. 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 3 OF SUBSET FOR DETOUR PLAN. ACCESS TO BUSINESSES ON CR314 WILL BE MAINTAINED.
5. WORK WITHIN THE TUNNEL WILL BE ON-GOING FOR THE DURATION OF THIS CONSTRUCTION PACKAGE. ALL EASTBOUND I-70 TRAFFIC WILL BE MAINTAINED ON THE DETOUR. TEMPORARY STOPPAGES IN BOTH DIRECTIONS WILL BE NECESSARY DURING TUNNEL BLASTING AND WILL BE ADDRESS WITH MHTS.

PHASE 1

DESCRIPTION:

COMPLETE WORK WITHIN PHASE 1 CONSTRUCTION AREA TO THE EAST OF THE TUNNELS.

TRAFFIC:

TWO LANES OF TRAFFIC WILL BE MAINTAINED AT ALL TIMES. TRAFFIC WILL BE SHIFTED TO THE SOUTH SIDE OF THE EXISTING PAVEMENT (EAST OF HIDDEN VALLEY INTERCHANGE).

NIGHTTIME CLOSURES OF EB I-70 EXIT 244 RAMP TO US 6 WILL BE NECESSARY TO CONSTRUCT WALL L.

PHASE 2

DESCRIPTION:

COMPLETE WORK WITHIN PHASE 2 CONSTRUCTION AREA EAST OF THE TUNNELS.

TRAFFIC:

TWO LANES OF TRAFFIC WILL BE MAINTAINED AT ALL TIMES. TRAFFIC WILL BE SHIFTED TO THE NORTH SIDE OF THE PAVEMENT CONSTRUCTED IN PHASE I (EAST OF HIDDEN VALLEY INTERCHANGE).


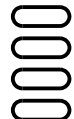

PHASE 3

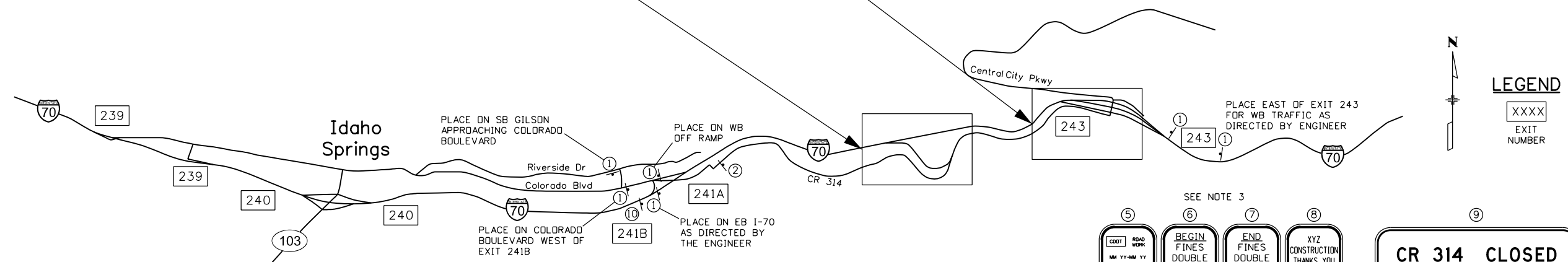
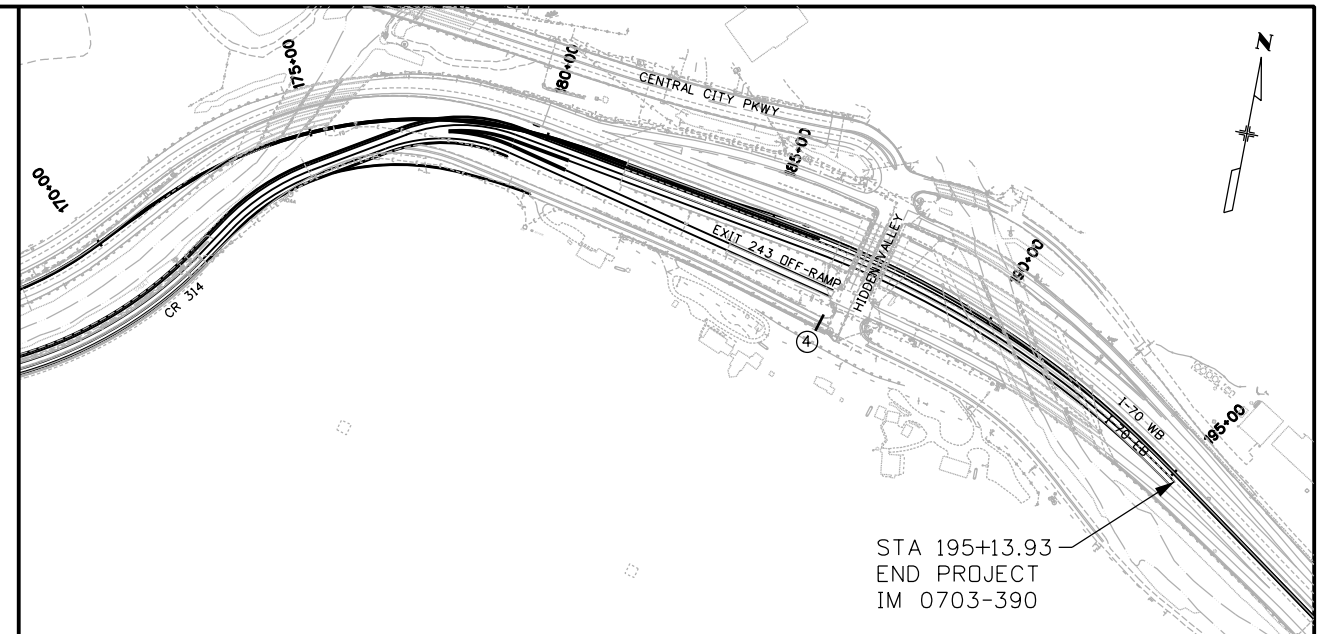
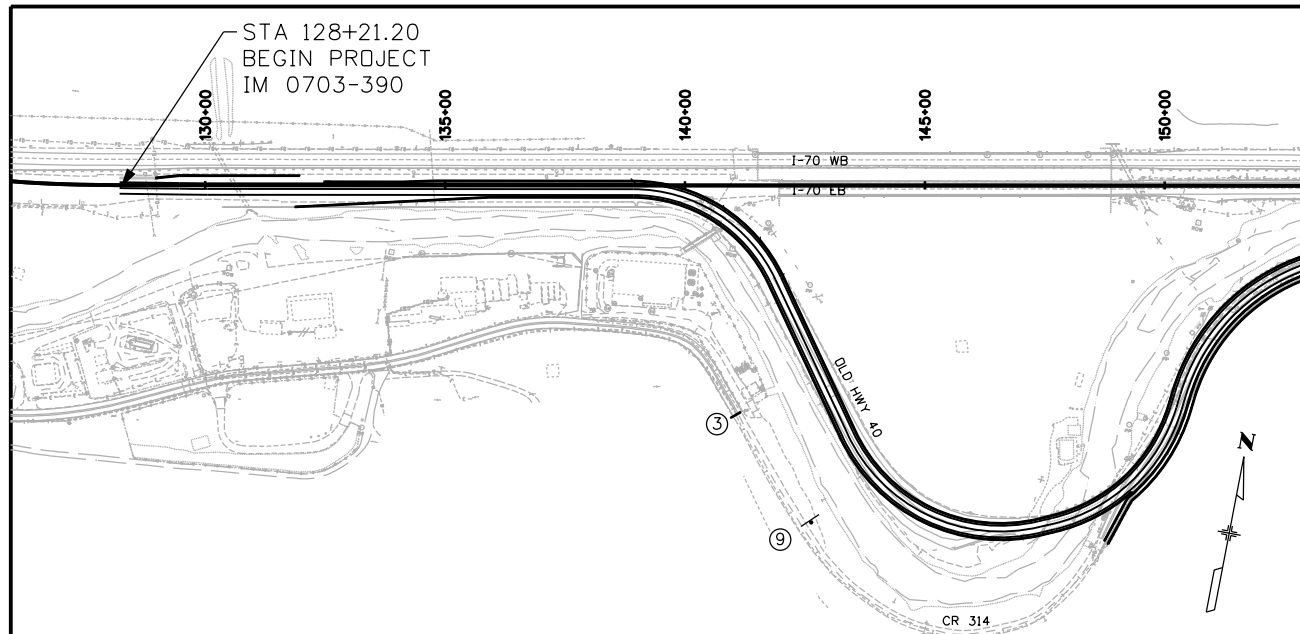
DESCRIPTION:

COMPLETE WEST PORTAL WORK AND DETOUR PAVEMENT REMOVAL.

TRAFFIC:

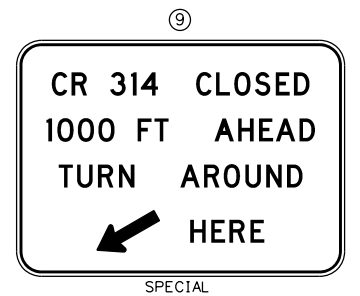
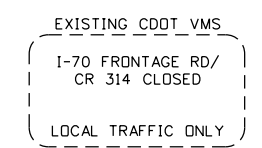
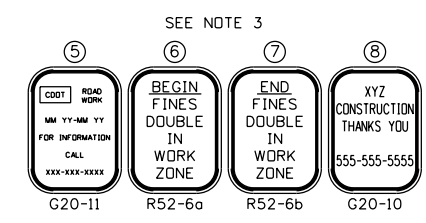
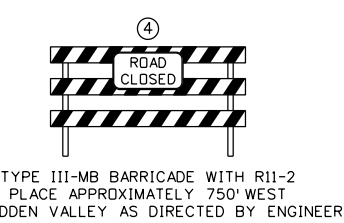
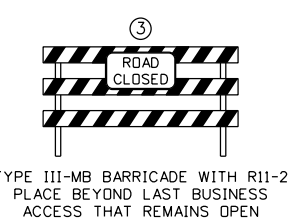
TRAFFIC WILL BE IN THE ULTIMATE CONFIGURATION. SHOULDER CLOSURES AND LAND CLOSURES (AS PERMITTED BY THE PROJECT LANE CLOSURE STRATEGY) SHALL BE PLACES ACCORDING TO CDOT M&S STD PLANS S-630-1 CASES 5, 8, AND 11.

Print Date: 3/9/2013		Sheet Revisions	Colorado Department of Transportation	As Constructed	EASTBOUND I-70 CONSTRUCTION PHASING PLAN	Project No./Code
File Name: 18832PHAS_CP2_TCTab2.dgn		Date: Comments Init.	 425 A Corporate Circle Golden, CO 80401 Phone: 720-497-6918 FAX: 720-497-6901	No Revisions:	Designer: D.Sprague Structure	IM 0703-391
Horiz. Scale: 1:1 Vert. Scale:			Region 1	Revised:	Detailer: J. Gellner Numbers	19036
 4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276			CRC	Void:	Subset: Phasing Subset Sheets: 2 of 31	Sheet Number 349



NOTES:

1. 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).
2. REFER TO PHASING PLANS FOR LANE WIDTH REQUIREMENTS AND ADDITIONAL INFORMATION.
3. 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.
4. 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.
5. 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.
6. CONTRACTOR SHALL COORDINATE WITH LOCAL BUSINESSES TO IDENTIFY ACCESS RESTRICTIONS AND MINIMIZE IMPACTS OF THE CONSTRUCTION.
7. 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.
8. TWO PORTABLE MESSAGE PANELS SHALL BE ASSUMED AS PART OF MHT PLANS, LOCATED AS DIRECTED BY THE ENGINEER.
9. REFER TO TWIN TUNNELS INCIDENT MANAGEMENT PLAN AND PROJECT SPECIAL PROVISIONS FOR EMERGENCY ACCESS REQUIREMENTS.



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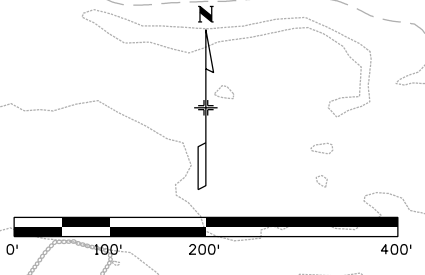
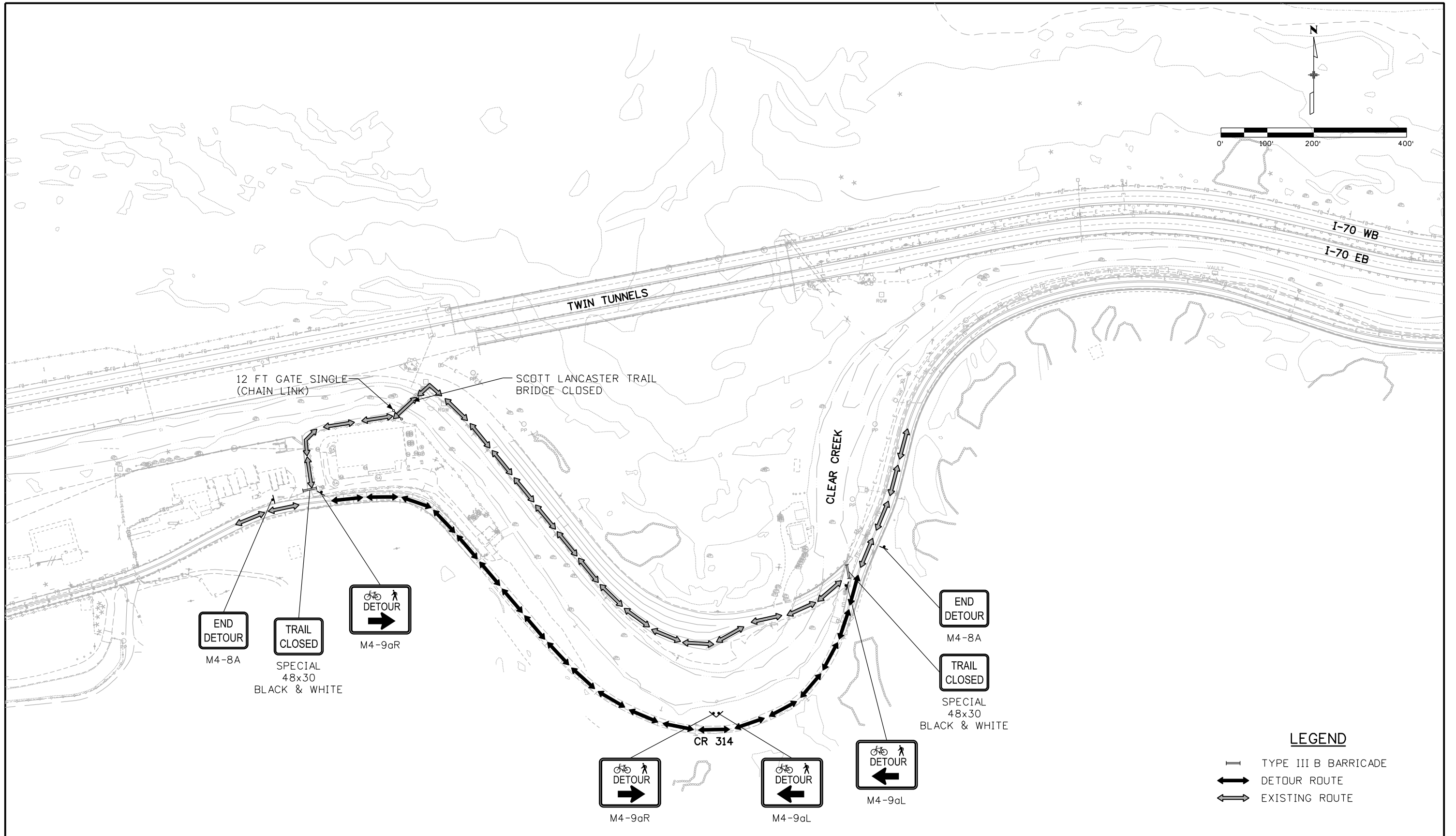
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Region 1 CRC

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CR 314 CLOSURE PLAN			
Designer:	D.Sprague	Structure	
Detailer:	J. Gellner	Numbers	
Subset:	Phasing	Subset Sheets:	3 of 31

Project No./Code
IM 0703-391
19036
Sheet Number 350



LEGEND

- TYPE III B BARRICADE
- DETOUR ROUTE
- EXISTING ROUTE

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Region 1 **CRC**

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No Revisions:
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EASTBOUND I-70 DETOUR CONSTRUCTION PHASING PLAN SHARED PATH SIGNING			
Designer:	D.Sprague	Structure Numbers	
Detailer:	J. Gellner	Subset Sheets: 4 of 31	
Subset:	Phasing		

Project No./Code
IM 0703-391
19036
Sheet Number 351

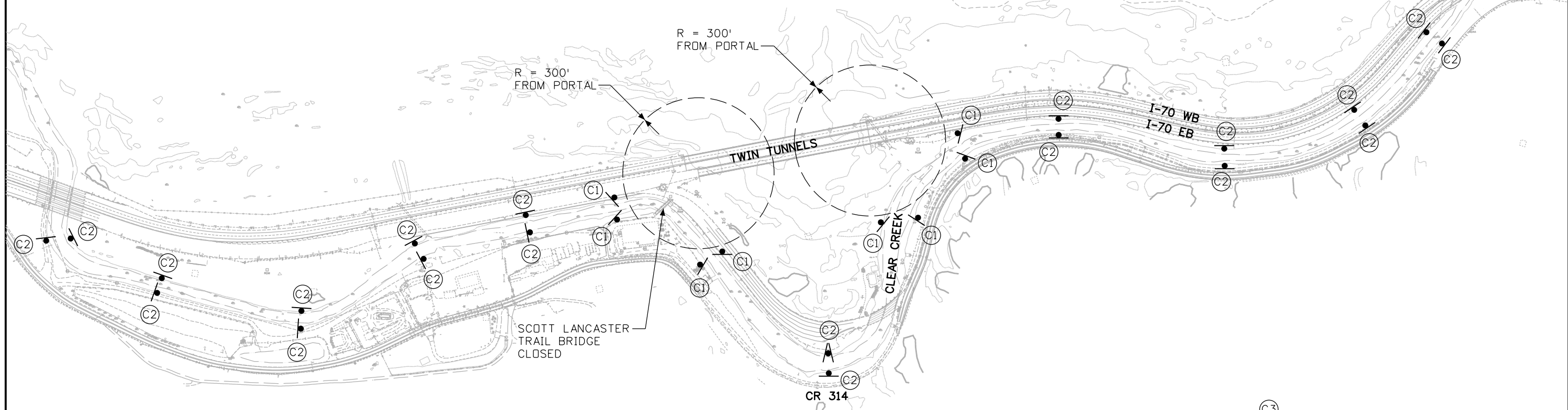


LEGEND

— — BLASTING ZONE

NOTES

1. ALL SIGNS SHALL BE FIELD LOCATED FOR THE BEST VISIBILITY BY RECREATIONAL USERS.
2. SEE SUBSET SHEET 29 OF 31 FOR SIGN PANEL DETAILS.



BLASTING SIGN (1A) **WARNING**
BLASTING ZONE BETWEEN SIGNS
EXIT BLASTING ZONE WHEN SIGNALS HEARD

OR

BLASTING SIGN (1B) **WARNING**
BLASTING ZONE BETWEEN SIGNS
EXIT BLASTING ZONE WHEN SIGNALS HEARD

BLASTING SIGN (1C) **BLASTING SIGNALS**
WARNING SIGNAL:
A 1-MINUTE SERIES OF LONG BLASTS
5 MINUTES PRIOR TO BLAST SIGNAL
BLASTING SIGNAL:
A SERIES OF SHORT BLASTS
1 MINUTE PRIOR TO THE SHOT
ALL CLEAR SIGNAL:
A PROLONGED BLAST FOLLOWING
THE INSPECTION OF THE BLAST AREA

BLASTING SIGN (1D) **CALL HOTLINE FOR APPROX. BLASTING TIMES 303-327-4034**

BLASTING SIGN (1C) **BLASTING SIGNALS**
WARNING SIGNAL:
A 1-MINUTE SERIES OF LONG BLASTS
5 MINUTES PRIOR TO BLAST SIGNAL
BLASTING SIGNAL:
A SERIES OF SHORT BLASTS
1 MINUTE PRIOR TO THE SHOT
ALL CLEAR SIGNAL:
A PROLONGED BLAST FOLLOWING
THE INSPECTION OF THE BLAST AREA

BLASTING SIGN (1D) **CALL HOTLINE FOR APPROX. BLASTING TIMES 303-327-4034**

IT'S ABOUT: TITING YOUR TRIP.

BE SAFE WHILE YOU ENJOY CLEAR CREEK

BLASTING DOWNSTREAM AT TWIN TUNNELS

CALL 303.327.4034 FOR BLASTING TIMES

PROCEED TO SAFE AREA WHEN DIRECTED

I-70 Mainline Center **I-70 TWIN TUNNELS eastbound** DOT

LOCATIONS OF C3 ARE NOT IDENTIFIED IN THE PLANS. TEN SIGNS SHALL BE PLACED UPSTREAM OF THE PROJECT, AS DIRECTED BY THE ENGINEER.

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Phone: 720-497-6918 FAX: 720-497-6901
Region 1 **CRC**

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Void:

CLEAR CREEK BLASTING WARNING SIGN PLAN

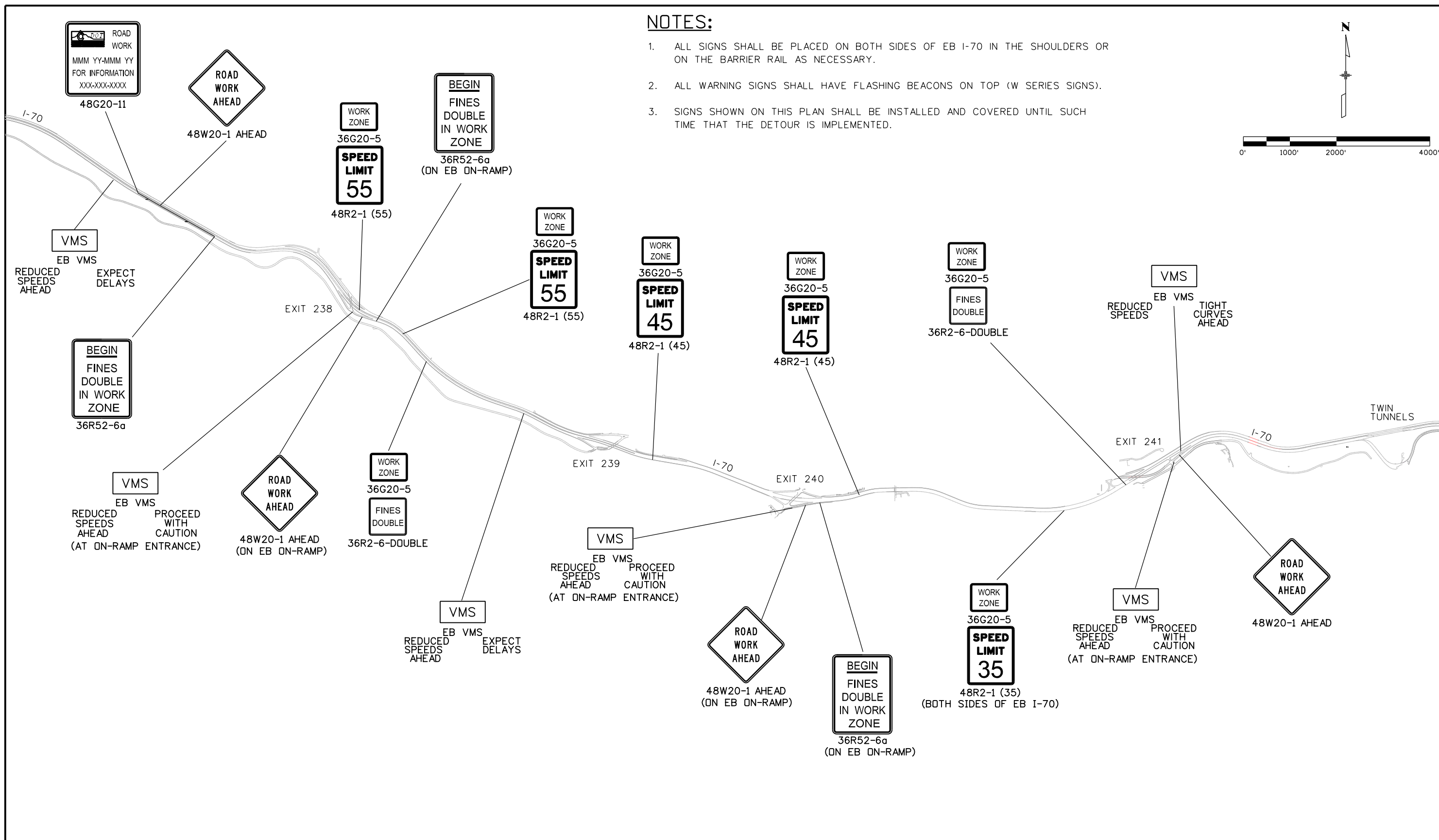
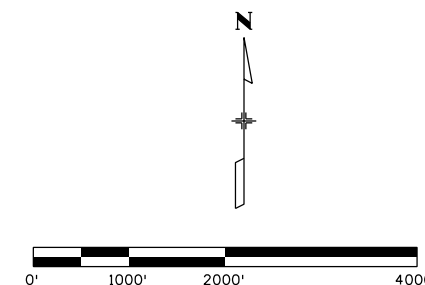
Designer:	D.Sprague	Structure Numbers	
Detailer:	J. Gellner	Subset Sheets:	5 of 31
Subset:	Phasing		

Project No./Code
IM 0703-391
19036
Sheet Number **352**

17543 3:58:15 PM c:\pw_work\pbes\pw1\common\dms26924\18832PHAS_CP2_PH_Closure_Plan003.dgn


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: 3/7/2013
 File Name: 18832TRAF_CP2_Adv Detour Signing001.dgn
 Horiz. Scale: 1:2000 Vert. Scale:
ATKINS 4601 DTC Boulevard, Suite 700
 Denver, CO 80237
 Phone: (303) 221-7275 Fax: (303) 221-7276

Sheet Revisions		
Date:	Comments	Init.

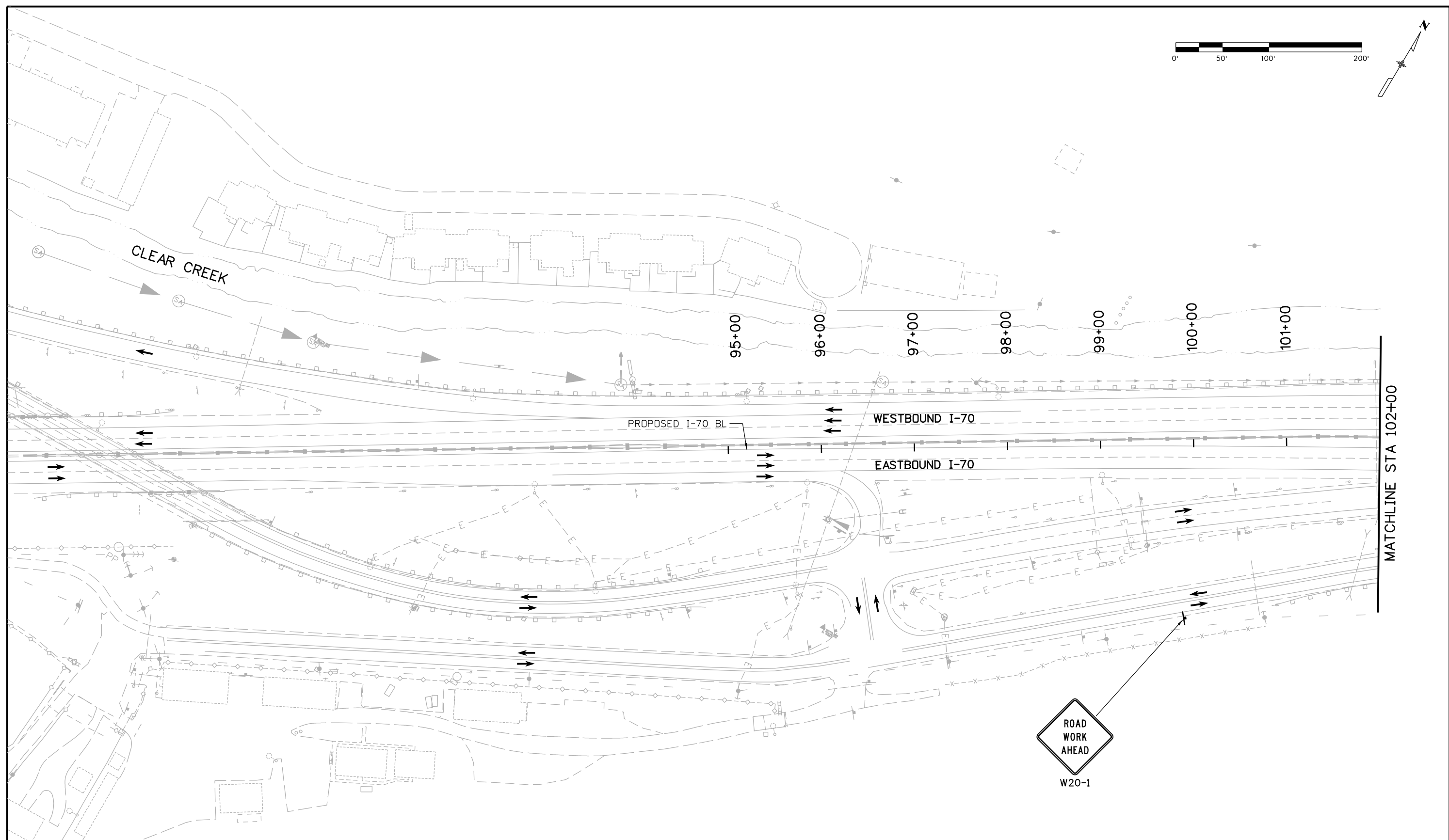
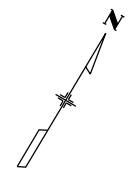
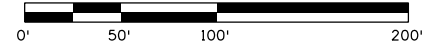
Colorado Department of Transportation

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

As Constructed
 No Revisions:
 Revised:
 Void:

**TWIN TUNNELS DETOUR
 ADVANCED SIGNING
 PHASE 1 & 2**

Designer:	D.Sprague	Structure Numbers	
Detailer:	J. Gellner	Subset Sheets:	6 of 31
Subset:	Phasing		

Project No./Code
 IM 0703-391
 19036
 Sheet Number **353**



Print Date: 3/7/2013
 File Name: 18832PHAS_CP2_PHI_Plan001.dgn
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 Denver, CO 80237
 Phone: (303) 221-7275 Fax: (303) 221-7276

Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation

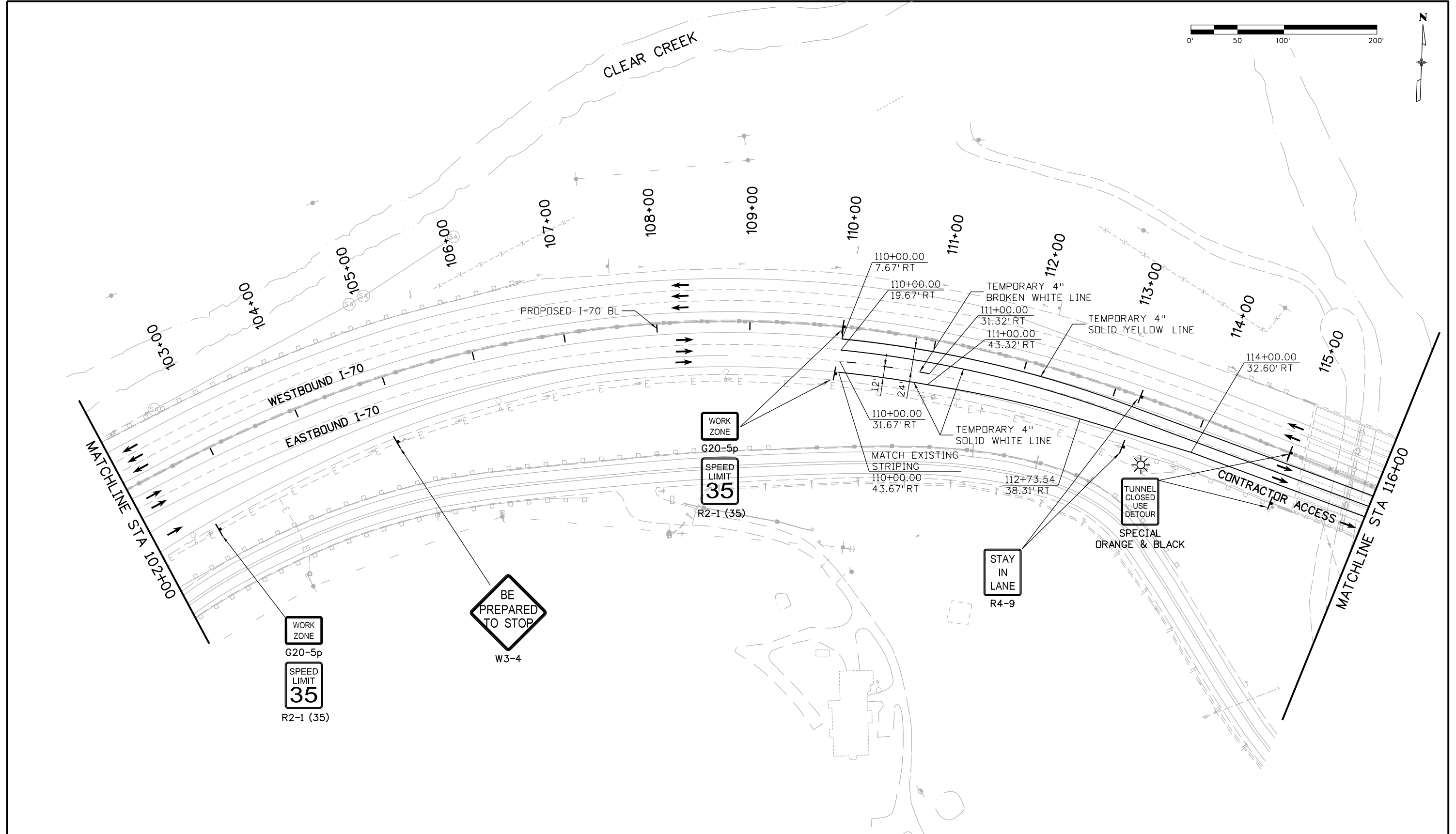
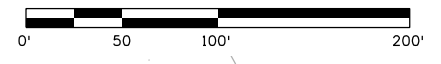
 425 A Corporate Circle
 Golden, CO 80401
 Phone: 720-497-6918 FAX: 720-497-6901
Region 1 **CRC**

As Constructed
 No Revisions:
 Revised:
 Void:

**EASTBOUND I-70
 CONSTRUCTION PHASING PLAN
 PHASE 1**
 Designer: D.Sprague
 Detailer: J. Gellner
 Subset: Phasing
 Structure Numbers
 Subset Sheets: 7 of 31

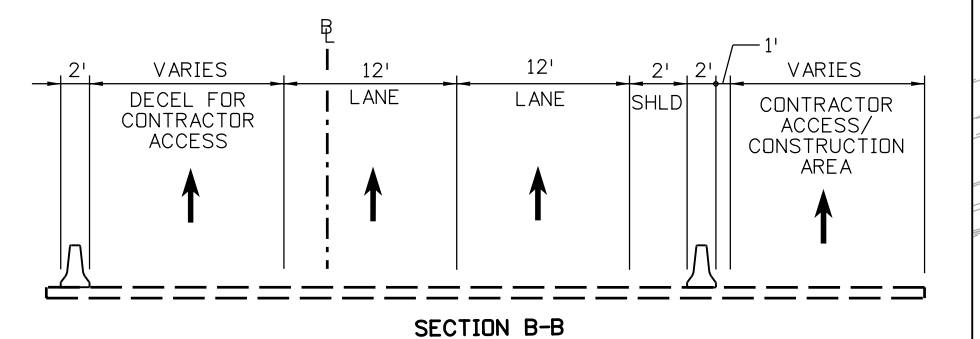
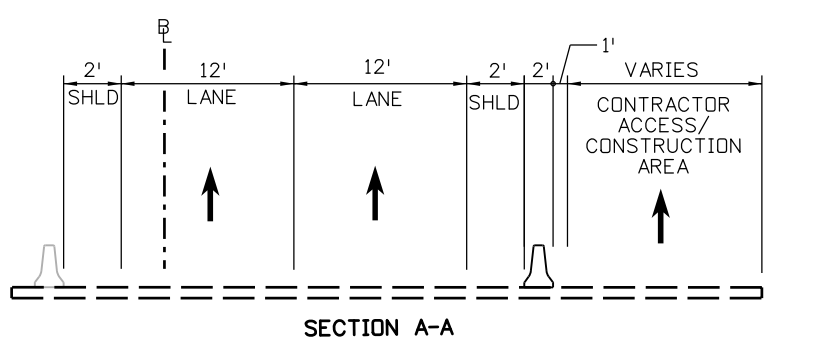
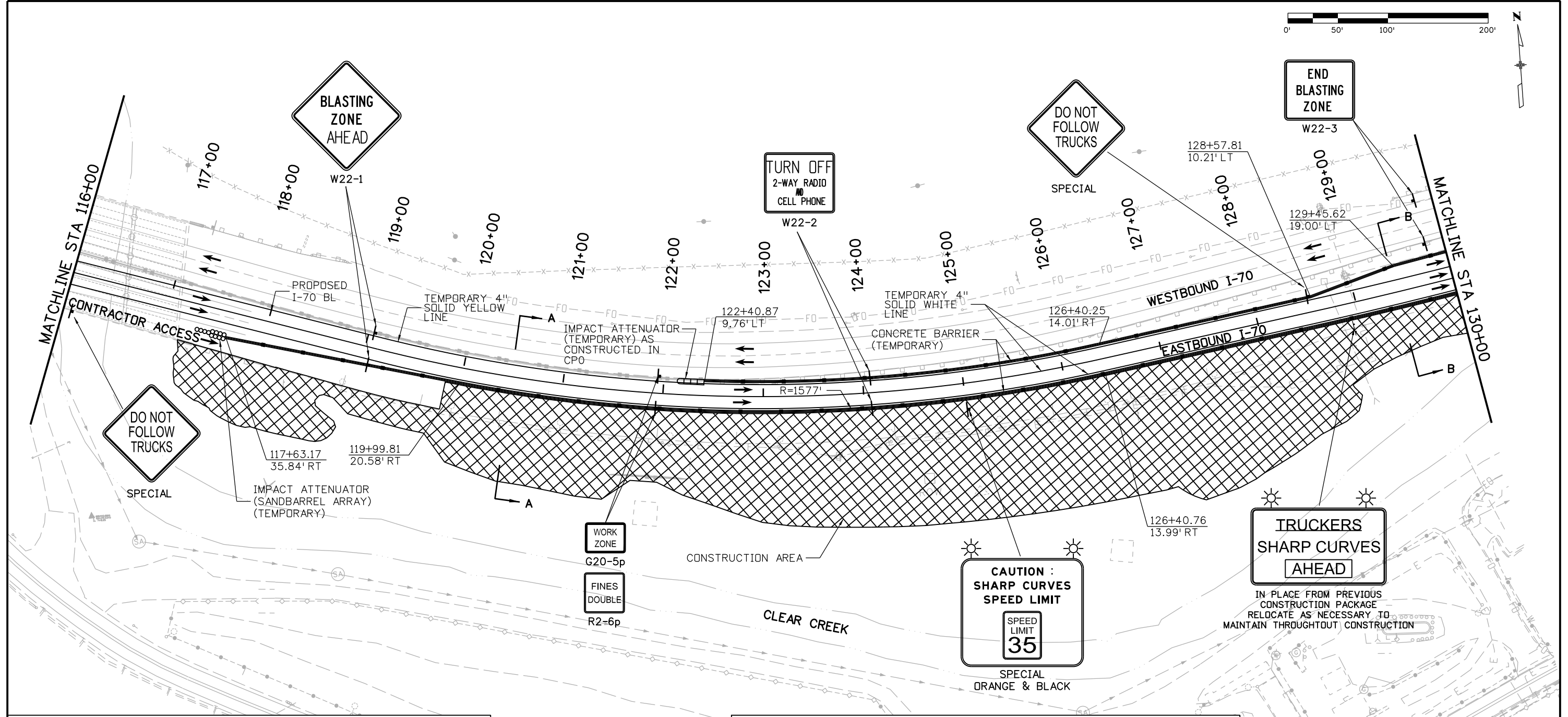
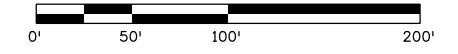
Project No./Code
 IM 0703-391
 19036
 Sheet Number **354**

