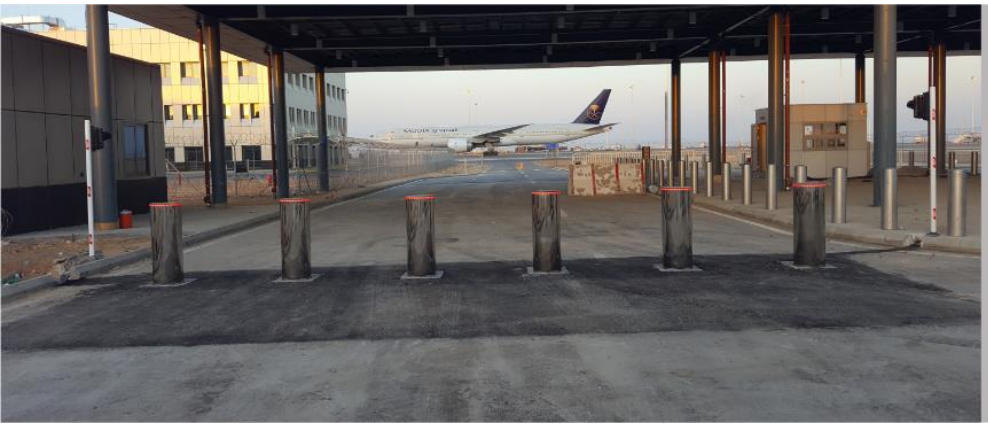

1. GENERAL DESCRIPTION

This specification defines supply of rising bollard, hydraulic power unit, control circuit, features and options designed for high-security access points in groups of 1, 2, 3, 4, 5, and 6.

2. SYSTEM CONFIGURATION

2.1 Rising Bollard

2.1.1. Rising bollard is composed of a fixed and upper moving body that are made of steel and in contact with the ground. Unauthorised access is denied to approaching vehicles when the road is closed. Rising bollard should be capable of standing to the initial energy in case of an impact, and subsequently transmitting it to the units.

2.1.2. Moving body of the rising bollard is S275Jr or S355Jr quality steel seamless tube; wall thickness should minimum 35mm (+-1mm).

2.1.3. Rising bollard height from its upper point of mobile body to the road surface should be minimum 900mm (+-2mm) selectable depending on the safety level.

2.1.4. Rising part of the rising bollard should be in a form of a cylinder with 356mm (+/-1mm) diameter.

2.1.5. Moving part of the rising bollard that will be thrusted into the ground should be in a form of square and made of S355JR quality sheet of minimum 6 mm wall thickness.

2.1.6. Optionally, all metal surfaces of the rising bollard should be coated with hot dip galvanize -in order to protect it from corrosion. The exposed part of the moving body should be cladded with 316 quality stainless steel. This particular feature should be specified in advance.

2.1.7. Upper lids of the rising bollard and rectangular casing should be made of metal sheet, not of cast material so that it does not break at the time of impact. The exposed parts of the rising bollard that contact the vehicle tyre(s) should be coated with cataphoresis.

2.1.8. The rectangular casing should not contact the concrete. It should resist the impact, remain in the concrete, and made of S235JR quality metal sheet that prevents contact of the rectangular bed and concrete.

2.1.9. Part of the rising bollard that faces the road should be rectangular so that it appeals to the eye when the road is pitched. Round or other geometrical shapes are not to be preferred.

2.1.10. On and off speed of the product is between 4 and 8 seconds.

2.1.11. It should enable passage of 15-ton vehicles per axis that are compatible with technical parameters.

2.1.12. Rising bollards in combination should be capable of operation as a whole synchronously.

2.1.13. Delay difference of 900 mm-stroke rising bollards should not exceed +/- 4 cm.

2.1.14. The rising bollard should be equipped with solar-powered LED warning lights mounted under the top of the moving part. These LED lights should be embedded under the top of the rising bollard, and designed to make sure that they are never tripped off to vehicle tyre(s).

2.1.15. Rising bollard should be equipped with magnetic switch in IP69 standards. The system should cease as the product is rising up. Likewise, the switch should function when the product is lowering.

2.2 HYDRAULIC POWER UNIT (HPU)

2.2.1. Hydraulic unit is composed of a high-pressure pump driven by an electric engine that triggers pistons. There should be an electrical guiding valve that moves the product upwards or downwards. Hydraulic system should be optionally equipped with all parts necessary for emergency motion.

