

## DB Section 141.21 - Roadway Geometrics

**(a) Introduction** - This Section covers the basic geometric elements (horizontal alignments, vertical alignments, superelevation, typical sections, etc.) applicable to the Project.

**(b) Standards and References** - Design-Builder shall design Roadway geometrics in accordance with the requirements of this Section 141.21.

### (1) Standards

- Memos to Designers, as applicable (on line at: <http://www.odot.state.or.us/tsroadway/index.htm>)
- ODOT *Highway Design Manual*
- The appropriate ODOT/APWA Oregon Standard Construction Drawings from the following site: <http://www.odot.state.or.us/tsroadway/std-dwg-02.htm>
- AASHTO, "A Policy on Geometric Design of Highways and Streets" (Green Book)
- AASHTO *Roadside Design Guide*
- ODOT Project Delivery Leadership Team Operational Notice (Number: PD-03) available from the following site: <http://www.oregon.gov/ODOT/HWY/OPD/docs/OPnotices/PDLTNotice03.pdf>
- ODOT *Striping Design Guidelines Manual*
- *Manual of Uniform Traffic Control Devices* and Oregon Supplements
- **DB Standard Specifications** (Parts 00200 through 03000 of the *Oregon Standard Specifications for Construction*)
- FHWA "Policy on Additional Interchanges to the Interstate System," 1998
- ODOT "Access Management Requirements," 2001
- ODOT Bicycle and Pedestrian Plan

**(2) References** - Electronic Mapping data (MicroStation basemaps/InRoads terrain models)

### (c) Requirements

**(1) General** - Design-Builder shall design all Roadway geometrics (horizontal alignments, vertical alignments, superelevation, typical sections, etc.) in accordance with the Standards listed in Subsection (b)(1) "Standards," above.

Management of access (permanent and temporary) to and from the Roadway, if required, is to be accomplished in accordance with the ODOT "Access Management Requirements," 2001.

**(2) Design Exceptions** - Design-Builder shall submit design exception requests in accordance with the procedures outlined in Chapter 13 of the ODOT *Highway Design Manual*. However, design exceptions for vertical clearance shall not be permitted. Authorization of all design exceptions shall be at the sole discretion of Agency, and Design-Builder shall not assume that a request for any design exception will be granted unless Agency has specifically stated so in writing. Nowhere in this Subsection or elsewhere in the Contract Documents is authorization of, or intent to authorize, design exceptions stated or implied.

**(3) Specific Technical Requirements/Limitations** - The existing number of Traffic Lanes shall not be changed.

Any impacted ramp shall be upgraded to meet the Standards established herein.

Impacts that require an Interchange Management Plan shall not be allowed without prior Agency approval. An Interchange Modification Request shall be made if Design-Builder's solution impacts existing interchange configuration or precludes known future modifications not part of this Contract. All modifications to existing interchanges and all proposed interchanges shall be approved by Agency.

Modifications to the interstate system require approval by FHWA, and shall comply with the FHWA policy "Additional Access to the Interstate System" (found in FHWA Federal Policy Guide Supplement NS 23 CFR 630C). If Design-Builder elects or is required to modify an interchange, three steps must be taken, as follows:

**a. Step 1** - shall consist of formal discussions with Agency, and shall occur prior to Definitive Design submittal. The initial meeting is to discuss general design parameters for the interchange design concepts and to review the requirements of FHWA "Additional Access to the Interstate System" policy.

**b. Step 2** - shall consist of submittal of a draft Additional Access to the Interstate System Report to FHWA via Agency. The draft report shall include an interchange layout sheet complying with (3)-d below. Upon receipt of the draft report, Agency will forward the document to FHWA for its review. Comments from Agency and FHWA will be forwarded to Design-Builder to be included in the final Additional Access to the Interstate System Report. Design-Builder may request Agency review of the draft Additional Access to the Interstate System Report prior to formal draft submittal. Review of the draft document by Agency and FHWA is to determine interchange design compliance with design Standards and compliance with the FHWA Interchange Policy.

