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CHAPTER FOURTEEN

PLAN PREPARATION

Other Parts of this *Manual* provide the designer with uniform criteria and procedures for the design of a highway facility. A design must be incorporated into the construction plans so that it can be clearly understood by contractors, material suppliers, and Department personnel assigned to inspect the construction of the project. To ensure a consistent interpretation of the construction plans, individual sheets should have a standard format and content, and the sequence of plan assembly should be the same. This Chapter provides the general information in conjunction with the Project Development Process (PDP) necessary to prepare a complete set of construction plans for a road, bridge, traffic-signs, signalization, or lighting project. Chapter Eighty-five discusses criteria for the preparation of right-of-way plans. In addition to the information provided in this Chapter, the *INDOT Typical Plan Sheets* provides sample construction-plans sheets and guidance on what information should appear on each sheet.

14-1.0 PLANS DEVELOPMENT

14-1.01 Responsibilities

Figure 14-1A, Sheet Preparation Responsibilities for Road, Bridge, or Traffic Project, illustrates who is responsible for preparing the details for an in-house designed project. For consultant-designed plans, the consultant will be responsible for the preparation of all plans sheets. Minor, or baby, projects related to signs, lighting, or signals should be combined into one generic traffic project, which is associated with the lead project.

The designer will initially complete all plans sheets, computation sheets, quantity estimates, and cost estimates. A second qualified individual will independently review these documents. The qualifications of the reviewer should be commensurate with the item to be reviewed. For example, a second drafter should be qualified to check the preliminary drafting, but an engineer will be required to review the structural details and computations for a bridge design.

At a number of design stages the plans will be submitted to various Department units for review. Section 14-2.0 identifies the construction-plans sheets that should be completed at each design stage.

Prior to these submissions, the project manager is responsible for ensuring that all appropriate information has been incorporated onto the plans or is included with the plans; the plans are

consistent; all comments from previous submittals have been addressed; all calculations have been checked; and the overall content satisfies the Department's criteria.

14-1.02 Project Development

Chapter Two illustrates the steps the designer should follow in preparing a set of construction plans. Using this process will ensure that all appropriate information will be addressed in the construction documents. The following discusses the project development relative to the plan sheets.

14-1.02(01) Project Initiation

The Office of Planning and Programming is responsible for preparing the Engineer's Report. This Report provides the scoping information the designer needs to initiate the project design.

Prior to beginning design on an existing facility, the designer should review the as-built plans or the final design plans for that previous work. Final design plans are on file, on microfilm, in the Planning Division's Research and Documents Library. The actual as-built plans or microfilm are located in the appropriate district office. The district office is responsible for correcting the final design plans to reflect the as-built conditions.

Although the as-built plans are an important resource, the designer will conduct a field review or have a survey conducted for each road or bridge project. Section 14-3.0 discusses how to incorporate the survey data into the construction plans. For most traffic signing, signalization, or lighting work, a survey will not be performed. However, a field review will be required.

If the design requires a deviation from an INDOT *Standard Drawing*, it may be handled by either of the methods as follows.

1. A detail is included in the plans.

2. Reference is made to an INDOT *Standard Drawing*, which is not applicable to the situation, but is warranted anyway. For example, Standard Drawing 610-DRIV-05 is applicable if the mainline shoulder is paved and 8 ft or greater in width. In a restricted situation, it may be appropriate to have the drive constructed in accordance with 610-DRIV-04 instead. In this situation, it will be sufficient to add a note in the Pavement Quantities and Approach Table's Remarks column, as follows: *Construct in accordance with Standard Drawing 610-DRIV-04.*

The designer of a mother project should coordinate the combining of multiple projects into one contract. The pay items should be consistent (i.e., if one has QC/QA pavement, the other must also use QC/QA pavement if not otherwise warranted). If there is no mother project (i.e., two independent bridge replacement projects), the INDOT designer or project manager should coordinate the combining of the projects into one contract.

14-1.02(02) Field Check Stage

The designer is responsible for preparing and distributing plans for each field check. This will consist of the following:

1. Scheduling Field Check. The designer is responsible for setting the field check date. The designer must coordinate this effort with the project manager and the district Office of Construction's area engineer so that all the appropriate personnel can attend.

2. Notification and Plan Distribution. The designer is responsible for preparing the field check notification letter and submitting electronic plans so that they are received by all parties on the distribution list at least two weeks prior to the field check. The designer should strive for all plans to be distributed electronically. Utilities or other parties not able to accept electronic plans may require the transmission of paper copies. See Figure 14-1B, Field-Check Notification. An editable version of this form may also be found on the Department's website at www.in.gov/dot/div/contracts/design/dmforms/.

> ** *PRACTICE POINTER* **
>
> For work in Gibson, Posey, Vanderburgh, or Warrick county, a copy of the plans and notification letter should be sent to EUTS (Evansville Urban Transportation System). This information is shown on the distribution list on the Designer Forms webpage, at www.in.gov/dot/div/contracts/design/dmforms/.

4. Field Check Report. After the field check has been completed, the designer will be responsible for preparing a report of the meeting and listing the comments from all individuals involved in the field check. Copies of this report will be electronically distributed to all those involved in the field check and to those individuals listed in the distribution in Figure 14-1B.

14-1.02(03) Final Tracings Submittal

The construction project number should be shown in the box in the upper left hand corner of the Title Sheet and the lower right hand corner of all other plan sheets. For right-of-way plans, the right-of-way project number should be shown.

The designer will electronically transmit the Final Tracings to the project manager. The project manager will submit the Final Tracings to the Contract Administration Division. All submissions should be submitted electronically into ERMS. This submittal should include Figure 14-1C, Contract-Preparation Documents to Constracts Administration Division memorandum. An editable version of this document may be found on the Department's website, at www.in.gov/dot/div/contracts/design/dmforms/.

Other items to be submitted are as follows:

1. one set of marked-up Final Check Plans in PDF format;

2. final cost estimate (on Estimator), with a separate estimate prepared for each Des number, using the most recent bid history and pay item list files;

3. Recurring Special Provisions Menu in Microsoft Excel, covering all Des numbers in the contract. The Menu may be found on the Department's website, at www.in.gov/dot/div/contracts/standards/rsp/index.html.

4. modified recurring special provisions and unique special provisions in Microsoft Word.

5. Figure 14-1C, the Contract-Preparation Documents to Constracts Administration Division memorandum which includes information on the status of permits, right-of-way, etc. An editable version of this document may be found on the Department's website, at www.in.gov/dot/div/contracts/design/dmforms/;

6. Figure 10-2B, Utility Coordination Certification, and Figure 10-2D, Utility Coordination Certification waiver. Both appear on the dmforms website;

7. Figure 7-4A, Summary of Commitments, should be complete at the time of submittal of Figure 14-1C. The Summary should include all environmental-document, regulatory-agency, property-acquisition, and context-sensitive commitments. The Summary of Commitments Form appears on the dmforms website;

8. permits or permit information. See Section 9-1.03 for additional information;

9. subsurface investigation, or geotechnical summary;

10. Level One checklist;

11. design-exceptions summary;

12. Scope/Environmental Compliance Certification/Permit Application Certification form. An editable version of this document may be found on the Department's website, at www.in.gov/dot/div/contracts/design/dmforms/.

13. design computations and quantity calculations;

14. project correspondence files;

15. original survey books and electronic survey files on diskette or CD-ROM;

16. Bridge Search Data form. An editable version of this document may be found on the Department's website, at www.in.gov/dot/div/contracts/design/dmforms/.

17. Quality Assurance form. An editable version of this document may be found on the Department's website, at www.in.gov/dot/div/contracts/design/dmforms/.

18. Figure 14-1D, Asbestos Certification (for new bridge construction, bridge replacement, or bridge rehabilitation project), with original to the appropriate district bridge inspector; a copy to the Environmental Services Office's Environmental Policy Team leader; and a copy to be placed in the design calculations document. An editable version of the Asbestos Certification may be found on the Department's website, at www.in.gov/dot/div/contracts/design/dmforms/;

19. Geotechnical Review of Final Check Prints form. An editable version of this document may be found on the Department's website, at www.in.gov/dot/div/contracts/design/dmforms/;

20. Limited Review Certification. An editable version of this document may be found on the Department's website, at www.in.gov/dot/div/contracts/design/dmforms/;

21. consultant-project output files, if project is consutant-designed;

22. the map of the official detour route, where applicable, as developed by the district Office of Traffic, should be provided to the Contract Administration Division's Office of Contracting for incorporation into the Contract Information book; and

23. Traffic Management Plan (TMP) / Map, where applicable.

Maps of unofficial detour routes should not be provided. Also, the output from the pipe-material selection program should not be provided.

The Scope/Environmental Compliance Certification/Permit Application Certification form, design computations, quantity calculations, project correspondence files, and survey books are maintained by the Research and Documents Library Team as a reference file for the project.

If the contract-documents submission has been uploaded into ERMS and transitioned to CSREVIEW, and an additional document is required, it should be uploaded into ERMS.

If a submitted contract document has been uploaded into ERMS and transitioned to CSREVIEW and it requires revision, the procedure described below should be followed.

A new file should not be uploaded into ERMS. The original document should be revised, showing changes or additions highlighted in yellow, or deletions highlighted in red and struck through. The revised document should be e-mailed to the Contract Administration Division, Office of Estimating's planner.

If a new or revised document is to be submitted within 8 weeks of the letting date, it should first be e-mailed to the district construction engineer for approval. Upon such approval, he or she will then e-mail it to the Office of Estimating's planner.

Before a new user can access the FTP Site, he or she must have prior approval to access the site. A first-time user of ERMS must enroll in ERMS and designate the FTP Site as one of the selections in his or her profile. A current enrollee must modify his or her selections by adding the site to the profile.

1. <u>Instructions for the FTP Upload of Documents</u>.

    a. Login through the INDOT Web Portal (IWP).

    b. Once logged into IWP, click on the link for Design Submittals – FTP.

    c. Enter e-mail address in the top textbox. Currently, no e-mail will automatically be sent. However, an automatic e-mail service is being constructed.

    d. Click on the Browse button to open the file selection window. One or multiple files can be selected to load into the system. Once all desired files are selected, click on the Open button.

e. The lower right of the upload form shows the status of the upload of the files. Wait until it indicates the upload to be complete.

f. Once the files have uploaded completely, click on the arrow numbered 2 for step two.

g. Once all of the filenames have been sent to the step two box, highlight the first file in the list.

h. Information can be added to the files through either of the following methods.

(1) Complete all of the required fields (those in red) and the desired optional fields. After this information is completed, click on the Apply button. Highlight the next file in the list and repeat the process for entering the information, and again click on the Apply button. Continue this procedure for all files until all of the information is entered. Once each file includes the correct information, click on the step three arrow to complete the process.

(2) Complete all of the required fields (those in red) and the desired optional fields. After this information is completed, check the box next to Apply to All Files. Click on the Apply button. That set of information is now applied to each file in the list. Uncheck the box next to Apply to All Files. Review each file, highlight it individually, change the information that must be changed for each specific document, and click on the Apply button after each change. If the Apply button is not clicked, the changes will not take effect. Once each file includes the correct information, click on the step three arrow to complete the process.

2. <u>File-Uploading Considerations</u>.

1. The files must be fully uploaded before proceeding to the step 2 box. Otherwise the upload will be cancelled and the files will not be correct.

2. Files should not be uploaded more than once. Once the files are uploaded, they are kept on the server with their information until a background service runs and collects the files to place them into ERMS.

3. Files being uploaded more than once will show mistakes in their information. They will remain in the FTP until the Help Desk cleans and resets the FTP. If files are uploaded into ERMS through the FTP and they do not appear in ERMS

by the end of the day, submit a Help Desk request and the Help Desk will address the situation.

4. The title field for the required information is forced to the name of the file. Therefore, the name of the file should reflect its desiredERMS title.

5. The size of each file should not be greater than 40 megabytes. If a file becomes too large, there are issues with consultants and contractors who are trying to download the file from the system.

6. Not more than 180 files should be uploaded at one time.

3. Final Tracings Checklist. Figure 14-1E, Final Tracings Checklist, is available on the Department's website, at www.in.gov/dot/div/contracts/design/dmforms/.

Figure 14-1C, Contract-Preparation Documents to Contract Administration Division memorandum, should be completed by the project manager with the aid of the designer. The project manager or designer should transmit plans and environmental permits, along with right-of-way, utilities, and other pertinent information to the appropriate district construction engineer so that the construction engineer can assist in completion of the Contract Requirements Worksheet portion. The plans, permits, and information should be transmitted to the construction engineer in a timely manner such that the construction engineer can provide information including possible new or revised pay items or quantities. Once completed, the entire memorandum should be transmitted to the Planning Division's Research and Documents Library Team with the Final Tracings submittal. The construction engineer's recommendations should be incorporated into the Final Tracings submittal.

The ERMS I.D. required on the memorandum should preferably be the contract number. If the contract number is not yet assigned, the I.D. should be the Des number.

The project manager is responsible for the complete, accurate, and timely submittal of the Contract-Preparation Documents to Contract Administration Division Office of Estimating memorandum. If a project manager is not assigned to the work, the responsibility is that of the designer.

The editable version of the memorandum is on the Department's website, at www.in.gov/dot/div/contracts/design/dmforms/.

It is the responsibility of the designer handling a mother project to be certain that the tracings for all included projects are brought together and submitted to the project manager.

The Contract Administration Divsion's Office of Contracting enters the preliminary data on the project into TRANSPRT at this time. The information is processed by the Des number. If there

is more than one Des number, the data must be entered for each Des number and the cost estimates segregated by the Des number.

The Contracts Administration Division's Office of Contracting along with the Research and Documents Library Team prepares the original tracings for letting. Contract numbers and project numbers are checked, reference points are checked, Des numbers are checked, and a memorandum is prepared for the signer of the plans. The plans are signed and dated by the project designer and the Production Management Division director after the project is awarded.

14-1.02(04) Plans Revision Prior to Letting

Plans revisions are the changes made to a set of plans up to one week prior to letting. At this point, original plans sheets, other than the Title sheet, may be replaced with new sheets and numbered exactly as the original deleted sheets, with the original sheets discarded. New sheets that were not in the original plan numbering, that are inserted into an original set of plans will be numbered with a numeric extension as follows.

1. A new sheet inserted after 22 and before 23, should be numbered as 22-1.
2. Three new sheets inserted after 13 and before 14, should be numbered as 13-1, 13-2, and 13-3.
3. A new sheet added at the end of a 40-sheet set of plans should be numbered as 40-1, and not 41.

A change is made to the tracings with a revision note placed in the revision block on the title sheet (bridge project) or index sheet (road project). This revision note should include the date of the revision, the revised sheet numbers, and a short explanation of the change. A note should also be placed on the revised sheet or sheets in a location that will not restrict its visibility.

1. Erasures are permitted from the time the tracings are turned in to the Research and Documents Library Team until the plans are printed for distribution to potential bidders or others. This is approximately 5 weeks before the letting date. Within this 5-week period, revisions may only be made to the tracings with the approval of the appropriate district construction engineer. Such revisions are to be shown in clouds. Although with electronic drafting it is common for the designer to delete a sheet and substitute a new one in its place, the designer should still use clouds to assist plans users in finding the changes on the new sheet.

2. Revise the special provisions, noting all changes, if needed.

3. Revise quantities and construction cost estimate if needed.

4. Submit through ERMS the revised tracings, special provisions package, quantity computations, and the construction cost estimate using Estimator.

5. No changes are permitted within the week prior to the letting date.

The letting date, and not the plan signing date, controls when and how revisions can be made to the plans.

14-1.02(05) Contract Information Book Certification

Within 48 hours after receipt from the Contract Administration Division, the designer should review the plans and Contract Information book. The designer should complete Figure 14-1F, the Contract Information Book Certification form, and e-mail the completed form to the contact person identified on the form. An editable version of this document may be found on the Department's website, at www.in.gov/dot/div/contracts/design/dmforms/.

14-1.02(06) Construction Change

A construction change is made to a set of plans following the project letting and subsequent awarding to a contractor. Each construction change must be routed through the project manager to the Research and Documents Library Team for processing. A construction change is processed as follows.

1. Plans Sheets. Where a change is made to the tracings, a revision note should be placed in the revision block on the Title Sheet for a bridge project, or the Index Sheet for a road project. This revision note should include the date of the revision, the revised sheet numbers, and a short explanation of the change. A note should also be placed on the revised sheet or sheets in a location that will not restrict its visibility. No erasures may be made to the original tracings as they are considered a legal contract document at the time of letting.

   If space allows, the original item to be revised should be hatchmarked through and the revision should be made on the same sheet. The revision should be placed on the sheet in a location that will not restrict visibility, and should be shown in a cloud. If the revision is too large to be shown on the original sheet, the deleted sheet number should be noted in the revision block. This deleted sheet should remain in the original set of plans.

   a. Replacing an Existing Plans Sheet. If an existing plans sheet is to be replaced, the replacement sheet should be numbered with an alphabetic extension (number-letter) to indicate that it is a replacement sheet. The deleted sheet should be

identified in the revision block and should remain in the plans for future reference. Clouds must be used on the replacement sheet to indicate the changes made. The replacement sheet number should also be identified in the revision block. Examples of the number-letter extension are as follows.

(1) Sheet 2 is deleted, and sheet 2-A will take its place.
(2) Sheet 23 is deleted, and sheet 23-A will take its place.
(3) Sheet 17-A is deleted, and sheet 17-B will take its place.
(4) Sheet 15-1 is deleted, and sheet 15-1-A will take its place.

The number followed by a letter indicates that an existing sheet has been replaced.

b. Inserting a New Plans Sheet. If a new sheet is to be inserted into the original plans after the project is let and awarded, the added sheet should be given a numeric extension (number-number) to indicate that it is an added sheet. A new sheet is numbered according to the sheet preceding the insertion. The added sheet should be identified in the revision block. Examples of the number-number extension are as follows.

(1) Sheet 15-3 is inserted after sheet 15-2 and before sheet 16.
(2) Sheet 7-1 is inserted after 7-B and before sheet 8.
(3) Sheet 40-3 is inserted after 40-2 at the end of the set of plans.
(4) Sheet 5 is revised and two new sheets are added. The sheet numbers are 5-A (the revision to sheet 5), 5-1, and 5-2 (the two new sheets).

If a construction change is submitted electronically (through ERMS), the project manager must make certain that the Research and Documents Library Team receives the change. The Research and Documents Library Team will then prepare a Construction Change Memorandum for distribution. It will provide the district with three full-size sets of plans and the contractor with four full-size sets of plans. The remainder of the distribution will be made by e-mail, ERMS, or CD. Copies may be made at the recipient's own convenience.

2. Research and Documents Library Team. A memorandum will be prepared by the Research and Documents Library Team to the district construction engineer (see Figure 14-1G, Construction Change memorandum). An editable version of this form may also be found on the Department's website at www.in.gov/dot/div/contracts/design/dmforms/. Six sets of full-size plans should accompany this memorandum to the district Office of Construction. Quantity revisions are computed and transmitted by the designer with the memorandum for use by the project's field personnel in preparing Form IC-626.

3. Distribution. A half-size set of plans and a copy of the memorandum should be distributed to the following:

   a. the Federal Highway Administration, if applicable;
   b. the contractor;
   c. the project engineer;
   d. Contract Administration Division's Office of Contracting;
   e. Office of Real Estate, if right of way or railroad is involved;
   f. project manager;
   g. consultant, if applicable;
   h. Planning Division's Bridge Inventory Team, if a bridge project;
   i. Planning Division's Research and Documents Library Team;
   j. district manager of Office of Real Estate and Right-of-Way;
   k. Production Division's load rating engineer, if revision involves a bridge;
   l. data specialist, Office of Construction Technical Support;
   m. district director (letter only);
   n. district manager of Office of Consultant Services (letter only)

14-1.02(07) Shop Drawings and Falsework-Review Procedure

The following procedure should be implemented for submittal and review of shop drawings, falsework drawings, or related documents as described below. Regardless of the submittal process described, it is the intent that the contractor communicates directly with the project engineer or supervisor to keep him or her informed of the status of submittals. If the district has concerns about the structural integrity of shop drawings certified by a professional engineer, it should contact its construction management field engineer for further assistance.

1. Structural Members and Related Work. Shop drawings for the following work are to be submitted by the fabricator or supplier, for review and approval. Shop drawings must be in accordance with the applicable specifications. Work which does not require certification by a professional engineer for submittal is as follows:

   a. structural steel or structural concrete members;
   b. expansion joints type M;
   c. expanstion joints type S-S; or
   d. elastomeric bearings.

