

**STATE OF OHIO
DEPARTMENT OF TRANSPORTATION**

**SUPPLEMENT 1113
VALUE ENGINEERING IN CONSTRUCTION**

October 19, 2012

1113.01	Description
1113.02	References
1113.03	Definitions
1113.04	Value Engineering Change Proposal Process
Appendix A:	Value Engineering Change Proposal Flow Chart
Appendix B:	Sample Value Engineering Change Proposal Change Order Language
Appendix C:	Sample Value Engineering Change Proposal Itemized Summary of Changes

1113.01 Description. This supplement outlines Value Engineering Change Proposal (VECP) processing during the construction phase of a project.

1113.02 References.

23 U.S.C. 106(d), 106(e), 106(f), 302, 307, and 315;

23 CFR 627 March 15, 2012;

Ohio Revised Code, Section 5525.01

Federal Highway Administration Value Engineering link: <http://www.fhwa.dot.gov/ve/index.cfm>

1113.03 Definitions.

Function: Any performance characteristic that an item or service accomplishes.

Life Cycle Cost: Total cost of an item's ownership. This includes initial acquisition costs (right-of-way, planning, design, construction), operation, maintenance, modification, replacement, demolition, financing, taxes and disposal as applicable.

Unnecessary Costs: Those costs which are not required for the performance of the necessary functions.

Value Engineering Change Proposal (VECP): A written document submitted by a Contractor in accordance with this supplement. A VECP modifies the project contract requirements to allow limited changes in materials or construction techniques, which, if accepted and implemented, provides for an overall cost, and possibly, time savings. Material or construction technique changes that are permitted without changes to the project documents are NOT considered VECP's.

1113.04 Value Engineering Change Proposal Process.

A. General Considerations

1. The Contractor who has been awarded a contract may submit a VECP as permitted in the Contract. The VECP must reduce the cost and possibly time of a project.
2. Considerations for the calculation of VECP costs and time:
 - a. The Contractor's share of the net savings as defined in this supplement shall be considered full compensation to the Contractor for the VECP.
 - b. Changes in collateral or life cycle costs to the Department shall not be considered in the determination of the estimated costs savings and are specifically excluded.
 - c. A minimum guaranteed cost and possibly time savings must be included.
 - d. If allowed in the Contract, the Contractor may propose a VECP which reduces the completion time for the entire project or for a project portion which has an interim completion date. The total value of a calendar day of time on the project or portion of a project is defined as the cost of the time savings incurred by the Department. The cost of time savings to the Department will be the amount of the daily liquidated damages as set forth in Section 108.07 of the specified Construction and Material Specifications or a contract provision which establishes a daily liquidated damages amount. The Contractor and Department will each share equally (50 percent) the net savings in the value of time for the Contract calculated using the number of calendar days less than the original project completion date (or revised completion date if revised based on factors unrelated to the VECP) or interim completion date or time specified in the contract and using the total value of time as described in this section. Any other method of valuing time, including road user costs, are specifically excluded.
 - e. In the event that the Department accepts a final VECP based on both time savings and a change in material or specification that results in a lower cost to the project, the Department will process the change order for the material or specification changes, division of time savings and the agreed upon change in completion date only after receipt of the acceptable final drawings. However, any payments due

the Contractor for the time savings will be held until the completion of the project or a specific portion referenced in the VECP in order to verify that the time savings actually occurred. If the entire time savings is achieved, the Department will then initiate payment of the final time-savings portion of the VECP change order. If only a portion of the time savings is achieved and the project is completed before the original completion date, the Department will deduct from the time savings portion of the VECP change order payment for the number of days exceeding the revised completion date. If the project is completed after the original completion date (or revised completion date if revised based on factors unrelated to the VECP), the Department will deduct the entire time savings payment from the approved VECP and will assess liquidated damages for each day that the actual completion exceeds the original completion date (or revised completion date if revised based on factors unrelated to the VECP).

