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INNOVATIVE BIDDING TOOLKIT**

INFORMATION AND SPECIAL INSTRUCTIONS:

Attached is Change 2 of the 2013 Edition of the Innovative Bidding Toolkit. The following list highlights the revisions to this edition of the manual:

Chapter 6.5 - Added new section regarding Use Guidelines - Bridge Warranty, 50-Month Warranty.

Chapter 5.2 - Added clarification regarding A+Bx Bidding and liquidated damages.

All District Offices should distribute this Manual to the appropriate staff within their organization responsible for preparing Plans, Specifications and Estimate and ultimately bid packages. District Contract Management Offices should assure that all bid packages are in compliance with this Manual.

CANCEL AND DESTROY THE FOLLOWING:

The 2013 Edition of Publication 448, Change 1

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by:

A handwritten signature in blue ink, appearing to read "Brian G. Thompson", written over a horizontal line.

for Brian G. Thompson, P.E.
Director
Bureau of Project Delivery

Publication 448

INNOVATIVE BIDDING TOOLKIT

2013 Edition, Change 2

**Bureau of Project Delivery, Highway Delivery Division
Project Schedules, Specifications and Constructability Section**



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PENNSYLVANIA DEPARTMENT OF TRANSPORTATION
INNOVATIVE BIDDING TOOLKIT

CHAPTER 1 – OVERVIEW	1
1.0 INTRODUCTION.....	1
1.0.1 Background.....	1
1.1 GENERAL CONSIDERATIONS	2
1.1.1 Prequalification Requirements	2
1.1.2 CPM Scheduling.....	2
1.1.3 Road User Costs	2
1.1.4 Quality Control / Quality Assurance	2
1.1.5 Procurement of Services	3
1.1.6 Coordination between Design and Construction.....	3
1.2 METHODS	3
1.2.1 Design-Build	3
1.2.2 Time-Based Methods	5
1.2.3 Quality-Based Methods	6
1.2.4 Other Methods.....	7
1.3 PROJECT GUIDANCE MATRIX FOR INNOVATIVE CONTRACTING PRACTICES	7
CHAPTER 2 – GENERAL DESIGN-BUILD CONSIDERATIONS	1
2.0 INTRODUCTION.....	1
2.1 DESIGN-BUILD METHOD SELECTION	1
2.2 DESIGN-BUILD QUALIFICATION REQUIREMENTS	3
2.3 CONFLICT OF INTEREST	3
2.4 FHWA INVOLVEMENT	4
2.5 PROJECT STAFFING REQUIREMENTS AND THE QUALITY ASSURANCE PROCESS	4
2.6 LOCAL ADMINISTERED FEDERAL-AID PROJECTS	4
2.7 GROUPINGS OF PROJECTS	5
CHAPTER 3 – LOW BID DESIGN-BUILD PROCESS	1
3.0 INTRODUCTION.....	1

3.1 DESIGN-BUILD PROJECT SCREENING	1
3.1.1 Action Plans.....	2
3.1.2 Environmental.....	3
3.1.3 Right-of-Way	5
3.1.4 Bridge.....	5
3.1.5 Permitting	6
3.1.6 Utility Involvement	7
3.1.7 Railroad Involvement/Coordination	7
3.1.8 Availability of Resources	8
3.1.9 Schedule	8
3.1.10 Photogrammetry and Surveys.....	8
3.1.11 Non Highway-related Design Elements	8
3.1.12 Project Screening Checklist.....	9
3.1.13 Quality Assurance Review Screening.....	11
3.1.13.1 Quality Assurance by Department Review	11
3.1.13.2 Quality Assurance by Peer Review.....	11
3.1.13.2.1 Roadway Design.....	11
3.1.13.2.2 Bridge Work Activities.....	11
3.2 PRE-AWARD ACTIVITIES – CONCEPTUAL DESIGN AND BID PACKAGE PREPARATION	12
3.2.1 Scope of Work Development for Conceptual Design	12
3.2.2 Project Announcement	15
3.2.3 Conceptual Design.....	16
3.2.3.1 Conceptual Drawings	16
3.2.3.1.1 Conceptual Drawings – Structures	17
3.2.3.1.2 Hydrologic and Hydraulic Report.....	18
3.2.3.1.3 Conceptual Type, Size, and Location (TS&L)	18
3.2.3.1.4 Foundations.....	20
3.2.3.1.5 Noise Barrier Acoustical and Aesthetic Information.....	24
3.2.3.2 Special Provisions	24
3.2.3.2.1 General Special Provisions	25
3.2.3.2.2 Roadway Special Provisions	29
3.2.3.2.3 Bridges/Structures Special Provisions	29
3.2.3.2.4 Maintenance and Protection of Traffic Special Provisions	43
3.2.3.2.5 Right-of-Way Special Provisions.....	43
3.2.3.2.6 Utility Special Provisions	44
3.2.3.2.7 Environmental / Permitting Special Provisions	44
3.2.3.2.8 Concrete Curb Ramp Special Provisions	45
3.2.3.2.9 Special Provision Checklist.....	45
3.2.3.3 Bid Items.....	45
3.2.3.3.1 Standard Items.....	45
3.2.3.3.2 Unit Price Items	45
3.2.3.4 Project Development Checklist.....	46
3.2.3.4.1 Project Development Checklist Items	46
3.2.3.4.2 Cost Estimate and Pre-bid Schedule	47
3.2.4 Final Package Process.....	47

3.2.4.1 DBE Goal.....	47
3.2.4.2 Bid Package for Central Office for Review	47
3.2.4.3 Bid Package Published in ECMS.....	48
3.2.4.4 Optional Pre-Bid Meeting	48
3.2.5 Bid Submission, Opening, and Contract Award	48
3.3 POST-AWARD - FINAL DESIGN SUBMISSIONS AND CONTRACT ADMINISTRATION	48
3.3.1 Prior to Award	49
3.3.2 Immediately after Award	49
3.3.2.1 Establish Digital Plan Submission System.....	50
3.3.2.2 Establish Paper Plan Submission System	50
3.3.2.3 Submittal Management Set-up Checklist	50
3.3.2.4 Prompt Payment	50
3.3.3 Preconstruction Conference.....	51
3.3.4 General Submittal Items.....	51
3.3.4.1 Quality Plan (either QA by Department Review or QA by Peer Review)	52
3.3.4.2 Submittal Details.....	52
3.3.4.2.1 Coordination of Review Comments and Issuance of Reviewed Plans	52
3.3.4.2.2 Project Cost Tracking	53
3.3.4.2.3 Reproduction.....	54
3.3.4.2.4 Construction Value Engineering	54
3.3.4.2.5 Working and Shop Drawings	54
3.3.4.2.6 Construction and As-Built Plans.....	54
3.3.4.2.7 Construction Problems.....	54
3.3.4.2.8 Revisions During Construction	54
3.3.4.3 Roadway Submissions	54
3.3.4.3.1 Geotechnical.....	55
3.3.4.3.2 Pavement Design.....	55
3.3.4.3.3 Survey.....	55
3.3.4.3.4 Erosion and Sediment Pollution Control Plan	55
3.3.4.3.5 NPDES Permit Application	55
3.3.4.3.6 Pre-Final Roadway Plans.....	55
3.3.4.3.7 Signing and Pavement Markings	56
3.3.4.3.8 Final Roadway Drawings.....	56
3.3.4.3.9 Publication 408, Section 686 Construction Survey	56
3.3.4.3.10 As-Built Plans.....	56
3.3.4.4 Structure Submissions.....	56
3.3.4.4.1 Hydrologic and Hydraulics Report Amendment.....	56
3.3.4.4.2 Final Type, Size, and Location (TS&L)	56
3.3.4.4.3 Subsurface Exploration and Foundation Design	57
3.3.4.4.4 Final Structure Plans.....	58
3.3.4.4.5 Partial Final Structure Plans.....	58
3.3.4.4.6 Final Tracings and Computations.....	58
3.3.4.5 Maintenance and Protection of Traffic Submissions	58
3.3.4.5.1 Incident Management Plan.....	59
3.3.4.5.2 Transportation Management Plan	59
3.3.4.5.3 Preliminary TCP Submission	59
3.3.4.5.4 Partial Submissions, Final Plans and Computations.....	59
3.3.4.6 Permit Submissions.....	59
3.3.4.7 Utility Coordination Submissions.....	59
3.3.4.8 Right-of-Way Design and Acquisition Service Submissions	59

3.3.5 Schedules of Values Submissions	60
3.3.5.1 Design Items	60
3.3.5.2 Construct Items	60
3.3.6 Measurement and Payment for Construct Items	60
3.3.7 Post-Construction Quality Survey	61
CHAPTER 4 – ADJUSTED BID DESIGN-BUILD PROCESS	1
4.0 INTRODUCTION	1
4.1 DESIGN-BUILD PROJECT SCREENING	1
4.1.1 Approach Plan	1
4.1.2 Environmental	2
4.1.3 Right-of-Way	2
4.1.4 Bridge	2
4.1.5 Permitting	2
4.1.6 Utility Involvement	2
4.1.7 Railroad Involvement	3
4.1.8 Availability of Resources	3
4.1.9 Schedule	3
4.1.10 Photogrammetry and Surveys	3
4.1.11 Estimated Construction Value	3
4.1.12 Quality Assurance Review Screening	3
4.1.12.1 Quality Assurance by Department Review	3
4.1.12.2 Quality Assurance by Peer Review	3
4.2 PRE-AWARD ACTIVITIES	4
4.2.1 Conceptual Design Development	4
4.2.1.1 Scope of Work Development for Conceptual Design	4
4.2.1.2 Conceptual Design	7
4.2.1.2.1 Conceptual Drawings	8
4.2.1.2.2 Conceptual Drawings – Structures	9
4.2.1.3 Special Provisions	15
4.2.1.3.1 General Special Provisions	16
4.2.1.3.2 Roadway Special Provisions	19
4.2.1.3.3 Bridges/Structures Special Provisions	20
4.2.1.3.4 Maintenance and Protection of Traffic Special Provisions	33
4.2.1.3.5 Right-of-Way Special Provisions	33
4.2.1.3.6 Utility Special Provisions	34
4.2.1.3.7 Environmental / Permitting Special Provisions	34
4.2.1.3.8 Concrete Curb Ramp Special Provisions	34
4.2.1.4 Bid Items	35
4.2.1.4.1 Standard Items	35
4.2.1.4.2 Unit Price Items	35
4.2.1.5 Project Development Checklist	36

4.2.1.5.1 Project Development Checklist Items	36
4.2.1.5.2 Cost Estimate and Pre-bid Schedule	36
4.2.2 Adjusted Bid Selection Process	37
4.2.2.1 Project Announcement	37
4.2.2.1.1 Contractor Announcement	37
4.2.2.1.2 Consultant Announcement	39
4.2.2.2 Technical Review Committee (TRC).....	40
4.2.2.3 Design-build contract advertisement	41
4.2.2.3.1 Scope of Work Development for Stipend Agreement.....	41
4.2.2.3.2 Determine Stipend for Technical Approach.....	42
4.2.2.3.3 Determine Selection Process for Technical Approach Review: Firm Neutral Selection or Alternate Technical Concept (ATC) Process Selection	43
4.2.2.3.4 Determine Technical Evaluation Criteria (Scoring) for Technical Approach	43
4.2.2.3.5 Determine Adjusted Bid Scoring Method	44
4.2.2.3.6 Advertisement	46
4.2.2.3.7 Optional Statement of Interest Pre-Proposal Meeting	52
4.2.2.3.8 Question/Answer Option to Advertisement.....	52
4.2.2.3.9 Statement of Interest Submission for Two-Step Adjusted Bid Projects	52
4.2.2.4 Review of Statements of Interest	52
4.2.2.4.1 District Shortlisting Committee.....	52
4.2.2.4.2 Statements of Interest Review	53
4.2.2.4.3 Statement of Interest Qualification Rating Sheet	53
4.2.2.4.4 Unsuccessful Design-Build Team Debriefing	53
4.2.3 Bid Package	53
4.2.3.1 Central Office Bid Package Review	54
4.2.3.2 Bid Package Published	54
4.2.4 Technical Approach.....	54
4.2.4.1 Optional Pre-Bid Conference with Shortlisted Design-Build Teams	54
4.2.4.2 Technical Approach for Firm Neutral Process – General.....	54
4.2.4.2.1 Additional Design-Build Team Questions during Preparation of Technical Approaches ..	55
4.2.4.2.2 Technical Approaches for Firm Neutral Process – Submission	55
4.2.4.3 Technical Approach for Firm Neutral Process – Department Review	55
4.2.4.3.1 Technical Approach for Firm Neutral Process – Coding.....	55
4.2.4.3.2 Technical Approaches and Technical Review Form	55
4.2.4.3.3 Initial Individual TRC Review	56
4.2.4.3.4 Firm Neutral Process Questions.....	56
4.2.4.3.5 Firm Neutral Process Question Responses	56
4.2.4.3.6 Technical Approaches for Firm Neutral Process – Scoring.....	56
4.2.4.3.7 Technical Approaches for Firm Neutral Process – Composite Scoring.....	56
4.2.4.3.8 Decode Firm Neutral Scores for each Technical Approach.....	57
4.2.4.4 Technical Approach for Alternate Technical Concept (ATC) Process – General.....	57
4.2.4.4.1 ATC Meetings	57
4.2.4.4.2 Technical Approaches for ATC Submission Process	58
4.2.4.4.3 Technical Approaches and Technical Review Form	58
4.2.4.4.4 Initial Individual TRC Review	58
4.2.4.4.5 Contact Design-Build Teams with Questions for ATC Process.....	58
4.2.4.4.6 ATC Question Responses.....	59
4.2.4.4.7 Individual TRC Review – Scoring.....	59
4.2.4.4.8 Technical Approaches for ATC Process – Composite Scoring.....	59
4.2.5 Bid Submission, Opening, Review, and Contract Award.....	59
4.2.5.1 Bid Opening.....	59
4.2.5.2 Contract Award Process.....	60

4.2.5.3 Bid Review	60
4.2.5.4 Technical Approach Incorporated into Construction Contract	60
4.2.5.5 Debrief Unsuccessful Design-Build Teams	60
4.2.5.6 Unsuccessful Design-Build Team Stipend.....	60
4.3 POST-AWARD - FINAL DESIGN SUBMISSIONS AND CONTRACT ADMINISTRATION	61
4.3.1 Prior to Award	62
4.3.2 Immediately after Award	62
4.3.2.1 Establish Digital Plan Submission System.....	62
4.3.2.2 Establish Paper Plan Submission System	63
4.3.2.3 Submittal Management Set-up Checklist	63
4.3.2.4 Prompt Payment	63
4.3.3 Preconstruction Conference.....	64
4.3.4 General Submittal Items.....	64
4.3.4.1 Quality Plan (either QA by Department Review or QA by Peer Review)	64
4.3.4.2 Submittal Details.....	65
4.3.4.2.1 Coordination of Review Comments and Issuance of Reviewed Plans	65
4.3.4.2.2 Project Cost Tracking	66
4.3.4.2.3 Reproduction.....	66
4.3.4.2.4 Construction Value Engineering	66
4.3.4.2.5 Working and Shop Drawings	66
4.3.4.2.6 Construction and As-Built Plans.....	66
4.3.4.2.7 Construction Problems.....	66
4.3.4.2.8 Revisions During Construction	67
4.3.4.3 Roadway Submissions	67
4.3.4.3.1 Geotechnical.....	67
4.3.4.3.2 Pavement Design.....	67
4.3.4.3.3 Survey.....	67
4.3.4.3.4 Erosion and Sediment Pollution Control Plan	68
4.3.4.3.5 NPDES Permit Application	68
4.3.4.3.6 Pre-Final Roadway Plans.....	68
4.3.4.3.7 Signing and Pavement Markings	68
4.3.4.3.8 Final Roadway Drawings.....	68
4.3.4.3.9 Publication 408, Section 686 Construction Survey	68
4.3.4.3.10 As-Built Plans.....	68
4.3.4.4 Structure Submissions.....	68
4.3.4.4.1 Hydrologic and Hydraulics Report Amendment.....	69
4.3.4.4.2 Final Type, Size, and Location (TS&L)	69
4.3.4.4.3 Subsurface Exploration and Foundation Design	69
4.3.4.4.4 Final Structure Plans.....	70
4.3.4.4.5 Partial Final Structure Plans.....	70
4.3.4.4.6 Final Tracings and Computations.....	71
4.3.4.5 Maintenance and Protection of Traffic Submissions	71
4.3.4.5.1 Incident Management Plan.....	71
4.3.4.5.2 Transportation Management Plan	71
4.3.4.5.3 Preliminary TCP Submission	71
4.3.4.5.4 Partial Submissions, Final Plans and Computations.....	71
4.3.4.6 Permit Submissions.....	71
4.3.4.7 Utility Coordination Submissions.....	71
4.3.4.8 Right-of-Way Design and Acquisition Service Submissions	71
4.3.5 Schedules of Values Submissions	72

4.3.5.1 Design Items	72
4.3.5.2 Construct Items	72
4.3.6 Measurement and Payment for Construct Items	73
4.3.7 Post-Construction Quality Survey	73
CHAPTER 5 – TIME-BASED METHODS	1
5.0 INTRODUCTION	1
5.1 INCENTIVE/DISINCENTIVE FOR EARLY COMPLETION	1
5.1.1 Definition	1
5.1.2 Benefits/Risks	1
5.1.3 Typical Project Types	1
5.1.4 Design Considerations	2
5.1.5 Letting and Award of Contract.....	3
5.1.6 Construction Considerations.....	3
5.2 A+BX BIDDING	3
5.2.1 Overview	3
5.2.2 Benefits/Risks	4
5.2.3 Typical Project Types.....	4
5.2.4 Best Practices Determination of Road Users Liquidated Damages Value	4
5.2.5 Design Considerations.....	5
5.2.6 Award of Contract.....	6
5.2.7 Construction Considerations	7
5.2.8 Other Considerations	7
5.3 LANE RENTAL	7
5.3.1 Overview	7
5.3.2 Benefits/Risks	8
5.3.3 Typical Project Types	8
5.3.4 Design Considerations	8
5.3.5 Award of Contract	8
5.3.6 Construction Considerations.....	9
5.3.7 Other Considerations.....	9
CHAPTER 6 – QUALITY-BASED METHODS	1
6.0 INTRODUCTION	1
6.1 WARRANTIES	1

6.1.1 Overview	1
6.1.2 Benefits/Risks	1
6.1.3 Typical Project Types	2
6.1.4 Design Considerations	2
6.1.5 Letting and Award of Contract.....	2
6.1.6 Construction Considerations.....	2
6.1.7 Other Considerations.....	2
6.2 Use Guidelines - Asphalt Concrete Pavement, 60-Month Warranty	2
6.2.1 PROJECT SELECTION:	2
6.2.1.1 Use on Mainline Pavement Only.....	2
6.2.1.2 Base and Drainage Conditions.....	3
6.2.1.3 Ride Quality.	3
6.2.1.4 Pavement Type Alternate Bid Projects.	3
6.2.1.5 Utility Concerns.	3
6.2.2 PAVEMENT AND PROJECT DESIGN FOR WARRANTY SPECIFICATION:	3
6.2.2.1 Pavement Design.	3
6.2.2.2 Mainline Variable Depth Pavement Courses.	3
6.2.2.3 SRL.	3
6.2.2.4 Traffic Classification Counts.	4
6.2.2.5 Segments and offsets.....	4
6.2.2.6 ADT and ADTT.	4
6.2.2.7 20-Year Design Life ESALs.	4
6.2.2.8 Ride Quality Specification.....	4
6.2.2.9 Warranty Work Traffic Control Plan.....	4
6.2.2.10 Sawing and Sealing Joints.	4
6.2.2.11 Payment for Fifth Member of Conflict Resolution Team.....	4
6.2.2.12 Tack Coat on Existing Pavement.....	4
6.2.2.13 Road User's Liquidated Damages (RULDs).....	4
6.2.3 PRE-CONSTRUCTION MEETING:	5
6.2.3.1 Identify Conflict Resolution Team.	5
6.2.4 CONSTRUCTION:.....	5
6.2.4.1 Review of Job-Mix Formulas.	5
6.2.4.2 Construction Inspection During Mix Placement.....	5
6.2.4.3 Construction Inspection After Mix Placement.....	5
6.2.5 DISTRICT RESPONSIBILITIES DURING THE 60-MONTH WARRANTY PERIOD:	5
6.2.5.1 Annual Automated Performance Surveys.	5
6.2.5.2 Annual Manual Performance Surveys.	5
6.2.5.3 Notification to Contractor of Manual Performance Surveys.	5
6.2.5.4 Notification to Contractor of Performance Survey Results.	6
6.2.5.5 Notification of Required Warranty Work.	6
6.2.5.6 Routine Traffic Classification Counts.....	6
6.2.5.7 Maintenance Forces.	6
6.3 Use Guidelines - Asphalt Concrete Pavement, 84-Month Warranty	6
6.4 Use Guidelines - Asphalt Concrete Pavement, 120-Month Warranty	6

6.5 Use Guidelines – Bridge warranty, 50-Month Warranty	6
6.5.1 Project Selection:.....	6
6.5.1.1 Use on Structure Replacement projects only.....	6
6.5.1.2 Utility Concerns.	6
6.5.1.3 Design Build Projects.....	6
6.5.2 Bridge Design for Warranty Specification:	6
6.5.2.1 Structure Design.	7
6.5.2.2 Multiple Bridges.....	7
6.5.2.3 Alternate Structure.....	7
6.5.2.4 Payment for 5 th Member of Conflict Resolution Team.....	7
6.5.2.5 Road User’s Liquidated Damages (RULDs).....	7
6.5.3 Pre-Construction Meeting:.....	7
6.5.3.1 Identify Conflict Resolution Team.	7
6.5.4 Construction:	7
6.5.4.1 Bridge Safety Inspection.....	7
6.5.4.2 Baseline Survey and As-built Drawings.....	7
6.5.4.3 Finalization of construction project.	7
6.5.5 District Responsibilities During the 50-Month Warranty Period:.....	8
6.5.5.1 Bi-annual Bridge Safety Inspection (NBIS).	8
6.5.5.2 Request by Contractor for Safety Inspection Results.....	9
6.5.5.3 Notification of Required Warranty Work.	9
6.5.5.4 Maintenance Forces.	9
6.5.5.5 Notification of Local Officials and Public.....	9
 CHAPTER 7 – OTHER METHODS	 1
7.0 INTRODUCTION	1
7.1 LUMP SUM	1
7.1.1 Overview	1
7.1.2 Benefits/Risks	1
7.1.3 Typical Project Types	1
7.1.4 Design Considerations	1
7.1.5 Award of Contract	1
7.1.6 Construction Considerations.....	1
7.1.7 Other Considerations.....	2
 APPENDIX A - DESIGN-BUILD PROJECT SCREENING CHECKLIST-EXPANDED	 1
 APPENDIX B - SUBMITTAL REVIEW RESPONSIBILITY CHECKLIST	 1
 APPENDIX C - DESIGN-BUILD SPECIAL PROVISIONS CHECKLIST	 1
 APPENDIX D - PROJECT MANAGEMENT CHECKLIST	 1

APPENDIX E	- PROJECT SCHEDULE OF VALUES	1
APPENDIX F	- SHORTLISTING COMMITTEE AND TECHNICAL EVALUATION COMMITTEE CONFIDENTIALITY STATEMENT	1
APPENDIX G	- STATEMENT OF INTEREST – QUALIFICATIONS RATING FORM	1
APPENDIX H	- TECHNICAL APPROACH – INITIAL REVIEW AND CODING FORM.....	1
APPENDIX I	- TECHNICAL APPROACH – TECHNICAL REVIEW FORM.....	1
APPENDIX J	- REFERENCES.....	1
APPENDIX K	- GLOSSARY	1

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CHAPTER 1 – OVERVIEW

1.0 INTRODUCTION

The purpose of this Manual is to introduce Project Managers to available alternate methods of project delivery, select alternate methods when appropriate for a particular project, and guide the Manager through the necessary Pre-Award and Post-Award procedures to ensure compliance with Department requirements and to realize the full benefit of these innovative project delivery methods.

1.0.1 BACKGROUND

Agencies and contractors have continuously sought alternate methods for contracting transportation improvement projects in an effort to reduce the amount of time and money required to complete these projects. In order to meet the safety, convenience, and economic needs of the traveling public, contracting methods considering quality, time, innovation, and other value adding factors can improve the project delivery process. Numerous surveys of the traveling public revealed opportunities for the Department to improve contracting procedures to meet increasing customer expectations for reduced construction congestion and improvements in project quality.

The traditional low-bid contracting method factors a contractor's expenses and profits into the bid, but leaves little room for the Department or the contractor to consider social costs such as disturbance to the traveling public. By identifying particular performance measures besides low cost in the contract bidding process, factors that affect both social and economic costs can be stipulated and accounted for within the construction contract. This modification of low-bid selection becomes a method that evaluates those social costs as part of the overall project cost. Innovative bidding also provides opportunities for the contractor to realize greater financial benefit while satisfying the social conditions and performance measures that are identified in the contract. The performance measures are established to account for social and economic costs, such as inconvenience and delay experienced by the traveling public.

The Department's implementation of innovative contracting methods is intended to enhance the existing partnership between the Department and the contracting community, and allow contractors to realize a reasonable profit while addressing social cost items. The inclusion of incentives in the contract language provides motivation to the contractor to meet the social parameters, and changes the traditional bidding paradigm that only cost and responsiveness are taken into account by the contractor.

In the 1990s, the Department initiated work on the development of policies, procedures, and presentation materials to implement innovative bidding techniques and educate the Department on their applicability and benefits. The Business Process Re-engineering (BPR) Report on Innovative Bidding (issued March 17, 1998) recommended, among other things, the development of this Manual to create a common understanding of the bidding methods for various innovative bidding techniques. The BPR Report further recommended continued analysis, education, and pilot implementation of selected innovative bidding techniques which resulted in the Bureau of Project Delivery selection of the following techniques for implementation:

- Design-Build (both Low Bid and Adjusted Bid);
- Cost plus Time (A+Bx) Bidding;
- Lane Rental;
- Incentive/Disincentive for Early Completion;
- Warranties; and
- Lump Sum.

This Manual includes the definition and purpose, benefits, project selection criteria, potential risk analysis and application procedures for each of these methods, including changes in the Department's bidding process.

1.1 GENERAL CONSIDERATIONS

The following are general issues that have increased relevance when considering alternate project delivery methods.

1.1.1 PREQUALIFICATION REQUIREMENTS

There are no additional prequalification requirements for contractors to bid alternate project delivery methods. Contractors must be pre-qualified in accordance with 67 PA Code Chapter 457 (Prequalification of Bidders).

For design-build projects, consulting firms employed by the contractor must be registered Business Partners in the Department's Engineering and Construction Management System (ECMS) and have a current Qualifications Packages on file. Additional requirements apply, and are described in [Section 2.2](#).

1.1.2 CPM SCHEDULING

While Department projects require the preparation and approval of a detailed Pre-Bid Construction Schedule, the time-compressing nature of the alternative methods discussed in this Manual increases the importance of a Pre-Bid schedule that accounts for the various activities in the construction contract. In design-build, the design activities (including right-of-way, utility, and permitting) for which a contractor is responsible, along with submission and review time must be included in the pre-bid construction schedule. For Time-based methods, the milestones and completion dates identified in the contract must be achievable by the contractor through the use of reasonable means and methods.

1.1.3 ROAD USER COSTS

Road User Costs (RUC) quantify the financial impact of a highway construction project on the traveling public. These RUC are the basis for establishing the incentive and disincentive amounts imposed in contracts utilizing time based methods. RUC include:

- The cost of additional travel time or delay that result from reduced speeds through work zones;
- Additional fuel costs from reduced speeds through work zones and delays;
- Additional delay and fuel costs if a detour is used on a project;
- The cost of projected increases in the crash rates in work zones or the additional number of crashes due to the additional vehicle miles of travel on a detour; and
- Winter shut down cost, maintenance of traffic cost on the project and/or project detour cost and additional cost due to delays in opening adjacent projects or subsequent phases.

The RUC are estimated based on the above information and with consideration of the project's road classification, traffic volume data, and traffic control plans. RUC are expressed as a monetary value by applying a "value to time" ("dollars/vehicle-hour" or "dollars/person-hour") to the above information.

Refer to Publication 10C, Design Manual Part 1C, *Transportation Engineering Procedures*, Section 5.6D for criteria for the calculation of RUC. Several methodologies are identified, and any calculations used to develop RUC should provide a reliable percentage of truck traffic in the computations, reflect assumptions about real time elements, spell out assumptions clearly, and be as simplified as possible.

1.1.4 QUALITY CONTROL / QUALITY ASSURANCE

In some alternate project delivery methods, namely design-build, the contractor's final designs need to be reviewed by a qualified third party to ensure that those designs comply with federal and Commonwealth requirements. For the standard design/bid/build project delivery, Publication 10, Design Manual Part 1, *Transportation Program Development and Project Delivery Process*, Section 4, and Publication 10X, Design Manual Part 1X, *Appendices to Design Manuals 1, 1A, 1B, and 1C*, Appendix D, *Quality Management Manual for Project Development* establish the policies for Quality Assurance and Quality Control, and define the responsibilities among Central Office, Districts, Districts' design consultants, and FHWA. In those procedures, Quality Assurance is defined as a limited, high-level review by a party not involved in Quality Control to confirm quality, economy, and compliance with

laws, regulations, and policies, prior to final acceptance by the Department. In design-build, the final design documents for which the design has been delegated to the contractor require a quality control process. This design-build Quality Assurance review can be performed by either the Department (or its consultant) or, for some projects, by a third party consultant procured by the contractor.

1.1.5 PROCUREMENT OF SERVICES

By statute, the Department is required to select contractors by competitive sealed bidding. The primary exception to sealed bidding is procurement of professional design or construction services, where selection is based on demonstrated competence and qualifications. Alternate project delivery methods may modify competitive sealed bidding to the extent that price is evaluated together with other factors to result in an adjusted bid. In one of the time-based alternatives, RUC are factored into the calculation of the bid. In two design-build methods, qualifications of the design consultant teamed with the bidding contractor are considered along with other factors related to the specific project, such as technical approach, management, and staffing as defined in the bid documents.

1.1.6 COORDINATION BETWEEN DESIGN AND CONSTRUCTION

During a typical project design phase, the primary interaction between Department design and construction personnel takes place during the Constructability Reviews, required by Publication 10C, Design Manual Part 1C, *Transportation Engineering Procedures*, Section 4.13.A. When considering alternate project delivery methods, interaction with construction personnel becomes vital to a project's success. When assembling the Constructability Review Team, the Project Manager should include the District construction staff that are to be involved in managing the project. Although "Innovative Contracting Methods" is identified in Publication 10C, Design Manual Part 1C, *Transportation Engineering Procedures*, Section 5.5 as a biddability review item (thus occurring during the later phases of project development), contemplated alternate delivery methods should be discussed at the earliest possible stage of the project development process. In this manner, the potential risks associated with the method(s) under consideration can be discussed; together with potential influence factors that are both within and outside the Department's control, and their probability and extent of possible impact to the project.

With regard to design-build project delivery, it is also important to assess the District's resources available to manage this type of project following award. Since design-build significantly blends the design and construction phases, and depending on each District's approach to managing those projects, construction personnel could be responsible for managing what ordinarily are design functions, e.g. processing final design submittals for review. For this reason, it is important not only to involve construction personnel as early as possible in the project development, but also the availability of capable construction personnel to manage design-build projects at the time they are anticipated to be let. Whether these construction personnel are available can be a factor in determining the viability of the use of design-build.

1.2 METHODS

The six alternate project delivery methods, divided into the categories of Design-Build, Time-based Methods, Quality-based Methods, and Other Methods are described in general below. The purpose of this section is to present the objectives and intended results of each method to determine whether one or more of the methods should be considered for a project. Once a method is selected for consideration, proceed to the appropriate individual chapter(s) to determine if the project meets the selection criteria.

1.2.1 DESIGN-BUILD

Generally, design-build is a project delivery method under which a project owner executes a single contract for both engineering services and construction. The design-builder may be a single firm, a consortium, joint venture, or other organization. However, the fundamental element of design-build delivery remains that one entity assumes primary responsibility for design and construction of the project.

A number of factors have led owners to consider the design-build approach. Design-build delivery provides owners with the benefit of a single point of responsibility for the majority of project development, which can streamline coordination between the design and construction teams. It can reduce the owner's administrative burdens by eliminating the need to coordinate or arbitrate between separate design and construction entities. With the primary designer and the contractor working as a team, scheduling considerations can be addressed up front, often leading to more efficient implementation. Together with these efficiencies, the fact that design and construction activities can proceed concurrently also creates the potential for timesaving and ideally lowers implementation costs.

Design-build can also promote innovation by utilizing the designer's and contractor's separate strengths to develop new design and construction techniques. The innovations can be included in proposals in order to gain a competitive advantage in the selection process, or as part of the project implementation phase in order to cut costs, speed implementation, or gain maximum benefit from any incentive programs. Because of these factors, design-build delivery is often chosen for complex projects or when fast track implementation is a priority.

Within the Department, the design-build process modifies the design phase of a project to the extent that the District performs Preliminary Engineering, either in-house or by its design consultant, and the Final Design is developed by the contractor and its design consultant subcontractor after contract award. Because Final Design is included as an activity in the construction contract, the lead responsibility for design shifts from the Department as the owner to the design-build contractor. Therefore, it is important for the Department to identify all relevant design requirements in the contract documents in order to provide the contractor with the parameters for completion of the Final Design. Because the contractor is responsible for Final Design, cost overruns, work orders addressing design errors or omissions and requests for time extensions are minimized. In the design-build process, the Department maintains control of the design specifications, yet benefits from the shorter completion time and controlled costs.

The process is divided into two primary phases: 1) Pre-Award phase, including the development of the Department's Preliminary Engineering (referred to as Conceptual Design), preparation of contract documents, advertisement of contract and selection of the design-build contractor, and 2) Post-Award phase, including completion of project design and construction. Each phase requires coordination of efforts from both design and construction units to ensure delivery of the end product.

Two design-build processes are covered in this Manual: Low Bid Design-Build (previously referred to as One-Step Low Bid) and Adjusted Bid Design-Build. Adjusted Bid Design-build (previously referred to as Best Value) has two options: Adjusted Bid One-Step, and Adjusted Bid Two-Step. In Low Bid, contracts are awarded based on the lowest responsible bid, where the contractor's design subcontractor need only have the prequalification listed in 1.1.1. In Adjusted Bid, the contractor selection is made by using the adjusted bid criteria identified in the bid package to determine the best value (project content for associated bid price) to the Department. For both Adjusted Bid options, the bidder's Technical Approach is evaluated with the bid; in the Two-Step option, a "shortlist" selection step precedes the actual bidding, where the shortlist is developed by the evaluation of "Statements of Interest" submitted by each potential bidder (contractor and design consultant).

NOTE: Currently, and until further notice, only the Low Bid Design-Build method is available for use in Department projects. Approval from the Director of the Bureau of Project Delivery is required before considering the use of Adjusted Bid Design-Build for any project, and is not supported by ECMS without manual support.

Regarding types of projects to consider for design-build, the most suitable are those that are non-controversial in nature and have a well-defined scope of work. These project types include:

- New alignments;
- New bridges;
- Bridge replacements;
- Bridge rehabilitations;
- Roadway reconstruction;
- Resurfacing;
- Intelligent Transportation Systems (ITS);
- Emergency projects; and

- To remedy emergency safety conditions that must be fast tracked.

Examples of projects not typically well suited for design-build are those that include:

- Federal Aviation Administration (FAA) involvement for airport clearances;
- Complex environmental issues;
- Complex community concerns;
- Extensive Railroad involvement and alterations to Railroad facilities;
- Unique or complicated geotechnical issues;
- Complex bridge or foundation issues;
- Potential to encounter mining issues (e.g., mine voids, coal seams);
- Extensive or complex right-of-way or utility issues;
- Impact on adjacent projects, large events and environmental surroundings;
- Complex geometric alignment issues,
- Complex projects requiring iterative design solutions developed with outside parties; and
- MSE Retaining Walls and Precast Modular Retaining Walls.

In addition, projects can be let as "partial" design-build if certain elements of a project design would benefit from contractor innovation and thus potential cost-savings, such as retaining walls (except MSE walls and precast modular walls as these are pre-engineered/proprietary systems), noise barrier walls, or bridge superstructures. Specific design components to be considered for partial design-build projects may include roadway, Maintenance and Protection of Traffic, structures, or ADA Curb Ramps. Utility coordination, right-of-way acquisition, permit acquisition, or Railroad coordination may also be considered for design-build components, but generally, only in circumstances they are directly affected by the design of other design-build components such as the roadway and/or structures.

Projects, which are originally scoped as Design-Bid-Build require approval from the Chief of the Project Schedules, Specifications and Constructability Section in the Bureau of Project Delivery to be converted to design-build (full or partial).

1.2.2 TIME-BASED METHODS

Time-based innovative bidding and project delivery methods employ special contract provisions drafted to shorten construction time duration and to enhance the likelihood of on-time project completion. Depending on the requirements of a project, certain objectives are emphasized and the contractor is expected to take the necessary action to realize them.

Emergency projects, because of their urgent nature, lend themselves well to time-based innovative bidding techniques. The use of incentives on total time as well as specific milestones can be a very effective means of reducing project durations. Refer to Publication 550, *Disaster Recovery Manual*, and Publication 625, *Expedited Post-Disaster Project Delivery Manual*.

Incentive/Disincentive (I/D) for Early Completion is a contract special provision that permits compensating the contractor a stipulated amount of money for each day identified critical work is completed ahead of schedule. It also assesses a deduction for each day the contractor overruns the I/D time. Use of I/D is primarily intended for those critical projects where traffic inconvenience and delays are to be held to a minimum. The amounts are based upon estimates of such items as traffic safety, traffic maintenance, and road user costs. The incentive amount and the disincentive amount are the same.

It should be noted that there is a distinction between the intent of I/D special provisions and liquidated damages. Liquidated damages allow recovery of construction engineering and additional costs associated with the contractor's failure to complete the project on time. The I/D provision is intended to motivate the contractor so that work will be completed on or ahead of schedule. Liquidated damages provisions apply to most projects; however, I/D provisions should only be applied to special projects where warranted.

Cost plus time, A+Bx bidding, enables the Department to award a project based on both cost and time, or other factors. Each bid submitted consists of two parts:

- The "A" portion of the bid is the sum bid for the contract work items.
- The "Bx" portion accounts for the time or other components of importance, where "B" is the time multiplied by "x", the daily RUC.

The contract is awarded based on the sum of the "A" portion and the "B" portion of the bid. The contract amount after award is limited to the "A" portion of the bid. A+Bx bidding is supported by ECMS only if identified in ECMS prior to bid opening.

A+Bx bidding encourages contractors to develop well thought out plans in order to bid on the time to complete a project or project phase. Since the time bid by each Contractor is based on its own capabilities to perform the work, it also encourages contractors to plan to work overtime, double shifts and at night to reduce construction time, as well as develop innovative ways to reduce construction duration at the lowest cost. This permits submitting a lower bid.

Lane Rental is a contract special provision that encourages contractors to minimize road user impacts during construction. Under the lane rental method, a special provision for a rental fee assessment is included in the contract. The lane rental fee is based on estimated cost of delay or inconvenience to the road user during the rental period. The fee is assessed for the time that the contractor occupies or obstructs part of the roadway and is deducted from the monthly progress payments. The rental fee rates are stated in the bid package in dollars per lane per time period, which could be daily, hourly or fractions of an hour. Neither the contractor nor the contracting agency gives an indication as to the anticipated amount of time for which the assessment will apply. The low bid is determined solely on the lowest amount bid for the contract items. The rental fee rates are dependent on the number and type of lanes closed and can vary for different hours of the day. The intent of lane rental is to encourage contractors to schedule their work to keep traffic restrictions to a minimum, both in terms of duration and number of lane closures. The lane rental concept has merit for use on projects that significantly impact the traveling public. Major urban area projects are prime candidates for this approach.

1.2.3 QUALITY-BASED METHODS

Warranties are defined as a guarantee of the integrity of a product and the contractor's responsibility for the repair or replacement of the deficiencies. A warranty specifies the desired performance characteristics of a particular product over a specified period as well as who is responsible for the product during that period. Warranties are typically assigned to the prime contractor but may be passed down to the subcontractors as pass-thru warranties.

There are two types of warranties in the highway industry: materials and workmanship warranties, and performance warranties. Particular attention should be given to the difference between the two warranty types because the risk allocation, particularly for design liability, varies a great deal. Warranties may be applicable to new construction, rehabilitation, or preventive maintenance type projects. Project selection criteria for pavement warranty projects should include evaluation of the existing subgrade conditions, particularly when considering preventive maintenance projects. There are distinct advantages to this innovative contracting technique such as reduced inspection and testing, and improved project performance. Warranties are intended to increase performance by addressing quality during construction, not as future maintenance agreements. Warranties are not appropriate for addition to contracts after award to address substandard materials or operations performed by the contractor.

When warranties are used on the National Highway System (NHS) they must comply with 23 Code of Federal Regulations (CFR) 635.413, which specifies that warranty requirements must be approved in advance of PS&E by the FHWA Division Administrator and that no warranty requirement may place an undue obligation on the contractor for items over which the contractor has no control. Warranty requirements may substantially change contractor and Department quality assurance roles that should be addressed in the scope of work. ECMS does not support electronic warranty bonds and therefore the bonds must be provided in paper.

1.2.4 OTHER METHODS

The Lump-Sum method of contracting, as an alternative to Time-based or Quality-based methods requires the bidding contractor to calculate quantities and develop a lump sum bid for all work based on a set of bid documents. Costs associated with changed or unforeseen conditions as well as added or deleted work are negotiated. Lump Sum contracting remains classified as experimental under FHWA's Special Experiment Project No. 14 and requires the approval of the FHWA Division Administrator.

1.3 PROJECT GUIDANCE MATRIX FOR INNOVATIVE CONTRACTING PRACTICES

This following matrix is a tool that can be used as a general guide in selecting projects that may be good candidates for innovative contracting type provisions.

Table 1.3-1 - Project Guidance Matrix for Innovative Contracting Practices

Project Criteria	Low Bid Design-Build	Adjusted Bid One Step Design-Build	Adjusted Bid Two Step Design-Build	Incentive/Disincentive for Early Completion	A+Bx Bidding	Lane Rental	Warranties	Lump Sum
Emergency Project	X	X	X	X	X			
Minimize construction time	X			X	X			
Must complete project by a specific date	X			X				
Possible conflict between construction and a major public event				X		X		
Significant construction impact to local businesses				X	X	X		
Lengthy detours/significant delays				X	X	X		
Detours impractical but lane and/or shoulder closures required					X	X		
High traffic volume roads/high road user costs (RUC)				X	X	X		
High RUC and public desire to complete project early				X	X	X		
C factor					X			
Low RUC but need to expedite construction				X	X	X		
Safety issues related to construction				X	X	X		
Multiple bidders anticipated					X			
Low number of bidders anticipated			X	X	X			
Major objective is to reduce total project duration (design & construction)		X	X	X				
Major objective is to reduce design procurement time		X						
Major objective is to guarantee quality of specific items							X	
Well defined project with common work items	X	X						X

KEY: RUC = Road User Costs

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CHAPTER 2 – GENERAL DESIGN-BUILD CONSIDERATIONS

2.0 INTRODUCTION

Once it is determined that a project should be considered for design-build project delivery, the second step in the selection process, discussed in this Chapter, involves the determination of which of the two design-build methods, Low Bid and Adjusted Bid, is best suited for the project in question. The third and final step is performing the Design-Build Project Screening, discussed within the respective chapters for the two methods, to determine if the project meets the Preferred Criteria.

Note: Although Low Bid is currently the only design-build choice, general criteria relevant to both design-build methods are discussed in this Chapter. Do not proceed to Chapter 3 without completing this Chapter.

2.1 DESIGN-BUILD METHOD SELECTION

Refer to Figure 2.1-1 for a graphic showing the selection process.

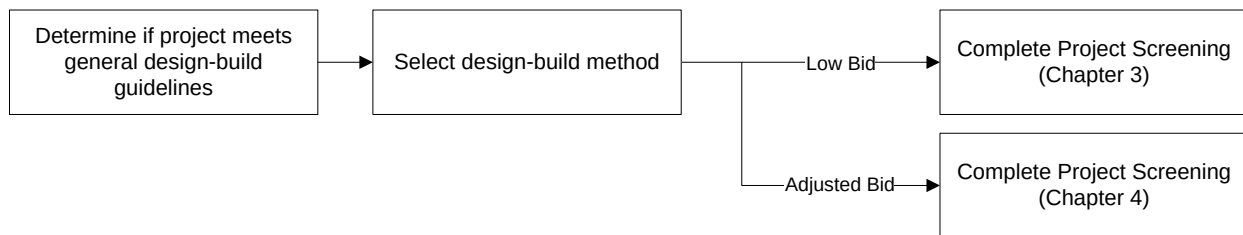


Figure 2.1-1 - Design-Build Project Selection

Two design-build methods are discussed in this Chapter: Low Bid and Adjusted Bid. *As noted above, Low Bid is currently the only process in use by the Department. Approval from the Director of the Bureau of Project Delivery is required before considering the use of Adjusted Bid Design-Build for any project, and is not supported by ECMS without manual support.*

The two methods alter the Department's project development process to the extent that the design phase is truncated at a certain point and then proceeds with the bid package preparation. Generally, Adjusted Bid projects will shift more of the design responsibility to the contractor than Low Bid projects, and Adjusted Bid projects are larger in scope than Low Bid. In Adjusted Bid, the Preliminary, or Conceptual Design is completed to the point where the Environmental Clearance is obtained. The Low Bid method usually requires more items in the Conceptual Design be completed to meet the preferred criteria, and if partial design-build is chosen, the Final Design is completed for those project components that are not included in the partial design-build. The most significant difference between the Low Bid and Adjusted Bid design-build procurement is that the Adjusted Bid allows the Department to base its selection of the design-build contractor on not just price alone, but other factors that may include the suitability of the design-build team's experience with the specific project type and scope, the level of innovation brought to the project in both design and construction techniques, and the level of mitigation efforts proposed to address a project's environmental, economic, and traffic impacts. Design-build, in concept, combines the design and construction. The advantage of Adjusted Bid selection is that it combines two components into one procurement method: the low-bid selection of contractors and the qualifications-based selection of design consultants. Conversely, the disadvantage of Low Bid is that the Department's selection ability is limited to the whether or not the low bid contractor's design consultant meets the minimum prequalification requirements and qualifications specified in the special provisions.

In Low Bid, the Department, at a minimum, obtains environmental clearance, obtains approval of Design Exceptions, performs Preliminary Engineering, provides conceptual design information and selects the appropriate special contract requirements, which are assembled in the bid package, and let in the conventional manner on

ECMS. Contractors submit a bid that includes developing Final Design based on the contract documents and then they construct the project.

Low Bid is suitable for projects where the design and construction criteria are concise and clearly defined. Examples are bridge projects with specified foundation type, beam type, and span lengths. Resurfacing projects are restricted to Low Bid. Projects that include partial design-build elements are also restricted to Low Bid. Low Bid is suitable where:

- The primary goal is time savings and there is less opportunity for contractor innovation on the project as a whole;
- Estimated construction costs are generally less than \$15 million;
- The scope of work is well defined and Preliminary Engineering (Conceptual Design) will be completed;
- Environmental mitigation commitments are well defined;
- Particular elements of the project have the potential for contractor innovation or alternatives;
- The required right-of-way has been or will be acquired by the Department prior to contract award, or minimal additional right-of-way is to be acquired by the contractor;
- The type, size, location, and ownership of existing utilities are known and the magnitude of required utility relocations are generally known;
- The Department has sufficient resources to conduct reviews; and
- There are no alterations to Railroad-owned facilities included in the project scope.

Regarding partial design-build projects, including only limited design activities in a design-build contract, such as utility coordination or right-of-way acquisition shifts an undetermined and disproportionate amount of risk to the contractor, which may result in higher bid costs. It is generally not appropriate to use design-build for elements such as right-of-way acquisition and utility clearance, unless they are directly affected by the design of other design-build components such as the roadway and/or structures.

For Adjusted Bid, the Department obtains environmental clearance and provides general technical criteria. Each bidding contractor responds by submitting a Statement of Interest (Two-Step only) and /or a "Technical Approach" with a bid (Two-Step and One-Step) for the project. During the selection process, determination of the lowest responsible bidder is made by using the project's published Adjusted Bid scoring criteria to determine the best value (project content for associated bid price) to the Department from the proposals and bids received from the design-build teams. A design-build team is defined as a partnership consisting of a contractor and a consultant formed to prepare and submit a proposal and bid for a Department advertised design-build project.

Within Adjusted Bid, two selection options exist:

- One-Step, where design-build teams do not submit a Statement of Interest, but rather submit only a Technical Approach and Bid in response to the Bid Package published in ECMS eBidding.
- Two-Step, where design-build teams submit a Statement of Interest in response to a Project Announcement in the ECMS Consultant Agreement System detailing their qualifications, key resumes and an organizational chart. The Department determines a shortlist of design-build teams based on the submitted Statement of Interests. If applicable, the shortlisted design-build teams will then enter agreements to receive a stipend. All shortlisted design-build teams will then submit a Technical Approach and bid in response to the bid package published in ECMS eBidding.

Consider Adjusted Bid for projects where overall outcomes can be clearly defined; however, a number of alternatives may exist that could provide the desired outcomes. An example of project type is a bridge project where alternative foundations, spans, and material types are acceptable. Adjusted Bid projects can include Alternate Technical Concepts (ATCs), where design-build teams are permitted to propose innovative ideas within the advertised Scope of Work. Permitting ATCs can promote further innovation, realize benefit from the unique expertise of each design-build team, and may result in a reduction of the project cost. In addition, ATCs can provide the Department with new ideas, techniques, or materials to incorporate into future projects.

Consider Adjusted Bid for projects where:

- There is more opportunity for contractor innovation and the Department is looking for multiple design solutions and creativity;
- Projected construction costs generally exceed \$15 million;
- The Department plans to use Quality Assurance by Peer Review rather than Department Review; or
- Preliminary engineering, or conceptual design, will not be developed to as much detail.

The final step in verifying the suitability of Low Bid or Adjusted Bid is the Design-Build Project Screening. This entails the evaluation of various aspects of a project to determine if it meets the preferred criteria for the selected method, and if not, what additional steps are necessary to proceed. Each method has specific factors to be evaluated, and by nature, factors evaluated for Low Bid are more restrictive than those for Adjusted Bid.

Before proceeding to the Project Screening in Chapter 3 for Low Bid and Chapter 4 for Adjusted Bid, review the following requirements common to both design-build methods.

2.2 DESIGN-BUILD QUALIFICATION REQUIREMENTS

In order for consulting firms to be eligible to be selected by contractors bidding design-build projects, firms must take additional steps beyond being a registered Business Partner in ECMS and having a current Annual Qualifications Package on file with Bureau of Project Delivery's Contract Management Section. The firm's business partner relationship in ECMS must be amended to include both Consultant and Construction Contractor relationships. Consultants will be listed in the ECMS Contractor Database as a Service. This includes subconsultants and Disadvantaged Business Enterprises (DBEs).

In order to amend the business partner relationship, the consultant must fax a statement on company letterhead, signed by a company signatory, requesting that the company business partner type be amended to include the business partner relationship of "Construction Contractor" (Service). Consultants must fax the signed statement to the Bureau of Project Delivery, Innovation and Support Services Division, Systems Management Section, at (717) 214-8943. Once the business partner relationship has been amended, ECMS USERID security must be amended to include Construction Contractor security groups such as "Contractor Principal."

Finally, consultants must contact the Department's Prequalification Office to become listed as a Prequalification Exempt Service Provider in the subcontractor database. The Contractor Evaluations Engineer in the Bureau of Project Delivery is responsible.

In ECMS, contractors must "add" design firms as subcontractors, and this cannot occur unless the above steps are taken. Just as all subcontractors must be approved in ECMS prior to the start of work, this policy applies to design-build projects and these steps are to be completed prior to the start of the design activities. These instructions are provided in the standard special provision entitled Special Bidding – Design-Build utilized in design-build contracts.

In addition to the above requirements, where Right-of-Way Acquisition Services are required, the right-of-way firm must be pre-approved to provide Right-of-Way Acquisition Services through ECMS.

The awarded bidder on design-build projects is required to complete the "Design-Build Design Activities Firm Identification and Qualifications" in accordance with the Special Bidding – Design-Build special provision.

2.3 CONFLICT OF INTEREST

Consultants and sub-consultants to the Department that participate in the preparation of a design-build bid package for a particular project are not permitted to participate on a design-build team proposing on that project. Conflicts of interest are addressed in the Special Bidding – Design-Build special provision. Design-build teams may request a determination on a potential conflict of interest by completing the "Request for Consideration for Engineering Involvement Restrictions" form located in ECMS file cabinet and faxing to the District Project Manager indicated in

the Special Bidding – Design-Build special provision. These provisions are necessary on federal aid projects to comply with 23 CFR 636.116, which addresses organizational conflicts of interest requirements for design-build projects.

2.4 FHWA INVOLVEMENT

Normally, FHWA's approval requirements remain in effect per the Stewardship and Oversight agreement (e.g., proprietary items, pavement designs, value engineering proposals, and design exceptions) on design-build projects. FHWA review specific to design-build projects is as follows:

- Pre-Award for Federal Oversight projects:
 - o Low Bid and projects: approval of the Bid Package and the 4232 will constitute FHWA's project authorization and the approval of the request to release the document.
 - o Adjusted Bid projects: approval of the Advertisement for the Statement of Interest and approval of the Bid Package and 4232 will constitute FHWA's project authorization and the approval of the request to release the document.
- Pre-Award for PennDOT Oversight projects:
 - o Approval of 4232 constitutes FHWA's authorization

These approvals carry the same significance as plan, specification and estimate approval on a conventional design-bid-build Federal-aid project. In addition, for Federal Oversight Adjusted Bid projects, the FHWA Area Engineer is invited to participate as non-voting member for both the District Shortlisting Committee and the Technical Review Committee during the pre-award process.

- Post-Award:
 - o For FHWA Oversight projects, FHWA will perform coordination as usual and will perform design reviews in accordance with contract documents.

2.5 PROJECT STAFFING REQUIREMENTS AND THE QUALITY ASSURANCE PROCESS

As discussed in Chapter 1, design-build projects require the commitment of additional resources following Award. Compared to conventional design/bid/build projects, where submittal reviews by the Department and its design consultants are typically limited to shop drawings and working drawings, design-build projects demand adequate reviewing capacity to accommodate a significantly greater volume and complexity of drawings, as well as the capacity to manage the submittal process itself. This is the Quality Assurance process.

During the Pre-Award process, the decision must be made whether to specify Quality Assurance by the Department, or specify Quality Assurance by Peer Review in the bid package. Refer to [Section 3.1.13.2](#) for the details. The Quality Assurance by Peer Review special provision requires the contractor to retain a third party consultant to perform the Quality Assurance reviews of the designs specified to be prepared by the contractor's design consultant. In the case of Peer Review, the level of review required of the Department is the limited Owner's Perspective Review. While Department Review is the preferred option, Peer Review can be specified on Adjusted Bid projects, but is only permitted to be used on Low Bid projects in some circumstances.

Consider throughout the project development process the anticipated Quality Assurance needs for the project, and evaluate the capabilities of the District to meet those needs within the review times specified in the contract.

2.6 LOCAL ADMINISTERED FEDERAL-AID PROJECTS

Federally funded Local or Municipal design-build projects will generally follow the process described herein, but activities performed by the District Offices or the "Department" (such as project evaluation, project screening, development of conceptual design, reviews, etc.) will be performed by the municipality (or their consultants) and submitted to the District Office for review and approval. As discussed in the previous section, the design-build

process requires extensive reviews by qualified individuals after project award, so resources must be evaluated prior to selecting the design-build process for municipal projects. Prior to proceeding with the design-build process, municipalities must obtain approval from the Assistant District Executive of Design. At a minimum, the request for approval must include the following:

- Discussion of the suitability of the design-build process for the project (See [Section 2.1](#))
- Completion of the Design-Build Project Screening (see [Section 3.1](#) or [Section 4.1](#))
- Discussion of how contract documents will address coordinated reviews (District and municipal reviews)
- Discussion of the availability of qualified staff for reviews (before and after award)

2.7 GROUPINGS OF PROJECTS

Project Grouping is the process of combining multiple bridges or multiple roadway sections into a single design-build contract. Effective grouping provides an efficient means of delivering a larger number of bridges or roadway improvements while achieving economies of scale and minimizing motorist inconvenience. For design-build projects, Project Grouping must consider both design and construction impacts, with a primary emphasis on project scheduling. Variations in levels of impacts, permitting, and type of work should be considered in regard to the construction project schedule. For example, it may be possible to include a single project with significant right-of-way impacts in a project grouping if the construction schedule is staggered and full clearance is not needed until the following construction season. The successful grouping of projects for design-build requires the development of a detailed, realistic schedule addressing both design (including right-of-way, utility coordination, and permitting) and construction activities. See Publication 10, Design Manual Part 1, *Transportation Program Development and Project Delivery Process*, Chapter 2 for additional information regarding Groupings of Projects.

In certain circumstances, a project with distinct phases can be considered a grouped project if each phase has logical termini and each subsequent phase can occur without impacting prior completed phases. For example, it may be desirable to complete all utility relocations as the first project within a grouping, if all work related to the utility relocation can be confined to existing right-of-way. By grouping the utility relocations as the first project in a grouped project, work can proceed on the utility relocation while final design activities are being completed.

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CHAPTER 3 – LOW BID DESIGN-BUILD PROCESS

3.0 INTRODUCTION

Once a project is identified as a candidate for Low Bid Design-Build, the final step in the selection process is to determine if the project meets the preferred criteria. This step, the Design-Build Project Screening, evaluates the project's characteristics, and if the conditions are met, the project may proceed as a Low Bid Design-Build. If the conditions cannot be met, either additional approvals must be secured, or the project development must proceed as a conventional design/bid/build project. This Chapter begins with the Project Screening evaluation and Quality Assurance Review method selection, and then covers the two primary phases – Pre-Award and Post-Award. The Pre-Award phase includes the development of the Department's initial design information, preparation of contract documents, and letting, all of which leads to the selection of the design-build contractor. The Post-Award phase includes completion of project design and construction. The activities associated with each phase are described in the following sections.

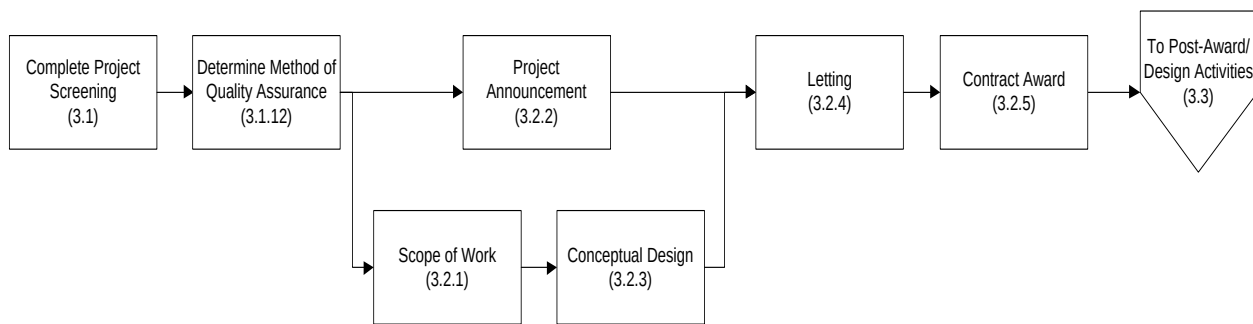


Figure 3.0-1 – Overview of Pre-Award Activities

3.1 DESIGN-BUILD PROJECT SCREENING

This step identifies standard design-build conditions and identifies potential issues that will require special consideration in the preparation of bid documents. Design-Build Project Screening is to be conducted as part of the Engineering and Environmental Scoping phase in accordance with Publication 10C, Design Manual Part 1C, *Transportation Engineering Procedures*, Section 2.

The flow chart shown in Figure 3.1-1 provides a breakdown of the steps required to complete the Project Screening. A detailed description of each of the steps follows the flow chart.

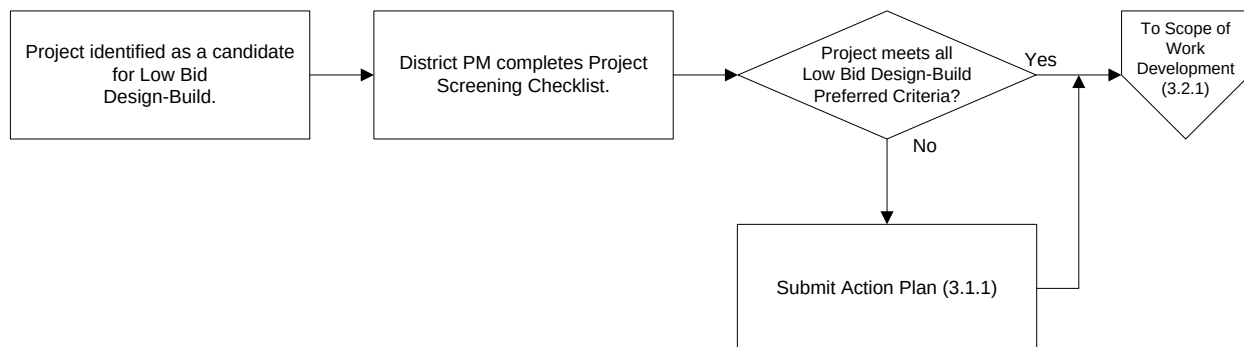


Figure 3.1-1 – Design-Build Project Screening

Perform the Project Screening by evaluating the conditions in ten project component categories to determine if the project (with its specific components) is a suitable candidate for Low Bid Design-Build:

- Environmental
- Right-of-Way
- Bridge
- Permitting
- Utility Involvement
- Railroad Involvement
- Availability of Resources
- Schedule
- Photogrammetry and Surveys
- Non Highway-related Design Elements

Complete the conditional analysis for each of the above-listed categories. The Project Screening evaluation should generally be completed within 30 days of project scoping. Projects should also be reviewed at significant milestones after project scoping to determine if any project conditions will require additional consideration (such as the development of an Action Plan).

