

Standard Operating Procedure

Subject: Bridge and Culvert Data

21 February, 2000

General Scope of Work:

Bridge and/or culvert data shall be developed when it is required by the scope of work. Bridge/culvert details, cross sections, profiles, and photographs shall be obtained at each crossing in the project area. Data developed under this S.O.P. shall be incorporated with other data as required. See the [S.O.P. for Topographic Surveys](#) for general data collection requirements.

General Procedures:

Bridge Data to be collected:

1. Roadway centerline profile along the centerline of the structure extending a minimum of 100' beyond each abutment or to the limits specified.
2. Natural ground section. This section shall be taken as indicated in Figure 1., upstream of the structure beyond the effects of the roadway embankment, (100' minimum). The section shall be normal to the flow with the stationing as shown.
3. A face section along the face of the structure. The face section shall show deck elevation, (Top of rail for railroad bridges), low chord elevation from abutment to abutment, ground data, and bent locations and sizes.
4. The structure shall be sketched in detail showing length and width, type of construction materials, span data, bent data, bank protection methods around the structure such as rip-rap, gabions, etc. Bent data shall include type of piling, sizes, wing-wall construction, etc. The bridge and bent skew angle shall be shown. All bridge information shall be shown in plan and section view in a Microstation Design File. The bridge data shown in the plan view design file shall be located at the proper northing and easting as specified in the scope of work.
5. Photographs of the structure in section view.

Culvert Data to be collected:

All culvert data shall be similar to the bridge data with the following to be included:

1. Both invert elevations at the upstream and downstream ends of the culvert shall be obtained.
2. The Microstation files shall clearly show both invert elevations.