- f. Time savings will not include weather delays or winter shut down periods.
3. A VECP which includes changes to bridges and structures shall conform to the current AASHTO LRFD Bridge Design Specifications as modified by the ODOT Bridge Design Manual. The Contractor is obligated to perform in accordance with the terms and conditions of the existing contract until a change order authorizing VECP work is executed.
4. The VECP submittal must be made by the prime Contractor. The Contractor is cautioned not to base any bid prices on the anticipated approval of a VECP proposal and to recognize that such a proposal may be rejected. In the event of a rejection, the Contractor is required to complete the project in accordance with the plans, specifications and bid prices.
5. The VECP shall become the property of the Department and shall contain no restrictions imposed by the Contractor on their use or disclosure. The Department will have the right to use, duplicate, and disclose in whole or in part any data necessary for the utilization of the proposal. This provision is not intended to deny rights provided by law with respect to patented materials or processes.

B. Conceptual VECP Submission by Contractor

1. The conceptual proposal must be written, identified as a Value Engineering Change Proposal and shall outline the general technical concepts associated with the proposal and the total estimated cost savings which will result.

2. The Department will not approve VECP's with any of the characteristics listed in C&MS 105.19.
3. General requirements for the Conceptual VECP submittal.
 - a. VECPs must result in savings of money and possibly time as determined by the Department without altering the essential functions and characteristics of a project.
 - b. Electronic submission of the conceptual proposal shall be to the District Construction Engineer (DCE): who will forward the submission to the Engineer, the District Value Engineering Coordinator, and the Central Office VECP Coordinator.
 - c. The conceptual VECP submittal must include:
 1. Cover letter proposing VECP and written description.
 2. design assumptions
 3. guaranteed savings
 4. Preliminary sketch.
 5. Traffic Control changes
 6. Life Cycle cost analysis
 7. Required ROW

C. Conceptual VECP Review by District and Central Office

1. A conceptual VECP with total savings of less than \$50,000 does not require Central Office review and may be approved by the District Deputy Director. The District will copy the Central Office VECP Coordinator on the letter to the Contractor approving or rejecting the VECP.
2. A conceptual VECP with total savings of \$50,000 or greater requires Central Office review and approval. The DCE will forward the conceptual VECP submission to the Central Office VECP Coordinator.
3. A VECP with a total savings of \$50,000 or greater, the conceptual VECP submittal will be reviewed by the District and Central Office and, if found to be conceptually acceptable, approval to submit a preliminary proposal will be granted.
4. The District will respond to conceptual proposals within 5 working days.
5. The Contractor shall have no claim against the Department for any costs or delays due to the Department's review or rejection of the conceptual VECP.
6. The Department reserves the right to reject any VECP submitted.

7. The District Construction Engineer may hold meetings with the Design Consultant, Contractor, Central Office reviewers, or others to work out review schedules and design constraints. The Contractor may request a meeting with the Department to discuss their submittal.
8. If the Department already is considering revisions to the contract which are subsequently incorporated into a VECP proposal, the Department may reject the Contractor's conceptual VECP or portions thereof and may proceed with such revisions without any obligations to the Contractor.
9. Department review must include the following considerations:
 - a. Reviewers cost check (is VECP worth review time)
 - b. Planning commitment check
 - c. Highway management check
 - d. ROW check
 - e. MOT check
 - f. Production check
 - g. Construction check
 - h. Program Manager concurrence.
10. The Department **may not** approve VECPs that:
 - a. Change essential functions and characteristics including design standards, service life, reliability, economy of operation, ease of maintenance, safety, and necessary standardized features and any engineering commitment such as environmental mitigation measures both during and following construction.
 - b. Require additional right of way.
 - c. Require excessive time and/or costs for review, evaluation and/or investigation.
 - d. Is not consistent with the Department's design policies and basic design criteria for the project, or has been previously evaluated as documented in the Value Engineering Design analysis Summary of Potential Savings.
 - e. Conflict with agreements made with local governmental agencies.
 - f. Are experimental in nature;
11. The Department **will not** approve VECPs with any of the characteristics listed in C&MS 105.19.
12. The savings generated by the VECP must be of sufficient significance to

warrant review and processing. The Department will be the judge in determining sufficient significance.