3.1.1 ACTION PLANS

Each conditional analysis below identifies additional steps and approvals necessary to continue with Low Bid if the preferred criteria are not met. These Action Plans, as identified in each section below, require identification of the specific deviation(s) from preferred criteria, a detailed discussion of the how the unique circumstances of the project will mitigate the unnecessary transfer of risk from the Department to contractor, and meet Department objectives. Identify in the Action Plans additional steps to be accomplished during the Conceptual Design phases to mitigate potential risk. The plan should also identify procedures to address issues that could potentially arise during Post-Award.

At a minimum, include the following in the Action Plan:

- Identification of the project
 - Location (District, County, state route, segment, and section)
 - Project title
 - Description of project
- Name and title of individual submitting Action Plan
- Identification of design activities anticipated to be included as design-build elements
- Purpose: Identification of Project Screening component for which Action Plan is prepared (as listed in [Section 3.1](#), such as Environmental, Right-of-Way, Bridge, etc.).
- Purpose of Action Plan - identify specific deviation(s) from preferred criteria.
- Identification of additional steps to be accomplished during Conceptual Design to mitigate potential risk, including at a minimum:
 - Additional coordination requirements to be identified in the bid documents.
 - Additional scheduling requirements to be included in the bid documents.
 - Methods of managing unknown or undefined costs in the bid documents.
 - Required additional project specific considerations, criteria, or restrictions to be included in the bid documents.
 - Method of addressing these additional steps, such as modifying the standard special provision to include project specific requirements.
- Additional criteria as indicated in the following [Sections 3.1.2 through 3.1.11](#).

Actions Plans should generally be developed within 30 days of completing or updating the Project Screening evaluation and submitted for approval. Action Plans must be approved by the Assistant District Executive (ADE) for Design or the Portfolio Manager, if approval is so delegated by the ADE-Design. The District must maintain a record of all approved Action Plans in the project file. Approval is required for each Action Plan before the project can proceed as a Low Bid Design-Build and the District must maintain a record of all approved Action Plans in the project file for reference and implementation throughout the project delivery process. If conditions change after the scoping phase, or through further evaluation it is determined conditions do not meet the preferred criteria, the project

should be reevaluated and an amended Action Plan developed and approved as stated above before continuing as a design-build project. For projects requiring Central Office or FHWA approval of the Plans, Specifications, and Estimate (PSE) package, a copy of all Approved Action Plans must be submitted with the PSE package.

3.1.2 ENVIRONMENTAL

Design-build projects must have Environmental Clearance prior to advertisement. Evaluate the following environmental conditions to determine if the preferred design-build criteria are met.

1. Environmental Clearance— one of the following conditions must be true:

- Federal-aid projects: Clearance will be obtained with a Categorical Exclusion Evaluation (CEE), an Environmental Assessment (EA), or a Bridge and Roadway Programmatic Agreement (BRPA).
- 100% state funded projects: Clearance will be obtained with an Environmental Document (ED), an Environmental Evaluation Report (EER), or a BRPA.

Projects cleared with an Environmental Impact Statement (EIS) are typically considered Complex, and require preparation of an Environmental Action Plan, as detailed at the end of this Section. Identify in the Action Plan specific coordination efforts that will be required and related scheduling considerations which will be developed during Conceptual Design and identified in the bid documents.

2. General Environmental Considerations – all of the following conditions must be true:

- The project is unlikely to impact protected environmental resources, other than those identified in the approved CEE or EA document, or ED and EER for 100% state funded;
- All potential impact areas within the project area can and will be well defined on the Conceptual Plans; and
- Project does NOT have significant known opposition from local stakeholders or negative public perception.

Projects that do not meet the above conditions will require the preparation of an Environmental Action Plan as detailed at the end of this Section. Detail in the Action Plan steps to be taken during Conceptual Design to identify, define, and restrict potential impacts in the bid documents. Include strategies to identify potential opposition concerns and incorporate clear requirements in bid documents to mitigate concerns and develop scheduling requirements.

3. Mitigation Commitments – all of the following conditions must be true:

- The mitigation commitments are clearly defined in the approved CEE or EA document, or ED and EER for 100% state funded;
- The mitigation commitments are standard and predictable, and can be readily implemented;
- The time required to address and implement the mitigation commitments prior to or during construction is well defined; and
- The mitigation commitments do not require a consultative process that could result in delays.

Projects that do not meet the above conditions will require the preparation of an Environmental Action Plan as detailed at the end of this section. Detail in the Action Plan steps to be taken during Conceptual Design to identify and define additional requirements to be included in the bid documents to further refine mitigation commitments. For projects involving a consultative process during the Final Design (Post-Award stage), identify methods of defining potential alternatives that are acceptable to all parties and will provide clear guidance and requirements in the bid documents.

4. Waste Sites (as applicable)

- Phase II Environmental Site Assessment (ESA) or Phase III ESA (if required) must be completed by the Department prior to design-build contract advertisement.

Including a Phase II ESA or a Phase III ESA as a design-build activity will require the preparation of an Environmental Action Plan as detailed at the end of this Section. Identify in the Action Plan a determination of anticipated remediation efforts and indicate that the following conditions are met:

- o standard and predictable mitigation is anticipated for identified waste site(s);
- o Costs of remediation efforts will not exceed a maximum of \$100,000; and
- o No state or federal remediation (Hazardous Sites Clean-up Program/Superfund) efforts are required at identified waste sites – ongoing state or federal clean-up sites cannot be included in a design-build contract.

5. Natural Resources - both of the following conditions must be true:

- There will be no unresolved Pennsylvania Natural Diversity Inventory (PNDI) issues on the project at time of bidding; and
- Time restrictions relative to PNDI issues are known and will be incorporated into the project schedule.

Projects that do not meet the above conditions will require the preparation of an Environmental Action Plan as detailed at the end of this Section. Identify in the Action Plan steps to be taken during Conceptual Design to identify and define additional requirements to be included in the bid documents to address and resolve PNDI issues and develop scheduling requirements.

6. Cultural Resources – all of the following conditions must be true:

- The Department will complete any analysis of alternatives or assessment of impacts required by Section 106 of the National Historic Preservation Act;
- Either "no effect", "conditional no adverse effect", or "conditional no-impact avoidance" conditions apply ;
- All required archaeological studies (Phases I, II and III) will be completed by the Department prior to design-build contract advertisement; and
- The project does not include an historic bridge (bridges listed on, or eligible for listing on, the National Register of Historic Places).

Projects not meeting the above conditions will require the preparation of an Environmental Action Plan at the end of this Section. Provide in the Action Plan steps to be taken during Conceptual Design to identify required coordination, consultative, and approval processes to be defined in the bid documents, and to develop scheduling requirements. Include discussion of how potential risk in regard to cost and scheduling delays will be mitigated in the contract documents (such as including Phase III archaeological studies as design activities). For projects impacting a bridge listed on, or eligible for listing on the National Register of Historic Places, indicate in the Environmental Action Plan that the following conditions are met:

- The historic bridge is not within or adjacent to a historic district;
- All of the Mitigation Commitments meet "preferred" criteria as listed in [Section 3.1.2.3](#) or are addressed separately within an Environmental Action Plan;
- Identification and evaluation archaeological studies (Phases I and II, if required) are to be completed by the Department prior to design-build contract advertisement; and
- Contract Documents will be developed to specify required coordination with Pennsylvania Historical and Museum Commission (PHMC) and address adequate review schedules (30 days for PHMC review of Final Design).

Environmental Action Plans: Projects that do not meet the above environmental conditions require the preparation of an Action Plan in accordance with [Section 3.1.1](#).

Prepared by: District Environmental Manager

Additional information to be included in Action Plan: As indicated in [Sections 3.1.2.1 through 3.1.2.6](#) above.

3.1.3 RIGHT-OF-WAY

Evaluate the following right-of-way conditions to determine if the preferred design-build criteria are met.

1. Required right-of-way acquisition is limited to ten Temporary Construction Easement claims or less; or
2. If additional right-of-way is required and will not be acquired by the Department before design-build contract advertisement, all of the following conditions must be true:
 - The required area consists of land of only minimal impacts to the parcels and damages estimated using a Waiver Valuation [Form RW-260] or a Strip Appraisal [Form RW-270];
 - Takes from improved commercial properties are NOT required;
 - No more than ten claims are required;
 - Utility work does NOT require acquisition of substitute right-of-way;
 - Personal property, including outdoor advertising devices are NOT located within required right-of-way;
 - Required takes do NOT involve conservation easements;
 - Significant improvements do NOT exist within required right-of-way;
 - Takes will NOT have a serious impact to the remaining property, such as access or parking;
 - Does NOT affect a parcel that may meet the criteria of a larger parcel;
 - None of the parcel owners of the required right-of-way have filed for bankruptcy in US District Court;
 - Acquisition of Railroad property is NOT required;
 - Takes from state or federal agencies are NOT required;
 - Residential or business relocations are NOT required;
 - Pre-condemnation approval is NOT required from Agricultural Lands Condemnation Approval Board (ALCAB) is not required;
 - NO negative public perception;
 - NO gas wells, oil wells, or known minerals within required areas; and
 - Additional right-of-way is affected by other design activities included in the design-build contract, but the extent of the acquisition will be determined by the final design dimensional requirements.

Right-of-Way Action Plans: Projects that do not meet the above right-of-way conditions require the preparation of an Action Plan in accordance with [Section 3.1.1](#).

Prepared by: District Right-of-Way Administrator

Additional information to be included in Action Plan: Include strategies to mitigate potential risks, minimize the potential for project delays, and define impacts of right-of-way activities to the project schedule (impacts to both design and construction activities).

3.1.4 BRIDGE

If bridge design is to be included as a design activity in the design-build contract, evaluate the following bridge conditions to determine if the preferred design-build criteria are met. All of the following conditions must be true:

1. Conceptual Type, Size, and Location (TS&L) information will be developed for all bridge work on the project during Conceptual Design and included in the bid package (see [Section 3.2.3.1](#) for information to be developed);
2. Complete foundation design or Foundation Design Guidance Report will be developed and provided in the bid package; and
3. The project is well defined and includes no unknown conditions, such as adequacy of existing substructure.
4. The project does not include **MSE or precast modular retaining walls as design build activities**.

Bridge Action Plans: Projects that do not meet the above bridge conditions require the preparation of an Action Plan in accordance with [Section 3.1.1](#).

Prepared by: District Bridge Engineer

Submitted to: See [Section 3.1.1](#)

Additional information to be included in Action Plan: Include discussion of specific requirements which will be included in bid documents to adequately define project scope and ensure Department objectives are met.

3.1.5 PERMITTING

If permit acquisition by the contractor will be included as a design activity, evaluate the following permitting conditions to determine if the preferred design-build criteria are met.

1. Hydrologic and Hydraulic (H&H) Reports (if applicable) – one of the following three conditions must be true:
 - A full H&H report will be developed during Conceptual Design and provided in the bid documents;
 - An H&H analysis is required and an abbreviated H&H Report meeting the requirements of Publication 13M, Design Manual Part 2, *Highway Design*, Section 10.7, will be prepared by the Department during the conceptual design; or
 - A conceptual TS&L can be developed without the completion of an abbreviated or full H&H in conceptual design.
2. Waterway Permits (if applicable) – Evaluate the following conditions to determine if the preferred design-build criteria are met:
 - The Department will obtain Waterway Permits during conceptual design; or
 - Waterway Permit will be included as a design activity and the project:
 - Is bridge rehabilitation/preservation/repair work, proposed work is covered by Programmatic Agreement or Exx-9999 permit, and the existing hydraulic opening is determined to be adequate; or
 - Qualifies for use of abbreviated H&H report (see Publication 13M, Design Manual Part 2, *Highway Design*, Section 10.7) and report will be provided by the Department; and;
 - Is a bridge replacement in which all of the following are true:
 - GP-11 Permit will be used or the Corps of Engineers required level of involvement will be identified prior to design-build contract advertisement;
 - Current flooding conditions and backwater issues are known and identified;
 - Conditional Letter of Map Revision (CLOMAR) is not required;
 - If in a non-FEMA flood zone, no pressure flow exists, and no overtopping occurs at the design year event;
 - If in a FEMA flood zone, no pressure flow exists, and no overtopping occurs at the 100-year event;
 - If in a non-FEMA flood zone, no pressure flow exists, and no overtopping occurs at the design year event; and
 - Impacts to line and grade are known and will be identified prior to design-build project advertisement.
3. Causeway Permits – one of the following must be true:
 - Permits for causeways in detailed FEMA flood study areas, high quality and exceptional value watersheds or areas in which known endangered or threatened species are present will be obtained by the Department;
 - Permits for causeways will be included as a design activity in the bid package if the waterway permit is included as a design activity in the bid package; or
 - Permits for causeways where the Department obtains the waterway permit will be obtained by the Department.

Permitting Action Plans: Projects that do not meet the above permitting conditions require the preparation of an Action Plan in accordance with [Section 3.1.1](#).

Prepared by: District Permit Coordinator

Additional information to be included in Action Plan: Include strategies to mitigate and avoid the duplication of effort in activities performed in Conceptual Design and Final Design (design activities in the bid package). This discussion should include level of effort by the Department (including consultants, if applicable) along with reviews by other agencies (such as the Department of Environmental Protection, etc).

3.1.6 UTILITY INVOLVEMENT

If utility coordination by the contractor is to be included as design activity, evaluate the following utility involvement conditions to determine if the preferred design-build criteria are met. All of the following conditions must be true:

1. The type, size, location, and ownership of existing utilities are known and will be shown on the plans in the bid package;
2. The magnitude (type, extent, and number) of required utility relocations is known;
3. No underground utility relocations are required;
4. No substitute right-of-way will be required for any utility relocation;
5. No utility relocations with major lead times are required;
6. Utilities requiring bridge attachments are known; and
7. The project is not being considered for a partial design-build contract where utility coordination is the only intended design-build item in the contract.

Utility Involvement Action Plans: Projects that do not meet the above utility involvement conditions require the preparation of an Action Plan in accordance with [Section 3.1.1](#).

Prepared by: District Utility Administrator

Additional information to be included in Action Plan: Include strategies to mitigate potential risks, address coordination of utility engineering, minimize the potential for project delays, and define impacts of utility involvement activities to the project schedule (impacts to both design and construction activities).

3.1.7 RAILROAD INVOLVEMENT/COORDINATION

Evaluate the following Railroad conditions to determine if the preferred design-build criteria are met. All of the following conditions must be true:

1. There are no alterations to Railroad facilities required within the project limits;
2. Existing rail lines are inactive or abandoned;
3. No involvement with the PUC is required (unless a PUC order has already been obtained by the Department); and
4. Acquisition of any Railroad property will be completed prior to design-build contract advertisement.

Note: A Railroad facility in this context does not refer to Railroad bridges where the Department has or will be entering into ownership or maintenance agreements.

Railroad Involvement/Coordination Action Plans: Projects that do not meet the above railroad involvement conditions require the preparation of an Action Plan in accordance with [Section 3.1.1](#).

Prepared by: District Grade Crossing Coordinator

Additional information to be included in Action Plan:

At a minimum, the Railroad Involvement/Coordination Action Plan is to document how all applicable Railroad Involvement/Coordination activities will take place in accordance with Publication 371, *Grade Crossing Manual*, with a corresponding schedule. Include the following in the Action Plan:

- Description of Department's Highway/Bridge Project involving a Railroad facility.
- Indicate whether PUC involvement will be required. If "yes", provide an outline and schedule of the submissions and coordination activities that will occur with the PUC.
- Will the project involve alterations to the existing highway-railroad crossing? If "yes", describe in detail the Railroad alterations. This description is to include what work will need to be performed by the Railroad and/or its contractor as part of the Department's project and how such Railroad alterations will be coordinated with the Railroad.
- If the project involves acquisition of Railroad property, indicate whether Railroad property will be acquired by amicable settlement or through PUC appropriation. In either scenario, provide an outline and schedule of when the required ROW plan submissions will be made to the Railroad and/or PUC.
- If the project does not involve Railroad alterations, will Railroad protective services (flagging) be required?
- Address the following applicable tasks in the Action Plan outline and schedule:
 - o Coordination meetings with Railroad
 - o Submission of PUC application
 - o PUC Field Conferences

- o Railroad property acquisition and required submissions to Railroad and/or PUC
- o Obtaining PUC Orders/Secretarial Letters
- o Required submission of construction plans to the Railroad and/or PUC
- o Railroad reimbursement agreements (design and construction)

3.1.8 AVAILABILITY OF RESOURCES

Evaluate the following conditions related to Department resources and coordination to determine if the preferred design-build criteria are met:

1. Resources must be available to allow for expedited project reviews/approvals (District Office, Central Office, and Federal Highway Administration).
2. It is imperative that the project's early coordination includes design, construction, and maintenance staff in the selection of design-build candidate projects.

Availability of Resources Action Plans: Projects that do not meet the above availability of resources conditions require the preparation of an Action Plan in accordance with [Section 3.1.1](#).

Prepared by: District Project Manager

Additional information to be included in Action Plan: Include strategies to develop realistic and achievable review times in contract documents while balancing the overall objective of streamlining the design/construction activities through the use of design-build.

3.1.9 SCHEDULE

Evaluate the following conditions related to project schedule to determine if the preferred design-build criteria are met. All of the following must be true:

1. The letting schedule has been established for the project as a design-build project;
2. Where possible, the letting schedule has been established to maximize the benefits of the design-build process (*e.g.*, when final design activities can occur during typical winter shutdowns); and
3. Construction must be able to commence within twelve months of Award.

Schedule Action Plans: Projects that do not meet the above schedule conditions require the preparation of an Action Plan in accordance with [Section 3.1.1](#).

Prepared by: District Project Manager

Additional information to be included in Action Plan: Include strategies to manage risk associated with potentially lengthy delays between project award and the start of construction activities.

3.1.10 PHOTOGRAMMETRY AND SURVEYS

Evaluate the following conditions related to Department surveying and photogrammetry resources to determine if the preferred design-build criteria are met:

1. All project preliminary surveys, photogrammetric services, *i.e.* design scale mapping, and terrestrial or mobile laser scanning will be completed during the Conceptual Design phase.

Photogrammetry and Survey Action Plans: Projects that do not meet the above conditions, and where survey and photogrammetric services are to be performed as part of the design-build contract, require the preparation of an Action Plan in accordance with [Section 3.1.1](#).

Prepared by: District Survey Manager

Additional information to be included in Action Plan: Include discussion of Department surveying resources availability for the project under consideration, along with the general parameters of the project, the proposed design-build contract advertisement date, and who will be performing the conceptual design (in-house or consultant).

3.1.11 NON HIGHWAY-RELATED DESIGN ELEMENTS

Evaluate the following conditions related to other design elements to determine if the preferred design-build criteria are met:

1. Project will not contain non-Highway related design elements (such as buildings, parking facilities, bus shelters, etc.).

Non Highway-related Design Elements Action Plan: Projects that include non-Highway related design elements will require the preparation of Action Plan in accordance with [Section 3.1.1](#).

Prepared by: District Project Manager

Additional information to be included in Action Plan: Include discussion of how designer qualifications and contract documents (including specification requirements) will be developed for the non-highway related design elements. Also include discussion of who will be performing the reviews for the Department to ensure compliance with contract documents.

3.1.12 PROJECT SCREENING CHECKLIST

At the conclusion of the above evaluation, complete the Project Screening Checklist – Summary in Table 3.1.12-1. Include a copy in the project file, along with copies of any required Action Plans and approvals. The documents must also be attached to the Project Development Checklist in ECMS prior to design-build contract advertisement. For additional guidance, refer to the Project Screening Checklist – Expanded in APPENDIX A.

Once the Summary Project Screening Checklist is complete and approvals obtained, proceed to the project Quality Assurance Review Method Options.

Table 3.1.12-1 – Project Screening Checklist

Design-Build - Project Screening Checklist - Summary				
Project Information				
District	County	Primary Roadway		
MPMS#	Project Title	SR	Sect	Seg
ECMS #	Project Manager	Primary Work:		
Design Activities		Included in D/B Contract?	Approval Required?	
☐	Design Roadway	☐	☐	
☐	Design MPT	☐	☐	
☐	Design Structures	☐	☐	
☐	ROW Design & Acquisition	☐	☐	
☐	Utility Coordination	☐	☐	
☐	Permitting	☐	☐	
☐	Environmental Mitigation	☐	☐	
☐	Design Curb Ramps	☐	☐	
Environmental - Project Screening (See Section 3.1.2 for additional information)				
☐	True	☐	False	
☐	True	☐	N/A	
Project meets Design-Build Low Bid "preferred" criteria				
Project requires action plan approval from EPDS prior to proceeding as D/B project				
Right-of-Way - Project Screening (See Section 3.1.3 for additional information)				
☐	True	☐	False	
☐	True	☐	N/A	
Project meets Design-Build Low Bid "preferred" criteria				
Project requires action plan from District R/W Administrator and approval from URWS prior to including R/W activates in bid package				
Bridge - Project Screening (See Section 3.1.4 for additional information)				
☐	True	☐	False	
☐	True	☐	N/A	
Project meets Design-Build Low Bid "preferred" criteria				
Project requires action plan from District Bridge Engineer and approval from BDTD prior to including bridge design activates in bid package				
Permitting - Project Screening (See Section 3.1.5 for additional information)				
☐	True	☐	False	
☐	True	☐	N/A	
Project meets Design-Build Low Bid "preferred" criteria				
Project requires action plan from District Permit Coordinator and approval from BDTD prior to including permitting activities in bid package				
Utility Involvement - Project Screening (See Section 3.1.6 for additional information)				
☐	True	☐	False	
☐	True	☐	N/A	
Project meets Design-Build Low Bid "preferred" criteria				
Project requires action plan from District Utility Administrator and approval from URWS prior to including utility activities in bid package				
Railroad Involvement - Project Screening (See Section 3.1.7 for additional information)				
☐	True	☐	False	
☐	True	☐	N/A	
Project meets Design-Build Low Bid "preferred" criteria				
Project requires action plan from District Grade Crossing Coordinator and approval from URWS prior to including railroad activities in bid package				
Availability of Resources - Project Screening (See Section 3.1.8 for additional information)				
☐	True	☐	False	
☐	True	☐	N/A	
Project meets Design-Build Low Bid "preferred" criteria				
Project requires action plan approval from Chief of the HDD prior to proceeding as D/B				
Schedule - Project Screening (See Section 3.1.9 for additional information)				
☐	True	☐	False	
☐	True	☐	N/A	
Project meets Design-Build Low Bid "preferred" criteria				
Project requires action plan approval from Chief of the HDD prior to proceeding as D/B				
Field Survey/Photogrammetry - Project Screening (See Section 3.1.10 for additional information)				
☐	True	☐	False	
☐	True	☐	N/A	
Project meets Design-Build Low Bid "preferred" criteria				
Project requires action plan approval from Chief of the Photogrammetry Section of the Bureau of Project Delivery prior to proceeding as design-build				
Non Highway-related Design Elements - Project Screening (See Section 3.1.11 for additional information)				
☐	True	☐	False	
☐	True	☐	N/A	
Project meets Design-Build Low Bid "preferred" criteria				
Project requires action plan approval from Chief of Contract Management Section prior to including as a design activity				
Attach required Action Plans (See Section 3.1.1) along with the completed checklist to the Project Development Checklist.				

3.1.13 QUALITY ASSURANCE REVIEW SCREENING

Two Quality Assurance review procedures are available: Quality Assurance by Department Review or Quality Assurance by Peer Review. These options are presented here so that the Manager understands the choices during the conceptual design phase and is aware of the limitations of the applicability of Quality Assurance by Peer Review to Low Bid projects, even though many of the limiting factors may not be fully known until completion of the conceptual plans. The final selection of the method to be included in the bid package is not required until the development of the Special Provisions, as discussed in [Section 3.2.3.2.1](#) below.

3.1.13.1 Quality Assurance by Department Review

Quality Assurance by Department Review is the preferred option for Low Bid projects for complex or moderately complex projects. It consists of a detailed review of the plans, specifications, and calculations by the Department or its consultants, and FHWA (as appropriate) to ensure that the project's specified design criteria are being followed and satisfied.

3.1.13.2 Quality Assurance by Peer Review

Quality Assurance by Peer Review is permitted on non-complex Low Bid design-build projects, as described below. It consists of a detailed review of the plans and calculations by a qualified, independent third-party engineering consultant retained by the contractor, not involved with the plan and calculation development. The Special Provisions will require that the contractor possess no financial interests in the third party firm. The third-party review is to ensure that the project's specified design criteria are being followed and satisfied, as well as the plan development and associated calculations. The selection of Peer Review requires the additional step of the Owner's Perspective Review. This is a limited review by Department and FHWA (as appropriate) to determine that the plans and calculations have been developed in conformance with Department criteria and standards and that a Quality Assurance (QA) review was performed by peer review in conformance with the design Quality Plan developed by the contractor. Unless discrepancies are found in the plans, calculations, or Quality Control (QC)/QA process, the Owner's Perspective Review is not to be an in-depth review of the actual design. Both the QA by Peer Review and Owner's Perspective Review are discussed in more detail in later sections of this Manual.

Review the following criteria on the use of QA by Peer Review on Low Bid design-build projects. Projects that do not meet the criteria either can proceed as Low Bid using QA by Department Review, or can be considered for use of QA by Peer Review by development and approval of an Action Plan similar to that described in [Section 3.1.1](#). Action Plans for requests to use QA by Peer Review should include identification of the specific deviation(s) from criteria, the circumstances concerning the projected unavailability of the necessary resources within the District to accomplish a timely review, and proposed additional steps to address any potential compromise in the integrity of the QA review process.

3.1.13.2.1 Roadway Design

Quality Assurance by Peer Review is permitted on Low Bid roadway projects where the project scope meets the criteria of typical Non-Complex (Minor), as defined in Publication 10, Design Manual Part 1, *Transportation Program Development and Project Delivery System*, Section 2.1.

Projects that do not meet this criterion require the preparation and approval of an Action Plan in accordance with [Section 3.1.13.2](#) prior to using Quality Assurance by Peer Review.

3.1.13.2.2 Bridge Work Activities

Quality Assurance by Peer Review is permitted on Low Bid bridge projects where the following conditions are present:

1. Bridge Replacement/Bridge Rehabilitation where:
 - The project meets all criteria for review and approval by the District Bridge Engineer, including TS&L and Final Plan approval as identified in Publication 15M, Design Manual Part 4, *Structures*, Table 1.9-

- 1, and foundation approval as identified in Publication 15M, Design Manual Part 4, *Structures*, Table 1.9-2; and
- The foundation type does NOT include driven piles in Karst or in mining areas, micro piles, or caissons.

2. Bridge Preservation where:

- The project consists of activities identified in Publication 15M, Design Manual Part 4, *Structures*, Part A, *Policy and Procedures*, Section 5.6.1, *Bridge Preservation*; and
- There is none of the following work on fracture critical girders: bearing replacement/repair, beam end repairs, or fatigue retrofits.

Projects that do not meet this criterion require the preparation and approval of an Action Plan in accordance with [Section 3.1.13.2](#) prior to using Quality Assurance by Peer Review.

3.2 PRE-AWARD ACTIVITIES – CONCEPTUAL DESIGN AND BID PACKAGE PREPARATION

Pre-award activities include the scope of work development for Conceptual Design, Project Announcement in ECMS, Conceptual Drawing development, Special Provision development, bid items, Project Development Checklist, and final package process.

3.2.1 SCOPE OF WORK DEVELOPMENT FOR CONCEPTUAL DESIGN

The Conceptual Design phase of a Low Bid design-build project generally follows the same process and requirements as the Preliminary Engineering phase of a traditional design/bid/build project, in accordance with Publication 10C, Design Manual Part 1C, *Transportation Engineering Procedures*, Section 3. However, unlike the Preliminary Engineering phase of a traditional design/bid/build project, the Conceptual Design phase of a design-build project must also incorporate functions that are normally completed during the Final Design phase of a traditional design/bid/build project:

- Obtaining permits;
- Acquiring right-of-way;
- Determining utility requirements;
- Preparing geotechnical information;
- Obtaining Design Exceptions;
- Preparing estimated construction quantities and cost estimates;
- Preparing a pre-bid construction schedule; and
- Preparing a bid package.

When preparing a Scope of Work for consultant services to develop design-build contract documents, consider including the following tasks, listed in order of presentation of the standard Work Breakdown Structure items:

1. Project management/administration
2. Coordinate constructability review
3. Wetland studies
4. Environmental Clearance/Designation Activities
5. Surveys
6. Roadway (Conceptual) /Design Exceptions/Design Value Engineering
7. Line and grade
8. Typical sections
9. Pavement design
10. Geotechnical investigation efforts
11. Right-of-way activities
12. Hydrologic and hydraulic report or analysis
13. Conceptual Type, Size, and Location (TS&L) information
14. Waterways permits
15. Conceptual traffic control plan

16. Safety review/audit
17. Utilities/Railroad Requirements
18. Erosion and sediment pollution control plan / NPDES Permit
19. Assemble final project documents for contract management
20. Post-design activities

Additional supplemental plans may need to be developed, depending on the type of project. Refer to Publication 13M, Design Manual Part 3, *Plans Presentation*, Section 2.1(H) for a complete listing of potential supplemental plans. The Conceptual Plans, including all required supplemental plans, will generally be prepared to the Design Field View (DFV) level of development.

The above tasks are the same regardless of whether the Conceptual Design will be developed by a consultant or in house by the District.

Notations regarding design-build applications of the aforementioned tasks are listed below. Bear in mind that when comparing scopes of work for Conceptual Design development in design-build projects and Preliminary Engineering/Final Design in conventional design/bid/build projects, those tasks not included in the scope for design-build must be ultimately addressed by Special Provisions included in the bid package. Special Provision use and development is discussed in [Section 3.2.3.2](#).

1. Project Management/Administration – Statements of work and Department details are consistent with those of a design/bid/build project. Consider identifying the number of meetings, design schedule preparation, and project reporting requirements.
2. Coordinate Constructability Review – Statements of work and Department details are consistent with those of a design/bid/build project, except that the duration of coordination is only through the conceptual design development, and emphasis will be placed on identifying potential design-build issues in addition to the customary constructability issues.
3. Wetland Studies – Statements of work and Department details are consistent with those of a design/bid/build project.
4. Environmental Clearance/Designation Activities – Since environmental clearance (NEPA) must be obtained by the Department prior to design-build contract advertisement, statements of work and Department details are consistent with those of a design/bid/build project.
5. Surveys – Statements of work and Department details are consistent with those of a design/bid/build project. Field survey and aerial mapping should be performed during the Conceptual Design Phase. Include details to establish horizontal and vertical controls and to collect data at intervals and widths necessary for the proper design for highways and structures. Also, consider including the roadway approaches for bridge projects, particularly where bridges are near a roadway curve since the superelevation rate and transitions need to be verified.
6. Roadway (Conceptual) - This task will consist of preparing Conceptual Roadway Plans as described in [Section 3.2.3.1](#) Conceptual Drawings. Conceptual plans are generally developed to the Design Field View stage, which is approximately the 30% stage. Include the particular details as necessary to define the limits of the conceptual plan development to suit the individual project goals. Also include obtaining approval of any Design Exceptions during the Conceptual Design stage. The scope of work should also include provisions for design Value Engineering reviews and reports (see Appendix R of Publication 10X, Design Manual Part 1X, *Appendices to Design Manuals 1, 1A, 1B, and 1C*, for Value Engineering criteria and recommendations).
7. Line and Grade – Statements of work and Department details are consistent with those of a design/bid/build project. Include details to define the scope of the horizontal and vertical alignments, the pavement cross slopes, and required superelevation rates to be established.
8. Typical Sections – Include, at a minimum, the task to develop the typical sections to include the proposed lane and shoulder widths, cross slopes, superelevation rates, and embankment/cut slopes. Identify the pavement design if it is to be developed as part of the Conceptual Design.

9. Pavement Design – Include this task if it is to be developed during the Conceptual Design phase and if the task is to be performed by the consultant.
10. Geotechnical Investigations – Determine the appropriate level of geotechnical investigation and reporting tasks for the planned level of investigation and reporting to be performed during conceptual design. Include available geotechnical information in the bid documents. The special provisions in the bid documents should detail any additional geotechnical information or reports to be prepared by the contractor.

Two foundation development options are available for structures: the preparation of a complete foundation submission during the Conceptual Design phase, and a limited foundation investigation during the Conceptual Design phase and completion of the foundation investigation during final design by the contractor. Include the level of investigation tasks necessary to support the desired option. Additional details regarding the scope of work for both options are described in [Section 3.2.3.1.4 Foundations](#).

11. Right-of-Way Activities – For projects in which right-of-way will be acquired prior to design-build contract advertisement, statements of work and Department details are consistent with those of a design/bid/build project, including the work preparing preliminary and final right-of-way plans.

For projects where the intent is for right-of-way to be acquired by the contractor, the preparation of right-of-way plans and right-of-way acquisition services will be performed by the contractor. The anticipated required right-of-way and/or easements should be shown on the Conceptual Roadway Plan.

For grouped projects, right-of-way acquisition and right-of-way clearance may occur on a project-by-project basis (i.e. for each MPMS number). In some cases, one project in a grouping may fall within existing right-of-way limits and have right-of-way clearance prior to design-build contract advertisement, while other projects within the grouping will include right-of-way tasks as design activities in the design-build contract. Coordinate with the District Right-of-Way Administrator to develop appropriate schedules and establish criteria for multiple right-of-way clearances for the entire grouping. See Publication 10A, Design Manual Part 1A, *Pre-TIP and TIP Program Development Procedures*, Chapter 2 for additional information on grouped projects.

12. Hydrologic and Hydraulic Report – Include the preparation of the H&H report in the scope of work for Conceptual Design. The statements of work and Department details are consistent with those of a design/bid/build project. Where applicable, include in the scope the preparation of an abbreviated H&H report meeting the requirements of Publication 13M, Design Manual Part 2, *Highway Design*, Section 10.7.
13. Conceptual Type, Size, and Location (TS&L) information and or plan – Include in the scope the necessary requirements for the particular structure and scope of work. Details are listed in [Section 3.2.3.1](#). The task is described in detail in [Section 3.2.3.1.3 Conceptual Type, Size, and Location](#).
14. Waterways Permits – Under the conditions detailed in [Section 3.1.5](#), permitting tasks can be specified to be performed by the contractor. When permitting is not to be performed by the contractor, include tasks to acquire permits during the Conceptual Design phase.
15. Conceptual Traffic Control Information and/or Plan – For a Low Bid project, Conceptual Traffic Control information must be developed for inclusion in the bid documents. Specify the desired level of detail to be developed, such as phasing or detour requirements, in the scope of work. Also include the task to perform the work required in Publication 46, *Traffic Engineering Manual*, Chapter 6 regarding Work Zone Safety and Mobility up through the Design Field View Submission, the including development of a draft Transportation Management Plan, if required.
16. Safety Review/Audit – The details of this task would generally be consistent with what would be included in a design/bid/build project for preparing a safety review submission. Determine whether a Design Exception will be necessary, and if so include the preparation of Design Exceptions with this task. Guiderail and length of need calculations should be provided under this task.

17. Utilities/Railroad Requirements –Utility coordination should be included as a design-build activity on full design-build projects or when utilities are affected by the design of other design-build activities. When utility clearance is desired prior to design-build contract advertisement, include in the scope statements of work and Department details consistent with those of a design/bid/build project. When design-build activities for utilities will be included in the bid package, include in the scope only the level of utility engineering to provide sufficient conceptual information in the bid package. Review the project scope with the District Utilities Administrator to determine the anticipated scope of utility engineering to be performed by the conceptual designer. Where utility facilities are to be located on a structure or constructed by the contractor (incorporated work), the scope of the utility coordination to be performed during Conceptual Design includes determining what utilities will be included on the structure, the materials required for each utility, and the party who will be furnishing and installing the material. Refer to Publication 16M, Design Manual, Part 5, *Utility Relocation*.

When there is Railroad involvement, include a task for coordination with the Railroad companies and PUC process.

18. Erosion and Sediment Pollution Control Plan / NPDES Permit / General Permits – The scope of work required depends on whether the NPDES Permit will be acquired by the Department during the Conceptual Design phase, or included as a design activity in the bid package. If the Department is going to secure the permit, then a detailed Erosion & Sedimentation Control Plan will be required for approval from PADEP and/or the Soil Conservation District. The details of this task would generally be consistent with what would be included in a design/bid/build project.

If the NPDES Permit acquisition will be specified to be performed by the contractor, then Conceptual Erosion and Sediment Control design must be developed to determine the limits of disturbance and areas of impact for the project and prepare bid documents (including Special Provisions). Depending on project complexity and scope of work, an Conceptual Erosion and Sediment Control Plan may be prepared to serve as a guide as to the erosion and sedimentation control measures required. Adjust the scope of work accordingly.

19. Assemble Final Project Documents for Contract Management – The detailed requirements of the bid package for a Low Bid project is described in [Section 3.2.3](#) Conceptual Design. Statements of work and details will be similar to those of design/bid/build projects, except that the construction cost estimates and pre-bid construction schedule must be developed by including the cost and time for Final Design activities to be performed by the contractor. Refer to [Section 3.2.3.4.2](#) Cost Estimate and Pre-Bid Schedule for additional details.
20. Post-design activities – Include this task in the scope of work for the Conceptual Design phase consultant if Quality Assurance by Department Review is anticipated to be specified in the bid package, as well as if shop drawing review will not be performed by the Contractor's Lead Design Engineer.

3.2.2 PROJECT ANNOUNCEMENT

Because bidding on design-build projects requires the pairing of construction contractors with design consultants, it is important to provide advance announcement of upcoming design-build lettings to allow sufficient time for teaming arrangements to be made. To facilitate this, Central Office publishes an automated report entitled "Upcoming Innovative Bidding Projects" as a Bulletin in ECMS to provide announcement of projects scheduled to be let within six months of the report date.

First, verify that a MPMS project(s) has been established for the design-build project (in the case of project grouping, multiple MPMS projects must be established) and the project is included on the Transportation Improvement Program (TIP). At a minimum, the following information must be completed and accurate:

- Project title;
- Short narrative;
- Improvement description; and
- Bridge information, including completion of the following fields for each bridge included in the project:

- o Bridge Worked On indicator,
- o SD Correction indicator,
- o Bridge Scope of Work field (Preservation, Rehabilitation, Replacement, or Repair), and
- o Bridge Estimated Construction Costs.

When establishing the SPN, for all design-build projects, use the letter "Z" exclusively in the 7th character of the SPN, also known as the sub project field (P-xxxxxxZxxxxxxxxxxx) for all phases of work.

Request the District Portfolio Manager to create an ECMS project. Include the following data, at a minimum:

- Project title;
- Short description;
- Location information;
- Anticipated ECMS Let Date;
- MPMS number(s) associated to project; and
- Design-Build Indicator (F for Full Design-Build, P for Partial Design-Build).

For partial design-build projects, indicate what design items will be included in the bid package to allow for the formation of appropriate contractor – consultant teams. In the ECMS Short Description for Partial Design-Build projects, include the following phrase at the end of the description: "design activities limited to [list design activities]." An example: "SR 999 Freeport Mills Interchange; design activities limited to design of noise walls and design of BRKEY 99999."

Once all required data fields are completed in MPMS and ECMS, the project will appear on the "Upcoming Design-Build Projects" report posted in ECMS when the anticipated let date is within the reporting period of the report (generally six months). Monitor the published report to ensure the project is included in the report. Contact the Chief of the Project Schedules, Specifications and Constructability Section if errors are discovered in the published report.

3.2.3 CONCEPTUAL DESIGN

In the development of the conceptual plans, specifications and estimate for a Low Bid design-build project, it is important to present as much information as possible for contractors and their lead design engineers to properly bid and perform the work. Yet it is equally important to not provide unnecessary information or perform work that would be duplicated by contractors' lead design engineers in producing the Final Design. The conceptual design phase for Low Bid consists of the development of four main components to be published in ECMS for the letting process:

1. Conceptual Drawings
2. Special Provisions
3. Bid Items
4. Project Development Checklist Attachments

3.2.3.1 Conceptual Drawings

The development of conceptual drawings generally follows the process for the Preliminary Engineering phase for conventional projects as defined in Publication 10C, Design Manual Part 1C, *Transportation Engineering Procedures*, Chapter 3, *Preliminary Engineering Procedures*, Section 3. The conceptual plans are the contract drawings that will be included in the bid package and are equivalent to 30% design (DFV) stage drawings. Prepare conceptual drawings in accordance with Publication 14M, Design Manual Part 3, *Plans Presentation* and include the following, as required:

1. Title Sheet (An example of a typical Title Sheet is shown in Publication 14M, Design Manual Part 3, *Plans Presentation*, Chapter 15, Section 15.2, Plate B-IX).
2. Index Sheet
3. Typical Section Sheet
4. Summary of Quantities Sheets (items as shown in Bid Proposal)
5. Plan Sheets (existing and relocated utilities, right-of-way location and cut/fill limits, roadway design, etc.)

6. Conceptual Traffic Control Plan (if applicable), including Draft Transportation Management Plan (if project meets criteria in Publication 46, *Traffic Engineering Manual*, for a Transportation Management Plan)
7. Conceptual TS&L (General Plan Sheet with elevation view and cross section)
 - a. Conceptual TS&Ls must be provided for all NHS and Interstate bridges
 - b. For non-NHS and non-Interstate bridges, provide Conceptual TS&Ls, except for deck replacements where at a minimum existing structure plans and conceptual details, including plan, elevation and cross section must be provided.
8. Conceptual General Notes (Bridge)
9. Structure Boring Plan (if available)
10. Conceptual Erosion and Sediment Pollution Control Plan (if applicable)
11. Conceptual Traffic Signal Plans or Reference Publication 222, *Geotechnical Investigation Manual*
12. Foundation Design Parameters (as applicable)
13. H&H Report including Permits (if applicable)

Additional supplemental plans may be required depending on the type of project. Refer to Publication 13M, Design Manual Part 3, *Plans Presentation* Section 2.1(H) for a complete listing of potential supplemental plans. The Conceptual Plans, including all required supplemental plans, should be prepared to the DFV level of development.

The following types of design-build projects generally do not require the same level of conceptual drawing detail and may utilize 8 ½" x 11" size plans. Prepare abbreviated plans in accordance with Publication 13M, Design Manual Part 3, *Plans Presentation*.

- Milling and Resurfacing projects (where scope is limited to those activities)
- ITS projects
- Highway Lighting projects
- ADA Curb Ramp projects

To bid a Low-Bid project without conceptual plans, or with conceptual plans that do not meet the level of plan detail specified above, seek prior approval from the Chief of the Highway Delivery Division. Prepare and submit a request at least 90 days prior to the planned letting date, describing how the contract documents will adequately define the project requirements and restrictions.

If Conceptual Drawings are not provided, at a minimum include the following information in the bid documents:

1. Typical section
2. Horizontal and vertical clearance
3. Design Exceptions
4. Limits of work
5. Identification of anticipated required permits
6. Area of impact
7. Right-of-way limits
8. Existing as-built plans or plans of record

The conceptual drawings must have a Professional Engineer's Seal Block in accordance with Section 2.1.K and Figure 2.1 of Publication 14M, Design Manual Part 3, *Plans Presentation*.

3.2.3.1.1 Conceptual Drawings – Structures

Conceptual design for structures will include hydrology and hydraulics analysis; development of conceptual type, size and location information; foundation exploration; foundation recommendations or foundation design guidelines; and specifications. The Final Design to be performed by the contractor's lead design engineer as defined in the Special Provisions will include final type, size, and location; subsurface exploration and foundation design for some projects; final structure plans and specifications; and as-built plans. Waterway permits or amendments to the waterway permits and alternate foundation design, as applicable, may also be specified to be included in final design. Any deviations from the procedures and requirements in [Sections 3.2.3.1.2 through 3.2.3.1.4](#) will require approval of the Chief Bridge Engineer.

The chronology of the structure-related submissions for review and approval during conceptual design will be as follows:

1. Hydrologic and Hydraulic Report (as applicable)
2. Conceptual Type, Size and Location (Conceptual TS&L)
3. Foundation Submission
4. Bid Plans and Special Provisions

Refer to Figure 3.2.3.1.1-1 for a graphic showing the bifurcation of the project development process for structures.

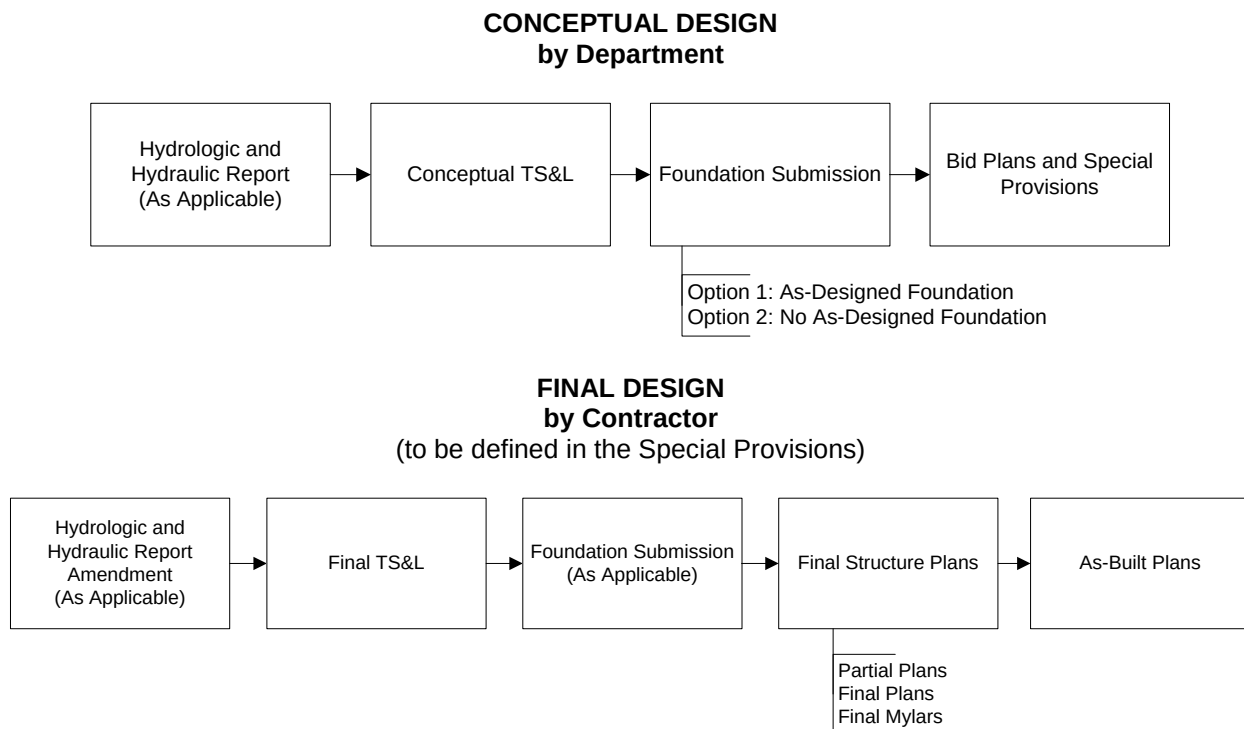


Figure 3.2.3.1.1-1

3.2.3.1.2 Hydrologic and Hydraulic Report

In accordance with Publication 15M, Design Manual 4, *Structures*, Section PP1.9.2 and as follows:

If the Department will be obtaining the waterway permit, base the hydraulic analysis on the structure recommended in the Conceptual TS&L, and submit the JPA to obtain a waterway permit. If in the instance that the Department intends to include more than one recommended structure type in the Conceptual TS&L for the purposes of providing alternates for bidding, perform hydraulic analyses on each of the recommended structure types and submit the JPA with a request to obtain a waterway permit that allows for construction of any one of the alternate structures.

If the waterway permit will be included as a design activity in the bid documents (see [Section 3.1.5.2](#) for limitations), Hydrologic and Hydraulic (H&H) analysis is required to determine the minimum required hydraulic opening for the proposed structure. As appropriate, prepare an abbreviated H&H Report meeting the requirements of Publication 13M, Design Manual Part 2, *Highway Design*, Section 10.7.

3.2.3.1.3 Conceptual Type, Size, and Location (TS&L)

Arrange for and request the District Bridge Engineer or his/her representative to attend a field review of all structures to be included on the project for their input in finalizing the location and horizontal and vertical alignment, taking into account site-specific conditions such as scour potential. Where complex geotechnical conditions are anticipated, request the District Geotechnical Engineer Manager's attendance.

Investigate a proposed structure with sufficient detail to select and justify the type, size, and location based on the information available from the various phases of study outlined in Publication 10C, Design Manual Part 1C, *Transportation Engineering Procedures* including any foundation information obtained. Perform preliminary cost comparisons to support the Conceptual TS&L recommendations.

In general, develop the Conceptual TS&L submission in accordance with Publication 15M, Design Manual Part 4, *Structures*, PP1.9.3.3 for TS&L submissions. However, certain details that are normally finalized at the TS&L stage may not need to be finalized in the Conceptual TS&L plans. For example, if a multiple span bridge is proposed with multiple pier fixity, the number of fixed piers does not need to be finalized in the Conceptual TS&L plans. In this case, indicate in the Conceptual TS&L plans and/or special provisions that the number of fixed piers shall be established by the Contractor's Lead Design Engineer subject to the design requirements in Publication 15M, Design Manual Part 4, *Structures*, and the contract special provisions. Contact the BDTD to obtain guidance on the level of detail where uncertainties occur on individual projects. At a minimum, the Conceptual TS&L will include the plan view, cross section, and elevation and indicate minimum widths, vertical clearance and required waterway opening.

Prepare Conceptual TS&L plans, dual H&H analysis, and waterway permits, as applicable, for both steel and concrete structures where cost differences are insignificant, and where other project specific requirements do not justify the selection of an individual material type. Prepare Conceptual TS&L plans for both steel and concrete structures for all major structures, as defined in Publication 15M, Design Manual Part 4, *Structures*, PP1.5. A Conceptual TS&L for a single material type may be developed for a major bridge with approval from the Director, Bureau of Project Delivery. When existing substructure units will be retained and new loads are to be applied, evaluate the existing substructure units during the Conceptual TS&L stage to assure adequate load carrying capacity for proposed conditions.

Conceptual TS&L for any structure supported on proprietary walls will not be approved until adequate foundation information including scour evaluation (if applicable) is available, or the foundation investigation is completed and recommendations are available.

Refer to Publication 15M, Design Manual Part 4, *Structures*, Tables PP1.9-1 and PP1.9-3 for the review and approval responsibility for the Conceptual TS&L.

When the District is responsible for TS&L approval, submit two copies of the Conceptual TS&L submission to the District Bridge Engineer for approval. Send to the BDTD an informational copy of the District Bridge Engineer's Conceptual TS&L approval letter, with roadway plans, applicable Quality Assurance Forms, and Conceptual TS&L plans showing the core-boring layout.

When the BDTD and FHWA are responsible for TS&L approval, submit to BDTD through the District Executive, one copy of the Conceptual TS&L submission for an estimated structure cost of less than \$10 million, and two sets for a structure cost over \$10 million. For 100% State-funded projects, only one set is required.

Mark in red all District review comments to a Consultant's plan submission and forward to BDTD with an explanation as appropriate. Alternatively, prepare and transmit comments in a written itemized form. BDTD will review the submission, obtain FHWA approval, when required, and approve it if it is found satisfactory. Submission of revised conceptual plans will be requested, if necessary.

Prepare a Conceptual TS&L submission for the proposed bridge. Prepare and transmit the submission in accordance with Publication 15M, Design Manual Part 4, *Structures*, Part A, *Policies and Procedures*, Chapter 1.9.3.3, other applicable sections of Publication 15M, Design Manual Part 4, *Structures*, Part A, *Policies and Procedures*. Specifically address all bullet items listed in PP1.9.3.3(c) (4). Additionally, include in the report a summary of design requirements for the structure shown on the Conceptual TS&L plan and for alternate structures. Format the summary such that the data can be directly integrated into the "DESIGN OF, S-XXXXX" and "CONSTRUCTION OF __, S-XXXXX" standard special provisions. Refer to [Section 3.2.3.2.3](#) below for discussion of the use of the available structure-related standard special provisions.

Where utility facilities are to be located on a structure, the Conceptual TS&L plans must provide utility loads to be designed for and sufficient details for the Contractor's Lead Design Engineer's use in preparing the final structure plans. Indicate in tabular form on the Conceptual TS&L plans the materials required for each utility and the party who is to furnish and install the material. Refer to Publication 16M, Design Manual Part 5, *Utility Relocation*,

Chapter 7, for Utility Occupancy of Highways and Bridges, for general guidelines coordination procedure and guidelines for accommodation of utilities on structures.

For superstructure replacement projects, note that no contractor foundation submission is required. This implies that the existing foundation has been deemed capable of supporting the new superstructure. At a minimum, determine during Conceptual Design that the existing substructure can support the Conceptual TS&L superstructure. Alternate superstructures types can then be restricted by specifying criteria in the Special Provisions limiting the total superstructure dead load that may be applied to the existing substructures (note that both increased and decreased loads are important).

3.2.3.1.4 Foundations

Two foundation development options are available for Low Bid projects. The first option involves the preparation of a complete foundation submission as per Publication 15M, Design Manual Part 4, *Structures*, PP 1.9.4 during conceptual design. This includes a complete subsurface exploration program, recommendations for a foundation type(s), and preparation of geotechnical design parameters for use by the Contractor's Lead Design Engineer. Recommendations for permissible alternate foundation types and the use of the as-designed foundations at relocated substructure must be provided. This design process, identified as "Option 1: As Designed Foundation Design Prepared During Conceptual Design," is defined in below.

The second option involves a limited foundation investigation during conceptual design and completion of the foundation investigation during final design. During conceptual design, a limited geotechnical exploration, recommendations for permissible foundation types, recommendations for geotechnical design parameter limitations, and a Foundation Design Guidance Report as defined below must be completed. During final design, the Contractor's Lead Design Engineer completes the subsurface exploration and prepares a foundation report, which must include the proposed foundation type and recommended geotechnical design parameters. This process, which is intended to expedite conceptual design, is identified as "Option 2: No As Designed Foundation Prepared During Conceptual Design." This process is defined below and its use is subject to certain limitations as described therein.

Refer to Figure 3.2.3.1.4-1 for graphics showing the foundation development process, illustrating the Department's responsibility during Conceptual Design, and the contractor's responsibility for Final Design that must be specifically defined in the Special Provisions.

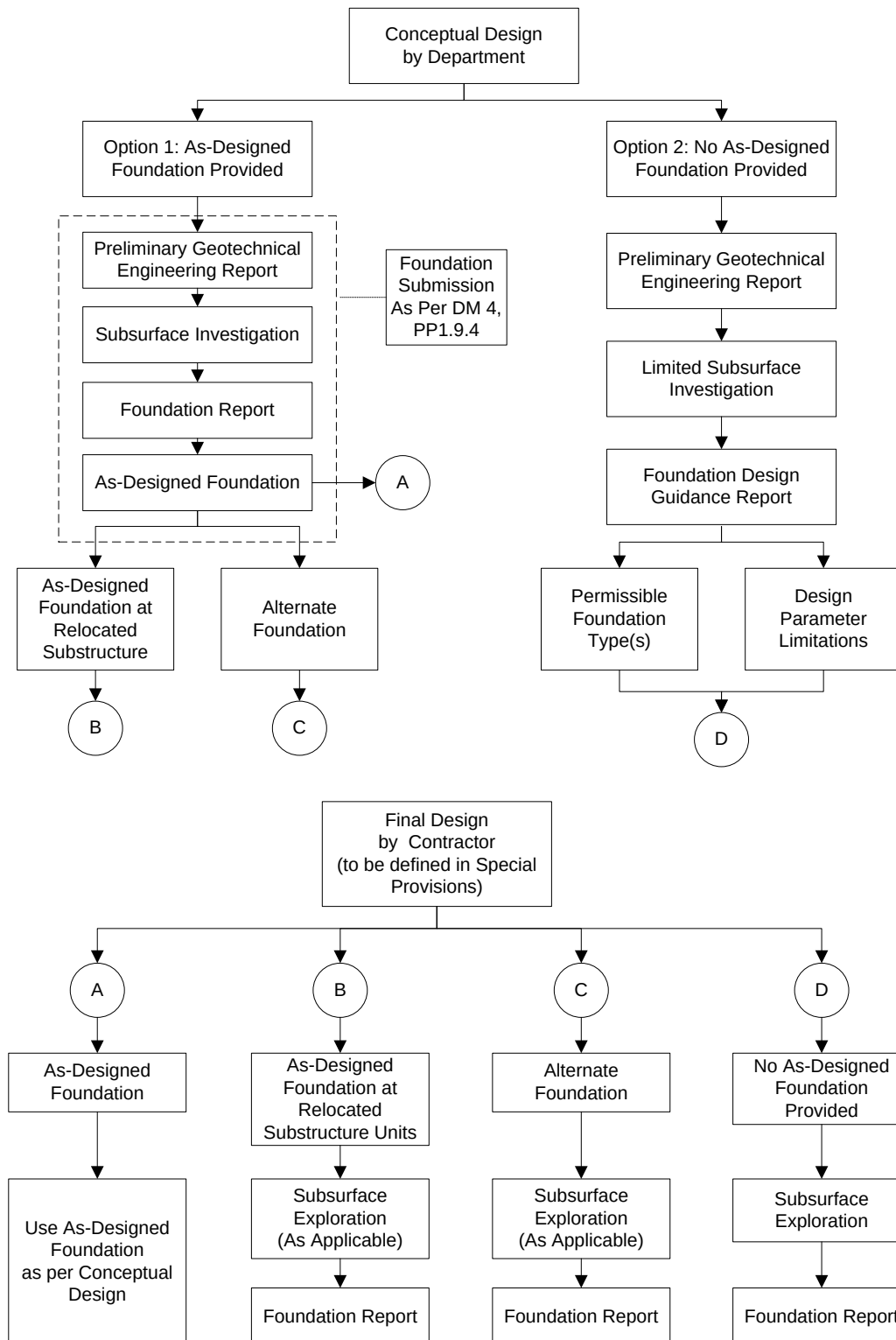


Figure 3.2.3.1.4-1

Refer to Publication 15M, Design Manual Part 4, *Structures*, Table PP1.9-2 for the review and approval responsibilities for foundations. The BDTD and, as applicable, FHWA will be responsible for approving Foundation Design Guidance Reports.

When the District is responsible for foundation approval, submit two copies of the Foundation Submission to the District Geotechnical Engineer/Manager. The District may consult with the BDTD, the Geotechnical Engineers/Managers, and Geotechnical Section of the Innovation and Support Services Division about unusual cases.

When BDTD and FHWA are responsible for approval, request the District Bridge Engineer and the District Geotechnical Engineer/Manager to review the foundation submission. Forward the District's recommendation to BDTD with three copies of the foundation submission for Department oversight projects and four sets for FHWA oversight projects.

Mark in red all District review comments to a Consultant's plan submission and forward to BDTD with an explanation as appropriate. Alternatively, prepare and transmit comments in a written itemized form. BDTD will review the submission and approve it if it is found satisfactory and after obtaining necessary FHWA approval. Submission of revised data and information will be requested, if necessary. Consult the Geotechnical Section of the Innovation and Support Services Division about unusual or complex foundations.

- Option 1: As-Designed Foundation Design Prepared During Conceptual Design

Prepare a subsurface exploration and foundation recommendation in accordance with Publication 15M, Design Manual Part 4, *Structures*, PP1.9.4.

Summarize foundation recommendations in the foundation report to allow for direct integration of this information into the applicable "DESIGN OF (AS-DESIGNED FOUNDATION PROVIDED), S-XXXXX" standard special provision. Provide for each substructure unit the foundation design parameters that are required input items in the Department's computer programs. For noise barriers, provide foundation design parameters required for use with the Bridge Design Standard Drawings. Address guidelines on the use of as-designed foundations at relocated substructure units and the use of alternate foundations in the report as follows:

Relocated Substructure Units using As-Designed Foundations

1. Provide recommendation on the use of as-designed foundations at substructure units relocated from the positions shown on the Conceptual TS&L plan.
2. Provide listing of project limitations. Typically, this will consist of the design and construction requirements specified for the as-designed foundation locations.
3. Provide recommendation on the need for additional test borings. Typically, it is expected that a minimum of two borings will be provided within the footprint of each substructure unit. These can be borings from the conceptual design or specify that additional borings be drilled by the Contractor's Lead Design Engineer. Where uniform subsurface conditions are expected, give consideration to reducing the extent of exploration and testing required during final design. For example, if piles are specified for the as-designed foundation and the borings taken during preliminary design show the presence of bedrock at elevations that can be interpolated between borings, the need for additional borings may be limited to that necessary to verify the top of rock elevation and rock competency at the relocated substructure unit.