2. Mechanically-Stabilized Earth Retaining Wall. The shop drawings and calculations are to be submitted by the contractor or fabricator directly to the designer of record for review and approval. The shop drawings must be certified by a professional engineer.

The designer will attach a cover letter and transmit the approved shop drawings to the fabricator and two sets to the district Office of Construction for further distribution.

3. Precast-Concrete Structure. The shop drawings and design calculations for a 3-sided or oversized-box structure are to be submitted to the Office of Roadway Services for review and approval. The shop drawings must be certified by a professional enfineer. Roadway Services will distribute the approved shop drawings to the fabricator and district Office of Construction.

4. Traffic-Control Work. For an IPOC project, shop drawings are to be submitted to the Office of Roadway Services for review and concurrence. For a non-IPOC project, shop drawings are to be submitted to the designer for review and concurrence.

5. Falsework or Temporary Bridge. Drawings are to be submitted to the project engineer or supervisor. Each drawing must include the contract number and contractor's name, and must be certified by a professional engineer. Work which requires drawings submittal is as follows:

   a. cofferdam;
   b. temporary deck falsework;
   c. coping falsework;
   d. falsework for a reinforced-concrete slab superstructure;
   e. falsework for a hammerhead-pier cap; or
   f. temporary bridge or runaround.

The submittal for a temporary bridge must also include design calculations.

The project engineer or supervisor will review the drawings only for compliance with the specifications and the specific project conditions. The Division of Construction Management's field engineer is available for assistance. Questions should be directed through the district Office of Construction area engineer.

6. Permanent Metal Deck Forms. The shop drawings are to be submitted by the contractor to the District Office of Construction for review only for compliance with the specifications and the specific project conditions. Shop drawingss submitted by the contractor must be certified by a professional engineer. The Division of Construction Management maintains a deck-forms calculation spreadsheet that can be of assistance in review of the shop drawings.

7. Foundation Seal or Deck-Pour Sequence. A request for the use of a foundation seal not shown on the plans is to be submitted to the Division of Construction Management for review and approval. The submittal must include the contract number and contractor's

name, and must indicate the location and dimensions of the seal. The Division of Construction Management will distribute the approved request.

A request to revise the planned deck-pour sequence is to be submitted to the Division of Construction Management for review and approval. The submittal must include the contract number, contractor's name, and the original and proposed alternate sequence and pour rate. The Division of Construction Management will distribute the approved request.

8. Stream Crossing or Work Bridge. A proposal for this work is to be submitted to the District Construction office for review and approval. If the proposal varies from the contract's environmental-permit conditions, the contractor must obtain approval for the change from the appropriate agency.

9. Miscellaneous Work. Shop drawings for miscellaneous work not described above, i.e., post-tensioning plan, non-standard manhole, etc., should be submitted through the project engineer or supervisor. He or she should work with the district Office of Construction and the Division of Construction Management to determine the approval process for the work.

Shop drawings and calculations should be submitted in the contract's measurement units.

14-2.0 PLANS SUBMISSIONS

14-2.01 Road Plans, New Construction or Reconstruction Project

14-2.01(01) Grade-Review Meeting

A grade-review meeting should be held with the project manager prior to the Stage 1 plan-review submittal. The meeting is primarily for a Major project and is to be held at the discretion of the project manager. The following plans sheets and overall sheets must be prepared for the grade-review meeting.

1. Typical Cross Sections. These should include the following:

   a. lane and shoulder widths;

   b. profile grade;

   c. cross slope;

d. curbs;

e. sidewalk locations and widths;

f. bicycle facilities;

g. side slopes;

h. shoulder corrugations, if warranted; and

i. ditches.

2. Overall Plan View. A sheet showing the overall plan view of the existing topography and preliminary geometrics is required. The overall plan view should be to a scale which is legible for review and discussion at the meeting. More than one sheet may be required.

3. Overall Proposed Profile Sheet. A sheet showing the overall proposed profile with the existing ground is required. The overall proposed profile should be to a scale which is legible for review and discussion at the meeting. More than one sheet may be required.

4. Interchange Layout or Overall Layout Sheet. A sheet showing the overall plan view of the existing topography and preliminary geometrics for each interchange is required. The overall plan view should be to a scale which is legible for review and discussion at the meeting. More than one sheet may be required.

14-2.01(02) Interchange-Geometrics Submission to FHWA

For a project which includes at least one interchange requiring Federal oversight, the proposed horizontal alignment for the interchange may be required prior to the Stage 1 review submission. The following must be considered for Quality Assurance.

1. Geometrics. The plans sheets for the interchange geometrics should be graphically completed including stationing, curve data, bearings, etc. The design speed for each ramp should be shown.

2. Ramp Grades. Investigate ramp grades in as much detail as required to determine their effect on the proposed horizontal alignment.

3. Traffic Elements. The traffic elements to be considered to determine their effect on the interchange alignment are as follows:

a. traffic counts and turning movements;

b. consideration of signing;

c. consideration of signals at ramp terminals; and

d. consideration of illumination (high mast or conventional).

4. Design Information. Include all applicable design information (e.g., economic analysis, drainage analysis).

14-2.01(03) Stage 1 Review Submission

Plans should be approximately 25% complete at this stage.

Place the proposed design information in the computer-aided details file for this submittal. This information will be submitted in pdf format. However, the plans need not be in final form. The designer should place notes on the plans which explain situations or items which are not readily apparent, and which may influence the proposed design. The notes are to be removed in later submissions.

The following sheets and information must be reviewed for Quality Assurance and should be included with the review submission:

1. Conformance. Review the plans for conformance with the Level One controlling design criteria listed in Section 40-8.02(01), and indicate apparent or possible design exceptions. Also, identify discrepancies from the Level Two design criteria listed in Section 40-8.02(02).

2. Abbreviated Engineer's Assessment. Provide a written scope of the project requirements. This will be a short description of the criteria proposed for use in the design of the project.

   a. If an Abbreviated Engineer's Assessment has been prepared, a copy should be included with the submission.

   b. If an Abbreviated Engineer's Assessment was not prepared, the designer should provide a brief written description of the project. The description will, at a minimum, include the information as follows:

      (1) project location;

(2) project need and purpose;
(3) existing facility;
(4) traffic data;
(5) identification of proposal;
(6) cost estimate;
(7) environmental issues;
(8) right-of-way impact;
(9) traffic maintenance during construction; and
(10) concurrence. For an INDOT project, signed by the district production director or the district planning director. For an LPA project, signed by the Project Sponsor.

3. Level One Checklist and Design Computations. The designer should submit a Level One checklist, including computations for the mainline and each S-line. The designer should include computations for the required intersection sight distance at each public road, including each local-service road or frontage road within the project limits. The designer should also submit documentation of the intersection sight distance provided at each public road. Level One Criteria verification is not required for maintenance of traffic at this time.

It is not necessary to submit a Level One checklist for an S-line that does not exceed the work necessary to build the appropriate public-road approach, including the required taper distance to account for transitioning to the existing pavement width. This does not relieve the designer of making the project satisfy all Level One design elements for such an S-line, e.g., maximum grade, vertical stopping sight distance, and intersection sight distance.

The computations for the Level One items and intersection sight distance are to be initialed and dated by the designer and reviewer before submission. The items to be included are as follows:

a. Level One checklist;

b. project-length computations including guardrail lengths and other contributing factors; and

c. design computations for determining geometrics.

4. Index and Title Sheet. At this project stage, information on the title sheet should include the following:

a. project numbers;

b. description (des) number;

c. location map;

d. project location map including north arrow and scale;

e. description of the project work type and location;

> ** *PRACTICE POINTER* **
>
> The location description should be simple and should follow the description on the schedule. For example, *Bridge replacement on State Road 67 over Fall Creek, located 8 miles southwest of the south junction with State Road 39, in Section 13, T-11-N, R-2-W, Ray Township, Morgan County, Indiana.* A legal description should not be used.

f. design data including design speed, project design criteria, functional classification, terrain, traffic data, urban or rural area, and access control.

g. applicable reference point (does not apply to local agency project);

h. signature blocks, but not filled in at this stage;

i. gross and net project lengths, not including incidental construction or lengths along S-lines;

j. an index of plan sheets at this stage. Sheet numbers will change for future submittals;

k. list of utility owners and addresses;

l. bridge structure information;

m. latitude and longitude; and

n. appropriate version of Standard Specifications.

5. Typical Cross Sections. Typical cross sections should show only the basic configuration and design features. These include the following:

   a. lane and shoulder widths;

   b. profile grade, construction centerline, paper-relocation line, and survey-line locations;

   c. basic design features including curbs, sidewalk locations and widths, pavement and shoulder cross slopes, side slopes, ditches, shoulder configurations (if warranted), bicycle facilities, etc.; and

   d. clear-zone width for 4R project, or obstruction-free-zone width for 3R project.

6. Plan and Profile Sheets. These sheets will include only the preliminary design information. The details that should be addressed include the following:

   a. existing topography;

   b. beginning and end of project;

   c. horizontal alignment (e.g., horizontal curve data, PC, PI, PT, bearings);

   d. vertical alignment and its relationship to grade-controlling features;

   e. preliminary drainage design including mainline culverts, but not including ditch grades or storm sewers;

   f. preliminary public-road approach and drive locations;

   g. alignment-controlling features (e.g., high-water levels, existing crossroads and bridges, regulated drains, drainage structures, railroads, underdrain criteria, traffic-maintenance considerations, cemeteries, historical buildings, parks, ADA requirements, etc.);

   h. construction limits;

   i. proposed guardrail limits; and

   j. survey reference ties and benchmark data.

7. Details. These should include only the superelevation-transition diagrams.

8. Interchange. If the project includes at least one interchange, the general layout of the interchange should be shown, including the following:

   a. geometrics;

   b. preliminary ramp grades;

   c. horizontal and vertical alignments;

   d. traffic elements; and

   e. design information.

9. Cross Sections. The preliminary cross sections should include the following:

   a. templates of the typical sections placed on the existing cross sections;

   b. profile-grade elevations; and

   c. mainline drainage structures.

10. Design Information. In addition to the plans, the designer should include copies of the preliminary hydraulic analysis for each mainline culvert, if applicable, and results of economic analyses that may have been completed for alternative grade lines. The preliminary cost estimate should be developed for the major pay items with percentages for the minor pay items. The hydraulic analysis should be signed and sealed by a professional engineer licensed in Indiana.

11. Certification. Provide a current copy of the Scope/Environmental Compliance Certification/Permit Application Certification form with this submission.

12. Quality Assurance Form.

14-2.01(04) Geotechnical Investigation Request Submittal

Upon approval of the Stage 1 review submission, the Geotechnical Investigation will be requested. Anticipated pavement sections and intended treatment should be provided. The sheets to be included with this request are as follows:

1. title sheet;

2. Typical Cross Sections;

3. roadway plan and profile;

4. bridge General Plan;

5. Layout;

6. Details. This should show approximate location of a noise wall, retaining wall, or high-mast-lighting tower; and

7. cross sections.

14-2.01(05) Preliminary Field Check Meeting

A preliminary field check meeting should be held after the Stage One review submission and prior to the Stage Two review submission. The preliminary field check meeting is not part of a review submittal. Plan sets should be distributed a minimum of two weeks prior to the meeting (see Figure 14-1B, Field-Check Notification).

To hold the Preliminary Field Check meeting, plans should be approximately 40% complete. The following plans sheets and information must be included for Quality Assurance.

1. Previous Reviews. Incorporate comments from the previous reviews.

2. Conformance. The designer should check the plans for conformance with the Level One controlling design criteria listed in Section 40-8.02(01). Apparent or possible design exceptions should be identified. Discrepancies from the Level Two design criteria listed in Section 40-8.02(02) should also be identified. The required documentation for all Level One and Level Two design exceptions should be prepared.

3. Title and Index Sheet.

4. Plat Sheet. A preliminary Plat No. 1 should be included for a project on a Department-maintained route requiring right of way. See Section 85-2.0.

4. Plan and Profile Sheets. In addition to the information described in Section 14-2.03(02), show the following:

   a. project limits;

b. elevations and grades of ditches so that accurate right-of-way requirements can be determined;

c. construction limits;

d. proposed right of way, including temporary right of way;

e. public-road approach and drive locations;

f. approximate roadside barrier locations;

g. new sidewalks, bicycle lanes, etc., if not shown on the Details sheets; and

h. conceptual storm-sewer layout which includes the trunk line and outlet locations.

5. Details Sheets. Include preliminary layouts for the details as follows:

a. roadway and shoulder layout for guardrail;

b. modified approaches, signs, sign structures, lighting, signals, where applicable;

c. intersection layout details including right- and left-turn lanes with the turning movements indicated;

d. retaining walls;

e. special drainage structures;

f. superelevation-transition diagrams;

g. weigh station and associated facilities;

h. rest area and associated facilities; and

i if shoulder corrugations are warranted, and the plans include details for non-standard public-road approaches, drives, etc., each detail should show the extent of corrugations installation required in conjunction with the construction illustrated by the detail. If applicable, the INDOT *Standard Drawings* should be used as a guide in determining the limits of corrugations installation relative to the feature shown in the detail.

6. Traffic-Maintenance Details. The conceptual traffic-maintenance scheme and phasing should be outlined. Level One criteria verification is not required at this time. Plans should be developed to satisfy the PDP Manual's Project Constructibility Review 1.

7. Cross Sections. The preliminary draft should include the following:

   a. profile-grade elevations;

   b. templates of the typical sections placed on the existing cross sections;

   c. drainage structures;

   d. approaches and drives; and

   e. buildings.

8. Design Information. The activities which should occur include the following:

   a. Fish and Wildlife Review, if applicable;

   b. Geotechnical coordination;

   c. unique special provisions initiation;

   d. preliminary woody-revegetation determination; and

   e. pavement design request submittal.

14-2.01(07) Preliminary Right-of-Way Plans Preparation

See Chapter Eighty-five for criteria and information that should be included with the Right-of-Way Plans. The designer should review the instructions for Quality Assurance.

14-2.01(08) Stage 2 Review Submission

Plans should be approximately 55% complete at this stage.

Plans for this submittal should be close to their final form and should be legible and consistent with the quality desired for public viewing at a public-information meeting, if required. The procedure for such meeting should be in accordance with Section 14-02(02). The designer

should review the *INDOT Typical Plan Sheets* document to determine what information should be included on each sheet. Review the following sheets and information for Quality Assurance and include them with this submission.

1. Previous Reviews. Include the marked-up plans from the Stage One submittal, changes made from the Preliminary Field Check meeting, and comments from the construction review with this submission. Include revisions to the plans due to Geotechnical Report recommendations, if completed. Include responses to preliminary field check questions.

2. Conformance. The designer should check the plans for conformance with the Level One controlling design criteria listed in Section 40-8.02(01). Apparent or possible design exceptions should be identified. Discrepancies from the Level Two design criteria listed in Section 40-8.02(02) should also be identified. The required documentation for all Level One and Level Two design exceptions should be prepared.

3. Index and Title Sheet. Finalize the title sheet and index sheet for the roadway plans.

4. Plat Sheets. Plat sheets, if required, should be consistent with the plans and finalized.

5. Plan and Profile Sheets. Right of way should be finalized and consistent with the detail sheets. Additional information to be shown is as follows:

    a. drainage features (e.g., storm sewers, pipe structures, ditch grades, preliminary inlet spacing for storm-sewer trunk line design, etc.) and proposed drainage notes; and

    b. permanent erosion protection, including paved side ditches, riprap, and sodding limits.

6. Structure Data Table The table should be in a preliminary form and should include structure numbers and locations.

7. Approach Table. The table should be in a preliminary form and should include approach geometrics.

8. Cross Sections.

9. Design Information. Information to be included is as follows:

    a. hydraulics and storm-sewer calculations, signed and sealed by a professional engineer licensed in Indiana; and

b. cost estimate. The preliminary cost estimate should be refined for the major pay items with percentages shown for the minor pay items.

10. Level One Checklists and Design Computations. If there are no changes to the plans which affect Level One criteria since the prior submission, it is acceptable to copy the previous Level One Checklist and add a statement that no changes have been made to the plans that affect Level One criteria. The statement should be initialed and dated for the current submission. The plans must be developed to satisfy the PDP Manual's Project Constructibilty Review 2.

The designer should submit a Level One checklist, including computations for the mainline, each S-line, and each traffic-maintenance phase. The designer should include computations for the required intersection sight distance at each public road, including each local-service road or frontage road within the project limits. The designer should also submit documentation of the intersection sight distance provided at each public road. This requirement also applies to the traffic-maintenance phases.

11. Certification. Include a current copy of the Scope/Environmental Compliance Certification/Permit Application Certification form.

12. Quality Assurance form.

14-2.01(09) Right-of-Way Plans Preparation, if done by others

Chapter Eighty-five provides the criteria and information that should be included with a set of right-of-way plans. The designer should review the instructions for Quality Assurance as follows.

1. Previous Reviews. Incorporate all revisions made during the previous plan submissions.

2. Checklist for Right-of-Way Plans. Complete the checklist shown in Figure 85-2F.

3. Plan Sheets. The required sheets and information are as follows:

a. title sheet;

b. Index and General Notes sheet;

c. plat sheet;

d. Location Control Route Survey Plat;

e. plan and profile sheets;

f. Details sheets;

g. Approach Table;

h. all sheet cross references; and

i. all project-information boxes, including right-of-way project number and sheet numbers.

4. Initiate right-of-way engineering.

5. Quality Assutance form.

14-2.01(10) Hearing Plans Preparation, if required

If a public-information meeting or hearing is required, provide plans and documents to the Office of Public Hearings for Certification of the Hearing Process. The public-information meeting may be a requirement due to the amount of right of way being taken or deemed necessary by the project manager. The meeting will be held after the Stage 2 plans have been reviewed.

An opporunity for a public hearing will be afforded if a project satisfies at least one of the criteria as follows:

1. more than 0.5 ac of permanent right of way is required;

2. the layout of the improved facility's function is to be substantially changed;

3. it may have an adverse impact on abutting property;

4. it may have a significant social, economic, environmental, or other effect;

5. a ramp within the project limits is to be closed for 7 days or longer;

6. there is impact on a wetland;

7. it involves a significant floodplain encroachment;

8. there is impact on a resource eligible for or included in the National Register of Historic Places; or

9. FHWA has determined that an opportunity should be afforded.

If an opportunity for a public hearing need not be afforded, a public notice must be made available for comment on Section 106 findings.

The following sheets and information should be provided.

1. Stage 2 plan sheets and the revisions from the Stage 2 review.

2. Environmental requirements are satisfied by one of the following:

    a. the Environmental Impact Statement is complete and the Record of Decision (ROD) has been issued;

    b. the Environmental Assessment is complete and a Finding of No Significant Impact (FONSI) is made by FHWA; or

    c. the Categorical Exclusion is complete and concurred in by FHWA.

3. Updated Scope/Environmental Compliance Certification/Permit Application Certification form.

4. Traffic-Maintenance Plan. In preparation for a public information meeting, the designer may be asked to perform the activities as follows.

    a. Displays. Prepare displays that can be used in a coordination meeting or a public information meeting. These include, but are not necessarily be limited to, sketches of the typical cross section for each phase of the construction, and composite drawings showing all ramp closures with traffic-flow arrows indicating the number of lanes to be open during each construction phase.

    b. Transportation Management Plan (TMP). Address the requirements of a TMP that has been developed for the project.

    c. Queues. Analyze the capacity constraints due to lane closures, including anticipated queues and user costs. This can be done using the QUEWZ software discussed in Chapter Eighty-one.

14-2.01(11) Final Plans Right-of-Way Plans Preparation

Chapter Eighty-five provides the criteria and information that should be included with a set of right-of-way plans. This submission is not required for a local public agency project. The designer should review the instructions for Quality Assurance, and perform the following:

1. include the marked-up Preliminary Right-of-Way Plans with this submission, if required;

2. incorporate all revisions made during the Preliminary Right-of-Way Plans submission review;

3. complete all project-information boxes, including right-of-way project number and sheet numbers;

4. complete all sheet-numbers cross references; and

5. review the plans against the checklist shown as Figure 85-2F.

