



Correctional Service  
Canada

Service correctionnel  
Canada



SAFETY, RESPECT  
AND DIGNITY  
FOR ALL

LA SÉCURITÉ,  
LA DIGNITÉ  
ET LE RESPECT  
POUR TOUS

## Technical Criteria for Correctional Institutions

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## **SP-1 SITE – SITE PLANNING AND DEVELOPMENT**

### **1. SCOPE**

This section outlines planning and development principles and specific definitions of terms related to detention institutions.

### **2. RELATED SECTIONS**

SP-2 – Fence

SP-3 – Gates / Sally Port

SP-4 – Exterior Lighting

SP-5 – Traffic Circulation and Parking

### **3. INSTITUTIONAL PROPERTY**

**3.1** There is no specific requirement for demarcation or fencing at the CSC owned property line. Signage at the property limit is recommended. Where signage is used, it shall follow the Federal Identity Program<sup>1</sup>.

**3.2** Property features such as topographical conditions and existing trees and bushes shall be used to screen CSC institutions from adjoining properties. Landscaping and site development along the main entry road shall be visually appealing.

**3.3** Where more than one institution is located on a CSC property, sufficient space shall be allowed between institutions. Minimum security institutions shall be located furthest from that part of a medium or maximum institution where inmate circulation and activities take place.

### **4. RESERVE OF OPEN LAND**

**4.1** Where possible and with minimal alterations to natural land and its condition, a reserve of open land shall be provided for a distance of 100 m from the exterior of the outer perimeter fence to facilitate views of an intruder or escapee. Where natural grade changes exist, these shall be retained. Where open land reserves are smaller than the 100 m due to prohibitive site conditions or limiting extent of CSC property, additional security measures may be required, as determined on a project specific basis.

**4.2** Landscaping for the first 100 m within the open land reserve shall consist of grasses, trees and shrubs which minimize the potential for screening an intruder or an escapee.

**4.3** Due to specific operational requirements, the reserve of open land can extend over structures such as CSC service buildings, parking lots, flag posts and light standards, and site enhancements. These elements should be located close to the main entrance of the institution and away from inmate outdoor circulation and activity areas in order to limit the potential for contraband transfer over the institutional perimeter.

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<sup>1</sup>

4.3 – Common-use and operational signs, Federal Identity Program Manual, March 1990  
[http://www.tbs-sct.gc.ca/fip-pcim/man\\_4\\_3-eng.asp](http://www.tbs-sct.gc.ca/fip-pcim/man_4_3-eng.asp)

**5. NO MAN ZONE**

- 5.1** This zone is the ground area between the outer perimeter fence and the inner perimeter fence. The distance between the perimeter fences is 7.5 m.
- 5.2** The no man zone ground surface shall have the top soil removed and covered with filter fabric and crushed stone for a depth of at least 200 mm to minimize plant growth.
- 5.3** This zone is equipped with an in-ground sensor to detect motion. It is a component of the Perimeter Intrusion Detection System (PIDS), referred to as the Motion Detection System (MDS). To minimize false alarms activated by the MDS, the ground surface between the fences shall be graded to prevent pooling of water and run-off shall be collected as described in section SU-1, Storm and Sanitary Sewers.
- 5.4** This zone is covered by camera surveillance. The cameras will focus on the section of the fence line which has been disturbed. Cameras are an integrated part of the PIDS.

**6. BUFFER ZONE**

- 6.1** A 4-meter buffer zone parallel to the interior side of the inner perimeter fence shall be free of all structures, trees, shrubs and roads, except for road access through the perimeter and connecting interior fences where required.
- 6.2** Where adjacent to playfields, ceremonial grounds, and gardens, this zone shall be marked by signage informing inmates not to trespass. Fencing shall not be used to demarcate this zone as it only serves to obstruct views from the mobile patrols on the outside of the perimeter. As well, the fence may capture balls which may only encourage retrieval resulting in enforcement and imposition of charges.
- 6.3** The buffer zone is covered by a separate line of PIDS cameras from those used to cover the no man zone. Similar to the no man zone, the cameras will focus on the section of the buffer zone in which the fence has been disturbed.

**7. NO BUILDING ZONE**

- 7.1** With the exception of the Gatehouse, no building shall be closer than 12 m to the inner perimeter fence.

**8. NO INMATE ZONE**

- 8.1** This is the area along the perimeter fence which is close to the Gatehouse and functions receiving vehicles. Access to inmates here is generally restricted or highly controlled. There is no specific distance to delimit this zone as it varies depending on the site layout configuration.
- 8.2** Functions allowing controlled access to inmates within this zone include Visits and Private family visits, both shared with outside visitors.

## 9. SITE PLANNING AND DEVELOPMENT OF AN INSTITUTION

- 9.1** Planning of facilities and amenities shall be dictated by time of use and user type. Institutional buildings closest to the gatehouse shall accommodate functions which are inaccessible to inmates or where access is supervised. Those functions requiring vehicle access for servicing and supplies shall also be relatively close to the gatehouse while vehicle access routes shall be away from inmate circulation and activity areas. Evening use functions, housing, playfields, gardens, and ceremonial grounds shall be located furthest from the entrance.
- 9.2** See item 11 for Landscaping and limited access grounds and item 12 for Playfields and yards. Also see Plate SP-1-1 for idealized site plan which illustrates building relationships.

## 10. SIGNAGE

- 10.1** All exterior and interior building signage shall conform to the Federal Identity Program (FIP). The FIP Manual is fully available at:

<http://www.tbs-sct.gc.ca/fip-pcim/>

- 10.2** The CSC “Search Sign” shall be located at each public entry leading to an institution. The “Search Sign” is a warning sign as prescribed in the Federal Identity Program Manual<sup>2</sup> (Caution!, Attention! under Type 3). The standard is yellow background with black letters. For the purpose of a reading distance of 30 m and a vehicular speed of 30 km/h, “x” is defined as 50 mm. Therefore, the text letters size is 50 mm (x) and the header letters size is 150 mm (3x). The layout is provided in Table 5 – Standard spaces, 50 mm to 200 mm x-height of section 4.3 of the FIP Manual (see footnote 8). The bilingual text is side by side, the official language on the left side being according to the regional practice. As the font and design follows the Federal Government standards the use of the Department signature or CSC badge is optional.

<p style="text-align: center;"><b>Attention!</b></p> <p style="text-align: center;">You are now entering a Correctional Service Canada reserve and all vehicles and persons on this reserve are subject to search.</p>	<p style="text-align: center;"><b>Attention!</b></p> <p style="text-align: center;">Vous pénétrez présentement sur une réserve du Service Correctionnel Canada et tout véhicule et personne sur cette réserve sont sujets à être fouillés.</p>
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OR

<sup>2</sup> Federal Identity Program Manual – 4.3 Common-use and operational signs, Treasury Board of Canada, Secretariat, March 1990; [http://www.tbs-sct.gc.ca/fip-pcim/documents/man\\_4\\_3\\_p1.pdf](http://www.tbs-sct.gc.ca/fip-pcim/documents/man_4_3_p1.pdf) and [http://www.tbs-sct.gc.ca/fip-pcim/documents/man\\_4\\_3\\_p2.pdf](http://www.tbs-sct.gc.ca/fip-pcim/documents/man_4_3_p2.pdf)  
Federal Identity Program Manual – 4.5 Signage typeface, Treasury Board of Canada, January 1988; [http://www.tbs-sct.gc.ca/fip-pcim/documents/man\\_4\\_5.pdf](http://www.tbs-sct.gc.ca/fip-pcim/documents/man_4_5.pdf)

<p><b>Attention!</b></p> <p>Vous pénétrez présentement sur une réserve du Service Correctionnel Canada et tout véhicule et personne sur cette réserve sont sujets à être fouillés.</p>	<p><b>Attention!</b></p> <p>You are now entering a Correctional Service Canada reserve and all vehicles and persons on this reserve are subject to search.</p>
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Refer to *CAN/CGSB-109.1M-1989*<sup>3</sup> for the sign structure and characteristics.

- 10.3** All areas restricted only to authorized personnel shall be clearly and boldly identified according to the common-use and operational signs as described in the Federal Identity Program Manual<sup>4</sup>. Refer to section A-9 Interior Signage for interior signage requirements.

## 11. LANDSCAPING AND LIMITED ACCESS GROUNDS

- 11.1** Only indigenous plants and locally available materials shall be used.
- 11.2** All layouts and landscape material shall take into account snow removal, grass cutting, watering and tree and shrub trimming to ensure minimum watering.
- 11.3** Soft landscaping is encouraged but plant type should be selected so as not to obstruct views. Gentle contouring is also acceptable as are earth berms and timber retaining walls provided they do not facilitate hiding.
- 11.4** Colour and visual relief can be achieved by the use of flowers beds, which shall be planted and maintained by inmates.
- 11.5** At medium security level and above, all site furniture shall be secured in place. All walking surfaces shall be of monolithic material or compacted stone dust. Small and light paving materials (brick, concrete pavers, or gravel) shall not be used.
- 11.6** Positive drainage for the entire site shall be provided with the use of ditches, swales and flumes. All drainage areas shall be designed to be as shallow as possible to allow for ease of maintenance and so not to obstruct visibility.
- 11.7** The minimum grade slope shall be 3% or gradual slope where natural grade changes exist for grass and landscaped areas.
- 11.8** Vegetable gardens where provided shall be located in designated areas away from general inmate traffic and playfields. Authorized inmates are permitted access to gardens.
- 11.9** Fruit trees are not permitted on institutional grounds.
- 11.10** Sacred Grounds for sweat lodge and ceremonies shall be located in designated areas away from general inmate traffic and playfields. Only authorized inmates are given access to sacred grounds. Firewood used in ceremonies shall be stored under cover and be protected.

<sup>3</sup> CAN/CGSB-109.1M-1989 – Signage System, Extruded Aluminum, Federal Identity Program

<sup>4</sup> Page 11 – Federal Identity Program Manual – 4.3 Common-use and operational signs, Treasury Board of Canada, Secretariat, March 1990; [http://www.tbs-sct.gc.ca/fip-pcim/documents/man\\_4\\_3\\_p1.pdf](http://www.tbs-sct.gc.ca/fip-pcim/documents/man_4_3_p1.pdf)



**11.11** Snow storage areas shall be located in a manner that does not restrict drainage and visibility. A space wide enough to accommodate tractor power mowers shall be provided between trees and planting beds. Hose bibs shall be provided throughout the site as required on a project specific basis. Underground watering pipes or hoses shall not be used.

**12 PLAYFIELDS AND YARDS** Playfields, which often have a high concentration of inmates, generally have their outer bounds located adjacent to the perimeter fence. When planning playfields for new institutions or where housing unit disposition permits at existing, playfields shall be located within an interior courtyard bounded by housing units. Playfields in either location shall be distant from the Gatehouse, service buildings located on the exterior, and parking lots in order not to offer opportunities to covertly approach the perimeter fence line and throw over contraband in proximity of the playfield. Playfields shall also be located distant from Segregation and its yards and from Health Care facilities.

**12.2** Playfields are typically grassed except where the activity calls for a hard surface. Compacted fine gravel or stone dust or, a monolithic hard surface such as asphalt is acceptable.

**12.3** Mini fenced yards associated with Segregation, maximum security or special population units are provided with an engineered asphalt surface to allow use in all weather, to prevent hiding of contraband, and to facilitate maintenance. The asphalt surface shall extend beyond the containment fence by 900 mm for anti-tunnelling protection and to prevent edge fracture and removal. Poured in place concrete surface may be used on account of seasonal or installation constraints. Use of concrete may be favoured for ease of construction and maintenance where a yard is enclosed by buildings or walls where a wall is intended for screening.

## **13 FLAG AND FLAGPOST**

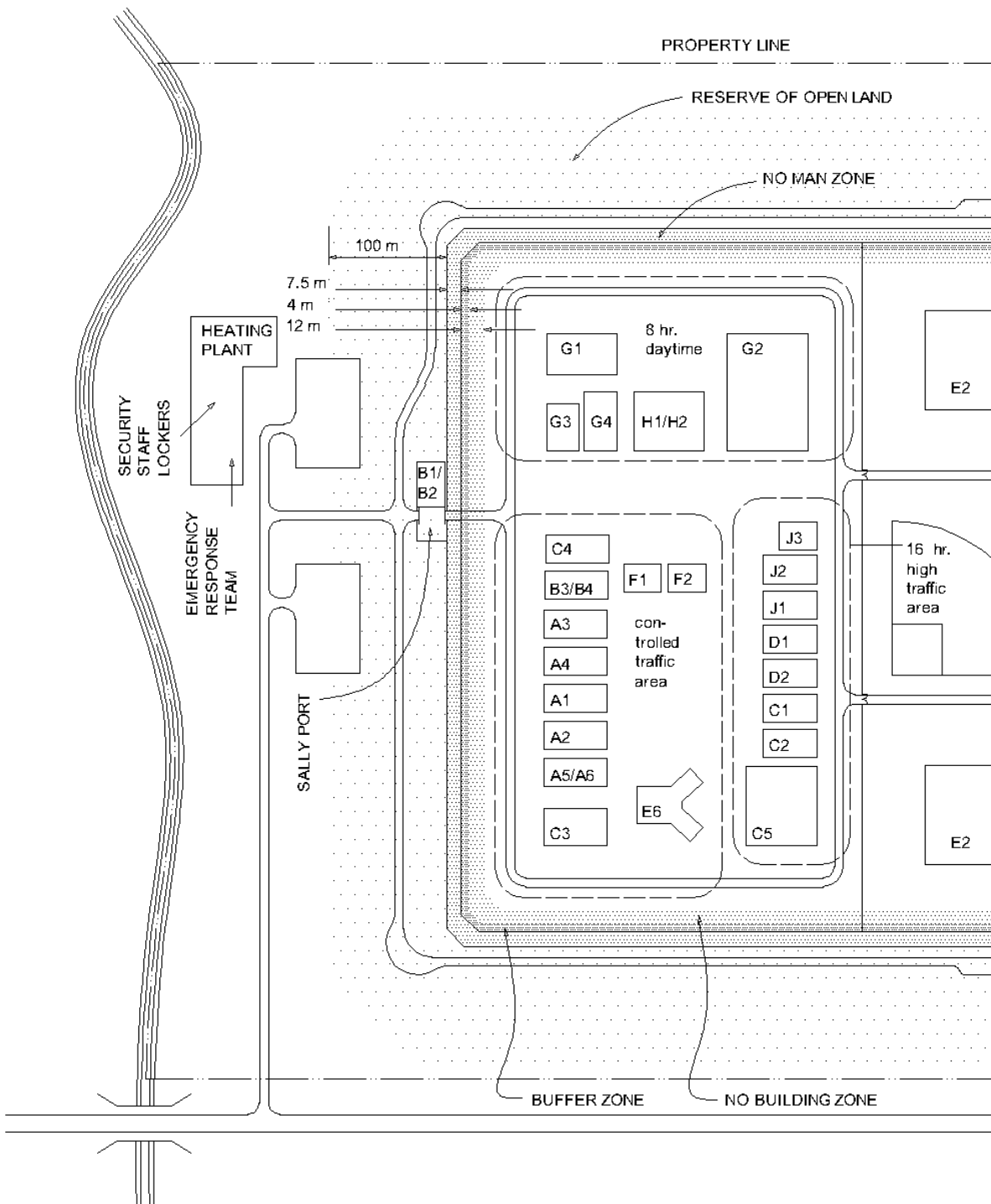
Rules and protocol for “flying the flag” are fully available at:

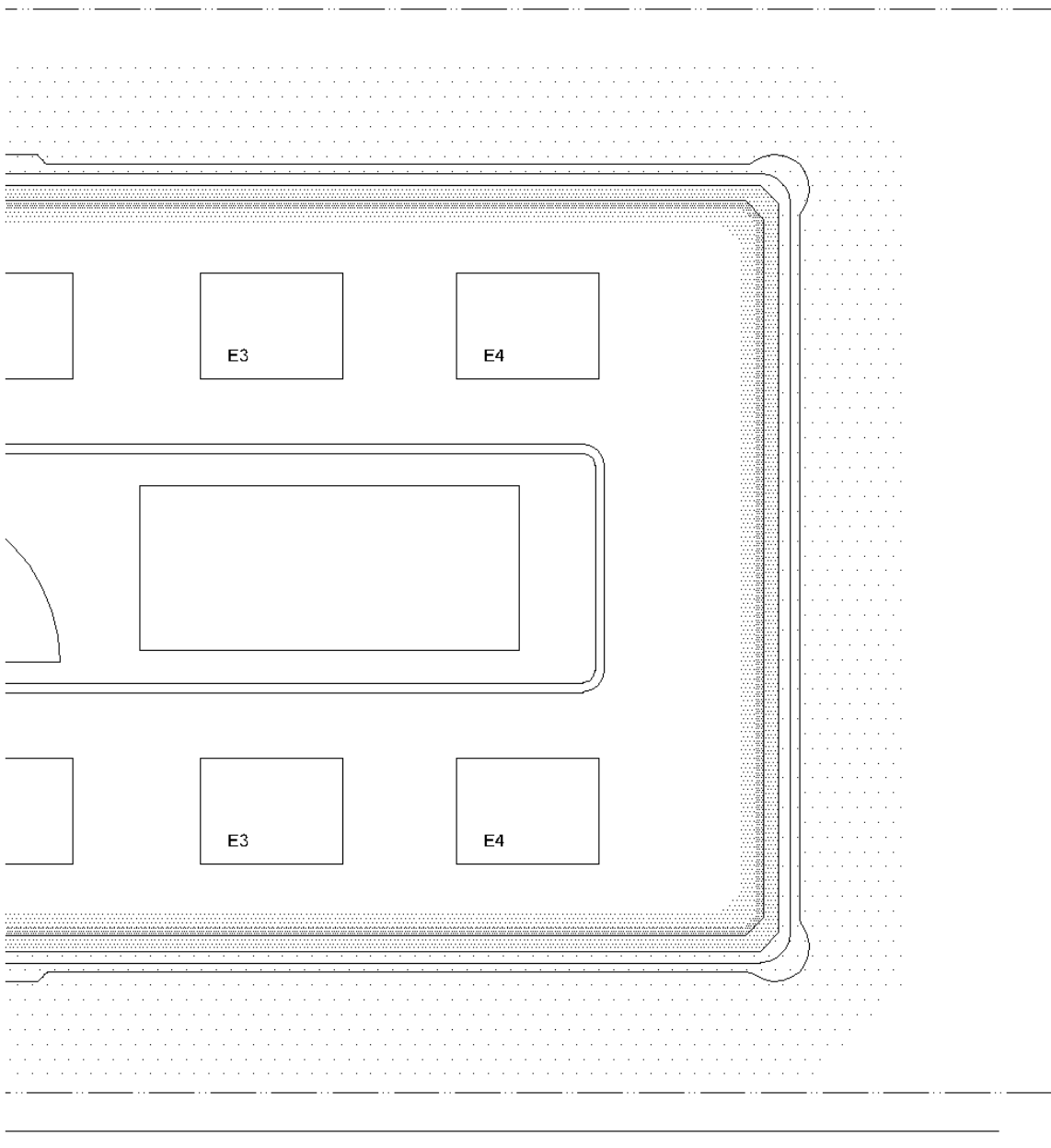
<http://www.pch.gc.ca/pgm/ceem-cced/etiqt/101-eng.cfm>

Refer to *CAN/CGSB-98.1-2003*<sup>5</sup> for the outdoor use of the National Flag of Canada.

