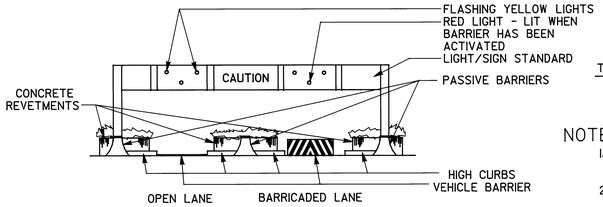
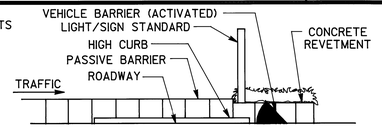
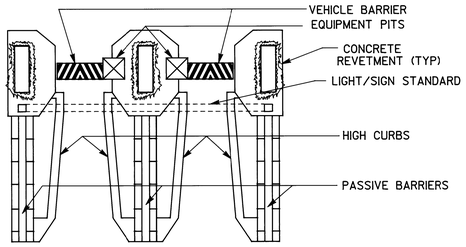


ELEVATION



SECTION

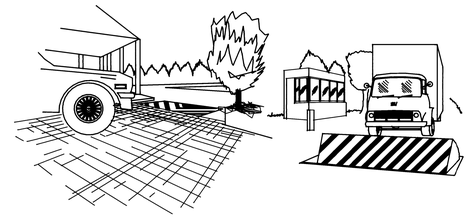


PLAN

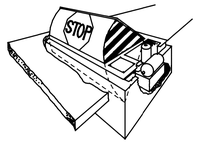
NOTES:

1. PASSIVE BARRIERS ARE REQUIRED TO PREVENT THE THREAT FROM GOING AROUND THE BARRIERS.
2. BARRIER CURBS AND CONCRETE REVETMENTS OR PLANTERS SHOULD BE USED TO NARROW THE ROADWAY AT THESE BARRIERS AND TO SLOW DOWN VEHICLES AS THEY APPROACH THE BARRIERS.
3. WARNING LIGHTS AND SIGNS SHOULD BE USED TO CAUTION DRIVERS ABOUT THE LOCATION OF THE BARRIERS. SIRENS, HORNS, AND GONGS MAY BE USED TO INDICATE DEPLOYMENT.
4. LOCATE OPERATING EQUIPMENT, HYDRAULIC PUMPS, AIR COMPRESSORS, ETC. IN A PROTECTED LOCATION NEAR THE BARRIERS.
5. DRAINAGE FOR THE PITS OF BARRIERS SHALL BE PROVIDED.
6. BARRIER WIDTH MAY BE ADJUSTED TO MEET THE THREAT AND TO VARY THE COST OF THE BARRIER.
7. THESE BARRIERS MAY REQUIRE HEATERS OR OTHER TYPES OF WEATHER PROTECTION FOR PROPER OPERATION IN SOME CLIMATES.

VB-1 GENERAL CONCEPT



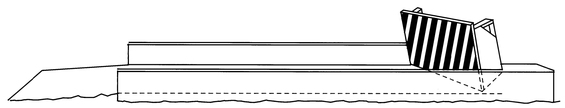
OPEN BARRIER DEPLOYED BARRIER



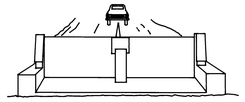
BARRIER

TYPE: HIGH VEHICLE THREAT RANGE
OPERATION: RAMP RISES FROM A RECESS IN THE ROADWAY, PRESENTING AN ALMOST VERTICAL FACE TO THE ONCOMING VEHICLE
MANUFACTURER: D, N, W, M, T AND BC
COST: $24,000 TO $45,000/10 FT. BARRIER
COMMENT: DESIGN CAPACITY = 0.7 TO 1.3 MILL. FT.-LBS.

VB-2 RAMP BARRIER/SURFACE BARRIER

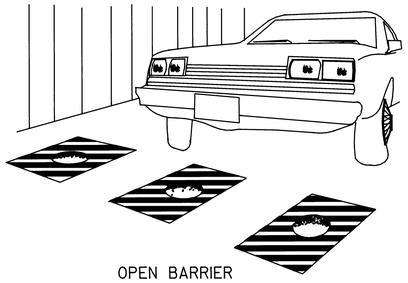


TYPE: HIGH VEHICLE THREAT RANGE
OPERATION: PORTABLE VEHICLE BARRIER, HYDRAULIC OPERATED
MANUFACTURER: BC
COST: $53,000 INSTALLED

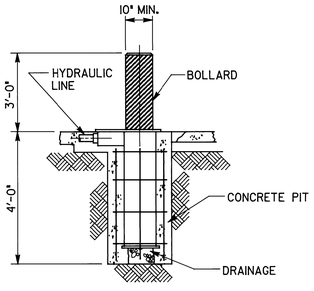


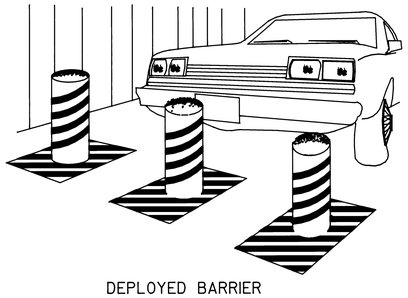
VB-3 PORTABLE VEHICLE BARRIER

TYPE: MEDIUM VEHICLE THREAT RANGE
OPERATION: THE BOLLARDS RISE FROM PITS IN THE ROADWAY
MANUFACTURER: D,W
COST: $18,500 FOR 3 BOLLARDS
COMMENT: DEPLOYMENT SPEED VARIES WITH HYDRAULIC AND PNEUMATIC OPERATORS