13. For a VECP with a total savings of \$50,000 or greater, once a tentative decision is reached, the Central Office VECP Coordinator will obtain concurrence of the Deputy Directors of Construction Management, Engineering, Operations and the District.

D. Preliminary VECP Submittal by Contractor Electronic submission of the preliminary VECP to the DCE who will forward the submission to the Engineer, the District Value Engineering Coordinator, and the Central Office VECP Coordinator. The Central Office VECP Coordinator shall forward the submission to FHWA if the project has full federal oversight.

1. The Contractor will submit the following as part of a VECP:
2. A statement that the Preliminary VECP is submitted in accordance with established Department guidelines.
3. A description of the difference between the existing contract requirements and the proposed change, and the comparative advantages and disadvantages of each including considerations of service life, reliability, economy of operation, ease of maintenance, safety and necessary standardized features.
4. Separate detailed cost estimates for both the existing contract requirements and the proposed change in the approved format (See Appendix C). The cost estimates shall be broken down by contract item numbers indicating quantity increases or decreases and deleted pay items. Additional proposed work, not covered by contract items, shall be identified by current Department pay item numbers. In preparing the estimates, the Contractor shall include overhead and profit. No separate pay items are allowed for these costs.
5. An estimate of the effects the VECP will have on life cycle costs including, but not limited to, operational and maintenance costs.
6. Complete drawings, specifications and calculations showing the proposed revisions in sufficient detail to identify and describe specific features of the contract which must be changed if the VECP is accepted. The proposal must show how these changes can be accomplished with an assessment of their impact on other project elements. If the VECP involves a design change, the design of the proposed changes shall be performed by a consulting engineering firm prequalified by the Department in the applicable class of design work. If the VECP involves a specification change or non-roadway or non-structural design change (e.g. maintenance of traffic change), the use of a pre-qualified designer is not required. All drawings and engineering

calculations shall bear the signature of and be sealed by a Professional Engineer registered in the State of Ohio.

7. An updated schedule and the specific date by which Departmental approval of the VECP must be issued to obtain the total estimated cost reduction during the remainder of the contract, noting any effect on the contract completion time or delivery schedule. The date must be selected to allow the Department ample time, usually 10 working days, or as mutually agreed to by the parties, for review and processing of the VECP and change order or extra work change order. The Department may require up to 20 working days for extremely complex VECP submittals. Should the Department find that insufficient time is available for review and processing, it may reject the VECP solely on that basis. If the Department responds by rejecting the proposal, the Contractor shall consider the final proposal rejected and shall have no claim against the Department as a result thereof.
8. A report of all previous uses or testing of the VECP on other projects including the project numbers, conditions, results, contact names and telephone numbers. Even though a similar submitted VECP was accepted on another project, the Department reserves the right to accept or reject the proposal.

E. Preliminary VECP Review by District and Central Office

1. VECPs will be processed expeditiously. However, the Department shall not be liable for any delays or any VECP development cost in the case where a VECP is rejected or withdrawn prior to approval of the Preliminary VECP. The Contractor may withdraw, in whole or in part, a VECP not approved by the Department within the period specified in the VECP.
2. General review considerations are the same as above, with the following additions:
 - a. 10 working days will be allowed for Central Office / FHWA review.
 - b. For projects with Federal oversight required or for VECPs involving proprietary items on Federal-aid projects, the concurrence of FHWA on the accepted VECP is required.
 - c. The Office of Estimating will provide the Minimum Guaranteed VECP Savings.
 - d. The central office VECP coordinator will coordinate the appropriate engineering reviews to be performed, notify the appropriate Offices, and distribute materials accordingly.

