Form C-104
Rev. 02/2009

VALUE ENGINEERING CHANGE PROPOSAL
MISSOURI DEPARTMENT OF TRANSPORTATION

☒ **Conceptual Proposal** ☐ **Final Proposal** **Date** 2/12/10

Contract ID 090821-602 **Job No.** J6U1028P & J6U1028Q

County St. Charles **Original Bid Cost** $43,991,879.40

Contractor Fred Weber, Inc. **By** Brett Lennon

Designed By MODOT **Phone** 314-316-6154

VECP# 10-09 **(to be completed by C.O.)** **VECP** ☐ **or** **PDVECP** ☐

1. **Description of existing requirements and proposed change(s). Advantages/Disadvantages**
   Existing: Currently at bridges A7690 and A6211 over Jungermann Road the plans show us boring a 12' rock socket and then driving pile with shear studs attached to the flanges of the pile.

   Proposed: See attached sheet.

2. **Estimate of reduction in construction costs.** $16,126.00

3. **Prediction of any effects the proposed change(s) will have on other department costs, such as maintenance and operations.**
   None

4. **Anticipated date for submittal of detailed change(s) of items required by Section 104.6 of the Specifications.**

   2/12/10
   (date)

5. **Deadline for issuing a change order to obtain maximum cost reduction, noting the effect of contract completion time or delivery schedule.**

   _____ (date) _____ (effect)

6. **Dates of any previous or concurrent submission of the same proposal.**

   N/A
   (date and/or dates)

Additional Comments:

** Portion Below This Line To Be Filled Out by MoDOT **

Comments: I recommend rejection of this proposal based on Comments received from MoDOT Bridge Dept. MoDOT Bridge is concerned that by not driving pile the pile will not be seated and we would be relying on side friction only. If we are relying on side friction only a rebar cage and CSL Testing is required similar to a drilled shaft.

Submitted by Resident Engineer — Date 3-2-10

Comments:
I AM IN AGREEMENT WITH BRIDGE DIV. AND RECOMMEND REJECTION OF THIS VE AS NOTED ABOVE.

☐ Approval Recommended
☒ Rejection Recommended

District Engineer — Date 3-8-10

Comments:

☐ Approval Recommended
☐ Rejection Recommended

N/A

Federal Highway Administration
Required for FHWA Full Oversight Projects

Date

Comments: This VE is rejected on the basis of the Bridge Division's concerns regarding the support provided to the structure by side friction only. 3/10/2010 Denis Glascock.

☐ Approval
☒ Rejection

David D. Glascock — Digitally signed by Denis Glascock DN: cn=Denis Glascock, c=US, o=MoDOT, ou=3H35, email=Denis.Glascock@modot.mo.gov Date: 2010.03.10 08:37:32 -06'00'

State Construction and Materials Engineer — Date 3/10/2010

Distribution: Resident Engineer, Project Manager, District Construction & Materials Engineer, State Construction & Materials Engineer, FHWA Value Engineering Administrator – MoDOT, P. O. Box 270, Jefferson City, MO 65102

1. **Description of existing requirements and proposed change(s). Advantages/Disadvantages**

Fred Weber, Inc. would like to propose to eliminate the requirement to strike the pile in the rock socket. The advantages to this are that it requires no additional design since it is a current design practice and there will be a cost savings. The risk of damaging the pile while attempting to drive it into rock will also be eliminated. There are no disadvantages to this to this as it is standard practice as seen on the attached drawings from another MODOT job.

COST BREAKDOWN

PROJECT: Route 94, St. Charles County/Route 364, St. Charles County DATE : 2/12/2010
MODOT JOB NO.: J6U1028P/J6U1028Q
DESCRIPTION OF WORK : Value Engineering Proposal
FWI JOB NO. : 409501

A7690 and A6211- Briges over Jungermann

	Quantity		Bid Price	Proposed Pric	Savings
Structural Steel Piles(14")	1721.0	LF	$66.00	$60.00	$10,326.00
Pile Point Reinforcment	40.0	EA	$145.00	$0.00	$5,800.00
				TOTAL :	$16,126.00
				MODOT:	$8,063.00
				FRED WEBER:	$8,063.00