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Print Date: 3/7/2013	Sheet Revisions			Colorado Department of Transportation 425 A Corporate Circle Golden, CO 80401 Phone: 720-497-6918 FAX: 720-497-6901	As Constructed No Revisions: Revised: Void:	EASTBOUND I-70 CONSTRUCTION PHASING PLAN PHASE 1			Project No./Code
File Name: 18832PHAS_CP2_PHI_Plan002.dgn	Date:	Comments:	Init.:			IM 0703-391			
Horiz. Scale: 1:100 Vert. Scale:	0000			Region 1	CRC	Designer: D.Sprague	Structure Numbers	19036	Sheet Number 355
ATKINS 4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276						Detailer: J. Gellner	Subset Sheets: 8 of 31		

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Print Date: 3/11/2013
 File Name: 18832PHAS_CP2_PHL_Plan003.dgn
 Horiz. Scale: 1:100 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:

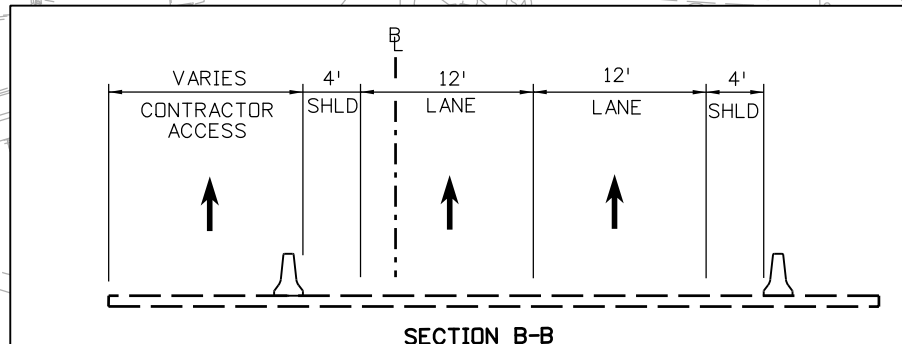
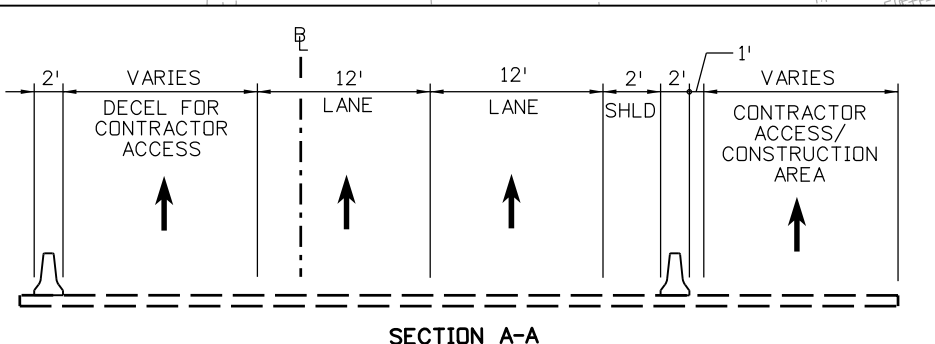
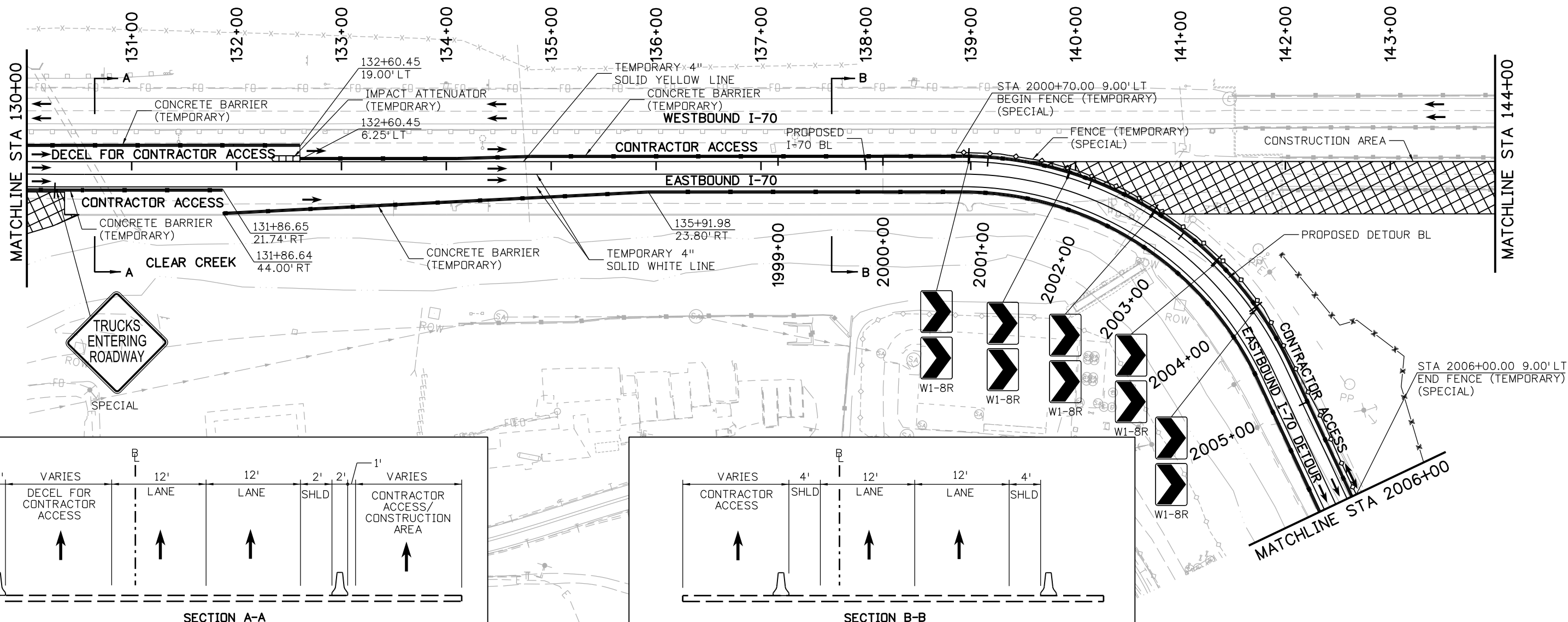
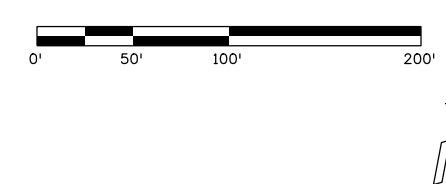
**EASTBOUND I-70
 CONSTRUCTION PHASING PLAN
 PHASE 1**
 Designer: D.Sprague
 Detailer: J. Gellner
 Subset: Phasing
 Structure Numbers
 Subset Sheets: 9 of 31

Project No./Code
 IM 0703-391
 19036
 Sheet Number **356**

16055 6:33:14 AM c:\pw_work\pbs\jpw\common\dms26924\18832PHAS_CP2_PHL_Plan003.dgn


NOTES:

1. TRAFFIC CONFIGURATION SHOWN ON THIS SHEET WAS CONSTRUCTED UNDER CONSTRUCTION PACKAGE 1B PHASING.



Print Date: 3/11/2013
 File Name: 18832PHAS_CP2_PHI_Plan004.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
 No Revisions:
 Revised:
 Void:

**EASTBOUND I-70
 CONSTRUCTION PHASING PLAN
 PHASE 1**

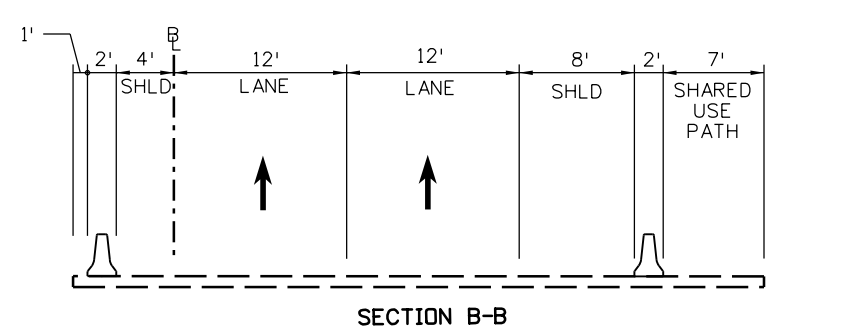
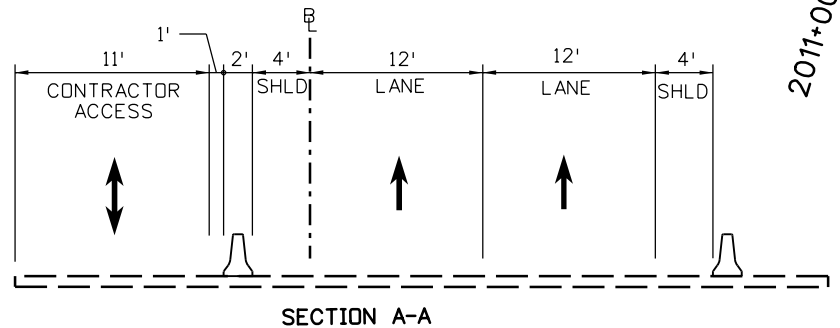
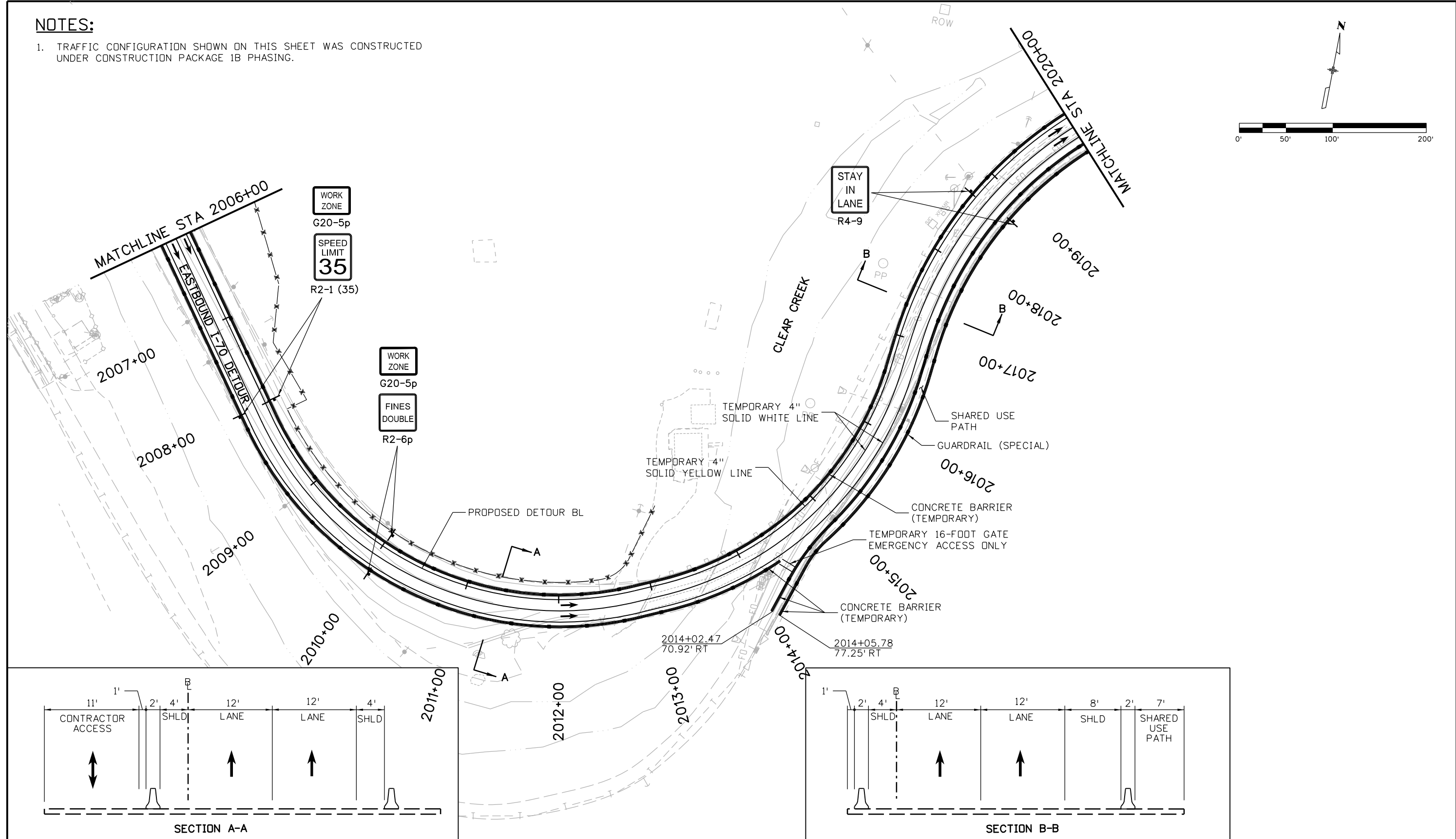
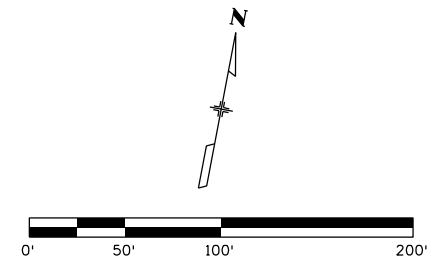
Designer:	D.Sprague	Structure Numbers	
Detailer:	J. Gellner	Subset Sheets:	10 of 31
Subset:	Phasing		

Project No./Code
 IM 0703-391
 19036
 Sheet Number **357**

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NOTES:

1. TRAFFIC CONFIGURATION SHOWN ON THIS SHEET WAS CONSTRUCTED UNDER CONSTRUCTION PACKAGE 1B PHASING.



Print Date: 3/7/2013
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 Horiz. Scale: 1:100 Vert. Scale:
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 Denver, CO 80237
 Phone: (303) 221-7275 Fax: (303) 221-7276

Sheet Revisions		
Date:	Comments	Init.

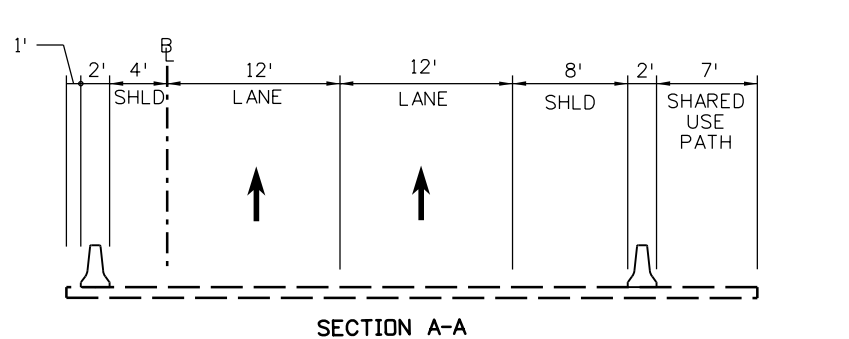
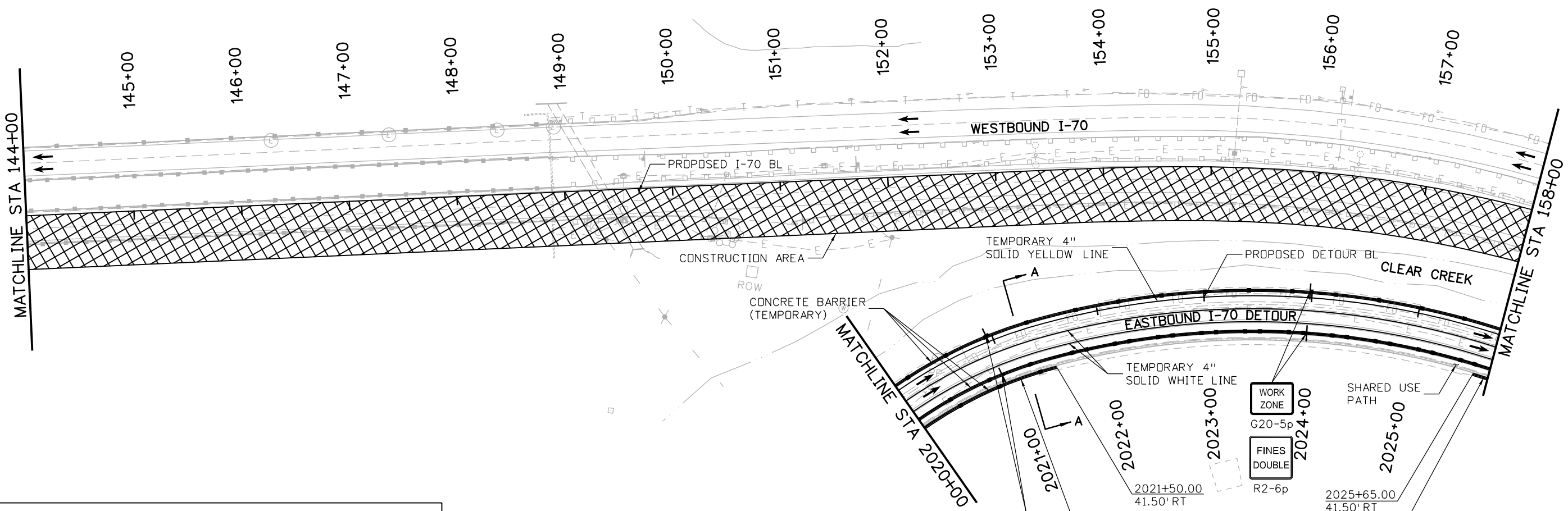
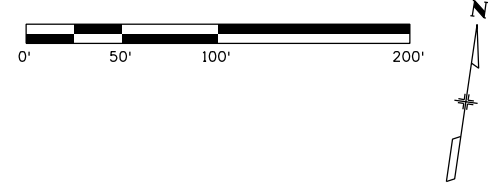
Colorado Department of Transportation
 425 A Corporate Circle
 Golden, CO 80401
 Phone: 720-497-6918 FAX: 720-497-6901
Region 1 **CRC**

As Constructed
 No Revisions:
 Revised:
 Void:

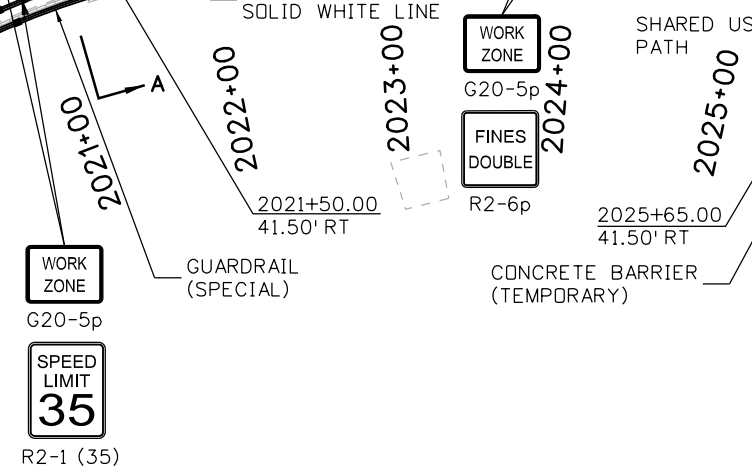
**EASTBOUND I-70
 CONSTRUCTION PHASING PLAN
 PHASE 1**
 Designer: D.Sprague
 Detailer: J. Gellner
 Subset: Phasing
 Structure Numbers
 Subset Sheets: 11 of 31

Project No./Code
 IM 0703-391
 19036
 Sheet Number **358**

17543 3:59:32 PM c:\pwwork\pws\jpw\common\dms26924\18832PHAS_CP2_PHI_Plan005.dgn



NOTES:
 1. TRAFFIC CONFIGURATION SHOWN ON THIS SHEET WAS CONSTRUCTED UNDER CONSTRUCTION PACKAGE 1B PHASING.



Print Date: 3/7/2013
 File Name: 18832PHAS_CP2_PHI_Plan006.dgn
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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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 No Revisions:
 Revised:
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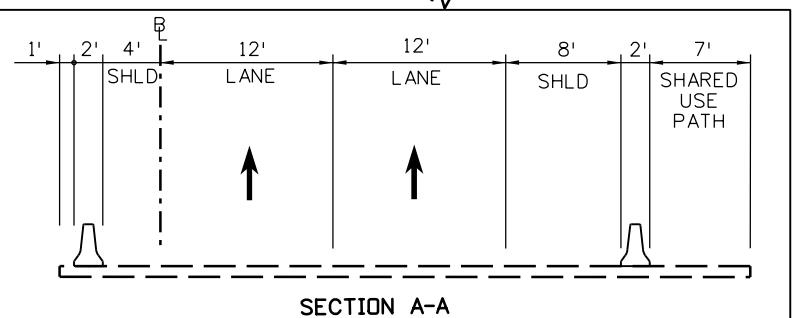
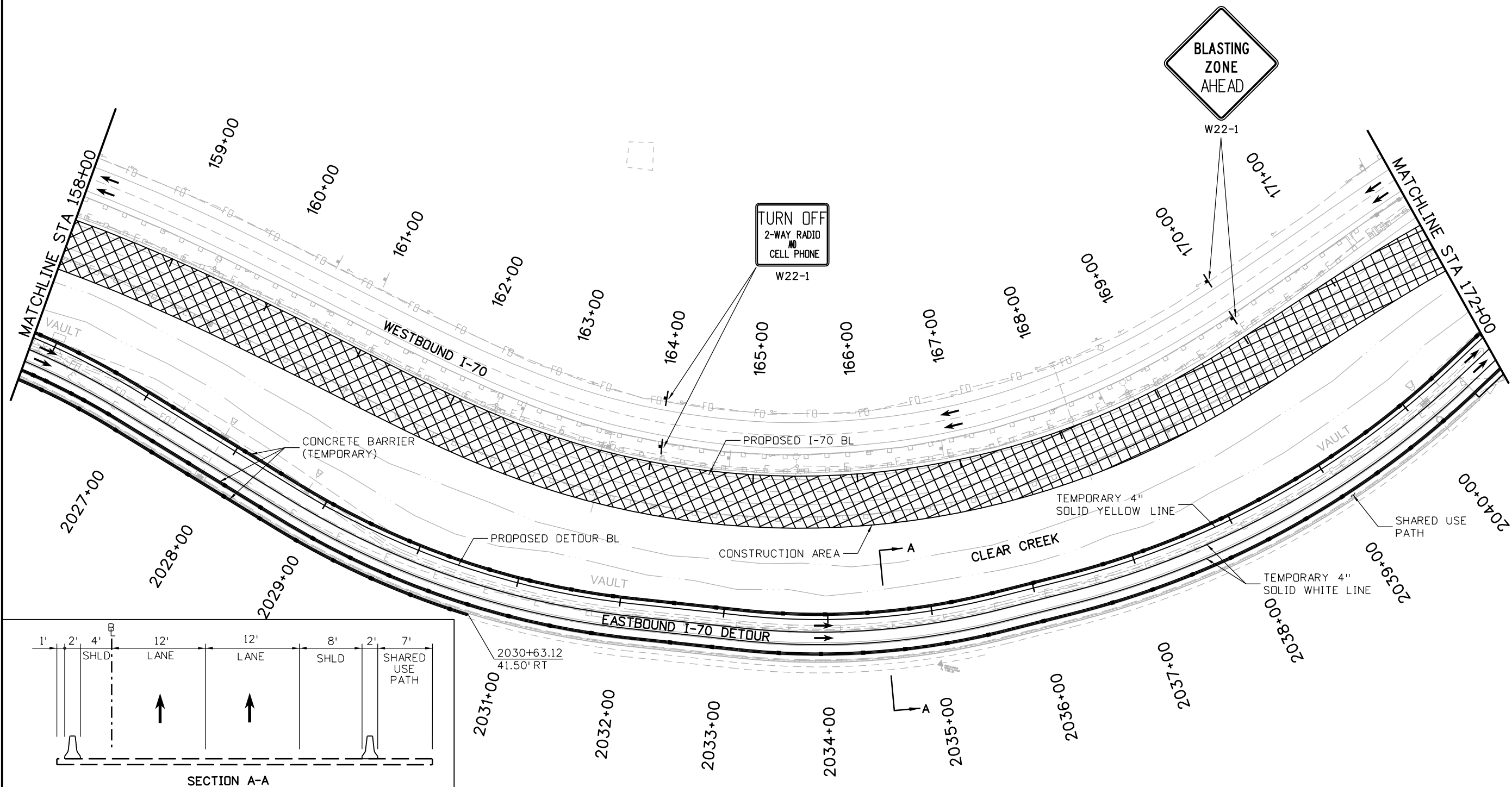
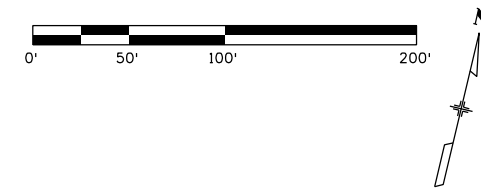
**EASTBOUND I-70
 CONSTRUCTION PHASING PLAN
 PHASE 1**
 Designer: D.Sprague
 Detailer: J. Gellner
 Subset: Phasing
 Structure Numbers
 Subset Sheets: 12 of 31

Project No./Code
 IM 0703-391
 19036
 Sheet Number 359

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1. TRAFFIC CONFIGURATION SHOWN ON THIS SHEET WAS CONSTRUCTED UNDER CONSTRUCTION PACKAGE 1B PHASING.



Print Date: 3/7/2013
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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:
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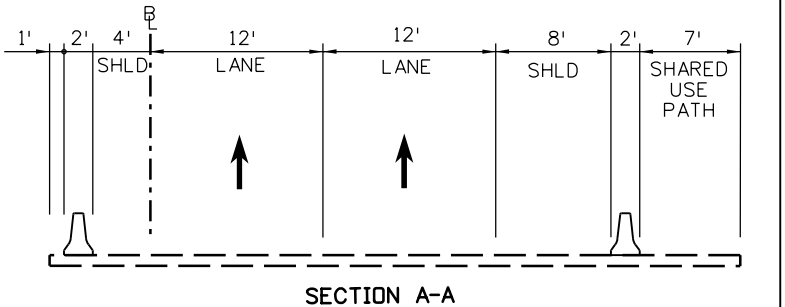
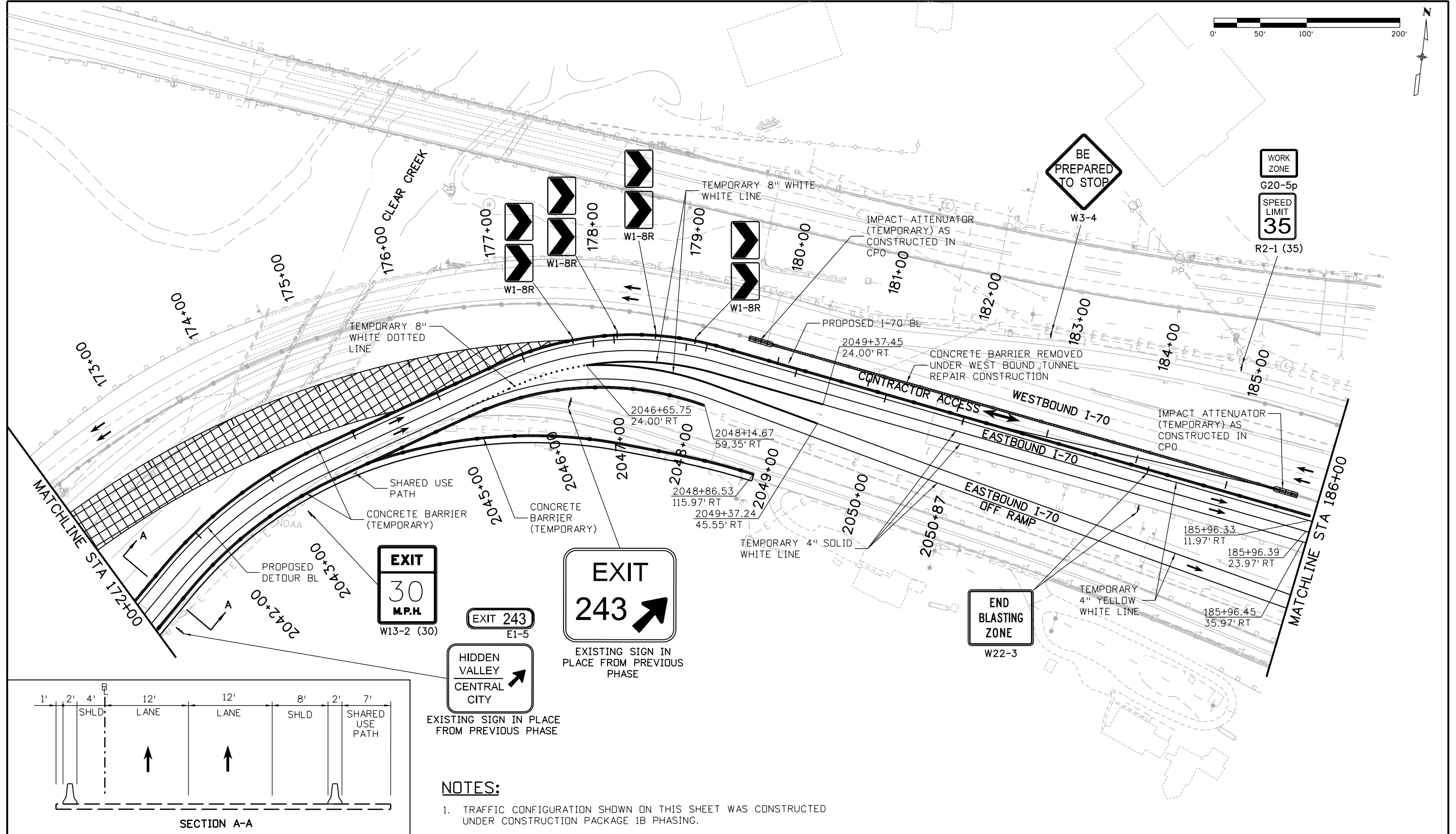
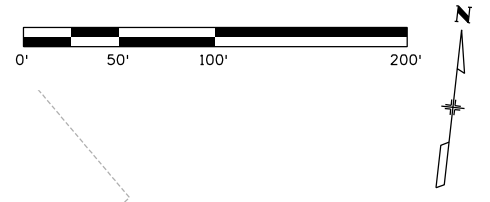
**EASTBOUND I-70
 CONSTRUCTION PHASING PLAN
 PHASE 1**

Designer: D.Sprague
 Detailer: J. Gellner
 Subset: Phasing

Structure Numbers
 Subset Sheets: 13 of 31

Project No./Code
 IM 0703-391
 19036
 Sheet Number 360

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NOTES:
 1. TRAFFIC CONFIGURATION SHOWN ON THIS SHEET WAS CONSTRUCTED UNDER CONSTRUCTION PACKAGE 1B PHASING.

