

Thomas Hunt

**COLORADO DEPARTMENT OF TRANSPORTATION  
BRIDGE PROJECT STATUS SHEET**

Sheet # \_\_\_\_\_ of \_\_\_\_\_

Project #: BR 086A-037		Project code (SA#): 13380	
Combined with:		Project code (SA#):	
Hwy #: 86	Description: Bridge Replacement Widening / HBP Overlay		County: Douglas
Region #: 1	Consultant or CDOT Designer: CDOT		
R.E. William Scheuerman	Contractor: Lawrence Construction		
Bids opened: 3/14/02	Completion date:	Notice & Final settlement:	
6/14/02 110	Temp. file kev.: B-5		

New/Rehad'd Structure #	Description (number & length of spans)	Structure cost with 10%	
G-17-CE	CBC (10'x6') CS		
Removed/Replaced Structure #	Description (number & length of spans)		
G-17-W			

**Shop plan distribution** Fabricator:

# of copies	Order #	Date rec'd	Sheet #'s	Consultant approval sent	Ret'd to contr.	P or F
		7/19/02	Plum Clark & Wilson Design CS	7/19/02	8/1/02	P

Remarks: *\* In Status 4-22-02*

Project #: BR 086A-037

Oversight / NHS		As Constructed	
		No. Revisions:	
FHWA REGION VIII OVERSIGHT	<input checked="" type="checkbox"/> NO <input type="checkbox"/> YES	Construction Project Name: SH 86, 5 miles east of Castle Rock (Mitchell Gulch)	Revised:
NATIONAL HIGHWAY SYSTEM	<input checked="" type="checkbox"/> NO <input type="checkbox"/> YES		Void:

# DEPARTMENT OF TRANSPORTATION STATE OF COLORADO

HIGHWAY CONSTRUCTION BID PLANS OF PROPOSED

PROJECT NO. BR 086A-037

STATE HIGHWAY NO. 86

DOUGLAS COUNTY


CONSTRUCTION PROJECT CODE NO. 13380

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Responsible for CMO #1  
Revisions Only

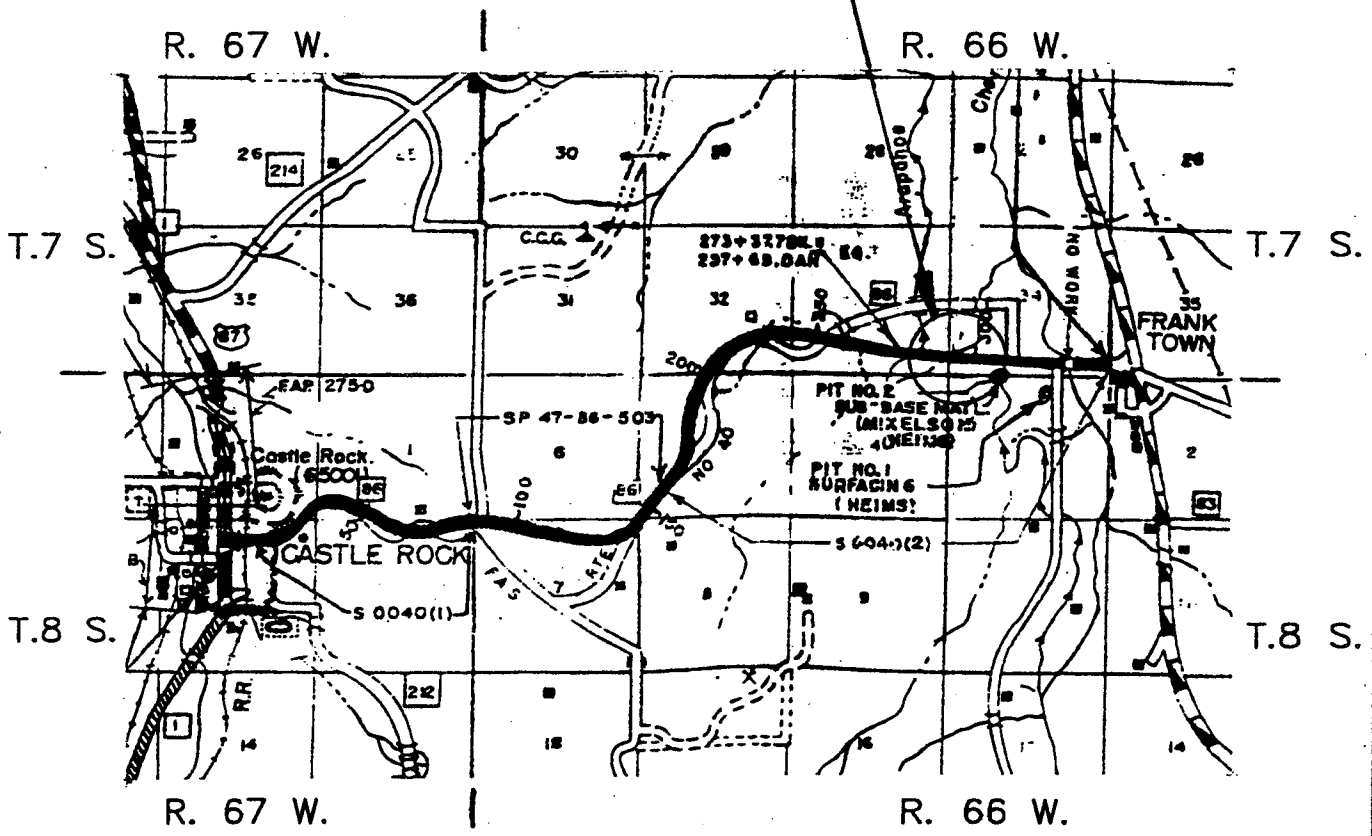



Index of Revisions			Contract Information	
(R-1)	06/17/02	CMO#1	MMS	Contractor:
				Resident Engineer:
				Project Engineer:
				PROJECT STARTED: // ACCEPTED: //
				Comments:

Computer Information				TITLE SHEET		Project No./Code	
Creation Date:	11/30/00	Initials:	TRH			BR 086A-037	
Last Modification Date:	06/05/02	Initials:	RJG	13380			
Full Path:	Q:\SH86\DWGS\PLAN			Designer:	RJE	Region:	1
Drawing File Name:	1Title-86.dwg			Detailer:	TRH	WDS	
ACAD Ver. 2002	Scale: None	Units: English	Sheet Subst:			Sheet:	1

As Constructed
No. Revisions:
Revised:
Void:

PROJECT LOCATION  
 STA. 313+80  
 REF POINT 5.8



<b>Computer Information</b>				<b>Project Location Map</b>		<b>Project No./Code</b>	
Creation Date:	10/04/2000	Initials:	RJE			BR 086A-037	
Last Modification Date:	11/14/2001	Initials:	RJE	13380			
Full Path:	\\earthman\projects\sh86	Designer:	RJE	Region:	1	Sheet Number 2	
Drawing File Name:	location map.dwg	Detailer:	RJE	Unit Leader:	WDS		
ACAD Ver. 2002	Scale: None	Units: English	Sheet Subst:				

As Constructed

No. Revisions:

Revised:

Void:

Station	Linear Feet	
	Roadway	Major Str.
BEGIN PROJECT = STA. 309+00 (R.P. 5.73)	461.33'	33.4' 39.67'
STA. 313+61.33 STA. 313+65.3 STR. NO. G-17-CE STA. 313+98.7 STA. 314+01.00		
END PROJECT = STA. 320+00 (R.P. 5.94)	599.00'	
Totals	1100.00	
<u>SUMMARY</u>		
Roadway	1060.33	39.67'
Major Structure		33.4'
<u>DESIGN DATA</u>		
Minimum Radius of Curve	N/A	
Maximum Grade	-2.42%	
Minimum SSD Vertical	N/A	
Minimum SSD Horizontal	N/A	
Maximum Design Speed	60 mph	
2022 Traffic Volume	ADT	25,213
	DHV	3,278
	% Trucks	9.0
Project Lane Miles = 0.4167		

Responsible for CMO #1  
Revisions Only



For Information only

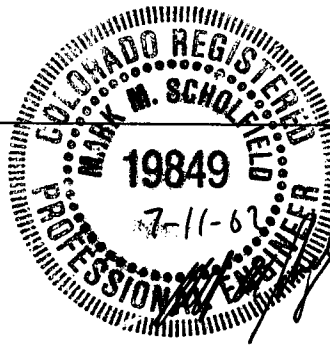
CMO#1, Revised 06/17/02,  
MMS, Wilson & Company

PROJECT DESCRIPTION:

This project is located on State Highway 86 in Douglas County, beginning at R.P. 5.7, west of Franktown and continuing east to R.P. 5.9.

The scope of work includes removal of the existing timber bridge, replacement with a three-cell 10'x6' cell M-standard concrete box culvert, new bridge structure, minor widening, HBP overlay, shouldering, striping, seeding, mulching, and detour construction and removal.

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Last Modification Date:	06/05/02	Initials:	JPG				
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						Sheet Number	3



As Constructed
No Revisions:
Revised:
Void:

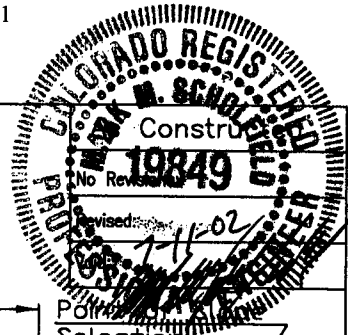
PLAN NUMBER	M STANDARD TITLE	PAGE NUMBER	PLAN NUMBER	M STANDARD TITLE	PAGE NUMBER
<input checked="" type="checkbox"/> M-100-1	STANDARD SYMBOLS	1	<input type="checkbox"/> M-608-1	CURB RAMPS	88
<input type="checkbox"/> M-203-1	APPROACH ROADS	2	<input type="checkbox"/> M-609-1	CURBS, GUTTERS, AND SIDEWALKS (2 SHEETS)	89-90
<input checked="" type="checkbox"/> M-203-2	DITCH TYPES	3	<input type="checkbox"/> M-611-1	CATTLE GUARD (2 SHEETS)	91-92
<input checked="" type="checkbox"/> M-203-10	SUPERELEVATION CROWNED HIGHWAYS	4	<input type="checkbox"/> M-613-1	CONVENTIONAL HIGHWAY LIGHTING (3 SHEETS)	93-95
<input type="checkbox"/> M-203-11	SUPERELEVATION DIVIDED HIGHWAYS SHOULDER PIVOT	5	<input type="checkbox"/> M-613-2	HIGH MAST LIGHTING (2 SHEETS)	96-97
<input type="checkbox"/> M-203-12	SUPERELEVATION STREETS	6	<input type="checkbox"/> M-614-1	RUMBLE STRIPS (2 SHEETS)	98-99
<input type="checkbox"/> M-203-13	SUPERELEVATION DIVIDED HIGHWAYS CENTER PIVOT	7	<input type="checkbox"/> M-615-1	EMBANKMENT PROTECTOR, TYPE 3	100
<input checked="" type="checkbox"/> M-206-1	EXCAVATION AND BACKFILL FOR STRUCTURES (2 SHEETS)	8-9	<input type="checkbox"/> M-615-2	EMBANKMENT PROTECTOR, TYPE 5	101
<input type="checkbox"/> M-206-2	EXCAVATION AND BACKFILL FOR BRIDGES (2 SHEETS)	10-11	<input type="checkbox"/> M-616-1	INVERTED SIPHON	102
<input checked="" type="checkbox"/> M-208-1	TEMPORARY EROSION CONTROL (7 SHEETS)	12-18	<input type="checkbox"/> M-620-1	FIELD LABORATORY, CLASS 1	103
<input checked="" type="checkbox"/> M-210-1	MAILBOX SUPPORTS (2 SHEETS)	19-20	<input type="checkbox"/> M-620-2	FIELD LABORATORY, CLASS 2	104
<input checked="" type="checkbox"/> M-214-1	PLANTING DETAILS	21	<input type="checkbox"/> M-620-11	FIELD OFFICE, CLASS 1	105
<input type="checkbox"/> M-412-1	CONCRETE PAVEMENT JOINTS (3 SHEETS)	22-24	<input type="checkbox"/> M-620-12	FIELD OFFICE, CLASS 2	106
<input type="checkbox"/> M-506-1	GABIONS AND SLOPE MATTRESS	25	<input checked="" type="checkbox"/> M-629-1	SURVEY MONUMENTS (2 SHEETS)	107-108
<input type="checkbox"/> M-510-1	STRUCTURAL PLATE CULVERT PIPE H-20 LOADING	26			
<input type="checkbox"/> M-801-1	SINGLE CONCRETE BOX CULVERT (2 SHEETS)	27-28			
<input type="checkbox"/> M-801-2	DOUBLE CONCRETE BOX CULVERT (2 SHEETS)	29-30			
<input type="checkbox"/> M-801-3	TRIPLE CONCRETE BOX CULVERT (2 SHEETS)	31-32			
<input type="checkbox"/> M-801-10	HEADWALL FOR PIPE CULVERTS	33	<input checked="" type="checkbox"/> S-612-1	TYPICAL DELINEATOR INSTALLATIONS (5 SHEETS)	109-113
<input type="checkbox"/> M-801-11	TYPE "S" SADDLE HEADWALL FOR PIPE CULVERTS	34	<input checked="" type="checkbox"/> S-614-1	TYPICAL GROUND SIGN PLACEMENT	114
<input type="checkbox"/> M-801-12	HEADWALLS AND CULVERT OUTLET PAVING	35	<input checked="" type="checkbox"/> S-614-2	CLASS I GROUND SIGN INSTALLATIONS	115
<input type="checkbox"/> M-801-20	WINGWALLS FOR PIPE OR BOX CULVERTS	36	<input type="checkbox"/> S-614-3	CLASS II GROUND SIGN INSTALLATIONS	116
<input checked="" type="checkbox"/> M-803-1	METAL AND PLASTIC CULVERT PIPE (2 SHEETS)	37-38	<input checked="" type="checkbox"/> S-614-4	CLASS III SIGNS, SHEET ALUMINUM PANELS (3 SHEETS)	117-119
<input type="checkbox"/> M-803-2	REINFORCED CONCRETE PIPE	39	<input checked="" type="checkbox"/> S-614-5	BREAK-AWAY SIGN SUPPORT DETAILS FOR GROUND SIGNS (2 SHEETS)	120-121
<input type="checkbox"/> M-803-3	PRECAST CONCRETE BOX CULVERT	40	<input type="checkbox"/> S-614-6	CONCRETE FOOTINGS AND SIGN ISLANDS FOR CLASS III SIGNS (2 SHEETS)	122-123
<input checked="" type="checkbox"/> M-803-10	CONCRETE AND METAL END SECTIONS (2 SHEETS)	41-42	<input type="checkbox"/> S-614-10	TYPICAL MARKER ASSEMBLY INSTALLATIONS	124
<input type="checkbox"/> M-804-10	INLET, TYPE C	43	<input type="checkbox"/> S-614-11	MILEPOST SIGN AND INSTALLATION	125
<input type="checkbox"/> M-804-11	INLET, TYPE D	44	<input type="checkbox"/> S-614-12	STRUCTURE NUMBER INSTALLATION (BRIDGE INFORMATION SHEET)	126
<input type="checkbox"/> M-804-12	CURB INLET, TYPE R (2 SHEETS)	45-46	<input type="checkbox"/> S-614-14	FLASHING BEACON AND SIGN INSTALLATION (2 SHEETS)	127-128
<input type="checkbox"/> M-804-13	CONCRETE INLET, TYPE 13	47	<input type="checkbox"/> S-614-20	TYPICAL POLE MOUNT SIGN INSTALLATION	129
<input type="checkbox"/> M-804-20	MANHOLES (3 SHEETS)	48-50	<input type="checkbox"/> S-614-21	CONCRETE BARRIER SIGN POST INSTALLATIONS	130
<input type="checkbox"/> M-804-25	VANE GRATE INLET WITH FRAME AND CONCRETE APRON (5 SHEETS)	51-55	<input type="checkbox"/> S-614-22	TYPICAL MULTI-SIGN INSTALLATIONS	131
<input type="checkbox"/> M-805-1	SUBSURFACE DRAINS	56	<input type="checkbox"/> S-614-40	TYPICAL TRAFFIC SIGNAL INSTALLATION DETAILS (5 SHEETS)	132-136
<input type="checkbox"/> M-806-1	GUARDRAIL, TYPE 3, W-BEAM (15 SHEETS)	57-71	<input type="checkbox"/> S-614-50	OVERHEAD SIGNS MONOTUBE (12 SHEETS)	137-148
<input type="checkbox"/> M-806-12	GUARDRAIL, TYPE 4, CONCRETE BARRIER (2 SHEETS)	72-73	<input checked="" type="checkbox"/> S-627-1	TYPICAL PAVEMENT MARKINGS (5 SHEETS)	149-153
<input type="checkbox"/> M-806-13	GUARDRAIL, TYPE 7, F-SHAPE BARRIER (4 SHEETS)	74-77	<input checked="" type="checkbox"/> S-630-1	TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION (10 SHEETS)	154-163
<input checked="" type="checkbox"/> M-807-1	WIRE FENCES AND GATES (3 SHEETS)	78-80	<input checked="" type="checkbox"/> S-630-2	BARRICADES, DRUMS, CONCRETE BARRIERS (TEMP) & VERTICAL PANELS	164
<input type="checkbox"/> M-807-2	CHAIN LINK FENCE (3 SHEETS)	81-83	<input checked="" type="checkbox"/> S-630-3	FLASHING BEACON (PORTABLE) DETAILS	165
<input type="checkbox"/> M-807-3	BARRIER FENCE	84			
<input type="checkbox"/> M-807-4	DEER FENCE AND GATES (2 SHEETS)	85-86			
<input type="checkbox"/> M-807-10	PICKET SNOW FENCE	87			

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

COLORADO  
DEPARTMENT OF TRANSPORTATION  
STANDARD PLANS LIST  
M & S STANDARDS  
OCTOBER 1, 2000

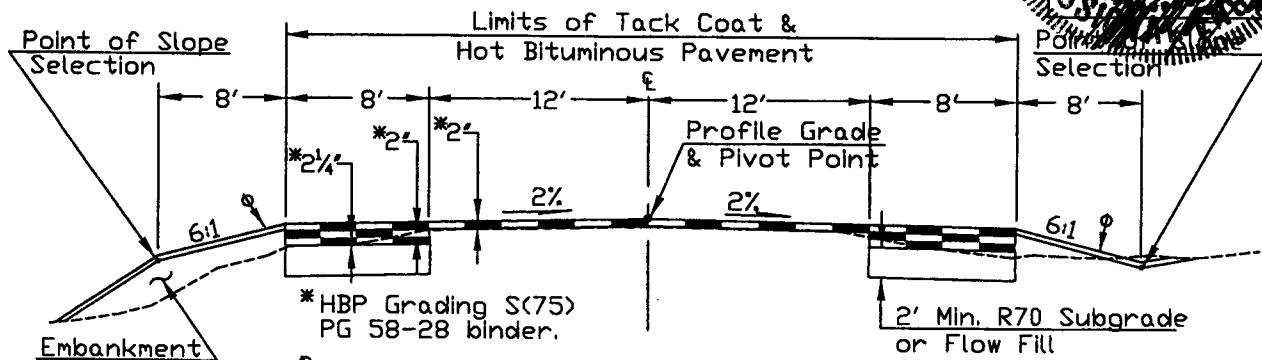
CMO#1, Revised 06/17/02,  
MMS, Wilson & Company

Standard Plans List		Computer File Information			Project No./Code
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Designer: TH		Region: 1	Last Modification Date: 06/05/02	Initials: JPG	
Detailer: RJE		Unit Leader: WDS	Full Path: Q:\SH86\DWGS\PLAN		BR 086A-037
Sheet Subset:		Sheet:	Drawing File Name: Standard Plans List.dwg	13380	
		Acad Ver. 2002	Scale: None	Units: English	Sheet Number 4



### Mainline Typical Section

Sta 309+00 to Sta 312+75 &  
Sta 315+15 to Sta 320+00



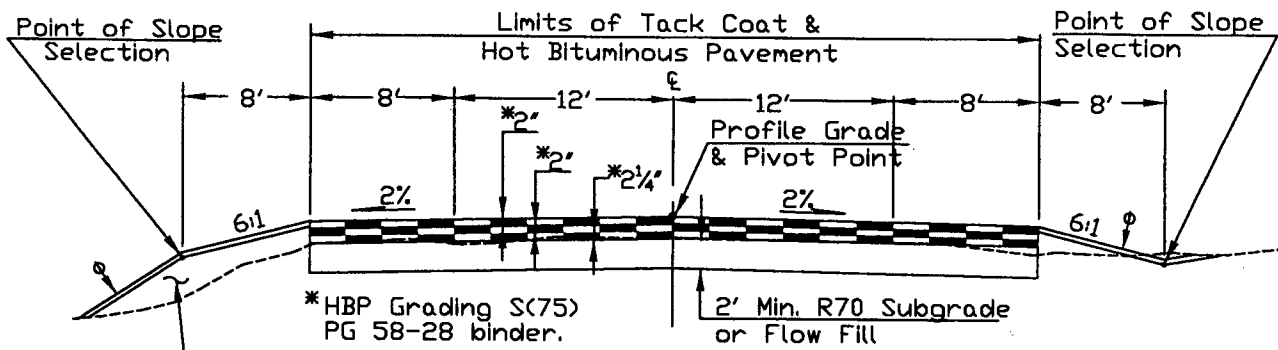
\* HBP Grading S(75)  
PG 58-28 binder.

Topsoil to this line.

Break points in slopes and in bottom of ditches shall be rounded during construction for a pleasing appearance.

### Mainline Typical Section

Sta 312+75 to Sta 315+15



\* HBP Grading S(75)  
PG 58-28 binder.

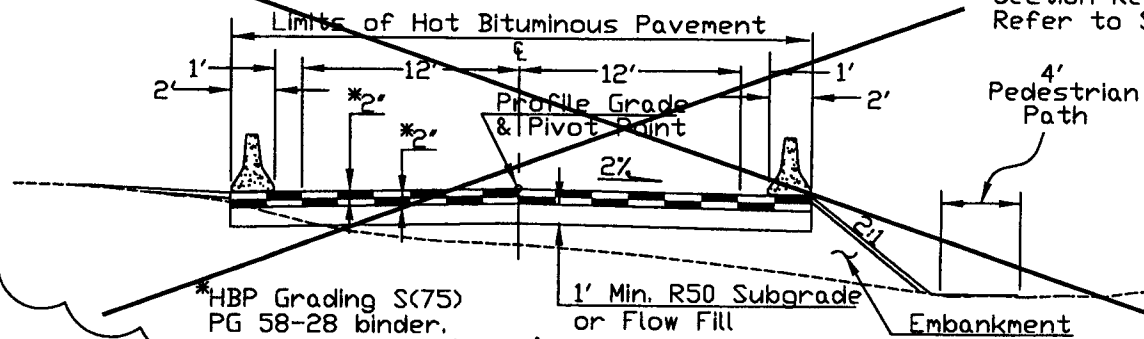
Topsoil to this line.

CMD#1, Revised 06/17/02,  
MMS, Wilson & Company

### Detour Typical Section

Sta 309+00 to Sta 319+00  
(Run detour over section of new CBC)

Detour Typical Section Revised,  
Refer to Sht. 5a



\* HBP Grading S(75)  
PG 58-28 binder.

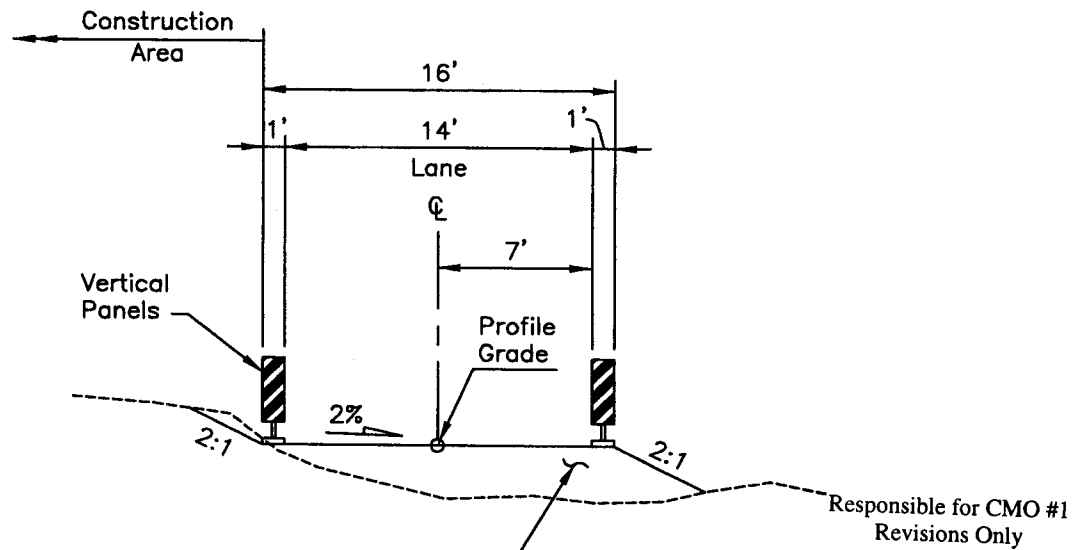
1' Min. R50 Subgrade  
or Flow Fill

Embankment

Computer File Information			TYPICAL SECTIONS		Project No./Code	
Creation Date:	05/16/01	Initials: RJE			BR 086A-037	
Last Modification Date:	06/05/02	Initials: JPG	13380		Sheet Number	
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Drawing File Name:	Typical.dwg		Unit Leader:	WDS	5	
Acad Ver.	2002	Scale: None	Sheet Subset:			

As Constructed
No Revisions:
Revised:
Void:


## Detour Typical Section – Bridge Construction One Way Traffic



Embankment sealed with Magnesium Chloride. Magnesium Chloride will not be paid for separately, but shall be included in the price of the work.



