LAWRENCE CONSTRUCTION COMPANY

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LITTLETON, CO 80125

"AN EQUAL OPPORTUNITY EMPLOYER"

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April 17, 2002

Mr. Thomas R. Hunt, P.E.
Project Engineer
Colorado Department of Transportation
Region 1 – Inverness Residency
359 Inverness Drive South, Suite K
Englewood, Colorado 80112

Re: Conceptual Value Engineering Change Proposal
Colorado Project No. BR 086A-027
State Highway 86 at Mitchell Gulch

Dear Mr. Hunt:

Lawrence Construction Company is submitting the following as a Conceptual Value Engineering Change Proposal in accordance with the Colorado Department of Transportations "Standard Specifications for Road and Bridge Construction, 1999, Section 104.07 (b)".

Lawrence Construction Company proposes to redesign the current triple concrete box culvert with a single span precast girder bridge. The conceptual design includes replacing the original triple concrete box culvert with a 43-foot wide bridge, which includes 2-12 foot driving lanes, 2-8 foot shoulders and 2-1.5 foot bridge rails (Type 10). Original horizontal and vertical alignments of the roadway and structure will be maintained. The proposed bridge length would be approximately 40-foot centerline of abutment to centerline of abutment and include the following:

1. The superstructure would be 20" deep precast/pretension concrete.
2. The abutment caps would be precast and conventionally reinforced approximately 42 inches wide x 48 inches deep with plate imbeds in the bottom at the pile foundation locations.
3. The foundation system would consist of HP 12x74 steel piling approximately 30 feet deep into bedrock formations. Each abutment would require 4 piles with a smaller size pile at the end of each wingwall. (Total 12 pile)
4. Joints between precast units will be sealed against moisture leakage and to provide structural continuity between units prior to placement of subgrade and pavement materials.
5. Backfill behind abutments will be flow fill to allow faster placement of superstructure and roadway elements.
6. Approach and departure guardrail will be required and will be Type 3.

The existing proposed structure is a 90-foot long triple concrete box culvert requiring a two stage construction phasing. Additionally the existing structure will require a significant paved detour (bypass) roadway with temporary barrier rail, hot bituminous paving and traffic control. The two-phase construction sequence existing will require long construction time frames for each phase of work.

The proposed structure is anticipated to be completely constructed in one weekend with traffic closure to the mainline beginning late on a Friday and construction completion by Monday morning

complete with paving and striping. The construction reduces significantly construction time requirements and would require only a gravel 25 mph 2-lane detour with traffic control over one weekend. Abutment piling can be installed prior to the weekend with traffic control for single lane operation of the highway. The piling will be driven below the surface of the existing pavement and the pavement will be patched until existing structure removal and placement of the new structure and roadway elements. Guardrail placement, wingwall placement, approach-departure guardrail installation and final shoulder treatments can be accomplished after bridge placement with traffic control measures.

The difference in cost is a savings of $20,087.25.

The service life of the original proposed structure will be maintained with the proposed bridge structure.

The proposed bridge structure offers hydraulically a larger opening than the triple concrete box structure with significantly less debris maintenance through the structure. Future potential widening of SH 86 at the bridge can be easily accomplished without disruption to the traveling public, and reduced potential environmental issues and concerns.

The appearance of the structure will be the normal gray concrete texture of concrete and has not been an issue with CDOT representatives. No architectural treatment either imbedded in the concrete or structural coating has been required.

Safety aspects of the construction have been improved with minimal highway mainline closure, reduced traffic control requirements, and minimal disruption to the traveling public with detour measures. It is anticipated that only 60-72 hours of mainline traffic closure will be necessary.

Lawrence Construction Company will be working with Wilson & Company who will be responsible for the redesign engineering. Lawrence and Wilson are committed to assuring CDOT that the proposed bridge structure is as comparable to the original structure as possible. Attached are the following concept documents: Construction Sequence, Bridge Section and Bridge Elevation. Upon approval and direction, Wilson & Company will prepare complete bridge plans to CDOT standards for approval and construction.

