



public works

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Department:  
Public Works  
**REPUBLIC OF SOUTH AFRICA**

## **DEPARTMENT OF PUBLIC WORKS**

### **SECURITY**

### **STANDARD TECHNICAL SPECIFICATION FOR AN**

### **OUTER PERIMETER FENCE FOR PRISONS**

MAY 2005 Rev1

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# 1 SPECIFICATION FOR A SECURITY OUTER PERIMETER FENCE

## 1.1. SCOPE

1.1.1 The contractor shall furnish labour, equipment, and materials for the following systems in this Section of the specification:

- a. 4.5m Bowed welded mesh security outer fence.
- b. Preparation of strip where fence will be installed
- c. 4.5m bowed fence detection system.
- d. Detection system controller.
- e. Gate detection system.
- f. Surge protection.
- g. Power supplies.
- h. Training.
- i. Spare Parts.

## 1.2 GENERAL

1.2.1 The Perimeter Security Fence shall be based on the following systems:

- a. 4.5m Bowed outer security fence
- b. Delay fence integrity detection
- c. Gate area detection solution

1.2.2 The Delay fence disturbance detection system shall be based on kinematics principles detecting any cut or removal of components of the delay fence as is detailed hereunder in this specification. This detection system shall be installed on the outer perimeter fence as indicated in the fence layout drawing.

1.2.3 The physical perimeter shall consist of an inner fence and an outer fence of 4.5m in height.

1.2.4 Furthermore the outer fence detection system shall be installed on the outer perimeter fence attached to the outer fence structure as per the specifications of the technology manufacturer.

1.2.5 Due to the various gate area designs found on various facilities a gate area security and detection solution has to be designed on an application to application basis and has to be approved by the appointed representative from the head office of the end-user. The representative shall be identified by the Department of Public works on a project to project basis.

1.2.6 It is a requirement that all sub-systems must be integrated with the security management system on a site. Contractors shall ensure that the control system offered comply with this requirement.

## 2. 4.5m PERIMETER SECURITY FENCE

The Perimeter Security Fence must not be closer than 20m from the buildings except in cases where the site is an existing site and site limitations are experienced. The perimeter fence shall enclose all the holding units and all the support buildings accessible to prisoners or supporting inmate activities.

### 2.1 Standard Fencing Specifications

#### 2.1.1 Posts

Curved 101.6mm x 4.5mm Grade W 300 Hot dipped galvanised tubular posts to radius specified with 3mm capping plate. Posts have predrilled 11mm diameter holes for M8 bolts to fix cover plate to posts. Refer to details for top rail fixing plate. Posts to be positioned in Class 6, 103mm ID P.V.C x 2.58mm wall thickness x 1500mm long sleeves set in 500mm x 500mm x 1500mm 15MPA concrete foundation. Ground conditions may require additional concrete.

#### 2.1.2 Covering plate

Covering plates required on all curved posts from ground to top of post 50mm x 5mm flat steel required, predrilled with 11mm diameter holes for fixing mesh to post.

#### 2.1.3 Fixing Accessories

Cover plates to posts: M8 x 150mm galvanised cup-square bolts with galvanised washers and shear off nuts.  
Top rail to post & post at corners: M10 x 40mm galvanised cup-square bolts with galvanised washers and shear off nuts.  
Corner post bracket: M12 U-bolt galvanised with galvanised washers and shear off nuts.

#### 2.1.4 Welded wire mesh panels

The mesh panels shall be manufactured from high tensile Galfan Class A coated wire in accordance with SANS 10244-2:2003 specification.

Vertical wires shall be welded on either side of the horizontal wires. The vertical wires on the inside (prison side) shall be to a height of 3000mm. The vertical wires on the outside shall be for the total length (6000mm) of the welded mesh panel. All vertical wires shall be spaced at 76.2mm and all horizontal wires spaced at 12.7mm centre to centre.

Inside apertures	: 72.2mm x 8.7mm
Centre to centre	: 76.2mm x 12.7mm
Wire diameter	: 4mm
Width of panel	: 3050mm

Height of panel	: 6000mm
Tensile Strength of wire	: 600 – 900 N/mm <sup>2</sup>
Weld strength	: 60 – 80%

### 2.1.5 **Top rail**

50mm x 50mm x 5mm Angle Iron top rail. Pre-drilled holes according to detail drawings including 50mm x 5mm covering plate to fix Razor Wire coil to angle iron top rail.

### 2.1.6 **Galvanising**

All posts, rails and cover plates to be Hot dipped galvanised in accordance with ISO 1461 (Min.70 microns)

## 2.2 **Additional**

### **Razor Wire Coil (1)**

Barbed Tape Concertina 730mm dia. Medium barb - Barbed Tape Concertina Coil. Galfan Class A coated to SANS 10244-2:2003 (Maximum stretch – 10000mm)

### **Razor Wire Coil (2)**

Barbed Tape Concertina 610mm dia. long barb - Barbed Tape Concertina Coil. Galvanised (Maximum stretch 10000mm)

## 2.3 **Gates**

Swing or sliding gates shall be allowed depending on site conditions and management of access control. Ensure that this option is cleared with the client before tenders are invited.

Sliding gates shall be controlled manually or by means of an electrically controlled industrial type gate motor. Beams shall be provided to prevent closing of the gate while a vehicle is driving through.

Refer to detail drawings.

The frame to be constructed of 60 x 40 x 2mm rectangular steel tubing and Hot dipped galvanised to ISO 1461 (Min thickness 45 micron). Each gate must consist of two leaves of same size.

Locking devices shall be to client's specification and acceptance.

Each section of the gate must be secured to the gate post by means of 3 approved hinges. Proposed hinges shall be submitted for approval before fitting.

The gate must be installed in such a way that the leaves can open in both directions.

Each gate must be clad with the same mesh as that of the fence using similar cover plate & bolting system.

The gap between the bottom of the gate and the road surface shall not exceed 50mm

For detail of the construction of the gate area closing frame and side panels refer to the detail drawings.

## **2.4 Erection of the fencing posts**

After excavation of the fencing post holes, 1300mm of the 103mm ID P.V.C sleeve with positioning bolt to be set vertically in concrete foundation. Slide post into sleeve. Minimum 5 days setting time to be allowed before positioning posts. After setting of concrete the top 200mm PVC sleeve to be cut off before erection of posts. The PVC sleeves shall protrude through the 100mm concrete strip. Care must be taken to ensure all posts are aligned (vertically and at tops), plump, perpendicular and in the correct position on the route of the fencing. All sleeves must be encased in a 25/19 concrete footing of adequate size. The contractor shall note that all galvanising shall be done after manufacturing of the posts.

Prior to erection of the fence poles permission shall be obtained from both the Clients representative as well as Civil consultant of the Department to ensure that all conditions have been met.

## **2.5 Concrete slab for outer security fence**

A 25/19mm concrete slab must be cast in situ along the inside of the external fence. The dimensions of the slab shall be as follows: 1000 x 100mm or other as specified on top of prepared ground level. The wire mesh panels of the fence shall be cast into the concrete slab. An expansion gap of 50mm wide must be provided at 3000mm intervals, to provide drainage and movement.

The wire mesh panels of the fence shall be cast into the concrete slab. The Section of mesh into concrete beam and in ground shall be bitumen dipped / covered up to 100mm above ground level

Civil construction will include route preparations, and casting of the 1000mm wide concrete slab with welded mesh steel reinforcing to a nominal thickness of 100mm and a minimum compressive strength of 20Mpa.

All existing electrical services as well as the cables required for this installation shall be installed in 50mm PVC sleeves in the concrete slab to ensure that these services can be maintained after completion of the contract.

The area underneath the concrete plinth shall be cleared of all vegetation prior to casting and treated with a suitable sterilization herbicide to prevent any vegetation growth.

The contractor shall allow and install a 250 micron PVC sheet underneath the concrete slab, to prevent any vegetation growth.

## **2.6 Preparation of the fence lines**

The fence lines and the eight metre strip between the inner (when required by DCS, this must be cleared before the contract starts) and the outer fence shall be prepared in such a way that each zone length runs as close as possible to the same gradient. Marginal gradient changes will only be allowed on zone ends. Approval for gradient changes in soil preparation shall only be done once written approval from the Engineer has been obtained.

## **2.7 Preparation of the strip between the outer and the inner fences**

The eight metre strip between the inner and the outer fence shall be cleared of all vegetation, treated with a suitable sterilization herbicide, preventing any vegetation growth and the area shall be covered by a layer of 19 mm single sized stone on a geo-textile similar to Bidum U34 as part of this contract.

The contractor shall include in his offer the cost to maintain this area for the full duration of the contract and shall include as part of his offer a suitable sterilization herbicide treatment once every six months for the full duration of his maintenance contract.

The contractor shall note that it shall be the responsibility of the fencing contractor to do all liaisons regarding all civil work with the civil consultant of the Department of Public works. All information required e.g. soil conditions, back filling etc. shall be taken into consideration during the tender period and no additional costs as a result of poor liaison shall be tolerated.

## **2.8 SECURITY FENCE PERIMETER LIGHTING**

The tenderer shall design and make allowance for security fence perimeter lighting surrounding the prison. Lamps used in the security fence perimeter lighting system shall be of the compact fluorescent type to ensure instant cold and hot re-strike.

The security fence perimeter fence lighting system shall consist of a streetlight luminaire, equipped with two 26 watt compact fluorescent lamps and mounted at a rake angle of 15° above the horizontal and at 6 metres above ground level on a GRP/galvanised steel pole positioned 1,5m inside the outer fence. The spacing shall be in such a way as to achieve an average initial illumination level of 5 lux and a minimum initial illumination level of 3 lux in the area between the outer and inner fence. In addition, a floodlight luminaire equipped with two 24 watt compact fluorescent lamps and aimed at 60° above the downward vertical, shall be mounted next to the streetlight type luminaire by means of a special spigot arrangement on top of the GRP or galvanised steel pole. Both luminaires are to face towards the inside of the prison.

The streetlight type luminaire and floodlight luminaires circuit shall be controlled by a photoelectric cell.

### **3. OUTER FENCE DETECTION SYSTEM**

#### **3.1 POWER AND COMMUNICATIONS CABLE**

All cables must comply with the manufacturer recommendations.

Exterior wire and cables shall be installed in schedule 40 PVC conduit and rated for direct burial use. The conduit shall be installed in the inner fence concrete strip if an inner fence is simultaneously erected otherwise it shall be installed in the outer fence concrete strip.

Power distribution wire from the main equipment room to remote processors, transponders, detection units, or other remote electronics on the site perimeter shall be minimum 2.5 mm<sup>2</sup> copper and shall be increased in size as necessary to ensure no more than 5% (AC or DC) voltage drop from the main equipment room to the remote equipment. It is required to submit power voltage drop calculations for all field located perimeter equipment.

Provide a two core multimode fiber optic cable, direct bury type cable between all perimeter system enclosures and the head end to create a loop around the perimeter system. Provide 1500mm of spare cable for each cable in each perimeter system enclosure.

All cables that will be directly buried shall be rated for direct burial and approved for wet locations.



All conductors shall be rated for direct burial and approved for wet locations in accordance with SABS.

Signal and power cables shall be separate cables and not combined as part of the same cabling jacket.

### 3.2 ACCESSORIES

The system shall include all accessories required to perform the functions described in this Section.

### 3.3 MARKERS AND NAMEPLATES

#### 3.3.1 Cable Tags:

Cable tags shall be provided in accordance with SABS.

