

SCANNED
4-16-10
Perry, Dennis
ad

VALUE ENGINEERING CHANGE PROPOSAL
MISSOURI DEPARTMENT OF TRANSPORTATION

Conceptual Proposal Final Proposal Date 4-8-10

Contract ID 091218-407 Job No. J4P2148

County PLATTE 45 Original Bid Cost 3,784,739.39

Contractor L. G. BARCUS & SONS, INC. By LARRY D. ROSS

Designed By HNTB Phone 913-621-1100

VECP# 10-41 (to be completed by C.O.) VECP or PDVECP

1. Description of existing requirements and proposed change(s). Advantages/Disadvantages
 Plan Sheet No. 2 shows Rock Fill with a minimum thickness of 4 feet on the face of the spill slopes for Bridge A7739. We are proposing reducing the minimum thickness of the Rock Fill to 2 feet. This would increase the quantity of Embankment In Place and decrease the quantity for Rock Fill. The total plan quantity of Rock Fill is 3,330 C.Y. The total volume of Rock Fill @ 2 feet thick is 1,559 C.Y. The Rock Fill underrun would be $(3,330 - 1,559) = 1,771$ C.Y. The construction cost savings would be $(1,771 \times \$45.75) - (1,771 \times \$6.50) = \$69,511.75$

2. Estimate of reduction in construction costs. \$69,511.75

3. Prediction of any effects the proposed change(s) will have on other department costs, such as maintenance and operations.
 Do not anticipate proposed change will have any effect on costs for other departments.

4. Anticipated date for submittal of detailed change(s) of items required by Section 104.6 of the Specifications.
4-12-10
 (date)

5. Deadline for issuing a change order to obtain maximum cost reduction, noting the effect of contract completion time or delivery schedule.
4-13-10 No effect on contract completion time
 (date) (effect)

6. Dates of any previous or concurrent submission of the same proposal.
None
 (date and/or dates)

Additional Comments:

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

Comments:

The contractor's proposal was reviewed by MoDOT's geotechnical engineering staffed. It was recommended to not change the design of the four foot rock blanket to two foot. The contractor's proposal would result in a reduction of the Factor of Safety (FS) for the long term global stability of the end slopes. The end slopes are designed to the minimum acceptable FS of 1.5. Please find the attached supporting emails from Bruce Harvel, Randy Johnson, Alan Miller and Charles Pursley.

Shelie Daniel

Submitted By Resident Engineer

04-16-10

Date

Comments:

BASED ON THE RECOMMENDATIONS OF BOTH THE DISTRICT AND DIVISION GEOLOGISTS AS WELL AS BRIDGE DIVISION AND DESIGN DIVISION, THE DISTRICT DOES NOT SUPPORT THE APPROVAL OF THIS VE PROPOSAL.

Approval Recommended

Elizabeth A. Nystrom (FSN)

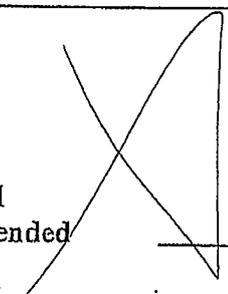
District Engineer

4-23-10

Date

Rejection Recommended

Comments:



Approval Recommended

Rejection Recommended

Federal Highway Administration
Required for FHWA Full Oversight Projects

Date

Comments:

REJECTED FOR REASONS NOTED BY THE DISTRICT.

Approval

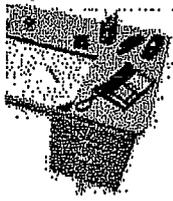
David D. Coover by PGB

State Construction and Materials Engineer

4-28-10

Rejection

Date



Randy L Johnson/D4/MODOT
04/12/2010 08:25 AM

To Shelle A Daniel/D4/MODOT@MODOT
cc John W Casey/D4/MODOT@MODOT, Mike A
Fritz/SC/MODOT@MODOT, Perry J
Allen/D4/MODOT@MODOT, Randy L
bcc

Subject Fw: J4P2148, Route 45, Platte County - VEC/PDU#2
(A7739)

History This message has been forwarded.

Shelle,
It appears from our geotechnical team that it may not be in our best interest to reduce the rock wedge.
Any savings up-front may cause increased maintenance/costs later along with potential stability issues.