14-2.01(12) Final Field Check Meeting

A Final Field Check meeting should be held after the Stage Two review submission and prior to the Stage Three review submission. The Final Field Check meeting is not part of a review submittal. The meeting is to be held at the discretion of the project manager for each major project. The meeting should not be required for a minor project. Plans sets should be distributed a minimum of two weeks prior to the meeting (see Figure 14-1B, Field-Check Notification).

To hold the Final Field Check meeting, plans should be approximately 80% complete. The following sheets and information must be included for Quality Assurance.

1. Previous Reviews. Incorporate comments from the previous reviews.

2. Plans Sheets. The plans should be nearly complete. Changes resulting from the public information meeting, geotrechnical recommendations, and pavement-design recommendations should be incorporated onto the plans. Legends on sheets should be completed and checked for accuracy and consistency with Section 14-3.04. The designer should include the information on the sheets as follows.

    a. Title Sheet. Complete the Design Data block.

    b. Index and General Notes Sheet. Check the general notes to ensure that they are current and accurate. Revise the index as necessary.

c. Plan and Profile Sheets.

(1) Ensure that structure notations are completed; sodding, riprap, and paved sodded ditch locations are indicated; earthwork balances are shown; and removal items identified.

(2) Update all property lines based on right-of-way engineering. Add the station-and-offset callout for each right-of-way or property-line break point.

d. Details Sheets. Ensure that all details are completed and included. This includes details for traffic maintenance and traffic-design elements (e.g., intersections, signals, signing, and lighting). The plans must be developed to satisfy the PDP Manual's Project Constructibilty Review 3.

e. Tables. Complete all data tables including the following:

(1) Structure Data Table;

(2) Approach Table; and

(3) Underdrain Table.

f. Cross Sections. Design information should be essentially complete. This includes final structure indications, earthwork areas and volumes, and benching areas and volumes.

14-2.01(13) Stage 3 Review Submission

Plans should be approximately 95% complete at this stage.

The purpose of this submittal is to ensure that the plans are complete and satisfy the criteria provided in the Engineering Assessment studies. The following should be completed and reviewed for Quality Assurance. Include responses to Final Field Check questions.

1. Previous Reviews. Include the marked-up plans from the Stage 2 submittal and changes made from the Final Field Check meeting with this submission.

2. Conformance. Review the plans for conformance with the Level One controlling design criteria listed in Section 40-8.02(01) and indicate approved dates for design exceptions.

3. Plans Set. If a Final Field Check meeting is not held at the discretion of the project manager, all of the plans requirements of Section 14-2.01(09) should be incorporated.

   a. Erosion Control Plan. Include the completed set.

   b Road Summary Sheets. The content and requirements are described below. For a large project for which the standard-sized Summary tables cannot accommodate all of the items, multiple custom Summary sheets should be used to accommodate all the necessary information. The Summary sheet frames, in DXF format, can be downloaded from www.in.gov/dot/div/design. The Pavement Quantities and Approach Table, Structure Data, Paved Side Ditch Summary, Riprap Ditch and Sodding Table, Underdrain Table, Guardrail Summary Table with guardrail-related pay items, Sign Summary Table, Pipe Material Selection, and mailbox approaches information including required HMA quantities should be completed. The Structure Data tables should be updated to include Service Life, Site Designation, and pH for pipes.

   c. Cross Sections. The project engineer or supervisor will require the elevations for existing cross sections in order to calculate the final earthwork quantities.

      If the project was designed from an electronic survey, the design calculations should include a data table created from the electronic cross-sections which indicates all existing cross-section elevations.

      An example data table is shown as Figure 14-2A.

4. Quantities. Finalize all quantities.

5. Reports. Ensure that the recommendations from the Geotechnical Report and other reports regarding peat, hazardous waste, special waste, etc. have been incorporated into the plans, specifications, and cost estimate.

6. Cost Estimate. Conduct a detailed review to ensure that all necessary pay items have been included. Finalize the construction cost estimate using Estimator.

7. Level One Checklists and Design Computations. If there are no changes to the plans which affect Level One criteria since the prior submission, it is acceptable to copy the previous Level One Checklist and add a statement that no changes have been made to the plans that affect Level One criteria. The statement should be initialed and dated for the current submission.

8. Certification Form. Include a copy of the Scope/Environmental Compliance Certification/ Permit Application Certification form.

9. Special Provisions. Complete the special provisions menu, and include special provisions for non-standard pay items.

10. Rule 5. If required, and not previously submitted in accordance with Section 9-1.02, complete the Rule 5 Submission as described in Chapter Thirty-seven.

11. Underground-Storage-Tanks Removal. If this work is required, the designer should coordinate such activity with the Office of Environmental Services manager. The designer should complete Figure 14-2B, Underground Storage Tanks Removal information request. An editable version of this document may be found on the Department's website, at www.in.gov/dot/div/contracts/design/dmforms/. If a final field check is not required, the coordination should take place six months prior to the Ready for Contract date.

    This coordination is to ensure that required pay items such as excavation and handling of contaminated soil are included in the contract.

12. Quality Assurance form.

14-2.01(14) Final Tracings Submission

Plan should be 100% complete at this stage. The construction project number should be shown in the box in the upper left-hand corner of the title sheet and the lower right-hand corner of all other sheets.

The project manager will submit the Final Tracings package to the Contracts Administration Division's Office of Contracting. The submittal should include the items listed in Section 14-1.02(03).

14-2.02 Road Plans, Rehabilitation Project with No Additional Right of Way Required

14-2.02(01) Grade-Review Meeting

A grade-review meeting should be held with the project manager prior to the Stage 1 plan review submittal. The meeting is for a major project and is at the discretion of the project panager. The following plan sheets and overall sheets must be prepared for the grade-review meeting;

1. Typical Cross Sections. This should include the following:

   a. lane and shoulder widths;

   b. profile grade;

   c. cross slopes;

   d. curbs;

   e. sidewalk locations and widths;

   f. bicycle facilities;

   g. side slopes;

   h. shoulder corrugations, if warranted;

   i. ditches;

   j. detailed pavement design showing intended pavement treatment, such as resurfacing, crack and seating, rubblizing, replacement, etc.;

   j. underdrains, with locations shown relative to pavement; and

   k. clear-zone width, if 4R project.

2. Overall Plan View. A sheet showing the overall plan view of the existing topography and preliminary geometrics is required. The overall plan view should be to a scale which is legible for review and discussion at the meeting. More than one sheet may be required.

3. Overall Proposed Profile Sheet. A sheet showing the overall proposed profile with the existing ground is required. The overall proposed profile should be to a scale which is legible for review and discussion at the meeting. More than one sheet may be required.

4. Interchange Layout or Overall Layout Sheet. A sheet showing the plan view of the existing topography and preliminary geometrics of each interchange is required. The overall plan view should be to a scale which is legible for review and discussion at the meeting. More than one sheet may be required.

14-2.02(02) Stage 1 Review Submission

See Section 14-2.01(03).

14-2.02(03) Geotechnical Investigation Request Submittal

See Section 14-2.01(04).

14-2.02(04) Preliminary Field Check Meeting

See Section 14-2.01(05).

14-2.02(05) Stage 2 Review Submission

See Section 14-2.01(06).

14-2.02(06) Public-Information Meeting

See Section 14-2.01(08).

14-2.02(07) Final Field Check Plans Submission Meeting

If a final field check is required, see Section 14-2.01(10).

14-2.02(08) Stage 3 Review Submission

See Section 14-2.01(11).

14-2.02(09) Final Tracings Submission

See Section 14-1-02(03).

14-2.03 Road Plans, Partial 3R Project

14-2.03(01) Preliminary Plans

1. Title Sheet. This is the first page and should include the information as follows:

   a. contract and Des numbers;
   b. traffic data;
   c. design data as follows:

      (1) design speed;
      (2) project design criteria: Partial 3R (non-freeway);
      (3) functional classification;
      (4) rural or urban setting;
      (5) terrain; and
      (6) access control;

   d. project description information as follows:

      (1) route number;
      (2) county name and congressional township, range, and section;
      (3) limits described from Department-maintained route intersections and by Reference Post system; and
      (4) length (gross and net);

   e. location map, including information as follows:

      (1) civil boundaries;
      (2) county, township lines, corporate limits;
      (3) nearby Department-maintained routes and major local roads;
      (4) north arrow; and
      (5) project limits, with stations and highlighted graphics;

   f. paving exceptions, with stations;
   g. station equations;
   h. current INDOT *Standard Specifications* effective year;
   i. certification block; and
   j. state location map.

2. Construction Plans Index. The Construction Plans Index is a tabulation and description of the numbered design drawings to be included in the plans document.

3. Strip Map. This is a line drawing which shows the following:

   a. route number;
   b. beginning and ending stations and reference posts and station equations.

Consistent units should be used throughout the plans;

c. stations and reference posts for intersecting streets, county roads, city or town limits, and intersecting county lines and railroad crossings, bridges, and paving exceptions;

d. north arrow;

e. location of all recommended construction signs;

f. existing utility lines within construction limits; and

g. civil townships.

4. Typical Cross Sections. These are composed of the basic parts as follows.

a. Illustration.

(1) Existing conditions and dimensions (i.e., pavement width, material type, thickness cross-slope, curb, shoulder, ditches, etc.).

(2) Proposed construction and dimensions (i.e., HMA courses with binder grading, overlay cross-slope, widening, curb shoulders, ditches, shoulder corrugations if warranted, etc.).

b. Legend showing labels and corresponding items. The descriptions shown in the pay item names should be used where applicable.

c. Title block.

(1) Route number.

(2) limits of section and exceptions.

d. Supplemental information block (i.e., curve data for superelevation).

5. Typical Approach Details. The INDOT *Standard Drawings* should be used. Existing field conditions not in accordance with the details shown on the *Standard Drawings* will require details to be shown on the plans.

6. Miscellaneous Details. These include all other details not covered by the strip map, typical section, or INDOT *Standard Drawings*.

7. Special Provisions. The designer should follow the guidelines for preparing special provisions described in Section 19-2.0. The designer should not specify the use of proprietary or experimental products or construction methods.

14-2.03(02) Assessing Preliminary Pavement Design

Once the project has been assessed to be a partial 3R project, the designer should determine an approximate pavement thickness for developing preliminary typical cross sections.

14-2.03(03) Preliminary Field Check

The preliminary field check should occur at a point before development of preliminary plans. The preliminary field check should be scheduled with the district-office entities involved with plan development. The arrangements for scheduling the preliminary field check should be made while plan development is still proceeding, if possible. Copies of preliminary plan documentation should be made available for review prior to the preliminary field check.

The persons who should attend the preliminary field check are as follows:

1. District Personnel.

    a. Design Team leader.
    b. Office of Construction area engineer.
    c. Office of Construction field engineer.
    d. Subdistrict manager or unit foreman.
    e. Designer.
    f. Traffic engineer.
    g. Utilities/railroads engineer.

2. Other Personnel.

    a. Local government agency if applicable.
    b. Local utilities if applicable.
    c. Planning Division's Office of Pavement Engineering manager, if AADT $\geq$ 5000 or trucks percentage $\geq$ 10%.

14-2.03(04) Right of Way

Right-of-way acquisition should not be required. If it is required, the designer should return to the Engineering Assessment phase to consider the project as full 3R, 4R, or possibly new construction.

14-2.03(05) Public Hearing

Public involvement should not be required. If it is, the designer should see Chapter Eight.

14-2.03(06) Utilities and Railroads

The portions of the project limits which may affect existing utilities should also be addressed early in the PPD phase. The designer should stay in contact with the district Utilities/Railroads Team leader to ensure that existing utilities are relocated to avoid delays in the project development. To accomplish this, the district Utilities/Railroads Team leader should have final check prints as early as possible.

If one or more railroad crossings are within the project limits, the district Utilities/Railroads Team leader should be advised. See Chapters Eleven and Forty-seven.

14-2.03(07) Calculations

The calculations must follow a systematic and logical methodology. All calculations should be reviewed for accuracy. Systematic calculations make review and verifying quantities considerably more efficient. All calculations should be submitted with the final documents and should remain the property of the Department.

14-2.03(08) Returned Correspondence

Once input from the district offices of Highway Management, Roadway Services, Construction, and Traffic has been received with suggested changes following the preliminary field check, it may be necessary to arrange and conduct a final field check. See Section 14-2.08(02) for the personnel list who should attend this field check.

14-2.03(09) Final Pavement Design

If the current AADT $\geq$ 5,000 or the trucks percentage $\geq$ 10%, a request for a final pavement design should be submitted to the Planning Division's Office of Pavement Engineering. If the AADT < 5,000 or the trucks percentage < 10%, the designer performs the final pavement design.

14-2.03(10) Final Check Prints

The final check prints should now be completed. These documents are outlined below.

1. Transmittal Letter. This document should include the following:

    a. date;
    b. To, Thru, From personnel;
    c. contract number;
    d. route number;
    e. county;
    f. Des number;
    g. project description and location;
    h. estimated contract completion date or number of work days;
    i. estimated costs; and
    j. letting date.

2. Proposal Book Cover Sheet. This sheet should include the contract number and letting date.

3. Contract Information Book Cover Sheet. This sheet should include the following:

    a. contract number;
    b. letting date; and
    c. certifications (approval signatures and seals).

4. Contract Requirements Worksheet. The designer should place project identification information on this sheet. The designer should coordinate with the district construction engineer to acquire appropriate necessary information. The designer will then transmit it the Contract Administration Division's Office of Contracting. The identification information should include the following:

    a. contract number;
    b. letting date;
    c. district;
    d. project number;
    e. route number;
    f. description, including work type;
    g. location;
    h. county; and
    i. effective dates of Standard Specifications and List of Approved Materials.

5. Table of Contents. This should indicate the documents to be identified as follows:

a. contract number;
b. map of official detour;
c. Proposal;
d. Schedule of Pay Items;
e. construction plans and number of pages; and
f. special provisions.

6. Estimate of Quantities and Cost Estimate. All pay items, including undistributed items, should be referenced in the plans. All pay items are to be worded using the nomenclature shown in the INDOT *Standard Specifications* and authorized-estimating-software listing. The sequence, or order of the pay items, should be numerical by INDOT *Standard Specifications* reference number.

14-2.03(11) Review of Final Check Prints

After the designer has assembled the final check prints, a copy may be circulated among other designers for review and comment. The final check prints are then forwarded to the district Design Office manager for additional review and comments. Upon completion, the designer will make the appropriate revisions.

A set of the final check prints is to be sent to the appropriate district offices of Program Management, Construction, Roadway Services, or Traffic, as required. They are expected to review and return the set to the district Office of Design within one to two weeks. A cover letter should be sent with the set indicating what is expected and when it should be returned.

1. Office of Program Management Preliminary Review. A copy of the contract documents is supplied for its use in coordinating local-agency agreements and detours, and updating the production schedule.

2. Construction Review. The area engineer should review the contract documents and indicate errors, inconsistencies, and constructability. The area engineer completes the remaining information required on the Contract Requirements Worksheet such as the field-office requirements or the need for a profilograph, and also establishes the earliest date to begin work and the contract completion time.

3. Roadway Services Review. The Office of Roadway Services reviews the contract documents and suggests additional changes or corrections. The review pertains to small drainage structures or pipes, wedge and level, patching, guardrail, and ditch work.

4. Traffic Review. The Office of Traffic reviews the contract documents and suggests additional changes or corrections pertaining to traffic maintenance or traffic safety. It

also verifies and coordinates the locations and impacts to signal loops, detector housings, no-passing zones, pavement markings, etc.

5. Discussion with Design Office manager. After the other Offices have reviewed the contract documents and have offered suggested changes, the designer is to meet with the Design Office manager to discuss the changes and suggestions. The Design Office manager will then decide which corrections are to be made. The designer will then make the appropriate changes.

6. Office of Program Management Final Review. After all changes are made, a copy of the contract documents is sent to the Office of Program Management for final review. The manager may suggest more changes.

7. Office of Testing Review. The materials engineer may suggest changes to the Plant Laboratory recurring special provision.

14-2.03(12) Shelf-Ready Project

The final check prints are considered shelf-ready after they have been reviewed by the Design Office manager. The documents, now final plans, are to be kept on file until funds are appropriated and a letting date has been established.

14-2.03(13) Signatures and Seals

Once funds are appropriated and a letting date has been established, the final plans should be reviewed and updated. The final plans should then be signed and sealed by the appropriate individuals as shown in Section 14-1.02(03).

14-2.03(14) Contract-Documents Package

Upon receipt of the approved final plans by the Office of Program Management, they are ready to be transmitted as contract documents to the Contract Administration Division's Office of Contracting for processing. The package should consist of the following.

1. Plans.

   a. 11 in. x 8½ in. Plans-Sheets Format. The original construction plans and cross sections with one photocopied set should be transmitted. If the cross sections are

in the 36 in. x 24 in. format, only the originals of the cross sections should be sent.

b. 36 in. x 24 in. Plan-Sheets Format. The original construction plans and cross-sections and two sets of prints of the construction plans without cross-sections prints should be transmitted.

2. Estimate of Quantities and Cost Estimate. The estimate of quantities and cost estimate should be generated using the authorized estimating software. The transmittal should consist of a diskette and one hard copy of both the estimate of quantities and cost estimate.

3. Special Provisions. One hardcopy of the prepared Special Provisions Menu with completed recurring special provisions and unique special provisions should be transmitted. A diskette including the unique special provisions should be provided.

4. Detour Map. A map of the official detour and a map of an unofficial local detour, if required, with the approved unofficial-local-detour documents should be transmitted.

The approved package should be sent to the Contract Administration Division's Office of Contracting, where the documents will be processed and prepared for letting. This step should be completed at least 14 weeks prior to the contract letting date.

14-2.03(15) Review Process

1. Pre-Letting. The Office of Contracting may require additional information or further corrections to be made in order for the contract documents to be properly processed. The designer should promptly address these concerns. All responses from the designer should be directed to the district construction engineer.

2. Post-Letting. Following the contract award, a preconstruction conference will be held. The designer should be available upon request to answer questions.

14-2.04 Bridge Plans, New Construction or Replacement Project

14-2.04(01) Hydraulics Submittal

Submittal of hydraulics information will be required a minimum of 60 days prior to the Stage 1 Review submittal. In preparing this submittal, consider the following.

1. All preliminary plotting should be completed and checked.

2. For a new bridge over a waterway, a structure replacement, or a bridge on a new alignment, provide a Layout sheet with the contours plotted on the plan view. For a consultant-designed project, provide the cross sections used in the model.

3. For a crossing with roadway overflow, include the road plan and profile sheets so that the road profile can be reviewed.

4. For a larger-waterway crossing, include a Details sheet of the plan view with the contours plotted to the survey limits. This information will be used by the Department for review (consultant project) or the hydraulic analysis (in-house project).

5. If the project is consultant-designed, include the hydraulic analysis, scour computations, and recommendations for review. If the bridge requires an IDNR permit, the modeling check list should to be included. The consultant needs to provide documentation that contact was made with the county surveyor's office to determine if the stream is a regulated drain.

6. The plans sheets will be for information purposes only, except for the Layout sheet which will include the preliminary structure geometrics.

7. A Quality Assurance form is required.

8. The hydraulic analysis and scour calculations should be signed and sealed by a professional engineer licensed in Indiana.

14-2.04(02) Stage 1 Review Submission

Plans should be approximately 25% complete at this stage.

Place the proposed design information in the computer-aided details files for this submittal. This information will be submitted in pdf format. However, the plans need not be in final form. The designer should add notes to the plans explaining situations or items which are not readily apparent, and which may influence the proposed design. The notes should be removed for later submissions.

The following sheets and information must be reviewed for Quality Assurance and included with this submission.

1. Conformance. Review the plans for conformance with the Level One controlling design criteria listed in Section 40-8.02(01) and indicate apparent or possible design exceptions. Also, indicate discrepancies from the Level Two design criteria listed in Section 40-8.02(02).

2. Abbreviated Engineering Assessment. Provide a written scope of the project requirements. This will be a short description of the design criteria proposed for use in the design of the project.

   a. If an Abbreviated Engineering Assessment has been prepared, a copy should be included with the submission.

   b. If an Abbreviated Engineering Assessment was not prepared, the designer should provide a brief written description of the project. This description will, at a minimum, include the information as follows:

      (1) project location;
      (2) project need and purpose;
      (3) existing facility;
      (4) traffic data;
      (5) identification of proposal;
      (6) cost estimate;
      (7) environmental issues;
      (8) right-of-way impact;
      (9) traffic maintenance during construction; and
      (10) concurrence. For an INDOT project, signed by the district production director or the district planning director. For an LPA project, signed by the Project Sponsor.

