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Code of Practice for the Provision of Mobile Access Facilities in Specified Buildings for the Provision of Public Mobile Radiocommunications Services

Communications Authority
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Table of Contents

Page

Foreword 3

Section 1 **Types of Specified Buildings** 5

Section 2 **Criteria for Specified Buildings to Provide Space and MAFs** ... 6

Section 3 **Developments Comprising Multiple Specified Buildings** 7

Section 4 **Exemption from Gross Floor Area** 10

Section 5 **General Requirements** 10

Section 6 **Mobile Access Facilities ("MAFs") on Rooftop** 14

Section 7 **MAFs at Lower / Intermediate level** 15

Section 8 **MAFs at Telecommunications and Broadcasting Equipment Room** 17

Section 9 **Vertical Risers and Cable Containment** 18

Section 10 **Provision of Indoor Mobile Coverage** 19

Section 11 **Obligations of Building Developers, Building Owners and Incorporated Owners / Building Management Offices** 21

Section 12 **Obligations of Mobile Network Operators** 23

Annex 1 **List of Mobile Network Operators** 27

Annex 2 **Illustrative Examples of Mixed-Type Building and Multiple-Building Development** 28

Annex 3 **Tables of the Technical Requirements of MAFs** 30

Annex 4 **Illustrative Examples of Development Comprising Multiple Specified Buildings** 32

Annex 5 **General Schematic Diagrams showing the Typical Arrangement and Possible Locations of MAFs at Different Levels of the Specified Buildings** 34

Foreword

Mobile communications services have been developing rapidly and become an essential part of our daily life. An advanced mobile communications infrastructure making use of the fifth and future generation mobile technologies is pivotal to the continuous development of a smart city.

F2. In order to provide extensive mobile network coverage with high-speed and high-capacity data transmission to meet the demand of various innovative applications, higher density of mobile communications facilities would need to be installed at different height levels and locations, including rooftops and other locations of buildings. By nature of mobile networks, the mobile communications facilities installed at a building will not just provide mobile network coverage and capacity to mobile users inside the building but also to those in the vicinity. The mobile network coverage provided by mobile communications facilities installed at buildings across the territory will form the essential network infrastructure for providing robust and resilient mobile services benefitting the public at large.

F3. Before the enactment of the Telecommunications (Amendment) Ordinance 2024 ("TO Amendment Ordinance"), there were no spatial requirements for installation of mobile communications facilities by mobile network operators ("MNOs")[1] at the planning and design stage of buildings, posing difficulties for MNOs to find suitable space inside buildings to install mobile communications facilities for providing mobile network coverage. Given that mobile telecommunications services have become a daily necessity similar to other essential utilities like electricity, water supply and fixed telecommunications services, the Government has taken the policy initiative to amend the Telecommunications Ordinance (Cap. 106) ("TO") and issue/amend relevant guidelines to ensure that appropriate space is made available in Specified Buildings (see F.5 and Section 1 below) for installation of mobile communications facilities. Such initiative will facilitate MNOs to provide a comprehensive mobile network coverage across the territory and on a localised level.

F4. Against this background, and further to the amendments made to section 14 of the TO by the TO Amendment Ordinance, this Code of Practice for the Provision of Mobile Access Facilities in Specified Buildings for the Provision of Public Mobile Radiocommunications

[1] See the list of MNOs who hold valid Unified Carrier Licences granted by the Communications Authority in Annex 1.

Services ("Mobile CoP") is issued by the Communications Authority ("CA") after consultation with the relevant stakeholders in the telecommunications and building and construction industries, including various industry and professional bodies. The Mobile CoP provides practical guidance to MNOs on the installation, operation, and maintenance of mobile communications and related facilities inside Specified Buildings for the provision of mobile services, as well as guidance to the developers and construction professionals on the appropriate space and associated access facilities that should be made available in Specified Buildings for MNOs to install, operate and maintain mobile communications and related facilities. The Buildings Department has also updated the relevant Practice Note[2] pursuant to Regulation 28A of the Building (Planning) Regulations (Cap. 123F) ("B(P)R") to specify the design and associated requirements for Specified Buildings by adopting those set out in the Mobile CoP.

F5. The Mobile CoP applies to the arrangement of the mobile communications and related facilities inside Specified Buildings[3]. For new buildings[4] which are not Specified Buildings, developers and construction professionals are strongly encouraged to follow the arrangements and principles set out in the Mobile CoP as far as practicable in providing space

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[2] Practice Note for Authorized Persons, Registered Structural Engineers and Registered Geotechnical Engineers on "Access Facilities for Telecommunications and Broadcasting Services" ("PNAP APP-84").

[3] According to section 14(10A) of the TO, a building is a "specified building" if –

(a) the building is required to be provided with access facilities for telecommunications and broadcasting services under the Building (Planning) Regulations (Cap. 123 sub. leg. F); and

(b) either one of the following subparagraphs applies to the building –

(i) the earliest approval of any of the plans for the building works for the erection of the building is given for the purposes of section 14(1) of the Buildings Ordinance (Cap. 123) on or after the specified date;

(ii) where—

(A) not less than one-half (measured by volume) of the building is rebuilt; or

(B) the building is altered to such an extent as to necessitate the reconstruction of not less than one-half of the superficial area of the main walls,

the earliest approval of any of the plans for the building works in connection with the rebuilding or alteration is given for the purposes of section 14(1) of the Buildings Ordinance (Cap. 123) on or after the specified date,

but a specified building does not include a building, or any part of it, for the exclusive occupation or use of any person whilst the building or part is being so occupied or used.

According to section 14(10B) of the TO, "specified date" means the day next following the expiry of a period of 6 months beginning on the commencement date of section 3 of the TO Amendment Ordinance. As section 3 of the TO Amendment Ordinance commences operation on 1 October 2024, the specified date falls on 1 April 2025.

[4] According to section 2(1) of the Buildings Ordinance (Cap. 123), "new building" means any building hereafter erected and also any existing building of which not less than one half measured by volume is rebuilt or which is altered to such an extent as to necessitate the reconstruction of not less than one half of the superficial area of the main walls.

and access facilities for mobile communications facilities. In addition, new government buildings and public housing estates would also follow the relevant arrangements for the provision of space and access facilities for mobile communications facilities.

F6. The Mobile CoP is issued by the CA pursuant to Special Conditions ("SCs") 1[5] and 33.2[6] of the Unified Carrier Licence ("UCL"). MNOs as holders of UCL for the provision of public mobile radiocommunications services shall observe and comply with those requirements stipulated in the Mobile CoP that are applicable to them.

F7. Relevant stakeholders in the building industry including property developers, architects, building surveyors, structural engineers, building services designers, construction contractors and land owners (hereinafter collectively referred to "Building Developers") and owners and managers of Specified Buildings should observe those requirements stipulated in the Mobile CoP that are applicable to them.

F8. The Mobile CoP can be amended in part or in whole from time to time by the CA on a need basis.

Section 1 Types of Specified Buildings

1.1 The Mobile CoP sets out the spatial requirements for building structures, floor space and other access facilities reserved for installation of mobile communications facilities (hereinafter collectively referred as mobile access facilities or "MAFs") for Specified Buildings. Currently, there are four types of Specified Buildings pertaining to Regulation 28A of B(P)R that are subject to the provision of access facilities for telecommunications and broadcasting services, namely,

(a) commercial buildings;
(b) industrial buildings;
(c) residential buildings (excluding buildings for residence of a single family); and
(d) hotel buildings.

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[5] In particular, SC 1.1 provides that the licensee shall comply with such guidelines or codes of practices which may be issued by the CA as in its opinion are suitable for the purpose of providing practical guidance on any particular aspect of any conditions of the UCL.

[6] SC 33.2 provides that the licensee shall comply with any guidelines or codes of practice that may from time to time be issued by the CA for the facilitation and coordination of fair, non-discriminatory and orderly access to buildings for the installation, operation or maintenance of any cables, equipment or network for the provision of the service and other services similar to the service by other operators licensed by the CA.

The meaning of each of these four types of buildings is defined in Regulation 2(1) of B(P)R.