#### 3.3.2 Nameplates:

- a. Precision engraved letters and numbers with uniform margins.
- b. Character sizes shall be a minimum of 50 mm high.
- c. Indoor : Shall be phonemic, two colour laminated stock, 2 mm thick, machine engraved to expose inn core colour (white).
- d. Outdoor: Shall be Standard aluminium alloy plate stock, minimum 1 mm thick, engraved areas shall be enamel filled or background enamelled with natural aluminium engraved characters.
- e. All nameplates shall be permanently attached.

#### 3.3.3 Zone Identification:

- a. In order for the perimeter patrol officer to easily identify zone locations, at the end of each zone a 500mm x 250mm sign shall be installed. The sign shall face the perimeter road.
- b. All zones shall be identified by zone number.
- c. Black numbers on a reflective yellow background shall be used.
- d. All signs shall be visible from a distance of 12000mm.

### 3.4 POWER SUPPLIES

Power supplies shall be furnished with characteristics as required to support the operational performance of the sensor and signal processors.

### 3.5 ENCLOSURES

All exterior post mounted enclosures must have the following features:

- a. At least 1.6 mm stainless steel plate construction.
- b. Continuously welded seams.
- c. Cabinet lockable with all locks keyed alike.
- d. Equipped with tamper detection device connected to the processor tamper circuit. The tamper switch shall detect any attempt to vandalise the enclosure including the opening of the door and the cutting or breaking of the enclosure.

### 3.6 EARTHING

- 3.6.1 A continuous 70mm<sup>2</sup>, bare, stranded, copper earthing conductor shall be buried a minimum of 600 mm under the sidewalk and run the continuous length of the sidewalk.
- 3.6.2 At each sensor post, via cad-weld connections, the earthing conductor shall attach to the ground bus located inside the enclosure. Also, a 70mm<sup>2</sup> earthing conductor shall bond the processor enclosure, and the nearest outer fence post to the 70mm<sup>2</sup> ground ring. All doors of field cabinets shall be earthed.
- 3.6.3 At a point nearest the main electronics equipment room, a 70 mm<sup>2</sup>, bare, stranded, copper conductor shall bond the buildings electrical system ground bus to the 70mm<sup>2</sup> ground ring buried under the sidewalk. All direct buried ground connections shall be cad-weld type connections.
- 3.6.4 All systems described in this section shall be grounded in accordance with the responsible engineer's recommendations and meet the minimum requirements of the manufacturer.

### 3.7 SURGE PROTECTION

- 3.7.1 All metallic data, communications, video, and sensor lines entering or leaving a building shall be protected with surge protection devices.
- 3.7.2 Earthing of protective devices shall be in accordance with the manufacturer's recommendations and/or as described in these specifications and drawings.
- 3.7.3 All signal line protective devices shall be located at the terminal point nearest the cable interface with the exterior cable plant. Devices shall be mounted to the back panel of the cabinet.
- 3.7.4 Where equipment is fed from a panel board not protected by a panel board protector, provide a branch circuit protector installed at the panel board.

### 3.8 DETECTION MEASURES

#### 3.8.1 PURPOSE OF SYSTEM

The outer perimeter fence is a bowed welded mesh fence structure as per the attached drawings and acts mainly as a delay system.

This delay functions of the outer fence need to be protected to ensure that it fulfils its purpose. Detection is required to detect the cutting or removing of the structure and attempts thereof. The required detection is based on direct measurement of the causes of cutting and removing of the structure and not derivatives thereof such as short circuit detection or volumetric detection not measuring fence behaviour. Detection shall be based on the measurement of the kinematical behaviour of the structure during intrusion attempts.

The system shall be applied in order to ensure maximum coverage in the detection area.

#### 3.8.2 DESCRIPTION OF SYSTEM

##### a. Zones

The system shall be installed in specific lengths called Zones. Each zone and detection device can provide and report its own intrusion alarms, therefore

providing information on the area of any intrusion attempt. Zone lengths should not exceed 20m.

b. Detection units

Each zone shall be equipped with detection units, the detection unit shall include the transmitter, receiver, alarm processing unit and the required communication cable.

The parameters on the alarm processing unit must be adjustable in both the amplitude and frequency domain. The system must be commissionable to allow for maximum probability of detection (POD) and minimal nuisance alarms (NAR) and false alarms (FAR).

c. Installation

Measuring devices must be directly attached to the fence structure and connected via a field communication network. The network shall be connected to the main detection network via the field nodes and reflect in the main control room.

Each device will be represented in the main control user interface allow for parameter setting and diagnostics per device. The operator shall be able to identify the device that caused the alarm within a sector or zone.

The detection equipment shall be installed in accordance with the supplier specifications, the installation specifications must be presented before installation commences.

The detection units installed shall be sufficient to cover the specified area.

d. Maintenance

Sensor maintenance diagnostics shall be available in the control room and replacing a sensor shall be on a "plug and play" principle with no special tools required.

e. Detection

Detection parameters should be adjustable on an individual sensor basis for both the cutting and removing or moving of the fence and detection components.

The detection system shall announce at least the following alarm events:

- Fence cut
- Fence components removed
- Detection units moved

The contractor shall allow as part of this contract for the necessary tests to be effected as required by the end user.

### 3.9 FIELD CONTROLLER

#### 3.9.1 Processor

Each zone shall be equipped with a field processor unit, performing all the functions associated with a particular zone. A field processor shall provide for / contain the following sub-systems:-

- Digital inputs (8x Supervised Loop)
- Relay outputs (4 x 24VDC 5Amp)
- Processor
- Data communication
- Reset key switch transmitter type

Field processors shall be installed in the middle of each zone. The enclosure shall be manufactured from Stainless steel. Enclosures shall be rated IP 65 and fitted with a door lock and tamper switch as per Par 1.10 d.

A zone reset button (if required) shall be accessible from inside the perimeter fence and shall be of the transmitter type.

All cable entries to field units, if exposed shall be protected against vandalism by means of stainless steel covers.

#### 3.9.2 Data Communication

Field processors are linked with a fiber optic serial data communication cable, in a closed ring configuration.

Communication shall be fully functional with a single cut in communication cable.

### 3.9.3 Power

A single phase power feed shall supply the field processors. (230V should be supplied to each field node.)

All equipment shall be protected against lightning surges and transient voltages to all the relevant SABS specifications and regulations

### 3.9.4 Characteristics

The unit shall have features or characteristics as follows:

- a. Accept eight (8) dry contact supervised inputs.
- b. Provide two (4) dry contact outputs.
- c. Input voltage - 230VAC  $\pm 5\%$ .
- d. Equipped with transient suppression.
- e. Supervised circuits - inputs.
- e. Temperature Operating: -20 deg C to +70 deg C
- g. Humidity - 20% to 95% condensing.
- h. Unit shall be field addressable.
- i. Shall interface with the Perimeter Controller.

## 3.10 PERIMETER CONTROLLER

### 3.10.1 System operation

The system shall be installed as a zoned, automatic, supervised alarm detection system.

- a. The alarm condition is transmitted from the post mounted, zone field microprocessor via redundant fiber-optic loop to the perimeter Master Controller.
- b. Each detection zone shall be equipped with fiber-optic communication equipment to eliminate lightning surge problems.

- c. Each independent defined intrusion event shall affect a unique signal on the perimeter controller.
- d. The supervised circuit in the system causes a tamper/status alarm to signal if:
  - i. Sensor circuitry is disturbed (opened or grounded).
  - ii. Tamper switches are activated situated in the control cubicles in the field or control room.
- e. The location at any point at which an attempt is made to tamper with the system shall be identified at the perimeter controller.
- f. Approved detection measures shall be incorporated into the system and used as separate zones protecting the vehicle sally port. (One zone only)
- g. System status and all alarm conditions shall be reported to the central control from the field controllers to a perimeter controller.
  - i. From the perimeter controller each zone shall be capable of zone access, alarm acknowledges and alarm reset. The perimeter controller shall have a distinctive audible alarm. Alarm shall annunciate both visually and audibly. The same shall be possible from security management system.
  - ii. The perimeter controller shall interface with an event printer located in Central Control. The event printer shall print a date and time stamped message indicating all alarms, alarm resets, and zone accesses.
- h. System status and all alarm conditions shall be reported to the system operator from the perimeter controller to a graphics display unit.
- i. All fixed components of the perimeter alarm system shall receive power from the UPS provided in central control or a main electronics equipment room.

### 3.10.2 Hardware

The perimeter controller shall be installed in the Central Control console as shown on the drawings.

The perimeter controller shall be based on a Linux operating system with the following characteristics:

- a. Industrial grade hardware.
- b. Solid state storage memory.
- c. Complete with power supply.
- d. Standard panel mounting for 19 inch EIA rack. Rack space requirements shall be no greater than as shown on the drawings.
- e. Serial communication port
- f. Ethernet port
- g. Two USB ports
- h. VGA port
- i. Keyboard and mouse ports

The perimeter controller shall perform the following functions:

### 3.10.3 Field Communication

Communication with field controllers shall be via a redundant 2 core multimode optical fiber link. Operation of the system shall not be affected in case of a single break in the communication link.

### 3.10.4 Monitoring and Control

The controller shall contain the status map off all field detection and status devices. These devices shall include the following:

- a. Outer fence detection alarm
- b. Outer fence detection maintenance
- c. Field cabinet tamper



- d. Auxiliary inputs including gate area detection devices and gate status contacts at sally port.
- e. Field communication status for each field controller

### 3.10.5 Alarm and Event Printing

Alarms and selected events shall be printed on a suitable continuous paper printer via a parallel port

### 3.10.6 Alarm and Event Recording

The following shall be recorded on the alarm or event log:

- a. All changes in the state of field devices. This includes alarm and maintenance conditions. These events shall be logged per zone and per device.
- b. Operator master accept actions.
- c. Field reset actions.

Log entries shall be date and time stamped to the nearest second.

### 3.10.7 External Interfaces

The perimeter controller shall provide the following data interfaces:

#### TCP/IP Socket interface

All perimeter or system devices shall be included in this interface mechanism. The external system shall initialise on selected devices and events shall be posted when any change occurs in the status of such devices. Events shall also be sent to the perimeter controller. Messages shall be in clear text.

#### Modbus serial and Modbus TCP/IP interface

Devices shall be mapped in a set of holding registers for access by an external SCADA system

These external data interfaces shall be used to integrate the perimeter system with a Security Management System or CCTV system.

Where a Security Management System is in operation the Perimeter system shall be fully integrated with the SMS and CCTV systems for annunciation, print recording, logging of alarms and initiation of CCTV system functions upon an alarm condition.

All perimeter alarms shall be logged, annunciated, recorded and managed by the SMS alarm terminal in Central Control. Fence Alarms, trouble and tamper conditions shall be separately annunciated by individual zone designations.

The interface definition shall be documented and delivered with the system as part of the deliverable of this project. (Proof of the operability of the interface must be given.)

#### 3.10.8 Wide Area Networking

The Perimeter Controller shall be Internet Protocol (IP) enabled so as to be networked over a Wide Area Network (WAN) for the purposes of remote monitoring, control and viewing of historical information. This shall facilitate the performance assessment of both operator and equipment from anywhere on the client's network.

#### 3.10.9 Diagnostic Tools

A diagnostic screen shall be included at the master indicating the following:-

- On/off line status of field processors
- The alarm and maintenance status of all individual sensors
- The alarm and maintenance status of any other equipment attached to the system as required.

The diagnostic software shall include a data recording facility to record all the digital and analogue signals from any selected field processor unit and any selected detection device.

### **4. USER INTERFACE – FUNCTIONAL OPERATION**

This requirement shall apply to the graphical user interface that may form part of the perimeter controller or implemented on the Security Management System.