Alternate Foundations

1. Provide recommendation for permissible alternate foundation types.
2. Provide a listing of limitations that apply to the alternate foundations. Limitations that supersede or are not covered in AASHTO and Publication 15M, Design Manual Part 4, *Structures* should be covered.
3. Provide recommendation on the need for additional test borings and laboratory testing. Typically, it is expected that a minimum of two borings will be provided within the footprint of each substructure unit. These can be borings taken during the conceptual design or specify that additional borings be drilled by the Contractor's Lead Design Engineer.
4. Provide recommendations for geotechnical design parameter limitations for the permissible alternate foundations. The limitations should contain sufficient information to help prevent situations where interpretation of AASHTO and/or Publication 15M, Design Manual Part 4, *Structures* could result in the development of controversial or unacceptable design parameters by the Contractor's Lead Design Engineer. For example, if spread footings on soil are permitted, the maximum soil friction angle that would be permitted for the design should be established. Alternatively, if a spread footing on rock is permitted, establish the maximum ultimate bearing capacity that would be permitted for the rock.
5. Provide recommendations for subgrade preparation and construction monitoring (pile dynamic analysis, load tests, settlement monitoring, etc.).

- Option 2: No As-Designed Foundation Design Prepared During Conceptual Design

Only use the process where geotechnical design parameters are specified to be established by the Contractor's Lead Design Engineer during final design when favorable subsurface conditions are present, and not under the limitation conditions below. During conceptual design, provide reconnaissance pursuant to Publication 15M, Design Manual Part 4, *Structures*, PP6.2, for single and multiple-span bridges.

Limitations

Do not specify the foundation design to be prepared during final design where any of the following conditions are encountered unless otherwise approved by the Chief Bridge Engineer:

- Problematic subsurface conditions as per Publication 15M, Design Manual Part 4, *Structures*, D10.4.7P are identified in the reconnaissance or are discovered in the conceptual design test-boring program;
- Unusual scour conditions are present or are anticipated at the project site;
- Structure carrying or crossing over a Railroad;
- Retaining wall located along a Railroad;
- Mechanically stabilized earth wall abutments are proposed in the Conceptual TS&L;
- Proprietary retaining wall is proposed in the Conceptual TS&L; or
- Culverts.

In cases where special approval is requested from the Chief Bridge Engineer, address the method of payment for foundations. Specify a foundation payment method that will minimize significant risk-taking by the Contractor during the bidding.

Subsurface Exploration

Conduct a limited foundation exploration to establish subsurface conditions within the limits of the bridge structure. As a minimum, obtain one boring at each abutment. For multiple span bridges, obtain additional borings at a maximum interval of 150 feet between abutments. Preferably, take a minimum of one boring at each substructure unit as shown on the Conceptual TS&L plan. The exploration should be performed in accordance with Publication 15M, Design Manual Part 4, *Structures*, PP6.3, except prepare a Foundation Design Guidance Report as described below in lieu of the report indicated in PP6.3(e). Perform soil and water testing as required to establish the corrosion potential at the structure site.

Foundation Submission

Prepare a Foundation Design Guidance Report providing results of the subsurface exploration and recommendations of permissible foundation types. Include the following items in the report:

1. Brief description of each site including history, surface features, geological formation and items identified during the final exploration meeting.
2. Plotted logs of core borings and boring layouts.
3. Typewritten Engineer's logs.
4. Results of the professional engineer certified laboratory tests.
5. Endorsement of foundation investigation information and notes as per Publication 15M, Design Manual Part 4, *Structures*, PP1.9.4.3 (b) (5).
6. Additional subsurface exploration to be performed during final design, including:
 - a. Minimum number of borings per substructure unit. (Typically, it is expected that a minimum of two borings shall be provided within the footprint of each substructure unit. These can be borings from the conceptual design or additional borings drilled by the Contractor's Lead Design Engineer.)
 - b. Laboratory testing.
7. Permissible foundation types and recommended geotechnical design parameter limitations for each foundation type. The geotechnical design parameter limitations should contain sufficient information to help prevent situations where interpretation of AASHTO and/or Publication 15M, Design Manual Part 4, *Structures* could result in the development of controversial or unacceptable design parameters by the Contractor's Lead Design Engineer. For example, if spread footings on soil are permitted, the maximum soil friction angle that would be permitted for the design should be established. If a spread footing on rock is permitted, the maximum ultimate bearing capacity that would be permitted for the rock should be established.
8. Scour analysis

9. Minimum number of test piles.
10. Required construction monitoring (e.g., pile dynamic analysis, load tests, settlement monitoring, etc.)

Summarize foundation recommendations in the report to allow for direct integration of this information into the applicable standard special provision "DESIGN OF ____ (NO AS-DESIGNED FOUNDATION PROVIDED), S-XXXXX".

- Bid Plans

Incorporate information from the foundation exploration and foundation submission on the Conceptual TS&L plans. Where an as-designed foundation is developed during conceptual design, include information from the foundation plans, including test-boring locations, bottom of footing elevations, pile size and estimated minimum pile tip elevations, caisson sizes, etc. Incorporate test boring logs. Where an as-designed foundation is not developed during conceptual design, include test-boring locations and test boring logs on the plans.

3.2.3.1.5 Noise Barrier Acoustical and Aesthetic Information

The following information is to be provided on the Conceptual TS&L for noise barrier systems:

1. Station (each 50') and offset of center of the noise barrier system
2. Top elevation of the noise barrier system

The following information is to be provided to the contractor during bidding:

1. The Preliminary or Final Design Noise Report
2. FHWA TNM data files

Refer to Publication 24, *Project Level Highway Traffic Noise Handbook* for further guidance.

3.2.3.2 Special Provisions

The special provisions related to the design-build aspects of a project are the portion of the construction contract that changes the contract and its standard specifications and terms from that of a conventional design-bid-build to a design-build contract. Therefore, the special provisions must be complete in scope so as to fully transform the contract type with regard to the contractor taking over the role of designer for the final plans. The division of responsibilities between the contractor's Lead Design Engineer and the Department must be clearly articulated so that the design process and the Department's interests are not compromised. As per Publication 408, *Specifications*, Section 105.04, the special provisions take precedent over the Conceptual Drawings and other documents in the bid package, and therefore will be the ultimate authority on the contract work.

It is critical that all design requirements are clearly developed in the standard special provisions for Low Bid Design-Build. All design work must be in accordance with Department manuals and specifications, but the design-build process is designed to allow the contractor to develop the specific project design to minimize costs while meeting the contract requirements. For that reason, it is imperative that the contract special provisions identify any additional requirements to ensure the overall objectives of the Department are met, as well as District preferences. All project specific requirements must be clearly identified in the contract documents. For example, if full depth shoulders are preferred by the Department to accommodate future widening, the special provisions must include this requirement (Design Manuals will require typical shoulder types). Districts are encouraged to develop District-specific checklists so that specific District objectives are considered in the development of design considerations for design-build projects.

During the Conceptual Design phase, it is imperative that all design criteria are evaluated in light of potential impact to Final Design. The Low-Bid Design-Build process encourages the development of a Final Design which minimizes total project costs. For that reason, the Special Provisions must clearly identify and/or restrict activities to meet the overall Department objectives.

By way of example, consider a simple bridge replacement project for a bridge on a local route over an interstate. Establishing a 25 mph design requirement with no other design constraints could result in a Final Design on the local route involving a "camel back" vertical alignment which would produce reduced sight distances compared to the existing conditions. Although meeting design requirements for a 25 mph local road, the design would result in a

degradation of the existing site conditions unless additional design requirements are specified in the contract documents. While the following sections discuss the use of the special provision templates, each project must be customized so that the overall Department objectives are clearly specified in the project Special Provisions.

Templates of the special provisions for Low-Bid design-build projects are posted in the ECMS standard special provisions. These special provisions should be used as needed based on the project design-build components. The sections that immediately follow provide a description of each special provision and its use, and guidance on completing the editable portions within each, shown in the templates as bold and italicized text in parentheses. The design item and special bidding special provisions must fully establish all relevant criteria for the development and approval of the final design by the contractor. The available special provision templates are discussed below and follow the categories:

- General (to be included on all Low Bid projects)
- Roadway
- Bridges/Structures
- Maintenance and Protection of Traffic
- Right of Way
- Utilities
- Environmental / Permitting
- Concrete Curb Ramps

On projects where Action Plans addressing deviations from preferred project criteria have been approved, modifications to the Low Bid design-build standard special provisions should be made to fully incorporate the project-specific requirements in the bid documents. When creating the project-specific special provision, do not modify the standard special provision titles, so that cross references among the standard special provisions remain consistent.

The special provision templates have been developed for state design-build projects. Although the special provisions can generally be applied to local or municipal projects, the special provisions will need to be modified for use on locally administered projects to adequately address review submissions, coordination of reviews (local and District reviews), and submission requirements (such as the number of plan sets) for local projects.

3.2.3.2.1 General Special Provisions

Include the following design-build special provisions on all Low Bid design-build projects:

- **D-a29890 Special Bidding – Design-Build**

Special Bidding – Design-Build identifies the specific design-build activities to be included in each project and contains the majority of the general requirements, or boilerplate, for design-build projects. It includes actions required by the bidder before and after award, professional services involvement restrictions, submission contacts for reviews, submission requirements, number of plan sets required, review times and general design requirements. It is subdivided into eight sections.

DO NOT MODIFY SECTIONS I, II, OR III UNDER ANY CIRCUMSTANCES. In addition, **DO NOT** modify the Section numbers throughout this special provision, as they are referenced by most of the other design-build special provisions.

Sections IV through VII must be edited in detail to fit the specific project scope and characteristics.

IV. Design Activities – Identify all design activities to be included in the contract. Delete those not needed. This section is referenced frequently throughout the various design-build Special Provisions. Take extra care to ensure that the list is complete and correct.

V. Review Submission Contacts – Choose between the two options for the listing of the Department contacts for the transmission of design submittals; either (a) transmit submittals through the Department's identified Project Manager or (b) transmit certain submittals through the District Section Managers whose responsibility includes the plans to be reviewed, and copy the Project Manager.

The Project Manager to be identified in Section V, regardless of the option selected, will be determined by the District Executive. Depending on District resources and preferences, the contact person for all post-award design activities performed by the contractor can either be the Design Unit Project Manager, a District Design-Build Coordinator, or the District Assistant Construction Engineer to whom the project will be assigned. Insert the selected individual's name and contact information in Section V. If the first option is selected, delete the remaining text in Section V after the Project Manager's information. If the Design Unit Project Manager is identified in Section V, make sure to list in Section X the Construction Unit individual who will be responsible for the processing of the Current Estimate Payments.

If the second option is selected, the five offices generally will be:

- Roadway Design – Assistant District Executive-Design
- Bridge Design – District Bridge Engineer
- Maintenance and Protection of Traffic Design – District Traffic Engineer
- Utility Coordination – District Utility Administrator
- Right-of-Way Design and Acquisition – District Right-of-Way Administrator

Insert the selected individuals' names and contact information in Section V. Delete any of the Design Activities not listed in Section IV.

For submission location, determine whether submittals will be transmitted electronically through an FTP site, or delivered paper copies. This decision is a District preference. Depending on the needs of individual reviewing parties, a combination of electronic and paper submissions may need to be identified. If an FTP site is to be utilized, identify the site or state that the site will be identified to the successful bidder at the Preconstruction Conference.

Also identify outside reviewing parties such as County Conservation Districts, Department of Environmental Protection (DEP), and Army Corps of Engineers, as required.

VI. Location Information – Provide the appropriate mailing addresses for the District office, County Conservation District(s) office(s), Department of Environmental Protection Regional office and USACOE District office should be provided as applicable.

FTP Site – If electronic submissions are to be specified, use the first paragraph if the District's ftp site will be used, or the second paragraph if the contractor (or its Lead Design Engineer) is to provide. Delete the paragraph not selected. Delete both if paper submissions are to be specified.

VII. Submission Review Requirements/Review Times – First determine whether project is classified as Federal Oversight or PennDOT oversight. While this is more likely determined at the project scoping phase, the primary criterion for determining review responsibility is oversight status. Refer to Publication 10X, Design Manual Part 1X, *Appendices to Design Manuals 1, 1A, 1B, and 1C* Appendix C, *FHWA/PennDOT Stewardship and Oversight Agreement*, Part IX, Project Categories and Agency Roles for the current rules regarding oversight criteria.

Federal oversight means Central Office and FHWA review the design-build submittals; PennDOT oversight means reviews are handled within the District, except under unusual circumstances. Generally, for non-structure Design Activities, the Project Categories and Agency Roles table in Part IX of the FHWA/PennDOT Stewardship and Oversight Agreement governs. Publication 15M, Design Manual Part 4, *Structures*, identifies review responsibility by oversight and structure type:

- For specific foundation submittals, refer to Publication 15M, Design Manual Part 4, *Structures*, Table 1.9-2, *Review and Approval Responsibility for Foundation Approval for all Projects*.
- For specific structure submittals with Federal Oversight, refer to Publication 15M, Design Manual Part 4, *Structures*, Table 1.9-1, *Review and Approval Responsibility for Federal Oversight Projects*.
- For specific structure submittals with PennDOT Oversight, refer to Publication 15M, Design Manual Part 4, *Structures*, Table 1.9-3, *Review and Approval Responsibility for PennDOT Oversight Projects*.

If Central Office and/or FHWA reviews are required, specify "Central Office" or "Central Office and Federal Highway Administration" in the second paragraph. If the project is PennDOT oversight, and no Central Office or FHWA review of any Design Activity is required, delete the paragraph in its entirety.

The matrix in Section VII is to identify for the contractor the review times for each submittal for the Design Activities in the contract. When paper submissions are specified, the matrix also identifies the total number of sets required to be produced and submitted for review for each submittal.

Determine the parties responsible for reviewing each submission. Make a record of this information for later use by District personnel who will ultimately be responsible for the management of the post-award design submittal process. It is recommended to use the Submittal Review Responsibility Checklist (APPENDIX B). Completing this checklist will facilitate the calculation of the total number of sets of paper submissions for the Section VII. As an alternative to completing this checklist for each project, Districts can elect to utilize standard templates, one for PennDOT oversight design-build projects and one for Federal Oversight design-builds. The significance of this requirement is to establish an internal record of arrangements made during the conceptual design phase as to responsibilities for review of submittals, to convey this information to others within the District who may be responsible for managing submittals after award. This document should also indicate whether any design consultants under agreement to the District will have a role in the review activities. Regardless of the means utilized to pass this information on, the intent is to avoid any delays in the design-build submittal review process caused by confusion on the part of the Department.

To complete the checklist, first check which submission will be specified by the Design Activity items for the project. Then identify the reviewing party to be inserted in the appropriate column. For non-signature paper review submittals, generally two sets go to each party actually performing a review, and one set goes to non-reviewing parties for information. For example, in the case of consultant review in the District (PennDOT oversight), two copies go to the consultant, one is kept in the District. However, in the case of Federal oversight, two copies go to Central Office and two copies go to FHWA.

When electronic submissions will be specified, determine the District procedure for applying the signature and seal to the final plan sheets. Add the requirements of this process to Section VII. Some District processes do not require the submission of multiple copies, where others do.

Generally, for final, signature paper submissions, additional sets are necessary for the ultimate distribution, which in the scenario with the greatest number of copies, 13, would be as follows:

- Three sets – District
- One set – review consultant
- One set – Central Office
- One set – FHWA
- Seven sets – Contractor (includes one for Lead Design Engineer)

If Central Office, FHWA, and/or a review consultant are not involved, reduce the total by that number of sets.

If paper submissions are required, specify in Section VII that the contractor is responsible for providing the following number of half-size prints of final, signed drawings:

- One set – District Design Unit
- Two sets – District Construction Unit
- One set – review consultant
- One set – Central Office
- One set – FHWA

Similar to final submissions reduce the number of copies required if Central Office, FHWA, and/or a review consultant are not involved.

Once the above information is ascertained, insert the office of the reviewing party in the appropriate cell for the submissions for each of the Design Activities to be included in the contract. If paper submissions are required, insert the number of copies after the office title. For example, for Final Design for a structure on a PennDOT oversight project, indicate "District X-0 Bridge Engineer – 2". Use the "Other" column for outside agency reviewers.

To populate the Section VII matrix in the special provision with the number of paper submission copies, use the total number of copies listed in the corresponding row on the Submittal Review Responsibility checklist.

If electronic submissions are required, indicate the number of full and/or half-size sets desired for use during construction in the first paragraph of Section VII. If paper submissions are required, identify any half-size sets desired for construction use.

Include the Submittal Review Responsibility checklist, or some level of documentation of reviewing parties as an attachment to the project development checklist, but do not include with the bid package.

Delete rows not needed; add rows for submissions specified in the Design Activities but not listed in the template, such as submissions to other outside agencies that may be required.

An optional submission interim milestone provisions can be included when the District prefers to establish a schedule of submissions.

VIII. General Design Requirements – This section lists the general design requirements applicable to all Low Bid projects as well as the various design specifications. Do not edit this section. Additional design specifications, if needed, can be added to the applicable design special provision.

IX. Schedule of Values – Be sure to attach the Project Schedule of Values template (See APPENDIX E).

X. Construction Contact – Identify the individual who will be responsible for processing the Current Estimate Payments. If it differs from the Project Manager listed in Section V, identify the individual from the Construction Unit who will be assigned to the project and handle the estimates, particularly during the period between the Notice to Proceed and the start of construction which will involve payment for the Design activity items.

XI. Files Available after Award – if a full H&H Report has been prepared during conceptual design, include the provision to allow the HEC-RAS to be released to the contractor after award.

For files made available for viewing after award, include Preliminary Geotechnical Engineering Report if there are structure design activities identified in Section IV. Include Foundation Report when the structure design activities identified in Section IV include an as-designed foundation.

Make sure that the permit documents and others listed are on file and will be readily available in the District Office after bid opening.

- **D-a29899 - Quality Plan [Design] – With Quality Assurance Review by Department - Low Bid**

Or:

- **D-a29898 - Quality Plan [Design] – With Quality Assurance Review [Peer Review] - Low Bid**

Based on the limiting criteria discussed above in [Section 3.1.13](#), Quality Assurance Review Screening, the choice of review methods should have been narrowed early in the Conceptual Design phase. At this stage, make the final determination by re-reviewing the criteria, and if the project still is a candidate for Peer Review, consider it only if the Department resources (including the consultants under agreement with the Department) available to perform full quality assurance review do not appear to be sufficient to review the volume of submittals required by the project within the time limits identified in SPECIAL BIDDING – DESIGN-BUILD. Select the appropriate Quality Plan special provision based on the final choice.

Note that neither of the Quality Plan special provisions should be modified or edited without approval of the Chief of Project Schedules, Specifications and Constructability Section of the Highway Delivery Division.

- **ITEM 609-YYYY – Inspector's Field Office and Inspection Facilities, Design-Build Project**

Include this special provision on all design-build projects requiring an inspector's field office.

3.2.3.2.2 **Roadway Special Provisions**

Use the following special provisions when there is roadway work on the project:

3.2.3.2.2.1 **D-c29900 - Design Roadway**

Identifies the roadway related design activities to be performed by the contractor.
Edit the following:

- List additional design items that are not indicated on the Conceptual Drawings.
- List any additional designer qualifications above those listed in the Section II of Special Bidding – Design-Build.
- List all information/data to make available to the Contractor. Delete any information listed in the template that will not be provided.
- List any additional design specifications over and above those listed in Section VIII of Special Bidding – Design-Build. Be sure to identify which publications listed in Section VIII are superseded. Describe any Special Design Requirements.
- Insert the details of the pavement design, if developed by the Department during the Conceptual Design. If the pavement design has not been developed, provide the parameters under which the contractor is to develop the design. If bridge work is included in the project, include instructions regarding approach slab replacement.
- Describe the conceptual drainage plan and include pipe, inlet and ditch cleaning where appropriate.
- Describe any connections to existing guide rail or concrete barrier.
- Provide the applicable Geotechnical Design parameters.
- Specify paper, drafting film, or vellum for Title Sheet signature.

3.2.3.2.2.2 **D-c29901 - Construct Roadway**

This item must accompany the Design Roadway item. It covers the actual construction of the work indicated on the plans developed under the Design Roadway item.

3.2.3.2.2.3 **D-a29895 Temporary Excavation Support and Protection System for Design-Build Projects**

This item must be included in all projects that include structures, and roadway projects where support of excavation is anticipated.

3.2.3.2.3 **Bridges/Structures Special Provisions**

Include the following structure related items, as appropriate. Items are grouped by new design, then rehabilitation.

New Design**3.2.3.2.3.1 D-c82100 Design of Bridge Structure (As-Designed Foundation Provided), S-xxxxx**

Use on projects requiring the design of a new bridge where a foundation type and geotechnical design parameters are provided by the Department. Edit the following:

- On simple span structure replacement projects where a full Conceptual TS&L will be provided, the following two sentences may be added:
 - At the end of the Section I, DESCRIPTION, add: "A Final TS&L submission is not required if no changes are made to the Department's Conceptual TS&L Plans."
 - At the end of the first paragraph of Section II. DESIGN, (a) General, add "A Final TS&L submission is not required if the Contractor makes no changes to the Department's Conceptual TS&L Plans."
- In Section II, DESIGN, select (A) when a full Conceptual TS&L is provided, (B) when a final Approved TS&L is provided, or (C) when the minimum Conceptual TS&L consisting of plan view, cross-section, and elevation with minimum widths, vertical clearance, and required waterway opening is provided. Delete the option not selected.
- Identify any specific materials that will be precluded from consideration.
- List any additional designer qualifications above those listed in Section II of Special Bidding – Design-Build that may be desired for the particular type of structure.
- List information/data relevant to the design of the particular structure to be made available to the Contractor during bidding, including, but not limited to the items listed.
- List any additional design specifications and Railroad requirements over and above those listed in Section VIII of Special Bidding – Design-Build. Be sure to identify which publications listed in Section VIII are superseded.
- Cross reference other special provisions such as Temporary Excavation Support and Protection System for Design-Build Projects, or Dynamic Pile Load Monitoring to avoid duplicative language when requirements contained in other special provisions are relevant to this item.
- Describe general design requirements for this structure, in addition to those listed.
- List the parameters of any allowable geometry changes. Although some projects will require that geometrics closely follow the Conceptual TS&L Plans, one of the benefits of the Design-Build process is to provide flexibility in Final Design to provide the most effective bridge at a given location. Where possible, specify appropriate geometric criteria/limitations and the purpose of any limitations to allow the most efficient design. Be sure to indicate when no changes will be permitted.
- List site class of the foundation material per AASHTO LRFD Bridge Design Specification Section 3.10.3.1.
- Specify girder and joint requirements and limitations. Add others as necessary.
- State substructure limitations/allowances.
- When temporary bridges will be required for maintenance and protection of traffic purposes during construction, list design and construction requirements.
- Specify MPT requirements related to the structure or, if listed elsewhere in the bid package, refer to where it is provided.

- When the structure will be located adjacent or over a Railroad, specify the clearance and support requirements.
- Provide additional requirements for future widening to be incorporated into the design, when desirable.
- Provide additional design requirements for future redecking, when appropriate, within the listed items.
- List on-bridge lighting requirements, if any.
- List waterway requirements, when applicable, as well as parameters for alternate structures, when permitted; reference Permits for Design-Build Projects special provision. If the H&H Report is being prepared by the Department, include a requirement that the contractor is responsible for any amendments that result from an alternate structure.
- Refer to Environmental Commitments and Mitigation Tracking System Report special provision, if included in the bid documents.
- List utility information and reference to Utilities special provision.
- List any additional design requirements that do not fit the previous categories.
- Review list of geotechnical parameters with the District Geotechnical Unit and provide the applicable design parameters and construction requirements for the particular structure, and alternate foundation designs, if permitted.
- Review construction phasing with the constructability team to determine how the submittal process can be phased to allow construction to begin earlier than otherwise possible with single final design submittal. Define what partial submissions will be accepted, the level of approval required for construction to commence, and limitations on construction activities associated with the partial approval. Specify any limitations on concurrent partial submittals, or requirements for staggering of partial submissions as may be necessary if reviewing resources are limited.
- Specify paper, drafting film, or vellum for signature by the District Bridge Engineer.

3.2.3.2.3.2 D-c82110 Design of Bridge Structure (No As-Designed Foundation Provided), S-xxxxx

Use on projects requiring the design of a new bridge, no foundation design was developed during Conceptual Design, and therefore a Foundation Submission is required. Edit the following:

- On simple span structure replacement projects where a full Conceptual TS&L will be provided, the following three sentences may be added:
 - At the end of the Section I, DESCRIPTION, add: "A Final TS&L submission is not required if no changes are made to the Department's Conceptual TS&L Plans. A Foundation Report submission for the proposed structure."
 - At the end of the first paragraph of Section II. DESIGN, (a) General, add "A Final TS&L submission is not required if the Contractor makes no changes to the Department's Conceptual TS&L Plans."
- In Section II, DESIGN, select (A) when a full Conceptual TS&L is provided, (B) when a final Approved TS&L is provided, or (C) when the minimum Conceptual TS&L consisting of plan view, cross section, and elevation with minimum widths, vertical clearance, and required waterway opening is provided. Delete the option not selected.
- Identify any specific materials that will be precluded from consideration.

- List any additional designer qualifications above those listed in Section II of Special Bidding – Design-Build that may be desired for the particular type of structure.
- List information/data relevant to the design of the particular structure to be made available to the Contractor during bidding, including, but not limited to the items listed.
- List any additional design specifications and Railroad requirements over and above those listed in Section VIII of Special Bidding – Design-Build. Be sure to identify which publications listed in Section VIII are superseded.
- Describe general design requirements for this structure, in addition to those listed.
- List the parameters of any allowable geometry changes. Although some projects will require that geometrics closely follow the Conceptual TS&L Plans, one of the benefits of the design-build process is to provide flexibility in Final Design to provide the most effective bridge at a given location. Where possible, specify appropriate geometric criteria/limitations and the purpose of any limitations to allow the most efficient design. Be sure to indicate when no changes will be permitted.
- List site class of the foundation material per AASHTO LRFD Bridge Design Specification Section 3.10.3.1.
- Specify girder and joint requirements and limitations. Add others as necessary.
- State substructure limitations/allowances.
- When temporary bridges will be required for maintenance and protection of traffic purposes during construction, list design and construction requirements.
- Specify MPT requirements related to the structure or, if listed elsewhere in the bid package, refer to where it is provided.
- When the structure will be located adjacent or over a Railroad, specify the clearance and support requirements.
- Provide additional requirements for future widening to be incorporated into the design, when desirable.
- Provide additional design requirements for future redecking, when appropriate, within the listed items.
- List on-bridge lighting requirements, if any.
- List waterway requirements, when applicable, as well as parameters for alternate structures, when permitted; reference Permits for Design-Build Projects special provision.
- Refer to Environmental Commitments and Mitigation Tracking System Report special provision, if included in the bid documents.
- List utility information and reference to Utilities special provision.
- List any additional design requirements that do not fit the previous categories.
- For foundations, provide the necessary parameters for contractor to develop a complete foundation design. Although the contractor is required to calculate the actual strength / resistance / *etc.*, the intent herein is to place an upper limit on these values. The appropriate upper limit may be based on available information such as borings, District experience, site conditions, presumptive values, adjacent structures, *etc.*

- Review construction phasing with the constructability team to determine how the submittal process can be phased to allow construction to begin earlier than otherwise possible with single final design submittal. Define what partial submissions will be accepted, the level of approval required for construction to commence, and limitations on construction activities associated with the partial approval. Specify any limitations on concurrent partial submittals, or requirements for staggering of partial submissions as may be necessary if reviewing resources are limited.
- Specify paper, drafting film, or vellum for signature by the District Bridge Engineer.

3.2.3.2.3.3 D-c82310 Construction of _____ Bridge Structure, S-xxxxx

Use with c82100 Design of Bridge Structure (As-Designed Foundation Provided), S-xxxxx or c82110 Design of Bridge Structure (No As-Designed Foundation Provided), S-xxxxx special provision. For as-designed foundations, in Measurement and Payment, chose the appropriate subsection IV (b), (c), (d), and/or (e) to address overlength or underlength payment situations. When no as-designed foundation is specified, or the contractor chooses an alternate to the as-designed foundation, the foundation should be bid and paid for as a lump sum item. When specifying Pile Dynamic Analysis, use unit price items. When no as-designed foundation is specified in a Karst region, specify unit price items for foundation components.

List any additional construction requirements.

3.2.3.2.3.4 D-c82120 Design of Retaining Wall (As-Designed Foundation Provided), S-xxxxx

Use on projects requiring the design of a new retaining wall where the foundation type and geotechnical design parameters have been developed during conceptual design and will be provided in the bid package. This specification is not to be used for proprietary retaining walls such as MSE or precast modular walls. Edit the following:

- List any additional designer qualifications above those listed in Section II of Special Bidding – Design-Build that may be desired for the particular type of structure.
- List information/data relevant to the design of the particular structure to be made available to the Contractor during bidding, including, but not limited to the items listed. Note that (for steel pile & lagging/wall panel facing type walls), drilled-in (steel) piles are often used over driven steel piles. For instance, the PERMANENT ANCHORED WALLS special provision, Section V.(d) Drilling for Piles, indicates "*Unless otherwise specified or indicated, all piles will be drilled piles constructed in accordance with...*"

Drilled-in piles can typically be placed more accurately than driven piles. Precast concrete wall panels are not permitted for use with driven piles. Cast-in-place concrete wall panels are allowed with driven piles only due to construction tolerances associated with pile driving.

- List any additional design specifications and Railroad requirements over and above those listed in Section VIII of Special Bidding – Design-Build. Be sure to identify which publications listed in Section VIII are superseded.
- Describe general design requirements for this structure, in addition to those listed.
- List the parameters of any allowable geometry changes, but be sure to indicate when no changes will be permitted.
- Specify MPT requirements related to the structure or, if listed elsewhere in the bid package, refer to where it is provided.
- When the structure will be located adjacent to a Railroad, specify the clearance and support requirements.

- List on-wall lighting requirements, if any.
- List waterway requirements, when applicable, as well as parameters for alternate structures, when permitted; reference Permits for Design-Build Projects special provision.
- Refer to Environmental Commitments and Mitigation Tracking System Report special provision, if included in the bid documents.
- List utility information and reference to Utilities special provision.
- List any additional design requirements that do not fit the previous categories.
- Review list of geotechnical parameters with the District Geotechnical Unit and provide the applicable design parameters and construction requirements for the particular structure, and alternate foundation designs, if permitted.
- Review construction phasing with the constructability team to determine how the submittal process can be phased to allow construction to begin earlier than otherwise possible with single final design submittal. Define what partial submissions will be accepted, the level of approval required for construction to commence, and limitations on construction activities associated with the partial approval. Specify any limitations on concurrent partial submittals, or requirements for staggering of partial submissions as may be necessary if reviewing resources are limited.
- Specify paper, drafting film, or vellum for signature by the District Bridge Engineer.

3.2.3.2.3.5 D-c82130 Design of Retaining Wall (No As-Designed Foundation Provided), S-xxxxx

Use on projects requiring the design of a new retaining wall no foundation design was developed during Conceptual Design, and therefore a Foundation Submission is required. This specification is not to be used for proprietary retaining walls such as MSE or precast modular walls. Edit the following:

- List any additional designer qualifications above those listed in Section II of Special Bidding – Design-Build that may be desired for the particular type of structure.
- List information/data relevant to the design of the particular structure to be made available to the Contractor during bidding, including, but not limited to the items listed.
- List any additional design specifications and Railroad requirements over and above those listed in Section VIII of Special Bidding – Design-Build. Be sure to identify which publications listed in Section VIII are superseded.
- Describe general design requirements for this structure, in addition to those listed.
- List the parameters of any allowable geometry changes, but be sure to indicate when no changes will be permitted.
- Specify MPT requirements related to the structure or, if listed elsewhere in the bid package, refer to where it is provided.
- When the structure will be located adjacent to a Railroad, specify the clearance and support requirements.
- List on-wall lighting requirements, if any.
- List waterway requirements, when applicable, as well as parameters for alternate structures, when permitted; reference Permits for Design-Build Projects special provision.

- Refer to Environmental Commitments and Mitigation Tracking System Report special provision, if included in the bid documents.
- List utility information and reference to Utilities special provision.
- List any additional design requirements that do not fit the previous categories.
- For foundations, provide the necessary parameters for contractor to develop a complete foundation design. Although the contractor is required to calculate the actual strength / resistance / *etc.*, the intent herein is to place an upper limit on these values. The appropriate upper limit may be based on available information such as borings, District experience, site conditions, presumptive values, adjacent structures, *etc.*
- Review construction phasing with the constructability team to determine how the submittal process can be phased to allow construction to begin earlier than otherwise possible with single final design submittal. Define what partial submissions will be accepted, the level of approval required for construction to commence, and limitations on construction activities associated with the partial approval. Specify any limitations on concurrent partial submittals, or requirements for staggering of partial submissions as may be necessary if reviewing resources are limited.
- Specify paper, drafting film, or vellum for signature by the District Bridge Engineer.

3.2.3.2.3.6 D-c82320 Construction of Retaining Wall, S-xxxxx

Use with c82120 Design of Retaining Wall (As-Designed Foundation Provided), S-xxxxx or c82130 Design of Retaining Wall (No As-Designed Foundation Provided), S-xxxxx special provision.

- List any additional construction requirements.

3.2.3.2.3.7 D-c82140 Design of Culvert (As-Designed Foundation Provided), S-xxxxx

Use on projects where the foundation type and geotechnical design parameters are provided by the Department. Edit the following:

- List any additional designer qualifications above those listed in Section II of Special Bidding – Design-Build that may be desired for the particular type of structure.
- List information/data relevant to the design of the particular structure to be made available to the Contractor during bidding, including, but not limited to the items listed.
- List any additional design specifications and Railroad requirements over and above those listed in Section VIII of Special Bidding – Design-Build. Be sure to identify which publications listed in Section VIII are superseded.
- Describe general design requirements for this structure, in addition to those listed.
- List the parameters of any allowable geometry changes. Although some projects will require that geometrics closely follow the Conceptual TS&L Plans, one of the benefits of the design-build process is to provide flexibility in Final Design to provide the most effective bridge at a given location. Where possible, specify appropriate geometric criteria/limitations to allow the most efficient design. Be sure to indicate when no changes will be permitted.
- Specify MPT requirements related to the structure or, if listed elsewhere in the bid package, refer to where it is provided.
- List waterway requirements, when applicable, as well as parameters for alternate structures, when permitted; reference Permits for Design-Build Projects special provision.

- Refer to Environmental Commitments and Mitigation Tracking System Report special provision, if included in the bid documents.
- List utility information and reference to Utilities special provision.
- List any additional design requirements that do not fit the previous categories.
- Review list of geotechnical parameters with the District Geotechnical Unit and provide the applicable design parameters and construction requirements for the particular structure, and alternate foundation designs, if permitted.
- Review construction phasing with the constructability team to determine how the submittal process can be phased to allow construction to begin earlier than otherwise possible with single final design submittal. Define what partial submissions will be accepted, the level of approval required for construction to commence, and limitations on construction activities associated with the partial approval. Specify any limitations on concurrent partial submittals, or requirements for staggering of partial submissions as may be necessary if reviewing resources are limited.
- Specify paper, drafting film, or vellum for signature by the District Bridge Engineer.

3.2.3.2.3.8 D-c82330 Construction of Culvert, S-xxxxx

Use with c82140 Design of Culvert (As-Designed Foundation Provided), S-xxxxx

- List additional construction requirements.

3.2.3.2.3.9 D-c82150 Design of Noise Barrier (As-Designed Foundation Provided), S-xxxxx

Use on projects requiring the design of a new noise barrier wall where the foundation type and geotechnical design parameters are provided by the Department. Edit the following:

- List any additional designer qualifications above those listed in Section II of Special Bidding – Design–Build that may be desired for the particular type of wall.
- List information/data relevant to the design of the particular wall to be made available to the Contractor during bidding, including, but not limited to the items listed. Insert the date and title of the Design Noise Report.
- List any additional design specifications and Railroad requirements over and above those listed in Section VIII of Special Bidding – Design-Build. Be sure to identify which publications listed in Section VIII are superseded.
- Describe general design requirements for this wall, in addition to those listed, such as access and hydrant requirements.
- List the parameters of any allowable geometry changes.
- List site class of the foundation material per AASHTO LRFD Bridge Design Specification Section 3.10.3.1.
- Specify MPT requirements related to the wall(s) or, if listed elsewhere in the bid package, refer to where it is provided.
- Refer to Environmental Commitments and Mitigation Tracking System Report special provision, if included in the bid documents.
- List utility information and reference to Utilities special provision.

- List any additional design requirements that do not fit the previous categories.
- Review list of geotechnical parameters with the District Geotechnical Unit and provide the applicable design parameters and construction requirements for the particular structure, and alternate foundation designs, if permitted.
- Review construction phasing with the constructability team to determine how the submittal process can be phased to allow construction to begin earlier than otherwise possible with single final design submittal. Define what partial submissions will be accepted, the level of approval required for construction to commence, and limitations on construction activities associated with the partial approval. Specify any limitations on concurrent partial submittals, or requirements for staggering of partial submissions as may be necessary if reviewing resources are limited.
- Specify paper, drafting film, or vellum for signature by the District Bridge Engineer.

3.2.3.2.3.10 D-c82151 Design of Noise Barrier (No As-Designed Foundation Provided), S-xxxxx

Use on projects requiring the design of a new noise barrier, no foundation design was developed during Conceptual Design, and therefore a Foundation Submission is required. Edit the following:

- List any additional designer qualifications above those listed in Section II of Special Bidding – Design-Build that may be desired for the particular type of wall.
- List information/data relevant to the design of the particular wall to be made available to the Contractor during bidding, including, but not limited to the items listed. Insert the date and title of the Design Noise Report.
- List any additional design specifications over and above those listed in Section VIII of Special Bidding – Design-Build. Be sure to identify which publications listed in Section VIII are superseded.
- Describe general design requirements for this wall, in addition to those listed, such as access and hydrant requirements.
- List the parameters of any allowable geometry changes.
- List site class of the foundation material per AASHTO LRFD Bridge Design Specification Section 3.10.3.1.
- Specify MPT requirements related to the wall(s) or, if listed elsewhere in the bid package, refer to where it is provided.
- Refer to Environmental Commitments and Mitigation Tracking System Report special provision, if included in the bid documents.
- List utility information and reference to Utilities special provision.
- List any additional design requirements that do not fit the previous categories.
- For foundations, provide the necessary parameters for contractor to develop a complete foundation design. Although the contractor is required to calculate the actual strength, resistance, etc., the intent herein is to place an upper limit on these values. The appropriate upper limit may be based on available information such as borings, District experience, site conditions, presumptive values, adjacent structures, etc.

- Review construction phasing with the constructability team to determine how the submittal process can be phased to allow construction to begin earlier than otherwise possible with single final design submittal. Define what partial submissions will be accepted, the level of approval required for construction to commence, and limitations on construction activities associated with the partial approval. Specify any limitations on concurrent partial submittals, or requirements for staggering of partial submissions as may be necessary if reviewing resources are limited.
- Specify paper, drafting film, or vellum for signature by the District Bridge Engineer.

3.2.3.2.3.11 D-c82340 Construction of Noise Barrier, S-xxxxx

Use with c82150 Design of Noise Barrier (As-Designed Foundation Provided), S-xxxxx or c82151 Design of Noise Barrier (No As-Designed Foundation Provided), S-xxxxx special provision.

- List additional construction requirements.
- Specify payment for work not included in Lump Sum price.

Bridge Rehabilitation/Widening**3.2.3.2.3.12 D-c82160 Design of Rehabilitation and/or Widening of Bridge Structure (As-Designed Foundation Provided), S-xxxxx**

Use on projects requiring the design of rehabilitation and/or widening of an existing bridge where a foundation type and geotechnical design parameters are provided by the Department. Edit the following:

- List any additional designer qualifications above those listed in Section II of Special Bidding – Design-Build that may be desired for the particular type of structure.
- List information/data relevant to the design of the particular structure to be made available to the Contractor during bidding, including, but not limited to the items listed.
- List any additional design specifications and Railroad requirements over and above those listed in Section VIII of Special Bidding – Design-Build. Be sure to identify which publications listed in Section VIII are superseded.
- Describe general design requirements for this structure, in addition to those listed.
- List the parameters of any allowable geometry changes, but be sure to indicate when no changes will be permitted.
- List site class of the foundation material per AASHTO LRFD Bridge Design Specification Section 3.10.3.1.
- Specify girder and joint requirements and limitations. Add others as necessary.
- State substructure limitations/allowances.
- When temporary bridges will be required for maintenance and protection of traffic purposes during construction, list design and construction requirements.
- Specify MPT requirements related to the structure or, if listed elsewhere in the bid package, refer to where it is provided.
- When the structure will be located adjacent or over a Railroad, specify the clearance and support requirements.

- Provide additional requirements for future widening to be incorporated into the design, when desirable.
- Provide additional design requirements for future redecking, when appropriate, within the listed items.
- List on-bridge lighting requirements, if any.
- List waterway requirements, when applicable, as well as parameters for alternate structures, when permitted; reference Permits for Design-Build Projects special provision.
- Refer to Environmental Commitments and Mitigation Tracking System Report special provision, if included in the bid documents.
- List utility information and reference to Utilities special provision.
- List any additional design requirements that do not fit the previous categories.
- Review list of geotechnical parameters with the District Geotechnical Unit and provide the applicable design parameters and construction requirements for the particular structure, and alternate foundation designs, if permitted.
- Review construction phasing with the constructability team to determine how the submittal process can be phased to allow construction to begin earlier than otherwise possible with single final design submittal. Define what partial submissions will be accepted, the level of approval required for construction to commence, and limitations on construction activities associated with the partial approval. Specify any limitations on concurrent partial submittals, or requirements for staggering of partial submissions as may be necessary if reviewing resources are limited.
- Specify paper, drafting film, or vellum for signature by the District Bridge Engineer.

3.2.3.2.3.13 D-c82170 Design of Rehabilitation and/or Widening of Bridge Structure (No As-Designed Foundation Provided), S-xxxxx

Used on projects requiring the design of rehabilitation and/or widening of an existing bridge, no foundation design was developed during Conceptual Design, and therefore a Foundation Submission is required. Edit the following:

- List any additional designer qualifications above those listed in Section II of Special Bidding – Design-Build that may be desired for the particular type of structure.
- List information/data relevant to the design of the particular structure to be made available to the Contractor during bidding, including, but not limited to the items listed.
- List any additional design specifications and Railroad requirements over and above those listed in Section VIII of Special Bidding – Design-Build. Be sure to identify which publications listed in Section VIII are superseded.
- Describe general design requirements for this structure, in addition to those listed.
- List the parameters of any allowable geometry changes, but be sure to indicate when no changes will be permitted.
- List site class of the foundation material per AASHTO LRFD Bridge Design Specification Section 3.10.3.1.
- Specify girder and joint requirements and limitations. Add others as necessary.

- State substructure limitations/allowances.
- When temporary bridges will be required for maintenance and protection of traffic purposes during construction, list design and construction requirements.
- Specify MPT requirements related to the structure or, if listed elsewhere in the bid package, refer to where it is provided.
- When the structure will be located adjacent or over a Railroad, specify the clearance and support requirements.
- Provide additional requirements for future widening to be incorporated into the design, when desirable.
- Provide additional design requirements for future redecking, when appropriate, within the listed items.
- List on-bridge lighting requirements, if any.
- List waterway requirements, when applicable, as well as parameters for alternate structures, when permitted; reference Permits for Design-Build Projects special provision.
- Refer to Environmental Commitments and Mitigation Tracking System Report special provision, if included in the bid documents.
- List utility information and reference to Utilities special provision.
- List any additional design requirements that do not fit the previous categories.
- For foundations, provide the necessary parameters for contractor to develop a complete foundation design. Although the contractor is required to calculate the actual strength / resistance / *etc.*, the intent herein is to place an upper limit on these values. The appropriate upper limit may be based on available information such as borings, District experience, site conditions, presumptive values, adjacent structures, *etc.*
- Review construction phasing with the constructability team to determine how the submittal process can be phased to allow construction to begin earlier than otherwise possible with single final design submittal. Define what partial submissions will be accepted, the level of approval required for construction to commence, and limitations on construction activities associated with the partial approval. Specify any limitations on concurrent partial submittals, or requirements for staggering of partial submissions as may be necessary if reviewing resources are limited.
- Specify paper, drafting film, or vellum for signature by the District Bridge Engineer.

3.2.3.2.3.14 D-c82350 Construction of Rehabilitation and/or Widening of Bridge Structure, S-xxxxx

Use with c82160 Design of Rehabilitation and/or Widening of Bridge Structure (As-Designed Foundation Provided), S-xxxxx or c82170 Design of Rehabilitation and/or Widening of Bridge Structure (No As-Designed Foundation Provided), S-xxxxx special provision. Include all items for which quantities can be defined at the Conceptual TS&L stage in this lump sum item, such as removal of portion of existing bridge, concrete for a new deck and parapets, reinforcement bars, *etc.* Identify separate unit price pay items for which quantities cannot be defined at the Conceptual TS&L, such as deck repairs, repair of deteriorated substructures, crack repair, *etc.* For as-designed foundations, provide separate unit price pay items to address conditions that may be encountered beyond the contractor's control, such as pile or caisson lengths. When no as-designed foundation is specified, or the contractor chooses an alternate to the as-designed foundation, the foundation should be bid and paid for as a lump sum item.

List additional construction requirements.

3.2.3.2.3.15 D-c82180 Design of Superstructure Replacement, S-xxxxx

Use on projects where the existing superstructure is to be replaced on a structure. Edit the following:

- List any additional designer qualifications above those listed in Section II of Special Bidding – Design-Build that may be desired for the particular type of structure.
- List information/data relevant to the design of the particular structure to be made available to the Contractor during bidding, including, but not limited to the items listed.
- List any additional design specifications and Railroad requirements over and above those listed in Section VIII of Special Bidding – Design-Build. Be sure to identify which publications listed in Section VIII are superseded.
- Describe general design requirements for this structure, in addition to those listed.
- List the parameters of any allowable geometry changes, but be sure to indicate when no changes will be permitted.
- List site class of the foundation material per AASHTO LRFD Bridge Design Specification Section 3.10.3.1.
- Specify girder and joint requirements and limitations. Add others as necessary.
- When temporary bridges will be required for maintenance and protection of traffic purposes during construction, list design and construction requirements.
- Specify MPT requirements related to the structure or, if listed elsewhere in the bid package, refer to where it is provided.
- When the structure will be located adjacent or over a Railroad, specify the clearance and support requirements.
- Provide additional design requirements for future redecking, when appropriate, within the listed items.
- List on-bridge lighting requirements, if any.
- List waterway requirements, when applicable, as well as parameters for alternate structures, when permitted; reference Permits for Design-Build Projects special provision.
- Refer to Environmental Commitments and Mitigation Tracking System Report special provision, if included in the bid documents.
- List utility information and reference to Utilities special provision.
- List any additional design requirements that do not fit the previous categories.
- Review construction phasing with the constructability team to determine how the submittal process can be phased to allow construction to begin earlier than otherwise possible with single final design submittal. Define what partial submissions will be accepted, the level of approval required for construction to commence, and limitations on construction activities associated with the partial approval. Specify any limitations on concurrent partial submittals, or requirements for staggering of partial submissions as may be necessary if reviewing resources are limited.

3.2.3.2.3.16 D-c82360 Construction of Superstructure Replacement, S-xxxxx

Use with c82180 Design of Superstructure Replacement, S-xxxxx special provision. Include items for which quantities can be defined at the Conceptual TS&L stage in this lump sum item, such as removal of portion of existing bridge, concrete for a new deck and parapets, reinforcement bars, etc. Identify separate unit price pay Items for which quantities cannot be defined at the Conceptual TS&L, such as repair of deteriorated substructures, crack repair, etc. List additional construction requirements.

Other Structures**3.2.3.2.3.17 D-c82190 Design of Intelligent Transportation Devices and Dynamic Message Sign Structures (No As-Designed Foundations Provided), S-xxxxx**

For use on projects requiring the design of ITS devices and of DMS Support Structures and Foundations. Structure design is to be in accordance with Publication 647M ITS-1003M. Components include DMS Support, Structure and Foundation; CCTV Poles and Foundations; VDS Poles and Foundations; Tag Reader Mast Arms, Poles, and Foundations; and CCTV, VDS, and TTS-TR attachments to existing structures:

- Insert the S-number for each DMS structure in the Header
- List each DMS structure by S-number and location in the Description
- List any additional designer qualifications above those listed in Section II of Special Bidding – Design-Build that may be desired for the particular type of wall (or indicate "None").
- List any additional design specifications over and above those listed.
- Describe general design requirements in addition to those listed. Include any needed provisions to accommodate future widening.
- List any additional design requirements that do not fit the previous categories.
- Specify MPT requirements related to the devices and structures or, if listed elsewhere in the bid package, refer to where it is provided.
- Insert instructions regarding location of utilities, and supply of power and communication services.
- Insert all necessary information for foundation design.
- Specify paper, drafting film, or vellum for signature by the District Bridge Engineer.

3.2.3.2.3.18 D-c82370 Construction of Intelligent Transportation System Devices and Dynamic Message Sign Structures, S-xxxxx

Use with c82190 Design of Intelligent Transportation System Devices and Dynamic Message Sign Structure, S-xxxxx special provision. Insert the S-number for each structure in the Header and in Section IV, Measurement and Payment. List additional construction requirements.

Shop Drawings

There are two options for review of shop drawings: by the Department (or its design consultant) or by the contractor's Lead Design Engineer. Department review is covered by Publication 408, *Specifications*, Section 105.02(d). When review by the Lead Design Engineer is desired include the following Special Provision:

3.2.3.2.3.19 a10502 - Bridge Shop Drawings

Use when review and acceptance of the shop drawings will be performed by the Contractor's Lead Design Engineer.

3.2.3.2.4 Maintenance and Protection of Traffic Special Provisions

Include the following special provisions on projects with traffic control as a Design Activity component of the project.

3.2.3.2.4.1 D-c29902 - Design Traffic Control Plan

Identifies the traffic control related design activities to be performed by the Contractor. Edit the following:

- List any additional designer qualifications above those listed in Section II of Special Bidding – Design–Build that may be desired for any unique features on the project.
- List any additional design specifications over and above those listed in Section VIII of Special Bidding – Design–Build. Be sure to identify which publications listed in Section VIII are superseded.
- If an Incident Management Plan and a Transportation Management Plan are required, include the appropriate text.
- If no Conceptual Traffic Control Plans are provided with the bid package, list requirements for MPT criteria specific to the project such as minimum lane widths, lane restriction limitations, time restrictions, special event restrictions, and District specific requirements.
- Specify the partial plan submission review procedure. Partial submissions are strongly encouraged, but can be limited to fit the circumstances. Review construction phasing with the constructability team to determine how the submittal process can be phased so that TCPs can be submitted by individual phases rather than a single final design submittal. Define what partial submissions will be accepted, the level of approval required for MPT activities to commence, and limitations on construction activities associated with the partial approval.

3.2.3.2.4.2 D-c29903 - Construction of Maintenance and Protection of Traffic

Must accompany I-c29902-A Design Traffic Control Plan in the bid package. It covers the actual construction of the work indicated on the plans developed under the Design Traffic Control Plan item.

3.2.3.2.5 Right-of-Way Special Provisions

Include following special provision on the project if the preparation of Final Right-of-Way Plans and the provision of Right-of-Way Services are included as a design activity.

- D-c29904 Right-of-Way Design and Acquisition Services

Edit the following:

- List any additional professional service qualifications above those listed in Section II of Special Bidding – Design–Build that may be desired for the particular type of services required.
- List information/data relevant to the right-of-way status of the project.
- Section II(e)5, must identify all Right-of-Way Clearances required on the construction contract. If projects are grouped, identify the Clearance required for each MPMS project, either as Clearances obtained by the Department by the time of advertisement, or as Clearances required to be obtained by the contractor through providing the services described in this special provision. For each MPMS

project listed, identify the limits of each project, including SR, segments or range, and any limitations to construction activities included.

3.2.3.2.6 Utility Special Provisions

Include the following special provision on projects to require the Contractor to coordinate the various aspects of utility relocation activities. If utilities will be cleared prior to design-build contract advertisement, no special provision is needed, and a Utility Clearance (Form D-419) must be included.

- D-c01072 Utility Relocation Information for Design-Build Projects

Edit the following:

- Select the appropriate text for the Description depending on the status of the project.
- Determine if a Utility Coordination Manager needs to be assigned to the project if the utility relocations are complex.
- List the utilities on the project along with contact names, phone numbers and identify any operational restrictions utilities may have that would impact facility relocations (i.e., blackout dates for service interruptions, required lead times to deactivate facilities).
- Specify a partial payment schedule if the project has utility relocations that will occur in stages, apportioning the payment among the stages. Also include a partial payment schedule to cover circumstances where utilities are temporarily relocated for construction, and then must be relocated back to the original location at the end of construction. Another example of when a partial payment schedule would be needed is a bridge reconstruction where a water line would have to be reattached to a new superstructure late in the project.

3.2.3.2.7 Environmental / Permitting Special Provisions

Include the following special provisions on all One-Step, Low Bid projects:

3.2.3.2.7.1 N-a10561 Environmental Commitments and Mitigation Tracking System (ECMTS) Report

Identifies the environmental clearance obtained for the project, lists all the environmental commitments, and requires the contractor to maintain the Environmental Commitments Mitigation Tracking System Report (ECMTS) during final design and construction. Edit the following:

- Indicate the level of environmental clearance obtained for the project.
- Indicate the CEE Expert System Package Number to provide access to the Environmental Documents.
- Insert the list of all environmental commitments to be tracked by the contractor during Final Design and construction.

3.2.3.2.7.2 D-c01070 Permits for Design-Build Projects

Identifies the permits that the contractor is responsible to obtain, if applicable. Edit the following:

- List the applicable permits/approvals the contractor will be required to obtain.
- Determine if the Conceptual E&S Plan, Conceptual SWM Plan, H&H Report and Preliminary Drainage and SWM design computations are available. Add available documents to project attachments.
- Add DRAFT ECMTS to project attachments.

3.2.3.2.8 Concrete Curb Ramp Special Provisions

Include the following special provisions on projects that have the applicable work related to Concrete Curb Ramps as part of the design-build project. Approval must be requested from the Chief of Project Schedules, Specifications and Constructability Section of the Highway Delivery Division to proceed with a project that will include payment for curb ramp design by lump sum, rather than by quadrant or each for design.

3.2.3.2.8.1 Design of Concrete Curb Ramps

Use for the design and preparation of drawings for the construction of ADA accessible curb ramps. Two versions of the Special Provision are available for use, including Payment made by each quadrant, and payment by each ramp. For either option, edit the following of the appropriate special provision:

- List any additional designer qualifications above those listed in Section II of Special Bidding – Design-Build that may be desired for any unique features on the project.
- List any additional design specifications over and above those listed in Section VIII of Special Bidding – Design-Build. Be sure to identify which publications listed in Section VIII are superseded.
- Determine need to modify Traffic Signal Permit Plans.
- Delete requirement to provide photographs of each location if not necessary.

3.2.3.2.8.2 Construct Concrete Curb Ramps and Sidewalks (Square Yard)

The pay item for construction where payment is on a square yard basis for use on design-build projects. This is the preferred item for ADA curb ramps since the particular characteristics of each location can result in widely varying ramp dimensions. Provide an estimated quantity in the bid documents.

3.2.3.2.8.3 D-a00150 Revised Changed Condition Clause for Design Build Projects with ADA Curb Ramp Items of Work

This special provision is mandatory when curb ramps are included as a design-build activity in any project.

3.2.3.2.9 Special Provision Checklist

An optional Special Provision Checklist is included in APPENDIX C.

3.2.3.3 Bid Items

Unlike conventional design-bid-build contracts, design-build projects have very few contract items; limited to the typically paired "Design of" and "Construct" items. A few standard items must be included, and other unit price should be considered, depending on the scope of the project.

3.2.3.3.1 Standard Items

Include standard items in the bid package:

- 0608-0001 Mobilization
- 0686-000X Construction Surveying – when appropriate
- 0689-000X Construction Scheduling – choose appropriate type, CPM Schedule is preferred for design-build

3.2.3.3.2 Unit Price Items

There are instances where unit price bid items should accompany lump sum construction special provisions. Work Class Codes assigned to items should be in accordance with Publication 51, *Specifications and Estimate Package Delivery Process Policies and Preparation Manual*, and must be reviewed to assure that a properly pre-qualified

contractor will be able to bid the project. Coordinate with Prequalification Office regarding questions on Work Class Codes.

Depending on the specific scope of the project, consider breaking out certain unit price items from lump sum items that cover work too difficult to bid reasonably within the lump sum; work that is of an uncertain extent, high risk, subject to subsurface variations, or where the quantities will be determined with input from or direction by the Department after Award. Examples are:

- Deck repairs
- Pavement patching
- Undercut
- Leveling courses
- Foundation elements such as piles, drilled shaft foundations, Class C concrete for no as-designed foundations
- Pile Dynamic Testing/Analysis for no as-designed foundations
- Spall repair
- Joint inspection and repair
- Test borings for no as-designed foundations
- Utility relocations
- Hazardous waste removal and disposal

Consult the District Construction Unit or Constructability review team for recommendations for other unit price items appropriate for the specific project.

3.2.3.4 Project Development Checklist

3.2.3.4.1 Project Development Checklist Items

The selection of appropriate Project Development Checklist Items for bid package preparation generally follows the same process and requirements as a traditional design/bid/build project in accordance with Publication 51, *Plans, Specifications and Estimate Package Delivery Process Policies and Preparation Manual*. Before any attempt is made to submit a bid package, it is very important to obtain all required documents, contract drawings, design estimates, and supporting data. Follow the procedures outlined in Publication 10, Design Manual Part 1, *Transportation Program Development and Project Delivery Process* and Publication 10C, Design Manual Part 1C, *Transportation Engineering Procedures*, Section 4, for the design development process. A final plan check and "Plan Review Report" are required for all projects with plans. Make sure that all necessary documentation is scanned and/or imported in the appropriate locations on the Project Development Checklist (PDC) in ECMS.

Supporting documents, such as environmental clearances and re-evaluations, funding authorization, Program Management Committee (PMC) approvals, Department of Environmental Protection (DEP) and Corps of Engineer Permits, utility and right-of-way clearances, agreements, and related administrative requirements, must also be scanned and imported in the appropriate fields on the Project Development Checklist. Missing supporting documents complicate the Plans, Specifications and Estimate (PS&E) process. This may generate errors and warnings in ECMS, and may affect project advancement to publication.

During the preparation of a design-build bid package, the following items should be provided to bidders in addition to the standard Project Development Checklist items:

- Environmental Commitment and Mitigation Tracking System (ECMTS) Report/Matrix
- Preliminary Drainage and Storm Water Management Hydraulic Computations
- Hydrologic and Hydraulics Report
- Conceptual Storm Water Management Plan
- Foundation Design Guidance Report
- Design Exception Report
- Land XML Files – include at a minimum:
 - Surveyed surface(s)
 - Design surface(s)
 - Alignment file(s)

Provide reproducible attachments to the bid package that will be pertinent to construction. Make sure that the "include in bid package" button is checked on those documents that are necessary for the contractor to see. DO NOT check this button for documentation not to be viewed by the contractor. This is especially important for documentation that includes the cost estimate that is not public information.

The "include in bid package" button should NOT be checked for the following attachments:

- Pre-Bid (Cost) Estimate
- Project Screening Checklist and Action Plans (as appropriate)
- Railroad agreements
- Submittal Review Responsibility Checklist

3.2.3.4.2 Cost Estimate and Pre-bid Schedule

Include a construction cost estimate with the PS&E submission. Develop the cost estimate in accordance with Publication 352, *Cost Estimating Manual*. The construction cost estimate should be a mid-level itemized estimate, similar to what is prepared for the Design Field View and TS&L stage of a design/bid/build project, except that design costs must also be included. The major items of the project should be identified and a minimum of 30 to 40 items would typically be developed.

In developing the estimate, document the factors being utilized to account for the contractor's risks associated with the particular design activities on the project. Also include all assumptions regarding quantities, bid costs, design costs, and work force rates, etc.

Include a pre-bid construction CPM schedule with the PS&E submission. The construction schedule should be similar to what is prepared for a typical design/bid/build project, except it will need to include reasonable time frames for preparing design activities and appropriate submission review periods. The review times provided in the schedule should be consistent with the durations listed in Section VII of the SPECIAL BIDDING – DESIGN-BUILD special provision. Where partial plans submissions are permitted, include the review time for a reasonable number of partial plan submissions in the pre-bid CPM schedule. If Right-of-Way Design and Acquisition Services is a design activity, include sufficient time for property acquisition proceedings.

3.2.4 FINAL PACKAGE PROCESS

3.2.4.1 DBE Goal

The District Contract Management Unit will request the approval of the DBE goal from the Contract Management Section. Specify that the project is Low-Bid design-build when requesting the goal. The DBE goal will be developed by examining the design and construction portions of the project and then combining the goals into one overall project percentage goal.