1.2 In the Mobile CoP, a single new building consisting of mixed uses under Regulation 28A of the B(P)R (for example, a building with residential apartments on the upper floors and a shopping mall on the lower floors, or a building with hotel rooms on the upper floors and offices on the lower floors, etc.) is referred to as a "mixed-type building". An illustrative example is depicted in Diagram 1 of Annex 2.

1.3 On the other hand, where there is a new development comprising multiple buildings erected on top of a common base structure/podium (for example, a large shopping mall is built on the lower levels with two residential buildings erected above), none of these buildings or portion of the buildings is regarded as a "mixed-type building". The common base structure and the buildings erected on top of it are each to be regarded as a separate building. In this example, the development comprises three Specified Buildings, namely one commercial building (shopping mall) which is the common base structure, and two residential buildings which are built on top. An illustrative example is depicted in Diagram 2 of Annex 2.

Section 2 Criteria for Specified Buildings to Provide Space and MAFs

2.1 Some Specified Buildings are small in scale and would be difficult to follow strictly the requirements to provide the necessary space and MAFs. Subject to Section 3 below, small Specified Buildings are not required to provide space and MAFs due to their physical constraints. The following table sets out the criteria applicable to different types of Specified Buildings (the "Criteria"). Specified Buildings that meet the Criteria are required to provide space and MAFs in accordance with the requirements in the Mobile CoP –

Building Types	Criteria
Commercial / Industrial Buildings	More than 3,000 m^2 of usable floor space per building
Residential Buildings	More than 50 residential flats per building
Hotel Buildings	More than 75 hotel rooms per building

2.2 For a Specified Building meeting the Criteria, the amount of floor space and MAFs required to be reserved and provided are specified in Annex 3.

Section 3 Developments Comprising Multiple Specified Buildings

3.1 For a new development comprising multiple Specified Buildings, each of the buildings inside the development will be assessed individually with respect to the Criteria regarding the provision of space and MAFs as stipulated in paragraph 2.1 above, so as to determine the total number of buildings which need to provide space and MAFs (denoted as "MC")[7]. If MC is greater than zero, the number of Specified Buildings within the new development that are required to reserve space and provide MAFs will be determined in accordance with paragraph 3.2 below. On the other hand, if MC is equal to zero (i.e. none of the Specified Buildings in the new development meet the Criteria in paragraph 2.1 above for the provision of space and MAFs if assessed individually), such new development will be further evaluated on a collective basis according to paragraph 3.3 below to determine the requirements on space and MAFs to be reserved/provided.

[7] For a Specified Building that consists of more than one type of use (i.e. a mixed-type building referred to in the Mobile CoP), so long as at least one type of the use fits the Criteria set in paragraph 2.1, the building as a whole is taken into account as one building for the purpose of determining the minimum number of Specified Buildings required to provide space and MAFs in a new development. For example, for a building comprising 1,000 m^2 usable floor space for commercial purpose and 100 hotel rooms, the hotel part of the building fits the Criteria to provide space and MAF. Accordingly, the building will be taken as one building for the purpose of determining the minimum number of Specified Buildings required to provide space and MAF.

A Portion of Specified Buildings within a New Development Meeting the Criteria (Illustrative Example at Diagram 1 of Annex 4)

3.2 If MC is greater than zero, the minimum number of Specified Buildings subject to the space and MAF requirements equals to the lowest integer that is not less than 25% of MC, i.e. the number of Specified Buildings in the new development meeting the Criteria in paragraph 2.1 above. The Specified Buildings selected for provision of space and MAFs have to be among those buildings meeting the Criteria. Building Developers have to select the tallest buildings[8] among the Specified Buildings, or the buildings mutually agreed between them and MNOs[9], for provision of space and MAFs in accordance with the requirements set out in Annex 3[10]. Illustrative examples are given in the following table:

If MC > 0	
Number of Specified Buildings in the new development meeting the Criteria in paragraph 2.1	Minimum number of buildings to reserve space and provide MAFs
1 to 4	1
5 to 8	2
9 to 12	3

For example, a new development consists of seven residential buildings, two of which with 30 flats, four with 60 flats and one with 70 flats. The latter five residential buildings are further built on top of a common base structure serving as a shopping mall with usable floor space of 10,000 m^2. With reference to paragraph 1.3, each of the residential buildings and the shopping mall will be regarded as a separate building and assessed individually whether it meets the Criteria set out in paragraph 2.1. The two residential buildings with 30 flats will not meet the Criteria whilst the

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[8] The height of a building is measured as stipulated in Regulation 23(1) of B(P)R.

[9] The Office of the Communications Authority ("OFCA") may seek justifications from Building Developers including proof of agreement between the Building Developers and MNOs.

[10] For a building that consists of more than one type of use as described in footnote 7 above and is selected to provide space and MAF, the requirements specified in Annex 3 corresponding to the type of use of the building that fits the Criteria set in paragraph 2.1 and would provide the largest space and MAFs should be followed. As an illustration, taking the example given in footnote 7 above, as it is the hotel part of the building that fits the Criteria to provide space and MAF, the space and MAFs should be provided in the building in accordance with the requirements specified in the relevant column of the table in Annex 3 that applies to "hotel building". As another example, assuming that a building comprises 3,500 m^2 usable floor space for commercial purpose and 150 residential flats, then both the commercial and residential parts of the building fit the Criteria. With reference to the requirements specified in the relevant column of the respective tables in Annex 3 that apply to "commercial building" and "residential building", it is the relevant column of the table for "residential building" that requires the larger space and MAFs and hence should be followed.

remaining five residential buildings, each of which has more than 50 flats, will. The shopping mall, a commercial building, will also meet the Criteria since its usable floor space is larger than 3,000 m^2. In total, there are therefore six buildings meeting the Criteria (i.e. MC = 6). Based on the table above, at least two out of these six buildings are required to reserve space and MAFs. Building Developers have to select two buildings that are the tallest, or buildings mutually agreed between them and MNOs, among the six buildings for provision of space and MAFs. Please refer to Diagram 1 of Annex 4 for illustration. The amount of floor space and MAFs required to be reserved and provided in the selected buildings are specified in Annex 3.

None of the Specified Buildings within a New Development Meeting the Criteria (Illustrative Example at Diagram 2 of Annex 4)

3.3 If MC is equal to zero (i.e. none of the Specified Buildings in the new development meet the Criteria if considered individually), the total number of such Specified Buildings in the new development will be considered. If there are more than **five** Specified Buildings in such new development (irrespective of whether the buildings are commercial, industrial, residential, hotel or mixed-type buildings), at least one building among all Specified Buildings has to reserve floor space and provide MAFs for installation of mobile communications facilities, as indicated in the table below. Building Developers have to select the tallest building, or the building mutually agreed between them and MNOs[11], among the Specified Buildings for such space and MAF provision. Please refer to Diagram 2 of Annex 4 for illustration. The amount of floor space and MAFs required to be reserved and provided in the building have to meet the minimum requirements set for the corresponding building type as specified in Annex 3.

If MC = 0	
Number of Specified Buildings in the new development where none of the buildings meet the Criteria in paragraph 2.1	Minimum number of buildings to reserve space and provide MAFs
≤ 5	0
> 5	1

[11] OFCA may seek justifications from Building Developers including proof of agreement between the Building Developers and MNOs.

3.4 For the avoidance of doubt, where a new development has a mixture of commercial, industrial, residential, hotel and/or mixed-type buildings, the Criteria apply to each of the buildings in the development individually according to its building type as specified in paragraph 2.1.

Section 4 Exemption from Gross Floor Area

4.1 Pursuant to Regulation 23(3)(b) of the B(P)R, in determining the gross floor area ("GFA") for the purposes of Regulations 21 and 22 of the B(P)R, the Building Authority ("BA") may disregard any floor space that he is satisfied is constructed or intended to be used solely for, inter alia, access facilities for telecommunications and broadcasting services as required under Regulation 28A of the B(P)R.

Section 5 General Requirements

Holistic Design

5.1 MAFs should be integrated in the design of Specified Buildings in a holistic manner to minimise any visual impact and concerns on radiation safety from the occupants in the buildings. Typical arrangement and possible locations of MAFs at different levels of the Specified Buildings are shown in Annex 5 (for illustration only).