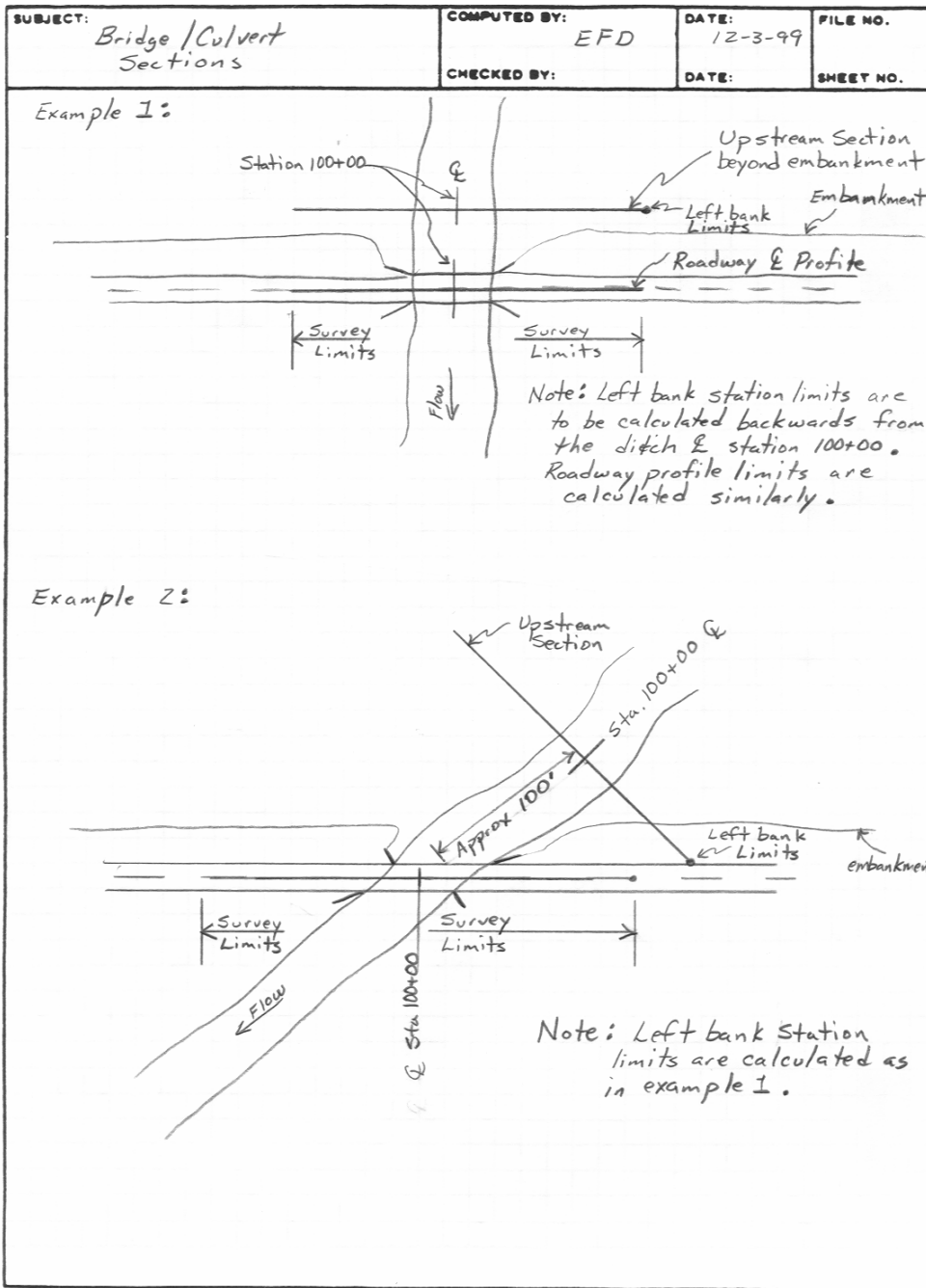


Figure 1.

Positional tolerances of collected points shall correspond to accuracy standards as outlined in [Table 2-1 of EM 1110-1-1005, Dated 31 August, 1994 \(Maintenance & Repair or Renovation of Existing Structures, Roadways, Utilities, Etc.\)](#). Level of project accuracy shall be specified in the scope of work. All topographic surveys shall be subject to map checks as outlined in the referenced EM. Target Map Scale, ASPRS Class, and Target Contour Interval will be specified in the scope of work

Deliverables:

1. All field books used in the survey development. Field books shall be submitted in both hardcopy and as scanned Adobe Acrobat pdf format.
2. All monument recovery forms. Monument recovery forms are to be completed at the time of monument recovery. All field documentation forms shall be scanned and submitted as Adobe Acrobat pdf files.
3. If GPS is used, all raw and processed data files shall be submitted along with hardcopy printouts of the GPS message files. (Trimble)
4. A 3-d alignment file shall be developed for original, unadjusted traverse data. An alignment file shall also be developed for adjusted traverse data. ALL adjusted control information and or baseline shall be shown in the design file. All monuments located during reconnaissance and or used or set shall be shown in the design file.
5. Vertical control runs shall be submitted with field books checked and reduced in the field. Loop closures shall be calculated prior to leaving the field. All vertical control readings shall be entered in an Excel spreadsheet and checked against the field-calculated data prior to development of level abstracts.
6. Profiles shall be developed for all ditch centerlines, right and left top bank lines, water surfaces, roadway centerlines, and other transportation feature centerlines. Profiles shall be plotted at 1"=100' horizontal and 1"=10' vertical exaggeration. Ditch or creek centerline and right and left top bank centerlines shall be contained on the same profile for comparisons. Feature points along the profiles shall be annotated. Culvert inverts, low chords, and roadway centerline elevations shall be shown on the profiles where they cross the drainage feature. Likewise, drainage feature elevations shall be annotated and plotted on profiles of roadways and transportation features.
7. An overall plan view design file shall be submitted containing all horizontal and vertical control information. Baseline points shall be connected with labeled lines. Vertical control points shall be connected with arrows noting the directions of the runs.
8. Plan view design files of bridge/culvert data with plots at 1"=30' or 1"=50' unless otherwise specified. Section view design files of bridge/culvert data at specified scales.
9. Photographs as individual jpg format files and combined in a single Adobe Acrobat pdf file. Photographs shall be annotated using Memphis District supplied labeling software. If the software has not been previously supplied, it will be supplied upon request.

References:

[EM 1110-1-1005, Dated 31 August, 1994. Topographic Surveying](#)