3. The Department shall be the sole judge of the acceptability of a VECP and of the estimated net savings in construction costs or time from the adoption of all or any part of such proposal. In determining the estimated net savings from a VECP, the Department reserves the right to consider other factors in addition to the contract bid prices and proposed unit prices if, in the judgment of the Department, such prices do not represent a fair measure of the value of the work to be deleted from or added to the contract.
4. The Department may modify a VECP with the written concurrence of the Contractor in order to make it acceptable. If a modification increases or decreases the net savings resulting from the VECP, the Contractor's fair share will be determined upon the basis of the VECP as modified and upon determination of final quantities. The net savings shall be computed by subtracting the revised lump sum total cost of all bid items affected by the VECP design from the total cost of the same bid items as represented in the original contract.
5. When materials or processes not covered by specifications are proposed by the VECP, the proposal shall include complete material and process controls and past performance documentation to ensure the performance described in the VECP. In the event that additional test equipment is required to ensure compliance with those specifications, such equipment, properly calibrated, shall be provided, at no cost, for the use of Department Construction project personnel for the duration of the project. Instruction in the use of this equipment, by the manufacturer shall also be provided at no cost to the Department.
6. Upon acceptance of a VECP, any restrictions imposed by the Contractor, Subcontractors or suppliers on the use or disclosure of information submitted shall be void. The Department shall thereafter have the right to use, duplicate and disclose in whole or in part any data necessary for utilization of the VECP on this project or other department projects.
7. If additional information is needed by the Department to evaluate a VECP, this information must be provided in a timely manner, otherwise the proposal will be rejected. Such additional information could include, revised waterway permits, where design changes are proposed, results of field investigations and surveys, design computations and field change sheets.

F. District Executes first VECP Change Order Authorizing Design Work

1. For all VECP's, the first VECP change order is processed authorizing design work to proceed after the preliminary District / Central Office review and approval. The minimum guaranteed savings stated in the change order will be calculated by the Office of Estimating.

2. Standard VECP Change Order clause language is shown in Appendix B.
3. Compensation for necessary modifications to an approved VECP shall not reduce the guaranteed minimum savings indicated on the VECP change order unless approved by the Deputy Directors of Construction Management, Engineering, Operations and the District.
4. This change order may be used for VECP's that require extensive design work.

G. Final VECP and Final Drawings Submittal by Contractor

1. Electronic submission of the final VECP to the DCE: who will forward the submission to the Engineer, the District Value Engineering Coordinator, and the Central Office VECP Coordinator. The Central Office VECP Coordinator shall forward the submission to FHWA if the project has full federal oversight.
2. The final VECP submission will be considered after Department approval of the conceptual and preliminary VECP submittals, and after the Change Order authorizing the VECP is processed.
3. The Contractor shall submit final drawings to the DCE showing all details consistent with the accepted VECP design. Failure of the Contractor to provide acceptable final drawings within 15 working days after the change order authorizing the VECP may result in rejection of the entire VECP and the Contractor shall have no claim against the Department.
4. The final drawings shall be submitted to the DCE in accordance with current versions of the ODOT Location & Design Manual, Volume III and the ODOT Bridge Design Manual. If the VECP involves design changes, the design of the proposed changes shall be performed by a consulting engineering firm prequalified by the Department in the applicable class of design work.
5. **All drawings and engineering calculations shall bear the signature of and be sealed by a Professional Engineer registered in the State of Ohio.**
6. Final drawings will be submitted in hard copy form and electronic CADD (MicroStation format).

H. District Executes second and third VECP Change Orders

1. The Contractor and Department shall each receive 50% of the net reduction in the cost of the Contract due to the VECP.
2. The second VECP change order is processed after the final drawings are

received and approved by the Engineer. The dollar amount of the change order should be the sum of the original items that are to be replaced as part of the VECP and be a negative dollar amount.

3. The third VECP change order is processed at the same time as the second VECP change order. The dollar amount of the change order should be the sum of the new VECP lump sum items, (as calculated by the Office of Estimating) plus 50% of the net VECP savings.
4. Standard VECP Change Order clause language is shown in Appendix B.

