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# Field Examination Checklist (New and Reconstructed Highways)

Design Manual  
Chapter 1  
General Information

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## Field Exam Requests

The Design Projects Engineer should submit a request to schedule a Design Field Exam (D2) to the Pre-Design/Field Exam Engineer (Field Exam Engineer) approximately 4 to 6 weeks prior to the desired field exam date. The following information should be included in the request:

- County name.
- Project number.
- Project identification number (PIN).
- Project location, as stated in the production schedule.
- Anticipated date plans will be available for review. Five copies of the plans should be provided to the Field Exam Engineer for distribution at least 2 weeks before the scheduled field exam (1 – Field Exam Engineer, 1 – Federal Highway Administration, and 3 – District Office).
- Any special information about the project and/or attendees.

The Field Exam Engineer will contact the appropriate District Office Development Engineer to schedule the field exam. If necessary, the Field Exam Engineer will make reservations for lodging. The District Office Development Engineer will contact any non-DOT personnel such as county engineers, city engineers, other affected state agencies, etc.

The Field Exam Engineer will then send out confirmation (via Lotus Notes) of the scheduled field exam. Distribution of this confirmation note should include the following personnel:

- District Office Development Engineer.
- District Office Construction Engineer.
- District Office Maintenance Engineer.
- FHWA representative.
- Design Engineer.
- Assistant Design Engineers.
- Pavement Design Engineer.
- Soils Design Engineer.
- Assistant Bridges and Structures Engineer.
- Preliminary Bridge Engineer.
- Methods (if there is interchange, geometric, or lighting issues).
- Right of Way Design representative.

- FHWA.
- Records Center.
- Design Projects Engineer.

The confirmation note should include the following information:

- County name.
- Project number.
- PIN.
- Project location.
- Date of field exam.
- Meeting location and time.
- Departure location and time for central office personnel.

## **Plan Development Prior to Field Exam**

Prior to the field exam, the Design Projects Engineer should review the plans for completeness. The field exam plans should contain, but not be limited to the following:

- Preliminary title sheet.
- Project concept letter, if available.
- Overall plan layout for large complicated projects.
- Typical cross sections.
- Plan and profile sheets.
- Preliminary cross sections.
- Side road plan and profile sheets.
- Reference information and bench marks.
- Bridge and/or culvert situation plan sheets.
- On-site detour plan and profile.
- Staging and traffic control sheets.

### **Title Sheet**

The following information should be included on the title sheet:

- County name.
- Project number.
- PIN.
- County map showing project location.
- Design data, project information, traffic, etc.
- Preliminary earthwork quantities (borrow required or waste generated).

## Typical Cross Sections

At least half of Sheet B.01 should be left blank for taking notes.

The following information should be included:

- Typical cross section(s) for mainline grading and/or paving.
- Typical cross section(s) for side roads (paved and/or granular).
- Typical cross section(s) for shoulders.
- Typical cross section(s) for on-site detour paving and/or runarounds.
- Any other applicable typical cross sections.

## Plan and Profile Sheets

The following information should be shown in the plan view:

- Plan view of design and related information.
- Horizontal alignment.
- Bridge and culvert information—drainage arrows; drainage area; existing culvert descriptions; proposed type, size, and location of new structures; carry drainage ahead or back.
- Intercept lines.
- Access control and access locations
  1. Side road locations, including traffic data and reference to the appropriate side road plan and profile sheet
  2. Entrance locations.
- On-site detours.
- Turn lanes (The use of turning lane pavement markings will be determined by the District Engineer. See Section 7D-3).
- Any questions to be discussed during the field exam should be surrounded by a “cloud” to stand out on the plans.

The following items should be shown in the profile view:

- Profile with grades, lengths of vertical curves, K value, and design speed.
- Existing ground line.
- Existing roadway profile and/or railroad profile, if applicable. If the existing roadway is to be used as constructed (UAC) as part of a “new” four-lane roadway construction, then the K values and design speed of the existing vertical curves (especially crest vertical curves) should be reviewed and noted. Assume the posted speed limit will be raised to 65 mph (70 mph design speed). Specific locations with concerns, such as a side road or entrance located beyond a vertical curve not meeting the higher speed criteria, should be noted for review on the field exam.
- Entrance profiles with grades.
- Ditch grades.
- Ditch bar chart with descriptions.