- Standard Design Estimate x DBE Design Goal = Design Goal Dollar amount
 - o The Contract Management Section, Highway Delivery Division, and Bureau of Project Delivery will determine the appropriate DBE Goal for the estimated design portion of the contract.
- Standard Construction Estimate x DBE Construction Goal = Construction Goal Dollar amount
 - o Contract Management Section will determine the appropriate DBE Construction Goal for the construction elements of the contract.

Therefore:

- $(\text{Design Goal Dollar amount} + \text{Construction Goal Dollar amount}) / \text{Design-Build Project Estimate} = \text{Low Bid Design-Build DBE Project Goal}$

3.2.4.2 Bid Package for Central Office for Review

Once the Bid Package has been developed and is ready to be published, the District Contract Management Unit will forward the Bid Package to Central Office Project Schedules, Specifications, and Constructability Section of the Highway Delivery Division for their review and concurrence to publish. In addition, the District Project Manager

will review the previously proposed Bid due date (typically 7 weeks) and propose any adjustments to Central Office based on the current project schedule.

Districts are permitted to request authorization to publish design-build projects meeting the "Non-Complex (Minor) Project" criteria as defined in Publication 10, Design Manual Part 1, *Transportation Program Development and Project Delivery Process*, Table 2.1 by submitting a written request to the Chief of Highway Delivery Division. Any such request must demonstrate the District's successful use of design-build on similar projects in the previous year. The evaluation of request will be based on findings of previous reviews for similar projects. Authorization requests can be renewed annually and will be based on successful Quality Assurance Reviews conducted by Project the Schedules, Specifications, and Constructability Section for similar projects.

3.2.4.3 Bid Package Published in ECMS

Once the Bid Package has been approved by the Central Office Reviewer (if required), and FHWA for Federal Oversight projects the Bid Package will be published. For Low Bid projects, advertisements must be published in accordance with Publication 10C, Design Manual Part 1C, *Transportation Engineering Procedures*, Section 5. Low Bid design-build projects require a minimum five week advertisement period (unless otherwise approved by the Chief of the Highway Delivery Division).

3.2.4.4 Optional Pre-Bid Meeting

Pre-bid meetings can be useful when the project contains unique features or design parameters. However, the preferred criteria for Low Bid generally limit projects to those more conventional in nature. Should a Pre-bid Meeting be desired, follow the guidelines in Publication 51, *Specifications and Estimate Package Delivery Process Policies and Preparation Manual*.

3.2.5 BID SUBMISSION, OPENING, AND CONTRACT AWARD

Once the Bid Package has been published in ECMS, the standard bid submission, opening, and contract award process is handled by Central Office in the same manner as the conventional design/bid/build projects. The only variation with design-build are the requirements in the Special Provision SPECIAL BIDDING – DESIGN-BUILD, Part 1, for the Bidder to submit certain assurances regarding design firms being used in the bid. If the Bidder's design firms are unable to comply with Section III of SPECIAL BIDDING – DESIGN-BUILD, the Bidder must submit to the Project Manager the "Request for Consideration of Professional Services Involvement Restrictions". Upon receipt, fax the completed form to the Contract Management Section Chief at 717-705-2378 for concurrence by Contract Management Section and Office of Chief Counsel. Refer to [Section 3.3.1](#) for follow-up actions.

3.3 POST-AWARD - FINAL DESIGN SUBMISSIONS AND CONTRACT ADMINISTRATION

This section is intended to guide the District Construction Unit personnel through the design and plan approval process that occurs subsequent to contract award. Depending on District preferences, the Design Project Manager may maintain the role of submittal manager during the final design phase by the contractor, or have a Design-Build Coordinator maintain control over the project throughout the construction phase. Regardless, the key to the success of a design-build project and full realization of the advantages of design-build is effective, efficient, and timely submittal management.

All of the procedural requirements for contractor's design submissions are identified in the Special Provisions for the design items, the Quality Plan, and SPECIAL BIDDING – DESIGN-BUILD. SPECIAL BIDDING – DESIGN-BUILD is the central Special Provision for design-build contracts, which identifies the Design Activities, the elements of the final design for which the contractor is responsible, the Department contact information, and the submittal procedures – whether the contractor is required to make electronic submissions via a Department-established ftp site, or paper submissions. If the latter is specified, SPECIAL BIDDING – DESIGN-BUILD indicates how many sets of drawings and calculations the contractor is required to submit. Always refer to the Special Provisions for the contractor submittal requirements.

The offices and individuals responsible for the review and approval of the various design submission vary, depending on whether the project is Federal Oversight, or Department Oversight, and whether the structures are of a

particular type, size, or cost, as dictated by Publication 10C, Design Manual Part 1C, *Transportation Engineering Procedures* and Publication 15M, Design Manual Part 4, *Structures*. In addition, there may be certain plans that must be submitted to outside agencies for approval. To eliminate the uncertainty once the project responsibility has been transferred from Project Management, this Manual requires the Design Project Manager at the conclusion of the Conceptual Design phase to establish and document the reviewing party for each of the submittals listed in Section VII of SPECIAL BIDDING - DESIGN-BUILD. This document is to be included as an attachment to the Project Development Checklist, but not published with bid package. Although this Manual recommends a Submittal Review Responsibility checklist (APPENDIX B) be completed specifically for each project, it is District Project Management's choice as to the method to convey the information.

Also required to be included in any document identifying the reviewing parties is the number of sets required to be sent to each reviewing party when paper submissions are specified. Additionally, the document will identify if a design consultant under agreement with the District will be tasked to assume the District's role as a reviewing party. Obtain this document from the Design Project Manager.

On contracts where the special provision QUALITY PLAN – WITH QUALITY ASSURANCE BY PEER REVIEW is included, quality assurance reviews are handled by the contractor through the third party peer reviewer. The reviews identified in Section VII of SPECIAL BIDDING - DESIGN-BUILD and the Submittal Review Responsibility checklist are Owner's Perspective Reviews, as defined in QUALITY PLAN – WITH QUALITY ASSURANCE BY PEER REVIEW.

In overview, the post-award phase requires that a significant amount of coordination occur between the Department and the contractor and its Lead Design Engineer. It should go without saying that significant delays can result if coordination is not facilitated. Whether the Assistant Construction Engineer, the Design Project Manager, or the Design-Build Coordinator, the individual designated to manage the submittal process must do so proactively, in the same manner as managing the construction itself – with the goal of keeping the contractor's fate in their own hands at all times.

One additionally important aspect of the initial Post-Award phase is to review and approve the contractor's Schedules of Values submissions for payment on certain lump sum design-build items. Processing of the first estimate is contingent upon approval of all Schedules of Values. Refer to [Section 3.3.5](#) for details. Timely submission by the contractor and approval by the Department of these Schedules of Values will meet the Department goal of prompt payment for all subcontractors.

3.3.1 PRIOR TO AWARD

If the contractor's selected Lead Design Engineer or subconsultant does not meet the requirements of Section III of SPECIAL BIDDING - DESIGN-BUILD, the Professional Services Involvement Restriction, the contractor is permitted to submit a Request for Consideration for Professional Services Involvement Restrictions form (available on the References tab on ECMS) immediately upon notification of low bid. Immediately upon receipt, email or fax the completed form to the Contract Management Section Chief at 717-705-2378 for concurrence by the Contract Management Section and Office of Chief Counsel. The Contract Management Section will notify the District of the results of the review. Do not approve the Design Activities Identification and Qualification form until the involvement restriction issue is resolved.

3.3.2 IMMEDIATELY AFTER AWARD

Three calendar days after award, Section II of SPECIAL BIDDING - DESIGN-BUILD requires the contractor to submit the Design-Build Design Activities Firm Identification and Qualifications form. This document includes resumes of key staff of the contractor's Lead Design Engineer staff (including Secondary Design Service Professionals). Forward to the ADE – Design for review and approval. The response must be transmitted to the contractor within eight calendar days.

Within five days of the approval of the Quality Control Reviewer identified by the contractor on the Design-Build Design Activities Firm Identification and Qualifications form, either the special provision QUALITY CONTROL PLAN – WITH QUALITY ASSURANCE BY DEPARTMENT REVIEW, or QUALITY PLAN – WITH QUALITY ASSURANCE BY PEER REVIEW (QUALITY PLAN) require the initial submission of the Lead Design Engineer's Quality Plan for review. Also forward to the ADE – Design for review.

Coordinate with the contractor to schedule a Quality Coordination Meeting within 10 days after the Notice-to-Proceed, either separately or in conjunction with the Pre-Construction Conference. Follow the requirements of the appropriate Quality Control Plan special provision in conducting the meeting. Refer to [Section 3.3.4.1](#) for the remaining submission requirements for the Quality Plan.

3.3.2.1 Establish Digital Plan Submission System

Section VI of SPECIAL BIDDING – DESIGN-BUILD will specify whether a File Transfer Protocol (ftp) site for the purposes of distributing electronic plan submissions to and from reviewing parties will be required. The ftp site will either be specified to be provided by the Department or the contractor. If provided by the Department, arrange for the establishment of a password protected, project specific folder in advance of the Pre-Construction Conference. Establish a user name and password for the folder. Regardless of who maintains the site, provide direction as to the establishment of subfolders within the project folder for each of the Design Activities identified in Section IV of SPECIAL BIDDING - DESIGN-BUILD. Within each design activity subfolder, create a subfolder for each deliverable identified in the Special Provision for that design activity. For example, for Item 8210-xxxx, Design of Bridge Structure (As-Designed Foundation Provided), the subfolders would include: Final TS&L, Final Plan – Substructure, Final Plan – Superstructure, Final Plan Set, Computations, and As-Built Drawings. If the Special Provision permits partial plan submittals, include further subfolders for each of the identified submissions.

Establish an email distribution list based on the Submittal Review Responsibility checklist. Include the District's design consultant if tasked to perform reviews. The process functions as follows:

- The Contractor uploads documents to be reviewed to the ftp site and notifies the distribution list that a document has been submitted for review to the ftp site.
- Reviewer performs the review, uploads final comments or final approval to the ftp site and notifies the distribution list that a document has been reviewed and the comments or approval are on the ftp site.
- Repeat as needed as comments are addressed.

Be responsible to coordinate review comments as detailed in [Section 3.3.4.2.1](#).

In advance of the Pre-Construction Conference, prepare a memorandum for distribution to the contractor and reviewing parties detailing the submission of digital plans for review. Include:

- Discussion of protocol for any acceptance of partial submissions, if permitted in the Special Provisions
- FTP site information including site location, user name, password, description of folders to be used
- File naming convention
- Email distribution list once a submission has been posted to the ftp site
- Review process for uploading review comments (folder location, file naming convention, email distribution list)

3.3.2.2 Establish Paper Plan Submission System

Refer to the Submittal Review Responsibility checklist, and establish an email contact list to assist in the expediting of paper submissions.

3.3.2.3 Submittal Management Set-up Checklist

The checklist in APPENDIX D Submittal Management Set-up Checklist can be used as a guide to define specific processes and protocols to be integrated into the post-award/design phase, particularly with regard to digital plan submissions.

3.3.2.4 Prompt Payment

In order to ensure prompt current estimate payments for initial Design activities, the method of processing payments must be established and initiated within 15 days of the issuance of Notice to Proceed, or as soon as the Schedules of

Values as required by certain lump sum design-build items are approved. Refer to Section IX of SPECIAL BIDDING – DESIGN-BUILD and [Section 3.3.5](#) for requirements. Choose one of the two following methods:

- ECMS payment processing: Payments processed in ECMS can be made from any computer, including within District Offices or from the Field Office.
- NextGen payment processing: Payments processed in the NextGen system will require the use of a secure computer connection.
 - If a field office is specified to be installed immediately following the Notice to Proceed, all payments will be processed through the field office.
 - If a field office is not required to be installed immediately following the Notice to Proceed, an alternate method of processing payments must be established.
 - Option A: Load NextGen schedule onto a network computer within the District Offices and process payments at this location. Once the field office is installed, the NextGen schedule will need to be downloaded from the network computer and installed on the laptop computer in the field office.
 - Option B: Load NextGen schedule onto a leased laptop computer and use to process payments at an alternate location. For some projects, the laptop computers can be set-up at different field office. Caution should be used with using a leased laptop computer to process payments within District Offices. Leased laptop computers are not permitted to be connected to the Department's network, but internet connection is required. Coordinate with the IT unit to establish a connection method. For some Districts, it may be possible to use Training facilities to obtain an internet connection independent of the Department's network system.

3.3.3 PRECONSTRUCTION CONFERENCE

Review the submittal procedures in detail at the Preconstruction Conference. Identify any changes. If necessary, establish a schedule of biweekly coordination meetings, either in person or by teleconference, to be held during the Final Design submittal preparation phase.

3.3.4 GENERAL SUBMITTAL ITEMS

[Figure 3.3.4-1](#) illustrates the highlights of the Contractor's Lead Design Engineer's submissions during the Final Design phase after award. The substantive design specifications and submittal content requirements are identified in the design special provision items. Refer to the Submittal Review Responsibility checklist.

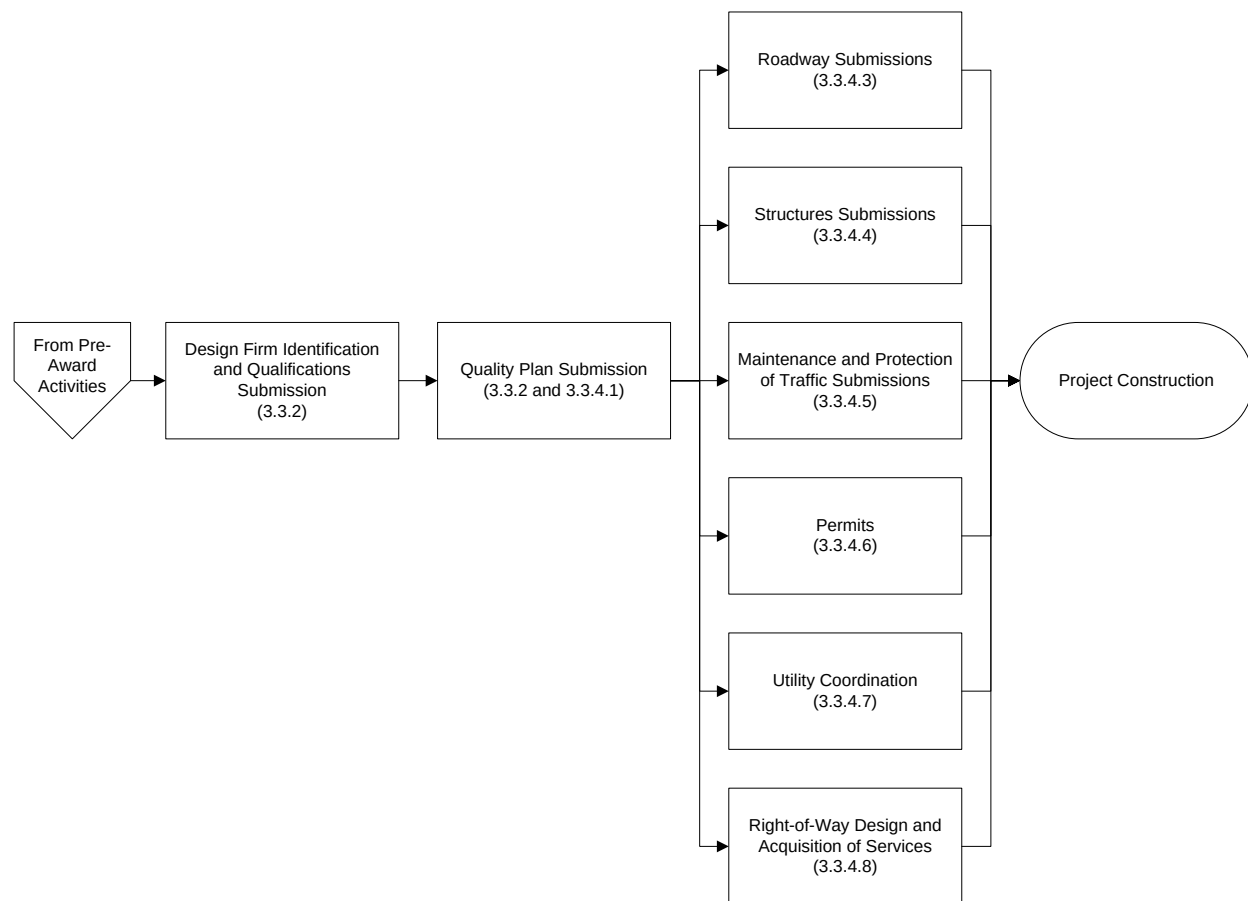


Figure 3.3.4-1 – Overview of Post-Award/Design Activities

3.3.4.1 Quality Plan (either QA by Department Review or QA by Peer Review)

With the Design Firm Identification and Qualifications approved and the Quality Coordination Meeting held (as discussed in [Section 3.3.2](#)), the Lead Design Engineer is required by the Special Provisions to submit the final Quality Plan for review within a specified number of days after the Coordination Meeting. Refer to the Part III (d) of the QUALITY PLAN special provision. The Quality Plan is typically reviewed and approved by the ADE - Design or the Director, Bureau of Project Delivery. Refer to the Submittal Review Responsibility checklist. Upon acceptance, the entire Quality Plan becomes part of the contract documents. Once work begins under the approved Quality Plan, continuously evaluate the work in accordance with the Quality Plan. Do not implement any changes without prior acceptance by the Department.

The Quality Assurance Specification requires the Contractor to compile, maintain, and submit a status report every 30 calendar days following the approval of the Quality Plan. The report is to be filed on the form titled "Design Activity Submissions Monthly Report" available in the ECMS File Cabinet under the References tab. The Contractor must continue to file the Report until the Final Drawings have been Released for Construction. Upon receipt of this form from the Contractor, forward it to the Chief of HDD.

3.3.4.2 Submittal Details

3.3.4.2.1 Coordination of Review Comments and Issuance of Reviewed Plans

Coordinate comments from reviewers for the Quality Assurance reviews when performed by the Department, or for the Owner's perspective reviews when Quality Assurance is by Peer Review. Where reviews are performed by outside agencies, facilitate with those agencies to the extent that the Department's best interests are served by the contractor's submissions receiving a timely review and resolution of issues.

Once submissions have been uploaded to the ftp site and the reviewers notified, or in the case of paper submissions the copies have been distributed, facilitate and coordinate comments from all reviewing parties, including outside agencies. Comments should be exchanged preferably via email or fax. To facilitate timely responses, encourage reviewers to discuss the comments via meeting or teleconference, and prepare a single set of comments comprised of comments agreed upon by the reviewers. If the District has tasked one of its design consultants with the review, the responsibility of gathering and preparing review comments can be delegated to the consultant. The design consultant should provide comments to or initiate discussions with the Department's reviewers as soon as possible, so that the Department's reviewers have sufficient time to conduct reviews. Even when using consultant reviewers, the District remains responsible to ensure that comments are consolidated (to eliminate redundant comments), are specific and "value added" in nature, and are submitted within the timelines established in the contract. If permitted in the Special Provisions and included in the Quality Plan, partial submissions within each design item may be submitted and reviewed separately. For each submission, determine from the review comments and a consensus from the reviewers whether the submission should be returned for corrections, or accepted as noted. For expediency, it is recommended that where comments are not major in nature, that the accepted-as-noted approach be utilized. When the submission is being returned for corrections, transmit the review comments to the contractor by email or letter.

As required by the Quality Plan special provisions Section III(e) Quality Assurance Review, prepare a letter to the contractor when the review is complete identifying the conditions of the release for construction, including all as-noted comments, the list of plan sheets released, and what portions of work if any at that time, can proceed based on the submission. Make sure that the released plan sheets have been stamped with the statement "Quality Assurance Review was conducted. Released for Construction." When the Department's consultant is performing the review, have the consultant stamp the reviewed sheets when the review is complete. When the Department is performing the review, stamp the reviewed sheets upon return from the Department reviewer. When Peer Review is specified, stamp the reviewed sheets following completion of the Owner's Perspective Review. Also check to see that all other prerequisites to starting construction in the particular location(s) covered by the stamped drawings have been addressed, such as Right-of-Way clearance, utility clearance, etc.

On some projects, multiple letters will have to be issued, since plan submissions such as roadway, structure, and traffic control, among others, may be made separately. If partial submissions are permitted, when those reviews are complete, letters will also have to be issued. Several submissions may be combined in a single letter, particularly if those submissions are related and permit related work to proceed at the same time. It is critical for partial submissions that the letter be explicit in defining the plan sheets released and the work permitted to proceed as a result of the review.

When all reviews have been completed, and when the first sheet of each final structure tracing has been sealed by the District Bridge Engineer (as detailed in [Section 3.3.4.4.6](#)), the Contractor submits the Title Sheet of the Final Roadway drawings (refer to [Section 3.3.4.3.8](#)) to the District for signature by the ADE – Design. To formally record the transmission of this sheet to the Contractor, prepare a final letter listing all previously issued "Released for Construction" letters and state that the Title Sheet combined with the drawings covered by the previously issued letters comprise the Final Construction drawings. Provide a draft of the letter to the ADE – Design for review before he/she signs the Title Sheet.

3.3.4.2.2 Project Cost Tracking

For all design-build projects, the letter "Z" should be the 7th character of the SPN, also known as the sub project field (P-xxxxxxZxxxxxxxxxx) for all phases of work. All Department personnel should charge time to this SPN when reviewing final design information for any design item. This may also include time for design review related meetings such as design coordination and resolution of outstanding comments. Also, use this SPN for all design items in design-build contracts.

Apply the following codes when reviewing final design information for any Design Item as well as Quality Assurance Items.

- **Final Design Review** – consultants under agreement with the District performing Final Design Review should use Work Breakdown Structure (WBS) 2.11.4 Scope of Work (SOW), IO 82804.

- **Peer Review** – when included in the Contract, the cost is incidental to the Design and Construct Items. Any coordination work should be charged to IO 82804.
- **Owner's Perspective Review** – Department personnel payrolls should charge time to IO 82804 along with an SPN defined as above (with the "Z" code). If a consultant is used to perform Owner's Perspective Review, use WBS 2.11.5 SOW, IO 82804. *This should be used on a very limited basis; Central Office approval is required.*

3.3.4.2.3 **Reproduction**

SPECIAL BIDDING – DESIGN-BUILD, Section VII, defines the reproduction responsibilities of the contractor.

3.3.4.2.4 **Construction Value Engineering**

Construction Value Engineering proposals may be submitted by the contractor for design-build projects. As stated in Section 5.2 of Publication 10C, Design Manual Part 1C, *Transportation Engineering Procedures*, "The purpose of construction Value Engineering (VE) is to eliminate or modify any contract provision that adds cost to a project but is not required for the proper function of the finished product." As in traditional projects, a Value Engineering proposal can be submitted by a contractor to modify design-build contract provisions that meet the requirements of Publication 408, *Specifications*, Section 104.

3.3.4.2.5 **Working and Shop Drawings**

There are two options for shop drawing review: review by the Department (or its consultant) or by the contractor's Lead Design Engineer. If no special provision regarding shop drawings is included in the contract, then the District is responsible for review of shop drawings, as well as all working drawings submitted by the contractor, per Section 105.02(c) and 105.02(d). If the contract includes the special provision N-a10502-A Bridge Shop Drawings, then the Lead Design Engineer is responsible for review of all shop drawings.

3.3.4.2.6 **Construction and As-Built Plans**

In accordance with Publication 10C, Design Manual Part 1C, *Transportation Engineering Procedures*, Section 5.7. Note that the design item special provisions require the contractor to compile, complete, and return the as-built plans to the Department within three months of Final Acceptance.

3.3.4.2.7 **Construction Problems**

Bring design-related roadway construction problems to the attention of the Assistant District Executive for Design. The Assistant District Executive for Design will approve modifications or corrections according to the approval authority of the original design (as approved and released for construction). For all Federal oversight projects and major, unusual, and complex projects, contact Central office with detailed information for approval. Central Office will secure FHWA approval prior to approving the modifications.

If a design error occurs, the Contractor is fully responsible for the costs associated with providing additional design analysis and construction modifications, acceptable to the Department, to correct the problem.

The Department may require reimbursement for design errors to cover engineering review costs for significant design changes made after approval and construction release. Deduct this amount from the lump sum cost for the construction item(s) via work order.

3.3.4.2.8 **Revisions During Construction**

The contractor is responsible for making changes to the contract drawings, making and distributing necessary copies of revised plans to affected parties, and providing electronic files to the Department if required.

3.3.4.3 **Roadway Submissions**

Unless a project is a partial design-build, nearly all design-build contracts will include Roadway Design. The final roadway design, prepared by the Lead Design Engineer, will include pre-final roadway plans; pavement design for

some projects, erosion and sediment pollution control plan; NPDES permit application for some projects; final roadway plans; and as-built plans.

The chronology of the final design roadway-related submissions is:

1. Geotechnical
2. Pavement design (if specified)
3. Survey information for Final Design in accordance with Publication 122M, *Surveying and Mapping Manual*, (part of Pre-Final Roadway Plan submission requirements, as applicable)
4. Erosion and Sediment Pollution Control Plan
5. NPDES Permit Application (as applicable)
6. Pre-Final Roadway Plans
7. Final Roadway Drawings
8. Signing and Pavement Marking plans
9. Publication 408, Section 686 Construction Surveying deliverables
10. As-Built Plans

3.3.4.3.1 Geotechnical

If required, the contractor will submit a geotechnical investigation program to the District Geotechnical Engineer for approval. The Design Roadway special provision will list the specific requirements, as well as other submittals to the District Geotechnical Engineer that may be required. The results will be utilized in the development of the Pre-Final plans. For projects involving primarily bridge replacements and rehabilitations, having limited roadway work, the roadway geotechnical investigation results and recommendations may be covered with the foundation submission.

3.3.4.3.2 Pavement Design

If no pavement design is included in the Conceptual Drawings, the Design Roadway special provision will require the contractor to develop the pavement design. This will be included with Pre-Final plan submission. If the contractor proposes an alternate pavement design, coordinate the various aspects of the review with the District Pavement Management Engineer.

3.3.4.3.3 Survey

If applicable, surveying/mapping deliverables in accordance with Publication 122M, *Surveying and Mapping Manual*, should be submitted to the Manager, Photogrammetry and Surveys Section.

3.3.4.3.4 Erosion and Sediment Pollution Control Plan

The contractor must prepare an Erosion and Sediment Pollution Control Plan and submit directly to the specified County Conservation District or DEP for approval. The approved plans are to be submitted to the Department with the Pre-Final plan submission. Facilitate timely reviews by maintaining contact with the reviewing agencies.

3.3.4.3.5 NPDES Permit Application

Unless obtained by the Department prior to design-build contract advertisement, the contractor will be required in the special provisions to prepare an NPDES Permit Application based on the approved Erosion and Sediment Pollution Control Plan developed during final design. The NPDES Permit Application is required to be submitted to the District for review. After review, the District returns the application to the contractor, who in turn submits the application directly to the County Conservation District for review and approval.

3.3.4.3.6 Pre-Final Roadway Plans

The Pre-Final Roadway Plans are plans developed to the 60% to 70% stage, with horizontal and vertical alignment established, typical sections determined, limits of construction shown, etc.

3.3.4.3.7 Signing and Pavement Markings

The Signing and Pavement Markings plan should be submitted prior to the Final Roadway Drawing submissions, to the District Traffic Engineer for review.

3.3.4.3.8 Final Roadway Drawings

The Final Roadway Drawings include all final construction drawings (including structures) for the project, and upon completion of review must be stamped "Released for Construction." Refer to [Section 3.3.4.2.1](#). The Title Sheet does not have to be sent to Central Office for Signature. Upon completion of all QA (or Owners Perspective, as required) reviews, the contractor will provide the ADE – Design a paper copy, drafting film, or vellum (as required in the Special Provisions) of the title sheet for signature. The ADE – Design or his/her designee (must be a Professional Engineer) will sign the title sheet. The District will then produce an electronic copy (pdf) of the title sheet and upload it to the ftp site for distribution. Prepare a letter as detailed in [Section 3.3.4.2.1](#) as a formal record of the transmission. Computations, including all applicable Q/A forms should also be uploaded to the ftp site for storage by the District.

3.3.4.3.9 Publication 408, Section 686 Construction Survey

Submissions to the Representative defined in Publication 408, Section 686 should be reviewed in the same manner as a conventional design-bid-build project.

3.3.4.3.10 As-Built Plans

As-built plans are to be submitted in accordance with Publication 10C, Design Manual Part 1C, *Transportation Engineering Procedures*, Section 5.7 within three months of final inspection acceptance.

3.3.4.4 Structure Submissions

The final structure design, prepared by the Lead Design Engineer, will include for some structures hydrologic and hydraulics report amendments and/or subsurface exploration and foundation design; final type, size and location, final structure plans; and as-built plans for all structures. Amendments to the waterway permits and alternate foundation design, as applicable, will also be included in final design. Refer to the structure design item special provisions for details. Refer to the Submittal Review Responsibility checklist for submittal distribution details.

The chronology of the final design structure-related submissions is as follows:

1. Hydrologic and Hydraulics Report Amendment (as applicable)
2. Final Type, Size and Location (Final TS&L)
3. Subsurface Exploration and Foundation Design (as applicable)
4. Final Structure Plans
5. As-Built Plans

3.3.4.4.1 Hydrologic and Hydraulics Report Amendment

In instances where the contractor proposes a span arrangement and/or substructure configuration different from that utilized to prepare the hydraulic studies during the conceptual design phase and specified in the waterway permit, the contractor must revise the Hydrologic and Hydraulic Report and other applicable documents. The revised report must be reviewed and approved by the Department and outside agencies. Amendments are reviewed and forwarded to the other agencies by the District Regulatory Permit Coordinator. In addition, major amendments require review by Highway Delivery Division.

3.3.4.4.2 Final Type, Size, and Location (TS&L)

The contractor may submit a Final TS&L based on the Conceptual TS&L plan presented in the bid documents, or another structure subject to the limitations specified in the structure design item special provision.

Depending on structure type, size, estimated cost, and funding, the Final TS&L may be reviewed by the District Bridge Engineer, Bridge Design and Technology Division (BDTD), and/or FHWA. Refer to the Submittal Review Responsibility checklist for individual project requirements.

3.3.4.4.3 Subsurface Exploration and Foundation Design

Depending on the structure design item special provisions in the contract, the foundation design performed by the Lead Design Engineer will fall into one of four categories. Figure 3.3.4.4.3-1 illustrates the foundation design processes of the four foundation scenarios. Foundation approval, depending on type and funding, will be the responsibility of FHWA, BDTD, or the District Bridge Engineer. Refer to the Submittal Review Responsibility checklist for individual project requirements.

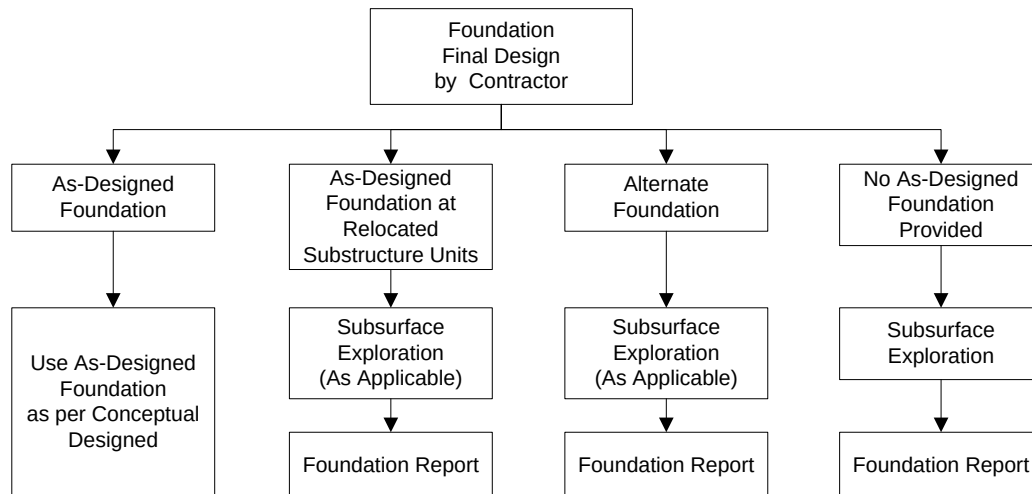


Figure 3.3.4.4.3-1

3.3.4.4.3.1 As-Designed Foundation

Where a foundation design is included in the bid documents and the contractor utilizes the as-designed foundation with substructure units located at positions shown on the Conceptual TS&L plan, then no foundation submission is required during final design. In this instance only, the contractor can include the Core Boring Logs that were provided in the Conceptual Drawings as part of the Final Design Drawings.

3.3.4.4.3.2 Relocated Substructure Units Using As-Designed Foundations

If a foundation is included in the bid documents, but the contractor proposes to change the locations of substructure units (from that indicated on the Conceptual TS&L), then a revised foundation design and construction drawings must be submitted at no additional cost. The use of relocated substructure units using as-designed foundations will be subject to any limitations specified in the design item special provision. The Core Boring Logs provided in the Conceptual Drawings cannot be included in the Final Drawings for relocated substructure units, but may be included as an Appendix to the submitted foundation report designated "Information Provided by Others."

3.3.4.4.3.3 Alternate Foundations

When permissible, and subject to the limitations in the design item special provision, the contractor may elect to prepare and submit an alternate to the as-designed foundation provided in the bid documents. A foundation report, foundation design, and construction drawings must be submitted at no additional cost. The Core Boring Logs provided in the Conceptual Drawings cannot be included in the Final Drawings, but may be included as an Appendix to the submitted foundation report designated "Information Provided by Others."

3.3.4.4.3.4 No As-Designed Foundation Provided

Where no foundation design is included in the bid documents, and the design item special provision title includes "No As-Designed Foundation Provided", the contractor must perform subsurface exploration, prepare a foundation report, prepare a foundation design and construction drawings as required by the special provision. The Core Boring Logs provided in the Conceptual Drawings cannot be included in the Final Drawings, but may be included as an Appendix to the submitted foundation report designated "Information Provided by Others."

3.3.4.4.4 Final Structure Plans

The contractor will submit a complete set of S-drawings for each structure design item. Review responsibility will be the same as the Final TS&L. The Lead Design Engineer must sign and seal each sheet per Publication 15M, Design Manual Part 4, *Structures*, PP 1.6.3.1. The final reviewing party shall sign and seal the first sheet per Publication 15M, Design Manual Part 4, *Structures*, PP 1.3.4 for reviews performed by consultants on behalf of the Department or the peer reviewer. In addition, have the first sheet signed and dated by the District Bridge Engineer or Chief Bridge Engineer plus the remaining structure sheets date stamped. Structure construction cannot begin until the District Project Manager transmits a letter to the Contractor issuing the signed structure drawings as detailed in [Section 3.3.4.2](#). The District will produce an electronic copy (pdf) of the sheets and upload to the ftp site for distribution.

If paper submissions are required, the contractor should submit the number of sets listed in Section VII SPECIAL BIDDING - DESIGN-BUILD for Final Structure Plans for signature. Distribute plan sets as indicated on the Submittal Review Responsibility checklist.

3.3.4.4.5 Partial Final Structure Plans

Partial final structure plans and computations may be submitted for QA review to expedite the project. Partial submission requirements and limitations, if any, will be listed in the design item special provision. The contractor must identify any partial submissions and address partial submission procedures in the Quality Plan. All applicable Publication 15M, Design Manual Part 4, *Structures*, Quality Assurance forms, D-506 through D-518, must be also be completed and submitted with each partial submission.

As with final structure drawings, the Lead Design Engineer must sign and seal each sheet per DM-4 1.6.3.1. The final reviewing party shall sign and seal the first sheet per DM-4 PP.1.3.4 for reviews performed by consultants on behalf of the Department or the peer reviewer. In addition, have the first sheet signed and dated by the District Bridge Engineer or Chief Bridge Engineer plus the remaining structure sheets date stamped. Structure construction cannot begin until the District Project Manager transmits a letter to the Contractor issuing the signed structure drawings as detailed in [Section 3.3.4.2](#). The District will produce an electronic copy (pdf) of the sheets and upload to the ftp site for distribution.

If paper submissions are required, the contractor should submit the same number of sets as is listed in Section VII SPECIAL BIDDING - DESIGN-BUILD for Final Structure Plans for signature. Distribute plan sets as indicated on the Submittal Review Responsibility checklist.

The partial final plans distribution process described above may be modified at the preconstruction meeting to meet the needs of individual projects.

3.3.4.4.6 Final Tracings and Computations

Upon completion of design, the contractor will provide the District Bridge Engineer a paper copy, drafting film, or vellum (as required in the Special Provisions) of the first sheet of each structure drawing for signature. The District will produce an electronic copy (pdf) of the first sheet and upload it to the ftp site for distribution. Computations, including all applicable Q/A forms should also be uploaded to the ftp site for storage by the District.

3.3.4.5 Maintenance and Protection of Traffic Submissions

The DESIGN TRAFFIC CONTROL PLAN special provision will require the contractor to develop a Traffic Control Plan (TCP), an Incident Management Plan for some projects, and a Transportation Management Plan for some projects. Generally, the District Traffic Engineer has the submittal review responsibility.

3.3.4.5.1 Incident Management Plan

Should be submitted prior to or concurrent with the Preliminary Plan submission, if required.

3.3.4.5.2 Transportation Management Plan

In a similar manner to the Incident Management Plan, this should be submitted prior to or concurrent with the Preliminary Plan submission, if required.

3.3.4.5.3 Preliminary TCP Submission

The Conceptual Plans may or may not contain a conceptual TCP. If there is no conceptual TCP, the minimum criteria will be specified, such as minimum lane widths, lane closure restrictions, etc. The Preliminary Plan submission should include the plans for all stages, phases, and/or sequences of construction to complete the work.

3.3.4.5.4 Partial Submissions, Final Plans and Computations

If permitted in the Special Provisions, the contractor can submit partial plans for distinct individual phases of the TCP for review and approval prior to the Final Plan submission in order to expedite the work. The special provisions should state the partial plan submission procedure and state when the contractor can proceed with the MPT work covered by a partial submission.

3.3.4.6 Permit Submissions

All permits to be acquired by the contractor will be listed, along with the corresponding review agency contact information in the PERMITS FOR DESIGN-BUILD PROJECTS special provision.

3.3.4.7 Utility Coordination Submissions

All submissions from the contractor relating to the UTILITY RELOCATION INFORMATION FOR DESIGN-BUILD PROJECTS special provision must be reviewed and approved by the District Utility Administrator.

3.3.4.8 Right-of-Way Design and Acquisition Service Submissions

Right-of-way plan submissions should be submitted to the ADE – Design for review and approval.

Note that the contractor must utilize the services of a pre-qualified right-of-way acquisition firm as listed on ECMS. All other submissions, relating to appraisal and acquisition should be submitted to the District Right-of-Way Administrator. All work performed by the contractor must be consistent with Publication 378, *Right-of-Way Manual*.

Once the Right-of-Way plan is approved, the contractor's right-of-way acquisition firm proceeds with the appraisal planning tasks that they have been assigned which may include all or some of the following: preparing the RW-971 Right-of-Way Project – Funding Estimate, RW-275 series Appraisal Problem Analysis unless the Appraisal Problem Analysis was provided by the District Right-of-Way Administrator, which establishes the parameters of the appraisal assignment to be performed, the administrative tasks to contract for appraisals as per Appraisal Contract ITQ 357I01, manage and track when the appraisals are received, when they go to appraisal review, when the appraisal is approved or critiqued, and when corrections are received and back to appraisal review. The document management procedures will be established by the District Right-of-Way Unit.

Appraisal approval starts the negotiation phase, with the establishment of an offer of just compensation. If an amicable settlement is reached, then the claim will be processed for settlement. If an amicable settlement requires payment of funds exceeding the original offer, approval must be requested for an administrative settlement. Claims that cannot be amicably settled will require condemnation. Condemnation is handled within the Department. Payments made to acquire parcels are made directly from the Department to the parcel owner.

When all parcels have been acquired, the Chief, Utilities and Right-of-Way Section will issue the Clearance Certificate. For grouped projects, individual Clearances will be issued for each project included in the grouping.

Construction can proceed for each project in the grouping as Clearance is issued (and other required approvals have been obtained).

3.3.5 SCHEDULES OF VALUES SUBMISSIONS

SPECIAL BIDDING – DESIGN-BUILD, Section IX, requires the contractor to submit a schedule of values for lump sum design and construct items where indicated in the individual item Measurement and Payment section. The current functioning of the CDS NextGen system necessitates that all schedules of values, where required, must be approved before the first contract estimate can be processed.

3.3.5.1 Design Items

In design items where a schedule of values is required, the Measurement and Payment section lists the components to be included in the schedule. The contractor is to identify the increments of the lump sum in which it desires to be paid for the listed components. The contractor is not required to submit in the exact format as the template included with SPECIAL BIDDING – DESIGN-BUILD, but must contain the correct item number, all of the components identified in the associated special provision, reasonably distributed percentages, and percentages that total 100%.

Review each schedule of values for completeness and conformance with the special provisions. Review the percentages assigned to the various components for reasonableness. Schedules of values that are obvious attempts to front-load payments should not be approved unless the contractor provides sufficient justification showing the relationship to the actual value of design work performed. Note that Design items components that contain the word "Approval" in the title designated in the Special Provisions, such as "Final TS&L Approval," can receive 75% of the component percentage when that submission is logged in by the Department, and the remaining 25% when the submission is approved. Otherwise, components such as "As-Built Drawings" are only eligible for payment when the indicated task is complete.

3.3.5.2 Construct Items

In construction items where a schedule of values is required, unlike the design items, no payment components are specified. Rather, the contractor must identify components that are relevant to the particular scope of the project. The components listed in the template attached to SPECIAL BIDDING – DESIGN-BUILD, such as those in Construct Roadway: Excavation, Drainage, Subgrade/Subbase, Concrete Roadway, Asphalt Roadway, Guiderail & Concrete Barrier, Signing & Pavement Marking, and Miscellaneous, are very generalized because it is difficult to encompass the components of "typical" project and the contractor's approach to the work. More importantly, since no partial payment is permitted on individual components within Construct items, the burden is on the contractor to develop a list of components to fit the scope of work and fit the intended progress so that it can be paid for progress on biweekly estimates. One method of developing the Schedule of Values, particularly for Construct Roadway, is to utilize activities in the construction schedule as components. With this method, updating the CPM schedule will provide the backup for the estimate – activities with a status of 100% will be eligible for payment on the next estimate.

Review each schedule of values for completeness in covering the various aspects of work under the particular item. If there are portions of the work that not specifically identified by a component, obtain clarification from the contractor. Similar to the design items, review the percentages assigned to the various components for reasonableness. Schedules of values that are obvious attempts to front-load payments should not be approved unless the contractor provides sufficient justification showing the relationship to the actual value of work performed. Since SPECIAL BIDDING – DESIGN-BUILD specifies that all schedules of values be approved prior to the processing of the first estimate, encourage the contractor to submit the schedules as soon as possible after NTP so that there is no delay in processing estimates.

3.3.6 MEASUREMENT AND PAYMENT FOR CONSTRUCT ITEMS

It is not necessary to calculate actual quantities in the same manner as a design-bid-build project to determine payment. If the contractor has sufficiently broken down the work into components that are likely to be able to be completed in less than 2 – 3 estimate periods, it should be easy to determine the completion of the work within each component, which will trigger payment on that component. As noted above, if the contractor utilizes CPM activities as components in a Schedule of Values, updating the schedule will provide the information for the estimate. Bear in

mind that ultimately the contractor will receive 100% payment for each of the construct items, if completed in accordance with the specifications and approved plans.

3.3.7 POST-CONSTRUCTION QUALITY SURVEY

To build a database on design-build projects and lead design engineers' performance, complete a post-construction Quality Survey for Design Items. Request the contractor also complete the form for the conceptual design. The Quality Survey for Design Items can be found in the Closeout Section of the Project Information Screen in EMCS. Provide the Lead Design Engineer on the project the opportunity to review and comment on the completed survey.

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CHAPTER 4 – ADJUSTED BID DESIGN-BUILD PROCESS

4.0 INTRODUCTION

Once a project is identified as a suitable candidate for the Adjusted Bid Design-Build, the final step in the selection process is to determine if the project meets the preferred criteria. This step, the Project Screening, evaluates the project's characteristics, and if the conditions are met, the project may proceed as an Adjusted Bid Design-Build. If the conditions cannot be met, either additional approvals must be secured, or the project development must proceed as a conventional design/bid/build project. The advantage of Adjusted Bid selection is that it combines two components into one procurement method: the low-bid selection of contractors and the qualifications-based selection of design consultants. Adjusted Bid projects provide the Department with the most potential for multiple design solutions and innovation in the use of materials. In general, the Adjusted Bid process should only be considered for projects that have cost between \$15 Million and \$50 Million (ITS projects may have a lower threshold).

Within Adjusted Bid, two options are available: One-Step and Two-Step. For both Adjusted Bid options, the bidder's Technical Approach is evaluated with the bid; in the Two-Step option, a "shortlist" selection step precedes the actual bidding, where the shortlist is developed by the evaluation of Statements of Interest submitted by each potential bidder (design-build team of pre-qualified contractor and design consultant).

This Chapter begins with the Project Screening evaluation and Quality Assurance method selection. It then covers the two primary phases – Pre-Award and Post-Award. The Pre-Award phase includes the Department's preparation of design-build contract documents, initial design, and letting/award, all of which leads to the selection of the design-build contractor. The Post-Award phase includes completion of the project design and construction by the successful bidder. The activities associated with each phase are described in the following sections.

4.1 DESIGN-BUILD PROJECT SCREENING

This step identifies standard design-build conditions and identifies potential issues that will require special consideration in the preparation of bid documents. Project screening is to be conducted as part of the Engineering and Environmental Scoping phase in accordance with Publication 10C, Design Manual Part 1C, *Transportation Engineering Procedures*, Section 2.

Perform the project screening by evaluating the conditions in ten project component categories to determine if the project (with its specific components) is a suitable candidate for Adjusted Bid Design-Build:

- Environmental
- Right-of-Way
- Bridge
- Permitting
- Utility Involvement
- Railroad Involvement
- Availability of Resources
- Schedule
- Photogrammetry and Surveys
- Estimated construction value

Note that screening for Quality Assurance should occur after the Approach Plan has been approved.

4.1.1 APPROACH PLAN

Review each of the following categories and the general preferred criteria. Prepare an Approach Plan that addresses each category, the deviations from the preferred criteria, and what steps will be taken during conceptual design to

mitigate the unnecessary transfer of risk from the Department to contractor. The plan should also identify procedures to address issues that could potentially arise during Post-Award. Submit the Approach Plan to the Chief of the Highway Delivery Division for review. HDD will coordinate review among the various Sections or Units. Pre-Approval from the Director of the Bureau of Project Delivery is required prior to proceeding with Adjusted Bid Design-Build.

4.1.2 ENVIRONMENTAL

The following environmental conditions are the preferred criteria.

1. Environmental Clearances will be obtained prior to design-build contract advertisement.
2. Protected environmental resources will not be impacted other than those identified in the approved CEE or EA document and all potential impact areas within the project area will be defined on the plans.
3. Mitigation Commitments are clearly defined in the approved CEE or EA document; are standard and predictable, can be readily timely implemented.
4. Phase II Environmental Assessment (ESA) or Phase III ESA (if required) will be completed by the Department prior to design-build contract advertisement.
5. Cultural Resources are addressed by the Department completing the Alternative Development and Impact Analysis required by Section 106 of the National Historic Preservation Act; all archeological studies (Phase II and III) will be completed by the Department prior to design-build contract advertisement; and conditioned no-impact avoidance conditions apply.
6. No unresolved Pennsylvania Natural Diversity Inventory (PNDI) issues on the project.

4.1.3 RIGHT-OF-WAY

The following right-of-way condition is the preferred criteria.

1. All right-of-way acquisition will be completed prior to design-build contract advertisement.

4.1.4 BRIDGE

The following bridge conditions are the preferred criteria.

1. Conceptual Type, Size, and Location information (TS&L) will be developed for bridge work on the project by the Department and included in the bid package.
2. Complete foundation design or Foundation Design Guidance Report will be developed and provided in the bid package.

4.1.5 PERMITTING

The following permitting conditions are the preferred criteria.

1. Hydrologic and Hydraulic (H&H) analysis when required will be prepared by the Department during conceptual engineering phase.
2. No Causeway Permits in critical FEMA flood areas, high quality and exceptional value watersheds or areas in which known endangered or threatened species.
3. All waterway permits will be obtained by the Department.

4.1.6 UTILITY INVOLVEMENT

The following utility involvement conditions are the preferred criteria.

1. The type, size, location, and ownership of existing utilities are known and will be shown on the plans in the bid package;
2. The magnitude (type, extent, and number) of required utility relocations is known or can be easily determined; and

3. Preliminary coordination has already occurred with affected utilities.

4.1.7 RAILROAD INVOLVEMENT

The following railroad conditions are the preferred criteria.

1. No Railroad facility involvement
2. No PUC involvement.

4.1.8 AVAILABILITY OF RESOURCES

The following conditions related to Department resources are the preferred criteria.

1. The Department has the available resources to allow for expedited project reviews/approvals (District Office, Central Office, and Federal Highway Administration).
2. The District has utilized design, construction, and maintenance staff in the selection of design-build candidate projects in the project's early coordination.

4.1.9 SCHEDULE

The following condition is the preferred criteria.

1. A portion of construction can commence before design is completed (e.g., foundation construction before completing superstructure design details).

4.1.10 PHOTOGRAMMETRY AND SURVEYS

The following condition is the preferred criteria.

1. All project preliminary surveys, photogrammetric services, *i.e.* design scale mapping, and terrestrial or mobile laser scanning will be completed during the Conceptual Design phase.

4.1.11 ESTIMATED CONSTRUCTION VALUE

The following condition is the preferred criteria.

1. Estimated construction value greater than \$30 million, less than \$50 million.

4.1.12 QUALITY ASSURANCE REVIEW SCREENING

Two Quality Assurance review procedures are available: Quality Assurance by Department Review or Quality Assurance by Peer Review. These options are presented here so that the Manager understands the choices during the conceptual design phase and is aware of the limitations of the applicability of Quality Assurance by Peer Review to Adjusted Bid One-Step or Two-Step projects, even though many of the limiting factors may not be fully known until completion of the conceptual plans. The final selection of the method to be included in the bid package is not required until the development of the Special Provisions, as discussed in [Section 4.2.1.3.1](#) below.

4.1.12.1 Quality Assurance by Department Review

Quality Assurance by Department Review is typically used with One-Step Low Bid projects. It consists of a detailed review of the plans, specifications, and calculations by the Department and FHWA (as appropriate) to ensure that the project's specified design criteria are being followed.

4.1.12.2 Quality Assurance by Peer Review

Quality Assurance by Peer Review is the preferred option with Adjusted Bid design-build projects. It consists of a detailed review of the plans and calculations by an independent third-party engineering consultant retained by the contractor, not involved with the plan and calculation development. The Special Provisions will require that the contractor and its subcontractor/design consultant possess no financial interests in the third party firm. The third-party review is to ensure that the project's specified design criteria are being followed, as well as the plan development and associated calculations. The selection of Peer Review requires the additional step of the Owner's Perspective Review, which is a limited review by Department and FHWA (as appropriate) to determine that the plans and calculations have been developed in conformance with Department criteria and standards and a Quality Assurance (QA) review was performed by peer review in conformance with the design Quality Plan developed by the contractor. Unless discrepancies are found in the plans, calculations, or Quality Control (QC)/QA process, the review is not to be an in-depth review of the actual design. Both the QA by Peer Review and Owner's Perspective Review are discussed in more detail in later sections of this Manual.

4.2 PRE-AWARD ACTIVITIES

This section details two parallel processes, the development of the conceptual design and the package for bidding/selection, and the selection process. Once it is determined that a project is an Adjusted Bid Design-Build project, proceed with both processes simultaneously. Although the bulk of the selection process occurs in later stages, be aware that certain tasks are time-dependent, so it is necessary to be familiar with the selection process requirements in order to implement them at the proper time during conceptual design development. Conceptual design will be discussed in its entirety, followed by the selection process.

4.2.1 CONCEPTUAL DESIGN DEVELOPMENT

4.2.1.1 Scope of Work Development for Conceptual Design

The Conceptual Design phase of an Adjusted Bid One-Step and Two-Step design-build project generally follow the same process and requirements as the Preliminary Engineering phase of a traditional design/bid/build project, in accordance with Publication 10C, Design Manual Part 1C, *Transportation Engineering Procedure*, Section 3s. However, unlike the Preliminary Engineering phase of a traditional design/bid/build project, the Conceptual Design phase of a design-build project must also incorporate functions that are normally completed during the Final Design phase of a traditional design/bid/build project:

- Obtaining Environmental Clearance;
- Acquiring permits;
- Obtaining right-of-way;
- Determining utility requirements;
- Preparing geotechnical information;
- Preparing estimated construction quantities and cost estimates;
- Preparing a pre-bid construction schedule; and
- Preparing bid package.

When preparing a Scope of Work for consultant services to develop design-build contract documents, consider including the following tasks, listed in order of presentation of the standard Work Breakdown Structure items:

1. Project management/administration
2. Coordinate constructability review
3. Wetland studies
4. Environmental Clearance/Designation Activities
5. Surveys
6. Roadway (Conceptual)
7. Line and grade
8. Typical sections

9. Pavement design
10. Geotechnical investigation efforts
11. Right-of-way activities
12. Hydrologic and hydraulic report
13. Conceptual Type, Size, and Location (TS&L)
14. Waterways permits
15. Conceptual traffic control plan
16. Safety review/audit
17. Utilities
18. Erosion and sediment pollution control plan / NPDES Permit
19. Assemble final project documents for contract management
20. Post-design activities

The above tasks are the same regardless of whether the Conceptual Design will be developed by a consultant or in house by the District.

Notations regarding design-build applications of the aforementioned tasks are listed below. Bear in mind that when comparing scopes of work for conceptual design development in design-build projects and Preliminary Engineering/Final Design in conventional design/bid/build projects, those tasks not included in the scope for design-build must be ultimately addressed by Special Provisions included in the bid package. Special Provision use and development is discussed in [Section 4.2.1.3](#).

1. Project Management/Administration – Statements of work and Department details are consistent with those of a /bid/build project. Consider identifying the number of meetings, design schedule preparation, and project reporting requirements.
2. Coordinate Constructability Review – Statements of work and Department details are consistent with those of a design/bid/build project, except that the duration of coordination is only through the conceptual design development, and emphasis will be placed on identifying potential design/bid/build issues in addition to the customary constructability issues.
3. Wetland Studies – Statements of work and Department details are consistent with those of a design/bid/build project.
4. Environmental Clearance/Designation Activities – Since environmental clearance (NEPA) must be obtained by the Department prior to design-build contract advertisement, statements of work and Department details are consistent with those of a design/non/build project.
5. Surveys – Statements of work and Department details are consistent with those of a design/bid/build project. Field survey and aerial mapping should be performed during the Conceptual Design Phase. Include details to establish horizontal and vertical controls and to collect data at intervals and widths necessary for the proper design for highways and structures. Also, consider including the roadway approaches for bridge projects, particularly where bridges are near a roadway curve since the superelevation rate and transitions need to be verified.
6. Roadway (Conceptual) – This task will consist of preparing Conceptual Roadway Plans as described in [Section 3.2.3.1](#) Conceptual Drawings. Conceptual plans are generally developed to the Design Field View stage, which is approximately the 30% stage. Include the particular details as necessary to define the limits of the conceptual plan development to suit the individual project goals. Also include obtaining approval of any Design Exceptions during the Conceptual Design stage. The scope of work should also include provisions for design Value Engineering reviews and reports (see Appendix R of Publication 10X, Design Manual Part 1X, *Appendices to Design Manuals 1, 1A, 1B, and 1C*, for Value Engineering criteria and recommendations).

7. Line and Grade – Statements of work and Department details are consistent with those of a design/bid/build project. Include details to define the scope of the horizontal and vertical alignments, the pavement cross slopes, and required superelevation rates to be established.
8. Typical Sections – Include, at a minimum, the task to develop the typical sections to include the proposed lane and shoulder widths, cross slopes, superelevation rates, and embankment/cut slopes. Identify the pavement design if it is to be developed as part of the Conceptual Design.
9. Pavement Design – Include this task if it is to be developed during the Conceptual Design phase and if the task is to be performed by the consultant.
10. Geotechnical Investigations – Determine the appropriate level of geotechnical investigation and reporting tasks for the planned level of investigation and reporting to be performed during conceptual design. Include available geotechnical information in the bid documents. The special provisions in the bid documents should detail any additional geotechnical information or reports to be prepared by the contractor.

Two foundation development options are available for structures: the preparation of a complete foundation submission during the Conceptual Design phase, and a limited foundation investigation during the Conceptual Design phase and completion of the foundation investigation during final design by the contractor. Include the level of investigation tasks necessary to support the desired option. Additional details regarding the scope of work for both options are described in [Section 3.2.3.1.4 Foundations](#).

11. Right-of-Way Activities – For projects in which right-of-way will be acquired prior to design-build contract advertisement, statements of work and Department details are consistent with those of a design/bid/build project, including the work preparing preliminary and final right-of-way plans.

For projects where the intent is for right-of-way to be acquired by the contractor, the preparation of right-of-way plans and right-of-way acquisition services will be performed by the design-build team. The anticipated required right-of-way and/or easements should be shown on the Conceptual Roadway Plan.

For grouped projects, right-of-way acquisition and right-of-way clearance may occur on a project-by-project basis (i.e. for each MPMS number). In some cases, one project in a grouping may fall within existing right-of-way limits and have right-of-way clearance prior to design-build contract advertisement, while other projects within the grouping will include right-of-way tasks as design activities in the design-build contract. Coordinate with the District Right-of-Way Administrator to develop appropriate schedules and establish criteria for multiple right-of-way clearances for the entire grouping. See Publication 10A, Design Manual Part 1A, *Pre-TIP and TIP Program Development Procedures*, Chapter 2 for additional information on grouped projects.

12. Hydrologic and Hydraulic Report – Include the preparation of the H&H report in the scope of work for Conceptual Design. The statements of work and Department details are consistent with those of a design/bid/build project. Where applicable, include in the scope the preparation of an abbreviated H&H report meeting the requirements of Publication 13M, Design Manual Part 2, *Highway Design*, Section 10.7.
13. Conceptual Type, Size, and Location (TS&L) information and or plan – Include in the scope the necessary requirements for the particular structure and scope of work. Details are listed in [Section 3.2.3.1](#). The task is described in detail in [Section 3.2.3.1.3 Conceptual Type, Size, and Location](#).
14. Waterways Permits – Under the conditions detailed in [Section 3.1.5](#), permitting tasks can be specified to be performed by the contractor. When permitting is not to be performed by the contractor, include tasks to acquire permits during the Conceptual Design phase.
15. Conceptual Traffic Control Information and/or Plan – For an Adjusted Bid project, Conceptual Traffic Control information must be developed for inclusion in the bid documents. Specify the desired level of detail to be developed, such as phasing or detour requirements, in the scope of work. Also include the task

to perform the work required in Publication 46, *Traffic Engineering Manual*, Chapter 6 regarding Work Zone Safety and Mobility up through the Design Field View Submission, the including development of a draft Transportation Management Plan, if required.

16. Safety Review/Audit – The details of this task would generally be consistent with what would be included in a design/bid/build project for preparing a safety review submission. Determine whether a Design Exception will be necessary, and if so include the preparation of Design Exceptions with this task. Guiderail and length of need calculations should be provided under this task.
17. Utilities/Railroad Requirements –Utility coordination should be included as a design-build activity on full design-build projects or when utilities are affected by the design of other design-build activities. When utility clearance is desired prior to design-build contract advertisement, include in the scope statements of work and Department details consistent with those of a design/bid/build project. When design-build activities for utilities will be included in the bid package, include in the scope only the level of utility engineering to provide sufficient conceptual information in the bid package. Review the project scope with the District Utilities Administrator to determine the anticipated scope of utility engineering to be performed by the conceptual designer. Where utility facilities are to be located on a structure or constructed by the contractor (incorporated work), the scope of the utility coordination to be performed during Conceptual Design includes determining what utilities will be included on the structure, the materials required for each utility, and the party who will be furnishing and installing the material. Refer to Publication 16M, Design Manual, Part 5, *Utility Relocation*.

When there is Railroad involvement, include a task for coordination with the Railroad companies and PUC process.

18. Erosion and Sediment Pollution Control Plan / NPDES Permit / General Permits – The scope of work required depends on whether the NPDES Permit will be acquired by the Department during the Conceptual Design phase, or included as a design activity in the bid package. If the Department is going to secure the permit, then a detailed Erosion & Sedimentation Control Plan will be required for approval from PADEP and/or the Soil Conservation District. The details of this task would generally be consistent with what would be included in a design/bid/build project.

If the NPDES Permit acquisition will be specified to be performed by the contractor, then Conceptual Erosion and Sediment Control design must be developed to determine the limits of disturbance and areas of impact for the project and prepare bid documents (including Special Provisions). Depending on project complexity and scope of work, an Conceptual Erosion and Sediment Control Plan may be prepared to serve as a guide as to the erosion and sedimentation control measures required. Adjust the scope of work accordingly.

