

Experimental Features in Highway Construction Work Plan Development and Reporting Guidelines

Alaska Department of Transportation & Public Facilities
Division of Design & Engineering Services
Statewide Research & Technology Transfer

Clint Adler, P.E.
Research Engineer and Experimental Features Coordinator

March 2001

Table of Contents

Table of Contents	ii
Experimental Features Work Plan and Reporting Guidelines	1
Suggested work plan format for category 2 projects.....	1
Description of Experimental Feature	1
Background / History	1
Objectives and Scope	2
Work Plan.....	2
I. Description of Test Site/Section	2
II. Control Site (Section).....	2
III. Method of Evaluation.....	3
IV. Reporting.....	4
V. Cost Estimate.....	5
Reporting guidelines for category 2 projects	6
Construction Report	6
Interim Reports.....	6
Final Report.....	6
Appendix A – Description of ADOT&PF Experimental Features Program.....	8
Introduction	8
The Three Types of Experimental Feature Projects.....	9
Category 1 Projects	9
Category 2 Projects	10
Category 3 Projects	10
Appendix B – FHWA FAPG G 6042.4.....	B
Appendix C – FHWA FAPG G 6042.8.....	C
Appendix D – Example Evaluation Report.....	D

Experimental Features Work Plan and Reporting Guidelines

The ADOT&PF statewide Research Section provides the following general guidelines to help in the preparation of Category 2 experimental feature work plans and reports. Most experimental features are Category 2 projects. (See Appendix A – Description of ADOT&PF Experimental Features Program, for explanation of Experimental Feature Categories.) Contact the ADOT&PF statewide Research Section for answers to specific questions not addressed by these guidelines.

Suggested work plan format for category 2 projects

Experimental Feature in Construction
Work Plan

Work Plan Title

For inclusion in
Federal Project Name
Federal Project #
State Project #

Month, Year

Description of Experimental Feature

Generally describe the feature that the ADOT&PF will be constructing and evaluating. Be clear and concise.

Background / History

Include an explanation/description of why the feature is experimental. This explanation should clearly define the circumstances or parameters that are unknown and need evaluation. The background and/or history of the experimental condition provide knowledge and important background for the development of the work plan.

FHWA defines an experimental feature as:

“a material, process, method, equipment item, traffic operational device, or other feature that:

- (1) has not been sufficiently tested under actual service conditions to merit acceptance without reservation in normal highway construction, or
- (2) has been accepted but needs to be compared with alternative acceptable features for determining their relative merits and cost effectiveness.”

Objectives and Scope

Describe the knowledge that ADOT&PF expects to gain at the completion of the evaluation. Describe this knowledge in terms of goals that develop, evaluate, and/or demonstrate the merits of new, non-standard, or alternate highway design, construction features, methods and practices, products, equipment, and materials by using them in highway construction work and establishing their behavior under actual highway service conditions. Include a description of the scope of the evaluation to set limits on what is and what is not to be included in the evaluation.

Work Plan

The plan of work demonstrates an understanding of the techniques and method you will use to construct and evaluate the experimental feature. The work plan must contain all components necessary for the successful evaluation; design of the experiment; lab, testing and computer facilities; data collection elements and procedures; analytical procedures; notation of key decision points; schedules of meeting; and reporting details.

We recommend including the following subsections:

I. Description of Test Site/Section

Describe the test site or section. Include enough information that will allow the exact locations of the experimental feature to be revisited/reproduced in the future. Include the following as appropriate:

- a) Construction project number(s)
- b) Route Number(s) and/or name(s)
- c) Location(s) of the experimental feature
- d) Lengths and/or quantities at specific locations
- e) Conceptual specifications and/or drawings
- f) Other relevant details

II. Control Site (Section)

Describe the control site/section or alternative means of comparing performance. Include enough information that will allow the exact locations of the control feature to be revisited/reproduced in the future. Include the following as appropriate:

- a) Construction project number(s) (if available)
- b) Route Number(s) and/or name(s)
- c) Location(s) of the control section
- d) Lengths and/or quantities at specific locations
- e) Specifications and/or drawings
- f) Other relevant details

III. Method of Evaluation

The method of evaluation should include procedures and specify equipment and personnel for measuring, comparing (control vs. experimental sections), and documenting the following, where applicable:

- a) Cost and Economic Analysis
 - 1) Total costs and unit costs
 - 2) Cost comparisons to standards, or accepted practice
 - 3) Maintenance
 - 4) Etc.
- b) Construction
 - 1) Installation or application
 - 2) Production Rates
 - 3) Costs
 - 4) Techniques
 - 5) Personnel used
 - 6) Suppliers and their availability
 - 7) Appearance
 - 8) Quality
 - 9) Problems
 - 10) Inspections
 - 11) Etc.
- c) Measures of Effectiveness
 - 1) Data comparisons
 - 2) Inspections
 - 3) Statistical Techniques
 - 4) Equipment
 - 5) Etc.
- d) Maintenance
 - 1) Record Keeping
 - 2) Cost Data
 - 3) Aesthetics
 - 4) Problems
 - 5) Etc.

IV. Reporting

Include a reporting schedule that includes:

- a) Expected date that installation will be completed
- b) Date that construction report will be submitted (generally immediately after installation)
- c) Dates that interim reports, if any, will be submitted (generally once a year throughout the evaluation period)
- d) Date that final report will be submitted. The final report is a summary report. It should contain the basic data and conclusions of the previous reports as well as reaching an overall project conclusion. The final report should be completely independent of previous reports.
- e) Names of persons and/or sections who are responsible for preparing the reports.

An example-reporting schedule follows:

Experimental Feature Evaluation Schedule

Items	Responsible Personnel	Estimated Date(s) of Completion
Installation of Product/Feature		
Construction Inspection/Evaluation(s)		
Construction Report		
Post Construction Inspection/Evaluation(s)		
Interim Evaluation Report(s)		
Final Evaluation/Report		

V. Cost Estimate

Include a cost estimate for construction and evaluation of the experimental feature. An example follows:

Experimental Feature Cost Estimate

Experimental Feature Construction Costs				
	Labor	Material	Other	Total Cost
Item 1				
Item 2				
...				
Total Construction				

Evaluation & Reporting Costs					
		Construction	Post		
Names of Evaluators	Hourly Rate	Inspection (hours)	Construction Inspections (hours)	Total Hours	Total Cost
<i>Inspections:</i>					
Evaluator 1					
Evaluator 2					
...					
Total Inspections					

	Construction report	Interim Report(s)	Final Report	Total Cost
<i>Reporting</i>				
Evaluator 1				
Evaluator 2				
...				
Total Reporting				

Reporting guidelines for category 2 projects

Construction Report

Submit this report as soon as possible after installation of the experimental feature. With FHWA approval, you may sometimes delay the construction report for a few months, so that preliminary performance information may be included with it. The report should include (where applicable):

1. Unit costs and quantities
2. Dates and locations of installations
3. Ease of installation (or problems)
4. Photographs (prints, or digital photos, not Xeroxes)
5. Production rates
6. Techniques
7. Appearance
8. As-built drawings and specifications
9. Other information that would be helpful for the design or construction of this type of feature.

Construction reports should be prepared in accordance with FAPG G 6042.8. (Attached in Appendix C)

Interim Reports

The work plan specifies the requirements for interim reports. A brief annual update is usually all that is necessary. It can often be simply a memo to the Experimental Features Coordinator. Interim reports normally address some or all of the following:

1. Progress of construction/evaluation
2. Inspections, measurements, etc.
3. Maintenance needs and costs
4. Effectiveness
5. Appearance/noise/aesthetics
6. Public response
7. Economics/cost effectiveness
8. Other pertinent information

Appendix D – Example Evaluation Report, contains an example an Interim/Final report.

Final Report

Write the final report as soon as it becomes evident that additional information of interest or experimental value is unlikely to develop. In some cases, this may occur before the end of the evaluation period specified in the work plan.

The final report should be complete and independent by itself. It therefore should contain the basic data and conclusions of the earlier reports. Often the earlier reports can simply be included (in complete or edited form) as chapters in the final report.

The final report should include, where applicable:

1. The data collected, or summaries of them
2. Overall performance of the experimental feature
3. Cost effectiveness of the experimental feature
4. Documentation of effectiveness
5. Documentation of maintenance and associated issues
6. Recommendations for further experimentation, if needed
7. Recommendations for design or construction technique modifications, if needed
8. Description of conditions under which future use of the feature is recommended
9. Other information, recommendations, or conclusions that would be useful to others interested in the feature.

Photographs are very helpful in most cases and can eliminate the need for wordy descriptions. Provide original prints, negatives, or high-resolution digital photographs to the Research Section with the report. The Research Section can provide photo reproduction, typesetting, report printing and distribution, and other publication services.

