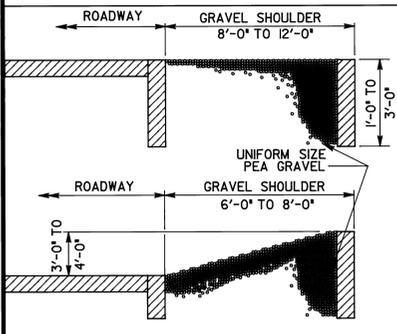


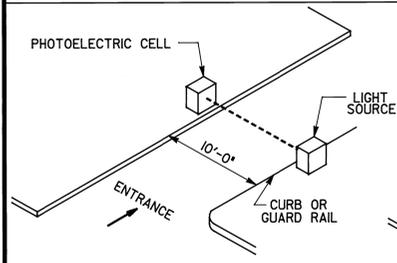
USE WARNING STRIPS TO WARN DRIVERS OF UPCOMING HAZARDS - CURVES, CHECKPOINT, OR BARRICADE.

TC-1 WARNING STRIPS
SCALE: 3/16"=1'-0"

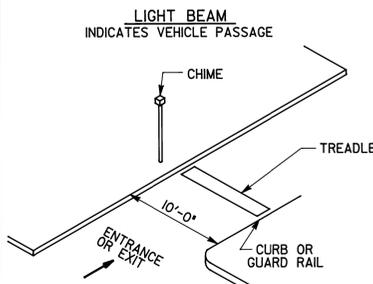


LOOSE UNIFORM SIZE PEA GRAVEL MAY BE USED TO BREAK THE FORWARD MOTION OF A VEHICLE. GRAVEL MUST REMAIN DRY AND UNCOMPACTED. GRAVEL SHOULDERS MAY BE USED TO KEEP VEHICLES ON THE ROAD.

TC-2 GRAVEL PITS
SCALE: NONE

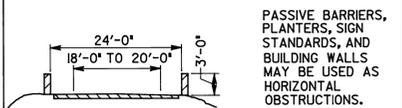
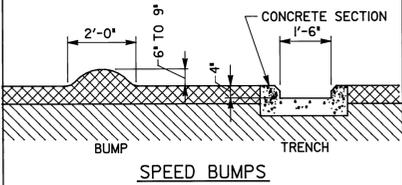
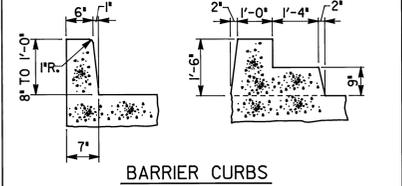


A BEAM OF LIGHT AND A PHOTO-ELECTRIC CELL MAY BE USED TO DETECT A PASSING VEHICLE. MULTIPLE LIGHT BEAMS MAY BE USED TO MEASURE VEHICLE SPEED AND INDICATE TRAVEL DIRECTION WHEN CONNECTED TO A TIMER.

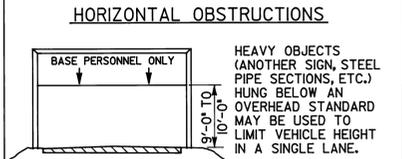


TREADLE MAY BE USED TO INDICATE WHEN A VEHICLE PASSES THROUGH A GATE. CHIME UNIT MAY BE MOUNTED IN AN ENTRY CONTROL POINT OR VISITOR CONTROL CENTER. MULTIPLE TREADLES WITH A TIMER MAY BE USED TO DETECT EXCESSIVE SPEED OR AVEHICLE TRAVELING IN THE WRONG DIRECTION.