Estimated Quantities

Item		Substr.	Superstr.	Total
Class 1 Excavation	cu. yard	65		65
Removal of Bridge A594	lump sum			1
Drilled Shafts (4 ft. 6 in. Dia.)	linear foot	60.2		60.2
Rock Sockets (4 ft. 0 in. Dia.)	linear foot	64.0		64.0
Supplementary Television Camera Inspection	each	4		4
Foundation Inspection Holes	linear foot	104.0		104.0
Concrete Coring	linear foot	35.2		35.2
Sonic Logging Testing	each	4		4
Structural Steel Piles (12 in.)	linear foot	378		378
Pre-Bore for Piling	linear foot	49		49
Pile Point Reinforcement	each	6		6
Class B Concrete (Substructure)	cu. yard	103.0		103.0
Slab on Steel	sq. yard		1465	1465
* Safety Barrier Curb	linear foot		411	411
Raised Median Barrier	sq. foot		791	791
Reinforcing Steel (Bridges)	pound	14120		14120
Conduit System on Structure	lump sum		1	1
Reinforcing Steel (Epoxy Coated)	pound	23440		23440
Fabricated Structural Low Alloy Steel (Plate Girder) A709, Grade 50	pound		758360	758360
Intermediate Field Coat (System G)	sq. foot		31500	31500
Finish Field Coat (System G)	sq. foot		4200	4200
Vertical Drain at End Bents	each	2		2
Laminated Neoprene Bearing Pad (Tapered)	each		8	8
Laminated Neoprene Bearing Pad Assembly	each		4	4
Corrugated Metal Pipe Pile Spacers	each	6		6

All concrete between the upper and lower construction joints in the end bents is included in the Estimated Quantities for Slab on Steel.

All reinforcement in the end bents is included in the Estimated Quantities for Slab on Steel.

Laminated Neoprene Bearing Pads (Tapered) shall be in accordance with Sec 716.

Cost of channel shear connectors C4x5.4 (ASTM A709 Grade 36) in place will be considered completely covered by the contract unit price for Structural Steel Piles (12 in.)

* Safety barrier curb shall be cast-in-place option or slip-form option.

Estimated Quantities for Slab on Steel

Item		Total
Class B-2 Concrete	cu. yard	441.0
Reinforcing Steel	pound	10520
Reinforcing Steel (Epoxy Coated)	pound	117980

The table of Estimated Quantities for Slab on Steel represents the quantities used by the State in preparing the cost estimate for concrete slabs. The area of the concrete slab will be measured to the nearest square yard with the horizontal dimensions as shown on the plan of slab. Payment for prestressed panels, conventional forms, all concrete and coated and uncoated reinforcing steel will be considered completely covered by the contract unit price for the slab. Variations may be encountered in the estimated quantities but the variations cannot be used for an adjustement in the contract unit price.

Method of forming the slabs shall be as shown on the plans and in accordance with Sec 703. All hardware for forming the slab to be left in place as a permanent part of the structure shall be coated in accordance with ASTM A123 or ASTM B633 with a thickness class SC 4 and a finish type I, II, or III.

Slab shall be cast-in-place with conventional forming. Precast prestressed panels and stay-in-place corrugated metal forms will not be permitted.

General Notes:

Design Specifications:
2002 - AASHTO 17th Edition
Load Factor Design
Seismic Performance Category (SPC) B
Acceleration Coefficient = 0.12

Design Loading:
HS20 Modified
35#/Sq. Ft. Future Wearing Surface
Earth 120#/Cu. Ft., Equivalent Fluid Pressure 45#/Cu. Ft.
Fatigue Stress - Case 1
Superstructure: Continuous composite for live-load.

Design Unit Stresses:
Class B Concrete (Substructure) f'c = 3,000 psi
Class B-2 Concrete (Drilled Shafts & Rock Sockets) f'c = 4,000 psi
Class B-2 Concrete (Superstructure, except Safety Barrier and Median Barrier Curb) f'c = 4,000 psi
Class B-1 Concrete (Safety Barrier and Median Barrier Curb) f'c = 4,000 psi
Reinforcing Steel (Grade 60) fy = 60,000 psi
Structural Steel (ASTM A709 Grade 50) fy = 50,000 psi
Steel Pile (ASTM A709 Grade 36) fb = 9,000 psi

Neoprene Pads:
Bearings shall be 60 durometer neoprene pads.

