A ReCon barrier wall was analyzed with respect to vehicle impact. Two cases were checked.

The basic configuration of the barrier wall consists of two 24-inch deep blocks, with a cap block, placed upon two 45-inch deep retaining wall blocks, with vertical reinforcing in the block cores. The cap blocks should be bonded to the barrier wall with adhesive, to prevent them from dislodging during a vehicle impact.

The vehicle barrier is assumed to be installed on a retaining wall constructed of 45-inch deep ReCon Block.

**Case 1**

The structure was analyzed with respect to the standard for “Vehicle Barriers” set forth in the International Building Code (IBC 1607.7.3), which is intended to apply to parking structures or vehicle barriers protecting building elements. The standard is also generally accepted for parking lots, residential side streets or private drives where low vehicle speeds would be typical.

The IBC standard specifies resistance to “a single load of 6000 pounds applied horizontally in any direction to the barrier system”...at a height of 18 inches. It must be pointed out that the prescribed load is an arbitrary static load intended to provide nominal restraint to a slow moving vehicle, I.E., at the edge of parking decks. It is not intended to resist the impact from any specific combination of vehicle mass and velocity.

#4 bars in each core of the barrier wall (24-inches on-center) will resist the prescribed load and provide an approximate factor-of-safety of 1.8 with respect to allowable stresses. A Geogrid or other tie-back system providing a minimum lateral resistance of 100 lbs. per linear foot, is required to resist sliding and overturning with a minimum factor-of-safety of 1.5.

**Case 2**

The structure was also analyzed with respect to impact from moving vehicles.

#5 bars in each block core of the barrier wall will provide an approximate factor-of-safety of 1.5, with respect to allowable steel stresses, due to a 90-degree impact from a mid-sized sedan weighing 3500 lb. and traveling at 15-mph. Minor cracking and dislocation of blocks may occur, but the wall will stop the vehicle and remain essentially intact.

A Geogrid or other tie-back system providing a minimum lateral resistance of 1200 lbs. per linear foot is required to resist sliding and overturning with a minimum factor-of-safety of 1.5.

Higher velocity impacts can be resisted as the angle of incidence decreases. A 20-mph impact at 25-degrees or a 30-mph impact at 15-degrees are nominally equivalent to the 15-mph impact at 90-degrees.

Supporting Calculations can be found in the Ericksen Roed & Associates report dated Dec. 2, 2005 (available upon request from ReCon Wall Systems).

Note: For information regarding the construction of a ReCon Guardrail, including the concrete to be used in the hole through which the rebar is placed, please check the ReCon website for the Guardrail Block Specification and Installation Instructions.
Curved Wall-Guardrail Block

When constructing a ReCon Guardrail Wall that is curved, it is important that the 6" diameter holes that are cast into the Guardrail Blocks (two courses) and into the ReCon (45" deep) Retaining Wall Blocks (two courses) continue to “line up” so that the reinforcing rebar can be inserted through the four courses of block and a concrete grout then applied to fill these holes. As the radius of the curve becomes tighter, alignment becomes more of a challenge. If the wall being built has an “inside curve”, the radius should never be any tighter than 35’ if one is to avoid cutting of block to maintain alignment. If the wall being built has an “outside curve”, the radius can be as tight as 40’, but this will require cutting off 2” from the inside wing of the Guardrail Block (on both courses). Given the variability of block spacing that can occur in the field, it would be advisable to keep the radius to no less than 50’ to avoid some unexpected alignment issues.

**Minimum Turning Radius, Inside Curve 35’**

**Minimum Turning Radius, Outside Curve 40’**

40’ Radius with 2” cut/removed from inside wing of Guardrail in field
Warranty

Each Block will have a 28 day compressive strength of at least 4000 PSI for 15 years after proper installation. If a Block does not meet this warranty standard, please notify the manufacturer in writing. If after it has been determined that the Block has not met the specifications, the manufacturer will have shipped to you, replacement Blocks which shall be the manufacturer’s sole remedy for breach of this warranty. However, neither the manufacturer nor ReCon Wall Systems, Inc. shall have any obligation to install such replacement Blocks.

This warranty shall not apply to any Block which is damaged, defective or fails to meet the warranty standard due to improper installation of the Block, chemical contact, structural design of the wall, or excessive and unforeseen site conditions beyond the manufacturer’s or ReCon Wall Systems, Inc.’s control.

The above warranty is the exclusive limited product warranty. ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, ARE DISCLAIMED.