

4.2-i PAVING PARKING AREAS AND ROADS

Alternate Names: Pavement Practices, Impervious Paving

DESCRIPTION

All roads, driveways, and parking lots proposed for year-round use shall be paved with a hard plowable surface. A variety of materials may be used to pave including asphalt, concrete, paving stones, and pervious paving materials. Paved surfaces shall be designed and located to preserve natural vegetation, prevent future soil disturbance, maintain relatively clean stormwater runoff, convey stormwater to infiltration systems, blend with the natural landforms, protect against erosion, and cause the least adverse impacts on water quality, traffic, air quality, transportation, and safety.

Limited grading to achieve sheet flow supports achievement of on-site treatment and infiltration with minimal storm-drain infrastructure. Paving is best incorporated into projects during the design and engineering phases.

Stormwater runoff generated from paved surfaces shall be contained and infiltrated on-site, unless specifically authorized by the regulatory or permitting agency. Refer to Section 4.1, Hydrologic Source Control for BMPs designed to infiltrate stormwater runoff generated from paved surfaces.



Sediment laden runoff entering the right of way from an unpaved driveway.

BMP DESIGN APPROACH	
<input checked="" type="checkbox"/>	Pollutant Source Control
<input type="checkbox"/>	Hydrologic Source Control
<input type="checkbox"/>	Stormwater Treatment
SCALE OF APPLICATION	
<input checked="" type="checkbox"/>	All SFR and MFR < 1 acre
<input checked="" type="checkbox"/>	MFR 1-5 Acre and CICU < 5 acres
<input checked="" type="checkbox"/>	MFR and CICU > 5 acres and all WQIPs
BMP TYPE	
<input type="checkbox"/>	Temporary
<input checked="" type="checkbox"/>	Permanent

APPLICABILITY

All roads, driveways, and parking areas proposed for year-round use shall be paved.

Advantages

- Prevents the discharge of degraded runoff from dirt roads, driveways, and parking areas.
- Allows snow removal activities without causing soil disturbance.
- Provides access to homes, buildings, and parking areas.

Disadvantages

- Paved impervious areas increase the volume of runoff and velocity of stormwater flow (particularly on slopes), reducing the time of concentration and increasing peak runoff.
- Asphalt contains material derived from crude oil that degrades when weathered and adds to pollutants entering the watershed. Asphalts also lose their plasticity with age and harden, crack, and crumble when they are oxidized. This requires routine maintenance/replacement despite the lower initial installation cost.

DESIGN CONSIDERATIONS

- All paving practices shall conform to local, state, and/or federal agency guidelines.
- Paved surfaces must be designed and installed by qualified professionals.
- Prior to paving, verify land coverage or it may be subject to removal and the land restored to natural conditions. Refer to Chapter 7 Permitting for more details regarding land coverage.
- Limit the amount of paved surfaces on a property to the extent feasible to reduce the volume of stormwater runoff.
- Preserve natural vegetation to the greatest extent possible and in accordance with fire defensible space practices. Refer to Chapter 5 Soil and Vegetation Management, Section 5.3.2.5 Fire Defensible Space for more detail.
- Use landscaping and screen planting around parking areas as much as possible.
- Paved surfaces should be sloped slightly, 1 to 5 percent, to provide drainage and to prevent pooling and ponding. A paved surface shall not exceed a 10 percent slope; however, if the construction of a paved surface with a 10 percent slope or less will require excessive excavation, the maximum slope allowed would be 15 percent. In no case shall a paved surface exceed 15 percent.
- Stormwater runoff from paved surfaces must be contained and infiltrated on-site.
 - On a relatively level site, grade the paved surface away from the right of way so that water sheet flows on-site to an infiltration system. This may avert the need for a separate structural conveyance system (e.g. slotted channel drain). See Examples of Alternative Grading for Parking Lot Infiltration Figure and Grading for Sheet Flow Figure.