Thanks

Randy L. Johnson, P.E, PTOE, ACTAR
Transportation Project Manager
Missouri Department of Transportation
randy.johnson@modot.mo.gov
816-622-0483

----- Forwarded by Randy L Johnson/D4/MODOT on 04/12/2010 08:23 AM -----



Alan D Miller/SC/MODOT
04/12/2010 06:56 AM

To Bruce A Harvel/D4/MODOT

cc John W Casey/D4/MODOT@MODOT, Mike A
Fritz/SC/MODOT@MODOT, Perry J
Allen/D4/MODOT@MODOT, Randy L
Johnson/D4/MODOT@MODOT, Shelle A
Daniel/D4/MODOT@MODOT, Thomas W
Fennessey/SC/MODOT@MODOT

Subject Re: Fw: J4P2148, Route 45, Platte County - VEC/PDU#2
(A7739)

I see no reason to reduce the thickness of the rock wedge.

Alan D. Miller, M.S., P.E.
Geotechnical Engineer
Geotechnical Section
Construction and Materials
Bus. (573) 526-5730
Fax (573) 526-4345
alan.miller@modot.mo.gov

Bruce A Harvel---04/08/2010 05:41:06 PM---Gentlemen, Could you take a look at this contract



Bruce A Harvel/D4/MODOT
04/08/2010 05:41 PM

To Alan D Miller/SC/MODOT@MODOT, Thomas W
Fennessey/SC/MODOT@MODOT
cc Perry J Allen/D4/MODOT@MODOT, John W
Casey/D4/MODOT@MODOT, Randy L
Johnson/D4/MODOT@MODOT, Shelle A
Daniel/D4/MODOT@MODOT, Mike A
Fritz/SC/MODOT@MODOT

Subject Fw: J4P2148, Route 45, Platte County - VEC/PDU#2



(A7739)

Gentlemen,

Could you take a look at this contractor VE Proposal for me (Located at the bottom of this email). It appears that this is in regards to reducing the Rock Wedge thickness on the spill slopes for Structure No. A7739 from 4 feet thick to 2 feet thick at the top of the slope. It's my understanding the embankment height at the bridge ends are 37' and 27'. This will affect the global stability of the spill slopes.....to what degree I'm not sure?

I have previously discussed this project with Alan, regarding the Wick Drains which is going to be underrun on this project. Also, we discussed and loosened the select fill requirement that had been structured into the contract, however when we took that into consideration.....the fact was we had the 4' Rock Wedge on the spill slopes. I'm not confident that a 2' rock wedge will provide us with an acceptable factor of safety for the bridge spill slopes with and or without the select fill? Therefore, I need your input.

I have attached some lab data from the contractor's proposed borrow sites. One site is from the latan borrow location which was for the select fill. The other borrow location is at the Snow Creek site, which I understand he intends to build the entire embankment out of now.

[attachment "MoDOT Route 45- Borrow Area Soil Tests.pdf" deleted by Randy L Johnson/D4/MODOT]

HNTB did the Geotechnical report on this project. I have copied Wayne Duryee's comments from a previous email I received from him.

Bruce, with the select embankment fill and the rock toe berm, we were able to achieve a FS of 1.3 for short term and 1.5 for long term stability as I recall. The select fill material adds an additional benefit by reducing the internal settlement amount and time of the embankment materials. These embankments are getting up there in height, 27 to 37 feet tall, so better embankment material and tighter compaction control is usually preferred. I don't know what your experience is with similar height embankments using fat clays.

The foundation materials settlement amounts were borderline for us to recommend wick drains. If it had not been for the estimated settlement times ranging from 4- to 8 months, we probably would have just built the embankments, possibly with a little surcharge, and waited it out. What lead us to the wick drains was that we were told there was a maximum of about 3 months in the schedule to wait out the settlement before driving piles. The window for shutting down the power line did not allow for a longer wait time we were told as well as the overall schedule did not have 4 to 8 months time available. We talked it over with several MoDOT folks, I don't remember specifically whom, it might have been Alan (although his comments indicate otherwise). The agreed on decision was to install the wick drains to reduce the settlement time to meet the schedule.

I would not necessarily be opposed to eliminating the wick drains, but one would have to discuss with the contractor whether they have the 4 to 8 months wait time available before driving piles. It is not just the end bent piles that might be affected by the embankment settlement, the interior pier piles are in the spill slope of the embankment, so we wanted to be cautious about negative skin friction for all piles. We also looked at designing for negative skin friction on the piles and not going with wick drains and a wait period, but the downdrag forces were significant and would have increased the number of piles substantially and required much larger foundations. There are also battered piles that don't

perform well when subjected to downdrag forces, they tend to become overstressed in bending quickly.

I hope this little bit of history helps. Let me know if you want to discuss anything.

NOTE NEW CELL#

Wayne Duryee

Geotechnical Section Manager

HNTB Corporation

715 Kirk Drive

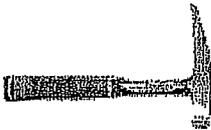
Kansas City, Missouri 64105

816-527-2234 direct phone number

816-510-0278 cell

816-472-4060 fax

wduryee@hntb.com



Bruce A. Harvel, R.G.