#### Site Perimeter Map

A graphical presentation of the site perimeter shall include the following:

- a. Position of the perimeter
- b. Detection zones
- c. Gates
- d. Other static information (buildings or roads) that may be required to assist the operator to identify the location of an occurrence.

The following Icons representing the alarm / maintenance status of field detection devices shall be included:

- a. Alarm status of Delay Fence Integrity Detection for each zone.
- b. Tamper status of each field enclosure.
- c. The status of detection devices and status monitoring in the sally port area.
- d. The operational (maintenance) status of field equipment for each field controller.

Abnormal conditions shall be acknowledged by the operator by activating a single icon. This shall also stop the audible sounder.

The colour of status icons shall change in the following sequence.

- |                   |   |
|-------------------|---|
| 1. Green          | Normal condition                                |
| 2. Red - Flashing | New alarm condition                             |
| 3. Red - Solid    | Condition has been accepted by the operator     |
| 4. Yellow         | Condition has been reset in the field           |
| 5. Blue or Green  | A reset was activated at the central controller |

Blue shall indicate a device in a permanent abnormal condition and must be addressed by a maintenance repair procedure. Step 4 shall be omitted in case of certain maintenance devices or in case of CCTV surveillance where no field reset is required.

The following requirements shall be the minimum requirements for the user interface:

#### Operational Information

The following are shown on the operator interface:

- Site perimeter Layout
- Icons representing the alarm status of detection devices
- Indications of field node status and tamper

Buttons to accept and reset alarms  
Buttons to issue a reason for alarms

## Management Information

### Operational Status

Parameters providing a summary of the operational status of the equipment

This includes:

Percentage site online

Detection devices in inhibit status

Status of worst case field node

Condition of field communication network

### System performance

Summary of the number alarms during a daily, weekly and monthly period. Alarms are categorized as the following types:

Valid Alarms

Nuisance Alarms

Unknown Alarms

### Operator performance

Values representing the maximum time the current and previous operator took to accept and reset alarms. Unattended time shall also be indicated.

### Alarm and Event Reporting

Open a window to view the log

### Diagnostic Information

Real time Alarm status of all devices on the selected field node

Maintenance status of these devices

Buttons to inhibit any device

Analogue values of detection devices

Controls to adjust the operating parameters of field devices

### Networking

Multiple operator interfaces can be linked to the same perimeter controller. These user workstations can be local or remote.

The graphical user interface as proposed must be presented to the end-user's authorised representative for approval before commencement of work. All available system information and

specified requirements must be accessible through the User Interface. The user interface shall always be fully compliant to the above requirements.

## **5. TESTING:**

- 5.1 The Contractor shall notify the Engineer two (2) weeks prior to the system tests so that arrangements can be made to have The DPW and DCS personnel witness the tests.
- 5.2 Each penetration of the detection system shall produce an alarm.
- 5.3 If an alarm is not detected on the first try of any test, the test shall be deemed a failure and all testing shall cease.
- 5.4 The Contractor shall be allowed time (not to exceed 1 hour) to make the necessary repairs before continuing the test. If additional failures are noted during the test, the test shall cease and be rescheduled for another day.
- 5.5 If the test is deemed a failure by the Engineer, DPW or DCS personnel, the Contractor shall be responsible for all cost incurred by the Government for scheduling a second test.
- 5.6 The gate area detection system shall be tested based on the requirement that the gate area detection must be of the same standard as the perimeter detection system.
- 5.7 Delay Fence Integrity Detection System  
  
A simulated breaching of the outer perimeter fence shall be performed.  
  
The outer fence detection system shall generate an alarm when such an attempt is made.

## **6. SPARE PARTS**

The Contractor shall provide the institution with the following spare parts upon system completion:

- 6.1. 2 complete field node equipment sets.
- 6.2. 2 Copies of System Software.
- 6.3. 10 Delay fence detection units.
- 6.4. Perimeter controller.

## **7 COMPLIANCE TO THE SPECIFICATION**

The Contractor shall comply with all the requirements as per this specification. Proposed deviations shall only be considered after the award of the contract. Proposed deviations shall only be accepted if it meets with all of the following criteria:

- The proposed deviation offers a substantial improvement to the final product offered.
- The proposed deviation has been proven in other applications.

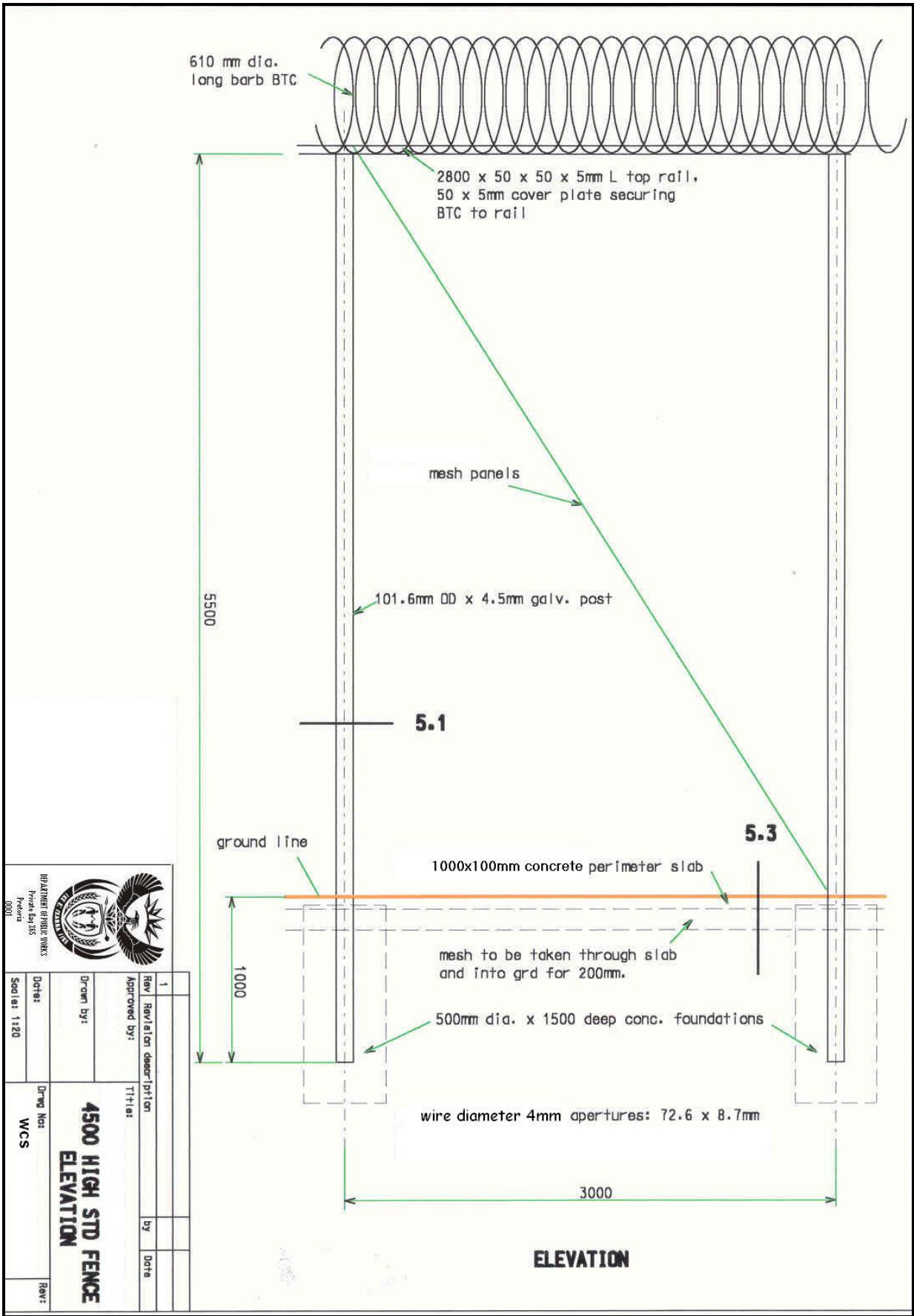
Any deviations from the specification can only be implemented with prior approval from the various representatives from DCS and DPW. The names of the authorised representatives should be obtained from the various Head Offices of the two involved government bodies.


## **8 PROVEN PRODUCT**

Due to the security nature of this requirement and the criticality of this application only proven product shall be considered.

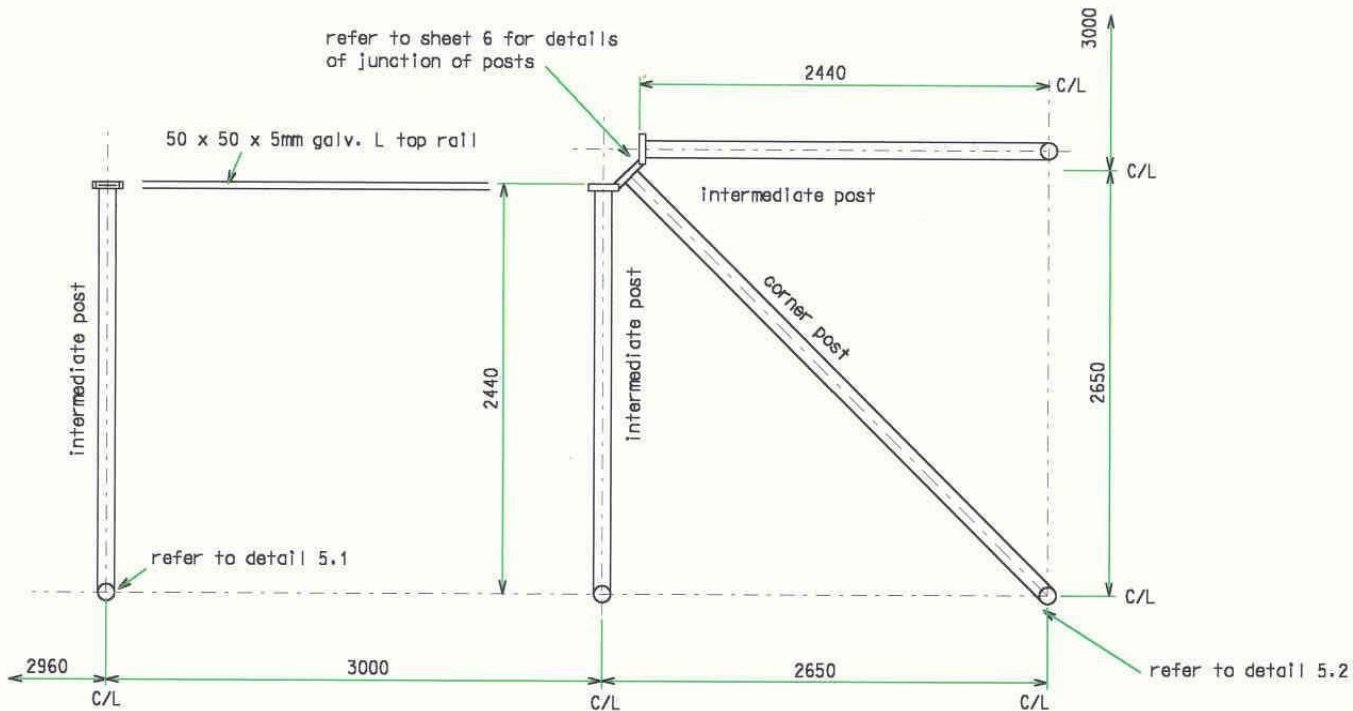
Product could be approved only after investigation by all applicable parties.

The international guideline for similar applications demands that five installations has to be operational in accordance with the above requirements for a minimum period of no less than two years before it would be considered as a proven product.



