Procurement Specification for a High Security Lift Arm Barrier (HSLAB)

EB950 CR Armstrong High Security Lift Arm Barrier

A. Requirement

This document is to be used to specify the physical and operational requirements of the EB950 CR Armstrong HSLAB for use in high security environments. Each system will be comprised of a number of HSLAB's with associated Control Systems and Access Control Equipment.

The EB950CR is a specialised blocking system for use in circumstances where foundations cannot be provided in the roadway.

B. Barrier Unit

B.1 Barrier Construction

The Barrier is to be constructed using a heavy steel plate cabinet housing the hydraulic power unit and ram. This power unit will raise and lower a steel arm constructed of a substantial steel section with stiffener plates fully welded to the top and bottom of the arm. The rotation will be facilitated by a heavy steel cross- with the rotation shaft secured through Nylocross self lubricating bearings, shaft secured through Nylocross self lubricating bearings.

The Barrier is to be mounted on a support plate which is attached to one of a pair of barrier arm support posts (one on both sides of the roadway).

The arm is to be fitted to a moveable joint which will slide, under impact, into hooks on the barrier arm support posts thereby locking the arm in position. In addition to this, the sliding joint will remove the impact forces from the barrier cabinet and drive unit ensuring that when the sliding joint is reset, the system will remain operational.

On impact, the forces exerted on the Barrier arm should be transmitted through the substantial support posts and into the re-enforced foundations. The Barrier 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 Barrier Height

The height of the segment when in the closed (lowered) position, as measured from the top of the arm frame, will be a minimum of 900mm in accordance with BS6571 part 4 to minimise the possibility of site penetration and to ensure that higher chassis vehicles are restrained.

B.3 Barrier Width

The width of the barrier arm will be between 3,000mm and 5,000mm to suit site conditions.

B.4 Finish

The Barrier cabinet and arm are to be finished with an anti-corrosion paint.

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 Barrier arm 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.

C.2 Hydraulic ram

The double acting hydraulic ram fitted to the Barrier incorporates with an over centre valve which will stop the arm from lowering if damage is sustained to the hydraulic hoses.

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

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, 230v unit with a power rating sufficiently sized to allow for continuous operation (100% duty cycling).

An inverter system is to be provided to enable a graduated acceleration and deceleration at the Barriers raised and lowered limits.

The motor should be protected by a thermal / magnetic trip device mounted in the inverter system.

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 Barrier cabinet will have fully lockable doors to the front of the cabinet for ease of access. Vents can be fitted into the cabinet if required 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, barrier 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 8 inputs and 6 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 230v 1phase 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 Barrier cabinet and should give easy access to all electrical components for connection, maintenance and programming.

E. Access Control

E.1 Remote Control Panel

Each HSLAB will come with its own remote control panel which will be comprised of push buttons to raise, lower and emergency stop the equipment.

E.2 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 HSLAB 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 HSLAB 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 HSLAB 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 50 Kph (30 mph) into a single HSLAB.

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 HSLAB will be able to cause sufficient damage to a 7500 kg vehicle travelling at 50kph so as 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 8 and 12 seconds for either raising or lowering.

In normal operation the HSLAB shall be capable of operating at 150 cycles per hour (100% duty cycling at 12 second settings) and must have been satisfactorily factory tested in a continuous run of 1,200 cycles.

G. QA

G.1 Equipment Testing

The manufacturer will have fully tested the HSLAB, 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 HSLAB will be fitted with a nameplate bearing the manufacturers details, serial number and test date.

The manufacturer's quality system must be certified to ISO 9001.

G.2 Despatch

The HSLAB will be packed ready for despatch with cardboard sheeting strapped to the outer casing for protection. 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 recommend that advice is taken from relevant security or safety engineers with regard 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 EB950CR Armstrong High Security Lift Arm Barrier can be purchased from the following sources:

Avon Barrier Corporation Ltd
149 South Liberty Lane
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Tel +44 117 9535252
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