CMO#1, Added new sheet 5a, with new detour typical sections – 06/17/02, MMS, Wilson & Company

Computer File Information				TYPICAL SECTIONS		Project No./Code		
Creation Date:	06/04/02	Initials:	RJG			BR 086A-037		
Last Modification Date:	06/17/02	Initials:	RJG			13380		
Full Path:	Q:\SH86\DWGS\PLAN		Designer:			RJE	Region:	1
Drawing File Name:	5aTypical.dwg		Detailer:	RJE	Unit Leader:	WDS	Sheet Number	5a
Acad Ver.	2002	Scale:	None	Units:	English	Sheet:		

## GENERAL NOTES

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

1. For preliminary plan quantities of pavement materials, the following rates of application were used:

Hot Bituminous Pavement (Grading S(75)(PG 58-28))..... 110 lbs/SY/inch  
 Tack coat diluted emulsified asphalt (slow setting) ..... 0.1 gal/SY (diluted)

Rates of application shall be as determined by the Engineer at the time of application.

2. Diluted emulsified asphalt for tack coat shall consist of 1 part emulsified asphalt and 1 part water.

3. Water shall be used as a dust palliative as directed by the Engineer. This will not be paid for separately, but shall be included in the work.

Rates of application shall be as determined by the Engineer at the time of application.

4. A ski type device at least 30 feet in length shall be furnished and used with each bituminous paver.

5. Prior to applying bituminous material, removal of dirt and gravel from the existing mat is required. This will not be paid for separately, but shall be included in the work. Where new bituminous pavement is placed next to existing asphalt pavement, the edge of the existing pavement shall be cut full depth to a neat line. This will not be paid for separately, but shall be included in the work.

6. Any layer of bituminous pavement that is to have a succeeding layer placed thereon shall be completed full width before the succeeding layer is placed.

7. Depth of moisture-density control for this project shall be as follows:  
 Full depth of all embankments  
 Bases of cuts and fills 0.5 feet


Type of compaction for this project will be AASHTO T-99. Excavation required for compaction of bases of cuts and fills will be considered subsidiary to that operation and will not be paid for separately.

Two feet of R-70 material will be required beneath new permanent pavement. If the existing material does not meet this requirement, it will need to be excavated and replaced with acceptable material. The imported material will be paid for as Embankment (CIP). Clean excavated material may be used in side slopes in accordance with applicable provisions of Section 203.

8. After removal of the detour, the embankment shall be graded to conform to the permanent design configuration. Regrading will not be paid for separately but shall be included in the cost of the work. Material removed from the detour may be used as slope flattening along the mainline.

9. It is estimated that 10 hours of dozing with a (small) 100 to 150 HP dozer will be required for drainage modification at the CSP extension, as directed by the Engineer.

10. Utility lines as shown on the plan and profile sheets are plotted from the best available information. The Contractor shall field verify the location of utility lines before commencing with work. The Contractor's attention is directed to section 105.06 of the standard specifications concerning coordination with utility companies.

<b>Computer File Information</b>			<h1 style="font-size: 2em;">General Notes</h1>			Project No./Code	
Creation Date:	04/27/01	Initials: TRH				BR 086A-037	
Last Modification Date:	01/31/02	Initials: TRH	13380		Sheet Number	6	
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Drawing File Name:	6GenNote1-86.dwg		Detailer:	TRH	Unit Leader:	WDS	
ACAD ver.:	2002	Scale: None	Units: None	Sheet Subject: GenNot		Sheet 1 of 2	



As Constructed
No. Revisions:
Revised:
Void:

**GENERAL NOTES (cont'd)**

11. The 36" pipe at station 319+53 will be extended at both ends. The pay item for this work will be for installed pipe, complete in place. Excavation and backfill will not be paid separately but shall be included in the work. No additional embankment will be required over these pipe extensions unless directed by the Engineer.

~~12. The Contractor shall maintain a 4' wide pedestrian path around the work zone. This will not be paid for separately but shall be included in the work.~~

13. Clearing and Grubbing will not be paid for separately but shall be included in the work.

14. The Contractor shall limit construction activities to those areas within the limits of disturbance and toes of slopes as shown in the plans and cross-sections. Any disturbance beyond the limits shall be restored to original condition at the Contractor's expense. Construction activities include all work processes as well as vehicle and equipment parking, disposal of litter, and any other activity which would alter existing conditions. Vehicle or equipment parking shall not be permitted in or near the streambed.

15. Natural water may exist at structures. Pumping this water is considered incidental to the project and will not be paid for separately. The Contractor shall be responsible for obtaining all required permits, in accordance with section 107 of the Standard Specifications and any applicable laws, before dewatering commences.

16. The Contractor is responsible for notifying local residents, the fire department, police, and schools of detour schedules and lane closure schedules for this project.

17. Construction surveying will be required on this project and will be paid for as construction surveying, lump sum. A type 2 monument will be required to replace #580 (east of the bridge).

18. It is also estimated that the following will be required on this project:

Responsible for CMO #1 Revisions Only

- 202 Remove Bridge 1 each
- 202 Remove Delineator 13 each
- 202 Remove Guardrail Type 3 225 LF
- 202 Remove End Anchorage 4 each
- 203 Potholing 4 hours
- 612 Delineator (Type I) (crystal) 4 each
- 612 Delineator (Type II) (crystal) 8 each
- 612 Delineator (Type III) (yellow) 4 each
- ~~620 Field Office (Class 1) 1 each~~
- ~~620 Field Lab (Class 1) 1 each~~
- 620 Sanitary Facility 1 each
- 626 Mobilization 1 LS



CMO#1, Revised 06/17/02, MMS, Wilson & Company

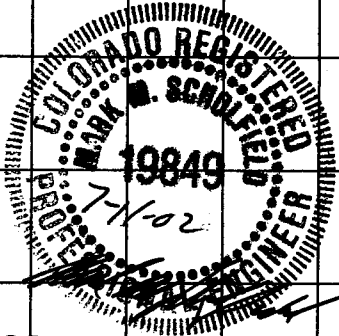
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Last Modification Date:	06/17/02	Initials: JPG	Region: 1		13380	
Full Path:	Q:\SH86\DWGS\PLAN		Designer:	RJE	Unit Leader: WDS	
Drawing File Name:	7GenNote2-86.dwg		Detailer:	TRH	Sheet Number 7	
ACAD ver.:	2002	Scale: None	Units: None	Sheet Subject: GenNot	Sheet 2 of 2	



**SUMMARY OF APPROXIMATE QUANTITIES**

INDEX			CONTRACT ITEM NO.	CONTRACT ITEM	UNIT	Roadway		Structure G-17-CE		PROJECT TOTALS	
BOOK	PAGE	SHEET				PLAN	AS CONST.	(R-1)	PLAN	AS CONST.	PLAN
			202-00090	Removal of Delineator	EACH	13					13
			202-00250	Removal of Pavement Marking	SF	150					150
			202-00400	Removal of Bridge	EACH			1			1
			202-01000	Removal of Fence	LF	501					501
			202-01130	Removal of Guardrail Type 3	LF	225					225
			202-01300	Removal of End Anchorage	EACH	4	(R-1)				4
			203-00060	Embankment Material (Complete In Place)	CY	2,773					2,773
			203-01550	Dozing	HOUR	10					10
			203-01597	Potholing	HOUR	4					4
			206-00000	Structure Excavation	CY			604			604
			206-00065	Structure Backfill (Flow-Fill)	CY			173			173
			206-00200	Structure Backfill (Class 2)	CY			188			188
			207-00205	Topsoil	CY	480		257			480
			207-00210	Stockpile Topsoil	CY	480					480
			208-00005	Erosion Log	LF	100					100
			208-00020	Silt Fence	LF	200					200
			210-00011	Reset Mailbox Structure (Type 1)	EACH	1					1
			210-01011	Reset Gate	EACH	1					1
			212-00006	Seeding (Native)	ACRE	0.9					0.9
			213-00002	Mulching (Weed Free Hay)	ACRE	1.1					1.1
			213-00061	Mulch Tackifier	LB	165					165
			403-00720	Hot Bituminous Pavement (Patching) (Asphalt)	TON	50					50
			403-33721	Hot Bituminous Pavement (Grading S) (75) (PG 58-28)	TON	1,153					1,153
			420-00111	Geotextile (Drainage)(Class A)	SY			370			370

Responsible for CMO #1 Revisions Only

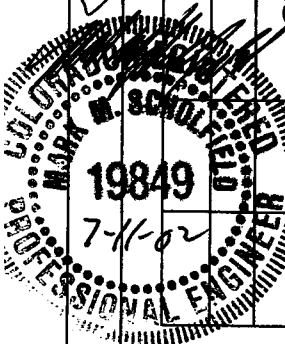


<b>Computer File Information</b>			<b>Sheet Revisions</b>				<b>SUMMARY OF APPROXIMATE QUANTITIES</b>			<b>Project No./Code</b>	
Creation Date: 02/19/02	Initials: TRH	(R-1)	06/17/02	CMO #1		MMS				BR 086A-037	
Last Modification Date: 06/17/02	Initials: RJG									Designer: RJE	
Full Path: Q:\SH86\DWGS\PLAN							Detailer: TRH		Unit Leader: WDS		
Drawing File Name: 13380_Sheet8SAQ.dwg							Sheet Subset: SAQ		Sheet: 1 of 3		
AutoCAD by Autodesk									Sheet Number: 8		

**SUMMARY OF APPROXIMATE QUANTITIES**

INDEX			CONTRACT ITEM NO.	CONTRACT ITEM	UNIT	Roadway			Structure G-17-CE			PROJECT TOTALS	
BOOK	PAGE	SHEET				PLAN	AS CONST.		PLAN	AS CONST.		PLAN	AS CONST.
			411-10255	Emulsified Asphalt (Slow-Setting)	GAL	714						714	
			501-00300	Drive Steel Sheet Piling	SF				579			579	
			502-11274	Steel Piling (HP 12x53)	LF				736			736	
			506-00212	Riprap (12 Inch)	CY				188			188	
			507-00400	Bituminous Slope and Ditch Paving (Asphalt)	TON				10			10	
			<del>601-03030</del>	<del>Concrete Class B (Box Culvert)</del>	<del>CY</del>				<del>301</del>			<del>301</del>	
			601-21000	Precast Wall Segment (Abutment)	EACH				2			2	
			601-21000	Precast Wall Segment (Wingwall)	EACH				4			4	
			606-00301	Guardrail Type 3 (6-3 Post Spacing)	LF	625						625	
			606-01370	Transition Type 3G	EACH	4						4	
			606-02005	End Anchorage (Flared)	EACH	4						4	
			<del>602-00000</del>	<del>Reinforcing Steel</del>	<del>LB</del>				<del>64,353</del>			<del>64,353</del>	
			606-11030	Bridge Rail Type 10M	LF				77			77	
			607-00005	End Post	EACH	2						2	
			607-00010	Corner and Line Brace Post	EACH	14						14	
			607-01000	Fence Barbed Wire with Metal Posts	LF	380						380	
			607-11580	Fence (Temporary)	LF	359						359	
			612-00001	Delineator (Type I)	EACH	4						4	
			612-00002	Delineator (Type II)	EACH	8						8	
			612-00003	Delineator (Type III)	EACH	4						4	
			614-00013	Sign Panel (Class III)	SF	7						7	
			614-01502	Steel Sign Post (2 Inch Round)	LF	20						20	
			617-00036	36 Inch Culvert Pipe	LF	26						26	
			618-06038	Prestressed Concrete Slab (Special)	EACH				8			8	
			620-00001	Field Office (Class 1)	EACH	1						1	
			620-00011	Field Laboratory (Class 1)	EACH	1						1	
			620-00020	Sanitary Facility	EACH	1						1	
			621-00460	Detour Pavement	SY	1,593						1,593	
			625-00000	Construction Surveying	L S	1						1	
			626-00000	Mobilization	L S	1						1	
			627-00002	Thermoplastic Pavement Marking	SF	1,350						1,350	
			627-00011	Pavement Marking Paint (Waterborne)	GAL	20						20	
			629-01002	Survey Monument (Type 2)	EACH	1						1	
			630-00000	Flagging	HOUR	112						112	