Print Date: 3/7/2013
 File Name: 18832PHAS_CP2_PHI_Plan008.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

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 No Revisions:
 Revised:
 Void:

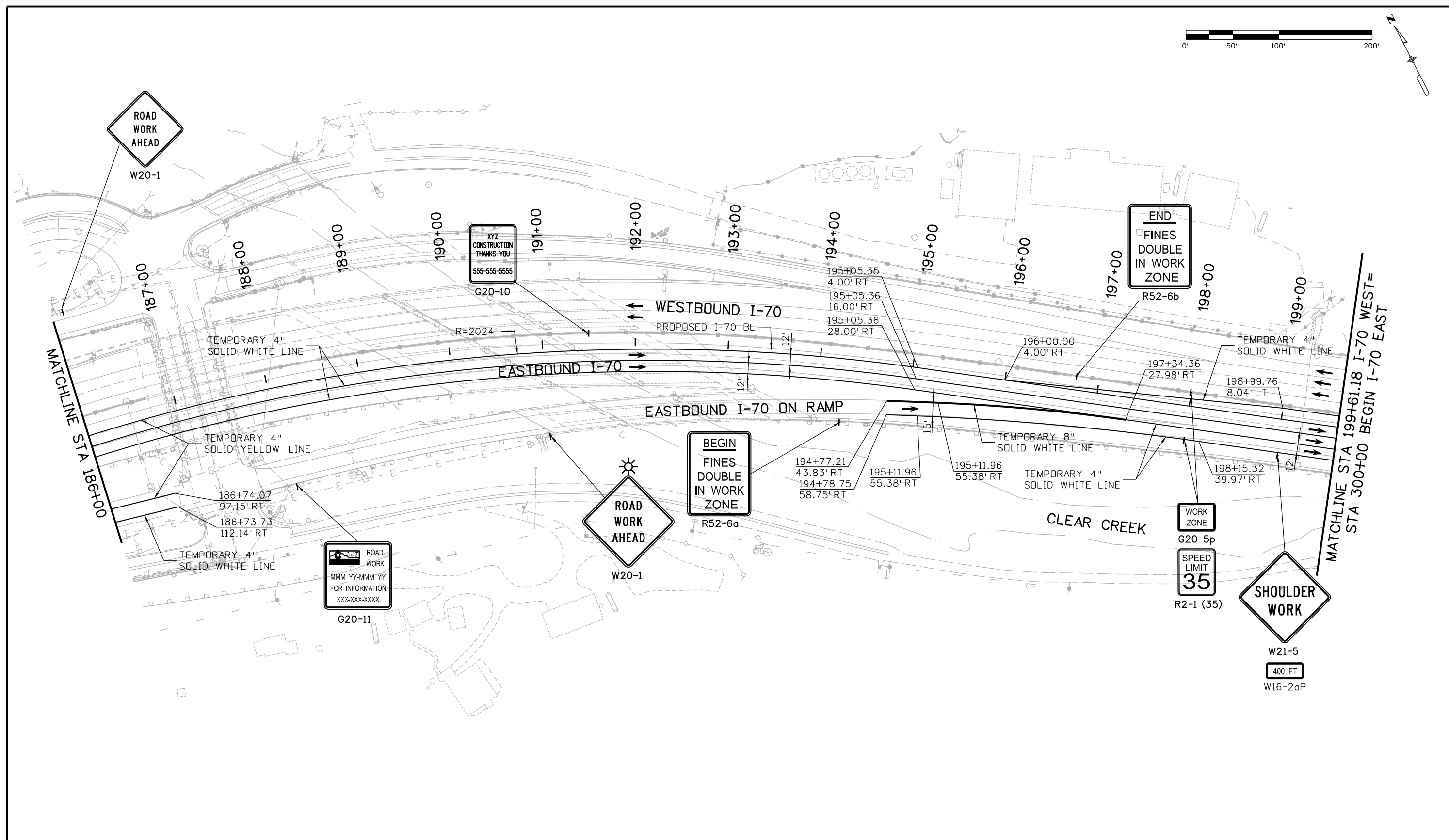
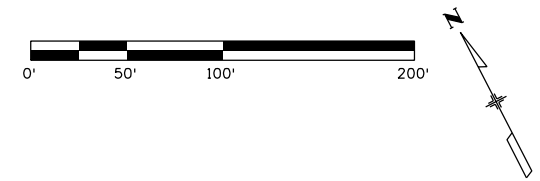
**EASTBOUND I-70
 CONSTRUCTION PHASING PLAN
 PHASE 1**

Designer: D.Sprague
 Detailer: J. Gellner
 Subset: Phasing

Structure Numbers
 Subset Sheets: 14 of 31

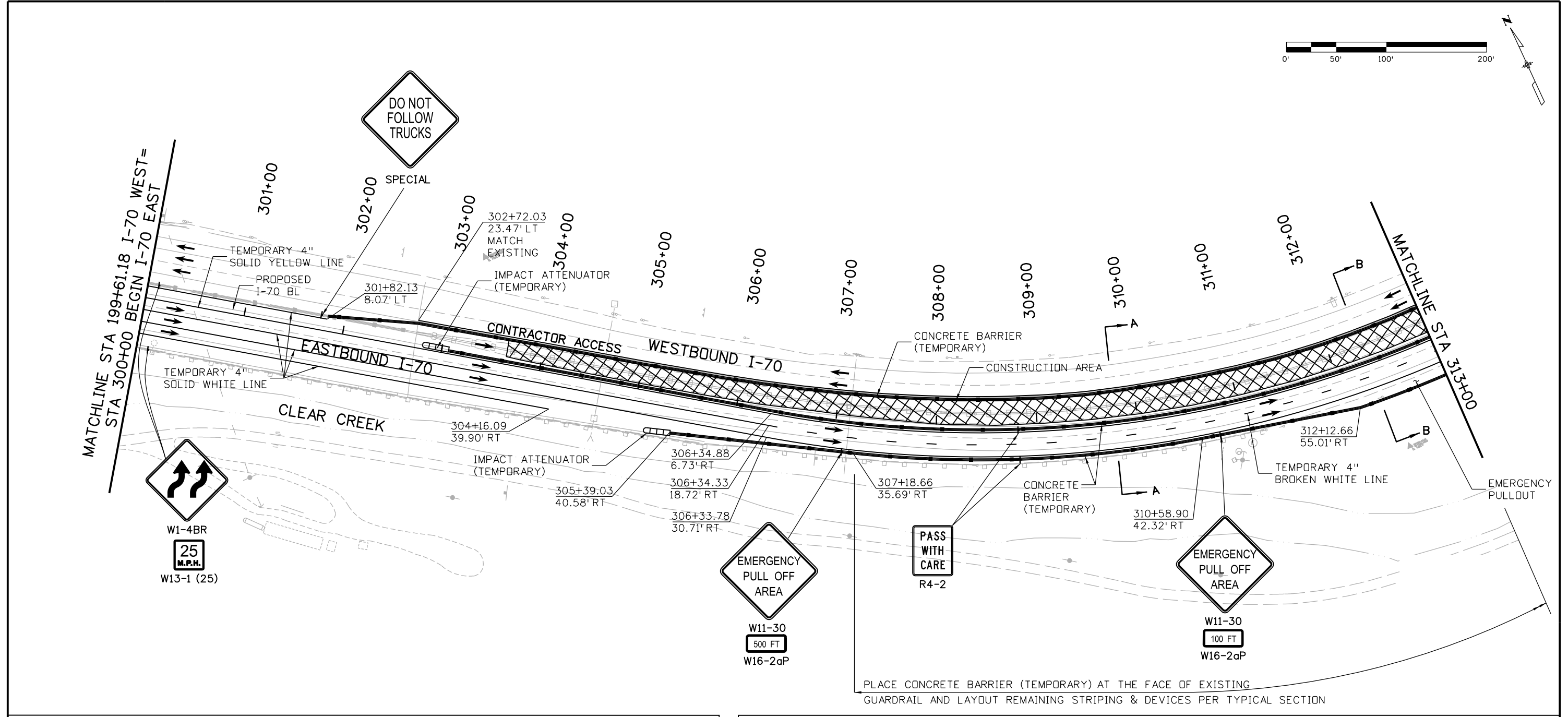
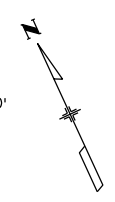
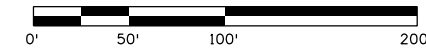
Project No./Code
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 Sheet Number 361

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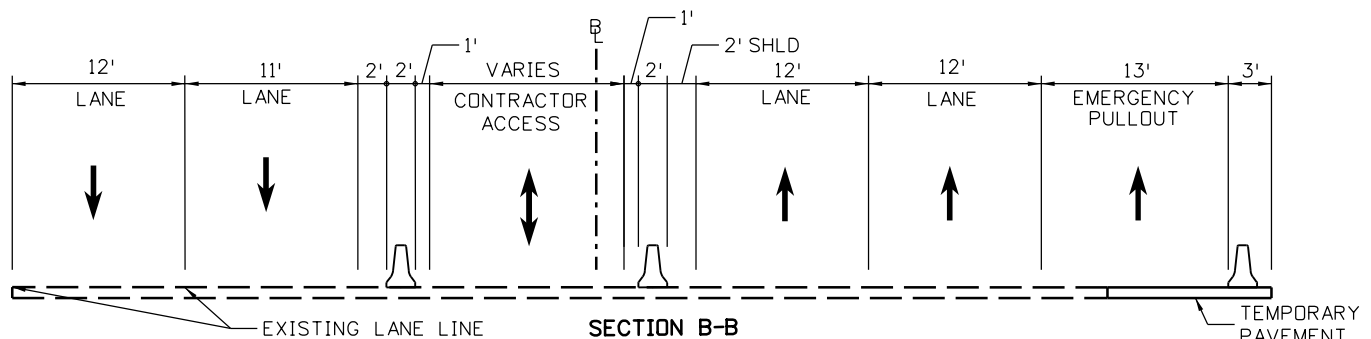
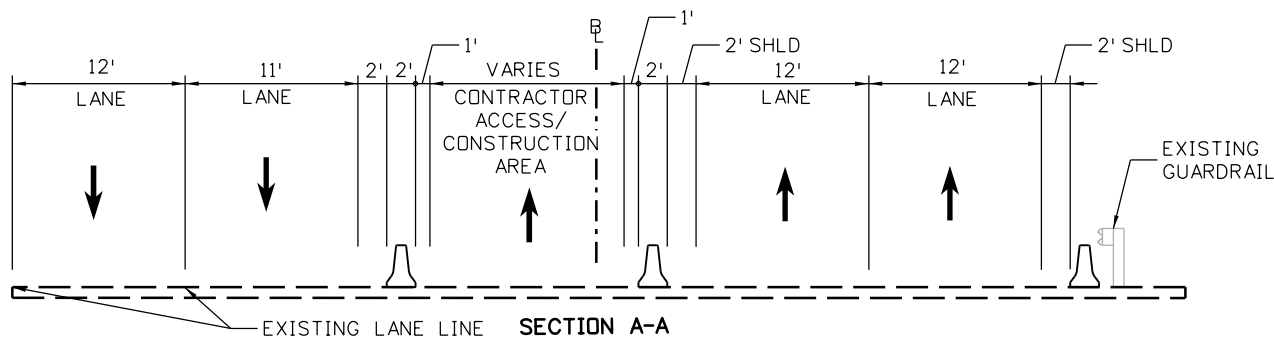


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Print Date: 3/7/2013		Sheet Revisions		Colorado Department of Transportation		As Constructed		EASTBOUND I-70 CONSTRUCTION PHASING PLAN PHASE 1		Project No./Code	
File Name: 18832PHAS_CP2_PHI_Plan009.dgn		Date:	Comments	Init.	425 A Corporate Circle Golden, CO 80401 Phone: 720-497-6918 FAX: 720-497-6901		No Revisions:		Designer: D.Sprague		IM 0703-391
Horiz. Scale: 1:100 Vert. Scale: 1"=20'					Region 1		Revised:		Detailer: J. Gellner		19036
ATKINS 4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276					CRC		Void:		Subset: Phasing		Sheet Number 362
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									Subset Sheets: 15 of 31		



PLACE CONCRETE BARRIER (TEMPORARY) AT THE FACE OF EXISTING GUARDRAIL AND LAYOUT REMAINING STRIPING & DEVICES PER TYPICAL SECTION



Print Date: 3/7/2013
 File Name: 18832PHAS_CP2_PHI_Plan010.dgn
 Horiz. Scale: 1:100 Vert. Scale: 1"=20'
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Date:	Comments	Init.

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 425 A Corporate Circle
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 Phone: 720-497-6918 FAX: 720-497-6901
Region 1 **CRC**

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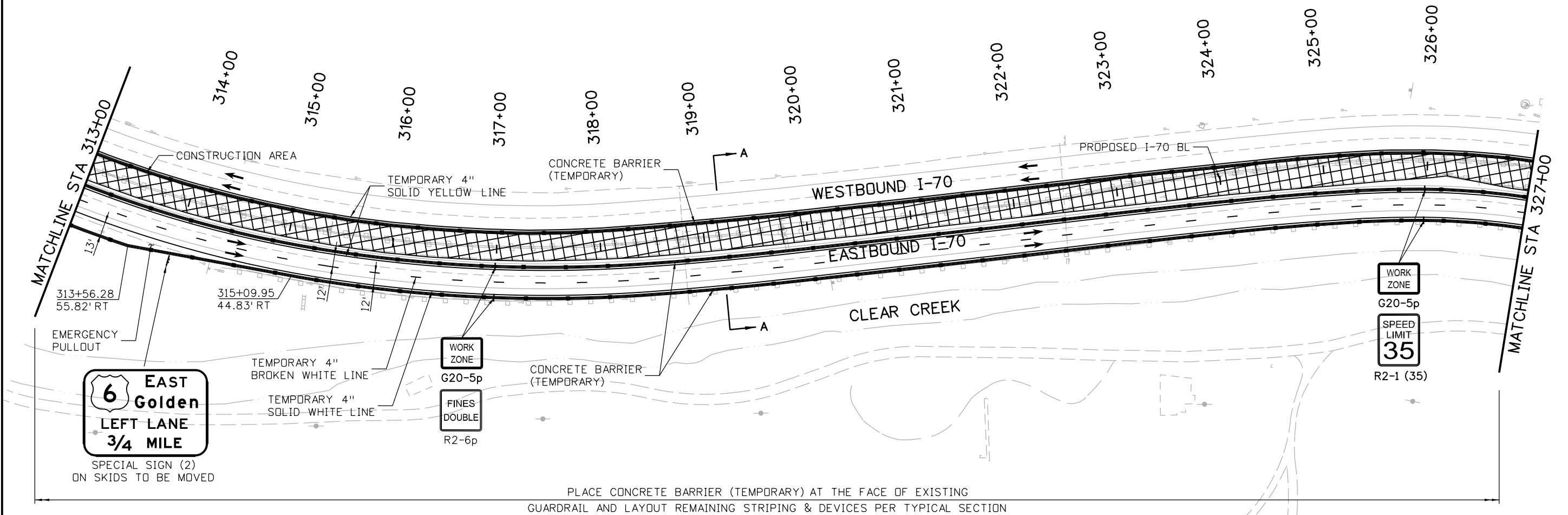
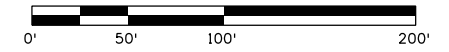
**EASTBOUND I-70
 CONSTRUCTION PHASING PLAN
 PHASE 1**
 Designer: D.Sprague
 Detailer: J. Gellner
 Subset: Phasing
 Structure Numbers
 Subset Sheets: 16 of 31

Project No./Code
 IM 0703-391
 19036
 Sheet Number **363**

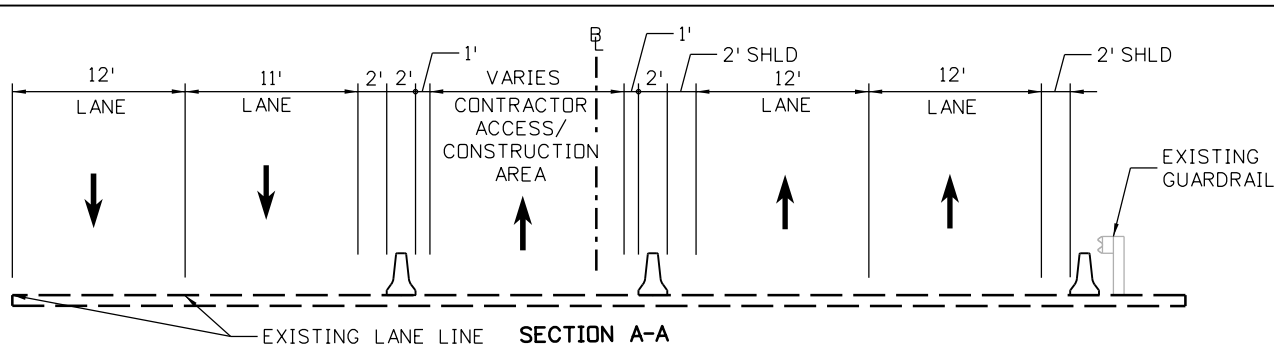
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NOTES:

1. SEE SUBSET SHEET 30 OF 31 FOR SPECIAL SIGN (2) DETAILS.



PLACE CONCRETE BARRIER (TEMPORARY) AT THE FACE OF EXISTING GUARDRAIL AND LAYOUT REMAINING STRIPING & DEVICES PER TYPICAL SECTION



Print Date: 3/7/2013
 File Name: 18832PHAS_CP2_PHI_Plan011.dgn
 Horiz. Scale: 1:100 Vert. Scale: 1"=20'

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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

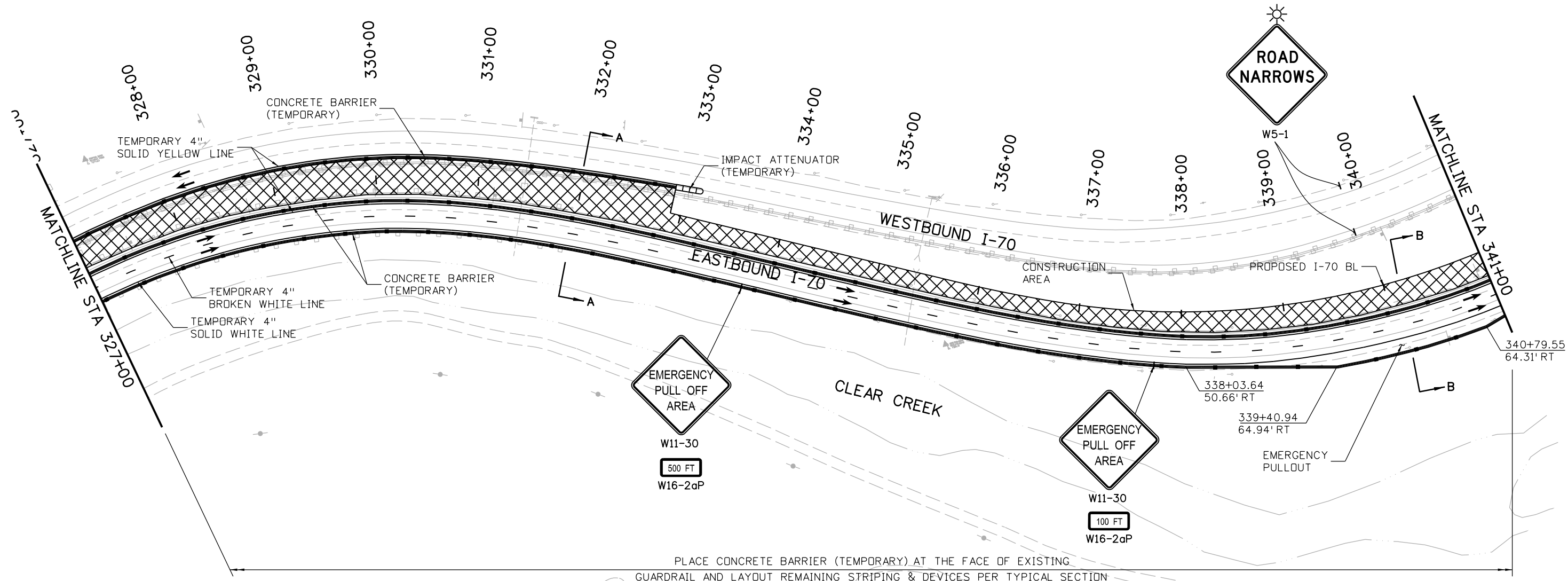
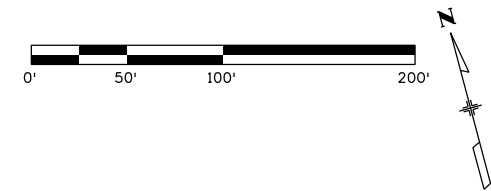
As Constructed
No Revisions:
Revised:
Void:

**EASTBOUND I-70
 CONSTRUCTION PHASING PLAN
 PHASE 1**

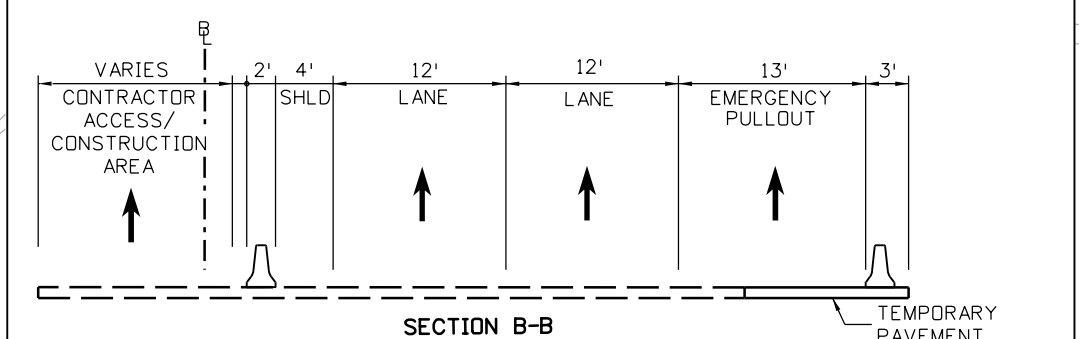
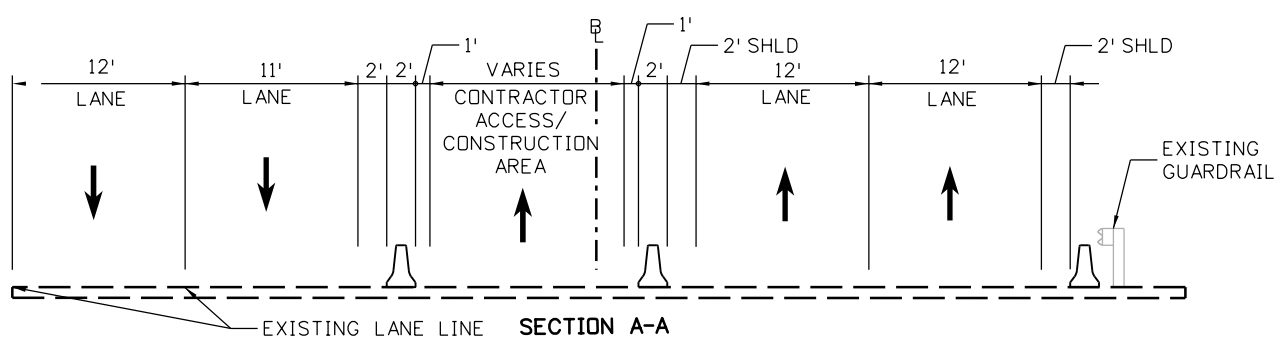
Designer: D.Sprague	Structure Numbers
Detailer: J. Gellner	
Subset: Phasing	Subset Sheets: 17 of 31

Project No./Code
IM 0703-391
19036
Sheet Number 364

17543 4:00:45 PM c:\pwwork\pwsjpw\common\dms26924\18832PHAS_CP2_PHI_Plan011.dgn



PLACE CONCRETE BARRIER (TEMPORARY) AT THE FACE OF EXISTING GUARDRAIL AND LAYOUT REMAINING STRIPING & DEVICES PER TYPICAL SECTION



Print Date: 3/7/2013
 File Name: 18832PHAS_CP2_PHI_Plan012.dgn
 Horiz. Scale: 1:100 Vert. Scale: 1"=20'
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:
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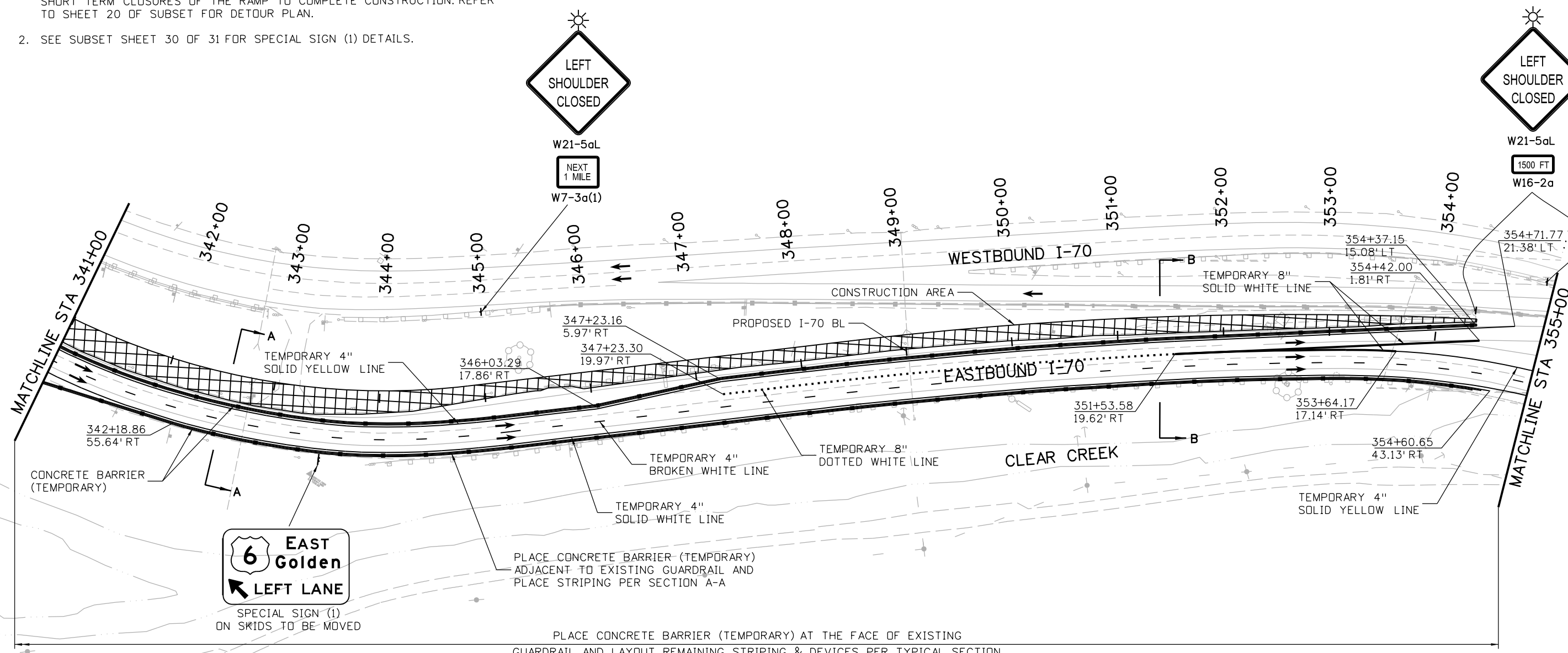
**EASTBOUND I-70
 CONSTRUCTION PHASING PLAN
 PHASE 1**
 Designer: D.Sprague
 Detailer: J. Gellner
 Subset: Phasing
 Structure Numbers
 Subset Sheets: 18 of 31

Project No./Code
 IM 0703-391
 19036
 Sheet Number 365

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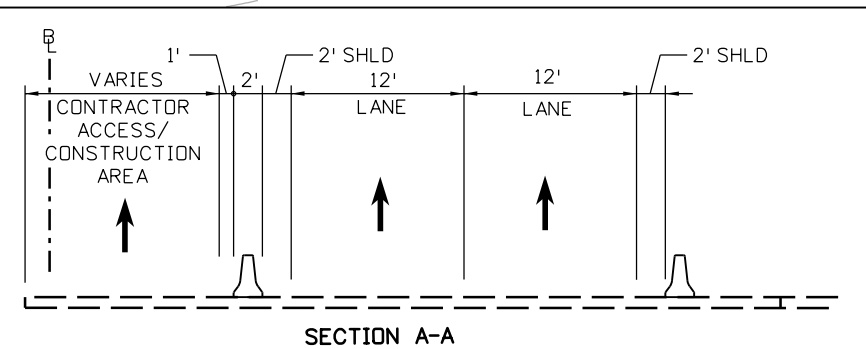
NOTES:

1. THE WORK ADJACENT TO THE EB OFF-RAMP TO USE US 6 WILL REQUIRE SHORT TERM CLOSURES OF THE RAMP TO COMPLETE CONSTRUCTION. REFER TO SHEET 20 OF SUBSET FOR DETOUR PLAN.
2. SEE SUBSET SHEET 30 OF 31 FOR SPECIAL SIGN (I) DETAILS.

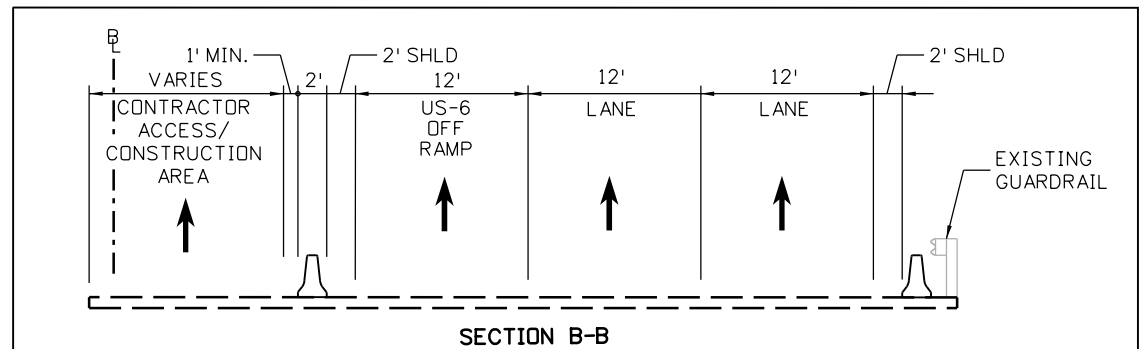


SPECIAL SIGN (I)
ON SKIDS TO BE MOVED

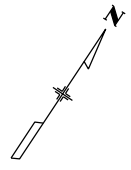
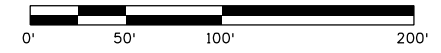
PLACE CONCRETE BARRIER (TEMPORARY) AT THE FACE OF EXISTING GUARDRAIL AND LAYOUT REMAINING STRIPING & DEVICES PER TYPICAL SECTION



SECTION A-A



SECTION B-B



Print Date: 3/7/2013
 File Name: 18832PHAS_CP2_PHI_Plan013.dgn
 Horiz. Scale: 1:100 Vert. Scale: 1"=20'
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

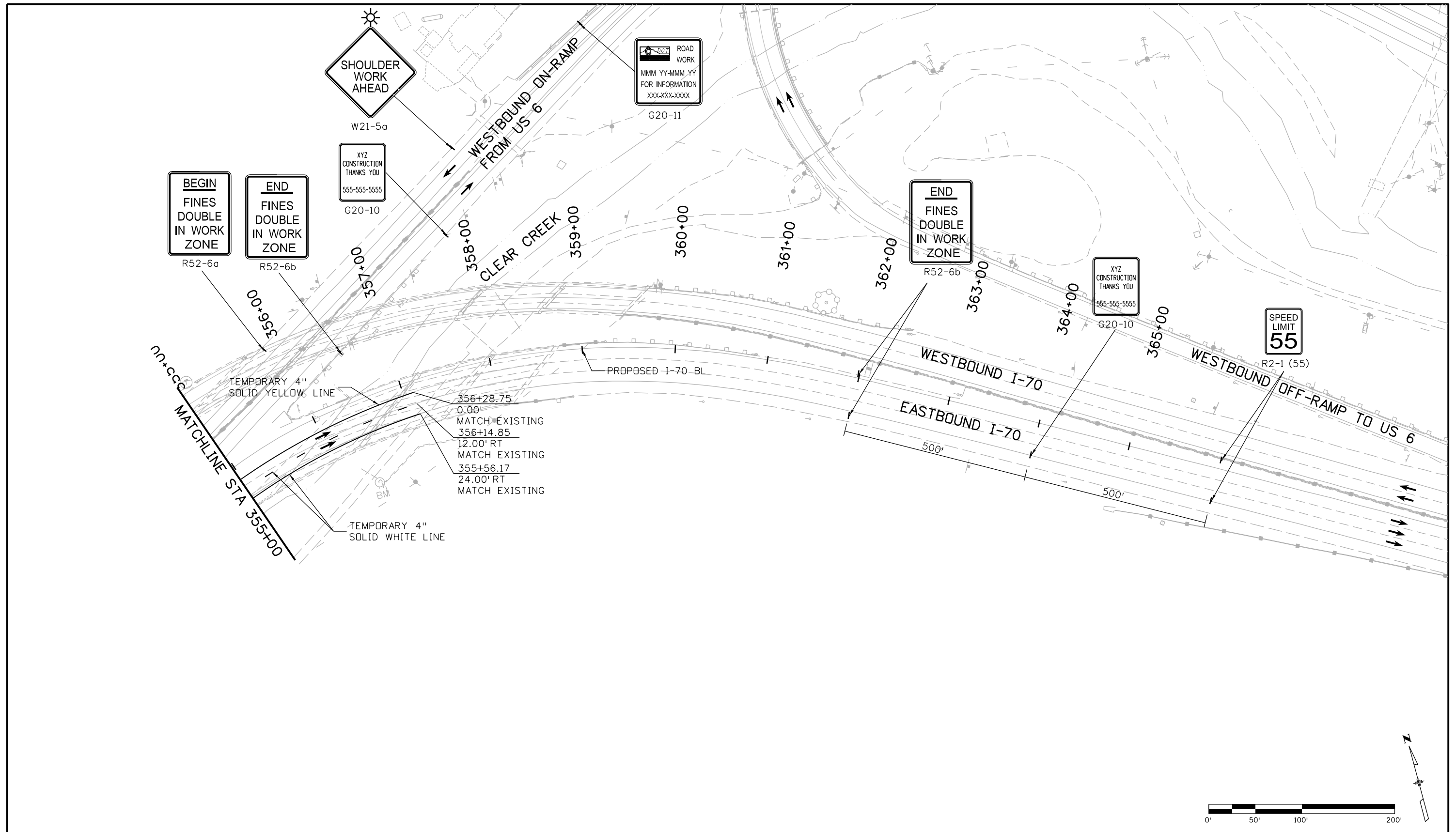
As Constructed
 No Revisions:
 Revised:
 Void:

**EASTBOUND I-70
 CONSTRUCTION PHASING PLAN
 PHASE 1**
 Designer: D.Sprague
 Detailer: J. Gellner
 Subset: Phasing
 Structure Numbers
 Subset Sheets: 19 of 31

Project No./Code
 IM 0703-391
 19036
 Sheet Number 366

17543 4:01:08 PM c:\pw_work\pws\pwi\common\dms26924\18832PHAS_CP2_PHI_Plan013.dgn

17543 4:01:20 PM c:\pw_work\pbes\pwl\common\dms26924\18832PHAS_CP2_PHI_Plan014.dgn



Print Date: 3/7/2013	
File Name: 18832PHAS_CP2_PHI_Plan014.dgn	
Horiz. Scale: 1:100	Vert. Scale: 1"=20'
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

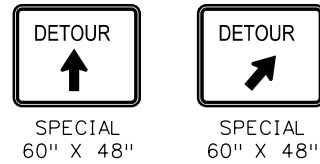
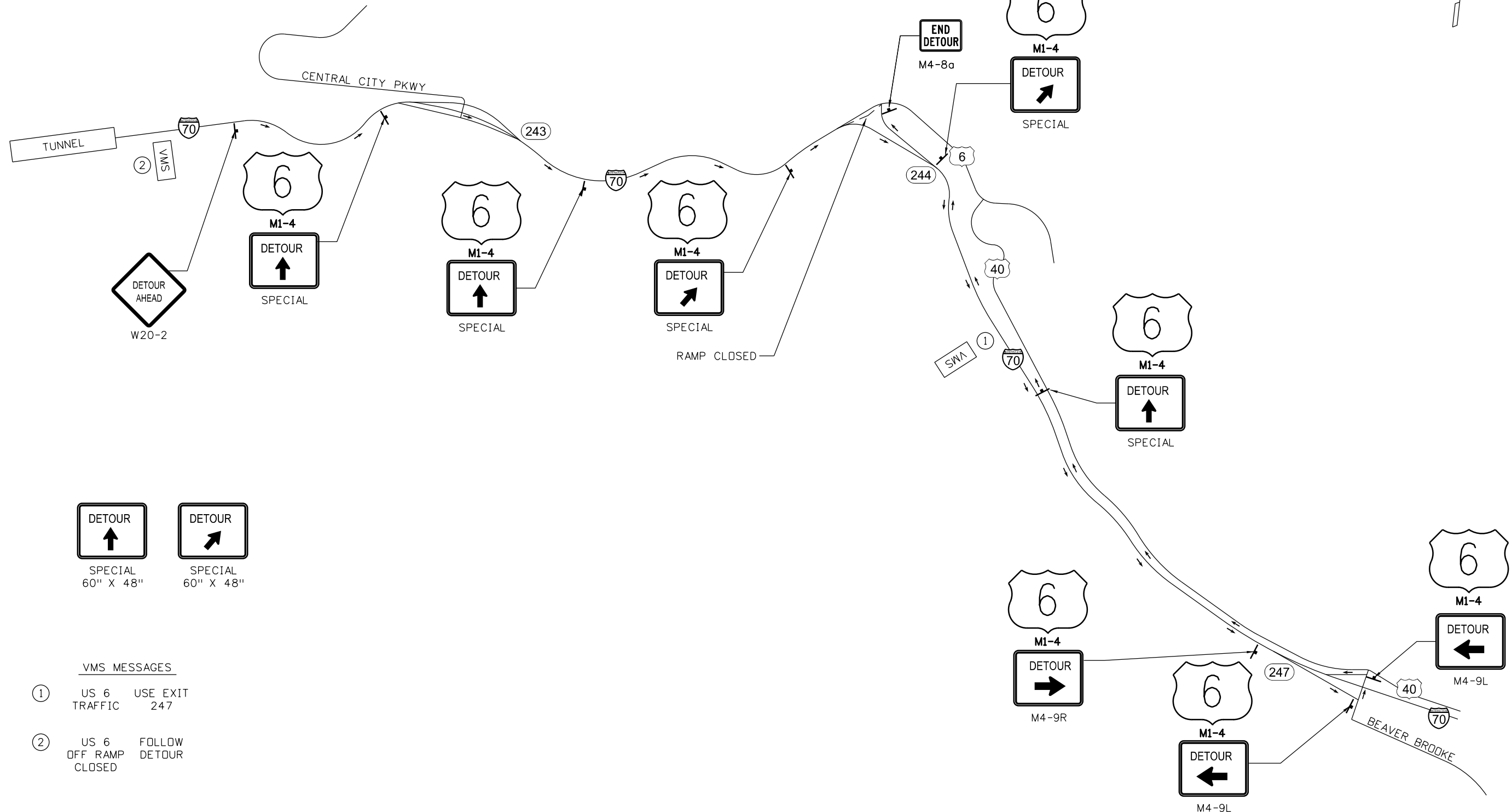
As Constructed	
No Revisions:	
Revised:	
Void:	

EASTBOUND I-70 CONSTRUCTION PHASING PLAN PHASE 1		
Designer:	D.Sprague	Structure Numbers
Detailer:	J. Gellner	
Subset:	Phasing	Subset Sheets: 20 of 31

Project No./Code	
IM 0703-391	
19036	
Sheet Number	367

LEGEND

- — CLDSURE
- VMS PORTABLE VARIABLE MESSAGE SIGN
- XXX EXIT NUMBER




VMS MESSAGES

- ① US 6 USE EXIT TRAFFIC 247
- ② US 6 FOLLOW OFF RAMP DETOUR CLOSED

Print Date: 3/7/2013
 File Name: 18832PHAS_CP2_PHI_Plan015.dgn
 Horiz. Scale: 1:100 Vert. Scale:
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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Region 1 **CRC**

As Constructed
No Revisions:
Revised:
Void:

**EASTBOUND I-70
 CONSTRUCTION PHASING PLAN
 PHASE 1**

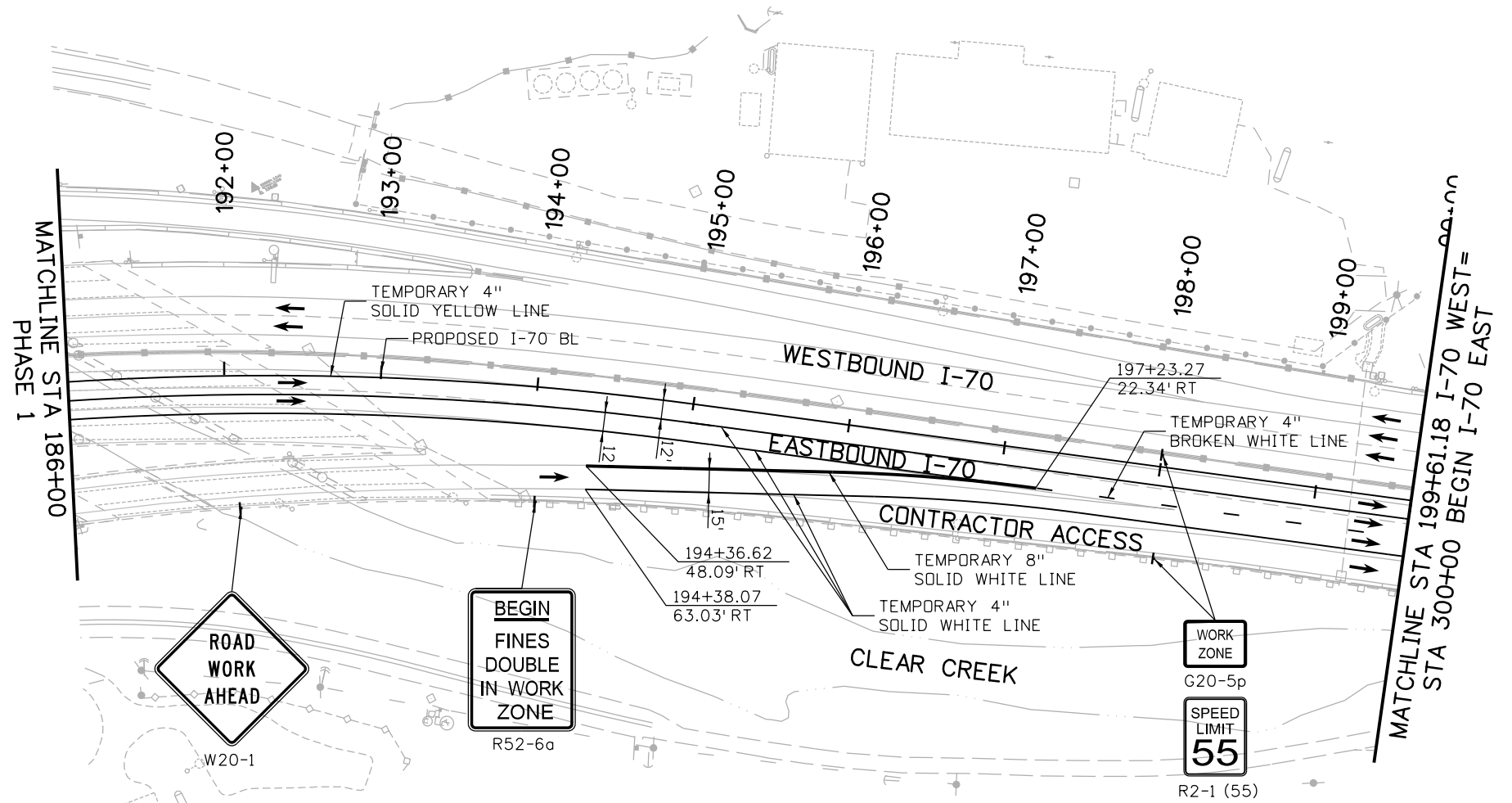
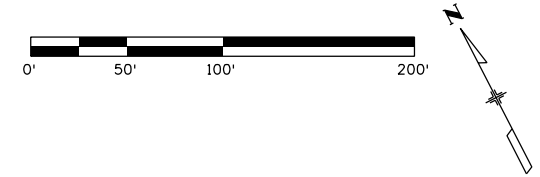
Designer: D.Sprague	Structure Numbers
Detailer: J. Gellner	
Subset: Phasing	Subset Sheets: 21 of 31