TREADLE INDICATOR INDICATES VEHICLE PASSAGE

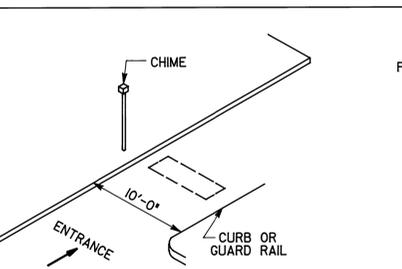


HORIZONTAL OBSTRUCTIONS REDUCE THE EFFECTIVE LANE WIDTHS MORE THAN BARRIER CURBS. OBSTRUCTIONS MAY BE CONTINUOUS (N.J. BARRIER) OR INTERMITTENT (BOLLARDS). USE SIGNS TO CAUTION MOTORISTS OF UPCOMING HORIZONTAL OBSTRUCTIONS.

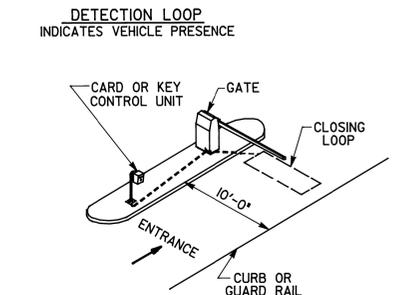


LOW VERTICAL CLEARANCES WILL CREATE TRAFFIC FRICTION AND LIMIT ACCESS BY TALL VEHICLES (TRUCKS). USE SIGNS TO CAUTION MOTORISTS OF UPCOMING LOW CLEARANCES AND TO STATE WHAT THE CLEARANCE IS.

TC-3 TRAFFIC FRICTION DEVICES
SCALE: NONE



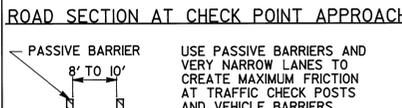
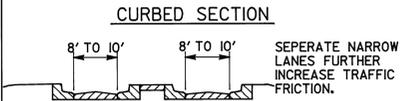
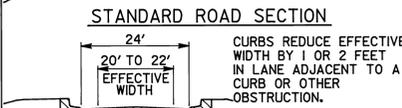
DETECTION LOOPS MAY BE USED TO INDICATE THE PRESENCE OF A VEHICLE AT A CHECKPOINT OR SALLY PORT. CHIME UNIT MAY BE MOUNTED IN AN ENTRY CONTROL POINT OR VISITOR CONTROL CENTER. INDUCTION LOOP DETECTS THE VEHICLE STANDING OR PASSING OVER IT.



VEHICLE STOPS AT CONTROL UNIT TO ALLOW INSERTION OF CARD, AND CAUSE GATE ARM TO RAISE. CLOSING LOOP DETECTOR SENSES CAR AND LOWERS GATE ARM AS CAR MOVES AWAY. CLOSING LOOP WILL ALSO DETECT A VEHICLE PASSING THROUGH THE GATE WITHOUT PROPER AUTHORIZATION AND ACTIVATE AN ALARM OR VEHICLE BARRIER.

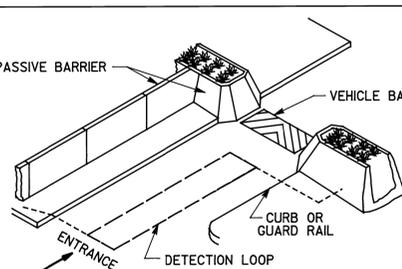
DETECTION LOOP CONTROLS ENTRY ONLY

GENERAL
WIDE LANES, SHOULDERS, MEDIAN STRIPS AMPLIFY LATERAL AND VERTICAL CLEARANCE. MULTIPLE LANES, MINIMUM GRADES, GOOD CURVE ALIGNMENTS, LONG SIGHT LINES, DRY PAVEMENT AND NO GRADE LEVEL INTERSECTIONS ALL CONTRIBUTE TO ROAD SAFETY AND HIGH ROADWAY CAPACITY. THE OPPOSITE CONDITION OF THE ABOVE MAY BE USED TO CREATE "FRICTION" ALONG A ROAD. THIS FRICTION MAY BE USED TO SLOW DOWN DRIVERS AS THEY APPROACH THE CHECK POINT AND VEHICLE BARRIERS. WHEN CREATING FRICTION ALONG A BASE ACCESS ROAD, THE REQUIREMENTS FOR HIGHWAY SAFETY AND BASE SECURITY MUST BE CAREFULLY BALANCED. APPROACHING DRIVERS MUST BE FORE-WARNED ABOUT THE USE OF ANY OF THESE FRICTION CAUSING DEVICES.