- Grading an A/C swale seamlessly into the pavement may also prevent the need of a separate structural conveyance system.
 - Where new paving or repaving is not feasible, retrofit with a slotted channel drain, A/C swale, or curb and gutter.
 - Refer to Section 4.3, Stormwater Collection and Conveyance for more details regarding these systems.
- Use stormwater pretreatment for paved surfaces generating runoff that contains high levels of pollutants or with the potential for hazardous waste spills prior to discharging to an infiltration system or off-site.
 - Paved surfaces shall be designed for snow removal and storage. Snow storage areas must be relatively flat, well mulched, and vegetated to minimize erosion and facilitate immediate infiltration, or stored on paved surfaces upslope of conveyance structures and infiltration systems. Alternatively, snow may be removed from the property and stored off-site at an approved location. Refer to Section 4.2-c, Snow Storage for more details regarding this practice.
 - Install parking barriers to limit disturbance from vehicles to adjacent soil and vegetation (Refer to Section 4.2-l, Parking and Vehicle Barriers).
 - Un-paved roadways, driveways, pathways, or parking lots may be permitted only when the use is of a seasonal or temporary nature to provide access to National Forest areas or construction sites. Vehicle access shall be excluded during periods of soil saturation or surface water runoff, and traffic upon such roads is limited to light vehicles and low speeds. No snow removal shall be conducted.
 - Orient parking areas and walkways toward the south, east and west, where practical, to optimize solar gain and minimize ice build-up.
 - Efficient design of parking areas is encouraged:
 - Segregate parking areas for small and large cars with landscape areas to break up the pattern of parking lots, include stormwater retention areas, and provide parking for an equivalent number of automobiles with less land surface coverage.
 - The necessary capacity of discharge drainage systems can be reduced by including infiltration and treatment systems between and within parking areas. (Refer to Alternative Grading for Parking Lot Infiltration Figure)



Stormwater runoff from a paved parking lot and the use of pervious pavement along the perimeter and for designated parking stalls.

INSTALLATION CONSIDERATIONS

Driveways should be designed and installed by a qualified professional. Install paved surfaces in a way that limits soil disturbance and utilize temporary BMPs to reduce construction impacts.

