

30 REQUIREMENTS FOR BUILT ENVIRONMENTS TO PREVENT CRIME AND FOR RESILIENCE AGAINST EXTREME EVENTS

30.1 General

These requirements deal with the design of built environments (including the built and unbuilt), in a manner that facilitates prevention of crime and extreme events by design. Additionally, some built environments need to be resilient to sustain and survive man-made extreme events as per the threat profiles identification basis outlined here. These parameters shall be used to integrate appropriate measures to prevent crime and counter terror and such 'extreme events'.

30.2 Categorization of Threats

Building design shall address an array of threats to the structure and the assets in a built environment based on the type of building use and profile of threats identified for the asset therein. These are categorised into two major heads:

- a) *Common Crimes* – includes all crimes against a person or his/her belongings including gender based crimes, thefts, personal crimes, vandalism, etc.
- b) *Structural Threats or 'extreme events'* – affect the structure of a building with the intent to directly affect people or masses of them. These include all threats that affect the structure including civil unrest, riots and arson.

Over-population or crowding falls under both categories, as in extreme situations it can generate panic, threatening the structure and also offer opportunities for most crimes. Any occupancy patterns in excess of the designed for occupancy (as per calculation criteria given in Part 4 'Fire and Life safety' of the Code will be considered as crowded or over-populated.

30.3 Classification of Buildings Based on Security Needs

The building use and the assets identifiable therein directly indicate the likely threats, vulnerabilities and security expectations. These are categorized on the basis of total needs into a broad categorisation of buildings based on security to ease compliance in the design of buildings, refer Table 10.

Table 10 Security based Building Categories
(Clause 30.3)

SI No.	Building Category		Function/Asset	Example	Risk Level and Threats	Threat Ratio	As per classification in Part 4
(1)	(2)		(3)	(4)	(5)	(6)	(7)
	A	CRITICAL AND SENSITIVE BUILDINGS					
i)	A1	Critical Buildings	Highest, near absolute security needs, Function	Nuclear reactor, Petrochemical refineries,	Highest risk levels Structural threats & extreme event are	CT:CP = 9:1	G3, J

SI No.	Building Category		Function/Asset	Example	Risk Level and Threats		Threat Ratio	As per classification in Part 4
(1)	(2)		(3)	(4)	(5)		(6)	(7)
			affecting millions and for generations	Power grids, Dams	the biggest concern, crime insignificant			
ii)	A2	Sensitive Buildings	Essential Services Immediate impact on millions	Ministries, Rashtrapati Bhavan, Military HQ, Parliament, Courts	Extremely High	CT:CP = 8:2	Categories , Jails under C3	
					Terror is the biggest concern, crime too minor			
	B	PUBLIC BUILDINGS						
iii)	B1	Iconic Public Buildings	Buildings with national prestige and international lives	Taj Mahal, Taj Hotel Mumbai, Stock Exchange, Akshardham	Very high	CT:CP = 7:3	Category D1-D4, D6-D7, A1, A5, A6, maybe B2, E1-5, F	
					Structural threats are bigger, crime significant			
iv)	B2	Sensitive Public Buildings	Essential Services like hospitals, police stations	Police HQ, Speciality Hospitals, Airports, Railway stations, Bus terminals	High - scalable to very high	CT:CP = 6:4	Category C2-3 (high value) , D7, E2 , G2	
					Structural threats are bigger, crime as significant			
v)	B3	Populous Public Buildings	All high footfall environments not covered in higher categories	Malls, Multiplexes, Hotels, Recreational, Convention Centre, Stadia	High	CT:CP = 5:5	Category D1-D4, D6-D7, A1, A5, A6, maybe B2), E1-5, F	
					Structural threat and crime equally significant			
	C	RESTRICTED PUBLIC ENVIRONMENTS						
vi)	C1	Open Air or Temporary Public Environments	Huge crowds in non-formal enclosed environments	Durga Pooja pandals, fairs, melas or exhibitions	High	CT:CP = 4:6	Category D5	
					Low structural threat and crime more significant			
vii)	C2	Institutional Environments	Large populations over large areas (B, C1 & C2 as/Part 4 not covered in B2)	Schools, colleges, university campuses	Moderate	CT:CP= 3:7	A3, C2-3,	
					Crime more significant, minimal structural threats			
	C3	Industrial Environments			Moderate to low	CT:CP= 2:8	G1-3, H	

SI No.	Building Category		Function/Asset	Example	Risk Level and Threats	Threat Ratio	As per classification in Part 4
(1)	(2)		(3)	(4)	(5)	(6)	(7)
viii)			May be large numbers but over larger area	Factories, plants, workshops	Crime dominates the security scenario		
	D	RESIDENTIAL ENVIRONMENTS					
ix)	D1	High Rise Residential Environments	Large numbers (more than 20 dwelling units), high-rise but low risk	Multi-storeyed housing, group housing, cooperative housing	Low risk but moderate crime impact	CT:CP = 1:9	Category A1-3, C2
					Crime is only significant; minimal structural threats		
x)	D2	Low Rise Residential Environments	Density at 1 person/m ² or less, low rise and low risk	Plotted houses, bungalows, farmhouses	Low risk but high crime	CT:CP = 1:9	Category A1-4, C2
					Crime is the dominant security consideration		
	E	OPEN-AIR ENVIRONMENTS					
xi)	E1	Transport and Infrastructure Open Air Environments	Vital installations, not housing lives or critical installations	Roads, bridges over land or water, water tanks, canals, Mobile towers, Windmills, Solar farms	Low risk	CT:CP 0:10	-
					Crime is the only concern here		-
xii)	E2	Least Sensitive Open Air Environments	Low density of human lives, No structural threat	Parks, Landscape, Leisure sports activities	Low risk	CT:CP 0:10	-
					Crime is the only concern here		-
	Legend: CT – Proportion of consideration for Counter- Terror CP – Proportion of consideration for Crime Prevention				If a building falls under multiple categories it should be considered in the highest one relevant		
NOTE – If a building falls under multiple categories it shall be deemed to fall under the highest security category applicable, with category A as the highest and E as the lowest. Also for mixed-use building types with functions falling under different categories, the highest one shall be applicable							

30.4 Risk Assessment

Identification of the 'Asset(s)' that needs to be protected in a built environment shall include human lives (always the top priority); the function or purpose that the building is meant for; the building itself and all the properties therein and the intangible values attached like prestige, reputation, history, symbolism, etc. The risk shall be assessed considering the criticality of the asset, attractiveness of the environment as a target, level of impact achievable in worst case scenarios, potential of the likely adversaries and vulnerability analysis (see Annex G).

Based on these, the built environment shall be assigned one of the categories as per the classifications in Table 11. This classification guides the further design considerations to security, based on the varying proportions of Structural threats therein, while expecting common crime to be nearly constant in all. For example, in Category 'A' crime may seem insignificant in comparison to the enormity of the structural threats (see Table 11).

Table 11 Building Classification based Security Strategies
(Clauses 30.4, 30.5, 30.6, 30.7)

SI No.	Building Category	Crime prevention (CP)	CPTED	Structural Threat (CT)	Checks and Scans to Resist Structural Threats	Resilient Structure and Architecture
(1)	(2)	(3)	(4)	(5)	(6)	(7)
i)	A	Very Low	Optional	Critical	Mandatory	Mandatory
ii)	B	High	Desirable for B2, Mandatory in B1 and B3	High	Mandatory	Mandatory
iii)	C	High	Mandatory	Moderate	Mandatory for C1	Mandatory for C1
iv)	D	High	Mandatory	Low	-	Avoid
v)	E	Moderate	Mandatory	Nil	-	Avoid

30.5 Crime Prevention

Crime is known to inflict physical, psychological and mental harm to human life and property. Built environments in categories B to E shall be designed to enhance desirable behaviour, reduce potential opportunities for crime, create deterrence and promote social conditions that retard crime and fear of crime, following principles of CPTED. 'Crime Prevention Through Environmental Design' is a technique of design and control of the physical environment in a manner that it does not offer an opportunity for crimes to be committed therein. Refer Annex H for a complete checklist of design consideration towards preventing crime and fear of crime by design.

30.5.1 Surveillance

Surveillance shall be a combination of two types:

- a) Natural surveillance by people, communities and
- b) Mechanical surveillance by the use of cameras and other such mechanical devices.

