

Constructability Review Guidelines



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CONSTRUCTIBILITY REVIEW PROCESS

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IDAHO TRANSPORTATION DEPARTMENT

CONSTRUCTABILITY REVIEW GUIDELINES

INTRODUCTION

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- Preliminary Concept Field Review
- Concept Approval

CONSTRUCTIBILITY REVIEW GUIDELINES: DESIGN STAGE

- Project Levels for Constructability Reviews
- Project Constructability Review Team
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- Preliminary Design Review
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INTRODUCTION

The purpose of constructability reviews during project development is to ensure that projects are biddable, buildable, cost-effective and maintainable. Constructability reviews involve the optimum use of construction knowledge and experience in the planning and development of a project.

One of the primary goals of constructability reviews is to foster a greater level of involvement by construction personnel during project planning and development. The Regional/Resident/Maintenance Engineers and staff are key providers of comments on constructability issues throughout the project development process.

Waiting to conduct constructability reviews in the late stages of design is not effective. By project end, significant resources have been expended in developing the design. Plan changes at this late stage are costly to implement, have a significant effect on the project schedule and may conflict with long established approved permits and commitments. It is imperative that knowledgeable construction people are involved early in planning and development.

DEFINITIONS

A constructability review is a systematic process to ensure that a project possesses clear and feasible construction techniques. The Constructability Review Process starts at the inception of the project and continues throughout project development. Several constructability reviews are incorporated into the project planning and development. The combination of the reviews makes up the Constructability Review Process.

Biddability is part of the Constructability Review Process and is the review of the contract documents to identify errors, omissions and conflicts in the plans, specifications and bid item schedule. Biddability reviews identify uncertainty and minimize unquantified risks to the bidder. A biddability review is required on all projects as part of the PS&E review and is completed at the District after final review comments are incorporated and prior to submittal to Roadway Design.

CONSTRUCTIBILITY REVIEW GUIDELINES: PRE-DESIGN STAGE

Preliminary Concept Field Review

The Preliminary Concept Field Review (ITD-2708) must be completed as outlined in the Design Manual. At a minimum, the field review shall include the Design, Construction, Materials and Maintenance personnel from the District and others as appropriate for the specific project. During the field review the project shall be reviewed for scope and to identify constructibility issues.

Concept Approval

A Concept Report must be completed and approved, as outlined in the Design Manual. Project Development sets the design standards, defines the alternative solutions and costs and refines the estimate. The Approved Concept Report should be distributed in the District to the Construction, Maintenance and Materials sections.

CONSTRUCTIBILITY REVIEW GUIDELINES: DESIGN STAGE

Project Levels for Constructibility Reviews

Constructibility reviews shall be incorporated into the existing design review process outlined in the Design Manual. For determining the level of constructibility review required, projects are categorized as level one, two or three.

State Simple and Federal Simple projects are considered level one. State Complex and Federal Complex projects are typically considered level two. State Complex and Federal Complex projects with new, innovative, expensive or complex design features may be considered level three. Project will be designated as level three at the discretion of the District.

Table I indicates when constructibility reviews are required in conjunction with the already established design review process. An X indicates that a constructibility review is required.

	Preliminary Design Review	Intermediate Design Review	Final Design Review	PS&E/ Biddability Review
Level One Projects	District Option	District Option	X	X
Level Two Projects	X	District Option	X	X
Level Three Projects	X	X	X	X

Table I. Constructability Review Summary

Project Constructability Review Team

A Constructability Review Team will be established for all projects. On level one projects, the team must be established prior to final design review, or earlier as deemed necessary by the District. On level two and level three projects the team must be established prior to Preliminary Design Review.

The District Project Development Engineer in coordination with District Management will be responsible for identifying the Constructability Review Team for each project. On all projects, the team will consist of, at a minimum, District representatives from Design, Construction and Maintenance and, as applicable for the project, representatives from Materials and Traffic. A representative from FHWA may also be included on the team on federal projects. Every effort should be made to ensure that the established team remains in place throughout the duration of the project development.

To take advantage of the wealth of knowledge and experience that exists in the construction industry, a consultant and/or a contractor with special expertise is recommended as part of the team on level three projects. **The consultant and/or contractor can be brought onto the team for the Intermediate and Final Design Reviews at the discretion of the District.** A facilitator

may also be utilized for the constructability reviews on level three projects, which may involve multiple entities.

For each project level, the recommended Constructability Review Team makeup is provided in Table II.