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<sup>5</sup> CAN/CGSB-98.1-20011 – National Flag of Canada (Outdoor Use) ICS 99.020.10

**PLATE SP-1-1**



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**BLE A-1-1 – ORGANIZATION OF DEPARTMENTS****GROUP A – ADMINISTRATION**

- A1 MANAGEMENT CENTRE
- A2 FINANCE
- A3 STAFF SERVICES AND TRAINING
- A4 ADMINISTRATION AND PERSONNEL
- A5 CASE AND SENTENCE ADMINISTRATION
- A6 NATIONAL PAROLE BOARD HEARING

**GROUP B – SECURITY**

- B1 EXTERNAL CONTROL (GATEHOUSE)
- B2 EMERGENCY RESPONSE TEAM AND ARMOURY
- B3 SECURITY ADMINISTRATION
- B4 ADMISSIONS AND DISCHARGE

**GROUP C – SOCIALIZATION**

- C1 SOCIAL AND CULTURAL DEVELOPMENT
- C2 ARTS AND CRAFTS
- C3 PRIVATE FAMILY VISITING
- C4 VISITS AND CORRESPONDENCE
- C5 RECREATION

**GROUP D – SPIRITUALITY**

- D1 CHAPLAINCY
- D2 ABORIGINAL SERVICES

**GROUP E – HOUSING**

- E1 FREE EGRESS – SMALL GROUP ACCOMMODATION (S-2)
- E2 RESPONSIBILITY UNITS (S-3)
- E3 STRUCTURED SECURITY UNITS – OPEN POST / RANGE (S-4)
- E4 STRUCTURED SECURITY UNITS – CLOSED POST / RANGE (S-5)
- E5 MAXIMUM SECURITY UNITS (S-6 / S-7)
- E6 SEGREGATION UNIT
- E7 SPECIAL HANDLING UNIT

**GROUP F – HEALTH CARE**

- F1 HEALTH CARE CENTRE
- F2 MENTAL HEALTH CARE

**GROUP G – TECHNICAL SERVICES**

- G1 MAINTENANCE
- G2 FOOD SERVICES
- G3 INSTITUTIONAL SERVICES
- G4 MATERIAL MANAGEMENT

**GROUP H – OCCUPATIONAL DEVELOPMENT PROGRAMS**

- H1 OCCUPATIONAL DEVELOPMENT PROGRAMS (ODP) CORE
- H2 CORCAN

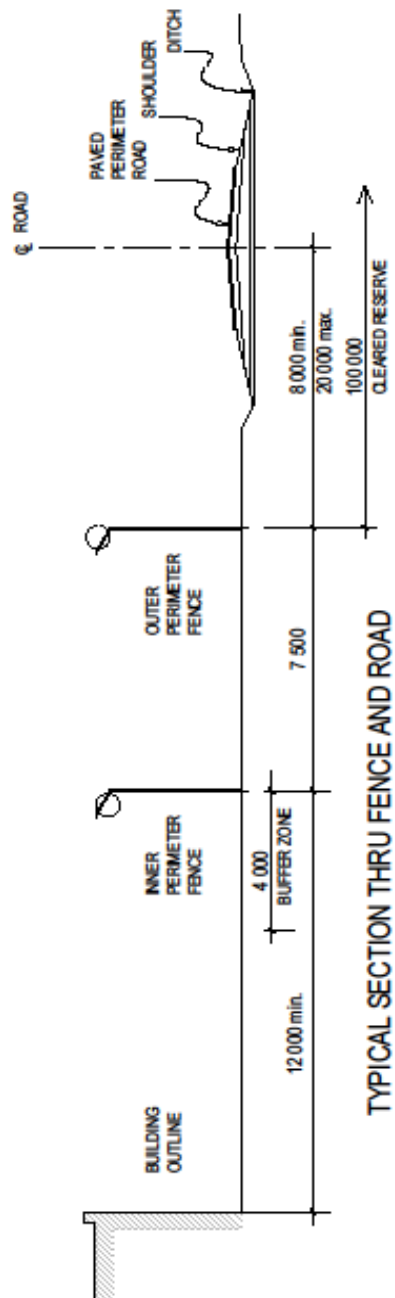
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**GROUP J – EDUCATION AND PERSONAL DEVELOPMENT**

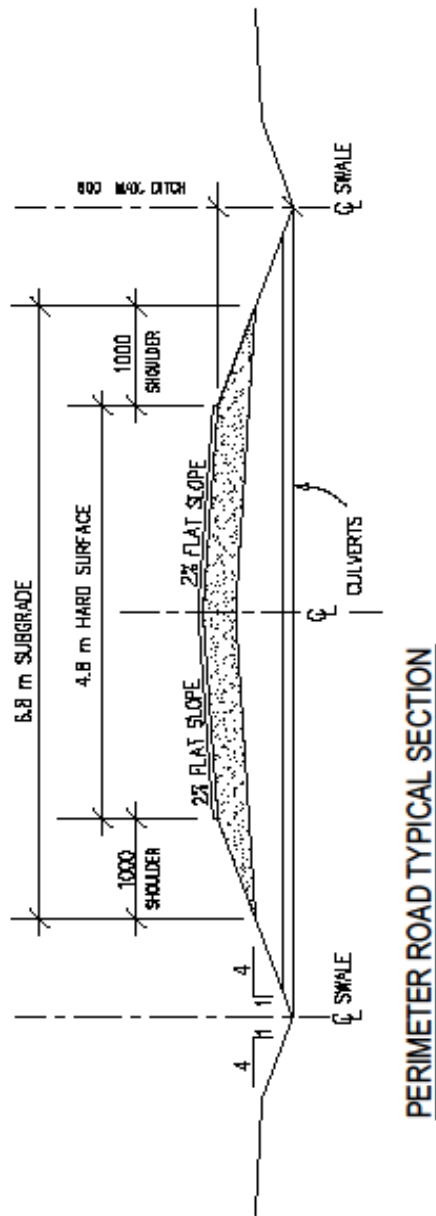
J1 EDUCATION

J2 CORRECTIONAL PROGRAMS

J3 LIBRARY



**PLATE SP -1-2 - SECTION THROUGH FENCE AND ROAD**



## SP-2 SITE - FENCE

### 1. SCOPE

This section provides performance criteria and conforming specifications for all fences related to institutions of security levels medium, maximum and multi-level inclusive. There are no special requirements for fences at minimum institutions.

It is imperative that all fence projects, either perimeter or interior, are submitted to the office of the Director Facility Planning and Standards at NHQ for review and approval.

### 2. RELATED SECTIONS

#### 2.1 *Technical Criteria Document sections:*

SP-1 – Site Planning and Development  
SP-3 – Gates/Sally Ports  
SP-4 - Exterior Lighting  
SP-5 – Traffic Circulation and Parking  
ST-1 – Guard Towers  
& any sub-section referring to the Perimeter Intrusion Detection System (P.I.D.S.)

#### 2.2 *National Master Specification Section*

01 35 13.16 – Special Project Procedures for Detention Facilities  
28 01 10 – Operation & Maintenance of Electronic Access Control & Intrusion Detection  
28 16 00 (13705) – Intrusion Detection  
32 31 13 – Chain Link Fences and Gates  
32 31 13.53 – High-Security Chain Link Fences and Gates

### 3. EXTERNAL BOUNDARY FENCES

External boundary (property) lines shall not be fenced unless specific site conditions warrant it. The type of fence in such locations will be project specific.

### 4. PERIMETER SECURITY FENCES

#### 4.1 *Performance Criteria*

- 4.1.1 The institution will be enclosed by a double chain link fence perimeter supported by intrusion detection and camera system, and mobile patrol on the exterior of the perimeter. The perimeter fences form the last physical obstacle to escape from the institution. The design of the fence system shall be such that an escapee shall not be able to breach the perimeter in less than 45 seconds. This time duration is based on a maximum time for the perimeter security mobile patrol to respond after the first signal following a detected disturbance of the fence at the Main communication control post (MCCP). The optimal reaction time for the mobile patrol is 30 seconds.
- 4.1.2 Fences shall be erected in straight lines from corner to corner for direct viewing by camera. The corners of the perimeter shall be truncated at 45° to allow suitable placement of camera poles and cameras to afford optimal viewing

between the fences and on the interior of the Inner Perimeter Fence. In addition, the truncated corners allow for a gentler curve of the patrol road.

- 4.1.3 To render climbing more difficult, the fence fabric shall be installed on the institution side of the fence posts. Sharp corners of less than 120°, shall be avoided except where fences intersect.
- 4.1.4 For fences equipped with a Fence Detection System (FDS), the fence shall balance fabric tension to ensure fabric vibration travel across posts while not causing excessive false alarms. Fabric vibration terminates at strain post locations where the fence fabric ends thus allowing zone separations for the PIDS.
- 4.1.5 Special attention shall be paid to sloped sites to ensure that gaps do not develop between the ground surface and the lower fence rail. Where necessary, due to severe ground slope longitudinally, fencing may be stepped, but the minimum height of the fence shall be maintained at all times. Ground slope across the fence line shall be minimized to prevent erosion under the perimeter fences.
- 4.1.6 Water shall be prevented from pooling between the perimeter fences, as this could affect the operation of the Motion Detection System (MDS). For special underground drainage requirements relating to perimeter fences, see sections SU-1 Storm and Sanitary Sewers.
- 4.1.7 Barbed tape concertina (BTC) wire shall be installed in such a manner that it prevents the passage of a person across the barbed coils. (See plates SP-2-2 and SP-2-3).
- 4.1.8 Where interior fences intersect the Inner Perimeter Fence, the interior fence shall be designed to prevent it from being used to aid in crossing the Inner Perimeter Fence. To achieve this, the interior fence shall be equipped with:
  - a Fence detection system (FDS) for a length of 2.5 meters. The fence fabric shall extend for that length and be connected to a strain post so that the vibration does not travel beyond.
  - and BTC on both sides on the fence No gap between posts or fabric shall exceed 125 mm.
- 4.1.9 To inhibit tunnelling under the Inner Perimeter Fence, a ground barrier shall be provided by installing either a continuous concrete footing or a concrete or asphalt sidewalk on the institution side. (See Plate SP-2-1). Roadways crossing perimeter fence lines shall be topped with asphalt which also serves as a ground barrier.
- 4.1.10 The fence system comprising foundation, line, strain, corner and gate posts shall meet local environmental conditions. Fence systems shall be engineered to resist local wind and snow conditions.
- 4.1.11 Where a building or other structure interrupts the perimeter fence run, the design to ensure perimeter integrity shall be approved by the issuing authority.
- 4.1.12 Where a perimeter comprises or integrates a wall, the design to ensure perimeter integrity shall be approved by the issuing authority.



## 4.2 Conforming Specifications

- 4.2.1 Perimeter fences shall consist of two (2) parallel fences, erected in straight lines, with a 7.5-m gravel strip between the fence lines. For retrofit installations, where it has been proven that a lesser separation has been effective, the existing spacing shall be maintained. Height of both fences, excluding overhang arms, shall be 3.6 m. Corners shall be truncated and the maximum length of the interior fence on the truncated line shall be 25 m.
- 4.2.2 No structure, with the exception of the Gatehouse and guard towers, shall be closer than 12 m to the Inner Perimeter Fence.
- 4.2.3 The area between the perimeter security fences shall be free of topsoil and be graded to a slope of 2% from the interior to the Outer Perimeter Fence. The surface will then be covered with a filter fabric and topped with a mix no larger than 20 mm crushed stone to a depth of 200 mm. For the Outer Perimeter Fence an area of 500 mm on each side of the fence shall be stabilized to a depth of 300 mm with a compaction of 95% corrected maximum dry density to hinder run off erosion and tunnelling by inmates.
- 4.2.4 All chain link fencing shall be installed in accordance with the *National Master Specification (NMS) 32 31 13*<sup>6</sup> and *CAN/CGSB-138.3-96* standard<sup>7</sup>. Where there is a conflict between the NMS and this criterion, the TCD shall prevail.
- 4.2.5 Chain link fence fabric shall conform to the following specifications<sup>8</sup>:
  - 4.2.5.1 Wire Size: 4.8 mm (min) (6 Gauge)
  - 4.2.5.2 Size of mesh: 50.8 mm
  - 4.2.5.3 Height of fence fabric: 3600 mm
  - 4.2.5.4 Barbed edges top and bottom
  - 4.2.5.5 Average mass of zinc coating to be not less than 610 g/m<sup>2</sup> of uncoated wire
  - 4.2.5.6 Breaking tensile strength to be 10,000 N·min.
- 4.2.6 Wire mesh shall be continuous from top to bottom and shall be applied on the institutional compound side of the posts.
- 4.2.7 Fence fabric shall be pulled taut before fixing in place. Tautness, when fixed in place, is to be established by pull tests. The application of a 12 kg perpendicular pull at the midpoint of the mesh panel (midpoint of posts/rails) shall show a displacement of no more than 30 mm from the fence at rest plane.
- 4.2.8 Posts, (corner, gate, strain, line) shall conform to *CAN/CGSB-138.2-96*<sup>9</sup>, galvanized steel pipe.
  - 4.2.8.1 Posts shall be spaced a maximum of 2.5 m apart.
  - 4.2.8.2 Line post minimal size shall be 73 mm O.D. 8.6 kg/m.

<sup>6</sup> National Master Specification 32 31 13 – Chain Link Fences and Gates (2004/12/31), there is also specifically Master format reference number 32 31 13.53 for High-Security Chain Link Fences And Gates

<sup>7</sup> CAN/CGSB-138.3-96 – Installation of Chain Link Fence

<sup>8</sup> Refer also to: CAN/CGSB-138.1-96 – Fabric for Chain Link Fence

<sup>9</sup> CAN/CGSB-138.2-96 -- Steel Framework for Chain Link Fence

- 4.2.8.3 Strain post minimum size shall be 114.3 mm O.D. 15.92 kg/m. Strain posts shall be spaced not more than 60 m apart.
- 4.2.8.4 Corner and gate post minimum size shall be 143.3 mm O.D. 21.0 kg/m.
- 4.2.9 Galvanized steel arms shall be provided on all posts where barbed concertina is to be installed, as shown on Plate SP-2-2 and SP-2-3.
- 4.2.10 Bottom and top rails shall be 42.2 mm O.D. minimum, 3.4 kg/m.
- 4.2.11 Tie wires shall be 3.7 mm diameter (9 gauge) galvanized steel wire to secure chain link fabric to bottom rail, top rail and line posts at 300 mm spacing.
- 4.2.12 An intermediate galvanized anchor shall be used to secure the bottom rail to the ground barrier, where such a barrier is installed. This anchor shall limit vertical movement of the bottom rail to a maximum of 125 mm.
- 4.2.13 Intermediate rails shall not be used.
- 4.2.14 Tension bars used for holding the ends of the fence fabric at the location of strain posts and corner posts shall be 5 mm x 20 mm minimum x 3600 mm galvanized steel.
- 4.2.15 Tension bar bands shall be 3 mm x 20 mm minimum galvanized steel and spaced vertically at 300 mm o.c.
- 4.2.16 Where nuts and bolts are required for fastening, nuts shall face compound exterior and be torqued tight.
- 4.2.17 Where tension cables are used at corner, end, gate, strain posts, and fittings shall be of galvanized steel.
- 4.2.18 Barbed tape concertina (B.T.C.) shall be galvanized tape 20 x 0.5 mm clenched around a 2.5 mm diameter spring steel galvanized core wire to form a concertina coil with a nominal exterior coil diameter of 710 mm. The coil, when installed, shall have a minimum diameter of 635 mm. The barbed concertina shall have 20 mm long blade type barbs measured from tip to tip of the blade, and barb clusters shall be spaced approximately 45 mm on centre (see Plate SP-2-3). The concertina shall be formed by clipping adjacent loops of single helical coils together at a minimum of three (3) points on the circumference. Clips shall be galvanized. The resulting coil, when stretched, shall form a cylindrical pattern. The loop spacing shall not exceed 230 mm.
- 4.2.19 For concertina coil support at fence top, two barbed wires stretched and fixed to post arms shall be provided. Barbed wire shall consist of two strands of 12 gauge wire with 4 point barbs at 130 mm spacing, all galvanized.
- 4.2.20 Concertina coils are to be turned onto a secondary internal fence for a distance of 2.5 m when such a fence meets the perimeter fence. (See plate SP-2-6).
- 4.2.21 Installation of barbed tape coils shall be as follows:
- 4.2.21.1 The barbed tape concertina is to be supported and tied at 230 mm spacing onto each of the barbed wire. Additional coils that are required on fences are to be tied as shown on Plate SP-2-3.

- 4.2.21.2 A second row of BTC may be installed on fence tops at existing sites due to local conditions with the approval of the issuing authority (see plate SP-2-3)

## **5. INTERIOR FENCES**

### **5.1 Area and Yard Fences**

#### **5.1.1 Performance Criteria**

- 5.1.1.1 Interior fences located at Maximum security institutions and those defining segregation yards at Mediums and Maximums shall be a maximum of 3.6 m in height topped with steel arms, barbed wire, and BTC. Other fenced areas at Medium Institutions may be topped with BTC where the fence separates inmate high activity from vehicle circulation areas and loading bays.
- 5.1.1.2 The use of fences and those topped with BTC for refuge corridors for staff evacuating housing units will be evaluated based on a Threat Risk Assessment. Proposed works must be submitted for approval to the issuing authority.
- 5.1.1.3 The use of fences and those topped with BTC for separation of housing unit types in mediums such as S-3, S-4 and S-5 will be evaluated based on a Threat Risk Assessment. Proposed works must be submitted for approval to the issuing authority. See item 6 for Separation of distinct populations as in multi-level
- 5.1.1.4 Where interior fences intersect the Inner Perimeter Fence, refer to item 4.1.8 above and plate SP-2-6.
- 5.1.1.5 Tunnelling barriers are not required on interior fences except where they are topped with BTC. Barrier type shall be compacted gravel to 300 mm on either side extending 900 mm.
- 5.1.1.6 See chapter SP-1 Site Planning and Development, item 12.3 for mini yard ground surface and anti-tunnelling protection.
- 5.1.1.7 Fences shall not be used to demarcate the buffer zone.

#### **5.1.2 Conforming Specifications**

- 5.1.2.1 Materials shall be similar to those specified for the perimeter fences (see item 4.2).
- 5.1.2.2 For fences where post steel arms or outriggers are not provided, posts shall be provided with galvanized post caps.
- 5.1.2.3 Two coils of BTC shall be installed on the top of Segregation exercise yard fence as indicated on Plate SP-2-3. A flat solid wall shall be provided where visibility and contact is at issue with approval of the issuing authority.

## **6. SEPARATION OF DISTINCT POPULATIONS IN ONE INSTITUTION (MULTI-LEVEL)**

### ***Types of Multi-level and Fencing Needs***

Multi-level institutions vary in the type of populations they accommodate. Two populations such as minimum and medium may be fully integrated with no physical separation or fencing required. Control and supervision is managed through operational means.

A second type of multi-level institution accommodates several populations, short term and assigned to a specialized program. Inmates here have limited access to the institution at large and have restricted movement. The housing units accommodating these populations are generally self-contained integrating staff and related program areas including mini yards. These units do not require fenced separation as movement outside of the units are under escort and limited to individual or small groups. Yards for these units are fenced and topped with BTC.

A third type of multi-level is where a distinct smaller population as part of a specialized program remains largely in their unit and does not mix with the general population which has normal movement to program and activity areas. The specialized program unit is also self-contained which includes mini yards. The mini yards of this unit are fenced and topped with BTC while the complete unit is separated from the rest of the institution by a fence but without BTC topping. The fenced mini yards here do not form part of the separation fence.

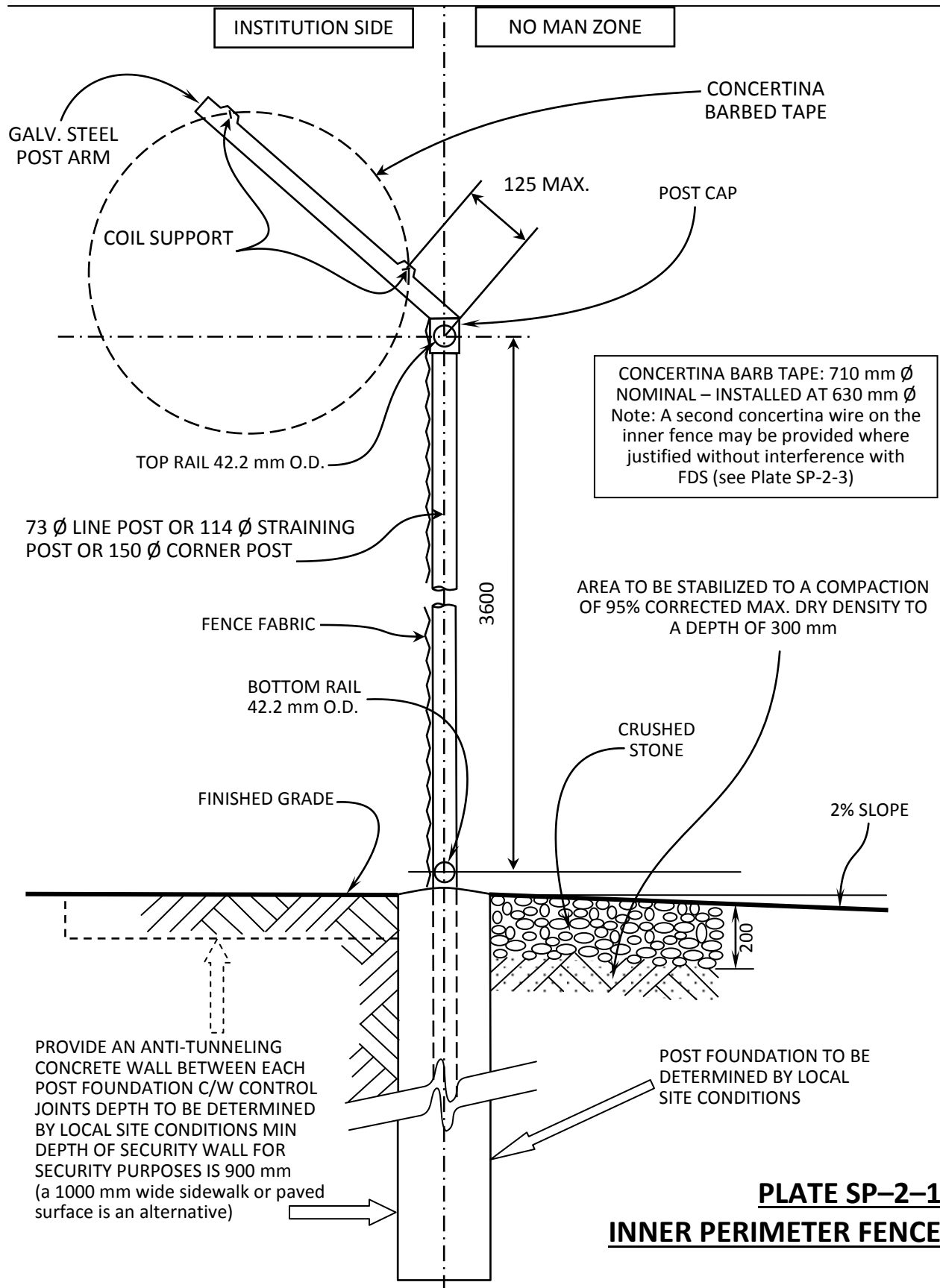
## **7. EXTERIOR SERVICE COMPOUND FENCE**