5.2 Building Developers should coordinate with the relevant MNOs on the technical requirements of MAFs for Specified Buildings during the initial building design stage to prepare for the submission of the building plans to the BA for approval.

5.3 The MAFs should be made available in Specified Buildings for the installation of Radio Base Stations ("RBSs") by all relevant MNOs on a non-discriminatory basis.

5.4 MNOs are required to make effective use of space in Specified Buildings for installation of mobile communications facilities. As a default arrangement, MNOs should adopt mobile network sharing so long as it is practicable and technically feasible. The sharing effectively reduces the number of antennae / radio equipment to be installed at a Specified Building when more than one MNO intends to install mobile

communications facilities at the building. MNOs should coordinate with one another and share the available space and facilities in good faith.

5.5 The MAFs should be used solely for the purpose of the provision of public mobile radiocommunications services that are authorised under a licence issued by the CA pursuant to the Telecommunications Ordinance (Cap. 106).

Spatial Requirements

5.6 Subject to Section 2 and Section 3 above, appropriate floor space have to be made available in the telecommunications and broadcasting equipment room ("TBE Room for MAFs"), on the rooftop and on a lower / intermediate level (where applicable[12]) of Specified Buildings for the installation of RBSs. The spatial requirements at different locations are summarised below and details are given in Annex 3.

Designated Locations in Specified Buildings	**Area of Floor Space Required**
Rooftop	10 – 30 m^2
Lower / Intermediate level of high-rise buildings, where applicable	10 – 30 m^2
TBE Room for MAFs	10 – 30 m^2

Access Pathway to the MAFs Reserved

5.7 The MAFs reserved have to be designated as common parts and be accessible from the common parts of the building, and the access pathway to the MAFs should be adequate and reasonable such that MNOs could easily access the MAFs reserved on rooftop, lower / intermediate floor and in TBE room for site survey, installation, operation and maintenance of their mobile communications facilities, without causing undue disturbance to the occupants of the Specified Buildings.

Electrical Power

5.8 Building Developers have to provide appropriate power connection points with associated facilities (e.g. fused switches or circuit breakers) at the required locations for MNOs to make application to power companies for electricity provision and metering at the Specified Building. The electrical power system at the Specified Building should be designed

[12] See paragraph 7.2 below.

to enable access to the electrical installation (e.g. low-voltage main switchboard) by MNOs for the installation of power meters.

Provision of Indoor Mobile Coverage

5.9 Mobile coverage inside the buildings and any covered areas within the site boundary of the buildings (e.g. lifts, car park areas, indoor areas of club houses and shopping malls, etc.) would benefit occupants of the buildings and the general public visiting these buildings. Building Developers should coordinate with MNOs during the building design stage on the requirements of indoor mobile coverage, and provide the necessary space and access facilities for MNOs to install their mobile communications facilities for early provision of indoor mobile coverage. Please refer to Section 10 for the detailed arrangements and requirements in relation to the provision of indoor mobile coverage.

Other Statutory and Regulatory Requirements

5.10 In designing the access facilities and the subsequent installation, operation and maintenance of RBSs and associated ancillary devices, Building Developers and MNOs should, apart from compliance with PNAP APP-84, observe all relevant statutory and regulatory requirements applicable to them respectively, including but not limited to the following –

(a) Requirements of the relevant statutory town plan: for installation of RBSs meeting the requirements specified in the Definition of Terms in relation to 'Telecommunications Radio Base Station' [13] in Specified Buildings in non-conservation zones, no planning permission from the Town Planning Board is required. For installation of RBSs in Specified Buildings in conservation zones (e.g. Conservation Area, Coastal Protection Area, Site of Specific Interest, Other Specified Uses annotated "Comprehensive Development and Wetland Enhancement Area", etc.) or RBSs not meeting the requirements specified in the Definition of Terms, planning permission from the Town Planning Board is required;

[13] 'Telecommunications Radio Base Station' means any installation including an equipment cabinet not bigger than 5 metres x 4.5 metres x 3.5 metres (LxWxH) and antenna(e) not bigger than 0.6 metre x 0.6 metre x 2.5 metres (LxWxH), excluding pole, for planar shape or 0.8 metre in diameter for circular shape, within, attached to or on the roof top of a building or structure for the provision of public telecommunications services to serve the local district, that would always be permitted within areas covered by Outline Zoning Plans (OZP) except in conservation zones.

(b) Requirements of the Buildings Ordinance, its allied regulations, Codes of Practices and PNAPs issued by the Buildings Department, etc.;
(c) Relevant building height restriction with the interpretation stipulated in the Joint Practice Note No. 5[14]: roof-top ancillary structures would be counted towards the height of the buildings for the purpose of administering building height restriction if the height of the structures (i) exceeds 3 metres for building with height of not more than 30 metres; (ii) exceeds 10% of the building height or 15 metres (whichever is the less) for building with height exceeding 30 metres;
(d) Radiation safety requirements as set out in the *Code of Practice for the Protection of Workers and Members of Public Against Non-ionizing Radiation Hazards from Radio Transmitting Equipment*[15]; and
(e) Regulatory requirements for seeking CA's approval of the use of RBSs according to licence conditions of UCLs held by MNOs (applications submitted under the "*Guidance Note for Submission of Applications by Public Telecommunications Operators for the Installation of Radio Base Stations for Public Telecommunications Services in Buildings and on Rooftops*").

5.11 To dovetail with the provisions in section 14 of the TO, the Lands Department ("LandsD") will make appropriate provisions in the relevant new land leases [16] or modified land leases to allow radiocommunications installations in private residential or non-commercial buildings without a need to apply for a waiver[17] from LandsD. To facilitate installation of radiocommunications facilities at Specified Buildings (as defined in this Mobile CoP) to be redeveloped and rebuilt under existing land leases, similar arrangement will apply via modifying of the relevant restrictions of the existing land leases.

Demarcation of Responsibilities

5.12 Building Developers / building owners / Building Management Office ("BMO") / Incorporated Owners ("IO") and MNOs should enter

[14] See Joint Practice Note No. 5 issued by Buildings Department, Lands Department and Planning Department for details and its applicability: https://www.bd.gov.hk/doc/en/resources/codes-and-references/practice-notes-and-circular-letters/joint/JPN05.pdf
[15] https://www.ofca.gov.hk/filemanager/ofca/en/content_175/cop-radiation-hazards.pdf
[16] "New land leases" cover Government Leases or Conditions of Sale / Exchange etc. (as the case may be).
[17] Such waiver will waive the user restriction and other consequential aspects such as Gross Floor Area, site coverage, building height, etc.

into agreements, undertakings or other instruments to demarcate their respective duties and responsibilities as well as administrative arrangements regarding, inter alia, the provision and maintenance of the MAFs and access pathways, as well as the installation, operation and maintenance of mobile communications facilities. The general principle is that the party who provides the facilities should be the party responsible for their maintenance. The general principle is elaborated in greater detail in Sections 11 and 12. The terms and conditions of any such agreements, undertakings or instruments should not contravene the requirements of the Mobile CoP and other relevant practice notes and guidelines.

Section 6 Mobile Access Facilities ("MAFs") on Rooftop

6.1 All mobile communications facilities including antennae on rooftop should be installed within the Rooftop Telecommunications Equipment room(s) ("RTE room") with fixed opaque windows that allow effective propagation of radio signals (for example, glass or fibre glass window pane). The RTE room should be located at appropriate place(s) that can maximise the mobile coverage provided by the mobile communications facilities installed therein, with adequate and reasonable pathways for access. The design of the RTE room should also aesthetically match with the design of the Specified Buildings.

6.2 In case there are special circumstances in which genuine difficulties in locating the RTE room on rooftop may be encountered (such as where the rooftop is designed for use other than the four types of use specified in Regulation 28A of B(P)R, or due to the height restriction under the Hong Kong Airport (Control of Obstructions) Ordinance, Cap. 301), the RTE room may be located at a level not lower than 90% of the building height.

6.3 The floor space requirements of the reserved RTE room(s) for MAFs on rooftop for different types and sizes of Specified Buildings are given in Annex 3. For development with more than one Specified Building required to provide space and MAFs, the RTE rooms should be provided in each of those Specified Buildings selected in accordance with the requirements specified in the relevant column of the table in Annex 3 that applies to the respective buildings selected. In other words, combined RTE rooms for multiple buildings are not allowed.