Responsible for CMO #1  
Revisions Only



Computer File Information		Sheet Revisions			SUMMARY OF APPROXIMATE QUANTITIES			Project No./Code	
Creation Date: 02/19/02	Initials: TRH	<input checked="" type="checkbox"/> 06/17/02	CMO #1	MMS				BR 086A-037	
Last Modification Date: 06/17/02	Initials: RJG	<input type="checkbox"/>			13380				
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AutoCAD by Autodesk		<input type="checkbox"/>							

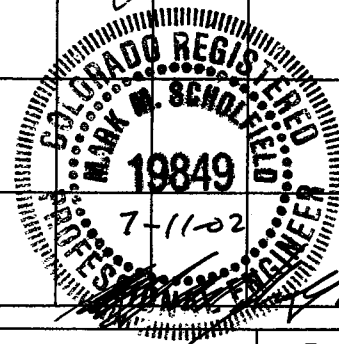
Designer: RJE  
Detailer: TRH  
Sheet Subset: SAQ



Region: 1  
Unit Leader: WDS  
Sheet: 2 of 3

**SUMMARY OF APPROXIMATE QUANTITIES**

INDEX			CONTRACT ITEM NO.	CONTRACT ITEM	UNIT	Roadway				Structure G-17-CE		PROJECT TOTALS	
BOOK	PAGE	SHEET				PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.		
			630-00007	Traffic Control Inspection	DAY	6						6	
			630-00012	Traffic Control Management	DAY	15						15	
			<del>630-80336</del>	<del>Barricade (Type 3 M-B) (Temporary)</del>	EACH	<del>4</del>						<del>4</del>	
			630-80341	Construction Traffic Sign (Panel Size A)	EACH	8						8	
			630-80342	Construction Traffic Sign (Panel Size B)	EACH	10						10	
			630-80343	Construction Traffic Sign (Panel Size C)	EACH	4						4	
			630-80344	Construction Traffic Sign (Special)	SF	64						64	
			630-80350	Vertical Panel	EACH	60						60	
			<del>630-80360</del>	<del>Drum Channelizing Device</del>	EACH	<del>50</del>						<del>50</del>	
			630-80370	Concrete Barrier (Temporary)	LF	200						200	
			630-80380	Traffic Cone	EACH	100						100	
			<del>630-85010</del>	<del>Impact Attenuator (Temporary)</del>	EACH	<del>2</del>						<del>2</del>	
				FORCE ACCOUNT =====									
			700-70010	F/A Minor Contract Revisions	F A	1					Responsible for CMO #1 Revisions Only	1	
			700-70012	F/A Asphalt Pavement Incentive	F A	1						1	
			700-70380	F/A Erosion Control	F A	1						1	



Computer File Information			Sheet Revisions				SUMMARY OF APPROXIMATE QUANTITIES			Project No./Code	
Creation Date: 02/19/02	Initials: TRH	<input checked="" type="checkbox"/> (R-1)	06/17/02	CMO #1	MMS	BR 086A-037					
Last Modification Date: 06/17/02	Initials: RJG	<input type="checkbox"/>				13380					
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Drawing File Name: 13380_Sheet10SAQ.dwg		<input type="checkbox"/>									
AutoCAD by Autodesk		<input type="checkbox"/>									

Designer: RJE  
Detailer: TRH  
Sheet Subset: SAQ



Region: 1  
Unit Leader: WDS  
Sheet: 3 of 3



CMO#1, Revised 06/17/02,  
MMS, Wilson & Company

As Constructed  
 No. Revisions:  
 Revised:  
 Void:

### TABULATION OF STRUCTURES

INDEX			LOCATION	REM OF BRIDGE	UNCLASSIFIED EXCAVATION			STRUCTURE EXCAVATION	STRUCTURE BACKFILL (Class 2)	CONCRETE (Class D) BOX CULVERT	REINFORCING STEEL	CULVERT PIPE	"H" OVER CULV	RESET MAILBOX	END SECTION (FOR INFO. ONLY)
BOOK	PAGE	SHEET			CUBIC YARD										
			EACH	EXCAV.	DITCH	EMB.									
			309+00											1	
			313+82	1			173	257	301	64,353			2		
			319+53				5*	5*				{13 13}			{1}
SHEET TOTALS				1			173	257	301	64,353		26		1	2

\*for information only

### TABULATION OF FENCE

LOCATION	SIDE	REMOVAL OF FENCE		FENCE BARBED WIRE WITH METAL POST	END POST	CORNER AND LINE BRACE POST	15 FOOT GATE (RESET)		FENCE (TEMPORARY (LIVESTOCK))	
		LIN FT		EACH	EACH	EACH	LIN FT		LIN FT	
312+06 to 313+54	RT	163								
312+06 to 313+55	RT			166-152		4				
312+06 to 315+58	RT								359	
313+22 to 313+52	LT			52-38		3				
313+22 to 313+55	LT	65			2			1		
313+55	LT	33								
313+62 to 314+02	LT	40								
314+03-17 to 314+42	LT			51-38		3				
314+07-17 to 315+58	RT			165-152		4				
314+10 to 315+58	RT	160								
314+14 to 314+42	LT	40								
Totals		501		434-380	2	14		1		359

NOTE: The permanent fence will extend from the wingwalls to the new right-of-way line and run along the new right-of-way line until it ties into the existing fence.

Computer Information				STRUCTURE & FENCE TABULATIONS				Project No./Code	
Creation Date: 11/06/01		Initials: TRH						BR 086A-037	
Last Modification Date: 06/05/02		Initials: JPG		13380					
Full Path: Q:\SH86\DWGS\PLAN		Designer: RJE		Region: 1					
Drawing File Name: 11struct-fence.dwg		Detailer: TRH		Unit Leader: WDS					
ACAD Ver. 2002		Scale: None		Units: English					
Sheet Subst: PLANS		Sheet:		Sheet Number 11					

As Constructed

No. Revisions:

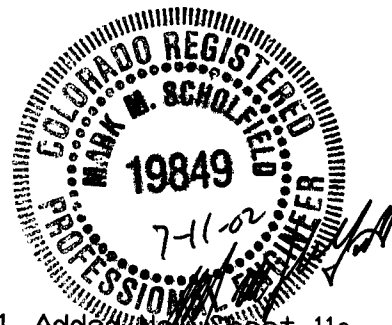
Revised:

Void:


### TABULATION OF GUARDRAIL

LOCATION	SIDE	GUARDRAIL TYPE 3 (6-3 POST SPACING)		TRANSITION TYPE 3G		END ANCHORAGE (FLARED)	
		LIN	FT	EACH	EACH	EACH	EACH
311+08.87 to 313+61.33	RT	193.75		1		1	
311+83.87 to 313+61.33	LT	118.75		1		1	
314+01.00 to 315+78.46	RT	118.75		1		1	
314+01.00 to 316+53.46	LT	193.75		1		1	
<b>Totals</b>		<b>625</b>		<b>4</b>		<b>4</b>	

Responsible for CMO #1  
Revisions Only



CMO#1, Added New Sheet 11a,  
Tabulation of Guardrail- 06/17/02,  
MMS, Wilson & Company

Computer Information				GUARDRAIL TABULATIONS		Project No./Code	
Creation Date:	06/04/02	Initials:	RJG			Region: 1	
Last Modification Date:	06/05/02	Initials:	JPG	Unit Leader: WDS			
Full Path:	Q:\SH86\DWGS\PLAN	Designer:	RJE			Sheet Number 11a	
Drawing File Name:	11guardrail.dwg	Detailer:	TRH			Sheet:	
ACAD Ver. 2002	Scale: None	Units: English	Sheet Subst: PLANS				

# Tabulation of Earthwork

As Constructed

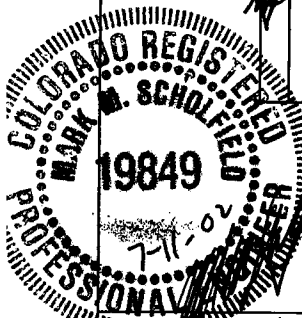
No Revisions:

Revised:

Void:

INDEX			PROJECT TOTALS		
			PLAN	AS CONS.	
BOOK	PAGE	SHEET	<u>EMBANKMENT MATERIAL (Complete in Place)</u>		
			Mainline (309+00 To 320+00)	2,239*	<del>2,686</del> *
			Build Detour	588	<del>1,265</del> **
			Total For Pay Quantity	2,827	<del>3,951</del>
			*** FOR INFORMATION ONLY ***		
				Cu Yd.	Cu. Yd.
			<u>UNCLASSIFIED EXCAVATION</u>		
			Mainline (309+00 To 320+00)		264
			Remove Detour	588	<del>1,265</del>
			Total	852	<del>1,529</del>
			<u>COMPACTION (AASHTO T99)</u>		
			Embankment	2,239	<del>2,686</del>
			Base of Cuts & Fills		720
			Total	2,959	<del>3,460</del>
			*** FOR INFORMATION ONLY ***		
				Cu Yd.	Cu. Yd.
			<u>ROADWAY QUANTITIES BALANCE</u>		
			⌀ Excavation - Unclassified		
			Mainline	852	<del>1,529</del>
			From Contractor's Source	2,540	<del>3,212</del>
			Total	3,392	<del>4,741</del>
			Embankment		
			Mainline	2,827	<del>3,951</del>
			Subtotal	2,827	<del>3,951</del>
			Embankment x Factor		
			<del>3,951</del> x 1.2	3,392	<del>4,741</del>
			2,827	3,392	<del>4,741</del>
			Total	3,392	<del>4,741</del>

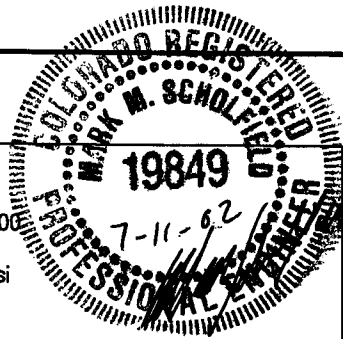
Responsible for CMO #1  
Revisions Only



⌀ Includes Removal of Asphalt Mat.  
\* It is Estimated that 1750 Cu. Yds. will be R70 or Flow Fill.  
\*\* It is Estimated that 556 Cu. Yds. will be R50 or Flow Fill.

CMO#1, Revised 06/17/02,  
MMS, Wilson & Company

Computer File Information			Tabulation Of Earthwork		BR 086A-037	
Creation Date: 5/17/01	Initials: RJE				13380	
Last Modification Date: 06/17/02	Initials: RJG					
Full Path: Q:\SHB6\DWGS\PLAN	Designer: RJE		Region: 1			
Earthwork Tab.dwg	Detailer:		Unit Leader: WDS			
Acad Ver. 2002	Scale: None	Units: English	Sheet Subset:	Sheet:	Sheet Number	12



**Stabilization Based On:**

20-year flexible 18K ESAL's ..... 4,000,000  
 Reliability ..... 90%  
 Subgrade Resilient Modulus ..... 25,317 psi  
 Minimum R-Value ..... 70  
 Required Structural Number ..... 2.68  
 Minimum HBP Thickness ..... 2.68/0.44 = 6.09" (Use min. 6.25")

As Constructed
No. Revisions:
Revised:
Void:

**Roadway Surfacing Plan**

Sta. From	Sta. To	Tack Coat	HBP (Grading S)(75)(PG58-28)				Total	Patching	
			2.25" Bottom Lift	2" Middle Lift	2" Top Lift				
		Gallons	Tons				Tons		
309+00	310+00	45	11	10	39	60			
310+00	312+75	171	61	54	134	249			
312+75	315+15	214	132	117	117	366			
315+15	319+00	239	85	75	188	348			
319+00	320+00	45	11	10	39	60			
Irregularities			30		40	70			
Patching (throughout project)								50	
<b>Totals</b>		<b>714</b>	<b>330</b>	<b>266</b>	<b>557</b>	<b>1153</b>		<b>50</b>	
<i>As Const. Totals</i>									

**Detour Surfacing Plan (for information only)**

Sta. From	Sta. To	Tack Coat	HBP (Grading S)(75)(PG58-28)		
			2" Bottom Lift	2" Top Lift	Total
		Gallons	Tons		
311+43	316+21	159	175	175	350
			18 (irreg.)		18
<b>Totals</b>		<b>159</b>			<b>368</b>
<i>As Const. Totals</i>					

NOTE: The pay item is Detour Pavement (SY). The total area for the pay item is 1593 SY (approx.)