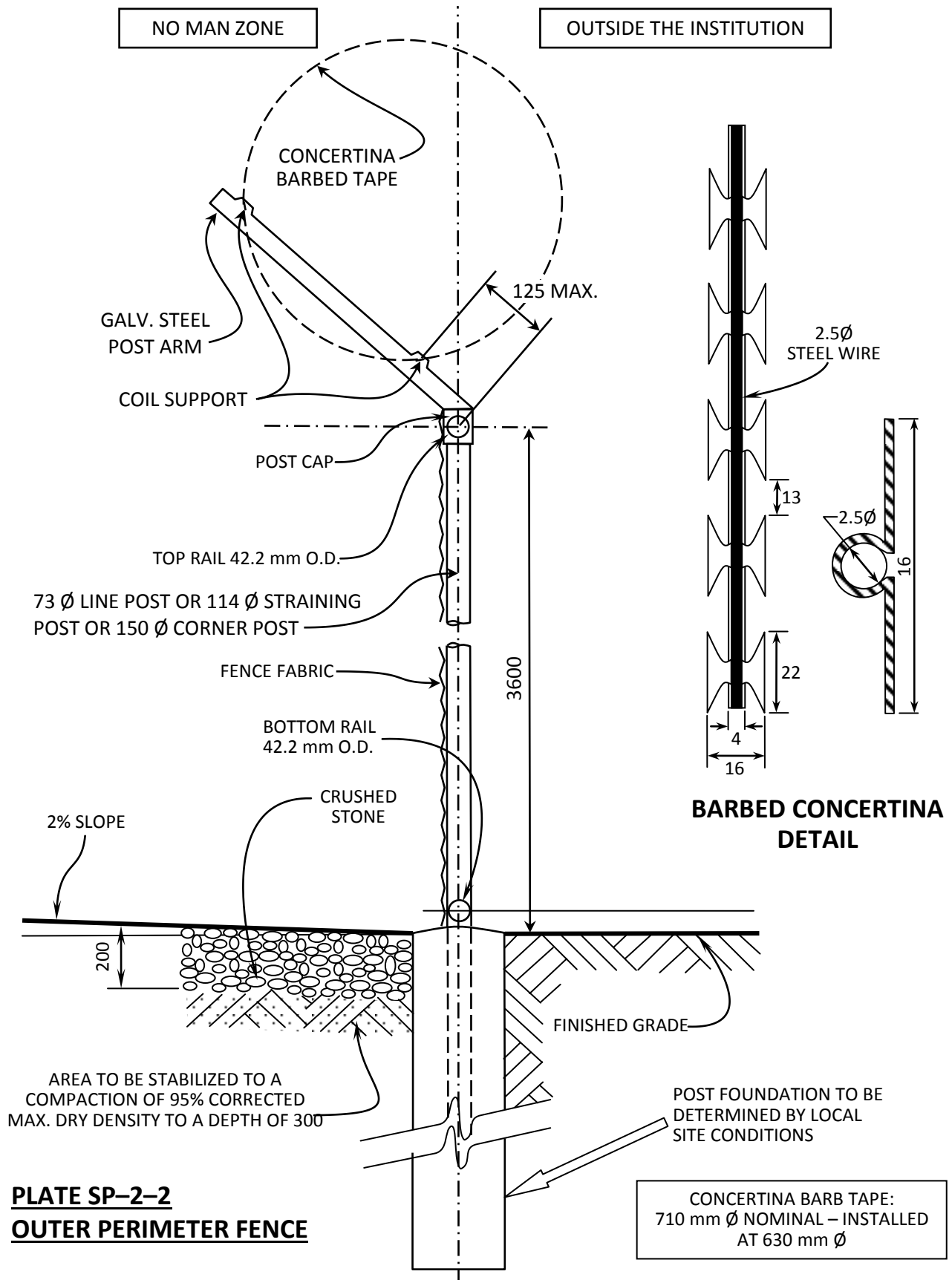
### **7.1 *Performance Criteria***

Where bulk fuel storage (propane and gasoline) is provided, the storage area shall be fenced (see section SP-5, Traffic Circulation and Parking).

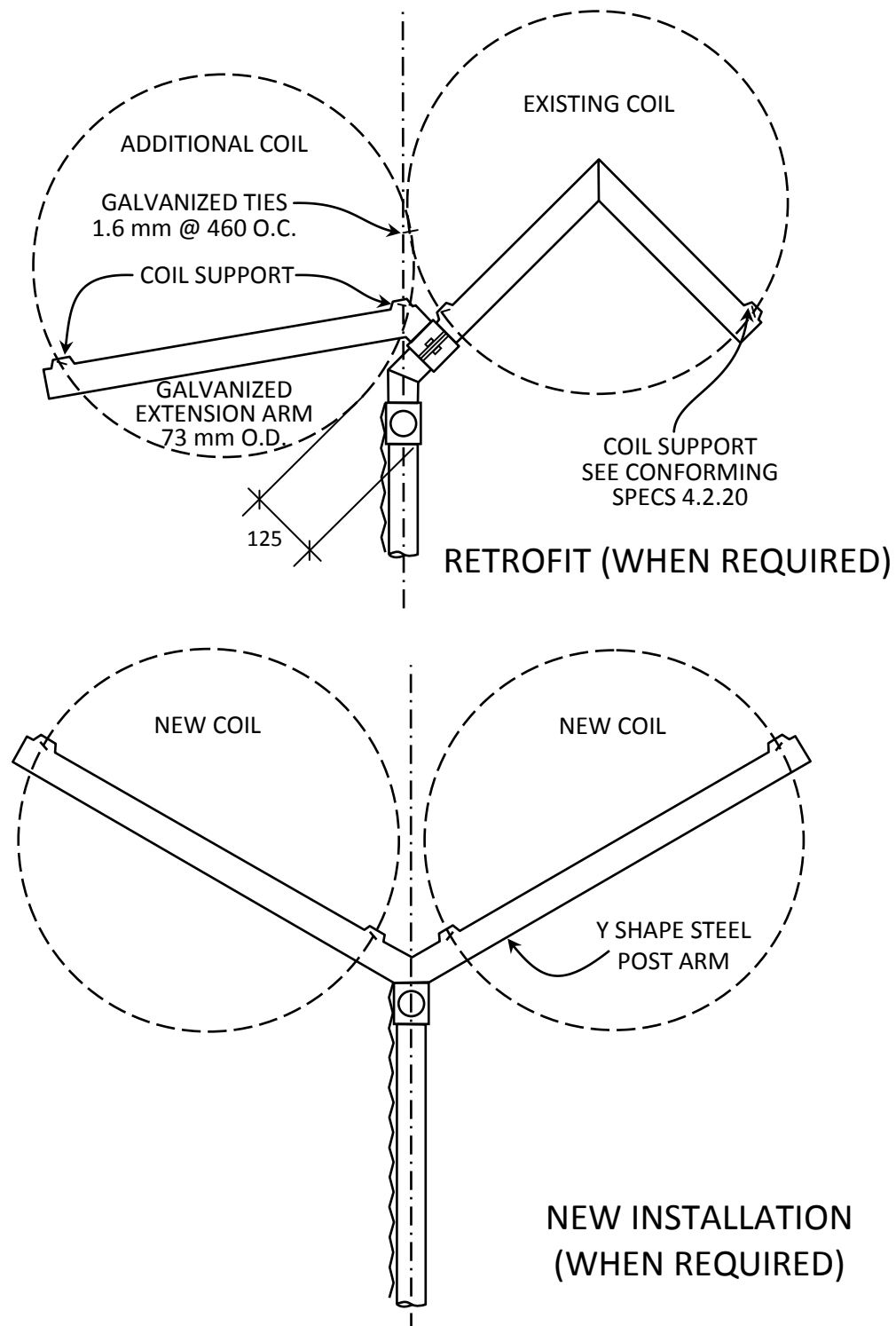
### **7.2 *Conforming Specifications***

- 7.2.1 Materials will be similar to those specified for the perimeter fences (item 4).
- 7.2.2 Fence height shall be 2.5 m.

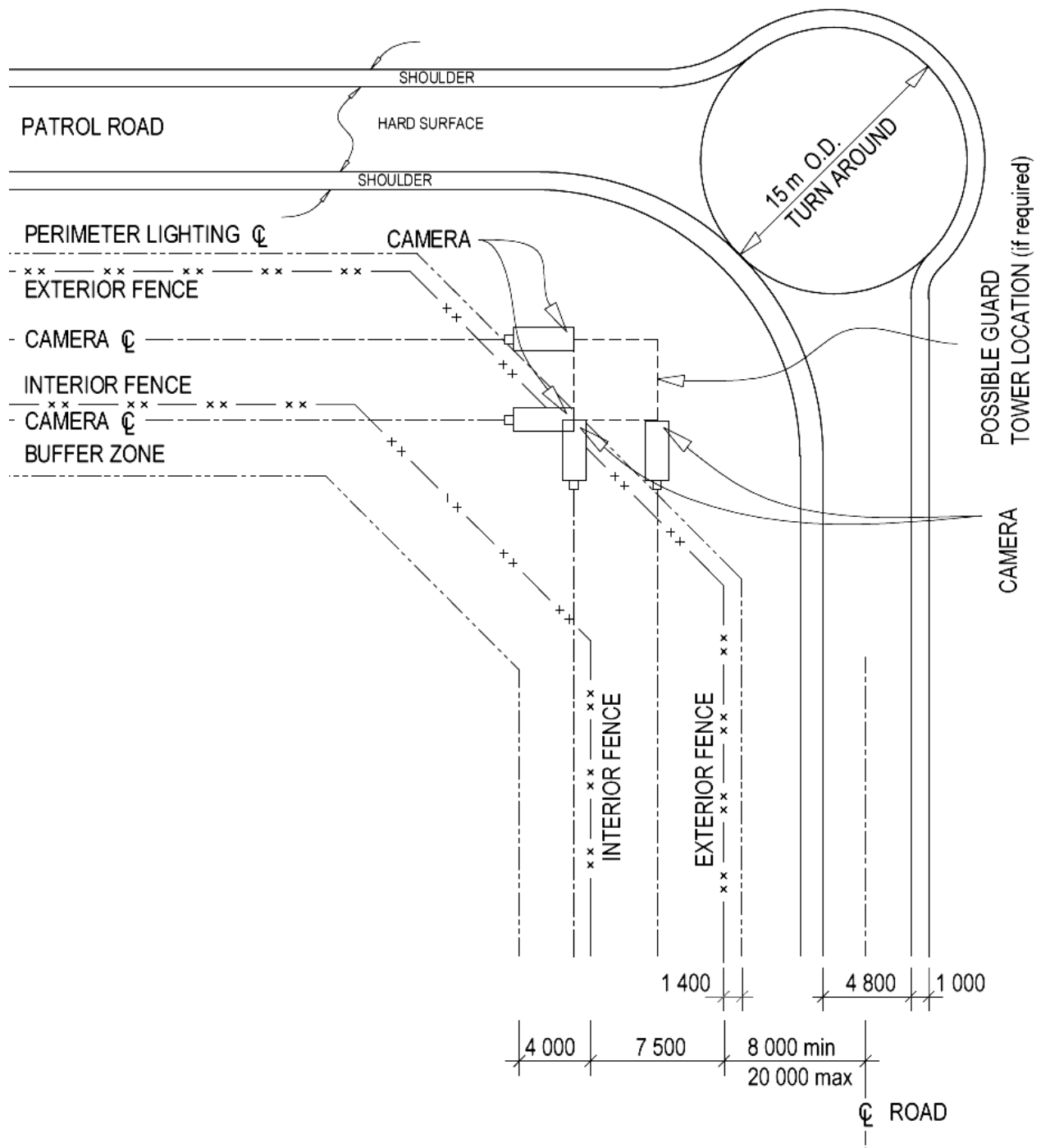




**PLATE SP-2-2**  
**OUTER PERIMETER FENCE**



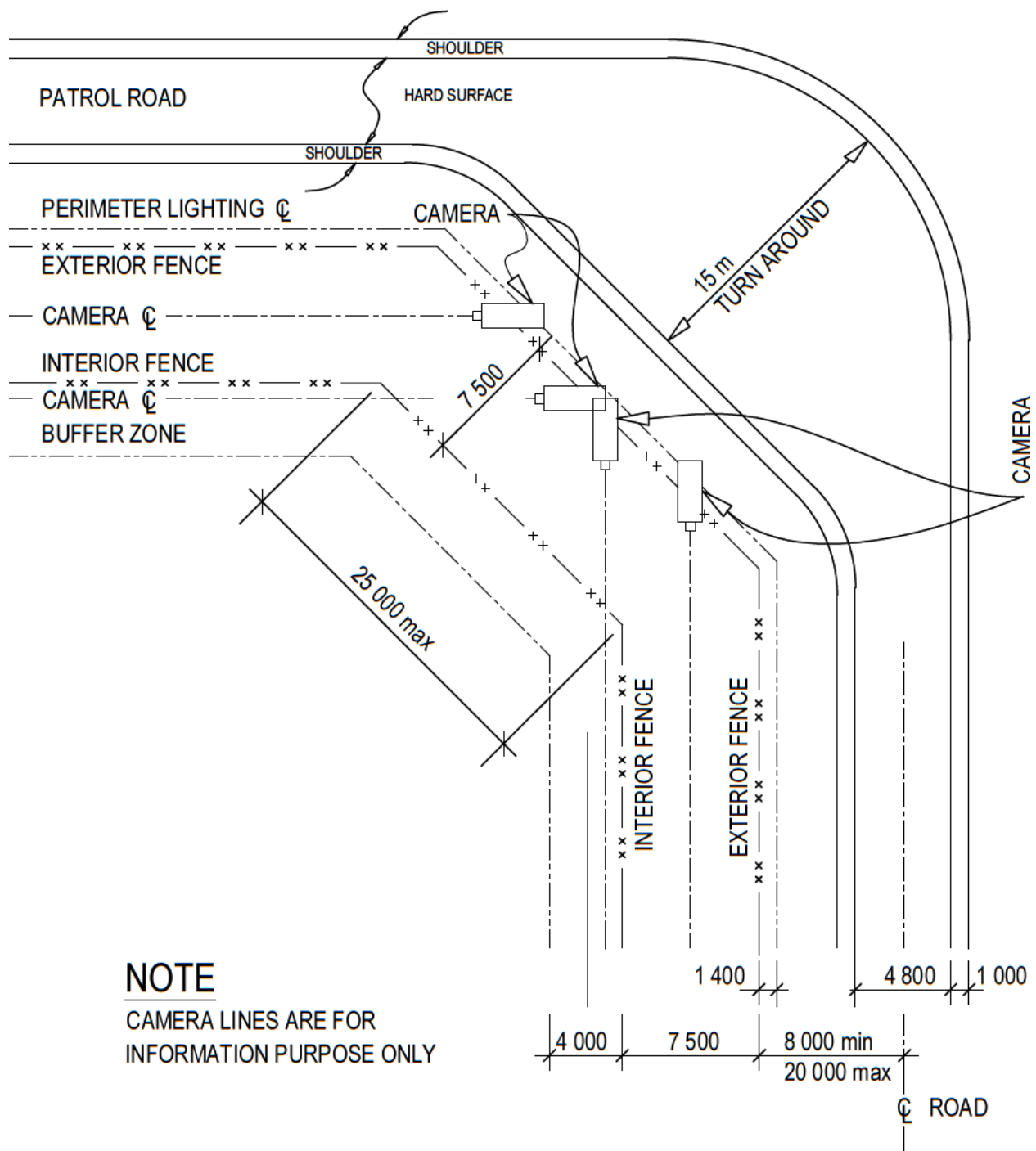
**PLATE SP-2-3 – INNER FENCE WITH A SECOND CONCERTINA TAPE**  
**CONCERTINA BARB TAPE: 710 mm Ø NOMINAL – INSTALLED AT 630 mm Ø**



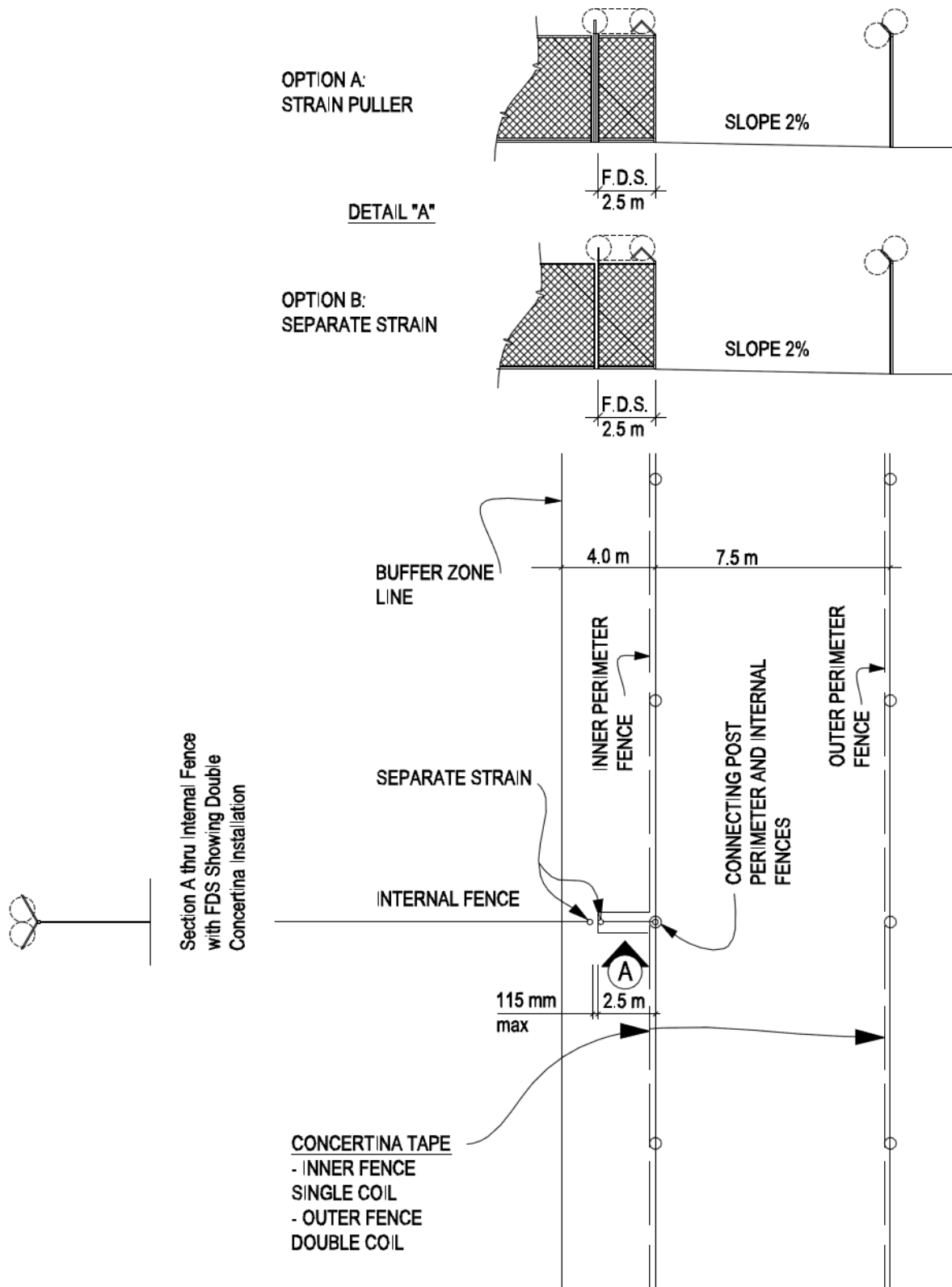
**PLATE SP-2-4 – TYPICAL PERIMETER FENCE CORNER WITH TOWER**

NOTE: CAMERA LINES ARE FOR INFORMATION PURPOSES ONLY





**PLATE SP-2-5 – TYPICAL PERIMETER FENCE CORNER WITHOUT TOWER**  
CAMERAS ARE MOUNTED ON OUTRIGGERS OVER THE CONCERTINA



**PLATE SP-2-6 – INTERNAL FENCES INTERSECTING  
THE INNER PERIMETER FENCE – DETAILS**

## SP-3 SITE – GATES/SALLY PORT

### 1. SCOPE

This section outlines requirements for vehicle and pedestrian access and egress control for institutions with a secure perimeter as at medium, maximum and multi-level institutions.

Access and egress control for open minimum institutions involves signage and reporting to a 24 hr Duty office but does not include fencing and gates. Refer to A-12 Control posts for functional requirements as well as the CSC Accommodation Guidelines.

It is imperative that all Gate projects, on either perimeter or interior fences, are submitted to the office of the Director Facility Planning and Standards at NHQ for review and approval.

### 2. RELATED SECTIONS

#### **7.3     *Technical Criteria Document sections:***

SP-1 – Site Development

SP-2 – Fences

A-6 – Hardware

A-10 – Contraband Control Systems

A-12 – Control Posts and Dedicated Security Routes

#### **2.1     *National Master Specification Section***

01 35 13.16 – Special Project Procedures for Detention Facilities

08 34 56 – Security Gates

32 31 13 – Chain Link Fences and Gates

32 31 13.53 – High-Security Chain Link Fences and Gates

34 71 13 – Vehicle Barriers

34 71 13.16 – Vehicle Crash Barriers

34 75 13.13 – Active Vehicle Barriers

#### **2.2     *ASTM Standards***

F2656-07 – Standard Test Method for Vehicle Crash Testing of Perimeter Barriers

### 3. ACCESS CONTROL SECURITY REQUIREMENTS

**3.1** All new institutions equipped with a fenced perimeter shall have one entrance point for pedestrian and vehicle traffic, referred to as the Principal Entrance.