<u>Level One Projects</u>	<u>Level Two Projects</u>	<u>Level Three Projects</u>
District Management	District Management	District Management
Project Manager	Project Manager	Project Manager
Designer/ Design Consultant	Designer / Design Consultant	Designer / Design Consultant
Resident Engineer or Representative	Resident Engineer or Representative	Resident Engineer or Representative
Maintenance Representative	Maintenance Engineer or Representative	Maintenance Engineer or Representative
Materials Representative	Materials Engineer or Representative	Materials Engineer or Representative
Traffic Representative	Traffic Engineer or Representative	Traffic Engineer or Representative
	Environmental Representative	Environmental Representative
	Right-Of-Way Representative	Right-Of-Way Representative
	HQ Construction Associate	HQ Construction Associate
	HQ Roadway Design or Area Engineer	HQ Roadway Design or Area Engineer
	HQ Specialty Areas (Bridge, Etc.)	HQ Specialty Areas (Bridge, Etc.)
	FHWA (federal projects)	Contractor *, **

		Consultant *, **
		Facilitator **
		FHWA (federal projects)

* Included in the Intermediate and Final Design Reviews **at the discretion of the District**

**Optional

Table II – Recommended Constructibility Review Team Makeup

Consultant and Contractor Involvement Guidelines

The process for bringing consultants and/or contractors into the constructibility review process can be accomplished in the same way for either resource. For small projects, it can be handled through service agreements with consultation from PM&M. In order to have a list of qualified and willing participants, it is desirable to have an on call list.

For consultants, an on call list already exists as the Term Agreement List maintained by the Consultant Administration Unit. Consultants approved in the Value Engineering category would be qualified for constructibility reviews.

The Consultant Administration Unit will maintain a list of contractors qualified to perform constructibility reviews via the Term Agreement List under the Constructibility Review category.

On complex projects likely to be level three, the District should program adequate PC dollars (preliminary engineering by consultant) to cover the cost of hiring a consultant and/or contractor to participate in the Intermediate and Final Design Reviews.

The District is responsible for selecting the consultant and/or contractor for level three projects. Consideration should be given to the consultant or contractor's level of expertise in the area needed for the specific project. Consultation with the Associated General Contractors (AGC) is recommended for contractor selection.

Consultants selected to participate in the Intermediate and Final Design Reviews for a project should not be the same consultant involved in the design of the project. Although the design consultant may be involved as a part of the design team, a second consultant should be selected to provide a construction perspective.

When a contractor is selected to participate in the Intermediate and Final Design Reviews the contractor will not be precluded from bidding on the project. However, in order to maintain fair and competitive bidding, review documents will be made available to all interested contractors at the Intermediate and

Final Design stages. The review documents will be available through the Associated General Contractors (AGC) plan room and at the District. Contractors will be informed of the availability of the review documents through the AGC, the Notice to Contractors mailing list and the ITD web site. Contractors will be allowed to make copies and may also comment on the review documents to the District.

The Engineer's Estimate will not be made available to any contractor and will not be included in the Intermediate and Final Design review packages. The Engineer's Estimate must be kept confidential and will be reviewed internally on level three projects.

Preliminary Design Review

On level one projects, involvement of the Constructability Review Team at Preliminary Design is at the District's option. On level two and level three projects, the Preliminary Design plans will be distributed to all members of the project Constructability Review Team. The Constructability Review Team will be given a minimum three-week review period. On level three projects, the review period may be extended depending on the complexity of the plans.

In reviewing the Preliminary Plans for constructability, geometric feature, such as line and grade, and traffic control shall be considered. A list of Constructability Considerations for Preliminary Design Review is provided in Appendix D to assist the team in the constructability review process. The Constructability Considerations are not to be used as a checklist or turned in as review comments. The intent of the Considerations is to focus on the issues that should be considered and discussed at the Preliminary Design Review stage.

All members of the Constructability Review Team will conduct an independent review, compile their comments on the Design Review Comments Sheet provided in Appendix C, and attend the Preliminary Design Review Meeting.

Intermediate Design Review

On level one and level two projects, involvement of the Constructability Review Team at Intermediate Design is at the District's option. On level three projects, the Intermediate Design plans will be distributed to all members of the Constructability Review Team. The Constructability Review Team will be given a minimum three-week review period. On level three projects, the review period may be extended depending on the complexity of the plans.

