# Instructions for Completing the Request for Approval: Local Road System Form

(referred to as Form 1-E) (Form 621003E)

A sample Form 1-E is included after the instructions below.

Line 1 – Location:

Indicate the location within the section where the bridge or culvert is located. For example: "SW ¼ of NE ¼ of Section 12."

Line 3 – Project number:

Use the Iowa DOT project number, as assigned by the Administering Office.

Line 5 – Extreme high water:

This is an actual known elevation, not a calculated elevation such as in Line 29 for "Design high water." Accurate information here is very important. This information indicates how the existing structure performed during extreme floods and helps determine the bridge opening that will be needed.

If possible, include a high water mark at or near the typical valley section used for designing the bridge opening. On existing bridges, the downstream high water marks are more usable than high water marks on a pier or upstream from the bridge. Pier high water marks are effected by draw down. Upstream high water marks are effected by backwater caused by the present bridge. However, all are helpful in designing a new bridge.

Line 6 – Ordinary high water:

"Ordinary high water" on Form 1-E really means a typical high water that happens every year or two and no more often than every five years. Do not use long interval flood data here, such as a 50-year flood. Also, Line 6 should not be confused with the "Ordinary High Water" that is calculated for 404 Permits, as discussed in I.M. I.M. 3.130, 404 Permit Process. These are completely different uses of the same term, so do not confuse them.

Line 7 – Fall in stream:

Stream slope is more accurately determined using low water shots than using stream bed shots. Stream bed shots may contain blow holes and humps that can considerably distort the value. These holes and humps can be so gradual that they are not apparent until the survey information is plotted. Give the plan data if the stream is in a Drainage District and the last clean-out plans are available. The stream slope should not be confused with the Main Channel Slope (MCS). The MCS is based on the basin slope of the watershed, not the stream slope up and downstream of the structure.

Line 8 – Buildings in the floodplain:

This information is important especially if design high water elevation will be increased due to raising the road grade or reducing the hydraulic opening of the structure.

Line 12 and 13 – Ice and debris:

Potential for ice or debris in the stream may result in stronger piers than would otherwise be needed. In general, P-10 pile bent piers may be used in most of the bridges below 100 square mile drainage area. If ice and debris is a problem, stronger piers may be needed on even a much smaller drainage area. Bridges draining more than 100 square miles will generally need a stronger pier than the P-10 type. That could be a fully-encased P-10 pier or a river tee pier.

Line 29 and 30 – Design high water & road grade overflow:

Do not confuse design high water and extreme high water. Design high water is determined by taking a calculated flood discharge such as a $Q_{25}$ and then using hydraulic analysis software to develop the water

surface elevation. Extreme high water is an actual high water elevation obtained from sources such as maintenance records or residents who have lived near the bridge site for many years.

Less important roads can be designed to pass a smaller and more frequent flood by allowing road grade overflow. Where the structure is over a large stream or over a stream where drift or ice could be a problem, adequate clearance for the bridge should be provided even though the approaches are over-topped by a relatively small flood. Bridges over these large streams should have clearance above the 50-year flood and, in most cases, should be above the extreme high water. Overflow bridges can be set with the low superstructure one foot above the design high water.

Road grade overflow as a design means of allowing shorter bridges becomes more attractive as road funds dwindle. The practicality of road grade overflow is an option that the engineer must evaluate. If road grade overflow is used, the plans should be so noted. This will help guard against a future grade raise without reanalyzing the hydraulics of the crossing.

Line 32 – Wing dikes:

Use wing dikes on all bridges with significant overbank flows. It is much better to have the end of a wing dike erode away than have the bridge berm damaged. For more information about wing dikes, refer to the Iowa DOT Guidelines for Preliminary Design of Bridges and Culverts.

Line 34 – Traffic count:

Use most recent and accurate traffic count available.

Back of Form I-E:

The "Valley Cross Section Data" on the back side of this form is very important and should be completed as accurately as possible. Always list the location of the valley section under the "Remarks" section. Read the instructions on taking a valley section. This information can also be provided from hydraulic analysis software printouts.

Form 621003E
11-02wd
(Form 1-E)

# Iowa Department of Transportation

## REQUEST FOR APPROVAL: LOCAL ROAD SYSTEM

### LOCATION

1. County/City Appanoose Sec. 27, SW 1/4 Twp. 69N Range 28W
2. Over (River, Cr., Dr., Ditch) Little Creek Civil Twp. Johns
3. Road System ☐ Farm to Market ☒ Local Co. ☐ City Proj. No. L-92761--73-04 Sta. Pres. Struct. 103+80 Sta. Prop. Struct. 103+92.50 FHWA No. 042260

### GENERAL DATA (FIELD)

4. Drainage area 23 sq. mi. Character Hilly Approx. length and width 4 mi. x 7 mi.
5. Extreme highwater: Date of occurrence June 1947 Information from John Doe (landowner)
(Elev. near site 994.0 Location 300 feet upstream) (Elev. Upstream 996.4
Location 1/2 mile) (Elev. Downstream 992.0 Location 2000 feet)
6. Ordinary highwater, Elev. 990.0 Ft. Occurs every 2 Years. Date of last occurrence 1992
7. Average low water: (Elev. At site 980.5 Average streambed 980.0) (Water elev. 980.5 On date of survey 07-21-93)
(Water elev. 981.7 Upstream 1320 ft.) (Water elev. 979.4 downstream 1250 ft.) Fall in stream 4.75 ft./mi.
8. List buildings in flood plain Corn crib Location 300 feet upstream Floor elev. 996.5
9. Is excessive local scour probable? No Probable max depth of scour below streambed N/A ft.
10. Is stream deepening or filling? Neither Approx. amount per year N/A
11. Is stream widening? No (Show direction, rate, and amount)
12. Does stream carry appreciable amount of ice? No Elev. of high ice N/A
13. Does stream carry appreciable amount of large driftwood? No
14. Bench Mark No. 10 spike in 32" diameter Boxelder tree - Sta. 103+25, 60' Rt. Elev. 1001.37