**3.2** Because the Principal Entrance may at some time be inoperable, one Emergency Vehicle Entrance shall be provided, to be located at a point convenient for vehicle access. This Emergency Vehicle Entrance can have either a Sliding Gate (Section 5.1) or a Swing Gate (Section 5.2).

**3.3** Vehicle access shall be provided into the area between the inner and Outer Perimeter Fences for snow clearing and maintenance of the Motion Detection System (MDS). Snow build up between the fences can adversely affect the operation of the MDS.

## **4. PRINCIPAL ENTRANCE**

### **4.1 Definition**

The Principal Entrance is formed by a Gatehouse for pedestrian traffic control and an open air chain-link fence compound with inter locking gates for vehicle traffic control (vehicle Sally Port). The Gatehouse contains the Principal Entrance Control Post and a reception station from which staff supervise all traffic in and out of the institution and operate by remote control all gates and doors. For detailed requirements see A-12 Control Posts and Dedicated Security Routes. At institutions where a separate vehicle service entrance Sally Port exists, Sally Port gates are remote operated from an adjacent tower or a post within the Sally Port. The tower or ground post officer also observes the inspection of vehicles and assures the safety of the vehicle inspection officer.

- 4.1.1 All vehicle Sally Ports shall be equipped with sliding gates. The sliding gates shall be remote controlled from the Principal Entrance control post and interlocked to prevent simultaneous unlocking. The sliding gates control must provide for the opening of one of the gate only when the other gate is in its latched position. Both gates shall be also capable of manual unlocking and opening.
- 4.1.2 Vehicle Sally Ports shall be sized to include an inspection area, to facilitate a thorough inspection of vehicles, which can hold in width two van type trucks (8.5 m min.), and hold one semi trailer truck in length (23 m min.).
- 4.1.3 In order to prevent forced drive through of vehicles, the exterior gate of the vehicle Sally Port shall be equipped with a crash barrier (see section 4.4 and Plates SP-3-6 to SP-3-8). The width of the Sally Port shall be sized to accommodate the crash barrier in the open position.
- 4.1.4 All Principal Entrance pedestrian traffic shall be physically separated from vehicular traffic.
- 4.1.5 Where vehicle access into the area between the perimeter fences is provided from the vehicle Sally Port, the gates shall be swing type, manually operated and lockable with a padlock.
- 4.1.6 All pedestrian traffic through the Principal Entrance, including traffic between the vehicle Sally Port and the pedestrian Sally Port, shall be through swing gates. Principal Entrance pedestrian gates shall be remote unlocking, self closing and locking, and capable of manual unlocking.
- 4.1.7 To allow continuous CCTV coverage of the area between the perimeter fences while maintaining a minimum number of cameras, the Gatehouse building shall be sited on the outside of the Outer Perimeter Fence with one face of the building flush with that Outer Perimeter Fence.
- 4.1.8 See Plate SP-3-1 for a typical Principal Entrance layout.

### **4.2 Crash Barriers**

- 4.2.1 Crash barriers for Sally Port sliding gates shall be connected to the interior side of the exterior gate or the rack and pinion rail depending on the gate operator type and shall be operated simultaneously with the remote operation of the gate.

- 4.2.2 In order to resist vehicle impact, crash barriers shall be made of a steel I-beam or rectangular tubing supported on anti friction rollers on heavy uprights. In a test equivalent to the US Department of State K4 certification<sup>10</sup> (6 804 kg @ 48.3 km/hr or 15,000 lbs @ 30 mph) the vehicle must be inoperable after hitting the crash bar; disabling the vehicle being the main purpose.
- 4.2.3 Three heavy engineered uprights support the crash barrier and as well serve as bollards protecting the adjacent fence and gate posts. In either open or closed gate position, the crash barrier is supported by 2 uprights.
- 4.2.4 If crash barriers are used for emergency gates on the perimeter, they shall be made of a simple beam or rectangular tubing with a counter weight mechanically lifted and lockable in closed position with the use of a security padlock.
- 4.2.5 Gates having integrated crash bar or crash cables system are acceptable if they meet M30 designation of ASTM F2656-07<sup>11</sup>, K4 certification of the US Department of State (see footnote 1) or the European equivalent.
- 4.2.6 See Plates SP-3-3 to SP-3-5 for typical Sally Port crash barriers.

## 5. FENCE GATES

### 5.1 *Vehicle Sliding Gates*

- 5.1.1 The size of each gate shall provide for a 4 m wide x 4.5 m high clear opening.
- 5.1.2 Gate chain link fabric shall match perimeter fence. (See section SP-2, Fences).
- 5.1.3 Gate framing members shall be 73 mm O.D. pipe weighing 8.6 kg/m welded and drained.
- 5.1.4 Motorized gates shall be capable of moving at a speed of 150 mm/s.
- 5.1.5 Gate shall have three point locking (top, bottom and middle) or be locked by way of rack and pinion mechanism and a vertical channel to clasp the gate.
- 5.1.6 Locking column shall be equipped with an emergency manual control mechanism located for easy access.
- 5.1.7 Operator and track shall be protected and electrically heated to ensure all weather operation. In rack and pinion system (or “drive rail” operator) the teeth of the rack can be unprotected provided that they are on the lower side of the rack and visible to the operator.
- 5.1.8 Outer perimeter gates with connected crash beams shall be designed to take the additional weight into account.
- 5.1.9 For gates operated by an overhead chain drive system, a guide shall be provided at the bottom of the gate running in a channel.
- 5.1.10 Motors shall be located low to the ground to facilitate maintenance
- 5.1.11 All gate components shall be galvanized.

<sup>10</sup> US Department of State SD–STD–02.01, Revision A , March 2003, Test Method for Vehicle Crash Gate Testing of Perimeter Barriers and Gates

<sup>11</sup> ASTM F2656–07, Standard Test Method for Vehicle Crash Testing of Perimeter Barriers, M30 Designation: Medium-duty truck (M) 6800 kg @ 50 km/h

5.1.12 All security hardware shall be in accordance with chapter A-6, Hardware of the present document. All other components shall be in accordance with the Fences section of this criterion.

5.1.13 See Plates SP-3-2 and SP-3-3 for a typical gate installation.

## **5.2 Vehicle Swing Gates (Perimeter and Internal Fences)**

5.2.1 Gates shall consist of a pair of 2 m wide by 4.5 m high sections, for an opening of 4 m wide X 4.5 m high, except where municipal by law or sufficient height and width for local emergency vehicles (fire trucks) dictate otherwise<sup>12</sup>.

5.2.2 The swing direction of gates shall be based on road access design and snow removal constraints.

5.2.3 Any gap between the bottom rail of a gate and the ground shall not exceed 125 mm. Where gates are located on a fence equipped with a ground barrier, this barrier shall be continuous.

5.2.4 The chain link fabric for gates shall match that of the fence (see section SP-2, Fences).

5.2.5 Gate framing shall be as per item 5.1.3 above.

5.2.6 There shall be three gate hinges and they shall be of standard quality. Foot, mid height, and top locking shall be accomplished with either detention grade cremone lock or engineered mechanism and locked with the use of padlocks.

5.2.7 Plate SP-3-7 illustrates a typical design for vehicle swing gate.

## **5.3 Pedestrian Gates (Perimeter and Internal Fences)**

5.3.1 The size of each swing gate shall provide for a 1.2 m wide x 2.1 m high clear opening.

5.3.2 Items 5.2.2, 5.2.3 and 5.2.4 noted above for vehicle swing gates shall apply.

5.3.3 Swing gate framing members shall be 43 mm O.D. pipe weighing 3.4 kg/m.

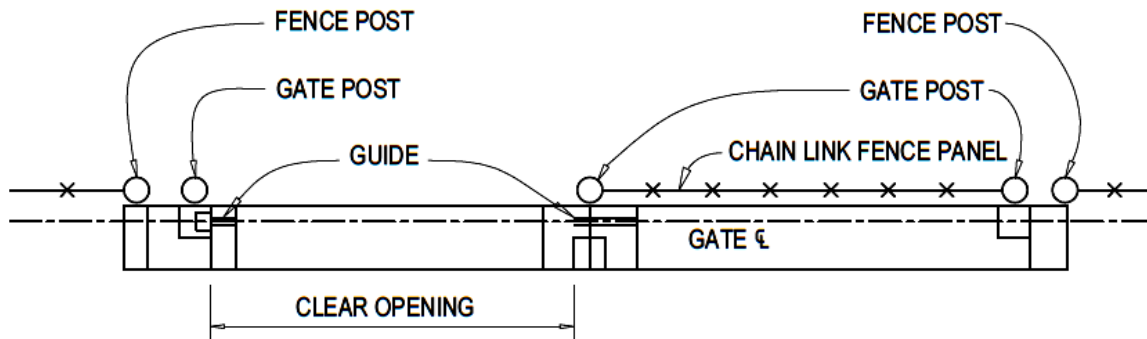
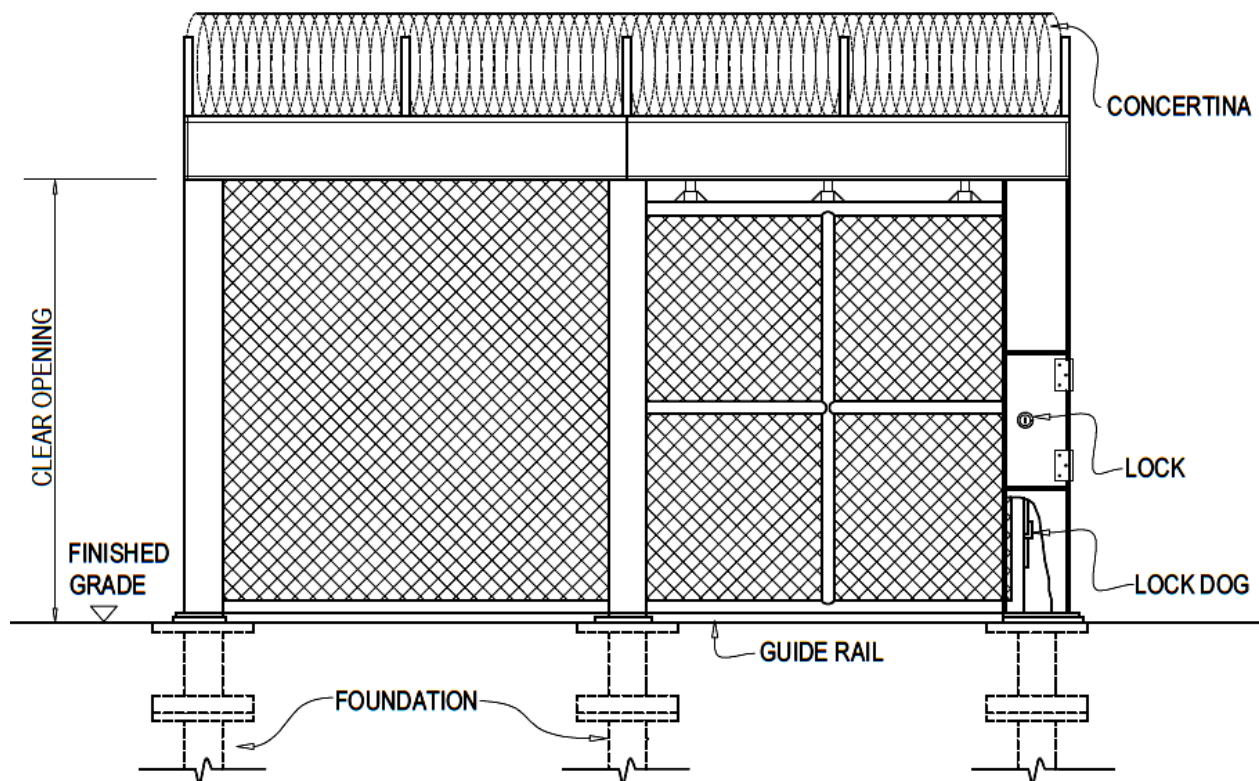
5.3.4 Swing gates shall be manually operated with security key locks when gates are used daily. Principal Entrance gates shall be remote unlocked and equipped with closers. Infrequently used gates shall be security padlocked.

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<sup>12</sup>

For example, in Ontario the *Highway Traffic Act* Section 109 stipulate a maximum height of 4.15 m by a width of 2.6 m, which is similar to the 13'-6" (4.12 m) by 8 (2.43 m) in USA.