In reviewing the Intermediate Plans for constructability the specific details of the design shall be considered. A list of Constructability Considerations for Intermediate and Final Design Review is provided in Appendix E to assist the team in the constructability review process. The Constructability Considerations are not to be used as a checklist or turned in as review comments. The intent of the Considerations is to focus on the issues that should be considered and discussed at the Intermediate Design Review stage.

All members of the Constructability Review Team will conduct an independent review, compile their comments on the Design Review Comments Sheet provided in Appendix C, and attend the Intermediate Design Review Meeting.

Final Design Review

On level one, two and three projects, the Final Design documents will be distributed to all members of the Constructability Review Team. The Constructability Review Team will be given a minimum three-week review period. On level three projects, the review period may be extended depending on the complexity of the plans.

In reviewing the Final Design documents for constructability, the plans, special provisions, estimate, permits, schedule and all other aspects of the project shall be reviewed in detail. A list of Constructability Considerations for Intermediate and Final Design Review is provided in Appendix E to assist the team in the constructability review process. The Constructability Considerations are not to be used as a checklist or turned in as review comments. The intent of the Considerations is to focus on the issues that should be considered and discussed at the Final Design Review stage.

All members of the Constructability Review Team will conduct an independent review, compile their comments on the Design Review Comments Sheet provided in an Appendix C, and attend the Final Design Review Meeting.

Biddability Review

A biddability review is required on all projects as part of the PS&E review and is completed at the District after final review comments are incorporated and prior to submittal to Roadway Design.

The biddability review is the responsibility of District Design and may be conducted by a single individual selected by the District Project Development Engineer. A list of Biddability Review Considerations is included in Appendix F to aid the reviewer in identifying problems commonly found in the contract documents. The Biddability Considerations are not to be used as a checklist or turned in with the PS&E package. The intent of the Considerations is to focus on the issues that are often overlooked and cause confusion in advertising and bidding the project.

Design Review Comment Sheet

The Design Review Comment Sheet included in Appendix C is required for all project design reviews. The reviewer summarizes all review comments on the form. All comments will be discussed and resolved at the design review meeting. The comment sheets will be given to the designer at the end of the design review meeting.

The Action column of the Design Review Comment Sheet is to be completed by the designer or project manager and returned to the reviewer as a follow-up to each comment. All comments

must be addressed as to their resolution. The response will indicate how the comment was incorporated, and if not incorporated, an explanation will be provided. The Design Review Comment Sheets will be used to produce the design review reports as outlined in the Design Manual.

CONSTRUCTIBILITY CONSIDERATIONS

PRELIMINARY DESIGN REVIEW

Access, Traffic Maintenance, Utilities and General Constructibility Issues

- Is the sequence of construction compatible with the maintenance of traffic phasing and/or utility relocation phasing?
- Is there sufficient clearance within the work zone for construction operations (such as crane swing room)?
- Is there adequate access to the construction?
- Will construction be impacted by existing horizontal and vertical clearances?
- Is access to businesses and residences provided?
- Have pedestrian and bicycle accommodations been addressed?
- Can residents and customers safely use approaches? Are approach tie-ins reasonable? Are they too steep?
- Will school buses, mail carriers, fire trucks, emergency vehicles or other local traffic require special maintenance of traffic provisions?
- Will sound wall be required?
- Are there utilities that will be impacted?
- Are there railroad and/or highway crossing within 25 feet of construction?
- Will a railroad agreement be required?
- Is there any maintenance problems or procedures anticipated as a result of the proposed construction? If yes, has special attention been directed to each situation?
- Have conditions changed since project was first initiated?

Removal/Demolition

- Do removal items require asbestos survey?
- Are there clear limits of removal vertically and horizontally?
- Have hazardous materials been identified?
- Is there adequate construction access for demolition?

New Structures and Structure Rehabilitation

- Have borings been taken in locations where the information will be helpful? Are there enough borings? Are the depths sufficient? How do the locations of borings compare to actual locations of the foundations?
- Is stream navigable either by law or local usage?

