Chapter 710 Site Data for Structures

710.01 General
710.02 Required Data for All Structures
710.03 Additional Data for Waterway Crossings (Bridges and Buried Structures)
710.04 Additional Data for Grade Separations
710.05 Additional Data for Widenings
710.06 Site Data for Design-Build Conceptual Drawings
710.07 Structure Preliminary Plan and Structure Conceptual Drawing Process Responsibilities
710.08 References
Exhibit 710-1 Structure Site Data Checklist
Exhibit 710-2 Conceptual Plan Structure Site Data Checklist

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 with a structural clear span equal to 30 feet or greater measured along the overcrossing alignment. This includes all buried structures such as concrete three-sided structures, concrete box culverts and split box culverts, and steel and aluminum structural plate, pipes, arches, and boxes.

Structures conforming to the National Bridge Inspection Standards (NBIS) definition of a bridge, as cited in Chapter 720, having structural clear spans less than 30-feet as a general rule do not require preparation of a preliminary plan at the onset of design, and hence do not require structure site data to be submitted to HQ Bridge and Structures Office. See Section 720.03(14) when the delivery method involves a contractor supplied design. However, unique site-specific conditions known at the completion of the Preliminary Hydraulics Report may indicate the need for preparation of a preliminary plan in the design process, and thus require development of structural site data. Contact HQ Bridge and Structures Office after the completion of the Preliminary Hydraulics Report for collaboration. See Chapter 800 for specialty group coordination.

Site data shall also provide information on nonstandard retaining walls needing project-specific design by the HQ Bridge and Structures Office.

Submit the structure site data to the HQ Bridge and Structures Office, Project Support unit, by email. In the email message, provide a general description of the project and provide a bullet list itemization of the structure site data forms, files, and data attached or linked in the email.

Submit the structure site data as a CAD file with associated 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, Project Support unit. 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 as part of the preliminary hydraulic design (PHD) and final hydraulic design (FHD) reports. Contact the HQ Geotechnical Office and the HQ Hydraulics Office to determine whether a scour analysis is required. See Chapter 800.

710.02(2) CAD Files and Supplemental Drawings

710.02(2)(a) Plan

- Vertical and horizontal datum control (see Chapter 400 and Chapter 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 multimodal 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 scour countermeasure or other slope protection requirements at the structure site (type, plan limits, and cross section) as determined by the HQ Hydraulics Section. See Chapter 800.
- Show maintenance access from the roadway to all scour countermeasures when said scour countermeasures are placed at bridge abutments supported by deep foundations (e.g., piles, drilled shafts) and the scour countermeasure are required to prevent scouring of the abutment's supporting soils. See Section 720.03(15) for more information.
- Show a profile of the waterway. The extent will be determined by the HQ Hydraulics Section.
- Show cross sections of the waterway including the new stream profile, section, minimum hydraulic opening, hydraulic width, and structure free zone. The extent will be determined by the HQ Hydraulics Section. Contact the HQ Hydraulics Section to verify the extent of the information needed. Coordinate any realignment 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:
    - Names and addresses of the landowners adjacent to the bridge site.
    - 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 structural clear span parallel to the centerline of roadway width is less than 30 feet, the Region's designer shall contact the US Coast Guard for determination of waterway jurisdiction and any associated permit requirements.

For all waterway crossings, where the structural clear span parallel to the centerline of roadway width is 30 feet or greater, the Bridge and Structures Office US Coast Guard Liaison will contact the US Coast Guard for determination of waterway jurisdiction and any associated 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 an exemption to navigation permit requirements. The HQ Bridge and Structures Office is responsible for coordination with the U.S. Coast Guard for waterways that require a navigation 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 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 Widenings

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.
- Description of existing barriers, railings, expansion joints, and bridge attachments, in accordance with Form 235-002A.

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 Site Data for Design-Build Conceptual Drawings

Structure site data content and submittal requirements for development of structure conceptual drawings associated with Design-Build projects are similar but simplified to those associated with Design-Bid-Build projects. The simplified content requirements are outlined in Exhibit 710-2. The submittal of elements identified in Exhibit 710-2 as conceptual plan structure site data components shall conform to and be as described in Sections 710.02 through 710.05.

710.07 Structure Preliminary Plan and Structure Conceptual Drawing Process Responsibilities

The sequential process and responsibilities for development of a structure preliminary plan in a project under the design-bid-build delivery method is described in Section 2.2 of the WSDOT Bridge Design Manual LRFD M 23-50. The assignment of plan preparation, review, and approval is summarized below:

Lead Unit Developing Structure Preliminary Plan	**Responsibility for Approval**
HQ Bridge and Structures Office or Consultant under agreement with the Bridge and Structures Office	HQ Bridge and Structures Office and Region Approval
Consultant under agreement with Region	HQ Bridge and Structures Office Review Only Region Approval

The sequential process and responsibilities for development of a structure conceptual drawing in a project under the design-build delivery method is described in Section 15.2.1.A (as supported by Chapter 2) of the WSDOT Bridge Design Manual LRFD M 23-50. The assignment of drawing preparation and approval is summarized below:

Lead Unit Developing Structure Conceptual Drawing in conjunction with developing RFP Chapter 2.13	**Responsibility for Approval**
HQ Bridge and Structures Office or Consultant under agreement with the Bridge and Structures Office	HQ Bridge and Structures Office Review Only Region Approval
Consultant under agreement with Region	HQ Bridge and Structures Office Review Only Region Approval

710.08 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
_____Bicycle and Pedestrian Facility and widths
_____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
_____Scour Countermeasure Cross Section Detail
_____Structure Free Zone
_____Stream Profile
_____Stream Section

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
_____Pedestrian facility width
_____Bicycle facility width
_____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

Exhibit 710-2 Conceptual Plan Structure Site Data Checklist

Plan (in CAD file)

____Survey Lines and Station Ticks
____Survey Line Bearings
____Roadway and Median Widths
____Lane and Shoulder Widths
____Bicycle and Pedestrian Facility and widths
____Bridge Deck Sidewalk Width
____Profile Grade and Pivot Point
____Roadway Superelevation Rate (if constant)
____Traffic Arrows
____Existing utilities Type, Size, and Location
____Contours
____Stream Flow Arrow
____R/W Lines and/or Easement Lines
____Exist. Bridge No. (to be removed, widened)
____Section, Township, Range
____County, City or Town
____North Arrow
____SR Number
____Scale

Tables (in tabular format in CAD file)

____Curb Line Elevations at Top of Existing Br. 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
____Profile Grade Vertical Curves
____Railroad Agreement Status
____Highway Classification
____Design Speed
____ADT, DHV, and % Trucks
____In Roads reports

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

____Bridge Site Data General
____Pedestrian Barrier/Pedestrian Rail Height
____Datum
____Control Section
____Project Number
____Region Name
____Project Name
____Bridge Site Data for Stream Crossings
____Water Surface Elevations and Flow Data
____Structure Free Zone
____Stream Profile
____Stream Section

Bridge, Crossroad, & Approach Roadway Cross Sections (may be in CAD file or on Separate drawings)

____Bridge Roadway Width
____Lane and Shoulder Widths
____Bicycle facility width
____Pedestrian facility width
____Profile Grade and Pivot Point
____Superelevation Rate
____Survey Line
____PB/Pedestrian Rail Dimensions