3. Level One Checklist and Computations. Include the information and computations as follows.

   a. Level One Checklist. The designer should submit a Level One checklist, including computations, with each submission, for the mainline, each S-line, and each traffic-maintenance phase. The designer should include computations for the required intersection sight distance at each public road, including each local-service road or frontage road within the project limits. The designer should also submit documentation of the intersection sight distance provided at each public road. This requirement also applies to the traffic-maintenance phases.

      The computations for the Level One items and intersection sight distance are to be initialed and dated by the designer and reviewer before submission;

b. design computations for determining the structure size and geometrics;

c. project-length computations including guardrail lengths and other contributing factors; and

d. waterway-opening calculations for each stream crossing.

4. Economic Analysis. Include a copy of structural economic analyses that may have been conducted to determine the most economic structural alternative. Guidelines for this analysis are listed in Section 59-5.0. A cost estimate should be provided for the selected alternative.

5. Index and Title Sheet. This should include the information as follows:

a. project number;

b. description (des) number (include all des numbers akin to the project);

c. bridge file number;

d. county location map;

e. project location map including north arrow and scales;

f. description of the project work type and location;

> ** *PRACTICE POINTER* **
>
> The location description should be simple and should follow the description on the schedule. For example, *Bridge replacement on State Road 67 over Fall Creek, located 8.00 miles southwest of the south junction with State Road 39, in Section 13, T-11-N, R-2-W, Ray Township, Morgan County, Indiana.* A legal description should not be used.

g. design data including design speed, project design criteria, functional classification, terrain, and traffic data;

h. applicable reference point (does not apply to local-agency project);

i. signature blocks; the blocks will not be completed at this stage;

j. an index of plan sheets at this stage. Sheet numbers will change for future submittals; and

k. latitude and longitude.

6. Typical Cross Sections. Typical cross sections should only show basic configuration and design features. This will include the following:

a. lane and shoulder widths;

b. profile grade, construction centerline, paper-relocation line, and survey line locations; and

c. basic design features including curbs, sidewalks, pavement and shoulder cross slopes, side slopes, ditches, shoulder corrugations if warranted, etc.

7. Road Plan and Profile Sheets. At this project stage, these sheets will only include the preliminary design information. Some of the details that should be addressed include the following:

a. plotting of existing topography should be complete;

b. beginning and end of project;

c. horizontal alignment (e.g., horizontal curve data, PC, PI, PT, bearings);

d. vertical alignment and its relationship to grade-controlling features;

e. preliminary drainage design including mainline culverts;

f. preliminary public-road approach and drive locations;

g. approximate construction limits; and

h. proposed guardrail limits.

8. Layout Sheet. This should include the preliminary design information for the following:

a. existing-ground contours;

b. horizontal alignment;

c. vertical alignment;

d. drainage structures;

e. public-road approach and drive locations;

f. approximate construction limits;

g. plan view showing bridge centerline station and skew;

h. proposed structure geometrics (span lengths and clear roadway widths in the title block);

i. channel protection;

j. utility owners;

k. existing structure data; and

l. hydraulic data.

> ** *PRACTICE POINTER* **
>
> The scour elevation to be shown on the Layout sheet should be the scour elevation for Q_{500}.

9. Channel-Change Layout Sheet. Include this sheet if the extent of the channel change is beyond the general layout. The sheet should include the preliminary design information for the following:

   a. stream profile;
   b. new channel geometrics;
   c. channel typical cross section; and
   d. slope protection.

10. General Plan Sheet. This should include the information as follows:

   a. plan view;

b. elevation view;
c. typical bridge cross section;
d. design data. A note should be included which reads as follows:

(1) Superstructure and substructure designed for HL-93 loading, in accordance with the AASHTO *LRFD Bridge Design Specifications, ___th Edition*, [current-edition year], and its subsequent interims.

Substructure foundation designed for HS-25 loading, in accordance with the AASHTO *Standard Specifications for Highway Bridges, ___th Edition,* [current-edition year], and its subsequent interims; or

(2) Designed for HS-25 loading, in accordance with the AASHTO *Standard Specifications for Highway Bridges, ___th Edition,* [current-edition year], and its subsequent interims ; or

(3) Designed for HS-20 loading, in accordance with the AASHTO *Standard Specifications for Highway Bridges, ___th Edition,* [current-edition year], and its subsequent interims.

e. suggested substructure type; and
f. minimum vertical clearance.

11. Cross Sections. The preliminary cross sections should include the following:

a. templates of the typical sections placed on the existing cross sections;
b. profile grade elevations; and
c. drainage structures.

12. Design Information. In addition to the plans, the designer should include copies of the preliminary hydraulic analysis for each mainline culvert, if applicable, and results of economic analyses that may have been completed for alternative grade lines.

13. Preliminary Cost Estimate. This should be developed for the major pay items with percentages shown for the minor pay items.

14. Certification. Provide a current copy of the Scope/Environmental Compliance Certification/Permit Application Certification form with this submission.

15. Quality Assurance form.

14-2.04(03) Geotechnical Investigation Request Submittal

Upon approval of the Stage 1 Review Submission, the Geotechnical Investigation will be requested. The plans sheets to be included with this request are as follows:

1. title sheet;

2. Typical Sections sheet, including tabulation of subgrade-treatment information;

3. Details sheets. If the project requires a MSE wall, include a preliminary wall layout;

4. roadway plan and profile sheets;

5. Layout sheet;

6. General Plan sheet. Include the anticipated foundation loads. If the structure requires pile loads in excess of 70 tons, the required pile capacity should be shown; and

7. Cross Section sheets.

14-2.04(04) Preliminary Field Check Meeting

A Preliminary Field Check meeting should be held after the Stage One review submittal and prior to the Stage 2 review submittal. Plans sets should be distributed a minimum of three weeks prior to the meeting (see Figure 14-1B, Field-Check Notification).

To hold the Preliminary Field Check meeting, plans should be approximately 35% complete. The following sheets and information must be included.

1. Previous Reviews. Incorporate comments from previous reviews.

2. Index and Title Sheet.

3. Typical Cross Sections.

4. Plat Sheet. Include a preliminary Plat No. 1 (does not apply to local-agency project).

5. Road Plan and Profile Sheets. In addition to the information described in Section 14-2.04(02), show the following:

a. elevations and grades of ditches so that accurate right-of-way requirements can be determined;

b. construction limits;

c. proposed right of way including temporary right of way;

d. public-road approach and drive locations;

e. drainage features (e.g., storm sewers, pipe structures, ditch grades); and

f. permanent erosion protection, including paved side ditches, riprap, or sodding limits.

6. Details Sheets. Include the preliminary layouts for the details as follows:

a. roadway and shoulder layout for guardrail;

b. special elements where applicable (e.g., modified approaches, signs, signals);

c. intersection layout details including right- and left-turn lanes with the turning movements indicated; and

d. superelevation transition diagrams.

If shoulder corrugations are warranted, and the plans include details for a non-standard public-road approach, drive, etc., each detail should show the extent of corrugations installation required in conjunction with the construction illustrated by the detail. If applicable, the INDOT *Standard Drawings* should be used as a guide in determining the limits of corrugations installation related to the feature shown in the detail.

7. Traffic-Maintenance Details. The proposed traffic-maintenance scheme and phasing should be outlined.

8. Road Summary Sheet. This preliminary sheet should include the following:

a. approach table with type, location, geometric data, and types of materials; and

b. Structure Data table with location, size, and type for each structure.

9. Cross Sections. See the information regarding cross sections in Section 14-2.04(02). Finalize the cross sections according to the revisions from the Stage 1 review plans. Also show the public-road approaches and drives.

10. Design Information. In addition to the plans, the designer should complete the following:

    a. Fish and Wildlife Review (if applicable);

    b. initiate unique special provisions;

    c. preliminary woody-revegatation determination; and

    d. submit a request for the final pavement design to the Office of Pavement Engineering.

14-2.04(04) Preliminary Right-of-Way Plans Preparation

See Chapter Eighty-five for criteria and information that should be included with Right-of-Way Plans.

14-2.04(05) Stage 2 Review Submission

Plans should be approximately 50% complete at this stage.

Plans for this submittal should be close to their final form. The plans sheets for this submittal should be legible and consistent with the quality desired for public viewing. The right-of-way plans should be consistent with the requirements of Chapter Eighty-five. The following sheets and information must be reviewed for Quality Assurance and should be included with this submission.

1. Previous Reviews. This submission should include the following:

    a. marked-up plans from the previous submission;

    b. document changes made from the Preliminary Field Check meeting;

    c. revisions to the plans due to the Geotechnical Report, if completed; and

    d. responses to field check questions.

2. Conformance. Review the plans for conformance with the Level One controlling design criteria listed in Section 40-8.02(01) and indicate apparent or possible design exceptions. Indicate discrepancies from the Level Two design criteria listed in Section 40-8.02(02). The required documentation for all Level One and Level Two design exceptions should be prepared.

3. Index and Title Sheet. Finalize the title sheet for right-of-way plans and include the right-of-way index.

   a. Finalize the title sheet for the bridge plans; and

   b. Finalize the title sheet for the Right-of-Way plans and include the right-of-way index.

4. Plat Sheets. All plat sheets, if required should be consistent with the plans and finalized.

5. Soil Borings Sheet. Ensure the information is accurate from the Geotechnical Report. Each boring log should include an elevation at each break in the soil strata. The elevations should be shown along the vertical grid so that the elevation of each soil sample can be ascertained. Logs for roadway borings should not be included on this sheet.

> ** *PRACTICE POINTER* **
>
> Copies of the boring logs included in the Geotechnical Report may be scanned and placed onto the Soil Borings sheet, provided they are still legible once the plans are reduced to half-size.

6. Road Plan and Profile Sheets. Right-of-way should be finalized and consistent with the Details sheets. The sheets should include the information as follows:

   a. drainage features (e.g., storm sewers, pipe structures, ditch grades, preliminary inlet spacing for storm-sewer trunk line design, etc.) and proposed drainage notes; and

   b. permanent erosion protection, including paved side ditches, riprap, and sodding limits.

7. Layout Sheet. The Layout sheet should be essentially complete.

8. General Plan Sheet. The General Plan sheet should be essentially complete.

9. Road Summary Sheet.

   a. Structure data table is in preliminary form and should include structure numbers and locations.

   b. Approach table is in preliminary form and should include the approaches' design information.

10. Cross Sections.

11. Design Information. In addition to the construction plans, this submittal should include an updated cost estimate. The Department's cost-estimating procedures should be used for the preliminary construction cost estimate; see Chapter Twenty. Quantities will consist only of major pay items with a percentage added to consider minor pay items. If practical, the traffic-related pay items should be segregated.

12. Level One Checklists and Design Computations. If there are no changes to the plans which affect Level One criteria since the prior submission, it is acceptable to copy the previous Level One Checklist, and add a statement that no changes have been made to the plans that affect Level One criteria. The statement should be initialed and dated for the current submission.

    The designer should submit a Level One Checklist, including computations for the mainline, each S-line, and each traffic-maintenance phase. The designer should include computations for the required intersection sight distance at each public road, including each local-service road or frontage road within the project limits. The designer should also submit documentation of the intersection sight distance provided at each public road. This requirement also applies to the traffic-maintenance phases.

13. Foundation Review Form.

14. Permit Information. This should be provided as required.

15. Certification. Provide a current copy of the Scope/Environmental Compliance Certification/Permit Application Certification form with this submission.

15. Quality Assurance Form.

14-2.04(06) Hearing Plans Preparation (if necessary)

See the requirements listed in Section 14-2.01(08)

14-2.04(07) Final Right-of-Way Plans Preparation

Chapter Eighty-five provides the criteria and information that should be included with a set of right-of-way plans. This submission is not required for a local public agency project. The designer should review the instructions for Quality Assurance, and perform the following:

1. include the marked-up Preliminary Right-of-Way Plans with this submission, if required;

2. incorporate all revisions made during the Preliminary Right-of-Way Plans submission review;

3. complete all project-information boxes, including right-of-way project number and sheet numbers;

4. complete all sheet-numbers cross references; and

5. review the plans against the checklist shown as Figure 85-2F.

14-2.04(08) Stage 3 Review Submission

Plans should be approximately 95% complete at this stage.

For this submittal, finalize the plans and include all roadway, traffic, and bridge details, and check the computations. Complete the following and review these elements for Quality Assurance.

1. Previous Reviews. Include the marked-up plans from the previous submittal with this submission.

2. Conformance. Review the plans for conformance with the Level One controlling design criteria listed in Section 40-8.02(01) and identify approval dates of design exceptions.

3. Pavement Design. Incorporate the final pavement design into the typical cross section and final quantities.

4. Computations and Quantities. Include the computations and quantities with this submission as follows:

   a. final approach drainage design;
   b. superstructure design;
   c. end bent or abutment design;
   d. interior substructure design;
   e. bridge-seat elevations;
   f. screeds at copings, profile grade, each beam line, and each construction joint;
   g. superstructure quantities;
   h. end-bent or abutment quantities;
   i. interior substructure quantities;
   j. pavement, curb, sidewalks, and related quantities;
   k. drainage-structure quantities;
   l. riprap, sodding, and seeding quantities;
   m. earthwork quantities;
   n. traffic-related items and designs as discussed and revised from Field Check Plans;
   o. traffic-maintenance quantities;
   p. miscellaneous roadway quantities;
   q. updated construction cost estimate; and
   r. completed special provisions.

5. Reports. Ensure that the recommendations from the hearing comments, Geotechnical Report, or other reports regarding peat, hazardous waste, special wastes, etc., have been incorporated into the plans, specifications, and cost estimate.

6. Plans. The plans should be nearly complete at this stage and should include the following.

   a. Title Sheet. Complete the Design Data block and update the index as necessary.

   b. Typical Cross Sections. Add the final pavement design information.

   c. Plan and Profile Sheets. Ensure that structure notations are completed; sodding, riprap, and paved side ditch locations are indicated; earthwork balances are shown; and removal items identified. Right-of-way station offsets from the final right-of-way plans should be incorporated.

   d. Details Sheets. Ensure that all details are completed and included with this submission. This includes details for the following:

      (1) reinforced-concrete bridge approach bill of materials and details;

(2) temporary erosion control;
(3) traffic-maintenance details; and
(4) traffic-design elements (e.g., intersections, signals, signing, or lighting).

e. Bridge Sheets. Finalize the design for these sheets as follows.

(1) Soil Borings sheet.
(2) Layout sheet. Ensure that the riprap and slopewall quantities are shown and the earthwork summary is completed.
(3) General Plan sheet.
(4) End Bent or Abutment Details.
(5) Interior Substructure Details.
(6) Superstructure Details.

f. Tables. Complete all data tables including the following:

(1) Bridge Summary Table;
(2) Structure Data Table;
(3) Approach Table;
(4) Underdrain Table;
(5) Paved Side Ditch and Sodding Table;
(6) Guardrail Table; and
(7) Sign Summary Table.

g. Cross Sections. Design information should be essentially complete. This includes final structure notations, earthwork areas and volumes, and benching areas and volumes.

7. Level One Checklists and Design Computations. If there are no changes to the plans which affect Level One criteria since the prior submission, it is acceptable to copy the previous Level One Checklist and add a statement that no changes have been made to the plans that affect Level One criteria. The statement should be initialed and dated for the current submission.

The designer should submit a Level One Checklist, including computations for the mainline, each S-line, and each traffic-maintenance phase. The designer should include computations for the required intersection sight distance at each public road, including each local-service road or frontage road within the project limits. The designer should also submit documentation of the intersection sight distance provided at each public road. This requirement also applies to the traffic-maintenance phases.

8. Certification Forms. Include a copy of the Scope/Environmental Compliance Certification/Permit Application Certification form.

9. Rule 5 Submission. If required and not previously submitted, submit in accordance with Section 9-1.02.

10. Limited Review and Certification Form.

11. Quality Assurance Form.

12. Bridge Load Rating. A copy of the bridge plans, excluding cross sections, with a cover letter indicating the designer's name, design firm (if applicable), telephone number or e-mail address, and other necessary information should be transmitted to the Production Management Division's load rating engineer. The load rating engineer will run the available bridge load rating program and will notify the project manager of the results within 30 days.

    If the analysis shows an inventory rating less than 1.0, the project manager will transmit the information to the designer to review, comment, and revise the design and plans, as necessary, or resolve rating-input errors.

    The project manager should submit to the load rating engineer a copy of changes or revisions to the bridge plans, including those due to a cost-reduction proposal that may affect the load capacity rating after the load rating is completed.

    The project manager will provide the bridge inspection engineer with the structural calculations including computer output if the bridge is one of the types as follows:

    a. post-tensioned concrete beams; *
    b. segmental concrete; *
    c. three-sided structure; **
    d. oversize box culvert; ** or
    e. other as requested by the Bridge Inventory Team.

    * The designer will notify the bridge inspection engineer of this structure type as soon as practical after receipt of design approval.

    ** No submission of final check prints will be made for this structure type. Calculations will be furnished after shop plans are approved.

14-2.04(09) Final Tracings Submission

See the requirements listed in Section 14-1.02(03).

14-2.04(10) Bridge within Limits of Road Project

Plans for a bridge which is complementary to plans for road work must be developed as described below. Each structure which is assigned a bridge file number must also be assigned a Des number.

1. INDOT-Route Project.

    a. New or Replacement Beam or Slab Bridge. A separate set of plans should be developed for each bridge. However, plans for an overflow structure may be included in the set for the main-channel structure.

    b. New or Replacement Three-Sided, Box, or Pipe Structure. These may be incorporated into the road plans. The structure file number and Des number for each such structure included in the road plans should be shown on the title sheet.

    A separate set of plans with only one title sheet may be developed for one or more of these structures.

2. Local-Public-Agency Project. Bridge plans may be incorporated into road plans or developed as a separate set per the requirements of the local public agency. However, the structure file number and Des number for each structure included in the road plans should be shown on the road title sheet.

14-2.05 Bridge Plans, Rehabilitation Project

14-2.05(01) Preliminary Field Check and Inspection Report

Based on the initial inspection of the structure, prepare the Inspection Report. The Report should include, but should not be limited to, the following:

1. existing condition status;
2. rehabilitation recommendations;
3. tabulation of design criteria;
4. cost estimate;
5. quantity computations;

6. color photographs; and
7. environmental-permit requirements.

The Report may also include a detailed account of past repairs, a design exception request, and justification for a survey to verify geometric information.

Section 72-2.05 provides the Department's procedures for the initial Field Inspection and the suggested format and content of the Bridge Inspection Report.

If potential scour problems were identified on the initial inspection, the Hydraulics Team should be contacted.

If the project will include foundation work, the Office of Geotechnical Engineering should be contacted.

14-2.05(02) Scope-of-Work Approval

Once the Inspection Report has been determined by the reviewer to be satisfactory, approval of the Scope of Work is recommended. The designer will be requested to make a Preliminary Plans Submission upon Scope-of-Work Approval.

14-2.05(03) Preliminary Plans Submission

After receiving Scope-of-Work Approval, begin preparation of the preliminary plans. Information on these plans will include the following.

1. Index and Title Sheet. At this stage, this sheet should include the information as follows:

    a. project number, bridge file number, and Des number;

    b. project description;

    c. county location map;

    d. project layout map including north arrow and scale;

    e. design data including design speed, project design criteria, functional classification (rural or urban setting), type of terrain, and traffic data;

    f. signature blocks; these blocks will not be completed at this stage; and

g. an index of plan sheets at this stage. Sheet numbers may change for future submittals.

2. Traffic-Maintenance Details. The proposed traffic-maintenance scheme and phasing should be outlined.

3. Layout. A Layout sheet is not required unless the rehabilitation project is significant enough to warrant a full survey.

4. General Plan. This sheet should include the following:

   a. plan view;
   b. elevation view;
   c. typical bridge cross section;
   d. design data relative to structural elements;
   e. related general notes; and,
   f. general rehabilitation recommendations (e.g., legend, material notes).

Preliminary plans will be sent to the Production Management Division's Railroads and Utilities teams for their use. Preliminary Plans may be utilized in the application of relevant environmental permits. Upon approval of the Preliminary Plans, the designer will be requested to submit the Final Plans.