Roadway Plans

- Are sufficient typical sections provided to cover the proposed construction?
- Are typical sections provided for transitions, detour roads and turnouts?
- Is the alignment and grade for 550' beyond the beginning and end of the project shown?
- Are cross sections developed as required?
- Are benchmark data, needed elevations and curve data in the plan?
- Are there any areas where improvements can be made to the alignment?
- Do the designed sections match the existing conditions?
- Do the typical cross sections include existing conditions?
- Are the actual site conditions represented in the plans?
- Will designed sections fit into the right of way or will right of way need to be acquired?
- Will any right of entry agreements or construction easements be required?
- Are approach types, widths, profile and stations shown?
- Have plan/profile sheets been provided for turnouts where necessary?
- When doing a resurfacing project, has traffic barrier resetting or height adjustment been considered?
- Has guardrail post placement and installation over drainage structures, retaining structures or other features been considered?
- Are there any drainage issues that need addressed?

CONSTRUCTIBILITY CONSIDERATIONS

INTERMEDIATE AND FINAL DESIGN REVIEWS

Staging and Phased Construction

- Is staged construction adequately shown on the plans?
- Is construction staging addressed in the traffic control plans?
- Is transition from one phase into the next phase adequately addressed (horizontally and vertically)?
- Are there any safety issues between phasing and are they adequately addressed?
- Has construction site drainage been adequately addressed?
- Are there any drainage problems between phases?
- Can water get to inlets or drainage structures during phase transitions and during each phase of construction?
- Does the sequence of construction match the proposed layout?
- Do the staging plans show how traffic is being handled for each stage?
- Is there a striping plan for each maintenance of traffic phase?
- Is the construction phasing compatible with the maintenance of traffic phasing and/or utility relocation phasing?

Schedule

- Do work hour restrictions allow time to perform work?
- Has the construction schedule been reviewed for feasibility?
- Is the number of working days sufficient for the type of work?

- Are the hours and locations of lane closures specified if necessary?
- Will night construction be required?
- Will the project go through winter?
- Are there any conflicts with on-going or anticipated contracts or projects?

Constructibility

- Are the plans stakeable from a construction survey point of view?
- Is there sufficient clearance within the work zone for construction operations (such as crane swing room)?
- Is there adequate access to the construction?
- Will construction be impacted by existing horizontal and vertical clearances?

Maintenance of Traffic

- How will traffic be maintained?
- Are specifications for traffic handling and lane closures included and adequate?
- Are the traffic control plans clear and complete?
- Are the necessary restrictions (lane closure restrictions, hours of operation restrictions, holiday and weekend restrictions, etc.) indicated in plan?
- Is clearance sufficient under bridges to allow maintenance of traffic before final work phases?
- Are lanes on which traffic is to be maintained compatible to local conditions and intended to be paved?
- Will any temporary shoring be required to maintain traffic? If so, has a method of payment been established?
- Is traffic addressed on side streets?

- Will temporary maintenance aggregate be required and is it addressed in the plans?
- Have the minimum number of lanes and minimum lane widths been shown consistently on the traffic control plans, the cross sections and the typical sections?
- Are drop-offs adequately addressed and protected?
- Have temporary widenings been calculated into excavation and material quantities?
- Will borrow be required and cause a waste of material at end of job?
- Have excess material and waste sites been addressed?
- Are items and quantities for temporary lighting included if necessary?

Access

- Is access to businesses and residences provided in the design?
- Have pedestrian and bicycle accommodations been addressed?
- Can residents and customers use approaches safely? Are approach tie-ins reasonable? Are they too steep?
- Will school buses, mail carriers, fire trucks, emergency vehicles or other local traffic require special maintenance of traffic provisions?
- Can work be safely accessed, especially median work?
- During construction, is adequate access for residents and businesses in the area provided?
- Has consideration been given to shopping centers, churches, schools, military installations, seasonal traffic constraints, sports arenas, special local events, etc.?
- Has access for maintenance personnel (trash, landscape, electrical, structures, snow plow turnarounds, etc.) been adequately addressed in the design and during construction?

Detours

- Have detour routes been approved by the appropriate jurisdiction?
- Has duration of detours been identified?
- Will detours run through the winter? If so, has plowing of snow or maintenance of detour been considered?
- Does temporary jersey barrier need to be backed up to provide stability during winter slowdown?

Traffic Control Devices

Signs

- Does the contract provide for the relocation of existing signs if necessary?
- Do sign footings conflict with underground structures and/or obstructions such as utilities, retaining walls/MSE slopes, storm drains, under drains, outlets, concrete traffic barriers, other footings, etc.?

Signals/Electrical

- When staking out control cabinets for traffic and lighting devices, can signals and lights be seen from the controllers when technician is working on devices?
- Do the location of signal heads, poles, loops, power supply, etc. match project phasing and/or maintenance of traffic?
- Is the power supply to the traffic and lighting devices going to change as a result of moving the utility lines during construction of the project?
- Have the appropriate junction boxes been specified?
- Are the signal pole locations in conflict with utilities and drainage structures?