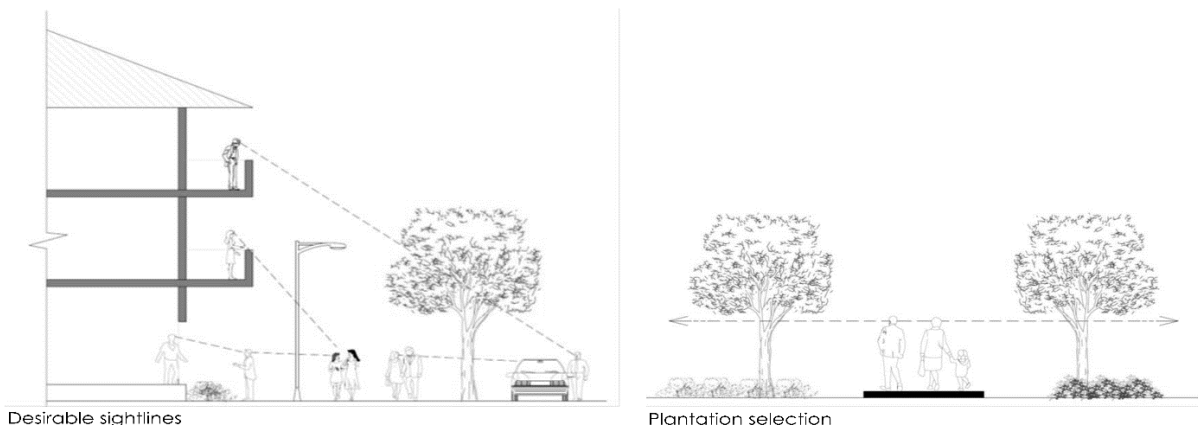


FIG. 13 CLEAR SIGHTLINES CREATING OPPORTUNITIES FOR CASUAL SURVEILLANCE

Natural or casual surveillance shall always be the preferred mode to be supplemented with mechanical as necessary, to enable the possibilities of preventing, apprehending and de-escalating crime like situations. Natural surveillance is also preferred due to the 'auditory connection', not achievable by mechanical means. These are included in the 'eyes on street' and 'positive social interaction' theories, known to enhance the 'feeling' of effectiveness of security (see Table 12).

30.5.1.1 Lighting shall be carefully designed in quality and quantity to support adequate surveillance whether it is by natural or mechanical means. The design layout of a building and unbuilt shall eliminate all blind spots, glares, be easy to maintain with redundancies and keep operational without dependencies. The level at which the light is housed, the foliage around and the accessibility of the lighting fixture to avoid tampering or being stolen while enabling maintenance, shall be suitably addressed. Dramatic accents, spotlighting and dark patches in specifying lux levels shall be avoided, using colour and warmth to create the desired perceptions and behaviours.

Lighting for all public routes shall be on the fail-safe electrical grids with emergency back-ups.

30.5.1.2 Cameras may supplement across all building categories with appropriate consideration to the strategic location of the devices (to capture entry or exit points), camera type/angle/location, light continuity, power back-up, data storage, inaccessibility, serviceability and integration in interior design. CCTV Monitor and Control rooms for the buildings should be located as per the hours of surveillance, number of monitors, staff and the strategic location on the main access floor, with access controls and in a manner to activate intervention to thereby prevent criminal events.

30.5.1.3 Unfrequented dark and shady areas where mechanical surveillance is not conventionally feasible like locker rooms, restrooms and public conveniences shall be located in frequented areas like lobbies and busy corridors and other compatible activities, to allow casual surveillance and auditory connectivity with the users inside and enable immediate action in distress situations. Additionally, these shall be supplemented with panic and emergency alarms.

30.5.1.4 Security command centre

For mechanical surveillance there shall be security command centres with CCTV monitoring room at different levels from city to neighbourhood to site level. All command centres shall be located strategically as per **30.7.3**. All built environment above 50 000 m² of FAR area or occupancy above 10 000, shall provide for a command centre within the site. The area provided for this shall not be less than 0.15 percent of the FAR sanctioned or 50 m² (whichever is higher). All built environments above 100 000 m², shall provide habitation facilities, for at least half the staff required to operate the same.

Table 12 Surveillance Requirements
(Clauses 30.5.1, 30.6 and 30.7)

SI No.	Build ing Cate goty	Command centre at site	CCTV and mechanic al	Hours of Surveillanc e	Natural Surveillance				
					Casual Surveillanc e	Communit y Control	Secondar y activities	Perimeter treatment	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	
i)	A	Mandatory for all	Mandatory all areas except private zones.	24×7	Restricted	-	-	Opaque or Translucent	
ii)	B1			Mandatory for occupancy above 10 000	24×7	Mandatory	Mandatory	Desirable	Transparency mandatory; Permeability optional
iii)	B2							Mandatory	
iv)	B3								
v)	C1								
vi)	C2		Mandatory in public and semi-public zone	24×7	Desirable	Desirable	Desirable	Transparency desirable	
vii)	C3			Operational hours					
viii)	D			24×7	Mandatory	Mandatory	Desirable	Transparency mandatory	
ix)	E								

30.5.1.5 The selection of plantations shall give due consideration to the type of trunk, level of foliage, span of foliage in all 3 dimensions to align with the angle of observation, location of cameras or human oversight. For very sensitive installations (category A), trees and vegetation shall be planted to ensure that no part of the same goes beyond the boundary. Tree height, location, boundary design and other features like trenches, ravines, etc, shall minimize concealment of dangerous items within a premises. While surveillance from outside looking into the site, at eye or street level is not desirable for category A buildings, it is a necessity for category B to E.

30.5.1.6 Secondary functions may develop as support activities or shall be created by design to reduce the opportunity for crime by enhancing activity, surveillance and populatedness with the ability to intervene or instigate community action. These shall be suitably designed into the design proposal to bolster all related aspects of natural surveillance like hours of operation, user profiles, actionability, continuity, etc. Mixed use planning, sustainable neighbourhood clustering of compatible uses are all ways to supplement mainstay functions using complementary secondary functions and shall be used to activate public realms in land-use based planning models and community facilities like parks, children play areas etc that tend to become derelict after hours.

30.5.1.7 Positive social interaction between the secured (private and semi-private zones) and unsecured (public and semi-public) areas shall be designed in every built environment. Visibility from private to public and from the public to the semi-private zones shall be critical to the outer most layer of the building interfacing with the public realm outside it, as per Table 10.

30.5.1.8 Urban responsibility of every architectural building, urban design or masterplan shall include a contribution to urban security of the neighbourhood and thereby the whole city. It shall be the responsibility of every building proponent to:

- a) mitigate threats to the building and its users;
- b) mitigate threats and vulnerabilities from the building use/purpose and its users to its urban context and neighbourhood;
- c) contribute to casual oversight and community participation with the feeding street networks and other components of public domain including parks, sidewalks, street furniture, etc to effect crime prevention outside the site perimeter and within.
- d) contribute to deterrence and community support of the neighbourhood through interventions and actionability on the surveillance
- e) create, nurture and maintain instruments like communities, RWAs etc, empowered to act on the surveillance, exercise access control, enforce territoriality and maintain the facilities within the neighbourhood and context.

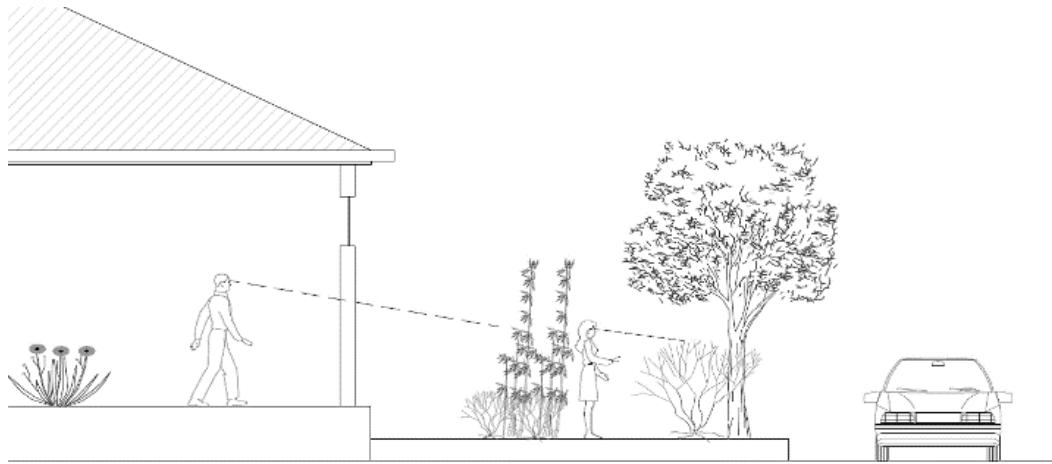


FIG. 14 PERIMETER AND CASUAL SURVEILLANCE

30.5.2 Access Control

30.5.2.1 Natural access control

The emphasis shall be on 'natural' access control that is not dependent on mechanical devices but design generated and subtle to create permanent access control without dependencies.