CMO#1, Revised 06/17/02,  
MMS, Wilson & Company

**Computer Information**

Creation Date: 07/23/01	Initials: TRH
Last Modification Date: 06/05/02	Initials: JPG
Full Path: Q:\SH86\DWGS\PLAN	
Drawing File Name: 13surftab.dwg	
ACAD Ver. 2002	Scale: None Units: English

**SURFACING PLAN**

Designer: RJE
Detailer: TRH
Sheet Subst: PLANS



Region: 1
Unit Leader: WDS
Sheet:

Project No./Code
BR 086A-037
13380
Sheet Number 13



As Constructed

No. Revisions:

Revised:

Void:

## SEEDING PLAN

Soil preparation, seeding, mulching and mulch tackifier will be required for estimated 0.9 acre of disturbed area within the Right-of-Way limits that are not surfaced. The following types and rates shall be used:

COMMON NAME	BOTANICAL NAME	APPLICATION RATE
		Pounds pls/Acre
Western wheatgrass	Pascopyrum smithii v. Arriba	8.0
Sideoats grama	Bouteloua curtipendula v. Vaughn	3.0
Blue grama	Bouteloua gracilis v. Hachita	1.0
Little bluestem	Schizachyrium scoparium v. Pastura	2.0
Junegrass	Koeleria cristata	0.3
Green needlegrass	Stipa viridula v. Lodorm	2.0
Sand dropseed	Sporobolus cryptandrus	0.1
Upright prairie coneflower	Ratibida columnifera	0.2
Purple prairie clover	Petalostemum purpurea	1.0
Dotted gayfeather	Liatris punctata	1.0
Blue flax	Linum lewisii	0.5
TOTAL:		19.1

## SEEDING APPLICATION:

Drill seed 0.25" to 0.50" into the topsoil. In areas that are not accessible to a drill, hand broadcast at triple the above rate and rake to a depth of 0.25" to 0.50" into the topsoil.

## MULCHING APPLICATION:

1.5 tons of certified weed free hay per acre to be mechanically crimped into the topsoil in combination with an organic mulch tackifier per Standard provision 213.

## SPECIAL REQUIREMENTS:

Detour slopes shall have 1.5 tons of certified weed free hay per acre mechanically crimped into the soil in combination with an organic mulch tackifier per Standard provision 213 for temporary erosion control. Mulch and tackifier shall be placed immediately upon completion of building the detour slopes. Mulch and mulch tackifier shall be paid for.

Fertilizer will not be required on the project.

It is estimated that 480 Cu. Yds. of items Topsoil & Stockpile Topsoil will be required for this project.

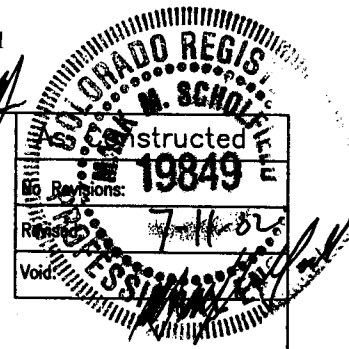
## PROJECT TOTALS:

PAY ITEM	DESCRIPTION	UNIT	QUANTITY
207	Topsoil	Cu. Yd.	480
207	Stockpile Topsoil	Cu. Yd.	480
208	Silt Fence	Lin. Ft.	200
208	Erosion Logs	Lin. Ft.	100
212	Seeding (native)	Acre	0.9
213	Mulching (weed free hay)	Acre	1.1
213	Mulch Tackifier	Pounds	165
700	Erosion Control	FA	1

## Computer Information

Computer Information		Seeding Plan		Project No./Code	
Creation Date:	8/02/01	Initials:	TRH	BR 086A-037	
Last Modification Date:	1/30/02	Initials:	TRH	13380	
Full Path:	\\13380\design\plansheets	Designer:	R/E	Region:	1
Drawing File Name:	14seedingplan.dwg	Detailer:	TRH	Unit Leader:	WDS
ACAD Ver. 2002	Scale: None	Units: English	Sheet Subst:	Sheet:	Sheet Number 14





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

- |   |                            |
|---|----------------------------|
| <input checked="" type="checkbox"/> Horizontal Control    | Format* <u>Plan Sheets</u> |
| <input checked="" type="checkbox"/> Vertical Control      | <u>Plan Sheets</u>         |
| <input checked="" type="checkbox"/> Roadway Alignment     | <u>Plan Sheets</u>         |
| <input checked="" type="checkbox"/> Original Terrain Data | <u>Electronic</u>          |
| <input type="checkbox"/> Other:                           | _____                      |

CMO#1, Revised 06/17/02,  
MMS, Wilson & Company

\*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: \_\_\_\_\_

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

**WORK PERFORMED BY THE CONTRACTOR'S SURVEYOR UNDER ITEM 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
- Removal Limits
- Excavation and Embankment
  - Excavation
    - Unclassified
    - Stripping
    - Muck
    - Rock
    - Borrow
    - Other: \_\_\_\_\_
  - Embankment
  - Site Grading
  - Erosion Control (Perm)
  - Other: \_\_\_\_\_
- As Staked Earthwork Quantities

SLOPE STAKING	GRID	GRADE STAKES	SPECIAL INTERVAL
yes	-	yes	50'
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
yes	-	yes	50'
-	-	-	-
-	-	-	-

- Landscaping
  - Top Soil
  - Seeding
  - Mulching
  - Planting
  - Other: \_\_\_\_\_

- Erosion Control
  - Seeding (Temp)
  - Silt Fences
  - Straw Bales
  - Temporary Berm
  - Riprap (Temp)
  - Other (Temp Diversion, Temp Slope Drain, Bush Barrier, Check Dam, Other: \_\_\_\_\_)

- Roadway Bases
  - Untreated Subgrade
  - Treated Subgrade
  - Aggregate Base Course
  - Other: \_\_\_\_\_

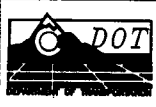
GRADE STAKES	GRID	SPECIAL INTERVAL	SPECIAL OFFSET
yes	-	50'	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
yes	-	25'	-
-	-	-	-
-	-	-	-

- Pavements
  - PMBB - Plant Mix Bituminous Base
  - HBP - Hot Bituminous Pavement
  - Concrete
  - Other: \_\_\_\_\_

- Roadway Elements
  - Curb and Gutter
  - Drop inlets - alignment and grades
  - Retaining Walls
  - Guard Rail
  - Sidewalk
  - Other: \_\_\_\_\_
- Riprap (Perm)
- Slope and Ditch Paving
- Minor Structures
  - Structure Excavation limits
  - Culverts
  - Culverts w/ Headwalls and Wingwalls
  - Concrete Box Culverts w/ Headwalls and Wingwalls
  - Pipes
    - Sanitary Sewer
    - Storm Sewer
    - Water
    - Irrigation
    - Miscellaneous

- Manholes
- Inlets
- Other: \_\_\_\_\_
- Major Structures - Overhead Signs, Concrete Box Culverts, Bridges - and all other structures assigned a structure number
  - Structure Excavation limits
  - Concrete Box Culverts w/ Headwalls and Wingwalls
  - Piling locations and cut off elevations
  - Coisson locations and elevations
  - Footing locations, alignment, and elevations
  - Abutment/Pier locations, alignment, and elevations
  - Wingwall skew angles/offsets
  - Structural concrete form locations
  - Substructure survey (Required by Subsection 601.12 for Bridges and S-614-50 for Overhead Signs)
  - Bridge expansion joint(s) alignment and grade (longitudinal and transverse)
  - Deck grades at Girder 10th or "n" th point locations and elev.
  - Slope and Ditch Paving
  - Other: \_\_\_\_\_
- Fencing
  - Temporary
  - Permanent
  - Sound Barriers
  - Other: \_\_\_\_\_
- Delineators
  - Temporary
  - Permanent
- Lighting and Traffic Control Devices (Perm)
  - Signal pole locations and elevations
  - Light pole locations and elevations
  - Signs
  - Field verify sign post locations, elevations, and lengths before fabrication.
  - Other: \_\_\_\_\_
- Pavement Marking
  - Striping (Temp)
  - Striping (Perm)
  - Symbols
  - Other: \_\_\_\_\_
- Temporary Lighting and Construction Traffic Control Devices
  - Signal pole locations and elevations (Temp)
  - Light pole locations and elevations (Temp)
  - Signs (Temp)
  - Other: \_\_\_\_\_
- Easement (Temp)(Staking)

**GENERAL NOTES FOR AND WORK PERFORMED BY THE CONTRACTOR'S SURVEYOR UNDER ITEM 629 WILL BE FOUND ON SURVEY SUBSET SHEET S2 OF 2**

Survey Tabulation (1 of 2)		Computer File Information			Project No./Code		
Designer: RJE		Region: 1	Creation Date: 06/25/01	Initials: DAS	BR 086A-037		
Detailer: TRH		Unit Leader: WDS	Last Modification Date: 06/05/02	Initials: JPG	13380		
Sheet Subset: Survey		Sheet: S1 of 2	Drawing File Name: 15survtab1.dwg	Acad Ver. 2002	Scale: N/A	Units: English	Sheet Number 15

As Constructed

No Revisions:

Revised:

Void:

WORK PERFORMED BY THE CONTRACTOR'S SURVEYOR UNDER ITEM 629:

- Monumentation
  - Control (One Type 2 Monument required to replace 580)
  - Right of Way (Temp) (Staking)
  - Right of Way
  - Land corners, Aliquot corners
  - Easement (Temp)(Staking)
  - Easement (Perm)
  - Reference the specified existing monuments: \*\* \_\_\_\_\_
  - Relocate the specified existing monuments: \*\* \_\_\_\_\_
  - Locate monuments. It is estimated \_\_\_\_\_ hours are required.

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

GENERAL NOTES:

All work shall be done in accordance with the latest edition of the entire CDOT Survey Manual including all revisions to date:  
- Chapter 5 - Construction Surveying, revised 02/07/96.

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 3 days prior to the Presurvey Conference.

The following surveying notebooks are required:

- Alignment Notebook
- Benchmark Notebook
- Control Survey/Monumentation Notebook
- Minor Structure Notebook
- Major Structure Notebook
- Slope Staking Notebook
- Grade Notebook
- Other Notebook(s): \_\_\_\_\_

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 maximum 160 m (500 ft) 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 the specified tolerance.

The Contractor 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.

Survey Tabulation (2 of 2)		Computer File Information		Project No./Code
		Creation Date: 06/25/01	Initials: DAS	
Designer: RJE		Region: 1	Last Modification Date: 01/28/02	BR 086A-037
Detailer: TRH		Unit Leader: WDS	Full Path: \\13380\design\plan sheets	13380
Sheet Subset: Survey		Sheet: S2 OF 2	Drawing File Name: 16survtab2.dwg	Acad Ver. 2002 Scale: N/A Units: English

June 17, 2002

COLORADO  
 DEPARTMENT OF TRANSPORTATION  
 SPECIAL PROVISIONS  
 SH 86, 5 Miles East of Castle Rock (@ Mitchell Gulch)

The 1999 Standard Specifications for Road and Bridge Construction controls construction of this project. The following special provisions supplement or modify the Standard Specifications and take precedence over the Standard Specifications and plans. When specifications or special provisions contain both English units and SI units, the English units apply and are the specification requirement.

PROJECT SPECIAL PROVISIONS

		Page
Index Pages	<del>(February 22, 2002)</del> (June 17, 2002)	1 - 2
Notice to Bidders	<del>(February 22, 2002)</del>	3
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Revision of Section 403-Hot Bituminous Pavement	(February 22, 2002)	11-13
<i>DBW</i> Revision of Section 601-Precast Wall Segment	(June 17, 2002)	13A
Revision of Section 607-Temporary Livestock Fence	(February 22, 2002)	14
Revision of Sections 614 & 630-Retroreflective Sign Sheeting	(February 22, 2002)	15
<i>DBW</i> Revision of Sections 618-Prestressed Concrete Slab (Special)	(June 17, 2002)	15A
Revision of Section 621-Detour Pavement	<del>(February 22, 2002)</del>	16 (Delete)
Revision of Sections 627 & 708-Pavement Marking with Waterborne Paint and Low VOC Solvent Base Paint	(February 22, 2002)	17-21
<i>DBW</i> Revision of Section 630-Impact Attenuator (Temporary)	<del>(February 22, 2002)</del>	<del>22-23 (Delete)</del>
General 404 Permit	(February 22, 2002)	24
Force Account Items	(February 22, 2002)	25
Traffic Control Plan-General	(February 22, 2002)	26
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*Responsible for initialed specifications*



Revised, CMO1  
 MMS, Wilson & Company

*John B. Wier*

11 Jul 02

[YELLOW PLAN SHEETS FOLLOW SPECIAL PROVISIONS]

*responsible for initialed specifications only.*

June 17, 2002

COLORADO  
 DEPARTMENT OF TRANSPORTATION  
 SPECIAL PROVISIONS  
 SH 86, 5 Miles East of Castle Rock (@ Mitchell Gulch)  
 STANDARD SPECIAL PROVISIONS

