*Reviewers,*

*These changes are small, so to streamline the review We have combined these chapters in to one file.*

*Keep in mind that in combining these chapters/sections into one file makes the formatting and numbering of the sections look incorrect. Do not worry about the formatting or the section numbers. We will fix all formatting and section numbers before we publish in September.*

*Please set your MS Word to “Review”, “All Markup” to see all track changes and comments. And do not worry if your changes/comments go into new pages. We will take care of it.*

*Please review the changes below as you would any other Design Manual review using MS Word’s Track Changes and please add a comment about each of your changes to help us understand why you are suggesting your changes.*

***Thank you*** *for helping us improve the Design Manual for users like yourself.*

***Reviewers,***

*This first section changes all the terms “Protective Screening” and “Screaming for highway structures” to “****Bridge Fence****”.*

***Chapter 720 Bridges***

**720.03 Bridge Site Design Elements**

***720.03(13) Bridge Fence***

The Washington State Patrol (WSP) classifies the throwing of an object from a highway structure as an assault, not an accident or collision. Therefore, records of these assaults are not contained in WSDOT’s crash databases. Contact the Region Traffic Engineer, RME’s office and the WSP for the history of reported incidents.

Bridge fence might reduce the number of incidents, but will not stop a determined individual at that location, or deter them from moving to other locations in the area. Enforcement provides the most effective deterrent and is typically the first approach used.

Installing bridge fence is analyzed on a case-by-case basis at the following locations:

* On existing structures where there is a history of multiple incidents of objects being dropped or thrown and where enforcement has not changed the situation.
* On new structures near schools, playgrounds, or areas frequently used by children not accompanied by adults.
* In urban areas on new structures used by pedestrians where surveillance by local law enforcement personnel is not likely.
* On new structures with walkways where experience on similar structures within a 1 mile radius indicates a need.
* On private property structures, such as buildings or power stations, subject to damage.

In most cases, installing bridge fence on a new structure can be postponed until there are indications of need.

Submit all proposals to install bridge fence on structures to the Director & State Design Engineer, Development Division, for approval. Contact the HQ Bridge and Structures Office for approval to attach bridge fence to structures and for specific design and mounting details.

***Chapter 560 Fencing***

**560.02 Design Criteria**

***560.02(4) Special Sites***

Fencing may be needed at special sites such as pit sites, stockpiles, borrow areas, and stormwater detention facilities.

Fencing is not normally installed around stormwater detention ponds. Evaluate the need to provide fencing around stormwater detention facilities when pedestrians or bicyclists are frequently present. Document your decision in the Design Documentation Package.

The following conditions suggest a need to evaluate fencing:

* Children or persons with mobility impairments are frequently present in significant numbers in locations adjacent to the facility, such as routes identified in school walk route plans or nearby residential areas or parks.
* Water depth reaches or exceeds 12 inches for several days.
* Sideslopes into the facility are steeper than 3H:1V.

Fencing proposed at sites that will be outside WSDOT right of way requires that local ordinances be followed if they are more stringent than WSDOT’s.

Wetland mitigation sites are not normally fenced. When evaluating fencing for wetland mitigation sites, balance the need to restrict human access for safety considerations (such as the presence of children) with the need to provide animal habitat.

Other special sites where fencing may be required are addressed in the following chapters:

Section 720.03(13), Bridge Fence

***Chapter 1510 Pedestrian Facilities***

**1510.14 Pedestrian Grade Separations (Structures)**

***1510.14(1) Pedestrian Bridges***

Pedestrian grade-separation bridges (see Exhibit 1510-28) are more effective when the roadway is below the natural ground line, as in a cut section. Elevated grade separations in cut sections, where pedestrians climb stairs or use long approach ramps, tend to be underused. Pedestrian bridges need adequate right of way to accommodate accessible ramp approaches leading up to and off of the structure. The bridge structure must comply with ADA requirements and meet the accessibility criteria for either a pedestrian circulation path (if the grade is 5% or less) or an access ramp (if the grade is greater than 5% but less than or equal to 8.3%), and must include a pedestrian access route. (See 1510.06 and 1510.07 for PCP and PAR accessibility criteria; see 1510.15(2) for access ramp accessibility criteria.)