			
Rev	Revision description	by	Date
1			
Approved by:		Title:	
Drawn by:		4500 HIGH STD FENCE ELEVATION	
Date:		Drawn No:	
Scale: 1:20		WCS	
		Rev:	

**ELEVATION**



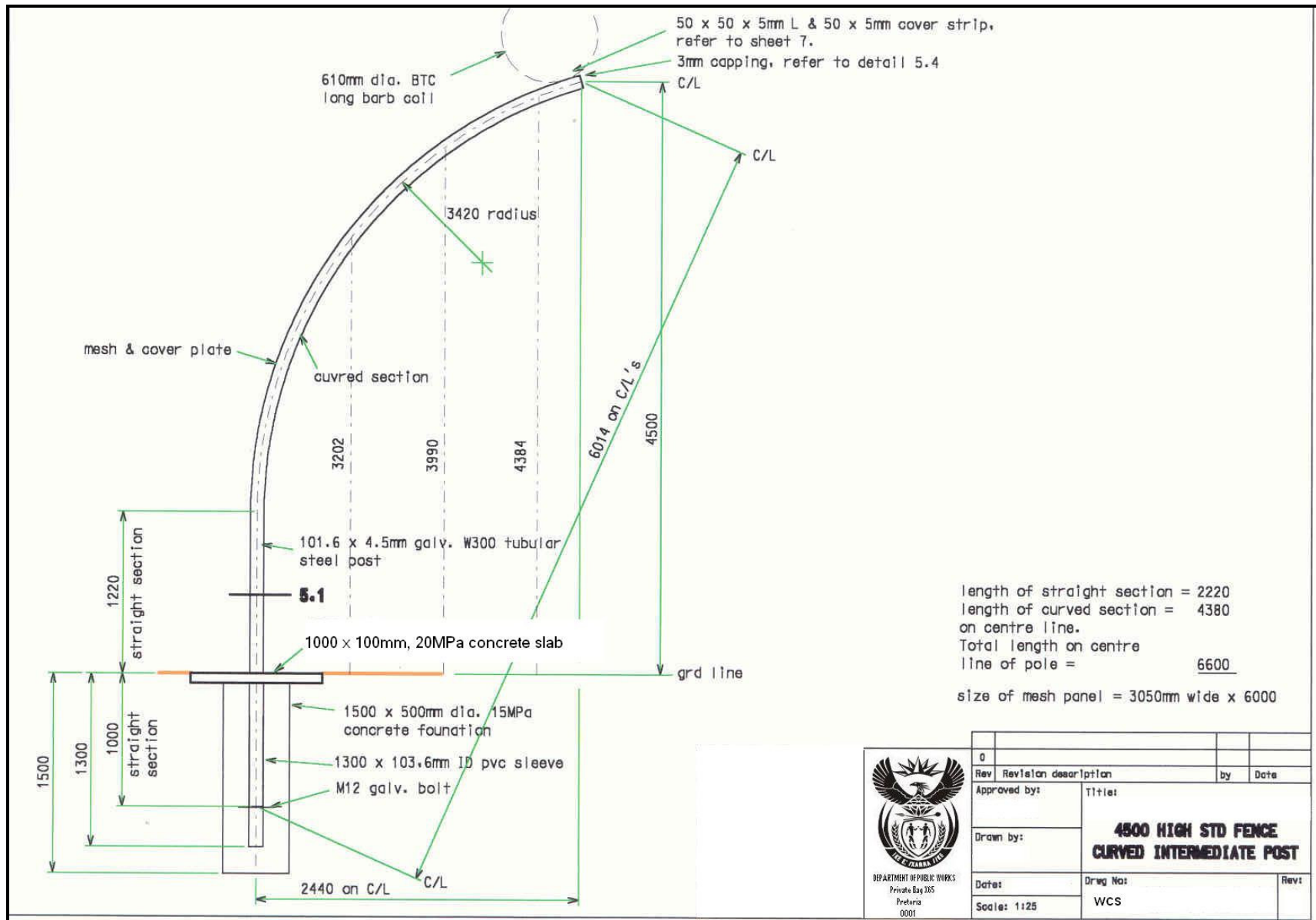
PLAN - 90 deg CORNER

Ground to be level either side of corner post up to the first intermediate post.



Rev	Revision description	by	Date
0			
Approved by:		Title:	
M Rodenburg		<b>4500 HIGH STD FENCE PLAN - EXTERNAL CORNER</b>	
Drawn by:		Drawn No:	Rev:
		WCS	
Date:		Scale: 1:125	





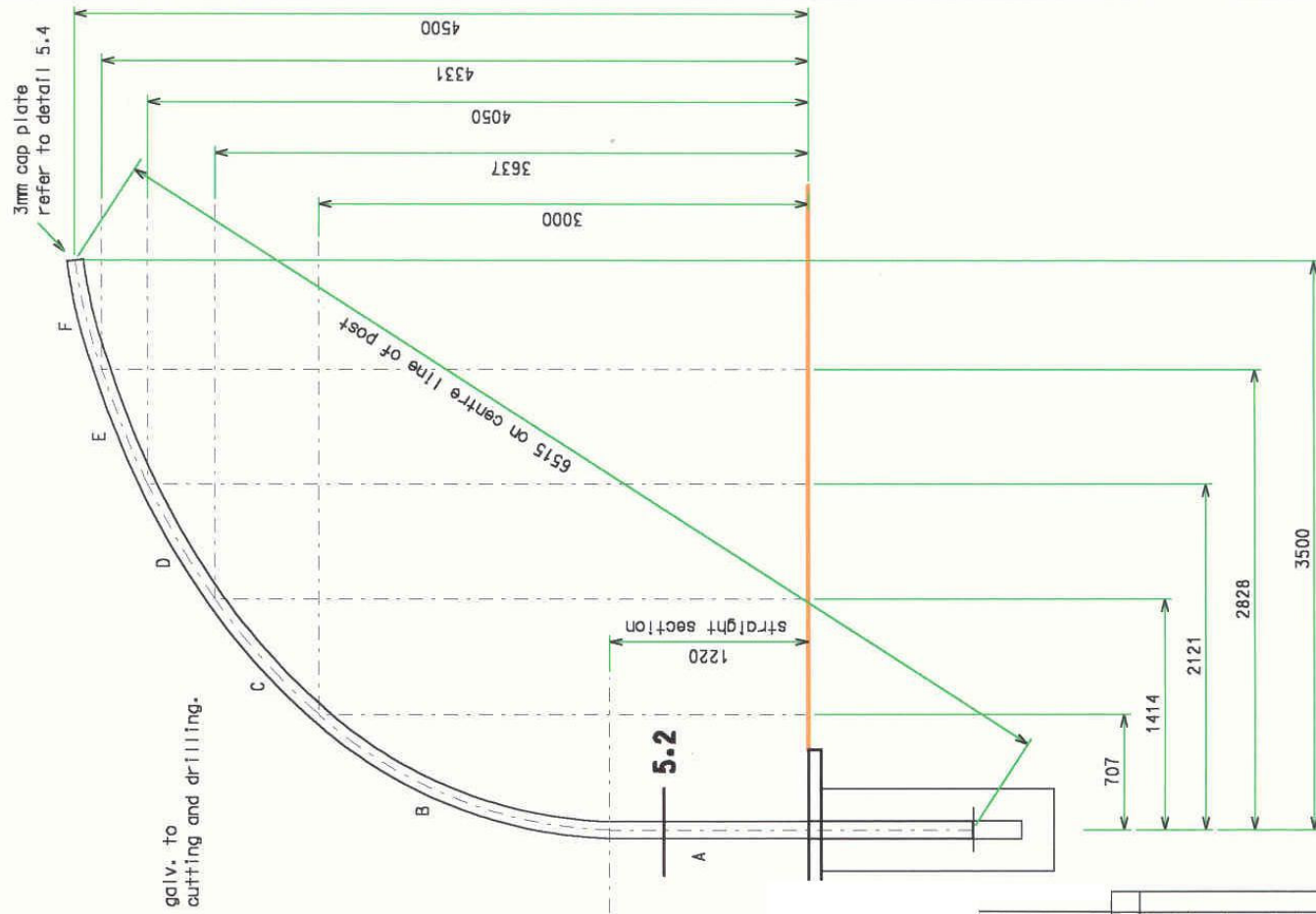
0			
Rev	Revision description	by	Date
Approved by:	Title:		
Drawn by:	<b>4500 HIGH STD FENCE CURVED INTERMEDIATE POST</b>		
Date:	Draw No:	Rev:	
Scale: 1:25	WCS		



RADIUS OF CURVES: (on c/l of post)

- A: straight section
- B: 2796mm
- C: 3940mm
- D: 4867mm
- E: 5643mm
- F: 3040mm

Post to be hot dip galv. to ISO 1461 after all cutting and drilling.

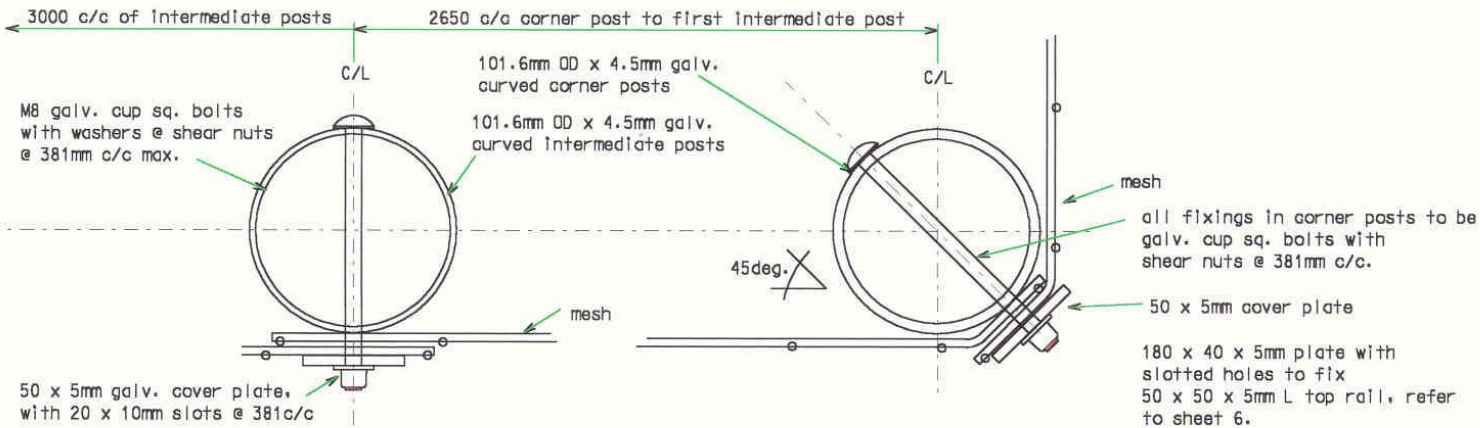


Post to be constructed from 101.6mm OD x 4.5mm W300 steel tube. length of post on c/l = 7462

Dimensions and radius of curves indicated are for a 90 deg corner. Corners less and greater than 90 deg. will require individual designs. The design and engineering cert. can be obtained from the manufacturer.