Appendix D – Example Evaluation Report, contains an example an Interim/Final report.

Appendix A – Description of ADOT&PF Experimental Features Program

Introduction

The Federal Highway Administration (FHWA) established the Experimental Features Program in order to encourage innovations in state highway design and construction. Experimental features built under this program are eligible for federal funding participation, which is normally limited to more proven and conventional items. Another advantage of the Program is that if an experimental feature fails prematurely, the FHWA will pay for its repair or replacement.

The FHWA's Federal Aid Highway Program Manual Vol. 6, Chap. 4, Sec. 2, Subset. 4 (See Appendix B) defines an experimental feature as:

A material, process, method, equipment item, traffic operational device, or other feature that:

- 1) has not been sufficiently tested under actual service conditions to merit acceptance without reservation in normal highway construction, or
- 2) has been accepted but needs to be compared with alternative acceptable features for determining their relative merits and cost effectiveness.

This broad definition shows that a wide variety of things can qualify for the program. Experimental features are often physical objects. One Alaskan project, for example, tried out a new type of sign foundation. Experimental features, however, can also be a new technique for using conventional materials. On another Alaskan project, the "experimental feature" was a set of monetary incentives for the contractor to minimize the amount of unpaved road on the job at any given time. The asphalt pavement itself was not experimental at all.

There are only two criteria necessary for an innovation to qualify as an "experimental feature". The first is that the innovation must have potential benefits to the highway agency or the public. The second is that the highway agency (DOT&PF) must follow up the use of the feature with an evaluation of how well it worked. The evaluation usually consists of documentation of measurements, inspections, or another type of analysis of the feature after construction, sometimes over a period of several years. For example, the evaluation of an experimental traffic safety feature could consist of a comparison of accident statistics for several years before and after construction. Based on this comparison, the evaluator will make recommendations based on performance and cost in light of any problems.

The Three Types of Experimental Feature Projects

The Alaska Department of Transportation and Public Facilities (DOT&PF) defines three types of Experimental feature projects as follows:

Category 1 - Projects wherein the nature of the feature being investigated calls for a long-term or complex level of field testing, evaluation, and reporting, involving HP&R funding for the evaluation phase as an "Experimental Construction Study."

Category 2 - Projects requiring a minimum of advance planning, moderately controlled conditions and simple evaluations based on comparisons with "control sections" constructed in a standard manner.

Category 3 - Projects incorporating an item of new technology that FHWA promotes and directly funds as part of their Demonstration Projects Program. ADOT&PF and/or FHWA design these projects to encourage evaluation of alternate standard items to permit performance and economic comparisons.

Any section of DOT&PF may submit proposals in any of these categories. Submit the proposals to the FHWA through the Research Section's Experimental Features Coordinator, who can also provide help (if needed) in preparing the proposal.

Category 1 Projects

These projects are full-scale research projects, and follow the normal procedure for such projects. The first step is to submit a preliminary proposal to the ADOT&PF Research Advisory Board. This board consists of DOT&PF officials from around the State, who meet each year to review and rank research project proposals. ADOT&PF staff submit these preliminary proposals to the Research Section on a simple one-page "Research Needs Statement" form. Obtain copies of the "Research Needs Statement" form from the ADOT&PF Research Section.

The ADOT&PF Research Manager funds these projects based on the board's ranking. If a preliminary proposal ranks high enough for funding, it becomes part of the ADOT&PF Research Section's work program for development as a research project. The ADOT&PF Research Section works with interested staff to develop a more detailed proposal/workplan with budget and manpower estimates, work schedules, and other information.

For this type of project, construction funds usually pay for the experimental feature itself, but FHWA Highway Planning and Research (HPR) funds cover the costs of evaluation (instrumentation, measurements, data analysis etc.). The Research Section monitors the progress of the project (if not actually performing the work) and, with FHWA approval, prints and distributes reports.

Category 2 Projects

These are the most common type of experimental feature projects. The projects themselves and the process for setting them up are less complicated than for Category 1 projects. ADOT&PF personnel submit a work plan for the project to the FHWA (through Research's Experimental Features Coordinator); work may begin on the project as soon as FHWA approves it.

ADOT&PF project personnel usually write work plans for Category 2 projects during the design stage of a construction project and submit them before or with the Plans Specifications and Estimates (PS&E). Anyone can add experimental features to ongoing construction projects by change order (with FHWA approval).