- Bench information for foreslopes and/or backslopes.
- Cut and fill quantities with borrow or waste circled.

## Plan Review Prior to Field Exam

The Field Exam Engineer will review the plans to become familiar with the scope of the project and the proposed design. The following checklist is provided for this review:

- Are plans complete enough to conduct the field exam and are they legible?
- Check the typical section. Are L, R, and BW correct for the assumed pavement thickness?
- Review the disposition shown for all drainage areas, whether diversion of water appears possible, and if the outlets for drainage areas are being cut out.
- Is the proposed profile grade high enough for adequate snow storage or is it too high requiring too much borrow?
- Do taper lengths, spirals, vertical curves, etc. conform to current design standards?
- What are the right-of-way impacts? Are “line shifts” necessary to minimize excess right-of-way? Are right-of-way “need” lines shown on the plans?
- Is design year traffic for the mainline and side roads shown on the plans?
- Is/are detour route(s) required for construction? If so, have any recommendations been made by Design? Does the map on the title sheet cover the detour area?
- Review the proposals made for the disposition of waste.
- Review the proposals made for the disposition of removal items.
- Review whether the class of access control has been shown.

## Checklist for the Field Examination

- Review the preliminary plans for any new items that should be included and/or any old items that should be removed since the preliminary data was obtained.
- Review the profile grades and horizontal alignment to determine if it fits the terrain. Also, do the proposed horizontal and vertical geometrics provide a good economical design to accomplish the intended need?
- Review drainage in regard to the following aspects:
  - Does the proposed grade line provide adequate positive drainage?
  - What relationship does drainage have with adjacent property?
  - Are the proposed drainage structures satisfactory, is there a diversion of water, and what is the condition of the structures being extended?
  - Do structures in drainage channels need provisions for the future lowering of the channel (this is of particular importance in regard to river bottoms and Northern Iowa flatland); attention should be given to established drainage ditches?
  - Are ditches, as proposed, going to satisfactorily drain the road without excessive erosion problems or diversion of water?
  - Are there areas which appear to need intercepting ditches or are there any proposed which appear to be unnecessary?

- Determine if any “letdown” structures are needed in backslopes or side ditches.
- Examine channel changes to determine if they are warranted.
- Review the traffic management assessment provided by the Office of Traffic and Safety, or the traffic control/staging concept developed in the project concept or by the Project Management Team. Examine whether or not additional measures are required for traffic management to mitigate traffic congestion and whether or not the project is constructible as staged. While on the field exam, discuss and document the traffic control measures decided on. Measures may include modifying contract periods to accelerate project completion, use of lane rental or incentives/disincentives for timely contract completion, extra law enforcement, special traffic control details, additional motorist warning devices, etc.
- Review whether sideroads/interchanges need to be kept open to maintain access or if closures are necessary. Discuss detour/runarounds in regard to surfacing, potential improvements to the detour route for capacity, or other safety measures. Determine if a county agreement is necessary. Document the additional Traffic Control measures requested in the field exam letter in the paragraph on staging/traffic control.
- Review if there are areas that may need to involve possible winter carry over of traffic control in the construction zone. Determine who will be responsible for maintaining the traffic control during this time period.
- Review whether proposed drives and field entrances give satisfactory access and whether there is adequate sight distance on the side roads for entering the primary road. In addition, the team will determine whether there are any proposed drives or entrances which appear unneeded and unwarranted.
- Review whether the abutments of two span bridges over the mainline encroach on sight distance on horizontal curves.
- The indication of needed horizontal line shifts will be reviewed by the team and a determination made of the apparent effect of the proposed road on the adjacent right-of-way. Review damage to farmsteads; see if minimum ditches are possible. Can we provide mowable backslopes either in our design or in the ROW agreement?
- Do entrances provide access to every part of the property?
- Can entrances with steep grades be adjusted or moved in order to reduce the grade?
- The team will review soils from the following aspects:
  - Determine if there are areas that appear unstable and need special attention for grade or alignment.
  - Determine whether there is an estimate of “boulders” required for bid item. If so, this will normally be proposed by the Soils Engineer with District Office concurrence.
  - Determine whether there appears to be changes needed in the “shrink factors.” If so, this will normally be proposed by the Soils Engineer with District Office concurrence.
- The team will make proposals for borrow considering the following aspects:
  - Are there any particularly desirable areas for borrow?
  - Can excess right-of-way serve as borrow area?
  - Can the selected borrow improve either snow, aesthetics, or wetland mitigation?
  - If the borrow needs to be drained is there a suitable drainage channel? Who owns the drainage channel?
  - Consider oversize ditches and widened backslopes for borrow.

