Technical Specifications of Crash-Rated Electro-Hydraulic Tyre Killer

1.0 SCOPE

This defines the specifications for Electro Hydraulic Tyre killer System, consisting of (one, two, three or four) Tyre killer operating (independently or in sets of two, three or four), a Hydraulic Power System, the Controls And Logic Circuits, and Related Features.

2.0 SYSTEM CONFIGURATION

2.1 Tyre killer (S)

2.1.1 Tyre killer Construction: Tyre killer shall be a below ground assembly containing a solid blocking spikes capable of being raised to an above ground guard position. In the lowered position the system is flushed with road surface. The guard position shall present a formidable obstacle to approaching vehicles. The blocking segment shall consist of spikes at an angle of 60° and shall be made up of tampered steel. The gap between the spikes measured from the centre of the spikes shall be between 100 mm and 200 mm.

2.1.2 Tyre killer height: Height of the spikes of the Tyre killer in guard position shall be 450 mm as measured from the top of the foundation frame to the top of the barrier inclusive of the top road plate. (The Tyre Killer spikes with height 300 mm to 475 mm are available)

2.1.3 Tyre killer width: Tyre killer width shall be _____. (Tyre killer width can be specified keeping in view the requirement and design of the site. The Tyre killers are available in width from 2.5 m to 6.00 m and can also be made available as per the customer’s requirement)

2.1.4 Normal Operation: Tyre killer shall provide excellent security and positive control of normal traffic in both directions by providing an almost insurmountable obstacle to vehicles. The Tyre killer system shall be designed to damage a vehicle by destroying tyres, axles and suspension of motor vehicles.

2.1.5 Operation time: Each Tyre killer (or set) shall be capable of being raised or lowered within 2 to 3 seconds.

2.1.6 Frequency of Operation: Bidder shall specify number full cycles per hour of Tyre killer operation. (It shall be around 200 cycles per hour or more depending on the requirement)

2.1.7 Power Off Operation. The accumulator shall be sized to allow minimum three full cycle operations of a single Tyre killer in the event of a power interruption.

2.1.8 Manual Operation. A hand pump shall be furnished to allow the Tyre killer to be raised manually in the event of a prolonged power interruption. (Bidder shall specify time taken and number of strokes to raise and lower the spikes)

2.1.9 Axle load bearing capability: The system shall be able to bear axle load of 20 tons of a moving vehicle.

2.1.10 Safety Interlock Detector: A Tyre killer vehicle detector safety loop (induction loop) shall be supplied to prevent the Tyre killer from being accidentally raised under an authorized vehicle. The detector shall utilize digital logic have fully automatic tuning for stable and accurate long-term reliability. The output of the detector shall delay any Tyre killer rise signal (except for emergency command) when a vehicle is over the loop.
2.1.11 Stop/Go Traffic Lights: Red/Green 20 cm. Traffic lights shall be supplied to alert vehicle
drivers of the Tyre Killer position. The green light shall indicate that the Tyre Killer is fully in
down. All other positions shall be indicated by red light.

2.1.12 Environmental Data (Please supply the following): Tyre killer shall operate satisfactorily
under the following environmental conditions:

(a) Tyre killer shall be operable in –20°C and +60°C. (customer to specify the extreme
temperatures at the location)

(b) Rainfall (customer to specify)
Yearly average _______ cms. Maximum expected hourly rate_____ cms./hour

(c) Snowfall (customer to specify)
Maximum expected hourly rate_______ cms./hour
Roadway will be (mechanically/manually/chemically) cleared ________.

2.1.13 Sump Pump: A self-priming sump pump shall be supplied to drain water collected in the
Tyre killer foundation. The pump shall have the capacity to remove ___ cms per minute of
rainfall at a distance of _____ feet to customer specified discharge drain. (to be specified by the
customer) Pump operating voltage shall be 230/1/50

2.1.14 Finish: The foundation and underside of the Tyre killer shall be asbestos free coated for
corrosion protection. The spikes shall have reflective red colour. The roadway plates shall have
special coating (anti-skid) to merge with road surface.