Fabricated Steel Connections:
Field connections shall be made with 7/8" diameter high strength bolts and 15/16" diameter holes, except as noted.

Joint Filler:
All joint filler shall be in accordance with Sec 1057 for preformed sponge rubber expansion and partition joint filler, except as noted.

Reinforcing Steel:
Minimum clearance to reinforcing steel shall be 1 1/2", unless otherwise shown.

All reinforcing bars in the top of substructure beams shall be spaced to clear anchor rod walls for bearings by at least 1/2"

Bearing Pile at End Bent No. 3:
The contractor shall install structural steel piles in predrilled rock sockets at End Bent No. 3 to the elevations shown on the plans. The contractor shall drill the rock sockets using rock core barrels and rock augers powered by a drilled pier rig suitably powered and chosen to penetrate the hard limestone rock formation. All overburden, rock fragments and other debris shall be removed and the rock socket shall pass the inspection of the engineer before placing the pile and concrete. The structural steel pile shall be placed plumb as a unit for the full length of the pile prior to placing concrete. The pile shall be supported by some positive method to prevent its movement. Concrete for the pile shall be placed as soon as practical after the pile has been placed in the socket.

No drilling shall be performed within a radius of 20 feet of concrete that has taken initial set and has not attained a compressive strength of at least 1,500 psi.

The structural steel pile shall meet the requirements of Sec 702. The concrete used to fill the pile rock socket shall be Class B concrete.

Payment for the above described work including all materials, labor, temporary bracing, concrete, equipment and all incidentals necessary to complete this item of work shall be considered completely covered by the contract unit price per linear foot for "Structural Steel Piles (12 in.)".

Payment for drilling rock sockets for the piles including all materials, labor, equipment and all incidentals necessary to complete this item of work shall be considered completely covered by the contract unit price per linear foot for "Pre-Bore for Piling".

DISCLAIMER:
THE PROFESSIONAL WHOSE SIGNATURE AND PERSONAL SEAL APPEAR HEREON ASSUMES RESPONSIBILITY ONLY FOR WHAT APPEARS ON THIS PAGE, AND DISCLAIMS (PURSUANT TO SECTION 327.411 RSMO) THE SPECIFICATIONS, ESTIMATES, REPORTS, OR OTHER DOCUMENTS OR INSTRUMENTS NOT SEALED BY THE UNDERSIGNED PROFESSIONAL RELATING TO OR INTENDED TO BE USED FOR ANY PART OR PARTS OF THE PROJECT TO WHICH THIS PAGE REFERS.

Structural Steel Protective Coatings:
Protective Coating: System G in accordance with Sec 1081.

Prime Coat: The cost of the prime coat will be considered completely covered by the contract unit price for the "Fabricated Structural Steel". Tint of the prime coat for System G shall be similar to the color of the field coat to be used.

Field Coat: The color of the finish field coat shall be Gray (Federal Standard #26373). The cost of the intermediate field coat will be considered completely covered by the contract unit price per sq. foot for "Intermediate Field Coat (System G)". The cost of the finish field coat will be considered completely covered by the contract unit price per sq. foot for "Finish Field Coat (System G)".

At the option of the contractor, the intermediate and finish field coats may be applied in the shop. The contractor shall exercise extreme care during all phases of loading, hauling, handling, erection and pouring of the slab to minimize damage and shall be fully responsible for all repairs and cleaning of the coating systems as required by the engineer.

Traffic Handling:
See Roadway Plans. No staging on this structure.

Miscellaneous:
High strength bolts, nuts and washers will be sampled for quality assurance as specified in Sec 106 and Field Section (FS-712) from Materials Manual.

"Sec" refers to the sections in the standard and supplemental specifications unless specified otherwise.

