

# Aesthetic Barrier

NAME	MANUFACTURER	TEST LEVEL		POST AND BLOCKOUT	RAIL	DISTINGUISHING CHARACTERISTICS
		NCHRP 350	MASH			
<b>FLEXIBLE SYSTEMS</b>						
<b>NatureRail</b> Gregory Highway Products <a href="http://www.gregorycorp.com/highway_nature_rail.cfm">http://www.gregorycorp.com/highway_nature_rail.cfm</a>		TL-2		6" diameter Wood-clad steel post. NatureRail 2m - 5'-11 7/8" post, 6'-6 3/4" post spacing NatureRail 4m - 5'-11 7/8" post, 13'-1 1/2" post spacing Steel spacer unit separates the post from the rail. No blockout.	Composite rail: 2m: Modified 7" diameter log and 3-15/16" x 3/16" x 13'-1 1/16" steel rail internally located in slotted wood rail with no exterior steel rail. 4m: Modified 7" diameter log and 3-15/16" x 3/16" x 13'-1 1/16" steel rail internally located in slotted wood rail with an additional steel rail mounted to the back of the wood rail.	Rail height 2'-3 1/2" All wood appearance blends into the surrounding environment. Dynamic Deflection 2m: 4'-7" and 4m - 6'-2". Use along edge of roadway. No crashworthy end terminal is currently available; acceptable end treatments include anchoring in a backslope or flaring the barrier to the edge of the clear zone.
<b>Ironwood Aesthetic Barrier</b> West - East Partners, LLC <a href="http://www.west-eastpartners.com/">http://www.west-eastpartners.com/</a>		TL-3		S3 x 5.7, 5'-3" long steel post, with a 8" x 2' steel soil plate Steel post encased by a 6 3/4" diameter wood sleeve. Post Spacing 6'-6".	Composite rail: 8" diameter routed wood beams and 1/4" thick steel channel embedded in and bolted to the timber rail. 8" x 7" rectangular timber rail - alternate design	Rail height 2'-2" All wood appearance blends into the surrounding environment. Dynamic deflection 5'-4 1/2" No crashworthy end terminal is currently available; acceptable end treatments include anchoring in a backslope or flaring the barrier to the edge of the clear zone.
<b>High Tension Cable Barrier</b> Brifen (WRSF) <a href="http://www.brifenus.com">http://www.brifenus.com</a> Gibraltar <a href="http://gibraltartx.com">http://gibraltartx.com</a> Gregory Highway Products <a href="http://www.gregorycorp.com/highway_safence.cfm">http://www.gregorycorp.com/highway_safence.cfm</a> Nucor Steel Marion <a href="http://nucorhighway.com/nu-cable.html">http://nucorhighway.com/nu-cable.html</a> Trinity Highway Products <a href="http://www.highwayguardrail.com/products/cb.html">http://www.highwayguardrail.com/products/cb.html</a>		TL-3 and TL-4		Sizes and post spacing designs vary. Refer to manufacturer's specifications.	Three and four cable designs available.	All systems are propriety. Blends in with surrounding environment, and reduces visual impairment. Refer to manufacturer's specifications for distance from post to embankment hinge point. Refer to manufacturer's specifications for availability of end treatments. Steel posts are typically galvanized. Coating alternatives are available to enhance aesthetic appearance. Use in medians and along edge of roadways.
				<p><b>For details on a specific system please go to manufacturer's website. For a comparisons of all systems, please refer to FHWA Cable Barrier Chart</b></p>		

