Procurement Specification for a High Security Automatic Bollard (HSAB)

SB970 CR Scimitar High Security Automatic Bollard

A. Requirement

This document is to be used to specify the physical and operational requirements of the SB970 CR Scimitar HSAB for use in high security environments. Each system will be comprised of a number of HSAB's with associated Hydraulic Power Units (HPU's), Control Systems and Access Control Equipment.

The SB970CR is a specialised blocking system for use in circumstances where a sympathetic aesthetic look is required while still affording high level protection from hostile vehicle attack.

B. Bollard Unit

B.1 Bollard Construction

The bollard shall be constructed of a minimum of 323.9mm (+/-1%) diameter high tensile steel section with mild steel top plate and cover. The road plate should be an anti-slip plate to withstand a calculated axle load of 30 tonnes. The bollard shall be secured into a sub-surface mounted stainless-steel shaft with Crossflon self lubricating bearings to allow free movement of the Bollard.

The mounting frame will be pre-re-enforced and concreted to minimise the risk of damage during transit and installation and this can be concreted into 1200mm x 1200mm x 2000mm re-enforced foundations.

On impact, the forces exerted on the bollard should be transmitted through the substantial tube and into the re-enforced foundations. The Bollard should be designed to absorb / withstand impacts from both US and European manufactured vehicles taking into account the varying weight distribution of both styles.

B.2 Bollard Height

The height of the segment when in the closed (raised) position, as measured from the top of the mounting frame, will be a minimum of 1000mm to minimise the possibility of site penetration and to ensure that higher chassis vehicles are restrained

B.3 Bollard Width

The diameter of each Bollard is 323.9mm (+/-1%) and arrays of Bollards must be set a maximum of 1500mm centres to ensure that gaps are limited to a maximum of 1200mm.

B.4 Finish

The Bollard and top plates are to be finished with an anti-corrosion paint in black with a single reflective yellow band around the Bollard.

An anti-debris protective brush must be fitted around the top of the Bollard shaft

C. Hydraulic System (HPU)

C.1 Operation

The HPU will consist of a heavy duty motor driving a hydraulic pump which will actuate, via a manifold and set of electrically operated valves, an hydraulic ram.

The Bollard will be driven both up and down by the double acting hydraulic ram to ensure positive action at all times without reliance on gravity for operation.

The HPU will have the facility for a hydraulic accumulator to be added to the system to allow a significantly increased raise speed in case of emergency.

C.2 Hydraulic ram

The double acting hydraulic ram fitted to the Bollard can be fitted with anti-burst valves as to maintain security if damage is sustained to the hydraulic hoses.

For safe maintenance, the hydraulic ram must be accessible from the road surface when the Bollard is in the fully lowered position.

If the system is to be used in extremely low temperatures then heater pads can be fitted to the ram to maintain the minimum oil temperature for operation.

C.3 Limit Switches

Proximity limit switches will be fitted to provide raised and lowered signalling to the control system. The switches will be M18 sized inductive type with no moving parts and have a minimum IP rating of IP68.

C.4 Motor

The heavy duty motor used in the HPU will be a 3ph, 380-415v unit with a power rating sufficiently sized to allow for continuous operation (100% duty cycling).

The motor should be protected by a thermal / magnetic trip device mounted in the electrical control panel.

C.5 Hydraulic Reservoir

The hydraulic oil will be contained in a steel reservoir which is to be sized to allow sufficient oil cooling necessary for 100% duty cycling of the blocker.

If the system is to be used in extremely low temperatures then an immersion tank heater can be added to maintain the minimum oil temperature for operation.

C.6 Power fail conditions

A hand pump / release will be provided to enable the manual raising and lowering of the blocking segment in the event of electrical power failure.

C.7 Casing

The HPU is to be fitted into a steel cradle which will have lifting and bolt down points, the cradle will come complete with an outer cabinet to give protection against the elements.

The cabinet will have fully lockable and removable full length doors to both the front and rear of the cabinet for ease of access. Vents will be fitted into the cabinet to allow good air circulation maintaining the ambient temperature.

D. Control System

D.1 Main Processor

The HPU will be controlled by a central programmable logic controller (PLC) which will accept inputs from the access control system, blocker monitoring equipment and hydraulic pack and output signals to the HPU control valves, back indication system and external signalling. The PLC controller shall be sized to suit site requirements but should have 16 inputs and 14 outputs as a minimum. The initial PLC programming shall be to suit specific client and site requirements however reprogramming of the system must be easily undertaken and password protected access to the program must be provided to the client with the relevant program ladder diagram.