Temporary Traffic Control Devices

- Have construction openings in barriers been provided and protected?

- Will temporary signals be required?
- What effect will traffic barriers and other devices have on sight distance, driveways, intersections and turning radius?
- Are temporary safety devices required and are there adequate provisions in the contract (i.e. guard rail, attenuators, barrier mill, etc.)?
- Are traffic operation requirements properly addressed (i.e. signing, pavement markings, signal, etc.)?
- Are flashing arrow boards and variable message signs at appropriate locations?
- Are there sufficient items and quantities for all necessary traffic control items such as lane markings, both tape and paint, flagging hours, drums, tubular markers, concrete barriers, signs, variable message signs and arrow panels, traffic control maintenance, etc.?

Sound Walls

- Have provisions for drainage been made on the property owner's side of wall?
- Are the access doors and hydrants in agreement?
- Is adequate clearing and access allowed to construct wall?

Utilities

- Are all utilities and required relocation indicated in plans?
- Is the right of way or easements adequate to allow construction of drainage structures?
- Are there any conflicts between drainage and utility work?
- If utility relocation is required, is the work to be done before construction or during construction and by whom?
- If utilities are to be relocated before construction is the utility schedule reasonable?
- Are existing utilities and facilities accurately shown on the plans?
- Are proposed utility relocations clear of proposed traffic control devices?
- Are underground obstructions clearly marked?
- If work is to be done by the utility companies: 1) How does it fit into the duration of the project? 2) Who is responsible for maintenance of traffic? 3) Who is responsible for access to the utilities? 4) Is a schedule for relocation of utilities provided? 5) Is time for clearing and grading being allowed in the schedule? 6) What impact will occur if reallocation does not happen as scheduled?

Removal/Demolition

- Are there clear limits of removal, both horizontally and vertically?
- Have hazardous materials been identified?

New Structures

- Have utilities through bridges been incorporated into bridge plans if necessary?
- Do the following items fit into the sequence of construction: wick drain locations, fill placement and settlement monitoring, retaining walls in multiple phases, stream diversions, sheeting for multiple phase construction?
- Have paint systems been verified, are they the correct type and do they match existing surroundings?
- Could alternate paint systems or methods be used to expedite painting?
- Have borings been taken in the appropriate locations and are they sufficient in number and depth?
- How do the boring locations compare to the actual foundation locations?
- Is the structure compatible with the retaining wall/MSE system?
- Are straps or other devices on retaining walls in the way of excavation and or the foundation?
- If wetlands/waterways are involved, do are closure periods shown?
- Are the stream diversions shown, if necessary, and are they practical and/or buildable in conjunction with other work scheduled for area involved?
- Do permits require work not shown on plans?
- Are traffic control plans for the bridge coordinated with roadwork phasing?
- If battered piles are used will leads be over moving traffic?

- Is the high water elevation shown?
- Will rip rap/armoring be required and has the type, location and other details been included?
- Are pile design loads and type shown?

Structure Rehabilitation

- Have all areas of repair been identified clearly on plans?
- Are the quantities for repairs sufficient?
- Are suggested or allowed removal procedures included?

Roadway Plans

- Are sufficient typical sections provided to cover the proposed construction?
- Are typical sections provided for transitions, detour roads and turnouts?
- Is the alignment and grade beyond the beginning and end of the project shown?
- Is the detour alignment shown, if required?
- Are cross-sections developed as required?
- Have cross-sections for grade changes at phase tie ins been checked?
- Do site conditions conform to those represented in plan?
- Will designed sections fit into the right of way or has right of way acquisition been planned?
- Are the limits of grubbing, clearing and landscaping clear?
- Have existing trees that are required to remain in place been identified?
- Have manholes, inlets, valve boxes, etc, requiring adjustment been noted?

- Are approach types, widths, profiles and stations shown?
- Are abandoned alignments noted and dashed?
- Have areas where abandoned roadways are to be obliterated shown on the plans?
- Are locations, sizes and descriptions of drainage structures to be removed shown?
- Are all exiting drainage structures addressed?
- Have plan/profile sheets been provided for turnouts where necessary?
- Are special conditions spelled out in Special Provisions?
- How are tie-ins to be made and are they appropriate for existing conditions and phases?
- Will sawed joints be required for pavement removals and has a method of payment been included?