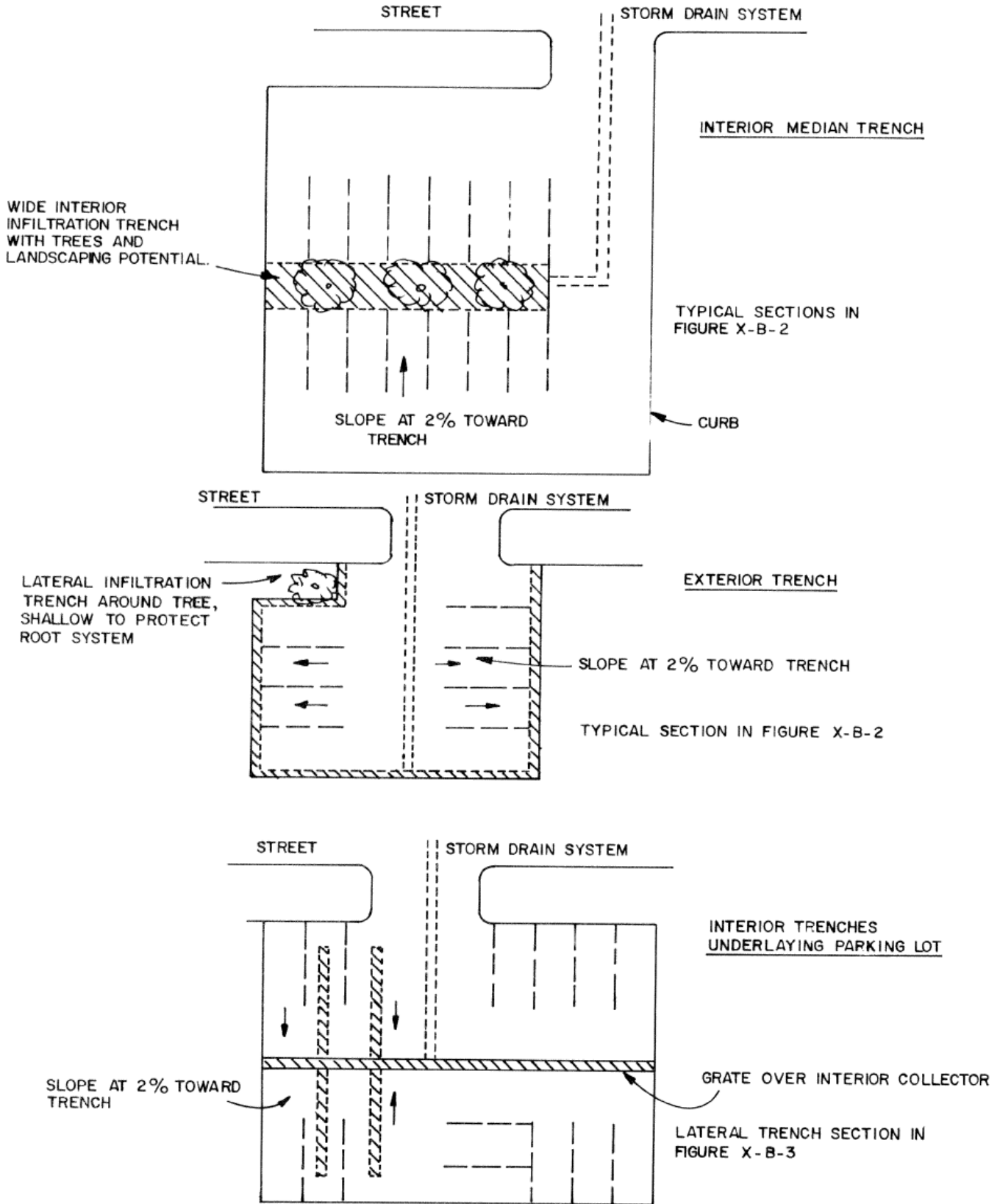
INSPECTION AND MAINTENANCE

- Winter conditions in the Lake Tahoe Region bring continuous freeze thaw events that can create sheets of ice over impervious paving. Snow and ice control compounds shall be used only in quantities necessary to remove and prevent ice build-up and for public safety.
- Paved areas should not be allowed to deteriorate and should be kept clean of debris and free from substances which will worsen the quality of runoff waters from these surfaces.
- Anytime an exceptional build-up of tiller, sediment material, or debris is present, sweep the surface, regardless of any set schedule. Accelerate the sweeping schedule after heavy pine needle fall or excessive ice control activities. Sweeping after ice control shall proceed as expediently as possible following the drying of the pavement surface.