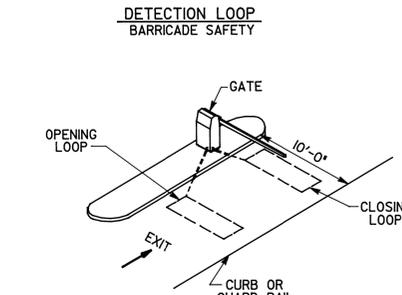


TC-6 TRAFFIC DETECTORS
SCALE: NONE

TC-1 WARNING STRIPS MAY BE USED AHEAD OF VEHICLE BARRIER TO SLOW AND WARN PASSENGERS.

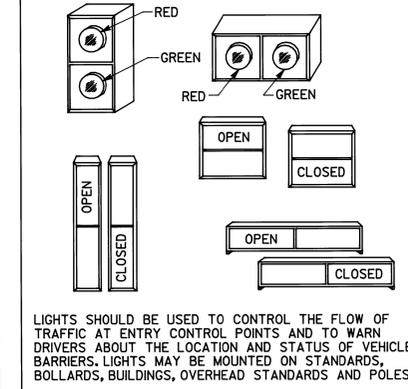


DETECTION LOOPS MAY BE USED TO AVOID VEHICLE COLLISIONS AND LIFTED VEHICLES WHEN THE BARRIER IS ACTIVATED BY ERROR. THE VEHICLE NEAR THE BARRIER IS SENSED BY THE LOOP WHICH PROHIBITS BARRIER ACTIVATION UNDER NON-EMERGENCY CONDITIONS.

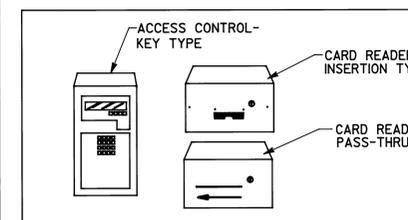


CONTROLLED DIRECTION LANE HAS CONTROL UNIT TO ALLOW CARD OR KEY TO RAISE GATE. CLOSING DETECTOR LOOP SENSES CAR AND LOWERS GATE ARM AS CAR LEAVES CLOSING LOOP. FREE DIRECTION INITIATED WHEN CAR ENTERS OPENING LOOP. GATE REMAINS UP UNTIL CAR LEAVES CLOSING LOOP. CLOSING LOOP WILL ALSO DETECT A VEHICLE PASSING THROUGH THE GATE WITHOUT PROPER AUTHORIZATION AND ACTIVATE AN ALARM OR VEHICLE BARRIER.

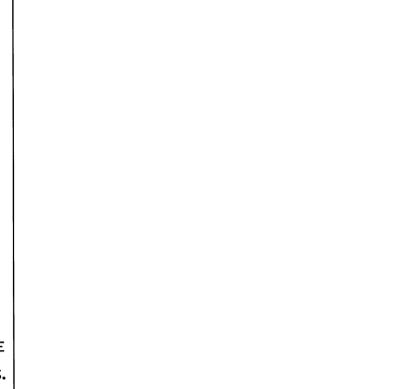
DETECTION LOOP CONTROLS EXIT ONLY



TC-4 TRAFFIC LIGHTS
SCALE: NONE



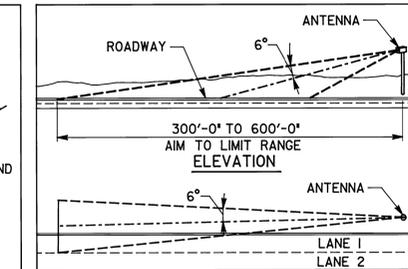
ACCESS CONTROL AND CARD READER UNITS MAY BE USED TO OPEN GATES FOR BOTH INCOMING AND OUTGOING VEHICLES. THEY MAY BE USED TO REDUCE THE REQUIRED NUMBER OF GUARD PERSONNEL FOR SOME LEVELS OF SECURITY. THEY MAY BE COMBINED WITH A COMPUTER FOR GREATER PROTECTION.