Guardrail

- Do cross sections reflect the embankment widening required for guardrail?
- Has adequate design and pay items been provided for grading needed for end treatments?
- When doing a resurfacing project, has traffic barrier resetting or height adjustment been addressed in the plans?
- Has guardrail post placement and installation over drainage structures, retaining structures or other features been adequately addressed?

Right of Way

- Are all necessary construction easements identified?
- Are right of entry agreements required and who will obtain them?

Erosion Control/Seeding/Landscaping

- Will plants fit into specified areas, such as behind sidewalks and between curbs and sidewalks and not impact ADA requirements?
- Who will supply the seed?
- Is replacement planting during construction addressed?
- Are there adequate erosion and pollution control items and measures?
- Are sediment and erosion control devices located correctly and for the proper use?
- Do sediment and erosion control devices to match different phases of construction?

Drainage

- Are ditches compatible with existing and proposed drainage structures?
- Are elevations shown in the plans and compatible with existing conditions?
- Are there provisions for temporary drainage and drainage of the construction area if necessary?
- Are there provisions for and a proposed method of connecting new and old drainage facilities?
- Are outfall locations of temporary and permanent drainage facilities identified?
- Will proposed or existing drainage structures function during different phases of construction?
- Are temporary drainage devices needed during different phases?
- Have existing and proposed inverts been verified to assure tie-ins will fit?
- Have clearances above and below pipes and structures been verified?

- Have the plans been reviewed to verify that pipe is not in the pavement section and there are no conflicts between inlets and utilities?
- Have existing site conditions changed, such as a new development, and is the design sufficient to handle site changes?
- Is future development planned for the area and has it been considered?
- If used, is pipe jacking methods or channel lining appropriate for given site conditions?
- Are the drainage specifications adequate?
- Are there provisions for maintenance cleanouts for drainage?

General Checks

- Are any special agreements needed between State and local government?
- The right of way agreements, environmental permits, utilities agreements and materials reports have been reviewed in conjunction with the plans and proposal for consistency?
- Have the impacts of construction windows required by environmental resource agencies been addressed?
- Is there any maintenance problems or procedures anticipated as a result of the proposed construction and has special attention been directed to each situation?
- Have conditions changed since project was first designed and have modification been made as necessary to account for the changes?

BIDDABILITY REVIEW CONSIDERATIONS

- Verify that plan notes do not conflict with specifications and special provisions. Ideally plan notes should not reiterate what is already covered in the specifications and special provisions.
- Verify that typical section item descriptions exactly match the item descriptions in the roadway summary, bridge summary and bid schedule.
- Verify that the roadway summary and bridge summary item descriptions exactly match the bid schedule and special provisions descriptions.
- Verify that all bid items shown on the plans and called out in the special provisions are included in the bid schedule.
- Check the standard specification sections pay items against the bid schedule to ensure that all needed items are included in the bid schedule, or if not that these items are either 1) included in the bid item description or 2) called out as incidental to an included item. For example, items are often missed in Sections 212 and 405. An item for Braces is often missed in Section 610.
- Verify that specified sizes of pipes and structures match bid item descriptions.
- Verify that the summary of quantities are tabulated and summarized correctly.
- If there is more than one project included in the contract, verify that the roadway summary, bridge summary and bid schedule item descriptions are not conflictive among the projects. For example, if one project has plant mix including asphalt and additives as a bid item and the other project has three separate items for plant mix, asphalt and anti-strip confusion can ensue.
- Review latest edition of supplemental specifications for conflicts.
- Verify that the most current editions of SSPs and standard inserts are included.
- Verify that all special provisions have the necessary measurement and payment clauses.
- Verify that all required permits are included (e.g., SWPP, 404, NPDES).
- Verify that the estimating basis on the Project Clearance Summary Sheet is complete and includes estimating data for all aggregate items on the bid schedule.
- Check that the nominal maximum aggregate size is called out for plant mix and base in the estimating basis and is consistent with the bid schedule and roadway summary.

- Verify that a list of all utility owners and contact numbers is included for the utilities shown on the plan sheets.
- Verify that the limits of are construction shown and that abandoned alignments are noted and dashed on the plan sheets.
- Verify that required drainage structures are numbered in the plan and profile sheets.
- Verify that the Index of Sheets on the Title Sheet is complete and accurate.
- Verify that the log of test borings is included, if applicable.