6.4 The RTE room(s) should form integral structure(s) of the Specified Building and meet the following requirements –

(a) Appropriate security measures such as door locks should be installed to prevent unauthorised access;
(b) The RTE room(s) should be easily accessible. The entrance to the RTE room(s) should preferably be at least 1.2 metres wide and 2.4 metres high;
(c) Water pipes, sewage pipes, water drainage, water sprinklers, high voltage power supply cables, power transformers should not be installed inside the RTE room(s);
(d) Appropriate measures should be imposed to avoid water leakage into the RTE room(s);
(e) Connection to vertical riser ducts as well as necessary horizontal cables linking up all MAF structures should be provided with proper cable containments;
(f) Sufficient electrical power supply of at least 100 A, 3-phase should be made available with provision of dedicated power meter;
(g) Sufficient lighting and maintenance access should be provided;
(h) Sufficient natural and/or mechanical ventilation (e.g. louvre and/or exhaust fan) should be provided. If it is infeasible to provide natural or mechanical ventilation, facilities such as space and electrical power supply should be made available to MNOs for the installation of air-conditioner or other appropriate ventilation facilities;
(i) In case louvres are provided for the RTE room(s), appropriate measures such as waterproofing and drainage should be implemented as necessary to prevent water accumulation inside the RTE room(s) and seepage to the storey below; and
(j) Relevant statutory requirements as appropriate including all necessary fire safety requirements should be complied with.

Section 7 MAFs at Lower / Intermediate level

7.1 High-rise buildings are common in Hong Kong. However, antennae installed on the rooftop of very tall buildings may not be able to provide satisfactory mobile network coverage to users at lower and ground levels. It is therefore necessary to install additional mobile communications facilities at a lower or intermediate level (e.g. podium

floor) of these very tall buildings for the provision of more comprehensive coverage to users at lower and ground levels.

7.2 Building Developers have to provide MAFs at a lower or intermediate level of a Specified Building that exceeds 175 metres in height[18], in addition to the provision of MAFs on rooftop. Building Developers should coordinate with MNOs during the building planning stage on the identification of appropriate location at a lower or intermediate level above ground for accommodation of MAFs and the relevant design, for the preparation of the building plans and subsequent design plans.

7.3 All mobile communications facilities including antennae at a lower or intermediate level should be installed within the Intermediate Telecommunications Equipment room(s) ("ITE room") with fixed opaque windows that allow effective propagation of radio signals (for example, glass or fibre glass window pane). The ITE room(s) should be located at appropriate place(s) that can maximise the mobile coverage provided by the mobile communications facilities installed therein, with adequate and reasonable pathways for access. The design of the ITE room(s) should also aesthetically match with the design of the Specified Buildings.

7.4 The floor space requirements of the reserved ITE room(s) for MAFs at a lower or intermediate level for different types and sizes of buildings are given in Annex 3. For development with more than one Specified Building required to provide ITE rooms, the rooms should be provided in each of those Specified Buildings selected in accordance with the requirements specified in the relevant column of the table in Annex 3 that applies to the respective buildings selected. In other words, combined ITE rooms for multiple buildings are not allowed. Furthermore, RTE room is not allowed to be combined with ITE room.

7.5 The ITE room(s) should meet the following requirements –

(a) Appropriate security measures such as door locks should be installed to prevent unauthorised access;
(b) The ITE room(s) should be easily accessible. The entrance to the ITE room(s) should preferably be at least 1.2 metres wide and 2.4 metres high;
(c) Water pipes, sewage pipes, water drainage, water sprinklers, high voltage power supply cables, power transformers should not be installed inside the ITE room(s);

[18] The height of a building is measured as stipulated in Regulation 23(1) of B(P)R.

(d) Appropriate measures should be imposed to avoid water leakage into the ITE room(s);
(e) Connection to vertical riser ducts as well as necessary horizontal cables linking up all MAF structures should be provided with proper cable containments;
(f) Sufficient electrical power supply of at least 100 A, 3-phase should be made available with provision of dedicated power meter;
(g) Sufficient lighting and maintenance access should be provided;
(h) Sufficient natural and/or mechanical ventilation (e.g. louvre and exhaust fan) should be provided. If it is infeasible to provide natural or mechanical ventilation, facilities such as space and electrical power supply should be made available to MNOs for the installation of air-conditioner or other appropriate ventilation facilities;
(i) In case louvres are provided for the ITE room(s), appropriate measures such as waterproofing and drainage should be implemented as necessary to prevent water accumulation inside the ITE room(s) and seepage to the storey below; and
(j) Relevant statutory requirements as appropriate including all necessary fire safety requirements should be complied with.

Section 8 MAFs at Telecommunications and Broadcasting Equipment Room

8.1 MNOs should install mobile communications facilities inside the common TBE room (when shared by MNOs and FNOs) for effective use of the reserved MAFs for the provision of public mobile radiocommunications services. MNOs should place as much mobile equipment (e.g. baseband equipment) as practicable inside the common TBE room, in order to save floor space and reduce floor loading on the rooftop and at the lower / immediate level (if applicable), as well as to facilitate indoor coverage, given that mobile equipment in the common TBE room could generally be more easily connected to indoor antennae and radio units installed at indoor common areas.

8.2 For the avoidance of doubt, the requirements for accommodating the MNOs' mobile communications facilities are in addition to the requirements for TBE room stipulated in the Fixed CoP[19], including –

[19] Fixed CoP refers to "*Code of Practice for the Provision of Access Facilities in Buildings for the Supply of Telecommunications and Broadcasting Services*".

(a) additional requirement on floor space for MAFs in TBE room for different types and sizes of buildings given in Annex 3;
(b) sufficient electrical power supply of at least 60 A, 3-phase available with provision of dedicated power meter to support mobile communications facilities; and
(c) other installation requirements (e.g. lighting, ventilation/air-conditioning, fire safety, maintenance access, security) for mobile communications facilities.

8.3 Building Developers should make relevant demarcation in the common TBE room for the respective use by MNOs and FNOs (e.g. different colour marking on the ground). Where a common TBE room is considered not practicable, Building Developers should coordinate with the relevant MNOs on the provisioning of MAFs by a separate TBE room in accordance with the requirements set out in paragraphs 8.1 and 8.2 for accommodating the MNOs' mobile communications facilities.

Section 9 Vertical Risers and Cable Containment

Vertical Risers

9.1 Vertical riser ducts have to be made available for cabling connection of mobile communications facilities installed at different levels of building as needed, including from the TBE room to installations at rooftop/intermediate level.

9.2 Vertical riser ducts normally go as far up to the ceiling of the top floor. If connection to mobile communications facilities at levels above the top floor is needed, provision should be made to allow the extension of the riser ducts or enable the proper cabling from the riser to such levels.

9.3 Vertical riser ducts for mobile communications facilities may share the riser accommodation and rooms with other fixed telecommunications and broadcasting facilities. As a minimum, a vertical riser duct of 200 mm x 200 mm has to be provided for MNOs to connect mobile communications facilities along the riser space connecting all floor levels, including TBE room(s), rooftop, intermediate level and the appropriate floors with indoor installations.

Cable Containment (Cable Conduits, Cable Trunks and Cable Trays)

9.4 Connection from risers have to be extended to the MAFs on the relevant floors via horizontal cable containment in the form of cable conduits, cable trunks or cable trays.

9.5 Such cable containment has to be provided by the Building Developers at the time of construction. Building Developers should coordinate with the MNOs to work out the most suitable ways of providing the horizontal trunks and the required quantities. The dimensions of the cable containment should meet the following minimum requirements –

(a) Cable conduit (4x32 mm diameter) for carrying optical fibre cables;
(b) Cable tray (75mm width) for carrying an armoured power cable of 50mm^2; and
(c) Cable tray (200mm width) for carrying coaxial cables and other relevant cablings as needed.

Access to Fixed Network Facilities

9.6 MNOs' RBS installations would require fixed telecommunications services for backhaul transmission connection to MNOs' core networks. There would be interconnection of equipment for fixed telecommunications services in the TBE room with mobile communications facilities.