**c. Step 3** - shall consist of submittal of the final Additional Access to the Interstate System Report. The final report will be submitted to FHWA via Agency. Design-Builder shall be required to obtain FHWA approval for the Additional Access to the Interstate System prior to receiving Agency's Acceptance of Definitive Design for the interchange modification. Design-Builder should allow 90 Calendar Days for Agency and FHWA processing of the draft report, followed by 30-Calendar Day process by Agency and FHWA of the final report.

**d. Interchange Layout Sheet** - An interchange layout sheet for any proposed changes to an interchange shall be submitted in draft form to Agency after Step 1, described above, for its Review and Comment. The interchange layout sheet shall:

- Conform to Standard Interchange Layout Sheet Criteria
- Be prepared and stamped by the Responsible Engineer
- Be accompanied by an interchange design narrative

The interchange layout sheet must be approved by the ODOT Roadway Section's Engineering Services Unit prior to Definitive Design Acceptance by Agency. The approved interchange design shall be shown on a final interchange layout sheet, together with all required approval signatures. Upon Definitive Design Acceptance, the approved interchange design must be used in the Plans.

**(d) Required Submittals**

**(1) Definitive Design** – At a minimum, Design-Builder shall include the following in its Definitive Design submittal:

**a. Title sheet**

**b. Plan and profile sheets** - These sheets must be completed to a level that the alternative concept can be evaluated based on items of particular interest, such as proposed large drainage Structures, horizontal and vertical alignments, cut/fill lines, and intersections. The Plans will be limited to the concept portrayal and potential obstacles, such as:

- Existing Utilities
- Existing Right of Way
- Fences
- Known or suspected environmental features
- Railroad tracks
- Airports
- Irrigation ditches
- Typical Sections
- Roadway detour Typical Sections
- Roadway detour Plan and profiles
- Staging Plans
- Temporary barrier locations
- Design Exceptions (list with brief description)

**(2) Readiness-for-Construction** – At a minimum, Design-Builder shall include the following in its Readiness-for-Construction submittal:

**a. Plans**

1. Title sheet.

DB 141.21(d)(2)a.2.

2. Index of standard drawings.
3. Typical Sections.
4. General construction sheet(s).
5. Items of particular interest including:
  - Major construction callouts
  - Cut/fill lines
  - Large drainage structures
  - Vertical and horizontal alignment
  - Pipe data
  - Special details
  - Intersection layout and details
  - Existing utilities and relocations
  - Existing right of way and anticipated acquisitions
  - Fencing
  - Environmental features and detailed mitigation sites
  - Railroad tracks
  - Airports
  - Irrigation ditches
  - Pit, plant, and disposal sites

**b. Roadway detour Typical Sections**

**c. Roadway detour Plan and profiles**

**d. Staging Plans**

**e. Temporary barrier locations**

**f. Design Exceptions** - The Plans must be complete and buildable. Buildable Plans include the design calculations for permanent and temporary features such as: horizontal alignment, vertical alignment, superelevation, staking information, special-ditch alignments (horizontal and vertical), etc. The information must be expressed in either station-offset-elevation or coordinates-elevation format in order that the Project can be efficiently staked during construction.

Design-Builder shall complete the Readiness-for-Construction design according to any approved Design Exceptions.

Completed, signed and sealed (by the Engineer of Record) Design Exceptions (as listed at Definitive Design) shall be submitted as part of the RFC Plans for transmittal to Agency for concurrence and approval.

**(3) Design-Builder Specifications** - Design-Builder shall complete and submit to Agency PM **Design-Builder Specifications**.

**(4) As-Constructed Plans and Design-Builder Specifications** - Refer to **DB General Provisions**, Section 155, for specific requirements.

**(5) Submittals Identified in the DB Special Provisions** - Design-Builder shall submit the following to Agency PM for Review and Comment by the deadlines established herein or in **DB Special Provisions**, SP 141.21(d):

- “Additional Access to the Interstate System” report
- Interchange Layout Sheet
- Design Exceptions
- Definitive Design submittal as specified above
- Readiness-for-Construction submittal as specified above
- As-Constructed Plans and **Design-Builder Specifications**