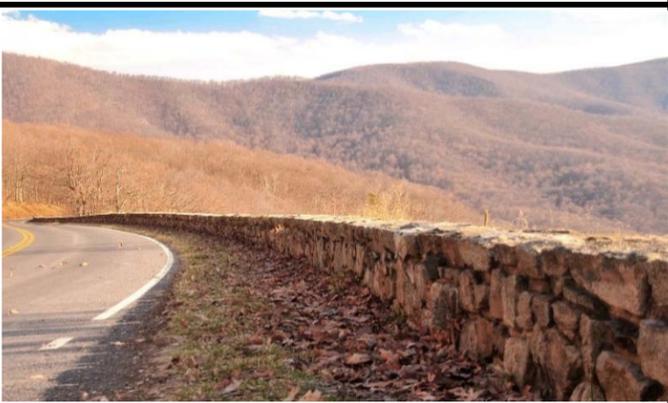
# Aesthetic Barrier

NAME	MANUFACTURER	TEST LEVEL		POST AND BLOCKOUT	RAIL	DISTINGUISHING CHARACTERISTICS
		NCHRP 350	MASH			
<b>SEMI-RIGID SYSTEM</b>						
<b>Deception Pass Log Rail</b> <a href="http://www.wsdot.wa.gov/Research/Reports/600/642.1.htm">http://www.wsdot.wa.gov/Research/Reports/600/642.1.htm</a>		TL-2		Reinforced concrete, rock and mortar, bollard posts designed to replicate the historic Civilian Conservation Corp construction.  18' bollard spacing  Intermediate spacing of 6" diameter steel posts.  No blackout.	Composite rail: Modified 12" diameter log and 6" x 6" x 3/8" steel plate embedded into the log rail.	Rail height 2'-3"  Wood and rock appearance blends into the surrounding environment.  Design reduces visual impairment of the environment.  No crashworthy end terminal is currently available; acceptable end treatments include anchoring in a backslope or flaring the barrier to the edge of the clear zone.
<b>TimBarrier StreetGuard Plus</b>  S.I. Storey Lumber Co.  <a href="http://www.sistoreylumber.com/pdf/StreetGuardPlusFlyer.pdf">http://www.sistoreylumber.com/pdf/StreetGuardPlusFlyer.pdf</a>		TL-2		6" x 8" x 6' long timber post  Wood blockouts 6" x 8" x 10"  Post spacing 8'	Composite rail: 4" x 12" x 7'-11" long timber rail backed by 1/4" x 6" x 7'-6" long steel plates.	Rail height 2'-5"  All wood appearance blends into the surrounding environment.  Use along edge of roadway.  No crashworthy end terminal is currently available; acceptable end treatments include anchoring in a backslope or flaring the barrier to the edge of the clear zone.  Dynamic deflection 4'-4".
<b>Steel-Backed Log Rail</b>  <a href="http://flh.fhwa.dot.gov/resources/pse/standard/#fp617">http://flh.fhwa.dot.gov/resources/pse/standard/#fp617</a>		TL-2		12" diameter x 7' log post  Wood blockouts 8" x 6" x 8" notched into log post  Post spacing 10'.	Composite rail: Modified 10" diameter log rail, backed with 6" x 3/8" thick steel plate.	Rail height 2'-7"  Wood appearance blends into the surrounding environment.  No crashworthy end terminal is currently available; acceptable end treatments include anchoring in a backslope or flaring the barrier to the edge of the clear zone.  Dynamic deflection 4"