Section 10 Provision of Indoor Mobile Coverage

10.1 Unlike outdoor antennae that are relatively sizable and are installed on rooftop and/or intermediate floors to provide outdoor mobile coverage to large areas in the vicinity of the buildings, antennae for providing indoor mobile coverage are generally small in size, low in power level and installed in a distributed manner inside a building.

10.2 MNOs should, to the extent that is economically reasonable and technically feasible, provide reasonable indoor coverage to areas of buildings which are not exclusively occupied or used by any person at the request of the Building Developers, especially to indoor facilities including but not limited to lift shafts and underground car parks as they are

frequently used or visited by occupants, visitors and the general public but are less easily served by outdoor antennae.

10.3 Building Developers should coordinate with MNOs during the design of buildings[20] on the requirements of indoor mobile coverage and the desirable installation locations of indoor antennae, associated cables, ancillary devices and power supply facilities.

10.4 Building Developers should provide the necessary space and access facilities, including cable ducts/trunks, false ceiling, electricity outlets at relevant locations for MNOs to install their mobile communications facilities for the provision of indoor mobile coverage effectively (e.g. if antennae are required to be concealed behind features like cladding or false ceiling, the material of such features should allow effective propagation of radio signals).

10.5 MNOs should set up a common antenna system ("CAS") for their RBSs for the provision of indoor coverage and share use of the reserved MAFs as depicted in Sections 5-9 above to install the necessary additional equipment for the efficient use of space. For example, MNOs may install some of their mobile communications facilities (e.g. radio amplifiers, baseband equipment, backhaul transmission equipment, power supply equipment) at the MAFs in the TBE room, and route the associated cablings (e.g. optical fibre cables, coaxial cables) via the available cable containment facilities to the CAS.

10.6 As a reference, the CAS for distribution of indoor coverage generally consists of the following components –

(a) Active components (requiring supply of electricity)
- Power supply equipment
- Point of interconnection/interface for MNOs' signal inputs to the CAS
- Optical fibre equipment for optical and electrical signal conversion and amplification
- Active indoor antennae as appropriate

(b) Passive components (not requiring supply of electricity)
- Radio frequency coaxial cables for indoor signal distribution at the floors concerned
- Radio frequency ancillary devices

[20] Building Developers should also incorporate requirements pertaining to the provision of indoor mobile network coverage when sourcing contractors for the relevant indoor facilities, e.g. for installation and maintenance of lifts.

- Passive indoor antennae

A schematic diagram of CAS arrangement can be found at Diagram 1 of Annex 5.

10.7 MNOs should be responsible for the installation, operation and maintenance of their mobile communications facilities including cables and associated ancillary devices where applicable such as cabling facilities, backhaul connection to fixed network services, electricity and interconnection with the in-building telecommunications system (as applicable), as to provide the indoor coverage.

10.8 In case indoor coverage may need to be extended to areas exclusively occupied or used by any person (e.g. inside a tenant's office), whether at the request of the Building Developers during the building design stage or the building owner / tenant / BMO / IO concerned after completion of the building, the arrangement would be subject to commercial agreement between the MNOs and the Building Developers / building owner / tenant / BMO / IO concerned.

10.9 In case additional space and building access facilities beyond the MAFs provided according to the Mobile CoP and PNAP APP-84 and as approved in the relevant building plans for the erection, rebuilding[21] or alteration[22] of Specified Buildings are required to provide such indoor coverage, Building Developers and MNOs are advised to make commercial agreement for such provision in a similar manner as in existing buildings.

Section 11 Obligations of Building Developers, Building Owners and Incorporated Owners / Building Management Offices

During the Design Phase of Specified Buildings

11.1 By adopting a holistic design approach, Building Developers should coordinate with MNOs on the requirement of MAFs for RBS installations during the initial building design stage.

11.2 Building Developers should keep MNOs informed of new

[21] Namely where not less than one-half (measured by volume) of the building is rebuilt.

[22] Namely where the building is altered to such an extent as to necessitate the reconstruction of not less than one-half of the superficial areas of the main walls.

development projects in a timely manner, seek and to the extent possible take into account MNOs' input regarding the locations and design of the MAF structures and include such MAF structures as part of the building plans for approval by the BA.

11.3 Building Developers should provide the space and MAFs for installation of mobile communications facilities in Specified Buildings and reserve adequate and reasonable access pathway according to Sections 1-9 above in the Mobile CoP.[23] Where MNOs provide coverage to indoor areas of buildings at the request of Building Developers according to paragraph 10.2, Building Developers should provide the necessary space and facilities for MNOs' installations as per paragraphs 10.3 and 10.4.

11.4 Building Developers should provide adequate and appropriate power provision facilities (e.g. fused switches or circuit breakers) at the relevant locations such that MNOs are able to make application to power companies for electricity provision and metering.

After the Completion of Specified Buildings

11.5 Building owners / IO / BMO (whoever that manages the building and collectively referred to as "IO/BMO" hereafter) should allow MNOs' access to the building concerned for site survey, installation, operation and maintenance of mobile communications facilities and associated devices and cablings in accordance with section 14 of the TO. For the avoidance of doubt, where a building with MAFs provided forms part of a development of multiple buildings, and access to the building concerned has to be through the common areas of the development (such as a common lobby which is not located within the building concerned), the IO/BMO should allow MNOs to make use of such common areas for access to the building concerned for site survey, installation, operation and maintenance purposes. The Guidelines for Deeds of Mutual Covenant[24] issued by the LandsD have clearly specified that areas for the installation or use of aerial broadcast distribution or telecommunications network facilities must form part of the common areas. IO/BMO should, among others, ensure that

[23] In Specified Buildings that are not subject to the space and MAF requirements, Building Developers may:
(a) provide TBE room for MAFs and vertical riser duct for the provision of indoor mobile coverage by the MNOs; and
(b) provide RTE room(s) or ITE room(s) in special circumstances (e.g. the buildings are located in an area in need of additional MAFs) subject to support by OFCA. OFCA will review such additional provision on a case by case basis and may seek justifications including proof of agreement between the Building Developers and MNOs.

[24] The document is available at https://www.landsd.gov.hk/doc/en/practice-note/laco/79Awac_e.pdf

access to these common areas is not obstructed.

11.6 IO/BMO should be responsible for the maintenance of the MAFs and access pathways that Building Developers are obliged to provide, and should be responsible for carrying out all necessary repair works in respect of any malfunctions or defects of the MAFs as reported by MNOs.

11.7 IO/BMO should endeavour to facilitate a late joining MNO to use the space and MAFs already provided, subject to the arrangement of the incumbent MNOs and the late joiner on the share use of the MAFs as per paragraph 12.14.

11.8 Any request for extra space or facilities other than the MAFs provided according to the Mobile CoP and PNAP APP-84 and as approved in the relevant building plans for the erection, rebuilding or alteration of Specified Buildings are subject to commercial agreement between the MNO(s) and the IO/BMO in a similar manner as in existing buildings.

Section 12 Obligations of Mobile Network Operators

During the Design Phase of Specified Buildings

12.1 MNOs should ensure that operation of their mobile communications facilities in Specified Buildings strictly complies with the *Code of Practice for the Protection of Workers and Members of Public Against Non-ionizing Radiation Hazards from Radio Transmitting Equipment*[25].

12.2 Upon notification of a new development by a Building Developer, MNOs should indicate if they are interested in making use of the MAFs in the new development initially. If so, MNOs should nominate and appoint a coordinator to coordinate all the requirements from the interested MNOs and liaise with the Building Developer in the initial building design stage of the new development. The MNO coordinator should coordinate with the FNO coordinator [26] on their respective requirements for and use of the common TBE room. To avoid undue delay,

[25] https://www.ofca.gov.hk/filemanager/ofca/en/content_175/cop-radiation-hazards.pdf

[26] According to "*Information Note for Incorporated Owners and Building Management Office of Building Regarding Access to Buildings by Network Operators with Section 14 Authorization Granted by the Communications Authority under the Telecommunications Ordinance*" issued by OFCA, IO/BMO may appoint one FNO as a coordinator to liaise with all other interested FNOs for installation of in-building telecommunications systems in the building.

the MNOs, or the MNO coordinator as the case may be, should timely respond to the Building Developer regarding indication of interest and requests for inputs on MNOs' MAF requirements.