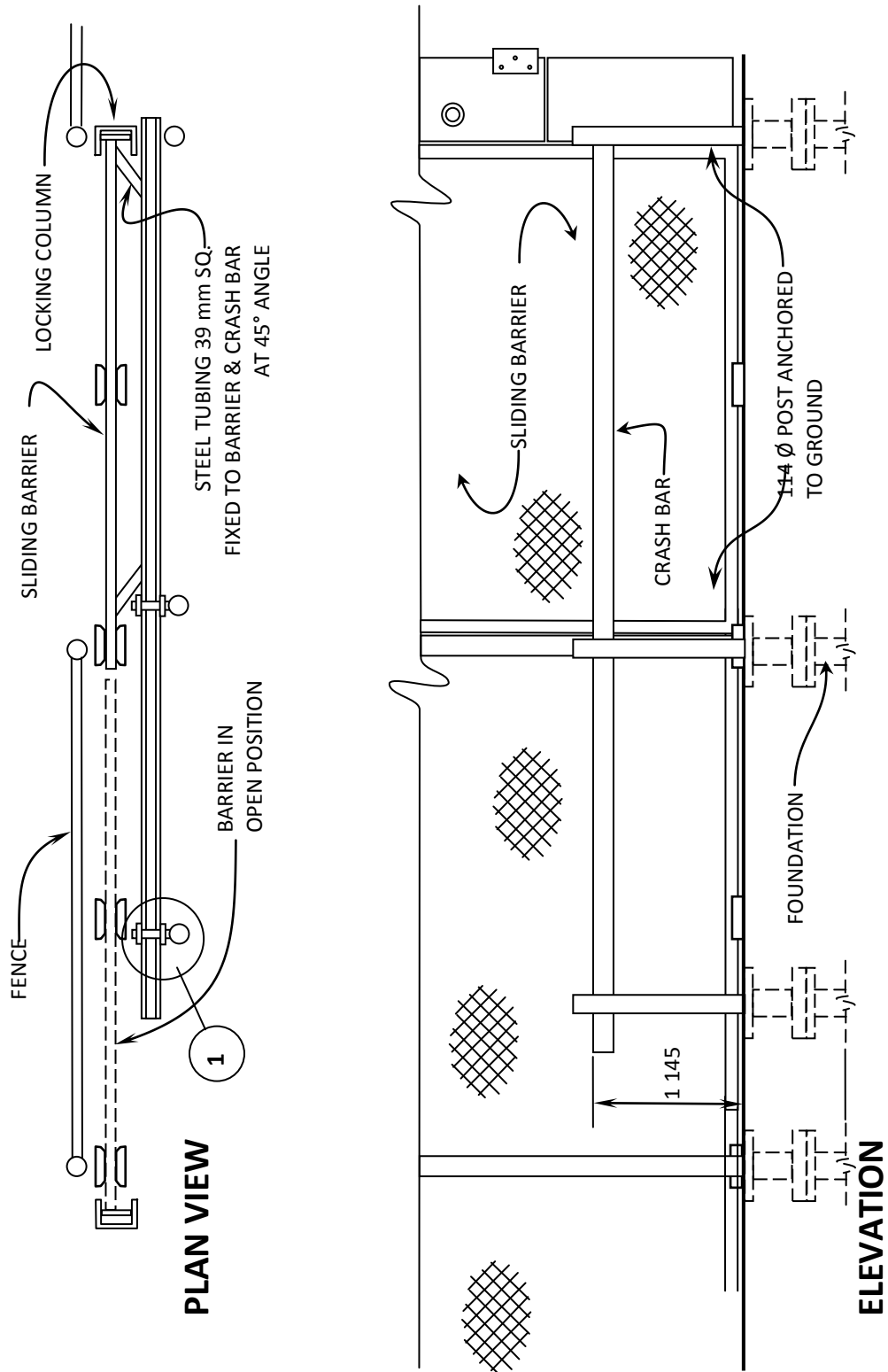


TOP VIEW

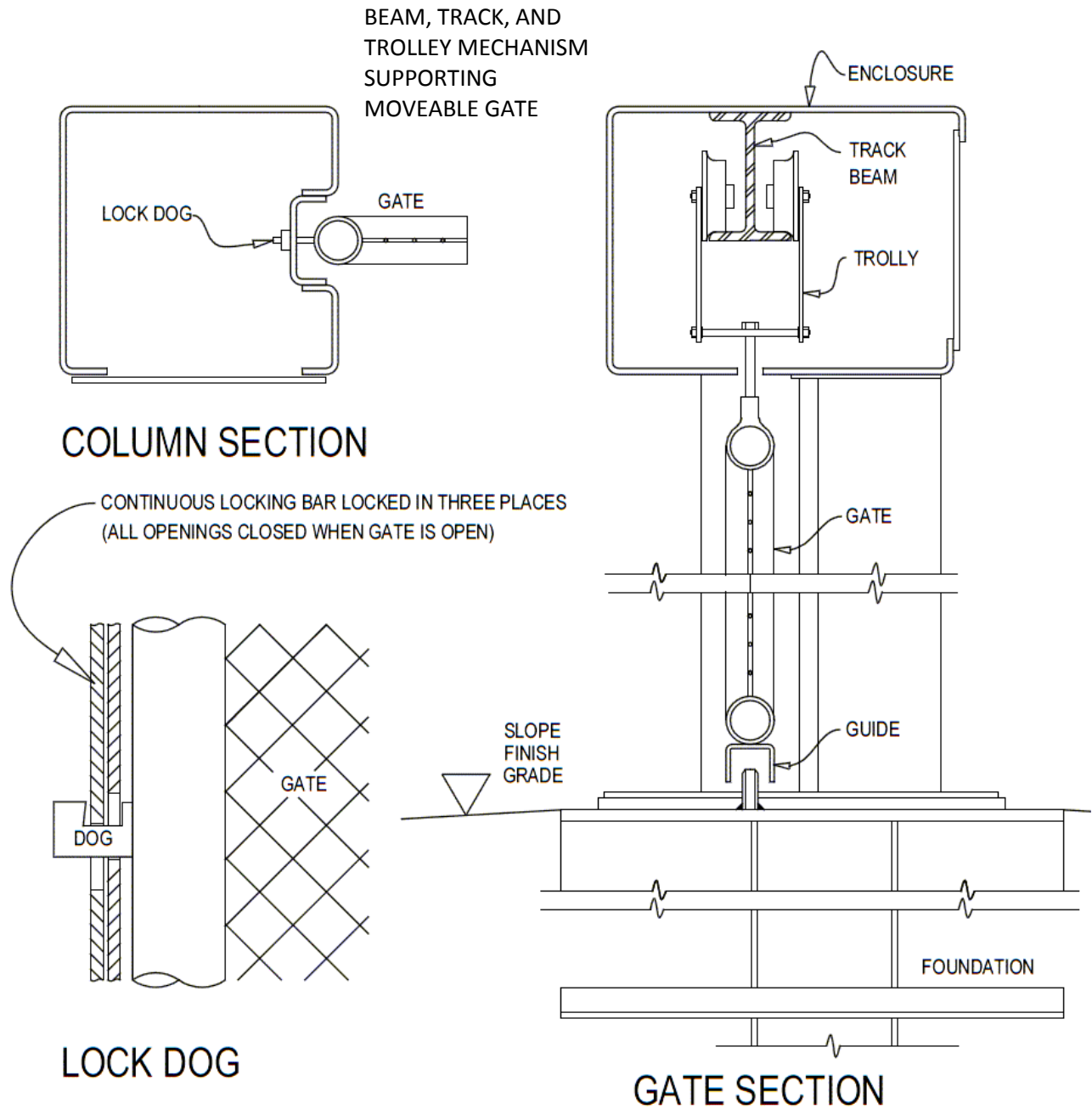
FRONT VIEW

**PLATE SP-3-2 – FENCE GATE WITH OVERHEAD CHAIN DRIVE**  
**INNER PERIMETER FENCE**

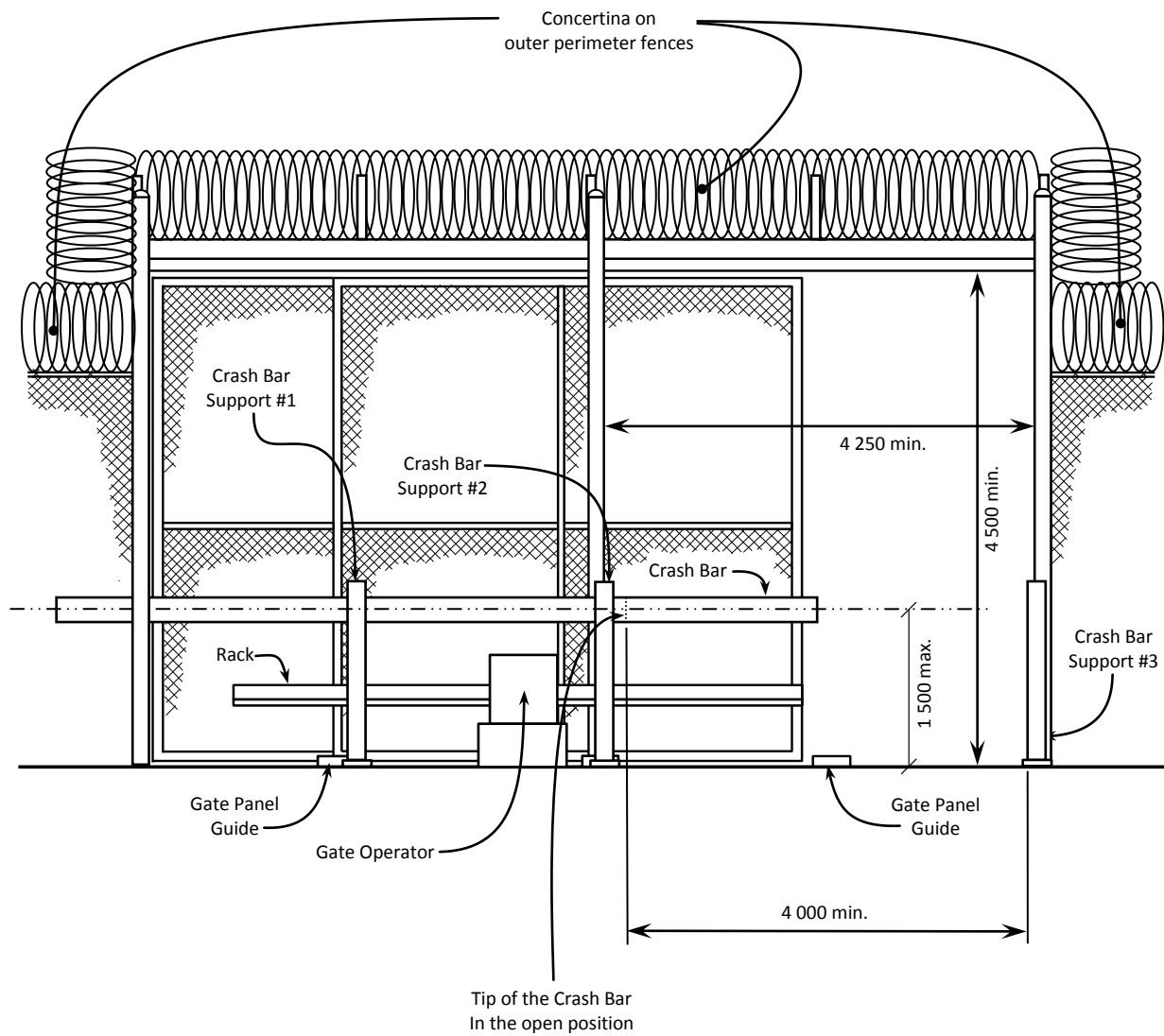




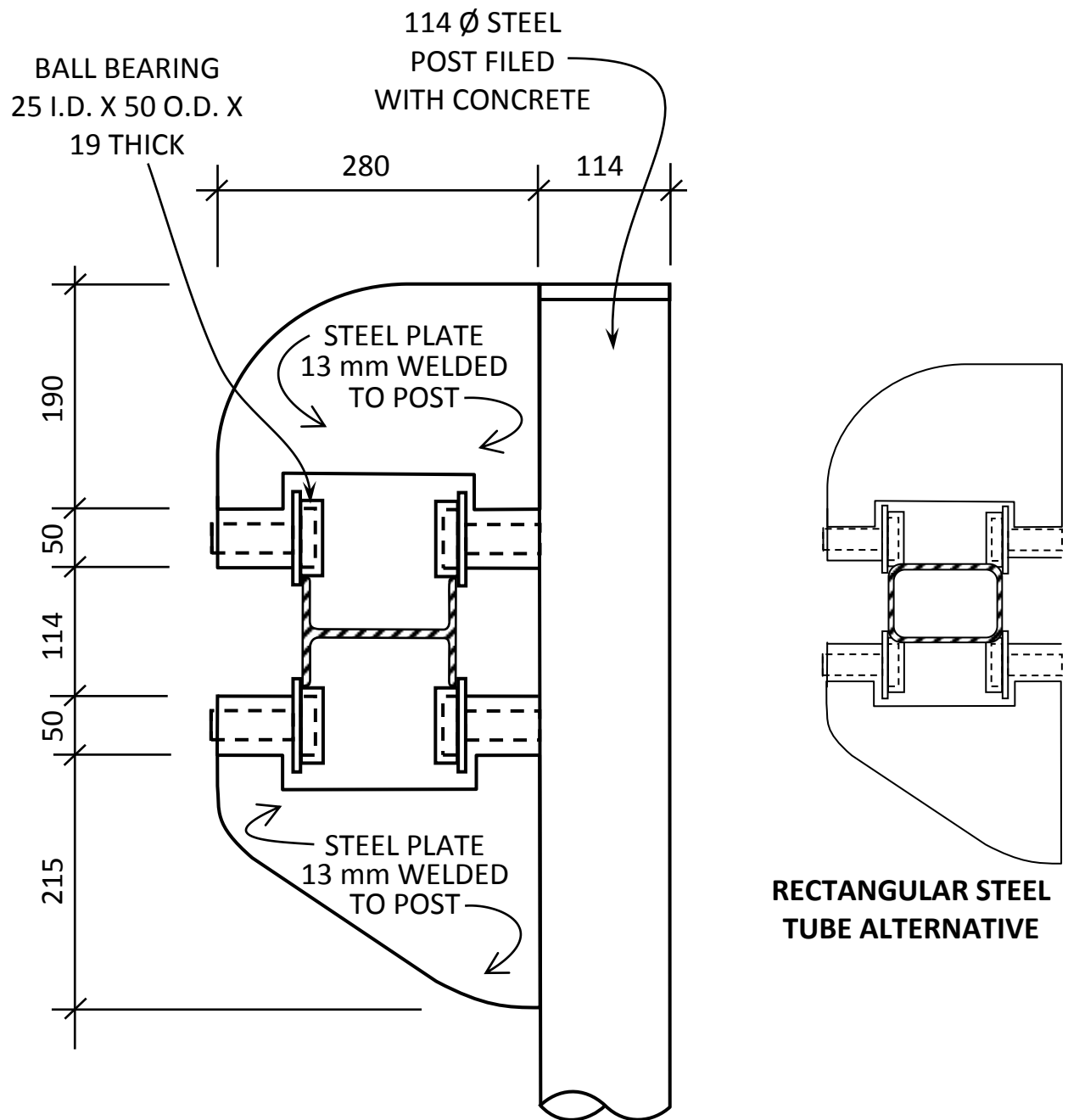
**SP-3-3 – FENCE GATE WITH OVERHEAD CHAIN DRIVE  
OUTER PERIMETER FENCE**



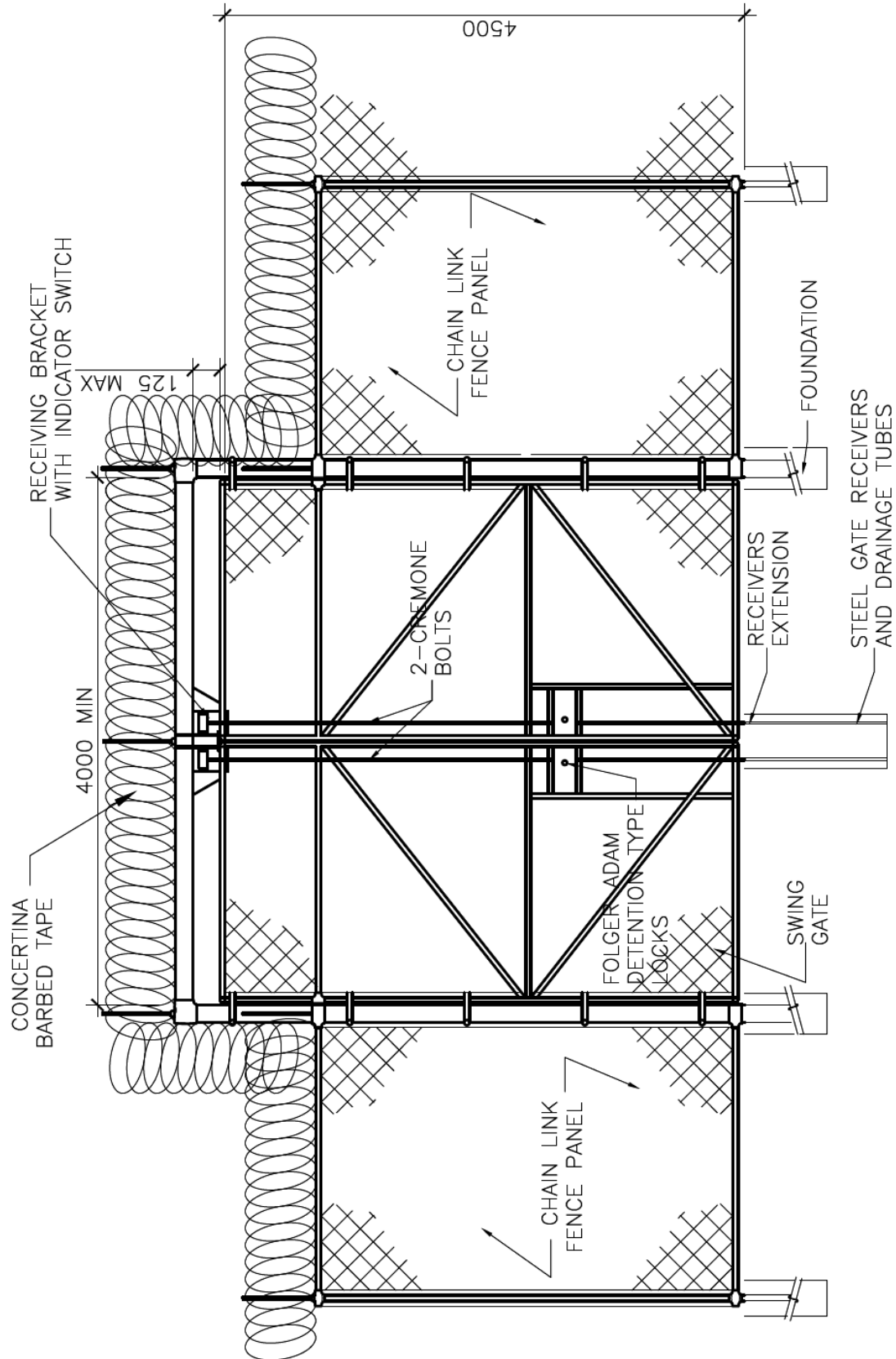
**PLATE SP-3-4 – FENCE GATE WITH OVERHEAD CHAIN DRIVE – DETAILS**



**PLATE SP-3-5 – FENCE GATE WITH RACK & PINION –**  
**INSIDE ELEVATION OUTER PERIMETER FENCE**



**PLATE SP-3-6 – CRASH BAR DETAILS**



**PLATE SP-3-7 – VEHICLE SWING GATE (EMERGENCY GATE)**



## SP-4 SITE – EXTERIOR LIGHTING

### 1. SCOPE

This section outlines the requirements for site lighting including perimeter fence lighting and provides design guidelines for the following:

- Type of lighting systems and standards.
- Recommendations for lighting levels.
- Quality of illumination.
- Recommendations for control of glare.
- Recommendations for uniformity and brightness control of the environment.

### • RELATED SECTIONS

SP-2 – Fences

SP-5 – Traffic Circulation

E-1 – General Electrical Engineering and Electrical Distribution

E-7 – Emergency Electrical

ST-1 – Guard Towers

### 2. GENERAL REQUIREMENTS

- 3.1 Exterior lighting is provided for safety and security within institutional grounds; to assist in the visual detection of escape attempts, and to permit the use of exterior amenities after daylight.
- 3.2 Exterior lighting shall be situated to minimize light entering sleeping areas.
- 3.3 Exterior lighting systems shall be designed to cast a practicably uniform level of lighting, free of shadows or dark spots and with minimal glare.
- 3.4 Energy saving features and systems shall be used in accordance with government policy.
- 3.5 Levels of illumination herein presented refer to average and avg./min. ratio values for either horizontal, ground level, or vertical illumination, unless otherwise stated. Local conditions may make it necessary to adjust values.
- 3.6 Lighting is provided to assist CCTV and vehicle patrol monitoring on the perimeter.
- 3.7 Systems shall be designed to withstand a wind velocity of 160 km/h and ice loading characteristic of the area in which the institution is located.
- 3.8 All security lighting systems shall be equipped with automatic control and manual override. The manual override shall reset itself to the automatic mode after it has been left in the manual mode for 24 hours. Recreational lighting controls shall be manual only.

### 3. APPLICATIONS

Exterior lighting is designed to provide illumination of the following:

- Signage
- Entranceways and exits, including exterior stairways and ramps
- Pedestrian walks
- Institutional Grounds
- Parking lots and roadways
- Outdoor amenity areas
- Perimeter fences (and walls).

## 4. PERFORMANCE REQUIREMENTS

### 5.1 *Security Lighting*

#### 5.1.1 Lighting requiring Emergency Power Source

5.1.1.1 Perimeter Fence Lighting System - Special requirements for the perimeter system are covered in item 5.2.

5.1.1.2 Medium and Maximum security institutions. – the entire area within the inner perimeter fence illuminated to 10 lx average to allow silhouetting surveillance.

#### 5.1.2 Illumination

5.1.2.1 Entrances and Sally Ports shall be illuminated to allow recognition of persons entering the institution after daylight hours. Fixture placement shall not impede optimal visibility. The Entrance and Sally Ports shall generally have an illumination level matching that of the perimeter fence.

5.1.2.2 Glare Control -.Lighting system shall be engineered to ensure that spill light will not produce a glare problem without affecting the minimum illumination levels.

5.1.2.3 Uniformity – The placement of the luminaires should be arranged so as to ensure good uniformity of illumination over the area illuminated. Uniformity is expressed as the ratio of average illumination to minimum. In the area between perimeter fences the ratio should not exceed 3:1.

5.1.2.4 Luminaires – Exterior security lighting fixtures shall be based on the following requirements:

- a) Shatterproof lenses and vandal resistant housings
- b) Non yellowing lenses
- c) Pole, luminaires and brackets capable of withstanding the force of 160 km/h wind
- d) Lighting fixtures location to facilitate replacement of components.

5.1.2.5 Electrical System – The electrical system must meet the following minimum requirements.

- a) The security lighting system including the perimeter fence lighting shall be connected to the standby power system for continuity of service.
- b) Grounding methods shall meet the requirements of the Canadian Electrical Code, CSA C22.1 2012 <sup>1</sup>.
- c) Protect each phase with dedicated single phase circuit breaker. This will prevent the possibility of a fault on one phase affecting the other two.

5.1.2.6 Codes and Standards – Installation shall comply with the latest edition of the Canadian Electrical Code, Part 1, CSA C22.1-2012 (see footnote 1) and any applicable local or provincial regulation. Requirements outlined herein however, shall take precedence.

### 5.2 *Perimeter Fence Lighting*

#### 5.2.1 General

5.2.1.1 Security Lighting for Perimeter Fences shall:



- a) Discourage or deter escape attempts.
- b) Make detection certain should an escape be attempted within the immediate area of the perimeter fence.
- c) Avoid glare that can impact good visibility while not adversely affecting surrounding area.
- d) Ensure high system reliability.
- e) Meet levels of illumination indicated in Plates SP-4-2 and SP-4-6.
- f) Have automatic control.
- g) Consist of poles, lighting equipment and components located outside the double security fences and be made vandal or sabotage proof.
- h) Be connected to the standby power system for continuity of service.
- i) Provide minimum illumination level of 10 lx to the centre line of the perimeter road (typically between 8 m and 20 m from the edge of the outer perimeter fence).

#### 5.2.2 Design

Perimeter Fence Lighting System shall be designed to achieve and maintain lighting quality based on the following factors and considerations:

- 5.2.2.1 Institutions are typically located in remote areas with little light from off property. Therefore, the lighting system shall autonomously enable clear viewing within the illuminated area of the fence line.
- 5.2.2.2 The height of the perimeter fences, the distance between fences and any structures such as guard towers or CCTV towers will impact the design of the security lighting system pertaining to the height of the poles and the mounting height of the fixtures.
- 5.2.2.3 A maintenance factor shall be applied in the design calculation to make allowance for luminaire dirt and any depreciation. Also consider weather conditions which will adversely affect visibility.

#### 5.2.3 Luminaire Type

- 5.2.3.1 LED Luminaires– The current choice for lighting is Light Emitting Diode (LED) These will normally be fully operable between -40°C (or less) and + 50°C (or more) and emit a white or bluish bright light of superior quality which enhances vision and colour distinction. See Plate SP-4-6 for LED layout. LED Luminaires are specified as follows:
  - a) Mounted directly onto posts at a 9m of height.
  - b) Type Short II diffusion pattern.
  - c) 100 000 hours or higher rated lifetime.
  - d) Colour temperature between 4000K and 5700K.
  - e) 90 lumens/Watt or better
  - f) CRI ≥80
  - g) Corrosion resistant finish of all materials of the fixture.
  - h) Integral 10kV surge protection in accordance to IEEE/ANSI C62.412
  - i) Power factor of 0.9 or greater.
  - j) Total harmonic distortion of 20% or lower.
  - k) IP66 rated fixture
  - l) Meets ANSI C136.31-2001 standard for vibration resistance
  - m) Designed to operate at temperature from -40°C.

- n) cULus listed.
- o) LED modules and driver to meet **CSA-C22.2 No. 250.13-12**
- p) LM-79 and LM-80 tested.
- q) Valid IES photometric data file.
- r) 10 years warranty on all parts.

5.2.3.2 Low Pressure Sodium is being used in most existing CSC institutions for perimeter lighting. See Plate SP-4-2 and SP-4-3 for layout.

Sodium Luminaires, Lamps and Ballasts – Sodium lamps are specified as follows:

- a) Type 135 W SOX low pressure sodium, with separate ballast, available from Philips series SDP 828 or approved equal.
- b) With “unitized” cast aluminium housing free of welds, butt joints and lapped corners with baked enamel finish, anodized aluminium reflector and a clear acrylic diffuser.
- c) With HRC fuse rating as per ballast manufacturer and installed in the transformer base for protection of each luminaire.
- d) With stainless steel hardware on the outside and corrosion resistant finish of all materials inside the fixture.
- e) With an optical system protected by a neoprene gasket to keep out dust and moisture.
- f) With guard for protection against excessive vibration by using porcelain lampholder and a spring steel plastic coated lamp support.
- g) With a T-21 bulb providing 21,500 lm output (minimum) and an average rated life of 15,000 hours.
- h) With ballasts designed and manufactured to meet *CSA C22.2 No. 74-96 (R2005)*<sup>13</sup>, *ANSI Standard C82.1-2004*<sup>14</sup> and CBM Standard. Ballast rated voltage shall match supply current voltage and voltage ratings of the lamps. Ballasts to have a power factor correction to a minimum of 90%.
- i) With ballasts designed to operate 135 W low pressure SOX sodium lamps at minus 40°C and to maintain lamp wattage within 8% of nominal with a supply line fluctuation of 20%.
- j) With ballast of constant wattage auto transformer type.

5.2.4 Poles are specified as follows:

5.2.4.1 Octagonal tapered of steel complete with transformer bases, eye bolts and gasketed electrical outlet boxes.

5.2.4.2 Hot dipped galvanized on interior and exterior surfaces as per *ASTM A123-09* and hot dipped galvanized anchor bolts and hardware accessories where possible.

5.2.4.3 Height and luminaire spacing to match type of lighting system as shown on Plates SP-4-3 & SP-4-6.

<sup>13</sup> CAN/CSA-C22.2 No. 74-96 (R2005) – Equipment for Use with Electric Discharge Lamps

<sup>14</sup> ANSI C82.1-2004 – American National Standard for Lamp Ballasts – Line Frequency Fluorescent Lamp Ballasts

- 5.2.4.4 Hardwood plywood template for retaining anchor bolts when grouting them in place in the concrete base.
- 5.2.4.5 With non-shrink grout.
- 5.2.4.6 Transformer base plates drilled in the manufacturer's plant to match the anchor bolt configuration set in the bases.
- 5.2.4.7 Access doors in the transformer bases are c/w gasket and use tamperproof hardware for securing doors in place.
- 5.2.4.8 Transformer base oriented so that their access doors are parallel to but facing away from the fence.
- 5.2.4.9 Yellow PVC guards installed on the guy wires on the anchor poles terminating the linear sections of the spans (applies to catenary system where used).
- 5.2.4.10 For grounding requirement specify:
  - a) 10 mm threaded copper grounding stud welded to the inside of each transformer base at the back and above the bottom of the door opening. Ground studs are supplied complete with two nuts, one lock washer and one copper clamp type lug for minimum 13 mm<sup>2</sup> stranded bare copper wire.
  - b) Ground studs welded to the transformer bases in such a manner as to present a smooth surface on the exterior of the bases.
- 5.2.4.11 Aluminium nameplate located one foot above its base to include the manufacturer's name or identification mark, year of manufacture, pole length and ordering reference number.
- 5.2.4.12 Shims for levelling consisting of one 1.5 mm and two "U" shaped 3 mm.

#### 5.2.5 Catenary System

Only to be used for low pressure sodium light system as illustrated SP-4-3. In specifying the catenary system, consider the following requirements:

- 5.2.5.1 The system shall be capable of withstanding a wind velocity of 160 km/h and ice loading characteristics of the area and a luminaire dead weight of not less than 9 kg and a projected area of 0.3 m<sup>2</sup>
- 5.2.5.2 Maintain total linear balance by anchoring the terminal poles of each linear section as shown in Plates SP-4-4 & SP-4-5.
- 5.2.5.3 The catenary (upper) and the messenger (lower) cables shall be 9 mm nominal diameter.
- 5.2.5.4 The strainer (vertical) and suspension cables shall be a minimum 3 mm diameter stainless steel.
- 5.2.5.5 Electrical cable assembly shall spiral around the messenger cable. Electrical cable shall be XLPE insulated stranded copper conductors in multi cord cable assembly with overall PVC jacket.
- 5.2.5.6 Provide 3 luminaires in each span of 30 m as shown in Plates SP-4-2 and SP-4-3 resulting in a luminaire every 10 m.
- 5.2.5.7 All hardware including turnbuckles, wire rope, clamps, etc., to be hot dipped galvanized steel.