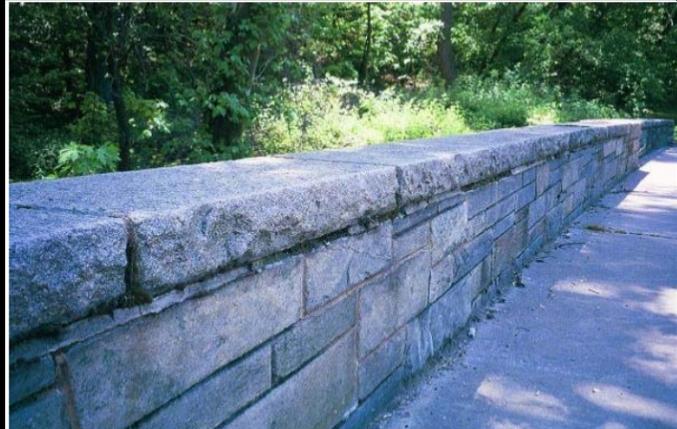
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<b>SEMI-RIGID SYSTEM</b>						
Steel-Backed Timber Guardrail		TL-3 (with blockouts)		10" x 12" x 7' long timber post. Post spacing 5'.	Composite Rail: 6" x 10" wood rail backed with a 3/8" thick steel plate.	Rail height 2'-3" All wood appearance blends into the surrounding environment.
		TL-2 (no blockouts)		Wood blockouts 4" x 9" x 12"		System can connect to Straight and Curved Stone Masonry Guardwall. Dynamic deflection 1'-11" with blockout
Steel Backed Timber Guardrail Tangent End Terminal		TL-2		The SBT end terminal is 40'-9" long and is designed to collapse when hit end-on. 9 - 6" x 10" weakened wood posts. 9 - 6" x 10" rail segment with angled ends and special attachment hardware.		
Merritt Parkway Aesthetic Guardrail Connecticut DOT		TL-3		W6 x 15 X 6' - 6" steel post Post below ground is galvanized. Post Spacing 9'-6". Wood blockout 4" x 8" x 11"	Composite Rail: 6" x 12" timber beams backed with 6" x 3/8" steel plates and splices to provide tensile continuity.	Rail Height 2'-6" All wood appearance blends into the surrounding environment. No crashworthy end terminal was developed for this system; acceptable end treatments include anchoring in a backslope or flaring the barrier to the edge of the clear zone. A granite transition curbing is required at transition to a bridge parapet. Dynamic deflection 3'-10" without a curb and 3'-4" when installed 12" behind a 4" sloped face curb.
Rustic-appearance Metal Beam Guardrail		TL-3		Uses wood or steel posts.	Standard metal beam guardrail	Blends in with the surrounding environment Propriety treatments to achieve rustic appearance on both post and rail elements: acid-etched, powder coated and weathered steel.
				<b>For a complete comparisons of these systems, please refer to FHWA Roadside Post and Beam Chart</b>		

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<b>RIGID SYSTEM</b>					
<b>Random Rubble Cavity Wall</b>  <a href="http://www.efl.fhwa.dot.gov/files/technology/abs/Random-rubble/B181RubbleGuardwall-WFLHD-FIN.pdf">http://www.efl.fhwa.dot.gov/files/technology/abs/Random-rubble/B181RubbleGuardwall-WFLHD-FIN.pdf</a>		TL-1		Wall width 1'-6"  Composed of alternating height sections: Section 1 is 1'-6" tall x 12' long Section 2 is 2' tall x 5'-6" long.  Reinforced concrete footings and core wall are poured and stone placed prior to filling the cavity with concrete.  Rock size is between 12" and 1'-6" with smaller rocks and masonry mortar.	Wall height: 1'-6" and 2' alternating height sections  Stone facing blends into the surrounding environment.  No crashworthy end terminal is currently available; acceptable end treatments include anchoring in a backslope or flaring the barrier to the edge of the clear zone.
<b>Rough Stone Masonry Guardwall</b>  <a href="http://safety.fhwa.dot.gov/roadway_dept/policy_guide/road_hardware/barriers/pdf/b202.cfm">http://safety.fhwa.dot.gov/roadway_dept/policy_guide/road_hardware/barriers/pdf/b202.cfm</a>		TL-2		Wall width: 2' single or 2'-3" double faced.  Three main components: reinforced concrete foundation slab, inner reinforced concrete core wall and rough stone masonry face with an attachment system.  Masonry face can have the projections a maximum of 1-1/2" beyond the working line. Avoid projections oriented toward oncoming traffic. Rake joints can be up to 2" deep, and mortar beds can be 2" - 3" thick.	Wall height: 1'-10"  Stone facing blends into the surrounding environment.  No crashworthy end terminal is currently available; acceptable end treatments include anchoring in a backslope or flaring the barrier to the edge of the clear zone.
<b>Rough Stone Masonry Guardwall</b>  <a href="http://safety.fhwa.dot.gov/roadway_dept/policy_guide/road_hardware/barriers/pdf/b64d.pdf">http://safety.fhwa.dot.gov/roadway_dept/policy_guide/road_hardware/barriers/pdf/b64d.pdf</a>		TL-3		Wall width: 2' single or double faced.  Three main components: reinforced concrete foundation slab, inner reinforced concrete core wall and rough stone masonry facing with an anchor attachment system.  Masonry face can have the projections a maximum of 1-1/2" beyond the working line. Avoid projections oriented toward oncoming traffic. Rake joints can be up to 2" deep, and mortar beds can be 2" - 3" thick.	Wall height: 2'-3"  Stone facing blends into the surrounding environment.  Used in medians when double-faced.  No crashworthy end terminal is currently available; acceptable end treatments include anchoring in a backslope or flaring the barrier to the edge of the clear zone.