Project No./Code
 IM 0703-391
 19036
Sheet Number 368

17543 4:01:31 PM c:\pw_work\pbsjpw1\common\dms26924\18832PHAS_CP2_PHI_Plan015.dgn

NOTES:


1. TRAFFIC CONFIGURATION TO THE WEST MATCHES PHASE 1 CONFIGURATION



Print Date: 3/7/2013	0000
File Name: 18832PHAS_CP2_PH2_Plan001.dgn	
Horiz. Scale: 1:100 Vert. Scale: 1"=20'	
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Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation



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

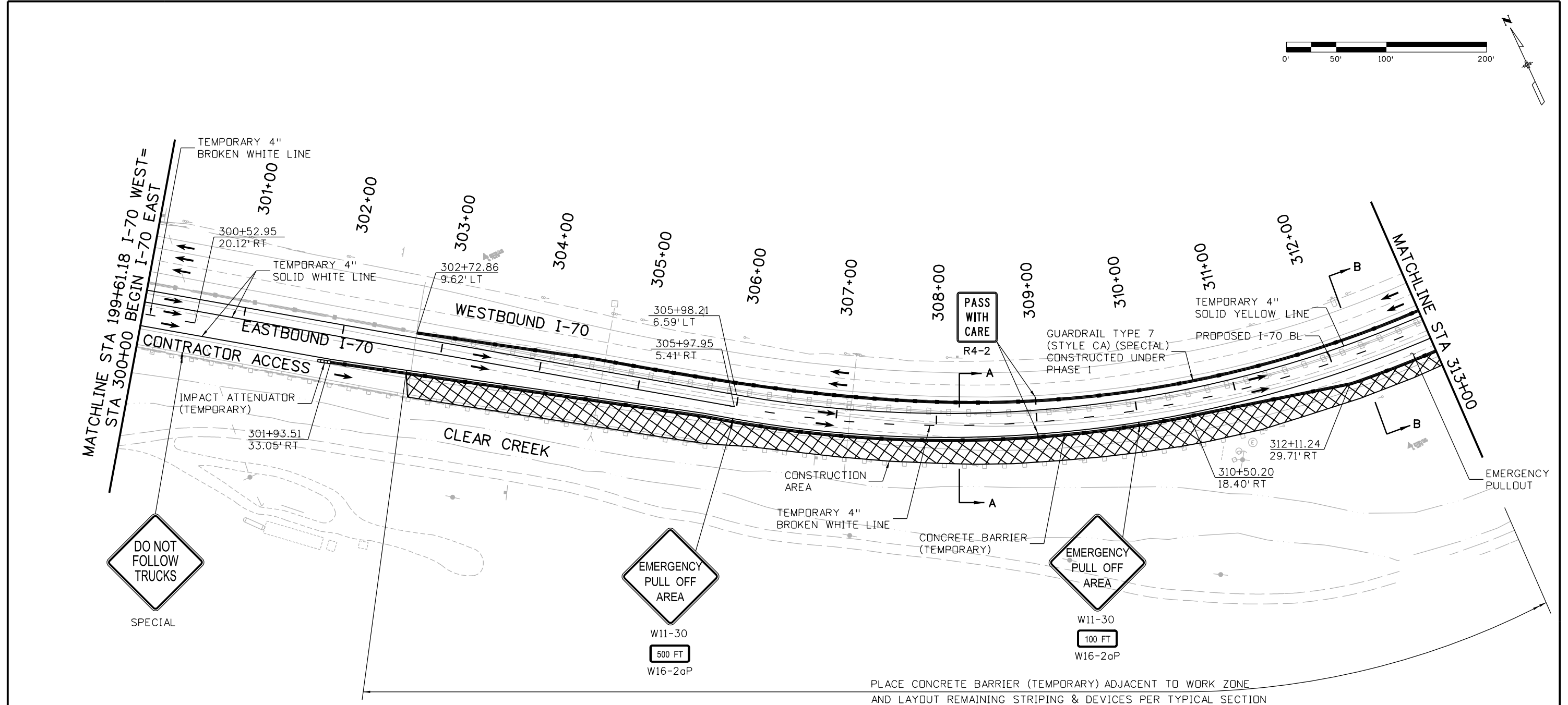
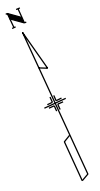
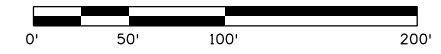
Region 1 CRC

As Constructed
No Revisions:
Revised:
Void:

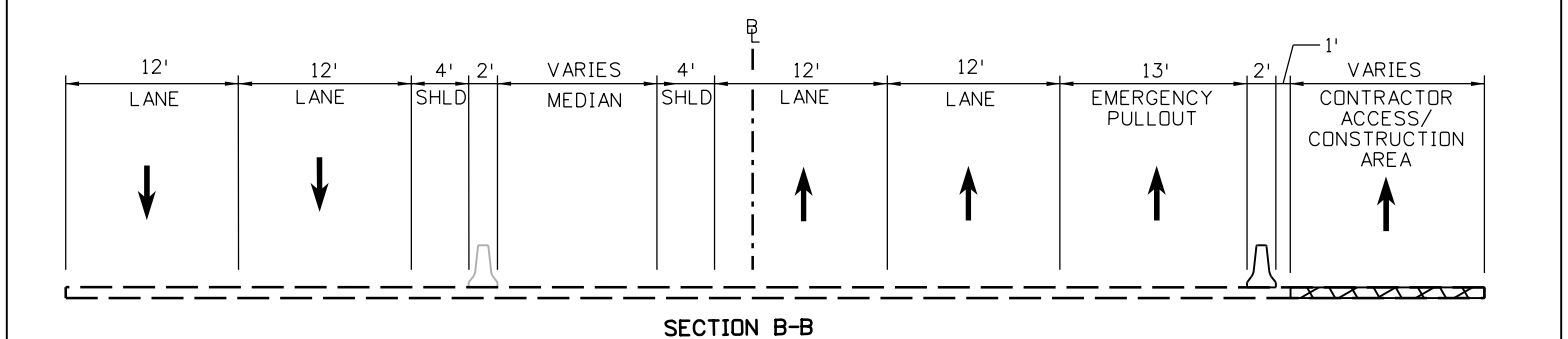
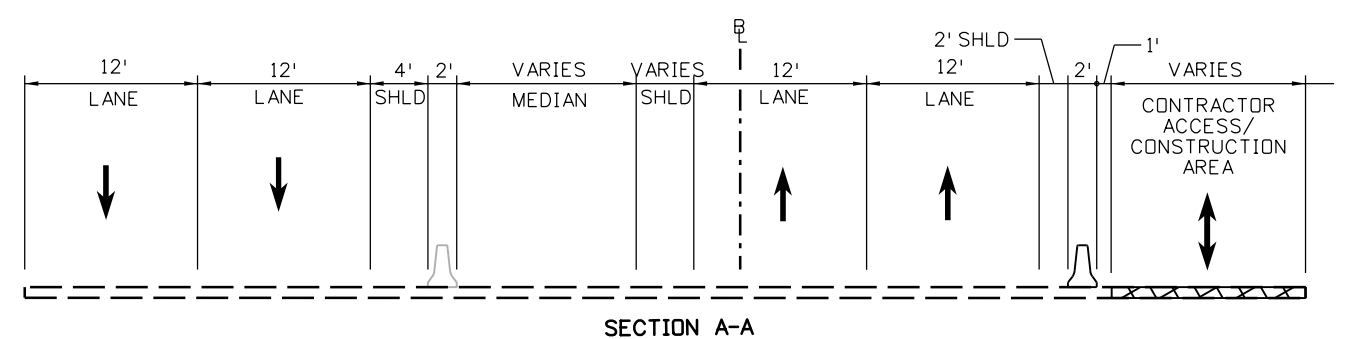
EASTBOUND I-70 CONSTRUCTION PHASING PLAN PHASE 2			
Designer:	D.Sprague	Structure Numbers	
Detailer:	J. Gellner		
Subset:	Phasing	Subset Sheets: 22 of 31	

Project No./Code
IM 0703-391
19036
Sheet Number 369

17543 4:01:44 PM c:\pw_work\pbes\pwl\common\dms26924\18832PHAS_CP2_PH2_Plan001.dgn



PLACE CONCRETE BARRIER (TEMPORARY) ADJACENT TO WORK ZONE AND LAYOUT REMAINING STRIPING & DEVICES PER TYPICAL SECTION



Print Date: 3/7/2013
 File Name: 18832PHAS_CP2_PH2_Plan002.dgn
 Horiz. Scale: 1:100 Vert. Scale: 1"=20'
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:

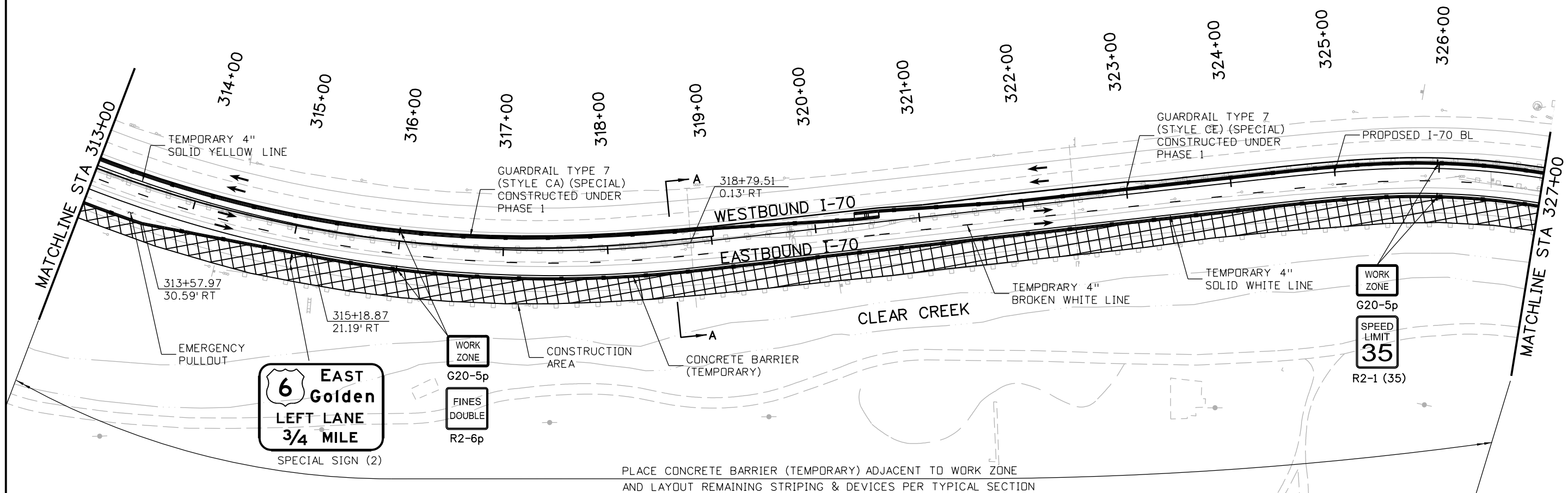
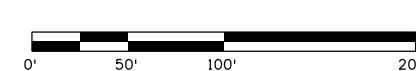
**EASTBOUND I-70
 CONSTRUCTION PHASING PLAN
 PHASE 2**
 Designer: D.Sprague
 Detailer: J. Gellner
 Subset: Phasing
 Structure Numbers
 Subset Sheets: 23 of 31

Project No./Code
 IM 0703-391
 19036
 Sheet Number 370

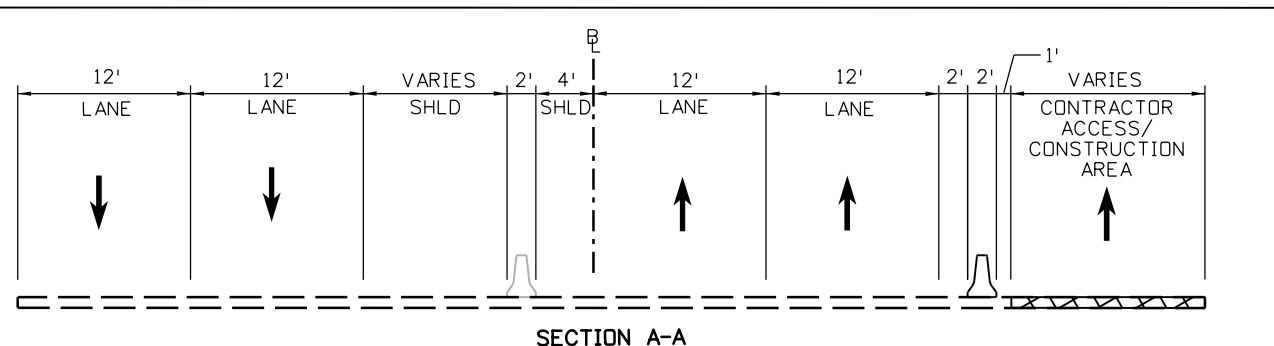
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NOTES:

1. SEE SUBSET SHEET 30 OF 31 FOR SPECIAL SIGN (2) DETAILS.



PLACE CONCRETE BARRIER (TEMPORARY) ADJACENT TO WORK ZONE AND LAYOUT REMAINING STRIPING & DEVICES PER TYPICAL SECTION



Print Date: 3/7/2013
 File Name: 18832PHAS_CP2_PH2_Plan003.dgn
 Horiz. Scale: 1:100 Vert. Scale: 1"=20'

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Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation

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Region 1 CRC

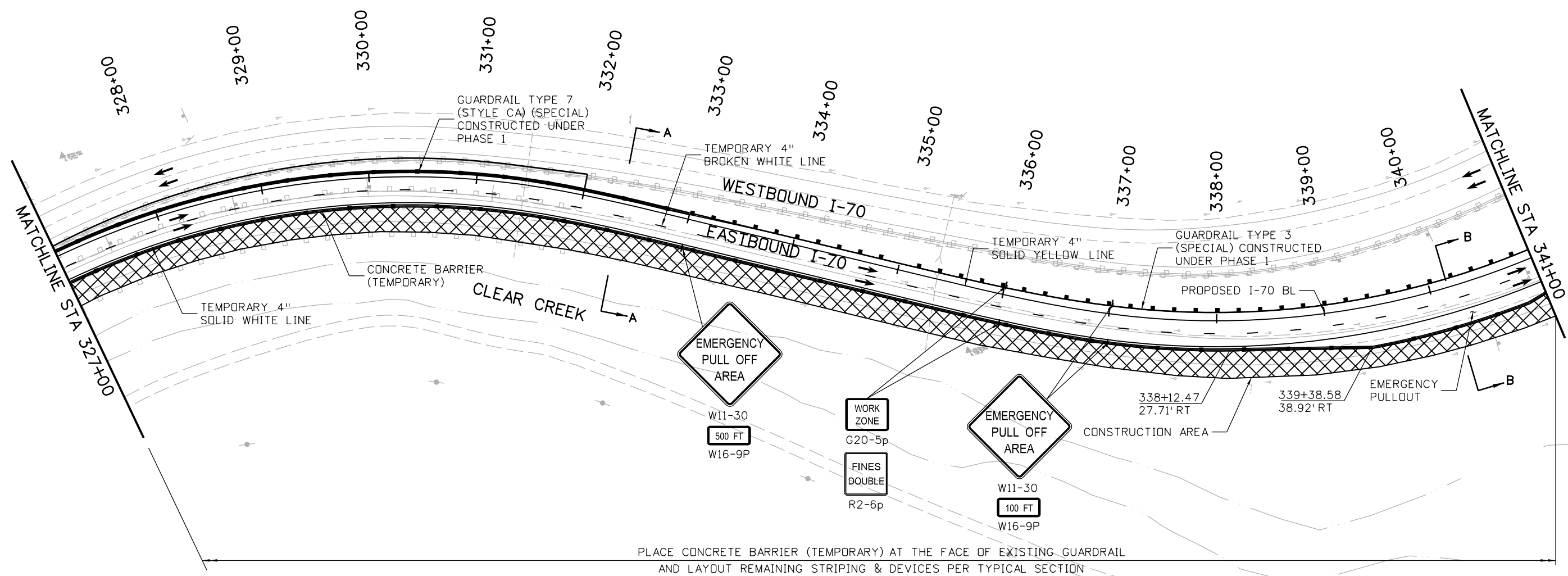
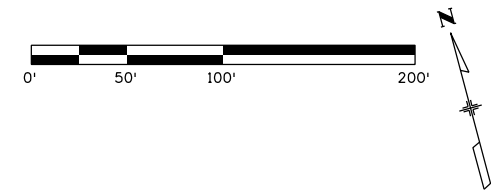
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No Revisions:
Revised:
Void:

**EASTBOUND I-70
 CONSTRUCTION PHASING PLAN
 PHASE 2**

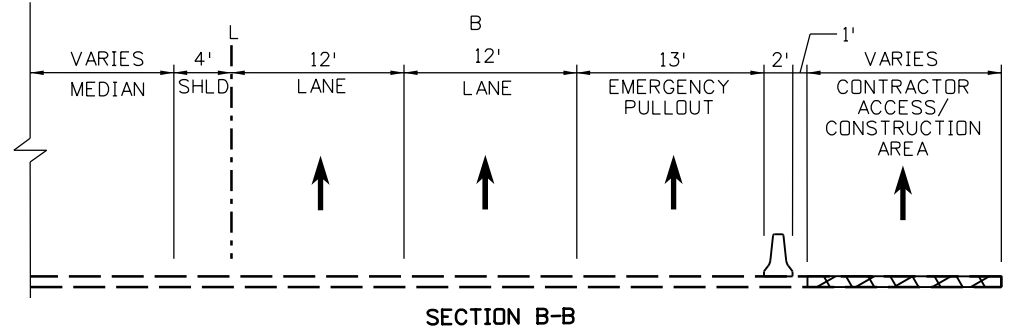
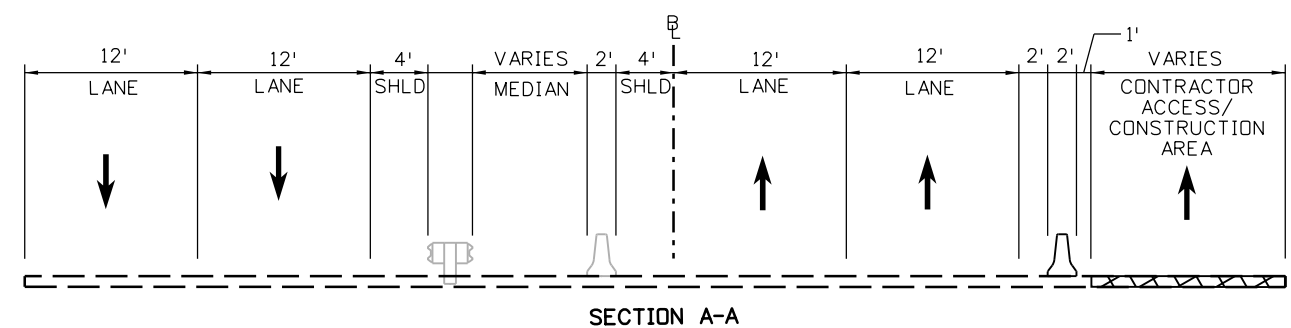
Designer: D.Sprague	Structure Numbers
Detailer: J. Gellner	
Subset: Phasing	Subset Sheets: 24 of 31

Project No./Code
IM 0703-391
19036
Sheet Number 371

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PLACE CONCRETE BARRIER (TEMPORARY) AT THE FACE OF EXISTING GUARDRAIL AND LAYOUT REMAINING STRIPING & DEVICES PER TYPICAL SECTION



Print Date: 3/7/2013
 File Name: 18832PHAS_CP2_PH2_Plan004.dgn
 Horiz. Scale: 1:100 Vert. Scale: 1"=20'
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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 I-70
 CONSTRUCTION PHASING PLAN
 PHASE 2**
 Designer: D.Sprague
 Detailer: J. Gellner
 Subset: Phasing
 Structure Numbers
 Subset Sheets: 25 of 31

Project No./Code
 IM 0703-391
 19036
 Sheet Number **372**

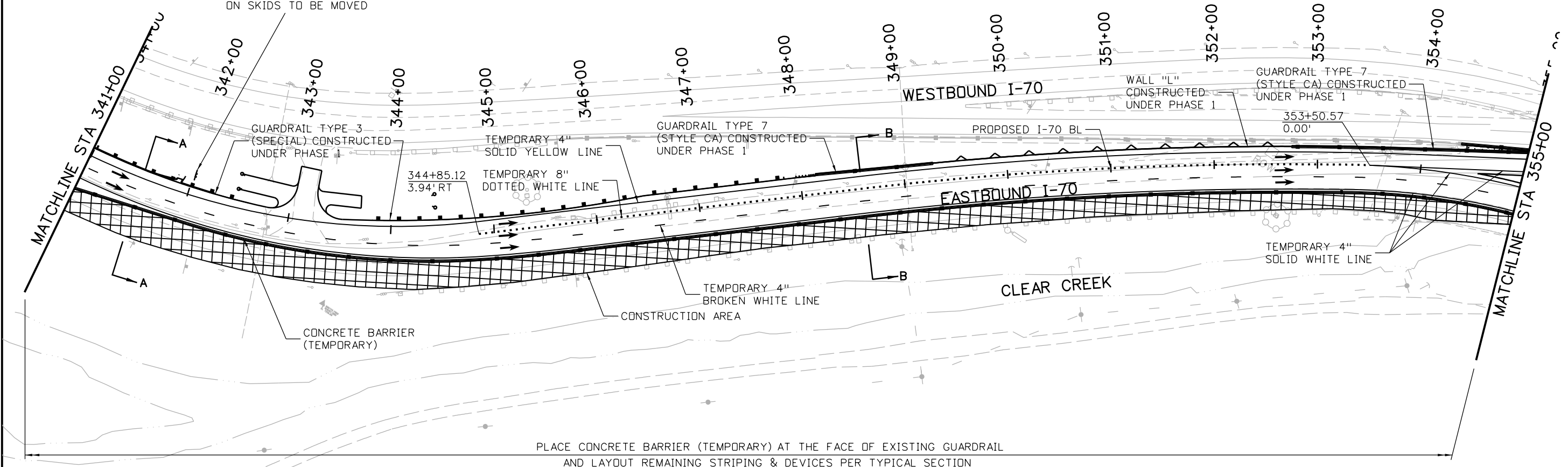
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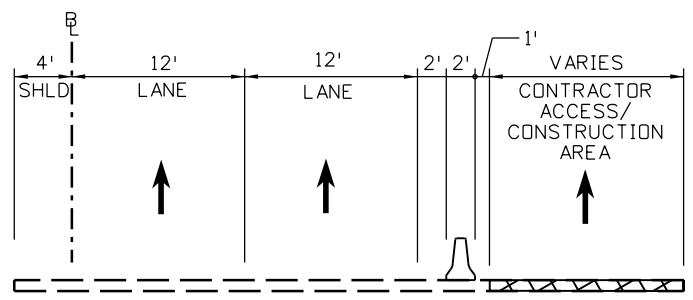
- SEE SUBSET SHEET 30 OF 31 FOR SPECIAL SIGN (1) DETAILS.



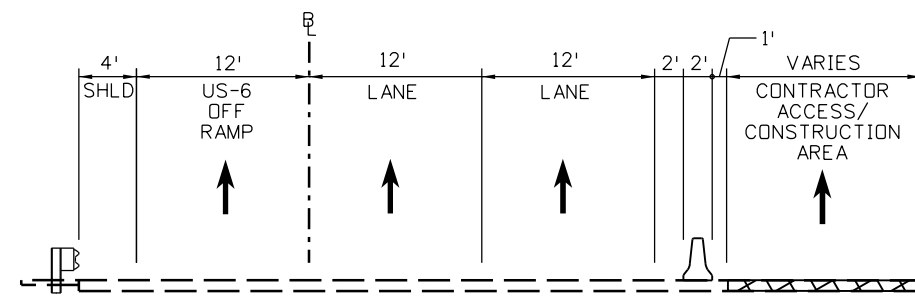
SPECIAL SIGN (1)
ON SKIDS TO BE MOVED



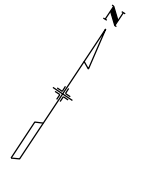
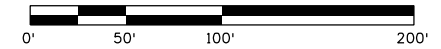
PLACE CONCRETE BARRIER (TEMPORARY) AT THE FACE OF EXISTING GUARDRAIL
AND LAYOUT REMAINING STRIPING & DEVICES PER TYPICAL SECTION



SECTION A-A




SECTION B-B



Print Date: 3/7/2013
File Name: 18832PHAS_CP2_PH2_Plan005.dgn
Horiz. Scale: 1:100 Vert. Scale: 1"=20'
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

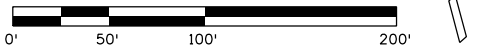
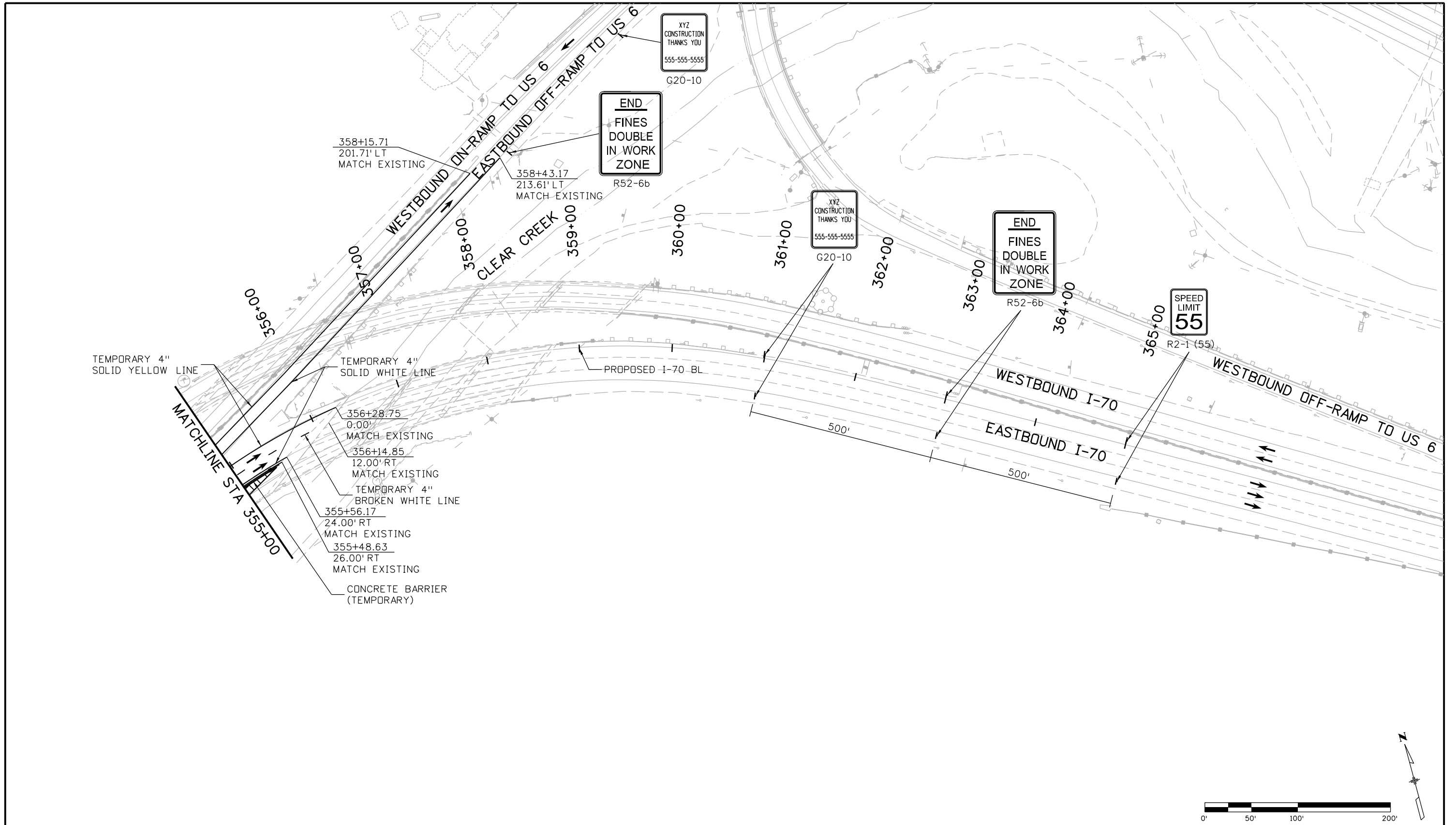
Region 1 CRC

As Constructed
No Revisions:
Revised:
Void:

EASTBOUND I-70 CONSTRUCTION PHASING PLAN PHASE 2		
Designer: D.Sprague	Structure Numbers	
Detailer: J. Gellner		
Subset: Phasing	Subset Sheets: 26 of 31	

Project No./Code
IM 0703-391
19036
Sheet Number 373

17543 4:02:34 PM c:\pwwork\pwsj\work\18832PHAS_CP2_PH2_Plan005.dgn



Print Date: 3/7/2013
 File Name: 18832PHAS_CP2_PH2_Plan006.dgn
 Horiz. Scale: 1:100 Vert. Scale: 1"=20'
ATKINS 4601 DTC Boulevard, Suite 700
 Denver, CO 80237
 Phone: (303) 221-7275 Fax: (303) 221-7276

Sheet Revisions		
Date:	Comments	Init.

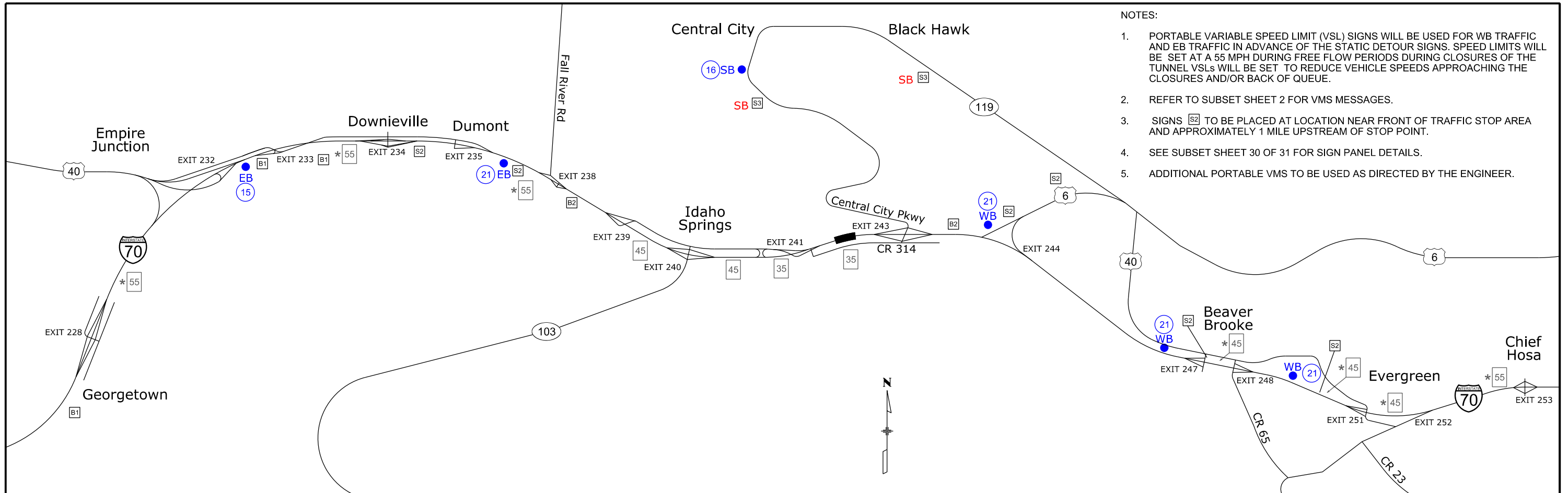
Colorado Department of Transportation
 425 A Corporate Circle
 Golden, CO 80401
 Phone: 720-497-6918 FAX: 720-497-6901
 Region 1 CRC

As Constructed
 No Revisions:
 Revised:
 Void:

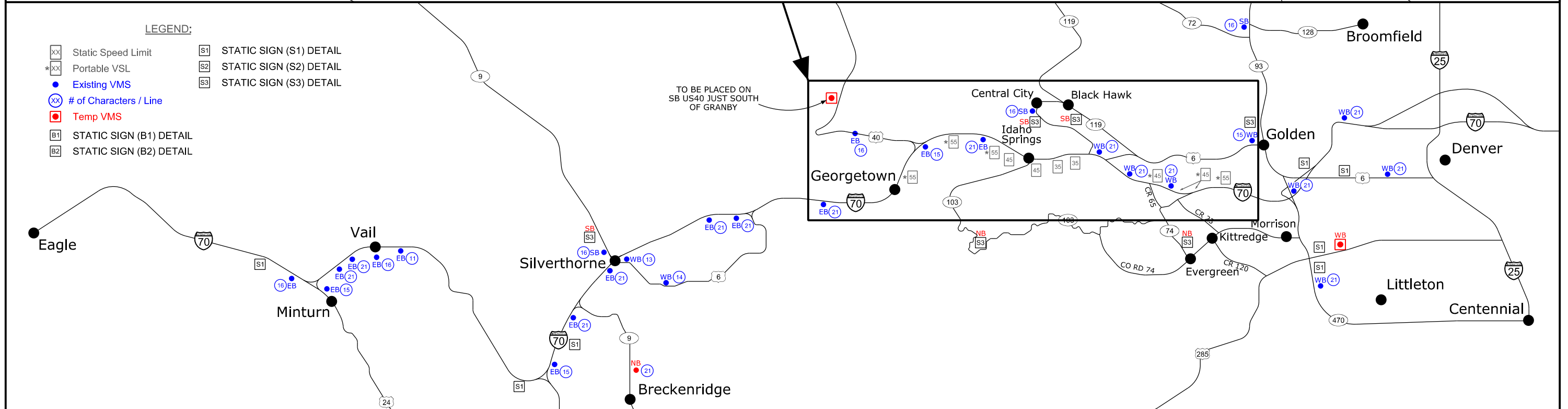
EASTBOUND I-70 CONSTRUCTION PHASING PLAN PHASE 2		
Designer:	D.Sprague	Structure Numbers
Detailer:	J. Gellner	
Subset:	Phasing	Subset Sheets: 27 of 31

Project No./Code
 IM 0703-391
 19036
 Sheet Number 374

17543 4:02:48 PM c:\pw_work\pbs\pw\common\dms26924\18832PHAS_CP2_PH2_Plan006.dgn



- NOTES:
1. PORTABLE VARIABLE SPEED LIMIT (VSL) SIGNS WILL BE USED FOR WB TRAFFIC AND EB TRAFFIC IN ADVANCE OF THE STATIC DETOUR SIGNS. SPEED LIMITS WILL BE SET AT A 55 MPH DURING FREE FLOW PERIODS DURING CLOSURES OF THE TUNNEL VSLs WILL BE SET TO REDUCE VEHICLE SPEEDS APPROACHING THE CLOSURES AND/OR BACK OF QUEUE.
 2. REFER TO SUBSET SHEET 2 FOR VMS MESSAGES.
 3. SIGNS S2 TO BE PLACED AT LOCATION NEAR FRONT OF TRAFFIC STOP AREA AND APPROXIMATELY 1 MILE UPSTREAM OF STOP POINT.
 4. SEE SUBSET SHEET 30 OF 31 FOR SIGN PANEL DETAILS.
 5. ADDITIONAL PORTABLE VMS TO BE USED AS DIRECTED BY THE ENGINEER.



- LEGEND:
- xx Static Speed Limit
 - *xx Portable VSL
 - Existing VMS
 - ⓧ # of Characters / Line
 - Temp VMS
 - B1 STATIC SIGN (B1) DETAIL
 - B2 STATIC SIGN (B2) DETAIL
 - S1 STATIC SIGN (S1) DETAIL
 - S2 STATIC SIGN (S2) DETAIL
 - S3 STATIC SIGN (S3) DETAIL

Print Date: 3/7/2013
 File Name: 18832TRAF_CP2_Adv Message Exhibit.dgn
 Horiz. Scale: 1:27525 Vert. Scale:
ATKINS 4601 DTC Boulevard, Suite 700
 Denver, CO 80237
 Phone: (303) 221-7275 Fax: (303) 221-7276

Sheet Revisions		
Date:	Comments	Init.