2.2.2. Electric engine that connects to high pressure pump should be fed by 230/3/50-60Hz or 380V/3/50-60Hz in compliance with the mains where it will be assembled.

2.2.3. When electricity to hydraulic power unit is optionally disconnected, it should connect to DC engine and accumulator system so that the system continues to function. This particular feature should be specified in advance.

2.2.4. In case of prolonged power cuts, there should be a manual hand-held pump and valve to move the product upwards and downwards. (Optional)

2.2.5. Hydraulic power unit cabin should be made of galvanised sheet in order to protect hydraulic power against corrosion.

2.2.6. Cabin should be made of galvanised sheet in order to protect hydraulic power unit and components against external factors. Two facades of the cabin should be equipped with a service hatch with a locker. The cabin should be dyed with RAL7047 paint.

2.2.7. Hydraulic cabin should be equipped with at least 1 thermostatic ventilation system.

2.2.8. Rising bollard system should enable stable operation from -20 to +70 degrees.

2.3 CONTROL AND LOGIC CIRCUIT

2.3.1. Control circuit should be equipped with a structure together with any other necessary equipment needed for controlling hydraulic power unit and all necessary accessories; and it should ensure smooth operation of the system.

2.3.2. Control card should be equipped with a high performing RISC processor, which should be supported by NanoWatt XLP, capable of extremely low power management.

2.3.3. Control circuit should operate at 220V 50-60Hz (optionally at 110V 50-60Hz). There should be an internal supply outlet of 12-24V Dc for accessories and equipment.

2.3.4. Control circuit should not exceed 100W power consumption under normal operating conditions.

2.3.5. Control circuit should be in an individual panel inside the hydraulic unit cabin where all connections and settings are enabled.

2.3.6. Control circuit should be in an individual panel inside the hydraulic unit cabin where all connections and settings are enabled.

2.3.7. Voltage inlet clamp of the control board will be a PCB with rocker switches, and supported with CAGE CLAMP connection technology. The clamp should have CCA EN 60947-7-4 and ENEC 15 EN 60998 certificates for electrical safety.

2.3.8. Control should enable connection to the panel with an insert socket.

2.3.9. Control card will be a PCB print. The card should have an optional 24VDC or 220VAC outlet to guide the valves in addition to a mini contactor to drive the engine, and adjustable current protection circuit, phase protection circuit, inverter control outlet, buzzer outlet, flasher outlet, optional 24VDC or 220VAC outlet for traffic signalisation light, external contactor outlet. Optionally, an LCD display should be connectable to the card. The card should enable setting the turning on and off time, automatic closing time, and synchronised operation time. The card should have deep switches to select different operation modes. Deep switch modes should have automatic turn off on and off enabled/disabled mode, valve deflexion, open-stop-close/ open-close-control modes, and a traffic signalisation mode.

2.4 ACCESSORY EQUIPMENT (One or all selectable)

2.4.1. Rising bollard should be equipped with an optimal-size armed barrier system to enhance visibility. Armed barrier system should operate in synchronisation with the product. (Optional)

2.4.2. System should be PLC circuit controllable. It should be equipped with whatever is necessary for PLC unit system operation. (Optional)

2.4.3. PLC circuit systems should be equipped with a Colour Touch Panel to allow setting and display all related product data. Position of the product should be displayed in a visual mode of operation. It should enable that all past operation data are recorded and monitored. (Optional)

2.4.4. In case of short-time power cut, there should be a 24V DC engine and accumulator system so that the system is capable of turning on and off. An automated charging unit will be needed for the accumulators. (Optional)

2.4.5. In case of a threat when the road is open or is opening, once pressing the EFO (Emergency Fast Operation) button, all safety equipment such as safety photocell or loop detector are deactivated and the rising bollard blocks the road swiftly in 1,5 to 2 seconds. System should not operate under any circumstance after pressing the EFO button. There should be a reset button to resume normal operation of the system. (Optional)

2.4.6. The system should be equipped with a uniform traffic signalisation light of 200V to warn vehicles and regulate vehicle traffic. High quality LEDs should be used for the traffic lights. Traffic light will be red when the road is blocked, otherwise it will be green when the road is clear. (Optional)

2.4.7. Rising bollard should be equipped with a pump system for draining water accumulation. (Optional)

2.4.8. A LOOP detector system should be available for safe operation of the system. Loop detectors should be placed in front of and behind the product. Loop detectors should be activated under normal operation condition, but they should be deactivated when pressing EFO.