30.5.2.2 Perimeter control (usually the first layer of security) is primarily a means of controlling access into a building precinct. Perimeter control features shall include any or all of the following:

- a) Boundary walls shall be used where structural properties, crash strength is required to resist forced entries and where visibility across the perimeter is not a desirable (category A only). For all other categories boundary walls shall be designed with transparency or openness as stipulated in Table 11.
- b) Fences by themselves or coupled with low boundary walls are able to provide crash strength if required without disrupting visual connections.
- c) Moats, mounds, trenches or other physical features may be used for delineation.
- d) Vegetation including trees, shrubbery or others are effective perimeter control elements that should be designed in spacing, etc to restrict vehicles and pedestrian access.
- e) Bollards or street furniture meant only to restrict vehicles (see **30.6.7.2**).

30.5.2.3 Mechanical and Digital Access Control

While deciding the design of such access control elements, the following shall be borne in mind- the level of security required, means of operation, reliability in case of electrical discontinuities, mode of operation etc. The process of selection of the optimum devices and means shall also recognise the favoured means:

- Conventional locks, bolts and keys- ideal for Category D as per operations.
- Digital locks with/without phone and video- for category D as per operations.

- Access cards, turnstiles, biometric, codes for allowing authorised personnel- for categories C and some of the users of Category B environments. RFID cards and other digital access mechanisms shall be used to further supplement access control within the various layers within an environment as per the relevant degrees permissible. These can further be used to regulate access to core, high value or high security areas or simply regulate circulation and even crown control.
- Complex combinations of digital, mechanical and personnel security shall be used redundantly for category A environments to eliminate misuse of digital or infallibility of mechanical devices.

30.5.2.4 Visual control

All the aforementioned perimeter control measures shall respect and respond to the visibility requirements as stated under **30.5.1**, especially if they perform any kind of public function inside or abut a public space outside. In special cases (under **30.6.2** and Table 13) some building categories shall require crash strength for the perimeter design which shall be achieved without compromising the visibility across. Unless the building function demands that the internal semi-public spaces not be visible to the public context outside the site perimeter (only in category A), all building perimeters shall be designed with not less than 75 percent unobstructed visibility across or less than 25 percent of the surface area shall be opaque (unless otherwise specified in Table 12).

30.5.2.5 Crowd Control

Too much population or crowds, create other criminal threats, including challenges to surveillance, offering opportunities for extreme events and a wide spectrum of crimes including gender based. Refer to section 30.6.7.5 for more details.

30.5.3 Ownership reinforcement

Perimeter controls (like boundary walls, etc) as symbols of the ownership and territorial rights to a site premises shall discourage the use of harsh measures. Alternatives that allow unobstructed public to semi-public/private visibility and positive interactions will be encouraged in all categories from B to E. Ownership responsibility towards community functions of security and belongingness to the community by the building and its users shall be enhanced without physical obstructions to public surveillance.

Empty plots without construction and buildings in categories B to E shall endorse their ownership rights as per the afore-mentioned guidelines for visibility. Security of the insides of the buildings under construction shall be the responsibility of the builder during the entire phase of construction. In the case of delayed, interrupted construction progress or abandoned/unfinished buildings without an assigned builder or one under dispute, it will be the liability of the owner(s) to secure the premises, control access to a deserted site and not allow it to fall prey to anti-social elements or offer them refuge.

Within the layout of buildings or building complexes like group housing (especially affordable/EWS/LIG housing), commercial/office spaces, etc, the ownership limits shall be designated with clarity on the shared and individual responsibilities towards maintenance, surveillance, lighting, access control etc. In the building faces that overlook the public spaces (especially in commercial, retail, recreational buildings), window sizes, sill/lintel levels and nature of design should promote oversight of the public realm by involved people with the power and ability to intervene. Dead facades or those without activity inside shall not be provided and discouraged in design. Every space within a layout especially common areas like staircases, lift lobbies, corridors, etc shall be assigned ownership for their maintenance and upkeep.

30.5.4 Image and Maintenance

Every building design shall have an operational plan to maintain the design as per original intent to ensure security. Building maintenance shall be incentivized, with legal/punitive liabilities on the owners for non-compliance of the following requirements:

- a) Buildings shall not be allowed to remain unoccupied (less than 50 percent occupancy) or abandoned for more than 12 months;
- b) Under-construction buildings shall not be allowed without construction activity for more than 6 months for categories C to E or 12 months for categories A and B unless security regimen is showcased on record;
- c) Buildings showing signs of vandalism including graffiti shall be corrected removing all such offensive material and future opportunities shall be curbed through security/CPTED audits or equivalent action;
- d) Buildings showing signs of decay like broken windows, unkempt landscape/vegetation, uncleaned gutters, etc for more than 3 months shall be rectified;
- e) Lighting shall be maintained in quality and quantity, avoiding too low, glares, dark pockets, disrepair, non-functional, power cuts, limited hours of service, etc especially for the public areas and streets. All light fixtures shall be repaired and maintained in good working condition through the life of a built environment.
- f) All common lobbies, shared staircases, driveways, stilts and other such common areas with shared ownership shall be approved only on demonstration of a workable and sustainable maintenance scheme.
- g) All landscape elements including plants shall be maintained in their height, foliage cover, etc to ensure that the original intent is maintained, no new vulnerabilities generated and to keep the visibilities clear as per aforementioned mandates.
- h) All areas must maintain hygiene of their drain ways, gutters, etc, especially ones feeding into the public networks.

30.5.5 Other CPTED Inclusions

Refer Table 13.

30.5.5.1 Community Cohesion

The role of communities is known to contribute to almost every aspect of the crime prevention and counter-terror strategies. All built environments shall be designed to enhance community action towards natural surveillance, access control, territoriality and other crime prevention initiatives.

Every design proposal especially for category D shall commit to modern-day community institutions like welfare organizations or NGOs (non-governmental organizations). The role of such community institutions shall be identified and detailed at the approval stage to ensure security continuity through the life of the environment. Methodology to be undertaken for these tasks to be performed, the funding mechanisms, decision making and powers shall be submitted as part of the security proposal for the same.

30.5.5.2 *Social Control*

All buildings and their operations shall ethically follow the universal principles of non-discrimination, inclusivity and socio-economic sustainability. Gated communities and group housing projects shall adopt these measures in their design and operations with officially submitted commitments towards them. It will be the social responsibility of all proponents of such developments to ensure that they do not create any pockets that shall be rendered lonely, without surveillance inside or outside the perimeter of the legal ownership and that the layouts of their proposed neighbourhoods would foster a healthy relationship with the urban context, inside and outside the perimeter of ownership.

30.5.5.3 *Gender Sensitivity*

All built environments shall be designed with special sensitivity to reduce/deter all gender based and sexual crimes:

- a) All public areas and streets within and outside the proposed built environment shall remain visible and connected with the semi-public, semi private and private spaces in the built environments, and kept active with secondary functions by design.
- b) Dead walls or opportunities to hide along pedestrian networks shall be avoided and wherever identified shall be addressed on priority using corrective action or activation techniques.
- c) Public routes and other spaces should be provided with emergency alarms or panic buttons to connect to police installations in case of distress by all genders alike.
- d) Special attention and security measures shall be taken for public conveniences especially female toilets, locating them in populated areas near secondary functions that ensure activity across the 24 h cycle. Entries and exits to the toilets shall be visible to communities and the insides of toilet blocks lightly veiled without harsh obstructions, to allow audio connectivity with visual privacy. Total privacy is necessary only for the WC compartments with restricted sizes, allowing opaqueness from level 300 mm to 1800 mm from finished floor level. Within the toilet blocks a provision for alarms and panic buttons is necessary in Category B and C.