### PRESENT OR OLD STRUCTURE (FIELD)

15. Superstructure: Type 80' x 20' Pony Truss with approaches Skew angle 0
16. Substructure: Type Wood abutments, concrete piers
17. Span lengths 15' - 50' - 15' Roadway width 20' Type of floor Concrete
18. Grade Elev. 996.0 Date built 1919 DOT Design No. N/A DOT File No. N/A
19. Condition of superstructure Poor
20. Condition of substructure Fair
21. Remarks: Contractor to remove and dispose.

### PROPOSED STRUCTURE (OFFICE)

☐ RA
☐ LA

List fill if RBC or Pipe ____ ft.
Length of RCB or Pipe ____ ft.
Flow Line Left ____
Flow Line Right ____

22. Superstructure: Type Continuous concrete slab Skew Angle 0
23. Substructure: Type P10 piers, integral abutments
24. Span Lengths 30 feet Total bridge length 112'-6" ft.
25. Bridge rdwy. width 30 ft. Approach rdwy.: Width sh to sh 30 ft. Type of surfacing PCC
26. Type of railing concrete Type of floor concrete Type of curb concrete Class of loading HS20
27. Grade elev. 997.4 Abuts. footing elev. 991.2 -991 Pier footing elev. 976.0 Request soundings by DOT? No
28. Length and type of piling: Abuts. design after soundings Piers same
29. Design highwater: Elev. 992.6 ft Discharge Q = 4200 cfs; Bridge Waterway Area 838 Sq. ft.; Frequency 50 Yrs.
30. What provision is made for overflow? Non
31. Can channel be cleared to provide more waterway? No
32. Are wing dikes to be provided? Yes
33. Disposition of existing structure Remove
34. Traffic count By Iowa DOT VPD 275 Year of Count 1985
35. Remarks: ____

Notes for Approval Checked ____

County/City Appanoose

Project No. L-92761--73-04

Notes and Recommendations By Ima N. Gineer, P.E. (City/County Engineer) July 15, 2000 (Date)

**VALLEY CROSS SECTION DATA**

The submittal of a bridge type structure will include a right angle valley section. This section should be taken downstream from the crossing. It shall be noted whether it is an average section or a control section. Enough ground shots will be taken to outline the valley to an elevation well above extreme highwater. Special care will be taken to accurately outline the main channel including several streambed shots. Each shot should be identified; that is (FP) flood plain, (TB) top of bank, (ES) edge of stream, etc. Mannings equation roughness factors will be assigned each shot. Include site photos with this information.

**REMARKS:** Section taken 100' downstream from crossing. It is an average section. There is no control section downstream from the bridge that affects the bridge hydraulics.

| Shot No. | Distance | Elevation | (N) Roughness | Remarks | Shot No. | Distance | Elevation | (N) Roughness | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 997.0 | 0.07 | FP | 16 | 807 | 1000.9 | 0.07 | FP |
| 2 | 92 | 995.0 | | | 17 | 900 | 1003.0 | 0.07 | FP |
| 3 | 145 | 993.0 | | | 18 | | | | |
| 4 | 275 | 991.0 | | | 19 | | | | |
| 5 | 430 | 990.0 | n=0.07<br>n=0.03 | TB | 20 | | | | |
| 6 | 462 | 982.5 | | ES | 21 | | | | |
| 7 | 472 | 979.5 | | CL | 22 | | | | |
| 8 | 487 | 982.5 | | ES | 23 | | | | |
| 9 | 510 | 990.0 | n=0.03<br>n=0.07 | TB | 24 | | | | |
| 10 | 562 | 990.0 | | FP | 25 | | | | |
| 11 | 705 | 993.0 | | FP | 26 | | | | |
| 12 | 745 | 995.0 | | FP | 27 | | | | |
| 13 | | | | | 28 | | | | |
| 14 | | | | | 29 | | | | |
| 15 | | | | | 30 | | | | |

**PLAT OF DRAINAGE AREA**

The drainage area is to be platted as completely and accurately as possible and to the largest practicable scale on a separate sheet. Use a definite scale, as 1" equals ¼, ½, 1, or 2 miles, and indicate what scale has been used. In addition to the outlines of the watershed, indicate the positions of the streams and, roughly, the character of the soil and the relative locations of the steep and flat portions. For most watersheds the information may be secured from the best existing data, soil maps, U.S.G.S. maps, and Bulletin No. 7-1.H.R.B. No plat is necessary if the area is listed in Bulletin Number 7.
**REMARKS:** _____

Give additional information by reference to marginal number on page 1 of this form.

| Marginal No. | |
|---|---|
| 5 | Mr. Doe has been living in this area all of his life (62 years). |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |

**IMPORTANT NOTE**

The information given on this form must in all cases be supplemented by complete plan and profile of the site, drawn to a convenient scale on a separate sheet.
The information as shown on this form is essential and must be supplied in detail before the plans can be approved. It may be necessary to return this form for correction unless the data supplied is complete