#### 5.2.6 Pole Mounted Luminaires and Lamps

- 5.2.6.1 Distance between luminaires shall be based on Light diffusion modelling using approved lighting, their manufacturers and fixtures. Plate SP-4-6

illustrates existing installation characteristics for pole mounted luminaires.

#### 5.2.7 Controls

Perimeter fence lighting shall be controlled by a photo cell and meet the following requirements:

5.2.7.1 A photo control unit shall automatically turn on the security fence lighting system.

5.2.7.2 The weatherproof unit capable of operating over a range of -60°C to +55°C shall be mounted on a fence lighting pole located closest to the Gatehouse.

5.2.7.3 The control shall energize the lamps on a preset (adjustable) value.

5.2.7.4 A manual control override turns the lights on and off as required.

5.2.7.5 The system shall operate on stand-by power and “be fail-secure”.

5.2.7.6 Controls shall be connected in parallel with the “ON” contacts of the “ON OFF” selector switch located as specified.

5.2.7.7 The photo control shall have a standard NEMA twist lock plug.

5.2.7.8 The photocell shall be temperature stabilized pre-aged and hermetically sealed.

5.2.7.9 The Installation Contractor shall adjust the photo control unit to switch on at not less than 40 lx. The unit shall be rated 1000 W incandescent, 120 volts, 60 HZ and CSA approved.

### 5.3 Other Exterior Lighting

5.3.1 Luminaire type - Lighting type shall be selected based on energy efficiency, economy and accepted practices for Recreational Areas, Parking Lots, Signage, Roads and sidewalks, Building entranceways and exits, and Institutional grounds. Luminaires must be fully operable between -40°C (or less) and + 50°C (or more).

5.3.2 Illumination Levels - The light levels requirements should be adapted for an LED technology conversion according to ***I.E.S. Handbook 10th Edition***

5.3.2.1 Recreation area illumination system shall be installed on a project specific basis so as to form an integral system as part of the exterior lighting system. Illumination levels for recreational purposes are approximately 70 lx.

Illumination levels for the following recreational activity areas are (Total Area 22,736 m<sup>2</sup>, see Plate 2 for typical layout):

a) Softball Diamond - 18 x 18 m overall with 73 m outfield radius, Infield 100 lx, outfield 70 lx.

b) Hockey Rink - 60 x 26 100 lx.

c) Running Track – 50 lx

d) Games / fitness as established on a project specific basis illuminated to a maximum of 100 lx.

e) Dedicated mini yards connected to living areas -70 lx.

5.3.2.2 Parking Lots, Institutional Grounds. Roads and sidewalk illumination levels:

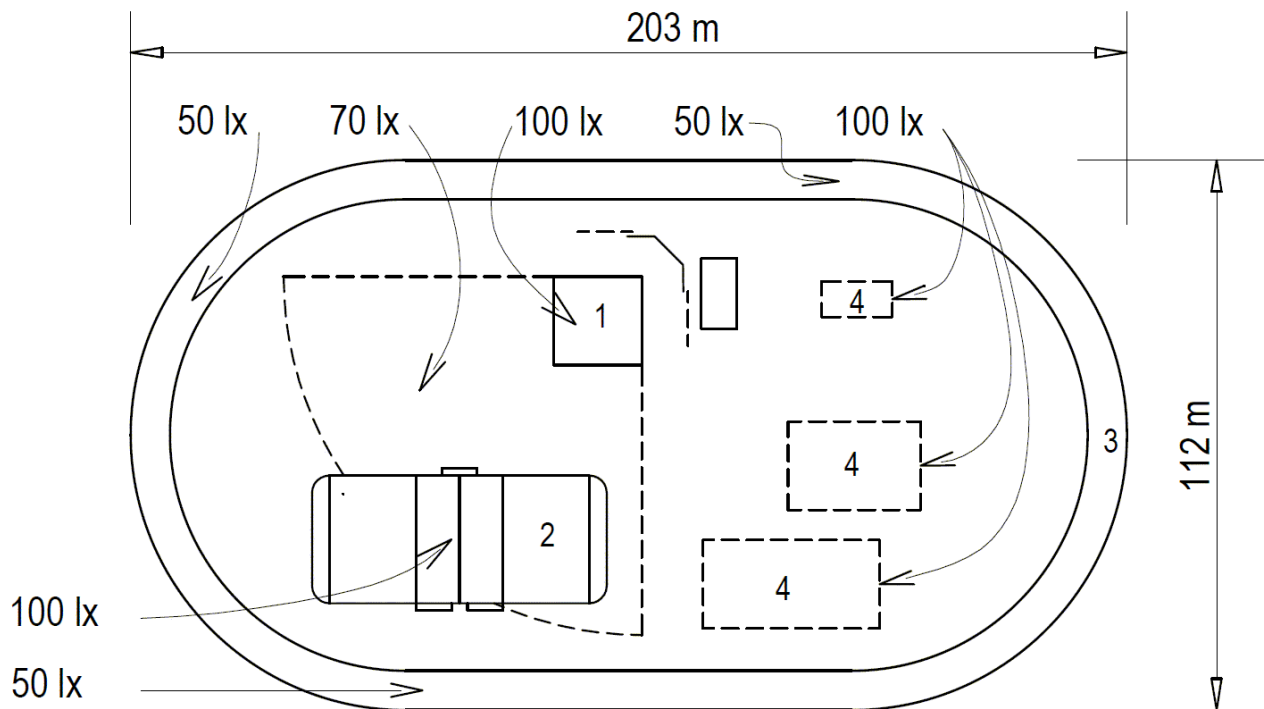
a) Average Illumination Levels – 10 lx.

- b) Illumination Uniformity – Maintain a maximum ratio of average lux to minimum lux of 3:1.
  - c) Illumination Quality – To minimize shadows especially between parked cars illuminate each point from at least two luminaire locations.
- 5.3.3 Signage, Building entranceways and exits
  - 5.3.3.1 Direct lighting with similar luminaires to that for sidewalks and roads will serve to illuminate the target door or sign to a higher level.
- 5.3.4 Controls
  - 5.3.4.1 The recreational lighting controls shall be manually switched on and off as required from a specified location.
  - 5.3.4.2 All other exterior lighting shall be controlled by photocell or astronomical dial time clock with manual bypass from a specified location. Lighting controls shall be separated for each use.
- 5.3.5 Poles and Masts
  - 5.3.5.1 Specify that all poles and masts used as light standards shall be fabricated from steel conforming to *CSA Standard G40.21-04 (R2009)*<sup>15</sup> Type T, grade 60T, Low silicon, 60,000 psi yield strength. Do not use concrete poles and masts.
  - 5.3.5.2 Avoid having steps on poles and masts.
  - 5.3.5.3 Minimum height of post for pedestrian walks 3.05 m, for parking lots 6.1 m.
  - 5.3.5.4 The lighting system should incorporate a method by which luminaires on high standards (poles) may be easily and economically maintained.
  - 5.3.5.5 High Standards (30 m poles) are not necessary for Minimum Institution but the pole height should be less than 13 m.

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<sup>15</sup>

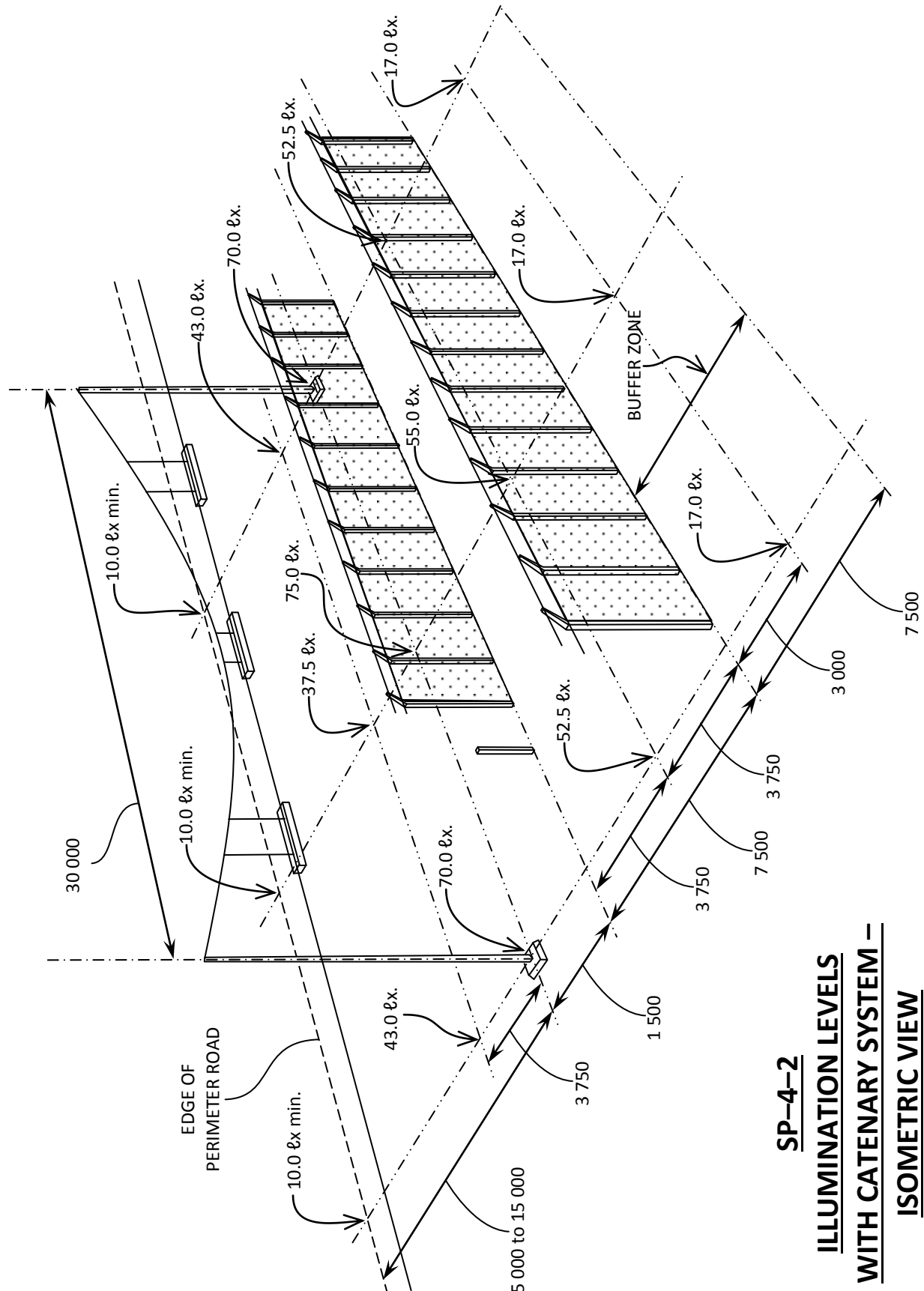
CSA G40.20-04/G40.21-04 (R2009) – General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel

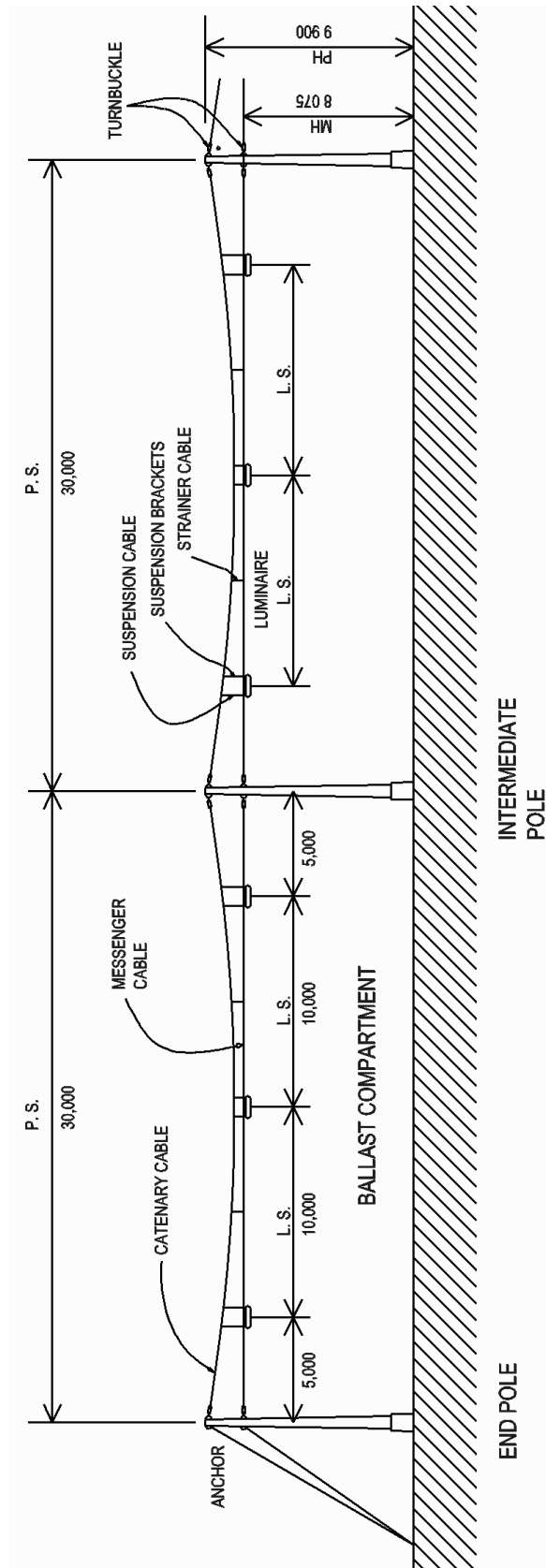


#### ALLOCATION FOR ILLUMINATION AND LIGHTING LEVELS

1. SOFTBALL DIAMOND 18 X 18 – 73 m OUTFIELD 4 183 m<sup>2</sup>  
(100 lx INFIELD, 70 lx OUTFIELD)
  2. ICE HOCKEY RINK 60 X 25 m, 155 m<sup>2</sup> (100 lx)
  3. TRACK LENGTH NON-STANDARD (50 lx)
  4. SMALL GAMES – VARIOUS, TOTAL 1 343 m<sup>2</sup>
- APPROXIMATE FIELD SIZE 22 736 m<sup>2</sup>

#### SP-4-1 – ATHLETIC FIELD LIGHTING



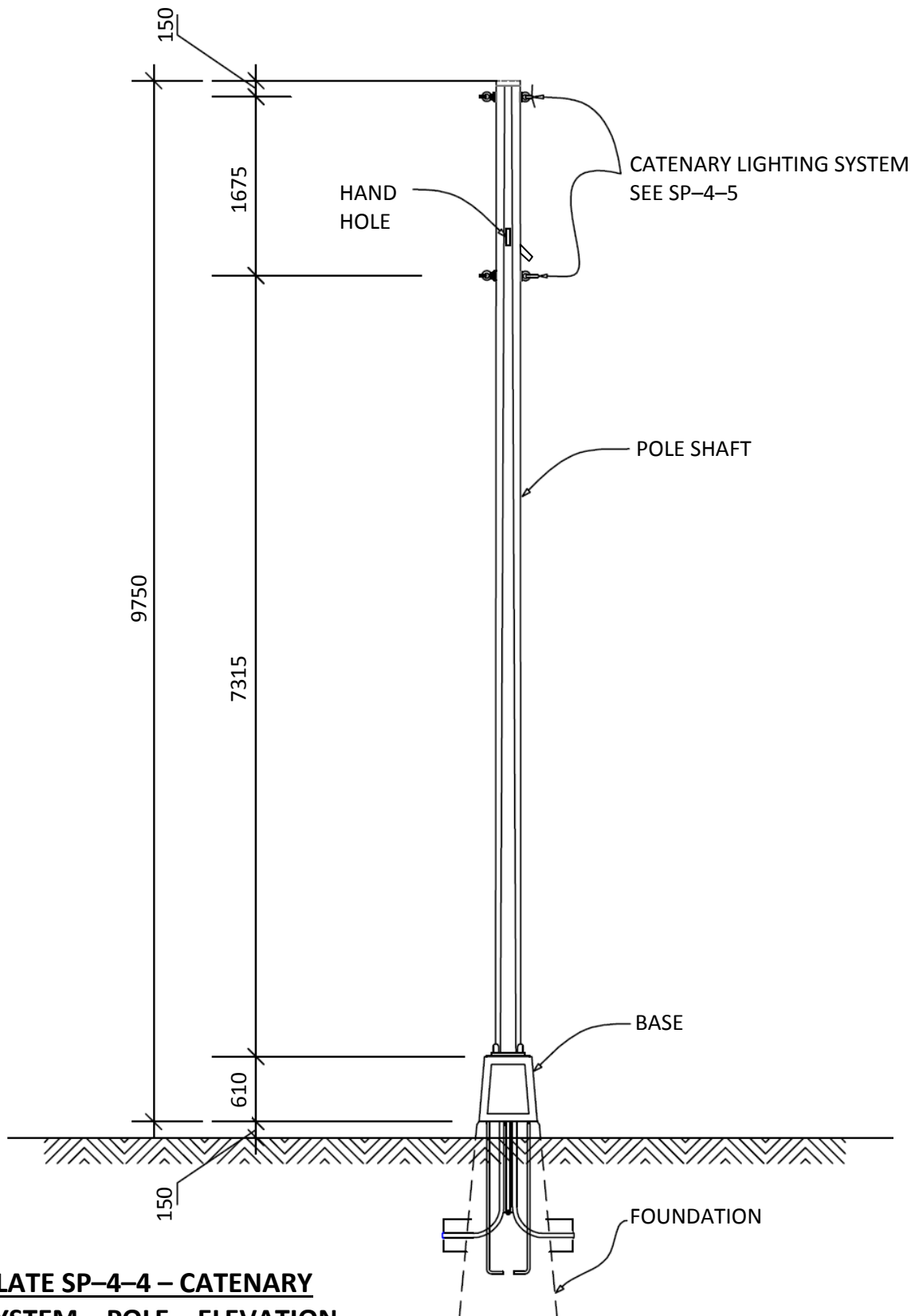


## LEGEND

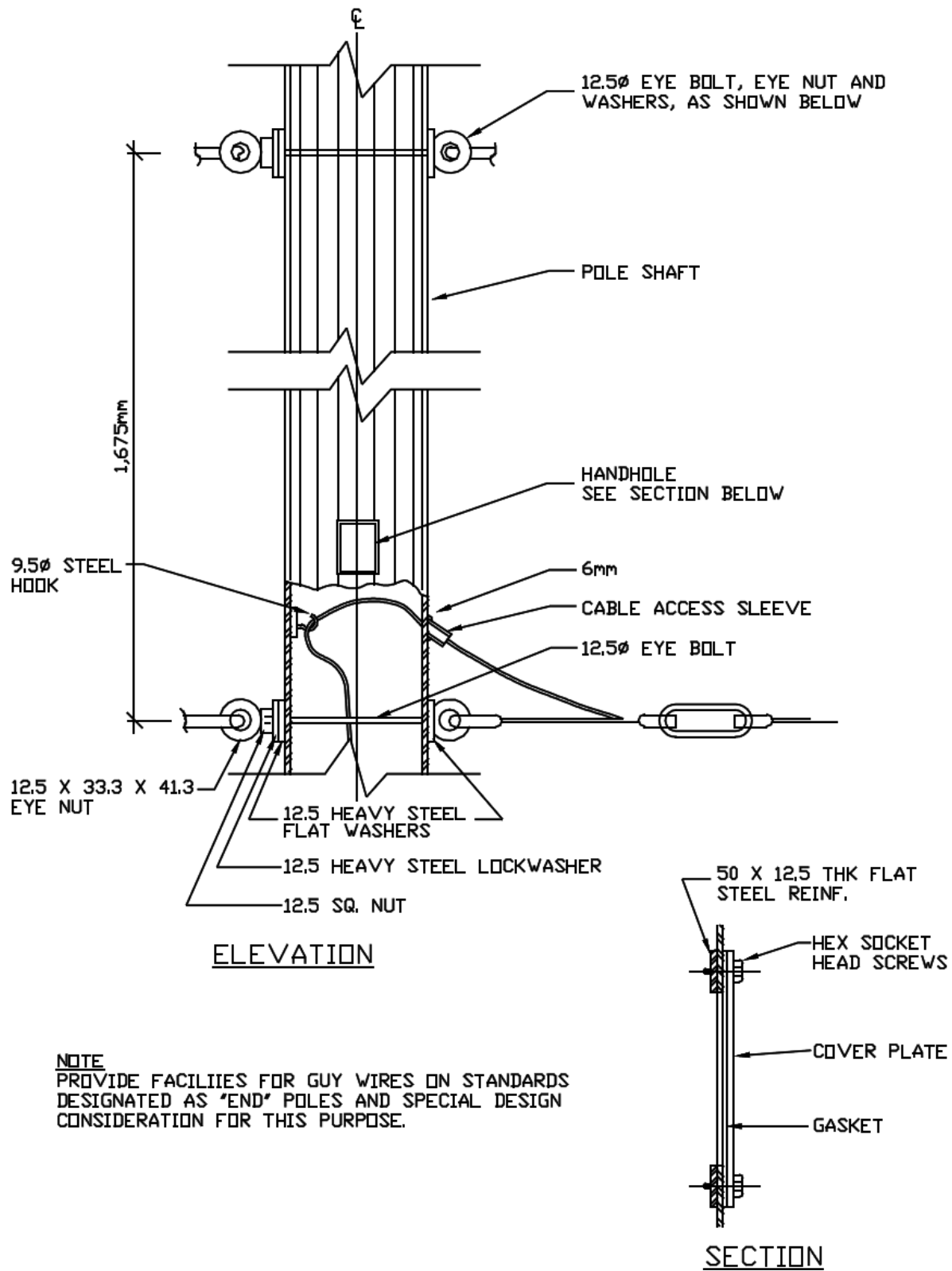
- P. S. - POLE SPACING
- L. S. - LUMINAIRE SPACING
- P. H. - POLE HEIGHT
- M. H. - LUMINAIRE MOUNTING HEIGHT