12.3 In formulating their requirements on MAF, MNOs should make sure the efficient use of reserved space and sharing of mobile communications facilities (including but not limited to antenna sharing) as far as practicable and technically feasible in order to minimise the number of antennae and size of equipment which need to be installed in Specified Buildings.

12.4 In case any MNO expresses no interest to access a Specified Building during the design stage, any late access by this MNO will be subject to the availability of the remaining space and access facilities and the feasibility of the incumbent MNOs to share equipment or facilities with the late joining MNO by reasonable reconfiguration. A late joining MNO should negotiate with the incumbent MNOs via the MNO coordinator and be prepared to accept that no access can be made to the existing MAFs due to physical or technical constraints.

After the Completion of Specified Buildings

12.5 MNOs' site coordinator should be responsible for liaising with the Building Developers / IO/BMO and coordinate MNOs' access to the Specified Buildings on issues concerning installation, operation and maintenance of mobile communications facilities and other related matters.

12.6 MNOs should be responsible for the installation (including any reconfigurations), operation and maintenance of their mobile communications facilities including cables and associated ancillary devices where applicable such as cabling facilities, backhaul connection to fixed network services and electricity.

12.7 MNOs should be responsible for providing and installing cables for the provision of public mobile radiocommunications services. These cables include for example –

(a) Optical fibre cables or other applicable cables for inter-connecting mobile communications facilities and ancillaries at different locations (e.g. between mobile communications facilities in TBE room to remote units or antenna units at other levels);

(b) Optical fibre cables and other applicable cables for backhaul transmission to MNOs' switching centres;
(c) Coaxial cables for radio signal transmission; and
(d) Power cables for mobile communications facilities and ancillaries.

12.8 MNOs should make an application to power companies for electricity provision and metering. Under all circumstances, MNOs should bear the electricity cost for the power supply feeding to their own mobile communications facilities and ancillary facilities.

12.9 MNOs should ensure good engineering practice in its works related to the use of the reserved space and facilities for installation of mobile communications facilities. When the mobile communications facilities are no longer in use, MNOs should remove installations of the mobile communications facilities from the reserved space and MAFs as soon as practicable.

12.10 MNOs should liaise with the Building Developers / IO/BMO in good faith and minimise disturbance or inconvenience to building occupiers or users.

12.11 Upon the request of Building Developers / IO/BMO as appropriate, MNOs should enter into agreement, undertaking or any other instrument to demarcate the respective duties and responsibilities as well as administrative arrangements on matters referred to in paragraph 5.12 and elaborated in Sections 11 and 12 before accessing the reserved space and access facilities at a Specified Building.

12.12 MNOs should prior to the commencement of any installation enter into arrangements for the provision of adequate insurance against the risk of losses and damages that are attributable to the installation or other activities associated with or incidental to the installation.

12.13 MNOs should do as little damage as possible to the Specified Building when they place and maintain mobile communications and related facilities. If there is any physical damage to the Specified Building that is attributable to the placement and maintenance of the mobile communications facilities or other associated activities by the MNOs, full compensation should be paid by the MNOs concerned in accordance with section 14(2) of the TO.

12.14 On late request of any MNO to use the MAFs, the incumbent

MNOs who have already been using the MAFs in the Specified Building should endeavour to share the MAFs and mobile communications facilities (e.g. antennae) so long as it is technically feasible and practicable. If the late joining MNO seeks to have any additional space and facilities beyond the MAFs provided according to the Mobile CoP and PNAP APP-84 and as approved in the relevant building plans for the erection, rebuilding or alteration of the Specified Building, it should liaise with the parties concerned and reach commercial agreement for such additional provision.

Annex 1 List of Mobile Network Operators

Building Developers should contact the mobile network operators during the planning stage of Specified Buildings (updated list as at September 2024):

(1) China Mobile Hong Kong Company Limited

Office Address:	Level 20, Tower 1, Kowloon Commerce Centre, No. 51 Kwai Cheong Road, Kwai Chung, New Territories
Contact:	Manager, IRS Site Acquisition and Operation
Telephone:	2945 8401
Facsimile:	2421 4962
Email:	bs-invitation@hk.chinamobile.com

(2) Hong Kong Telecommunications (HKT) Limited

Office Address:	5/F Lai Chi Kok Engineering Centre II, 4 Yuet Lun Street, Lai Chi Kok
Contact:	Site Acquisition Manager
Telephone:	2888 9171
Facsimile:	2529 9527
Email:	mobile-mbs-cop@pccw.com

(3) Hutchison Telephone Company Limited

Office Address:	5/F, Hutchison Telecom Tower, 99 Cheung Fai Road, Tsing Yi, New Territories
Contact:	Site Property Management Manager
Telephone:	3156 8619
Facsimile:	2123 1677
Email:	#hthk-hutchisonmobilecop@hthk.com

(4) SmarTone Mobile Communications Limited

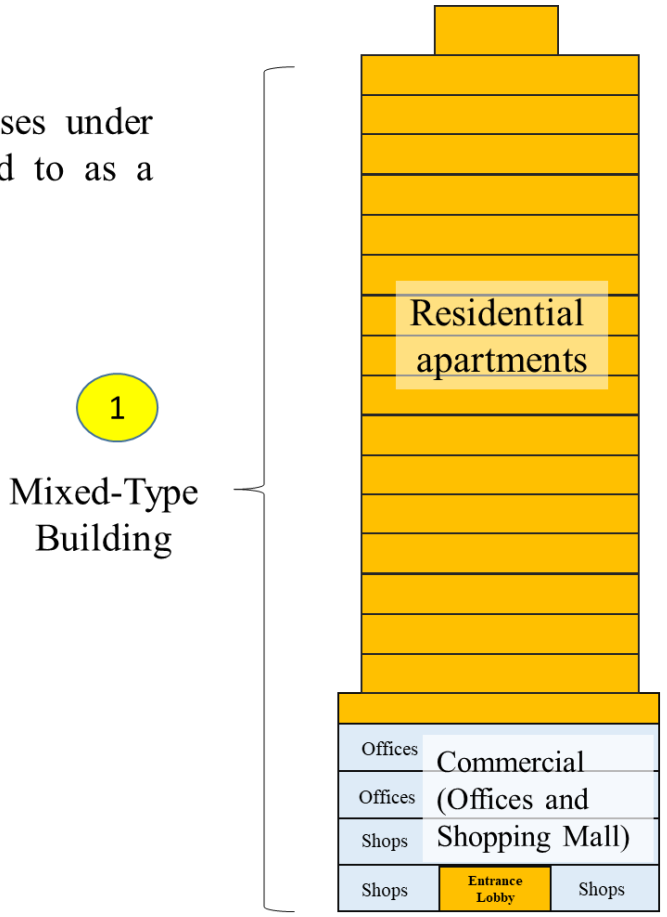
Office Address:	31/F., Millennium City 2, 378 Kwun Tong Road, Kwun Tong, Kowloon
Contact:	Manager, Site Acquisition
Telephone:	2597 6542
Facsimile:	2597 6560
Email:	mobile_cop_technical_group@smartone.com

The above list is subject to change. Please contact OFCA on mobilecop@ofca.gov.hk for an updated list.

