



#### FDM 9-60-1 Introduction

October 28, 1994

##### 1.1 When Used

This section covers both Separation Structure Surveys and Rehabilitation Structure Surveys. These surveys are used in connection with both new structures and the repair of existing structures. For details on structures requiring hydraulic information, please refer to Section 55.

##### 1.2 Standards and Specifications

For guidance on the specifications, standards and datums used for structure surveys, refer to Section 35, Horizontal Control - Traverse, and Section 40, Vertical Control.

##### 1.3 References

See Chapter 6 of the Bridge Manual for detailed guidance on structure surveys.

#### FDM 9-60-5 Field Procedures

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##### 5.1 Separation Structure Survey

Before conducting field operations, refer to Chapter 6 of the Bridge Manual for more guidance on Separation Structure Survey Reports. A separation structure survey will require the establishment of the alignment approximately 300 meters in each direction from the site. If an old plan exists with the proper cardinal direction of stationing, the surveyor should use that stationing or convert it to metric as necessary. At railroad crossings, an attempt should be made to establish railroad stationing. The surveyor should also establish and record the intersection stationing and angle of intersection or coordinates between the reference lines.

Profile the reference lines 300 meters minimum in all directions. Separation structure surveys require cross sections or DTM's a minimum of 90 meters along all reference lines. Topography should include all features within a minimum 90 meter radius of the site. Contact Diggers Hot Line in advance for underground utility locations. Photographs are required of the existing structure and all buildings within 50 meters of the site. The scope of survey data will depend on project needs, if in doubt, discuss the project with the designer.

##### 5.2 Rehabilitation Structure Survey

Rehabilitation structure reference lines are established by splitting the structure and using old plan stationing, if available. If old stationing is not available, assign a station to the end of the deck or centerline and extend the stationing 90 meters minimum beyond the ends of deck. The cross sections normal to the reference line shall be taken from both ends of the deck for 90 meters at intervals of 3 meters for the first 30 meters and at 15 meter intervals thereafter. The cross sections should be taken out to shoulder width, and include shots at the centerline, edge of lanes and gutters, if they exist.

On structures less than 30 meters in length, sections of the deck are required every 3 meters and at every construction joint. On structures over 30 meters in length, the cross section interval can be increased up to 10 meters. If in doubt on the cross section intervals, check with the Office of Design. See [Attachment 5.1](#) for a schematic of the scope of survey data for Rehabilitation Structure Surveys.

Beam seat elevations should be determined at each exterior girder, and at all substructure units. Drain elevations should also be determined. Measure joint openings at both the top and bottom of the deck, if accessible. Separate measurements should be taken at the centerline of roadway and at flow lines. Record the temperature and date of the measurement. Measure the clearance between the girder ends at the piers and the front face of the back wall at abutments.

Record the location of deck construction joints and the location and elevation of bench marks. The records must show and identify what was used as the basis of stationing on the structure. See [Attachment 5.2](#) for a detailed schematic of structure terminology and joint openings etc.

#### **LIST OF ATTACHMENTS**

[Attachment 5.1](#) Survey Data for Structure Rehabilitation Project

[Attachment 5.2](#) Structure Terminology Diagram

**FDM 9-60-10 Monumentation Required**

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**10.1 Separation Structure Survey**

Separation Structure Surveys shall have at least three horizontal, Type 2 or Type 3, monuments on each reference line, including one at the point of intersection. A minimum of two bench marks shall be set.

**10.2 Rehabilitation Structure Survey**

A structure rehabilitation survey may use the center of structure span or deck end to establish stationing. A PK nail in the centerline of joint or a chiseled 'x' with assigned stationing will suffice. Use known elevations if there is a bench mark disc in the structure or a known elevation nearby. If there are no established bench marks in the area, a temporary bench mark may be chiseled in a wingwall or abutment and assigned an arbitrary elevation.