Category 2 projects generally require at least a construction report and a final report. If the evaluation period lasts for more than a year, FHWA may require annual reports. Project personnel usually write construction reports after installation of the experimental feature. Construction personnel also write evaluation reports (including the final report). Any appropriately knowledgeable person may write the evaluation reports. Traffic and Safety sections, for example, may be the appropriate people to evaluate a highway safety improvement.

Submit reports to the Research Section, which will arrange for printing and distributing them to the FHWA and others. The Research Section, however, does not normally perform the evaluations or write reports for Category 2 projects. Category 2 experimental features are usually included in the project bid schedule and are paid for with construction funding. Costs of evaluation work by project personnel are usually paid with construction engineering funds. Evaluation costs for work done after the construction is closed may be paid with engineering funds from an active federal aid project if the active project "is similar and the performance of the completed work is related to the ongoing work". (See Appendix B) Evaluation costs, including the cost of instrumentation, may also be paid with HPR funds (by arrangement with the Research Section) or with State funds.

Category 3 Projects

These projects incorporate new technology which is being promoted by the FHWA through their Implementation Division or through the Demonstration Projects Program. The FHWA solicits proposals for this category of projects (unlike the others) through flyers or pamphlets describing the proposed work. If a State's proposal is accepted, the FHWA directly funds the work. The Alaska DOT&PF has had general agreements (contracts) with the FHWA for both demonstration and implementation projects. Specific projects are authorized by a work order under the general agreement.

FHWA specifies the construction and evaluation requirements for these projects in their solicitations of interest. These requirements may vary from project to project, but will be generally similar to those for other experimental features projects.

Appendix B – FHWA FAPG G 6042.4

Federal Aid Highway Program Manual Vol. 6, Chap. 4, Sec. 2, Subset. 4

**CONSTRUCTION PROJECTS INCORPORATING
EXPERIMENTAL FEATURES**

CHAPTER 6

CONSTRUCTION PROJECTS INCORPORATING
EXPERIMENTAL FEATURES

OPI: HTA-12

- Par. 1. Purpose
2. Authority
3. Definitions
4. Program Objectives
5. General Principles
6. Inspections
7. Reports
8. Evaluation Termination
9. Financing
1. PURPOSE. To prescribe the objectives and to provide guidelines relating to the development, inspection, financing, and reporting of Federal-aid highway construction projects which include experimental features.
2. AUTHORITY. 23 U.S.C. 307 and 315, 49 CFR 1.48(b)(35), and 23 CFR 635.411.
3. DEFINITIONS. In this directive the following definitions shall apply:
- a. Control Section - a section or feature of a highway designed and constructed in a standard manner and as nearly as practicable under identical conditions so that comparisons can be made.
 - b. Experimental Feature - a material, process, method, equipment item, traffic operational device, or other feature that: (1) has not been sufficiently tested under actual service conditions to merit acceptance without reservation in normal highway construction, or (2) has been accepted but needs to be compared with alternative acceptable features for determining their relative merits and cost effectiveness.
 - c. Experimental Project - a Federal-aid highway construction project incorporating one or more experimental features.
 - d. Work Plan - a written program of action including a description of the experimental feature, experi-

mental feature objectives, measurements to be made, characteristics to be evaluated, time schedules, reporting requirements, cost estimates, construction and post-construction inspection schedules, and control sections.

4. PROGRAM OBJECTIVES

- a. To encourage highway agencies to evaluate new or innovative highway technology, or alternative standard technology, under actual construction and operating conditions by means of a program of experimental construction projects.
- b. To provide a mechanism for the widespread dissemination and application of the results of these evaluations.

5. GENERAL PRINCIPLES

- a. Experimental Project Designation. Any Federal-aid construction project utilizing funds provided by the Office of Technology Applications or under the Highway Planning and Research (HP&R) Program should be designated an experimental project and treated accordingly.
- b. Work Plan. A work plan should be developed for each experimental feature.
- c. Project Approvals
 - (1) Unless otherwise directed by Washington Headquarters, work plans for experimental projects may be approved by the Division Administrator prior to or with Plans Specifications & Estimates (PS&E) approval. Experimental features included in ongoing projects by change order may also be approved by the Division Administrator.
 - (2) Work plans for experimental projects utilizing HP&R funds may be approved by the Division Administrator in accordance with normal approval procedures.
 - (3) Work plans for experimental projects utilizing Office of Technology Applications funds must be

reviewed and concurred in by the Technology Management Division prior to final action by the Division Administrator.