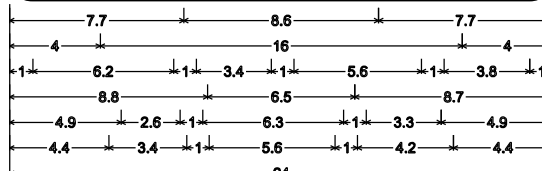
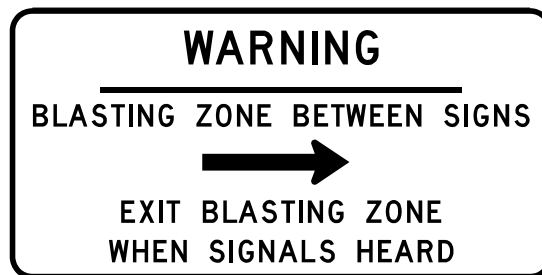
Colorado Department of Transportation

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

As Constructed
 No Revisions:
 Revised:
 Void:

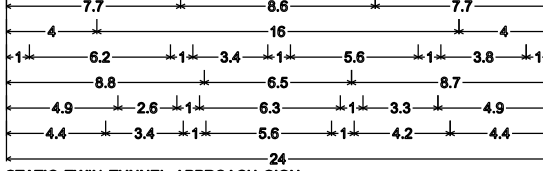
**TWIN TUNNELS DETOUR
 ADVANCED MESSAGING EXHIBIT**
 Designer: D.Sprague
 Detailer: J. Gellner
 Subset: Phasing
 Structure Numbers
 Subset Sheets: 28 of 31

Project No./Code
 IM 0703-391
 19036
 Sheet Number 375



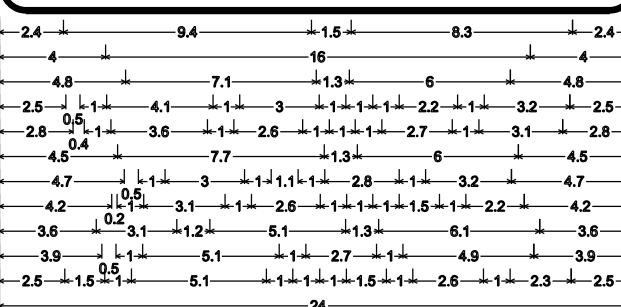
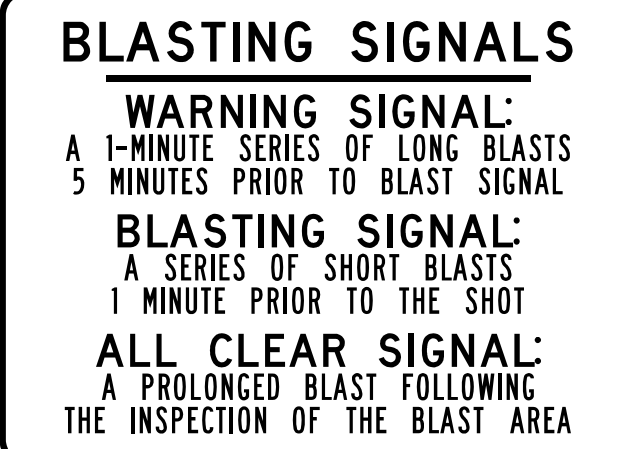
STATIC TWIN TUNNEL APPROACH SIGN;
1.0" Radius, 0.3" Border, Black on Orange;
"WARNING" D; "BLASTING ZONE BETWEEN SIGNS" D;
"EXIT BLASTING ZONE" D; "WHEN SIGNALS HEARD" D;

BLASTING SIGN (1A) DETAIL



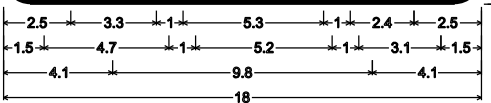
STATIC TWIN TUNNEL APPROACH SIGN;
1.0" Radius, 0.3" Border, Black on Orange;
"WARNING" D; "BLASTING ZONE BETWEEN SIGNS" D;
"EXIT BLASTING ZONE" D; "WHEN SIGNALS HEARD" D;

BLASTING SIGN (1B) DETAIL



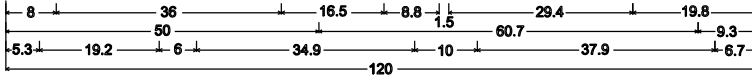
STATIC TWIN TUNNEL APPROACH SIGN; 1.0" Radius, 0.3" Border, Black on Orange;
"BLASTING SIGNALS" D; "WARNING SIGNAL" D;
"A 1-MINUTE SERIES OF LONG BLASTS" B; "5 MINUTES PRIOR TO BLAST SIGNAL" B;
"BLASTING SIGNAL" D; "A SERIES OF SHORT BLASTS" B;
"1 MINUTE PRIOR TO THE SHOT" B; "ALL CLEAR SIGNAL" D;
"A PROLONGED BLAST FOLLOWING" B; "THE INSPECTION OF THE BLAST AREA" B;

BLASTING SIGN (1C) DETAIL

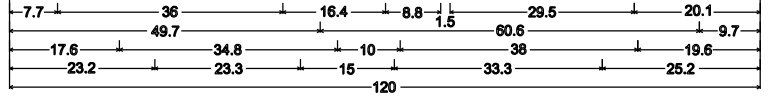


STATIC TWIN TUNNEL APPROACH SIGN;
1.0" Radius, 0.3" Border, Black on Orange;
"CALL HOTLINE FOR" D; "APPROX. BLASTING TIMES" C;
"303-327-4034" D;

BLASTING SIGN (1D) DETAIL



SPECIAL SIGN (1) DETAIL



SPECIAL SIGN (2) DETAIL



BLASTING SIGN (2) DETAIL

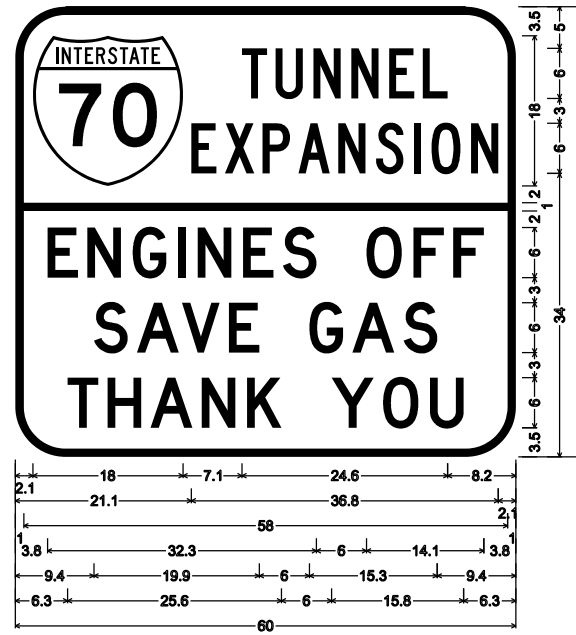
LAYOUT TO BE PROVIDED AS
A GRAPHIC BY CONTRACTOR

Print Date: 3/7/2013		Sheet Revisions			Colorado Department of Transportation	As Constructed	TWIN TUNNELS DETOUR ADVANCED MESSAGING EXHIBIT SIGN LAYOUTS		Project No./Code
File Name: I8832TRAF_CP2_Adv Message VMS001.dgn		Date:	Comments	Init.	425 A Corporate Circle Golden, CO 80401 Phone: 720-497-6918 FAX: 720-497-6901 Region 1	No Revisions:	Designer: D.Sprague	Structure Numbers	IM 0703-391
Horiz. Scale: 1:27525	Vert. Scale:					Revised:	Detailer: J. Gellner		19036
4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276						Void:	Subset: Phasing	Subset Sheets: 29 of 31	Sheet Number 376

17543 4:03:10 PM c:\pw_work\pbesipw1\common\dms26924\I8832TRAF_CP2_Adv Message VMS001.dgn



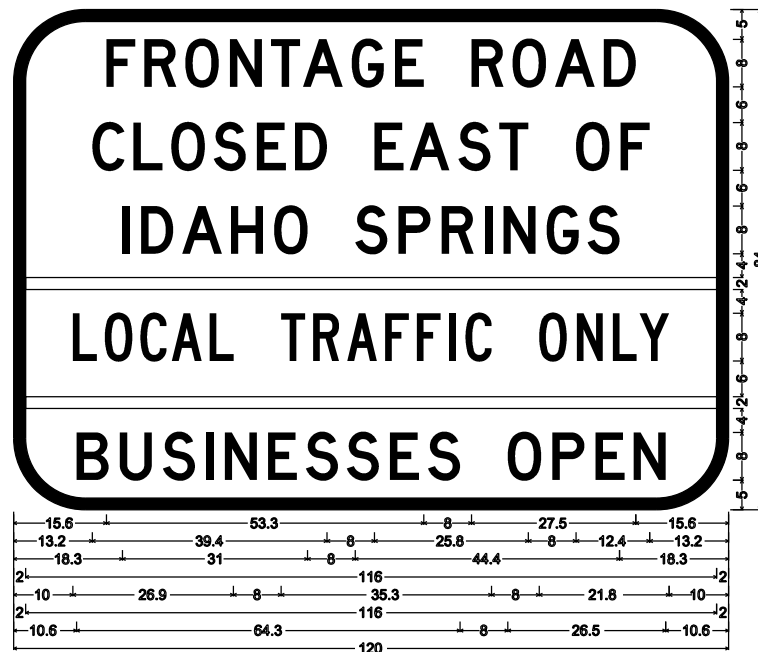
STATIC SIGN (S1) DETAIL



STATIC SIGN (S2) DETAIL



STATIC SIGN (S3) DETAIL



12.0" Radius, 2.0" Border, Black on Orange;
"FRONTAGE ROAD" D; "CLOSED EAST OF" D; "IDAHO SPRINGS" D; "LOCAL TRAFFIC ONLY" C;
"BUSINESSES OPEN" D;

STATIC SIGN (B1) DETAIL



9.0" Radius, 1.0" Border, Black on Orange;
"Businesses" E Mod; "on CR 314" E Mod; "OPEN" E Mod; "Use EXIT 241" E Mod;

STATIC SIGN (B2) DETAIL

Print Date: 3/7/2013
File Name: 18832TRAF_CP2_Adv Message VMS001A.dgn
Horiz. Scale: 1:27525 Vert. Scale:

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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:

TWIN TUNNELS DETOUR
ADVANCED MESSAGING EXHIBIT
SIGN LAYOUTS

Designer: D.Sprague	Structure Numbers
Detailer: J. Gellner	
Subset: Phasing	Subset Sheets: 30 of 31

Project No./Code
IM 0703-391
19036
Sheet Number 377

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VMS MESSAGES

VMS Wording In Between Closures (Two Screens)

(21 Characters/Line)

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VMS Wording During Closures (Two Screens)

(21 Characters/Line)

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NOTE:
ALL MESSAGES ARE APPLICABLE FOR BOTH EB AND WB TRAFFIC AND SHALL BE ADJUSTED AS APPROPRIATE FOR THE SIGN LOCATION.

Print Date: 3/7/2013	Sheet Revisions			 Colorado Department of Transportation 425 A Corporate Circle Golden, CO 80401 Phone: 720-497-6918 FAX: 720-497-6901 Region 1 CRC	As Constructed	TWIN TUNNELS DETOUR ADVANCED MESSAGING EXHIBIT VMS MESSAGES			Project No./Code IM 0703-391	
File Name: 18832TRAF_CP2_Adv Message VMS002.dgn	Date:	Comments:	Init.		No Revisions:					
Horiz. Scale: 1:27525 Vert. Scale:					Revised:	Designer: D.Sprague Structure:	Detailer: J. Gellner Numbers:	19036		
ATKINS 4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276				Void:	Subset: Phasing	Subset Sheets: 31 of 31	Sheet Number 378			

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, J, 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 under detour cross-over
- Traffic control for CR 314 detour, lane closures
- Temporary stormwater erosion control
- Installation of instrumentation in WB bore (check on lead time for instrumentation)
- 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
- Managed lane
- Installation/relocation of permanent ITS components (tolling equip, side fire radars, cameras, relocated ATR)
- Permanent wildlife fencing on WB at west portal
- Removal of portal-to-portal access road

- Deconstruct detour on Old US 40/CR 314 (remove barrier, signing, lighting, striping, etc.)
- 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
- Any low/no-cost enhancements identified
- Temporary stormwater erosion control
- Lab trailer and electrical setup
- Public Information Program

Construction Package 3

- Remainder of Wall J
- Noise barrier
- CR 314 retaining wall fascia
- 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 4

- 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 Wingwall 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)

Package 2

1. Tunnel construction -excavation/construction of tunnel including blasting, and lining
2. Portal construction

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File Name: 18832HYDR_CP2_SWMPNote01.dgn		Date:	Comments	Init.			IM 0703-391			
Horiz. Scale: 1:1 Vert. Scale: NA							19036			
ATKINS 4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276				CRC	Designer: J. Hollon Detailer: J. Gellner Subset: SWMPNOTE	Structure Numbers Subset Sheets: 1 of 5	Sheet Number 379			

3. Construction of retaining walls C, D, G, and L
4. Construct water quality ponds
5. Remaining drainage system
6. Chain station reconstruction
7. Wildlife fencing
8. Removal of portal to portal access road
9. Paving, signing and striping
10. Remove detour and construction phasing median shift

C. ACRES OF DISTURBANCE:

1. Total Limits of Disturbance: 49.0 acres
2. Total Permanent Disturbance: 22.08 acres
3. Acreage of seeding: 6.5 acres

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.

I. 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:

Josh Hollon, PE CFM, Group Manager, Integrated Water Resources
 Atkins
 4601 DTC Blvd, Suite 700
 Denver, CO 80237
 Phone: 303.221.7275
 Email: Joshua.Hollon@atkinsglobal.com

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.)

Grif Searles
 Edward Kraemer & Sons, Inc.
 10521 Livingston Drive
 Northglenn, CO
 Phone: 303.419.9262
 Email: gsearles@edkraemer.com

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		X		
Erosion Logs	sediment			X	X	X		
Permanent Sediment Trap/Basin (used as temporary BMP)	sediment							
Embankment Protector	erosion							
Outlet Protection	erosion			X	X	X		
Concrete Washouts	construction			X	X	X		
Vehicle Tracking Pad	construction			X	X	X		
Dewatering	sediment				X	X		
Temporary Stream Crossing	erosion				X	X		
Other								

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 Region 1 **CRC**

No Revisions:
 Revised:
 Void:

STORMWATER MANAGEMENT PLAN

Designer: J. Hollon
 Detailer: J. Gellner
 Subset: SWMPNOTE

Structure Numbers
 Subset Sheets: 2 of 5

Project No./Code
 IM 0703-391
 19036
 Sheet Number **380**

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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	X		
Seeding Permanent	erosion			X	X	X		
Mulch/Mulch Tackifier	erosion				X	X		
Soil Binder	erosion			X	X	X		
Soil Retention Blanket	erosion					X		
Turf Reinforcement Mat	erosion							
Vegetative Buffer Strips	erosion			X	X	X		
Protection of Trees	erosion			X	X	X		
Preservation of Mature Vegetation	erosion			X	X	X		
Spray-on Mulch Blanket	erosion					X		
Scheduling	construction							
Sweeping	erosion					X		
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.
 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.

EROSION 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 are 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.

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Horiz. Scale: 1:1 Vert. Scale: NA				Revised:											
 4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276								Void:		Subset: SWMPNOTE		Subset Sheets: 3 of 5		Sheet Number 381	

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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.

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. GENEAREL 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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 4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276							Designer: J. Hollon Detailer: J. Gellner Subset: SWMPNOTE	Structure Numbers Subset Sheets: 4 of 5	Sheet Number 382	

9. INTERIM AND FINAL STABILIZATION

A. SEEDING PLAN

Soil preparation, soil conditioning or topsoil, seeding (native), mulching (weed free) and mulch tackifier may be required for disturbed area within the right-of-way limits which are not surfaced. The following types and rates shall be used:

Common Name	Botanical Name	Pounds pls/acre
Blue grama	<i>Bouteloua gracilis 'Hachita'</i>	0.5
Arizona fescue	<i>Festuca arizonica 'Redondo'</i>	1.0
Sheep fescue	<i>Festuca ovina</i>	0.6
Canada wildrye	<i>Elymus Canadensis</i>	6.2
Sandberg bluegrass	<i>Poa sandbergii</i>	0.2
Western wheatgrass	<i>Pascopyrum smithii 'Rosanna'</i>	6.5
Mountain brome	<i>Bromus marginatus 'Bromar'</i>	4.0
Prairie junegrass	<i>Koeleria macrantha</i>	0.1
Slender wheatgrass	<i>Elymus trachycaulus ssp. Trachycaulus 'Pryor'</i>	1.0
Oats	<i>Avena sativa</i>	3.0
Blue flax	<i>Linum lewisii</i>	0.5
Rocky Mountain pestemon	<i>Penstemon strictus</i>	1.0
Yarrow	<i>Achillea millefolium</i>	0.1
Sulfer flower	<i>Eriogonum umbellatum</i>	1.0
Total		25.7

B. SEEDING APPLICATION

Drill seed 0.25 inch to 0.5 inch into the soil. In small areas not accessible to a drill, **hand broadcast at double the rate** and rake 0.25 inch to 0.5 inch into the soil. In areas as directed by Engineer, **hydroseed shall be applied at double the rate**, in a single slurry which contains seed, mulch tackifier, humate and fertilizer. Slurry shall be applied from top of slope downward, in 50' vertical lifts unless otherwise approved by the Engineer.

C. MULCHING APPLICATION

Apply a minimum of 1 1/2 tons of certified weed free native hay per acre and in accordance with Section 212 and mechanically crimp it into the soil in combination with an organic mulch tackifier.

D. SOIL CONDITIONING AND FERTILIZER REQUIREMENTS

[Minimum requirements for all disturbances to receive seeding (native).]

Soil conditioner paid for as Item 212- Soil Conditioning (Acre)		
Biological nutrient organic based fertilizer (lbs/acre)*	Humate (lbs/acre)	Spray-on hydraulic organic amendment (lbs/acre)*
600	200	3500

*Biological nutrient shall not exceed 8-8-8 (N-P-K). Humate based material shall be in accordance to Section 212.

*Spray-on hydraulic organic amendment shall be 3-6-3 or other as approved.

Soil conditioner shall be applied in a single slurry which contains seed, mulch tackifier, fertilizer, humate and spray-on hydraulic organic amendment.

E. BLANKET APPLICATION: On slopes and ditches requiring a blanket, the blanket shall be placed in lieu of mulch and mulch tackifier. See SWMP for blanket locations.

F. RESEEDING OPERATIONS/CORRECTIVE STABILIZATION

Prior to final acceptance:

- Seeded areas shall be reviewed during the 14 day inspections by the Erosion Control Supervisor for bare soils caused by surface or wind erosion. Bare areas caused by surface or gully erosion, blown away mulch, etc. shall be regraded, seeded, mulched and have mulch tackifier (or blanket) applied as necessary, at no additional cost to the project.
- Areas where seed has not germinated after one season shall be evaluated by the Engineer and CDOT Landscape Architect. Areas that have not germinated shall have seed, mulch and mulch tackifier (or blanket) reapplied. Work shall be paid for by the appropriate bid item.
- The Contractor shall maintain seeding/mulch/tackifier, mow to control weeds or apply herbicide to control weeds in the seeded areas until Final Acceptance.

10. PRIOR TO FINAL ACCEPTANCE

Final Acceptance shall be in accordance with subsection 208.10.

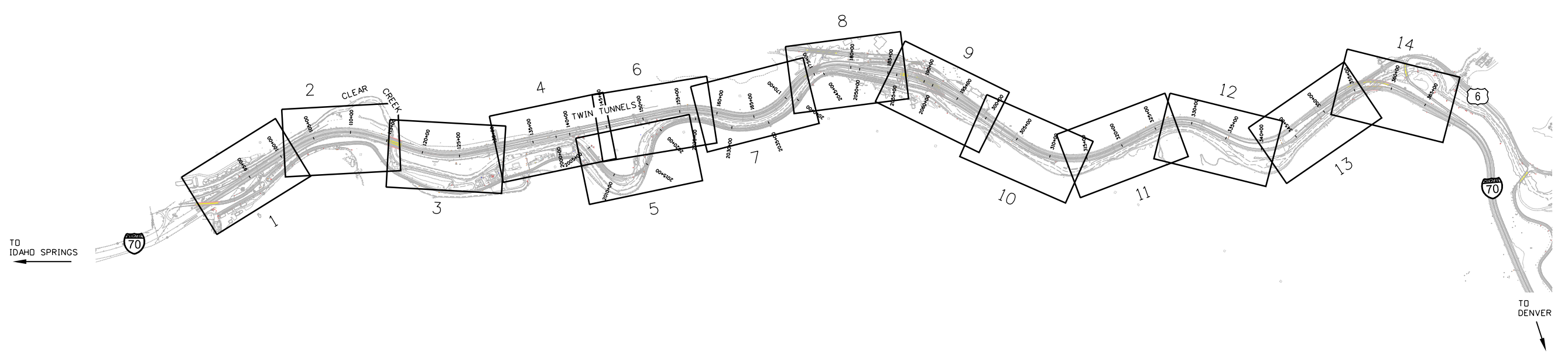
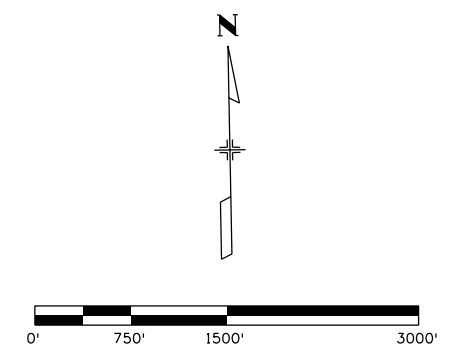
11. TABULATION OF STORMWATER QUANTITIES

Pay Item	Description	Pay Unit	*Quantities				
			1A	1B	2	3	4
203-01500	Blading	Hour	10	10	30		
203-01510	Backhoe	Hour	10	10	100		
203-01550	Dozing	Hour	20	20	100		
203-01594	Combination Loader	Hour	20	20	60		
207-00205	Topsoil	CY					
207-00210	Stockpile Topsoil	CY					
208-00001	Silt Dike	LF					
208-00002	Erosion Log (12 Inch)	LF	500	120	2700		
208-00004	Silt Berm	LF					
208-00009	Erosion Log (20 Inch)	LF					
208-00011	Erosion Bales (Weed Free)	Each					
208-00015	Sand Bag	Each			200		
208-00030	Sediment Basin	Each					
208-00033	Sediment Trap	Each					
208-00034	Gravel Bag	LF	3350	700	6600		
208-00040	Check Dam	Each	1		2		
208-00045	Concrete Washout Structure	Each	1	1	8		
208-00051	Storm Drain Inlet Protection (type 1)	Each					
208-00052	Storm Drain Inlet Protection (type 2)	Each					
208-00055	Rigid Inlet Protection Device	Each					
208-00060	Temporary Slope Drain	LF					
208-00070	Vehicle Tracking Pad	Each	4	4	12		
208-00103	Removal and Disposal of Sediment (Labor)	Hour	60	60	120		
208-00105	Removal and Disposal of Sediment (Equipment)	Hour	40	40	80		
208-00106	Sweeping (Sediment Removal)	Hour		60	260		
208-00107	Removal of Trash	Hour			80		
208-00205	Erosion Control Supervisor	Hour					
208-00206	Erosion Control Supervisor	Day	60	60	235		
208-00300	Temporary Berms	LF					
212-00006	Seeding (Native)	Acre	0.5		6.5		
212-00032	Soil Conditioning	Acre	0.5		6.5		
213-00004	Mulching (Weed Free Straw)	Acre			3.5		
213-00012	Spray-on Mulch Blanket	Acre	0.5		6.5		
213-00061	Mulch Tackifier	LB			910		
213-00100	Soil Binder	Acre	0.5		3.0		
216-00201	Soil Retention Blanket (Straw/Coconut) (Biodegradable Class 1)	SY			6000		
214-01010	Brush Layer Cutting	Each					
216-00301	Turf Reinforcement Mat (Class_1)	SY					
216-00302	Turf Reinforcement Mat (Class_2)	SY					
216-00303	Turf Reinforcement Mat (Class_3)	SY					
217-00000	Herbicide Treatment	Hour			40		

*It is anticipated that additional BMPs and BMP quantities not shown on the SWMP Site Maps shall be required on the project for unforeseen conditions and replacement of items that are beyond their useful service life, see subsection 208.03 and 208.04 (e). Quantities for all BMPs shown above are estimated, and have been increased for unforeseen Project conditions.

- A. BMP sediment removal and disposal shall be paid for as: 208 Removal and Disposal of Sediment (Equipment) and 208 Removal and Disposal of Sediment (Labor). All other BMP maintenance shall be included in the cost of the BMP Device.
- B. It is estimated that 290 hours of blading, dozing, combination loader and/or backhoe may be required for miscellaneous erosion control work as directed by the Engineer. Work shall be paid for as: 203 Blading, 203 Dozing, 203 Combination Loader or 203 Backhoe.
- C. Topsoil shall be paid for through Force Account.

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Horiz. Scale: 1:1 Vert. Scale: NA						19036	
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	Designer: J. Hollon Detailer: J. Gellner Subset: SWMPNOTE	Structure Numbers Subset Sheets: 5 of 5	Sheet Number 383		



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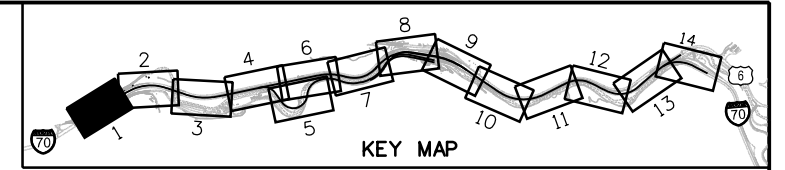
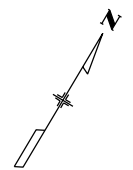
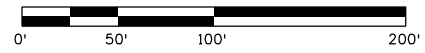
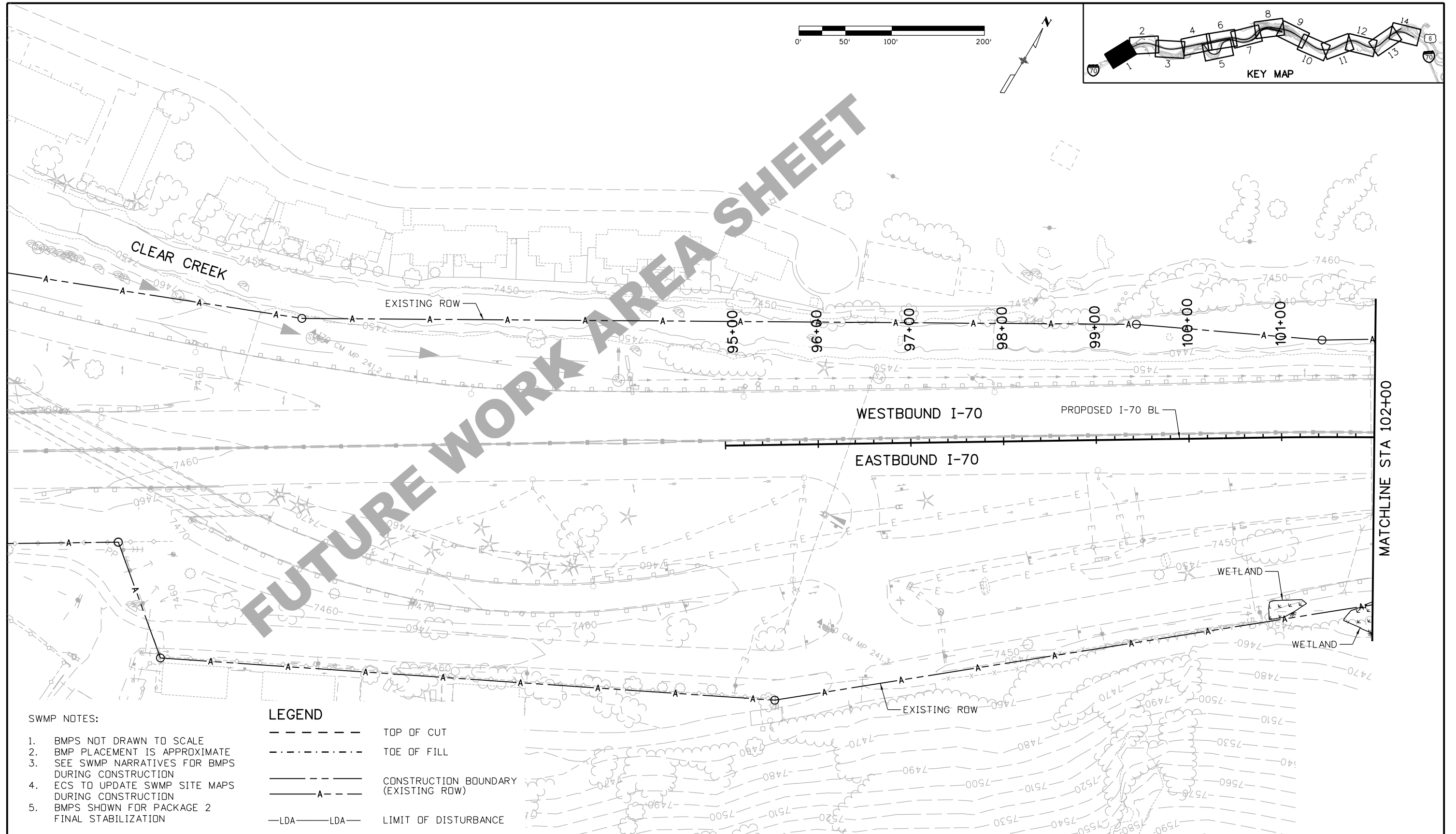
**EASTBOUND I-70
 STORMWATER MANAGEMENT PLAN
 SHEET KEY MAP**

Designer: J. Hollon
 Detailer: J. Gellner
 Subset: Keymap

Structure Numbers
 Subset Sheets: 1 of 1

Project No./Code
 IM 0703-391
 19036
 Sheet Number **384**

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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 2 FINAL STABILIZATION

LEGEND

- TOP OF CUT
- TOE OF FILL
- CONSTRUCTION BOUNDARY (EXISTING ROW)
- LDA --- LIMIT OF DISTURBANCE

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Sheet Revisions		
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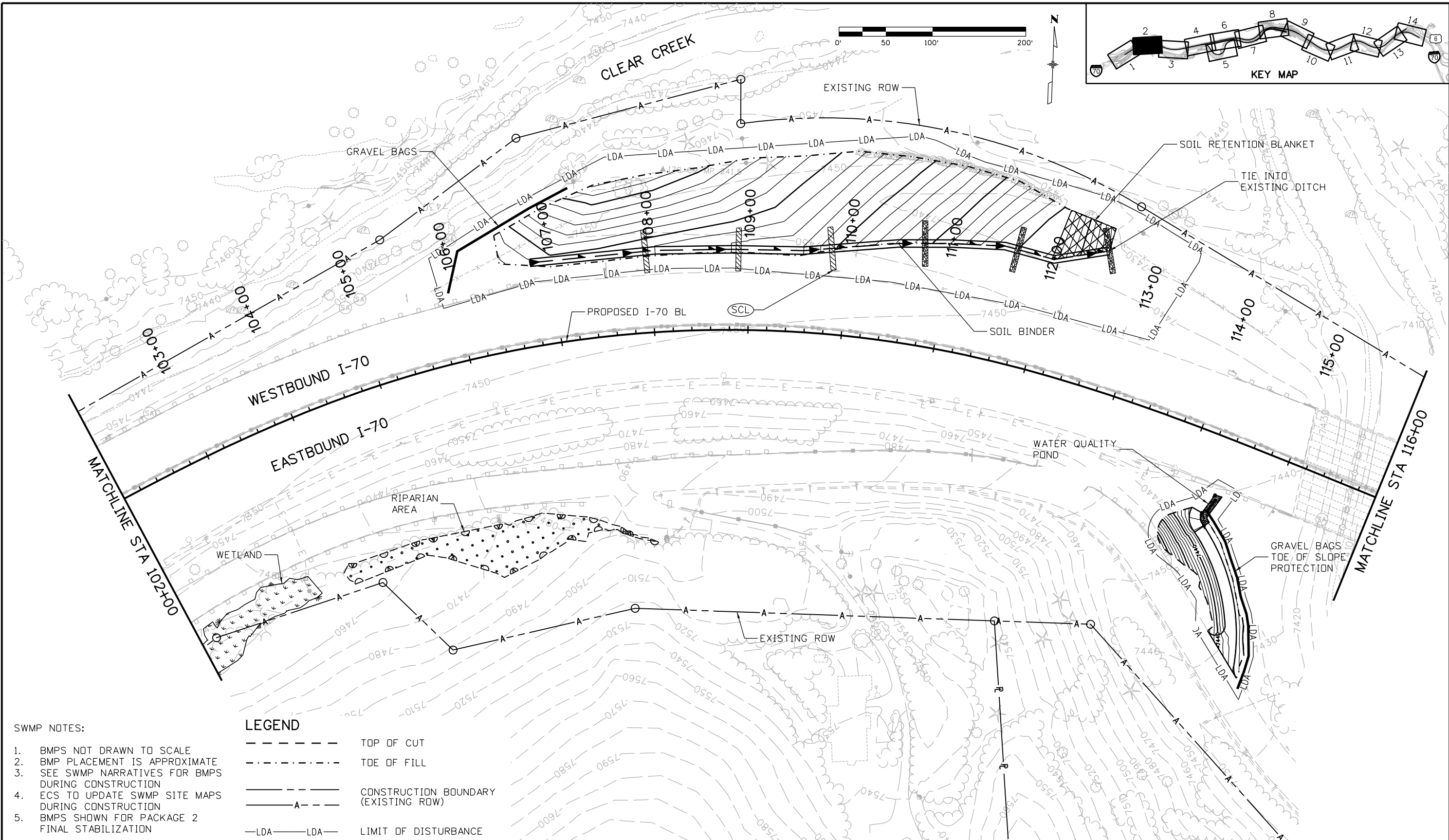
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**EASTBOUND I-70
 STORMWATER MANAGEMENT PLAN
 SITE MAP**

Designer:	J. Hollon	Structure Numbers	
Detailer:	J. Gellner	Subset Sheets:	1 of 14
Subset:	SWMP		

Project No./Code
 IM 0703-391
 19036
 Sheet Number 385

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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 2 FINAL STABILIZATION

LEGEND

- TOP OF CUT
- - - - - TOE OF FILL
- CONSTRUCTION BOUNDARY (EXISTING ROW)
- LDA---LDA--- 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

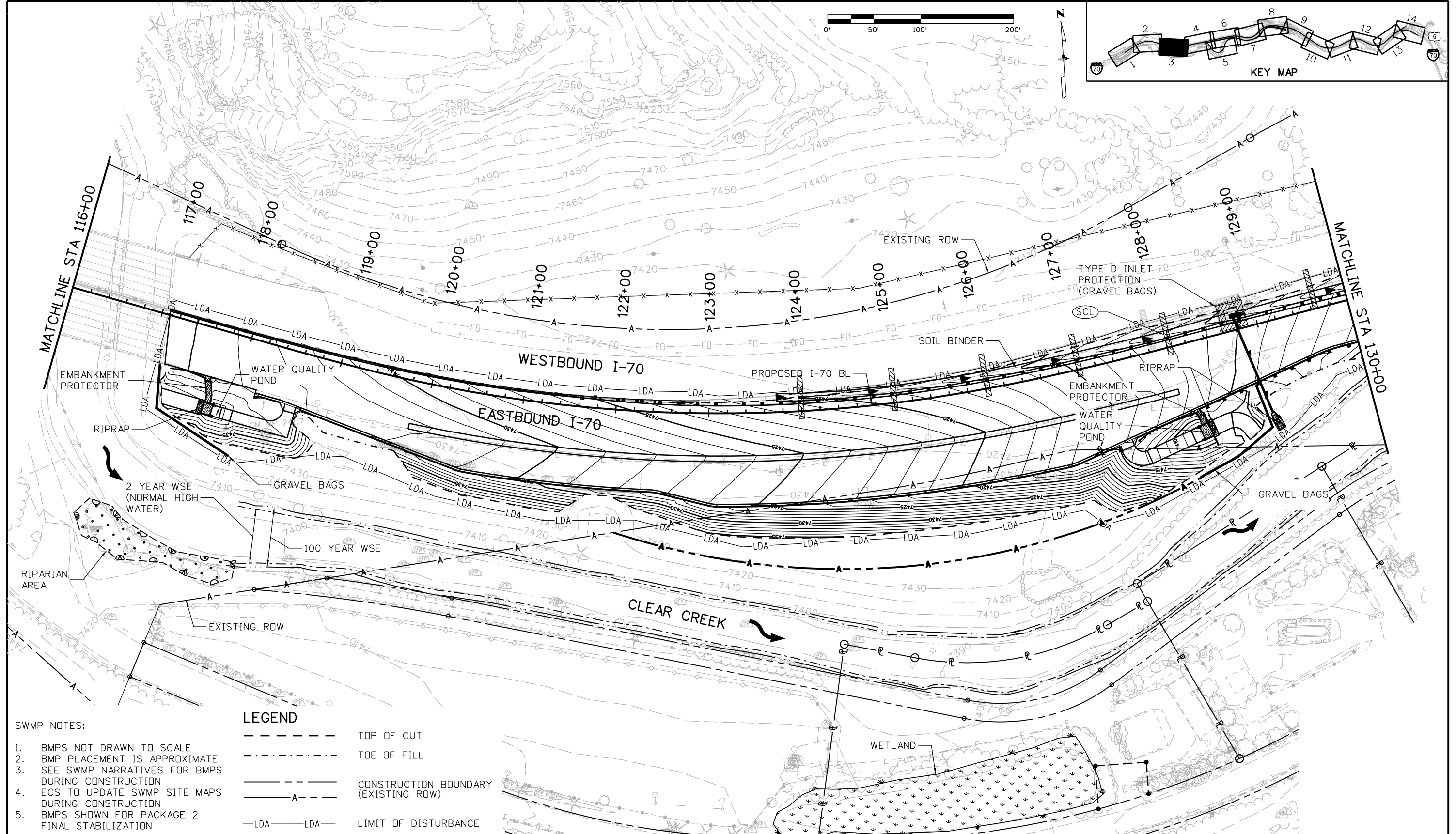
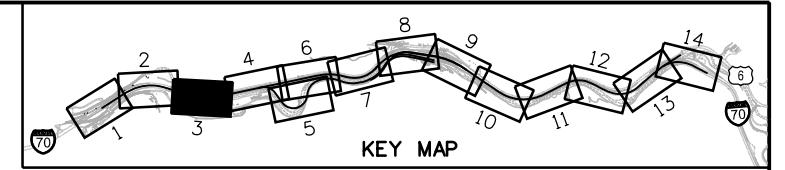
Subset Sheets: 2 of 14

Project No./Code

IM 0703-391

19036

Sheet Number 386



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 2 FINAL STABILIZATION

LEGEND

- TOP OF CUT
- - - - - TOE OF FILL
- CONSTRUCTION BOUNDARY (EXISTING ROW)
- LDA-LDA- LIMIT OF DISTURBANCE

Print Date: 3/7/2013
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Date:	Comments	Init.