30.5.5.4 Walkability

The streets and sidewalks shall be kept unhindered and unobstructed at all time as vital elements of activity control, surveillance and community action.

- Vegetation shall not hinder visual connectivity between building and street.
- All services, manholes, light poles etc shall not create obstruction to the pedestrian
- All lighting receptacles shall be maintained for continuity of their service and the design shall ensure they are not tampered with, stolen or damaged by miscreants.
- These shall remain continuous over the plot entrances while the vehicular road should be negotiated to ensure the continuity of the same without level change. This continuity shall be maintained even at times of construction activity in the specific plots and all disruptions to the same shall be made good by the owner of the plots at their cost within not more than 7 days.
- No infringement of these paths shall be acceptable for any reason including retail outlets, landscape, vehicles, residential upkeep, services maintenance etc.
- Any secondary activities, kiosks etc. shall be designed in a manner to keep the walking paths unhindered, continuous and reliable.
- Parking of cars or vehicles shall not be permitted on or along these and legal or punitive action shall be taken on violations.
- These shall be kept free of vehicle ingress including two-wheelers using adequately placed bollards, vegetation or benches, without reducing the width.
- For category D, a minimum width of 2000mm shall be provided for an unobstructed walkway while for categories B & C, they shall be not less than 3000mm.

Table 13 CPTED Requirements
(Clauses 30.5.4, 30.5.5 and 30.7)

SI No.	Build ing Cate gory	Maintenan c e	Community Cohesion	Social Control	Gender Sensitivity	Planning					
						Structural threats	CPTED compliance				
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)				
i)	A	Mandatory ↓	Desirable	Desirable	Desirable	High risk requires segregation from residential & institutional	-				
ii)	B1			Mandatory	Mandatory		Mandatory ↓	Mandatory			
iii)	B2		Mandatory		Traffic and urban design fallouts						
iv)	B3				Allocations with comp- atible & complementary functions distanced from High risk						
v)	C1		Desirable								
vi)	C2										
vii)	C3		Mandatory	Desirable							
viii)	D			Mandatory							
ix)	E										

30.6 Special Requirements for Mitigation of Structural Threats

Structural threats to a building are man-made and likely to affect the structural performance with the intent of causing harm to humans, loss of life, property or masses of them. Commonly known structural threats include blasts from explosives, arms, ballistics, arson, vandalism and such.

- a) The design shall include a complete professionally devised security proposal that identifies threats, enlists mitigation strategies to resist structural or extreme events (Annex J).
- b) The design shall ensure that in the unlikelyhood of an extreme event, the building is resilient enough to resist failure, respond and recover with minimum losses.

The expected outcome of structural threats, to be averted by way of design are:

- 1) Failed building components that may harm occupants and property therein;
- 2) Flying debris with the potential to disperse and harm for longer distances around the structure;
- 3) Services failure that may lead to power breakdown and disruption of continuity of the building function, its security infrastructure, communication or loss of critical function and data.
- 4) Progressive total structural collapse.

Fire, smoke, panic and stampedes are also established outcomes of extreme events in buildings, addressed in the Part 4 'Fire and Life Safety' of the Code. All measures mentioned below shall be integrated into the design of buildings as per the recommendations in Table 14.

Table 14 Physical Design Measures for Mitigation of Structural Threats
(Clauses 30.6 and 30.7)

SI No.	Building Category	Stand-off distance	Perimeter	Parking	Access control	
					Vehicles	People
(1)	(2)	(3)	(4)	(5)	(6)	(1)
i)	A	30 m or more	Crash tested and limited visibility	Remote or at SOD with structural/MEP isolation: Not in basement	Forced entry barriers with crash strength;	Gate and Digital devices or Manual
ii)	B1	Minimum 30 m or blast resistant design of building envelope	Visibility above 90 percent but crash tested	Remote, MLCP or at SOD but not basement	Forced entry barriers with crash strength; Queueing space = 10 percent of parking provided	Scans only
iii)	B2			Permissible in existing buildings in basement with effective checks		
iv)	B3			Basement parking not desirable		
v)	C1			Basement parking desirable for occupants only, not visitors		
vi)	C2	15 m of more	Visibility 80 to 90%	-	Perimeter/Access control measures for operational control only without infringing visibility	
vii)	C3					
viii)	D	-				
ix)	E	-		-		

30.6.1 Stand-off distance (SOD) shall be maintained as per the Table 14. If the same is not achievable due to other justifiable constraints, the structural envelope of the

building shall be strengthened as per the expected largest size of the potential threat like explosive/ballistics and its minimum likely distance in compliance with **7.8 of Part 6 'Structural Design Section 1 Loads, Forces and Effects' of the Code.**

30.6.2 Vehicular standoff

Each vehicle is a potential explosive and structural threat to the building. Hence if vehicles are allowed access into a site perimeter, the SOD calculations (see Table 10) would be applicable from the vehicular circulation therein.

30.6.3 Vehicular Control

While limiting vehicular movement on a site or in the vicinity of a building is the most effective, other design strategies used to enhance SOD or reduce the threats from vehicular circulation are:

- a) Control of vehicular size – This controls the damage potential of the vehicle.
- b) Control of vehicular speed – By way of design, by limiting straight stretches, introducing bends and turns, etc.
- c) Scans and checks of materials inside vehicles or in the boot space (see **30.6.7**).

30.6.4 Vehicular parking poses threats and contributes to the vulnerabilities in a built environment. Hence all buildings with structural risks (Table 14) shall ensure alternate strategies for vehicular parking, like multilevel car parks (MLCP) located remote or at the required stand-off distance.

Only in existing category B buildings, the basement parking provisions can continue to be used, provided the following conditions are met:

- a) Every vehicular entry into the structure of the building shall be effectively screened (mechanically or manually), to ensure elimination of structural threats.
- b) SOD of these check points from other vital installations, services and public areas is maintained.
- c) Adequate queueing space is provided without disrupting the road networks outside the perimeter.
- d) All fire and panic egress provisions function without compromise.

30.6.5 Layering

As a strategy of incremental security, treating each concentric layer as a ring of hardening shall be adopted to overcome site or operational vulnerabilities and mitigate identified threats. Each layer shall be designed individually minimising the threats and collectively to support each other and points of vulnerabilities or constraints to effectively create a composite security efficacy with least dependence on mechanical, organized or operational means, integrating aesthetics and dignity in the user experience. The layers commonly used are given in Fig. 15 and under definitions in **2.92**.