- d. Control Sections. Control sections or other alternatives should be provided for performance comparisons in all experimental projects unless the nature of the experiment is such that a control section or alternative would serve no purpose.
- e. Cost Data. Cost data should be compiled for all experimental and control features.
- f. Voluntary Reporting. For widespread dissemination and mutual sharing of information about experimental features, FHWA welcomes the voluntary submission of reports for non-Federal-aid and Federal highway (direct Federal) projects with experimental features.
- g. Certification Acceptance. States operating under Certification Acceptance should be encouraged to develop procedures for incorporating experimental features into a Federal-aid construction project. It is recommended that provisions be made for the State to submit preliminary plans or advance information to FHWA and to submit completed Forms FHWA 1461, Experimental Project Report, in accordance with paragraph 7 below.
- h. Multiple Project Justification. Two or three construction projects should be adequate to conclusively evaluate a single feature. The justification for more than five construction projects should be carefully analyzed prior to initiation.

6. INSPECTIONS

- a. Construction. Inspections of experimental projects during construction should be made in accordance with the procedure established by the Division Administrator under the provisions of Federal-Aid Policy Guide (FAPG) G 6042.8, Inspection of Federal-Aid Construction Projects.
- b. Post-Construction. The division office will be responsible for monitoring the post-construction inspection program in accordance with the approved

work plan.

7. REPORTS

- a. Initial Reporting. Form FHWA 1461 (RCS HHO-30-19) should be completed for all experimental features, following approval of the work plan, and forwarded to HTA-12 by the regional office. Form FHWA 1461 is not intended to replace reports required under (1) FAPG G 6042.8; (2) agreement with the Office of Technology Applications; or (3) other agreement incorporated into the approved work plan.
- b. Annual Update. Form FHWA 1461 should be used to annually update the status of each experimental feature. The update should be forwarded to HTA-12 by the regional office by October 1. Annual updates are optional for projects reported within the preceding year only if there has been no change in status.
- c. Construction Reports. Construction reports should be made in accordance with FAPG G 6042.8.
- d. Post-Construction Reports
 - (1) For experimental projects utilizing HP&R funds, the highway agency will normally be responsible for preparing the post-construction reports. Where the research work is conducted by a State, responsibility for preparation of reports should be retained by the State.
 - (2) For experimental projects utilizing Office of Technology Applications funds, the highway agency will be responsible for post-construction reports in accordance with the agreement.
 - (3) For all other experimental projects the preparation of post-construction reports will be in accordance with the requirements of the individual work plans.
- e. Final Reports
 - (1) A final report for experimental features, along with a completed Form FHWA 1461, prepared by the State, should be furnished to FHWA as soon as it

becomes evident that additional information of interest or experimental value is unlikely to develop.

- (2) Final reports for projects utilizing HP&R funds should be prepared by the State.
- (3) For experimental projects utilizing Office of Technology Applications funds final reports will be prepared by the States in accordance with the approved agreement.

8. EVALUATION TERMINATION. The Division Administrator may terminate an experimental evaluation when it is determined that work plan goals either have been achieved or cannot be achieved. However, termination of an experimental evaluation using HP&R funds must be approved by the same official who is delegated authority to initially approve the project. Likewise, termination of Office of Technology Applications projects will require the Technology Management Division concurrence. The NEEP project terminations should be reported to HTA-12 by the regional office.

9. FINANCING

a. Construction. Added construction costs attributable to experimental features may be financed as follows:

- (1) Federal-Aid Funds. Construction costs for experimental projects can be paid for from normal Federal-aid construction funds.
- (2) Office of Technology Applications Funds. Some experimental feature(s), or portion(s) thereof, may be approved for financing with Office of Technology Applications funds.
- (3) HP&R Funds. HP&R funds cannot be used for constructing experimental features.

b. Evaluation. Evaluation costs for observation and for the collection, assembly, analysis, interpretation, and reporting of data may be financed as follows:

- (1) HP&R Funds. Evaluation costs as well as the pertinent research and development costs in-

cluding instrumentation and recording of data of the sophistication associated with HP&R funds, may be financed with HP&R funds.

