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710.01 General

The Washington State Department of Transportation (WSDOT) Headquarters (HQ) Bridge and Structures Office provides preliminary site data reviews to determine the applicability of, and requirements surrounding, proprietary structural solutions, or the need for specific structural design strategies, as well as structural design services to the regions. This chapter describes the information required by the HQ Bridge and Structures Office to perform these functions.

710.02 Required Data for All Structures

Structure site data provides information about the type of crossing, topography, type of structure, and potential future construction. Submit structure site data to the HQ Bridge and Structures Office for all structures meeting the [Chapter 720](#) definition of a bridge: essentially all structures of with an interior span equal to 20 feet or greater measured along the overcrossing alignment. This includes all buried structures such as precast concrete arch structures, reinforced concrete arch structures, precast reinforced concrete three-sided structures, precast reinforced concrete box culverts, and precast reinforced concrete split box culverts with an interior span of 20 feet or greater. Site data can also provide information on nonstandard retaining walls requiring project-specific design by the HQ Bridge and Structures Office.

Provide a cover memo that gives general information on the project, describes the attachments, and transmits the forms and data included in the submittal. Submit site data as a CAD file, supplemental drawings, and a report. (See [Exhibit 710-1](#) for items to include in a structure site data submittal). Direct any questions relating to the preparation of structure site data to the HQ Bridge and Structures Office. The [Bridge Design Manual](#) shows examples of required WSDOT forms.

710.02(1) Scour

At any location where a structure can be in contact with water (such as culvert outfall, lake, river, or floodplain), there is a risk of scour. This risk is to be analyzed. Contact the HQ Geotechnical Office and the HQ Hydraulics Office to determine whether a scour analysis is required.

710.02(2) CAD Files and Supplemental Drawings

CAD files prepared for use as structure site data will be accepted in DGN (preferred) or DWG (acceptable) format.

Prepare plan, profile, and section drawings for all structures. Include copies of the CAD site data and supplemental drawings in the 11 x 17 plan sheet format with the submittal.

Use a complete and separate CAD file for each structure. Create the base map in 2D expanded level format only at 1:1 scale, with only one model per DGN or DWG file, and all base map levels in accordance with the [Electronic Engineering Data Standards](#) manual. Create a separate base map in 3D with the alignment and contour lines only—no contour text. Turn on all levels (existing and proposed) and merge all reference files, leaving the reference file list empty. Put the new and existing alignments in the same file.

The [Bridge Design Manual](#) contains examples of completed bridge preliminary plans. These plans show examples of the line styles and drawing format for site data in CAD.

Structure site data is used to prepare the layout plan, which is to be used in the contract plans. Include the following information in the CAD files or in the supplemental drawings.

710.02(2)(a) Plan

- Vertical and horizontal datum control (see Chapters [400](#) and [410](#)).
- Contours of the existing ground surface (index and intermediate). Use intervals of 2 feet. Show contours beneath an existing or proposed structure and beneath the water surface of any waterway. Do not partially delete contour lines that cover index contour text.
- Alignment of the proposed highway and traffic channelization in the vicinity.
- Location by section, township, and range.
- Type, size, and location of all existing or proposed sewers, telephone and power lines, water lines, gas lines, traffic barriers, culverts, bridges, buildings, and walls.
- Location of right of way lines and easement lines.
- Distance and direction to nearest state highway intersections along the main alignment in each direction.
- Location of all roads, streets, and detours.
- Stage construction plan and alignment.
- Type, size, and location of all existing and proposed sign structures, light standards, and associated conduits and junction boxes. Provide proposed signing and lighting items when the information becomes available.
- Location of existing and proposed drainage.
- Horizontal curve data. Provide the Inroads report for each alignment. Include coordinates for all control points.

710.02(2)(b) Profile

- Profile view showing the grade line of the proposed or existing alignment and the existing ground line along the alignment line.
- Vertical curve data. Provide the Inroads report for each alignment along with the CAD detail.

- Superelevation transition diagram for each alignment as applicable.

710.02(2)(c) Section

- Channelization roadway sections on the structure and at structure approaches. Indicate the lane and shoulder widths, cross slopes and side slopes, ditch dimensions, and traffic barrier requirements.
- Stage construction roadway geometrics with the minimum lane and roadway widths specified.

710.02(3) Report

Submit DOT Form 235-002, Bridge Site Data-General. Supplement the CAD drawings with the following items:

- Vicinity maps
- Class of highway
- Design speed
- Special requirements for replacing or relocating utility facilities
- ADT and DHV counts
- Truck traffic percentage
- Requirements for road or street maintenance during construction

710.02(4) Video and Photographs

Submit a video of the site. Show all the general features of the site and details of existing structures. Scan the area slowly, spending extra time showing existing bridge pier details and end slopes. A “voice over” narrative on the video is necessary for orientation.