14-2.05(04) Final Plans Submission

This submittal will include the following:

1. all revisions to the Preliminary Plans;
2. all necessary plans details required to adequately define the required repairs;
3. final quantities computations;
4. final design computations;
5. special provisions; and
6. final construction cost estimate.

The Final Plans should also include specific measures proposed by the Railroads, Utilities, Environmental, Geotechnical, or Hydraulics team.

A submission to obtain a bridge load rating analysis should be made as described in Section 14-2.04(08), item 13.

14-2.05(05) Final Field Check

After reviewing the Final Plans and finding them substantially complete and correct, a Final Field Check will be scheduled. The purpose of this Field Check will be as follows:

1. confirm the condition of the structure and appropriateness of the plans; and

2. allow the district representative to review the traffic-maintenance scheme and construction procedures.

14-2.05(06) Final Tracings Submission

All revisions resulting from the Final Field Check and Final Plans review will be completed for this submission.

14-2.05(07) Bridges within Limits of Road Project

Plans for multiple bridge rehabilitations which are complementary to plans for road work may be combined into one set of bridge plans. The structure file numbers and Des numbers for all such structures should be shown on the title sheet.

<u>14-2.06 Traffic Plans, Signing Project</u>

Separate traffic-signs plan sheets, including Title sheet, Index, and General Notes sheet, etc., are provided for each road project where a separate Des number is used for the traffic-signs portion of the project. This occurs if the project is 1 mi or longer, or for a major project including an interchange.

*** PRACTICE POINTER ***

Existing traffic-signs plans for a non-Interstate route are not required unless instructed otherwise.

14-2.0601) Preliminary Plans

Preliminary plans will consist of plan sheets with the information as follows:

1. mainline geometry and all intersecting roadways;
2. North arrow on each sheet; and
3. mainline and each intersecting roadway labeled, and centerline stationing.

14-2.06(02) Preliminary Field Check Plans Submission

For this submittal, the plans should include the sheets as follows.

1. Title Sheet. Include the layout map and show the project location on the location map.

2. Index and General Notes Sheet. The index blocks should be completed to indicate the sheet numbers for the plans at this stage. The sheet numbers will change for future submittals.

3. Signs Plans Sheets. These sheets should include the information as follows:

    a. plan view of the roadway;

    b. route numbers and street names;

    c. right-of-way limits;

    d. north arrow;

    e. stationing, identification number, and message of all existing sheet signs, ground-mounted panel signs, and overhead panel signs;

    f. stationing and identification number of each proposed sign;

    g. proposed panel-sign messages; and

    h. the applicable legend; see Section 14-3.04.

4. Sign Summary Table. The sign location (station) and type (sign code) should be shown. However, the sign size, summary, and post size need not be completed at this stage.

14-2.06(03) Final Field Check Plans Submission

The plans should be in their final form. However, some changes still may occur. Plans should include the following.

1. Title Sheet. This sheet should be essentially complete except for signatures.

2. Index and General Notes Sheet. This sheet should include a list of all utilities and a complete list of general notes.

3. Existing Signs Plans Sheets. These sheets will provide the stationing, identification number, and message for each existing sign.

4. Proposed Signs Plans Sheets. In addition to the criteria for Preliminary Field Check plan sheets, these sheets should include the information for overhead-sign lighting as follows:

   a. service point;
   b. cable duct;
   c. cable duct marker; and
   d. handhole.

5. Sign Layout Sheets. These sheets should include the following:

   a. size of sign;
   b. sign border;
   c. corner radii;
   d. height of message or legend;
   e. stationing and identification number;
   f. code for route shield;
   h. size of arrow and degree of slant; and
   g. notation for special color combinations (e.g., black copy on yellow background).

6. Cross-Sections. These sheets should include the following:

   a. for each box truss, monotube span, tri-cord, or cable-span structure, the full roadway cross section;

   b. for each cantilever structure, half cross section from the lane lines for a multilane facility or the centerline for a 2-lane facility to the front slope;

   c. for each ground-mounted panel sign, the cross section from the edge of the traveled way to the right-of-way line;

d. Cross section sheets for each ground-mounted panel sign will include the following:

(1) size of sign;
(2) sign message;
(3) size and length of posts;
(4) horizontal clearance from the edge of traveled way;
(5) vertical clearance from the edge of traveled way or ground line;
(6) footing dimensions;
(7) identification number; and
(8) stationing.

e. Cross section sheets for each overhead-sign structure will include the following:

(1) size of sign;
(2) legend;
(3) luminaire and spacing, if required;
(4) structure dimensions;
(5) identification number;
(6) stationing; and
(7) type of roadside protection.

7. Details Sheets. The details sheets to be included are as follows:

a. completed Sign Summary Table;
b. proposed route-marker-assembly details;
c. sheet sign details;
d. traffic sign details;
e. foundation details; and
f. any special design details.

8. Other Documents. Other documents that should be included with this submission may include structure and foundation calculations, special provisions, and cost estimates.

14-2.06(04) Final Check Prints Submission

The purpose of this submittal is to ensure that the plans are complete. Those items which were revised at the Final Field Check should have been addressed. All quantities should be finalized and a bound copy of the computations should be included with the submittal. Conduct a detailed review to ensure that all necessary pay items have been included and that a special provision is provided for each non-standard pay item. A finalized cost estimate should also be included.

14-2.06(05) Final Tracings Submission

The Final Plans submittal will include all necessary revisions from the Final Check Prints submittal. Section 14-1.02(03) discusses what is required for the Final Tracings submission.

14-2.07 Traffic Plans, Signalization Project

14-2.07(01) Preliminary Plans

Preliminary plans will consist of plan sheets with the information as follows:

1. mainline geometry and all intersecting roadways;
2. north arrow on each sheet;
3. outline of signalized intersections; and
4. centerline stationing.

14-2.07(02) Preliminary Field Check Plans Submission

For the Preliminary Field Check submittal, the plans should include the following.

1. Title Sheet. Include the layout map and show the project location on the location map.

2. Index and General Notes Sheet. The index block should be completed to indicate the sheet numbers for the plans at this stage. The sheet numbers will change for future submittals.

3. Signalization Plan Sheets. These sheets should include the information as follows:

    a. plan view of the intersection including intersection geometrics, curbs, shoulders, and building lines;

    b. route numbers and street names;

    c. right-of-way limits;

    d. north arrow;

    e. commission number for signal (State highway only);

f. all existing features (e.g., controller cabinets, signal poles, mast arms, foundations, sidewalks, curbs, pavement markings, utilities, etc.);

g. proposed signal installations (e.g., types of signal supports, location of controller cabinet, pavement markings, lane restrictions, intersection dimensions, roadway width, position and direction of signal heads, phase diagram, detector locations, conduit locations, number of wires in each cable run, power service location, detector housing, hand holes, disconnect hangers, etc.);

h. other applicable information includes the location of any pertinent signs, panel sign messages, approaches near the intersection, bus stops and loading zones, drainage structures, curb ramps, and utilities;

i. the applicable legend; see Section 14-3.04; and

j. posted speed limit.

14-2.07(03) Final Field Check Plans Submission

For this submittal, the plans should be in their final form. However, some changes still may occur. Plans will include the following.

1. Title Sheet. This sheet should be essentially complete except for signatures.

2. Index and General Notes Sheet. This sheet should include a list of all utilities and a complete list of general notes.

3. Signalization Plan Sheets. Include all revisions from the Preliminary Field Check and finalize the sheets.

4. Details Sheets. All necessary details sheets should be included with this submission.

14-2.07(04) Final Check Prints Submission

The purpose of this submittal is to ensure that the plans are complete. Those items which were revised at the Final Field Check should have been included. All quantities should be finalized in the Estimate of Quantities, with a bound copy of the computations included in the submittal. Conduct a detailed review to ensure that all of the necessary pay items have been included and

that a special provision is provided for each non-standard pay item. A finalized cost estimate should also be included.

The Details sheets should include the following:

1. intersection alignment and proper number of lanes;
2. all approaches with posted speeds clearly identified;
3. all drives;
4. all property lines;
5. all right-of-way lines;
6. all edges of pavement and shoulders;
7. locations of curbs, sidewalks, and curb ramps;
8. all pertinent pavement markings, including lane lines, crosswalk lines, and stop lines;
9. all existing and proposed guardrail locations;
10. underground and overhead utilities locations;
11. Legend, Phase Diagram, and Loop Tagging Table; and
12. route number including street name, if any.

Traffic diagrams should not be included.

14-2.07(05) Final Tracings Submission

The Final Plans submittal will include all necessary revisions from the Final Check Prints submittal. Section 14-1.02(03) discusses what is required for the Final Tracings submission.

14-2.08 Traffic Plans, Lighting Project

The lighting-plans portion to accompany plans for a road or bridge project should be submitted as a separate set of plans, including the title sheet, Index and General Notes sheet, etc.

14-2.08(01) Preliminary Plans

Preliminary plans will consist of plan sheets including the information as follows:

1. mainline geometry and all intersecting roadways;
2. north arrow on each sheet;
3. mainline and all intersecting roadways labeled; and
4. centerline stationing.

14-2.08(02) Preliminary Field Check Plans Submission

For the Preliminary Field Check submittal, the plans should include the following.

1. Title Sheet. Include the layout map and show the project location on the location map.

2. Index and General Notes Sheet. This sheet should include a list of all utilities and a complete list of general notes. The index block should be completed to indicate the sheet numbers for the plans at this stage. The sheet numbers will change for future submittals.

3. Plan Sheets. These sheets should include the information as follows:

    a. plan view of the roadway;
    b. route numbers and street names;
    c. right-of-way limits;
    d. north arrow;
    e. stationing and identification number of proposed light standards;
    f. identification of overhead-sign lighting, if required;
    g. applicable legend; see Section 14-3.04; and
    h. service point location and type.

4. Design Data. The following design data to be included is as follows:

    a. initial lamp lumens;
    b. average maintained illumination;
    c. lamp lumens depreciation factor;
    d. luminaire dirt depreciation factor;
    e. uniformity ratio;
    f. mounting height;
    g. luminaire classification; and
    h. pavement classification.

14-2.08(03) Final Field Check Plans Submission

For this submittal, the plans should be in final form. However, some changes still may occur. Plans will include the following.

1. Title Sheet. This sheet should be essentially complete except for signatures.

2. Index and General Notes Sheet. This sheet should include a list of all utilities and a complete list of general notes. The index block should be completed to indicate the sheet numbers for the plans.

3. Lighting Plans Sheets. In addition to the criteria for Preliminary Field Check plans sheets, these sheets should include the following:

   a. cable duct;
   b. circuit number;
   c. cable duct marker, if required;
   d. handhole, if required; and
   e. main breaker and circuit breaker rating.

4. Summary Table. This should include the following:

   a. luminaire or tower number;
   b. connection type;
   c. circuit connection;
   d. pole set-back distance from edge of traveled way, taper, or ramp;
   e. mast-arm length (conventional lighting);
   f. luminaire effective mounting height (E.M.H.); and
   g. top foundation elevation with respect to the edge of traveled way.

5. High-Mast Tower Plans. These should include the details as follows:

   a. pole data schedule;
   b. highway illumination tower detail;
   c. high-mast tower miscellaneous details;
   d. external winch concrete pad;
   e. lightning rod typical details; and
   f. tower retrofit details, if required.

6. Other Documents. Other documents may include the following:

   a. voltage drop and breaker rating calculations;
   b. design calculations;
   c. special provisions; and
   d. cost estimates.

14-2.08(04) Final Check Prints Submission

The purpose of this submittal is to ensure that the plans are complete. Those items which were revised at the Final Field Check should have been included. All quantities should be finalized and a bound copy of the computations should be included with the submittal. Conduct a detailed review to ensure that all of the necessary pay items have been included and that a special provision is provided for each non-standard pay item. A finalized cost estimate should also be included.

14-2.08(05) Final Tracings Submission

This submittal will include all necessary revisions from the Final Check Prints submittal. Section 14-1.02(03) discusses what is required for this submission.

14-3.0 DRAFTING GUIDELINES

14-3.01 Drafting Methods

All project drafting will be performed using Microstation. The *INDOT CADD System User Guide* provides information on the Department's Microstation system. For a consultant not using INDOT's Microstation system, Chapter Sixteen provides the Department's criteria for translating the CADD files to the Department's system.

The Department's preferred practice is to use only Microstation drafting. However, for a small in-house or consultant-designed project, manual drafting may be acceptable. For a manually-drafted project, the designer or drafter should use the criteria described in Chapter Fifteen and the *INDOT CADD System User Guide* for line weights, topography symbols, plotting accuracy, etc.

Where manual plotting is used, the drafter must consider line weights and text sizes to ensure that, once the plans size is reduced, the plans will still be readable. The minimum text should be at least 5/8 in. height. Letters should be open and formed with a dense but not wide line.

14-3.02 Plotting Survey Data

The designer is responsible for plotting all survey data received as an electronic file. The *INDOT CADD System User Guide* discusses how to plot the survey data. Each consultant should plot the survey data according to the procedures provided with the CADD software package.

In plotting survey data, the following accuracies should be used to show elements on the plans sheets.

1. Show horizontal alignment data (e.g., curve information, equations, reference-point tie-ins, section corner tie-ins) to the nearer 0.01 ft.

2. Show existing roadway elevations used for pavement tie-ins and vertical clearance computations to the nearer 0.1 ft. Show benchmark elevations to the nearer 0.01 ft.

3. Horizontal pluses, offsets, physical feature dimensions, and locations, etc., may be shown to either the nearer 0.05 ft or 0.01 ft. The nearer 0.01-ft accuracy is preferred.

4. The survey should be plotted for 300 ft beyond the project limits. At a minimum, the survey should be plotted for 150 ft beyond the project limits.

14-3.03 Sheet Size

The sheet sizes used for plans development are as follows.

1. 36 in. x 24 in. (A1). This sheet size is considered a full-size sheet and should be used for the design layout for each major project. A border around the sheet should be provided with a 2½-in. left-binding margin, a 1/4-in. right margin, and 5/8-in. top and bottom margins. This provides a working area of 33 in. x 22½ in..

2. 17 in. x 11 in. This sheet size is approximately half the scale of the A1 sheet described above. This size corresponds to the ledger size shown on most photocopiers. It is used for construction-plans reviews, bid advertising, construction, and project archives.

3. 11 in. x 8½ in. This sheet size corresponds to the letter size shown on a photocopier. It is only used for a project that does not require a significant amount of detail (e.g., partial 3R project). This type of project includes only a plan view with no profile view. If more-significant information is required to be shown, the A1 sheet size should be used instead.

All submittals, except for the Final Tracings submission and the Final Plans submission for a project using 11 in. x 8½ in. size sheets, will be printed on white paper. Section 14-1.02(03) discusses the Final Tracings submission requirements.

14-3.04 General Guidelines

The following provides general guidelines for plotting survey data and design details on the plan sheets.

14-3.04(01) Dimensions

In dimensioning, the following should be considered.

1. Measurement Units. Show all dimensions in english measure. Do not use dual metric and english units. Each unit symbol should be lower-cased and exponentiated, if required, in accordance with english-units customary practice. A period should follow only the symbols in. and gal.

2. Bridge Plans. Show all bridge-plans detail dimensions including span lengths, floor slab widths, etc., in feet and inches. Show all non-structure dimensions on the General Plan and Layout sheets in feet.

3. Road Plans. Road-plans sheets will be prepared using feet and decimals of a foot.

4. Traffic Plans. Traffic-plans sheets will use either feet and inches, or feet and decimals of a foot, depending upon the element shown. However, if the large majority of the dimensions of a drawing or detail are all in one units method or the other, show all dimensions using one method.

5. Common Units. Where all or most of the units are shown in one set of dimensions (e.g., either feet or inches), a footnote may be added to the sheet stating this fact. For example, *All dimensions are in inches (in.) except as noted.* Remove the ft or ’, or the in. or ” symbol from the plans to improve the sheet clarity.

6. Spacing. Provide a space between the value and abbreviation symbol (e.g., 12 ft or 12.25 ft or 6 in.). Do not provide a space between the value and punctuation symbol (e.g. 12’ or 6”). Provide a hyphen between a feet-and-inches value using punctuation symbols (e.g. 12’-6”).

7. Value Less Than 1. For a decimal value, place a zero before the decimal marker (e.g., 0.75 ft). For a fractional value of less than one inch in a feet-and-inches value using punctuation symbols, include a zero ahead of the fraction (e.g. 12’-0½”).

8. Large Number. For a number larger than three digits, use a comma to separate blocks of three digits (e.g., 12,000 ft^2). For plan dimensions, it will be satisfactory to either insert or omit the comma as desired.

14-3.04(02) Symbols and Legends

Chapter Fifteen provides the Department's electronic-drafting symbol library. These symbols should be used in the preparation of manually- or electronically-drafted plans. To obtain a copy of this library, the designer should contact the CADD Support Team.

Figure 14-3A, Recommended Plans Legends, provides the legends that may be used on plans. For traffic symbols and legends that should be used within a set of plans, see Chapter Fifteen. A circle with either a letter or number inside it may be used to indicate various construction items or materials. Where additional items are similar but with different thicknesses, layers, weights, etc., use an alphanumeric combination [e.g., (A1) 14-in. Plain Cement Concrete Pavement, (A2) 10-in. Plain Cement Concrete Pavement]. The legend should be consistent throughout a set of plans (i.e., each number or letter applies to an individual item throughout a set of plans). Do not renumber the legends on each sheet to account for the unused legends. List the legends used on a sheet in an open area on the sheet.

14-3.04(03) Text

Chapter Fifteen provides the Department's criteria for text sizes, fonts, and line weights. For each sheet type, use uniform text sizes and line weights. For example, all of the text for notations in the plan view should be of the same size and weight. However, the text for the summary table may be in a different text size. The font type should be uniform throughout the plans.

Words should not be abbreviated so should therefore be completely spelled out. However, this is not always practical. Figure 14-3B, Plans Abbreviations, provides the common abbreviations that should be used where it is necessary to abbreviate words. Spell out the words for those terms not listed in Figure 14-3B.

14-3.04(04) Plan Notes

Specific plan notes (e.g., dimensions, clarifications) should be placed directly on the applicable sheet. General notes which apply to the whole project or several sheets should be placed on the Index and General Notes Sheet. The types of notes that are acceptable for placement in the plans are as follows:

1. a specific reference to a drawing on a sheet;
2. a note with an arrow drawn to a part of a drawing it complements;
3. utility owners;
4. soil-borings information;
5. cross references to other plan sheets or INDOT *Standard Drawings*;
6. hydraulic data;

7. earthwork table or balance information;
8. bridge-seat calculation procedure;
9. legends;
10. screed instructions;
11. benchmark data;
12. traffic-signal diagram description;
13. Sign Summary description notes;
14. all tables; and
15. Structure Data sheet remarks.

Notes which describe the particular work, material requirements, construction requirements, method of measurement, or basis of payment are considered to be specifications and should not be included on a set of plans. These notes should be included in the INDOT *Standard Specifications*, recurring special provisions, or unique special provisions. Chapter Nineteen provides guidance on the use and preparation of these specifications.

14-3.04(05) Miscellaneous

The following provides guidelines which the designer should consider in preparing a set of plans.

1. Stationing. An english-units station of 100 ft is used, which is shown to two decimal places (e.g., 1 + 00.00). Show tic marks at 100-ft intervals. The tic marks are shown on the survey left side of the centerline. Indicate a full station at every 500-ft interval with plus stations at 100-ft intervals. For an example, see *INDOT Typical Plan Sheets.*

   For example, Sta. 12+27.96 indicates a point 27.96 ft forward of english-units Sta. 12+00. The location of the first even-hundred station on a new alignment is arbitrary.

2. Cross-Section Intervals. Use 50-ft cross-section intervals where the alignment is maintained over existing embankments and through rolling terrain. A larger interval may be used where uniform templates are used over flat terrain. Provide additional cross-section intervals where there are abrupt changes in either the typical section or the existing ground.

3. Angles. Express angles in degrees, minutes, and seconds.

4. North Arrow. Provide a uniform north arrow on the finished set of plans. Chapter Fifteen illustrates the appropriate north arrow that should be used.

5. Reduction. A full-sized set of mylar (reproducible) plans is required for construction and contract letting. Section 14-3.03 discusses the sheet sizes that are used by the

Department. Scales used for drafting the full-size sheets are no longer accurate once the plans are reduced. Once the plans are reduced, readability of the plans may become critical. Chapter Fifteen and the *INDOT CADD System User Guide* provide the minimum text sizes that should be used.