## SP-4-3 – CATENARY SYSTEM – SIDE VIEW

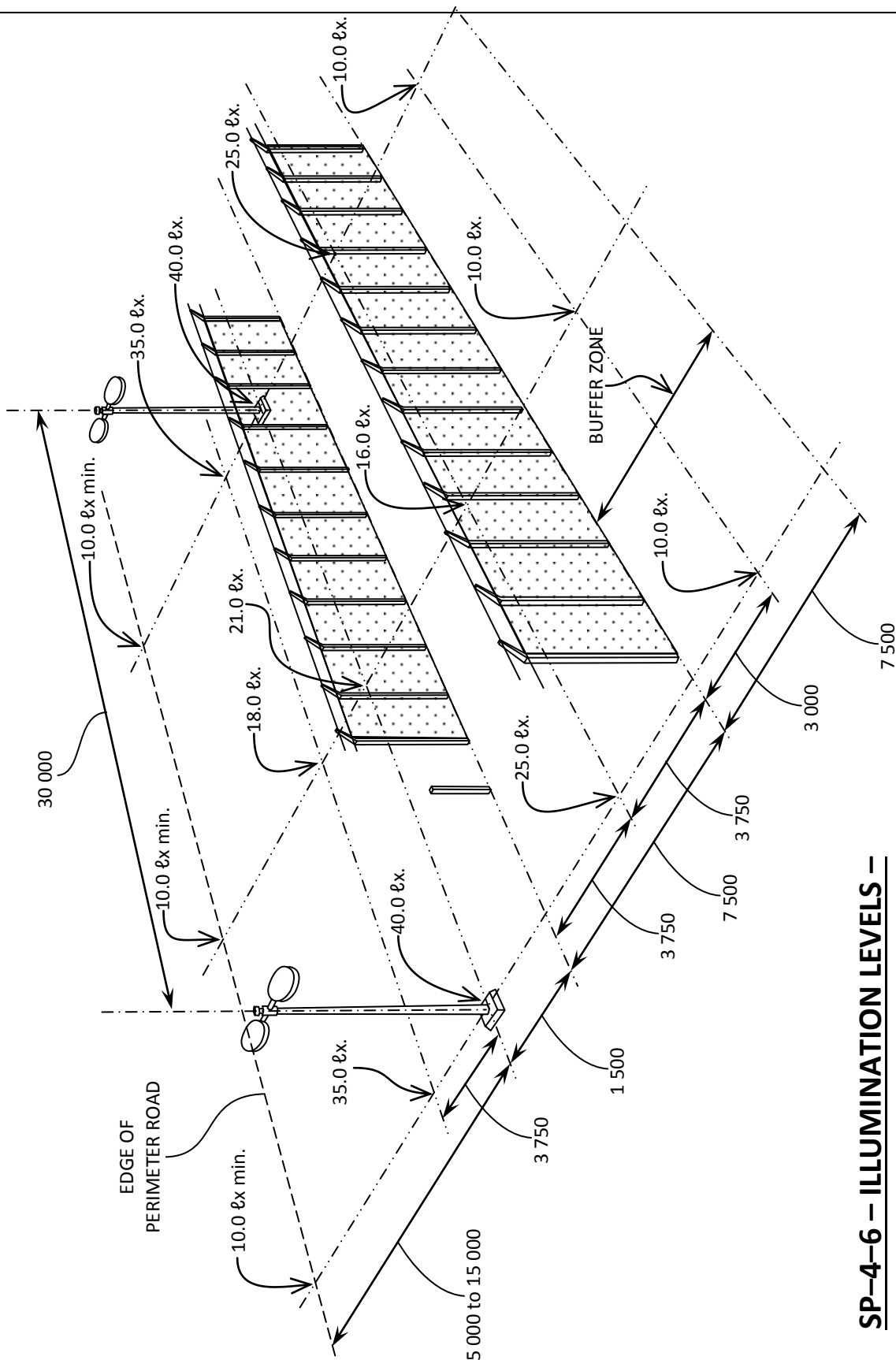




**PLATE SP-4-4 – CATENARY  
SYSTEM – POLE – ELEVATION**



### SP-4-5 – CATENARY SYSTEM – POLE DETAIL



**SP-4-6 – ILLUMINATION LEVELS –**  
**POLE MOUNTED LUMINAIRES –**  
**ISOMETRIC VIEW**



## SP-5 SITE – TRAFFIC CIRCULATION AND PARKING

### 1. SCOPE

This section outlines requirements for vehicle and pedestrian circulation and for vehicle parking inside and outside correctional institutions.

### 2. RELATED SECTIONS

SP-1 – Site Development

SP-2 – Security Fences

ST-1 – Guard Towers

SP-3 – Gates/Sally Ports

SP-4 – Lighting

### 3. CIRCULATION SECURITY REQUIREMENTS

#### 3.1 *Outside the Institutional Perimeter*

3.1.1 For ease of control, there shall be only one roadway providing access to the institution from a public thoroughfare.

3.1.2 All parking, including that of staff, visitor and CSC owned vehicles, shall be located on the exterior of the institution and in proximity to the Principal Entrance.

3.1.3 A dedicated perimeter patrol road shall be provided which will allow a rapid patrol vehicle response and which will have a minimum number of crossings. This road shall also be used for access into the institution via the Emergency Vehicle Entrance or a dedicated construction entrance and as well for maintenance of systems related to perimeter security.

3.1.4 Pedestrian walks shall only be provided from the parking area to the Principal Entrance.

#### 3.2 *Inside the Institutional Perimeter*

3.2.1 A pedestrian circulation network shall connect all buildings. At the Maximum security level, the network may be fenced, enclosed (unheated) or be part of the building for optimum movement control. Consideration of enclosed networks must be based on security requirements only; they are not intended to provide shelter from the elements for pedestrian movements from one activity area to another.

3.2.2 Fire vehicle access shall be in accordance with applicable authorities. Two different access routes, one to the Principal Entrance, one to the Emergency Vehicle Entrance shall be provided with clear signage (see SP-3:3.2).

3.2.3 Vehicle roadways are required for service functions and shops. Vehicle movement shall be separated from inmate circulation and located away from outdoor inmate activity areas.

- 3.2.4 Vehicle loading and unloading zones shall be centralized where possible, or located in proximity to one another to facilitate their control. Loading zones shall be located away from inmate movement and exterior activity areas, and shall be close to the Principal Entrance or Service Entrance where applicable.

#### **4. DESIGN REQUIREMENTS**

##### **4.1 Roadways (Other than Perimeter Patrol Road)**

- 4.1.1 The access road shall be integrated into the public road system; it shall not provide hazardous crossings nor cause undue congestion during peak hour movements.
- 4.1.2 All roads shall be asphalt paved unless local conditions dictate otherwise.
- 4.1.3 The minimum widths of paved surfaces shall be as follows:
- One way single lane: 3.5 m
  - Infrequently used access ways: 4.8 m
  - Two way double lane: 7.0 m
- 4.1.4 Roadway curbs shall not be used.
- 4.1.5 Drainage, turning radii, prepared shoulders and intersections shall conform to local municipal standards.
- 4.1.6 Pedestrians and vehicles shall share the same traffic surfaces except as provided for above.
- 4.1.7 Roadways shall be illuminated as per section SP-4 Exterior Lighting.

##### **4.2 Perimeter Patrol Road**

- 4.2.1 The perimeter patrol road shall encircle the complete perimeter at a distance of 8 m (minimum) to 20 m (maximum) from the face of the Outer Perimeter Fence to the centre line of the road.
- 4.2.2 The paved width of the patrol road shall be 4.8 m, with a prepared shoulder of 1 m on each side.
- 4.2.3 The patrol road surface elevation shall not be lower than the ground elevation between the perimeter security fences.
- 4.2.4 The area between the patrol road and the perimeter fence shall be clear of all obstructions, except for guard towers where applicable.
- 4.2.5 The roadway shall be generally straight; curves shall be mild and sufficiently banked to permit moderate speeds. Optimal response time for a patrol vehicle to travel one half of the perimeter circumference is 30 seconds by one of two vehicles (one vehicle patrols on the morning shift). Patrol road system should allow for a maximum response time of 45 seconds.
- 4.2.6 The patrol road shall have turn-arounds on each side of the institution as well as at each corner of the perimeter fence. Generally, turn-arounds are provided at approximately 150-m intervals. See Plates SP-2-4, SP-2-5 and SP-5-1. All turn-

around shall be paved and sized to allow for a vehicle to turn a full circle. Vehicle turning radius is assumed to be 7.5 m.

- 4.2.7 The patrol road when used for truck movement to construction sites via dedicated access points other than the principle entrance shall be widened at the location of the entrance gates in order to facilitate vehicles turns and to not obstruct patrol vehicle movement as trucks await entry.
- 4.2.8 Drainage for the patrol road shall consist of flanking shallow and broad swales to permit vehicle access onto the terrain on either side of the road. Maximum slope for the swale shall be 25% (1:4), to a maximum depth of 600 mm (Plate SP-5-2). The minimum grade cross-slope of the paved surface shall be 2% <sup>16</sup>. See Plate SP-1-2 for a perimeter fences and patrol road general layout and SP-1-3 for a cross-section detail of the road.
- 4.2.9 Culverts over 350 mm in diameter shall be provided with grilles to prevent their use as hiding places by inmates. Clear grille openings in any one direction shall not exceed 125 mm by 610 mm in the other direction (see details in M-4: 8.2).
- 4.2.10 Illumination of the patrol road shall be satisfied by perimeter fence lighting as per Section SP-4 Exterior Lighting.

#### **4.3 Pedestrian Walkways**

- 4.3.1 Walkways shall be of monolithic material such as asphalt, concrete, or compacted stone dust. Small or thin pavers which can be lifted or broken shall not be used.
- 4.3.2 Walkway design shall allow for movement of handicapped persons and snow removal equipment s well as projected traffic volume.

#### **4.4 Parking (Other than for CSC Vehicles)**

- 4.4.1 Inmate visitor parking and staff parking shall be separately demarcated. Inmate visitor parking stalls shall be provided at a ratio of 50% of the maximum number of inmates allowed in the visits area at one time (visit capacity); such visit capacity shall be identified on a project specific basis. For optimal time of use distribution, the visitor parking lot shall also accommodate official visitor cars.
- 4.4.2 The number of staff parking stalls shall be provided at the rate of 1.2 multiplied by the peak weekday shift. Staff complement shall be identified on a project specific basis.
- 4.4.3 Barrier-free parking shall be located close to the gatehouse and be combined for use by staff and visitors. The number of stalls shall be based on established need ranging from a minimum of 2 to a maximum of 4.
- 4.4.4 Parking areas shall be asphalt paved unless local conditions dictate otherwise.
- 4.4.5 Curbs shall not be used, although pre-cast wheel stops are permitted.
- 4.4.6 Landscape islands and trees are permitted but dense planting shall be avoided.

<sup>16</sup>

American Association of State Highway and Transportation Officials (AASHTO), A Policy on Geometric Design of Highways and Streets, 5<sup>th</sup> Edition, 2004 – AASHTO GD-2 A Policy on Geometric Design of Rural Highways, 1965 – Transport Association of Canada also refers to this document

4.4.7 Parking stall dimensions (including barrier-free) and drainage provisions shall conform to governing standards.

4.4.8 Parking areas shall be illuminated as per section SP-4 Exterior Lighting.

#### **4.5 *Parking for CSC Vehicles***

4.5.1 A CSC vehicle parking compound shall be provided, located on the outside of the perimeter fence; size shall be defined on a project specific basis.

4.5.2 The parking compound shall be located in proximity to the Principal Entrance and the perimeter patrol road for ease of periodic surveillance.

4.5.3 The parking compound shall house fuel dispensing pumps and tanks. The compound shall be protected by bollards and a 2.5m high fence.

4.5.4 Fuel shall be stored in registered tanks in accordance with the Storage Tank Systems for Petroleum Products & Allied Petroleum Products Regulations<sup>17</sup>. The fuel storage tanks (preferably aboveground) will be located adjacent to the fuel pumps and the distribution lines shall also be aboveground, where feasible.

4.5.5 The parking compound shall be illuminated as per section SP-4 Exterior Lighting.

#### **4.6 *Electrical Outlets for Engine Blocks***

Institutions are typically located in isolated areas in climate zones having sustained low temperatures, frequently -20°C or less. In such situations, a decision to determine whether electrical outlets for engine blocks are required is based on the following:

##### **4.6.1 CSC Vehicles**

CSC institutions, by their very nature, situation, and role, differ from other government installations. The intent is that institutions have ready to run CSC vehicles for everyday operations including escort or transfer of inmates. Consequently, electrical outlets for block heaters are mandatory.

##### **4.6.2 Staff Vehicles**

The provision of outlets must be consistent with local practices. For this, a survey of other Government buildings and local area business and plants will determine the need to provide electrical outlets for block heaters.

##### **4.6.3 Other Vehicles**

Electrical outlets for block heater shall not be provided for visitor parking or for other short term parked vehicles.

##### **4.6.4 Parking Electrical Outlets General Requirements**

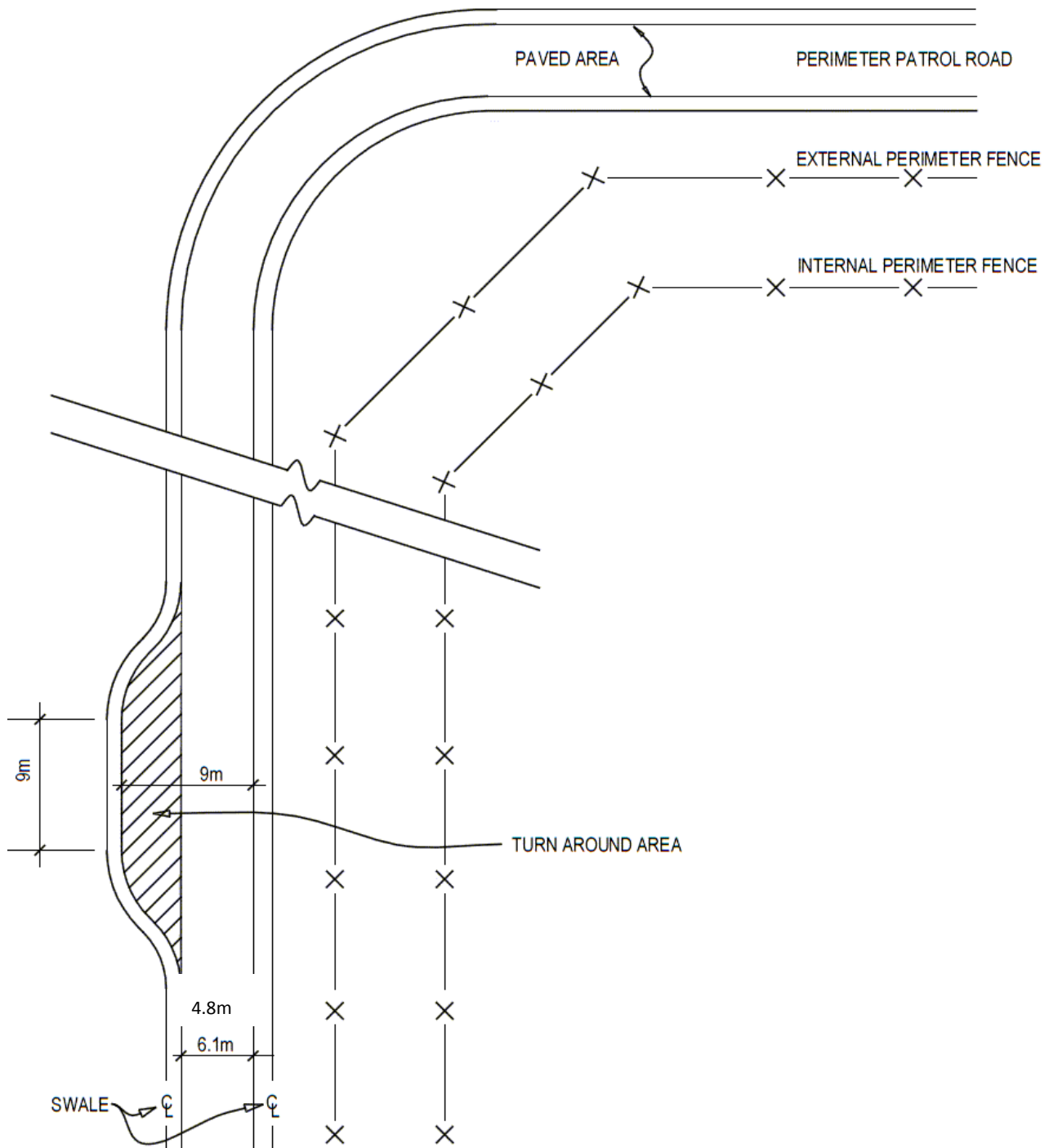
Where provided, electrical outlets may be controlled by timer or by a programmable controller.

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<sup>17</sup>

Tank Systems for Petroleum Products & Allied Petroleum Products Regulations (SOR/2008-197).  
Regulation under the Department of Justice Canada.  
<http://laws.justice.gc.ca/eng/SOR-2008-197/index.html>





**PLATE SP-5-1 – OPTIONS FOR TURN-AROUND**



## SP-6 SITE – TEMPORARY CONSTRUCTION FENCES

### 1. SCOPE AND DEFENITIONS

This section provides performance criteria and relevant specifications for all temporary construction fences for minimum, medium, maximum and multi-level Institutions.

Several options for temporary fences are available. Their selection must weigh the following factors: location of construction, the risk of breach, and the duration of construction. Fence types include:

**Type 1** Minimum institution construction fence is used primarily as a physical barrier to prevent unauthorized persons access to the site for reasons of safety and to protect the contractor's assets. This fence is no different from that used in the community.

**Type 2** Fence is used in restricted and highly controlled inmate areas such as where routine vehicle movement takes place for deliveries at medium and higher level institutions and therefore where breach concerns should not be elevated. This fence therefore serves to prevent unauthorized access for similar reasons as above and as such the fence type is also as above. Construction truck traffic is via the main entrance vehicle Sally Port where it is inspected for contraband. Type 2 Fence shall also be used where construction duration is short term as for a repair or replacement of existing systems or where the work site shifts by phase from building to building. The institution in this case will schedule inmate movement and activities so as to mitigate risk of breach. Truck traffic to the site will be escorted from the main entrance. Type 2 fence may be used as an alternative to Type 3 assuring adequate security where required by being topped with BTC.

**Type 3** Fences is used in inmate movement and activity areas at medium and higher level institutions and where breach is possible. Construction truck traffic is via the main entrance vehicle Sally Port where it is inspected for contraband. Trucks are escorted to the construction site. This fence is used for long term projects which have a substantial scope and cost. Fences here must assure appropriate security based on assessed risk.

**Type 4** Fence is used for long term projects which are in proximity to the perimeter fence, a secured fence compound shall be constructed which is integrated with the perimeter, effectively forming an extension of the inner perimeter fence. This fence will be fitted with a Fence detection system and covered by camera and lighting integrated with the PIDS. A dedicated Sally Port will be constructed on the perimeter fence line for construction truck traffic to be controlled by contracted commissionaires.

### 2. RELATED SECTIONS

#### 2.1 *Technical Criteria Document sections:*

SP-1 - Site Development

SP-2 - Fences

SP-3 - Gates/Sally Ports

SP-4 - Exterior Lighting

SP-5 - Traffic Circulation and Parking

#### 2.2 *Other CSC document*

Statement of Technical Requirements – Temporary Construction Fences at Medium and Maximum Security Institutions, Correctional Service Canada, Technical Services Branch – Electronic Systems, Issue 5, April 8, 2011.

**2.3 National Master Specification section:**

01 35 13 – Security Requirements (prior to 2004: 01003 – Security Requirements)

01 56 26 – Temporary Fencing

01 56 36 – Temporary Security Enclosures

**3. PERFORMANCE CRITERIA****3.1 Type 1 Fence**

This fence type shall be a self supporting welded mesh sectional fence typically available by rental ('Modu-loc' or similar). The height of the fence shall be no less than 1800 mm high but may be higher depending on local availability. The fence must be stable and self supporting. Welded wire mesh is considered to be non-climbable due to its mesh size which inhibits the insertion of foot to aid climbing. The top of the fence also has its vertical wire projecting over the top rail to discourage breach. Matching vehicle gates are padlocked after work hours. The temporary construction fence shall be removed from the institution by the contractor after construction is completed.

**3.2 Type 2 Fence**

This fence type shall be similar to the above but with a height of 2400 mm. This fence must not come in contact with the perimeter fence nor be closer than 12m to the perimeter fence so as not to interfere with PIDS camera viewing on the interior side of the institution. The temporary construction fence shall be removed from the institution by the contractor after construction is completed. Type 2 fence security can be enhanced by topping it with BTC rendering it an alternative to Type 3 fence which shall be considered as a measure to reduce project cost.