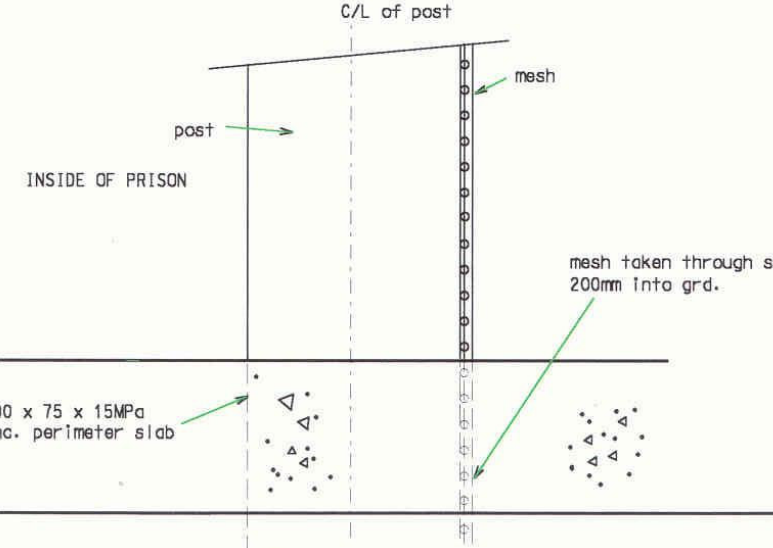


Rev		Revision description		by	Date
Approved by:		Title:			
Drawn by:		<b>4500 HIGH STD FENCE CURVED CORNER POST DETS.</b>			
Date:	Drawn No:	WCS		Revi	
Scale: 1:25					

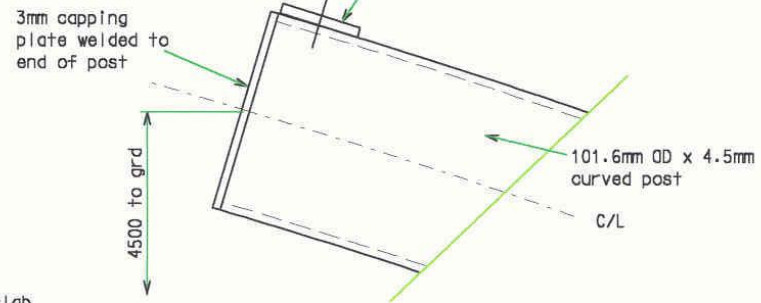


**PLAN INTERMEDIATE POST 5.1**

**PLAN AT CORNER POST 5.2**



**SECTION AT BOTTOM OF FENCE 5.3**



**TOP OF CURVED POST 5.4**

shape of post to be as BB-0027 sheet 3.  
Mesh is 358 single skin. (4mm)



Rev	Revision description	by	Date
Approved by:		Title:	
Drawn by:		<b>4500 HIGH STD FENCE DETAILS 5.1 to 5.4</b>	
Date:	Drawn No:	Rev:	
Scale: 1:2	WCS		

270 x 40 x 6mm plate

M10 x 114mm ID galv. U bolt

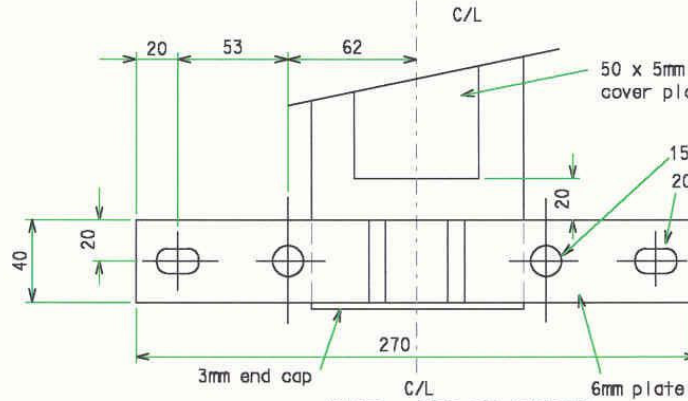
44

101.6mm OD post with 3mm end cap

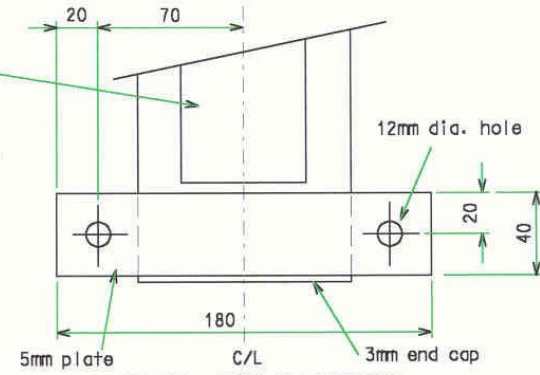
### ELEVATIONS OF ENDS OF POSTS

180 x 40 x 5mm plate welded each side to post

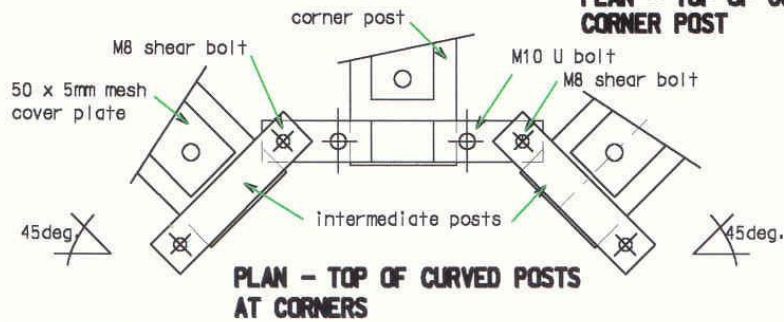
C/L of post




### PLAN - TOP OF CURVED CORNER POST



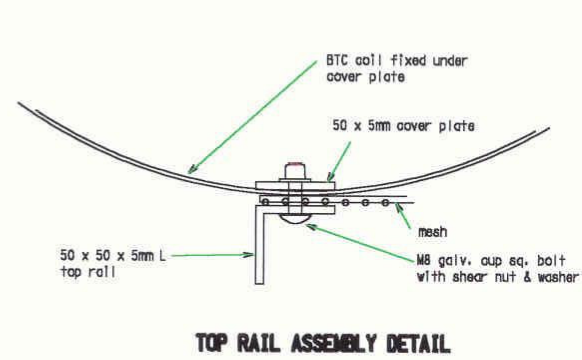
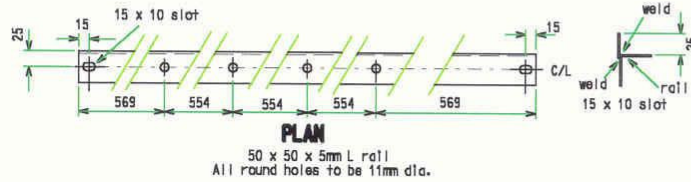
### PLAN - TOP OF CURVED INTERMEDIATE POST



### PLAN - TOP OF CURVED POSTS AT CORNERS

		0		
		Rev	Revision description	by
Approved by:		Title:		
Drawn by:		<b>4500 HIGH STD FENCE TOP OF POST DETAILS</b>		
Date:	Drawn No:	WCS		Rev:
Scale: 1:2				

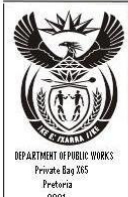
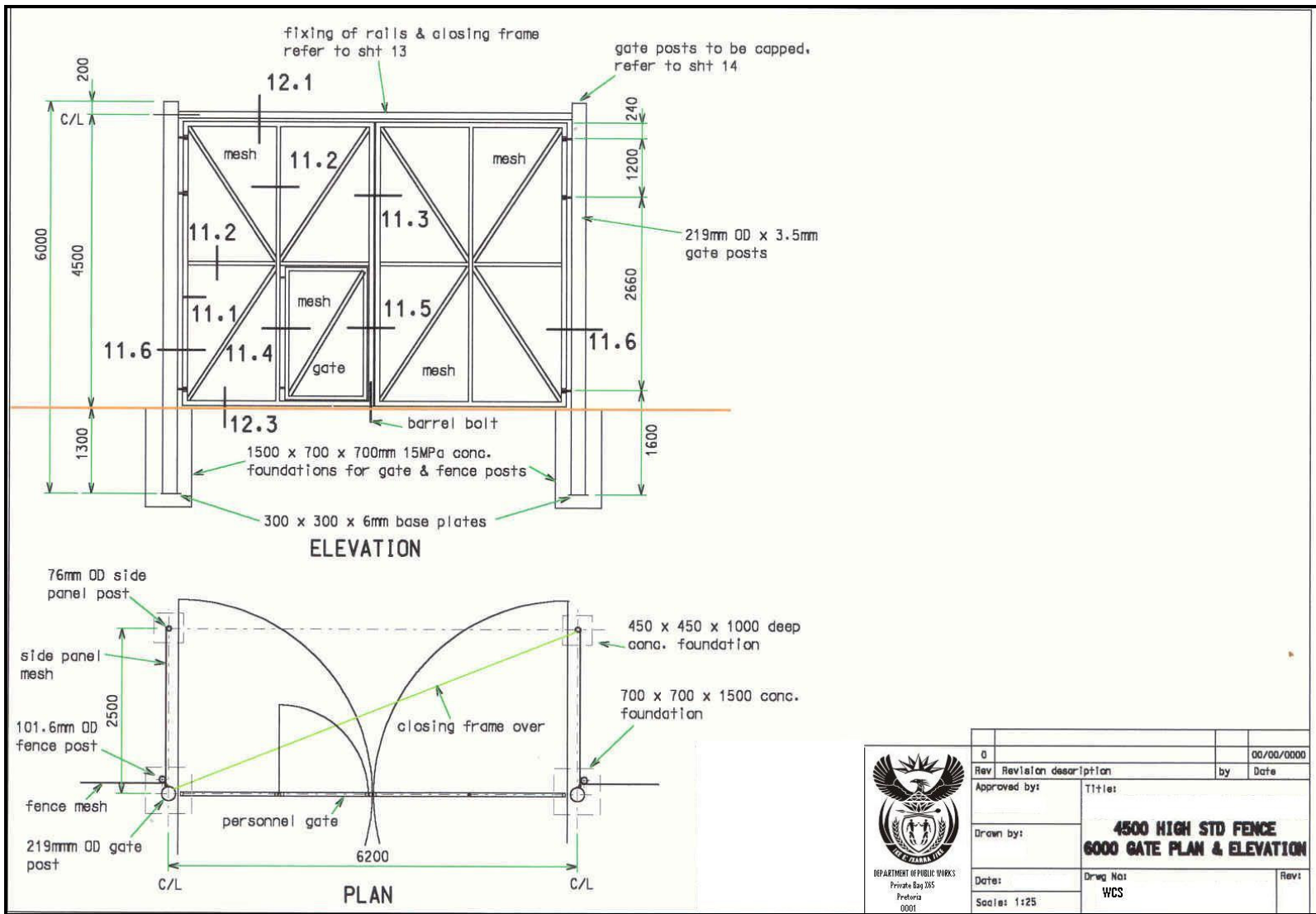
STEEL SECTIONS:  
All steel sections to be checked for straightness before manufacture and after galvanising.