19. Assemble Final Project Documents for Contract Management – The detailed requirements of the bid package for an Adjusted Bid project is described in [Section 4.2.1.2](#) Conceptual Design. Statements of work and details will be similar to those of design/bid/build projects, except that the construction cost estimates and pre-bid construction schedule must be developed by including the cost and time for Final Design activities to be performed by the contractor. Refer to [Section 4.2.1.5.2](#) Cost Estimate and Pre-Bid Schedule for additional details.
20. Post-design activities – Include this task in the scope of work for the Conceptual Design phase consultant if Quality Assurance by Department Review is anticipated to be specified in the bid package, as well as if shop drawing review will not be performed by the Contractor's Lead Design Engineer.

4.2.1.2 Conceptual Design

In the development of the conceptual plans, specifications and estimate for One-Step or Two-Step Adjust Bid design-build projects, it is important to present as much information as possible for contractors and their lead design engineers to properly bid and perform the work. Yet it is equally important to not provide unnecessary information or perform work that would be duplicated by contractors' lead design engineers in producing the Final Design. The

conceptual design phase for Adjusted Bid projects consist of the development of four main components to be published in ECMS for the letting process:

1. Conceptual Drawings
2. Special Provisions that includes QA Method
3. Bid Items
4. Project Development Checklist Attachments

4.2.1.2.1 Conceptual Drawings

The development of conceptual drawings generally follows the process for the Preliminary Engineering phase for conventional projects as defined in Publication 10C, Design Manual Part 1C, *Transportation Engineering Procedures*, Chapter 6, *Preliminary Engineering Procedures*, Section 3. The Conceptual plans are the contract drawings that will be included in the bid package and are equivalent to the 15 - 30% design stage drawings. Prepare conceptual drawings in accordance with Publication 13M, Design Manual Part 3, *Plans Presentation*, and include the following, as required:

1. Title Sheet (An example of a typical Title Sheet is shown in Publication 14M, Design Manual Part 3, *Plans Presentation*, Chapter 15, Section 15.2, Plate B-IX).
2. Index Sheet
3. Typical Section Sheet
4. Summary of Quantities Sheets (items as shown in Bid Proposal)
5. Plan Sheets (existing and relocated utilities, right-of-way location and cut/fill limits, roadway design, etc.)
6. Conceptual Traffic Control Plan, including Draft Transportation Management Plan (if project meets criteria in Publication 46, *Traffic Engineering Manual*, for a Transportation Management Plan)
7. Conceptual TS&L (General Plan Sheet with elevation view and cross sections)
 - a. Conceptual TS&Ls must be provided for all NHS and Interstate bridges.
 - b. For non-NHS and non-Interstate bridges, provide Conceptual TS&Ls except for deck replacements where at a minimum existing structure plans and conceptual details, including plan, elevation and cross section must be provided.
8. Conceptual General Notes (Bridge)
9. Structure Boring Plan (if available)
10. Conceptual Erosion and Sediment Pollution Control Plan
11. Conceptual Traffic Signal Plans or Reference Publication 222, *Geotechnical Investigation Manual*
12. Foundation Design Parameters (as applicable)
13. H&H Report including Permits

The following types of design-build projects generally do not require the same level of conceptual drawing detail and may utilize 8 ½" x 11" size plans. Prepare abbreviated plans in accordance with Publication 13M, Design Manual Part 3, *Plans Presentation*.

- Milling and Resurfacing projects
- ITS projects
- Highway Lighting projects
- ADA Curb Ramp projects

To bid an Adjusted Bid project without conceptual plans, or with conceptual plans that do not meet the level of plan detail specified above, seek prior approval from the Chief of the Highway Delivery Division. Prepare and submit a request at least 90 days prior to the planned letting date, describing how the contract documents will adequately define the project requirements and restrictions.

If Conceptual Drawings are not provided, at a minimum include the following information in the bid documents:

1. Typical section
2. Horizontal and vertical clearance
3. Design Exceptions

4. Limits of work
5. Identification of anticipated required permits
6. Area of impact
7. Right-of-way limits
8. Existing as-built plans or plans of record

The conceptual Construction Drawings must have a Professional Engineer's Seal Block in accordance with Section 2.1.K and Figure 2.1 of Publication 14M, Design Manual Part 3, *Plans Presentation*.

4.2.1.2.2 Conceptual Drawings – Structures

Conceptual design for structures will include hydrology and hydraulics; conceptual type, size and location; foundation exploration; foundation recommendations or foundation design guidelines; and specifications. The Final Design to be performed by the contractor's Lead Design Engineer as defined in the Special Provisions will include final type, size, and location; subsurface exploration and foundation design for some projects; final structure plans and specifications; and as-built plans. Amendments to the waterway permits and alternate foundation design, as applicable, will also be specified to be included in final design.

The chronology of the structure-related submissions for review and approval during conceptual design will be as follows:

1. Hydrologic and Hydraulics Report (as applicable)
2. Conceptual Type, Size and Location (Conceptual TS&L)
3. Foundation Submission
4. Bid Plans and Special Provisions

Refer to Figure 4.2.1.2.2-1 for a graphic showing the bifurcation of the project development process for structures.

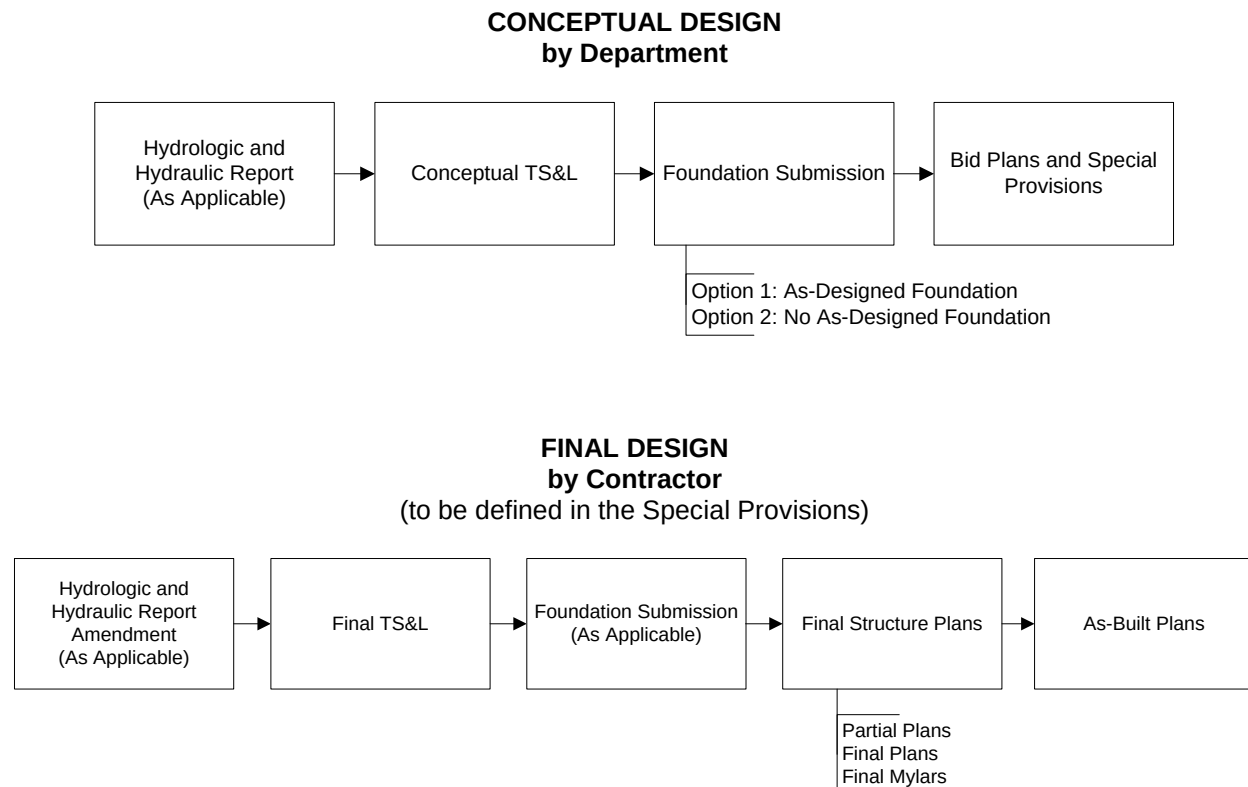


Figure 4.2.1.2.2-1

4.2.1.2.2.1 Hydrologic and Hydraulic Report

In accordance with Publication 15M, Design Manual Part 4, *Structures*, Section PP1.9.2 and as follows:

Base the hydraulic analysis on the structure recommended in the Conceptual TS&L, and submit the JPA to obtain a waterway permit. If in the instance that the Department intends to include more than one recommended structure type is included in the Conceptual TS&L for the purposes of providing alternates for bidding, perform hydraulic analyses on each of the recommended structure types and submit the JPA with a request to obtain a waterway permit that allows for construction of any one of the alternate structures.

4.2.1.2.2.2 Conceptual Type, Size, and Location (TS&L)

Request the District Bridge Engineer (DBE) or the DBE's representative to attend the Design Field View for all structure projects to provide input in finalizing the location and horizontal and vertical alignment for the project, taking into account site-specific conditions such as scour potential. Where complex geotechnical conditions are anticipated, request the District Geotechnical Engineer Manager's attendance.

Investigate a proposed structure with sufficient detail to select and justify the type, size, and location based on the information available from the various phases of study outlined in Publication 10A, Design Manual Part 1A, *Pre-TIP and TIP Program Development Procedures*, including any foundation information obtained. Perform preliminary cost comparisons to support the Conceptual TS&L recommendations.

In general, develop the Conceptual TS&L submission in accordance with Publication 15M, Design Manual Part 4, *Structures*, P1.9.3.3 for TS&L submissions. However, certain details that are normally finalized at the TS&L stage may not need to be finalized in the Conceptual TS&L plans. For example, if a multiple span bridge is proposed with multiple pier fixity, the number of fixed piers does not need to be finalized in the Conceptual TS&L plans. In this case, indicate in the Conceptual TS&L plans and/or special provisions that the number of fixed piers shall be established by the Contractor's Lead Design Engineer subject to the design requirements in Publication 15M, Design Manual Part 4, *Structures* and the contract special provisions. Contact the BDTD to obtain guidance on the level of detail where uncertainties occur on individual projects.

Prepare Conceptual TS&L plans for both steel and concrete structures where cost differences are insignificant, and where other project specific requirements do not justify the selection of an individual material type. Prepare Conceptual TS&L plans for both steel and concrete structures for all major structures, as defined in Publication 15M, Design Manual Part 4, *Structures*, PP1.5. A Conceptual TS&L for a single material type may be developed for a major bridge with approval from the Director, Bureau of Project Delivery. When existing substructure units will be retained and new loads are to be applied, evaluate the existing substructure units during the Conceptual TS&L stage to assure adequate load carrying capacity for proposed conditions.

Conceptual TS&L for any structure supported on proprietary walls will not be approved until adequate foundation information including scour evaluation (if applicable) is available, or the foundation investigation is completed and recommendations are available.

Refer to Publication 15M, Design Manual Part 4, *Structures*, Tables PPl.9-1 and PPl.9-3 for the review and approval responsibility for the Conceptual TS&L.

When the District is responsible for TS&L approval, submit two copies of the Conceptual TS&L submission to the DBE for approval. Send to the BDTD an informational copy of the DBE's Conceptual TS&L approval letter, with roadway plans, applicable Quality Assurance Forms, and Conceptual TS&L plans showing the core-boring layout.

When the BDTD and FHWA are responsible for TS&L approval, submit to BDTD through the District Executive, one copy of the Conceptual TS&L submission for an estimated structure cost of less than \$10 million, and two sets for a structure cost over \$10 million. For 100% State-funded projects, only one set is required.

Mark in red all District review comments to a Consultant's plan submission and forward to BDTD with an explanation as appropriate. Alternatively, prepare and transmit comments in a written itemized form. BDTD will

review the submission, obtain FHWA approval, when required, and approve it if it is found satisfactory. Submission of revised conceptual plans will be requested, if necessary.

Prepare a Conceptual TS&L submission for the proposed bridge. Prepare and transmit the submission in accordance with Publication 15M, Design Manual Part 4, *Structures*, Part A, *Policies and Procedures*, Chapter 1.9.3.3, other applicable sections of Publication 15M, Design Manual Part 4, *Structures*, Part A, *Policies and Procedures*. Specifically address all bullet items listed in PP1.9.3.3(c) (4). Additionally, include in the report a summary of design requirements for the structure shown on the Conceptual TS&L plan and for alternate structures. Format the summary such that the data can be directly integrated into the "DESIGN OF, S-XXXXX" and "CONSTRUCTION OF __, S-XXXXX" standard special provisions. Refer to [Section 4.2.1.3.3](#) below for discussion of the use of the available structure-related standard special provisions.

Where utility facilities are to be located on a structure, the Conceptual TS&L plans must provide sufficient details for the Contractor's Lead Design Engineer's use in preparing the final structure plans. Indicate in tabular form on the Conceptual TS&L plans materials required for each utility and the party who is to furnish and install the material. Refer to Publication 16M, Design Manual Part 5, *Utility Relocation*, Chapter 7, for Utility Occupancy of Highways and Bridges, for general guidelines coordination procedure and guidelines for accommodation of utilities on structures.

4.2.1.2.2.3 Foundations

Two foundation development options are available for Adjusted Bid projects. The first option involves the preparation of a complete foundation submission as per Publication 15M, Design Manual Part 4, *Structures*, PP 1.9.4 during conceptual design. This includes a complete subsurface exploration program, recommendations for a foundation type(s), and preparation of geotechnical design parameters for use by the Contractor's Lead Design Engineer. Recommendations for permissible alternate foundation types and the use of the as-designed foundations at relocated substructure must be provided. This design process, identified as "Option 1: As Designed Foundation Design Prepared During Conceptual Design," is defined in below.

The second option involves a limited foundation investigation during conceptual design and completion of the foundation investigation during final design. During conceptual design, a limited geotechnical exploration, recommendations for permissible foundation types, recommendations for geotechnical design parameter limitations, and a Foundation Design Guidance Report as defined below must be completed. During final design, the Contractor's Lead Design Engineer completes the subsurface exploration and prepares a foundation report, which must include the proposed foundation type and recommended geotechnical design parameters. This process, which is intended to expedite conceptual design, is identified as "Option 2: No As Designed Foundation Prepared During Conceptual Design." This process is defined below and its use is subject to certain limitations as described therein.

Refer to Figure 4.2.1.2.2-2 for graphics showing the foundation development process, illustrating the Department's responsibility during Conceptual Design, and the contractor's responsibility for Final Design that must be specifically defined in the Special Provisions.

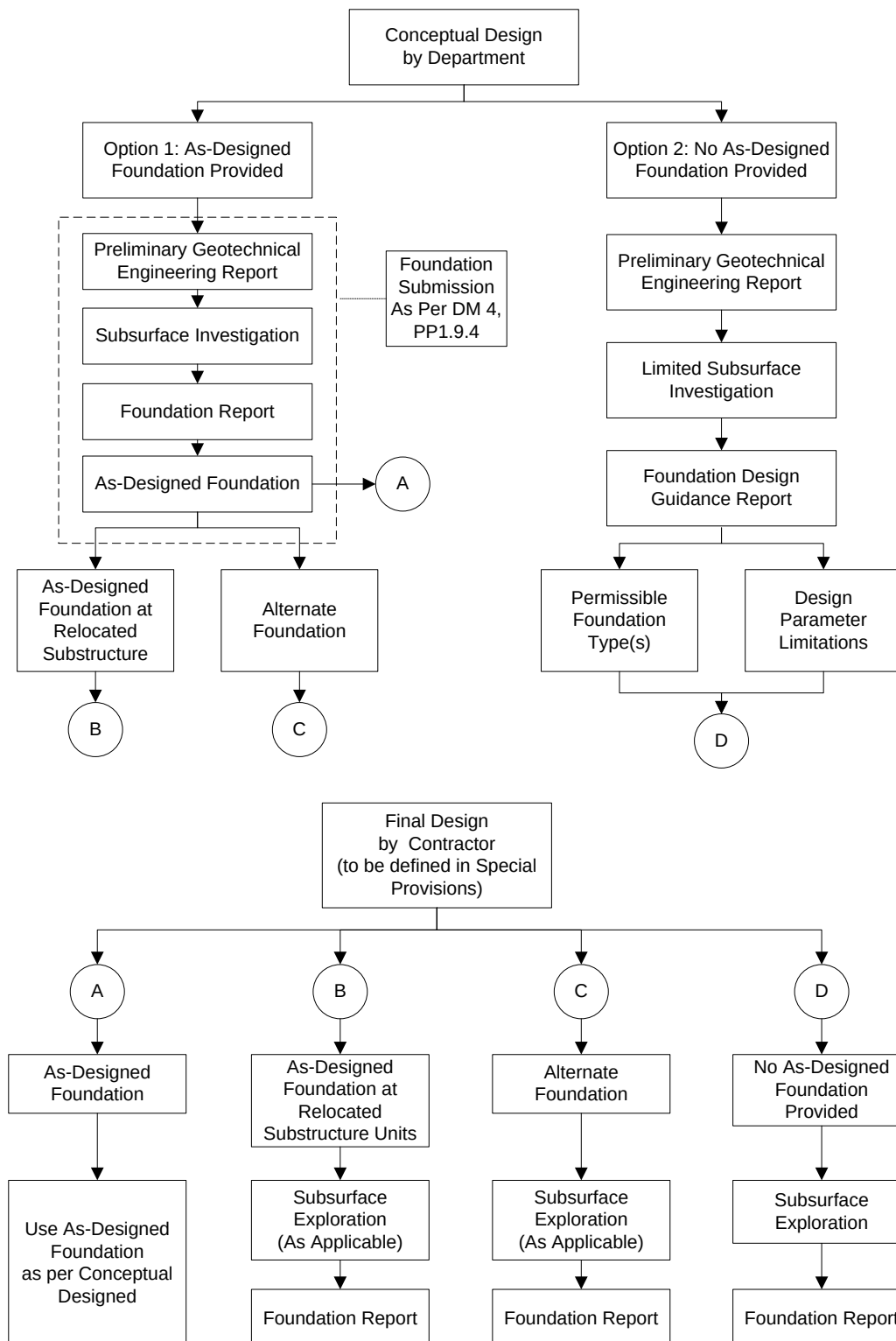


Figure 4.2.1.2.2-2

Refer to Publication 15M, Design Manual Part 4, *Structures*, Table PP1.9-2 for the review and approval responsibilities for foundations. The BDTD and, as applicable, FHWA will be responsible for approving Foundation Design Guidance Reports.

When the District is responsible for foundation approval, submit two copies of the Foundation Submission to the District Geotechnical Engineer/Manager. The District may consult with the BDTD, the Geotechnical Engineers/Managers, and Geotechnical Section of the Innovation and Support Services Division about unusual cases.

When BDTD and FHWA are responsible for approval, request the DBE and the District Geotechnical Engineer/Manager to review the foundation submission. Forward the District's recommendation to BDTD with three copies of the foundation submission for Department oversight projects and four sets for FHWA oversight projects.

Mark in red all District review comments to a Consultant's plan submission and forward to BDTD with an explanation as appropriate. Alternatively, prepare and transmit comments in a written itemized form. BDTD will review the submission and approve it if it is found satisfactory and after obtaining necessary FHWA approval. Submission of revised data and information will be requested, if necessary. Consult the Geotechnical Section of the Innovation and Support Services Division about unusual or complex foundations.

- Option 1: As-Designed Foundation Design Prepared During Conceptual Design

Prepare a subsurface exploration and foundation recommendation in accordance with Publication 15M, Design Manual Part 4, *Structures*, PP1.9.4.

Summarize foundation recommendations in the foundation report to allow for direct integration of this information into the applicable "DESIGN OF (AS-DESIGNED FOUNDATION PROVIDED), S-XXXXX" standard special provision. Provide for each substructure unit the foundation design parameters that are required input items in the Department's computer programs. For noise barriers, provide foundation design parameters required for use with the Bridge Design Standard Drawings. Address guidelines on the use of as-designed foundations at relocated substructure units and the use of alternate foundations in the report as follows:

Relocated Substructure Units using As-Designed Foundations

1. Provide recommendation on the use of as-designed foundations at substructure units relocated from the positions shown on the Conceptual TS&L plan.
2. Provide listing of project limitations. Typically, this will consist of the design and construction requirements specified for the as-designed foundation locations.
3. Provide recommendation on the need for additional test borings. Typically, it is expected that a minimum of two borings will be provided within the footprint of each substructure unit. These can be borings from the conceptual design or specify that additional borings be drilled by the Contractor's Lead Design Engineer. Where uniform subsurface conditions are expected, give consideration to reducing the extent of exploration and testing required during final design. For example, if piles are specified for the as-designed foundation and the borings taken during preliminary design show the presence of bedrock at elevations that can be interpolated between borings, the need for additional borings may be limited to that necessary to verify the top of rock elevation and rock competency at the relocated substructure unit.

Alternate Foundations

1. Provide recommendation for all permissible alternate foundation types.
2. Provide a listing of limitations that apply to the alternate foundations. Limitations that supersede or are not covered in AASHTO and Publication 15M, Design Manual Part 4, *Structures*, should be covered.
3. Provide recommendation on the need for additional test borings and laboratory testing. Typically, it is expected that a minimum of two borings will be provided within the footprint of each substructure unit. These can be borings taken during the conceptual design or specify that additional borings be drilled by the Contractor's Lead Design Engineer.
4. Provide recommendations for geotechnical design parameter limitations for the permissible alternate foundations. The limitations should contain sufficient information to help prevent situations where interpretation of AASHTO and/or Publication 15M, Design Manual Part 4, *Structures*, could result in the development of controversial or unacceptable design parameters by the Contractor's Lead Design Engineer. For example, if spread footings on soil are permitted, the maximum soil friction angle that would be

permitted for the design should be established. Alternatively, if a spread footing on rock is permitted, establish the maximum ultimate bearing capacity that would be permitted for the rock.

5. Provide recommendations for subgrade preparation and construction monitoring (pile dynamic analysis, load tests, settlement monitoring, etc.).
 - Option 2: No As-Designed Foundation Design Prepared During Conceptual Design

Only use the process where geotechnical design parameters are specified to be established by the Contractor's Lead Design Engineer during final design when favorable subsurface conditions are present, and not under the limitation conditions below. During conceptual design, provide reconnaissance pursuant to Publication 15M, Design Manual Part 4, *Structures*, PP6.2, for single and multiple-span bridges.

Limitations

Do not specify the foundation design to be prepared during final design where any of the following conditions are encountered unless otherwise approved by the Chief Bridge Engineer:

- problematic subsurface conditions as per Publication 15M, Design Manual Part 4, *Structures*, D10.4.7P are identified in the reconnaissance or are discovered in the conceptual design test-boring program;
- unusual scour conditions are present or are anticipated at the project site;
- structure carrying or crossing over a Railroad;
- retaining wall located along a Railroad;
- mechanically stabilized earth wall abutments are proposed in the Conceptual TS&L;
- proprietary retaining wall is proposed in the Conceptual TS&L; or
- culverts.

In cases where special approval is requested from the Chief Bridge Engineer, address the method of payment for foundations. Consider specifying a foundation payment method that will avoid significant risk-taking by the Contractor during the bid process.

Subsurface Exploration

Conduct a limited foundation exploration to establish subsurface conditions within the limits of the bridge structure. As a minimum, obtain one boring at each abutment. For multiple span bridges, obtain additional borings at a maximum interval of 150 feet between abutments. Preferably, take a minimum of one boring at each substructure unit as shown on the Conceptual TS&L plan. The exploration should be performed in accordance with Publication 15M, Design Manual Part 4, *Structures*, PP6.3, except prepare a Foundation Design Guidance Report as described below in lieu of the report indicated in PP6.3 (e). Perform soil and water testing as required to establish the corrosion potential at the structure site.

Foundation Submission

Prepare a Foundation Design Guidance Report providing results of the subsurface exploration and recommendations of permissible foundation types. Include the following items in the report:

1. Brief description of each site including history, surface features, geological formation and items identified during the final exploration meeting.
2. Plotted logs of core borings and boring layouts.
3. Typewritten Engineer's logs.
4. Results of the professional engineer certified laboratory tests.
5. Endorsement of foundation investigation information and notes as per Publication 15M, Design Manual Part 4, *Structures*, PP1.9.4.3 (b) (5).
6. Recommended additional subsurface exploration to be performed during final design, including:
 - a. Minimum number of borings per substructure unit. (Typically, it is expected that a minimum of two borings shall be provided within the footprint of each substructure unit. These can be borings from the conceptual design or additional borings drilled by the Contractor's Lead Design Engineer.)
 - b. Laboratory testing.

7. Recommended permissible foundation types and recommended geotechnical design parameter limitations for each foundation type. The geotechnical design parameter limitations should contain sufficient information to help prevent situations where interpretation of AASHTO and/or Publication 15M, Design Manual Part 4, *Structures* could result in the development of controversial or unacceptable design parameters by the Contractor's Lead Design Engineer. For example, if spread footings on soil are permitted, the maximum soil friction angle that would be permitted for the design should be established. If a spread footing on rock is permitted, the maximum ultimate bearing capacity that would be permitted for the rock should be established.
8. Scour analysis
9. Recommended minimum number of test piles.
10. Recommended construction monitoring (e.g., pile dynamic analysis, load tests, settlement monitoring, etc.)

Foundation recommendations in the report shall be summarized to allow for direct integration of this information into the applicable standard special provision "DESIGN OF (NO AS-DESIGNED FOUNDATION PROVIDED), S-XXXXX".

- Bid Plans

Incorporate information from the foundation exploration and foundation submission on the Conceptual TS&L plans. Where an as-designed foundation is developed during conceptual design, include information from the foundation plans, including test-boring locations, bottom of footing elevations, pile size and estimated pile tip elevations, caisson sizes, etc. Incorporate test boring logs. Where an as-designed foundation is not developed during conceptual design, include test-boring locations and test boring logs on the plans.

4.2.1.3 Special Provisions

The special provisions related to the design-build aspects of a project are the portion of the construction contract that changes the contract and its standard specifications and terms from that of a conventional design-bid-build to a design-build contract. Therefore, the special provisions must be complete in scope so as to fully transform the contract type with regard to the contractor taking over the role of designer for the final plans. The division of responsibilities between the contractor's Lead Design Engineer and the Department must be clearly articulated so that the design process and the Department's interests are not compromised. As per Publication 408, Section 105.04, the special provisions take precedent over the Conceptual Drawings and other documents in the bid package, and therefore will be the ultimate authority on the contract work.

It is critical that all design requirements are clearly developed in the standard special provisions for Adjusted Bid Design-Build. All design work must be in accordance with Department manuals and specifications, but the design-build process is designed to allow the contractor to develop the specific project design to minimize costs while meeting the contract requirements. For that reason, it is imperative that the contract special provisions identify any additional requirements to ensure the overall objectives of the Department are met. All project specific requirements must be clearly identified in the contract documents. For example, if full depth shoulders are preferred by the Department to accommodate future widening, the special provisions must include this requirement (Design Manuals will require typical shoulder types). Districts are encouraged to develop District-specific checklists so that specific District objectives are considered in the development of design considerations for design-build projects.

During the Conceptual Design phase, it is imperative that all design criteria are evaluated in light of potential impact to Final Design. The Adjusted Bid Design-Build process encourages the development of a Final Design which minimizes total project costs. For that reason, the Special Provisions must clearly identify and/or restrict activities to meet the overall Department objectives.

By way of example, consider a simple bridge replacement project for a bridge on a local route over an interstate. Establishing a 25 mph design requirement with no other design constraints could result in a Final Design on the local route involving a "camel back" vertical alignment which would produce reduced sight distances compared to the existing conditions. Although meeting design requirements for a 25 mph local road, the design would result in a degradation of the existing site conditions unless additional design requirements are specified in the contract

documents. Although the following sections discuss the use of the special provision templates, each project must be customized so that the overall Department objectives are clearly specified in the project Special Provisions.

Templates of the special provisions for design-build projects are posted in the ECMS standard special provisions. These special provisions should be used as needed based on the project design-build components. The sections that immediately follow provide a description of each special provision and its use, and guidance on completing the editable portions within each, shown in the templates as bold and italicized text in parentheses. The design item and special bidding special provisions must fully establish all relevant criteria for the development and approval of the final design by the contractor. The available special provision templates are discussed below and follow the categories:

- General (to be included on all design-build projects)
- Roadway
- Bridges/Structures
- Maintenance and Protection of Traffic
- Right of Way
- Utilities
- Environmental / Permitting
- Concrete Curb Ramps

4.2.1.3.1 General Special Provisions

Include the following design-build special provisions on all Adjusted Bid projects:

- **D-a29890 Special Bidding – Design-Build**

Special Bidding – Design-Build identifies the specific design-build activities to be included in each project and contains the majority of the general requirements, or boilerplate, for design-build projects. It includes actions required by the bidder before and after award, professional services involvement restrictions, submission contacts for reviews, submission requirements, number of plan sets required, review times and general design requirements. It is subdivided into eight sections, referred to as "Parts."

DO NOT MODIFY PARTS 1, 2, OR 3 UNDER ANY CIRCUMSTANCES. In addition, DO NOT modify the Part numbers throughout this special provision, as they are referenced by most of the other design-build special provisions.

Sections IV through VII must be edited in detail to fit the specific project scope and characteristics.

4. Design Activities – Identify all design activities to be included in the contract. Delete those not needed. This section is referenced frequently throughout the various design-build Special Provisions. Take extra care to ensure that the list is complete and correct.

5. Review Submission Contacts – Choose between the two options for the listing of the Department contacts for the transmission of design submittals; either (a) transmit submittals through the Department's identified Project Manager or (b) transmit certain submittals through the District Section Managers whose responsibility includes the plans to be reviewed, and copy the Project Manager.

The Project Manager to be identified in Section V, regardless of the option selected, will be determined by the District Executive. Depending on District resources and preferences, the contact person for all post-award design activities performed by the contractor can either be the Design Unit Project Manager, a District Design-Build Coordinator, or the District Assistant Construction Engineer to whom the project will be assigned. Insert the selected individual's name and contact information in Section V. If the first option is selected, delete the remaining text in Section V after the Project Manager's information. . If the Design Unit Project Manager is identified in Section V, make sure to list in Section X the Construction Unit individual who will be responsible for the processing of the Current Estimate Payments.

If the second option is selected, the five offices generally will be:

- Roadway Design – Assistant District Executive-Design
- Bridge Design – District Bridge Engineer
- Maintenance and Protection of Traffic Design – District Traffic Engineer
- Utility Coordination – District Utility Administrator
- Right-of-Way Design and Acquisition – District Right-of-Way Administrator

Insert the selected individuals' names and contact information in Section V. Delete any of the Design Activities not listed in Section IV.

For submission location, determine whether submittals will be transmitted electronically through an FTP site, or delivered paper copies. This decision is a District preference. Depending on the needs of individual reviewing parties, a combination of electronic and paper submissions may need to be identified. If an FTP site is to be utilized, identify the site or state that the site will be identified to the successful bidder at the Preconstruction Conference.

Also identify outside reviewing parties such as County Conservation Districts, Department of Environmental Protection (DEP), and Army Corps of Engineers, as required.

6. Location Information – Provide the appropriate mailing addresses for the District office, County Conservation District(s) office(s), Department of Environmental Protection Regional office and USACOE District office should be provided as applicable.

7. Submission Review Requirements/Review Times – First determine whether project is classified as Federal Oversight or PennDOT oversight. While this is more likely determined at the project scoping phase, the primary criterion for determining review responsibility is oversight status. Refer to Publication 10X, Design Manual Part 1X, *Appendices to Design Manuals 1, 1A, 1B, and 1C*, Appendix C, *FHWA/PennDOT Stewardship and Oversight Agreement*, Part IX, Project Categories and Agency Roles for the current rules regarding oversight criteria.

Federal oversight means either Central Office or FHWA review of design-build submittals; PennDOT oversight means reviews are handled within the District, except under unusual circumstances. Generally, for non-structure Design Activities, the Project Categories and Agency Roles table in Part IX of the FHWA/PennDOT Stewardship and Oversight Agreement governs. Publication 15M, Design Manual Part 4, *Structures* identifies review responsibility by oversight and structure type:

- For specific foundation submittals, refer to Publication 15M, Design Manual Part 4, *Structures*, Table 1.9-2, *Review and Approval Responsibility for Foundation Approval for all Projects*.
- For specific structure submittals with Federal Oversight, refer to Publication 15M, Design Manual Part 4, *Structures*, Table 1.9-1, *Review and Approval Responsibility for Federal Oversight Project*
- For specific structure submittals with PennDOT Oversight, refer to Publication 15M, Design Manual Part 4, *Structures*, Table 1.9-3, *Review and Approval Responsibility for PennDOT Oversight Projects*.

If Central Office and/or FHWA reviews are required, specify the "Central Office" or "Central Office and Federal Highway Administration" in the second paragraph. If the project is PennDOT oversight, and no Central Office or FHWA review of any Design Activity is required, delete the paragraph in its entirety.

The matrix in Section VII is to identify for the contractor the review times for each submittal for the Design Activities in the contract. When paper submissions are specified, the matrix also identifies the total number of sets required to be produced and submitted for review for each submittal.

Determine the parties responsible for reviewing each submission. Make a record of this information for later use by District personnel who will ultimately be responsible for the management of the post-award design submittal process. It is recommended to use the Submittal Review Responsibility Checklist (APPENDIX B). Completing this checklist will facilitate the calculation of the total number of sets of paper submissions for the Section VII matrix. As an alternative to completing this checklist for each project, Districts can elect to utilize standard templates, one for all PennDOT oversight design-build projects and one for Federal Oversight design-builds. The significance of this requirement is to establish an internal record of arrangements made during the conceptual design phase as to responsibilities for review of submittals, to convey this information to others within the District who may be responsible for managing submittals after award. This document should also indicate whether any design consultants under agreement to the District will have a role in the review activities. Regardless of the means utilized to pass this information on, the intent is to avoid any delays in the design-build submittal review process caused by confusion on the part of the Department.

To complete the checklist, first check which submission will be specified by the Design Activity items for the project. Then identify the reviewing party to be inserted in the appropriate column. For non-signature paper review submittals, generally two sets go to each party actually performing a review, and one set goes to non-reviewing parties for information. For example, in the case of consultant review in the District (PennDOT oversight), two copies go to the consultant, one is kept in the District. However, in the case of Federal oversight, two copies go to Central Office and two copies go to FHWA.

When electronic submissions will be specified, determine the District procedure for applying the signature and seal to the final plan sheets. Add the requirements of this process to Section VII. Some District processes do not require the submission of multiple copies, where others do.

Generally, for final, signature paper submissions, additional sets are necessary for the ultimate distribution, which in the scenario with the greatest number of copies, 13, would be as follows:

- Three sets – District
- One set – review consultant
- One set – Central Office
- One set – FHWA
- Seven sets – Contractor (includes one for Lead Design Engineer)

If Central Office, FHWA, and/or a review consultant are not involved, reduce the total by that number of sets.

If paper submissions are required, specify in Section VII that the contractor is responsible for providing the following number of half-size prints of final, signed drawings:

- One set – District Design Unit
- Two sets – District Construction Unit
- One set – review consultant
- One set – Central Office
- One set – FHWA

Similar to final submissions, reduce the number of copies required if Central Office, FHWA, and/or a review consultant are not involved.

Once the above information is ascertained, insert the office of the reviewing party in the appropriate cell for the submissions for each of the Design Activities to be included in the contract. If paper submissions are required, insert the number of copies after the office title. For example, for Final Design for a structure on a PennDOT oversight project, indicate "District X-0 Bridge Engineer – 2". Use the "Other" column for outside agency reviewers.

To populate the Section VII matrix in the special provision with the number of paper submission copies, use the total number of copies listed in the corresponding row on the Submittal Review Responsibility checklist.

If electronic submissions are required, indicate the number of full and/or half-size sets desired for use during construction in the first paragraph of Section VII. If paper submissions are required, identify any half-size sets desired for construction use.

Include the Submittal Review Responsibility checklist, or some level of documentation of reviewing parties as an attachment to the project development checklist, but do not include with the bid package.

8. General Design Requirements – This section lists the general design requirements applicable to all Adjusted Bid projects as well as the various design specifications. Do not edit this section. Additional design specifications, if needed, can be added to the applicable design special provision.

9. Schedule of Values – Be sure to attach the Project Schedule of Values template (See APPENDIX E).

10. Construction Contact – Identify the individual who will be responsible for processing the Current Estimate Payments. If it differs from the Project Manager listed in Section V, identify the individual from the Construction Unit who will be assigned to the project and handle the estimates, particularly during the period between the Notice to Proceed and the start of construction which will involve payment for the Design activity items.

And either:

- **D-c299XX-A Quality Plan [Design] – With Quality Assurance Review by Department - Adjusted Bid**

Or:

- **D-c299XX-A Quality Plan [Design] – With Quality Assurance Review [Peer Review] - Adjusted Bid**

Based on the limiting criteria discussed above in [Section 4.1.12](#), Quality Assurance Review Screening, the choice of review methods should have been narrowed early in the Conceptual Design phase. At this stage, make the final determination by re-reviewing the criteria, and if the project still is a candidate for Peer Review, consider it only if the Department resources (including the consultants under agreement with the Department) available to perform full quality assurance review appear not to be sufficient to review the volume of submittals required by the project within the time limits identified in SPECIAL BIDDING – DESIGN-BUILD. Select the appropriate Quality Plan special provision based on the final choice.

Note that neither of the Quality Plan special provisions should be modified or edited without approval of the Chief of Project Schedules, Specifications and Constructability Section of the Highway Delivery Division.

- **ITEM 0609-YYYY – Inspector's-____ – Inspector's Field Office and Inspection Facilities, Design-Build Project**

Include this special provision on design-build projects requiring an inspector's field office.

4.2.1.3.2 Roadway Special Provisions

Use the following special provisions when there is roadway work on the project:

4.2.1.3.2.1 D-c29900-A Design Roadway

Identifies the roadway related design activities to be performed by the contractor.
Edit the following:

- List additional design items that are not indicated on the Conceptual Drawings.
- List any additional designer qualifications above those listed in the Section II of Special Bidding – Design-Build.
- List all information/data to be made available to the Contractor. Delete any information listed in the template that will not be provided.
- List any additional design specifications over and above those listed in Section VIII of Special Bidding – Design-Build. Be sure to identify which publications listed in Section VIII are superseded. Describe any Special Design Requirements.
- Insert the details of the pavement design, if developed by the Department during the Conceptual Design. If the pavement design has not been developed, provide the parameters under which the contractor is to develop the design. If bridge work is included in the project, include instructions regarding approach slab replacement.
- Describe the conceptual drainage plan and include pipe, inlet and ditch cleaning where appropriate.
- Describe any connections to existing guide rail or concrete barrier.
- Provide the applicable Geotechnical Design parameters. Add special provision for subgrade stabilization
- Specify paper, drafting film, or vellum for Title Sheet signature.

4.2.1.3.2.2 D-c29901- Construct Roadway

This item must accompany the Design Roadway item. It covers the actual construction of the work indicated on the plans developed under the Design Roadway item.

4.2.1.3.3 Bridges/Structures Special Provisions

Include the following structure related items, as appropriate. Items are grouped by new design, then rehabilitation.

New Design

4.2.1.3.3.1 D-c82100 Design of Bridge Structure (As-Designed Foundation Provided), S-xxxxx

Use on projects requiring the design of a new bridge where a foundation type and geotechnical design parameters are provided by the Department. Edit the following:

- In Section II, DESIGN, select (A) when a full Conceptual TS&L is provided, (B) when a final Approved TS&L is provided, or (C) when the minimum Conceptual TS&L consisting of plan view, cross section, and elevation with minimum widths, vertical clearance, and required waterway opening is provided. Delete the option not selected.
- List any additional designer qualifications above those listed in Section II of Special Bidding – Design-Build that may be desired for the particular type of structure.
- List information/data relevant to the design of the particular structure to be made available to the Contractor during bidding, including, but not limited to the items listed.

- List any additional design specifications and Railroad requirements over and above those listed in Section VIII of Special Bidding – Design-Build. Be sure to identify which publications listed in Section VIII are superseded.
- Cross reference other special provisions such as Temporary Excavation Support and Protection System, or Dynamic Pile Load Monitoring to avoid duplicative language when requirements contained in other special provisions are relevant to this item.
- Describe general design requirements for this structure, in addition to those listed.
- List the parameters of any allowable geometry changes, but be sure to indicate when no changes will be permitted.
- List site class of the foundation material per AASHTO LRFD Bridge Design Specification Section 3.10.3.1.
- Specify girder and joint requirements and limitations. Add others as necessary.
- State substructure limitations/allowances.
- When temporary bridges will be required for maintenance and protection of traffic purposes during construction, list design and construction requirements.
- Specify MPT requirements related to the structure or, if listed elsewhere in the bid package, refer to where it is provided.
- When the structure will be located adjacent or over a Railroad, specify the clearance and support requirements.
- Provide additional requirements for future widening to be incorporated into the design, when desirable.
- Provide additional design requirements for future redecking, when appropriate, within the listed items.
- List on-bridge lighting requirements, if any.
- List waterway requirements, when applicable, as well as parameters for alternate structures, when permitted; reference Permits for Design-Build Projects special provision. If the H&H Report is being prepared by the Department, include a requirement to that the contractor is responsible for any amendments that result from an alternate structure.
- Refer to Environmental Mitigation and Tracking special provision, if included in the bid documents.
- List utility information and reference to Utilities special provision.
- List any additional design requirements that do not fit the previous categories.
- Review list of geotechnical parameters with the District Geotechnical Unit and provide the applicable design parameters and construction requirements for the particular structure, and alternate foundation designs, if permitted
- Review construction phasing with the constructability team to determine how the submittal process can be phased to allow construction to begin earlier than otherwise possible with single final design

submittal. Define what partial submissions will be accepted, the level of approval required for construction to commence, and limitations on construction activities associated with the partial approval.

- Specify paper, drafting film, or vellum for signature by the District Bridge Engineer.

4.2.1.3.3.2 D-c82110 Design of Bridge Structure (No As-Designed Foundation Provided), S-xxxxx

Use on projects requiring the design of a new bridge, no foundation design was developed during Conceptual Design, and therefore a Foundation Submission is required. Edit the following:

- In Section II, DESIGN, select (A) when a full Conceptual TS&L is provided, (B) when a final Approved TS&L is provided, or (C) when the minimum Conceptual TS&L consisting of plan view, cross section, and elevation with minimum widths, vertical clearance, and required waterway opening is provided. Delete the option not selected.
- List any additional designer qualifications above those listed in Section II of Special Bidding – Design-Build that may be desired for the particular type of structure.
- List information/data relevant to the design of the particular structure to be made available to the Contractor during bidding, including, but not limited to the items listed.
- List any additional design specifications and Railroad requirements over and above those listed in Section VIII of Special Bidding – Design-Build. Be sure to identify which publications listed in Section VIII are superseded.
- Describe general design requirements for this structure, in addition to those listed.
- List the parameters of any allowable geometry changes, but be sure to indicate when no changes will be permitted.
- List site class of the foundation material per AASHTO LRFD Bridge Design Specification Section 3.10.3.1.
- Specify girder and joint requirements and limitations. Add others as necessary.
- State substructure limitations/allowances.
- When temporary bridges will be required for maintenance and protection of traffic purposes during construction, list design and construction requirements.
- Specify MPT requirements related to the structure or, if listed elsewhere in the bid package, refer to where it is provided.
- When the structure will be located adjacent or over a Railroad, specify the clearance and support requirements.
- Provide additional requirements for future widening to be incorporated into the design, when desirable.
- Provide additional design requirements for future redecking, when appropriate, within the listed items.
- List on-bridge lighting requirements, if any.

- List waterway requirements, when applicable, as well as parameters for alternate structures, when permitted; reference Permits for Design-Build Projects special provision.
- Refer to Environmental Mitigation and Tracking special provision, if included in the bid documents.
- List utility information and reference to Utilities special provision.
- List any additional design requirements that do not fit the previous categories.
- For foundations, provide the necessary parameters for contractor to develop a complete foundation design.
- Review construction phasing with the constructability team to determine how the submittal process can be phased to allow construction to begin earlier than otherwise possible with single final design submittal. Define what partial submissions will be accepted, the level of approval required for construction to commence, and limitations on construction activities associated with the partial approval.
- Specify paper, drafting film, or vellum for signature by the District Bridge Engineer.

4.2.1.3.3.3 D-c82310 Construction of Bridge Structure, S-xxxxx

Use with c82100 Design of Bridge Structure (As-Designed Foundation Provided), S-xxxxx or c82110 Design of Bridge Structure (No As-Designed Foundation Provided), S-xxxxx special provision. For as-designed foundations, provide separate unit price pay items to address conditions that may be encountered beyond the contractor's control, such as piles or caissons. When no as-designed foundation is specified, or the contractor chooses an alternate to the as-designed foundation, the foundation should be bid and paid for as a lump sum item.

List any additional construction requirements.

4.2.1.3.3.4 D-c82120 Design of Retaining Wall (As-Designed Foundation Provided), S-xxxxx

Use on projects requiring the design of a new retaining wall where the foundation type and geotechnical design parameters have been developed during conceptual design and will be provided in the bid package. This specification is not to be used for proprietary retaining walls such as MSE or precast modular walls. Edit the following:

- List any additional designer qualifications above those listed in Section II of Special Bidding – Design–Build that may be desired for the particular type of structure.
- List information/data relevant to the design of the particular structure to be made available to the Contractor during bidding, including, but not limited to the items listed.
- List any additional design specifications and Railroad requirements over and above those listed in Section VIII of Special Bidding – Design-Build. Be sure to identify which publications listed in Section VIII are superseded.
- Describe general design requirements for this structure, in addition to those listed.
- List the parameters of any allowable geometry changes, but be sure to indicate when no changes will be permitted.

- List site class of the foundation material per AASHTO LRFD Bridge Design Specification Section 3.10.3.1.
- Specify MPT requirements related to the structure or, if listed elsewhere in the bid package, refer to where it is provided.
- When the structure will be located adjacent to a Railroad, specify the clearance and support requirements.
- List on-wall lighting requirements, if any.
- List waterway requirements, when applicable, as well as parameters for alternate structures, when permitted; reference Permits for Design-Build Projects special provision.
- Refer to Environmental Mitigation and Tracking special provision, if included in the bid documents.
- List utility information and reference to Utilities special provision.
- List any additional design requirements that do not fit the previous categories.
- Review list of geotechnical parameters with the District Geotechnical Unit and provide the applicable design parameters and construction requirements for the particular structure, and alternate foundation designs, if permitted
- Review construction phasing with the constructability team to determine how the submittal process can be phased to allow construction to begin earlier than otherwise possible with single final design submittal. Define what partial submissions will be accepted, the level of approval required for construction to commence, and limitations on construction activities associated with the partial approval.
- Specify paper, drafting film, or vellum for signature by the District Bridge Engineer.

4.2.1.3.3.5 D-c82130 Design of Retaining Wall (No As-Designed Foundation Provided), S-xxxxx

Use on projects requiring the design of a new retaining wall no foundation design was developed during Conceptual Design, and therefore a Foundation Submission is required. This specification is not to be used for proprietary retaining walls such as MSE or precast modular walls. Edit the following:

- List any additional designer qualifications above those listed in Section II of Special Bidding – Design-Build that may be desired for the particular type of structure.
- List information/data relevant to the design of the particular structure to be made available to the Contractor during bidding, including, but not limited to the items listed.
- List any additional design specifications and Railroad requirements over and above those listed in Section VIII of Special Bidding – Design-Build. Be sure to identify which publications listed in Section VIII are superseded.
- Describe general design requirements for this structure, in addition to those listed.
- List the parameters of any allowable geometry changes.
- List site class of the foundation material per AASHTO LRFD Bridge Design Specification Section 3.10.3.1.

- Specify MPT requirements related to the structure or, if listed elsewhere in the bid package, refer to where it is provided.
- When the structure will be located adjacent to a Railroad, specify the clearance and support requirements.
- List on-wall lighting requirements, if any.
- List waterway requirements, when applicable, as well as parameters for alternate structures, when permitted; reference Permits for Design-Build Projects special provision.
- Refer to Environmental Mitigation and Tracking special provision, if included in the bid documents.
- List utility information and reference to Utilities special provision.
- List any additional design requirements that do not fit the previous categories.
- For foundations, provide the necessary parameters for contractor to develop a complete foundation design.
- Review construction phasing with the constructability team to determine how the submittal process can be phased to allow construction to begin earlier than otherwise possible with single final design submittal. Define what partial submissions will be accepted, the level of approval required for construction to commence, and limitations on construction activities associated with the partial approval.
- Specify paper, drafting film, or vellum for signature by the District Bridge Engineer.

4.2.1.3.3.6 D-c82320 Construction of Retaining Wall, S-xxxxx

Use with c82120 Design of Retaining Wall (As-Designed Foundation Provided), S-xxxxx or c82130 Design of Retaining Wall (No As-Designed Foundation Provided), S-xxxxx special provision.

- List any additional construction requirements.

4.2.1.3.3.7 D-c82140 Design of Culvert (As-Designed Foundation Provided), S-xxxxx

Use on projects where the foundation type and geotechnical design parameters are provided by the Department. Edit the following:

- List any additional designer qualifications above those listed in Section II of Special Bidding – Design-Build that may be desired for the particular type of structure.
- List information/data relevant to the design of the particular structure to be made available to the Contractor during bidding, including, but not limited to the items listed.
- List any additional design specifications and Railroad requirements over and above those listed in Section VIII of Special Bidding – Design-Build. Be sure to identify which publications listed in Section VIII are superseded.
- Describe general design requirements for this structure, in addition to those listed.
- List the parameters of any allowable geometry changes, but be sure to indicate when no changes will be permitted.

- Specify MPT requirements related to the structure or, if listed elsewhere in the bid package, refer to where it is provided.
- Refer to Environmental Mitigation and Tracking special provision, if included in the bid documents.
- List utility information and reference to Utilities special provision.
- List waterway requirements, when applicable, as well as parameters for alternate structures, when permitted; reference Permits for Design-Build Projects special provision.
- List any additional design requirements that do not fit the previous categories.
- Review list of geotechnical parameters with the District Geotechnical Unit and provide the applicable design parameters and construction requirements for the particular structure, and alternate foundation designs, if permitted
- Review construction phasing with the constructability team to determine how the submittal process can be phased to allow construction to begin earlier than otherwise possible with single final design submittal. Define what partial submissions will be accepted, the level of approval required for construction to commence, and limitations on construction activities associated with the partial approval.
- Specify paper, drafting film, or vellum for signature by the District Bridge Engineer.

4.2.1.3.3.8 D-c82330 Construction of Culvert, S-xxxxx

Use with c82140 Design of Culvert (As-Designed Foundation Provided), S-xxxxx

- List additional construction requirements.
- Specify payment for work not included in Lump Sum price.

4.2.1.3.3.9 D-c82150 Design of Noise Barrier (As-Designed Foundation Provided), S-xxxxx

Use on projects requiring the design of a new noise barrier wall where the foundation type and geotechnical design parameters are provided by the Department. Edit the following:

- List any additional designer qualifications above those listed in Section II of Special Bidding – Design-Build that may be desired for the particular type of wall.
- List information/data relevant to the design of the particular wall to be made available to the Contractor during bidding, including, but not limited to the items listed. Insert the date and title of the Design Noise Report.
- List any additional design specifications and Railroad requirements over and above those listed in Section VIII of Special Bidding – Design-Build. Be sure to identify which publications listed in Section VIII are superseded.
- Describe general design requirements for this wall, in addition to those listed, such as access and hydrant requirements.
- List the parameters of any allowable geometry changes, but be sure to indicate when no changes will be permitted.

- List site class of the foundation material per AASHTO LRFD Bridge Design Specification Section 3.10.3.1.
- Specify MPT requirements related to the wall(s) or, if listed elsewhere in the bid package, refer to where it is provided.
- Refer to Environmental Mitigation and Tracking special provision, if included in the bid documents.
- List utility information and reference to Utilities special provision.
- List any additional design requirements that do not fit the previous categories.
- Review list of geotechnical parameters with the District Geotechnical Unit and provide the applicable design parameters and construction requirements for the particular structure, and alternate foundation designs, if permitted
- Review construction phasing with the constructability team to determine how the submittal process can be phased to allow construction to begin earlier than otherwise possible with single final design submittal. Define what partial submissions will be accepted, the level of approval required for construction to commence, and limitations on construction activities associated with the partial approval.
- Specify paper, drafting film, or vellum for signature by the District Bridge Engineer.

4.2.1.3.3.10 D-c82151 Design of Noise Barrier (No As-Designed Foundation Provided), S-xxxxx

Use on projects requiring the design of a new noise barrier, no foundation design was developed during Conceptual Design, and therefore a Foundation Submission is required. Edit the following:

- List any additional designer qualifications above those listed in Section II of Special Bidding – Design–Build that may be desired for the particular type of wall.
- List information/data relevant to the design of the particular wall to be made available to the Contractor during bidding, including, but not limited to the items listed. Insert the date and title of the Design Noise Report.
- List any additional design specifications over and above those listed in Section VIII of Special Bidding – Design-Build. Be sure to identify which publications listed in Section VIII are superseded.
- Describe general design requirements for this wall, in addition to those listed, such as access and hydrant requirements.
- List the parameters of any allowable geometry changes.
- List site class of the foundation material per AASHTO LRFD Bridge Design Specification Section 3.10.3.1.
- Specify MPT requirements related to the wall(s) or, if listed elsewhere in the bid package, refer to where it is provided.
- Refer to Environmental Mitigation and Tracking special provision, if included in the bid documents.
- List utility information and reference to Utilities special provision.

- List any additional design requirements that do not fit the previous categories.
- For foundations, provide the necessary parameters for contractor to develop a complete foundation design.
- Review construction phasing with the constructability team to determine how the submittal process can be phased to allow construction to begin earlier than otherwise possible with single final design submittal. Define what partial submissions will be accepted, the level of approval required for construction to commence, and limitations on construction activities associated with the partial approval.
- Specify paper, drafting film, or vellum for signature by the District Bridge Engineer.

4.2.1.3.3.11 D-c82340 Construction of Noise Barrier, S-xxxxx

Use with c82150 Design of Noise Barrier (As-Designed Foundation Provided), S-xxxxx or c82151 Design of Noise Barrier (No As-Designed Foundation Provided), S-xxxxx special provision.

- List additional construction requirements.
- Specify payment for work not included in Lump Sum price.

Bridge Rehabilitation/Widening**4.2.1.3.3.12 D-c82160 Design of Rehabilitation and/or Widening of Bridge Structure (As-Designed Foundation Provided), S-xxxxx**

Use on projects requiring the design of rehabilitation and/or widening of an existing bridge where a foundation type and geotechnical design parameters are provided by the Department. Edit the following:

- List any additional designer qualifications above those listed in Section II of Special Bidding – Design–Build that may be desired for the particular type of structure.
- List information/data relevant to the design of the particular structure to be made available to the Contractor during bidding, including, but not limited to the items listed.
- List any additional design specifications and Railroad requirements over and above those listed in Section VIII of Special Bidding – Design-Build. Be sure to identify which publications listed in Section VIII are superseded.
- Describe general design requirements for this structure, in addition to those listed.
- List the parameters of any allowable geometry changes, but be sure to indicate when no changes will be permitted.
- List site class of the foundation material per AASHTO LRFD Bridge Design Specification Section 3.10.3.1.
- Specify girder and joint requirements and limitations. Add others as necessary.
- State substructure limitations/allowances.
- When temporary bridges will be required for maintenance and protection of traffic purposes during construction, list design and construction requirements.

- Specify MPT requirements related to the structure or, if listed elsewhere in the bid package, refer to where it is provided.
- When the structure will be located adjacent or over a Railroad, specify the clearance and support requirements.
- Provide additional requirements for future widening to be incorporated into the design, when desirable.
- Provide additional design requirements for future redecking, when appropriate, within the listed items.
- List on-bridge lighting requirements, if any.
- List waterway requirements, when applicable, as well as parameters for alternate structures, when permitted; reference Permits for Design-Build Projects special provision.
- Refer to Environmental Mitigation and Tracking special provision, if included in the bid documents.
- List utility information and reference to Utilities special provision.
- List any additional design requirements that do not fit the previous categories.
- Review list of geotechnical parameters with the District Geotechnical Unit and provide the applicable design parameters and construction requirements for the particular structure, and alternate foundation designs, if permitted
- Review construction phasing with the constructability team to determine how the submittal process can be phased to allow construction to begin earlier than otherwise possible with single final design submittal. Define what partial submissions will be accepted, the level of approval required for construction to commence, and limitations on construction activities associated with the partial approval.
- Specify paper, drafting film, or vellum for signature by the District Bridge Engineer.

4.2.1.3.3.13 D-c82170 Design of Rehabilitation and/or Widening of Bridge Structure (No As-Designed Foundation Provided), S-xxxxx

Used on projects requiring the design of rehabilitation and/or widening of an existing bridge, no foundation design was developed during Conceptual Design, and therefore a Foundation Submission is required. Edit the following:

- List any additional designer qualifications above those listed in Section II of Special Bidding – Design-Build that may be desired for the particular type of structure.
- List information/data relevant to the design of the particular structure to be made available to the Contractor during bidding, including, but not limited to the items listed.
- List any additional design specifications and Railroad requirements over and above those listed in Section VIII of Special Bidding – Design-Build. Be sure to identify which publications listed in Section VIII are superseded.
- Describe general design requirements for this structure, in addition to those listed.

- List the parameters of any allowable geometry changes, but be sure to indicate when no changes will be permitted.
- List site class of the foundation material per AASHTO LRFD Bridge Design Specification Section 3.10.3.1.
- Specify girder and joint requirements and limitations. Add others as necessary.
- State substructure limitations/allowances.
- When temporary bridges will be required for maintenance and protection of traffic purposes during construction, list design and construction requirements.
- Specify MPT requirements related to the structure or, if listed elsewhere in the bid package, refer to where it is provided.
- When the structure will be located adjacent or over a Railroad, specify the clearance and support requirements.
- Provide additional requirements for future widening to be incorporated into the design, when desirable.
- Provide additional design requirements for future redecking, when appropriate, within the listed items.
- List on-bridge lighting requirements, if any.
- List waterway requirements, when applicable, as well as parameters for alternate structures, when permitted; reference Permits for Design-Build Projects special provision.
- Refer to Environmental Mitigation and Tracking special provision, if included in the bid documents.
- List utility information and reference to Utilities special provision.
- List any additional design requirements that do not fit the previous categories.
- For foundations, provide the necessary parameters for contractor to develop a complete foundation design.
- Review construction phasing with the constructability team to determine how the submittal process can be phased to allow construction to begin earlier than otherwise possible with single final design submittal. Define what partial submissions will be accepted, the level of approval required for construction to commence, and limitations on construction activities associated with the partial approval.
- Specify paper, drafting film, or vellum for signature by the District Bridge Engineer.

4.2.1.3.3.14 D-c82350 Construction of Rehabilitation and/or Widening of Bridge Structure, S-xxxxx

Use with c82160 Design of Rehabilitation and/or Widening of Bridge Structure (As-Designed Foundation Provided), S-xxxxx or c82170 Design of Rehabilitation and/or Widening of Bridge Structure (No As-Designed Foundation Provided), S-xxxxx special provision. Include all items for which quantities can be defined at the Conceptual TS&L stage in this lump sum item, such as removal of portion of existing bridge, concrete for a new deck and parapets, reinforcement bars, etc. Identify separate unit price pay Items for

which quantities cannot be defined at the Conceptual TS&L, such as deck repairs, repair of deteriorated substructures, crack repair, etc. For as-designed foundations, provide separate unit price pay items to address conditions that may be encountered beyond the contractor's control, such as piles or caissons lengths. When no as-designed foundation is specified, or the contractor chooses an alternate to the as-designed foundation, the foundation should be bid and paid for as a lump sum item.

List additional construction requirements.

4.2.1.3.3.15 D-c82180 Design of Superstructure Replacement, S-xxxxx

Use on projects where the existing superstructure is to be replaced on a structure. Edit the following:

- List any additional designer qualifications above those listed in Section II of Special Bidding – Design-Build that may be desired for the particular type of structure.
- List information/data relevant to the design of the particular structure to be made available to the Contractor during bidding, including, but not limited to the items listed.
- List any additional design specifications and Railroad requirements over and above those listed in Section VIII of Special Bidding – Design-Build. Be sure to identify which publications listed in Section VIII are superseded.
- Describe general design requirements for this structure, in addition to those listed.
- List the parameters of any allowable geometry changes, but be sure to indicate when no changes will be permitted.
- List site class of the foundation material per AASHTO LRFD Bridge Design Specification Section 3.10.3.1.
- Specify girder and joint requirements and limitations. Add others as necessary.
- When temporary bridges will be required for maintenance and protection of traffic purposes during construction, list design and construction requirements.
- Specify MPT requirements related to the structure or, if listed elsewhere in the bid package, refer to where it is provided.
- When the structure will be located adjacent or over a Railroad, specify the clearance and support requirements.
- Provide additional design requirements for future redecking, when appropriate, within the listed items.
- List on-bridge lighting requirements, if any.
- List waterway requirements, when applicable, as well as parameters for alternate structures, when permitted; reference Permits for Design-Build Projects special provision.
- Refer to Environmental Mitigation and Tracking special provision, if included in the bid documents.
- List utility information and reference to Utilities special provision.
- List any additional design requirements that do not fit the previous categories.