2.2 Hydraulic Power Unit (HPU)

2.2.1 Hydraulic Circuit Unit: The unit shall consist of an electrically driven hydraulic pump,
which shall pressurize a high-pressure manifold connected to a hydraulic accumulator.
Electrically actuated valves shall be installed on the manifold to allow oil to be driven to the up
and down side of a double acting hydraulic cylinder to raise and lower the Tyre killer. The
hydraulic circuit shall include all necessary control logic devices, interconnect lines and valves.

2.2.2 Main Power: The electric motor driving the hydraulic pump shall operate on power supply
440/3/50 (voltage, phase and frequency). Motor shall be sufficiently sized for continuous rating.

2.2.3 Weather Resistant HPU Enclosure: A lockable weather resistant enclosure shall be
provided for the HPU. The design shall provide for easy access to the HPU for maintenance and
emergency operation of the hydraulic system. Enclosure shall be provided with a corrosion
resistant coating.

2.3 Control And Logic Circuits

2.3.1 Control Circuit: A control circuit shall be provided to interface between all Tyre killer
control stations and hydraulic power unit. This circuit shall contain all relays, timers,
programmable logic controller and other devices necessary for the Tyre killer operation. The
control circuit shall operate from a supply 230 volt, 50 Hz or 24 VDC. An internally mounted
transformer shall reduce this to 24 VAC (24 VDC) for all external control stations.

2.3.2 Control Panel: A remote control panel shall be supplied to control the Road block
operation. This panel shall have a key lockable main switch with "main power on" and "panel
on" lights. Push buttons to ‘Up-Stop-Down’ with status lamps indicator for each Tyre killer (or
sets of Tyre killer) shall be provided. The remote control panel shall operate on 24 VAC
(optionally 24 VDC). (Select Central Control Panel 2.3.3 instead of 2.3.2 if Local Control Panel
2.3.4 is desired.)
2.3.3 Central Control Panel: A central control panel shall be supplied to control Tyre killer function. This panel shall have a key lockable main switch with "main power on" and "panel on" lights. Buttons to raise and lower each Tyre killer (or set) shall be provided. Tyre killer "up" and "down" indicator lights shall be included for each Tyre killer (or set). The central control panel shall operate on 24 VAC (optionally 24 VDC).

2.3.4 Local Control Panel: A local control panel shall also be supplied to control the Tyre killer operation. This panel shall have a "panel on" light that is lit when enabled by a switch on the remote control panel. Buttons to raise or lower each Tyre killer (or set) shall be provided. Tyre killer "up" and "down" indicator lights shall be included for each Tyre killer (or set). The local control panel shall operate on 24 VAC (optionally 24 VDC).

2.4 Integration with other systems: The system shall have the capability of integration with Access Control system, CCTV, loop detector, crash pad attached to boom-barrier and other crash-rated barriers such as Road blocker, Bollards, etc.

Shri. M. Malaviya, Addl. Commissioner of Security (Chairman)
Shri RS Sharma, Director, MHA (Member)

Shri Anil Kumar, Addl. DIG, CISF (Member)
Shri VK Malik, GM (Electronics), AAI (Member)

Shri RK Malhotra, Under Secy. Cab. Secretariat (Member)
Shri RE Shende, AGM Security, AI, Mumbai (Member)

Shri VS Baswani, OSD (Security), IB (Member)
Shri Ajay Luthra, AIG, SPG (Member)

Shri L. Ravi, Head Airport Systems, GHIAL (Member)
Lt. Col. RR Yadav, COE, BCAS, Delhi (Member)

Shri RD Gupta, Dy.Commissioner of Security, BCAS (Member)
Lt. Col. AK Sharma, Sqn. Cdr, WE, NSG (Member)

(Sh. R. Nair, Head Security, MIAL) (Member)