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Region 1 **CRC**

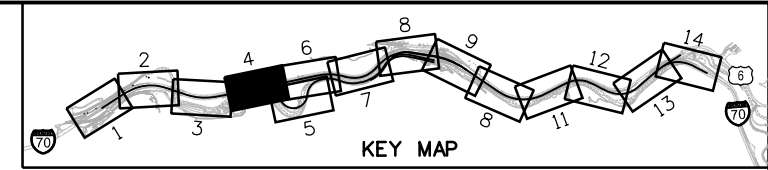
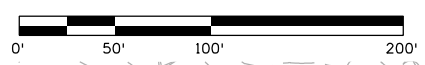
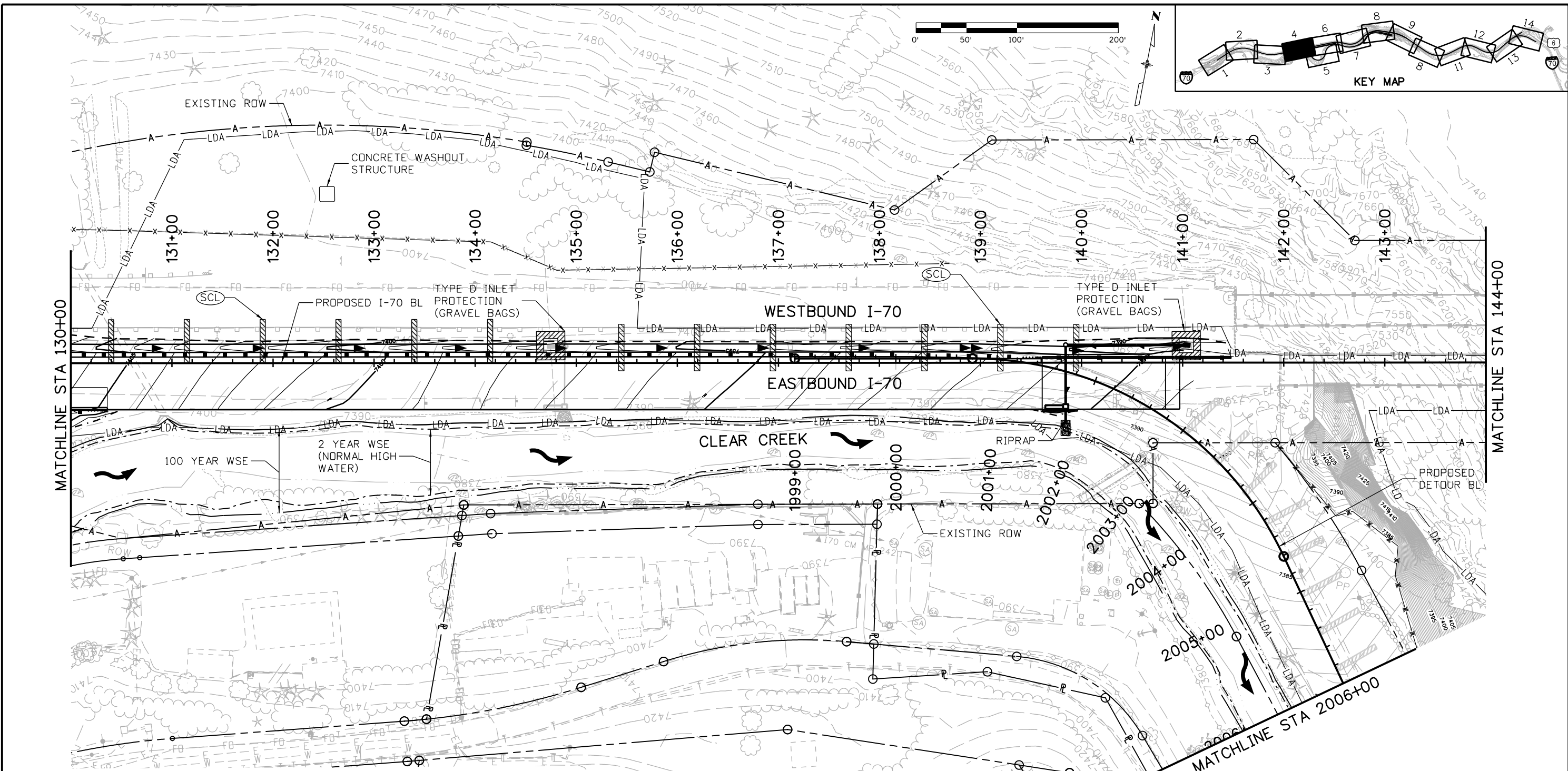
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Revised:	
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**EASTBOUND I-70
 STORMWATER MANAGEMENT PLAN
 SITE MAP**

Designer:	J. Hollon	Structure Numbers	
Detailer:	J. Gellner		
Subset:	SWMP	Subset Sheets:	3 of 14

Project No./Code	IM 0703-391
	19036
Sheet Number	387

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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 2 FINAL STABILIZATION

LEGEND

---	TOP OF CUT
- - - - -	TOE OF FILL
---	CONSTRUCTION BOUNDARY
-A-A-	(EXISTING ROW)
-LDA-LDA-	LIMIT OF DISTURBANCE

Print Date: 3/7/2013
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Date:	Comments	Init.

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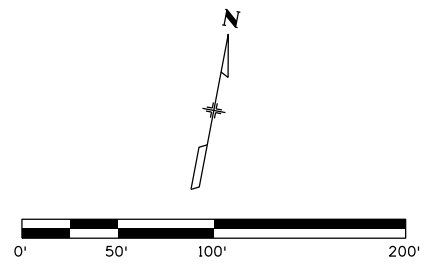
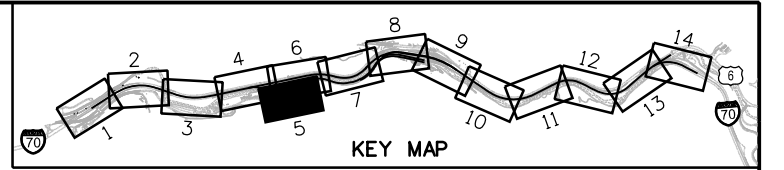
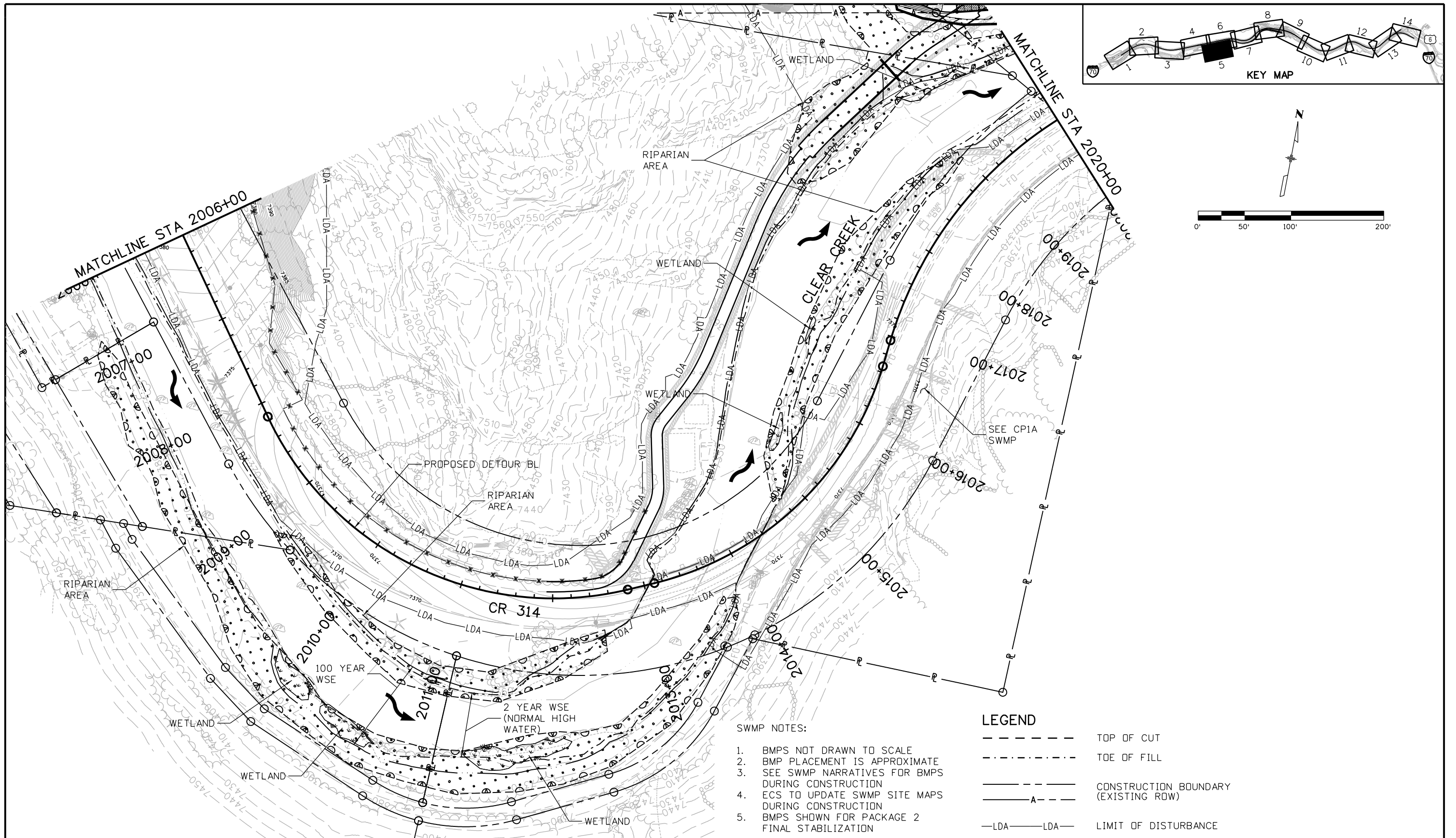
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No Revisions:
Revised:
Void:

**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 0703-391
19036
Sheet Number 388

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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 2 FINAL STABILIZATION

LEGEND

- TOP OF CUT
- .-.- TOE OF FILL
- CONSTRUCTION BOUNDARY (EXISTING ROW)
- A--
- LDA-LDA- LIMIT OF DISTURBANCE

Print Date: 3/7/2013
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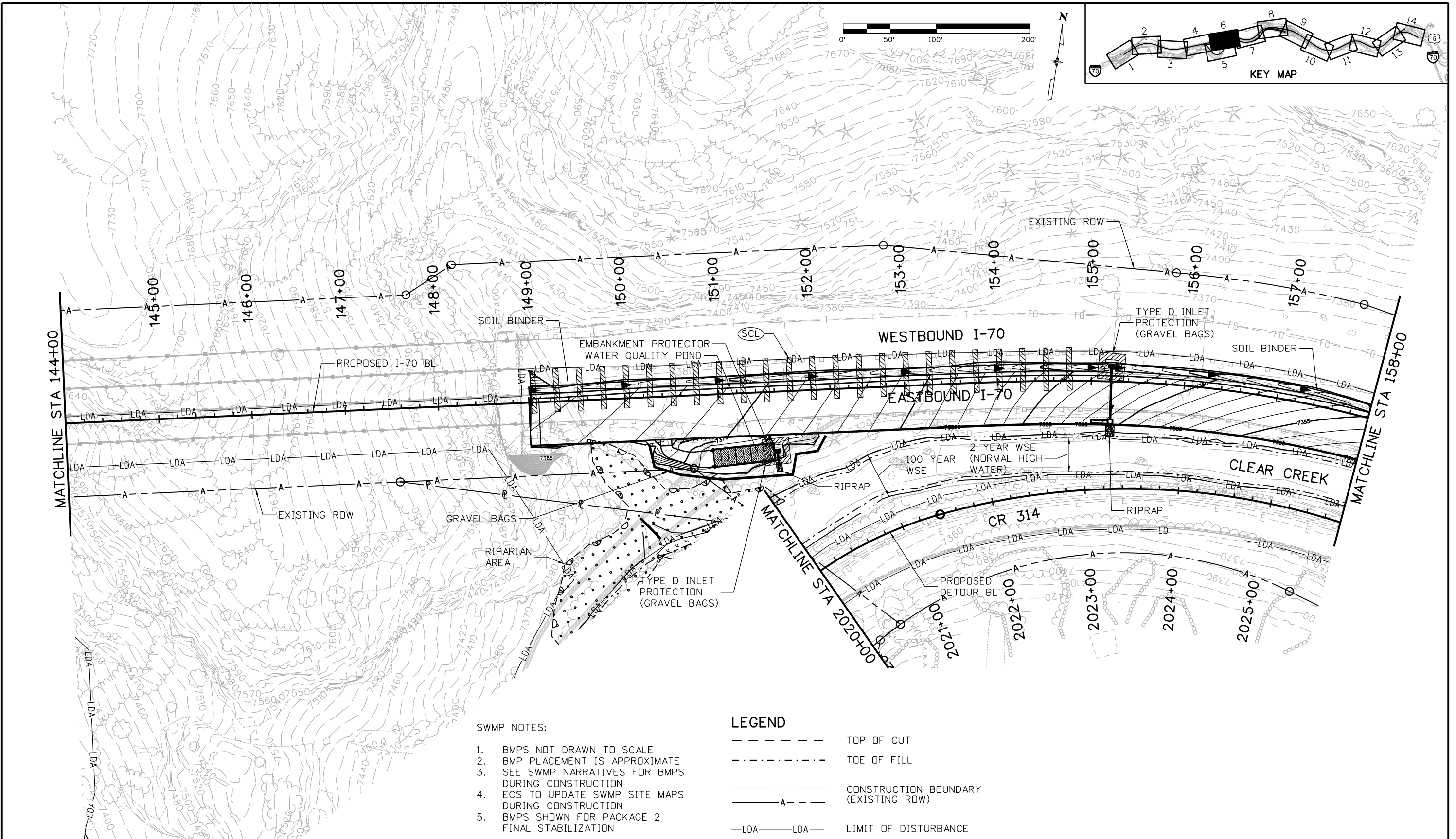
**EASTBOUND I-70
 STORMWATER MANAGEMENT PLAN
 SITE MAP**

Designer: J. Hollon
 Detailer: J. Gellner
 Subset: SWMP

Structure Numbers
 Subset Sheets: 5 of 14

Project No./Code
 IM 0703-391
 19036
 Sheet Number **389**

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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 2 FINAL STABILIZATION

LEGEND

- TOP OF CUT
- - - - - TOE OF FILL
- CONSTRUCTION BOUNDARY
- A-A- EXISTING ROW
- LDA-LDA- LIMIT OF DISTURBANCE

Print Date: 3/7/2013
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Void:	

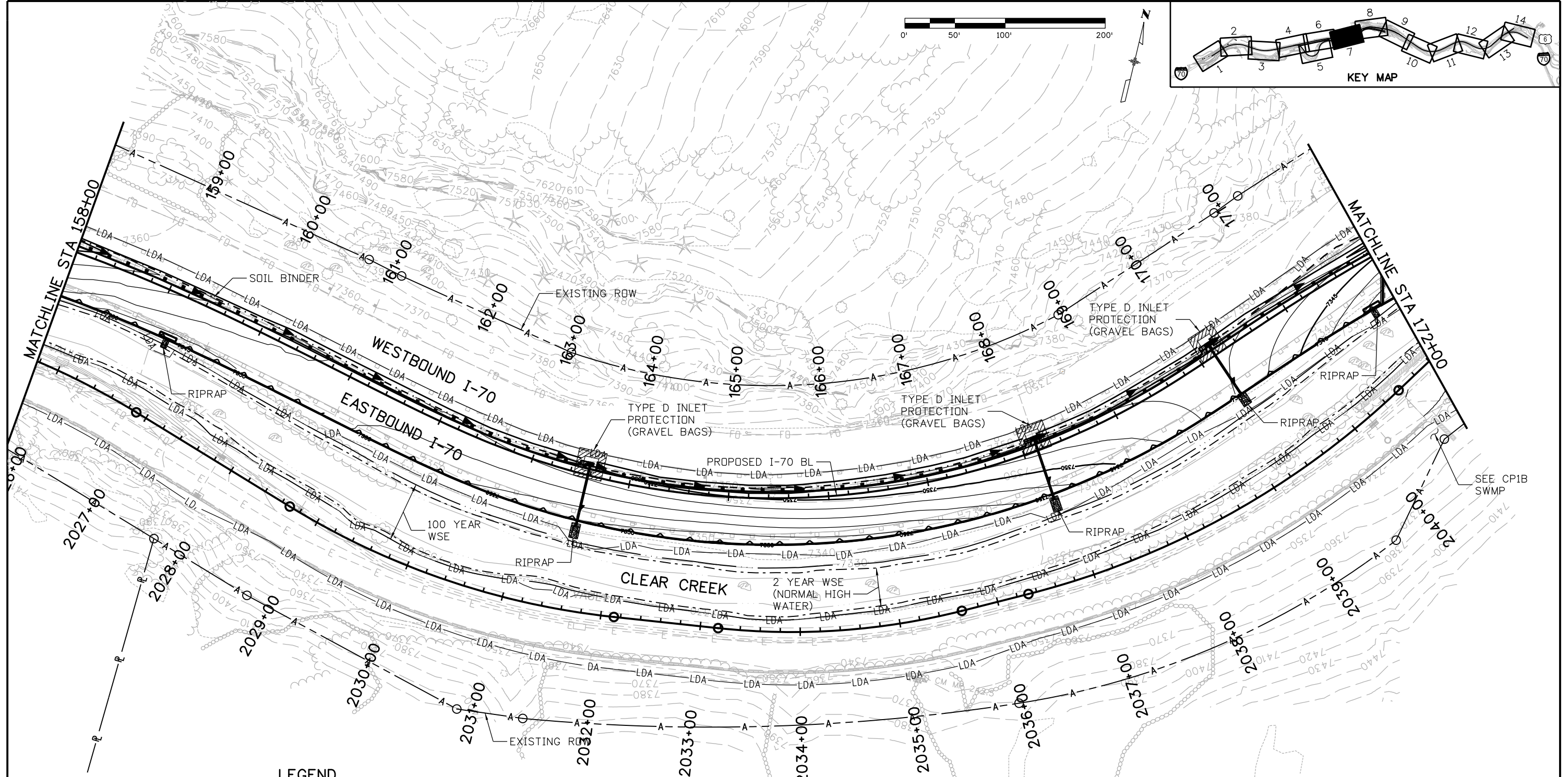
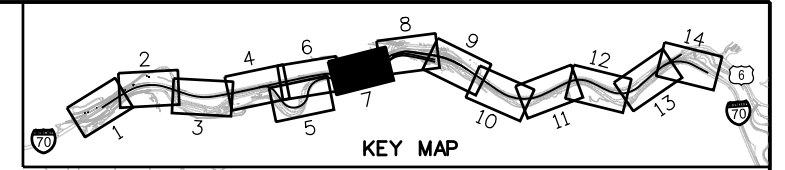
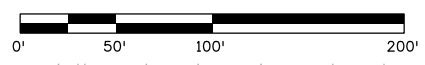
**EASTBOUND I-70
 STORMWATER MANAGEMENT PLAN
 SITE MAP**

Designer: J. Hollon
 Detailer: J. Gellner
 Subset: SWMP

Structure Numbers
 Subset Sheets: 6 of 14

Project No./Code	IM 0703-391
	19036
Sheet Number	390

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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 2 FINAL STABILIZATION

LEGEND

---	TOP OF CUT
- - - - -	TOE OF FILL
---	CONSTRUCTION BOUNDARY (EXISTING ROW)
-A- - -	LIMIT OF DISTURBANCE

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Date:	Comments	Init.

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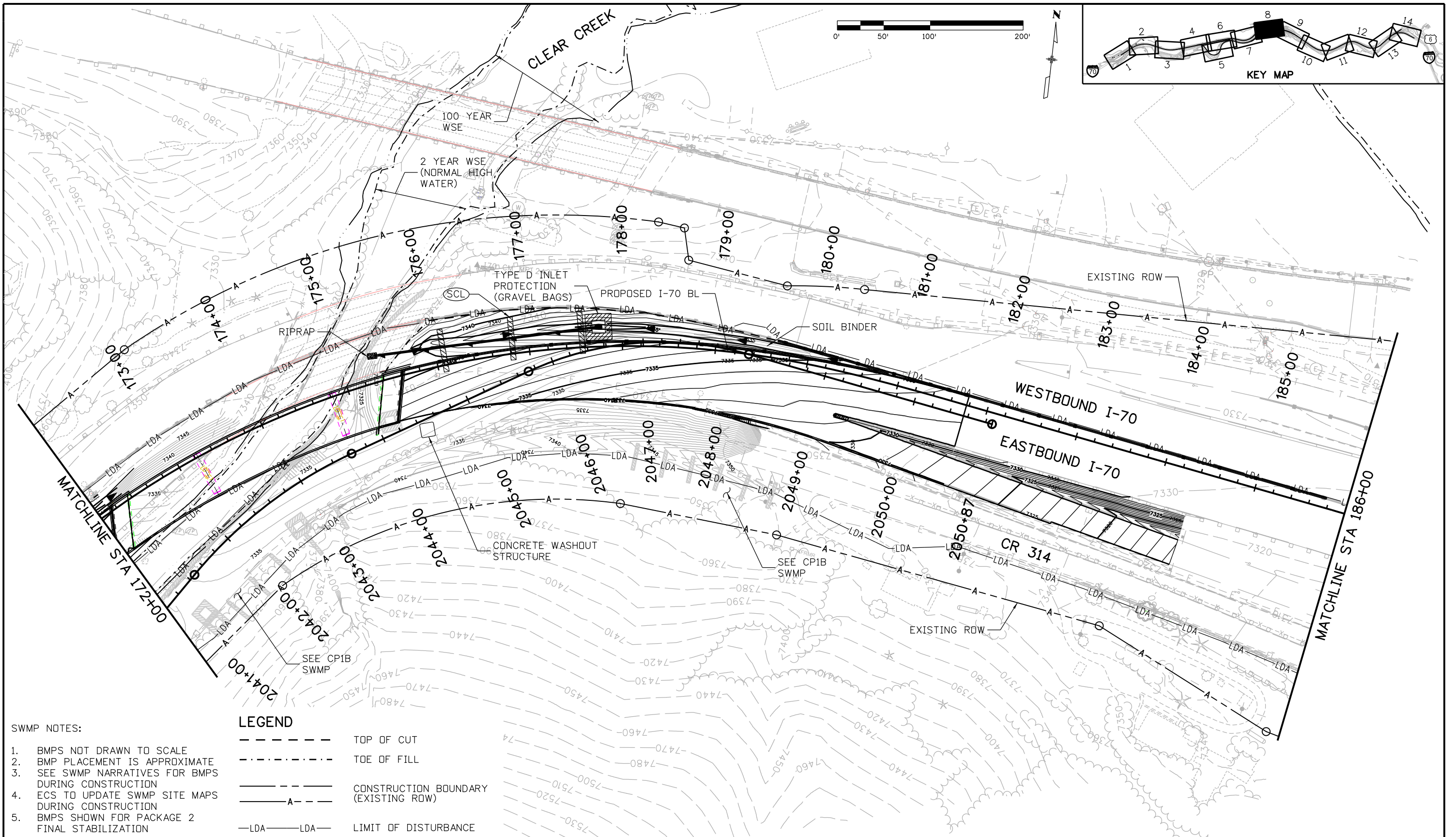
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Revised:
Void:

**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 0703-391
	19036
Sheet Number	391

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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 2 FINAL STABILIZATION

LEGEND

- TOP OF CUT
- - - - - TOE OF FILL
- CONSTRUCTION BOUNDARY (EXISTING ROW)
- - - - - LIMIT OF DISTURBANCE

Print Date: 3/7/2013

File Name: 18832HYDR_CP2_SWMP007.dgn
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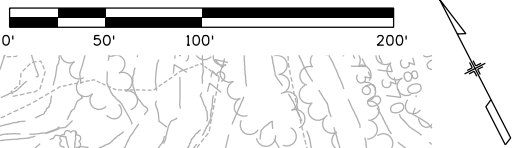
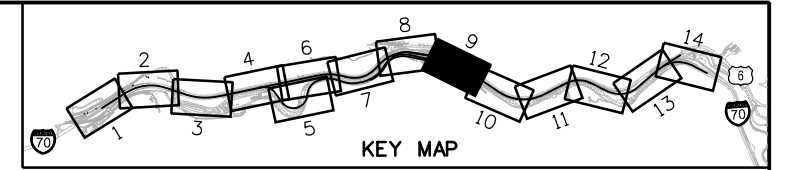
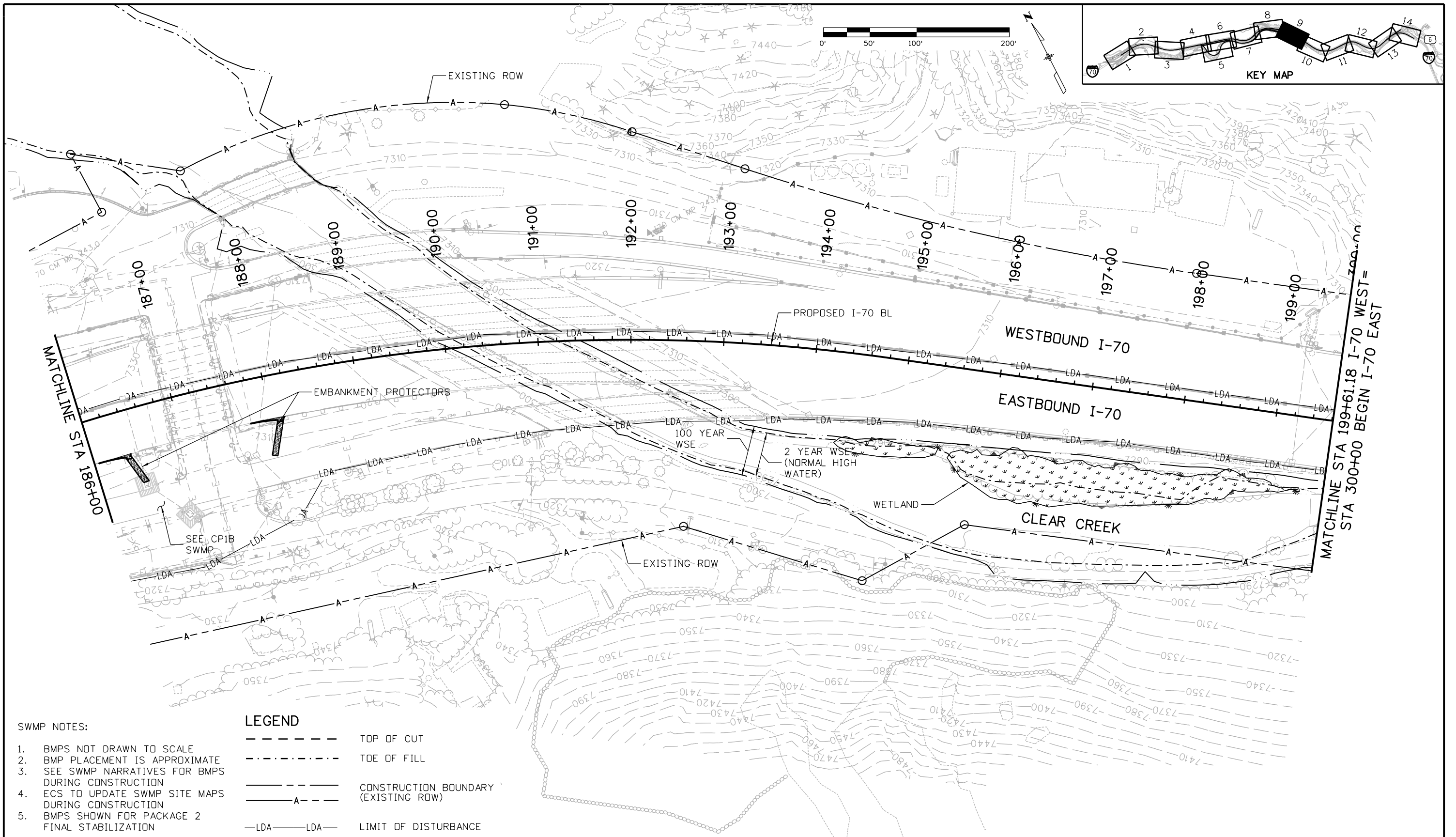
**EASTBOUND I-70
 STORMWATER MANAGEMENT PLAN
 SITE MAP**

Designer:	J. Hollon	Structure Numbers	
Detailer:	J. Gellner	Subset Sheets:	8 of 14
Subset:	SWMP		

Project No./Code	IM 0703-391
	19036
Sheet Number	392

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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 2 FINAL STABILIZATION

LEGEND

- TOP OF CUT
- - - - - TOE OF FILL
- CONSTRUCTION BOUNDARY (EXISTING ROW)
- - - - - LIMIT OF DISTURBANCE

Print Date: 3/7/2013
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Revised:	
Void:	

**EASTBOUND I-70
 STORMWATER MANAGEMENT PLAN
 SITE MAP**

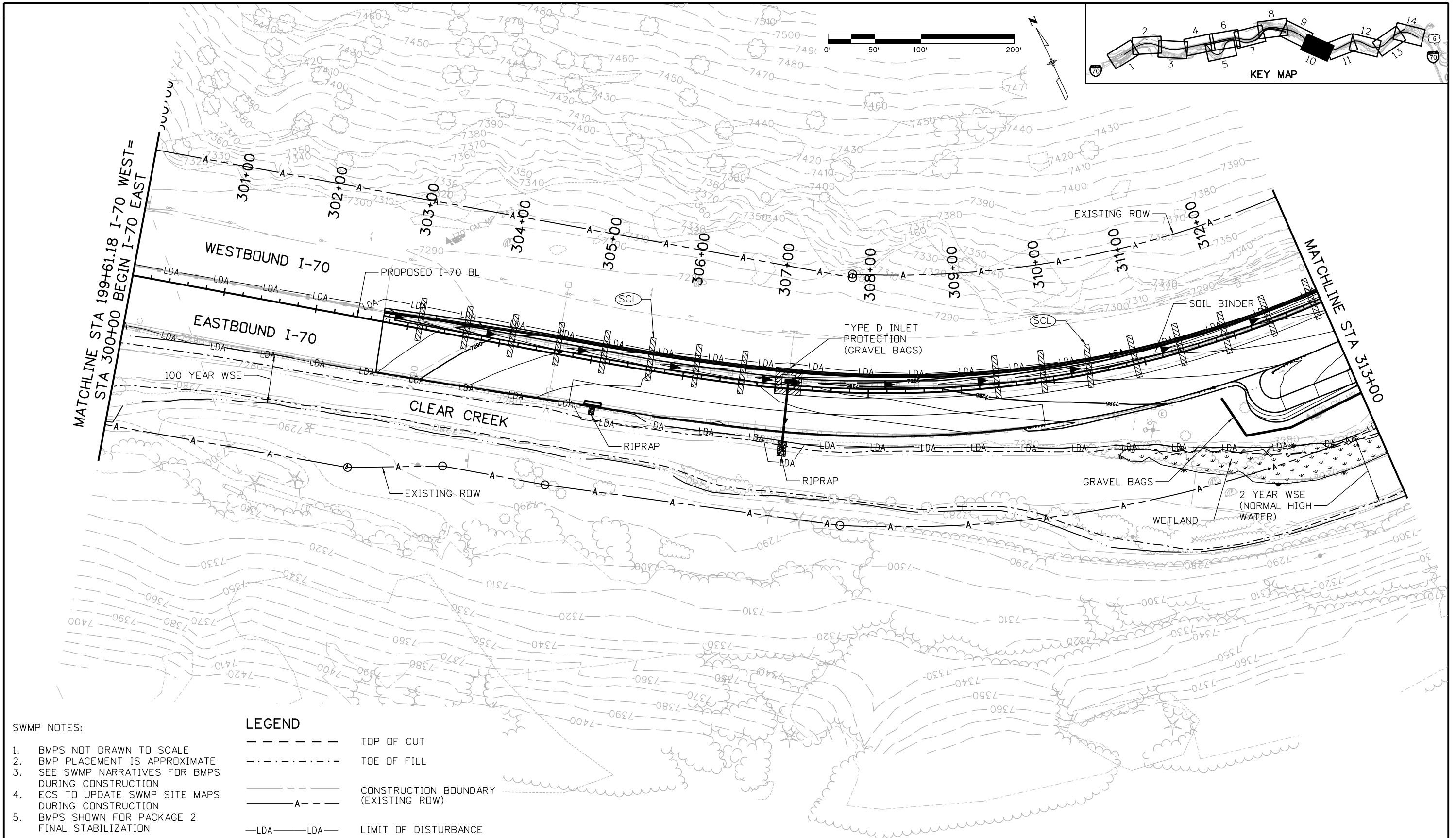
Designer:	J. Hollon	Structure Numbers	
Detailer:	J. Gellner	Subset Sheets:	9 of 14
Subset:	SWMP		

Project No./Code
 IM 0703-391

19036

Sheet Number **393**

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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 2 FINAL STABILIZATION

LEGEND

- TOP OF CUT
- - - - - TOE OF FILL
- CONSTRUCTION BOUNDARY (EXISTING ROW)
- A- -A- LIMIT OF DISTURBANCE

Print Date: 3/7/2013

File Name: 18832HYDR_CP2_SWMP009.dgn

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**EASTBOUND I-70
STORMWATER MANAGEMENT PLAN
SITE MAP**

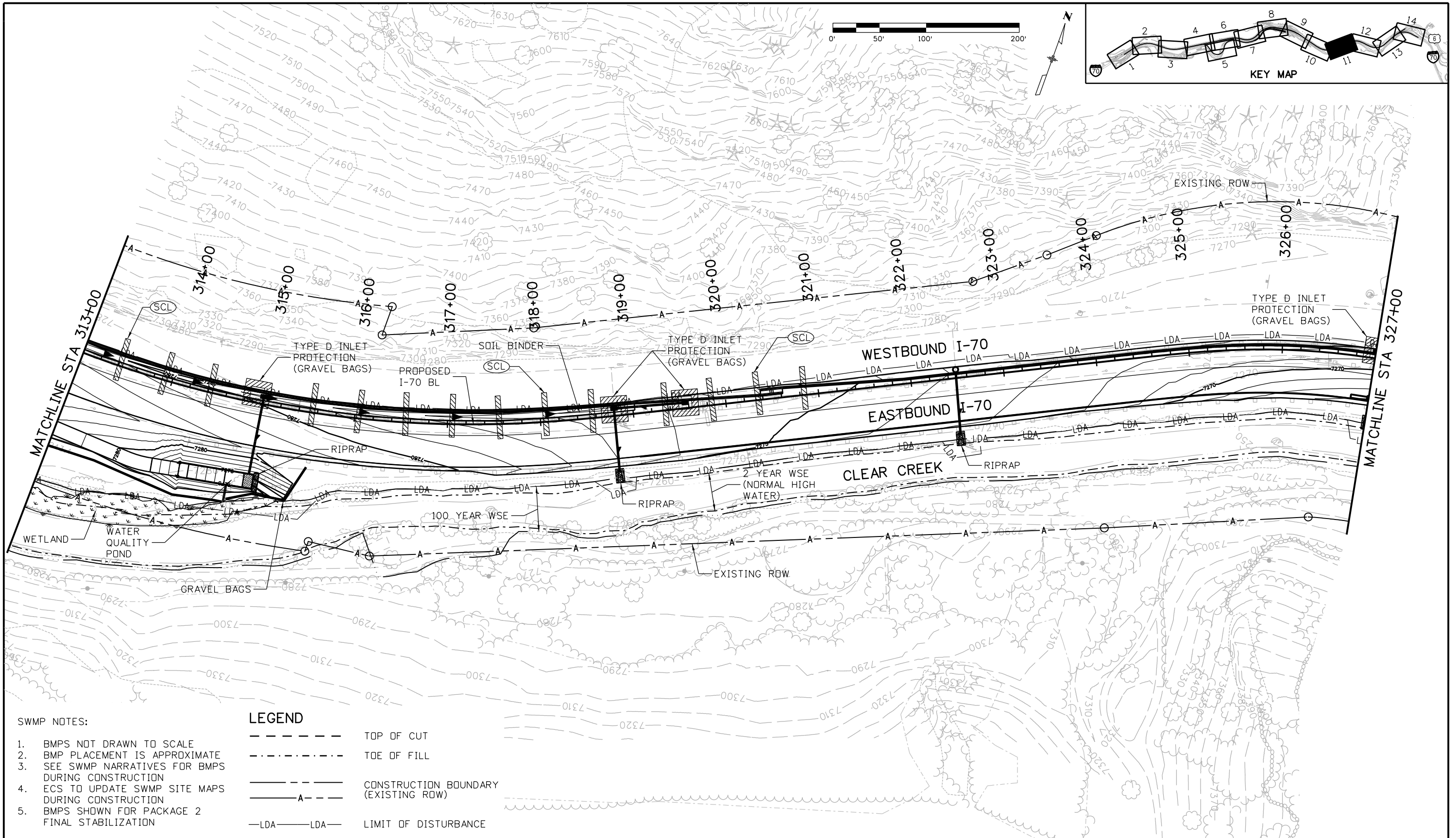
Designer:	J. Hollon	Structure Numbers	
Detailer:	J. Gellner	Subset Sheets:	10 of 14
Subset:	SWMP		