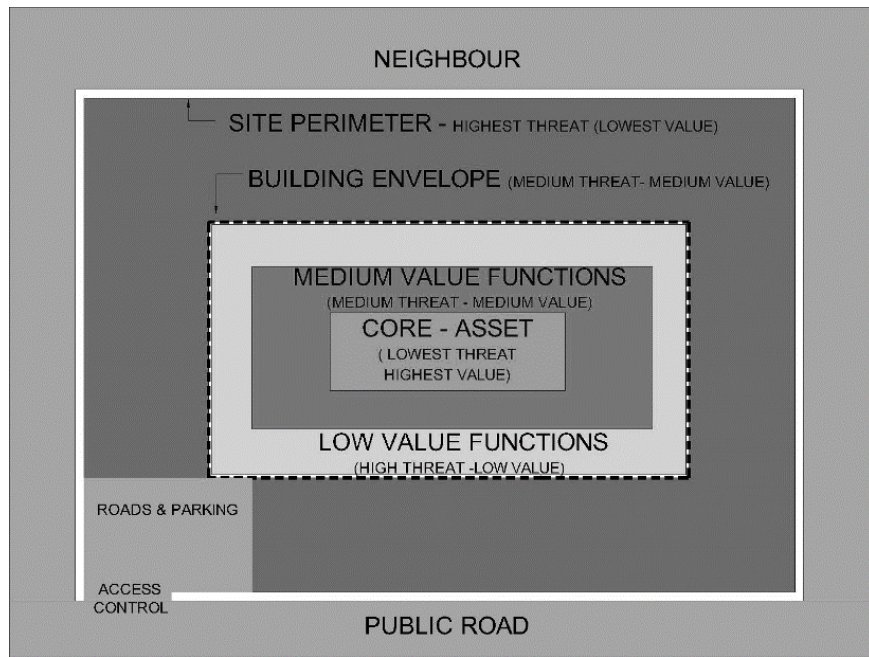
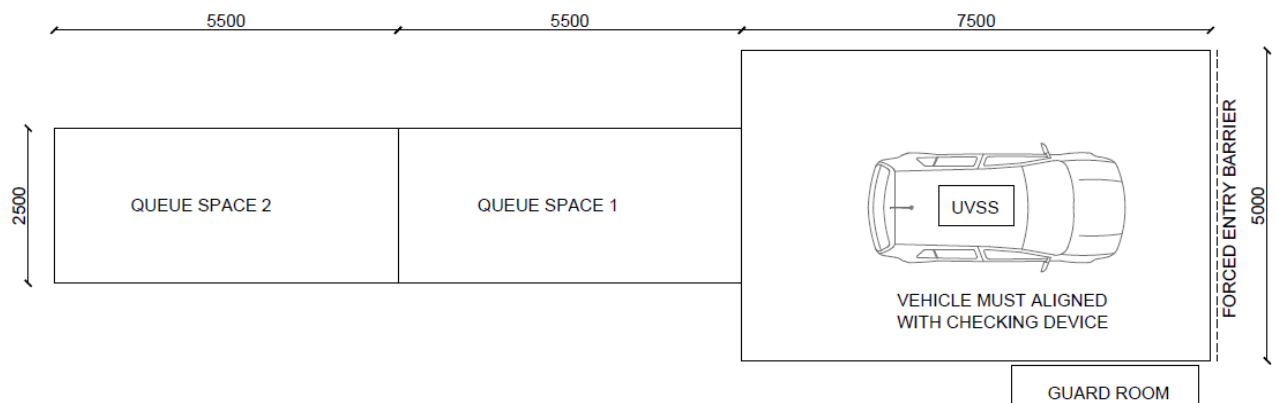


FIG. 15 LAYERWISE SITE DELINEATION

30.6.6 Special Surveillance Consideration

- Vantage points for the potential offender if any shall be identified and eliminated while vantage points for security personnel (category-A buildings only) like watch towers, shall be integrated using alternate subtle and covert means.
- CCTV monitor rooms and such control rooms for the buildings should be located as per the hours of surveillance, number of monitors, staff and the strategic location on the main access floor, distant from attractive attack points and with redundancy in access/exit routes.

30.6.7 Access control for buildings with high risk of extreme events shall be designed into each layer of security designed as per Table 12 to regulate the different types of circulation. The number of access points into a perimeter shall be limited with a clear planning of the segregation of circulation types, hours of operation, personnel requirements and fire rescue/egress demands.



All dimensions are in mm.

FIG. 16 SPATIAL REQUIREMENTS FOR VEHICLE SCANS AND QUEUEING SPACES

30.6.7.1 *Forced entry barriers*

A crash barrier system is typically engineered to stop a certain size vehicle travelling at a certain speed from penetrating a controlled perimeter. Depending upon the purpose and location of these installations in the overall site-plan, the provisions shall include the following considerations:

- a) When the vehicle is only to be stopped, the stand-off distance of the barrier from the building being protected shall comply the building category requirements.
- b) If the design allows the vehicle to penetrate beyond the barrier, then the stand-off will be calculated from the point of maximum vehicle ingress to the building envelope.

30.6.7.2 *Types of Forced entry barriers*

- a) *Gates* – Sliding, hinged, automated or remote controlled are all modes of access control but shall include structural strengthening if they have to resist forced entries. A gate's design in height, look and materials shall consider its purpose, surveillance quality and quantity through them as relevant to the building category (refer Table 15).
- b) Boom barriers, require attention for their appropriateness in location, function and the afore-mentioned considerations. Boom barriers are convenient and effective against vehicles but constrained in restricting human movement.
- c) *Bollards* – Shall be fixed or retractable and the distance between bollards shall be based upon what is to be controlled and what is to be allowed through. These are effective to control vehicles but constrained against human movement.
- d) The retractable versions need a structural system below the visible blocks, with mechanical systems for retraction and electronic controls that shall be kept climate-proof. All clashes with fire tender movement shall be resolved in design to ensure that the emergency paths remain clear in an emergency situation and in the event of breakdown of electrical or mechanical services. Design shall address the possibilities of operational failure in the case of power discontinuities, mechanical failure and inadvertent damage to vehicles in addition to the afore-mentioned considerations.
- e) *Tyre-busters* – Disable forced entries by bursting the tyres of the rogue vehicle with limitations in efficacy, as despite busted tyres they are known to continue in their momentum for considerable distances depending upon their velocity of impact. When installed they shall address in design the possibilities of operational failure in the case of power discontinuities, fire rescue circulation, mechanical failure and inadvertent damage to vehicles in addition to the afore-mentioned considerations. These are best recommended to regulate traffic movement, direction of movement and deter forced entries on unmanned, unprotected routes or exit gates.



Table 15 Forced Entry Barriers and Other Access Control Measures
(Clauses 30.5.2 & 30.6.7)

SI No.	Buildi ng Cater gory	Visibilit y throug h Gate	Boom Barrier	Bollards	Guard room	Scanners		Natural Access control			
						Vehicle	Person/ Belongings				
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)			
i)	A	0 to 50 percent	Crash tested and limited visibility	Retractable for vehicle movement only. Fixed shall be used for pedestrian circulations.	Minimum size including checking of persons and bags = 40 m ² . For checking suitcases, cargo and cartons= 50 m ² .	SOD=30 m with Queueing space of 1-2 cars	SOD=30 m; Isolated structurally and in services; Storage facility at 1 locker for every 10 occupants	Optional			
ii)	B1	Above 60 percent	Visibility above 90 percent but crash tested	Fixed bollards for limiting vehicle movement at spacing of not more than 700 mm and the height of bollards should be minimum 600 to 2-restrict wheeler movement through these	Crash tested walls, security glass and all provisions	SOD=30 metres + Queue= 10 percent of parking provision	SOD=30 metres; Isolated structurally and in Services; Storage facility at 1 locker for every 5 occupants	Mandatory			
iii)	B2					SOD=30 metres + Queue= 15 percent of parking provision					
iv)	B3										
v)	C1	Not less than 80 percent				Minimum size = 30 m ² .	SOD=30 metres + Queue= 5 percent of parking provision if residents/ staff entry is segregated	Optional			
vi)	C2	Not less than 50 percent									
vii)	C3										
viii)	D	Not less than 80 percent	Visibility 80 to 90 percent			SOD=30 metres + Queue= 5 percent of parking provision if residents/ staff entry is segregated	Only for prohibited or enlisted items	Optional			
ix)	E								Not required		
Mandatory											
	NOTE - For installations with 100 percent digital scanning facilities, the queueing requirements shall be halved										

30.6.7.3 Other access control measures

- a) Guard rooms used commonly to house the personnel and associated equipment at the entry points shall also afford adequate protection in terms of structural strength in its walls and windows depending upon the threat profiles of the category of building, vehicle velocity and layout vis a vis the crash loads likely.

While affording the guards adequate surveillance of the approaching visitors they should allow them to remain protected and concealed against rain, sun, snow and the offender. Provisions for their daily needs, like toilets, environmental control and

ample space for the devices to function and be serviced shall be maintained at all times.

- b) Scanners shall be used before allowing access to humans or vehicles based on the threat profile and security category of building as laid out in Table 13, to screen the vehicles, humans and their belongings for any substances that can threaten the structure of the building or the assets therein. These may be explosives, arms, ammunitions and other CBRN (chemical, biological, radiological or nuclear) material and the nature of scans or checks will depend upon the threat profile. These should be at the perimeter and when these go into the built environment, stand-offs shall be applicable only from the point of these scans. The scanning points shall be isolated structurally and environmentally from the rest of built environment especially the asset.

The design shall ensure that no habitable space is located immediately above or below these provisions and their minimum distance from habitable spaces or assets shall be not less than the SOD for the category. The design shall give due consideration to the effective movement of the visitors without clashes between the checked/cleared and unchecked, to eliminate opportunity of contamination of the scanned baggage.