Color photographs of the structure site are desirable. Include detailed photographs of existing abutments, piers, end slopes, and other pertinent details for widenings, bridge replacements, or sites with existing structures.

710.03 Additional Data for Waterway Crossings (Bridges and Buried Structures)

Coordinate with the HQ Hydraulics Section and supplement the structure site data for all waterway crossings with the DOT Form 235-001, Bridge Site Data for Stream Crossings, and the following:

- Show riprap or other slope protection requirements at the structure site (type, plan limits, and cross section) as determined by the HQ Hydraulics Section.
- Show a profile of the waterway. The extent will be determined by the HQ Hydraulics Section.
- Show cross sections of the waterway including new streambed design, defining the bankfull width and the bank shelf widths and slopes. The extent will be determined by the HQ Hydraulics Section. The requirements for waterway profile and cross sections

may be less stringent if the HQ Hydraulics Section has sufficient documentation (FEMA reports, for example) to make a determination. Contact the HQ Hydraulics Section to verify the extent of the information needed. Coordinate any rechannelization of the waterway with the HQ Hydraulics Section.

- Many waterway crossings require a permit from the U.S. Coast Guard (see [Bridge Design Manual](#) Chapter 2.2.4 and the [Environmental Manual](#)). Generally, ocean tide-influenced waterways and waterways used for commercial navigation require a Coast Guard permit. These structures require the following additional information:
 - o Names and addresses of the landowners adjacent to the bridge site.
 - o Quantity of new embankment material within the floodway. This quantity denotes, in cubic yards, the material below and the material above normal high water.

For all waterway crossings, where the structure parallel to the centerline of roadway width is less than 20 feet, the Region's designer shall contact the Coast Guard for permit requirements. For all waterway crossings, where the structure parallel to the centerline of roadway width is 20 feet or greater, the Bridge and Structure's Coast Guard Liaison shall contact the Coast Guard for permit requirements.

The region is responsible for coordination with the HQ Bridge and Structures Office, U.S. Army Corps of Engineers, and U.S. Coast Guard for waterways that may qualify for a permit exemption. The HQ Bridge and Structures Office is responsible for coordination with the U.S. Coast Guard for waterways that require a permit.

710.04 Additional Data for Grade Separations

710.04(1) Highway-Railroad Separation

Supplement structure site data for structures involving railroads with the following:

710.04(1)(a) Plan

- Alignment of all existing and proposed railroad tracks.
- Center-to-center spacing of all tracks.
- Angle, station, and coordinates of all intersections between the highway alignment and each track.
- Location of railroad right of way lines.
- Horizontal curve data. Include coordinates for all circular and spiral curve control points.

710.04(1)(b) Profile

- For proposed railroad tracks: profile, vertical curve, and superelevation data for each track.
- For existing railroad tracks: elevations accurate to 0.1 foot taken at 10-foot intervals along the top of the highest rail of each track. Provide elevations to 50 feet beyond the extreme outside limits of the existing or proposed structure. Tabulate elevations in a format acceptable to the HQ Bridge and Structures Office.

710.04(2) Highway-Highway Separation

Supplement structure site data for structures involving other highways by the following:

710.04(2)(a) Plan

- Alignment of all existing and proposed highways, streets, and roads.
- Angle, station, and coordinates of all intersections between all crossing alignments.
- Horizontal curve data. Include coordinates for all curve control points.

710.04(2)(b) Profile

- For proposed highways: profile, vertical curve, and superelevation data for each.
- For existing highways: elevations accurate to 0.1 foot taken at 10-foot intervals along the centerline or crown line and each edge of shoulder, for each alignment, to define the existing roadway cross slopes. Provide elevations to 50 feet beyond the extreme outside limits of the existing or proposed structure. Tabulate elevations in a format acceptable to the HQ Bridge and Structures Office.

710.04(2)(c) Section

- Roadway sections of each undercrossing roadway indicating the lane and shoulder widths, cross slopes and side slopes, ditch dimensions, and traffic barrier requirements.
- Falsework or construction opening requirements. Specify minimum vertical clearances, lane widths, and lateral clearances.

710.05 Additional Data for Widening

Bridge rehabilitations and modifications that require new substructure are defined as bridge widenings.

710.05(1) Bridge Widenings

Submit DOT Form 235-002A, Supplemental Bridge Site Data-Rehabilitation/ Modification. Supplement structure site data for structures involving bridge widenings by the following:

710.05(1)(a) Plan

- Stations for existing back of pavement seats, expansion joints, and pier centerlines based on field measurements along the survey line and each curb line.
- Locations of existing bridge drains. Indicate whether these drains are to remain in use or be plugged.