Annex 2 Illustrative Examples of Mixed-Type Building and Multiple-Building Development

(1) Mixed-Type Building

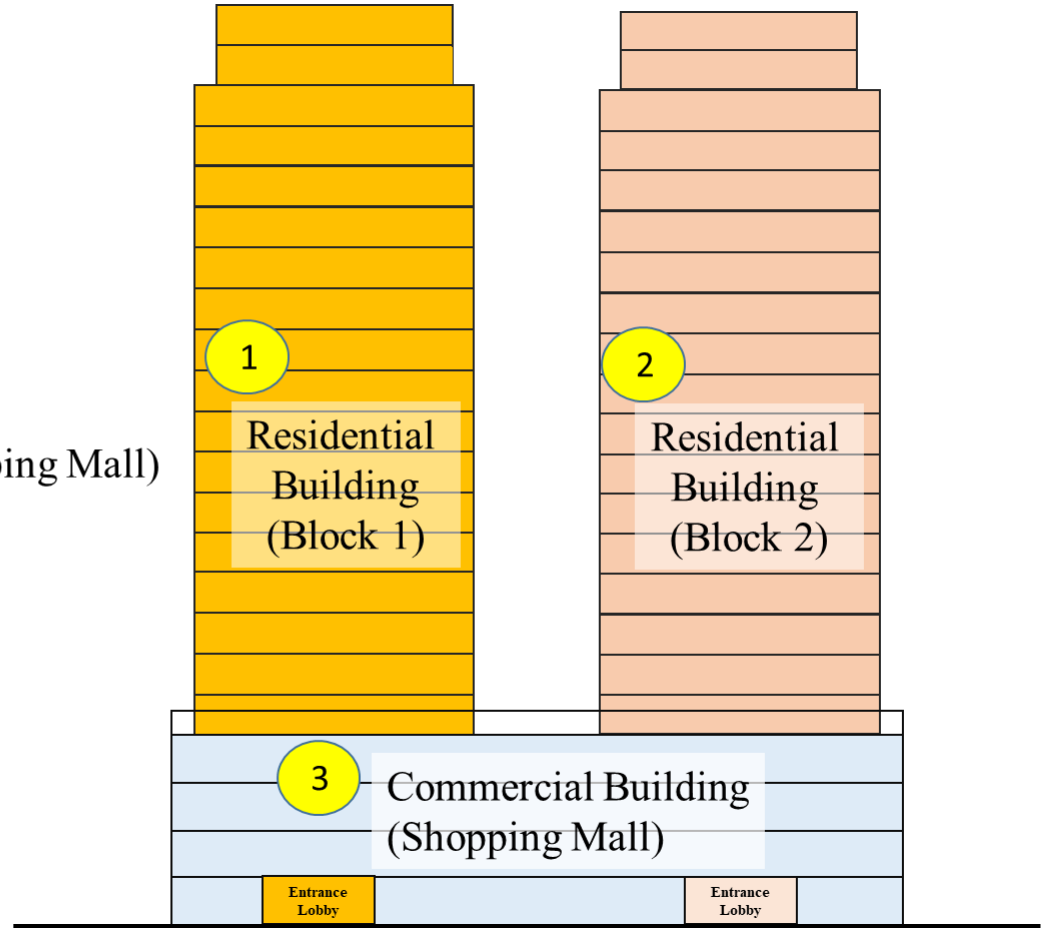
A single building consisting of mixed uses under Regulation 28A of the B(P)R is referred to as a "**mixed-type building**".



(2) Multiple-Building Development

Multiple-building development
with different types of buildings

- 2 Residential Buildings
- 1 Commercial Building (Shopping Mall)



Annex 3 Tables of the Technical Requirements of MAFs

COMMERCIAL AND INDUSTRIAL BUILDINGS					
Usable Floor Space per building, Æ (× 1000 m^2)	Æ ≤ 3	3 < Æ ≤ 12	12 < Æ ≤ 72	72 < Æ	
TBE Room Area (m^2) Clear Height (m)		10 to 20 3	15 to 25 3	20 to 30 3	
RTE Room on Rooftop Area (m^2) Clear Height (m)		10 to 20 3	15 to 25 3	20 to 30 3	
ITE Room at Lower / Intermediate floor Area (m^2) Clear Height (m)		10 to 20 3	15 to 25 3	20 to 30 3	
Vertical riser (mm) No. of vertical riser slot		200 x 200 1	200 x 200 1	200 x 200 1	

RESIDENTIAL BUILDINGS					
No. of Flats per building, N	N ≤ 50	50 < N ≤ 100	100 < N ≤ 500	500 < N ≤ 750	750 < N
TBE Room Area (m^2) Clear Height (m)		10 to 20 2.8	15 to 25 2.8	20 to 30 2.8	20 to 30 3
RTE Room on Rooftop Area (m^2) Clear Height (m)		10 to 20 2.8	15 to 25 2.8	20 to 30 2.8	20 to 30 3
ITE Room at Lower / Intermediate floor Area (m^2) Clear Height (m)		10 to 20 2.8	15 to 25 2.8	20 to 30 2.8	20 to 30 3
Vertical riser (mm) No. of vertical riser slot		200 x 200 1	200 x 200 1	200 x 200 1	200 x 200 1

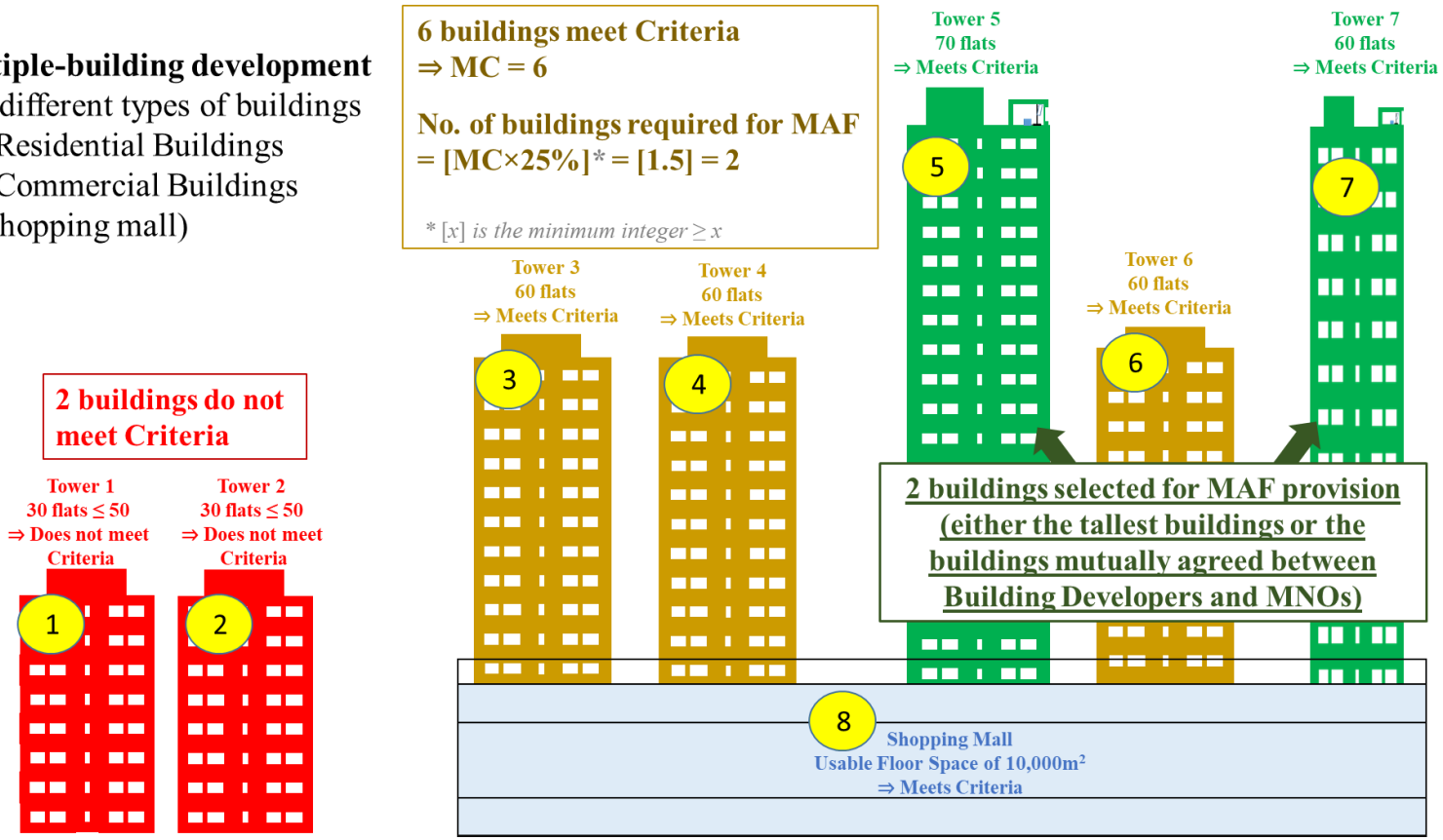
HOTELS				
No. of hotel rooms per building, N	N ≤ 75	75 < N ≤ 200	200 < N ≤ 600	600 < N
TBE Room				
Area (m^2)		10 to 20	15 to 25	20 to 30
Clear Height (m)		3	3	3
RTE Room on Rooftop				
Area (m^2)		10 to 20	15 to 25	20 to 30
Clear Height (m)		3	3	3
ITE Room at Lower / Intermediate floor				
Area (m^2)		10 to 20	15 to 25	20 to 30
Clear Height (m)		3	3	3
Vertical riser (mm)		200 x 200	200 x 200	200 x 200
No. of vertical riser slot		1	1	1

Note 1: The definition of "Usable Floor Space" should have the same meaning as defined in the Building (Planning) Regulations.
Note 2: The maximum non-accountable gross floor area ("GFA") under Building (Planning) Regulations should be the upper limit of the recommended range.