Project No./Code

IM 0703-391

19036

Sheet Number 394



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 2 FINAL STABILIZATION

LEGEND

- TOP OF CUT
- - - - - TOE OF FILL
- CONSTRUCTION BOUNDARY (EXISTING ROW)
- - - - - A - - - - -
- - - - - LDA - - - - - LDA - - - - - LIMIT OF DISTURBANCE

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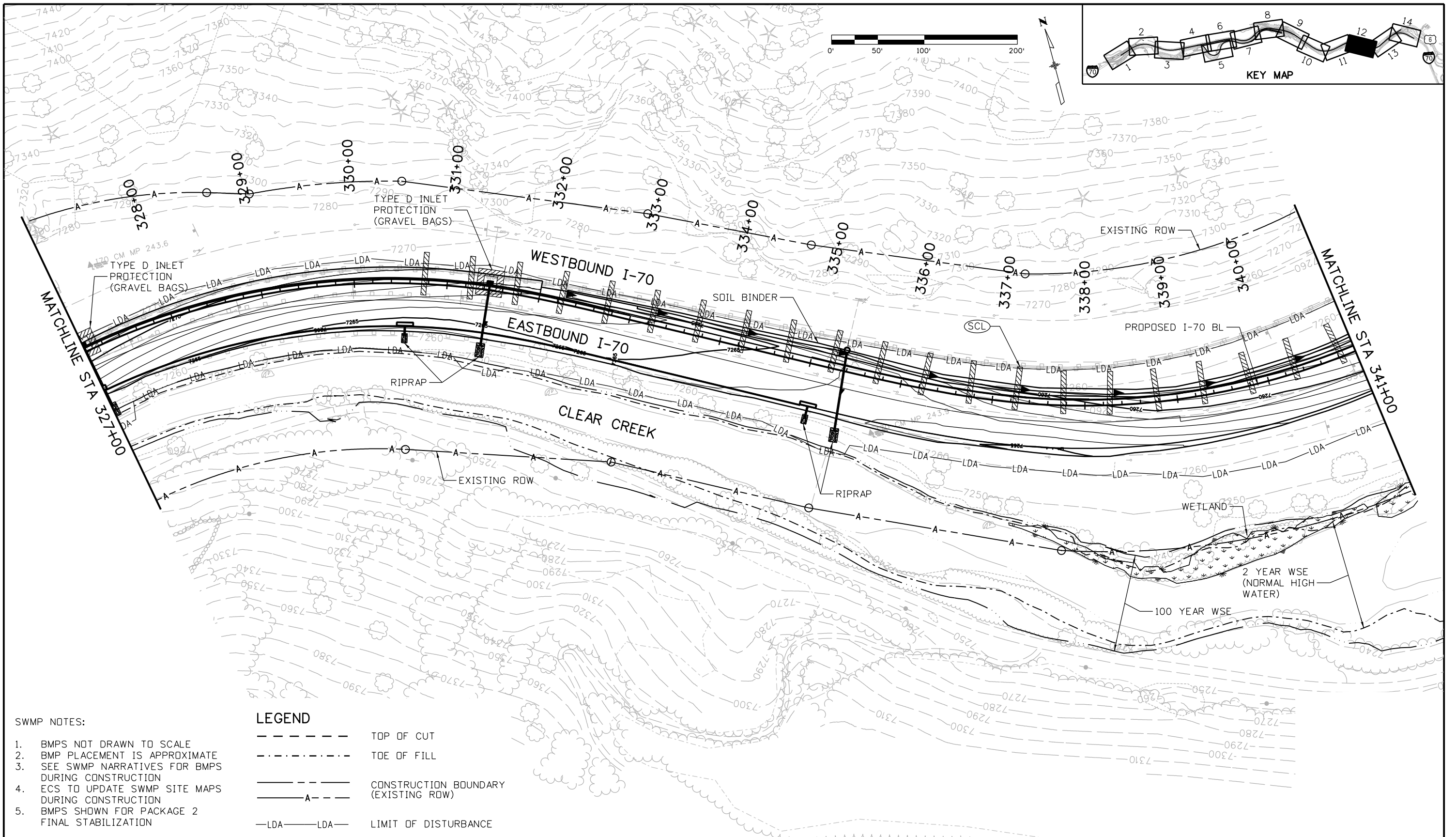
**EASTBOUND I-70
 STORMWATER MANAGEMENT PLAN
 SITE MAP**

Designer: J. Hollon
 Detailer: J. Gellner
 Subset: SWMP

Structure Numbers
 Subset Sheets: 11 of 14

Project No./Code	IM 0703-391
	19036
Sheet Number	395

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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 2 FINAL STABILIZATION

LEGEND

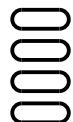
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- - - - - LIMIT OF DISTURBANCE

Print Date: 3/7/2013

File Name: 18832HYDR_CP2_SWMP011.dgn

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Region 1

CRC

No Revisions:

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**EASTBOUND I-70
STORMWATER MANAGEMENT PLAN
SITE MAP**

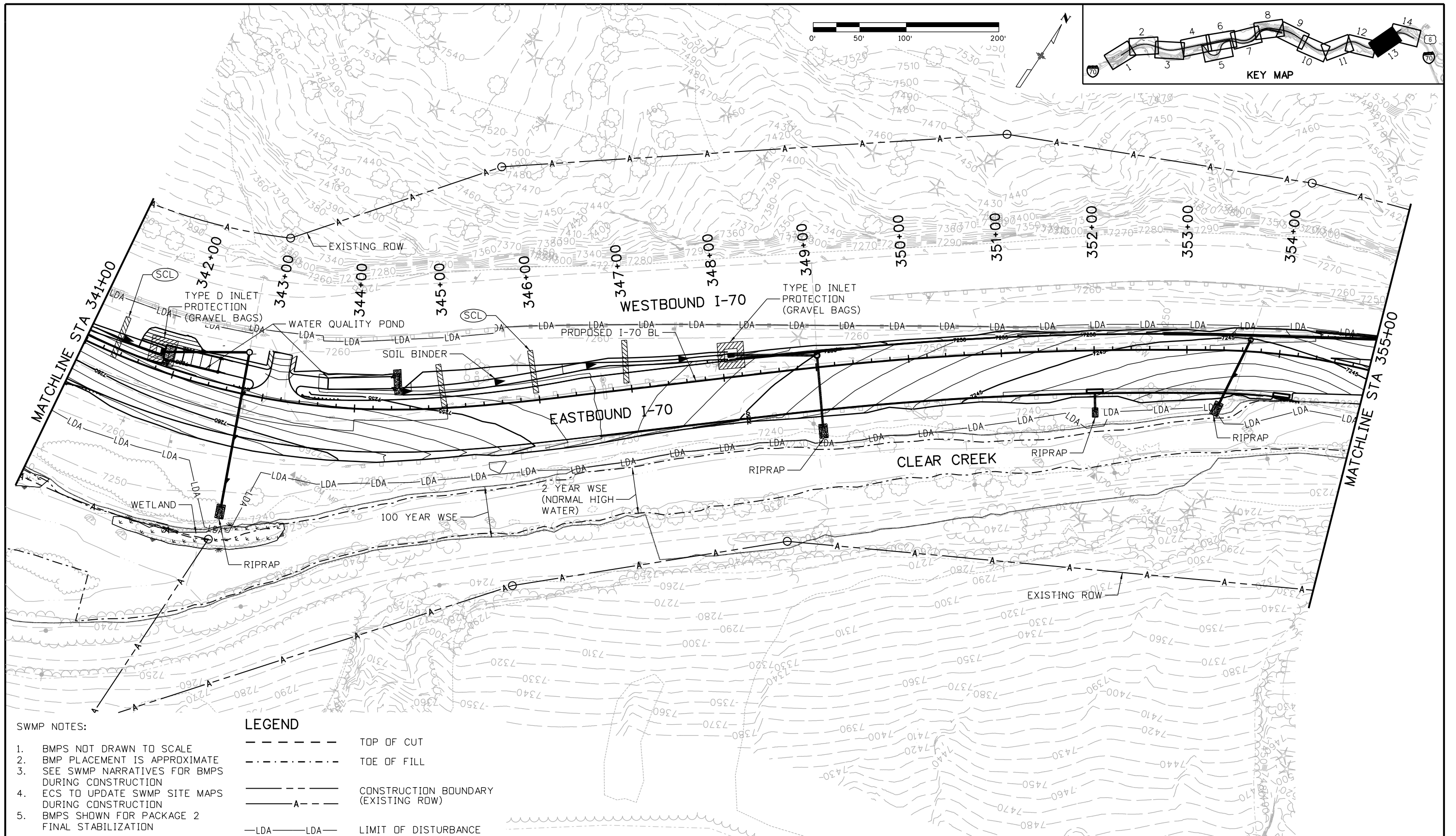
Designer:	J. Hollon	Structure Numbers	
Detailer:	J. Gellner	Subset Sheets:	12 of 14
Subset:	SWMP		

Project No./Code

IM 0703-391

19036

Sheet Number 396



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 2 FINAL STABILIZATION

LEGEND

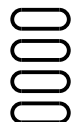
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Print Date: 3/7/2013

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No Revisions:

Revised:

Void:

**EASTBOUND I-70
STORMWATER MANAGEMENT PLAN
SITE MAP**

Designer: J. Hollon
Detailer: J. Gellner
Subset: SWMP

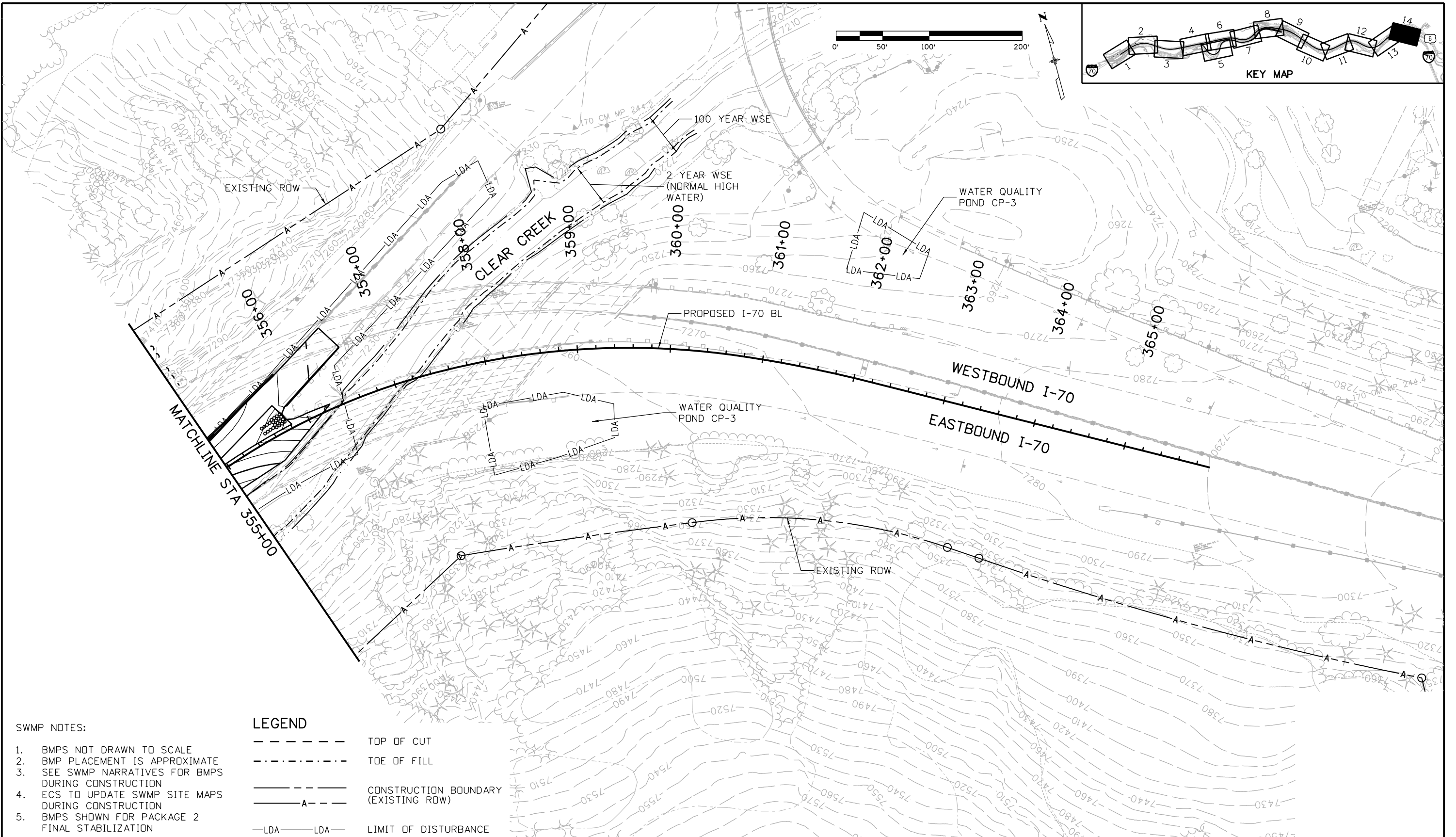
Structure Numbers
Subset Sheets: 13 of 14

Project No./Code

IM 0703-391

19036

Sheet Number 397



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 2 FINAL STABILIZATION

LEGEND

- TOP OF CUT
- - - - - TOE OF FILL
- CONSTRUCTION BOUNDARY (EXISTING ROW)
- - - - - LIMIT OF DISTURBANCE

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Revised:	
Void:	





















**EASTBOUND I-70
 STORMWATER MANAGEMENT PLAN
 SITE MAP**

Designer: J. Hollon
 Detailer: J. Gellner
 Subset: SWMP

Structure Numbers
 Subset Sheets: 14 of 14

Project No./Code	IM 0703-391
	19036
Sheet Number	398

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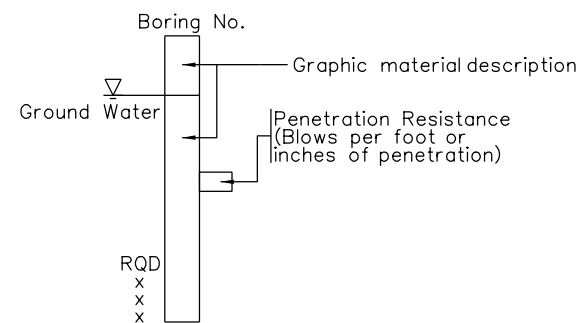
 Asphalt	 Cobbles and gravel	 Low Plasticity Clay	 Concrete
 Fill with Silt as major soil	 Fill with Clay as major soil	 Fill with Gravel as major soil	 Fill with Sand as major soil
 Poorly-graded Sandy Gravel	 Silty Gravel	 GNEISS	 Poorly-graded Gravel
 Void	 Silty Sand	 Poorly-graded Gravelly Sand	 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

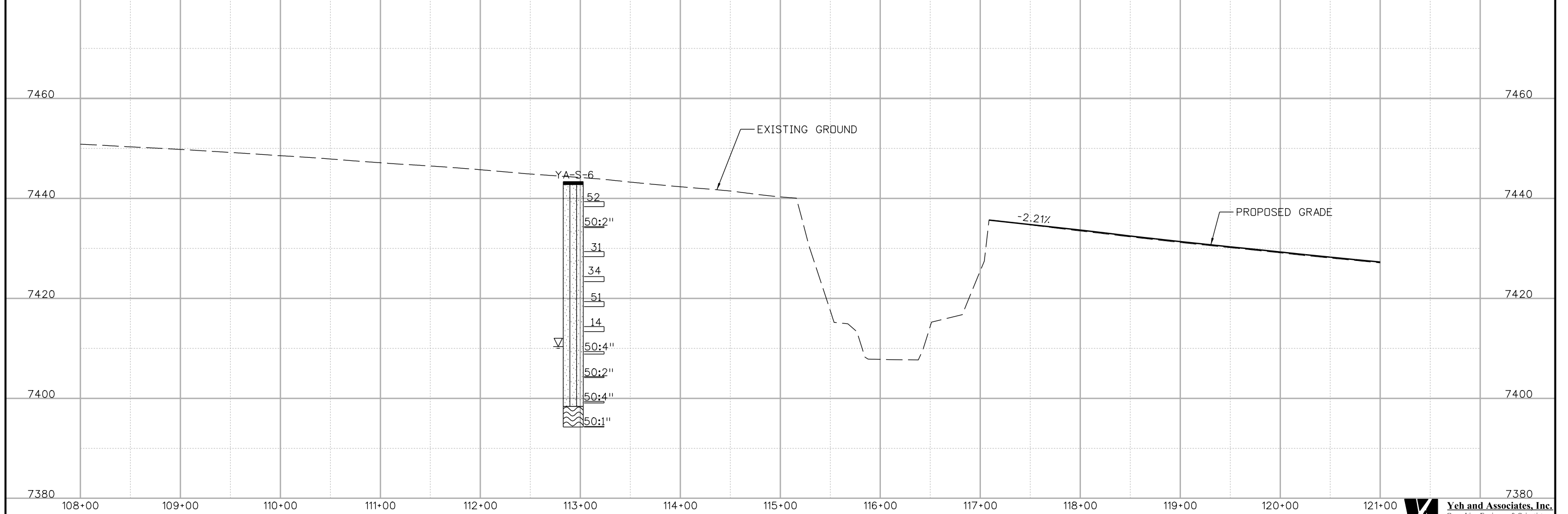
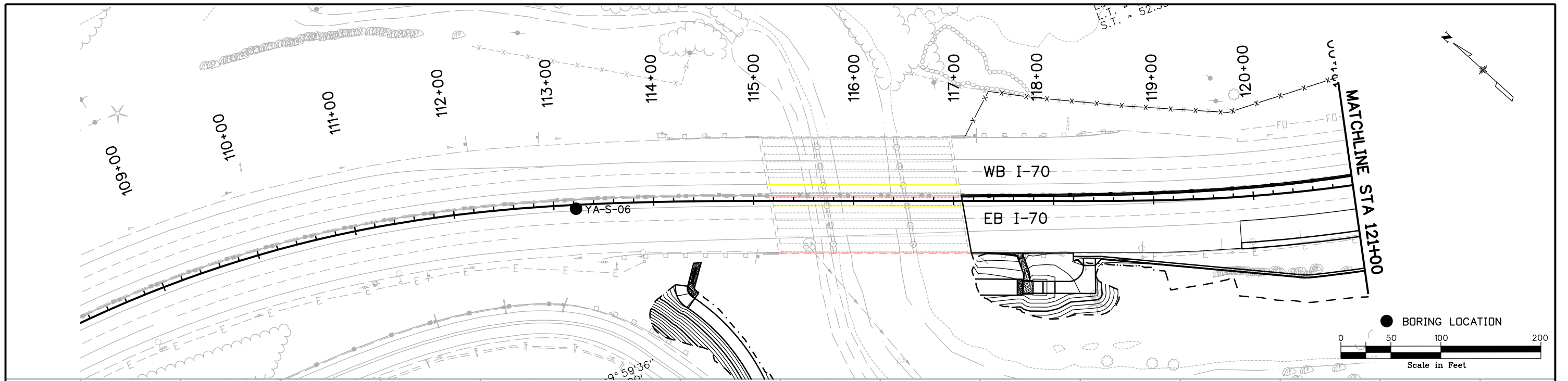
Joint Spacing
Noted near actual depth


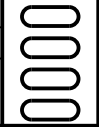
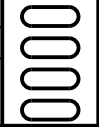
Fracture Frequency
Fractures per foot

Weathering Grade
 WI Fresh
 WII Slightly Weathered
 WIII Moderately Weathered
 WIV Completely Weathered or Decomposed
 WV Residual Soil

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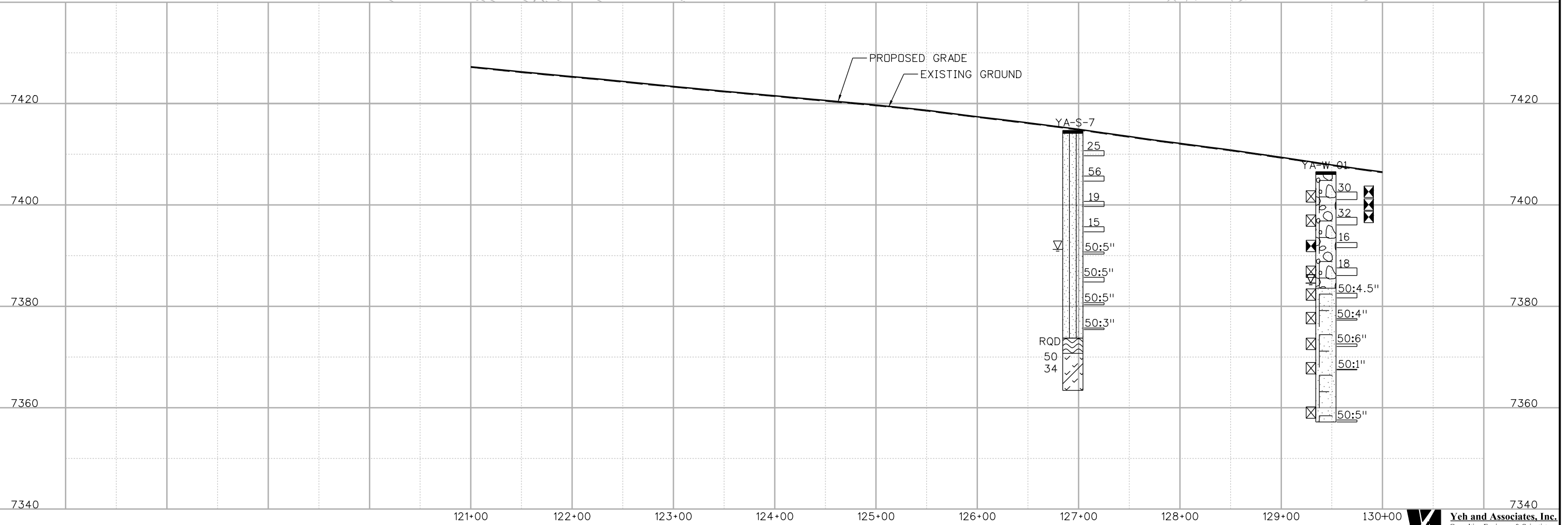
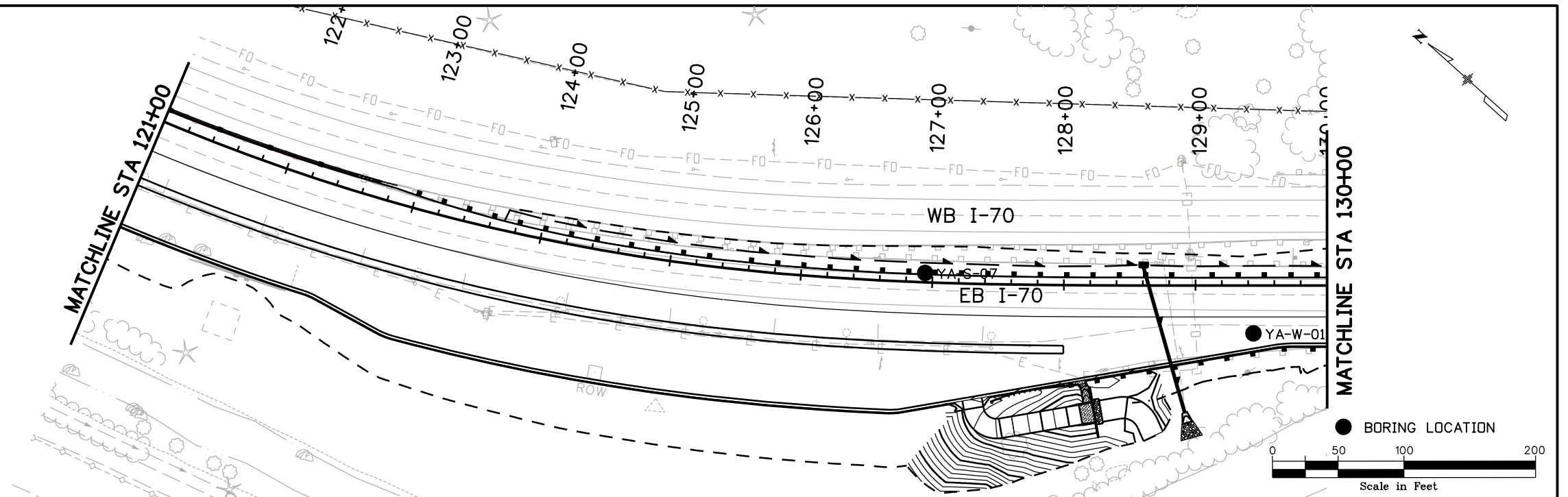
Print Date: 12/12/2012	 4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276	Sheet Revisions			 Colorado Department of Transportation 425 A Corporate Circle Golden, CO 80401 Phone: 720-497-6918 FAX: 720-497-6901 Region 1	As Constructed		EASTBOUND I-70 ENGINEERING GEOLOGY LEGEND			Project No./Code	
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Horiz. Scale: 1:1 Vert. Scale:						Revised:				19036		
Staff Bridge Branch-Unit 0221 STW						Void:				Sheet Number 399		



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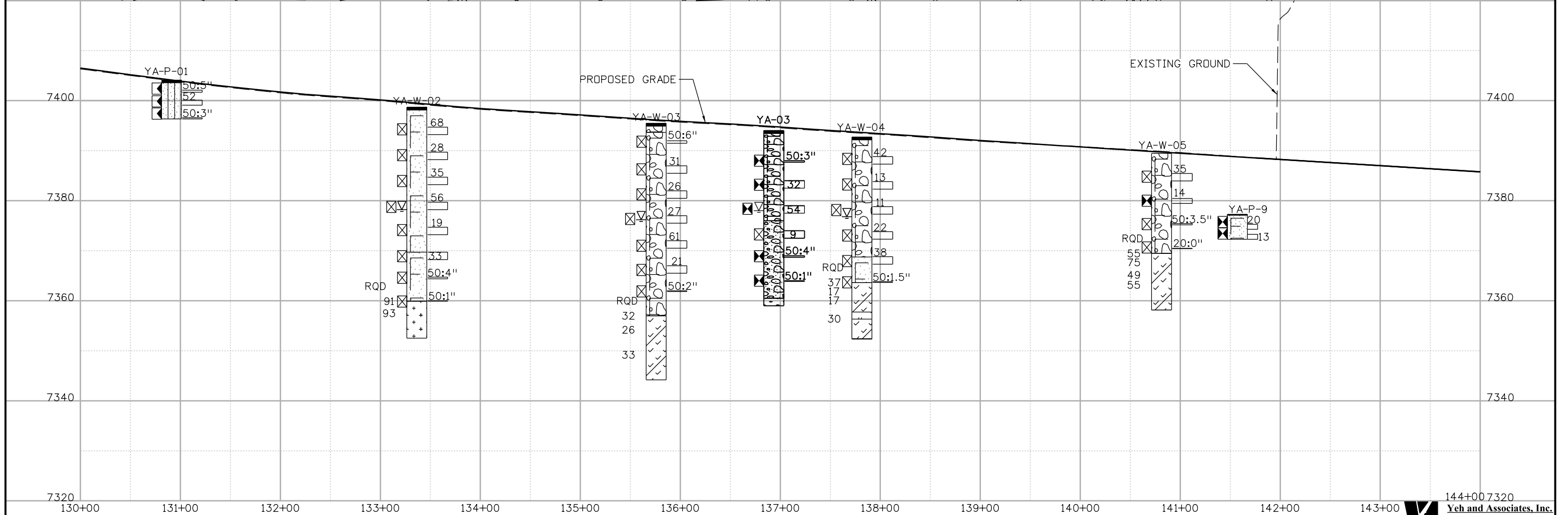
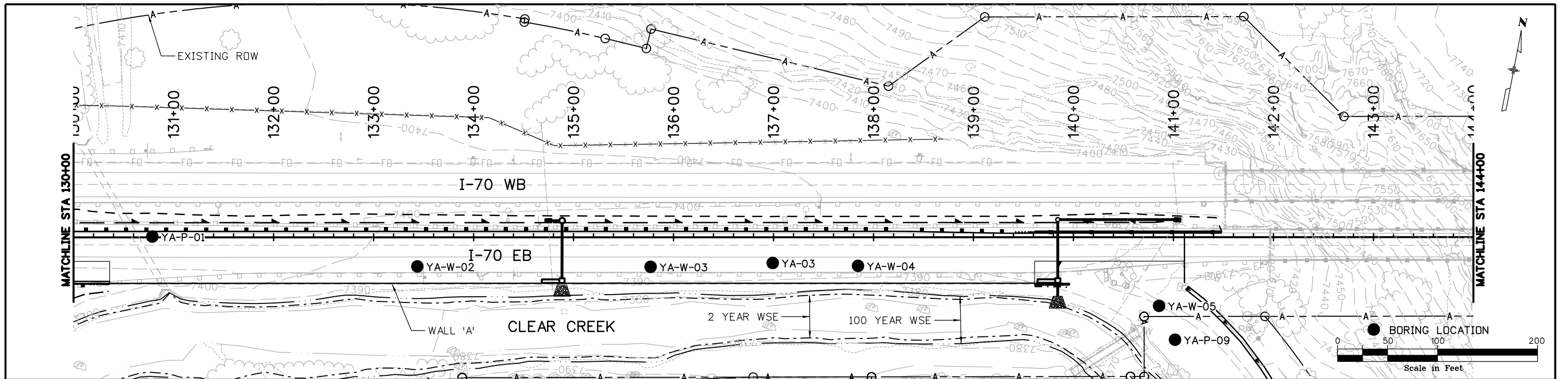
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**EASTBOUND I-70
 ENGINEERING GEOLOGY
 PAVING AND WALL**
 Designer: H. HUME
 Detailer: M. WALZ
 Subset: Geology
 Structure Numbers
 Subset Sheets: 3 of 16

Project No./Code
 IM 0703-391
 19036
 Sheet Number 401

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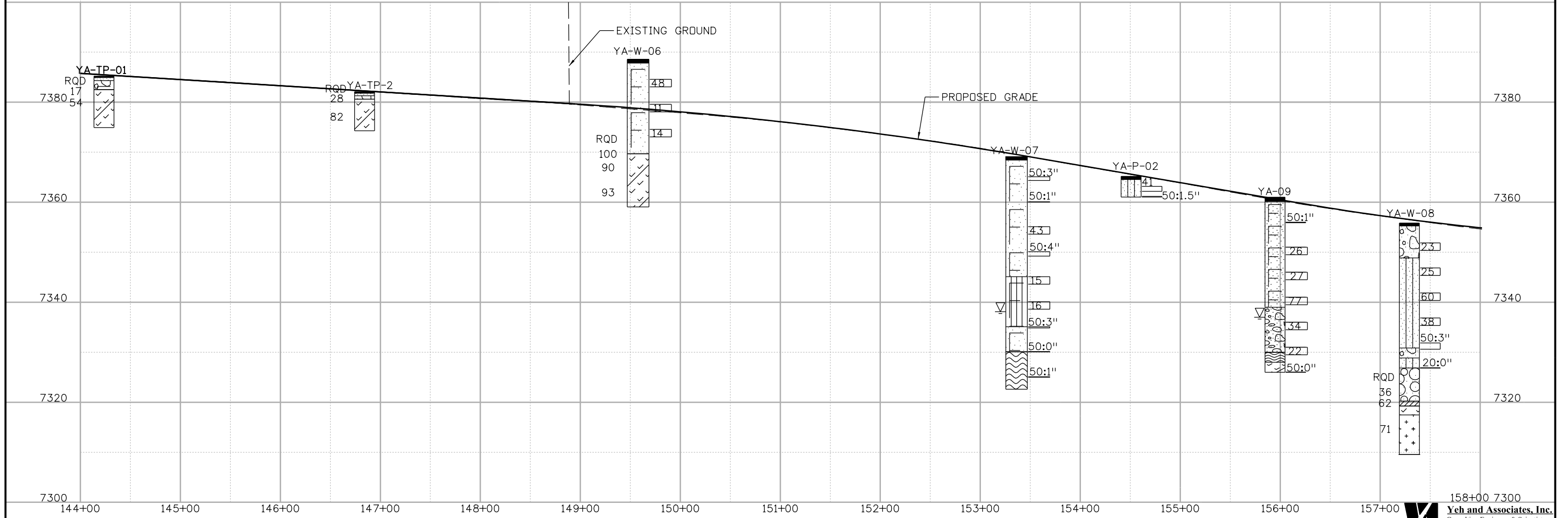
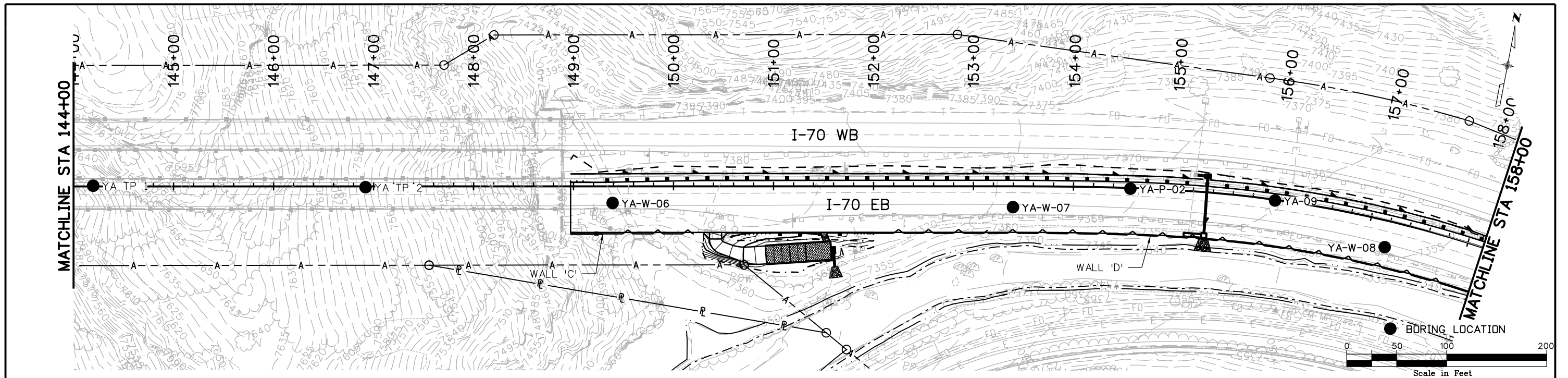
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EASTBOUND I-70 ENGINEERING GEOLOGY PAVING AND WALL			
Designer:	H. HUME	Structure	
Detailer:	M. WALZ	Numbers	
Subset:	Geology	Subset Sheets:	4 of 16