OPEN BARRIER

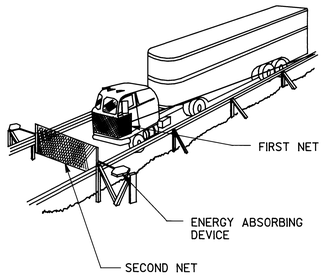


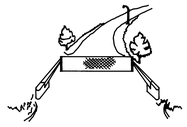


DEPLOYED BARRIER

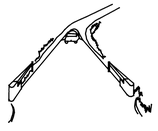
VB-4 BOLLARDS

OPEN BARRIER





DEPLOYED BARRIER



BARRIER ENGAGED

TYPE: HIGH VEHICLE THREAT RANGE
OPERATION: ENERGY OF RAMMING VEHICLE IS ABSORBED BY A HEAVY STEEL STRAP BEING BENT BACK AND FORTH AS IT PASSES THROUGH A SERIES OF OFF-SET CYLINDERS.
MANUFACTURER: EN
COST: $64,000/SINGLE LANE NET
COMMENT: STOPS A VEHICLE WITHOUT A SUDDEN STOP. NET MOUNTED ON SEMAPHORE ARMS FOR DEPLOYMENT. MULTIPLE UNITS MAY BE USED FOR GREATER CAPACITY. NET MAY ALSO BE MOUNTED ON TWIN TOWERS ALLOWING IT TO FALL STRAIGHT DOWN. DESIGN CAPACITY=0.6 MILL.FT.-LBS. WITH STANDARD UNITS.

VB-5 NET BARRIER

VEHICLE BARRIERS

REFERENCE MATERIAL

U.S. ARMY CORPS OF ENGINEERS, SECURITY ENGINEERING MANUAL

U.S.NAVY, TERRORIST VEHICLE BOMB SURVIVABILITY MANUAL (VEHICLE BARRIERS)

ACTIVE VEHICLE BARRIERS

THE SECURITY ENGINEERING MANUAL HAS SET UP THREE RANGES OF SPEED FOR THREE DIFFERENTLY SIZED VEHICLES. THESE RANGES ARE:

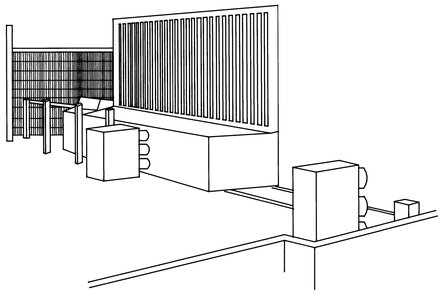
GROSS VEHICLE WT. (GVW)(LBS.)	IMPACT SPEED (MPH)	KINETIC ENERGY(1000 FT. LBS)
HIGH 12,000	20-55	160.5 TO 1,213
MEDIUM 5,000	20-55	66.8 TO 505
LOW 4,000	20-55	53.5 TO 404

CAUTION: THE FORCE OF IMPACT CONDITIONS BASED ON A RANGE OF ANY VEHICLE RAMMING THESE BARRIERS AT SPEEDS ABOVE 20 M.P.H. MAY BE LETHAL TO THE OCCUPANTS OF THAT VEHICLE. THEREFORE, EXTREME CAUTION MUST BE EXERCISED TO ENSURE THAT THEY ARE NOT ACTIVATED AT THE WRONG TIME. THE USE OF AUTOMATIC CONTROLS SHOULD BE AVOIDED SINCE A FALSE ALARM COULD HAVE DEADLY CONSEQUENCES.

FOR LEGEND OF MANUFACTURERS, DESIGN PARAMETERS, AND BARRIER SELECTION CRITERIA, SEE SHEET 11.

BARRIER COSTS

PRICES ARE BUDGET PRICES AS PER 415-7 USING 1988 PRICES AND LIST PRICE QUOTES FROM MANUFACTURERS. PRICES INCLUDE AN ALLOWANCE FOR FOUNDATIONS AND INSTALLATION. THEY DO NOT INCLUDE CONTROLS AND SITE UTILITIES. PRICES FOR BARRIERS ARE FOR WIDTHS STATED. THE COST OF SOME BARRIERS MAY BE REDUCED BY REDUCING THE WIDTH OF THE BARRIERS. HOWEVER, THE BARRIERS MUST NOT BE REDUCED IN WIDTH IF THE THREAT COULD THEN BYPASS THE NARROWER BARRIER.



TYPE: HIGH VEHICLE THREAT RANGE
OPERATION: MASSIVE BASE WITH HEAVY RAILING SECTION ROLLS HORIZONTALLY INTO PLACE TO BE RESTRAINED BY HEAVY STANDARDS.
MANUFACTURER: D
COST: $22,000/12 FT. BARRIER

VB-6 ANTI-CRASH GATE

Symbol	Description	Date	Approved
1	GENERAL REVISIONS - SHEET REDRAWN	27 FEB 89	AF

Revisions

U.S. ARMY ENGINEER DIVISION, HUNTSVILLE
CORPS OF ENGINEERS
HUNTSVILLE, ALABAMA

Site adapt A/E :

US Army Corps of Engineers

ENTRY POINTS FOR U.S. ARMY INSTALLATIONS

ACTIVE VEHICLE BARRIERS

Dwn. by : RDP
Ckd. by : AF
Reviewed by : Paul H. Williams
Approved by : Paul Fallord
Date : 27 FEB 89
Drawing code : DEF 872-50-01
Sheet reference number : 10
Design file no. :
Rev. 1
Sheet 10 of 14