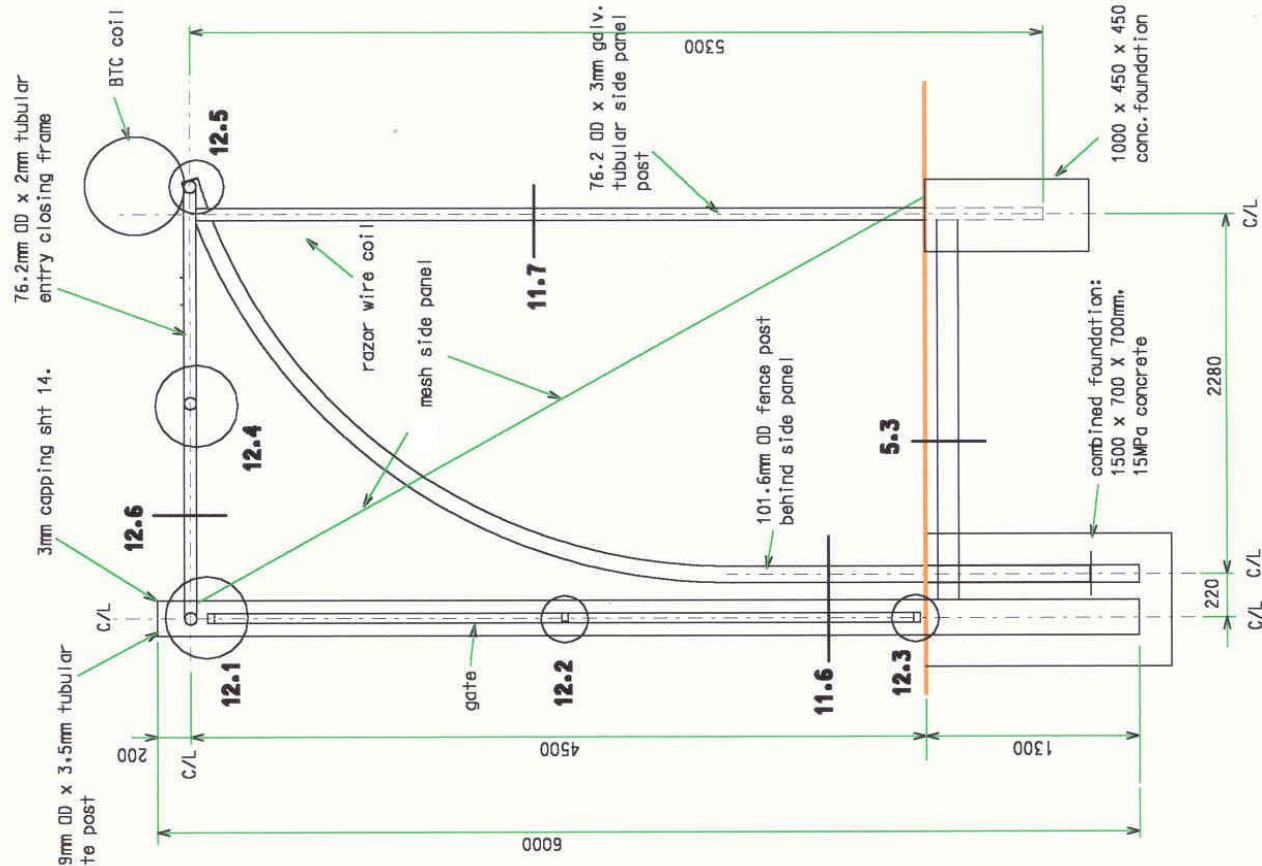
 <p>DEPARTMENT OF PUBLIC WORKS Private Bag 135 Pretoria 0001</p>	Rev	Revision description	by	Date
	Approved by:		Title:	
	Drawn by:		<b>4500 HIGH STD FENCE TOP RAIL DETAILS</b>	
	Date:	Drawn No:	WCS	Rev:
Scale: 1:5				







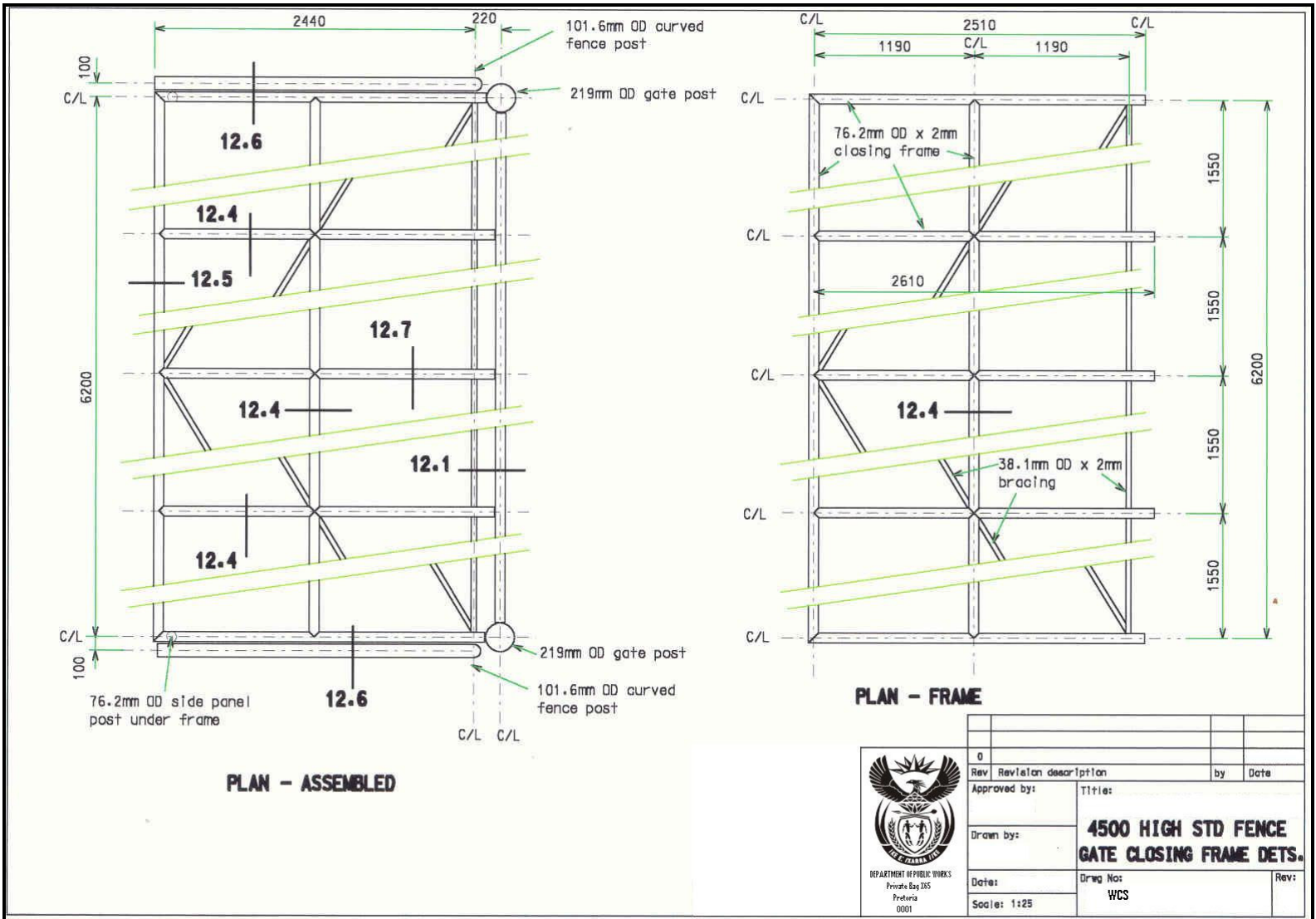
0			00/00/0000
Rev	Revision description	by	Date
Approved by:		Title:	
Drawn by:		<b>4500 HIGH STD FENCE 6000 GATE PLAN &amp; ELEVATION</b>	
Date:	Drawn No:	Rev:	
Scale: 1:25	WCS		

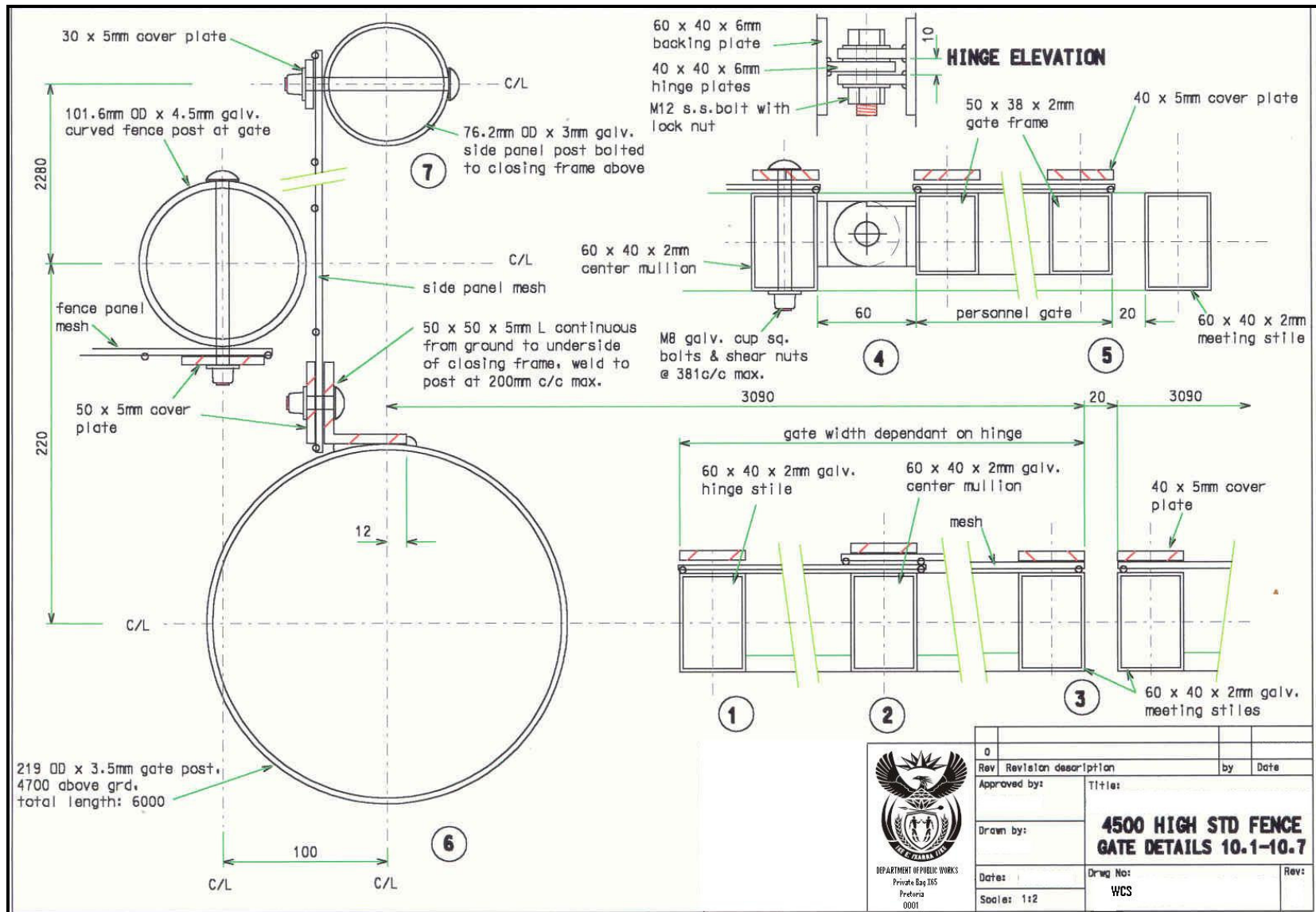


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Private Bag 285  
Pretoria  
0001