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<b>RIGID SYSTEM</b>					
<b>Smooth Stone Masonry Guardwall</b>  <a href="http://flh.fhwa.dot.gov/resources/pse/standard/#fp620">http://flh.fhwa.dot.gov/resources/pse/standard/#fp620</a>		TL-3		Wall width: 2' single or double faced.  Three main components: reinforced concrete foundation slab, inner reinforced concrete core wall and rough stone masonry face with an attachment system.  Masonry face can have the projections a maximum of 1-1/2" beyond the working line. Avoid projections oriented toward oncoming traffic. Rake joints can be up to 2" deep, and mortar beds can be 2" - 3" thick.	Wall height: 2'-3" with 3" crenulations above primary height.  Stone facing blends into the surrounding environment.  No crashworthy end terminal is currently available; acceptable end treatments include anchoring in a backslope or flaring the barrier to the edge of the clear zone.
<b>Precast Concrete Guardwall</b>  <a href="http://flh.fhwa.dot.gov/resources/pse/standard/#fp618">http://flh.fhwa.dot.gov/resources/pse/standard/#fp618</a>		TL-3		Wall width 2'-2"  10-ft long pre-cast units include 12 inch deep footings.  Foundation, core, and concrete stone facing are precast as a single unit.	Wall height: 2'-3-1/2"  Precast concrete stone facing and capstone blend into the surrounding environment.  Use in medians if double-faced or along edge of roadway.  Approved for use with 4" mountable curb at any offset.  No crashworthy end terminal is currently available; acceptable end treatments include anchoring in a backslope or flaring the barrier to the edge of the clear zone.
<b>Stone Cast Barrier</b>  <a href="mailto:Stonecastinc@gmail.com">Stonecastinc@gmail.com</a>  Stone Cast, Inc.  <a href="http://safety.fhwa.dot.gov/roadway_dept/policy_guide/road_hardware/barriers/pdf/b-73.pdf">http://safety.fhwa.dot.gov/roadway_dept/policy_guide/road_hardware/barriers/pdf/b-73.pdf</a>		TL-3		Unit dimension: 2'-7" tall; 1'-7" width at top and 2' at bottom.  Unit footing: 1' deep x 4' wide, cast integrally with its stem.  Foundation, stem, and stone veneer cast integrally as a single unit.  Units can be made in 5', 10' or 20' long segments, and can be curved to fit a specified radius	Wall height: 2'-7"  No crashworthy end terminal is currently available; acceptable end treatments include anchoring in a backslope or flaring the barrier to the edge of the clear zone.

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<b>RIGID SYSTEM</b>					
<b>California's Type 60 Concrete Barrier</b>  e.g.: Mission Arch, Deep Cobblestone Reveal, Dry stack, Fracture Granite	 	TL-3		Barrier has a constant single slope approximately 9 degs from the vertical.  General texture guidelines:  1. Sandblast textures with a maximum relief of 1/5". 2. Images or geometric patterns inset into the face of the barrier 1" or less and having 45-deg or flatter chamfered or beveled edges. 3. Textures or patterns of any shape and length inset into the face of the barrier up to the 1/2" deep and 1" width. 4. Any pattern or texture with gradual undulations that have a maximum relief of 3/4" over a distance of 1'. 5. Gaps, slots, grooves or joints of any depth with a maximum width of 3/4" and a maximum surface differential across these features of 1/5" or less. 6. Any pattern or texture with a maximum relief of 2-1/2", if such pattern begins 2' or higher above the base of the barrier and all leading edges are rounded or sloped. No part of this pattern or texture should protrude above the plane of the lower, untextured portion of the barrier.	Wall height: 2'-3" (vertical wall) to 2'-8" (single-slope barrier)  No crashworthy end terminal is currently available; acceptable end treatments include anchoring in a backslope or flaring the barrier to the edge of the clear zone.