A minimum vertical clearance of 15'-6" from crown of existing lanes and a minimum lateral clearance (total opening width) of 36'-0" to the nearest temporary construction falsework centered on existing lane shall be maintained during construction.

Full stations are measured by chords of 100 feet along Union Road Base Line. Intermediate stations are measured by a sub-chord from the last full station.

Remove existing Bridge A594 in accordance with Sec 216 with the following exception. Existing Intermediate Bent No. 3 shall be removed to an elevation flush with I-55 top of pavement.

The Contractor shall coordinate construction of End Bent No. 3, including pile pre-bore and installation of piles and corrugated metal pipe pile spacers, with the MSE Wall construction.

Corrugated metal pipe pile spacers shall have an inside diameter of at least 24 inches, see Special Provisions.

STATE OF MISSOURI
RODNEY D. RILEY NUMBER E-20287
01-27-09

DATE PREPARED	29-JAN-2009
ROUTE 55	STATE MO
DISTRICT 6	SHEET 2
COUNTY ST. LOUIS COUNTY & CITY	
JOB NO. J611541B	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO. A7369	

DATE	DESCRIPTION
	1

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
MoDOT
105 WEST CAPITOL
JEFFERSON CITY, MO 65109

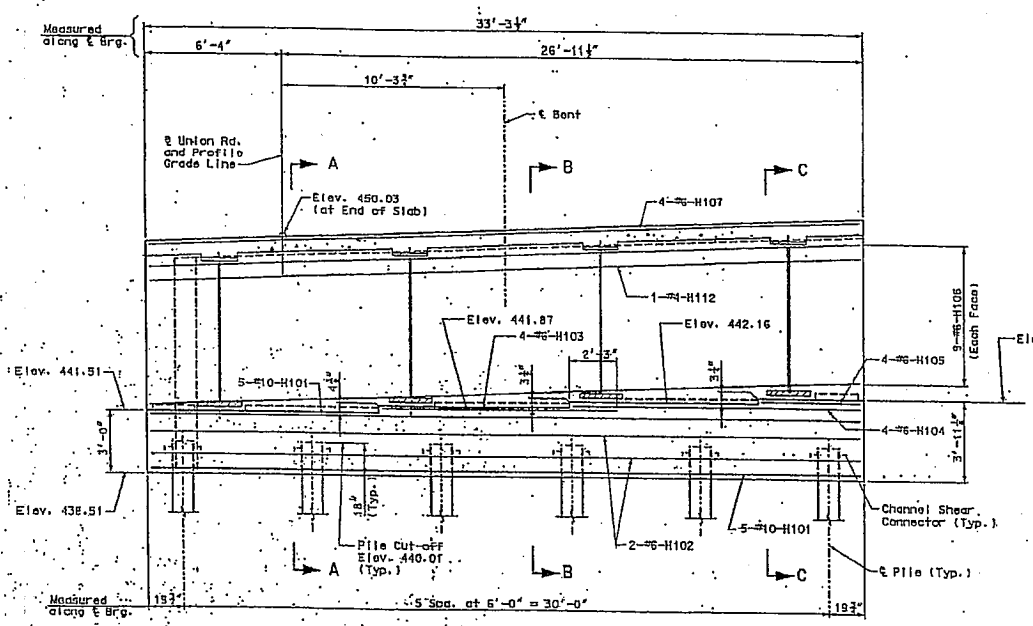
JACOBS
801 NORTH BROADWAY
ST. LOUIS, MO 63102
TEL. (314) 335-4000
CERTIFICATE / LICENSE NO. 000104

Detailed FAC APRIL 2008
Checked RDR MAY 2008

GENERAL NOTES AND ESTIMATED QUANTITIES

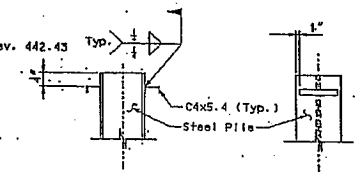
NOTE: THIS DRAWING IS NOT TO SCALE. FOLLOW DIMENSIONS.