For the minimum vertical clearance from the bottom of the pedestrian structure to the roadway beneath, see Chapter 720. The height of the structure can affect the length of the pedestrian ramp approaches to the structure. When access ramps are not feasible, provide both elevators and stairways.

Provide railings on pedestrian bridges. Bridge fence is sometimes desirable to deter pedestrians from throwing objects from an overhead pedestrian structure (see Section 720.03(13) Bridge Fence).

***Chapter 1515 Shared-Use Paths***

**1515.04 Grade Separation Structures**

Provide the same minimum clear width as the approach paved shared-use path plus the graded clear areas.

Carrying full widths across structures has two advantages:

* The clear width provides a minimum horizontal shy distance from the railing or barrier.
* It provides needed maneuvering room to avoid pedestrians and other bicyclists.

For undercrossings and tunnels, it is the Designer’s responsibility to determine the correct minimum vertical clearance (shared use path pavement surface to overhead obstruction) of each undercrossing or tunnel based on coordination with maintenance and emergency services. The minimum vertical clearance for bicyclists and equestrians is 10 feet.

Consult the region Maintenance Office and the HQ Bridge Preservation Office to verify that the planned path width and vertical clearance meets their needs. If not, widen and/or increase vertical clearance to their specifications.

Use expansion joints that accommodate shared-use path users. Expansion joints should be perpendicular to the path and have a maximum gap of ½ inch or be covered with a slip-resistant plate.

Installing bridge fence is analyzed on a case-by-case basis. Refer to Section 720.03(13) Bridge fence for guidance.

***Reviewers,***

*This second section changes clarifies Design Vehicle Guidance for Driveway Design.*

Chapter 1340 Driveways

# 1340.03 Driveway Design

The design of a driveway is based on the usage, design vehicle and traffic volumes anticipated for the driveway. Driveways should be designed for the largest design vehicle that will regularly use the driveway so that it can stay in the lane and not intrude into other traffic. Determine the specific footprint of the driveway based on the turning path width of the design vehicle and in coordination with the access permit. For example, a residential driveway connection will typically have smaller radii and a narrower access width than a higher-volume commercial driveway; however, if the property owner regularly has larger-wheelbase vehicles using the driveway, such as a home-based work vehicle, recreational vehicle, or truck and boat trailer combination, then a larger driveway may be appropriate.

Justification is required to design the driveway when the design vehicle stays within the paved surface but is allowed to intrude into other traffic lanes. See section 1310.02(5) for additional information pertaining to accommodating vs. designing for design vehicles.

Conversely, some driveways, such as a rural locked and gated, utility, farm, or logging access that larger vehicles sometimes use, may be better served with a smaller and narrower access. This is based on infrequent use and to prevent unauthorized use or dumping of debris on or near the driveway. Other design considerations are:

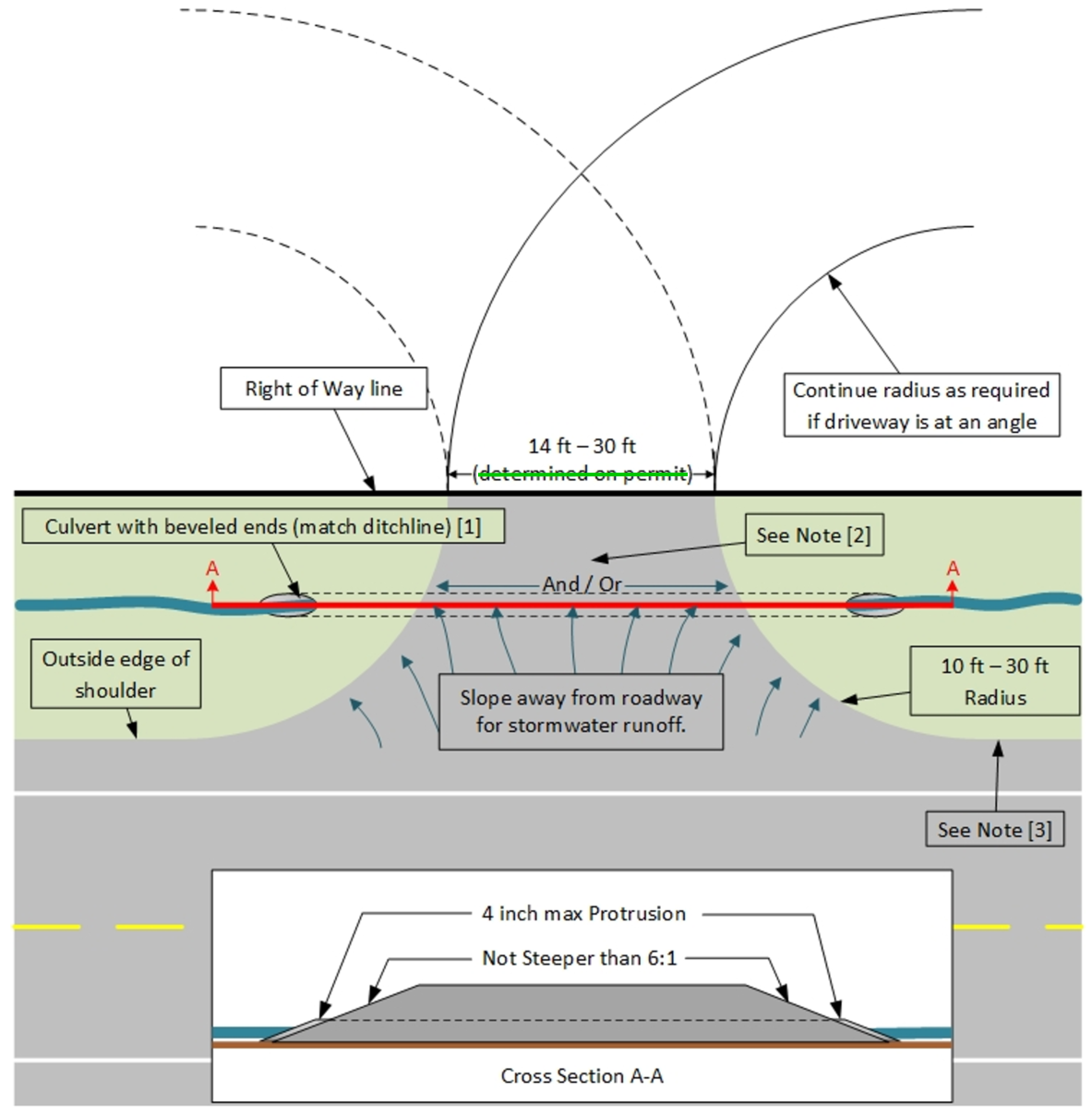
* Prevent stormwater from flowing onto the roadway from the driveway.
* Properly size culverts under the driveway to adequately accommodate the conveyance of stormwater in the roadway ditches and swales.
* Provide driveway sight distance.
* Accommodate for mailbox placement.
* Ensure surfacing materials and depths are appropriate.
* Generally, extend paving to the right of way line depending on the location/purpose of the driveway. The desirable intersection angle of the driveway is 90°, with 60° to 120° allowed.
* Where driveways intersect sidewalks, bike lanes, shared-use paths, or trails especially near schools, consider narrowing the driveway and/or reducing the radii to the minimum required by the design vehicle. Narrower driveway width and/or smaller driveway radii can reduce exposure and speed differentials between vehicles entering / exiting the driveway and pedestrians or bicycles.

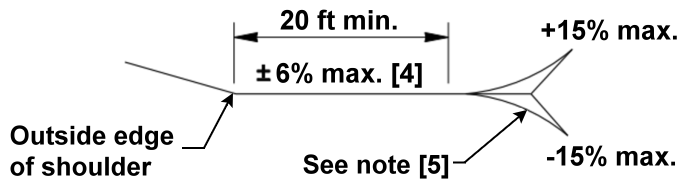
## 1340.03(1) Design Templates

There are two driveway design templates for use where there is no adjacent sidewalk. When a driveway connection has or will have adjacent sidewalk, see Section [1340.04](#_1340.05 Sidewalks). In both template designs, the sideslopes of the driveway shall not be steeper than 6H:1V. These templates may be used on both limited access and managed access state highways. If an Interstate limited access driveway is allowed, it must be gated. Use the design template dimensions that will accommodate the intended use of the driveway and will not adversely affect the operations of the traveled way of the state highway. See Chapter 530 and Chapter 550 for documentation requirements for access approaches to limited access facilities. Design driveways with as small a foot print as possible while accommodating the design vehicle specific to that driveway. Use turn simulation software (such as AutoTURN®) to verify the driveway design will accommodate the largest vehicle that will regularly use the driveway. Considering the context of use, Exhibit 1340-1 is generally used for private, special use, and low volume commercial driveways with design vehicles of SU-30, BUS, and smaller. Exhibit 1340-2 is generally used for low volume commercial and special use driveways with design vehicles of SU-30, BUS, and larger.