	Date	No. of Pages
Revision of Section 101-Holidays	(May 31, 2001)	1
Revision of Sections 101 and 105 – Duties of the Engineer	(Nov. 5, 1999)	1
Revision of Sections 101 and 108 – Workplace Violence	(Dec. 20, 2001)	1
Revision of Section 103 – Contract Bonds	(Nov. 5, 1999)	1
Revision of Section 105 – Conformity with Plans and Specifications	(Aug. 23, 2001)	5
Revision of Section 105 – Contractor Submittals	(Aug. 11, 2000)	1
Revision of Section 105 – Disputes and Claims for Contract Adjustments	(Nov. 5, 1999)	12
Revision of Sections 105 and 106 – Quality of Hot Bituminous Pavement (Less than 5000 Tons)	(October 4, 2001)	5
Revision of Sections 105, 202, 401, 405, 406, and 412 – Roadway Smoothness	(Aug. 23, 2001)	9
Revisions of Sections 106 and 620 – Qualification of Testing Personnel and Laboratories	(Oct. 4, 2001)	1
Revision of Section 108 – Liquidated Damages	(June 8, 2000)	1
Revision of Section 108 – Project Schedule	(July 21, 1999)	1
Revision of Section 108 – Subletting of Contract	(Nov. 30, 2000)	1
Revision of Section 109 – Measurement of Quantities	(July 21, 1999)	1
Revision of Section 109 – Partial Payments	(Oct. 5, 2000)	2
Revision of Section 109-Adjustments for Changes in Common Carrier Rates	(May 31, 2001)	1
Revision of Section 208 – Erosion Control	(July 21, 1999)	2
Revision of Section 209-Dust Palliatives	(May 31, 2001)	1
Revision of Section 401 – Plant Mix Pavements - General	(October 4, 2001)	3
Revision of Section 401 – Weather Limitations and Placement Temperatures	(July 21, 1999)	2
Revision of Sections 401 and 703 – Composition of Mixtures (Non-Voids Acceptance)	(Aug. 20, 1999)	3
Revision of Section 601 – Structural Concrete	(Aug. 23, 2001)	3
Revision of Section 606 – Guardrail Terminals and Transitions	(May 31, 2001)	1
<del>Revision of Section 620 – Field Laboratories without Forced Air Convection Oven</del>	<del>(Nov. 5, 1999)</del>	<del>2</del>
Revision of Section 630 – Construction Zone Traffic Control	(Nov. 30, 2000)	4
Revision of Section 630 – NCHRP 350 Requirements	(Sept. 26, 2000)	1
Revision of Section 701 – Hydraulic Cement	(Aug. 23, 2001)	1
Revision of Section 702 – SuperPave PG Binders	(October 4, 2001)	3
Revision of Section 706 –Concrete Pipes	(Dec. 20, 2001)	1
Affirmative Action Requirements – Equal Employment Opportunity	(July 21, 1999)	10
Disadvantaged Business Enterprise – Definitions and Requirements	(July 11, 2001)	10
Emerging Small Business Program	(Dec. 20, 2001)	8
Minimum Wages Colorado, U.S. Department of Labor Decision No. CO010001, Mod 11, Heavy and Highway Construction, Statewide	(Dec. 28, 2001)	8
On the Job Training	(July 21, 1999)	4
Required Contract Provisions – Federal-Aid Construction Contracts	(July 21, 1999)	11
Special Notice to Contractors	(May 31, 2001)	4

NOTICE TO BIDDERS

The proposal guaranty shall be a certified check, cashier's check, or bid bond in the amount of 5 percent of the Contractor's total bid.

Pursuant to subsections 102.04 and 102.05, it is recommended that bidders on this project review the work site and plan details with an authorized Department representative. Prospective bidders shall contact one of the following listed authorized Department representatives at least 12 hours in advance of the time they wish to go over the project.

Program Engineer -	Wes Goff	
	Office Phone:	303-757-9647
Resident Engineer -	William D. Scheuerman	
	Office Phone:	303-790-1020
Project Engineer -	Thomas R. Hunt	
	Office Phone:	303-790-1020

The above referenced individuals are the only representatives of the Department with authority to provide any information, clarification, or interpretation regarding the plans, specifications, and any other contract documents or requirements.

June 17, 2002

COMMENCEMENT AND COMPLETION OF WORK

The Contractor shall select the date that contract time begins for this project, subject to the following conditions:

- (a) The earliest date shall be April 15, 2002.
- (b) The latest date shall be July 1, 2002.
- (c) The Contractor shall notify the Engineer, in writing, at least 30 days before the proposed beginning date. If the earlier date, as stated above, follows the award date by less than 30 days, the Contractor's written notice to the Engineer shall be at least 10 days before the proposed beginning date.
- (d) The date that contract time begins shall be subject to the Region Transportation Director's approval. A different date may be authorized in writing by the Chief Engineer in the "Notice to Proceed."

The Contractor shall complete all work within 110 calendar days in accordance with the "Notice to Proceed."

If materials stockpiling begins before the beginning date, contract time will not be charged for the stockpiling effort. Stockpiling of materials before the beginning date is subject to the Engineer's approval. If such approval is given, stockpiled material will be paid for in accordance with Sections 109 and 626.

Salient features to be shown on the Contractor's progress schedule are:

1. ~~Concrete Box Culvert~~ Precast Concrete Bridge
2. Detour
3. Hot Bituminous Pavement
4. Type IV Barrier (Temporary)
5. Traffic Control
6. Topsoil, Seeding & Mulching

Section 108 of the Standard Specifications is hereby revised for this project as follows:

Subsection 108.03 shall include the following:

The Contractor's progress schedule shall be a Critical Path Method Schedule.

CONTRACT GOAL (COMBINED)

The Department has determined that Underutilized Disadvantaged Business Enterprises (UDBEs) will participate by contracting for a part of the work of this Contract. The contract goal for participation in this Contract by certified DBEs who have been determined to be underutilized has been established as follows:

UDBE\* 9 Percent

The percentage will be calculated from proposals received for this project according to the following formula:

$$\text{Percentage} = 100 \times \frac{\text{*Dollar amount of work to be contracted to underutilized DBEs (UDBEs)}}{\text{Total dollar amount of the original Contract}}$$

\* Based on DBE contract unit prices rather than prime contract unit prices.

\* All DBEs will be considered to be UDBEs.

NOTE: Specific Good Faith Efforts required to meet the Contract Goal specified above are defined in the Standard Special Provisions. In addition, the Transportation Commission has determined an overall 10.93% annual goal for the participation of all DBEs.



REVISION OF SECTION 102  
PROJECT PLANS AND OTHER DATA

Section 102 of the Standard Specifications is hereby revised for this project as follows:

Subsection 102.05 shall include the following:

<u>Cross Sections</u>	<u>Sheet Nos.</u>	<u>Computer Output Data</u>
Roadway-Mainline	301-316	Earthwork Quantities
Detour	401-417	

The Bid Plans Room will provide an area where contractors can review any available cross sections and computer output data. This material may be taken out of the Bid Plans Room area by either: (1) purchase of the material at the current reproduction price or, (2) deposit of cash or check (payable to: Colorado Department of Transportation) equal to the purchase price. The deposit will be refunded if the material is returned by 4:30 p.m. on the second full working day after obtaining the material. If not returned within that time, the deposit will be forfeited.

After the proposals have been opened, the low responsible bidder may obtain from the Reproduction Branch, Room 107, 4201 East Arkansas Avenue, Denver, Colorado 80222, at no cost: 6 sets of plans and special provisions; and if available for the project, one set of full-size cross sections, one set of full size major structure plan sheets, and one set of computer output data. If the low bidder has not picked up the plans and other available data by 4:30 p.m. on the second Friday after bid opening, they will be sent to the Resident Engineer in charge of the project. Additional sets of plans and other available data may be purchased on a cash sale basis from the Reproduction Branch at current reproduction prices. Subcontractors and suppliers may obtain plans and other data from the successful bidder or they may purchase copies on a cash sale basis from the Reproduction Branch at current reproduction prices.

Survey information is available at the Resident Engineer's office for review.

REVISION OF SECTION 106  
QUALITY OF HOT BITUMINOUS PAVEMENT

Section 106 of the Standard Special Provisions is hereby revised for this project as follows:

Subsection 106.03 shall include the following:

For this project, Contractor process control testing of hot bituminous pavement is voluntary.

REVISION OF SECTION 202  
REMOVAL OF TIMBER BRIDGE

Section 202 of the Standard Specifications is hereby revised for this project as follows:

Subsection 202.02 shall include the following:

The Contractor shall remove the existing timber bridge, including pier, abutments, and wingwalls. Salvable stringers, timber decking, wheel guards, and sill plates shall be salvaged and remain the property of the Department.

The stringers, timber decking, wheel guards, and sill plates shall be carefully dismantled, except the timber decking which may be removed in 5 foot sections, cleaned (all bolts and nails removed), and stockpiled by the Contractor within the project limits at a location designated by the Engineer. The Contractor shall load the salvaged material onto the Department's hauling equipment. Deteriorated or damaged timber members shall become the property of the Contractor.

When all Salvable timber members have been stockpiled, the Contractor shall contact CDOT Maintenance to arrange for pickup. The contact number will be available at the pre-construction conference.

REVISION OF SECTION 206  
EXCAVATION AND BACKFILL FOR CULVERTS

Section 206 of the Standard Specifications is hereby revised for this project as follows:

Subsection 206.07 shall include the following:

Structure excavation and structure backfill required for the 36" pipe extensions will not be measured and paid for separately but shall be included in the work.

REVISION OF SECTION 208  
EROSION LOGS

Section 208 of the Standard Special Provisions is hereby revised for this project as follows:

Subsection 208.01 shall include the following:

This work consists of furnishing, preparing, applying, placing and securing erosion logs for erosion control as directed.

Subsection 208.02 shall include the following:

(i) **Erosion Logs.** Erosion logs are made of curled aspen wood excelsior with a consistent width of fibers evenly distributed throughout the log. The casing is seamless, photo degradable tube netting. The curled aspen wood excelsior is fungus free, resin free and contains no growth or germination inhibiting substances. This material also qualifies as a weed-free material that can be used on all Federal lands.

Diameter 12 – 18 inches (300-457 millimeters) (nominal)

Length 10 feet (3.00 meters) (minimum)± 10%

Weight 3.25 lbs/foot (4.5 Kg/meter) (minimum)

Subsection 208.05 shall include the following:

(l) **Erosion Logs.** Erosion logs shall be installed in locations specified by the Engineer. Logs shall be double staked in opposite directions with wooden stakes 1.5 x 1.5 x 24 inches (40 x 40 x 600 mm) at the ends and alternating single stakes on approximately 2 ft. centers (600 mm).

Erosion logs shall remain in place until the project seeding reaches 70% cover. The Contractor shall maintain the erosion log during construction to prevent sediment from passing over or under the log or from sediment accumulation greater than two thirds of the original exposed height of the erosion log.

Subsection 208.07 shall include the following:

Erosion log will be measured by the linear foot complete in place and accepted. Stakes will not be paid for separately

Subsection 208.08 shall include the following:

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
Erosion Log	Linear Foot

REVISION OF SECTION 403  
 HOT BITUMINOUS PAVEMENT

Section 403 of the Standard Specifications is hereby revised for this project as follows:

Subsection 403.02 shall include the following:

The design mix for hot bituminous pavement shall conform to the following:

TABLE 403-1

Property	Test Method	Value for Grading	
		S(75 )	Patching
Air Voids, percent at: N (initial) [for information only] N (design)	CPL 5115	3.5 – 4.5	3.5 – 4.5
Lab Compaction (Revolutions): N (initial) [for information only] N (design)	CPL 5115	7 75	7 75
Stability, minimum	CPL 5106	28	28
Aggregate Retained on the 4.75 mm (No. 4) Sieve with at least 2 Mechanically Induced fractured faces, % minimum	CP 45	70	70
Accelerated Moisture Susceptibility Tensile Strength Ratio (Lottman), minimum	CPL 5109 Method B	80	80
Minimum Dry Split Tensile Strength, kPa (psi)	CPL 5109 Method B	205 (30)	205 (30)
Grade of Asphalt Cement, Top Layer		PG 58-28	PG 58-28
Grade of Asphalt Cement, Layers below Top		PG 58-28	PG 58-28
Voids in the Mineral Aggregate (VMA) % minimum	CP 48	See Table 403-2	See Table 403-2
Voids Filled with Asphalt (VFA), %	AI MS-2	65-80	65-80

Note: AI MS-2 = Asphalt Institute Manual Series 2

Note: The current version of CPL 5115 is available from the Region Materials Engineer.

Note: Mixes with gradations having less than 40% passing the 4.75 mm (No. 4) sieve shall be approached with caution because of constructability problems.