- Review construction phasing with the constructability team to determine how the submittal process can be phased to allow construction to begin earlier than otherwise possible with single final design submittal. Define what partial submissions will be accepted, the level of approval required for construction to commence, and limitations on construction activities associated with the partial approval.

4.2.1.3.3.16 D-c82360 Construction of Superstructure Replacement, S-xxxxx

Use with c82180 Design of Superstructure Replacement, S-xxxxx special provision. Include all items for which quantities can be defined at the Conceptual TS&L stage in this lump sum item, such as removal of portion of existing bridge, concrete for a new deck and parapets, reinforcement bars, etc. Identify separate unit price pay Items for which quantities cannot be defined at the Conceptual TS&L, such as repair of deteriorated substructures, crack repair, etc. List additional construction requirements.

4.2.1.3.3.17 D-c82190 Design of Intelligent Transportation Devices and Dynamic Message Sign Structures (No As-Designed Foundations Provided), S-xxxxx

For use on projects requiring the design of ITS devices and of DMS Support Structures and Foundations. Structure design is to be in accordance with Publication 647M ITS-1003M. Components include DMS Support, Structure and Foundation; CCTV Poles and Foundations; VDS Poles and Foundations; Tag Reader Mast Arms, Poles, and Foundations; and CCTV, VDS, and TTS-TR attachments to existing structures:

- Insert the S-number for each DMS structure in the Header
- List each DMS structure by S-number and location in the Description
- List any additional designer qualifications above those listed in Section II of Special Bidding – Design-Build that may be desired for the particular type of wall (or indicate "None").
- List any additional design specifications over and above those listed.
- Describe general design requirements in addition to those listed. Include any needed provisions to accommodate future widening.
- List any additional design requirements that do not fit the previous categories.
- Specify MPT requirements related to the devices and structures or, if listed elsewhere in the bid package, refer to where it is provided.
- Insert instructions regarding location of utilities, and supply of power and communication services.
- Insert all necessary information for foundation design.
- Specify paper, drafting film, or vellum for signature by the District Bridge Engineer.

4.2.1.3.3.18 D-c82370 Construction of Intelligent Transportation System Devices and Dynamic Message Sign Structures (No As-Designed Foundations Provided), S-xxxxx

Use with c82190 Design of Intelligent Transportation System Devices and Dynamic Message Sign Structure, S-xxxxx special provision. Insert the S-number for each structure in the Header and in Section IV, Measurement and Payment. List additional construction requirements.

Shop Drawings

There are two options for review of shop drawings: by the Department (or its design consultant) or by the contractor's Lead Design Engineer. Department review is covered by Publication 408, *Specifications*, Section 105.02(d). When review by the Lead Design Engineer is desired include the following Special Provision:

4.2.1.3.3.19 a10502 Bridge Shop Drawings

Use when review and acceptance of the shop drawings will be performed by the Contractor's Lead Design Engineer.

4.2.1.3.4 Maintenance and Protection of Traffic Special Provisions

Include the following special provisions on projects with traffic control as a Design Activity component of the project.

4.2.1.3.4.1 D-c29902 Design Traffic Control Plan

Identifies the traffic control related design activities to be performed by the Contractor. Edit the following:

- List any additional designer qualifications above those listed in Section II of Special Bidding – Design–Build that may be desired for any unique features on the project.
- List any additional design specifications over and above those listed in Section VIII of Special Bidding – Design–Build. Be sure to identify which publications listed in Section VIII are superseded.
- Determine need for Incident Management Plan and Transportation Management Plan.
- If no Conceptual Traffic Control Plans are provided with the bid package, list all requirements for MPT criteria specific to the project such as minimum lane widths, lane restriction limitations, time restrictions, and special event restrictions.
- Specify the partial plan submission review procedure if permitted. Review construction phasing with the constructability team to determine how the submittal process can be phased to allow TCPs to be submitted by individual phases rather than a single final design submittal. Define what partial submissions will be accepted, the level of approval required for MPT activities to commence, and limitations on construction activities associated with the partial approval.
-

4.2.1.3.4.2 D-c29903 Construction of Maintenance and Protection of Traffic

Must accompany I-c29902-A Design Traffic Control Plan in the bid package. It covers the actual construction of the work indicated on the plans developed under the Design Traffic Control Plan item.

4.2.1.3.5 Right-of-Way Special Provisions

Include following special provision on the project if the preparation of Final Right-of-Way Plans and the provision of Right-of-Way Services are included as a design activity.

- D-c29904 Right-of-Way Design and Acquisition Services

Edit the following:

- List any additional professional service qualifications above those listed in Section II of Special Bidding – Design–Build that may be desired for the particular type of services required.

- List information/data relevant to the right-of-way status of the project.
- List any additional specifications over and above those listed in Section VIII of Special Bidding – Design-Build. Be sure to identify which publications listed in Section VIII are superseded.

4.2.1.3.6 **Utility Special Provisions**

Include the following special provision on projects to require the Contractor to coordinate the various aspects of utility relocation activities. If utilities will be cleared prior to design-build contract advertisement, no special provision is needed, and a Utility Clearance (Form D-419) must be included.

- D-c01072 Utility Relocation Information for Design-Build Projects

Edit the following:

- Select the appropriate text for the Description depending on the status of the project.
- Determine if a Utility Coordination Manager needs to be assigned to the project if the utility relocations are complex.
- List the utilities on the project along with contact names, phone numbers and identify any operational restrictions utilities may have that would impact facility relocations (i.e., blackout dates for service interruptions, required lead times to deactivate facilities).

4.2.1.3.7 **Environmental / Permitting Special Provisions**

Include the following special provisions on all Adjusted Bid projects:

4.2.1.3.7.1 **Environmental Commitments and Mitigation Tracking System (ECMTS) Report**

Identifies the environmental clearance obtained for the project lists all of the environmental commitments, and requires the contractor to maintain the Environmental Commitments and Mitigation Tracking System Report (ECMTS) during final design and construction. Edit the following:

- Indicate the level of environmental clearance obtained for the project.
- Insert the list of all environmental commitments to be tracked by the contractor during Final Design and construction.

4.2.1.3.7.2 **D-c01070 Permits for Design-Build Projects**

Identifies the permits that the contractor is responsible to obtain, if applicable. Edit the following:

- List the applicable permits/approvals the contractor will be required to obtain.
- Determine if the Conceptual E&S Plan, Conceptual SWM Plan, H&H Report and Preliminary Drainage and SWM design computations are available. Add available documents to project attachments.
- Add project Environmental Document to project attachments
- Add DRAFT ECMTS to project attachments

4.2.1.3.8 **Concrete Curb Ramp Special Provisions**

Include the following special provisions on projects that have the applicable work related to Concrete Curb Ramps as part of the design-build project. Approval must be requested from the Chief of Project Schedules, Specifications, and Constructability Section of the Highway Delivery Division to proceed with a project that will include payment for either curb ramp design or construction by lump sum, rather than by quadrant for design and construction by square yard.

4.2.1.3.8.1 Design of Concrete Curb Ramps

Use for the design and preparation of drawings for the construction of ADA accessible curb ramps. Payment is made for each quadrant designed. Edit the following:

- List any additional designer qualifications above those listed in Section II of Special Bidding – Design–Build that may be desired for any unique features on the project.
- List any additional design specifications over and above those listed in Section VIII of Special Bidding – Design-Build. Be sure to identify which publications listed in Section VIII are superseded.
- Determine need to modify Traffic Signal Permit Plans.
- Add project Environmental Document to project attachments.

4.2.1.3.8.2 Construct Concrete Curb Ramps (Square Yard)

The pay item for construction where payment is on a square yard basis for use on design-build projects. This is the preferred item for ADA curb ramps since the particular characteristics of each location can result in widely varying ramp dimensions. Provide an estimated quantity in the bid documents.

4.2.1.3.8.3 D-a00150 Revised Changed Condition Clause for Design Build Projects with ADA Curb Ramp Items of Work

This special provision is mandatory when curb ramps are included as a design-build activity in any project.

4.2.1.4 Bid Items

A few standard items must be included, and other unit price should be considered, depending on the scope of the project.

4.2.1.4.1 Standard Items

Include standard items in the bid package:

- 0608-0001 Mobilization
- 0686-000X Construction Surveying
- 0689-0003 Construction Scheduling – CPM Schedule is required for Adjusted Bid

4.2.1.4.2 Unit Price Items

Identify unit price bid items associated with lump sum construction special provisions.

Unlike conventional design-bid-build contracts, design-build projects have very few contract items; limited to the typically paired "Design of" and "Construct" items. While in Low Bid Design-Build projects there are instances where unit price bid items should accompany lump sum construction special provisions, generally there should be fewer instances for Adjusted Bid. Work Class Codes assigned to items should be in accordance with Publication 51, *Specifications and Estimate Package Delivery Process Policies and Preparation Manual*, Chapter I.8, *Plans* and must be reviewed to assure that a properly pre-qualified contractor will be able to bid the project. Coordinate with Prequalification Office regarding questions on Work Class Codes.

Depending on the specific scope of the project, consider breaking out certain unit price items from lump sum items that cover work too difficult to bid reasonably within the lump sum; work that is of an uncertain extent, high risk, subject to subsurface variations, or where the quantities will be determined with input from or direction by the Department after Award. Consult the District Construction Unit or Constructability review team for recommendations for unit price items appropriate for the specific project.

4.2.1.5 Project Development Checklist**4.2.1.5.1 Project Development Checklist Items**

The selection of appropriate Project Development Checklist Items for bid package preparation generally follows the same process and requirements as a traditional design/bid/build project in accordance with Publication 51, *Plans, Specifications and Estimate Package Delivery Process Policies and Preparation Manual*. Before any attempt is made to submit a bid package, it is very important to obtain all required documents, contract drawings, design estimates, and supporting data. Follow the procedures outlined in Publication 10, Design Manual Part 1, *Transportation Program Development and Project Delivery Process* and Publication 10C, Design Manual Part 1C, *Transportation Engineering Procedures*, Section 4 for the design development process. A final plan check and "Plan Review Report" are required for all projects with plans. Make sure that the necessary documentation is scanned and/or imported in the appropriate locations on the Project Development Checklist (PDC) in ECMS.

Supporting documents, such as environmental clearances and re-evaluations, funding authorization, Program Management Committee (PMC) approvals, Department of Environmental Protection (DEP) and Corps of Engineer Permits, utility and right-of-way clearances, agreements, and related administrative requirements, must also be scanned and imported in the appropriate fields on the Project Development Checklist. Missing supporting documents complicate the Plans, Specifications and Estimate (PS&E) process. This may generate errors and warnings in ECMS, and may affect project advancement to publication.

During the preparation of a design-build bid package, consider the following items to provide bidders in addition to the standard Project Development Checklist items:

- Environmental Commitment and Mitigation Tracking System (ECMTS) Report/Matrix
- Preliminary Drainage and Storm Water Management Hydraulic Computations
- Hydrologic and Hydraulics Report
- Conceptual Storm Water Management Plan
- XML Files for plans

Provide reproducible attachments to the bid package that will be pertinent to construction. Make sure that the "include in bid package" button is checked on those documents that are necessary for the contractor to see. DO NOT check this button for documentation not to be viewed by the contractor. This is especially important for documentation that includes the cost estimate or information that is not public information.

The "include in bid package" button should NOT be checked for the following attachments:

- Pre-Bid (Cost) Estimate
- Project Screening Checklist and Action Plans (as appropriate)
- Railroad agreements
- Submittal Review Responsibility Checklist

4.2.1.5.2 Cost Estimate and Pre-bid Schedule

Include a construction cost estimate with the PS&E submission. Develop the cost estimate in accordance with Publication 352, *Cost Estimating Manual*. The construction cost estimate should be a mid-level itemized estimate, similar to what is prepared for the Design Field View and TS&L stage of a design/bid/build project, except that design costs must also be included. The major items of the project should be identified and a minimum of 30 to 40 items would typically be developed.

In developing the estimate, document the factors being utilized to account for the contractor's risks associated with the particular design activities on the project. Also include all assumptions regarding quantities, bid costs, design costs, and work force rates.

Include a pre-bid construction schedule with the PS&E submission. The construction schedule should be similar to what is prepared for a typical design/bid/build project, except it will need to include reasonable time frames for preparing design activities and review periods. The review times provided in the schedule should be consistent with the durations listed in Section VII of the SPECIAL BIDDING – DESIGN-BUILD special provision.

4.2.2 ADJUSTED BID SELECTION PROCESS

The primary difference between the Two-Step and One-Step Adjusted Bid selection process is that the Two-Step includes the pre-bid shortlisting of design-build teams based on their statements of interests, entering into stipend agreements, payment of stipends to short-listed firms not selected for award, and requires coordination with the Contract Awards office. In both One-Step and Two-Step processes, Technical Approaches are submitted and evaluated along with the bid, according to the criteria specified in the Design-build contract advertisement. In this Chapter, the term Design-build Team refers to a contractor/consultant partnership competing for an Adjusted Bid project. Upon award, the successful Design-build Team becomes the Contractor, the legal entity with whom the Department executes the contract to perform the work.

4.2.2.1 Project Announcement

Bidding on design-build projects requires pairing construction contractors with design consultants, therefore, it is important to provide advance announcement of all upcoming design-build lettings to allow sufficient time for teaming arrangements to be made. To facilitate this, Central Office publishes an automated report entitled "Upcoming Design-Build Projects" as a Bulletin in ECMS to provide announcement for projects scheduled to be let within six months of the report date. Two announcements must be made, one for the construction contracting solicitations and one for the consultant agreement solicitations. These announcements should be made at least six months before anticipated design-build contract advertisement.

4.2.2.1.1 Contractor Announcement

First, verify that a MPMS project has been established for the design-build project and the project is included on the Transportation Improvement Program (TIP). At a minimum, the following information must be completed and accurate:

- project title;
- short narrative;
- improvement description; and
- bridge information, including completion of the following fields for each bridge included in the project:
 - Bridge Worked On indicator,
 - SD Correction indicator,
 - Bridge Scope of Work field (Preservation, Rehabilitation, Replacement, or Repair), and
 - Bridge Estimated Construction Costs.

Once all required data fields are completed in MPMS and ECMS, the project will appear on the "Upcoming Design-Build Projects" report posted in ECMS when the anticipated let date is within the reporting period of the report (generally six months). Monitor the published report to ensure the project is included in the report. Contact the Chief of the Project Schedules, Specifications and Constructability Section if errors are discovered in the published report.

Using ECMS Bulletin Notice - in addition to the "Upcoming Innovative Bidding Projects" report, publish an ECMS Bulletin to notify contractors of upcoming Adjusted Bid projects each time they log into ECMS. This announcement should coincide with the Consultant announcement of a Planned Project (see [Section 4.2.2.1.2](#)).

Use the following Template to develop the ECMS Bulletin Notice:

(Insert County Name) County Adjusted Bid Design-Build (Insert Engineering Agreement Number)

Instructions to view Statement of Interest for Advertisement

(Insert SR, Segment, Offset, and Local Road Name)

To gain access to design-build Planned Project (advanced notice, prior to Advertisement for Statements of Interest):

- a. From ECMS main screen
- b. Go to "Solicitation" (not Contractor Services),
- c. Select "Consultants" (not Contractors)
- d. Select "Planned Projects"
- e. Select "Advanced Search" under the "Planned Projects Custom Searches" heading
- f. From the "Initiating Org" box,
- g. Select "Engineering District (**Insert District Number**)"
- h. Select "Search" button to create list of active Planned Projects
- i. Select (**Insert Engineering Agreement Number**)
- j. Select printer icon to print

To gain access to design-build Advertisement (for submission of Statement of Interest):

- a. From ECMS main screen
- b. Go to "Solicitation" (not Contractor Services),
- c. Select "Consultants" (not Contractors)
- d. Select "Advertisements"
- e. Select "Advanced Search" under the "Advertisement Custom Searches" heading
- f. From the "Initiating Org" box,
- g. Select "Engineering District (**Insert District Number**)"
- h. Select "Search" button to create list of active Advertisements
- i. Select (**Insert Engineering Agreement Number**)
- j. Select printer icon to print

The Statement of Interest submission from the consultant/contractor team is to be submitted by the consultant through the ECMS Consultant Agreement process by the required deadline.

Example: ECMS Announcement Screen Notice. The following is an example of an ECMS Announcement Screen Notice used for Adjusted Bid Design-Build:

Washington County Adjusted Bid Design-Build E00963

Instructions to view Statement of Interest for Advertisement

1.) S.R. 4049 Segment 0030 Offset 1265 (N Main St) over I-70 in South Strabane Township

2.) S.R. 1014 Segment 0050 Offset 0000 (Lakeview Dr) over I-70 in South Strabane Township

To gain access to design-build Planned Project (advanced notice, prior to Advertisement for Statements of Interest):

- a. From ECMS main screen
- b. Go to "Solicitation" (not Contractor Services),
- c. Select "Consultants" (not Contractors)
- d. Select "Planned Projects"
- e. Select "Advanced Search" under the "Planned Projects Custom Searches" heading
- f. From the "Initiating Org" box, Select "Engineering District 12-0"
- g. Select "Search" button to create list of active Advertisements
- h. Select "E00963" (new flash button)
- i. Select printer icon to print

To gain access to design-build Advertisement (for submission of Statement of Interest):

- k. From ECMS main screen
- l. Go to "Solicitation" (not Contractor Services),
- m. Select "Consultants" (not Contractors)
- n. Select "Advertisements"
- o. Select "Advanced Search" under the "Advertisement Custom Searches" heading

- p. From the "Initiating Org" box,
- q. Select "Engineering District 12-0"
- r. Select "Search" button to create list of active Advertisements
- s. Select "E00963"
- t. Select printer icon to print

4.2.2.1.2 Consultant Announcement

In addition to the Bulletin issued as "Upcoming Design-Build Projects" which is the announcement to the contracting community, the Adjusted Bid projects must also be announced as a "Planned Project" within ECMS in order to notify consultants.

Enter the Planned Project in ECMS; refer to Publication 93, *Procedures for the Administration of Consultant Agreements*, Section 2.3 – Creation and Announcement of Anticipated Project for additional information.

Planned Project Template. Using the Planned Project feature in ECMS, provide the consultant community with advanced notice of the Adjusted Bid Design-Build project. In addition to the guidance provided in Publication 93, *Procedures for the Administration of Consultant Agreements*, Section 2.3, *Creation and Announcement of Anticipated Project*, provide the following information in the Planned Project posted in ECMS to provide additional information to prospective design-build teams.

- a. **County, State Route, Section.** For the project, select the county, enter the State Route, and associated Section of the project. If there are multiple State Routes and Sections associated with the project, then enter information for each one that is part of the project.
- b. **Project Name.** For the project name, the Project Manager should provide the project name plus the following "Adjusted Bid Design-Build". A completed project name would look like "South Somerset Rehabilitation Adjusted Bid Design-Build" or "Adjusted Bid Design-Build SR 4049 over I-70 and SR 1014 over I-70".
- c. **Description of Work.** For the Description of Work, the Project Manager should provide in addition to the brief overview of the type of work envisioned for the project, the first paragraph should start with the following to alert consultants to the fact that this project will be selected via the Adjusted Bid Design-Build process:

"This project is an Adjusted Bid Design-Build project in (Insert County Name), SR (Insert SR and Section). Teams of contractors (prime) and engineers (subconsultant) will be required to submit qualification packages for Department review (Statements of Interest). The resulting shortlisted firms will then submit Technical Approaches for Department review, as well as Bids. The selected team will be chosen based on combination of the Technical Approach's evaluation and bid. Each Lead Design Engineer and contractor may only participate as a member of one team."

The Project Manager can then provide additional information regarding the project, as appropriate.

- d. **Estimated Construction Cost.** The District Project Manager will enter the anticipated range of the estimated construction cost for the Adjusted Bid Design-Build project.
- e. **Anticipated Advertisement Date.** The District Project Manager will select the anticipated advertisement date for the Project Specific Advertisement for the Adjusted Bid Design-Build project.

Example: Project-Specific Advertisement. The following is an example of a Planned Project Advertisement used for Adjusted Bid Design-Build:

County	SR	Section
Washington	4049	A11
Washington	1014	B11

- Project Name: Adjusted Bid Design-Build SR 4049 over I-70 and SR 1014 over I-70
- Description of Work: This project is the Adjusted Bid Design-Build project in Washington County, SR 4049-A11 and SR 1014-B11. Teams of contractors (prime) and engineers (subconsultant) will be required to submit Qualification Packages for Dept. review. The advertisement will be released on Feb. 8, 2006 for teams to respond to by Feb 13, 2006.
The projects are located on:
1.) SR 4049 (N Main St) over I-70
in S Strabane Twp Seg 0030 Offset 1265
2.) SR 1014 (Lakeview Dr) over I-70
in S Strabane Twp Seg 0050 Offset 0000
The project is for the design of replacement structures and minor roadway work on the SR 4049 project; and major roadway work on the SR 1014 project to raise the vertical under clearance for I-70.

Advertisement will be released on February 1, 2006 and Qualification Packages are due no later than February 23, 2006.
- Estimated Construction Cost: \$5-\$10 Million

Advertisement will be published on or after 02/01/2006.

4.2.2.2 Technical Review Committee (TRC)

Establish the TRC after the Project Announcement. The TRC, once established, can assist in the preparation of the Scope of Work for the Stipend Agreement, the Stipend amount, for inclusion in the Design-build contract advertisement. The TRC oversees the information provided in the Design-build contract advertisement, develops the scoring criteria and stipend for the Technical Approach, and performs the full evaluation of the Technical Approach and Bid. The TRC should consist of five to seven members from the following positions:

- District Plans Engineer (or designee)
- District Design Services Engineer (or designee)
- District Bridge Engineer (or designee)
- District Construction Services Engineer (or designee)
- District Assistant Construction Engineer (or designee)

In addition, for Federal Oversight projects, the invite the FHWA Area Engineer to participate as non-voting member of the TRC.

The TRC should not include any members from the District Shortlisting Committee, other than the ADE-Design and ADE-Construction that will short-list the design-build teams. Early establishment of the TRC allows the committee members to review and provide input on the Scopes of Work for the Conceptual Design and the Stipend Agreement, the Special Provisions, Technical Approach, and associated Bid Package.

Members of the TRC are prohibited from discussing the contents of the Technical Approach submissions outside of the TRC. The individuals conducting the Technical Approach Review will be required to sign a Statement of

Confidentiality, APPENDIX F. Forward the completed forms to the Chief of Contract Management Section. Any violation of the terms of these statements is subject to discipline.

It is the Project Manager's responsibility to perform administrative functions for the TRC; enter resulting compilation of information into ECMS. Support and work as a non-voting member for the TRC along with the Central Office Facilitator.

4.2.2.3 Design-build contract advertisement

The Advertisement for Two-Step Adjusted Bid is the solicitation for the Statement of Interest to be submitted by design-build teams for selection to proceed to the Technical Approach preparation and Bidding phase, along with the Technical Approach requirements and scoring criteria. The Advertisement for One-Step Adjusted Bid announces the Technical Approach requirements and scoring criteria.

The following steps are preparation of the information to be included in the Advertisement. In preparing for advertisement of a One-Step Adjusted Bid project, disregard the sections dealing with Stipends, Stipend Agreements, District Short-list Committee, and Statements of Interest.

4.2.2.3.1 Scope of Work Development for Stipend Agreement

Prepare the Scope of Work for the Stipend Agreement along with Central Office Facilitator and TRC. The Scope of Work details the requirements for all design-build teams to prepare the Technical Approach and state whether the Firm Neutral process or the Alternate Technical Concept process is being used for Technical Approach review. Also, it will indicate how the Technical Approaches should be delivered to the District. The Scope of Work will be included in the Design-build contract advertisement.

Use the template below to enter into the Department Details portion of the Scope of Work. Project Manager instructions are in italicized bold.

This task consists of the Technical Approach submission by the design-build team.

- Provide a Technical Approach to Project Manager in Engineering District ***(Insert Number)***-0 based on the design, construction, and selection criteria provided in Bid Package, ECMS Project # ***(Insert Construction Agreement Number)*** Special Bidding Procedures.
- The Technical Approach is limited to ***(Insert Number of Pages in words)*** ***((Insert Number of Pages as a number))*** pages, single sided (8 ½" x 11").
- The Technical Approach will be incorporated as part of the construction contract for the successful design-build team.

(If the firm neutral process is being used to evaluate the shortlisted design-build teams, then include the following two bullets:)

- No resumes and organization chart will be allowed in the Technical Approach.
- Any mention of information in the Technical Approach that reveals the identity of any of the design-build team members will result in scoring deductions or disqualification. The design-build teams shall not embed information such as, individuals, accomplishments, past projects, number of people in the firms, locations of offices/plants, specific equipment, or title of individuals.

The Stipend for the unsuccessful Adjusted Bid Design-Build teams that submit both a Bid Proposal and a Technical Approach that is deemed responsive by the Department's Technical Review Committee is ***\$(Insert Stipend Amount)***. The Technical Approach submitted to the Department shall constitute a work made for hire within the meaning of the Copyright Act of 1976, as amended. In the event that the property set forth in the Technical Approach to the Department does not fall within the enumerated categories of a work for hire, the Design-Build Team shall agree to assign all title and interest in the Technical Approach and its proprietary rights to the Department. The Department shall acquire all proprietary right, title and

interest in the property in the Approach, including, but not limited to, copyrights, trade secrets, formulas, research-data, know-how, specifications and trademarks and any associated good will.

Deliverables:

- As part of the design-build team's Technical Approach, the design-build team will identify all deliverables envisioned as part of the project.
- The Technical Approaches will be submitted in accordance with the Special Bidding Procedures given in ECMS Project # **(Insert Construction Agreement Number)**.
- All bid package clarification questions will also be submitted and responded to through the construction contractor via ECMS Project # **(Insert Construction Agreement Number)**.
- Technical Approach is determined to be responsive to the project selection criteria.
- Bid is submitted for ECMS Project # **(Insert Construction Agreement Number)**.

4.2.2.3.2 Determine Stipend for Technical Approach

The TRC determines the stipend that is to be provided to the unsuccessful, responsive shortlisted design-build teams during the development of the Technical Approach and the Bid Package. The stipend promotes competition by a means of reducing the cost to industry of participation in Adjusted Bid procurement, as well as providing the design-build team partial compensation for the Department owning their concepts, that may be incorporated into the project or used elsewhere by the Department.

Use the Scope of Work Detail Tasks in ECMS in order for the shortlisted design-build teams to receive stipends for their efforts associated with the design-build Technical Approach and Bid Proposal. The description in the Department Details for the Scope of Work serves as a reminder to the Adjusted Bid Design-Build teams regarding the requirements to receive the stipend associated with the project. A further description of the information provided in the Scope of Work in ECMS can be found in Section 2.5 of Publication 93, *Procedures for the Administration of Consultant Agreements*.

For Adjusted Bid Design-Build projects, the WBS Code of 2.10.99 – Other Final Design Activities will be the only WBS code used.

As part of the Detailed Task, the Detailed Task Name should be renamed Adjusted Bid Design-Build Stipend.

Stipends are suggested on larger projects where there is substantial opportunity for innovation and the cost of submitting the Technical Approach and associated Bid Proposal is significant. For these projects, stipends can be used to encourage competition; compensate unsuccessful, responsive design-build teams for a portion of their costs (usually one-third to one-half of the estimated proposal development cost), and ensure that smaller companies are not put at a competitive disadvantage.

The following are stipend ranges for various estimated contract values; these ranges are to be used as threshold values. A determination should be made for each project whether the project conditions and innovations require the design-build team to receive a stipend that is more than the threshold value. All stipends should be rounded to the nearest \$5,000.

Contract Value	Stipend Range	Stipend Rate
\$0 - \$5,000,000	\$0 - \$15,000	= (Value * .3%)
\$5,000,000 - \$10,000,000	\$15,000 - \$25,000	= \$15,000 + (Value - \$5M)*.20%
\$10,000,000 - \$20,000,000	\$25,000 - \$40,000	= \$25,000 + (Value - \$10M)*.15%
\$20,000,000 - \$40,000,000	\$40,000 - \$60,000	= \$40,000 + (Value - \$20M)*.10%
\$40,000,000 -	\$60,000 -	= \$60,000 + (Value - \$40M)*.05%

4.2.2.3.3 **Determine Selection Process for Technical Approach Review: Firm Neutral Selection or Alternate Technical Concept (ATC) Process Selection**

Technical Approaches address how the design-build teams plan to successfully complete the project. For One-Step and Two-Step Adjusted Bid projects, the TRC determines if the Technical Approach is evaluated on a firm neutral approach, or the ATC Process, where ATCs will be considered during the Technical Approach development, and the Technical Approach is then evaluated on a non-firm neutral basis. Firm-Neutral selection cannot be used when ATCs are permitted. The following two subsections detail the process to submit and evaluate the Technical Approach using each selection process.

4.2.2.3.3.1 **Firm Neutral Process to Review Technical Approach**

The Technical Approach developed by the design-build teams have no identifying characteristics of the team for a firm neutral process; and are evaluated based on a firm neutral perspective. The Technical Review Committee (TRC) does not know what firms comprise the design-build teams. Any mention of information in the Technical Approach that reveals the identity of any of the design-build team members results in scoring deductions or disqualification. The design-build teams that embed identifying information such as but not limited to, individuals, accomplishments, past projects, number of people in the firms, locations of offices/plants, specific equipment, or title of individuals risk disqualification.

4.2.2.3.3.2 **Alternate Technical Concept (ATC) Process to Review Technical Approach**

ATCs provide design-build teams with an opportunity to propose innovative ideas within the Department's Scope of Work or can be written into the Scope of Work. The use of ATCs can promote innovation and tap into the unique expertise of each design-build team and may result in a reduction of the Project's cost. In addition, ATCs can provide the Department with new ideas, techniques or materials to use in future Projects.

During the development of the Technical Approach, the design-build teams propose Alternate Technical Concepts (ATCs) to the Department prior to the submittal of Technical Approaches.

Once submitted, the Technical Approaches are reviewed and scored by the TRC on a non-firm-neutral basis. These technical scores are used in conjunction with the Bids to determine the successful design-build team. The Technical Evaluation Criteria announced in the Advertisement should match the criteria that are placed in the Scope of Work as well.

4.2.2.3.4 **Determine Technical Evaluation Criteria (Scoring) for Technical Approach**

The TRC determines the Technical Evaluation Criteria which must add up to 100%. Careful consideration should be given to the scoring criteria since the Technical Approach final score is part of the equation used to determine the final adjusted score (which takes into account the bid) for the Adjusted Bid final ranking.

Review the Technical Approach – Technical Review Form, APPENDIX I that will be used to review the Technical Approaches. Provide the worksheets at Project Specific Advertisement for the design-build teams to reference.

The following is an example of Technical Evaluation Criteria that may be used to score the Technical Approaches:

1. 40% **Schedule/Project Delivery** - Discuss how the design-build team will complete the project on time and within the budget. Describe the key issues and how the design-build team will manage these issues. Provide an assessment of risk for the timely completion and cost containment and the actions that the design-build team will take to manage these risks. Provide a summary of the key considerations in the development of the project schedule for design, fabrication/material acquisition, and construction. Clearly show in two pages a Critical Path Method (CPM) Schedule that provides a comprehensive and logical schedule. Show proper attention to the project's critical path. State if the project's completion date will be met or if the design-build team will complete the project earlier. If the design-build team will complete the project early, clearly state the proposed early completion date. Earlier completion dates will become the contractual completion dates.

2. 20% Maintenance and Protection of Traffic - Describe any approaches to Maintenance and Protection of Traffic that minimizes disruption of traffic. This shall include, but not be limited to, minimization of lane closures, maintaining lane widths, minimizing visual obstructions, and adjusting speed limits. Provide a discussion that addresses worker safety.
3. 10% Design Features - Provide a summary of the design features of the project. If any design features present challenges to the design-build team, list these challenging features and describe how the team will manage these issues.
4. 10% Quality Management/Quality Control Plan - Clearly describe the design-build team's approach to quality management and develop a project-specific Quality Control Plan. The discussion in the Quality Control Plan will address the project quality control, design quality control and assurance, design review process, permit acquisition, design timeline, fabrication, material acceptance, quality assurance, and monitoring the project schedule. Also, address how the design-build team will return the project to conformance in the event of non-conformance.
5. 5% Coordination - Describe how the design-build team will coordinate the project with the Department's project team; permitting/environmental agencies; utility owners; local governments; and the general public.
6. 5% Maintainability/Value Added - Clearly describe design features that minimize periodic and routine maintenance. The following elements will be considered: access to provide adequate inspections, ease of future maintenance, and quality of construction materials. Describe if the design-build team will exceed the minimum material requirements to enhance durability of structural components, or if the design-build team proposes to accept an alternate payment schedule, or if the design-build team will provide additional elements not specifically required in the Scope of Work.
7. 5% Construction Methods - Describe any construction methods that minimize impacts to the traveling public and the environment, reduce costs, improve worker safety, and minimize contract duration.
8. 5% Right-of-Way Acquisition Services - Provide a thorough description pertaining to the design-build team's approach towards preparation of a Final Right-of-Way Plan and providing Right-of-Way services for properties that are impacted by the design-build team's design. Provide a comprehensive and logical schedule. Schedule to include specified milestone dates. The schedule must clearly indicate how you will obtain Right-of-Way clearance, in accordance with Publication 378, *Right-of-Way Manual*, Pennsylvania Eminent Domain Code, the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended, (Federal Uniform Act).

4.2.2.3.5 Determine Adjusted Bid Scoring Method

During the development of an Adjusted Bid project, the Department has two options to consider to adjust the bids in order to rank the design-build teams. The Department determines the basis of award for Adjusted Bid projects that is best suited for the unique requirements of each project. The TRC determines the scoring criteria, which includes the appropriate magnitude of the Technical Approach and Bid in the scoring formula. Clearly define the selected method within the Project Specific Advertisement:

4.2.2.3.5.1 Adjusted Score – A (Bid Divided by Technical Approach Score)

Contract Award is based on the lowest adjusted score, which is determined by dividing the Bid value by the Technical Approach score. The design-build team selected is the team whose adjusted score is the lowest. The following chart provides an example:

Design-Build Team	Technical Approach Score	Bid	Adjusted Score
A	90	\$6.9 million	\$7.67 million
B	79	\$6.3 million	\$7.97 million
C	84	\$6.8 million	\$8.09 million

In this example, the contract would be awarded to Adjusted Bid team A with the lowest adjusted score of \$7.67 Million. The amount of the awarded contract would be for \$6.9 million, the value of the bid.

The advantage of the Adjusted Score – A is that the Department determines three design-build teams that are most qualified to design and construct the project, and innovation in the Technical Approach provides the design-build teams with additional points that could help in the adjusted score.

The disadvantage of the Adjusted Score – A is that it does not guarantee the design-build team with the lowest bid will be awarded the project or that the design-build team with the best Technical Approach will be awarded the project.

4.2.2.3.5.2 Adjusted Score- B (Weighted Bid and Technical Approach Score)

Contract Award is based on weighting the Technical Approach score and the Bid to determine an overall score for each design-build team. The highest score equates to the successful design-build team.

The bids for all teams with a responsive Technical Approach greater than 70-points are opened and evaluated at the same time. The scoring for the Bid will be computed in the following manner for a project where the Technical Approach and Bid are equally weighted:

Points awarded for Technical Approach= Technical Score (%) x 50

Points awarded for Bid = (Low Bid out of all design-build Bids / design-build team Bid) X 50

After the bid scores are determined, the technical score and the bid score are added together. The total points awarded for ranking are:

Total Score = Points Awarded for Technical Approach + Points Awarded for Bid

Design-Build Team	Technical Approach Score	Bid	Adjusted Score
A	90 (45.00 points)	\$6.9 million (45.65 points)	90.65
B	79 (39.50)	\$6.3 million (50.00)	89.50
C	84 (42.00)	\$6.8 million (46.32)	88.32

In this example, the contract would be awarded to Adjusted Bid team A with the highest adjusted score of 90.65 points. The amount of the awarded contract would be for \$6.9 million, the value of the bid.

For this scoring method, the following weighting schedule should be used depending on the anticipated value of the Bid.

Anticipated Bid	Technical Approach Weighting	Bid Weighting
\$0 - \$10 Million	50 points	50 points
\$10 Million - \$20 Million	33 points	67 points
\$20 Million - \$30 Million	25 points	75 points
\$30 Million - \$40 Million	20 points	80 points
\$40 Million - \$50 Million	17 points	83 points
\$50 Million - \$60 Million	15 points	85 points
\$60 Million - \$70 Million	13 points	87 points
\$70 Million - \$80 Million	11 points	89 points
\$80 Million - \$90 Million	10 points	90 points
\$90 Million - \$100 Million	9 points	91 points
\$100 Million -	8 points	92 points

This table was developed based on analysis that makes one point in scoring the Technical Approach worth approximately \$100,000.

The advantage of the Adjusted Score – B is that the Department determines three design-build teams that are most qualified to design and construct the project, and innovation in the Technical Approach gives the design-build teams additional points that could help in the adjusted score. The impact of one point in the Technical Approach remains consistent across Technical Approach scores. The impact of one point in the Technical Approach remains consistent the greater the amount of the anticipated bid.

The disadvantage of the Adjusted Score – B is that it does not guarantee the design-build team with the lowest cost bid will be awarded the project, or that the design-build team with the best Technical Approach will be awarded the project.

4.2.2.3.6 Advertisement

The following subsections show the different requirements for Design-build contract advertisement on One-Step and Two-Step Adjusted Bid projects. For a Two-Step Adjusted Bid project, the design-build teams respond to Design-build contract advertisement with a Statement of Interest. For a One-Step Adjusted Bid project, the design-build teams only respond after the Bid Package is issued.

Provide the draft Project Specific Advertisement to the District Portfolio Manager, Assistant District Executive for Design, Assistant District Executive for Construction, Central Office Contract Management Section Chief, and FHWA Area Engineer (for Federal Oversight Projects) for their review prior to publish in ECMS.

Submit the reviewed Project Specific Advertisement to the Central Office Contract Management Section Chief for publication.

4.2.2.3.6.1 Project Specific Advertisement for TWO-STEP ADJUSTED BID

Provide the following information for the Two-Step Adjusted Bid Design-build contract advertisement in ECMS for consultants after District review is complete; refer to Publication 93, *Procedures for the Administration of Consultant Agreements*, Section 2.3.3, *Advertisement*:

- Scope of Work
- Contract Duration
- Disadvantaged Business Enterprise (DBE) Goal
- General Requirements
- Selection Criteria and General Requirements for the Statement of Interest
- Time frame to submit the Statement of Interest
- Identify the date, time, and location for the pre-proposal meeting for the Statement of Interest if needed
- Selection Process to Review Technical Approach: Firm Neutral or ATC Process

- Additional technical qualifications required
- Technical Evaluation Criteria for the Technical Approach
- Approximate cost range for both design and construction
- Adjusted Bid Scoring Method
- Stipend Amount

The following is a template for Two-Step Adjusted Bid Advertisements. Using the Design-build contract advertisement in ECMS, provide the design-build teams with the projected duration of the project, selection criteria, and any specific information with respect to the selection process. Project Manager instructions are in italicized bold.

- a. Contract Duration. *(For the contract duration, provide an anticipated length of time to complete the Adjusted Bid Design-Build project.)*
- b. Firm Type. *(Indicate that for this portion of the agreement that an engineering firm is anticipated.)*
- c. Disadvantaged Business Enterprise (DBE) Entry. *(Select the appropriate Disadvantaged Business Enterprise (DBE) goal for the project from the pull down menu, as appropriate. The overall project DBE Goal will be developed by examining the design and construction portions of the project and then combining the goals into one overall project percentage goal.*

- *Standard Design Estimate x DBE Design Goal = Design Goal Dollar amount*
- *Standard Construction Estimate x DBE Construction Goal = Construction Goal Dollar amount*

Therefore:

- *(Design Goal Dollar amount + Construction Goal Dollar amount) / Design-Build Project Estimate = Adjusted Bid Design-Build DBE Project Goal)*

The design-build team has the discretion to determine how they will meet the DBE goal for the project.

- d. General Requirements. *(Select the most recent set of General Requirements to associate with the Advertisement.)*
- e. Selection Criteria. *(The selection criteria used in conjunction with each project will depend on the characteristics and requirements of the project. Determine the appropriate selection criteria for shortlisting design-build teams. If the firm neutral selection process is being followed for the Technical Evaluation Criteria, the selection criteria for shortlisting is the only submission by the design-build team that will allow the Department to obtain a sense of relevant previous experience for each of the design-build teams submitting. The following is a list of potential qualification selection criteria to shortlist design-build teams.)*
 1. Past Performance Reports: Contractor and Engineers. Summarize the past performance reports for the contractor, the Lead Design Engineer, and the Peer Review design consultant for the design-build team. Provide qualifying or extenuating information as deemed appropriate. The Department will independently review the past performance reports of the contractor, the Lead Design Engineer, and the Peer Review design consultant. Firms without a past performance report on file with the Department will not be penalized in the evaluation process. Information from other states or agencies may be used in the provided summary.
 - a. Penalties. Describe any outstanding damage claims for projects in which the prime contractor was involved within the last five years. Describe any instances of errors and omissions that have been brought against Lead Design Engineer. For each instance of

- damage claims or errors and omissions, identify the project owner's representative involved and his/her current phone number.
- b. Termination. Describe the conditions surrounding any contract (or portion thereof) entered into by the prime contractor, Lead Design Engineer, or peer review design consultant where any of those entities failed to comply with the contract terms which as a consequence resulted in termination of that contract, and that required completion by another party. List the reasons for the termination and the amounts involved that have occurred in the last 5 years. For each instance of termination, identify the project owner's representative involved and his/her current phone number.
 - c. Adherence to Schedule/Time Constraints. Describe any project that resulted in assessment of liquidated damages against the prime contractor within the last five years. Describe the causes of the penalties and the amounts assessed. For each instance of liquidated damages, identify the project owner's representative and provide his/her current phone number.
 - d. Environmental Record/History of Violations. Provide information concerning any Notices of Violations issued to the prime contractor, and the Lead Design Engineer.
2. Experience with Similar Work. Describe at least one but no more than four projects that primary contractor, the Lead Design Engineer, and the peer review design consultant has managed, designed and/or constructed within the last five years. For projects in which primary contractor, the Lead Design Engineer, and the peer review design consultant were involved, provide only one project description for this reference. Consider using project experience that clearly demonstrates that the members of the design-build team have performed design and construction of the same type, scope, and complexity as the advertised project. Provide a client contact person's name and telephone number for similar projects identified.
 3. Experience of Key Personnel. Experience and technical competence of the design-build team will be considered. Provide an organization chart showing the structure, composition and staffing for the design-build team. Provide no more than (Insert the number of resumes, minimum of 5, no more than 10) resumes of key members of the design-build team. List the key team members (project manager, field supervisor, lead bridge designer, lead highway/traffic designer, or others as deemed appropriate) for primary contractor, the Lead Design Engineer, and the peer review design consultant, their individual years of applicable experience, and their experience, during the last five years, on similar projects of comparable complexity on Pennsylvania's or other State's State Highway or local system. Local projects must have been funded with Federal Aid Highway Funds. Also, include a statement that the design engineer and the peer review design consultant have prepared designs with AASHTO or the Department or other applicable design criteria, standards, and construction specifications. If a single individual is to serve in multiple capacities (i.e., the project manager is also the field supervisor), please specify.
 4. Management Strategy for Design and Construction. Discuss the approach to managing and administering the advertised project. Key areas to address include design process and procedures, design quality control and assurance, design review process, permit acquisition, design timeline, contract management, subcontracting, project scheduling, cost accounting, record keeping, safety, and quality control, including coordination between the designer and contractor to achieve a quality product. Demonstrate an understanding of the requirements of the advertised project and the ability of the design-build team to meet those requirements.
 5. Current Workload of the Design-Build Teams. Provide information concerning the current workload of the Lead Design Engineer and the peer review design consultant. Design-build teams must clearly demonstrate that the Lead Design Engineer and the peer review design

consultant have the staffing, resources and materials required to complete the advertised project in a timely manner.

6. Timely Completion and Budget Control. Discuss how the design-build team will complete the project on time and within the budget. Describe the key issues and how the design-build team will manage these issues. Provide an assessment of risk to the timely completion and cost containment and the actions that the design-build team will take to manage these risks.

The weights given to the qualifications criteria for Statements of Interest must add up to 100%. As appropriate, other qualifications can be used to shortlist design-build teams.

7. Additional Design-build contract advertisement Information. ***(Incorporate the following information into the Design-build contract advertisement:)***

The Department of Transportation will retain a design-build team for the following:

The Department will receive Statements of Interest for an Adjusted Bid Design-Build project in ***(Insert County Name)*** County, S.R. ***(Insert SR and Section(s))***. The project is for the design and construction of ***(Insert Project Specific Information)***. The anticipated Notice to Proceed date is ***(Insert Date)***. The anticipated completion date is ***(Insert Completion Date)*** or earlier.

The Department will identify three (3) firms for the purpose of three (3) Stipend Agreements based on the Department's evaluation of the statements of interest received in response to this solicitation. The identification of the firms will be established directly from the statements of interest. Technical Proposals and Technical Approaches will not be requested prior to the establishment of the final ranking.

Project Location:

1.) S.R. ***(Insert SR)*** Segment ***(Insert Segment Number)*** Offset ***(Insert Offset Number)*** ***((Insert Local Road Name)) (Insert Local Government Name)***.

2.) S.R. ***(Insert SR)*** Segment ***(Insert Segment Number)*** Offset ***(Insert Offset Number)*** ***((Insert Local Road Name)) (Insert Local Government Name)***.

The Engineering and Construction Management System (ECMS) will be used to select the design-build team. The construction contractor will be considered the lead with the engineering firms as prime consultants and subconsultants. All construction contractors are limited to partnering with one prime engineering consultant and, similarly, all prime engineering consultants are limited to partnering with one construction contractor. A prime consultant cannot be a subconsultant on any other team. The design must be completed by a registered professional engineer licensed in the Commonwealth of Pennsylvania and construction must be completed by a pre-qualified contractor. All design consultants and subconsultants must have a current annual Qualification Package on file with the Bureau of Project Delivery's Contract Management Section. All engineering firms and construction contractors responding to this advertisement must be registered business partners in ECMS. Each design-build team responding to advertisement ***(Insert Engineering Agreement Number)*** will submit a Statement of Interest no later than ***(Insert Submittal Date)***.

The Statements of Interest will be limited to ***(Insert Number of Pages in words up to seven) ((Insert Number of Pages as a number up to 7))*** pages, single sided (8 ½" x 11"), in addition to the previously mentioned resumes.

PLEASE NOTE THAT THE STANDARD STATEMENT OF INTEREST (SHORTLIST) / TECHNICAL PROPOSAL (FINAL SELECTION) PROCEDURES AS

DESCRIBED ABOVE THE "Selection Criteria (in order of importance)" PORTION OF THIS ADVERTISEMENT DO NOT APPLY TO THIS ADJUSTED BID DESIGN-BUILD PROJECT.

THE PROCESS FOR DETERMINING THE SUCCESSFUL ADJUSTED BID DESIGN-BUILD TEAM WHICH WILL BE APPLICABLE TO THE ADJUSTED BID DESIGN-BUILD PROJECT IS DESCRIBED IN THE FOLLOWING PARAGRAPH:

The shortlisted design-build teams will be notified through ECMS of their shortlisted status. The shortlisted teams will enter into an agreement with the Department for a stipend of **\$(Insert Stipend Amount)**. The stipend will be paid to the unsuccessful Adjusted Bid Design-Build teams that submit a responsive Technical Approach.

The Technical Approaches will be evaluated based on the following criteria **(Choose the appropriate Technical Evaluation Criteria from the following list)**:

1. Schedule/Project Delivery Weight: __%
Discuss how the design-build team will complete the project on time and within the budget. Describe the key issues and how the design-build team will manage these issues. Provide an assessment of risk for the timely completion and cost containment and the actions that the design-build team will take to manage these risks. Provide a summary of the key considerations in the development of the project schedule for design, fabrication/material acquisition, and construction. Clearly show in two pages a Critical Path Method (CPM) Schedule that provides a comprehensive and logical schedule. Show proper attention to the project's critical path. State if the project's completion date will be met or if the design-build team will complete the project earlier. If the design-build team will complete the project early, clearly state the proposed early completion date. Earlier completion dates will become the contractual completion dates.
2. Maintenance and Protection of Traffic Weight: __%
Describe any approaches to Maintenance and Protection of Traffic that minimizes disruption of traffic. This shall include, but not be limited to, minimization of lane closures, maintaining lane widths, minimizing visual obstructions, and adjusting speed limits. Provide a discussion that addresses worker safety.
3. Design Features Weight: __%
Provide a summary of the design features of the project. If any design features present challenges to the design-build team, list these challenging features and describe how the team will manage these issues.
4. Quality Management/Quality Control Plan Weight: __%
Clearly describe the design-build team's approach to quality management and develop a project-specific Quality Control Plan. The discussion in the Quality Control Plan will address the project quality control, design quality control and assurance, design review process, permit acquisition, design timeline, fabrication, material acceptance, quality assurance, and monitoring the project schedule. Also, address how the design-build team will return the project to conformance in the event of non-conformance.
5. Coordination Weight: __%
Describe how the design-build team will coordinate the project with the Department's project team; permitting/environmental agencies; utility owners; local governments; and the general public.
6. Maintainability/Value Added Weight: __%
Clearly describe design features that minimize periodic and routine maintenance. The following elements will be considered: access to provide adequate inspections, ease of

future maintenance, and quality of construction materials. Describe if the design-build team will exceed the minimum material requirements to enhance durability of structural components, or if the design-build team proposes to accept an alternate payment schedule, or if the design-build team will provide additional elements not specifically required in the Scope of Work.

7. Construction Methods Weight: __%

Describe any construction methods that minimize impacts to the traveling public and the environment, reduce costs, improve worker safety, and minimize contract duration.

8. Right-of-Way Acquisition Services Weight: __%

Provide a thorough description pertaining to the design-build team's approach towards preparation of a Final Right-of-Way Plan and providing Right-of-Way services for properties that are impacted by the design-build team's design. Provide a comprehensive and logical schedule. Schedule to include specified milestone dates. The schedule must clearly indicate how you will obtain Right-of-Way clearance, in accordance with Publication 378, *Right-of-Way Manual*, Pennsylvania Eminent Domain Code, and the Federal Uniform Act.

(If the firm neutral selection process will be used for the evaluation of the Technical Approaches, use the following paragraph)

The Technical Approaches will be evaluated based on a firm neutral perspective. The Technical Review Committee (TRC) will not know what firms comprise the design-build teams. Any mention of information in the Technical Approach that reveals the identity of any of the design-build team members will result in scoring deductions or disqualification. The design-build teams shall not embed identifying information such as but not limited to, individuals, accomplishments, past projects, number of people in the firms, locations of offices/plants, specific equipment, or title of individuals.

(If Alternate Technical Concepts will be allowed as part of the Technical Approach development process, use the following paragraph)

Due to the complexity of the project, the Technical Approach development process will include the ability for the shortlisted Adjusted Bid Design-Build teams to propose Alternate Technical Concepts (ATCs) to the Department prior to the submittal of Technical Approaches.

Agreements ***(Insert Engineering Agreement Numbers)*** are being used for the stipend agreements with the shortlisted design-build teams. All bid package clarification questions will be submitted and responded to through the construction contractor via ECMS Project # ***(Insert Construction Agreement Number)***. The question/answer period will end five (5) days prior to the Technical Approach due date. A Bid will be submitted by each shortlisted design-build team in response to ECMS Project # ***(Insert Construction Agreement Number)***. An agreement will be prepared for ECMS Project # ***(Insert Construction Agreement Number)*** and it will include all design engineering and construction items required to satisfactorily complete the project. All engineering costs will be included as separate bid items in the contract.

The Technical Approaches will be reviewed and scored by a Technical Review Committee (TRC) comprised of District ***(Insert Engineering District)*** personnel. These technical scores will be used in conjunction with the Bids to determine the successful design-build team.

The Technical Evaluation Criteria that are announced in the Advertisement should match the criteria that are placed in the Scope of Work as well. Selection criteria for the Technical Approaches must add up to 100%.

4.2.2.3.6.2 Project Specific Advertisement for ONE-STEP ADJUSTED BID

Provide the following information for the One-Step Adjusted Bid Advertisement in ECMS for consultants after District review is complete; refer to Publication 93, *Procedures for the Administration of Consultant Agreements*, Section 2.3.3, *Advertisement*:

- Scope of Work
- Contract duration
- Disadvantaged Business Enterprise (DBE) Goal
- General Requirements
- Selection Process to Review Technical Approach: Firm Neutral or ATC Process
- Additional technical qualifications required
- Technical Evaluation Criteria for the Technical Approach
- Approximate cost range for both design and construction
- Adjusted Bid Scoring Method

Utilize the template in 4.2.2.3.6.1 for One-Step Adjusted Bid Advertisement, deleting the portions not appropriate for One-Step Adjusted Bid

4.2.2.3.7 Optional Statement of Interest Pre-Proposal Meeting

Determine if there is need for a pre-proposal meeting for the Statement of Interest along with the District Executive Staff. The date, time, and location for the pre-proposal meeting for the Statement of Interest are published within the Announcement. For Two-Step Adjusted Bid projects, this meeting is recommended to be mandatory for the design-build teams.

Prepare a meeting agenda/presentation for the design-build teams of the project. Generate meeting minutes from the Pre-Proposal Meeting that respond to the questions asked during this meeting. District Executive Staff will attend the meeting and review meeting minutes prior to issuance.

4.2.2.3.8 Question/Answer Option to Advertisement

Provide a procedure for design-build teams to submit questions during Statement of Interest preparation and distribution of Department responses using ECMS.

4.2.2.3.9 Statement of Interest Submission for Two-Step Adjusted Bid Projects

Follow the Standard Selection Procedure to collect the Statements of Interest; and then shortlist three to five design-build teams that will have the opportunity to submit a Technical Approach and Bid.

4.2.2.4 Review of Statements of Interest**4.2.2.4.1 District Shortlisting Committee**

Establish the District Shortlisting Committee to review the Statements of Interest and develop the Shortlist. The Committee should consist of a minimum of three of the following positions:

- Assistant District Executive for Design
- Assistant District Executive for Construction
- Director, Bureau of Project Delivery

In addition, for Federal Oversight projects, the FHWA Area Engineer will be invited to participate as non-voting member of the District Shortlisting Committee meeting.

Members of the District Shortlisting Committee will be prohibited from discussing the contents of the Statements of Interest that were submitted with anyone outside of the Shortlist Committee, District Project Manager and Central Office Facilitator. The individuals reviewing the Statements of Interest will be required to sign a Statement of Confidentiality, APPENDIX F. Any violation of the terms of these statements is subject to termination.

4.2.2.4.2 Statements of Interest Review

Perform cursory evaluation of the Statements of Interest submitted in ECMS along with the Central Office Facilitator to determine if they meet the advertisement requirements. Collect any additional information required to be obtained by the Department prior to evaluation for each design-build team as noted in the Design-build contract advertisement. Refer to Publication 93, *Procedures for the Administration of Consultant Agreements*, Section 2.4, *Statement of Interest* and Section 2.6, *IO Generates Shortlist*. Ensure that the following items are included within each Statement of Interest submission for the District Shortlisting Committee to review:

- Statement of Interest
- Project Team Organizational Chart
- Resumes of Key Personnel
- Qualifications
- Additional information as noted in the Project Announcement
- Project Announcement
- Statement of Interest Qualification Rating Sheet

Central Office Contract Management Section Chief will coordinate with design-build teams that have an issue with the Statement of Interest Package.

Request the District Shortlisting Committee to develop and rank the design-build teams to shortlist. The number of design-build teams shortlisted for an Adjusted Bid project can vary between three and five, though the typical number of design-build teams will be three.

Compile the explanations why select design-build teams were shortlisted and not shortlisted by the District Shortlisting Committee; enter into ECMS for both the shortlisted and non-shortlisted design-build teams.

4.2.2.4.3 Statement of Interest Qualification Rating Sheet

The District Shortlisting Committee ranks the design-build team's Statement of Interest package by using the Statement of Interest Qualification Rating Sheet, APPENDIX G.

4.2.2.4.4 Unsuccessful Design-Build Team Debriefing

If requested by a non-shortlisted design-build team, set-up a meeting to debrief. Refer to Publication 93, *Procedures for the Administration of Consultant Agreements*, Section 3.4.4, *Debriefing*.

Coordinate debriefing meeting with the Central Office Facilitator, ADE-Design, ADE-Construction, and non-shortlisted design-build team. Provide guidance on how the unsuccessful design-build team could improve their Statement of Interest package for the next Adjusted Bid project. In no way should the relative ranking of the Statement of Interest package be discussed with the unsuccessful design-build team.

Once the debriefing meeting has taken place, the unsuccessful design-build teams have no further involvement in the process.

4.2.3 BID PACKAGE

Compile the Bid Package, including all of Conceptual Design, Special Provisions, Bid Items, and Project Development Checklist detailed in [Section 4.2.1](#). Coordinate with the Central Office Facilitator and the TRC in order to post in ECMS. If Alternate Technical Concepts will be considered for the project, then include the Standard

Special Provision, a29903, Alternate Technical Concept to encourage the shortlisted design-build teams to bring innovative concepts to the project not contemplated within the project's specifications. Refer to Publication 51 for bid package assembly., *Specifications and Estimate Package Delivery Process Policies and Preparation Manual*.

The Bid Package will also include the following:

- Time frame for design-build teams to submit Technical Approach
- Time frame for design-build teams to respond to questions that arise during Technical Approach Review
- Time frame for design-build teams to submit Bid (typical three week lag after Technical Approach submission)

4.2.3.1 Central Office Bid Package Review

The District Contract Management Unit forwards the Bid Package to Central Office Project Schedules, Specifications, and Constructability Section of the Highway Delivery Division for their review and concurrence once the Bid Package is assembled and ready for publish.

Review the previously proposed Bid due date (typically 7 weeks) and recommend any adjustments to Central Office based on the current project schedule.

In addition, for Federal Oversight projects, the FHWA Area Engineer will review and approve the Bid Package prior to Advertisement.

4.2.3.2 Bid Package Published

Coordinate with Central Office Reviewer so that the Bid Package is published shortly after the shortlisted design-build stipend agreements are executed. The Bid Package posts in ECMS eBidding with the contractor's Bid Packages on the construction side of ECMS.

4.2.4 TECHNICAL APPROACH

Technical Approaches for Adjusted Bid projects address the technical elements relating to the design and construction of the project. The Technical Approach considers the design-build team's understanding of the project, the anticipated problems and the solutions to those problems, and project schedule. The shortlisted design-build teams develop their Technical Approaches in accordance with the Technical Evaluation Criteria provided at Design-build contract advertisement. The design-build team is to provide their methodology for the project and ensure that the Technical Approach meets each of the Technical Evaluation Criteria's requirements.

4.2.4.1 Optional Pre-Bid Conference with Shortlisted Design-Build Teams

Prepare a meeting agenda/presentation to the design-build teams in order to discuss the Bid Package requirements so that special attention can be drawn particular details or conditions of the projects. These details may include project schedule, specifications, construction sequencing, biddability, and constructability. Provide time for the design-build teams to ask questions and possibly see the job site during this meeting. Ensure that appropriate Department personnel are in attendance to answer questions.

Generate and issue meeting minutes that document the meeting including all questions and answers. Ensure that District Executive Staff review the meeting minutes prior to issue. Publish the meeting minutes via ECMS Addenda. Refer to Publication 51, *Specifications and Estimate Package Delivery Process Policies and Preparation Manual*.

4.2.4.2 Technical Approach for Firm Neutral Process – General

No resumes or organization charts are permitted in the Technical Approach. As part of the development of the Technical Approach, the design-build teams must not indicate their firm names, identities of any personnel, any projects worked on, or any information that would identify the make-up of the design-build team (or references such

as "we [versus the firm's actual name] have experience in..."). The Technical Approach is for the design-build team to provide their methodology to the project and meet the Technical Evaluation Criteria.

Store all Technical Approach documents in a secured (locked) room during non-working hours. Documents should be reviewed in a common, secured area during the day. All evaluation notes and comments shall be stored in the same manner. Documents are not accessible to anyone not involved in the shortlisting and technical evaluation process.

4.2.4.2.1 Additional Design-Build Team Questions during Preparation of Technical Approaches

Design-build teams have the ability to submit additional questions as appropriate to the Department. The questions can be submitted at any time during the Technical Approach process until the end of the question and answer period. All questions pertaining to the bid package clarification should be submitted by the design-build team through the contractor via the construction bid package in ECMS.

Review questions along with the Central Office Facilitator that are submitted by design-build teams in ECMS. Coordinate the response with the TRC and use care during this process to ensure that the identity of the design-build team is not discovered for a firm neutral review process. Post answers in ECMS through coordination with District Contract Management Unit for all design-build teams to reference.

4.2.4.2.2 Technical Approaches for Firm Neutral Process – Submission

Design-build Teams submit their Technical Approach to the Department as outlined in the Stipend Agreement [within the page numbers identified in the Special Bidding Procedures and Scope of Work] along with all bid package clarification questions in ECMS. The Technical Approach must identify all deliverables envisioned as part of the project.

Typically, there is a three week lag after the Technical Approach is submitted until the Bid is due. While the shortlisted design-build teams continue to develop the bids, the TRC reviews and evaluates the Technical Approaches by Firm Neutral Process.