Driveways to developments with greater than 1,500 (estimated) average daily trips both entering and exiting the development (shopping malls, housing developments, commercial complexes, etc.) should be designed as an intersection leg (see Chapter 1310).

Exhibit 1340-1 Driveway Design Template SU-30 and Smaller

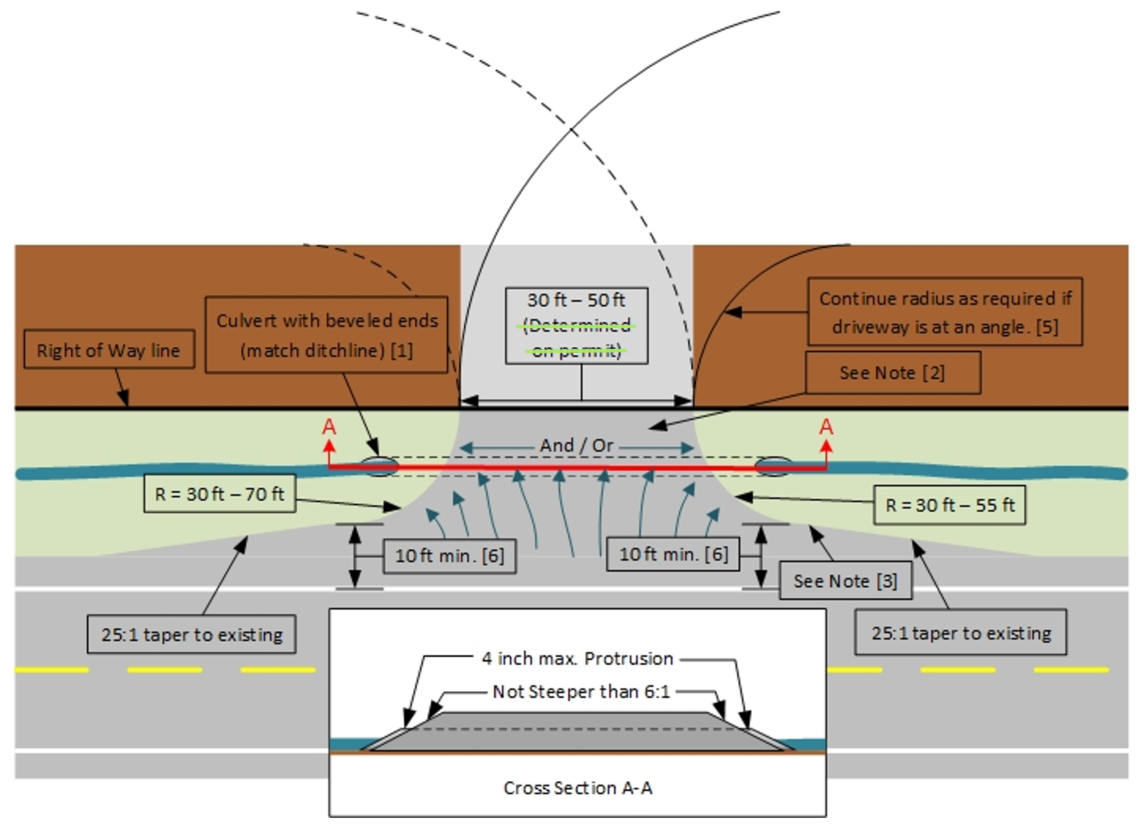


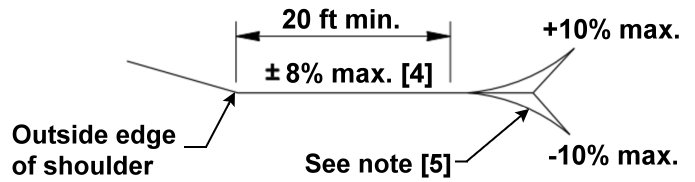


Notes:

1. Culvert pipe with beveled end treatment (see Chapter 1600). See Hydraulics Manual, Road Approach and Driveway Culverts for details.
2. When the travel lanes are bituminous, a similar surface may be used on the approaches.
3. For mailbox location and type, see Section 1340.07 and Chapter 1600.
4. Not to exceed ±8% maximum algebraic difference from shoulder slope.
5. Vertical alignment not to exceed a 3¼-inch hump or a 2-inch depression in a 10-foot chord

Exhibit 1340-2 Driveway Design Template SU-30 and Larger





Notes:

1. Culvert pipe with beveled end treatment (see Chapter 1600). See Hydraulics Manual, “Private Road Approach and Driveway Culverts” for details.
2. When the travel lanes are bituminous, a similar surface may be used on the approaches.
3. For mailbox location and type, see Section 1340.07, Chapter 1600.
4. Not to exceed ±8% maximum algebraic difference from shoulder slope.
5. Vertical alignment not to exceed a 3¼-inch hump or a 2-inch depression in a 10-foot chord.
6. Check turning template of driveway design vehicle.

***Reviewers,***

*This third and last section writes out as many “Hazard”s as Possible from the Design Manual.*

***Chapter 530 Limited Access Control***

***530.04 Partial Control***

***530.04(4) Access Approach***

### 530.04(4)(b) Design Considerations

The following considerations are used to determine the number and location of access approaches on partial control limited access highways.

1. Access approaches must be held to a minimum. The number is limited as follows:

* Principal arterial: two per side per mile
* Minor arterial: four per side per mile
* Collector: six per side per mile, including at-grade intersections

2. Approaches in excess of the number listed above may be allowed as staged construction (until full buildout is complete) if approved by the Director & State Design Engineer, Development Division.

3. Approaches are not allowed for parcels that have reasonable access to other public roads unless a parcel has extensive highway frontage.

4.  Relocate or close approaches ~~in areas~~ **at locations** where **available sight distance is below Design Manual criteria**. ~~sight limitations create undue hazards~~.

### 530.04(6) Pedestrian and Bicyclist Crossings and Paths

Pedestrian and bicyclist crossings are allowed on partial control limited access highways when they are grade-separated.

At-grade pedestrian and bicyclist crossings are allowed:

* Only at intersections where an at-grade crossing is provided in accordance with [Chapter 1510](https://www.wsdot.wa.gov/publications/manuals/fulltext/M22-01/1510.pdf).
* On two-lane highways at mailbox locations.
* On two-lane highways not less than 100 feet from a school bus loading zone (pullout) adjacent to the traveled lane, if school district and WSDOT personnel determine that the bus stopping in the traveled lane is ~~hazardous~~ not **recommended** ~~acceptable~~.

***Chapter 1350 Railroad Grade Crossings***

**1350.04 Traffic Control Systems**

*(1) Traffic Control System Elements*

**(b) Active Elements**

5. **Supplemental Safety Devices:** Supplemental safety devices are typically used at locations where it is known that motorists frequently drive around gates, where deemed appropriate due to unique local conditions, or as part of railroad quiet zones where trains are not required to sound the locomotive horn. (For more information about quiet zones, see 🖰 [www.fra.dot.gov/us/content/1318](http://www.fra.dot.gov/us/content/1318).)

*Chapter 1510 Pedestrian Facilities*

1510.17 Work Zone Pedestrian Accommodation

While Title II of the ADA requires that a public entity maintain its pedestrian facilities in operable working condition, including maintenance of their accessibility features, construction and maintenance activities often temporarily disrupt these facilities. When this occurs, provide access and mobility for pedestrians through and around work zones (see [Exhibit 1510-31](#Exhibit1510_31)). Address this in the temporary traffic control plans if the project occurs in a location accessible to pedestrians. The designer must determine pedestrian needs in the proposed work zone during the public input process and through field visits.

Detailed guidance on work zone pedestrian accommodation can be found in the WSDOT *Field Guide for Accessible Public Rights of Way*, the [MUTCD](http://www.wsdot.wa.gov/Publications/Manuals/MUTCD.htm), and [Chapter 1010](http://www.wsdot.wa.gov/publications/manuals/fulltext/M22-01/1010.pdf).

Provide walkways that are clearly marked and pedestrian barriers that are continuous, rigid, and detectable to vision-impaired persons who navigate with a cane. Also, keep:

* The pedestrian head space clear.
* Walkways free from holes, debris, and abrupt changes in grade or terrain.