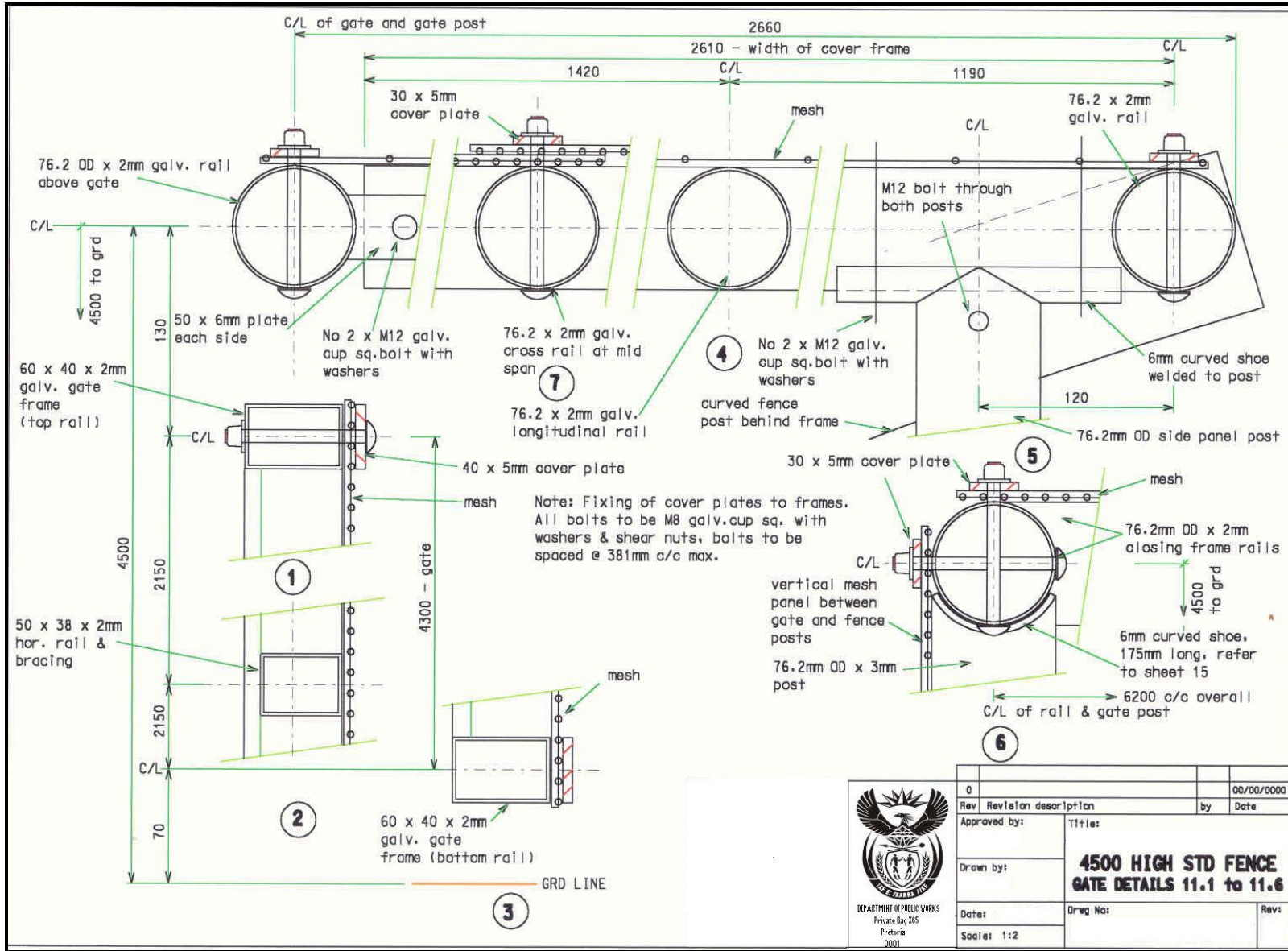
Rev	Revision description	by	Date
0			
Approved by:		Title:	
Drawn by:		<b>4500 HIGH STD FENCE 6000 GATES - SECTION</b>	
Date:		Drawn No:	Rev:
Scale: 1:25			



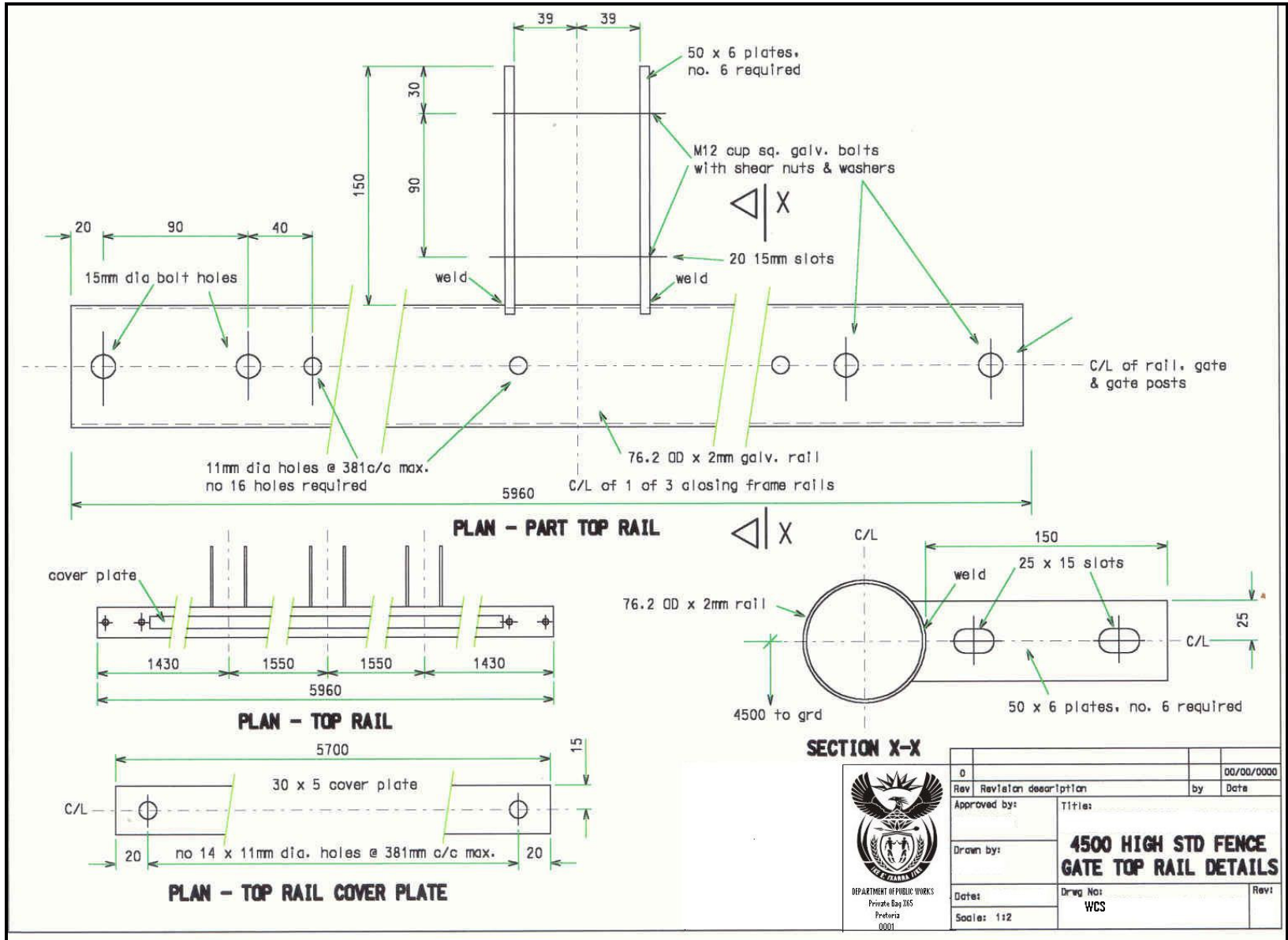




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Rev	Revision description	by	Date
Approved by:		Title:	
Drawn by:		<b>4500 HIGH STD FENCE GATE DETAILS 10.1-10.7</b>	
Date:	Drawn No:	Rev:	
Scale: 1:2	WCS		