4.2.4.3 Technical Approach for Firm Neutral Process – Department Review

While it is the responsibility of the Project Manager to open the envelopes after the submission date and time for the Technical Approaches and forward to the Central Office Facilitator, consider designating a disinterested Department employee to perform this function for confidentiality purposes. The responsibilities of the person opening are to (a) verify that submissions are firm neutral; (b) ensure that the submission does not state which design-build team is responsible for the submission, and (c) make notations regarding the review of each Technical Approach on the Technical Approach – Initial Review and Coding Form, APPENDIX H. Specific references should not include firm names, identities of any personnel, any projects worked on, or any information that would identify the make-up of the design-build team.

If a Technical Approach is found to have a team specific reference, complete the Technical Approach – Initial Review and Coding Form together with the Central Office Facilitator noting the firm neutral changes that need to be made by the design-build team. In addition, provide a timeframe to the design-build team to return the firm neutral document.

4.2.4.3.1 Technical Approach for Firm Neutral Process – Coding

Assign codes to each Technical Approach so that only the District Project Manager and Central Office Facilitator knows which Technical Approach is associated with each design-build team.

4.2.4.3.2 Technical Approaches and Technical Review Form

Verify that the ADE-Design or ADE-Construction distributes the technical evaluation criteria form that was provided at Project Announcement along with the Technical Approach to the TRC members.

4.2.4.3.3 Initial Individual TRC Review

Each member of the TRC performs an initial review of the Technical Approach in accordance with the Technical Evaluation Criteria which was previously established prior to Project Announcement. As part of the individual reviews, the TRC will determine whether there are any bid package clarification questions for the shortlisted design-build teams. TRC members provide questions based on their individual review directed to the design-build teams to the District Project Manager and Central Office Facilitator using the Technical Approach code.

4.2.4.3.4 Firm Neutral Process Questions

Contact the appropriate design-build team along with the Central Office Facilitator. Contact will be made with the design-build team's Project Manager as identified in the Organization Chart submitted within the Statement of Interest. Provide the questions in writing via either e-mail or fax along with an associated deadline that was established in the Bid Package to the design-build team.

4.2.4.3.5 Firm Neutral Process Question Responses

Design-build teams respond to the questions provided by the District Project Manager and the Central Office Facilitator within the specified time frame via fax or e-mail.

If the design-build team does not respond within the specified time frame, inform the TRC that no response was provided and to continue with the review of the Technical Approach.

Code each answer along with the Central Office Facilitator so that the TRC does not know the design-build team responsible for the answer.

4.2.4.3.6 Technical Approaches for Firm Neutral Process – Scoring

After individual review of the Technical Approaches, each member of the TRC scores the Technical Approach in accordance with scoring requirements stated in the Technical Evaluation Criteria using the Technical Review Form. Refer to Publication 93, *Procedures for the Administration of Consultant Agreements*, Section 2.7, *Technical Proposals*, Section 2.8, *IO Generates Final Ranking*, and Section 3.4, *Selecting Consultants – Qualifications Based Selection*. These technical scores are used in conjunction with the Bids to determine the successful design-build team.

4.2.4.3.7 Technical Approaches for Firm Neutral Process – Composite Scoring

After the initial review, the TRC meets to discuss ratings based on the Technical Evaluation Criteria. The District Project Manager and Central Office Facilitator, who coded the firm neutral Technical Approaches shall not participate in the TRC meetings so that no one in the room may have a potential conflict of interest to know which Technical Approach belongs to each design-build team. Coordinate the TRC to determine when and where the meeting will take place.

The ADE-Design (or delegate) facilitates, without influencing, the TRC members through a discussion of their individual scores. During the meeting, a combined score for each Technical Approach is developed in accordance with Technical Evaluation Criteria. This composite score is agreed upon by all TRC members through discussion during the meeting. The composite score is obtained based on ratings from the evaluation criteria.

Also, during this meeting, a debriefing document is to be generated that clarifies how each Technical Approach met the Technical Evaluation Criteria, as well as the strengths and weaknesses associated with each Technical Approach and the associated scores. The debriefing document for the unsuccessful design-build teams is used during the debrief process in the event that an unsuccessful design-build team requests a debriefing.

Invite the FHWA Area Engineer for Federal Oversight projects to participate as a non-voting member of the Technical Approach – Firm Neutral Review Meeting.

4.2.4.3.8 Decode Firm Neutral Scores for each Technical Approach

The TRC provides the composite scores and debriefing documents to the District Project Manager and Central Office Facilitator. Decode the firm neutral scores along with the Central Office Facilitator to the appropriate design-build teams. In addition, keep the Technical Approach composite scores in confidence until the time of the Bid Opening.

Provide the composite scores for each Technical Approach to the Bureau of Project Delivery, Contract Management Section, Contract Award Officer just prior to the opening of the Bids.

4.2.4.4 Technical Approach for Alternate Technical Concept (ATC) Process – General

The Technical Approaches developed by the design-build teams using Alternate Technical Concepts provide the design-build teams with an opportunity to propose innovative ideas. Each alternative is called an Alternative Technical Concept (ATC).

Short-listed design-build teams are encouraged to bring innovative concepts to the project not contemplated within the Scope of Work and associated specifications. Typically, potential ATCs affecting modifications to the general alignment will not be allowed. This limitation by the Department is based on several issues:

Status of the right-of-way acquisition process, typically already underway prior to release of the Scope of Work and associated specifications to the design-build teams; and the existing alignments are typically established.

In addition to alignment modifications, ATCs are not allowed to affect the right-of-way, ITS, pavement structures, or aesthetics components of a project.

Each ATC submitted by a design-build team, for review and consideration by the Department, will include the following information:

- detailed ATC description (Design-build team can provide drawings to highlight description) of where and how the ATC will be used on the project;
- list of deviations from the Scope of Work/Special Provision requirements, along with an explanation of deviation and a request for approval;
- full analysis justifying use of the ATC in lieu of the Scope of Work/Special Provision and why the deviation (if any) should be allowed;
- analysis of potential impacts on vehicular traffic, environmental permitting, community impact, safety, and life-cycle project and infrastructure costs (including impacts on the cost of repair and maintenance) resulting from acceptance of the ATC;
- list of other projects where the ATC has been used, its success, the names and telephone numbers of project owners that can be used as references; and
- description of added risks to the Department or third parties associated with implementing the ATC, as well as an estimate of the ATC implementation costs to the Department, the design-build team, and third parties.

All ATCs that are received from the shortlisted design-build teams become the property of the Department. Once selection of the Adjusted Bid design-build team is determined, the Department can then review the ATCs provided by the unsuccessful design-build teams, providing the successful Adjusted Bid design-build team an opportunity to negotiate those ATCs which the Department feels provide merit to the project. This negotiation process is to only be performed after the final award and contract execution is complete.

4.2.4.4.1 ATC Meetings

The purpose and goal of these meetings are to discuss the general understanding of a potential ATC prior to final submittal for pre-approval; to address specific questions that the Department may have concerning a potential ATC; and to provide direction to the shortlisted design-build teams.

The ATC meetings between the Department and each design-build team are performed under strict conditions of confidentiality; sharing of information on potential ATCs between design-build teams is strictly prohibited by all parties. The acceptance and approval of an ATC by the Department is in no way a guarantee that a design-build team will use the individual ATC in their final Approach. The pre-approval process only identifies ATCs that would be considered during the Technical Approach review, inclusion of any ATC would be judged on its merit during the final evaluation of the Technical Approach, with the Department reserving the sole right to reject or modify any ATC that did not meet the criteria of the Approach submittal process. ATCs will remain confidential until the determination of the successful design-build team through the Adjusted Bid selection process. The price bid for each ATC would be added or subtracted from the design-build teams' base price resulting in the Adjusted Bid Price for each individual design-build team.

The Department's pre-proposal ATC process provides each design-build team with a summary of findings for their proposed ATCs. The Department will review each ATC to make the following determinations:

- concept was acceptable for inclusion in the Approach as an ATC;
- concept was not acceptable for inclusion in the Approach as an ATC; or
- certain identified conditions must be met or certain clarifications or modifications must be made as a condition of acceptance for inclusion in the Approach as an ATC.

Note that the acceptance of any of the ATCs may require an addendum to be issued for the project to enable the bids to be within the specifications issued.

In addition, for Federal Oversight project, the FHWA Area Engineer will be invited to participate in the ATC meeting.

4.2.4.4.2 Technical Approaches for ATC Submission Process

Design-build teams submit their Technical Approach to the Department as outlined in the Stipend Agreement [within the page numbers identified in the Special Bidding Procedures and Scope of Work] along with all bid package clarification questions. The Technical Approach must identify all deliverables envisioned as part of the project.

Each Technical Approach submitted needs to clearly indicate whether the design-build team did or did not incorporate their ATCs that had been accepted.

4.2.4.4.3 Technical Approaches and Technical Review Form

Verify that the ADE-Design or ADE-Construction distributes the technical evaluation criteria form that was provided at Project Announcement along with the Technical Approach to the TRC members.

4.2.4.4.4 Initial Individual TRC Review

Each member of the TRC performs an initial review of the Technical Approach in accordance with the Technical Evaluation Criteria which was previously established prior to Project Announcement. As part of the individual reviews, the TRC will determine whether there are any bid package clarification questions for the shortlisted design-build teams. TRC members provide questions based on their individual review directed to the design-build teams to the District Project Manager and Central Office Facilitator.

4.2.4.4.5 Contact Design-Build Teams with Questions for ATC Process

Contact the appropriate design-build team along with the Central Office Facilitator. Contact will be made with the design-build team's Project Manager as identified in the Organization Chart submitted within the Statement of Interest. Provide the questions in writing via either e-mail or fax along with an associated deadline that was established in the Bid Package to the design-build team.

4.2.4.4.6 ATC Question Responses

Design-build teams respond to the questions provided by the District Project Manager and the Central Office Facilitator within the specified time frame via fax or e-mail.

If the design-build team does not respond within the specified time frame, inform the TRC that no response was provided and to continue with the review of the Technical Approach.

4.2.4.4.7 Individual TRC Review – Scoring

After individual review of the Technical Approaches, each member of the TRC scores the Technical Approach in accordance with scoring requirements stated in the Technical Evaluation Criteria using the Technical Review Form. Refer to Publication 93, *Procedures for the Administration of Consultant Agreements*, Chapters 3 and 4.

4.2.4.4.8 Technical Approaches for ATC Process – Composite Scoring

After the initial review, the TRC meets to discuss ratings based on the Technical Evaluation Criteria. Coordinate the TRC to determine when and where the meeting will take place.

The ADE-Design (or designee) facilitates, without influencing, the TRC members through a discussion of their individual scores. During the meeting, a combined score for each Technical Approach is developed in accordance with Technical Evaluation Criteria. This composite score is agreed upon by all TRC members through discussion during the meeting. The composite score is obtained based on ratings from the evaluation criteria.

Also, during this meeting, a debriefing document will be generated that clarifies how each Technical Approach met the Technical Evaluation Criteria, as well as the strengths and weaknesses associated with each Technical Approach and the associated scores. The debriefing document for the unsuccessful design-build teams will be used during the debrief process in the event that an unsuccessful design-build team requests a debriefing.

Invite the FHWA Area Engineer for Federal Oversight projects to participate as a non-voting member of the Technical Approach with ATC Review Meeting.

Provide the composite score for each Technical Approach to the Bureau of Project Delivery, Contract Management Section, Contract Award Officer just prior to the opening of the Bids.

4.2.5 BID SUBMISSION, OPENING, REVIEW, AND CONTRACT AWARD

If the shortlisted design-build teams did use accepted ATCs as part of their Technical Approach, they are to develop their bid price including the ATCs that they choose to incorporate.

The prime contractor of the design-build teams submits the Bids in ECMS.

4.2.5.1 Bid Opening

The Bids from shortlisted design-build teams are opened by Contract Management Section Contract Award Officer at the appointed date and time.

The Adjusted Bid is determined using the amount from each design-build team's Bid and the associated Technical Approach scores developed by the TRC. The following list presents the Adjusted Bid Scoring options:

- Adjusted Score – A (Bid Divided By Technical Approach Score); or
- Adjusted Score – B (Weighted Bid and Technical Approach Score)

Opening Bids for the project may result in the need to take ECMS offline for a time period. This offline period will allow the apparent rank order of the adjusted Scores to be revealed once the Adjusted Bid Score is determined for

each design-build team. The Contract Management Section Chief verifies the Adjusted Bid calculation. Once the Adjusted Bid scores are finalized, they are posted in ECMS.

In order to assure that the Contract Award Officer is aware that this project is an adjusted bid project, assure that a project condition has been entered in the ECMS Construction Project with a 'do not open bids' status and a title of 'adjusted bid design build' and a comment of 'bid must be adjusted using technical scores'. The Contract Award Officer will satisfy the condition prior to bid opening.

4.2.5.2 Contract Award Process

The successful design-build team moves on to the Contract Award process. The unsuccessful design-build teams have the opportunity to request a debriefing.

4.2.5.3 Bid Review

The Contract Management Section, Contract Award Officer reviews the Bid to verify that it is complete. Any Approach that does not meet the requirements of the Bid Package is rejected. If each step as part of the Contract Award process is properly completed, the apparent design-build prime contractor executes a Contract.

This review follows the current Contract Award process for traditional design-build contracts, including FHWA on Federal Oversight projects.

Failure of the design-build team to provide any necessary information to meet the requirements of the bid package causing its bid to be rejected/disqualified will result in failure to be eligible for the stipend.

4.2.5.4 Technical Approach Incorporated into Construction Contract

The Bureau of Project Delivery, Contract Management Section, Contract Award Officer adds the Technical Approach into the Project Development Checklist for inclusion in the Contract.

4.2.5.5 Debrief Unsuccessful Design-Build Teams

If requested by unsuccessful design-build teams, coordinate a debriefing with the ADE-Design or ADE-Construction and the unsuccessful design-build team. Refer to Publication 93, *Procedures for the Administration of Consultant Agreements*, Section 3.4.4, *Debriefing*.

During the debrief meeting, discuss how the Technical Approach met the Selection Criteria, as well as the strengths and weaknesses associated with the team's Technical Approach and provide guidance on how the unsuccessful design-build team could make improvements for the next Adjusted Bid project. In no way should the relative ranking and associated score of the Technical Approach be discussed with the unsuccessful design-build team.

4.2.5.6 Unsuccessful Design-Build Team Stipend

All unsuccessful design-build teams that were responsive (greater than 70% on the Technical Approach Evaluation) are provided the pre-determined stipend amount. The stipend is paid through ECMS directly to the lead design consultant for each design-build team. The lead design consultant must submit the invoice for the lump sum amount in ECMS and all information requested in the stipend agreement.

Payment of the stipend to the unsuccessful design-build teams is for their effort put forth in the development of the Technical Approach and Bid Proposals, as well as to purchase their innovative ideas. The stipend is not intended to cover the costs to prepare the Technical Approaches and Bid Proposals, but rather to offset some of the cost.

The following is text that may be utilized as part of the Stipend Payment release.

The Technical Approach submitted to the Department shall constitute a work made for hire within the meaning of the Copyright Act of 1976, as amended. In the event that the property set forth in

the Technical Approach to the Department does not fall within the enumerated categories of a work for hire, the Design-Build Team shall agree to assign all title and interest in the Technical Approach and its proprietary rights to the Department. The Department shall acquire all proprietary right, title and interest in the property in the Approach, including, but not limited to, copyrights, trade secrets, formulas, research-data, know-how, specifications and trademarks and any associated good will.

4.3 POST-AWARD - FINAL DESIGN SUBMISSIONS AND CONTRACT ADMINISTRATION

This section is intended to guide the District Construction Unit personnel through the design and plan approval process that occurs subsequent to contract award. Depending on District preferences, the Design Project Manager may maintain the role of submittal manager during the final design phase by the contractor, or have a Design-Build Coordinator maintain control over the project throughout the construction phase. Regardless, the key to the success of a design-build project and full realization of the advantages of design-build is effective, efficient, and timely submittal management.

All of the procedural requirements for contractor's design submissions are identified in the Special Provisions for the design items, the Quality Plan, and SPECIAL BIDDING – DESIGN-BUILD. SPECIAL BIDDING – DESIGN-BUILD is the central Special Provision for design-build contracts, which identifies the Design Activities, the elements of the final design for which the contractor is responsible, the Department contact information, and the submittal procedures – whether the contractor is required to make electronic submissions via a Department-established ftp site, or paper submissions. If the latter is specified, SPECIAL BIDDING – DESIGN-BUILD indicates how many sets of drawings and calculations the contractor is required to submit. Always refer to the Special Provisions for the contractor submittal requirements.

The offices and individuals responsible for the review and approval of the various design submission vary, depending on whether the project is Federal Oversight, or Department Oversight, and whether the structures are of a particular type, size, or cost, as dictated by Publication 10C, Design Manual Part 1C, *Transportation Engineering Procedures* and Publication 15M, Design Manual Part 4, *Structures*. In addition, there may be certain plans that must be submitted to outside agencies for approval. To eliminate the uncertainty once the project responsibility has been transferred from Project Management, this Manual requires the Design Project Manager at the conclusion of the Conceptual Design phase to establish and document the reviewing party for each of the submittals listed in Section VII of SPECIAL BIDDING - DESIGN-BUILD. This document is to be included as an attachment to the Project Development Checklist, but not published with bid package. Although this Manual recommends a Submittal Review Responsibility checklist (APPENDIX B) be completed specifically for each project, it is District Project Management's choice as to the method to convey the information.

Also required to be included in any document identifying the reviewing parties is the number of sets required to be sent to each reviewing party when paper submissions are specified. Additionally, the document will identify if a design consultant under agreement with the District will be tasked to assume the District's role as a reviewing party. Obtain this document from the Design Project Manager.

On contracts where the special provision QUALITY PLAN – WITH QUALITY ASSURANCE BY PEER REVIEW is included, quality assurance reviews are handled by the contractor through the third party peer reviewer. The reviews identified in Section VII of SPECIAL BIDDING - DESIGN-BUILD and the Submittal Review Responsibility checklist are Owner's Perspective Reviews, as defined in QUALITY PLAN – WITH QUALITY ASSURANCE BY PEER REVIEW.

In overview, the post-award phase requires that a significant amount of coordination occur between the Department and the contractor and its Lead Design Engineer. It should go without saying that significant delays can result if coordination is not facilitated. Whether the Assistant Construction Engineer, the Design Project Manager, or the Design-Build Coordinator, the individual designated to manage the submittal process must do so proactively, in the same manner as managing the construction itself – with the goal of keeping the contractor's fate in their own hands at all times.

One additionally important aspect of the initial Post-Award phase is to review and approve the contractor's Schedules of Values submissions for payment on certain lump sum design-build items. Processing of the first estimate is contingent upon approval of all Schedules of Values. Refer to [Section 3.3.5](#) for details. Timely submission by the contractor and approval by the Department of these Schedules of Values will meet the Department goal of prompt payment for all subcontractors.

4.3.1 PRIOR TO AWARD

If the contractor's selected Lead Design Engineer or subconsultant does not meet the requirements of Section III of SPECIAL BIDDING - DESIGN-BUILD, the Professional Services Involvement Restriction, the contractor is permitted to submit a Request for Consideration for Professional Services Involvement Restrictions form (available on the References tab on ECMS) immediately upon notification of low bid. Immediately upon receipt, fax the completed form to the Contract Management Section Chief at 717-705-2378 for concurrence by the Contract Management Section and Office of Chief Counsel. The Contract Management Section will notify the District of the results of the review. Do not approve the Design Activities Identification and Qualification form until the involvement restriction issue is resolved.

4.3.2 IMMEDIATELY AFTER AWARD

Three calendar days after award, Section II of SPECIAL BIDDING - DESIGN-BUILD requires the contractor to submit the Design-Build Design Activities Firm Identification and Qualifications form. This document includes resumes of key staff of the contractor's Lead Design Engineer staff (including Secondary Design Service Professionals). Forward to the ADE – Design for review and approval. The response must be transmitted to the contractor within eight calendar days.

Within five days of the approval of the Quality Control Reviewer identified by the contractor on the Design-Build Design Activities Firm Identification and Qualifications form, either the special provision QUALITY CONTROL PLAN – WITH QUALITY ASSURANCE BY DEPARTMENT REVIEW, or QUALITY PLAN – WITH QUALITY ASSURANCE BY PEER REVIEW (QUALITY PLAN) require the initial submission of the Lead Design Engineer's Quality Plan for review. Also forward to the ADE – Design for review.

Coordinate with the contractor to schedule a Quality Coordination Meeting within 10 days after the Notice-to-Proceed, either separately or in conjunction with the Pre-Construction Conference. Follow the requirements of the appropriate Quality Control Plan special provision in conducting the meeting. Refer to [Section 3.3.4.1](#) for the remaining submission requirements for the Quality Plan.

4.3.2.1 Establish Digital Plan Submission System

In advance of the Pre-Construction Conference, arrange for the establishment of a project specific folder, password protected, File Transfer Protocol (ftp) site for the purposes of distributing electronic plan submissions to and from reviewing parties (as specified in SPECIAL BIDDING – DESIGN-BUILD), either on the Department's ftp site, the contractor's ftp site, or the Lead Design Engineer's ftp site. Establish a user name and password for the folder. It is suggested to establish subfolders within the project folder for each of the Design Activities identified in Section IV of SPECIAL BIDDING - DESIGN-BUILD. Within each design activity subfolder, create a subfolder for each deliverable identified in the Special Provision for that design activity. For example, for Item 8210-xxxx, Design of Bridge Structure (As-Designed Foundation Provided), the subfolders would include: Final TS&L, Final Plan – Substructure, Final Plan – Superstructure, Final Plan Set, Computations, and As-Built Drawings. If the Special Provision permits partial plan submittals, include further subfolders for each of the identified submissions.

Establish an email distribution list based on the Submittal Review Responsibility checklist. Include the District's design consultant if tasked to perform reviews. The process functions as follows:

- The Contractor uploads documents to be reviewed to the ftp site and notifies the distribution list that a document has been submitted for review to the ftp site.
- Reviewer performs the review, uploads final comments or final approval to the ftp site and notifies the distribution list that a document has been reviewed and the comments or approval are on the ftp site.

- Repeat as needed as comments are addressed.

Be responsible to coordinate review comments as detailed in [Section 3.3.4.2.1](#).

In advance of the Pre-Construction Conference, prepare a memorandum for distribution to the contractor and reviewing parties detailing the submission of digital plans for review. Include:

- Discussion of protocol for any acceptance of partial submissions, if permitted in the Special Provisions
- FTP site information including site location, user name, password, description of folders to be used
- File naming convention
- Email distribution list once a submission has been posted to the ftp site
- Review process for uploading review comments (folder location, file naming convention, email distribution list)

4.3.2.2 Establish Paper Plan Submission System

Refer to the Submittal Review Responsibility checklist, and establish an email contact list to assist in the expediting of paper submissions.

4.3.2.3 Submittal Management Set-up Checklist

The checklist in APPENDIX D Submittal Management Set-up Checklist can be used as a guide to define specific processes and protocols to be integrated into the post-award/design phase, particularly with regard to digital plan submissions.

4.3.2.4 Prompt Payment

In order to ensure prompt payments for initial Design activities, the method of processing payments must be established and initiated within 15 days of the issuance of Notice to Proceed, or as soon as the Schedules of Values as required by certain lump sum design-build items are approved. Refer to Section IX of SPECIAL BIDDING – DESIGN-BUILD and [Section 3.3.5](#) for requirements. Choose one of the two following methods:

- ECMS payment processing: Payments processed in ECMS can be made from any computer, including within District Offices or from the Field Office.
- NextGen payment processing: Payments processed in the NextGen system will require the use of a secure computer connection.
 - If a field office is specified to be installed immediately following the Notice to Proceed, all payments will be processed through the field office.
 - If a field office is not required to be installed immediately the Notice to Proceed, an alternate method of processing payments must be established.
 - Option A: Load NextGen schedule onto a network computer within the District Offices and process payments at this location. Once the field office is installed, the NextGen schedule will need to be downloaded from the network computer and installed on the laptop computer in the field office.
 - Option B: Load NextGen schedule onto a leased laptop computer and use to process payments at an alternate location. For some projects, the laptop computers can be set-up at different field office. Caution should be used with using a leased laptop computer to process payments within District Offices. Leased laptop computers are not permitted to be connected to the Department's network, but internet connection is required. Coordinate with the IT unit to establish a connection method. For some Districts, it may be possible to use Training facilities to obtain an internet connection independent of the Department's network system.

4.3.3 PRECONSTRUCTION CONFERENCE

Review the submittal procedures in detail at the Preconstruction Conference. Identify any changes. If necessary, establish a schedule of biweekly coordination meetings, either in person or by teleconference, to be held during the Final Design submittal preparation phase.

4.3.4 GENERAL SUBMITTAL ITEMS

Figure 4.3.4-1 illustrates the highlights of the Contractor's Lead Design Engineer's submissions during the Final Design phase after award. Substantive design specifications and submittal content requirements are identified in the design special provision items. Refer to the Submittal Review Responsibility checklist.

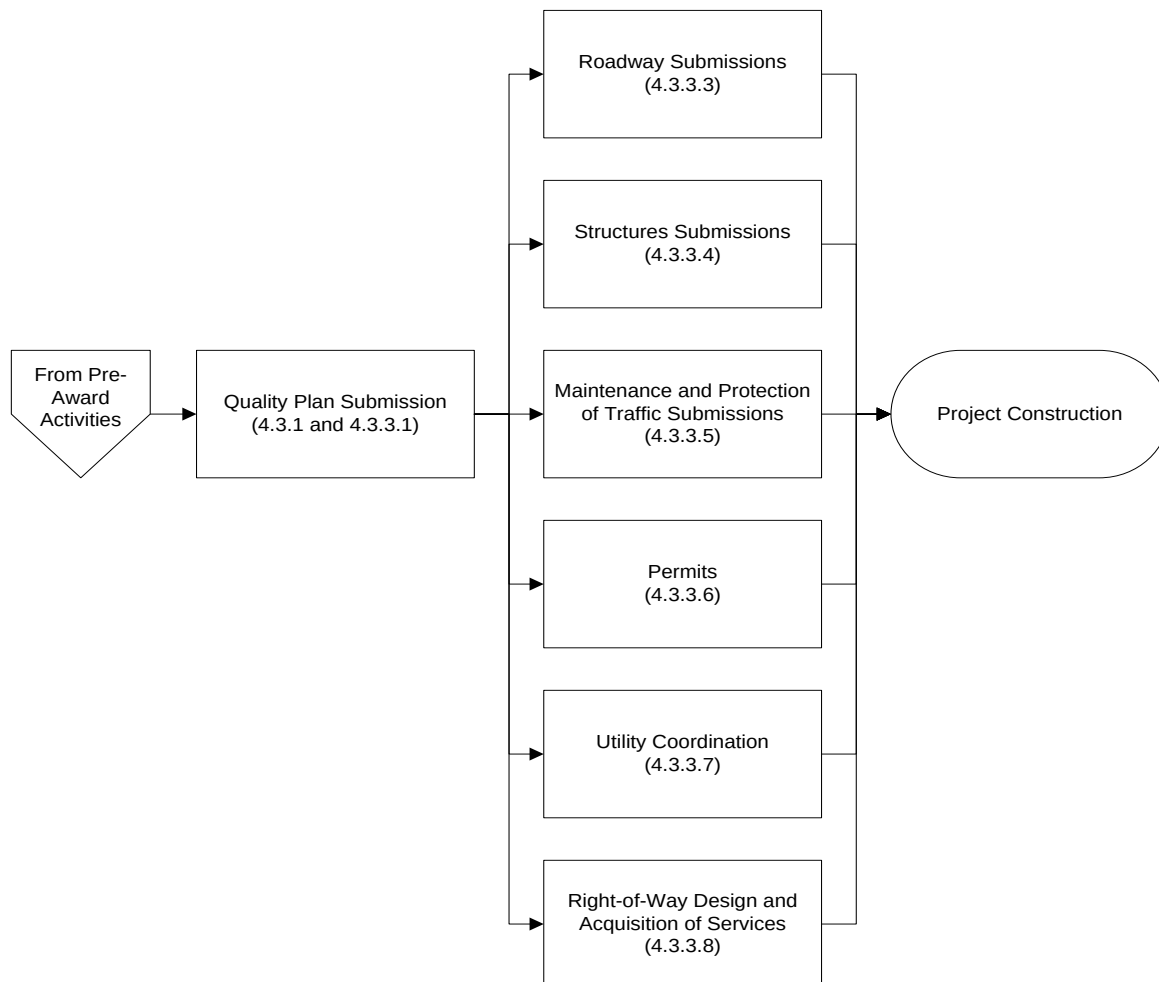


Figure 4.3.4-1 – Overview of Post-Award/Final Design Activities

4.3.4.1 Quality Plan (either QA by Department Review or QA by Peer Review)

With the Design Firm Identification and Qualifications approved, and the Quality Coordination Meeting held (as discussed in [Section 4.3.1](#)), the Lead Design Engineer is required by the Special Provisions to submit the final Quality Plan for review within a specified number of days after the Coordination Meeting. Refer to the Part III (d) of the QUALITY PLAN special provision. The Quality Plan is typically reviewed and approved by the ADE - Design or the Director, Bureau of Project Delivery. Refer to the Submittal Review Responsibility checklist. Upon acceptance, the entire Quality Plan becomes part of the contract documents. Once work begins under the approved

Quality Plan, continuously evaluate the work in accordance with the Quality Plan. Do not implement any changes without prior acceptance by the Department.

4.3.4.2 Submittal Details

4.3.4.2.1 Coordination of Review Comments and Issuance of Reviewed Plans

Coordinate comments from reviewers for the Quality Assurance reviews when performed by the Department, or for the Owner's perspective reviews when Quality Assurance is by Peer Review. Where reviews are performed by outside agencies, facilitate with those agencies to the extent that the Department's best interests are served by the contractor's submissions receiving a timely review and resolution of issues.

Once submissions have been uploaded to the ftp site and the reviewers notified, or in the case of paper submissions the copies have been distributed, facilitate and coordinate comments from all reviewing parties, including outside agencies. Comments should be exchanged preferably via email or fax. To facilitate timely responses, encourage reviewers to discuss the comments via meeting or teleconference, and prepare a single set of comments comprised of comments agreed upon by the reviewers. If the District has tasked one of its design consultants with the review, the responsibility of gathering and preparing review comments can be delegated to the consultant. The design consultant should provide comments to or initiate discussions with the Department's reviewers as soon as possible, so that the Department's reviewers have sufficient time to conduct reviews. Even when using consultant reviewers, the District remains responsible to ensure that comments are consolidated (to eliminate redundant comments), are specific and "value added" in nature, and are submitted within the timelines established in the contract. If permitted in the Special Provisions and included in the Quality Plan, partial submissions within each design item may be submitted and reviewed separately. For each submission, determine from the review comments and a consensus from the reviewers whether the submission should be returned for corrections, or accepted as noted. For expediency, it is recommended that where comments are not major in nature, that the accepted-as-noted approach be utilized. When the submission is being returned for corrections, transmit the review comments to the contractor by email or letter.

As required by the Quality Plan special provisions Section III (e) Quality Assurance Review, prepare a letter to the contractor when the review is complete identifying the conditions of the release for construction, including all as-noted comments, the list of plan sheets released, and what portions of work if any at that time, can proceed based on the submission. Make sure that the released plan sheets have been stamped with the statement "Quality Assurance Review was conducted. Released for Construction." When the Department's consultant is performing the review, have the consultant stamp the reviewed sheets when the review is complete. When the Department is performing the review, stamp the reviewed sheets upon return from the Department reviewer. When Peer Review is specified, stamp the reviewed sheets following completion of the Owner's Perspective Review. Also check to see that all other prerequisites to starting construction in the particular location(s) covered by the stamped drawings have been addressed, such as Right-of-Way clearance, utility clearance, etc.

On some projects, multiple letters will have to be issued, since plan submissions such as roadway, structure, and traffic control, among others, may be made separately. If partial submissions are permitted, when those reviews are complete, letters will also have to be issued. Several submissions may be combined in a single letter, particularly if those submissions are related and permit related work to proceed at the same time. It is critical for partial submissions that the letter be explicit in defining the plan sheets released and the work permitted to proceed as a result of the review.

When all reviews have been completed, and when the first sheet of each final structure tracing has been sealed by the District Bridge Engineer (as detailed in [Section 3.3.4.4.6](#)), the Contractor submits the Title Sheet of the Final Roadway drawings (refer to [Section 3.3.4.3.8](#)) to the District for signature by the ADE – Design. To formally record the transmission of this sheet to the Contractor, prepare a final letter listing all previously issued "Released for Construction" letters and state that the Title Sheet combined with the drawings covered by the previously issued letters comprise the Final Construction drawings. Provide a draft of the letter to the ADE – Design for review before he/she signs the Title Sheet.

4.3.4.2.2 Project Cost Tracking

For all design-build projects, the letter "Z" should be the 7th character of the SPN, also known as the sub project field (P-xxxxxxZxxxxxxxxxx) for all phases of work. All Department personnel should charge time to this SPN when reviewing final design information for any design item. This may also include time for design review related meetings such as design coordination and resolution of outstanding comments. Also, use this SPN for all design items in design-build contracts.

Apply the following codes when reviewing final design information for any Design Item as well as Quality Assurance Items.

- **Final Design Review** – consultants under agreement with the District performing Final Design Review should use Work Breakdown Structure (WBS) 2.11.4 Scope of Work (SOW), IO 82804.
- **Peer Review** – when included in the Contract, the cost is incidental to the Design and Construct Items. Any coordination work should be charged to IO 82804.
- **Owner's Perspective Review** – Department personnel payrolls should charge time to IO 82804 along with an SPN defined as above (with the "Z" code). If a consultant is used to perform Owner's Perspective Review, use WBS 2.11.5 SOW, IO 82804.

4.3.4.2.3 Reproduction

SPECIAL BIDDING – DESIGN-BUILD, Section VII, defines the reproduction responsibilities of the contractor.

4.3.4.2.4 Construction Value Engineering

Construction Value Engineering proposals may be submitted by the contractor for design-build projects. As stated in Section 5.2 of Publication 10C, Design Manual Part 1C, *Transportation Engineering Procedures*, "The purpose of construction Value Engineering (VE) is to eliminate or modify any contract provision that adds cost to a project but is not required for the proper function of the finished product." As in traditional projects, a Value Engineering proposal can be submitted by a contractor to modify design-build contract provisions that meet the requirements of Publication 408, *Specifications*, Section 104.

4.3.4.2.5 Working and Shop Drawings

There are two options for shop drawing review: review by the Department (or its consultant) or by the contractor's Lead Design Engineer. If no special provision regarding shop drawings is included in the contract, then the District is responsible for review of shop drawings, as well as all working drawings submitted by the contractor, per Publication 408, Section 105.02(c) and 105.02(d). If the contract includes the special provision N-a10502-A Bridge Shop Drawings, then the Lead Design Engineer is responsible for review of all shop drawings.

4.3.4.2.6 Construction and As-Built Plans

In accordance with Publication 10C, Design Manual Part 1C, *Transportation Engineering Procedures*, Section 5.7. Note that the design item special provisions require the contractor to compile, complete, and return the as-built drawings to the Department within three months of Final Acceptance.

4.3.4.2.7 Construction Problems

Bring design-related roadway construction problems to the attention of the Assistant District Executive for Design. The Assistant District Executive for Design will approve modifications or corrections according to the approval authority of the original design (as approved and released for construction) For all Federal oversight projects and major, unusual, and complex projects, contact Central office with detailed information for approval. Central Office will secure FHWA approval prior to approving the modifications.

If a design error occurs, the Contractor is fully responsible for the costs associated with providing additional design analysis and construction modifications, acceptable to the Department, to correct the problem.

The Department may require reimbursement for design errors to cover engineering review costs for significant design changes made after approval and construction release. This amount shall be deducted from the lump sum cost for the construction of the item(s) via work order.

4.3.4.2.8 Revisions During Construction

The contractor is responsible for making changes to the contract drawings, making and distributing necessary copies of revised plans to all affected parties, and providing electronic files to the Department if required.

4.3.4.3 Roadway Submissions

Unless a project is a partial design-build, nearly all design-build contracts will include Roadway Design. The final roadway design, prepared by the Lead Design Engineer, will include pre-final roadway plans; pavement design for some projects, erosion and sediment pollution control plan; NPDES permit application for some projects; final roadway plans; and as-built plans.

The chronology of the final design roadway-related submissions is:

1. Geotechnical
2. Pavement design (if specified)
3. Survey information for Final Design in accordance with Publication 122M, *Surveying and Mapping Manual*, (part of Pre-Final Roadway Plan submission requirements, as applicable)
4. Erosion and Sediment Pollution Control Plan
5. NPDES Permit Application (as applicable)
6. Pre-Final Roadway Plans
7. Final Roadway Drawings
8. Signing and Pavement Marking plans
9. Publication 408, Section 686 Construction Surveying deliverables
10. As-Built Plans

4.3.4.3.1 Geotechnical

If required, the contractor will submit a geotechnical investigation program to the District Geotechnical Engineer for approval. The Design Roadway special provision will list the specific requirements, as well as other submittals to the District Geotechnical Engineer that may be required. The results will be utilized in the development of the Pre-Final plans. For projects involving primarily bridge replacements and rehabilitations with limited roadway work, the roadway geotechnical investigation results and recommendations may be covered with the foundation submission.

4.3.4.3.2 Pavement Design

If no pavement design is included in the Conceptual Plans, the Design Roadway special provision will require the contractor to develop the pavement design. This will be included with Pre-Final plan submission. If the contractor proposes an alternate pavement design, coordinate all aspects of the review with the District Pavement Management Engineer.

4.3.4.3.3 Survey

If applicable, surveying/mapping deliverables in accordance with Publication 122M, *Surveying and Mapping Manual*, should be submitted to the Manager, Photogrammetry and Surveys Section.

4.3.4.3.4 Erosion and Sediment Pollution Control Plan

The contractor must prepare an Erosion and Sediment Pollution Control Plan and submit directly to the specified County Conservation District or DEP for approval. The approved plans are to be submitted to the Department with the Pre-Final plan submission.

4.3.4.3.5 NPDES Permit Application

Unless obtained by the Department prior to design-build contract advertisement, the contractor will be required in the special provision to prepare an NPDES Permit Application based on the approved Erosion and Sediment Pollution Control Plan developed during final design. The NPDES Permit Application is required to be submitted to the District for review. After review, the District returns the application to the contractor, who in turn submits the application directly to the County Conservation District for review and approval.

4.3.4.3.6 Pre-Final Roadway Plans

The Pre-Final Roadway plans are plans developed to the 60% to 70% stage, with horizontal and vertical alignment established, typical sections determined, limits of construction shown, etc.

4.3.4.3.7 Signing and Pavement Markings

The Signing and Pavement Markings plan should be submitted prior to the Final Roadway Drawing submissions, to the District Traffic Engineer for review.

4.3.4.3.8 Final Roadway Drawings

The Final Roadway Drawings include all final construction drawings (including structures) for the project, and upon completion of review must be stamped "Released for Construction." Refer to [Section 4.3.4.2.1](#). The Title Sheet does not have to be sent to Central Office for Signature. Upon completion of all QA (or Owners Perspective, as required) reviews, the contractor will provide the ADE – Design a paper copy, drafting film, or vellum (as required in the Special Provisions) of the title sheet for signature. The ADE – Design or his/her designee (must be a Professional Engineer) will sign the title sheet. The District will then produce an electronic copy (pdf) of the title sheet and upload it to the ftp site for distribution. Prepare a letter as detailed in [Section 3.3.4.2.1](#) as a formal record of the transmission. Computations, including all applicable Q/A forms should also be uploaded to the ftp site for storage by the District.

4.3.4.3.9 Publication 408, Section 686 Construction Survey

Submissions to the Representative defined in Publication 408, Section 686 should be reviewed in the same manner as a conventional design-bid-build project.

4.3.4.3.10 As-Built Plans

As-built plans are to be submitted in accordance with Publication 10C, Design Manual Part 1C, *Transportation Engineering Procedures*, Section 5.7 within three months of final inspection acceptance.

4.3.4.4 Structure Submissions

The final structure design, prepared by the Lead Design Engineer, will include for some structures hydrologic and hydraulics report amendments and/or subsurface exploration and foundation design; final type, size and location, final structure plans; and as-built plans for all structures. Amendments to the waterway permits and alternate foundation design, as applicable, will also be included in final design. Refer to the structure design item special provisions for details. Refer to the Submittal Review Responsibility checklist for submittal distribution details.

The chronology of the final design structure-related submissions is as follows:

1. Hydrologic and Hydraulics Report Amendment (as applicable)
2. Final Type, Size and Location (Final TS&L)
3. Subsurface Exploration and Foundation Design (as applicable)
4. Final Structure Plans
5. As-Built Plans

4.3.4.4.1 Hydrologic and Hydraulics Report Amendment

In instances where the contractor proposes a span arrangement and/or substructure configuration different from that utilized to prepare the hydraulic studies during the conceptual design phase and specified in the waterway permit, the contractor must revise the Hydrologic and Hydraulic Report and other applicable documents. The revised report must be reviewed and approved by the Department and outside agencies. Amendments are reviewed and forwarded to the other agencies by the District Regulatory Permit Coordinator. In addition, major amendments require review by BDTD.

4.3.4.4.2 Final Type, Size, and Location (TS&L)

The contractor may submit a Final TS&L based on the Conceptual TS&L plan presented in the bid documents, or another structure subject to the limitations specified in the structure design item special provision.

Depending on structure type, size, estimated cost, and funding, the Final TS&L may be reviewed by the District Bridge Engineer, BDTD, and/or FHWA. Refer to the Submittal Review Responsibility checklist for individual project requirements.

4.3.4.4.3 Subsurface Exploration and Foundation Design

Depending on the structure design item special provisions in the contract, the foundation design performed by the Lead Design Engineer will fall into one of four categories. Figure 4.3.4.4.3-1 illustrates the foundation design processes of the four foundation scenarios. Foundation approval, depending on type and funding, will be the responsibility of FHWA, BDTD, or the District Bridge Engineer. Refer to the Submittal Review Responsibility checklist for individual project requirements.

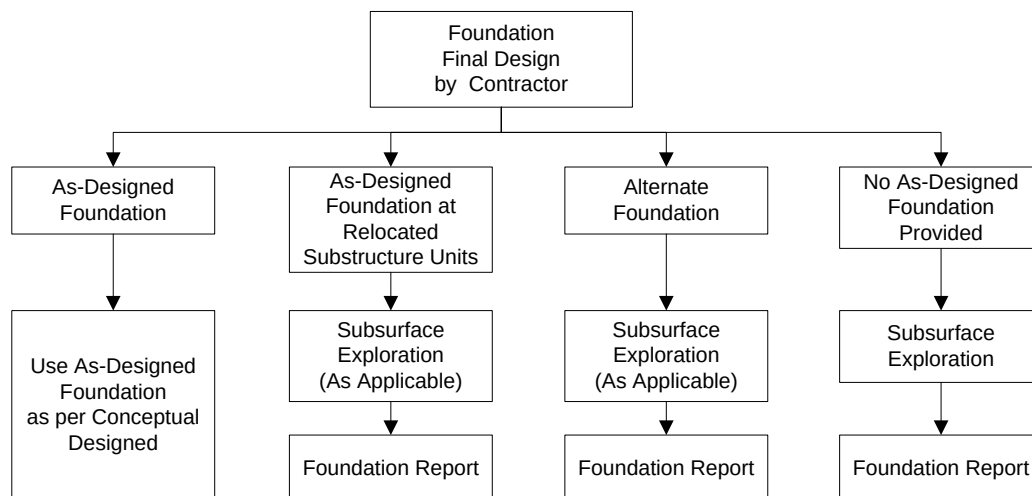


Figure 4.3.4.4.3-1

4.3.4.4.3.1 As-Designed Foundation

Where a foundation design is included in the bid documents and the contractor utilizes the as-designed foundation with substructure units located at positions shown on the Conceptual TS&L plan, then no foundation submission is required during final design. In this instance only, the contractor can include the Core Boring Logs that were provided in the Conceptual Drawings as part of the Final Design Drawings.

4.3.4.4.3.2 Relocated Substructure Units Using As-Designed Foundations

If a foundation is included in the bid documents, but the contractor proposes to change the locations of substructure units (from that indicated on the Conceptual TS&L), then a revised foundation design and construction drawings must be submitted at no additional cost. The use of relocated substructure units using as-designed foundations will be subject to any limitations specified in the design item special provision. The Core Boring Logs provided in the Conceptual Drawings cannot be included in the Final Drawings for relocated substructure units, but may be included as an Appendix to the submitted foundation report designated "Information Provided by Others."

4.3.4.4.3.3 Alternate Foundations

When permissible, and subject to the limitations in the design item special provision, the contractor may elect to prepare and submit an alternate to the as-designed foundation provided in the bid documents. A foundation report, foundation design, and construction drawings must be submitted at no additional cost. The Core Boring Logs provided in the Conceptual Drawings cannot be included in the Final Drawings, but may be included as an Appendix to the submitted foundation report designated "Information Provided by Others."

4.3.4.4.3.4 No As-Designed Foundation Provided

Where no foundation design is included in the bid documents, and the design item special provision title includes "No As-Designed Foundation Provided", the contractor must perform subsurface exploration, prepare a foundation report, prepare a foundation design and construction drawings as required by the special provision.

4.3.4.4.4 Final Structure Plans

The contractor will submit a complete set of S-drawings for each structure design item. Review responsibility will be the same as the Final TS&L. The Lead Design Engineer must sign and seal each sheet per Publication 15M, Design Manual Part 4, *Structures*, 1.6.3.1. The final reviewing party shall sign and seal the first sheet per Publication 15M, Design Manual Part 4, *Structures*, PP.1.3.4 for reviews performed by consultants on behalf of the Department or the peer reviewer. In addition, have the first sheet signed and dated by the District Bridge Engineer or Chief Bridge Engineer plus the remaining structure sheets date stamped. Structure construction cannot begin until the District Project Manager transmits a letter to the Contractor issuing the signed structure drawings as detailed in [Section 3.3.4.2](#). The District will produce an electronic copy (pdf) of the sheets and upload to the ftp site for distribution.

If paper submissions are required, the contractor should submit the number of sets listed in Section VII SPECIAL BIDDING - DESIGN-BUILD for Final Structure Plans for signature. Distribute plan sets as indicated on the Submittal Review Responsibility checklist.

4.3.4.4.5 Partial Final Structure Plans

Partial final structure plans and computations may be submitted for QA review to expedite the project. Partial submission requirements and limitations, if any, will be listed in the design item special provision. The contractor must identify any partial submissions and address partial submission procedures in the Quality Plan. All applicable Publication 15M, Design Manual Part 4, *Structures*, Quality Assurance forms, D-506 through D-518, must be also be completed and submitted with each partial submission.

As with final structure drawings, the Lead Design Engineer must sign and seal each sheet per Publication 15M, Design Manual Part 4, *Structures*, 1.6.3.1. The final reviewing party shall sign and seal the first sheet per DM4 PP.1.3.4 for reviews performed by consultants on behalf of the Department or the peer reviewer. In addition, have the first sheet signed and dated by the District Bridge Engineer or Chief Bridge Engineer plus the remaining structure sheets date stamped. Structure construction cannot begin until the District Project Manager transmits a letter to the Contractor issuing the signed structure drawings as detailed in [Section 3.3.4.2](#). The District will produce an electronic copy (pdf) of the sheets and upload to the ftp site for distribution.

If paper submissions are required, the contractor should submit the same number of sets as is listed in Section VII SPECIAL BIDDING - DESIGN-BUILD for Final Structure Plans for signature. Distribute plan sets as indicated on the Submittal Review Responsibility checklist.

The partial final plans distribution process described above may be modified at the preconstruction meeting to meet the needs of individual projects.

4.3.4.4.6 Final Tracings and Computations

Upon completion of design, the contractor will provide the District Bridge Engineer a paper copy, drafting film, or vellum (as required in the Special Provisions) of the first sheet of each structure drawing for signature. The District will produce an electronic copy (pdf) of the first sheet and upload it to the ftp site for distribution. Computations, including all applicable Q/A forms should also be uploaded to the ftp site for storage by the District.

4.3.4.5 Maintenance and Protection of Traffic Submissions

The DESIGN TRAFFIC CONTROL PLAN special provision will require the contractor to develop a Traffic Control Plan (TCP), an Incident Management Plan for some projects, and a Transportation Management Plan for some projects. Generally, the District Traffic Engineer has the submittal review responsibility.

4.3.4.5.1 Incident Management Plan

Should be submitted prior to or concurrent with the Preliminary Plan submission.

4.3.4.5.2 Transportation Management Plan

In a similar manner to the Incident Management Plan, this should be submitted prior to or concurrent with the Preliminary Plan submission if required.

4.3.4.5.3 Preliminary TCP Submission

The Conceptual Plans may or may not contain a conceptual TCP. If there is no conceptual TCP, the minimum criteria will be specified, such as minimum lane widths, lane closure restrictions, etc. The Preliminary Plan submission should include the plans for all stages, phases, and/or sequences of construction to complete the work.

4.3.4.5.4 Partial Submissions, Final Plans and Computations

If permitted in the Special Provisions, the contractor can submit partial plans for distinct individual phases of the TCP for review and approval prior to the Final Plan submission in order to expedite the work. The special provisions should state the partial plan submission procedure and state when the contractor can proceed with the Maintenance and Protection of Traffic work covered by a partial submission.

4.3.4.6 Permit Submissions

All permits to be acquired by the contractor will be listed, along with the corresponding review agency contact information in the PERMITS special provision.

4.3.4.7 Utility Coordination Submissions

All submissions from the contractor relating to the UTILITY RELOCATION INFORMATION FOR DESIGN-BUILD special provision must be reviewed and approved by the District Utility Administrator.

4.3.4.8 Right-of-Way Design and Acquisition Service Submissions

Right-of-way plan submissions should be submitted to the ADE – Design for review and approval.

Note that the contractor must utilize the services of a pre-qualified right-of-way acquisition firm as listed on ECMS. All other submissions, relating to appraisal and acquisition should be submitted to the District Right-of-Way Administrator. All work performed by the contractor must be consistent with Publication 378, *Right-of-Way Manual*.

Once the Right-of-Way plan is approved, the contractor's right-of-way acquisition firm proceeds with the appraisal planning tasks that they have been assigned which may include all or some of the following: preparing the RW-971 Right-of-Way Project – Funding Estimate, RW-275 series Appraisal Problem Analysis unless the Appraisal Problem Analysis was provided by the District Right-of-Way Administrator, which establishes the parameters of the appraisal assignment to be performed, the administrative tasks to contract for appraisals as per Appraisal Contract ITQ 357I01, manage and track when the appraisals are received, when they go to appraisal review, when the appraisal is approved or critiqued, and when corrections are received and back to appraisal review. The document management procedures will be established by the District Right-of-Way Unit.

Appraisal approval starts the negotiation phase, with the establishment of an offer of just compensation. If an amicable settlement is reached, then the claim will be processed for settlement. If an amicable settlement requires payment of funds exceeding the original offer, approval must be requested for an administrative settlement. Claims that cannot be amicably settled will require condemnation. Condemnation is handled within the Department. Payments made to acquire parcels are made directly from the Department to the parcel owner.

When all parcels have been acquired, the Chief, Utilities and Right-of-Way Section will issue the Clearance Certificate. For grouped projects, individual Clearances will be issued for each project included in the grouping. Construction can proceed for each project in the grouping as Clearance is issued (and other required approvals have been obtained).

4.3.5 SCHEDULES OF VALUES SUBMISSIONS

SPECIAL BIDDING – DESIGN-BUILD, Section IX, requires the contractor to submit a schedule of values for lump sum design and construct items where indicated in the individual item Measurement and Payment section. The current functioning of the CDS NextGen system necessitates that all schedules of values, where required, must be approved before the first contract estimate can be processed.

4.3.5.1 Design Items

In design items where a schedule of values is required, the Measurement and Payment section lists the components to be included in the schedule. The contractor is to identify the increments of the lump sum in which it desires to be paid for the listed components. The contractor is not required to submit in the exact format as the template included with SPECIAL BIDDING – DESIGN-BUILD, but must contain the correct item number, all of the components identified in the associated special provision, reasonably distributed percentages, and percentages that total 100%.

Review each schedule of values for completeness and conformance with the special provisions. Review the percentages assigned to the various components for reasonableness. Schedules of values that are obvious attempts to front-load payments should not be approved unless the contractor provides sufficient justification showing the relationship to the actual value of design work performed. Note that Design items components that contain the word "Approval" in the title designated in the Special Provisions, such as "Final TS&L Approval," can receive 75% of the component percentage when that submission is logged in by the Department, and the remaining 25% when the submission is approved. Otherwise, components such as "As-Built Drawings" are only eligible for payment when the indicated task is complete.

4.3.5.2 Construct Items

In construction items where a schedule of values is required, unlike the design items, no payment components are specified. Rather, the contractor must identify components that are relevant to the particular scope of the project. The components listed in the template attached to SPECIAL BIDDING – DESIGN-BUILD, such as those in Construct Roadway: Excavation, Drainage, Subgrade/Subbase, Concrete Roadway, Asphalt Roadway, Guiderail & Concrete Barrier, Signing & Pavement Marking, and Miscellaneous, are very generalized because it is difficult to

encompass the components of "typical" project and the contractor's approach to the work. More importantly, since no partial payment is permitted on individual components within Construct items, the burden is on the contractor to develop a list of components to fit the scope of work and fit the intended progress so that it can be paid for progress on biweekly estimates. One method of developing the Schedule of Values, particularly for Construct Roadway, is to utilize activities in the construction schedule as components. With this method, updating the CPM schedule will provide the backup for the estimate – activities with a status of 100% will be eligible for payment on the next estimate.

Review each schedule of values for completeness in covering all aspects of work under the particular item. If there are portions of the work that not specifically identified by a component, obtain clarification from the contractor. Similar to the design items, review the percentages assigned to the various components for reasonableness. Schedules of values that are obvious attempts to front-load payments should not be approved unless the contractor provides sufficient justification showing the relationship to the actual value of work performed. Since SPECIAL BIDDING – DESIGN-BUILD specifies that all design item schedules of values be approved prior to the processing of the first estimate, encourage the contractor to submit the schedules as soon as possible after NTP so that there is no delay in processing estimates.

4.3.6 MEASUREMENT AND PAYMENT FOR CONSTRUCT ITEMS

It is not necessary to calculate actual quantities in the same manner as a design-bid-build project. If the contractor has sufficiently broken down the work into components that are likely to be able to be completed in less than 2 – 3 estimate periods, it should be easy to determine the completion of the work within each component, which will trigger payment on that component. As noted above, if the contractor utilizes CPM activities as components in a Schedule of Values, updating the schedule will provide the information for the estimate. Bear in mind that ultimately the contractor will receive 100% payment for each of the construct items, if completed in accordance with the specifications and approved plans.

4.3.7 POST-CONSTRUCTION QUALITY SURVEY

To build a database on design-build projects and Lead Design Engineers' performance, complete a post-construction Quality Survey for Design Items. Request the design-build contractor also complete the form for the conceptual design. Quality Survey for Design Items can be found in the Closeout Section of the Project Information Screen in EMCS. Provide the Lead Design Engineer on the project the opportunity to review and comment on the completed survey.

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CHAPTER 5 – TIME-BASED METHODS

5.0 INTRODUCTION

The three available time-based methods, introduced in Chapter 1, are Incentive/Disincentive for Early Completion, A+Bx Bidding, and Lane Rental. Each is described in detail in this Chapter.

5.1 INCENTIVE/DISINCENTIVE FOR EARLY COMPLETION

5.1.1 DEFINITION

Incentive/Disincentive (I/D) special provisions provide a contract mechanism to reward a contractor for accelerating a project to early completion or penalize a contractor for late completion. I/Ds are typically assessed on a daily basis and are used to achieve specific milestones within a project or to encourage early completion of the total contract.

The Disincentive portion of the special provision should not be confused with Publication 408, Section 108.07(a), Construction Engineering Liquidated Damages. Liquidated damages are a stipulated amount to recover the additional costs expended by the Department as a result of a contractor's failure to complete a project within the contract time.

For FHWA guidance on the use of incentives/disincentives, see FHWA Technical Advisory T-5080.10, Incentive/Disincentive for Early Completion:

<http://www.fhwa.dot.gov/construction/contracts/t508010.cfm>

5.1.2 BENEFITS/RISKS

I/Ds may be included in contracts when the particular circumstances of a project demand the earliest possible completion date for a project or phase of a project. The major benefit is that by giving the contractor a financial incentive significantly increases the likelihood that the project or milestones are completed on or ahead of schedule, minimizing the impact to traffic, businesses, and the environment.

Several risks are present. Since the Department is responsible for determining the contract time, a contract duration that is too long permits a contractor from earning incentives without expending additional costs for acceleration. Too short a duration may result in the contractor including in its bid the costs of the disincentives, which not only artificially increases the bid price but more importantly defeats the reasons for using I/D with the end result of a late completion.

Establishing an I/D amount that is too low, or less than the contractor's costs to accelerate, eliminates the contractor's motivation to complete early. Establishing an I/D amount that is too high, or greater than the projected Road User Costs, will result in additional costs to the project that exceed the rate of return in terms of reducing construction delays. It is also necessary to cap the I/Ds to limit the Department's exposure in budgetary terms.

5.1.3 TYPICAL PROJECT TYPES

Limit the use of I/D provisions to projects where some or all of the following conditions are present:

Public Inconvenience

- High traffic volumes, typically in urban areas
- Traffic restrictions, lane closures, or detour will result in high Road User Costs (RUC)
- Major reconstruction or rehabilitation on existing facility that will significantly disrupt traffic
- Lengthy detours with high traffic volumes

Constructability

- Contractors' innovation is necessary to facilitate early completion

- I/D phase(s) can be completed in single construction season
- Traffic control phasing can be structured to maximize a contractor's ability to reduce the duration of construction
- Project is relatively free of utility conflicts, design uncertainties, or right-of-way issues that would impact the letting date or project schedule

Public Safety

- Safety concerns during construction, including impacts to public, pedestrian, and worker safety
- Disruption of emergency services
- Emergency response to an unexpected loss of highway facility

Public Priority

- Project completion by a specific date is in the public's interest
- Adjacent neighborhoods or businesses would suffer a significant impact
- Project will complete a gap in the highway system
- Major bridges will be out of service
- Completion time constraint
- Interference with major public events
- Highly sensitive project due to businesses impacted or political issues

5.1.4 DESIGN CONSIDERATIONS

Identify a project as potential for use of I/D provisions in the beginning of the design process.

Once it has been determined to include I/D provisions, certain decisions must be made during the final design phase. Four of these issues are: if the I/D will apply to the entire project or specific items of work, determining the appropriate completion date, setting the cap on the I/Ds, and determining the daily amount of I/D payments/credits. These issues are discussed in more detail below.

1. Determine whether the I/D provision apply to the entire project or specific items of work. Apply to all portions of the project that will severely impact traffic. Involve the District Construction Unit and the Constructability team in the discussions of these topics. The special provisions must explicitly identify the project elements that fall under the I/D provisions, what milestone(s) triggers the IDs.

2. Determine the I/D milestone or completion date and the duration of the I/D provision. The goal is to establish the I/D milestone in such a manner that the milestone is achievable utilizing more than ordinary means and methods, yet allowing for more extraordinary methods that will result in an earlier completion for which the contractor will receive compensation in the form of the incentive payment. The duration of the I/D provision refers to the maximum number of calendar days for which the Department will pay the per/day bonus and the maximum number of calendar days the Department will impose the per/day penalty identified in the special provision.

Develop a pre-bid project schedule to determine the project completion date. Utilize compressed time frames, considering realistically extended shifts, increased workforce, additional labor, and any other resources that will assist in compressing the schedule.

Use available history of similar projects, seeking input from Department personnel, and outside expertise to produce a feasible, compressed schedule. Consider the season for weather, holidays, and events.

Use caution on including the incentive/disincentive clause on projects using new construction methods. If it is necessary to use on a project with new methods, seek industry input to create a realistic schedule.

Consider the use of hourly I/Ds rather than calendar days on very short duration projects where the traffic impacts are severe.

3. Determining the I/D daily amount. The I/D rate is independent from the total contract cost. The I/D rate is calculated per the unit of time in which it will be measured.

Use Road User Costs to calculate incentive/disincentive rate. This will reflect the actual benefit for the incentive to the traveling public or inconvenience for an overrun schedule. For more information on calculating Road User Costs see Publication 10C, Design Manual Part 1C, *Transportation Engineering Procedures*, Section 5.6.D and the RULD Calculator in the ECMS file cabinet

Determine the incentive/disincentive amount on a project-by-project basis.

5.1.5 LETTING AND AWARD OF CONTRACT

A contract using Incentive/Disincentive for Early Completion provisions clauses is let and awarded in the same manner as any other contract. The I/D is not calculated as part of the bid.

5.1.6 CONSTRUCTION CONSIDERATIONS

I/D contracts have the same priorities as in any other construction contract, except that the focus on the schedule is intensified. Any delay for which the Department is responsible has the potential to impact the critical path therefore result in adjusting the I/D milestone. This not only could result in additional costs to the Department but also increases the length of traffic impacts without realizing the monetary benefit of the disincentive penalties from the contractor. Consider mitigating critical path delays by other means, either through re-sequencing, or in some instances negotiating with the contractor to accelerate critical path work beyond the rate indicated in the contractor's schedule.