I. District Executes payments

1. The Contractor takes full responsibility for the VECP quantities and pay items.
2. The Department will prorate payments of VECP lump sum items based on the work progress at the discretion of the Engineer.
3. The Contractor savings portion of the payment will be paid 50% at the time of the third VECP change order, and 50% upon successful completion of the VECP work.
4. The Guaranteed minimum savings will be maintained. Increases in VECP items that cause the Guaranteed minimum savings to be reduced will be deducted from the Contractors savings portion of the VECP. If there are any additional savings it will be shared equally between the Department and the Contractor.
5. C&MS section 104.02 adjustments allowing price adjustments on items of work that have changed significantly will not be applied to any VECP item.
6. Material Escalator adjustments will not be applied to work affected by the VECP.

J. VECP's on LPA Projects. Districts should give final concurrence of the VECP and subsequent change orders in accordance with the Locally Administered Transportation Projects Manual of Procedures. LPA projects each have a Construction Monitor assigned that is actively involved in progress meetings, documentation reviews and monitoring of construction progress. The amount of involvement is difficult to predict and include in this supplement as it depends on the LPA, the familiarity of using VECP's and the change proposal itself. At a minimum, the District should be involved in the evaluation of the VECP, impacts to the project scope and funding participation, and grant final eligibility determinationl approvers of the VECP.

Appendix A
Value Engineering Change Proposal Process

Flow Chart



Baseline Schedule received	Conceptual VECP Submittal Must include:	ODOT District Review Must include:	Preliminary VECP Submittal Must include:	ODOT District/CO Review Must include:	Change Order 1 May include:	Final VECP Submittal Must include:	Final Drawings Submittal Must include:	Change Order 2 Must include:	Change Order 3 Must include:
	Cover letter proposing VECP and written description	Reviewers cost check (is VECP worth review time?)	Updated schedule	Individual Central Office Review	Standard Change Order clauses	Final Structural / Design Calculations	Full Properly sealed Drawings for construction	Non-perform items to be VECP'ed	Standard Change Order clauses
	Traffic control changes	Planning commitment check	Minimum cost savings	Detailed Estimate	Guaranteed savings	Cover letter with all required information		Standard Change Order clauses	Adds all Lump Sum work items
	Preliminary sketch	Highway Management	Preliminary full drawings			Guaranteed savings		Guaranteed savings	Guaranteed savings
	Lifecycle cost analysis, Guaranteed savings	ROW check, MOT check, Production check	Preliminary Structural / Design calculations	If Savings under \$50k District review / Approval only		PE stamped calculations and plans			Standard Change Order clauses
	Required ROW, Design Assumption	Construction check and Program Managers concurrence	PE stamped calculations and plans	Must cc: CO Construction and Program Managers	Contractor is authorized to start VECP Design work		Must cc: DCA, Structures, Test Lab		Contractor is authorized to start VECP Construction work

Appendix B

FIRST CHANGE ORDER REQUIRED LANGUAGE (optional):

This change order reflects the Contractor's Value Engineering Cost Proposal (VECP) to [describe the VECP].

The Department has reviewed and approved this preliminary VECP, in accordance with the Supplement 1113, and by this change order grants the Contractor the permission to proceed with the VECP design work.

By signing this change order, the Contractor acknowledges that all VECP errors, omissions and cost overruns are the responsibility of the Contractor. The Department will not extend the contract nor compensate the Contractor for errors, omissions or cost overruns related to this VECP. Material Escalator adjustments will not be applied to work affected by the VECP.

By signing this change order, the Contractor guarantees the Department a cost savings of [\$]. (this is the Departments 50% share of the amount approved by the Office of Estimating)

SECOND CHANGE ORDER REQUIRED LANGUAGE:

The Department has reviewed and approved the final Value Engineering Cost Proposal (VECP) in accordance with the Supplement 1113 on [date].