P:\ch21800\700cadd\709str\Files for New Border\A7369_GenNOL_J611541B.dgn 10:00 29-JAN-20

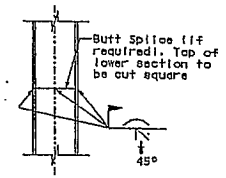


SECTION NEAR END BENT

PILE DATA			
Bent No.		End Bent No. 1	End Bent No. 3
Pile Type and Size		HP12x74	HP12x74
Number		6	6
Approximate Length	foot	39	24
Design Bearing	ton	75.5	75.5
Hammer Energy Required	foot-pound	16,988	-



CHANNEL SHEAR CONNECTOR DETAIL



STEEL PILE SPLICE DETAIL

(Required for all piles)

Note:
The cost of channel shear connectors complete in place shall be considered completely covered by the contract unit price for Structural Steel Piles (12 in.).

Pile Notes:

Pre-bore is required for piles at End Bent No. 3 to a depth of 5 ft. (min.) below top of rock, see Special Provisions.

Contractor shall be responsible for selecting an appropriate pile hammer to drive the piles to the required capacities and highest permissible tip elevations. The pile hammer and driving criteria will be determined based upon contractor's submittals as specified in the Special Provisions.

All piles at End Bent No. 1 shall be driven to practical refusal.

Minimum hammer energy requirements are based on design bearing value of piles.

Bearing piles shall conform to ASTM A709 Grade 36.

Manufactured pile point reinforcement shall be used on all steel piles at End Bent No. 1.

Notes:

For End Bent Notes, see Sheet No.5.

For details of End Bent No. 1 not shown, see Sheet Nos. 5, 6 and 8.

For Sections A-A, B-B and C-C, see Sheet No. 8.

DISCLAIMER:
THE PROFESSIONAL WHOSE SIGNATURE AND PERSONAL SEAL APPEAR HEREON ASSUMES RESPONSIBILITY ONLY FOR WHAT APPEARS ON THIS PAGE, AND DISCLAIMS (PERSUANT TO SECTION 327.411 RSMO) THE SPECIFICATIONS, ESTIMATES, REPORTS, OR OTHER DOCUMENTS OR INSTRUMENTS NOT SEALED BY THE UNDERSIGNED PROFESSIONAL RELATING TO OR INTENDED TO BE USED FOR ANY PART OR PARTS OF THE PROJECT TO WHICH THIS PAGE REFERS.

STATE OF MISSOURI
RODNEY D. RILEY
NUMBER E-28267
REGISTERED PROFESSIONAL ENGINEER
01-29-

DATE PREPARED 29-JAN-2009
ROUTE 55 STATE MO
DISTRICT 6 SHEET 7
COUNTY ST. LOUIS COUNTY & CITY
JOB NO. J6I1541B
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A7369

DATE	DESCRIPTION

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
MoDOT
105 WEST CAPITOL
JEFFERSON CITY, MO 65102

JACOBS
501 NORTH BROADWAY
ST. LOUIS, MO 63102
TEL. (314) 335-4000
CERTIFICATE / LICENSE NO. 000704

Detailed EEB APRIL 2008
Checked FAC APRIL 2008

DETAILS OF END BENT NO. 1

NOTE: THIS DRAWING IS NOT TO SCALE. FOLLOW DIMENSIONS.

SHEET NO. 7 OF 34

P:\clx21800\700cadd\709str\Files for New Border\A7369_EB105Abcz_J6I1541B.dgn

09:58 29-JAN-2

VALUE ENGINEERING CHECK SHEET

TYPE OF WORK

(Check one that applies)

- ➢ Bridge/Structure/Footings
- ☐ Drainage Structures (RCP, RCB, CMP's, ect.)
- ☐ TCP/MOT
- ☐ Paving (PCCP, ect.)
- ☐ Grading/MSE Walls
- ☐ Signal/Lighting/ITS
- ☐ Misc.

SUMMARY OF PROPOSAL

(If needed, condense summary to a couple of lines)

This VE involves a change in pile configuration and placement for a bridge.

SCANNING OF DOCUMENT

If the proposal is large, please mark or make note, which pages need to be scanned into the database. If there are special instructions, make note of them here.