- (2) Federal-Aid Funds. Evaluation costs which are engendered by design or project personnel in conjunction with or incidental to their other duties on a Federal-aid project may be financed as preliminary engineering or construction engineering. Costs for continuing evaluations of experimental project features beyond the termination date of the construction contract may be financed from preliminary engineering or construction engineering funds from an active Federal-aid project where the planned construction is similar and the performance of the completed work is related to the ongoing work.
 - (3) Office of Technology Applications Funds. Evaluation costs may be financed partially or completely with Office of Technology Applications funds in accordance with the approved work plan arrangements.
 - (4) The State may elect to pay all costs associated with the evaluation.
- c. Reconstruction. Experimental sections or features approved for incorporation on any Federal-aid construction project and which unpredictably fail may be programmed for replacement or reconstruction, to State standards, with consolidated primary, secondary, urban, urban system, or other funds as appropriate. Interstate funds are not eligible for this purpose.

Appendix C – FHWA FAPG G 6042.8

Federal Aid Highway Program Manual Vol. 6, Chap. 4, Sec. 2, Subset. 8

CONSTRUCTION MONITORING

CHAPTER 6 CONSTRUCTION MONITORING

OPI: HNG-21

Par.

1. Purpose
2. Definitions
3. Policy
4. Annual Construction Monitoring Program
5. Construction Inspections
6. Frequency of Inspections
7. Construction Inspection Reports
8. Annual Reports

Attachment 1 - Construction Inspection Report (Form FHWA 1446 A)

Attachment 2 - Final Acceptance Report (Form FHWA 1446 B)

Attachment 3 - Final Acceptance Report for CA and SRP projects (Form FHWA 1446 C)

1. PURPOSE. To establish policies, procedures, and guidelines relating to the inspection, acceptance, and quality of Federal-aid highway construction.
2. DEFINITIONS
 - a. Construction Monitoring Program (CMP) - those Federal Highway Administration (FHWA) activities which assess State highway agency (SHA) procedures and controls for assuring that projects are completed in reasonably close conformance with the plans and specifications, evaluate the quality of construction and promote improvements as appropriate.
 - b. Major Phase - the activity, or group of activities, which comprise a significant portion of the cost or work effort of a project.
 - c. Significant Findings - those findings from construction inspections or reviews which impact Federal-aid participation, adversely affect the performance of the completed project, or are of statewide importance.
3. POLICY. It is the policy of the FHWA that a balanced program of inspections or reviews of Federal-aid highway construction activities be conducted to:

- a. assess SHA procedures and controls for assuring that projects are completed in reasonably close conformance with the approved plans, specifications, and authorized changes, and if necessary, identify needed improvements to SHA activities,
- b. monitor the quality of construction and if appropriate, encourage and assist the SHA to implement improvements to enhance the quality of the constructed product, and
- c. assure consistency with the terms of the approved Certification Acceptance (CA) and Secondary Road Plan (SRP) agreements or other agreements which modify routine Federal-aid procedures.

4. ANNUAL CONSTRUCTION MONITORING PROGRAM

- a. Each division office shall annually develop a CMP consisting of the activities planned for the current year and a concise evaluation and brief summary report of the previous year's accomplishments. The following items should be considered in the development of the annual program.

(1) Current Year Activities:

(a) These activities should maximize the efficient use of resources to accomplish the objectives of FHWA's construction monitoring policy through the use of a program of construction inspections and/or reviews. The type and frequency of these inspections and/or reviews should be balanced so as to include both program and project level activities.

(b) The item or items which will be the focus of the division's construction monitoring program should be identified. These items should be based on national or regional emphasis areas, findings from prior year's programs, and/or cyclical requirements of other programs.

(2) Previous Year's Accomplishments:

(a) A summary of the significant findings noted and a brief discussion of the resolution of those findings.

(b) A summary of the actions taken to resolve recommendations and issues from joint reviews with other FHWA offices if these actions have not been previously reported.

- b. Each region office should review and provide comments to the division offices on the annual CMP. In addition, each region office should have internal procedures for oversight of the implementation of the division office programs. Whenever

possible, the region office should actively participate with the division offices in the development of the programs.

5. CONSTRUCTION INSPECTIONS. The following descriptions of construction inspection classifications have been developed to provide guidance for FHWA offices on construction monitoring activities.