These facilities shall be designed with space for queueing with climate control and cover from rain, heat or wind. In higher footfall environments, the provisions shall ensure not more than 10 min waiting time for those being checked. Accordingly frisking provisions with scope for increment shall be provided based on rush hours/days. In all cases taking longer than 3 minutes, adequate seating facilities (minimum 1 for every 3 persons) shall be provided in the waiting queues.

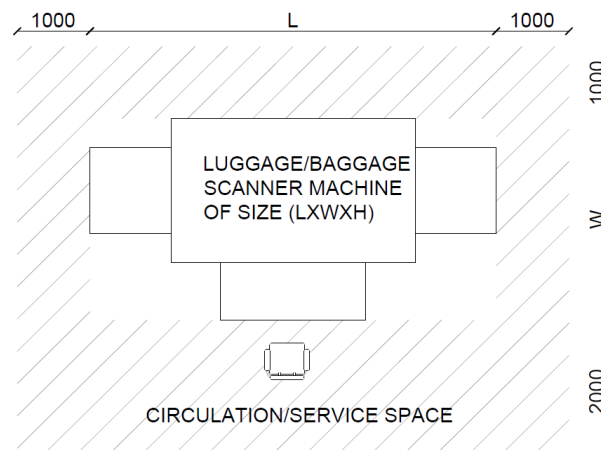
30.6.7.4 Types of scanners

- a) Under vehicle security scanners (UVSS) are used for the purpose of scanning the underside of a vehicle, especially its mechanical parts, for the presence of explosives or trigger mechanisms. While the function is performed, the vehicle should not be creating congestion on the feeding road network and for high traffic installations this would require queueing space within the site.
- b) *Baggage or luggage scanners* – Found in different sizes, depending upon the purpose of the installation, building and likely size of personal belongings expected therein shall be located as per afore-mentioned considerations.
- c) Manual checks shall be used in the absence of the afore-mentioned scanning machines, before the checking of the person. There shall be a counter top at a height of 750 mm as per the size of the expected bag or luggage to allow for the manual checking of the contents of the bag before the person is checked. A space allocation of not less than 10 m². shall be provided for checking of large size bags and not less than 5 m² for small bags carried on the person.

Gender-wise bifurcation of these check points shall be done for a perfect gender ratio of 1:1. Provisions for queueing of persons and short-term storage lockers

for objectionable, inaccessible, precious or confidential belongings shall be provided.

Cloakrooms or Short-term Storage - Adequate storage provisions, shall be structurally and mechanically isolated, maintaining SOD as specified for the category. Provided as per Table 13, they will be in addition to scans and check points, with circulation flow as per Fig. 17 with remote windows for deposit and retrieval of articles. The requirement for providing scanners and checking stations can be diluted if the facilities for storage are augmented to allow 100 percent storage, thereby enabling complete prohibition of any belongings inside a secured premises. In such cases, the mandatory provisions will need to be double of what is mandated. Locker sizes shall vary from small 25cc to large as per the building purpose but not less than 50% should be for 50 cm³ volume. Minimum size of such a storage facility shall be 10 sqm including minimum 1m for access of lockers and open area of 1 m × 1.5 m to stack any large or odd size articles. Whether the storage facility allows access to the visitors or not, the items shall be stored with a unique id without any chances of damage or misplacement of goods and the same shall be visible both at time of deposit and retrieval.



All dimensions are in mm

FIG. 17 SPACE REQUIREMENT FOR BAGGAGE SCANNER

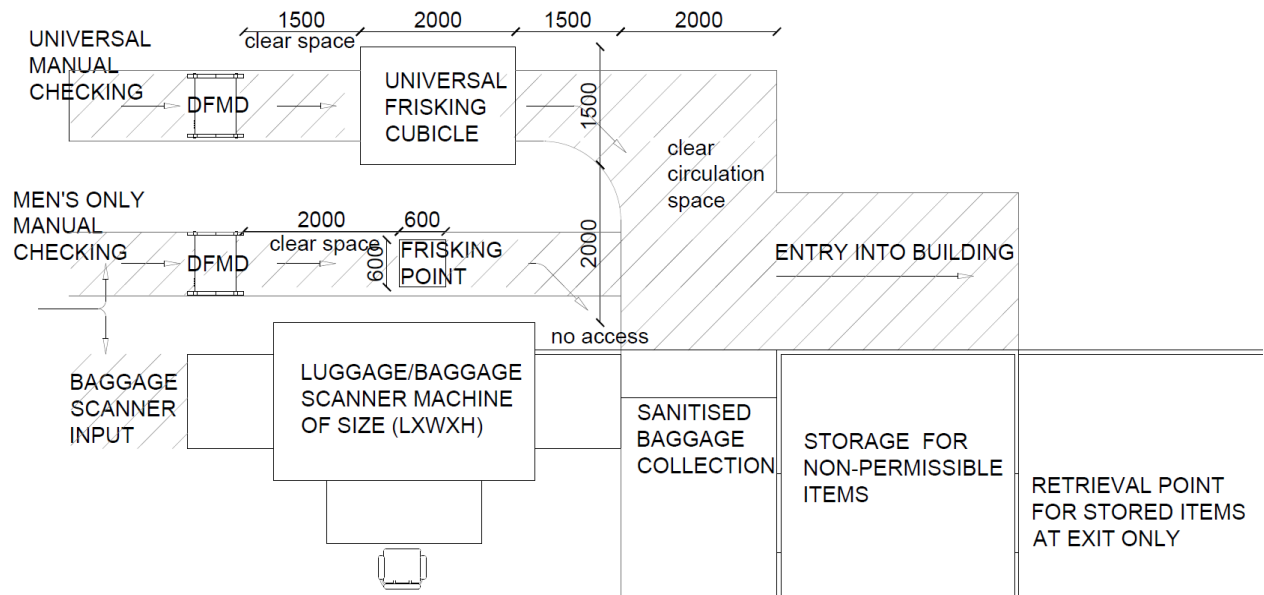


FIG. 18 SPACE REQUIREMENT AND CIRCULATION FLOW FOR SCAN AND CHECKS

- d) Frisking stations and HHMD (hand-held metal detectors) check points, shall be designed with desired circulation route, nature and size of enclosure for all genders, clearly segregating the checked from those yet to be checked. The size of a universal frisking enclosure (mandatory for women) should not be less than 3 m² for each security personnel. This should have adequate provision for privacy to the person checked and a counter top to place their belongings. The security professional shall be provided with a seat. However the frisking enclosure should not be completely closed with possibilities to look out above the 1 500 mm and below 500 mm level. The enclosure design shall allow auditory connection to the outside for both the security personnel and the visitor being checked.

When only a frisking point is created without enclosure (for men only), this should not block a circulation route, exit path or fire egress. The point shall be identifiable as a raised pedestal (not more than 150 mm high) or marking on the floor for the visitor to step on, allowing people to wait in queue at a distance, with no opportunity to skip the function or bypass it.

Minimum one UFE shall be provided at every human entry point as per building classification mandates. In higher footfall environments, the provisions shall ensure not more than 10 min waiting time for those being checked. Accordingly frisking provisions with scope for increment shall be provided. In all queues taking longer than 3 min, adequate seating facilities (minimum 1 for every 3 persons) shall be provided in the waiting queues with climate control and cover from rain, heat or wind.

- e) Door frame metal detectors (DFMD) are usually available as door integrated machines with a clear width of not more than 900 mm. The circulation design shall ensure mandatory passing through these for all human entries and allow for persons to empty their pockets or divert the metallic belongings into the baggage scanners with ample instructions and reminders. The machines shall

be maintained to a level where, only if and when it indicates, the person shall be subjected to frisking manually or by HHMD. These machines shall be housed with adequate movement and operational space while enhancing experiential aesthetics. Redundancy of equipment is necessary either in location or numbers, to ensure continuity of security depending upon the traffic and building use.

30.6.7.5 Crowd Control

Crowds and over-crowding create structural threats and panic stampedes. Such mass congregation shall be prevented with the use of access controls that check and govern the total numbers in a public space.

All public spaces prone to over-crowding (category B & C) shall install access control at the point for transition from public domain to the restricted one, ensuring that there are no inadvertent bottle necks. Secure exit of those denied entry in addition to secure, unambiguous circulation of authorised populations shall be ensured and documented for operations. Visitor authorisation points shall happen after security check points at the stand-off prescribed, preferably in proximity to limit the queueing, after undergoing all security check provisions under 30.6.7.4.