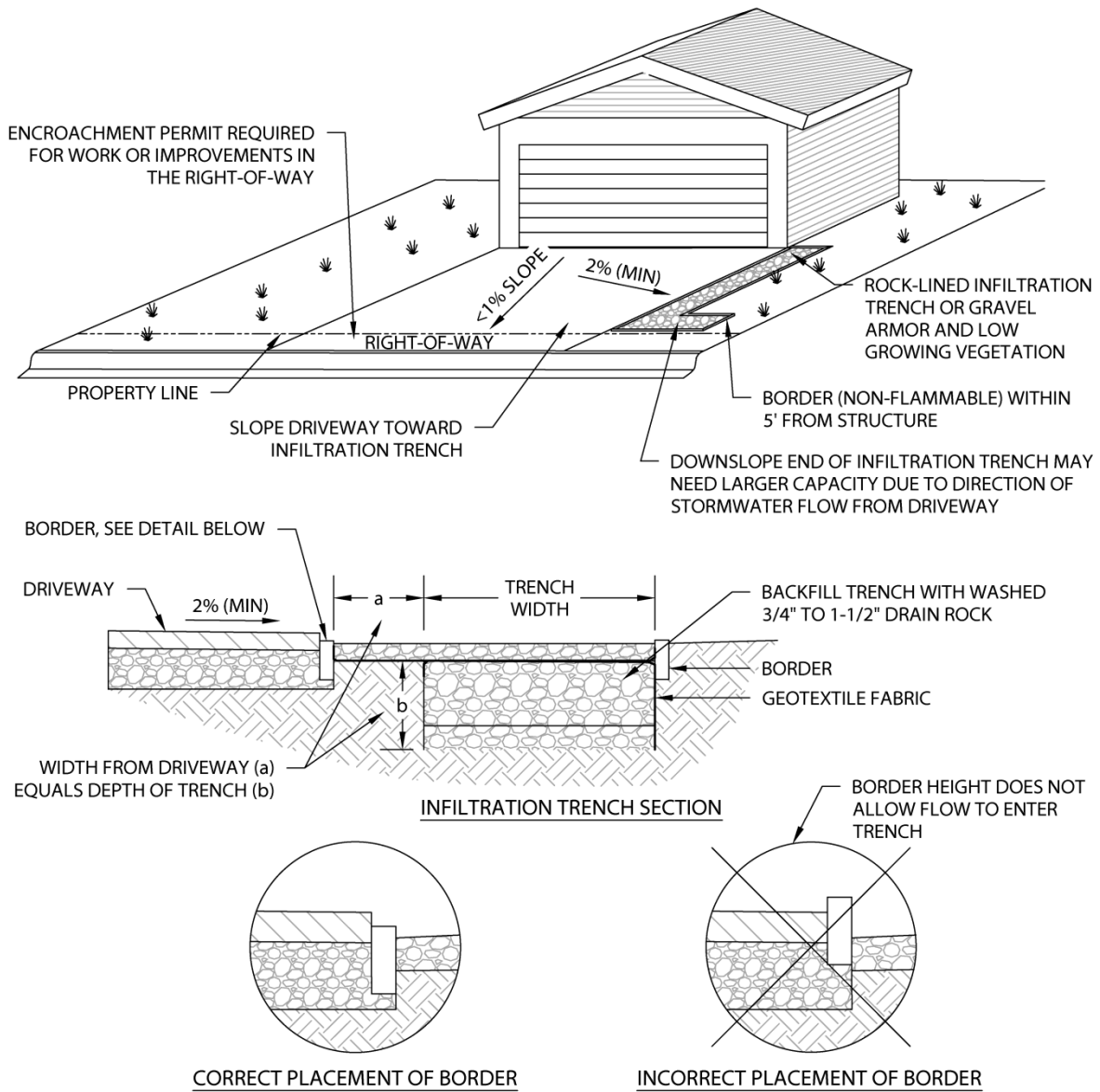
EFFECTIVENESS CONSIDERATIONS

Paved roads, driveways, and parking areas effectively cover compacted, disturbed soils and prevent vehicle tracking of soil if they are properly installed in accordance with the design criteria. Paved areas generate stormwater runoff and require an associated treatment and infiltration system to prevent further water quality degradation.

Examples of Alternative Grading for Parking Lot Infiltration Figure



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NOTES:

1. INFILTRATION TRENCH SHALL BE SIZED PROPERLY TO RECEIVE RUNOFF FROM DRAINAGE AREA.
2. PRECISE GRADING IS REQUIRED TO ENSURE WATER WILL FLOW INTO INFILTRATION TRENCH.
3. TRENCH BOTTOM MUST BE LEVEL. IF SLOPE OF TERRAIN IS >5% ALONG LENGTH OF TRENCH, STEPPED TRENCHES ARE NECESSARY (SEE INFILTRATION TRENCH DETAIL).
4. BORDER NEXT TO DRIVEWAYS MUST BE LOWER THAN DRIVEWAY ELEVATION TO ALLOW RUNOFF TO ENTER SYSTEM.
5. CROSS SLOPE SHOULD EQUAL TWO TIMES DOWN SLOPE. THE DOWN SLOPE GRADIENT SHOULD NOT EXCEED 4% FOR THIS STRATEGY. DRIVEWAYS WITH DOWN SLOPES STEEPER THAN 4% SHOULD EMPLOY OTHER APPROPRIATE STRATEGIES.
6. PARKING BARRIERS MAY NEED TO BE INSTALLED TO PREVENT VEHICLE COMPACTION OF INFILTRATION SYSTEMS.

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