This change order reflects the reference items to be non-performed as part of the Contractor's approved VECP. No other unit price adjustment shall apply to these reference items.

By signing this change order, the Contractor acknowledges that all VECP errors, omissions or cost overruns are the responsibility of the Contractor. The Department will not extend the contract nor compensate the Contractor for errors, omissions or cost overruns related to this VECP. Material Escalator adjustments will not be applied to work affected by the VECP.

By signing this change order, the Contractor guarantees the Department a cost savings of [\$]. (this is the Departments 50% share of the amount approved by the Office of Estimating)

The total VECP cost savings of [\$] will be equally shared between the Department and the Contractor. 50% of the Contractor' share is paid on this change order. The remainder 50% will be paid upon successful completion of all the VECP work by the Contractor.

See change order [#] for additional items related to this VECP.

THIRD CHANGE ORDER REQUIRED LANGUAGE:

The Department has reviewed and approved the final Value Engineering Cost Proposal (VECP) in accordance with the Supplement 1113 on [date] and by this change order grants the Contractor the permission to proceed with the VECP construction work.

This change order reflects the extra work items to be performed as part of the Contractor's approved VECP.

By signing this change order, the Contractor acknowledges that all VECP errors, omissions or cost overruns are the responsibility of the Contractor. The Department will not extend the contract nor compensate the Contractor for errors, omissions or cost overruns related to this VECP. Material Escalator adjustments will not be applied to work affected by the VECP.

By signing this change order, the Contractor guarantees the Department a cost savings of [\$]. (this is the Departments 50% share of the amount approved by the Office of Estimating)

See change order [#] for additional items related to this VECP.

Appendix C: SAMPLE VECP ITEMIZED SUMMARY OF CHANGES

Non-Performed Items

Line #	Item Code	Description	Unit	Bid Qty	Proposed Qty	Unit Bid Price	Net Change
1	511E46200	Class C Concrete	CY	800	0	\$500.00	-\$400,000.00
16	509E10000	Epoxy Coated Reinforcing Steel	LB	15,000	0	\$0.95	-\$14,250.00
46	202E11000	Structure Removed	Lump	1	0	\$150,000.00	-\$150,000.00
47	659E10000	Seeding and Mulching	SY	15,000	0	\$0.75	-\$11,250.00
100	605E31100	Aggregate Drains	FT	333	0	\$11.00	-\$3,663.00
NON-PERFORMED TOTAL =							-\$579,163.00

Quantity Change Items

Line #	Item Code	Description	Unit	Bid Qty	Proposed Qty	Unit Bid Price	Net Change
33	638E01204	8" Water Main D.I.P. Class 53	FT	1,000	75	\$75.00	-\$69,375.00
34	202E23000	Pavement Removed	SY	2,200	400	\$10.00	-\$18,000.00
35	203E10000	Excavation	CY	15,000	18,000	\$6.00	\$18,000.00
77	203E20000	Embankment	CY	18,200	24,000	\$4.50	\$26,100.00
78	204E10000	Subgrade Compaction	SY	400	100	\$1.93	-\$579.00
QUANTITY ADJUSTED TOTAL=							-\$43,854.00

New / Additional Work Items

Line #	Item Code	Description	Unit	****	Proposed Qty	Proposed Unit Cost	SubTotal
*	606E13000	Guardrail, Type 5	FT		1,200	\$12.00	\$14,400.00
*	602E20000	Concrete Masonry	CY		12	\$1,000.00	\$12,000.00
*	201E11001	Clearing and Grubbing, as per plan	Lump		1	\$15,000.00	\$15,000.00
*	503E11100	Cofferdams, Cribs and Sheeting	Lump		1	\$150,000.00	\$150,000.00
*	603E26000	72" Conduit, Type A	FT		100	\$300.00	\$30,000.00
ADDITIONAL ITEMS WORK TOTAL=							\$221,400.00
Proposed Guaranteed Minimum Savings =							-\$401,617.00