Geologist

Missouri Department of Transportation

600 NE Colbern Road

Lee's Summit, MO 64086

Office: (816) 622-6522 Fax: (573) 526-0031

email: Bruce.Harvel@modot.mo.gov

----- Forwarded by Bruce A Harvel/D4/MODOT on 04/08/2010 04:59 PM -----



Shelle A Daniel/D4/MODOT

04/08/2010 04:44 PM

To Bruce A Harvel/D4/MODOT@MODOT

cc Perry J Allen/D4/MODOT@MODOT, John W
Casey/D4/MODOT@MODOT, Randy L
Johnson/D4/MODOT@MODOT

Subject Fw: J4P2148, Route 45, Platte County - VECP/PDU#2

Bruce,

Please find the attached VE for review and recommendations. The due date listed on the VE is April 12, but the contractor verbally told me that this date can be extended. Please forward me the geotechnical recommendations at the earliest date. We will need all the documentation to support the recommendation. The plan sheet referred to in the VE is attached for your convenience.

[attachment "MoDOT Route 45- Plan Sheet 2.pdf" deleted by Randy L. Johnson/D4/MODOT] [attachment "MoDOT Route 45- VE2 Change Proposal.pdf" deleted by Randy L Johnson/D4/MODOT]

Let me know if you need any additional information.

Thank you.

Shelle Daniel, P.E.
Resident Engineer
5101 NW Gateway
Riverside, MO 64150
(816) 741-7030
(816) 215-7275 (cell)
(816) 741-0200 (fax)

Charles R Pursley/SC/MODOT
04/12/2010 03:49 PM

To Richard T Miller/SC/MODOT@MODOT
cc Shelie A Daniel/D4/MODOT@modot
bcc
Subject Re: Fw: J4P2148, Route 45, Platte County - VECP/PDU#2

Todd, I discussed this with Ron Temme. He then forwarded the response from Bruce Harvel to me. Ron had the same reasons for not accepting this idea as Bruce did. I concur that we should not accept this proposal.

Richard T Miller--04/09/2010 07:50:09 AM---Charles, For your information/review is a VECP of

Richard T Miller/SC/MODOT
04/09/2010 07:50 AM

To Charles R Pursley/SC/MODOT@MODOT
cc Shelie A Daniel/D4/MODOT@MODOT
Subject Fw: J4P2148, Route 45, Platte County - VECP/PDU#2

Charles,

For your information/review is a VECP on Route 45 in Platte County. The proposal is to reduce the thickness of the rock blanket under the bridge from 4' to 2'.

R. Todd Miller, P.E., A.V.S.
Innovations Engineer
(573) 522-9731

----- Forwarded by Richard T Miller/SC/MODOT on 04/09/2010 07:48 AM -----



Shelie A Daniel/D4/MODOT
04/08/2010 05:04 PM

To Richard T Miller/SC/MODOT@MODOT
cc
Subject Fw: J4P2148, Route 45, Platte County - VECP/PDU#2

Todd,

Please see the attached VE below. From discussing this with our Geologist, it sounds like there is a pretty good chance the recommendation may be to reject this one. He is going to discuss with the geotechs in Central Office and provide a recommendation next week.

Shelie Daniel, P.E.
Resident Engineer
5101 NW Gateway
Riverside, MO 64150
(816) 741-7030
(816) 215-7275 (cell)
(816) 741-0200 (fax)

----- Forwarded by Shelie A Daniel/D4/MODOT on 04/08/2010 05:01 PM -----



Shelie A Daniel/D4/MODOT
04/08/2010 04:44 PM

To Bruce A Harvel/D4/MODOT
cc Perry J Allen/D4/MODOT@MODOT, John W



Casey/D4/MODOT@MODOT, Randy L.
Johnson/D4/MODOT@MODOT
Subject Fw: J4P2148, Route 45, Platte County - VEC/PDU#2

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MoDOT Route 45- Plan Sheet 2.pdf MoDOT Route 45- VE2 Change Proposal.pdf

Let me know if you need any additional information.

Thank you.

Shelie Daniel, P.E.
Resident Engineer
5101 NW Gateway
Riverside, MO 64150
(816) 741-7030
(816) 215-7275 (cell)
(816) 741-0200 (fax)



Bruce A Harvel/D4/MODOT
04/12/2010 11:48 AM

To Shelie A Daniel/D4/MODOT@MODOT
cc Perry J Allen/D4/MODOT@MODOT, John W
Casey/D4/MODOT@MODOT, Randy L
Johnson/D4/MODOT@MODOT, Mike A
bcc

Subject Fw: J4P2148, Route 45, Platte County - VECP/PDU#2
(A7739)

History: This message has been forwarded

Shelie,

Here's my response to the contractors VE proposal. The Central Office geotechnical section may want to add some additional comments, should I be overlooking something. I understand we have embankment heights on the order of 37' at one bridge end and 27' on the opposite end of the structure.