Attached are estimates of the anticipated cost savings to the project based on the Value Engineering. The original structure and the redesign are compared based on cost components, quantities and costs. The total cost savings will presumably be shared equally between Lawrence Construction Company and the Colorado Department of Transportation in accordance with Section 104.07 of the Standard Specifications. Also attached are spreadsheets detailing two other options that were rejected by Lawrence Construction Company due to cost overruns.

The amount of potential scour protection is questionable in the cost estimate comparisons. Lawrence Construction Company has included in the cost comparison two (2) foot thick riprap as shown on the attached Bridge Elevation. If a detailed hydraulic analysis is required by CDOT, the amount of scour protection may require adjustment to the quantity and cost. This proposal utilizes the same hydraulic information as the existing design, Q_{25}=1,040 cfs. If required, the engineering to perform a HecRas study to assess hydraulic issues, since no study has been performed to date, would require an increase to the construction contract in the amount of $5,000.00 to cover the cost of an engineering study.

Lawrence Construction Company would request that CDOT complete its preliminary review of the Conceptual Value Engineering Proposal within 10 working days of receiving the package. This time frame should avoid adding any delays to the project. Time necessary for the full proposal will require 20 days. A Contract Modification Order must be executed by June 10, 2002 to obtain maximum benefit to the project. Lawrence Construction Company feels that by acting on this proposal in such a timely manner the impact on time for completing the contract would be a savings of 50 days to the project time count.

Lawrence Construction Company appreciates this opportunity to work with CDOT to provide an economical and time responsive construction project. Should you have questions or require further information related to this proposal, please contact Rick Lawrence at 303-791-5642.

Sincerely,

LAWRENCE CONSTRUCTION COMPANY

Richard J. Lawrence, P.E.
President

CONSTRUCTION SEQUENCE

Activities that can be done before bridge replacement.

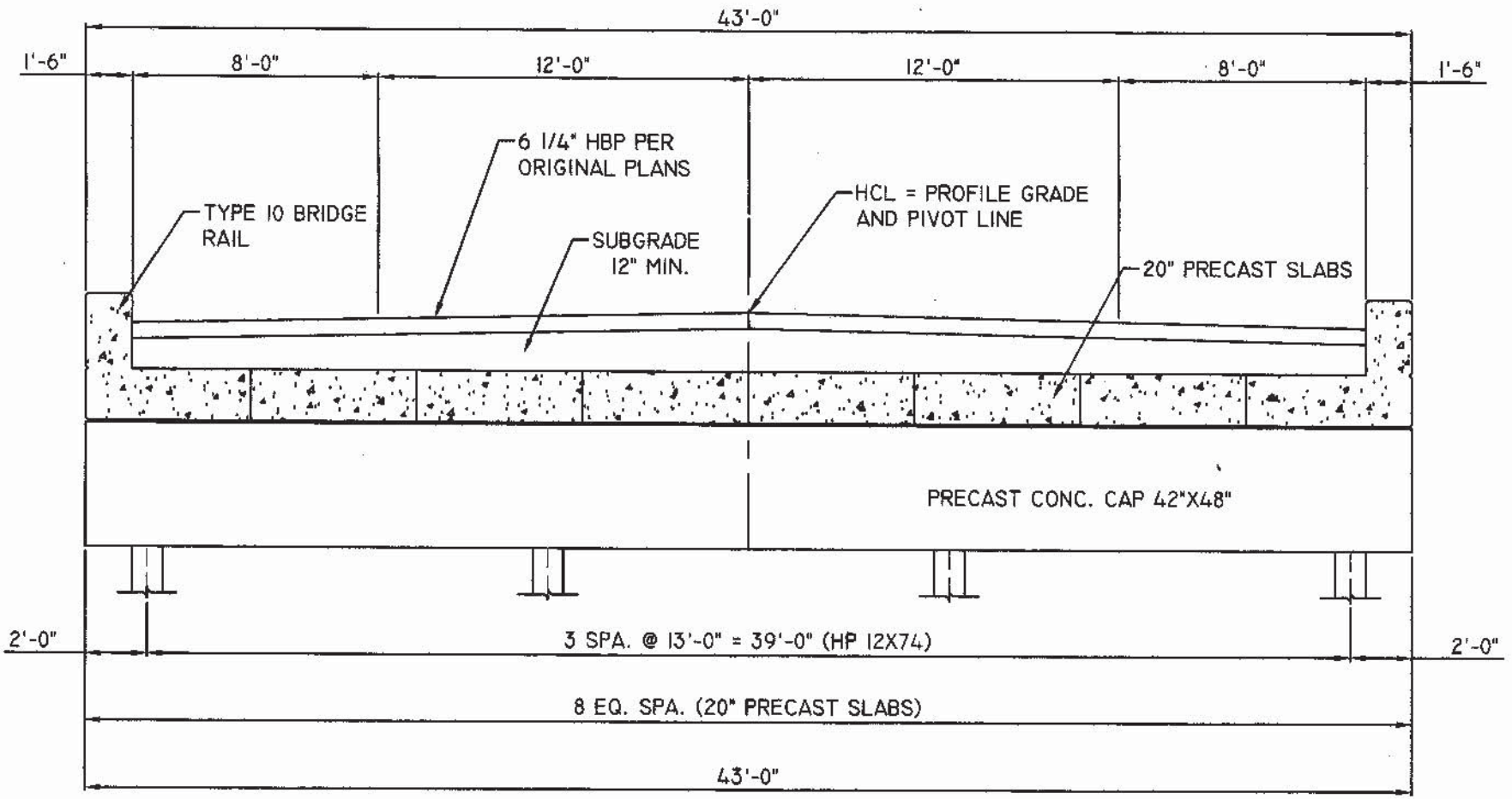
1. Install traffic control devices.
2. Construct gravel 2-lane temporary detour (bypass) on south side of existing bridge.
3. Drive abutment piling with traffic control. Set pile head slightly below surface of existing asphalt and patch with temporary pavement.