710.05(1)(b) Profile

- Elevations accurate to 0.1 foot taken at 10-foot intervals along the curb line of the side of the structure being widened. Pair these elevations with corresponding elevations (same station) taken along the crown line or an offset distance (10-foot minimum from the curb line). This information will be used to establish the cross slope of the existing bridge. Tabulate elevations in a format acceptable to the HQ Bridge and Structures Office.

Take these elevations at the level of the concrete roadway deck. For bridges with concrete overlay, elevations at the top of the overlay will be sufficient. For bridges with a nonstructural overlay, such as an asphalt concrete overlay, take elevations at the level of the concrete roadway deck. For skewed bridges, take elevations along the crown line or at an offset distance (10-foot minimum from the curb line) on the approach roadway for a sufficient distance to enable a cross slope to be established for the skewed corners of the bridge.

710.06 Documentation

Refer to [Chapter 300](#) for design documentation requirements.

710.07 References

Bridge Design Manual, M 23-50, WSDOT

Electronic Engineering Data Standards, M 3028

Environmental Manual, M31-11

Hydraulics Manual, M 23-03

Exhibit 710-1 Structure Site Data Checklist**PLAN** (in CAD file)

- _____ Survey Lines and Station Ticks
- _____ Survey Line Intersection Angles
- _____ Survey Line Intersection Stations
- _____ Survey Line Bearings
- _____ Roadway and Median Widths
- _____ Lane and Shoulder Widths
- _____ Sidewalk Width
- _____ Connection/Widening for Traffic Barrier
- _____ Profile Grade and Pivot Point
- _____ Roadway Superelevation Rate (if constant)
- _____ Lane Taper and Channelization Data
- _____ Traffic Arrows
- _____ Mileage to Towns Along Main Line
- _____ Existing Drainage Structures
- _____ Existing Utilities: Type/Size/Location
- _____ New Utilities: Type/Size/Location
- _____ Light Standards, Junction Boxes, Conduits
- _____ Bridge-Mounted Signs and Supports
- _____ Contours
- _____ Bottom of Ditches
- _____ Test Holes (if available)
- _____ Riprap Limits
- _____ Stream Flow Arrow
- _____ R/W Lines and/or Easement Lines
- _____ Exist. Bridge No. (to be removed, widened)
- _____ Section, Township, Range
- _____ City or Town
- _____ North Arrow
- _____ SR Number
- _____ Scale

TABLES (in tabular format in CAD file)

- _____ Curb Line Elevations at Top of Existing Bridge Deck
- _____ Undercrossing Roadway Existing Elevations
- _____ Undercrossing Railroad Existing Elevations
- _____ Curve Data

OTHER SITE DATA (may be in CAD file or on supplemental sheets or drawings)

- _____ Superelevation Diagrams
- _____ End Slope Rate
- _____ Profile Grade Vertical Curves
- _____ Coast Guard Permit Status
- _____ Railroad Agreement Status
- _____ Highway Classification
- _____ Design Speed
- _____ ADT, DHV, and % Trucks
- _____ InRoads reports

FORMS (information noted on the form or attached on supplemental sheets or drawings)

Bridge Site Data General

- _____ Slope Protection
- _____ Pedestrian Barrier/Pedestrian Rail Height Requirements
- _____ Construction/Falsework Openings
- _____ Stage Construction Channelization Plans
- _____ Bridge (before/with/after) Approach Fills
- _____ Datum
- _____ Video of Site
- _____ Photographs of Site
- _____ Control Section
- _____ Project Number
- _____ Region Number
- _____ Highway Section

Bridge Site Data for Stream Crossings

- _____ Water Surface Elevations and Flow Data
- _____ Riprap Cross Section Detail
- _____ Bankfull width
- _____ Bank shelf width

Supplemental Bridge Site Data: Rehabilitation/Modification

BRIDGE, CROSSROAD, AND APPROACH ROADWAY CROSS SECTIONS (may be in CAD file or on separate drawings)

- _____ Bridge Roadway Width
- _____ Lane and Shoulder Widths
- _____ Profile Grade and Pivot Point
- _____ Superelevation Rate
- _____ Survey Line
- _____ PB/Pedestrian Rail Dimensions
- _____ Stage Construction Lane Orientations
- _____ Locations of Temporary Barrier
- _____ Conduits/Utilities in Bridge
- _____ Location and Depth of Ditches
- _____ Shoulder Widening for Barrier
- _____ Side Slope Rate