As always, maintain open lines of communication during construction. Consider the following:

- Hold formal Partnering sessions with the contractor.
- Hold regularly scheduled progress meetings to facilitate the resolution of issues, update the schedule, and review the contractor's look-ahead work plans.
- Maintain communications with designers, utility facility owners, and other project stakeholder to resolve issues as quickly as possible, including during periods of extended work hours such as nights and weekends.

5.2 A+BX BIDDING

5.2.1 OVERVIEW

The cost plus time formula, A+Bx, consists of the traditional bid of the unit prices multiplied by the contract quantities, A, and the time component that reflects the total time in calendar days required to complete the project, B, as estimated by the bidder, multiplied by daily liquidated damages "x". There are two types of A+Bx bidding. For the first type, "B" is the total time required to complete an interim milestone, and "x" is Road User Liquidated Damages (RULD). For the second type, "B" is the total time necessary to complete the entire project, and "x" is Construction Engineering Liquidated Damages (CELD). The contract should specify that the time component has a minimum number of calendar days in order to avoid the bidder submitting a bid with zero days. Bidders that submit bids with calendar days less than the minimum or greater than any maximum time specified will be considered non-responsive and rejected.

The RULD rate is the calculated estimated daily cost of inconvenience to traffic resulting from the construction traffic restrictions. Inconvenience is defined in terms of lost time. RULD, expressed in the unit "dollars/day," can be determined through a RULD study conducted during the design phase. In this study, the delay time (vehicle-hours/day) anticipated from the effects of construction is estimated based on the project's road classification, traffic volume data, and the traffic control plans. It is then converted into a monetary value by applying a "value to time" ("dollars/vehicle-hour" or "dollars/person-hour"). Details to be considered when determining RULD are included in Publication 10C, Design Manual Part 1C, *Transportation Engineering Procedures*, Section 5.6.D.

The CELD rate is determined by using the table in Publication 408, Section 108.07(a). CELD are based on the original contract amount for the project.

A+Bx bidding is used on projects when the "C" factor is included. Details to be considered for determination of the "C" factor are included in Publication 242, *Pavement Policy Manual*.

During the design phase, place significant emphasis on constructability reviews to analyze the proposed scope of the project and potential phasing. The project's feasibility is evaluated to determine if the use of A+Bx bidding will satisfy project goals cost effectively and within desired time constraints. This review should also determine if alternative approaches could be utilized. If only one approach is determined to be feasible, the proposal should be designed accordingly, and the particular approach be mandated in the bid documents. The details of potential third party conflicts involving utilities, railroad agreements, environmental/archaeological issues, hazardous materials, public support issues, and other potential problems should also be addressed in the constructability review, and a plan developed to resolve these issues prior to bid.

5.2.2 BENEFITS/RISKS

The benefits and risks of the A+Bx method are similar in nature to those of I/D provisions, such that the primary benefit to be gained with A+Bx bidding is placing a value on the inconvenience to the traveling public by rewarding the contractor for executing the project on an accelerated schedule and continuously developing methods to decrease construction duration further.

The risks are also similar to I/D provisions in that the establishment of the RUCs must be accurate and of A+Bx bidding include a contractor potentially being awarded the job only to find they can't meet their own schedule.

5.2.3 TYPICAL PROJECT TYPES

A+Bx bidding is appropriate for projects on high volume roads where early completion of the entire project or a portion of the project will result in a significant benefit to the traffic. The benefit is measured in terms of RUC, traffic safety, and traffic maintenance.

A+Bx bidding is most effective on projects where there is a real need to shorten the duration of impacts to high traffic areas such as business or tourist areas. It might also be appropriate where the detour may impact an environmentally sensitive area or where the construction causes increased safety concerns, such as a heavily traveled highway. The following project types should consider A+Bx bidding as a possible contracting method:

- Projects that add capacity (may include grade separations);
- Projects where construction activities are expected to have an economic impact on local communities and businesses;
- Projects that are relatively free of utility conflicts, railroads, design uncertainties, or right-of-way issues which may impact the bid letting date or the critical project schedule;
- Rehabilitation projects in very high traffic volume areas; and
- Projects where a pavement alternate option is desired.

5.2.4 BEST PRACTICES DETERMINATION OF ROAD USERS LIQUIDATED DAMAGES VALUE

The determination and approval of the RULD calculation is the beginning "x" value for interim milestone A+Bx projects. After the RULD calculation is approved, then an additional evaluation must be completed. The District's early completion (or project milestone) date must be assessed and a determination of the dollar value for the early completion date must be made.

In order to estimate a "Bx" value that will produce bids with the desired result of an early completion for the interim milestone date, the following recommendation has been developed to provide guidance:

The value of x for interim milestone A+Bx bidding is determined by the Road Users Liquidated Damages (RULD) rate for the specified project. When evaluating if a project qualifies for interim milestone

A+Bx bidding, the RULD must be at least \$5,000.00. On occasion, the calculated RULD costs are excessively high in relation to the total value of the project (value of A). Therefore, the product of an estimated B value times x should not be higher than 40% of the value of A, where the B value utilized is total project time as determined in the pre-bid CPM schedule. In cases where the B times x product is higher than 40% of the project value, the RULD must be lowered to a level so that B times x product is less than 40% of the project value. Both of these conditions must be satisfied for A+Bx bidding to be utilized.

A high RULD will deter the bidder from reducing his calendar day bid because the penalty is too severe. If the need for early completion is sufficient to warrant a high penalty (high RULD), then consideration should be given to use another innovative bidding process such as disincentives.

5.2.5 DESIGN CONSIDERATIONS

1. Determine if the A+Bx provision will apply to the entire project or specific items of work, or if there will be multiple Bx components. Apply to items that will severely impact the traveling public. Special provisions must clearly identify areas of the project where the A+Bx provision will be applied in choosing the successful bidder. Each Bx should have a milestone identified.

2. Determining the schedule and completion date for the A+Bx provision. The schedule for the contract is determined using CPM to calculate a completion date. Use available history of similar projects, input from Department's personnel and outside expertise to assure a realistic schedule. Make sure to consider the season for weather, holidays, and events when determining a completion date.

3. Determining the Road User Cost for interim milestone A+Bx bidding. Roadway users incur User Delay Costs while roads are being maintained, repaired or reconstructed. User Delay Costs include the following:

- A. Delayed Vehicles. In order to calculate the number of delayed vehicles during an activity in a specific year, the following traffic information is required:
 - a. Initial ADT, Design Year, and Design Year ADT
 - b. Composition of the traffic mix by vehicle class (i.e. cars, single unit trucks, combination trucks)
 - c. Directional Factor
 - d. Totals Days of the Activity

From this information, the following items must then be calculated:

Traffic Growth Factor
ADT in each Activity Year ADT in each Direction
ADT Delayed in each Direction
Total Number of Vehicles Delayed During the Activity
Total Number of Vehicles Delay in each vehicle class

- B. Stopped Vehicles. If during construction, the number of lanes that are being maintained is reduced, then the capacity of the facility is affected. If the actual traffic exceeds capacity, then a backup will occur as traffic enters the construction zone. Vehicles will be stopped due to congestion at the restricted area, and Stopping Costs must be determined. To determine the number of vehicle stops, the ADT for the applicable year and the composition of the traffic must be determined, as described for determining Delayed Vehicles. In addition, the following items must be calculated:

- a. Hourly breakdown of traffic
- b. Roadway Capacity

The hourly breakdown (by percent of the total daily traffic) can be determined by a traffic study. If a study is not done, refer to the current Publication 601, *Pennsylvania Traffic Data*, Factoring Process: Traffic Adjustment Factors, Table 350.

Roadway Capacity is determined for one direction, and is dependent on the total number of lanes in that direction under normal operation, and the number of lanes maintained during construction.

- C. Added Time. Due to the reduced speeds, travel time is increased for all vehicles that pass through a construction zone. This added time must be determined in order to calculate User Delay Costs. The added

time may be dependent on the traffic control pattern to be implemented (i.e., high speed crossovers, detours, etc.)

For each traffic control pattern to be implemented during the life-cycle, the following information must be known:

1. Restricted Flow Length
2. Initial and Reduced Speeds

The following items must then be calculated:

1. Restricted Flow Time
2. Overall Increased Travel Time

The Restricted Flow Length is the length of roadway for which a speed reduction or lane closure is implemented. If traffic is detoured, the detour length is the Restricted Flow Length.

The Restricted Flow Time is the time required to travel through the Restricted Flow Length. If traffic is detoured, then the Restricted Flow Time equals the time necessary to travel through the Detour Length. Restricted Flow Time is used to determine Idling Costs.

The Overall Increased Travel Time is the difference between the Restricted Flow Time and the time required to travel the same distance at the normal posted speed. Overall Increased Travel Time is necessary to compute the Time Value Cost for Idling.

For each traffic control pattern that applies a different Restricted Flow Length, Initial Speed, or Reduced Speed, there is a different Restricted Flow Time and the Overall Increased Travel Time.

- D. Inflation Factor. The cost factors are inflated to present day costs by use of the Inflation Factor (I), which is based on the Engineering News-Record (ENR) Construction Cost Index. The current Construction Cost Index is found in the current edition of ENR under "Market Trends."

The Inflation Factor is determined as follows: I

$$= \frac{\text{Calendar Year Average Index}}{\text{Previous Calendar Year Average Index}}$$

4. Determining the Road Users Liquidated Damages for interim milestone A+Bx bidding

The "Bx" component represents the Road User Cost expressed in terms of the project time multiplied by the RULD. The RULD is a project specific value expressed as dollars/time unit (generally hours or days) that is customized for each project. The number is multiplied by the amount of time the contractor estimates in the bid proposal and is added to the cost estimate to determine the low bidder. The Road User Costs must be balanced against the total project cost. The use of a low RULD on a high cost project may cause problems. The contractor may use a low number of days to complete the project in order to be awarded the project, with the intent to pay the low RULD if they exceed the identified number of days to complete the project. For more information on calculating Road User Costs see Publication 10C, Design Manual Part 1C, *Transportation Engineering Procedures*, Section 5.6.D and the RULD Calculator in the ECMS file cabinet. RULD calculations derived from the RULD Calculator are to be reviewed and approved by the District Executive or designee. If another methodology is used for the calculation, request review and approval by the Chief of the Project Schedules, Specifications and Constructability Section.

5.2.6 AWARD OF CONTRACT

The project proposal must include information that the proposed contract will be awarded under A+Bx bidding, and

the A+Bx indicator marked in ECMS. Otherwise, ECMS will not recognize the A+Bx bidding process. For interim milestone A+Bx projects, the information used to calculate RULD should also be included on the Project Development Checklist. Maximum and minimum awarding schedules and provisions covering Liquidated Damage assessments should also be listed.

After the bids are submitted, the A+Bx equation is applied to each bid to determine the lowest bid amount. The contract is awarded to the bidder with the lowest combined bid amount as determined by the formula. The contract is executed with the successful bidder's completion date identified as the contract completion date, and for the bid amount less the Bx component (identification in ECMS as contract amount).

5.2.7 CONSTRUCTION CONSIDERATIONS

A+Bx contracts, similar to I/D contracts, have the same priorities as in any other construction contract, except that the focus on the schedule is intensified. Any delay for which the Department is responsible has the potential to impact the critical path therefore result in adjusting the contract completion date. This not only could result in additional costs to the Department but also increases the length of traffic impacts. Consider mitigating critical path delays by other means, either through re-sequencing, or in some instances negotiating with the contractor to accelerate critical path work beyond the rate indicated in the contractor's schedule.

As always, maintain open lines of communication during construction. Consider the following:

- Hold formal Partnering sessions with the contractor.
- Hold regularly scheduled progress meetings to facilitate the resolution of issues, update the schedule, and review the contractor's look-ahead work plans.
- Maintain communications with designers, utility facility owners, and other project stakeholder to resolve issues as quickly as possible, including during periods of extended work hours such as nights and weekends.

5.2.8 OTHER CONSIDERATIONS

For the most effective use of A+Bx bidding, there are several considerations that should be factored into the planning process:

1. Make sure the scope of work is thoroughly defined and potential delays to start of work are avoided.
2. Ensure that there is adequate inspection of the work and administration of the contract.
3. Make sure that all right-of-way and utility issues are resolved before letting.

In short, verify that all reasonably foreseeable potential work delays are accounted for prior to starting the bidding process.

5.3 LANE RENTAL

5.3.1 OVERVIEW

Similar to the cost-plus-time bidding concept, the goal of the lane rental concept is to encourage contractors to minimize road user impacts during construction. Under the lane rental concept, a provision for a rental fee assessment is included in the contract. The lane rental fee is based on Road User Costs. The fee is assessed for the time that the contractor occupies or obstructs part of the roadway and is deducted from the monthly progress payment.

The rental fee is dependent on the number and type of lanes closed or obstructed (i.e., shoulder and lane closure combinations). The rental fee is primarily assessed on a daily or hourly basis and may vary for different periods of the day (e.g., rush hour periods). Exactly how the closure time will be determined should be clearly defined in the specifications. The Department may choose to give contractors a specified number of "free" closure periods and not assess the rental fee until these have been used.

The bidding package does not normally indicate the Department's estimate for the length of time that the contractor's operations will impact traffic. Also, the contractor does not typically submit an estimate of impact time with the bid. The low bid is determined solely on the lowest amount bid for the contract items.

The intent of lane rental is to encourage contractors to schedule work to keep traffic restrictions to a minimum, both in terms of duration and number of lane closures.

5.3.2 BENEFITS/RISKS

The main benefit of Lane Rental is realized by providing the contractor with incentive to get in and out of the lane quickly in order to minimize the inconvenience to the traffic. A possible risk associated with lane rental is the failure to properly define key terms in the bid package, such as "lane closure" or "opening," as discussed under Other Considerations in this section.

5.3.3 TYPICAL PROJECT TYPES

Lane Rental provisions are appropriate for projects where temporary lane closures will have a significant impact on the traffic. If the project is in an area where the use of alternate routes or detours is impractical, making it impossible to reroute the traffic away from the construction site, a lane rental provision emphasizes the necessity of minimizing lane and shoulder closures to the contractor. Analysis of the Road User Costs in the project area would show that the benefit of reducing impact to the traffic is greater than the additional cost to minimize lane closures.

Projects appropriate for Lane Rental include projects where work can be restricted to one lane at a time. It is well suited for multiple lane roads with high traffic volumes or where alternate routes/detours are not available or are impractical. It also can be used in politically sensitive areas or projects with high profiles, or major roadways, bridges or interchanges with high ADT.

5.3.4 DESIGN CONSIDERATIONS

1. Determine project limits to which the Lane Rental provision will be applied. There may be multiple areas. Evaluate whether Lane Rental fees will be applied to full lane closures, partial lane closures, and or shoulder closures. Special provisions must clearly identify areas of the project to which the Lane Rental provision will be applied. Special provisions must clearly define closures, rental fee assessment, and what constitutes an open and closed lane or shoulder.
2. Determine the schedule and completion date for the Lane Rental provision. The schedule for the contract is produced using a CPM schedule to calculate a completion date. Use available history of similar projects, input from Department personnel, and outside expertise to assure a realistic schedule. Using calendar days limits the confusion and makes it clear what the motivation is for the incentive. Make sure to consider the season for weather, holidays, and events.
3. Determine the unit of time the Lane Rental fee will be charged. Evaluate the traffic patterns through the area. Use available history of similar projects, input from Department personnel, and outside expertise to determine a realistic time frame for the work in the areas where Lane Rental fees will be applied. For example, it may be reasonable to charge by the hour, half hour, day or half day depending on the type of work being performed.
4. Determine the Lane Rental Fee.
This is a project specific value that is customized for each project based on the Road User Liquidated Damages and calculated prior to the contract being advertised. For more information on calculating Road User Liquidated Damages see Publication 10C, Design Manual Part 1C, *Transportation Engineering Procedures*, Section 5.6.D, and the RULD Calculator, available in the ECMS file cabinet. Lane Rental will be a line item in the contract with the fee identified.
5. Additional details included as part of ECMS standard special provision, P-c20001 Lane Rental with (A+Bx) Bidding.

5.3.5 AWARD OF CONTRACT

The contract should be advertised clearly as including Lane Rental provisions. The contractor is charged the lane rental fee for each use of the lane. The contract is awarded in the standard way.

5.3.6 CONSTRUCTION CONSIDERATIONS

1. Formal partnering is strongly encouraged when Lane Rental provisions are used on a project.
2. As with all time-based contracts, close monitoring of the project is necessary for successful completion. In a Lane Rental contract, accurate records must be kept to document the amount of time the lane is closed to traffic. Monitor inspection, documentation, rental assessments and work performance continuously.
3. Confirm whether the presence of inspection staff is necessary during a single long shift up to 16 hours/day.
4. Use a CPM schedule for analysis.
5. Apply quick decision-making and in-depth knowledge of contract documents.

5.3.7 OTHER CONSIDERATIONS

The lane rental costs will be encumbered by the Department as part of the contract and this may be a negative aspect of the lane rental provision.

Lane Rental can be combined with other innovative bidding methods such as incentive/disincentive to achieve a timely finish to the project and maximize the contractor's profits while minimizing road user disturbance. Lane Rental bidding is recommended for use on projects that are free of third party conflicts (i.e., utility or right-of-way issues).

It is crucial that the lane rental fees are determined accurately for specific sequences during construction phases. The contractor must be able to benefit sufficiently to encourage interest, stimulate innovative ideas and increase profitability by meeting tight schedules.

Several other considerations include:

1. Ensure that definitions for "lane" and "closure" are spelled out in detail in the bid package. Is a shoulder considered a travel lane? Must the lane(s) be open 24/7? Are partial closures allowed? Are overnight closures allowed?
2. Ensure that there has been sufficient pre-contract investigation of the pavement, soil, drainage, bridges, etc., to avoid potential delays once construction starts.

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CHAPTER 6 – QUALITY-BASED METHODS

6.0 INTRODUCTION

A Warranty is "a guarantee of the integrity of a product and of the maker's responsibility for the replacement or repair of deficiencies." The emphasis on warranties in the highway construction industry places a guarantee on longer-term performance of highways for a specified period of time at no expense to the Department.

6.1 WARRANTIES

6.1.1 OVERVIEW

Warranties state that the contractor guarantees the integrity of a product and assumes the responsibility for the repair and replacement of any deficiencies. This stipulation, in theory, will produce better quality products, resulting in reduced maintenance costs. The warranty is generally provided in the form of a bond.

Highway construction warranties are generally for a specific product or work item. They generally provide for a two- to five-year warranty period and are only for items over which the contractor has full control. Long-term maintenance is not normally included.

When warranties are used on the National Highway System (NHS) they must comply with 23 Code of Federal Regulations (CFR) 635.413, which specifies that warranty requirements must be approved in advance of PS&E by the FHWA Division Administrator and that no warranty requirement may place an undue obligation on the contractor for items over which the contractor has no control. In advance of PS&E is generally interpreted to be FHWA approval during the Design Field View stage of Final Design. If warranties are used on design-build projects, refer to 23 CFR 635.413(e) for specific restrictions.

6.1.2 BENEFITS/RISKS

By including a warranty on a work item or project, the ultimate responsibility is shifted from the owner to the contractor. Warranties offer a solution to problems with work, which, when not properly performed, requires repairs within a few years.

Warranties lower the Department's risk by providing assurance that the contractor will correct early failures due to poor materials or workmanship that may have gone unnoticed during construction. This eliminates or reduces unnecessary costs of early maintenance due to poor performance. Warranties also induce a higher concern for quality by contractors, designers and suppliers, and encourage the development of better testing equipment and techniques and reduce inspection and contract administration responsibilities for the Department.

Used in combination with performance related specifications, warranties provide the contractor with the incentive to pursue more innovative technologies and methods for highway projects. Warranties, with improved contracting procedures for design and construction, are expected to lead to fewer contract disputes and reduced long-term litigation.

Warranties are only as good as the contractor and the surety company involved. It is still uncertain whether surety companies will provide the long term bonding guarantees required for warranties on large projects. Much higher risk is involved for sureties. Small or minority contractors may be discouraged from the bidding because of the difficulty in acquiring bonding or proof of financial responsibility that results from the high risk climate of long term warranties.

The use of warranties when adequate technology or processes to handle the contracts does not exist may lead to an increase in contract disputes. The effects of warranties on initial and total life cycle costs of facilities could negate

any maintenance savings. The duration of the warranty period necessary to discover deficiencies caused by poor material or construction can be difficult to determine. The use of warranties will increase the bid cost.

6.1.3 TYPICAL PROJECT TYPES

Warranties are most successful when applied to projects where risks can be accurately defined, such as projects on high volume limited access highways. Warranties are not successful on urban projects where third party impacts can affect performance. Existing project conditions must be well defined.

Warranty provisions are most appropriate where quality standards to be met are easily identifiable and quantifiable. Consider bituminous paving and bituminous rehabilitation projects, or high volume limited access or on certain aspects of bridge projects (decks, painting, expansion dams). Also consider work that has historically required repair within a shorter period of time than typical projects.

6.1.4 DESIGN CONSIDERATIONS

1. Seek input from industry regarding the life span of materials considered to be included in the warranty provisions. Focus on clearly defining the actual work to be included and the final work product to be warranted.
2. Determine the duration of the warranty period. Typical durations are between two and five years. The length will be specific to the work item; some work items will dictate longer durations, others shorter. Again, seek input from industry – both material manufacturers and installation contractors.

6.1.5 LETTING AND AWARD OF CONTRACT

A contract including Warranty provisions is let in the same manner as other standard Department contract. Similarly, the contract is awarded to the lowest qualified bidder. However, the warranty special provision should identify that the warranty bond be provided from the contractor to the Districts at completion and as a condition of final payment.

6.1.6 CONSTRUCTION CONSIDERATIONS

If the warranted item(s) involve particular manufactured materials, request the contractor to involve the material manufacturer's representative in the installation, such that the manufacturers' recommended procedures are followed. This is particularly important if the manufacturer will be backing the contractor's warranty to the Department.

Remember that the warranty provision is a performance specification. The means and methods utilized by the contractor are not as important as the functioning of the final product.

6.1.7 OTHER CONSIDERATIONS

Make sure contract specifications clearly define quality measurement techniques or failure thresholds to be used and the project has well defined limitations on work phasing. The contractor must be able to provide design input and should be able to choose the optimal design. Aspects of the design, or other factors not under the contractor's control, should have minimal impacts on the warranted work during the warranty period or can be distinguished from the warranted work. Determine if a warranty is desired or just a registration of the manufacturing warranty. If all that is wanted is the manufacturer's warranty specify that it be provided at completion as a condition of final payment. This should not affect bid prices.

6.2 USE GUIDELINES - ASPHALT CONCRETE PAVEMENT, 60-MONTH WARRANTY

6.2.1 PROJECT SELECTION:

6.2.1.1 Use on Mainline Pavement Only.

Publication 408, Section 496 is only intended for pavement areas which have the proper designed structural capacity to handle the twenty year design life Equivalent Single Axle Loads (ESALs) (traffic). Do not warranty shoulders, ramps, or other miscellaneous areas.

6.2.1.2 Base and Drainage Conditions.

Select projects with good existing base and drainage conditions. If existing base conditions or drainage facilities are not as desired, include construction item numbers in the contract to repair or replace poor base or drainage conditions. The warranty only covers the asphalt concrete pavement. Poor base and/or drainage conditions can void the warranty if the pavement distresses can be traced back to poor base or drainage conditions. Concrete pavements previously overlaid with asphalt material that warrant Falling Weight Deflectometer (FWD) testing after the old asphalt material is removed typically will not make good candidate projects for Publication 408, Section 496. The base condition in these instances will be questionable and the schedule can vary greatly as the project progresses. These uncertainties will be reflected in the Contractor's prices, making the warranty scenario not cost effective.

6.2.1.3 Ride Quality.

Select projects eligible to include a Ride Quality Specification. Publication 408, Section 496 relies on the Ride Quality Specification to ensure quality transverse joints and to control surface irregularities.

6.2.1.4 Pavement Type Alternate Bid Projects.

Do not use Publication 408, Section 496 on projects required to be bid as Pavement Type Alternate Bid Projects.

6.2.1.5 Utility Concerns.

Select projects that are not susceptible to utility cuts for the duration of the warranty period.

6.2.2 PAVEMENT AND PROJECT DESIGN FOR WARRANTY SPECIFICATION:

6.2.2.1 Pavement Design.

The Designer must perform a pavement design using the procedures described in Publication 242, *Pavement Policy Manual*. If the project is utilizing pavement preservation guidelines then follow guidelines according to Appendix G (Pavement Preservation and NEPP Guidelines) otherwise design the overlay according to Publication 242, Chapter 10, *Pavement Overlay Design*. The Designer must specify the minimum thickness of the total of all asphalt concrete layers to be constructed and warranted, the 20-year Design Life ESALs range and the Skid Resistance Level (SRL) designation of the wearing course. The contractor chooses the type of asphalt concrete courses and course thicknesses to meet the specified minimum total pavement thickness. Stone Matrix Asphalt (SMA) can be considered an acceptable mix type should the Contractor propose this option. Publication 408, Section 496 requires a minimum of two structural lifts with each lift at a minimum thickness not less than the minimum thickness specified in Publication 242, Chapter 9, *Full-Depth Flexible Pavement Design* and Table 9.5, *Superpave Material Thicknesses*. The surface layer is to be an acceptable wearing surface.

6.2.2.2 Mainline Variable Depth Pavement Courses.

Publication 408, Section 496 uses only square yards for Measurement and Payment. If locations on a project require variable depth pavement courses to correct superelevations or cross slopes, separate standard (non-warranty) Superpave bid items are to be included in the contract to construct these variable depth pavement courses.

6.2.2.3 SRL.

The Designer must specify a SRL for the surface course according to Publication 242, Table 5.4, *SRL Criteria*.

6.2.2.4 Traffic Classification Counts.

The Designer must schedule a traffic classification count if no current traffic classification count exists within the prior two years. Schedule the count with the Department's Bureau of Planning and Research, Transportation Performance Monitoring Division. Traffic classification counts are to be performed before the let date so that the results can be reflected in the Average Daily Traffic (ADT), Average Daily Truck Traffic (ADTT) and 20-year design life ESALs provided in the contract.

6.2.2.5 Segments and offsets.

The Designer must indicate the segment termini and segment lengths on the construction plans. Should a partial segment be included in the warranty area, the offset to the end of the warranty area must also be delineated.

6.2.2.6 ADT and ADTT.

The Designer must provide the current and design life ADT and ADTT in the contract.

6.2.2.7 20-Year Design Life ESALs.

The Designer must provide the estimated 20-year design life ESALs in the contract. A spreadsheet is available for download in the ECMS webpage under References, File Cabinet.

6.2.2.8 Ride Quality Specification.

The Designer must include the Ride Quality specification into the contract if the project is eligible for the Ride Quality Specification (See 6.2.1.3). The Ride Quality specification should be included as a separate construction item number in the contract.

6.2.2.9 Warranty Work Traffic Control Plan.

The Designer must include notes on the Traffic Control Plan indicating traffic control requirements for warranty work. Typical Traffic Control Plans found in Publication 213 are to be used unless existing conditions require a customized Traffic Control Plan. The Contractor is to use the Warranty Work Traffic Control Plan if warranty repairs are required during the warranty period. The Contractor must pay for the traffic control, but for safety and Department liability reasons, provide a Warranty Work Traffic Control Plan to close down a single lane for warranty repair or remediation work.

6.2.2.10 Sawing and Sealing Joints.

It is required that the Designer include a separate construction item number for sawing and sealing transverse joints when placing an Asphalt Concrete Pavement, 60-Month Warranty as an overlay on an existing jointed cement concrete pavement.

6.2.2.11 Payment for Fifth Member of Conflict Resolution Team.

Publication 408, Section 496 requires an independent person be named as the fifth member of the Conflict Resolution Team. If the services of this person are required, payment for their services will be shared between the Department and the Contractor.

6.2.2.12 Tack Coat on Existing Pavement.

Provide an item for tack coat beneath the lowest warranted asphalt layer. Tack coat between the warranted layers is at the Contractor's discretion.

6.2.2.13 Road User's Liquidated Damages (RULDs).

RULDs must be calculated for the project. The specification requires damages assessment in instances of non-performance.

6.2.3 PRE-CONSTRUCTION MEETING:

6.2.3.1 Identify Conflict Resolution Team.

Publication 408, Section 496 requires the identification of a five-member Conflict Resolution Team. One member is a representative from the District. One member is a representative from Bureau of Project Delivery (BOPD)/Innovative and Support Services Division (ISSD). Two members are representatives from the Contractor. The last member is an independent person mutually agreed upon by both the Contractor and the Department. BOPD will work with the Industry to identify an acceptable independent person. If a change in the team is required, the same selection procedure will be used as stated above. All members of the Conflict Resolution Team are to be identified at the preconstruction meeting.

6.2.4 CONSTRUCTION:

6.2.4.1 Review of Job-Mix Formulas.

The District does not need to review and sign the Producer's mix designs. With Publication 408, Section 496, the Asphalt Concrete Producer is given the freedom to design a mixture to meet the warranty performance criteria. However, the District must be provided with, and should review, but does not need to sign, the mix design intended for the surface course to ensure that the specified criterion are met (e.g., wearing course aggregate supplier and SRL).

6.2.4.2 Construction Inspection During Mix Placement.

Department inspection during placement should be limited to documenting the general operations of the Contractor and weather conditions. However, the Inspector should calculate the placement quantities for payment through biweekly estimates.

6.2.4.3 Construction Inspection After Mix Placement.

The Inspector is required to inspect the completed project or sections of project to ensure conformance to the specified construction end-result criteria in Publication 408, Section 496. Construction end-result acceptance starts the warranty period.

6.2.5 DISTRICT RESPONSIBILITIES DURING THE 60-MONTH WARRANTY PERIOD:

6.2.5.1 Annual Automated Performance Surveys.

Annually, the District must schedule the automated, video logging, pavement distress surveys with the Bureau of Maintenance and Operations, especially if the highway is a non-NHS highway. NHS highways are programmed for annual video logging. Most of the warranty performance criteria can be evaluated by the automated, video logging, pavement distress surveys. Schedule these reviews so that they are conducted prior to June 15.

6.2.5.2 Annual Manual Performance Surveys.

Annually, the District must schedule and perform manual performance surveys for areas of flushing and potholes. These items are not currently picked up by the automated, video logging, pavement distress surveys. Additionally, manual surveys may be required to clarify the degree of distress revealed in automated surveys. Complete these reviews prior to July 1.

6.2.5.3 Notification to Contractor of Manual Performance Surveys.

The District must notify the prime Contractor in advance of the scheduled date of manual pavement distress surveys as specified in Publication 408, Section 496.

6.2.5.4 Notification to Contractor of Performance Survey Results.

The District must provide all annual automated and manual performance survey results to the Contractor within a specific time as specified in Publication 408, Section 496.

6.2.5.5 Notification of Required Warranty Work.

The District must notify the Contractor and bonding company within the specified time of any required warranty work identified by the annual performance surveys.

6.2.5.6 Routine Traffic Classification Counts.

The District is to schedule routine traffic classification counts during the warranty period. Counts are to be done at least on the minimum frequency established by the Department for the highway classification. These routine counts are needed to monitor the increase in traffic as a check on the estimate provided at the time of construction. The warranty can be voided if the ESALs exceed 100% of the estimated 20 year design life ESALs or if the ESALs increase enough to warrant a change in the mix design in the number of gyrations.

6.2.5.7 Maintenance Forces.

The District must notify and periodically remind County Maintenance Forces to refrain from doing any routine or preventative pavement maintenance work on the section of warranted pavement during the 60-Month (5-year) warranty period. Distresses discovered by County Maintenance Forces must be reported immediately to the Assistant District Executive for Maintenance.

6.3 USE GUIDELINES - ASPHALT CONCRETE PAVEMENT, 84-MONTH WARRANTY

(Section is held for future policy development)

6.4 USE GUIDELINES - ASPHALT CONCRETE PAVEMENT, 120-MONTH WARRANTY

(Section is held for future policy development)

6.5 USE GUIDELINES – BRIDGE WARRANTY, 50-MONTH WARRANTY

6.5.1 PROJECT SELECTION:

6.5.1.1 Use on Structure Replacement projects only. The Bridge Warranty, 50-Month Warranty Standard Special Provision (SSP) is only intended for projects that include full structure replacement and is limited to the structure components only. It is the District's decision on what projects this SSP is used depending on particular sight conditions. It is intended to give the District a tool to improve construction quality and should be used accordingly.

6.5.1.2 Utility Concerns. Select projects that are not susceptible to utility attachments for the duration of the warranty period.

6.5.1.3 Design Build Projects. This SSP can be used for design build projects and was originally piloted on design build projects.

6.5.2 BRIDGE DESIGN FOR WARRANTY SPECIFICATION:

- 6.5.2.1 Structure Design. The structure design shall be performed in accordance with all current Department design manuals and standards. Do not specify experimental or proprietary items.
- 6.5.2.2 Multiple Bridges. If the Bridge Warranty, 50-Month Warranty (SSP) is used for a project with multiple bridge replacements in one contract, the Designer must specify which bridges will be warrantied in the SSP.
- 6.5.2.3 Alternate Structure. The standard special provision for alternate structures shall specify the alternate structure will be warrantied in accordance with the warranty specification provided in the contract for the as designed structure.
- 6.5.2.4 Payment for 5th Member of Conflict Resolution Team. The Bridge Warranty, 50-Month Warranty (SSP) requires an independent person be named as the 5th member of the Conflict Resolution Team. If the services of this person are required, payment for their services will be shared between the Department and the Contractor. A shared Work Order will be required as is typically required in partnered projects.
- 6.5.2.5 Road User's Liquidated Damages (RULDs). RULDs shall be calculated for the project. The specification requires damages assessment in instances of non-performance.

6.5.3 **PRE-CONSTRUCTION MEETING:**

- 6.5.3.1 Identify Conflict Resolution Team. The Bridge Warranty, 50-Month Warranty (SSP) requires the identification of a five-member Conflict Resolution Team. One member is a representative from BOPD/ISSD. Two members are representatives from the Contractor. The last member is an independent person mutually agreed upon by both the Contractor and the Department. The Bureau of Project Delivery will work with the Industry to identify an acceptable independent person. If a change in the team is required, the same selection procedure will be used as stated above. All members of the Conflict Resolution Team are to be identified at the preconstruction meeting.

6.5.4 **CONSTRUCTION:**

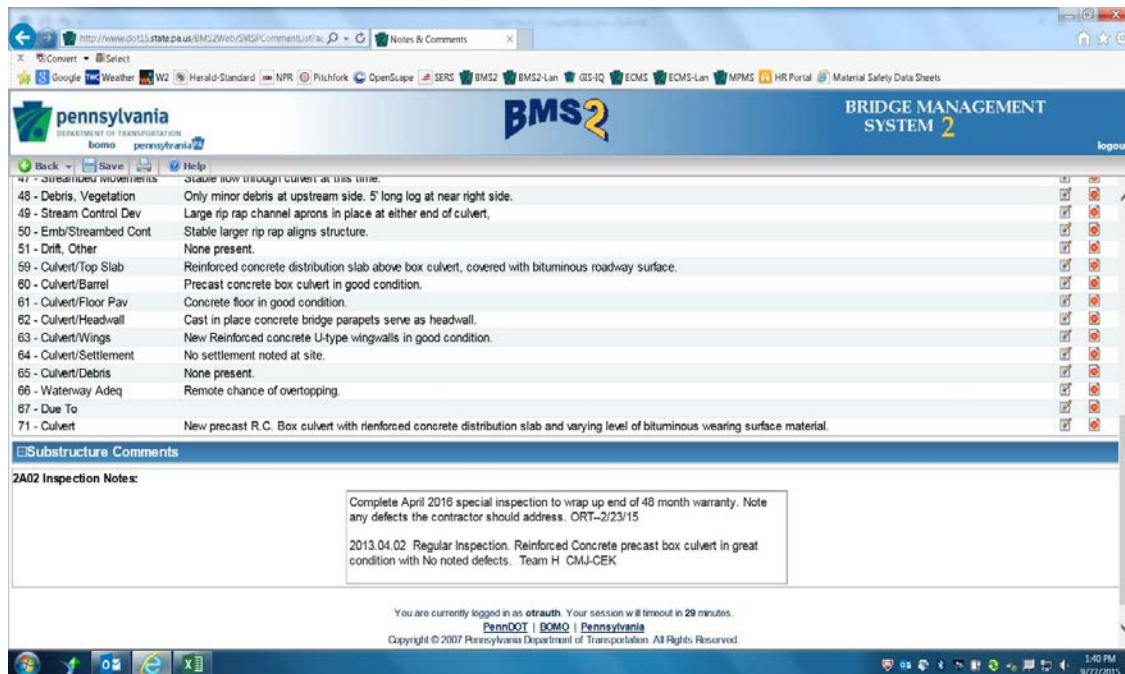
- 6.5.4.1 Bridge Safety Inspection. The District shall perform a Bridge Safety Inspection (NBIS inspection) prior to the final construction inspection and acceptance of the project or substantial portion of the project. The date of this acceptance will start the warranty period. If multiple bridges are warrantied on one contract, the provision in Pub 408 Section 110.08(a) for acceptance of substantial project sections should be followed and the start of each warranty period documented.
- 6.5.4.2 Baseline Survey and As-built Drawings. The District shall perform a baseline survey of the structure once complete and keep accurate as-built drawings during construction.
- 6.5.4.3 Finalization of construction project. The District Finals unit should enter a field in the ECMS finalization checklist (See example below) to require a warranty bond.

The screenshot displays the 'Finalization Checklist' within the Pennsylvania ECMS system. The interface includes a navigation bar with links like 'Business Partner', 'Solicitation', and 'Work Queue'. The main content area shows a table of checklist items categorized by 'Category' (e.g., Project Information, Acceptance Certificate, Project Records, Environment, Audit, Resolution of Materials Discrepancies, Notification of Final Quantities, Record Destroy Dates, Miscellaneous, Box). Each item has a 'Title', 'Status', 'Date', and 'Doc Link'. The 'Status' column indicates the completion status of each item, with some items marked as 'Complete' and others as 'Approved' or 'Accepted'. The 'Date' column shows the completion date for each item. The 'Doc Link' column provides a link to the document, indicated by a small icon. The table is titled 'Finalization: 06/12/2014' and 'Warranty Date:'. Below the table, there is an 'Audit Information' section with fields for 'Created By', 'Created On', 'Modified By', and 'Modified On'.

Category	Title	Status	Date	Doc Link
Project Information	Final Inspection	Complete	05/10/2013	
	Physical Work Complete	Complete	08/27/2013	
	Required Document Received	Complete	04/07/2014	
	Project Acceptance	Complete	04/07/2014	
Acceptance Certificate	Acceptance Certificate	Approved	04/21/2014	
Project Records	Records Received from Field	Complete	04/08/2014	
Environment	Environmental Mitigation Commitments	Complete	04/08/2014	
Audit	Final Items Quantity	Complete	05/06/2014	
Resolution of Materials Discrepancies	4238A - Certified by District Materials Engineer	Complete	04/08/2014	
Notification of Final Quantities	Verification of Claims	Complete	04/08/2014	
	Time Extension Requests Resolved	Complete	04/08/2014	
	Accrued Unbilled Costs (AUC)	Complete	04/08/2014	
	NFQ	Accepted	04/24/2014	
Record Destroy Dates	Calculated Record Destroy Date	Complete	06/12/2021	
	Central Office Override Destroy Date	Complete	06/12/2021	
	District Office Override Destroy Date	Complete	06/12/2021	
Miscellaneous	WBS CLOSED IN SAP	Complete	06/11/2014	
	Warranty Bond Received from contractor	Complete	09/13/2013	
	WBS Closure Email	Complete	06/11/2014	
Box	Box 438	Complete	08/08/2014	

6.5.5 DISTRICT RESPONSIBILITIES DURING THE 50-MONTH WARRANTY PERIOD:

- 6.5.5.1** Bi-annual Bridge Safety Inspection (NBIS). Bi-annually, the District shall schedule a NBIS certified bridge inspection for the warrantied bridge. The District will be responsible to perform 3 NBIS bridge inspection. The first shall be prior to the start of the warranty period, the second a maximum of 24 months after the start of the warranty period and the final safety inspection a maximum of 48 months from the start of the warranty period. The District bridge inspection staff will be required to insure the frequency of inspection is met and the final safety inspection is performed in time to complete the inspection report and disseminate results prior to the 50 month warranty expiring. It is recommended the bridge inspection staff enter notes in BMS2 (See example below) to inform inspectors the structure has a warranty associated.



- 6.5.5.2** Request by Contractor for Safety Inspection Results. If the Contractor requests results of the safety inspection the District shall provide the results to the Contractor as specified in the Bridge Warranty, 50-Month Warranty SSP.
- 6.5.5.3** Notification of Required Warranty Work. The District shall notify the Contractor and bonding company, within the specified time, of any required warranty work identified by the bridge safety inspection.
- 6.5.5.4** Maintenance Forces. The District must notify and periodically remind County Maintenance Forces to refrain from doing any preventative bridge maintenance work on the warrantied bridge during the 50-Month warranty period. Distresses discovered by County Maintenance Forces must be reported immediately to the Assistant District Executive for Maintenance and the District Bridge Engineer.
- 6.5.5.5** Notification of Local Officials and Public. If warranty work is required and this work must restrict traffic, the District shall be responsible for the notification of the local officials and public.

CHAPTER 7 – OTHER METHODS

7.0 INTRODUCTION

The bid documents for a Lump Sum project will not include a summary of quantities or other information detailing the quantities for the project work. The Department provides the potential bidders with complete bid documents and the bid will be made after the contractors calculate the quantities necessary to develop the lump sum amount. The bidding process requires the contract bidders to provide the Department with an estimate of a lump sum price as opposed to an estimate that lists individual pay items. The Lump Sum bidding method is typically suited for simple projects that have a limited scope of work and emergency projects with limited scope.

7.1 LUMP SUM

7.1.1 OVERVIEW

Lump Sum bidding requires the contractor to develop the quantities from the contract package prepared by the Department then submit a Lump Sum bid for the project as opposed to an estimate that lists individual pay items. The contractor bears the responsibilities for any change in estimated quantities. Any costs due to changed or unforeseen conditions as well as added or deleted work are negotiated using standard practices.

7.1.2 BENEFITS/RISKS

On simple projects, the Lump Sum method reduces quantity overruns that might result from design errors. Contract administration costs associated with quantity verification and measurement are reduced.

Lump Sum is intended to reduce quantity overruns due to errors in quantity calculations or changed field conditions. An added benefit is the reduction in paperwork related to quantity measurement and verification, allowing Department field personnel to spend more time on inspection of the work.

7.1.3 TYPICAL PROJECT TYPES

Lump Sum bidding is most effective on smaller, less complex projects with a limited scope of work. Projects with a limited budget and need to reduce design time and/or management costs are especially suitable. Potential project types include resurfacing, rehabilitation, maintenance projects, and emergency projects with limited scope.

Typically Lump Sum bidding is used for simple projects such as resurfacing, bike paths, box culvert extensions and minor bridge widening.

7.1.4 DESIGN CONSIDERATIONS

Lump Sum bidding requires that the design documents are clear and complete to provide the contractors with enough information to make an informed calculation.

7.1.5 AWARD OF CONTRACT

A contract using the Lump Sum bidding method is advertised as any other contract with the special status clearly explained. The contract is awarded in the standard way to the lowest qualified bidder.

7.1.6 CONSTRUCTION CONSIDERATIONS

Any costs associated with changed, unforeseen, added or deleted work will be negotiated with the contractor using standard practices.

Inspection requirements and paperwork are reduced because the contractor assumes responsibility for quantities.

7.1.7 OTHER CONSIDERATIONS

Ensure the design documents are clear and complete due to the nature of the contract. Pre-bid meetings and formal partnering are strongly encouraged when Lump Sum provisions are used on a project. Regularly scheduled site meetings will ensure changes are readily addressed and accounted for and the schedule is kept up to date.

APPENDIX A - Design-Build Project Screening Checklist-Expanded

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APPENDIX B - Submittal Review Responsibility Checklist

Plan set	✓	District	Central Office	FHWA	Other
Roadway Design					
Quality Plan					
Pavement Design					
Environmental/Permits					
Erosion and Sediment Pollution Control Plan					
NPDES Permit					
Draft Exploration Plan and Schedule of Borings					
Geotechnical Design					
Permanent Pavement Marking Design and Signing					
Pre-Final Plans					
Final Roadway Plans					
As-Built Roadway Plans					
Structure Design (S-_____) Refer to Publication 15M, Design Manual Part 4, Structures, Tables 1.9-1, 1.9-2, and 1.9-3					
Hydrologic and Hydraulic Report					
Final TS&L					
Waterway Permits/Permit Amendments					
Foundation Submission					
Final Structure Plans					
As-Built Plans					
Structure Design (S-_____) Refer to Publication 15M, Design Manual Part 4, Structures, Tables 1.9-1, 1.9-2, and 1.9-3					
Hydrologic and Hydraulic Report					
Final TS&L					
Waterway Permits/Permit Amendments					
Foundation Submission					
Final Structure Plans					
As-Built Plans					
Maintenance and Protection of Traffic Design					
Incident Management Plan					
Preliminary Plan					
Final Plan					
Transportation Management Plan					

Utility Coordination					
Utility Relocation Highway Occupancy Permits					
Utility Reimbursement Documentation					
Right-of-Way Acquisition					
Preliminary Right-of-Way Plan					
Appraisals					
Final Right-of-Way Plans					
Modified Final Right-of-Way Plans					
ADA Curb Ramp Design					
Traffic Signal Permit Plan revisions					
Technical Infeasibility Form					
Curb Ramp designs					

APPENDIX C - Design-Build Special Provisions Checklist

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APPENDIX D - Project Management Checklist

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APPENDIX E - Project Schedule of Values

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APPENDIX F - Shortlisting Committee and Technical Evaluation Committee Confidentiality Statement

ADJUSTED BID DESIGN-BUILD
SHORTLISTING COMMITTEE
AND
TECHNICAL EVALUATION COMMITTEE
CONFIDENTIALITY STATEMENT

In order to ensure fairness in the evaluation of Technical Approaches submitted in response to an Adjusted Bid Design-Build project, it is very important that the contents of Approaches remain confidential throughout the evaluation process. Members of the Adjusted Bid Design-Build Shortlisting Committee and Technical Evaluation Committee cannot divulge nor make known, in any manner whatsoever, to any person, other than a member of the Adjusted Bid Design-Build Shortlisting Committee and Technical Evaluation Committee or other Commonwealth employee who has signed a copy of this Confidentiality Statement for the same project, any information pertaining to any and all aspects of the Adjusted Bid Design-Build Shortlisting and Technical Evaluation (which has not already been made available to the public or all interested design-build teams) including but not limited to: the contents of design-build teams', experience, shortlisting criteria, Approaches, the scoring method, points allotted, evaluator scores, costs, or any other confidential information regarding the Adjusted Bid Design-Build Technical Evaluation process. Unauthorized sharing of information may have the result of giving a design-build team an unfair advantage over another design-build team and thereby render the process invalid. Any persons who divulge such information may be subject to disciplinary action, including termination of their employment with the Department.

As a member of a Adjusted Bid Design-Build Shortlisting Committee and Technical Evaluation Committee formed by the agency identified below for the project identified below, you are required to sign below indicating that you have read and understood the contents of this Confidentiality Statement.

I have read the above statement and fully understand it.

_____ Signature	_____ Date
_____ Name	_____ Adjusted Bid Design-Build Project Number
_____ Employing Agency	_____ Agency Issuing Adjusted Bid Design-Build Project

This statement must be signed by every member of the Adjusted Bid Design-Build Shortlisting Committee and Technical Evaluation Committee and every other Commonwealth employee that requires non-public information on this Adjusted Bid Design-Build project.

Transmit executed form to Chief of Contract Management Section.

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APPENDIX G - Statement of Interest – Qualifications Rating Form

Design–Build Team:

Agreement No.: /

Date of Submission:

Review for compliance with format requirements by:

Acceptable Unacceptable - Reason:

Qualification Criteria: Reviewed by:

Past Performance Reports
Weighted maximum score:
Contractor:
Engineer:
Penalties and Termination:
Adherence to Schedule/Time constraints:
Environmental Record/History of Violation:
Budget Control:
Score:

Experience with Similar Work
Weighted maximum score:
Contractor:
Engineer:
Score:

Experience of Key Personnel
Weighted maximum score:
Organization chart:
Resumes:
Design affidavit:
Score:

Management Strategy for Design and Construction Weighted maximum score: Contract management: Subcontracting: Project Scheduling: Cost Accounting/Record Keeping: EEO DBE: Safety: Quality control: Score:
Current Workload of the Design-Build Team Weighted maximum score: Lead Design Engineer: Score:
Total Score: 1. 2. 3. 4. 5. = Strengths: Weaknesses:

APPENDIX H - Technical Approach – Initial Review and Coding Form

Design-Build Team: Technical Approach Code:

Agreement No.: /

Date of Submission:

Review for Design-Build Team References by:
Acceptable Unacceptable - Reason:

Qualification Criteria: Reviewed by:

Required Action:

- None
- Contact Design-Build Team to resubmit
- Approach resubmitted and Acceptable
- Approach resubmitted and Unacceptable – Disqualify

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APPENDIX I - Technical Approach – Technical Review Form

Technical Approach Code:

Agreement No.: /

Date of Submission:

Qualification Criteria:

Reviewed by:

Schedule | Project Delivery
Weighted Maximum Score:
Project Completion Time:
Budget Control:
Key Issues / Resolution:
Schedule Constraints / Resolutions:
(Design, Fabrication/Material Acquisition, and Construction)
CPM Schedule:
Completion Date: Meet
Early Completion Date
Score:

Maintenance and Protection of Traffic
Weighted Maximum Score:
Approach to MPT:
Lane Closures:
Visual Obstructions:
Speed Reduction / Speed Limits:
Worker Safety:
Score:

Design Features Weighted Maximum Score: Summary of Features: Design Challenge / Solutions: Score:
Quality Management Quality Control Plan Weighted maximum score: Approach to Quality Management: Quality Control Plan: Design, Review & Approval: Construction Quality Control: Monitoring: Non-Conformance Management: Score:
Coordination Weighted maximum score: Department's Project Team: Permitting / Environmental Agencies: Utility Owners: Local Governments: Public: Score:

Maintainability Value Added Weighted Maximum Score: Design Feature that Minimize Maintenance: Inspection Access: Future Maintenance / Live Cycle: Quality of Materials: Alternate Schedule of (Payment) Values: Score:							
Construction Methods: Weighted Maximum Score: Construction Methods That minimize impact to the traveling public: That minimize impact to the environment: That reduce cost: That improve worker safety: That minimize contract duration: Score:							
Total Score: 1. 2. 3. 4. 5. 6. 7. =							

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APPENDIX J - References

Hancher, D.E., "Use of Warranties in Road Construction," NCHRP Synthesis of Highway Practices 195, Transportation Research Board, National Research Council, Washington D.C.:1994.

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Utah Technology Transfer Center, "Best Practices Guide for Innovative Contracting Procedures," Innovative Contracting Web Site, <http://www.ic.usu.edu/>, Logan, UT.

Kentucky Transportation Cabinet Division of Highway Design, Design Memorandum No. 5-98, <http://www.kytc.state.ky.us/design/memos/5-98.htm>.

Hancher, D.E., "Contracting Methods for Highway Construction," Transportation Research Board, National Research Council, Washington D.C.

Scott, S., "Contract Management Techniques for Improving Construction Quality," Report No. FHWA- RD-97-067, McLean, VA: July, 1997.

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Herbsman, Z., and C. R. Glagola., "Lane Rental-Innovative Way to Reduce Road Construction Time." Journal of Construction Engineering and Management. September/October, 1998: 411-417.

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Glossary of Highway Quality Assurance Terms www.nas.edu/trb/publications/ec010/ec010.pdf

The Design-build Institute of America web site: www.dbia.org

Briefing on FHWA Innovative contracting practices:
www.fhwa.dot.gov/infrastructure/progadmin/contracts/sep_a.cfm#s6

Techniques for Manually Estimating Road User Costs Associated with Construction Projects, Ginger Daniels, P.E., Texas Transportation Institute: [ftp://204.64.21.7/pub/txdot-info/cmd/407730.pdf](http://204.64.21.7/pub/txdot-info/cmd/407730.pdf)

23 CFR 636, "Design-Build Contracting".

Federal Register, Volume 72, Number 156, August 14, 2007 Final Rule on Design-Build Contracting.

"Glossary of Highway Quality Assurance Terms," Transportation Research Circular, Number E-C074, May 2005.

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APPENDIX K - Glossary

GLOSSARY OF TERMS UNIQUE TO PUBLICATION 448

A

A + Bx Bidding: Also known as Cost-Plus-Time Bidding. A procedure that selects the low bidder based on a monetary combination of the contract bid items (A) and the time (B) needed to complete the critical portion of the project multiplied by the calculated road user costs of the construction.

Adjusted Bid: A selection process in which qualitative aspects are scored on a 0 to 100 scale expressed as a decimal; price is then divided by qualitative score to yield an "adjusted bid" or "price per quality point," and the contract is awarded to design-build team with the lowest adjusted bid.

B

C

Cost Plus Time: See A+Bx Bidding.

D

Design-Build: A contracting procedure where a single business entity is contracted to design and construct a project to decrease project delivery time and associated user costs.

Design-Build Contractor: The entity with whom the Department legally contracts to design and construct a Design-Build project.

Design-Build Contract: An agreement that provides for design and construction by a design-build team. See Contract.

Adjusted Bid Design-Build One-Step: See One-Step Adjusted Bid Design-Build

Design-Build Low Bid: See Low Bid Design-Build

Design-Build Team: The partnership consisting of a contractor and consultant formed to prepare and submit Submissions of Interest, Technical Approach, and bids for a Department advertised design-build project.

Adjusted Bid Design-Build Two-Step: See Two-Step Adjusted Bid Design-Build

E

F

Firm Neutral: A Technical Approach in Adjusted Bid Design-Build developed by the design-build teams that contain no identifying characteristics of the teams submitting. The Approach should address how the team plans to successfully complete the project. No one on the TRC is to know or be able to easily determine which Approach was submitted by a particular design-build team. The Statement of Interest is the only submission in the selection process that the design-build team has to identify the key project personnel and appropriate past projects that are of the same magnitude as the design-build project.

G

Guarantee: See Warranty Clauses

I

Incentive/Disincentive for Early Completion: a contract provision which compensates the contractor a certain amount of money for each day identified critical work is completed ahead of schedule and assesses a deduction for each day the contractor overruns the I/D time. Its use is primarily intended for those critical projects where traffic inconvenience and delays are to be held to a minimum. The amounts are based upon estimates of such items as traffic safety, traffic maintenance, and road user costs.

J

L

Lane Rental: A contracting procedure where the contractor is charged a fee for occupying traveling lanes to perform contract work.

Lead Design Engineer (LDE): The design consultant engineering firm or contractor's personnel that are responsible for the design portion of the design-build contract.

Low Bid Design-Build: (formerly known as Design-Build Modified Turnkey or One-Step Low Bid): A design-build project where the Department typically provides Conceptual Drawings that define work limits, specify the line and grade and typical sections, provide the preliminary foundation design and conceptual design for bridges (including geotechnical data), and include environmental clearance. The Department may obtain all permits, clear all rights-of-way, and arrange the utility relocations. The design-build contractor completes the Final Design and constructs the project based on that Final Design.

Lump Sum: A contracting procedure where the bidder is provided with a set of bid documents and is required to calculate quantities and develop a lump sum bid for all work. Any costs associated with changed or unforeseen conditions as well as added or deleted work will be negotiated using standard practices.

M

N

O

One-Step Adjusted Bid Design-Build: A selection process that provides interested design-build teams with a scope of work describing the design and construction services to enable them to prepare and submit a Technical Approach and bid proposal for evaluation and selection. Awards for Adjusted Bid are made to the responsible and responsive bidder whose Technical Approach and bid proposal are determined to be the most advantageous to the Department.

One-Step Selection Process: A procurement process in Adjusted Bid Design-Build where a design-build team does not need to submit a Statement of Interest, but may submit a Technical Approach in response to the bid package published in ECMS eBidding. The design-build team will submit a bid in ECMS.

Owner's Perspective Review: Limited review by Department and FHWA (as appropriate) to determine that the plans and calculations have been developed in conformance with Department criteria and standards and a QA review was performed by the Peer Reviewer in conformance with the approved Quality Plan. Unless discrepancies are found in the plans, calculations, or QC/QA process, the review is not to be an in-depth review of the actual design.

P

Peer Review: See Quality Assurance Reviewer

Prime Consultant: The contractual party providing design consultant work and services pursuant to an Agreement with the Department. The Consultant may be an individual, partnership, corporation, or joint venture.

Q

Quality Assurance: All those planned and systematic actions necessary to provide confidence that a product or facility will perform satisfactorily in service. QA addresses the overall problem of obtaining the quality of a service, product, or facility in the most efficient, economical, and satisfactory manner possible. QA involves continued evaluation of the activities of planning, design, development of plans and specifications, and the interactions of these activities.

Quality Assurance Review: A detailed review of the plans, specifications, and calculations by the Department and FHWA (as appropriate) to ensure that the project's approved design criteria are being followed as well as the plan development and associated calculations.

Quality Assurance Reviewer (QA-R): The design consultant engineering firm or individuals functioning as Department and FHWA (as appropriate) representatives who check the validity of the Contractor's Quality Plan to ensure all work is done in accordance with the contract documents. Quality Assurance Reviewer may be Department and/or FHWA personnel, consultants under a Department Agreement, or a firm providing design services to the design-build contractor. The Quality Assurance Reviewer may not be the same firm as the contractor, the Lead Design Engineer, or the Quality Control Reviewer.

Quality Assurance Review by Peer Review: An independent, third-party engineering firm engaged by the Contractor to check the validity of the Quality Plan to ensure the various aspects of the work is done in accordance with the Contract documents. The QA-R in this instance is also referred to as the Peer Reviewer.

Quality Assurance (QA) Team: The Department and FHWA (as appropriate) representatives who check the validity of the Quality Plan to ensure the various aspects of the work is done in accordance with the Contract documents.

Quality Control (QC): The sum total of all activities performed on the contract to assess and control the accuracy and completeness of the design, to ensure contract compliance. Also called process control.

Quality Control Reviewer (QC-R): The design consultant engineering firm or individuals that is responsible to manage the quality control of the design-build contract, including the Quality Control Manager and the Alternate Quality Control Manager. The design Quality Control Reviewer is permitted to be the same firm as the Lead Design Engineer.

Quality Control Staff: The design consultant team or individuals that are responsible to manage the quality control of the design-build contract. The QC Staff includes the QC Manager, Alternate QC Manager, and sufficient number of qualified personnel to ensure contract compliance. The QC Staff is permitted to include personnel from the same firm as the Lead Design Engineer, but may not be involved with other design activities on the contract.

Quality Plan: The plan prepared for managing quality during final plan development for design activities on a design-build project that addresses key staff, responsibilities, milestones, monitoring budgets and schedules, communication efforts, Quality Control/Quality Assurance efforts and tracking procedures as a minimum. It should include a detailed description of the Quality Control staff, design procedures, and design review procedures

R

S

Secondary Design Service Professionals (SDSP): Other design consultant engineering firms providing design services to the design-build contractor beyond roles of Lead Design Engineer or design Quality Control Reviewer

Shortlisting: The narrowing of the field of design-build teams through the selection of the most qualified design-build teams who have responded to the design-build contract advertisement.

Stipend: Used only in conjunction with Two-Step Adjusted Bid Design-Build selection process. A payment provided to each of the responsive unsuccessful design-build teams as a means of compensating them for a portion of the Technical Approach and/or bid proposal development costs. If stipends are used, the shortlisted design-build teams will execute an Engineering Agreement to submit a responsive Technical Approach and associated bid package. The Department may retain the right to use ideas from unsuccessful design-build teams if they accept the stipends.

T

Technical Approach: The portion of an adjusted bid design-build proposal which contains design solutions and other qualitative factors that are provided in response to the bid package. Tasks, workload, schedules and documents to be produced are typically included therein. The Technical Approach will be reviewed by the Technical Review Committee to generate the qualitative score.

Technical Review Committee (TRC): The panel responsible for evaluating the design-build Technical Approaches in the Adjusted Bid process. The membership may include a mix of Federal, state, local or private sector engineers. The Technical Review Committee will be formed prior to and will participate in the development of the scope of work documents.

Two-Step Adjusted Bid Design-Build: A selection process that provides interested design-build teams with a scope of work describing the design and construction services to enable them to prepare and submit a Statement of Interest for evaluation and shortlisting. Shortlisted design-build teams then prepare and submit a Technical Approach and bid proposal for evaluation and selection. Awards for Adjusted Bid are made to the responsible and responsive bidder whose Technical Approach and bid proposal are determined to be the most advantageous to the Department.

Two-Step selection process: A procurement process in which the first phase consists of shortlisting (based on qualifications submitted in response to the design-build contract advertisement) in ECMS, Consultant Agreement System and the second phase consists of the submission of the bid in ECMS eBidding and Technical Approaches in response to the bid package.

W

Warranties: A contracting procedure that guarantees the quality of specific services by the contractor for a predetermined period of time.