REVISION OF SECTION 403  
 HOT BITUMINOUS PAVEMENT

*Note: Table 1 of CPL 5115, which contains the laboratory mixing and compaction temperatures to be used for mix design development and laboratory verification of project produced mixtures, is deleted for this project and replaced with the following:*

**CPL 5115 TABLE 1**

<b>Superpave Binder Grade</b>	<b>Laboratory Mixing Temperature, °C (°F)</b>	<b>Laboratory Compaction Temperature, °C (°F)</b>
PG 58-28	154 (310)	138 (280)
PG 58-22	154 (310)	138 (280)
PG 64-22	163 (325)	149 (300)
PG 70-28	163 (325)	149 (300)
PG 64-28	163 (325)	149 (300)
PG 58-34	154 (310)	138(280)
PG 76-28	163 (325)	149 (300)

**TABLE 403-2**

<b>Minimum Voids in the Mineral Aggregate (VMA)</b>			
<b>Nominal Maximum Size*, mm (inches)</b>	<b>Design Air Voids **</b>		
	<b>3.5%</b>	<b>4.0%</b>	<b>4.5%</b>
37.5 (1½)	11.5	12.0	12.5
25.0 (1)	12.5	13.0	13.5
19.0 (¾)	13.5	14.0	14.5
12.5 (½)	14.5	15.0	15.5
9.5 (¾)	15.5	16.0	16.5

\* The Nominal Maximum Size is defined as one sieve larger than the first sieve to retain more than 10%.

\*\* Interpolate specified VMA values for design air voids between those listed.

The Contractor shall prepare a quality control plan outlining the steps taken to minimize segregation of HBP. This plan shall be submitted to the Engineer and approved prior to beginning the paving operations. When the Engineer determines that segregation is unacceptable, the paving shall stop and the cause of segregation shall be corrected before paving operations will be allowed to resume.

Hot bituminous pavement for patching shall conform to the gradation requirements for Hot Bituminous Pavement (Grading S).

-3-  
REVISION OF SECTION 403  
HOT BITUMINOUS PAVEMENT

A minimum of one percent hydrated lime by mass (weight) of the combined aggregate shall be added to the aggregate for all hot bituminous pavement.

Subsection 403.03 shall include the following:

Delete subsection 403.05 and replace with the following:

**403.05** The accepted quantities of hot bituminous pavement will be paid for in accordance with subsection 401.22, at the contract unit price per ton for the bituminous mixture.

Payment will be made under:

<b>Pay Item</b>	<b>Pay Unit</b>
Hot Bituminous Pavement (Grading S)(75)(PG58-28)	Ton
Hot Bituminous Pavement (Patching)(Asphalt)	Ton

Aggregate, asphalt recycling agent, additives, hydrated lime, and all other work necessary to complete each hot bituminous pavement item will not be paid for separately, but shall be included in the unit price bid. When the pay item includes the PG binder grade, the asphalt cement will not be measured and paid for separately, but shall be included in the work. When the pay item does not include the PG binder grade, asphalt cement will be measured and paid for in accordance with Section 411. Asphalt cement used in Hot Bituminous Pavement (Patching) will not be measured and paid for separately, but shall be included in the work.

*Excavation, preparation, and tack coat of areas to be patched will not be measured and paid for separately, but shall be included in the work.*



**REVISION OF SECTION 601  
PRECAST WALL SEGMENT**

Section 601 of the Standard Specifications is hereby revised for this project as follows:

Subsection 601.01 shall include the following:

This work includes construction of the precast concrete abutments and wingwalls as shown on the plans.

Subsection 601.18 shall include the following:

The precast concrete abutments will be measured and paid for by the number of units installed. Each precast concrete abutment may be constructed of multiple pieces, but will be measured and paid for as a single unit. The precast concrete wingwalls will be measured and paid for by the number of units installed.

Subsection 601.19 shall include the following:

Payment will be made under:

<b>Pay Item</b>	<b>Pay Unit</b>
Precast Wall Segment (Abutment)	Each
Precast Wall Segment (Wingwall)	Each

Payment shall be full compensation for all materials, equipment and labor necessary to complete this work, including finished precast units, reinforcement, grouting, connections, and all incidentals necessary to complete the abutments and wingwalls.

REVISION OF SECTION 607  
TEMPORARY LIVESTOCK FENCE

Section 607 of the Standard Specifications is hereby revised for this project as follows:

Subsection 607.03 shall include the following:

In order to protect and control livestock, the Contractor shall install and maintain temporary fence at locations approved by the Engineer as needed during construction. Temporary fence shall be barbed wire.

Subsection 607.05 shall include the following:

Payment will be made under:

<b>Pay Item</b>	<b>Pay Unit</b>
Fence (Temporary)	Linear Foot

Payment shall be full compensation for furnishing, erecting, and maintaining all materials required for Fence (Temporary). Fence (Temporary) shall remain in place at the end of the project to be removed later by CDOT forces.

**REVISION OF SECTIONS 614 AND 630  
 RETROREFLECTIVE SIGN SHEETING**

Sections 614 and 630 of the Standard Specifications are hereby revised for this project as follows:

**In subsection 614.04, first paragraph, delete the second sentence and replace with the following:**

Retroreflective sheeting shall be type III and shall conform to subsection 713.04 and 713.06 when applicable.

**In subsection 614.07, first paragraph, delete the second sentence and replace with the following:**

Retroreflective sheeting shall be type III and shall conform to subsection 713.04.

**In subsection 630.02, delete the third paragraph and replace with the following:**

Retroreflective sheeting shall be one of the types specified for the particular application in Table 630-1.

**Table 630-1**

Sheeting	Type III	Type VI	Fluorescent <sup>1</sup>
Application	Work Zone	Work Zone	Work Zone
All Orange Construction Signs (Including Roll-up Signs)			X
Barricades (Temporary)	X		
Vertical Panels	X		
Flaggers Stop/Slow (May include flashing light approved under SHRP product # 3016)	X		
Drums <sup>2</sup>	X		
Non orange Fixed support signs with prefix "W"	X		X
Special warning signs	X		X
STOP sign (R 1-1) YIELD sign (R1-2) WRONG WAY sign (R5-1a) DO NOT ENTER sign (R5-1) EXIT sign (E5-1a)	X		
DETOUR sign (M4-9) or (M4-10)			X
All other fixed support signs <sup>3</sup>	X		
All other signs which use is limited to working hours only	X	X	X

<sup>1</sup> Fluorescent sheeting shall be of a type that is on the Colorado Approved Products List.

<sup>2</sup> Drum sheeting shall be manufactured for flexible devices.

<sup>3</sup> Fixed support signs are defined as all signs that must remain in use outside of working hours. They shall be mounted on barricades, or in accordance with height and lateral clearances shown on Standard Plan S-614-1, "Typical Ground Sign Placement", unless otherwise approved.

REVISION OF SECTION 618  
PRESTRESSED CONCRETE SLAB (SPECIAL)

Section 618 of the Standard Specifications is hereby revised for this project as follows:

Subsection 618.01 shall include the following:

This work includes construction of the prestressed concrete bridge superstructure as shown on the plans.

Subsection 618.16 shall include the following:

The prestressed concrete bridge superstructure will be measured, and paid for by the number of units installed.

Subsection 618.17 shall include the following:

Payment will be made under:

**Pay Item**

Prestressed Concrete Slab (Special)

**Pay Unit**

Each

Payment shall be full compensation for all materials, equipment and labor necessary to complete this work, including finished precast units, reinforcement, grouting, connections, and all incidentals necessary to complete the concrete bridge superstructure.

REVISION OF SECTION 621  
DETOUR PAVEMENT

Section 621 is hereby added to the Standard Specifications for this project and shall include the following:

DESCRIPTION

This work shall consist of constructing, maintaining and removing detour pavement as shown in the plans or as directed by the Engineer.

MATERIALS

The contractor shall be responsible for quality control required to assure adequate quality of hot bituminous pavement and any aggregate base course used.

CONSTRUCTION REQUIREMENTS

The detour location and dimensions shall be as shown on the plans or as directed by the Engineer. The minimum thickness of hot bituminous pavement shall be as shown on the typical section in the plans. If the materials used require that the Contractor provide pavement thicker than the minimum to serve for the life of the detour, this shall be provided at no additional cost. The Contractor shall remove the detour pavement when it is no longer needed to maintain traffic.

All necessary signs, pavement markings and other traffic control devices shall be provided in accordance with the Tabulation of Traffic Engineering Quantities & Schedule and paid for under the applicable items.

MAINTENANCE OF DETOUR

The Contractor shall maintain the detour for the entire period that it is open to traffic. Any distress that affects the ride, safety, or serviceability of the detour roadway shall be corrected to the satisfaction of the Engineer at the expense of the Contractor.

METHOD OF MEASUREMENT

The area of detour pavement actually placed will be measured and paid for as Detour Pavement.

BASIS OF PAYMENT

The detour shall be paid for at the square yard bid price for the item. Payment shall be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
Detour Pavement	Square Yard

Payment for the detour will be full compensation for all work and materials required to complete the item, including hot bituminous pavement, aggregate base course (as needed), maintenance, temporary delineators, removal of detour, and regrading slopes after removal of detour.

REVISION OF SECTIONS 627 AND 708  
PAVEMENT MARKING WITH WATERBORNE PAINT  
AND LOW VOC SOLVENT BASE PAINT

Sections 627 and 708 of the Standard Specifications are hereby revised for this project as follows:

Delete subsection 627.04 and replace with the following:

**627.04 Pavement Marking with Waterborne and Low VOC Solvent Base Paint.** Striping shall be done when the air and pavement temperatures are at least 7 °C (45 °F) and rising for waterborne paint and 4 °C (40 °F) and rising for low VOC solvent base paint. The pavement surface and weather conditions shall be conducive to satisfactory results.

Equipment shall be capable of painting a reasonably clean-edged stripe of the designated width ( $\pm 6$  mm) ( $\pm 1/4$  inch) and shall have a bead dispenser directly behind, synchronized with the paint applicator. Machines shall have multiple applicators. Each applicator shall have individual control and automatic skip control that will paint a stripe with a gap as shown on the plans. In areas where machines are not practical, suitable hand-operated equipment shall be used. Stripes shall be protected until dry.

Paint and beads shall be applied within the following limits:

**Application Rate or Coverage  
Per Liter (Gallon) of Paint**

	<i>MINIMUM</i>	<i>MAXIMUM</i>
Paint:	2.5 m <sup>2</sup> (100 sq. ft.)	2.7 m <sup>2</sup> (110 sq. ft.)
Beads:	700 g (5 lbs. 13 oz.)	740 g (6 lbs. 3 oz.)

*Subsection 627.13 shall include the following:*

<u>Pay Item</u>	<u>Pay Unit</u>
Pavement Marking Paint (Waterborne)	Liter(Gallon)

Delete subsection 708.01 and replace with the following:

**708.01 General.** This specification covers ready-mixed paints and coatings. Paints and coatings shall be manufactured eight weeks or less prior to delivery to the project. The date of manufacture shall be stenciled clearly on all containers. Paints shall be free of foreign material that is capable of clogging screens, valves, pumps, and other parts of the application equipment. Paints shall not form a surface skin within 48 hours in three-quarter filled, tightly closed containers. Paint and coating pigments shall be lead free, and shall not thicken, become granular, or curdle in their containers.

Paints and coatings shall not contain benzene, chlorinated solvents, ethylene glycol ethers and ethylene glycol acetates. Hexavalent chromium compounds shall be excluded from all coating formulations.

REVISION OF SECTIONS 627 AND 708  
 PAVEMENT MARKING WITH WATERBORNE PAINT  
 AND LOW VOC SOLVENT BASE PAINT

Volatile Organic Compound (VOC) levels for paints and coatings shall comply with the most current EPA regulations. All product compositional proportions are specified by mass (weight). Material Safety Data Sheets, and manufacturer's recommended application instruction sheets representing each paint and coating shall be supplied to the Engineer prior to use.

Federal Standard 595B, shall be used to designate colors. ASTM E 308 shall be used to quantitatively define colors.

Delete subsection 708.05 and replace with the following:

**708.05 Pavement Marking Materials.** Pavement marking materials shall conform to the requirements listed below. Pigment and vehicle compositions shall not vary by more than 1.0 percent of each amount specified. The manufacturer shall certify that the product does not contain mercury, lead, hexavalent chromium, chlorinated solvents, hydrolyzable chlorine derivatives, glycol ethers and their acetates, and carcinogens as defined in 29 CFR 1910.1200.

*After drying, yellow paint shall visually match Federal Standard 595B color chip number 33538, or be within 2% of green and red tolerance limits when compared on the U.S. Department of Commerce, "Highway Yellow Color Tolerance Chart", using the following C.I.E. chromaticity coordinates:*

X	Y	X	Y	X	Y	X	Y
-----	-----	-----	-----	-----	-----	-----	-----
0.4883	0.4468	0.4748	0.4452	0.4848	0.4327	0.4739	0.4377

- (a) *Low VOC Solvent Base Paint.* Ready mixed, low VOC compliant traffic marking paint to be applied to Asphalt or Portland Cement Concrete Pavements shall be defined herein. The exact formulation of the paint shall be decided by the manufacturer, and shall conform to the general requirements listed below.