All relays will be properly mounted and all interconnecting cabling must be in suitable containment running to terminal strips.

D.2 Voltage

The main system input voltage is to be 380v-415v 3phase 50-60Hz supply with the control system operating at 24V SELV provided from an internally mounted power supply.

D.3 Casing

The control system will be housed in a general purpose IP65 rated housing with a power isolation switch mounted externally for safety. The housing will be located inside the main HPU cabinet and should give easy access to all electrical components for connection, maintenance and programming.

E. Access Control

E.1 Remote Control Panel

Each HSAB will come with its own remote control panel which will be comprised of push buttons to raise, lower and emergency stop the equipment The blocking segment must be able to instantly reverse on command.

E.2 Emergency fast raise

If the system is fitted with an emergency fast raise circuit, then the control panel will include a panic button which will be larger then the normal controls and will self lock on activation (key reset required), the circuit will by-pass all safety systems and raise the Bollard within 1-2 second.

E.3 System Interfacing

The control system will be capable of accepting inputs from every major type of access control including but not limited to – Swipe card readers, proximity card readers, inductive loop systems, RF transmitter equipment and biometric readers.

The system must be able to interface with other equipment (by other manufacturers) to create an interlock.

F. Performance

F.1 Manufacturers Experience

The manufacturer of the HSAB will have a minimum of 15 years experience in the manufacture, installation and maintenance of this type of equipment and must be a member of a recognised Professional Trade Association.

F.2 Testing

The HSAB design must fully comply with CE regulations and an actual full scale crash test must have been carried out by a qualified independent testing agency with the HSAB remaining fully operational after the impact. The test will have consisted of the impact of a roadworthy and fully laden vehicle weighing 7,500Kg (16,500 pounds) travelling at 80 Kph (50 mph) into a single HSAB. A subsequent test to the same criteria should have been carried out using a pair of HSAB's with the same results.

The impact testing must have been carried out in accordance with PAS 68 and exceed the DoS test standard SD-STD-2.01 Rev A class K12/L3.

In addition, the HSAB will be able to cause sufficient damage to a 7500 kg vehicle travelling at 80kph to destroy the front suspension and main drive train of the vehicle rendering it inoperative.

F.3 Speed of operation

Standard operation speed will be between 4 and 8 seconds for either raising or lowering, with the raise time being reduced to 1-2 seconds when the emergency fast raise system is activated.

In normal operation the HSAB shall be capable of operating at 225 cycles per hour (100% duty cycling at 8 second settings) and must have been satisfactorily factory tested in a continuous run of 1,800 cycles.

G. QA

G.1 Equipment Testing

The manufacturer will have fully tested the HSAB, HPU, Control System and Access Control equipment prior to despatch. These tests will be fully traceable to each unit despatched and must be transparent.

The QA testing will include dimensional checks, workmanship quality and finish as well as full operational testing. Once fully tested, the HSAB will be fitted with a nameplate bearing the manufacturers details, serial number and test date.

The manufacturers quality system must be certified to ISO 9001.

G.2 Dispatch

The HSAB will be packed ready for dispatch with wooden sheeting strapped to the outer casing for protection and lifting eye bolts sockets provided at the relevant lifting points. The structure will be substantial enough to enable lifting from either below or above without incurring damage or warping.

Two full sets of operation and maintenance manuals will be provided with the equipment to include site specific program, wiring and installation drawings (additional manuals should be available at a nominal cost).

H. Disclaimer

This type of equipment is designed for high security use and while it is possible to integrate a number of safety features into the system design, it is generally better to provide adequate traffic calming measures, signage, area illumination and traffic lights to warn users of the potential hazard.

Avon Barrier Corporation Ltd can provide information on safety systems to suit most sites / applications on request.

It is strongly recommended that advice is taken from relevant security or safety engineers with regards to the system design, alternatively Avon Barrier Corporation would be pleased to provide such information – contact our Security Department at our UK offices.

I. Procurement Source

The SB970 CR Scimitar High Security Automatic Bollard can be purchased from the following sources:

Avon Barrier Corporation Ltd
Unit A, Blackfriars Road,
Nailsea, Bristol.
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UK
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