6. Limits. The limits of plan coverage on a road-project plans sheet will vary according to the plan and profile scale selected and type of plans sheet selected. Section 14-3.05 discusses the scales that should be used.

7. Plans Sheets. The Department's typical plans sheets can be obtained from the INDOT CADD library.

8. Alignment Placement. Where the horizontal alignment is on tangent, the centerline or survey line should parallel the top border and be centered vertically in the plan-view space. Where the horizontal alignment is on a curve, tangents should be angled to produce reasonable balance. Keep an entire curve on the same sheet.

9. Soil-Boring Logs. In plotting soil-boring logs for a bridge project, elevations should be shown along the vertical grid for each boring log so that the elevation of each soil sample can be ascertained. Road-boring logs should not be included in the plans.

   Boring logs may be scanned and placed onto the Soil Borings sheet, provided such logs are legible when reduced to half-size.

10. Project Block. Each sheet will have a project block along the bottom of the sheet. The project block will vary from sheet to sheet. These are illustrated in the *INDOT Typical Plan Sheets* document. The following information, from left to right, should be included in the project block.

    a. Design Information. In the lower left-hand corner of each plan and profile sheet, include the horizontal-alignment references. For most other sheets, this area will be left blank.

    b. Engineer's Seal. The engineer's seal is required on each sheet along with the signature of the engineer and date signed. The seal location may vary within the plans sheet depending on which engineer prepared the sheet.

    c. Signatures. The signature block will include the signatures for the design engineer, designer, drafter, and checkers.

    d. Sheet Title. Each sheet should be labeled.

e. Scales. Where applicable, identify the scales used on the drawing in the lower right-hand corner.

f. File Numbers. Show all applicable files and references including contract number, bridge file, Des number, survey book number, etc., in the lower right-hand corner.

g. Sheet Numbering. Provide the sheet number and the total number of sheets for the set in the lower right-hand corner of each sheet. Number all sheets sequentially including the title sheet. Sheets that are added after the sheet numbers have been placed should be designated as described in Section.14-1.02(04), and identified in the index. The additional sheets are not included in the total number of sheets. The sheet numbering should be the last thing the designer does prior to submitting the final tracings to the Research and Documents Library Team.

h. Survey Lines. If there are multiple survey lines, indicate the line designation with the sheet title (e.g., Plan and Profile Line "S-1-A").

14-3.04(06) Title Sheet Information Block

The information block on the title sheet should be in accordance with the format shown in Figure 14-3C. Part V includes geometric design tables which reflect the scope of project construction. The applicable design criteria in such tables are based not only on traffic volume characteristics, but also on road classification, rural or urban setting, type of terrain, and access control. The information block will have all of these design controls defined in one location. A person looking at the plans will immediately know which geometric design table and what design criteria were used in the project development.

14-3.05 Scales

The following provides the recommended drawing scales that should be used in developing a set of plans. The selected scales should be shown in the project block on each sheet. Where scales are not used, this should be shown in the project block.

14-3.05(01) Road Project

For a road project, use the following scales.

1. Title Sheet. For the location map, a 1" = 2000' scale should be used. A location map for an urban area may use a 1" = 1000' scale for better clarity. For a longer project, a scale of 1" = 4000' may be necessary.

2. Typical Sections. The scale for the typical-section figures, commonly ¼" = 1'-0", is at the designer's discretion. The scale selected should adequately show the necessary features. Although not desirable, the scale may vary from typical section to typical section. The vertical scale may be exaggerated to adequately show the pavement cross section.

3. Right-of-Way Sheets. The appropriate scale will depend on the plat sheet used. The following will apply.

   a. Route Survey Plat. Use a scale of 1" = 200'.

   b. Plat No. 1. For a rural area, use a scale of 1" = 400'. For an urban area, use 1" = 100'. For a spot improvement project (e.g., small structure replacement, sight distance improvement, etc.), a scale of 1" = 200' may be used.

   c. Plat No. 3. For a rural area, use a scale of 1" = 400'. For an urban area, use 1" = 100'. For an intermediate area, a scale of 1" = 200' may be used.

4. Plan and Profile Sheets. Plan and profile views will be shown together on one sheet, with the plan view on top and profile view on the bottom. The following scales are used.

   a. Plan View, Rural. A scale of 1" = 50' should be used. For a longer rural project, a 1" = 100' scale may be used.

   b. Plan View, Urban. Depending upon the complexity of the location and work to be accomplished, a scale of 1" = 20' or 1" = 50' should be used.

   c. Profile View, Horizontal. This will be the same scale as the plan view.

   d. Profile View, Vertical. The vertical-profile scale will be 1" = 5' or 1" = 10' depending on the complexity of the project and the plan-view scale selected. A 1" = 10' scale will be used with a plan-view scale of 1" = 100'. A 1" = 5' scale will be used with a plan-view scale of 1" = 50' or 1" = 20'.

   Other scales, as necessary, may be used to provide better clarity or more practical layouts. If a detail can not be adequately viewed in the selected scale, show the element on a Details sheet.

5. Superelevation-Transition Sheet. The selected scale is left to the designer's discretion. Select a scale which will adequately show the necessary features.

6. Details Sheet. The selected scale will vary based on the complexity of the detail and room available on the sheet. The following provides the scales that are commonly used.

   a. Construction Details. Use a plan-view scale of 1” = 20’.

   b. Intersection or Approach Details. Use a plan-view scale of 1” = 20’.

   c. Spot-Elevation Sheet. Use a plan-view scale of 1” = 20’.

   d. Signing Details. The plan-view scale will be 1” = 50’ for an urban area or 1” = 100’ for a rural area.

   e. Signal Details. The plan view scale will be 1” = 20’.

   f. Pavement Markings. The preferred plan-view scale is 1” =50’. Where significant detail is required, use a plan-view scale of 1” = 20’.

   g. Traffic-Maintenance Details. Use a plan-view scale of 1” = 50’ or 1” = 100’.

   The designer may select an alternative scale for one of the above details based on the complexity of the detail and space available on the sheet. For those details not listed, the designer will determine the scale as required.

7. Cross Sections. The horizontal and vertical cross-section scales will be 1” = 10’. A larger scale may be used where a greater cross-section width or height is required.

14-3.05(02) Bridge Project

Many of the sheets for a bridge project (e.g., index and title sheet, Typical Cross Sections, Right-of Way Plat, Plan and Profile sheets, cross sections) will use the same scales as listed in Section 14-3.05(01) for a road project. The scales for the structural details will vary according to the complexity of the drawing and space available on the sheet. The designer should select a scale which will adequately show the necessary detail and still allow the detail to be readable at a reduced scale. The scale for the Layout sheet should be 1” = 30’, 1’ = 40’, or 1” = 50’. For a complex urban project or a project in a steep rural area, a 1” = 20’ scale may be used.

14-3.05(03) Traffic Project

For a traffic-signs, signalization, or lighting project, the following scales should be used.

1. Title Sheet. For the location map, a 1" = 2000' scale should be used. The location map for an urban area may use a larger scale for better clarity. For a longer project or for a project scattered throughout a district, it may be necessary to use a scale of 1" = 5000' or smaller.

2. Plans Sheets. The selected scale will depend upon the type of project selected.

   a. Traffic-Signs Sheets. The plan-view scale will be 1" = 50' for an urban area. For a rural area, depending on the project complexity, the scale will be 1" = 100' or 1" = 200'.

   b. Signalization Sheets. The plan-view scale for signalization at an intersection will be 1" = 20'. Where details are required for work between intersections (e.g., interconnect details), the scale may be 1" = 100' or 1" = 50'.

   c. Lighting Sheets. The plan-view scale will be 1" = 50' in an urban area. For a rural area, depending on the project complexity, the scale will be 1" = 100' or 1" = 200'.

3. Details Sheets. The selected scales will be determined depending on the complexity of the detail and space available on the sheet.

4. Cross Sections. Where cross sections are required, the horizontal and vertical cross-section scales will be 1" = 10'. A larger scale may be used where a greater cross-section width or height is required.

14-3.06 Plans-Dimensions Accuracy

The accuracy of plan dimensions should be consistent with data upon which they are based. Accuracy for dimensions to be shown on plans is as follows.

14-3.06(01) Road or Traffic Plans

The following accuracies should be observed.

1. Stationing. Show all stationing to the nearest hundredth of a foot (i.e., 0 + 00.01). This will include PVI, PC, PI, PT, equation stations, etc.

2. Angle. An angle or bearing should be shown to the nearest second (i.e., 0º 00′ 01″).

3. Horizontal-Alignment Data. Figure 14-3D, Horizontal-Curve Data on Plans Sheets, provides the order and rounding accuracy that should be used to describe curve data.

4. Vertical-Profile Data. The following vertical-alignment accuracies should be used.

   a. PVI. Stationing. Show each PVI at an even station.

   b. Vertical-Curve Length. Round the length to the nearer 10 ft.

   c. PVI Elevation. Show the elevation to the nearer 0.01 ft.

   d. Grade. Show each vertical grade to the nearer 0.001%.

   e. Vertical Clearance. Show each vertical clearance to the nearer 0.01 ft.

5. Elevation. The following elevation accuracies should be used.

   a. Bench Mark. Show the elevation to the nearer 0.01 ft.

   b. Flow-Line Elevation. Show each elevation to the nearer 0.01 ft.

   c. Pavement Elevation. For existing pavement, show each elevation to the nearer 0.01 ft.

   d. Ground Line. Show the existing ground line to the nearer 0.01 ft.

   e. Other. Show all other vertical elevations, breaks in ditch grades, pipe invert elevations, etc., to the nearer 0.01 ft.

6. Contour Interval. The contour interval will be in 1-ft increments. Each fifth contour should be emphasized and identified. Intermediate contours will not be identified unless they represent a high or low contour. In rugged terrain or on a steep slope, the intermediate contour lines may be removed for clarity.

7. Topography Features. Show the location of all proposed features to the nearer 0.1 ft, or the nearer 0.01 ft where practical.

8. Typical-Cross-Section Elements. The following will apply.

   a. Width. Show all typical-cross-section elements in increments of 6 in.. This includes lane or shoulder widths, ditch widths, bench widths, median widths, sidewalks, etc.

   b. Cross Slope. Show each cross slope to the nearer 0.1%, including superelevation rates.

   c. Pavement Depth. HMA pavement-course density should be shown to the nearer 10 lb/yd^2. Show all other pavement elements (e.g., concrete-pavement thickness, aggregate or subbase depth, special-subgrade-treatment depth, underdrain dimensions, etc.) to the nearer inch.

8. Cross-Sections Elements. Show the profile-grade elevation to the nearer 0.01 ft.

9. Miscellaneous Features. For the following features, show the dimensions to nearer increment indicated as follows:

   a. drive location to the nearer 1 ft;
   b. culvert location to the nearer 1 ft;
   c. guardrail to the nearer 0.1 ft
   d. ditch-grade break to the nearer 1 ft.

14-3.06(02) Bridge Plans

In addition to the plan accuracies discussed for road plans, use the following accuracies on bridge plans.

1. Bridge Elements. Bridge elements should be shown in increments of 3 in. (e.g., footing length, span length, beam spacing, pier height, etc.). Where increments of 3 in. are not practical, use 2-in. or 1-in. increments.

2. Reinforcing Bars. Where practical, show the length of each straight bar to the nearer 3 in. For a bent bar, show the individual dimensions to the nearer ½ in. The total length of a bent bar should be rounded to the higher inch. Show spacing of reinforcing bars to the nearer 2 in..

3. Dimensions. Use the following accuracy.

a. Concrete Details. These should be shown in increments of 1 in. (e.g., deck thickness, column section, wall thickness, cap dimension, footing width, pile spacing, etc.). Where increments of 1 in. are not practical, use ½-in. increments.

b. Camber and Deflection Details. Show these to the nearer 0.001-ft increment.

c. Structural-Steel Details. For designations, dimensions, and properties of structural shapes, see ASTM A 6M and the AISC english-shape tables. Other dimensions on Details sheets (e.g., plate width, plate length, splice detail, hole spacing, steel-shoe-assembly size, etc.) should be dimensioned to the nearer 1/8 in. Plate thickness may be shown to the nearer 1/16-in. increment.

d. Precast Prestressed-Concrete Members. Show all cross-section dimensions for these elements to the nearer ¼ in.

e. Manufactured Items. Accuracy for detailed dimensions for these items (e.g., expansion joints, bearing devices, etc.) should be in accordance with industry standards.

f. Horizontal Alignment Tie-Up. Show these dimensions to the nearer 0.01 ft.

4. Elevation. Show each structure elevation, including top-of-bearing-plate elevation, to the nearer 0.01 ft, except as follows.

a. Top-of-Pile Elevation. Where a pile is encased in a concrete cap, show the top-of-pile elevation to the nearer 0.1 ft. Where superstructure beams are attached to the piling, show the top-of-pile elevation to the nearer 0.01 ft.

b. Existing Structure. Show each existing-structure elevation or concrete-removal-line elevation to the nearer 0.1 ft.

c. Ground Elevation. Show each of these (e.g., berm, channel clearing, upper limit of wet excavation, etc.) to the nearer 0.01 ft.

5. Bridge Quantities. Chapter Seventeen provides the rounding criteria for bridge quantities that are also shown on bridge plans.

14-3.07 Plans-Sheets Organization

To provide consistency from project to project, the plans sheets should be assembled in the sequence listed below for the applicable project type. Not all plans sets will include all sheets,

and some sheets can be combined together (e.g., Details sheets). For a project type not listed below, the sequence shown for a road project should be used.

14-3.07(01) Road Project

The recommended plans-sheets sequence is as follows:

1. title sheet;

2. Index and General Notes;

3. Typical Cross Sections;

4. Plat No. 1 or Plat No. 3;

5. Geometric Tie-Up sheet;

6. Traffic Maintenance Details. A sheet is not required for an official-detour route. A diagram thereof should be included in the Contract Information book;

7. Plan and Profile;

8. Superelevation-Transition Diagram

9. Details sheets, in the order as follows:

    a. Construction Details;
    b. Intersection Details;
    c. Spot Elevation Details;
    d. Channel Details;
    e. Geometric Details;
    f. Right-of-Way Details;
    g. Grading Plan;
    h. Drainage Details;
    i. Erosion Control Details (plan view);
    j. Retaining Wall Details; and
    k. Wetland Mitigation Details.

10. traffic-work details, in the order as follows:

    a. Signs (if separate traffic-sign plans are not required);

b. Signals;
c. Lighting (if separate lighting plans are not required); and
d. Pavement Markings.

11. miscellaneous tables;

12. Approach Table;

13. Underdrain Table;

14. Guardrail Summary Table;

15. Structure Data Table;

16. Pipe Materials sheet; and

17. cross sections.

14-3.07(02) Bridge Project

The recommended plans-sheets sequence is as follows:

1. index and title sheet;

2. Typical Cross Sections;

3. Traffic Maintenance Details. A sheet is not required for an official-detour route. A diagram thereof should be included in the Contract Information book;

4. Road Plan and Profile;

5. Superelevation-Transition Diagram;

6. Roadway Details, in the order as follows:

   a. Construction Details;
   b. Intersection Details;
   c. Spot-Elevation Details;
   d. Geometric Details;
   e. Right-of-Way Details;
   f. Grading Plan;

g. Drainage Details; and
h. Erosion-Control Details (plan view);

7. traffic-work details, in the order as follows:

a. Signs (if separate traffic-sign plans are not required);
b. Signals;
c. Lighting (if separate lighting plans are not required); and
d. Pavement Markings.

8. Soil Borings;

9. Channel Change Layout;

10. Layout;

11. General Plan;

12. structure-details sheets, in the order as follows:

a. Coping Offsets and Tie-up Dimensions;
b. Abutment/Bent/Pier Details and Bill of Materials;
c. Framing Plan and Girder Elevation;
d. Structural-Steel Details or Precast-Concrete Beam Details;
e. Jacking Frames;
f. Bearing Details;
g. Floor Details;
h. Corner Details and Floor Bill of Materials;
i. Railing Details;
j. Expansion Joint Details; and
k. Screeds (optional).

13. Reinforced-Concrete Bridge Approach Details;

14. Bridge Summary;

15. miscellaneous tables;

16. Approach Table;

17. Underdrain Table;

18. Guardrail Summary Table;

19. Structure Data Table;

20. Pipe Materials sheet; and

21. cross sections.

14-3.07(03) Traffic-Signs Project

The recommended plans-sheets sequence is as follows:

1. title sheet;
2. Index and General Notes;
3. Signing Plan;
4. Sign Layout;
5. cross sections;
6. Footing Details; and
7. Structural Details.

14-3.07(04) Signalization Project

The recommended plans-sheets sequence is as follows:

1. title sheet;
2. Index and General Notes;
3. Signal Plan; and
4. Signal Details.

14-3.07(05) Lighting Project

The recommended plans-sheets sequence is as follows:

1. title sheet;
2. Index and General Notes;
3. Lighting Plan; and
4. cross sections.

SHEET	Road, Bridge, or Traffic Project Manager	Traffic Signs Team	Traffic Signals Team	Highway Lighting Team
Title	X			
Index and General Notes	X			
Typical Sections	X			
R/W Plats	X			
Geometric Tie-Up Sheet	X			
Plan and Profile	X			
Superelevation Transition	X			
Details	X			
Construction Details	X			
Intersection Details	X			
Spot Elevation Details	X			
Channel Details	X			
Geometric Details	X			
Right-of-Way Details	X			
Grading Plan	X			
Drainage Details	X			
Erosion Control Details	X			
Traffic Details				
Signs	X	X		
Signals			X	
Lighting				X
Pavement Markings	X	X		
Traffic-Maintenance Details	X	X	X	X
Soil Borings	X			
Layout	X			
Bridge Structure Details	X			
Bridge Summary	X			
Miscellaneous Tables	X	X	X	X
Approach Table	X			
Underdrain Table	X			
Structure Data Table	X			
Pipe Materials	X			
Sign Structure Table	X			
Guardrail Summary Table	X			
Cross Sections	X			

SHEET-PREPARATION RESPONSIBILITIES
FOR ROAD, BRIDGE, OR TRAFFIC PROJECT

Figure 14-1A

FIELD CHECK NOTIFICATION

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Preliminary ☐ Final ☐ Field Check Notification

Work Type:
Route:
Des No.
PE Project No.
R/W Project No.
CN Project No.
Bridge File:
Over
Location: , ☐mi ☐ km of , in County

A Preliminary ☐ Final ☐ Field Check for this project has been scheduled for . The meeting will be held at at the project site. Anyone wishing to provide input into the design of this project should plan to attend.

Utilities with facilities within the limits of this project should review the plans to determine if their existing facilities are accurately shown. Utilities that believe that their facilities will need to be adjusted should attend this meeting. This meeting could provide opportunities for design changes that could eliminate some utility conflicts. Utilities will be contacted by the INDOT Production Management Division's Utilities Team leader at a later date concerning the project schedule and relocation coordination. The Utilities Team leader may be contacted at (317) 232-5308.