**3.3 Type 3 Fence**

This fence type shall be similar to a standard woven mesh interior fence, be 3.6m high, and be topped with BTC where required. This fence shall be installed on site with all posts set in concrete and with the ground surfaced with compacted gravel. Matching swing type vehicle gates shall be padlocked after hours. As for type 2 fence, this fence must not come in contact with the perimeter fence nor be closer than 12m. Truck access to this compound shall be via the Main entrance with all vehicles escorted. The temporary construction fence shall be dismantled by the contractor after construction is completed but parts such as the fabric may be left at the institution in accordance with the contract documents.

**3.4 Type 4 Fence**

This type of fence forms part of the perimeter and as such requires special provisions as follows:

3.4.1 This is a single fence of the same design as an Inner Perimeter Fence (see Plate SP-6-6) and conforms to Chapter SP-2 - Fences, performance criteria 4.1 except for anti-tunnelling which is achieved by compacted gravel surface for 1m distance on each side of the fence.

3.4.2 A Fence Detection System (FDS) is required and connected to the Main Communication Control Post (MCCP).

3.4.3 Cameras are required to monitor the fence line and connected to the MCCP and lighting may be required to enhance viewing.

3.4.4 A dedicated vehicular entrance is required similar to the main entrance Sally Port comprising three (3) gates (see Plate Sp-6-7, Detail 1):

a) Gate 1: Temporary gate for the outer perimeter fence,

- b) Gate 2: Temporary gate for the inner perimeter fence,
- c) Gate 3: Temporary gate in a temporary fence to form a vehicle Sally Port.

At any time, at least two gates of the temporary vehicular Sally Port are secured, with padlocks and keys under the control of a Commissionaire. A commissionaire's temporary hut is required within the Sally Port.

- 3.4.5 The fence must be clear of any building by 12 m but a shorter clearance may be considered since the compound is always protected by a double fence between it and the exterior of the institution.
- 3.4.6 The fence and systems must be dismantled and handed to the institution in accordance with the contract documents after the construction is completed. All systems must be reinstated to the original state and function.

## 4 RELEVANT SPECIFICATIONS

### 4.1 *Type 1 Fence*

Rental construction protection fence comes with welded wire mesh and components conforming to ASTM F2919 Welded Mesh Fence specification. Mesh is galvanized steel no larger than 50X150mm (vertically long rectangle) with vertical wire projecting and exposed at top. Fence must be at least 1800mm high and secured with pins inserted in the ground through the 'T' base support. Sections of fence must be securely clamped together to ensure that the each fence run acts as a continuous barrier which will resist lateral forces and separation. Sloped runs must be protected by mesh panels to ensure continuity of barrier from ground up.

### 4.2 *Type 2 Fence*

This fence is similar to Type 1 above but shall be 2400mm high. Ground along the fence run shall be surfaced with compacted gravel. 'Barbed tape concertina' (BTC) where required and used as an alternative to Type 3 fence shall be as per SP-2-4.2 except that it could be directly attached with galvanized twist ties or clips to the top rail or wire resting against the mesh on the threat side. Use of steel arms fastened to the posts may also be considered for the support of 2 barbed wires and BTC.

### 4.3 *Type 3 Fence*

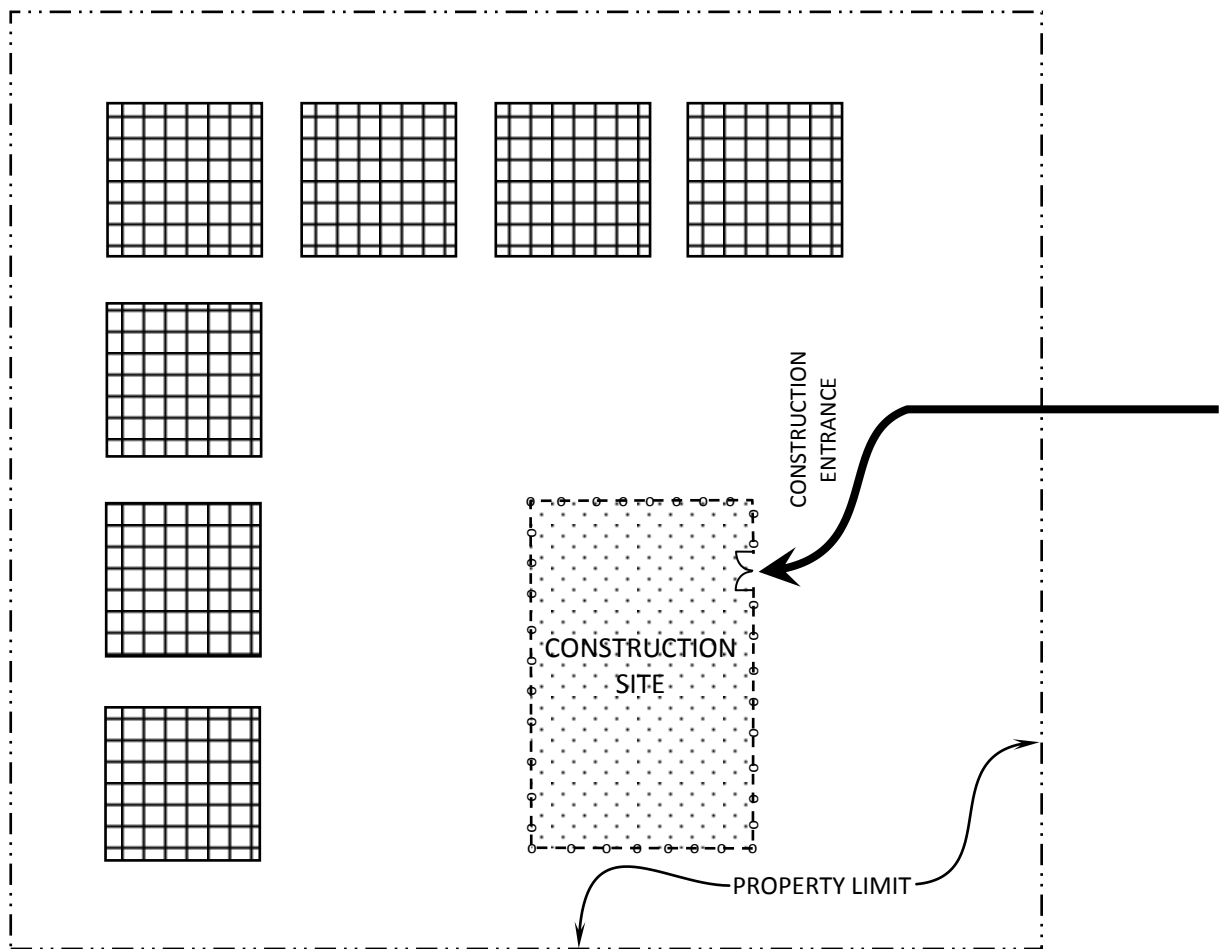
This fence conforms to the criteria set out in SP-2 for perimeter fences. It shall be topped by steel arms supporting 2 strands of barbed wire and BTC. The arms shall have 2 strands of barbed wire with the BTC cradled between. Steel arms lean towards the threat side.

### 4.4 *Type 4 Fence*

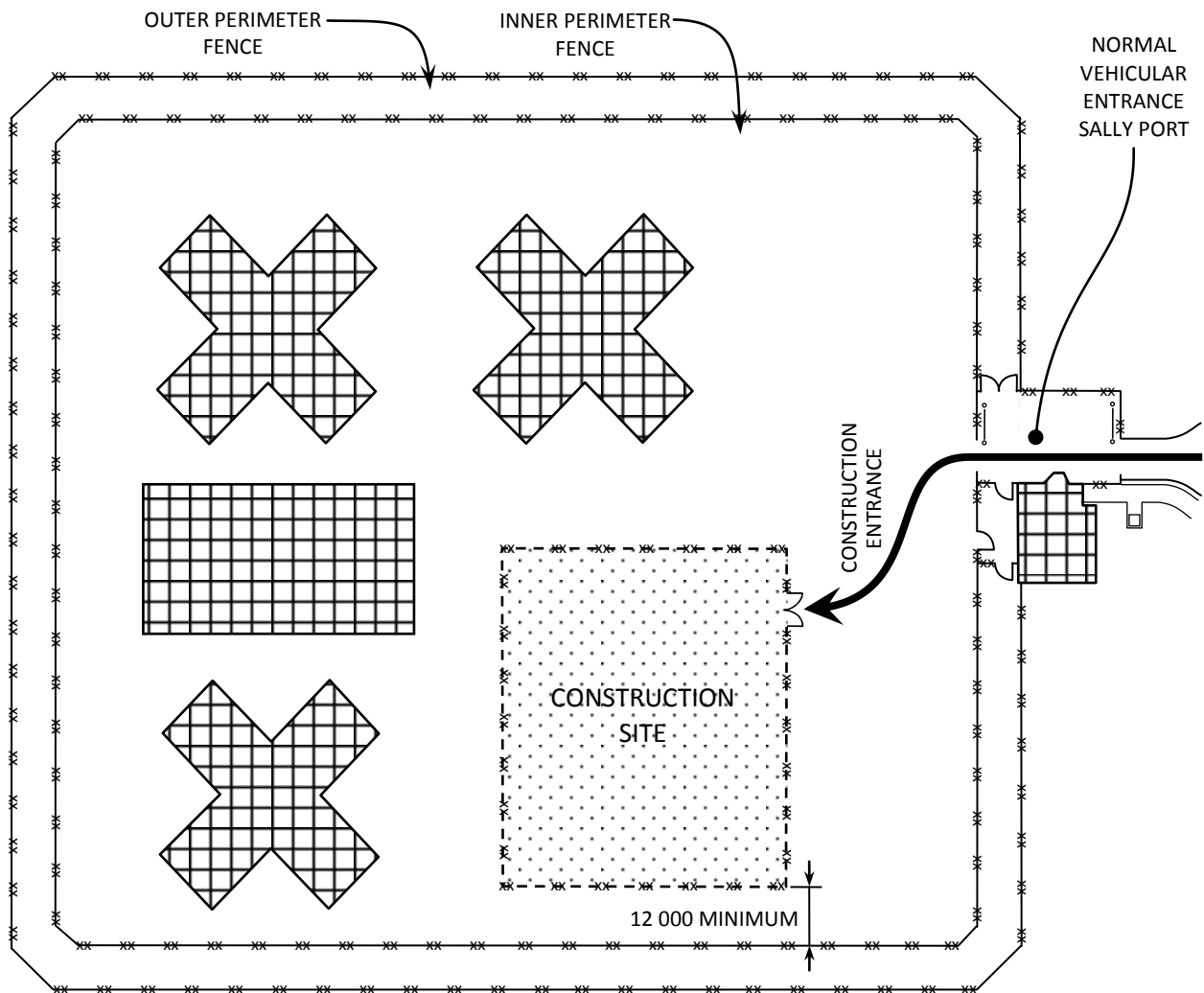
The following pertains to a single fence extension of the inner perimeter fence:

- 4.4.1 This fence is continuous connected to the inner perimeter fence at each end. It shall conform to the specification for an interior fence as in "Chapter SP-2 – Fence, Conforming Specifications 4.1.8 and 4.2." and relevant plates; only exception being that the BTC needs to be installed only on the threat side at the first intersecting panel.
- 4.4.2 The three temporary construction gates must conform to "Chapter SP-3 - Gates and Sally Port, 5. – Fence Gates, 5.2 Vehicle Swing gates". Gate 2 (the gate on the Inner Perimeter Fence) requires FDS that can be masked during construction hours and unmasked for all other times. The gate FDS must connect to the MCCP.

- 4.4.3 Motion Detection System (MDS) cable exists within the No Man Zone between the fences. This cable has to be protected from heavy trucks and machinery at the crossing by installing an asphalt pad of 150 mm thick without disturbing the gravel surface over the MDS cables (see Plate SP-6-7). This material can be removed following construction. It is also important to limit the use of salt during winter months. Excess salt will drain to the sides and seep into the surrounding surface adversely affecting the MDS cable's RF field.
- 4.4.4 A temporary microwave system covers the vehicle crossing area within the No Man Zone.
- 4.4.5 Temporary gates may be installed between the perimeter fences at the Sally Port crossing to allow maintenance vehicles to circulate, these gates must be designed to not interfere with both the MDS and the temporary microwave systems.

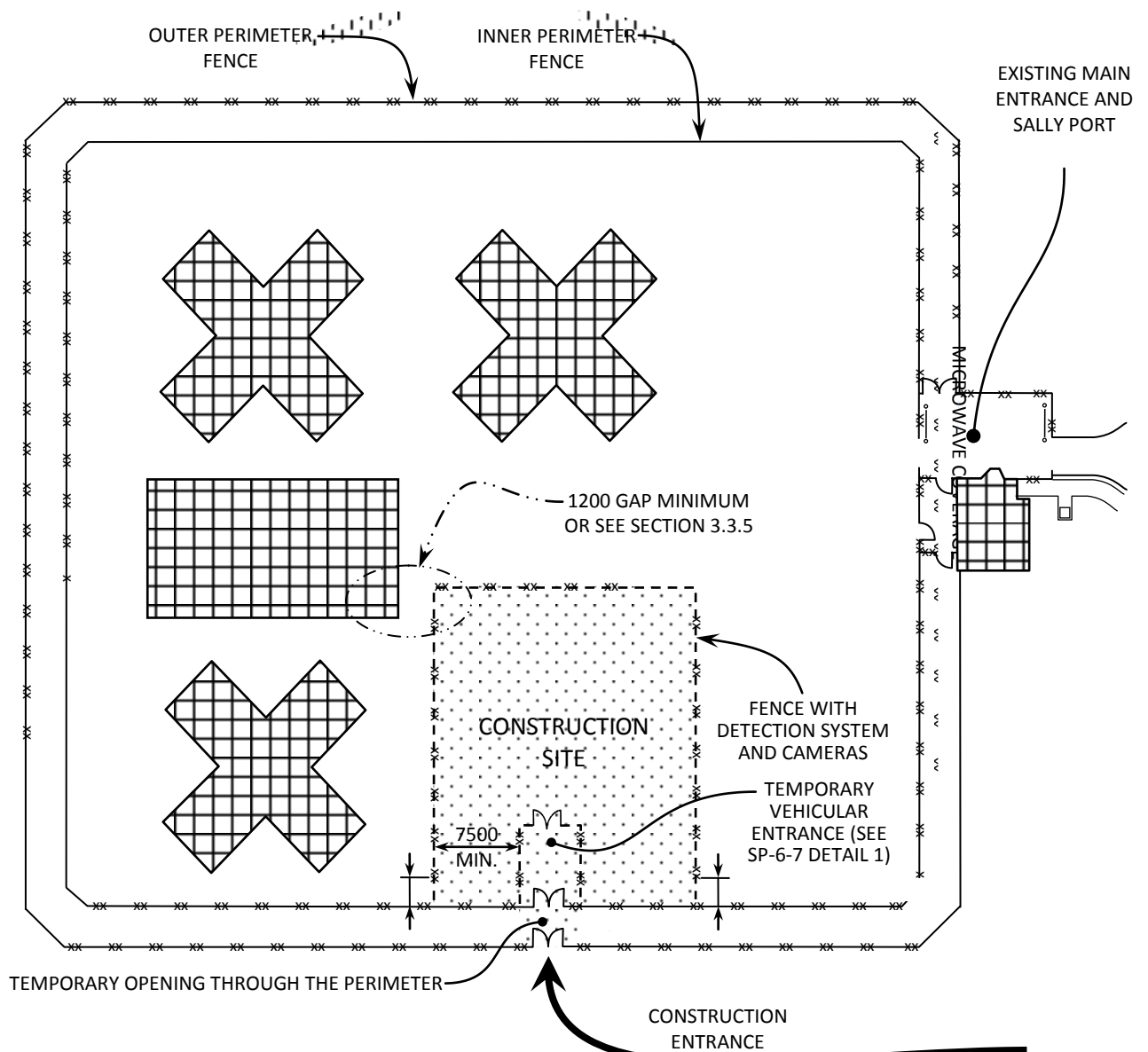


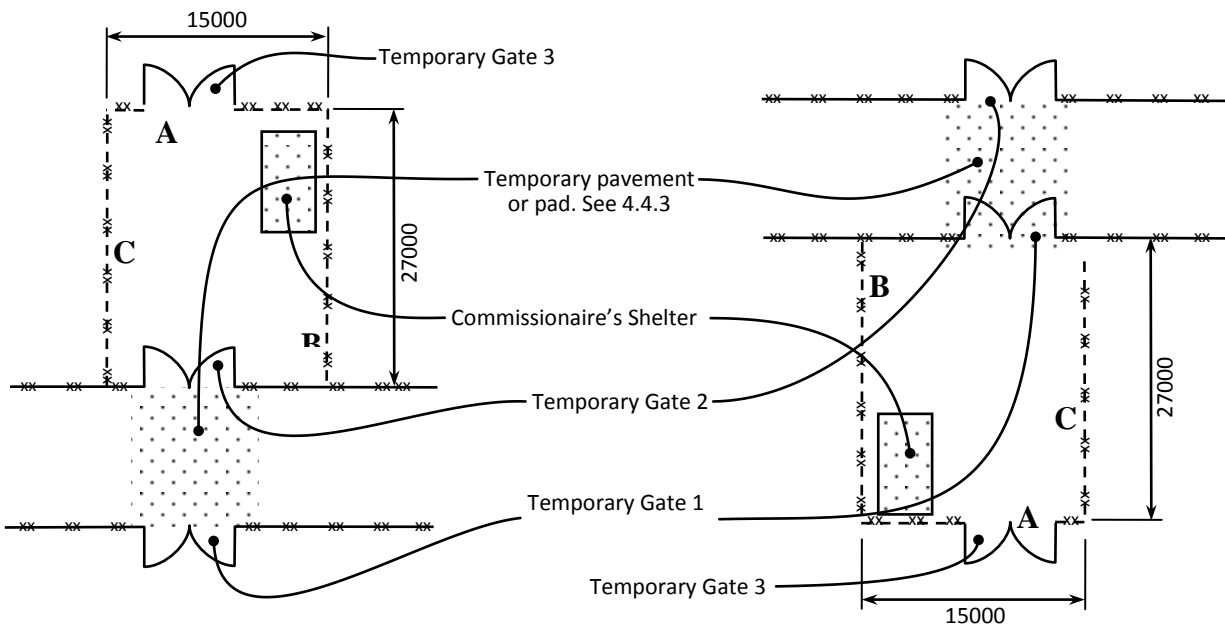
**PLATE SP-6-1 – TYPE 1 FENCE**



**PLATE SP-6-2 – TYPE 2 AND 3 FENCE**



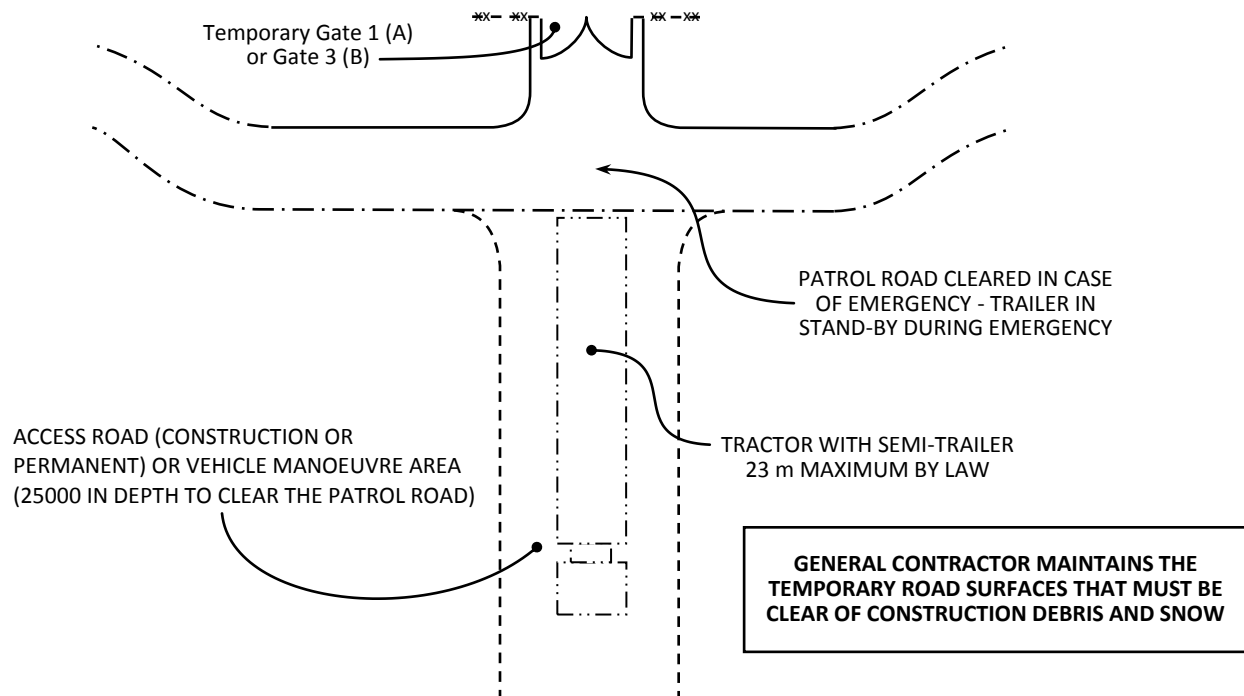
**PLATE SP-6-3 – TYPE 4 FENCE**



**A – INSIDE THE INSTITUTION**

**B – OUTSIDE THE INSTITUTION**

**SP-6-4 – TYPE 4 FENCE –**  
**ENTRANCE OPTIONS**



**SP-6-5 – TYPE 4 FENCES –**  
**VEHICLE ACCESS DETAIL**