/ maintenance access way to restrict and prevent unauthorized access or parking.

1.4.4. There shall be interface between the AMS and VSS such that intrusion into Critical / Important rooms will trigger an alarm and activate the corresponding display of the image of the relevant camera(s) automatically on the designated VSS viewing facility monitor.

1.4.5. The AMS shall support two factor authentication for access control. Such two-factor authentication may be achieved through a combination of physical tokens such as, but not limited to, presentation of a contactless smart card, Personal Identification Number (PIN) and / or Biometrics, subjected to the approval of the Authority.

1.4.6. The following scenarios depict the typical configurations in MRT stations. In the event that the design of the station does not fall within any of the following six scenarios, the Contractors are to promptly highlight the matter for approval by the Authority.

a. Configuration 1: Doorway from Publicly Accessible areas to Exit Staircases

   i. Card Reader (CR) on the publicly accessible face with Electro-magnetic Lock (EML), Door Contact (DC), Push Button (PB) and Emergency Break-Glass (EBG) on the secured face of the doorway.

b. Configuration 2: Doorway from Buffer Areas via End Return Doors (ERD)

   i. CR on both faces of doorway with EML, DC, PB and EBG on the secured face of the doorway.

c. Configuration 3: Doorway from Exit Staircase to Dead-end Corridor

   i. CR on the staircase face of the doorway with EML, DC, PB and EBG on the face of the dead-end corridor.

d. Configuration 4: Doorway from Exit Staircases to Buffer Areas

   i. CR on both faces of doorway with EML, DC, PB and EBG on the exit staircase face of doorway.

1.4.7. The above-mentioned clauses are summarized in Table 1 below. Details can also be found within the Authority's Design Criteria and Performance Specifications (DCPS). In the event of discrepancies between standards found within this chapter and the DCPS, the standards found within the latter shall prevail with said discrepancies promptly highlighted to the Authority. Variations not covered within this guide as well as proposals for deviations shall be submitted to the Authority for acceptance.

| Configuration Details | Card Reader (CR) Location |
|---|---|
| Doorway from Publicly Accessible areas to Exit Staircases | Publicly Accessible Areas |
| Doorway from Buffer Areas via End Return Doors (ERD) | Both faces of doorway |
| Doorway from Exit Staircase to Dead-end Corridor | Exit Staircase |
| Doorway from Exit staircases to Buffer areas | Both faces of doorway |

Table 1: Summary of Card Reader (CR) locations within MRT stations

## 1.5. General Recommendations & Requirements

1.5.1. Crime Prevention Through Environmental Design (CPTED) – CPTED principles and concepts shall be considered, such as brightening up the platform level through natural lighting and keeping the platform free of any obstructions/recesses which could be exploited for concealment of IED. Care shall also be taken to avoid creating spaces that will concentrate or "throttle" the force from a blast, such as alleyways, overhangs, or other enclosed spaces.

1.5.2. Any Alterations & Additions (A&A) works that affects the security of the existing Public Transport (PT) facilities shall follow the requirements stated in Annex A – Requirements for Alterations & Additions (A&A).

1.5.3. Landscaping around the station shall follow the requirements stated in Annex B – Landscaping and Security Requirements for Public Transport Infrastructures

1.5.4. Surveillance coverage – Video surveillance coverage in accordance to latest MHA VSS Standards shall be provided. Refer to Annex C – 'Requirements for VSS Field of View (FOV) Endorsement'.

a. In addition to the latest MHA VSS Standards, there shall be general coverage of the external access area of the AHU rooms shall be no less than 20%R.