HNTB did the geotechnical investigation for this project. Wayne Duryee's indicated to me in an email on March 23, 2010 the Factor of Safety (FS) for the long term global stability of the end slopes was calculated to be 1.5 (as it was originally designed with the select fill and a 4' Rock Wedge). A FS of 1.5 is the minimum value we would consider acceptable. Please keep in mind, since the project was designed we have made the decision to eliminate the select fill. The major contributing factor that aided in this decision was the fact we left the 4' Rock Wedge in place. By reducing the thickness of the Rock Wedge, we will be reducing the global stability of the end slopes. From a practical approach, I'm not comfortable with doing this. It's my opinion the cost savings associated with reducing the thickness of the Rock Wedge and decreasing the end slope stability does not merit taking risk on MoDOT's behalf. Without the 4' Rock Wedge we would have to have gone to flatter end slope, most likely a 2.5:1 minimum slope versus the 2:1 that is currently in the contract.

The Rock Wedge concept is something that has evolved with a lot of refinements over the past few years to reduce our costs. The steeper slopes allow us to reduce the overall length of our bridges. The use of rock allows us to design and construct a shorter structure while achieving stable end slopes. Initially, we used rock fill within our bridge approach embankments. To reduce the cost associated with the amount of rock we were using, we went to the Rock Wedge Concept that initially started out as 6' thick at the top of slope. To further refine this cost we currently use the 4' thickness.

If you have any questions, please feel free to contact me. I will not be available after 2pm today and will not be in the office tomorrow. I will be back Wednesday morning.

Bruce A. Harvel, R.G.
Geologist
Missouri Department of Transportation
600 NE Colbern Road
Lee's Summit, MO 64086
Office: (816) 622-6522 Fax: (573) 526-0031
email: Bruce.Harvel@modot.mo.gov

----- Forwarded by Bruce A Harvel/D4/MODOT on 04/12/2010 09:54 AM -----



Bruce A Harvel/D4/MODOT
04/08/2010 05:41 PM

To Alan D Miller/SC/MODOT, Thomas W
Fennessey/SC/MODOT
cc Perry J Allen/D4/MODOT@MODOT, John W



Casey/D4/MODOT@MODOT, Randy L
Johnson/D4/MODOT@MODOT, Shelie A
Daniel/D4/MODOT@MODOT, Mike A
Fritz/SC/MODOT@MODOT

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MoDOT
Route
45
Borrow
Area Soil
Tests.pdf

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NOTE NEW CELL#

Wayne Duryee

Geotechnical Section Manager

HNTB Corporation

715 Kirk Drive

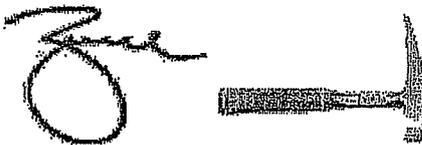
Kansas City, Missouri 64105

816-527-2234 direct phone number

816-510-0278 cell

816-472-4060 fax

wduryee@hntb.com



Bruce A. Harvel, R.G.

Geologist

Missouri Department of Transportation

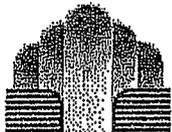
600 NE Colbern Road

Lee's Summit, MO 64086

Office: (816) 622-6522 Fax: (573) 526-0031

email: Bruce.Harvel@modot.mo.gov

----- Forwarded by Bruce A Harvel/D4/MODOT on 04/08/2010 04:59 PM -----



Shelie A Daniel/D4/MODOT

04/08/2010 04:44 PM

To Bruce A Harvel/D4/MODOT@MODOT

cc Perry J Allen/D4/MODOT@MODOT, John W
Casey/D4/MODOT@MODOT, Randy L
Johnson/D4/MODOT@MODOT

Subject Fw: J4P2148, Route 45, Platte County - VEC/PDU#2

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MoDOT Route 45- Plan Sheet 2.pdf MoDOT Route 45- VE2.Change Proposal.pdf

Let me know if you need any additional information.

Thank you.

Shelie Daniel, P.E.
Resident Engineer
5101 NW Gateway
Riverside, MO 64150
(816) 741-7030
(816) 215-7275 (cell)
(816) 741-0200 (fax)

VALUE ENGINEERING CHECK SHEET

TYPE OF WORK

(Check one that applies)

- X 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)

_____ Reduce planned 4-foot thick rock fill on spill face to 2-foot thick.

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.

_____ Scan proposal only.