For events that do not require tickets/other authorizations, the queues for entry/checking shall allow unrestricted egress at any point should a person want to exit the queue without chances for clashes, chaos or panic. For that purpose, queueing strategies like railings, barricades etc shall have breaks at every 10m distance.

Organised movement of the crowds through enclosed passages shall have atleast one face with natural light and ventilation and ease of access to adequately designed egress routes in compliance with the Part-4, Fire and Life Safety of the National Building Code 2025. All facilities prone to crowding, shall be permissible only on the ground level with direct egress (not more than 20m) to Assembly spaces of total area not less than the area of the facility. All doors or other access control devices for the same shall be allow unrestrcited egress at all times.

The egress doors should ideally be in excess of and different from the entry doors which may be fewer. Those wanting to enter the premises but being blocked shall be distanced from the egress door points to not allow their forced entries or clash with those egressing. All egress doors should open unrestricted in the direction of egress using panic bars but the entry at these point shall not be allowed except with special keys and codes available only to the emergency services.

30.6.8 Effective Building Layout

The following are relevant to designing for Structural threats but not limited to the same:

- a) Site selection is a vital factor as neighbouring buildings (existing and future), roads and larger context can create threats and vulnerabilities for the building

proposed. Conversely the building shall not contribute to the creation of new threats and risks to other in the vicinity.

- b) Orientation, massing and zoning techniques shall be cognizant of security value in space allocation to assets, compatibility of different spatial uses and mitigation of vulnerabilities.
- c) Site zoning and circulation shall ensure that the most critical assets are located in the core allowing maximum stand-off and layers of structural cover around it which shall be isolated from the rest of the structure to minimise impact from the adjoining structures. The layout shall ensure maximum separation, structural and environmental, from the adjacent structures that are outside immediate control.
- d) Drive-up and drop-off zones shall be kept away from large, glazed facades.
- e) The assets and other life safety provisions shall be kept under multiple layers of security.
- f) Sensitive or critical areas shall be kept away from other areas of controlled or uncontrolled access.
- g) The security category of buildings in the vicinity creating, known, unknown or future vulnerabilities shall be addressed in the design layout.
- h) Location of utilities and services shall be away from public access.
- j) Vulnerable facilities like diesel tanks and electricity generators shall be adequately access controlled, structurally remote, isolated and at a suitable stand-off distance from the asset.
- k) Security monitoring and control room shall be well provisioned with proper ergonomic furniture and sizing, with due consideration to the hours of operation, access, climate control, lighting and proximity to access control points of the building. Adequate space shall be provisioned for these on the main access floor in keeping with the personnel calculations and other operational details. The location of these shall not adjoin the security check and scan areas but shall definitely be proximal for immediate backup and support at the time of emergency.
- m) Toilets, lockers and dormitories for security staff shall be provisioned adequately and strategically as per the number of shifts and working hours.
- n) Mailrooms and loading docks are critical for CBRN concerns in category A and B buildings. They should be a stand-off distance away from the building cores, structural systems, services installations and should be isolated structurally and mechanically.

30.6.9 Structural Design

The structural components shall be designed to sustain the identified level of dynamic loads (from blasts, armed attacks, etc) depending upon specific threat level, category classification and post-design status after all afore-mentioned design interventions in compliance with [3(9)] as applicable.

- a) Selection of structural forms like high rise, large span, dome or framed, etc directly impact its structural behaviour and vulnerabilities and these shall be adequately mitigated in design.
- b) Structural detachment of assets is necessary through special protection and structural isolation to minimise impact and resilience to an extreme event.

For buildings at risk from structural threats, the selection of form, zoning, massing and layouts shall be cognizant of the structural threats and in strategization with other operational procedures, embed structural inputs as necessary.

30.6.10 Building Facade

Integration of preventive and resilient measures in façade design shall be as per Table 16. The structural design, strength and level of structural hardening for all components of the facade, listed below shall depend upon and can be optimised through the design of:

- a) Distance from a direct structural threat like an explosive, armed attack etc.
- b) Likely size of the threat source/explosive governs the magnitude of threat, the damage potential and thereby the level of structural hardening required to resist structural damage.
- c) *Fenestrations* – shall be restricted in compliance with [3(9)] when design is expected to counter structural threats, as per the afore-mentioned measures.
- d) *Glazing design* – including all the members therein shall be structurally designed for identified/designed loads to cover all types of disasters identified therein and minimize flying debris. As per Table 16 all the glazing components and frames shall be dynamically designed for the risk category.
- e) *Fixing arrangement* – The structural silicone bead or the glazing tape in the glazing design shall ideally be applied to both sides and other such measures to ensure that the fenestrations and other such components do not fail.
- f) External doors shall be limited, except as required for evacuation codes and where necessary buffered with aprons or vestibules. All exit doors shall be controlled for access and restricted to one-way operation only using panic bars and other access control features.
- g) Overhead mounted architectural features, façade maintenance devices and Services installations shall be structurally designed in compliance of the building category.
- h) Roofs and terraces being used for services and not in routine access shall be secured with restricted access or emergency egress by panic bars.
- j) Flying debris shall be controlled by selecting materials which do not cause harm upon fragmentation and remain fixed to the structure in the face of extreme overpressures. The selection of the material specifications and the strength of their fixing and attachment to the structure shall be designed to minimize flying debris in an extreme event as per category wise requirements in Table 16.

Table 16 Consideration for design of Building Facade, Structural Refuge & Services for Mitigation of Structural threats

[Clauses 30.6.8- 30.6.12]

SI No.	Building Category	Structural and Building Layout	Fenestration/ Glazing/ Fixing	External Doors	Overhead & Façade features	Flying Debris minimization	Structural Refuge or Bomb Shelter or Panic room	Services Considerations (all as listed)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)

i)	A	Mandatory	Structural code compliant	Minimize and strengthen	Structural code compliant	Mandatory	Mandatory	Mandatory segregation
ii)	B1			Not required here			Provision only for limited high value occupants	Mandatory but dampeners acceptable
iii)	B2							
iv)	B3							
v)	C1							
vi)	C2	Desirable	Desirable		Desirable	Desirable	Not required	Lighting mandatory
vii)	C3							
viii)	D	Not required	Not required		Not required	Not required		
ix)	E							

30.6.11 Structural refuge rooms or bomb shelters or Panic rooms are special enclosures unlike the fire refuge areas defined under Part 4 'Fire and Life Safety' of the Code. These shall be included as per Table 16 to withstand any contingency with structural, services and architectural isolation. Minimum area of 0.6 m². per person shall be provided based upon the projected occupancy of the building or specific section that it needs to serve. These shall be maintained regularly and the likely users shall be adequately trained through mock drills and training sessions.

30.6.12 Services Design

In keeping with stipulations of Table 16, the design shall include in the design of services, [as given below and also refer to the Part](#) :

- All service trenches, tunnels, etc, shall be access controlled, provided with surveillance at all times or sensor-based alarm for intrusion, fire control mechanisms and compartmentalised (Part 4 'Fire and Life Safety' of the Code) with separator walls with epoxy or smoke seals.
- Installations housed above the false ceilings shall be fixed to structural members with structurally tested joinery, and not resting on the ceiling itself.
- Services elements like shafts, ducts, trenches, cables and conduits shall be adequately designed structurally.
- Services isolation shall keep all ducting routes, electrical cabling, plumbing and sanitary routes for high value (assets, cores and egress routes) or high threat (foyer, vestibule, scan points, etc) areas segregated.
- Dampeners in ducts shall supplement mechanical isolation and segregation as aforementioned wherever complete ducting segregation is not achievable.
- All fittings, piping and overhead mounts shall be avoided on external walls and structures with high damage receiving potential for electrical and other installations, ensuring rigid and structurally designed fixing to withstand the maximum structural threat identified.
- Air circulation shall be designed to allow for isolation and segregation of high value or high threat areas. Fresh air and exhaust vents shall be out of human, unrestricted reach.
- Airborne contamination shall be limited in the design of mechanical systems and networks with special attention to areas that are vulnerable [to CBRN \(see definitions\) attacks](#) like mailrooms, loading docks and garbage hold, etc.

Further high and low value zones shall be isolated in the ventilations systems to disallow mixing and cross contaminations for all CBRN and especially to regulate pandemic and other such biological threats.