Activities from Friday night through Monday morning

1. Remove existing structure.
2. Excavate around piling and cut piling to elevation of precast cap bottom.
3. Place precast abutment caps on piling and weld piling to embeds in bottom of cap.
4. Backfill behind and under abutment caps with flowfill.
5. Place riprap at face of abutments
6. Set 20" deep precast slabs and weld top slab plates between adjacent slabs.
7. Waterproof joints between slabs and between precast slabs and abutment caps at back of abutments.
8. Complete abutment backfills.
9. Place wingwall panels and backfill.
10. Place subgrade material and bluetop for HBP.
11. Pave and stripe.
12. Open to traffic.

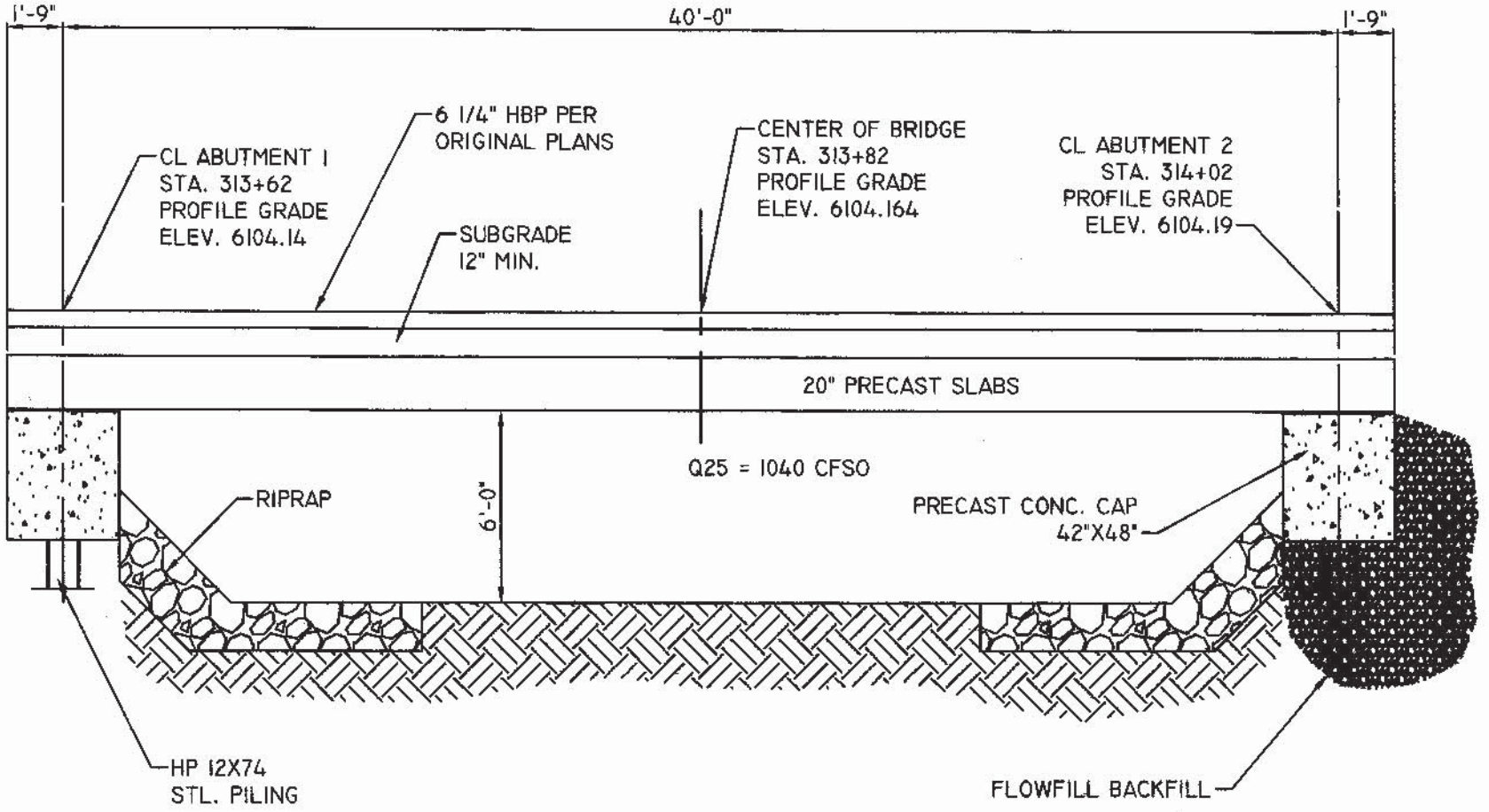
Activities subsequent to bridge replacement

1. Remove detour (bypass) on south side of bridge.
2. Fine grade shoulders and channel.
3. Construct approach-departure guardrail (Type 3) and end anchorages.
4. Place Type 10 bridge rail.
5. Complete roadway items.
6. Seed and mulch shoulders.



BRIDGE SECTION

LAWRENCE CONSTRUCTION COMPANY



BRIDGE ELEVATION

LAWRENCE CONSTRUCTION COMPANY

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(BRO86A) SH86 5mi E of Castle Rock
Lawrence Construction Company
Value Engineering Comparison
43' Wide Precast Bridge Completed Over One Weekend
24' Wide Dirt Detour (Selected Option)