- ❑ The following aspects of roadside development and erosion control should be considered by the team:
  - Are there any areas requiring special erosion control work during grading?
  - Are there areas which might be considered scenic or historic which can be preserved or enhanced?
  - Can inlets of ditches be raised to help upstream erosion conditions?
  - Are proposed ditches going to satisfactorily drain the road without erosion problems or diversion of water?
  - Are there trees or similar environmentally sensitive areas which can be saved?
  - Are there any areas that appear to be wetlands and could line shifts minimize impacts to these areas? If line shifts cannot minimize the impacts, what type of mitigation is needed? Are there impacts to any ponds or ponds that need to be drained?
- ❑ Review the need for shielding obstacles, steep embankments, or other areas of concern. Review flattening foreslopes and extending culverts to eliminate the use of guardrail.
- ❑ Review the proposals for disposition of removal items such as pavement (will it be used as subbase?), bridges, culverts, guardrail, etc.
- ❑ Ascertain the stations of locating tile lines.
- ❑ Review the fencing requirements on fully controlled access roads with particular attention given to culvert areas and special ditch areas for livestock control.
- ❑ Review existing lighting at secondary and minor roads and determine who owns these and is responsible if they are disturbed. The location and construction of these should be noted.

## **Field Exam Plan Notes**

- The Field Exam Engineer should list all people participating in a field examination and their identification on the title sheet of the plans.
- The Field Exam Engineer will have the responsibility of obtaining notes documenting all decisions made during the field examination.
- The Field Exam Engineer should check each sheet of the plans to make sure all questions are answered and that all proposals are accounted for, approved, changed, or further courses of action indicated. General notes affecting the whole project should be on the title sheet.

## **Post Field Exam**

- The field exam plans will be reviewed with the Assistant Design Engineer, Design Projects Engineer, the designer, and the Field Exam Engineer following the field exam. After discussion of the plans, the Assistant Design Engineer initials and dates the field exam plan.
- A detailed post field exam letter will be written by the Field Exam Engineer covering all of the major areas of discussion, decisions made, and any requests for additional information, survey, or unanswered questions. All items of discussion and differing opinions must be resolved and documented in the letter.
- The field exam letter should be addressed to the District Office Design Engineer.
- Copies of the field exam letter should be sent to the following (use the applicable individual names in place of the position titles):

Design Engineer  
Assistant Design Engineers  
Pavement Design Engineer  
Soils Design Engineer  
Methods Engineer (w/ attachment)  
Roadside Development  
Design Section Engineer (w/ attachment)  
Preliminary Bridge Engineer (w/ attachment)  
  
Resident Construction Engineer (w/ attachment)  
ROW Director  
ROW - Utilities  
Development Support - Railroad  
Development Support – Value Engineering  
Development Support - Agreements  
FHWA Division Administrator (w/ attachment)  
Project Planning Director (w/ attachment)  
Project Planning – Hearings (w/ attachment)  
Program Management Director  
Engineering Division Director  
Transportation Safety – Traffic Control (w/ attachment)  
Maintenance – Entrances/Access Permits  
Contracts – Production Schedule  
Consultant (if applicable) (w/ attachment)