- j) Further, high-value and high threat zones within the built environment, shall have adequate provisioning for an emergency shutoff of HVAC systems, except for the fire rescue essentials. If this is not automated in the system, then a switch for the HVAC containment shall be easily accessible in case of an emergency at a distance of not more than 60 m from any place, adequately labelled and colour coded for immediate action in the event of any emergency. This procedure should also be part of emergency drills akin to fire evacuation procedures.
- k) Critical services (HVAC, electrical, others) depending upon the building function shall be designed with redundancy for continuity of function in case of emergency. The main controls shall be protected from direct attack in addition to provisioning of reserve installation systems and their overriding operation from remote locations during extreme events.
- m) Lighting of uninhabited areas like landscapes and basements shall ensure that there are no grey areas and lux levels adequate for proper surveillance coverage at all times.
- n) Mass notification system (MNS) to keep occupants informed and to guide them to safety shall be linked to remote installations that can take over during extreme events including redundant systems for communication with the central agencies, panic alerts and radio systems. Adequate testing of the system, mock drills, etc, shall be done periodically.
- p) Garbage management shall keep the garbage hold areas as far away from the main built space as possible maintaining at least the minimum stand-off distance. The designated area shall be covered from all sides allowing no opportunity for unauthorized access or concealment and designed to deal with chemical, biological and radiological containment.
- q) Provision for food preparation, kitchens, storage and solid waste needs consideration from security perspective, especially for buildings that cannot afford rodents and other pests.

30.7 Planning for Crime Prevention and Resilience against Extreme Events

Urban security is a collective function best achieved by the integration of security from planning outlays, policy controls to isolated building layouts fitting into the overarching security fabric. These shall strive to achieve all the afore-mentioned desirables and enable the basic elements of social and community security functions. To successfully prevent crime and integrate resilience against structural threats, consideration shall begin from the urban planning and site layout levels itself.

30.7.1 Planning to Prevent Crime

All buildings, especially public spaces and transportation networks in the developmental plan of cities and towns, are vulnerable to the whole spectrum of crimes. Hence, to enable best performance of all CPTED principles to prevent crime and fear thereof, the following measures shall be integrated in the developmental policies:

- a) While the common crime factor is insignificant compared to the fear of extreme events in category A buildings and usually mitigated due to the high levels of hardening therein, the immediate public realm feeding these buildings including pedestrian routes shall be treated as afore-mentioned with extra emphasis on urban security and CPTED principles in these controlled areas to humanize and demilitarise them.
- b) Public environments (especially, building categories B and C) face crime and extreme event in equal significance and hence shall receive special attention to their location in a neighbourhood or city plan.
- c) Tall, opaque perimeters using dead boundary walls or landscaping shall not be permissible in any building types except category A1 or A2. Hence these shall be suitably located in city planning and be adequately compensated as mentioned above.
- d) Mixed use land-use models of planning shall be used to keep all neighbourhoods activated throughout the 24×7 cycles, using secondary activities with emphasis on availability of actionable casual surveillance by involved stakeholders and territorial communities.
- e) Residential neighbourhoods (category D) and open air environments (category E) shall be considered for their community function and contribution to urban security. They shall secure their area of influence while being secured in return.
- f) Neighbourhoods shall be planned to be sustainable, with their own groceries, pharmacies, primary healthcare, green areas, primary education and such basic needs for the population therein, designed as socially and economically self-sufficient components of a city.
- g) Perimeter treatment along transportation, especially pedestrian or public circulation routes shall be kept within height as laid down in the norms allowing visibility.
- h) Planned demographics shall aspire to enhance inclusive, non-discriminatory, cross-cultural and socio-economic heterogeneity.
- j) Gating of communities shall be planned with adequate measures of inclusivity without discrimination and laid out with interactive perimeters that contribute to the urban security infrastructure through surveillance and positive social interactivity across all sections socio-economically.
- k) Interactive perimeter treatments and dispensability of the non-interactive type perimeter shall be incentivised for all building categories.
- l) New settlements in the course of development shall present phased security layouts till the occupancy levels suffice for the crime prevention mechanisms. The developers shall support security functions till minimum 60 percent occupancy levels are achieved and the same are handed over to the maintenance and community organisations therein.
- m) Within these for sustainability, provisions for secondary functions shall also need to reach 60% operational levels across 24×7 cycle.
- n) Affordable housing and such budgeted developmental schemes, shall need to ensure ownership and maintenance are clearly assigned by design. Their community organisations shall be mandatory but may have different constitutional models making sure that every part of the city is covered with community instruments that oversee the installation and maintenance of all crime prevention infrastructure.
- o) Design of urban streets, roads and consideration of the size, continuity and walkability shall ensure natural surveillance by enabling actionable 'eyes on

street' available through 24×7 cycles. There shall be due consideration to gender sensitivity, territoriality and maintenance.

- p) Pedestrian centric approaches with controlled vehicular penetration shall be incentivised moving away from the vehicle centric.
- q) Security intensive environments (Category B) including transport oriented developments (TOD), public places, retail, recreational, etc environments shall be supplemented with secondary support to enable natural surveillance through the 24×7 cycle.
- r) All access routes to these destinations shall be designed with adequate widths, lighting etc to enable casual surveillance to and from the public or private domains they feed. These shall be provided sensitively with furniture or secondary activities to keep them activated, perimeter provisions like bollards, etc to keep secure from vehicles, easy to maintain finishes and lighting that is tamper-proof.
- s) The layout shall be cognizant of the surveillance, activity generation, positive interaction and all the afore-mentioned features giving consideration security at macro and micro levels. Each district or subdivision shall be security wise self-sufficient including the police stations, command centres to maintain it so.
- t) Category A-C destinations shall be specially considered for their connections with the security back-ups in the city, distance, connectivity and for their interactions and compatibility with categories D-E.

30.7.2 Planning for Structural Threats

Impact of structural threats on building categories (A to C) goes way beyond their perimeter and shall be accounted for with special sensitivity in their allocations in any master plan (see Table 11).

- a) Compatibility of the different land uses (from security point of view) to each other shall be integrated in planning approaches. For example, Category A buildings shall require adequate stand-offs and distancing from other public functions in urban planning masterplans.
- b) Category B buildings shall be considered for their security impact radius and fallouts in urban planning allocations. Sensitivity to their needs for stand-offs, checking spaces, parking segregations, pedestrian connectivity and other operational necessities shall be enabled by their careful allocations in master plans to reduce their negative impact on their immediate urban context, that is the traffic management, public movement, distance from non-compatible functions and security threats to and from the neighbours.
- c) The planning of categories A and B buildings shall ensure that the high security, hardening and resilience measure do not dilute or contradict the design inputs to prevent crime and fear thereof in line with CPTED principles.
- d) Category C1 buildings designed for occasional high population days shall be equally sensitive to serve the urban security needs during low-population phases also. Also, the public routes shall be designed for maximum population spike events.
- e) Natural topographic features shall be capitalised for high security buildings and used to distance these from the public realm as relevant.
- f) Circulation routes around these shall be designed redundantly with secured and segregated provisions for emergency vehicles.

- g) City transportation shall integrate dedicated lanes for emergency vehicles including emergency responders like fire tenders, ambulance, police and other disaster responders.
- h) Built environments prone to Crowding in categories B & C shall be provided with proximity to emergency services and be served by ample width of roads and pedestrian access routes to cater to the expected crowds. The assembly space outside the perimeter shall allow unhindered movement and disperse any crowding that may be likely to develop there.

30.7.3 *City Level Command Centre*

All command centres at the city level shall be located as per Table 10, strategically considering the following:

- a) These shall be considered as A2 category buildings in design and treatment.
- b) The location in city planning shall be away from congested and non-compatible functions.
- c) The access routes for emergency action and movement shall be clear, ample and uncompromised at all times.
- d) The access to this facility shall be well controlled and hardened.
- e) There shall be provision for 24x7 operations with redundancy in services support especially, electrical, communication, digital and climate control.
- f) Toilets, change rooms, lockers, resting facilities (between shifts) shall be amply provisioned.
- g) Living quarters for the staff on or off duty, should be proximal or within the same facility.
- h) Area program for provisions of all of the above, adequate provisions for staff of different levels and their operations in emergency situation shall be kept with allowance for growth.