Project Manager

The distribution of this notification is as follows:

INDOT CENTRAL OFFICE DISTRIBUTION					
Recipient	PFC	FFC	Letter	Plans	X-Sec.
Environmental Policy Team Leader, Production Management Div. (C)	X	X	X	X	
Geotechnical Engineering Mgr., Production Management Div.	X	X	X	X 2 sets	X 2 sets
Project Manager, Production Management Div. (C)	X	X	X	(2)	(2)
Railroads Team Leader, Production Management Div. (C)	X		X	X	
Real Estate Acquisition Team Leader, Production Mgmt. Div.	X	X	X	(3)	
Real Estate Administrative Services Team Leader, Production Management Div.	X	X	X		
Real Estate Property Mgmt. Team Leader, Production Mgmt. Div.	X		X	X (4)	
Utilities Team Leader, Production Management Div. (C) (5)	X	X	X		
Field Engineer, Construction Management Div.	X		X		
INDOT DISTRICT DISTRIBUTION					
Construction Engineer	X	X	X	X 2 sets	
Design Team Leader (D) (6)	X	X	X	X	X
Environmental Scoping Mgr. (D)	X	X	X	X	
Operations Manager	X	X	X		
Planning and Programming Director	X	X	X		
Production Director	X	X	X		
Program Coordinator	X	X	X		
Railroads Team Leader (D)	X		X	X	
Real Estate and R/W Pgm. Dir. (D)	X	X	X	X	
System Assessment Mgr. (D)	X	X	X		
Testing Office Mgr. (D)	X	X	X	X	X
Traffic Engineer	X	X	X	(7)	
Utilities Team Leader (D)	X	X	X	X	X
NON-INDOT DISTRIBUTION					
City officials (8)	X	X	X		
County Road Spvsr. or Hwy. Engr.	X	X	X	(9)	
FHWA Area Engineer	X	X	X	(10)	
U.S. Fish and Wildlife Service	X	X	X		
Utility companies	X	X	X	X	X

Notes:

(C) Central-Office-developed project only
(D) District-developed project only

(1) only for project other than Interstate-route bridge rehabilitation
(2) only if plans do not change from initial submittal
(3) only if additional right of way is required
(4) 2 sets plans if additional right of way is required
(5) only if Major Moves or Major New project
(6) only if district-developed, or if signs, pavement markings, signals, or lighting are involved
(7) only if traffic project
(8) only if metropolitan area is affected
(9) only if legal drains, etc., are involved
(10) only if project requires FHWA oversight

[CONSULTANT LETTERHEAD]

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Preliminary ☐ Final ☐ Field Check Notification

Work Type:
Route:
Des No.
PE Project No.
R/W Project No.
CN Project No.
Bridge File:
Over
Location: , ☐mi ☐ km of , in County

Our firm is under contract with the Indiana Department of Transportation for the design of the referenced project. A Preliminary ☐ Final ☐ Field Check for this project has been scheduled for . The meeting will be held at at the project site. Anyone wishing to provide input into the design of this project should plan to attend.

Utilities with facilities within the limits of this project should review the plans to determine if their existing facilities are accurately shown. Utilities that believe that their facilities will need to be adjusted should attend this meeting. This meeting could provide opportunities for design changes that could eliminate some utility conflicts. Utilities will be contacted by the INDOT Production Management Division's Utilities Team leader at a later date concerning the project schedule and relocation coordination. The Utilities Team leader may be contacted at (317) 232-5308.

Project Manager

The distribution of this notification is as follows:

INDOT CENTRAL OFFICE DISTRIBUTION					
Recipient	PFC	FFC	Letter	Plans	X-Sec.
Environmental Policy Team Leader, Production Management Div. (C)	X	X	X	X	
Geotechnical Engineering Mgr., Production Management Div.	X	X	X	X 2 sets	X 2 sets
Project Manager, Production Management Div. (C)	X	X	X	(2)	(2)
Railroads Team Leader, Production Management Div. (C)	X		X	X	
Real Estate Acquisition Team Leader, Production Mgmt. Div.	X	X	X	(3)	
Real Estate Administrative Services Team Leader, Production Management Div.	X	X	X		
Real Estate Property Mgmt. Team Leader, Production Mgmt. Div.	X		X	X (4)	
Utilities Team Leader, Production Management Div. (C) (5)	X	X	X		
Field Engineer, Construction Management Div.	X		X		
INDOT DISTRICT DISTRIBUTION					
Construction Engineer	X	X	X	X 2 sets	
Design Team Leader (D) (6)	X	X	X	X	X
Environmental Scoping Mgr. (D)	X	X	X	X	
Operations Manager	X	X	X		
Planning and Programming Director	X	X	X		
Production Director	X	X	X		
Program Coordinator	X	X	X		
Railroads Team Leader (D)	X		X	X	
Real Estate and R/W Pgm. Dir. (D)	X	X	X	X	
System Assessment Mgr. (D)	X	X	X		
Testing Office Mgr. (D)	X	X	X	X	X
Traffic Engineer	X	X	X	(7)	
Utilities Team Leader (D)	X	X	X	X	X
NON-INDOT DISTRIBUTION					
City officials (8)	X	X	X		
County Road Spvsr. or Hwy. Engr.	X	X	X	(9)	
FHWA Area Engineer	X	X	X	(10)	
U.S. Fish and Wildlife Service	X	X	X		
Utility companies	X	X	X	X	X

Notes:

(C) Central-Office-developed project only
(D) District-developed project only

(1) only for project other than Interstate-route bridge rehabilitation
(2) only if plans do not change from initial submittal
(3) only if additional right of way is required
(4) 2 sets plans if additional right of way is required
(5) only if Major Moves or Major New project
(6) only if district-developed, or if signs, pavement markings, signals, or lighting are involved
(7) only if traffic project
(8) only if metropolitan area is affected
(9) only if legal drains, etc., are involved
(10) only if project requires FHWA oversight

CONTRACT-PREPARATION DOCUMENTS TO
CONTRACT ADMINISTRATION DIVISION
Office of Estimating

Des No.:		Route:
Contract No.:		Letting Date:
Project No.:	PE	County:
	RW	Bridge File:
	CN	Over:
Location:		

It is recommended that tracings for the above noted project be accepted. The following items accompany the tracings.

- ☐ Final Design Book
- ☐ Final Cost Estimate, Disk ☐ CES ☐
- ☐ Detour Map
- ☐ Final Special Provisions, ☐ Disk ☐ ERMS
  ERMS Title: FTSplProv[Des No.]Contracts
  If not in ERMS, why?
- ☐ Detail Packet
- ☐ Permit Certification Form
- ☐ Design Calculations

Federal Highway Administration Oversight. Required? YES ☐ NO ☐

Asbestos Report. Required? YES ☐ NO ☐
ERMS Title: FTAsbRpt[Des No.]Contracts
If not in ERMS, why?

Environmental-Document Compliance. The environmental document was approved on . The plans were reviewed against it on and were determined to be in compliance with it.

Geotechnical Report. Required? YES ☐ NO ☐
ERMS Title: FTGeoRpt[Des No.]Contracts
If not in ERMS, why?

LPA Agreement Determination. Required? YES ☐ NO ☐
Transmitted to the Research and Documents Library Team on .

Railroad Agreement. Signed? YES ☐ NO ☐ N/A ☐
If not signed, what is status?
Railroad special provision included? YES ☐ NO ☐
ERMS Title: FTRRSP[Des No.]Contracts

If not in ERMS, why?

Right of Way. Additional R/W required? YES ☐ NO ☐ N/A ☐
Is R/W clear and is Certification Letter included? YES ☐ NO ☐
ERMS Title: FTR/WCert[Des No.]Contracts
If not in ERMS, why?
If not clear, number of parcels remaining is
Expected R/W clear date is
R/W contact person is

Utility Coordination. Complete? YES ☐ NO ☐
If not complete, what is status?
Utilities special provision 107-R-169 included? YES ☐ NO ☐
ERMS Title: FTUtilSplProv[Des No.]Contracts
If not in ERMS, why?
Utility Coordination Certification ☐ Waiver ☐ included? YES ☐ NO ☐
ERMS Title: FTUtilCert[Des No.]Contracts
If not in ERMS, why?
Utility contact person is

Permits

Coast Guard Permit.
Not Required ☐ Applied For ☐ Received .
ERMS Title: FTCstGd[Des No.]Contracts
If not in ERMS, why?

Corps of Engineers Permit.
Individual: Not Required ☐ Applied For ☐ Received
Regional General: Not Required ☐ Applied For ☐ Received
ERMS Title: FT404Corps[Des No.]Contracts
If not in ERMS, why?

DNR Permit for Construction in a Floodway.
Not Required ☐ Applied For ☐ Received
ERMS Title: FTDNR[Des No.]Contracts
If not in ERMS, why?

FAA Indiana Tall-Structures Permit.
Not Required ☐ Applied For ☐ Received
ERMS Title: FTFAA[Des No.]Contracts
If not in ERMS, why?

401 Water Quality Permit.

Not Required ☐ Applied For ☐ Received
ERMS Title: FT401Wtr[Des No.]Contracts
If not in ERMS, why?

Rule 5.
Not Required ☐ Applied For ☐ Received
ERMS Title: FTRule5Eros[Des No.]Contracts
If not in ERMS, why?

Are all Permits included with the submittal? Yes ☐ NO ☐
If No, why not?

Summary of Commitments. This consists of a listing of commitments from the environmental document, regulatory agencies, purchasing agreements, etc., including context-sensitive items, as related to design and construction.
ERMS Title: FTCommit[Des No.]Contracts
If not in ERMS, why?

Design Approval. Date

Proprietary Materials. Are any specified which are not listed in *Design Manual* Chapter 17?
YES ☐ NO ☐
If Yes, has the justification been submitted and approved for each item? YES ☐ NO ☐

Unique Pay Items. Are any listed in the Schedule of Pay Items? YES ☐ NO ☐
If Yes, has a unique special provision been drafted and a unique pay item number been requested for each in accordance with *Design Manual* Chapter 20? YES ☐ NO ☐
Unique special provisions authenticated by: Testing ☐ Design ☐ Construction ☐

Load Rating. Have all bridge structures in the contract been load rated or has the load-rating engineer indicated that structure(s) can not be rated at this time? YES ☐ NO ☐ N/A ☐

Coordination with District Construction Engineer.

For project with field office:
(628-R-552) Field Office, MOS
☐ Type A, 400 SFT (37 m2)
☐ Type B, 500 SFT (51 m2)
☐ Type C, 650 SFT (60 m2)
Field Office Computer System, Additional,
Qty. , Mos. YES ☐ NO ☐
For project without field office:

Mobile Laptop Computer System, Qty. , Mos. YES ☐ NO ☐
Mobile Internet Service, Qty. , Mos. YES ☐ NO ☐

For project with field laboratory:

(628-R-552) Field Laboratory, MOS

☐ Type A, 400 SFT (37 m2)
☐ Type B, 500 SFT (51 m2)
☐ Type C, 650 SFT (60 m2)

Cellular telephone (105-C-164), Qty. YES ☐ NO ☐
Anytime minutes, Qty.
Radio, Qty. YES ☐ NO ☐
Construction engineering YES ☐ NO ☐
Incentive/Disincentive (108-C-043) YES ☐ NO ☐
if YES, attach Justification form.
Partnering (108-C-078) YES ☐ NO ☐
Profilograph as pay item for HMA pavement YES ☐ NO ☐
Profilograph as pay item for PCCP pavement YES ☐ NO ☐
Traffic maintenance (104-C-112) (provide details) YES ☐ NO ☐

Latest date to begin work: Liquidated damages: $
(108-C-090)
Restriction time: Liquidated damages: $
(108-C-091 or -092) (provide details)
Closure time: Liquidated damages: $
(108-C-093)
Intermediate completion date: Liquidated damages: $
(108-C-094)
Calendar completion date: Liquidated damages: $
(108-C-095)
Earliest date to begin work: Liquidated damages: $
(108-C-127)

Designer:

Construction information provided by:

Comments:

Prepared by: Date:

ASBESTOS CERTIFICATION

Route:
Des. No.:
Contract No.:
Project No.:
Structure No.:
Over:
County:

I hereby certify that no asbestos-containing material was specified in a construction document as a building material for this project.

_____
(signed) Designer Date

INDOT location or consulting firm

:

cc: , District Bridge Inspection Engineer
, Environmental Policy Administrator
Project design calculations document

FINAL TRACINGS CHECKLIST Rev. 8-05-08

CONTRACT No: DES No: DATE:

DATE	SUBMITTAL TYPE	FORMAT	REMARKS	ERMS DOC TYPE
	TRANSMITTAL LETTER	PDF	LETTING-DATE CRITICAL	LETTERS
	FINAL TRACINGS PLANS	PDF	LETTING-DATE CRITICAL	FINAL TRACINGS
	FINAL TRACINGS CROSS SECTIONS	PDF	LETTING-DATE CRITICAL	FINAL TRACINGS
	SMALL PLANS OR DETAIL DRAWINGS	PDF	LETTING-DATE CRITICAL	PLANS
	COST ESTIMATE (GROUP NUMBER CHANGED TO 12)	CES	LETTING-DATE CRITICAL	NOT LOADED IN ERMS
	COST ESTIMATE (IN ESTIMATOR)	EST	LETTING-DATE CRITICAL	COST ESTIMATE
	COST ESTIMATE	PDF	LETTING-DATE CRITICAL; OPTIONAL	COST ESTIMATE
	SPECIAL PROVISIONS MENU	Excel	LETTING-DATE CRITICAL	PROVISIONS
	UNIQUE SPECIAL PROVISIONS AND MODIFIED RECURRING SPECIAL PROVISIONS	Word	LETTING-DATE CRITICAL	PROVISIONS
	CONTRACT PREPARATION DOCUMENTS SUMMARY TO CONTRACT ADMIN. DIV.	Word	LETTING-DATE CRITICAL	CONTRACT WORKSHEET
	PERMITS (404, 401, DNR, RULE 5, FAA, ETC)	PDF	LETTING-DATE CRITICAL	PERMITS
	UTILITY COORDINATION CERTIFICATION	PDF	LETTING-DATE CRITICAL	OTHER
	SUMMARY OF COMMITMENTS (Standard form)	Word	LETTING-DATE CRITICAL	OTHER
	RAILROAD SPECIAL PROVISIONS (if applicable)	Word	LETTING-DATE CRITICAL	PROVISIONS
	R/W CERTIFICATION LETTER	PDF	LETTING-DATE CRITICAL	LETTERS
	GEOTECHNICAL REPORT	PDF	LETTING-DATE CRITICAL	REPORTS
	ASBESTOS CERTIFICATION (BRIDGE)	PDF	LETTING-DATE CRITICAL	LETTERS
	ASBESTOS REPORT	PDF	LETTING-DATE CRITICAL	ASBESTOS REPORT
	PROPRIETARY-MATERIALS-USE JUSTIFICATION	PDF	LETTING-DATE CRITICAL	OTHER
	REVIEWER COMMENTS – FINAL CHECK PRINTS	PDF	INCORPORATED INTO FINAL TRACINGS? YES ☐ NO ☐	LETTERS
	LEVEL ONE DESIGN CRITERIA CHECKLIST	PDF		LEVEL 1 CHECKLIST
	DESIGN COMPUTATIONS	PDF		DESIGN COMPUTATIONS

DATE	SUBMITTAL TYPE	FORMAT	REMARKS	ERMS DOC TYPE
	QUANTITY CALCULATIONS	PDF		QUANTITY CALCULATIONS
	CORRESPONDENCE FILES	PDF	OPTIONAL FOR LPA PROJECT	LETTERS
	SCOPE / ENVIRONMENTAL COMPLIANCE CERTIFICATION / PERMIT APPLICATION CERTIFICATION	PDF		ENV COMP FORM
	QUALITY ASSURANCE FORM	PDF		QA FORM
	CONSULTANT PROJECT INPUT FORM	PDF	OPTIONAL FOR LPA PROJECT	OTHER
	LIMITED REVIEW CERTIFICATION	PDF		LTD REVIEW CERTIFICATION
	FINAL PAVEMENT DESIGN	PDF		OTHER
	GEOTECHNICAL REVIEW OF FINAL CHECK PRINTS	PDF		LETTERS
	BRIDGE SEARCH DATA FORM	PDF		OTHER
	BRIDGE LOAD-RATING MEMO	PDF		OTHER
	ORIGINAL FIELD NOTES	PDF	OPTIONAL FOR LPA PROJECT	OTHER
	SUBMITTAL DATE 14 WEEKS PRIOR TO LETTING DATE?		YES ☐ NO ☐	
	LPA-PROJECT MASTER CONTRACT SIGNED BY LPA?		YES ☐ NO ☐ N/A ☐	
	LPA-PROJECT CONSTRUCTION ENGINEERING AGREEMENT IN PLACE?		YES ☐ NO ☐ N/A ☐	

CONTRACT INFORMATION BOOK CERTIFICATION

(Return to INDOT in 48 hours)

INDOT contact person, , Project Coordinating Engineer,
Office of Estimating, Contract Administration Division

Letting Date:
Contract No.:
Route:
Des. No.:
County:

I certify that I have reviewed the plans and the Contract Information book (CIB), and have verified that they are correct as compiled, based on design submittals received by Contract Administration prior to the compilation of the CIB.

_____

(signed) project designer

INDOT location or consulting-firm name

Date,

OR

The plans or CIB include errors. The designer is responsible for documenting the errors, and for noting which errors were caused by omissions or misinterpretations by INDOT based upon the original material, or based upon new material. The designer shall transmit the documentation to the contact person identified above.

_____

(signed) project designer

INDOT location or consulting-firm name

Date,

CONSTRUCTION CHANGE

Date:

Contract No.: Work Type:
Route: Des No.: Location: of
Structure No.: Project No.:

TO:
District Deputy Commissioner

ATTN.:
District Construction Office Manager

FROM:
Project Manager

Transmitted herewith are copies of the above-referenced contract's revised plans sheets, numbered . These sheets were revised on . The revision involved the following:

Please have the Project Engineer or Supervisor prepare a Change in Plans, Form IC-626, addressing revised pay quantities, if applicable.

Two sets of the revised sheets are for your files and two sets each are to be delivered to the Contractor and Project Engineer or Supervisor. The FHWA is being provided with a half-size set of the revised sheets for its files (if applicable).

Note: Quantities revisions are to be computed and transmitted by the designer with this memorandum to the Project Engineer or Supervisor for aid in preparing Form IC-626.

DATE: 14JUN04. TIME: 08:58:37
MOSS

REPO SECTIONS DESIGN

MODELNAME	RECORD	SECURITY	LAST UPDATED
Sections	195	Free	14 Jun 04, 08:11:52
Design	194	Free	14 Jun 04, 08:37:04

LABEL	SUBREF	CONTENTS	NO. PTS.	X-MIN	Y-MIN	X-MAX	Y-MAX
G001	MBRA	7705	24	4843	4801	4936	4874

CHAINAGE 2100.000

Point	---X---	---Y---	---Z---	OFFSET	LABEL CUT
1	4843.480	4873.250	783.566	-58.220	BNDR
2	4843.597	4873.159	783.578	-58.072	TRIA
3	4849.094	4868.863	783.709	-51.096	BNDR
4	4857.378	4862.390	783.784	-40.582	*TR*
5	4865.662	4855.916	783.858	-30.068	BNDR
6	4870.090	4852.456	783.252	-24.449	DLL1
7	4870.323	4852.274	783.292	-24.153	TRIA
8	4870.603	4852.055	783.322	-23.798	TRIA
9	4873.658	4849.668	783.634	-19.921	TRIA
10	4878.029	4846.253	784.052	-14.374	ESL1
11	4881.321	4843.680	784.194	-10.196	TRIA
12	4881.836	4843.277	784.211	-9.542	TRIA
13	4881.930	4843.204	784.214	-9.423	EPL1
14	4890.246	4836.705	783.901	1.131	TRIA
15	4890.299	4836.664	783.899	1.199	RC01
16	4890.359	4836.617	783.895	1.274	TRIA
17	4899.115	4829.774	783.278	12.387	EPR1
18	4900.460	4828.724	783.283	14.093	TRIA
19	4902.977	4826.756	783.239	17.288	ESR1
20	4904.728	4825.389	782.875	19.510	BNDR
21	4913.940	4818.190	782.961	31.202	BNDR
22	4919.066	4814.184	784.485	37.707	TRIA
23	4933.653	4802.785	784.324	56.219	TRIA
24	4935.277	4801.516	784.460	58.281	BNDR

LABEL	SUBREF	CONTENTS	NO. PTS.	X-MIN	Y-MIN	X-MAX	Y-MAX
G002	MBRA	7705	21	4854	4814	4958	4898

CHAINAGE 2125.000

Point	---X---	---Y---	---Z---	OFFSET	LABEL CUT
1	4854.682	4897.293	782.607	-64.367	BNDR

EXISTING ELEVATIONS FROM
ELECTRONIC CROSS SECTIONS DATA

Figure 14-2A

UNDERGROUND STORAGE TANKS REMOVAL

, 20

MEMORANDUM

TO:

Environmental Services Office Administrator
Production Management Division

THRU:

☐ Roadway Services Manager, Production Management Division
☐ Structural Services Manager, Production Management Division
☐ District Design Manager

FROM:

Project Manager

SUBJECT: Underground Storage Tanks Removal

Route: Des. No.:
Project No.: : PE County:
Description and Location:

Transmitted herewith is one set of plans for the above-referenced project.

This project has underground storage tanks to be removed at the locations as follows:

Station:	Offset:	left	right
Station:	Offset:	left	right
Station:	Offset:	left	right

Please provide the list of pay items and required special provisions. Also provide us with additional details that may be needed to accomplish the task.

If you need further information, please contact me at or e-mail.

Attachments/Enclosures
1.
2.