Process Review/Product Evaluation (PR/PE) - comprehensive reviews to evaluate the SHA's procedures and controls. The purpose of a PR/PE is to provide oversight of the SHA construction and materials management activities and to determine compliance with Federal-aid requirements on a statewide or areawide basis. All process reviews should include a review of the process at key decision points and sufficient on-site project level inspections to verify that the process is being implemented as intended and is producing the desired product. As appropriate, CA and SRP projects should be included in the sample of projects inspected as part of a PR/PE.

- a. Inspection-In-Depth - a thorough on-site review to evaluate a specific contract item, combination of items, or major phase of a project. Inspections-in-depth may be accomplished on an individual project basis or on several projects with the findings summarized as an areawide or statewide review.
- b. Project Inspection - an on-site review to evaluate the SHA's activities, the quality and progress of the work, and if appropriate, to follow up on findings from previous inspections.
- c. Final Inspection

(1) A review to determine the extent to which the SHA has exercised its control to assure that the project has been completed in reasonably close conformance with the plans, specifications, and authorized changes.

(a) For all Federal-aid construction projects, except CA and/or SRP projects, a final inspection may be accomplished by any of the following methods:

1 an on-site review conducted at or near the completion of work,

2 a review of project records which are provided by the State at the completion of work, or

3 if previous PR/PE or inspection-in-depth reviews of the SHA's internal control programs for inspection of completed projects have indicated the SHA has satisfactory procedures, the final inspection may be based on the

finding that the SHA is properly exercising its internal controls and no additional review will be required.

(b) When similar types of work are included in an areawide project, an inspection of a sample of contract work locations may fulfill the requirement for a final inspection.

(c) Projects approved under CA and/or SRP procedures require an on-site review conducted at or near the completion of the work.

(2) The Division Administrator should develop and include as a part of the annual CMP a process to determine the final inspection requirements for construction projects. This determination should consider the type, size and complexity of the project, the degree to which the project has been previously inspected by FHWA personnel, the adequacy of the SHA's internal controls, and the degree of independent inspections and evaluations which have been provided by the State.

6. FREQUENCY OF INSPECTIONS. Sufficient construction inspections shall be conducted to assure compliance with the policy set forth in paragraph 3. The makeup of the construction monitoring program, the mix of inspection types, and the overall frequency of inspections shall be determined by the Division Administrator after considering such items as Federal-aid regulations, the efficient use of division resources, effectiveness of the SHA control, and other items unique to the SHA or FHWA division office. The CMP may include provisions to allow deviations from the division's overall construction monitoring guidelines on a project-by-project basis to accommodate the complexity and type of construction, degree of controversy, or other project specific factors. As appropriate, the CMP may also address the following in the determination of inspection frequency:

- a. In addition to the final inspection, review of CA and SRP projects may be warranted at other times as determined appropriate by the Division Administrator.
- b. To the extent feasible, major projects should be inspected during each major phase.
- c. Controversial projects and projects that incorporate innovative or new technology may warrant additional inspections.

7. CONSTRUCTION INSPECTION REPORTS

- a. Inspection reports numbered in sequence for each project shall be prepared in a timely manner for all inspections.
- b. For all Federal-aid projects, other than CA or SRP projects:

(1) Form FHWA 1446 A (or facsimile) (RCS-HHO-30-28), "Construction Inspection Report" (Attachment 1), shall be used to report all construction inspections, including final inspections, and

(2) Form FHWA 1446 B (or facsimile) (RCS-HHO-30-28), "Final Acceptance Report" (Attachment 2), may be used to report final acceptance or the division office may include an alternate method of documenting final acceptance in the annual CMP.

- c. Final inspections of CA and SRP projects shall be reported on Form FHWA 1446 C (or facsimile) (Attachment 3). Any other inspections of CA or SRP projects should be reported using Form FHWA 1446 A.
- d. Field offices are encouraged to prepare special reports on innovative or new construction materials, methods, or equipment.
- e. Regional offices should establish guidelines for receipt of copies of reports prepared in the division offices and for transmitting reports of region office construction oversight reviews, special reports, and reports which may be of national significance to the Washington Headquarters (HNG-20).

8. ANNUAL REPORTS

- a. A copy of each division office's annual CMP should be submitted to the region office for review and comment. No specific format or content for these submissions will be required by the Washington Headquarters. However, it is recommended that the submissions be as brief and concise as possible and include only the key item or items which will be the focus of the division's current year's activities and a summary of accomplishments.
- b. A copy of each division office's annual CMP should be submitted to Washington Headquarters (HNG-20) for information purposes.

Appendix D – Example Evaluation Report ([click here](#))