Code	Description	Quantity	UM	Bid Unit	Bid Total	Value Total
202-00090	Rem Delineator	13	EA	$ 5.00	$ 65.00	$ 65.00
202-00250	Rem Pavement Marking	0	SF	$ 2.00	$ 300.00	$ -
202-00400	Rem Bridge	1	EA	$ 15,000.00	$ 15,000.00	$ 15,000.00
202-01000	Rem Fence	501	LF	$ 2.00	$ 1,002.00	$ 1,002.00
202-01130	Rem Gdrail Ty 3	225	LF	$ 3.00	$ 675.00	$ 675.00
202-01300	Rem End Anchorage	4	EA	$ 100.00	$ 400.00	$ 400.00
203-00060	**Emb Matl (CIP)**	**3504**	**CY**	**$ 13.54**	**$ 53,515.90**	**$ 47,444.16**
203-01550	Dozing	10	HR	$ 81.18	$ 811.84	$ 811.80
203-01597	Potholing	0	HR	$ 200.31	$ 801.23	$ -
206-00000	**Str Excav**	**142**	**CY**	**$ 8.04**	**$ 1,391.14**	**$ 1,141.68**
206-00200	Str Bkfl (CL 2)	0	CY	$ 12.59	$ 3,236.32	$ -
207-00205	Topsoil	480	CY	$ 6.03	$ 2,895.02	$ 2,894.40
207-00210	Stockpile Topsoil	480	CY	$ 6.03	$ 2,895.02	$ 2,894.40
208-00005	Erosion Log	0	LF	$ 7.70	$ 770.00	$ -
208-00020	Silt Fence	200	LF	$ 5.00	$ 1,000.00	$ 1,000.00
210-00011	Res Mailbox Str (Ty 1)	1	EA	$ 150.00	$ 150.00	$ 150.00
210-01011	Res Gate	1	EA	$ 250.00	$ 250.00	$ 250.00
212-00006	Seeding (Native)	0.9	AC	$ 1,290.00	$ 1,161.00	$ 1,161.00
213-00002	Mulching (Weed Free Hay)	1.1	AC	$ 1,200.00	$ 1,320.00	$ 1,320.00
213-00061	Mulch Tackifier	165	LB	$ 3.00	$ 495.00	$ 495.00
403-00720	**HBP (Patching) (Asph)**	**10**	**TN**	**$ 96.32**	**$ 4,816.17**	**$ 963.20**
403-33721	**HBP (Gr S) (75) (PG 58-28**	**1027**	**TN**	**$ 38.60**	**$ 44,505.80**	**$ 39,642.20**
411-10255	**Emul Asph (SS)**	**714**	**GL**	**$ 1.25**	**$ 892.50**	**$ 892.50**
601-03030	Conc CL D (Box)	0	CY	$ 189.37	$ 56,999.26	$ -
602-00000	Reinf Steel	0	LB	$ 0.40	$ 25,972.87	$ -
607-00005	End Post	2	EA	$ 125.00	$ 250.00	$ 250.00
607-00010	Corner and Line Br Post	14	EA	$ 150.00	$ 2,100.00	$ 2,100.00
607-01000	Fence BW MP	434	LF	$ 5.25	$ 2,278.50	$ 2,278.50
607-11580	Fence (Temp)	0	LF	$ 2.00	$ 718.00	$ -
612-00001	Delin (Ty I)	4	EA	$ 20.00	$ 80.00	$ 80.00
612-00002	Delin (Ty II)	8	EA	$ 22.00	$ 176.00	$ 176.00
612-00003	Delin (Ty III)	4	EA	$ 22.00	$ 88.00	$ 88.00
614-00013	Sign Panel (CL III)	7	SF	$ 30.00	$ 210.00	$ 210.00
614-01502	Steel Sign Post (2 In Rd)	20	LF	$ 30.00	$ 600.00	$ 600.00
617-00036	36 In Culvert Pipe	26	LF	$ 64.00	$ 1,664.08	$ 1,664.00
620-00001	Field Office (CL 1)	0	EA	$ 7,476.46	$ 7,476.46	$ -
620-00011	Field Lab (CL 1)	0	EA	$ 7,476.46	$ 7,476.46	$ -
620-00020	Sanitary Facility	1	EA	$ 1,010.33	$ 1,010.33	$ 1,010.33
621-00450	Detour Pvmt	0	SY	$ 10.40	$ 16,567.20	$ -
625-00000	Const Surveying	1	LS	$ 13,500.00	$ 13,500.00	$ 13,500.00
626-00000	Mobilization	1	LS	$ 32,000.00	$ 32,000.00	$ 32,000.00
627-00002	Thermoplastic Pvmt Mkg	1350	SF	$ 3.50	$ 4,725.00	$ 4,725.00
627-00011	Pvmt Mkg Paint (Waterborn	20	GL	$ 75.00	$ 1,500.00	$ 1,500.00