:

cc:

(A) __(*thickness*)__ in. Plain PCCP

(A1) __(*thickness*)__ in. Plain PCCP

(C) __(*thickness*)__ in. PCCP for Driveways

(D) _____ lb/yd^2 HMA for Approaches ___*(type)*___ on _____ mm
Compacted Aggregate Base ___*(type)*___, __*(size)*__

(D1) _____ lb/yd^2 HMA Surface ___*(type)*___ on
_____ lb/yd^2 HMA Base ___*(type)*___ on
_____ mm Compacted Aggregate Base ___*(type)*___, *(size)*

(D2) _____ lb/yd^2 HMA Surface ___*(type)*___ on
_____ lb/yd^2 HMA Base ___*(type)*___

(F) Concrete Sidewalk

(J) _____ lb/yd^2 HMA Shoulder

(J1) __(*thickness*)__ in. Plain PCCP Shoulder

(J2) _____ in. Compacted Aggregate for Shoulder

(K) Full Depth HMA Pavement

(K1) Breakdown of Quantities, e.g., _____ lb/yd^2 HMA Surface on
_____ lb/yd^2 HMA Intermediate on
_____ lb/yd^2 HMA Base on
_____ in. Compacted Aggregate Base __*(type)*__

(N) _____ in. Compacted Aggregate for Surface ___*(size)*___

(O) _____ in. Compacted Aggregate Base ___*(type)*___, __*(size)*__

(P) _____ Prime Coat

(P1) _____ Seal Coat

(P2) _____ Tack Coat

(R) _____ lb/yd^2 HMA OverlayTack Coat

(R1) _____ lb/yd^2 HMA Surface on
_____ lb/yd^2 HMA Intermediate on
_____ lb/yd^2 HMA Base

(R4) ___(thickness)___ in. PCCP for Resurface

(U) ____(size)_____ Underdrain

(X) Construction Sign, Type A

(X1) Construction Sign, Type B

(X2) Construction Sign, Type ____

(Y) Barricade, Type _____

(Y1) Barricade, Type _____

(1) 33 in. Concrete Barrier

(2) 45 in. Concrete Barrier

(2A) Modified Concrete Barrier

(3) Longitudinal Joint

(5) Butt Joint

(6) Construction Joint

(7) Keyway Joint

(8) 1 in. Expansion Joint with Load Transfer

(9) __(width)___ in. Preformed Joint Filler

(12) Impact Attenuator, Type _____

(13) Concrete Curb

(14) Integral Concrete Curb

(15) Concrete Curb and Gutter

(16) Concrete Curb Type B

(18) Integral Concrete Curb and Gutter, Type ____

(20) Contraction Joint, Type ____

(21) Longitudinal Construction Joint

(22) Concrete Center Curb, Type ____

(23) Asphalt Curb

(24) Ear Construction, Type A

(25) Ear Construction, Type B

(26) Sodding

(27) Cement Concrete Header, Type ____

(28) Retrofitted Tie Bar

(31) Temporary Concrete Barrier

(32) Impact Attenuator, CZ, Type _____

(33) Snowplowable Raised Pavement Marker

(34) ___*(width)*___ in. Solid White Paint Line

(35) ___*(width)*___ in. Solid Yellow Paint Line

⬡ Concrete Curb Ramp
(Type is indicated by letter inside hexagon)

(36) ___*(message)*___ Preformed Plastic Pavement Message Marking

(37) ___*(message)*___ Thermoplastic Pavement Message Marking

(38) ___*(width)*___ in. ___*(type)*___ ___*(color)*___ Thermoplastic Transverse Marking

(39) ___*(width)*___ in. ___*(type)*___ ___*(color)*___ Preformed Plastic Transverse Marking

(40) ___*(width)*___ in. Solid White Preformed Plastic Line

(41) ___*(width)*___ in. Solid Yellow Preformed Plastic Line

(42) ___*(width)*___ in. Broken White Preformed Plastic Line

(43) ___*(width)*___ in. Broken Yellow Preformed Plastic Line

(44) 24 in. Solid White Preformed Plastic Line

(45) 24 in. White Stop Line, Preformed Plastic

(46) ___*(width)*___ in. Solid White Thermoplastic Line

(47) ___*(width)*___ in. Solid Yellow Thermoplastic Line

(48) ___*(width)*___ in. Broken White Thermoplastic Line

(49) ___*(width)*___ in. Broken Yellow Thermoplastic Line

(50) No Change Required to Existing Sign and Supports

(51) Remove Existing Panel Sign from Ground Mounted Supports

(52) Remove Existing Sheet Sign from Supports

(53) Remove Existing Panel Sign from Overhead Sign Structure

(54) Remove Existing Sheet Sign from Overhead Sign Structure

(55) Remove Existing Sign Foundation

(56) Remove Existing Sheet Sign and Supports

(57) Remove Existing Ground Mounted Panel Sign, Supports and Foundations

(58) Remove Existing Overhead Sign, Supports and Foundations

(59) Existing Sheet Sign on New Supports

(60) Existing Panel Sign on New Supports

(61) Existing Panel Sign on New Overhead Structure

RECOMMENDED PLANS LEGENDS

Figure 14-3A

&	And
@	At
Δ	Delta or Deflection Angle
=	Equals
	Fish
||	Parallel
%	Percent
⊥	Perpendicular
Ø	Phase or Diameter
	Begin L.A. R/W
	End L.A. R/W
A.A.D.T.	Annual Average Daily Traffic
AASHTO	American Association of State Highway and Transportation Officials
Ab.	Abrupt
Abut.	Abutment
Ac	Acres
A.C.	Aluminum Cap/Asphalt Cement
A.C.L.	Access Control Line
Add. Exc.	Additional Excavation
Adj.	Adjusted
Aggr.	Aggregate
Ah.	Ahead
Alum.	Aluminum
A.P.	Anchor Plate
App. Exist. R/W	Apparent Existing Right-of-Way
App. P. L.	Apparent Property Line
Appl.	Application
Appr.	Approach
Approx.	Approximate
Art.	Article
Asph.	Asphalt
ASTM	American Society for Testing Materials
Ave.	Avenue
Avg.	Average
AWG	America Wire Gauge
Az.	Azimuth
B.	Barn
B.E.	Bridge End
Beg.	Begin
B.I.P.	Boiler Iron Pipe
Bit.	Bituminous or Bitumen
Bk.	Back or Bank
℄	Baseline
Bldg.	Building
Blk	Block
Blktp.	Blacktop
Blvd.	Boulevard
Bm.	Beam
B.M.	Bench Mark
Bndry.	Boundary
Bot.	Bottom
Br.	Bridge
Brg.	Bearing
Brk.	Brick
Br. S.	Bridge Seat
B.S.	Backsight
B. Spk.	Boat Spike
B.S.T.	Bituminous Surface Treatment
Bur.	Buried
Calc.	Calculated
C.A.P.	Corrugated Aluminum Pipe
C.A.T.	Crash Cushion/Attenuating Terminal Guard Rail End Treatment
Cb.	Curb
C.B.	Catch Basin
Cb.In.	Curb Inlet
Cb.L.	Curb Line
C.B.W.	Concrete Block Wall
C.C.	Corn Crib
C-C	Center to Center
Cdtn.	Condition
Cem.	Cemetery
C.G.M.P.	Corrugated Galvanized Metal Pipe
Ch.	Channel or Chain
Chan. Chg.	Channel Change
Chd.	Chord
C.I.	Cast Iron
C.I.P.	Cast Iron Pipe
Cir.	Circle
℄	Centerline
Cl.	Class or Clearance
C.L.	Corporation or City Limits
C.L.T.F.	Chain Link Type Fence
C.M.B.	Concrete Median Barrier
C.M.P.	Corrugated Metal Pipe
Co.	County or Company
C.O.	Clean Out
Col.	Column
Comp.	Compacted or Composite
Conc.	Concrete
Conc. P.	Concrete Pipe
Conn.	Connection
Const.	Construction or Construct
Cont.	Continuous
Cor.	Corner
Corr.	Corrugated
Cov.	Cover
C.P.	Catch Point
Cr.	Crushed or Creek
Crs.	Course
C. Stn.	Crushed Stone
Ct.	Court
Ctr.	Center
Cu.	Cubic
Cul.	Culvert
Cyd	Cubic Yards
C.Z.	Clear Zone or Construction Zone
D	Distribution of Traffic
Dbl.	Double
Defl.	Deflection
Desc.	Description
Dest.	Destroyed
Det.	Detour or Detail
Detc.	Detector

D.H.	Drill Hole
D.H.V.	Design Hourly Volume
Dia.	Diameter
Diaph.	Diaphragm
Dim.	Dimension
Dist.	Distance or District
Dn.	Down
Dp.	Deep
Dr.	Drain or Drive
Dt.	Ditch
Drwg.	Drawing
E	East
Ea.	Each
E.B.	Eastbound
E.B. L.	Eastbound Lane
E.F.	Each Face
E.G.	Edge of Gutter
Elec.	Electric
El.	Elevation
E.M.	Edge of Metal (surface)
Emb.	Embankment
Eq.	Equation
Esmt.	Easement
E.T.L.	Edge of Traveled Lane
E.T.W.	Edge of Traveled Way
Exc.	Excavation
Exist.	Existing
Exp.	Expansion
Ext.	Extension
Fa.	Face
F.A.	Federal Aid
F.B.C.P.C.S.	Fully Bituminous Coated Perforated Corrugated Steel
F.Div.	Field Division
Fdn.	Foundation
Fe.	Fence
Fert.	Fertilizer
F-F	Face to Face
F.F.	Front Face
F.F.T.F.	Farm Field Type Fence
F. Hyd.	Fire Hydrant
Fig.	Figure
Fin.	Finish
Fix.	Fixed
Fl.	Flush
F.L.	Flow Line
Flg.	Flange
F.O.	Fiber Optic
F.P.	Fence Post
F.R.	Frontage Road
F.S.	Far Side or Foot of Slope
F.T.	Farm Tile
ft	Feet
Ftg.	Footing
Fut.	Future
Fwy.	Freeway
G.	Garage
Galv.	Galvanized
G.B.A.	Gravel Barrel Array Impact Attenuator
G.B.E.S._ _	Grated Box End Section (Pipes)
Gdr.	Girder
Geod.	Geodetic
G.L.	Gas Line
G.P.	Guy Pole
G.P.S.	Global Positioning System
G.R.	Guard Rail
Grav.	Gravel
G.R.E.A.T. __	GREAT Unit (Bays)
G.R.E.T.	Guard Rail End Treatment
Grnd.	Ground
Gr.Sep.	Grade Separation
G.S.	Gravel Surfacing
G.S.P.	Galvanized Steel Pipe
Gut.	Gutter
G.V.	Gas Valve
H.H.	Hand Hole
Hdw.	Headwall
H.I.	Height of Instrument
H.	House
Horiz.	Horizontal
H.P.S.V.	High Pressure Sodium Vapor
H.S.	High Strength
Ht.	Height
H.W.	High Water
H.W.L.	High Water Line
Hwy.	Highway
I	Interstate
I.C.	Incidental Construction
I.D.	Inside Diameter
I.F.	Inside Face
IMSA	International Municipal Signal Association
in.	Inches
In to In	Inside to Inside
Inc.	Incorporated
Incl.	Included
Inlt.	Inlet
Instr.	Instrument
Inters.	Intersection
Intch.	Interchange
Inv.	Invert
I.P.	Iron Pipe
I.P.B.	Iron Pipe Buried Below Plow Depth
I.P.F.	Iron Pin Flush
I.P.L.	Iron Pin Lightly Buried
I.P.N.F.	Iron Pin Not Found
Jct.	Junction
Jt.	Joint
L	Length of Curve, Liter or Loop
L.A.	Limited Access
L.A.R/W.	Limited Access Right of Way
Lb	Pounds
L.C.	Long Chord
L_C	Length of Circular Curve
L.D.	Loop Detector
Leng.	Length or Lengthen

Ln.	Lane
LRFD	Load Resistance Factor Design
L.S.	Land Surveyor
L.S.R.	Local Service Road
Lt.	Left
Lt. P.	Light Pole
L.W.	Low Water
Mac.	Macadam
Matl.	Material
Max.	Maximum
Mbox.	Mailbox
Mdwl.	Mudwall
Meas.	Measured
Med.	Median
Mh.	Manhole
Mi	Miles
Min.	Minimum, Mineral or Minute
Misc.	Miscellaneous
Mkr.	Marker
ML.	Mainline
Mncpl.	Municipal
M.O.	Mid Ordinate
Mom.	Moment
Mon.	Monument
M.P.C.	Mid-Point of Curve
N	North
N.B.	Northbound
N.B.L.	Northbound Lane
N.C.	Normal Crown
N.E.	Northeast
Neg.	Negative
NEMA	National Electrical Manufacturers Association
N.E.P.L.	No Evidence of Property Line
N.F.	Near Face
N.G.	Natural Gas
N.G.S.	National Geodetic Survey
Nl.	Nail
Nly.	Northerly
No. or #	Number
N.S.	Near Side
N.W.	Northwest
O.C.	On Centers or Overhead Crossing
O.D.	Outside Diameter
O.F.	Outside Face
Off.	Offset
Oh.	Overhang or Overhead
O-O	Out to Out
O.P.O.C.	Offset Point on Curve
O.P.O.S.T.	Offset Point of Semi-Tangent
O.P.O.T.	Offset Point on Tangent
Out.	Outlet
Oz	Ounces
P	Power Cable or Pipe
P. or Pg.	Page
P.B.	Pull Box
P.C.	Point of Curve (Beginning of Curve)
P.C.C.	Point of Compound Curve or Portland Cement Concrete
Ped.	Pedestrian
Pen.	Penetration
Perf.	Perforated
P.G.	Profile Grade
P.I.	Point of Intersection
Pl.	Place or Plate
P.L.	Property Line
Plas.	Plastic
P.M.P.	Perforated Metal Pipe
P.O.C.	Point on Curve
Pos.	Positive
P.O.S.T.	Point on Semi-Tangent
P.O.T.	Point on Tangent
P.O.V.C.	Point on Vertical Curve
Pp.	Pages
P.P.B.	Pedestrian Push Button
P.R.C.	Point of Reverse Curve
Prest.	Prestressed
Priv.	Private
Proc.	Processing
Proj.	Project or Projected
Prot.	Protect, Protector or Protection
P.S.D.	Paved Side Ditch
Pt.	Point
P.T.	Point of Tangent (End of Curve)
Pub.	Public
Pv.C.	Polyvinyl Chloride
P.V.C.	Point of Vertical Curve
P.V.I.	Point of Vertical Intersection
Pvm't.	Pavement
P.V.T.	Point of Vertical Tangent
Pwp.	Powerpole
Pwr.	Power (Lines)
Q	Peak Discharge (Water)
R.	Range or River
Rad. or R.	Radius
R.C.	Rapid Curing, Reinforced Concrete or Remove Crown
R.C.P.	Reinforced Concrete Pipe
Rd.	Road
Rdl.	Radial
Rd. N.	Road Nail
Rd NF.	Road Nail Flush
Rd NL.	Road Nail Lightly Buried
Rdwy.	Roadway
Rec.	Record or Recommended
Ref.	Reference
Reinf.	Reinforcement, Reinforcing, Reinforced
Req'd.	Required
Ret.	Retaining
Rev.	Revised
R.M.	Reference Monument
R.P.	Reference Point
R.P.M.	Raised Pavement Marker
R.R.	Railroad

R.R. Spk.	Railroad Spike
Rt.	Right or Route
Rte.	Route
R/W	Right-of-Way
R/W Mkr.	Right-of-Way Marker
Rwy.	Railway
S	South
S.	Shed
San.	Sanitary Sewer
S.B.	Southbound
S.B.L.	Southbound Lane
Sched.	Schedule
Sdwk.	Sidewalk
S.E.	Southeast
Sec.	Section or Second
Sec. Line	Section Line
Ser. Rd.	Service Road
S.G.	Subgrade
Sht.	Sheet
Shldr.	Shoulder
Sig.	Signal
S.L.D.	Sea Level Datum
Sly.	Southerly
Spa.	Spaces, Spacing
Spec. Prov.	Special Provision
Spk.	Spike
Spl.	Special or Splice
Sq.	Square
Sft	Square Feet
Sq. in.	Square Inches
S.R.	State Road or State Route
S.S.	Stainless Steel
St.	Street
Sta.	Station
Std.	Standard
Std. Spec.	Standard Specifications
Stiff.	Stiffener
Stk.	Staked or Stake
Stl.	Steel
Str.	Structure, Structural
Subd.	Subdivision
Subgr.	Subgrade
Supstr.	Superstructure
Surf.	Surface or Surfacing
Surv.	Survey
S.W.	Southwest or Sidewalk
Sym.	Symmetrical
T.	Tangent Length or Township (as T-6-N)
T	Ton
Tan.	Tangent
T.B.	Test Boring
T.B.M.	Temporary Bench Mark
Tbr.	Timber
Tel.	Telephone
Tel.C.	Telephone Cable
Tgp.	Telegraph Pole
Tfp.	Telephone Pole
Temp.	Temperature or Temporary
T.O.	Top of Opening
T.O.B.	Top of Bank
T.O.P.	Top of Pipe
T.O.S.	Top of Slope
Topog.	Topographic
T.P.	Turning Point
Trans.	Transmission Line or Transition
Trav.	Traverse
T.T.	Transmission Tower
Twp.	Township (as Center Township)
T.W.L.T.L.	Two-Way Left-Turn Lane
Typ.	Typical
U.	Unit
Ug.	Underground
Uncl.	Unclassified
U'pass.	Underpass
U.S.C. & G.S.	U.S. Coast & Geodetic Survey
U.S.Co.E.	U.S. Corps of Engineers
U.S.F.S.	U.S. Forest Service
U.S.G.S.	U.S. Geological Survey
U.S.P.L.S.	U.S. Public Land Survey
V	Design Speed or Velocity
V.C.	Vertical Curve
Veh.	Vehicle, Vehicular
Vert.	Vertical
W	West, Wide Flange Beam or Water
W/	With
W.B.	Westbound
W.B.L.	Westbound Lane
Wd.	Wood
W.L.	Water Line
Wly.	Westerly
W.P.	Working Point
Wt.	Weight
W.T.	Water Table
W.V.	Water Valve
W.W.	Wing Wall or Woven Wire
Xing.	Crossing
Xsec.	Cross Section

PLANS ABBREVIATIONS

Figure 14-3B

TRAFFIC DATA	
A.A.D.T. (20___) ①	V.P.D.
A.A.D.T. (20___) ②	V.P.D.
D.H.V. (20 ___) ②	V.P.H.
DIRECTIONAL DISTRIBUTION ③	%
TRUCKS ④	% A.A.D.T
	% D.H.V.
DESIGN DATA	
DESIGN SPEED	km/h
PROJECT DESIGN CRITERIA	⑤
FUNCTIONAL CLASSIFICATION	⑥
RURAL / URBAN	(7)
TERRAIN	(8)
ACCESS CONTROL	(9)

① Current year and count

② Design year and count

③ Current-year figure

④ Design-year figures

⑤ is ONE of the following:

NEW CONSTRUCTION (FREEWAY)
NEW CONSTRUCTION (NON-FREEWAY)
COMPLETE RECONSTRUCTION (FREEWAY)
PARTIAL RECONSTRUCTION (4R) (FREEWAY)
RECONSTRUCTION (NON-FREEWAY)
3R (FREEWAY)
3R (NON-FREEWAY)
PARTIAL 3R (NON-FREEWAY)

⑥ is ONE of the following:

PRINCIPAL ARTERIAL
MINOR ARTERIAL
STATE COLLECTOR
LOCAL AGENCY COLLECTOR
LOCAL ROAD

LOCAL STREET
RECREATIONAL ROAD

(7) is ONE of the following:
RURAL
URBAN (SUBURBAN)
URBAN (INTERMEDIATE)
URBAN (BUILT-UP)

(8) is ONE of the following:
LEVEL
ROLLING

(9) is ONE of the following:
FULL
PARTIAL
NONE

TITLE SHEET INFORMATION BLOCK

Figure 14-3C

DATUM	ACCURACY
PI	0 + 00.01
Δ	00º 00′ 01″
R, existing alignment	0.01 ft
R, new alignment	10 ft
T	0.01 ft
L	0.01 ft
E	0.01 ft
SE	0.1%

HORIZONTAL-CURVE DATA ON PLAN SHEETS

Figure 14-3D