**Vehicle Composition:** (white and yellow paint) The vehicle shall be one of the following:

- (1) 100% Acrylic Copolymer Resin Solution : Poly(Methyl-Methacrylate/N-butyl Methacrylate/Methacrylic acid) Copolymer resins or Isobutyl Methacrylate-Diethyl-Aminoethyl Methacrylate Copolymer resins, 17.5% minimum ASTM D3168
- (2) 100% Alkyd Resin Solution (AASHTO M248, Type F), modified for VOC Compliance, VM & P Naphtha, Federal Spec. TT-N-95, Type I, modified for VOC compliance

Driers, ASTM D600 class B

Anti-skinning agents

**Finished Paint Total Pigment :** 52.0% minimum ASTM D 2371

**Pigment Composition:** (white paint)

Titanium Dioxide, ASTM D476, Type III

Calcium Carbonate, ASTM D1199, Type GC-II

Magnesium Silicate, ASTM D605

Zinc Oxide, ASTM D79,

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Pigment Suspending Agents

**Pigment Composition:** (yellow paint)

Titanium Dioxide, ASTM D476, Type III

Organic Yellow Pigment 65

Calcium Carbonate, ASTM D1199, Type GC-II

Magnesium Silicate, ASTM D605

Aluminum Silicate, ASTM D603

Silica (diatomaceous) ASTM D604

Pigment Suspending Agents

**Solvents:**

Acetone ASTM D329

Xylene ASTM D846 less than 1.0%

Methanol ASTM D1152,

Toluene ASTM D 5580 less than 6.0%

VOC exempt solvents

Anti-skinning, Anti-settling agents

**Properties of the Finished Paint:** (white and yellow)

Total Solids by mass (weight) ASTM D 1644 70.0% minimum

Viscosity, in Krebs-Stormer Units

@ 25 °C (77 °F) ASTM D 562 75-80 ,+/-0.5 KU's

Weight per gallon ASTM D 1475 1.38 kg/liter (11.5 lbs/gal) minimum  
Non-volatile vehicle 35.0% minimum

VOC ASTM D 3960 150gms/liter (1.25lbs/gal) maximum

Color (Federal Standard 595) see subsection 708.05 paragraph 2

Laboratory dry time ASTM D 711, 10 minutes maximum

Field dry time , Actual No Tracking  
@ 25 °C (77 °F), 0.38 mm(15mils)

5 minutes maximum

Fineness of Grind ASTM D 1210 3 minimum

Reflectance (0.015), @ 0.38 mm (15 mil) wet film  
applied to a Leneta Chart

83% minimum for white

50% minimum for yellow

Dry Opacity (contrast ratio) @ 0.38 mm (15 mils) wet ASTM D 2805 0.98 minimum

Freeze Thaw resistance ASTM D 2243 5 cycles minimum

- (b) *Acrylic Waterborne Paint.* The exact manufacturing formulation for the paint shall be left to the discretion of the manufacturer, provided that a lead-free, 100% Acrylic resin polymer waterborne product is produced that meets the requirements listed in the table below. The finished product shall maintain its consistency during application at temperatures compatible with conventional equipment.



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 AND LOW VOC SOLVENT BASE PAINT

**ACRYLIC WATERBORNE PAINT**

Property	Minimum	Maximum	Test Method
<b>Composition Requirements</b>			
Nonvolatile portion of vehicle (white and yellow), %	42.5		
<b>Pigment Composition</b>			
(white and yellow), % by mass (weight)	58.0	62.0	ASTM D 4451 ASTM D 3723
White Paint			
Titanium Dioxide		10.0%; 120 g/L (1.0 lb/gal)	ASTM D 476, Type III
Calcium Carbonate, %		92.0	ASTM D 1199, Type GC-II
Yellow Paint			
Titanium Dioxide		5.0%; 24 g/L (0.2 lb/gal)	ASTM D 476, Type III
Calcium Carbonate		93.0	ASTM D 1199, Type GC-II
Organic Yellow Pigments, %	5.0		
Yellow Iron Oxide		0.063%; 3 g/L (0.025 lb/gal)	ASTM D 768
<b>Vehicle Composition, 100% acrylic polymers, (white and yellow), %</b>		43.0	FTMS 141C - Method 4031 or Method 4053.1
<b>Properties of the Finished Paint</b>			
Total Non-volatiles, (solids) % by weight (mass)			
White Paint, %	77.0		FTMS 141C - Method 4053.1,
Yellow Paint, %	76.0		ASTM D 2369, or ASTM D 4758
Density, kg/L (lbs/gal) <sup>1</sup>			
White and Yellow Paint	1.68 (14.0)		ASTM D 1475 using mass per liter (U.S. Standard weight per gallon) cup as defined in U.S. Military Standard 4566A
Consistency (Viscosity) White and Yellow, Krebs-Stormer Units	85	95	ASTM D 562
Freeze Thaw Stability	Shall complete 5 or more test cycles successfully		ASTM D 2243
Fineness of Grind, Visual Standard Rating B	3		ASTM D 1210
Hydrogen ion content: pH	9.6		ASTM E 70
Directional Reflectance: [0.38 mm (15 mil) Wet Film]			
White, dried	85		ASTM E 1347
Yellow, dried	50		
Dry Opacity (Contrast Ratio): [0.38 mm (15 mil) Wet Film]			
White Paint	0.95		ASTM D 2805
Yellow Paint	0.88		

<sup>1</sup>Density shall not vary more than 0.3 lbs/gal (36 g/L) between batches.

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REVISION OF SECTIONS 627 AND 708  
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AND LOW VOC SOLVENT BASE PAINT

**Performance Requirements:** The paint shall be water resistant and shall show no softening, blistering or loss in gloss when tested according to FTM 141C, Method 6011.

The paint shall dry to a no tracking condition in a maximum of 75 seconds. The no tracking condition shall be determined by actual application on the pavement at a wet film thickness of 0.38 mm (15 mils) with white or yellow paint, covered with glass beads at a rate of 720 grams per liter (6 pounds per gallon).

*A 0.30 to 0.38 mm (twelve to fifteen mil) sample of wet film of the candidate paint shall be placed immediately after application in a humidity chamber maintained at  $22.5 \pm 1.4$  °C ( $72.5 \pm 2.5$  °F) and 90% relative humidity for testing. The film shall have a "dry-through" time less than, equal to, or up to 15 minutes longer than the manufacturer's laboratory reference paint film when tested at or close to the same time according to ASTM D 1640. The pressure exerted shall be the minimum needed to maintain contact between the thumb and film.*

REVISION OF SECTION 630  
IMPACT ATTENUATOR (TEMPORARY)

Section 630 of the Standard Specifications is hereby revised for this project to include the following:

**DESCRIPTION**

This work consists of furnishing, installing, certifying, moving, maintaining, and removing temporary impact attenuators in accordance with these specifications and in conformity with the lines and details established.

**MATERIALS**

Each impact attenuator shall be either the TRACC or ADIEM system as manufactured by the SYRO Steel Company, Centerville, Utah (Telephone: 801-292-4461), the QUADGUARD CZ system as manufactured by Energy Absorption Systems, Inc., Chicago, IL (312-467-6750, 303-733-8447 in Denver), or an approved sand barrel array system (see designer note below). Impact attenuators shall conform to the requirements of the manufacturer and be capable of bi-directional shielding of the objects identified in the plans. Filler materials shall be treated according to the manufacturer's recommendations to prevent freezing to a temperature of -50°F.

The design speed of the impact attenuators shall be 55 mph.

**CONSTRUCTION REQUIREMENTS**

If barrel arrays are used, the Contractor shall paint, with white epoxy paint, an outline and the weight of each barrel on the pavement prior to final placement. All numbers shall be a minimum of 6 inches high. Barrel types shall be of those listed on the CDOT Approved Products List.

The site shall be prepared to receive the impact attenuator by filling, excavating, smoothing, constructing the paved foundation pad, installing approved transition and anchoring, and all other work necessary for the proper installation of the attenuator.

The impact attenuator shall be fabricated and installed in accordance with the manufacturer's recommendations. The Contractor shall provide a copy of the manufacturer's installation instructions and parts lists to the Engineer prior to installation of the device.

Each installation shall be supervised and certified as correct upon completion by a representative of the device manufacturer or by an employee of the Contractor who is a certified installer. The certified installer shall have completed device training and shall be registered with the manufacturer as a certified installer.

**METHOD OF MEASUREMENT**

Impact Attenuator (Temporary) will be measured by the number of attenuators installed, certified, and accepted.

**BASIS OF PAYMENT**

The accepted quantities will be paid for at the contract unit price for the pay item listed below:

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REVISION OF SECTION 630  
IMPACT ATTENUATOR (TEMPORARY)

Payment will be made under:

<b>Pay Item</b>	<b>Pay Unit</b>
Impact Attenuator (Temporary)	Each

Payment will be full compensation for all work and materials required to furnish, install, certify, move, maintain, and remove the impact attenuator. Site preparation, pavement pad, epoxy painting, and all necessary hardware including anchors and transitions will not be paid for separately, but shall be included in the work.

February 22, 2002

GENERAL 404 PERMIT

The proposed work as shown on the plans has been permitted by the U.S. Army Corps of Engineers under a General 404 Permit for roadway fill. The Contractor shall comply with all special and general conditions attached to the permit. All costs for permit compliance will not be paid for separately, but shall be included in the cost of the work.

Questions regarding this permit should be directed to the U.S. Army Corps of Engineers, Albuquerque District, Southern Colorado Project Office, P.O. Box 294, Pueblo, CO 81002, (719) 543-9459, Attention: Ms. Anita Culp.

A copy of this permit is available from the Resident Engineer.

FORCE ACCOUNT ITEMS

DESCRIPTION

This special provision contains the Division's estimate for force account items included in the Contract. The estimated amounts marked with an asterisk will be added to the total bid to determine the amount of the performance and payment bonds. Force Account work shall be performed as directed by the Engineer.

BASIS OF PAYMENT

Payment will be made in accordance with subsection 109.04. Payment will constitute full compensation for all work necessary to complete the item.

Force account work valued at \$5,000 or less, that must be performed by a licensed journeyman in order to comply with federal, state, or local codes, may be paid for after receipt of an itemized statement endorsed by the Contractor.

<u>Force Account Item</u>	<u>Quantity</u>	<u>Estimated</u>	<u>Amount</u>
F/A Minor Contract Revisions	F.A.		\$ 75,000*
F/A Asphalt Pavement Incentive	F.A.		\$ 5,000
F/A Erosion Control	F.A.		\$ 2,000*

TRAFFIC CONTROL PLAN - GENERAL

The key elements of the Contractor's method of handling traffic (MHT) are outlined in subsection 630.08.

The components of the TCP for this project are included in the following:

- (1) Subsection 104.04 and Section 630 of the specifications.
- (2) Standard Plan S-630-1, Traffic Controls for Highway Construction, Case IV and Standard Plan S-630-2.
- (3) Schedule of Construction Traffic Control Devices in the plans.
- (4) Detour Details in the plans.
- (5) Manual of Uniform Traffic Control Devices.

Special Traffic Control Plan requirements for this project are as follows:

The Contractor shall not have construction equipment or materials in the lanes open to traffic at any time, unless directed by the Engineer.

Prior to starting construction, the Contractor shall notify the Region 1 Traffic Engineer of the date the Contractor intends to start construction.

Lane closures will only be allowed for paving operations, moving traffic for construction phase changes, and other brief periods as necessary. A maximum of one lane may be closed at any time. No lane closures will be allowed between the hours of 6:00 am and 9:00 am and between 3:00 pm and 7:00 pm or as directed.

No work will be permitted on weekends without the approval of the Engineer.

All costs incidental to the foregoing requirements shall be included in the original contract prices for the project.

UTILITIES

Known utilities within the limits of this project are:

IREA Electric	Ron Smith	303-688-3100
Qwest Telephone	Darrel Koenig	303-792-6177
Qwest Comm (Fiber)	Brian Connell	303-445-7052
		303-884-8125 (mobile)
AT&T Cable	James Nolan	303-603-5604
Peoples Natural Gas	Dave Vincent	303-688-9009
CDOT Electric	Gordon Heil	303-365-7141

The Contractor shall coordinate with the CDOT Project Engineer to facilitate the installation, placement and relocation of all utilities impacted on this project.

The work described in these plans and specifications shall require coordination by the contractor with the utility companies in conducting their respective operations as necessary.

GENERAL:

The Contractor shall comply with Article 1.5 of Title 9, CRS ("Excavation Requirements") when excavation or grading is planned in the area of underground utility facilities. The Contractor shall notify all affected utilities at least two (2) business days prior to commencing such operations. Contact the Utility Notification Center of Colorado (UNCC) to have locations of UNCC registered lines marked by member companies. For all calls to UNCC use phone number 1-800-922-1987. All other underground facilities shall be located by contacting the respective company. Utility service laterals shall also be located prior to beginning excavating or grading.

The location of utility facilities as shown on the plan and profile sheets, and herein described, were obtained from the best available information.

All costs incidental to the foregoing requirements will not be paid for separately but shall be included in the work.