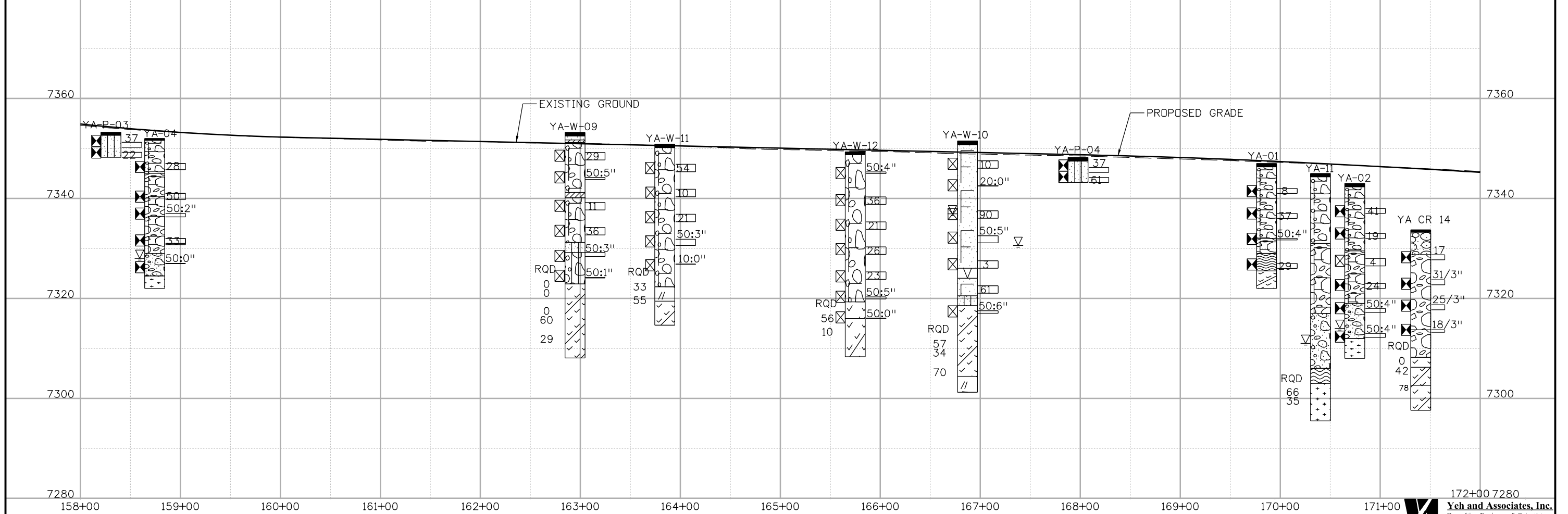
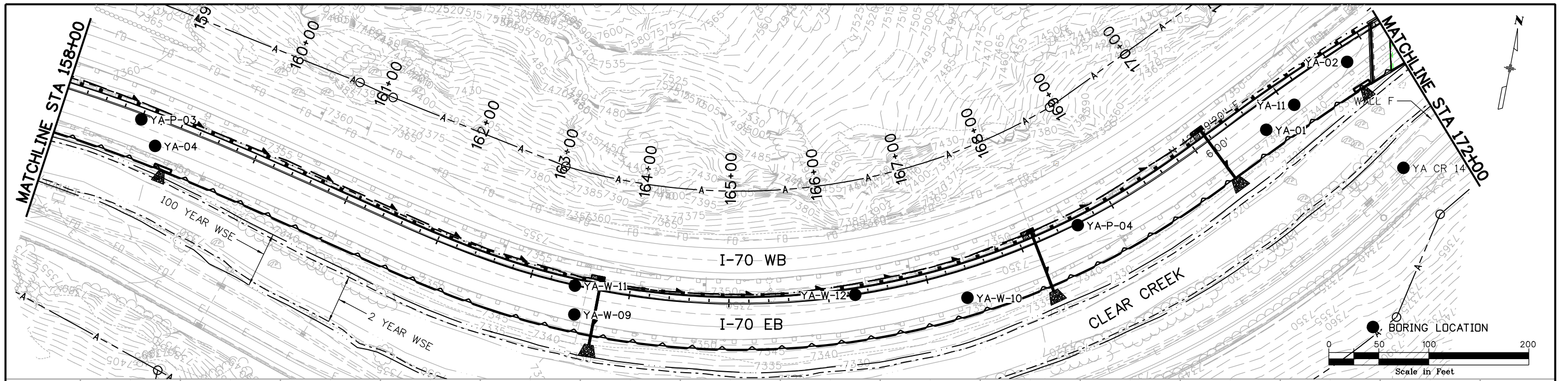
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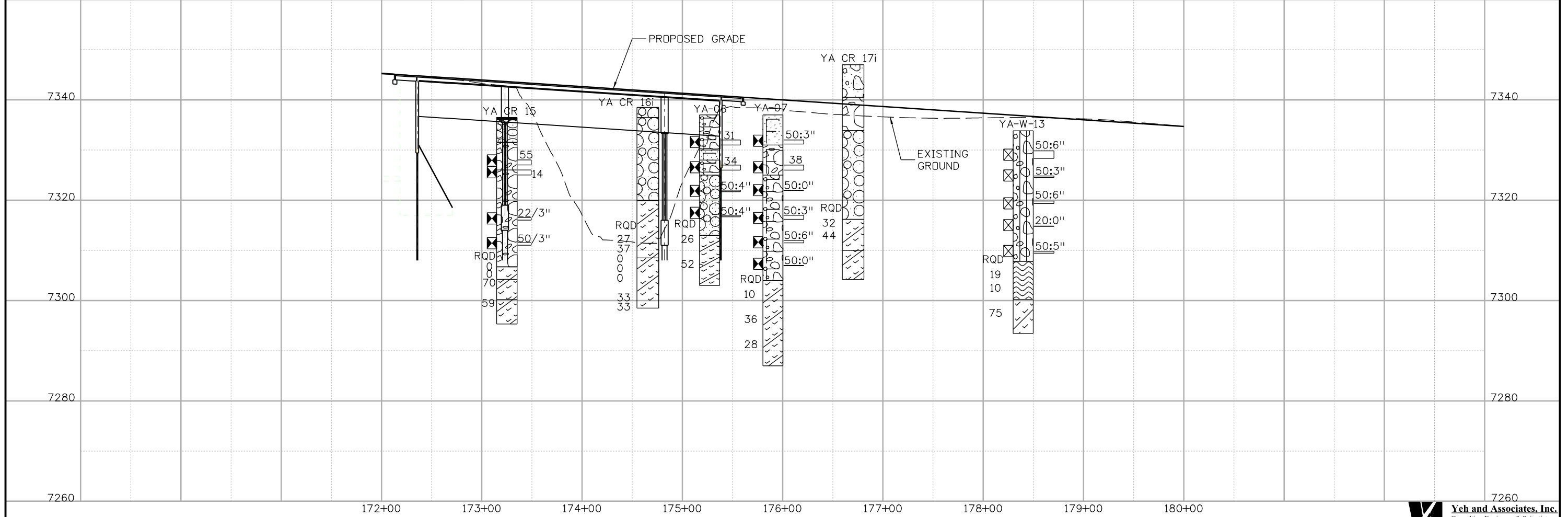
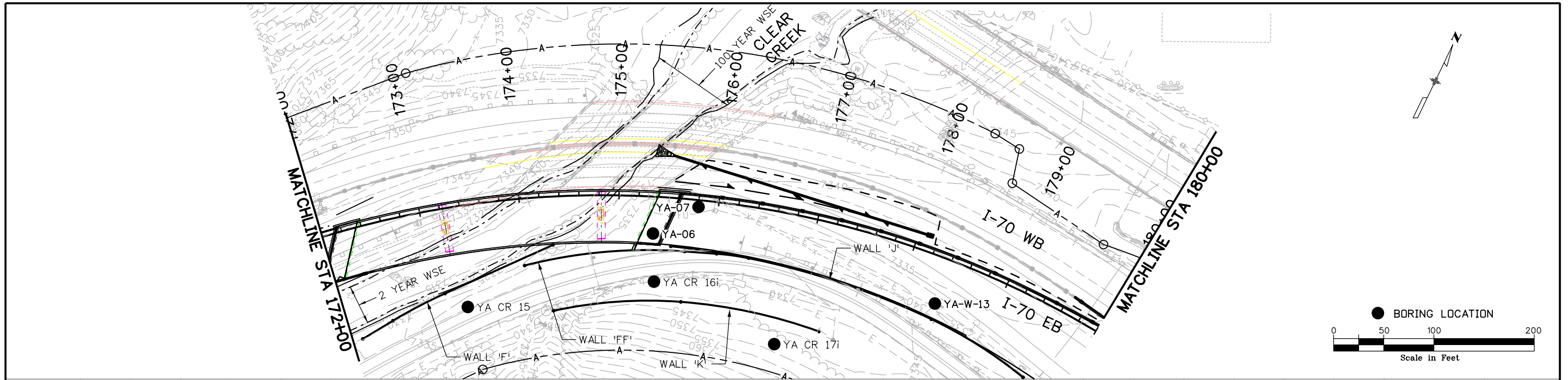
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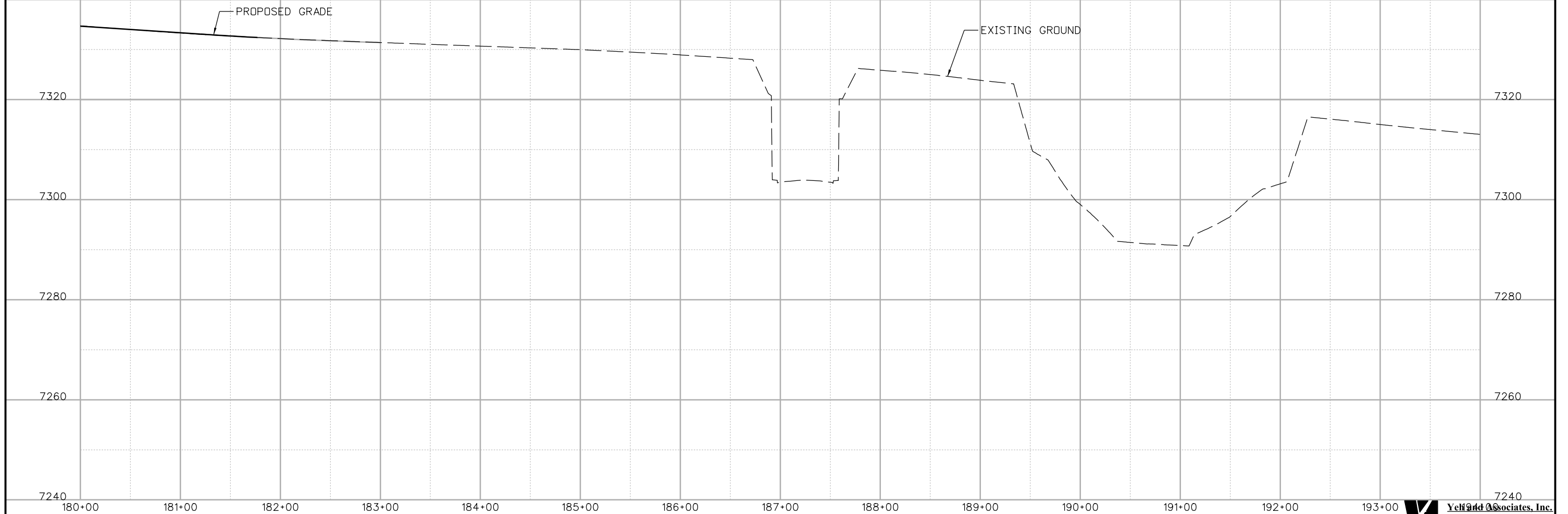
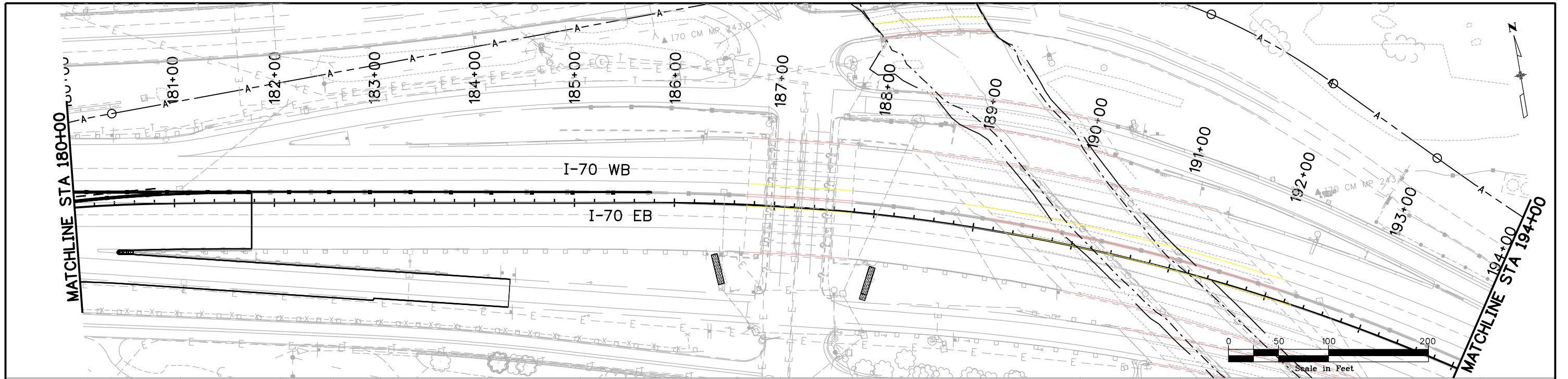
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ATKINS 4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276								Designer: H. HUME Detailer: M. WALZ Subset: Geology		Structure Numbers Subset Sheets: 7 of 16	

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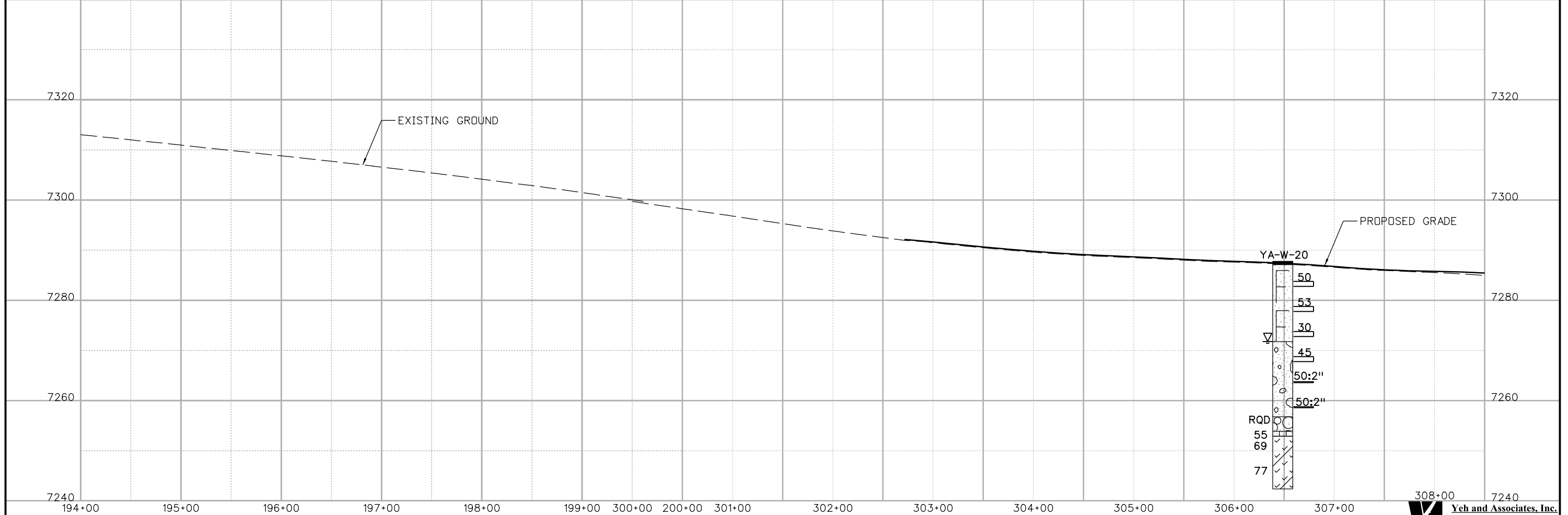
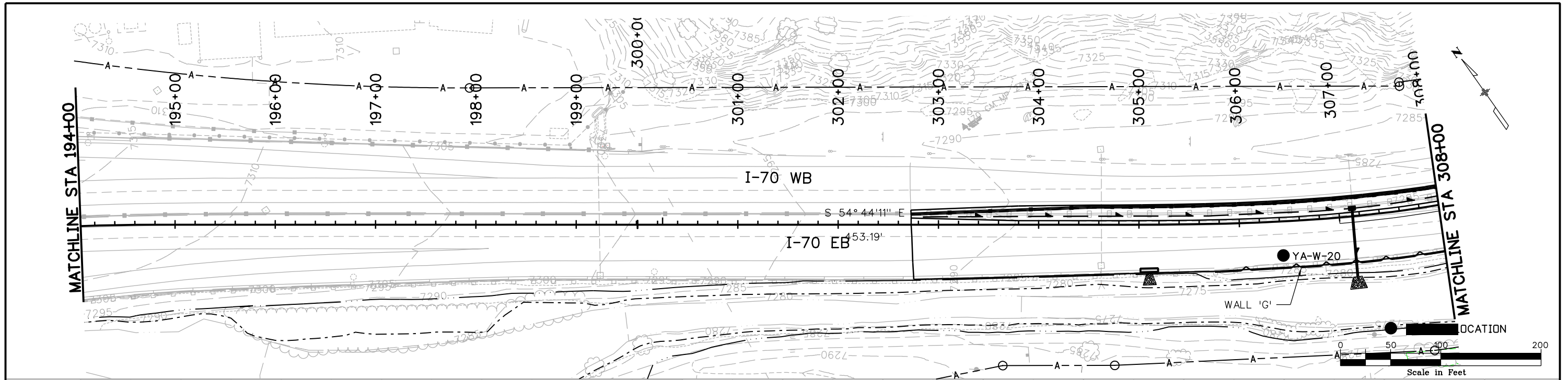
**EASTBOUND I-70
 ENGINEERING GEOLOGY
 PAVING AND WALL**

Designer: H. HUME
 Detailer: M. WALZ
 Subset: Geology

Structure Numbers
 Subset Sheets: 8 of 16

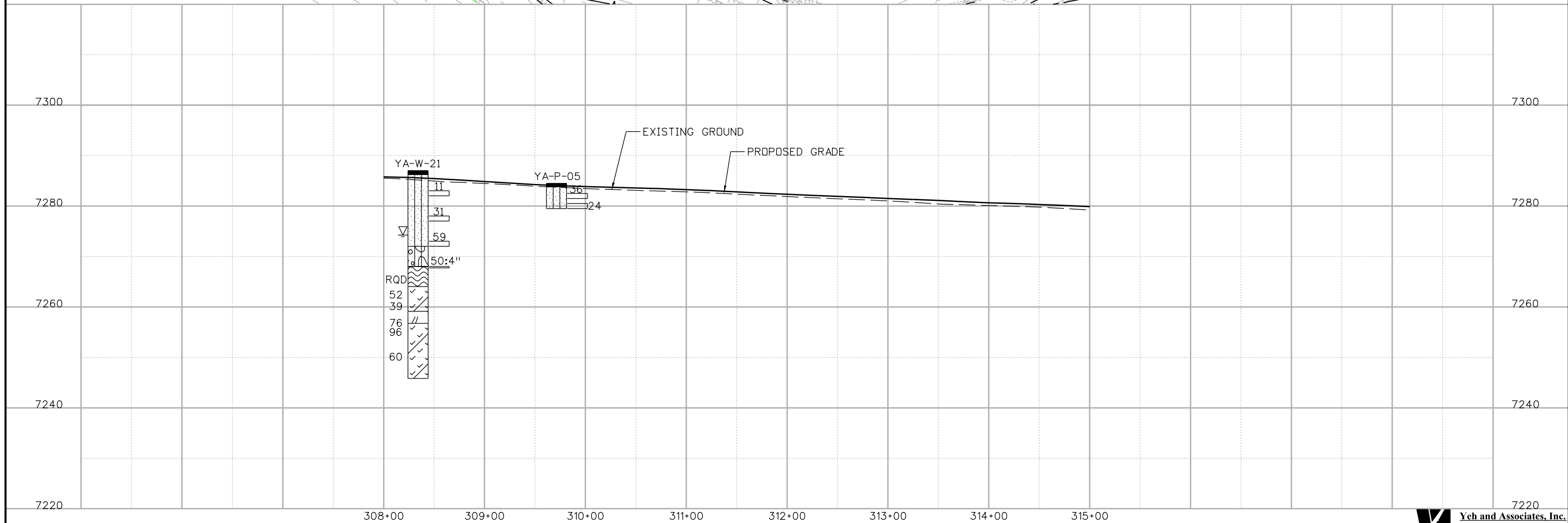
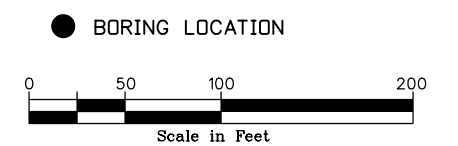
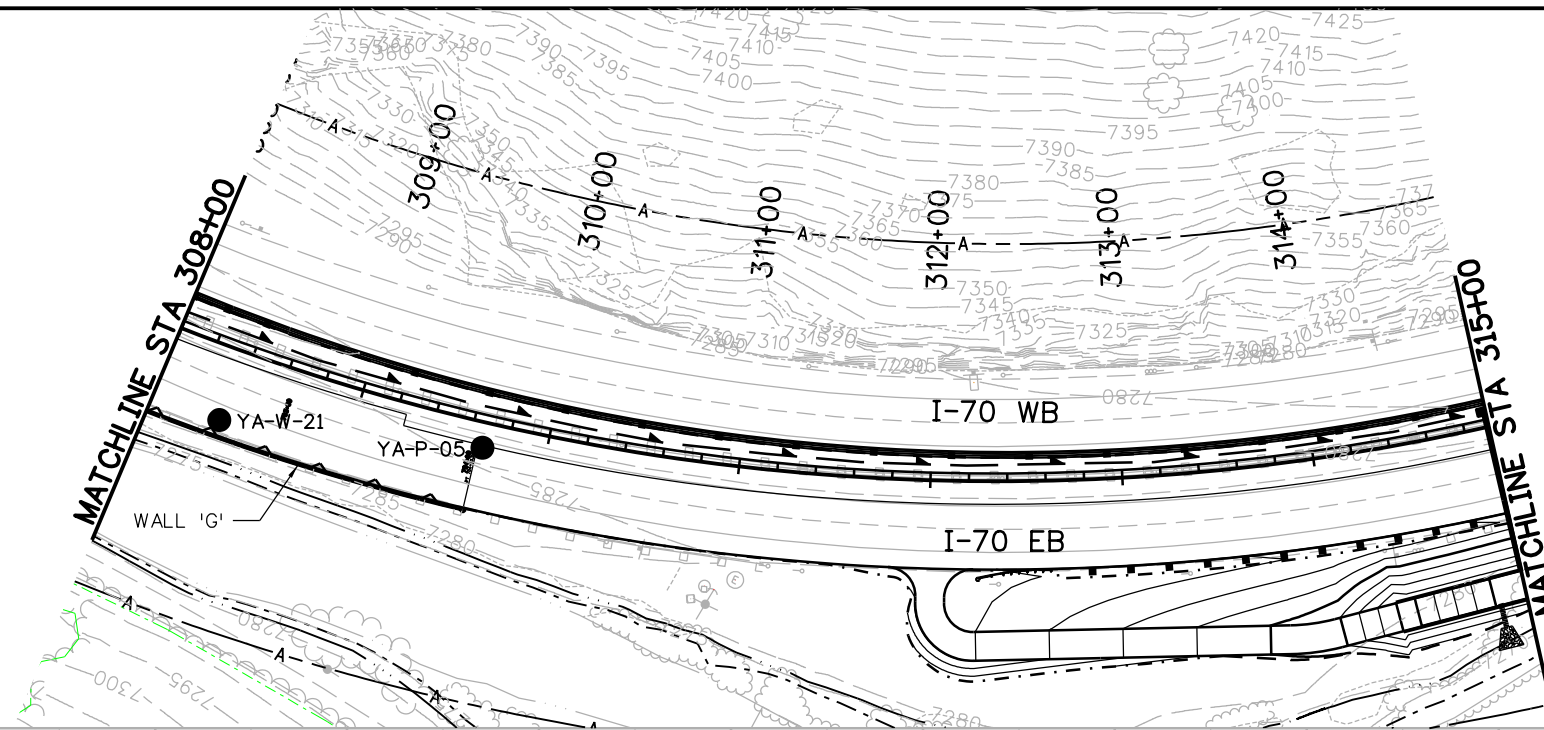
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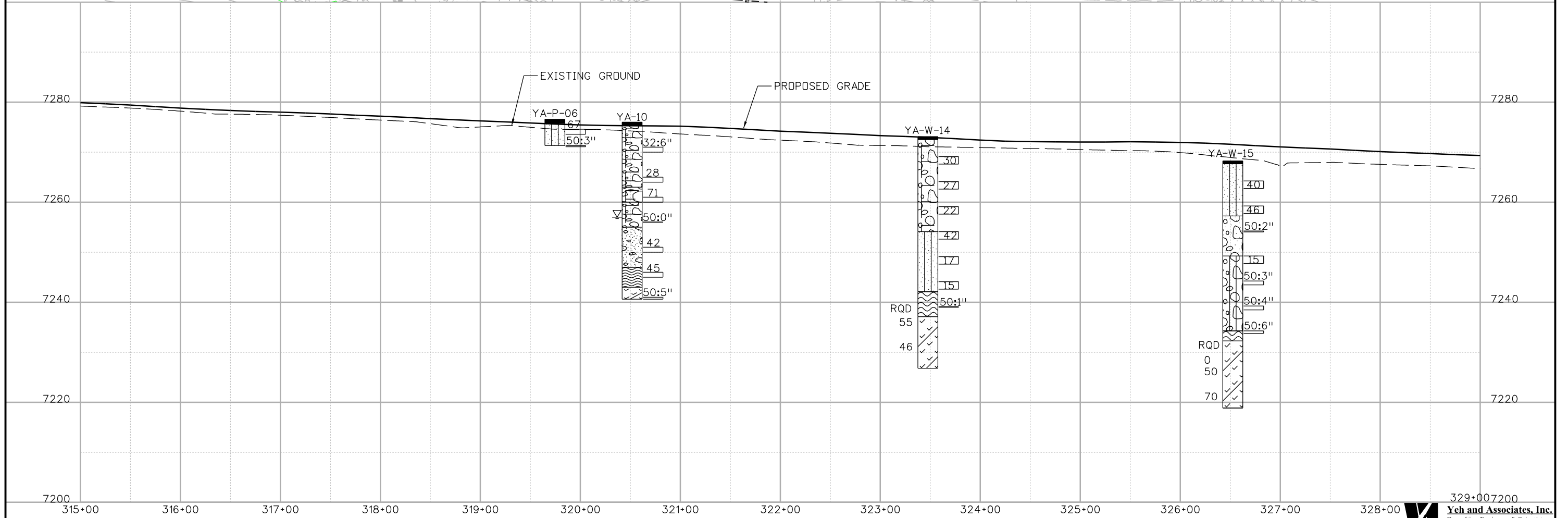
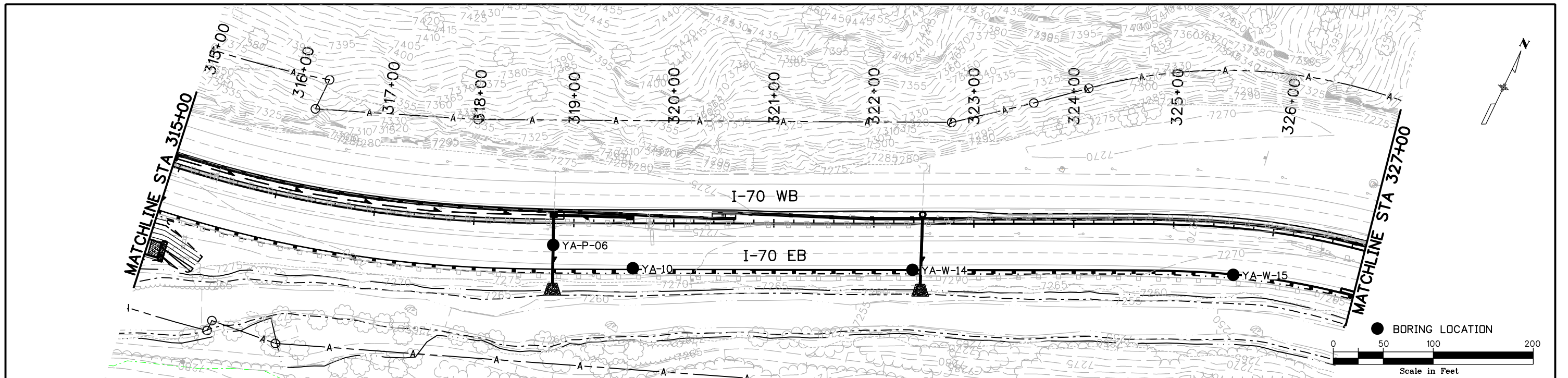
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Staff Bridge Branch-Unit 0221 STW										
4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276						425 A Corporate Circle Golden, CO 80401 Phone: 720-497-6918 FAX: 720-497-6901				
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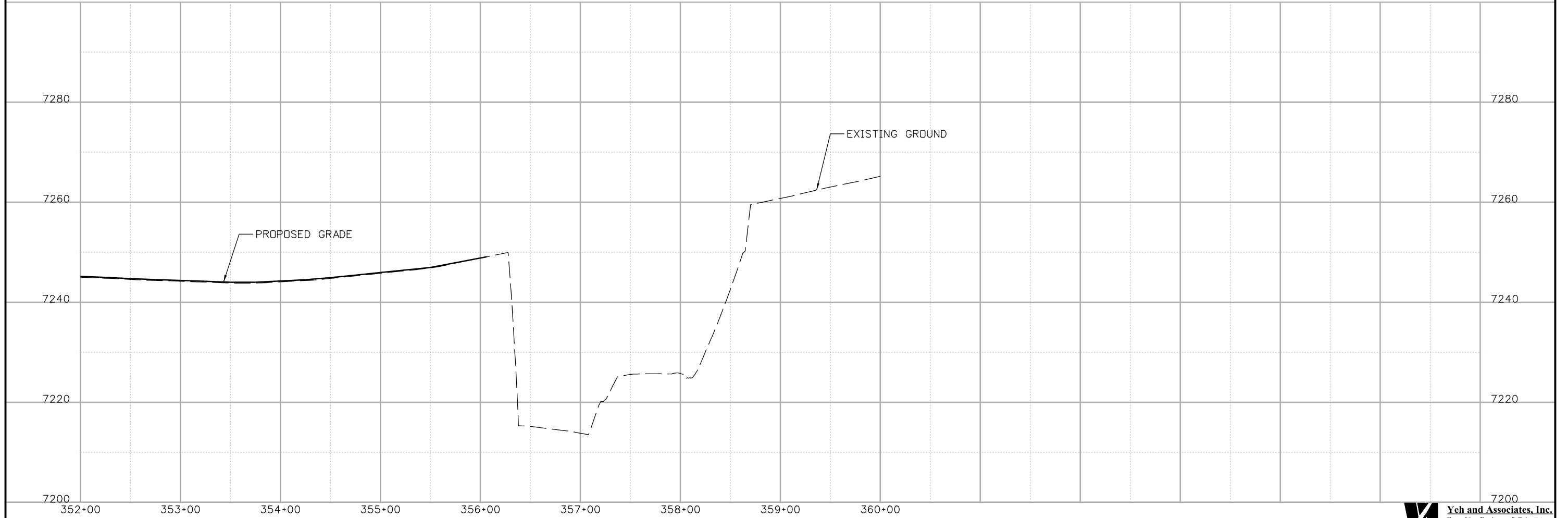
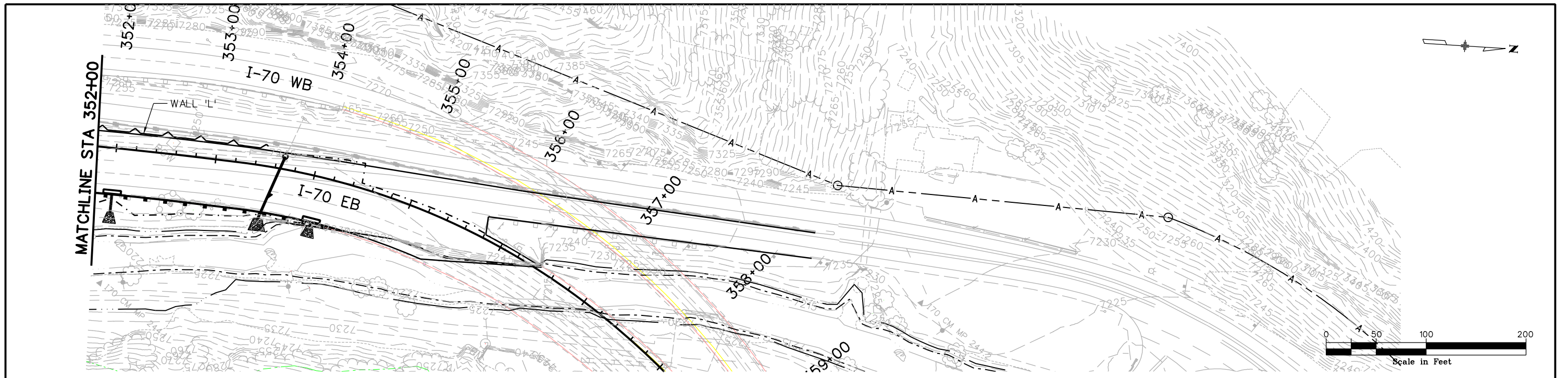
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ATKINS 4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276				Region 1 CRC	Designer: H. HUME Detailer: M. WALZ Subset: Geology	Structure Numbers Subset Sheets: 10 of 16					

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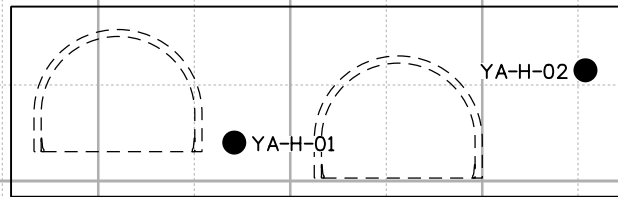
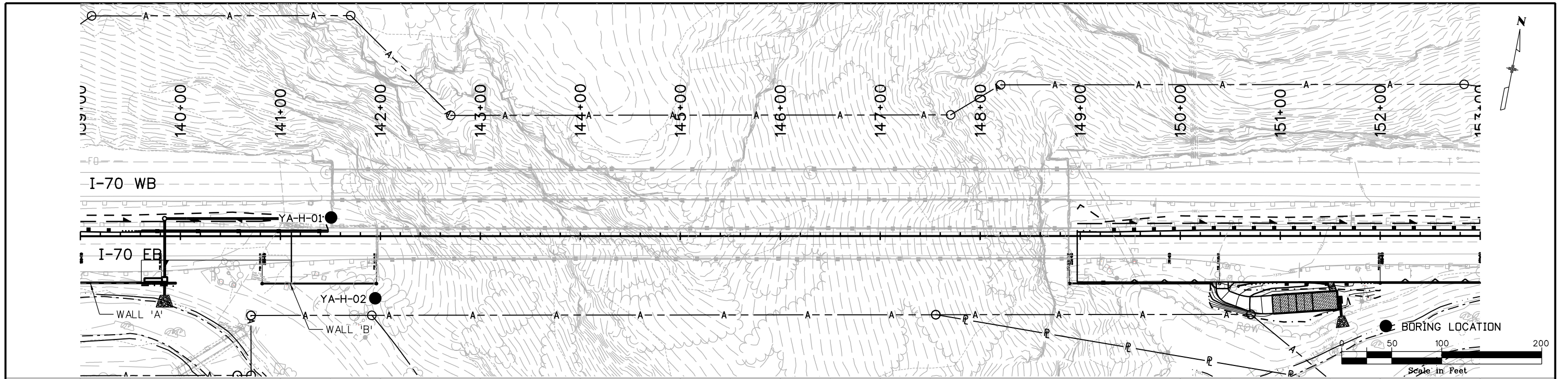
**EASTBOUND I-70
 ENGINEERING GEOLOGY
 PAVING AND WALL**

Designer: H. HUME
 Detailer: M. WALZ
 Subset: Geology

Structure Numbers
 Subset Sheets: 14 of 16

Project No./Code
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 Sheet Number 412

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YA-H-1



YA-H-2



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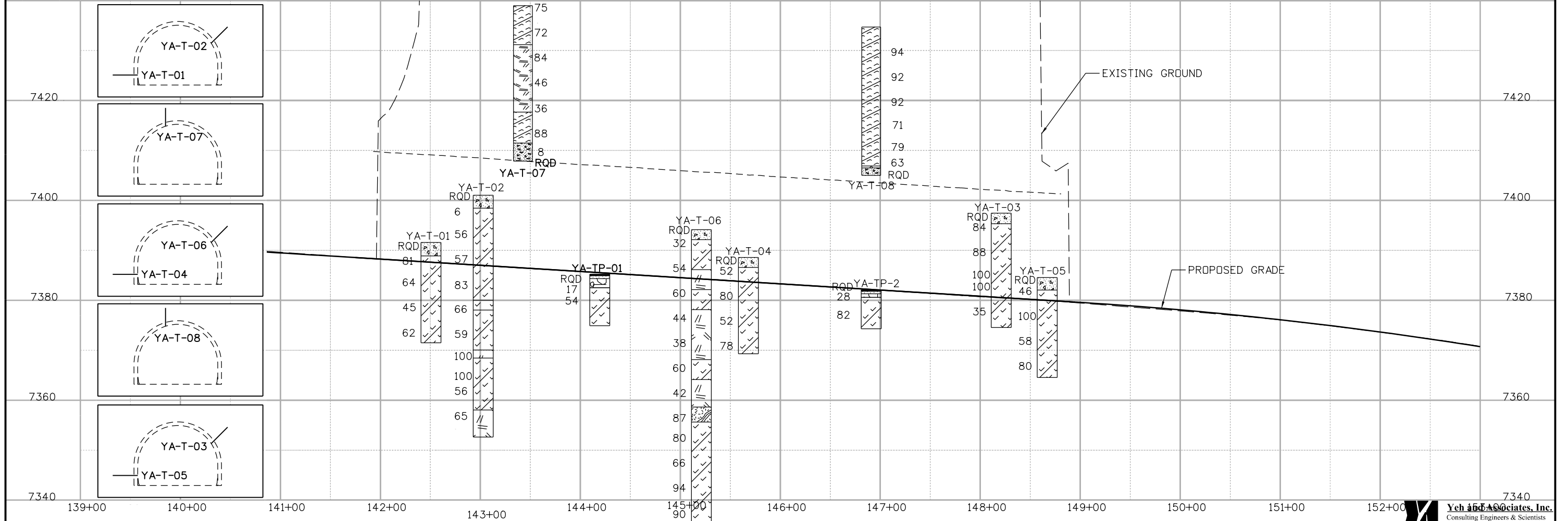
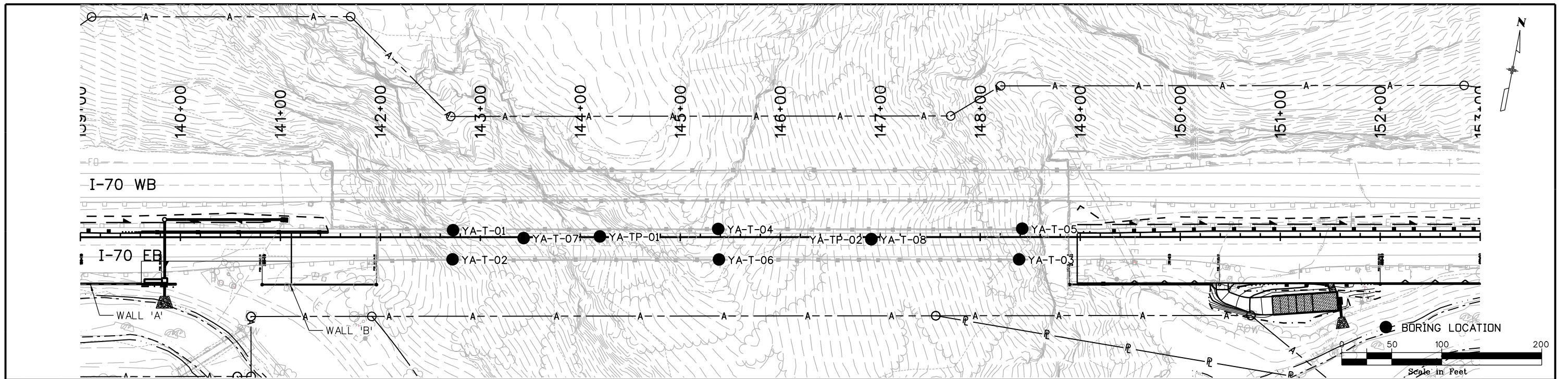
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**EASTBOUND I-70
 ENGINEERING GEOLOGY
 TUNNEL**
 Designer: H. HUME
 Detailer: M. WALZ
 Subset: Geology
 Structure Numbers
 Subset Sheets: 15 of 16

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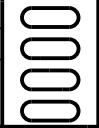
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EASTBOUND I-70
 ENGINEERING GEOLOGY
 TUNNEL
 Designer: H. HUME
 Detailer: M. WALZ
 Subset: Geology
 Structure Numbers
 Subset Sheets: 16 of 16

Project No./Code
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 19036
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