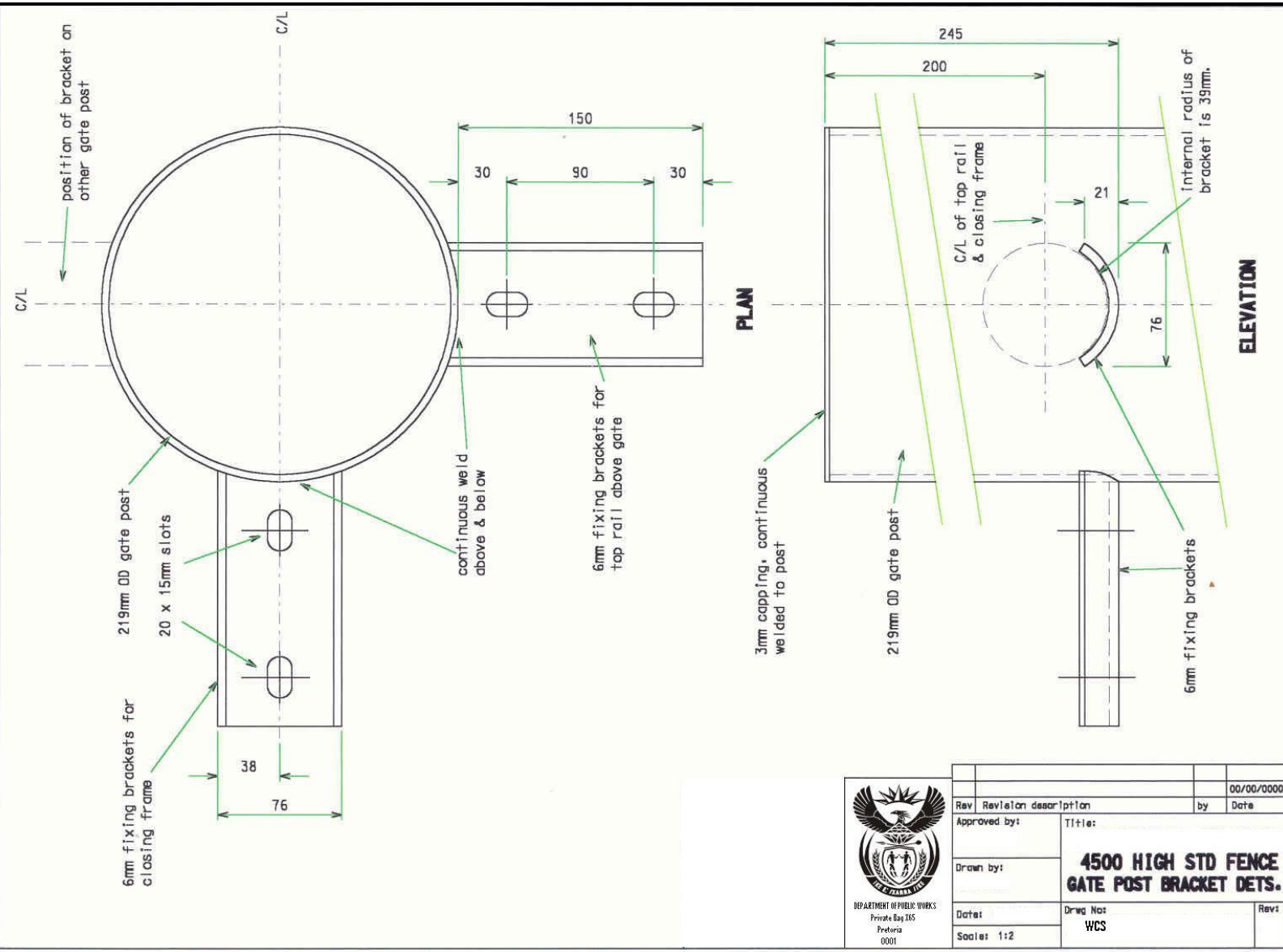






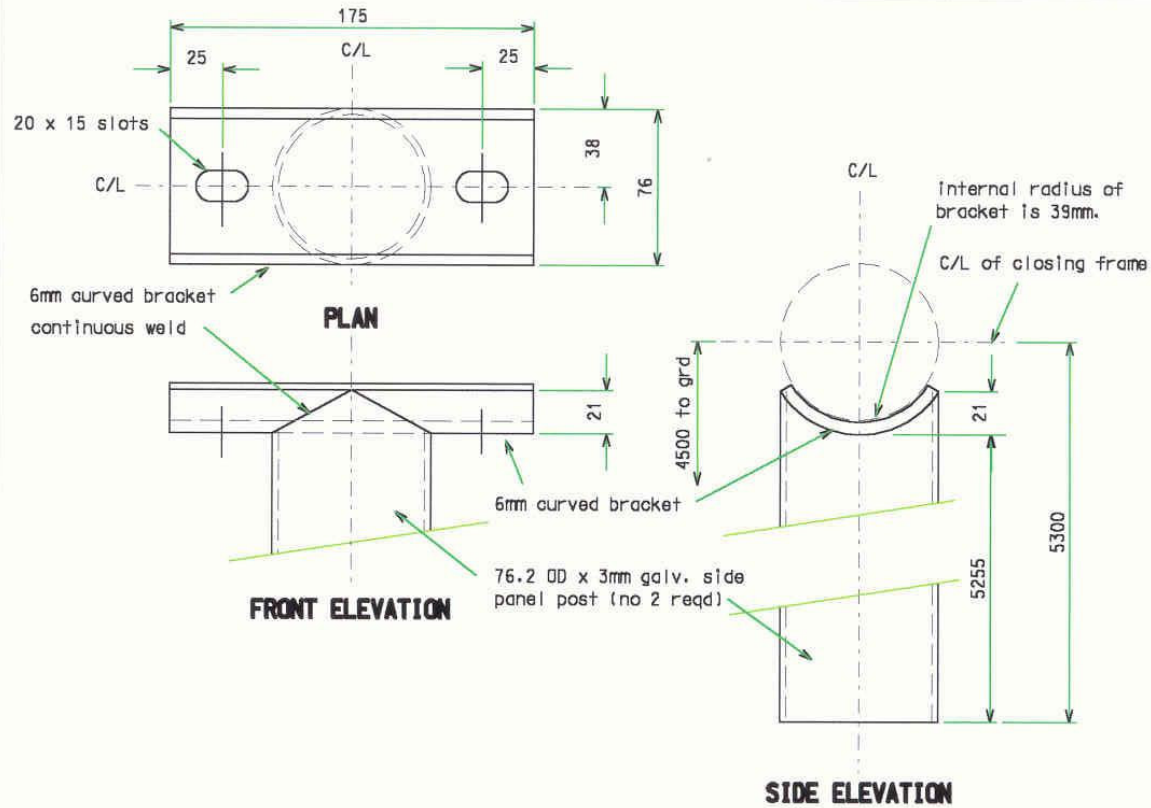
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Rev	Revision description	by	Date
Approved by:		Title:	
Drawn by:		<b>4500 HIGH STD FENCE GATE TOP RAIL DETAILS</b>	
Date:	Drawn No:	Rev:	
Scale: 1:2	WCS		





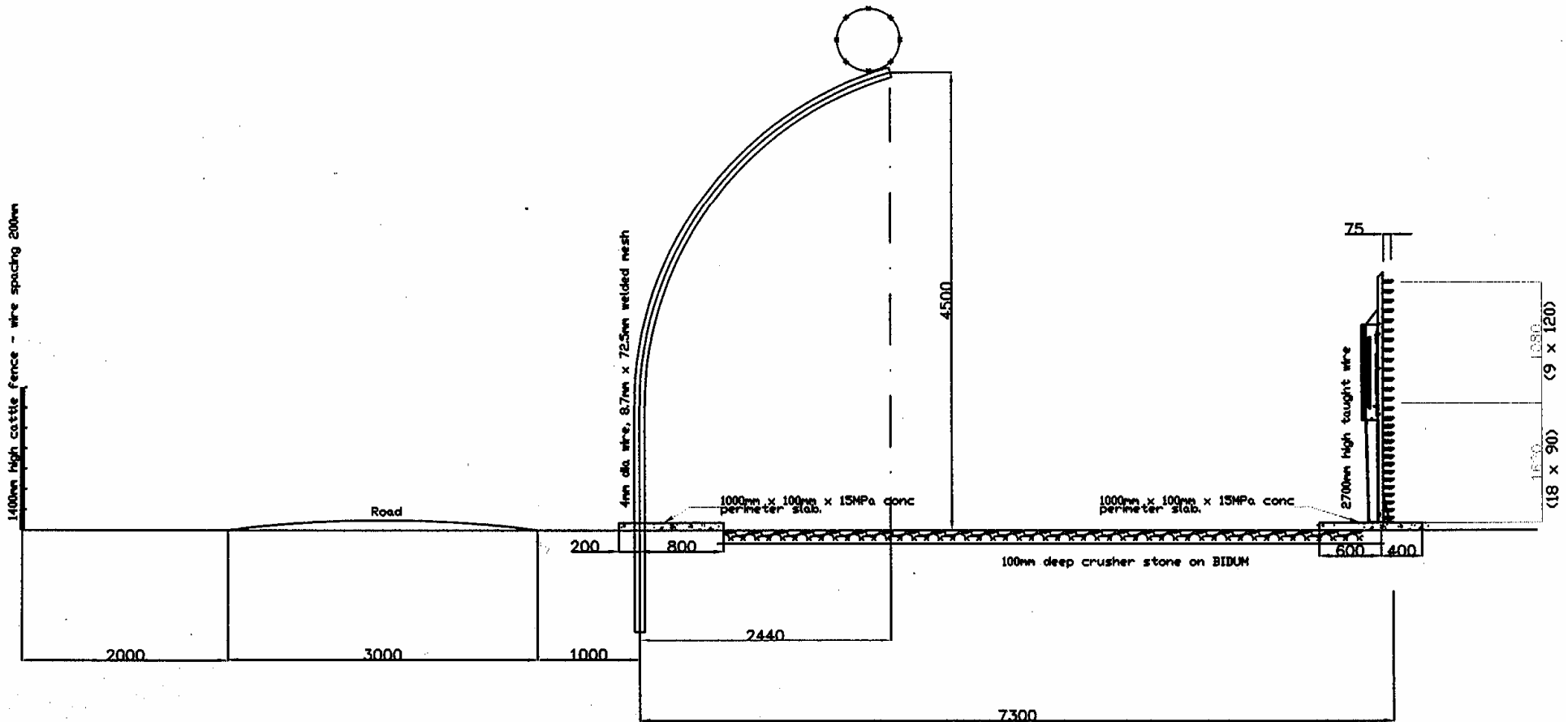
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Rev	Revision description	by	Date	
Approved by:		Title:		
Drawn by:		<b>4500 HIGH STD FENCE GATE POST BRACKET DETS.</b>		
Date:	Drawn:	Drawn:	Rev:	
Scale: 1:2	WCS			



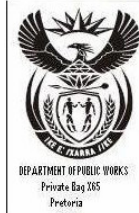


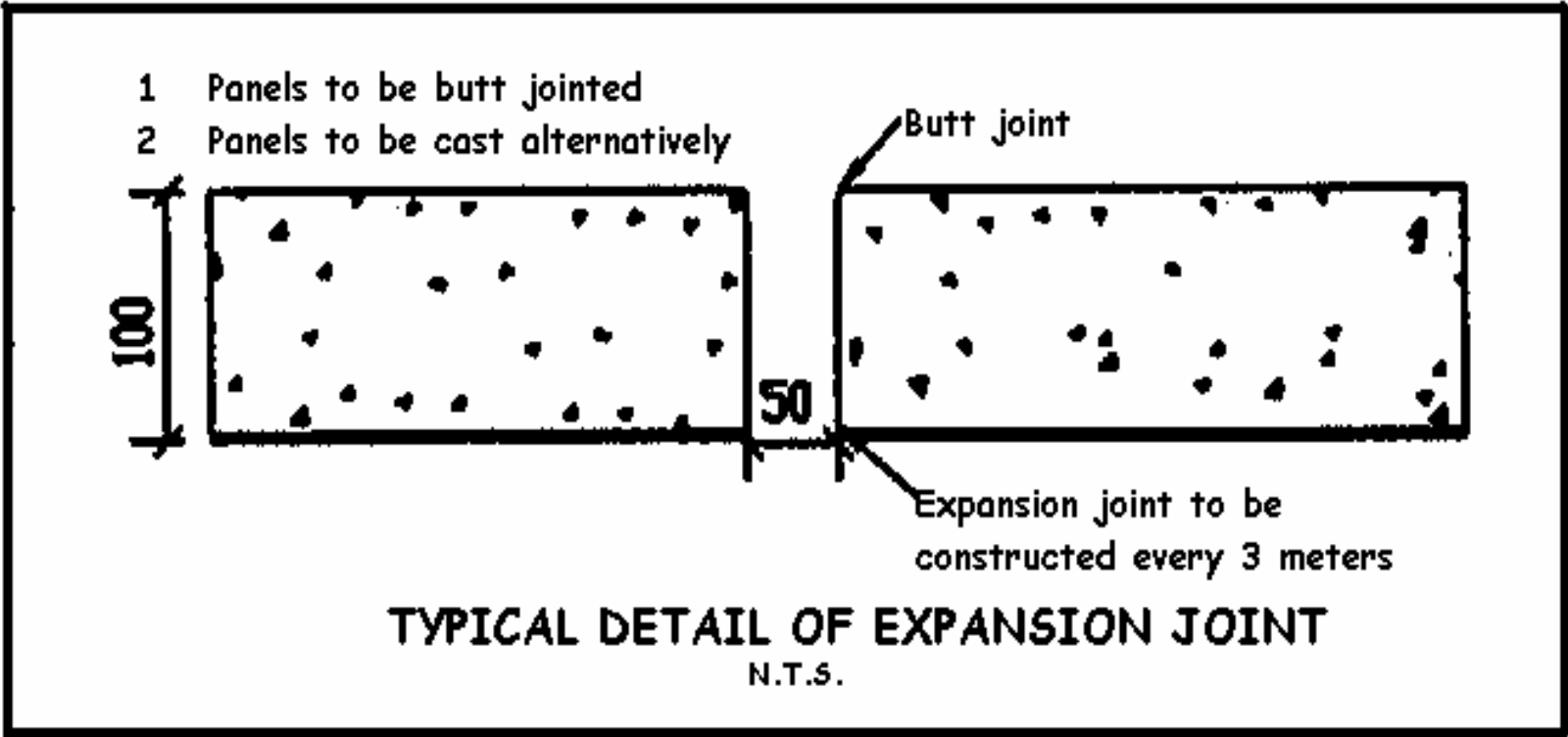
Refer to detail 5 on sheet 12.


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Rev	Revision description	by	Date	
Approved by:		Title:		



SECTION THROUGH PERIMETER FENCES  
SCALE 1:50

 <p>DEPARTMENT OF PUBLIC WORKS Private Bag 205 Pretoria 0001</p>	Rev	Revision description	by	Date
	Approved by:		Title:	
	Drawn by:		CROSS SECTION OF INNER FENCE AND AND OUTER FENCE WITH DIMENSIONS	
	Date:	Draw No:	Rev:	
	Scale: 1:25	WCS		



 DEPARTMENT OF PUBLIC WORKS Private Bag 265 Pretoria 0001	Rev	Revision description	by	Date
	Approved by:		Title:	
	Drawn by:		CONCRETE PLINTH DETAIL FOR INNER AND OUTER FENCE	
	Date:	Drwg No:	Rev:	
	Scale: 1:25	WCS		