2.4.9. Remote control button panel should control the rising bollard system. Panel should have keys to activate and deactivate control buttons. It should also have buttons to turn on and off the product. In case of systems equipped with an EFO mechanism, there should be EFO and reset buttons. Buttons should operate at 24VDC voltage level. Button panel should be a desktop model in 215x230x95mm size. (Optional)

2.4.10. There should be a buzzer system to warn the user when turning on and off the product. (Optional)

2.4.11. Hydraulic power unit should be equipped with an oil heater system designed for extremely cold ambient (Optional)

2.4.12. Hydraulic power unit should be equipped with an oil cooling system designed for extremely hot ambient. (Optional)

2.4.13. Rising bollard system should have a Windows-based software pack to check with the on-off, location info, operating efficiency, maintenance schedule etc. in a computerized medium. (Optional)

3. PERFORMANCE

3.1. Collision Details

3.1.1. Rising bollard should pose a nearly impassable obstacle against soft-skinned and pallet-free vehicles for safety and control of regular traffic. Rising bollard's design should be capable of stopping vehicles of speed and weight as given below in accordance with the internationally accepted standards. Rising bollard should be capable of operating efficiently after it stops a vehicle.

3.1.2. Rising bollard system should have at least two test certificates internationally recognised and is compatible with 7200 kg - 80 Kmph (15870 Pound at 50Mph) IWA 14 standards, and 6800 kg - 80Kmph (15000 pound at 50Mph) ASTM F2656 M50 - K12 standard.

3.1.3. The test center where crash test is performed should have a UKAS accreditation certificate.

3.1.4. The company should present a video in addition to necessary visuals for the crash test.

3.1.5. 10 finite element analysis test reports and videos produced on different dates and specifications will be provided for the rising bollard system.

3.1.6. The product should be ready and on alert against a second possible crash after the first crash.

3.2 Opening Speed

3.2.1. Under normal operating conditions, the product should turn on and off in 4 to 8 seconds. System should be stoppable at the time of operation and operation direction should be reversible when desired.

3.2.2. Unless a prolonged power cut and manual operation is applicable at EFO system, which will be optional, it will take 1,5 to 2 seconds for the product to switch from emergency fast operation when the product is totally retracted. The road should be in blocked position and on and off function should be deactivated until the EFO system is reset.

3.3 Operation Sustainability and Life

3.3.1. The product should be capable of moving fully upwards and downward 300 times an hour.

3.3.2. MTTF value of hydraulic power unit valves should be 150 years according to EN ISO 13849 standards. Manufacturer should prove this on a documentary basis.

3.3.3. Rising bollard should be guaranteed for 2 (two) years by the manufacturer.

4. MANUFACTURER EXPERIENCE

4.1.1. Rising bollard manufacturer should have minimum 14 years of experience. Experience in manufacturing should be proven with official registration documents of the company.

4.1.2. Reference list of the manufacturer should include at least 80 pcs of hydraulic rising bollard and 1268 stationery bollard projects at least at once. Project documents approved by the related ministry and authorised consultant should be presented.

4.1.3. Rising bollard product should have a CE, 3rd Party Test Report, IWA 14 N3A and ASTM 2656 M50 P1 - K12 Crash Test Report.

4.1.4. Manufacturer should have TUV CERT ISO 9001-2015, ISO 14001, OHSAS 18001 quality management certificates and Service Area Compliance Certificate.

4.1.5. Manufacturer should have TS 21 HYB, TS 12540 HYB, TS 12870 HYB and TS 13406 HYB certificates so as to be eligible for providing service to safety products.

4.1.6. Manufacturer should be employing at least 1 mechanical engineer, 1 electronic engineer, 1 mechatronics engineer. Manufacturer should prove this on a documentary basis.

4.1.7. Manufacturer should use robot welding.

5. QUALITY CONTROL TERM

5.1.1. Once the rising bollard system is complete, it will be fully tested before installing. In addition to all tests, the following checks will also be performed in order to verify function and processing speed.

5.1.2. FA tests will be performed after rising bollard is manufactured and before it is dispatched to the site; a certified FAT certificate will be delivered upon delivery of the product.

5.1.3. Assembling manual of the product, user manual, maintenance manual and crash test certificate will be delivered along with the products at the time of final control.

5.1.4. The rising bollard will have a tag that contains the manufacturer name, product model, serial number and manufacture date.

5.1.5. Rising bollard and its sub systems should be masterfully and carefully made.

5.1.6. Master dimensions should be compared with drawings and order dimensions.