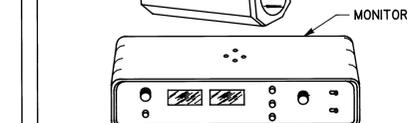
TC-5 ACCESS CONTROL DEVICES
SCALE: NONE

THE ACCESS CONTROL COMPUTER MAY PROVIDE THE FOLLOWING FEATURES WITH ACCESS UNITS:
ANTI-PASSBACK CONTROL
LOCK-OUT CONTROL
LIMIT ACCESS TIMES OF SOME CARD HOLDERS
IDENTIFY ALL PERSONNEL ON BASE AT ANY GIVEN TIME.
IDENTIFY UNAUTHORIZED ENTRY ATTEMPTS

TC-7 RADAR
SCALE: NONE



RADAR DETECTION EQUIPMENT MAY BE USED TO DETECT EXCESSIVE SPEED AND TO IDENTIFY A VEHICLE TRAVELING IN THE WRONG DIRECTION. THE DETECTION EQUIPMENT WILL SOUND AN ALARM OR ACTIVATE A BARRIER WHEN THE SPEED OF A VEHICLE EXCEEDS AN ADJUSTABLE SET POINT. WHILE ALL UNITS WILL DETECT SPEED, ONLY SOME MANUFACTURER'S MAKE UNITS THAT WILL IDENTIFY TRAVEL DIRECTION. THE UNIT WILL IDENTIFY TRAVEL DIRECTION. THE UNIT WILL HAVE TO BE AIMED AT THE DETECTION ZONE BY TRIAL AND ERROR. PLACING THE ANTENNA IN A DEEP ENCLOSURE WILL REDUCE THE 12" BEAM WIDTH. THE ANTENNA MAY BE MOUNTED ON A POLE, ROOF OF A BUILDING, OR OVERHEAD STANDARD.



RADAR EQUIPMENT

RADAR DETECTION EQUIPMENT MAY BE USED TO DETECT EXCESSIVE SPEED AND TO IDENTIFY A VEHICLE TRAVELING IN THE WRONG DIRECTION. THE DETECTION EQUIPMENT WILL SOUND AN ALARM OR ACTIVATE A BARRIER WHEN THE SPEED OF A VEHICLE EXCEEDS AN ADJUSTABLE SET POINT. WHILE ALL UNITS WILL DETECT SPEED, ONLY SOME MANUFACTURER'S MAKE UNITS THAT WILL IDENTIFY TRAVEL DIRECTION. THE UNIT WILL IDENTIFY TRAVEL DIRECTION. THE UNIT WILL HAVE TO BE AIMED AT THE DETECTION ZONE BY TRIAL AND ERROR. PLACING THE ANTENNA IN A DEEP ENCLOSURE WILL REDUCE THE 12" BEAM WIDTH. THE ANTENNA MAY BE MOUNTED ON A POLE, ROOF OF A BUILDING, OR OVERHEAD STANDARD.

DETECTION LOOP CONTROLS ENTRY/EXIT COMBINATION

TRAFFIC CONTROL DEVICES INCLUDE THE FOLLOWING:

1. WARNING DEVICES TO NOTIFY DRIVERS ABOUT THE TRAFFIC CHECKPOINT, VEHICLE BARRIERS, SPEED RESTRICTIONS, SHARP CURVES, AND OTHER ROAD HAZARDS.
2. TRAFFIC FRICTION DEVICES USED TO MAKE THE DRIVERS REDUCE THEIR SPEED.
3. SIGNS AND LIGHTS USED TO CONTROL THE FLOW OF TRAFFIC.
4. TOLL GATES USED TO CONTROL THE FLOW OF TRAFFIC, TO DETERMINE THE STOPPING POSITION OF VEHICLES, AND TO IDENTIFY VEHICLES VIOLATING THE ENTRY POINTS.
5. DEVICES USED TO INDICATE THE PRESENCE, DIRECTION, AND/OR SPEED OF A VEHICLE.
6. ACCESS CONTROL DEVICES USED TO CONTROL THE OPERATION OF TOLL GATES.
7. LIGHTING USED AT NIGHT TO ILLUMINATE THE CHECKPOINT AND PERSONS AND VEHICLES TRYING TO GAIN ACCESS AND TO BLIND UNAUTHORIZED PERSONS TRYING TO FORCE THEIR WAY THROUGH THE CHECKPOINT.
8. FLASHING LIGHTS, SIRENS, HORNS, AND GONGS USED TO IDENTIFY WHEN A VEHICLE VIOLATES THE APPROACH CONDITIONS.

ACCESS CONTROL COMPUTER

SMALL COMPUTERS USED TO CONTROL ACCESS TO PARKING LOTS ARE READILY AVAILABLE. KEYS, CARDS AND CYPHERS MAY BE ISSUED TO BASE PERSONNEL AND MAY BE USED TO GAIN ACCESS THROUGH AN AUTOMATIC GATE. WHEN CARDS ARE USED, THE SYSTEM CAN BE PROGRAMMED TO LIMIT THE DAYS AND/OR HOURS THAT THE CARD HOLDER MAY BE GRANTED ACCESS. THE SYSTEM CAN LIMIT THE NUMBER OF TIMES A CARD HOLDER MAY GAIN ACCESS. CARD READERS IN THE EXIT LANES, FINGERPRINT READERS, AND OTHER IDENTIFICATION DEVICES MAY BE USED TO INCREASE THE LEVEL OF SECURITY. A PRINTER MAY BE USED TO LIST THE NAMES OF PERSONS ENTERING THE BASE OR THE UNAUTHORIZED ATTEMPTS REFUSED BY THE SYSTEM.

BARRIER CONTROL

THE GUARDS AT THE CHECKPOINTS SHOULD ALWAYS HAVE MANUAL CONTROL OVER THE BARRIERS. THE CONCEPTS ALL SHOW MULTIPLE ENTRY CONTROL POINTS. EACH ENTRY CONTROL POINT SHOULD HAVE CONTROL OVER THE BARRIERS.

MOST OF THE BARRIERS MAY BE CONTROLLED BY AUTOMATIC MEANS SUCH AS DETECTION LOOPS AND RADAR. HOWEVER, AUTOMATIC CONTROLS SHOULD ONLY BE USED DURING HIGH SECURITY ALERT PERIODS DUE TO THE FREQUENCY OF FALSE ALARMS AND THE HAZARDS AND INCONVENIENCES ASSOCIATED WITH THE DEPLOYMENT OF THE BARRIERS.

FLASHING LIGHTS, SIRENS, HORNS, GONGS, ETC. MAY BE USED TO WARN GUARDS THAT A VEHICLE IS VIOLATING THE APPROACH CONDITIONS AND THAT THEY SHOULD DEPLOY THE BARRIERS. THESE SAME DEVICES WILL USUALLY CAUSE THE INADVERTENT VIOLATOR TO COME TO AN IMMEDIATE PAUSE.

Symbol	Description	Date	Approved
△	GENERAL REVISIONS. SHEET REDRAWN.	27 FEB 89	AF

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

ENTRY POINTS FOR U.S. ARMY INSTALLATIONS

TRAFFIC CONTROL DEVICES

Site adapt A/E :
Dwn. by : RDP
Ckd. by : AF
Reviewed by :
Date : 27 FEB 89
Approved by :
Drawing code : DEF 872-50-01
Sheet reference number : 7
Design file no. :
Rev. 1
Sheet 7 of 14