Annex 4 Illustrative Examples of Development Comprising Multiple Specified Buildings

(1) A Portion of Specified Buildings within a New Development Meeting the Criteria

Multiple-building development
with different types of buildings
- 7 Residential Buildings
- 1 Commercial Buildings (Shopping mall)



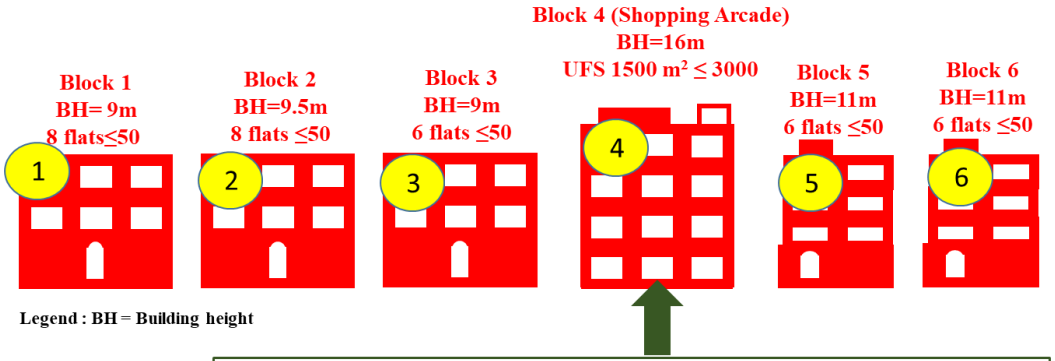
(2) None of the Specified Buildings within a New Development Meeting the Criteria

Multiple-building development of total 9 buildings

6 Buildings are considered:

- 3 residential blocks (6 flats)
- 2 residential blocks (8 flats)
- 1 shopping arcade (Usable Floor Space (UFS) of 1,500m^2)

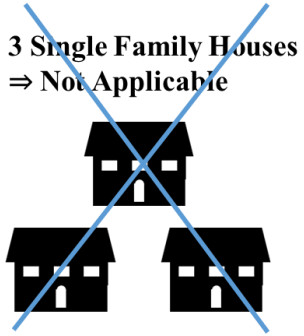
None of the buildings meet Criteria ⇒ MC = 0



At least one building selected for MAF provision (either the tallest building or the building mutually agreed between Building Developers and MNOs)

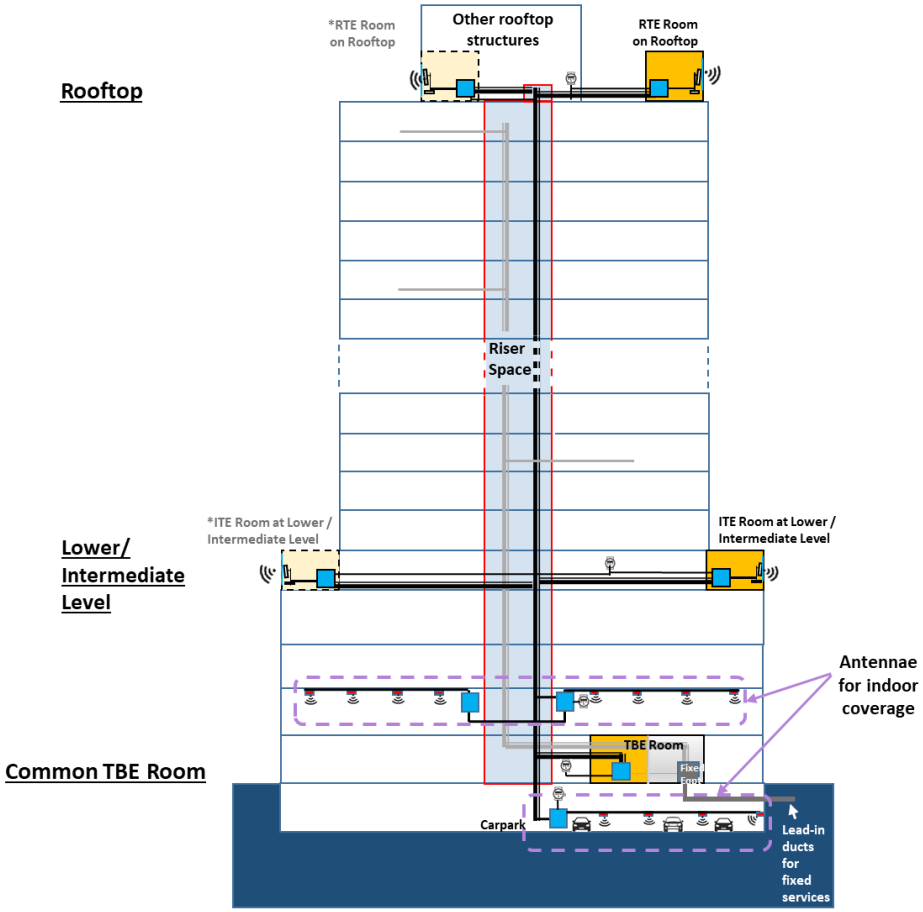
3 Buildings are not applicable:

- 3 single-family houses



Annex 5 General Schematic Diagrams showing the Typical Arrangement and Possible Locations of MAFs at Different Levels of the Specified Buildings

(1) Overall layout (For illustration only)



LEGEND:

RTE/ITE room with windows allowing effective radio signals propagation

*One room or more than one room may be provided to fulfil the relevant provision requirements.

Mobile equipment

Antennae for outdoor coverage

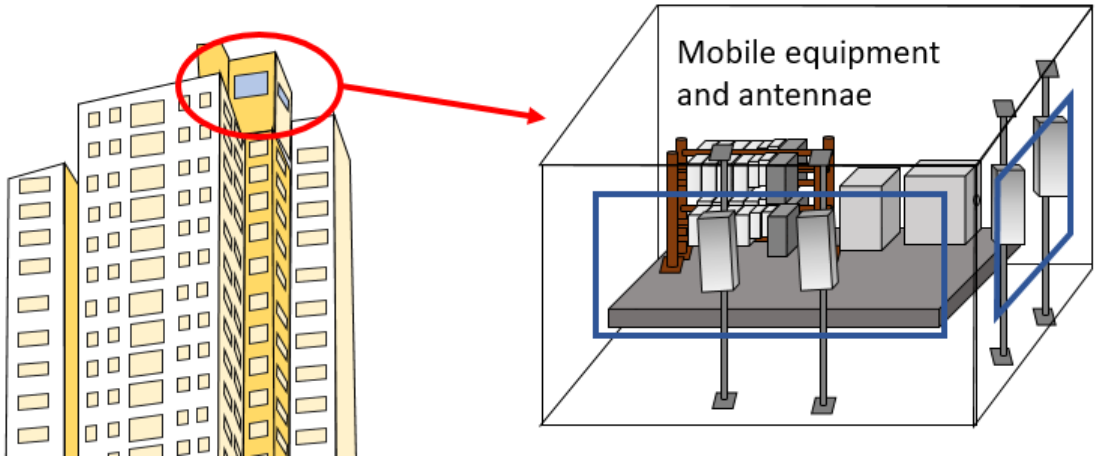
Antennae for indoor coverage

Riser/ horizontal duct/ trunking for mobile equipment

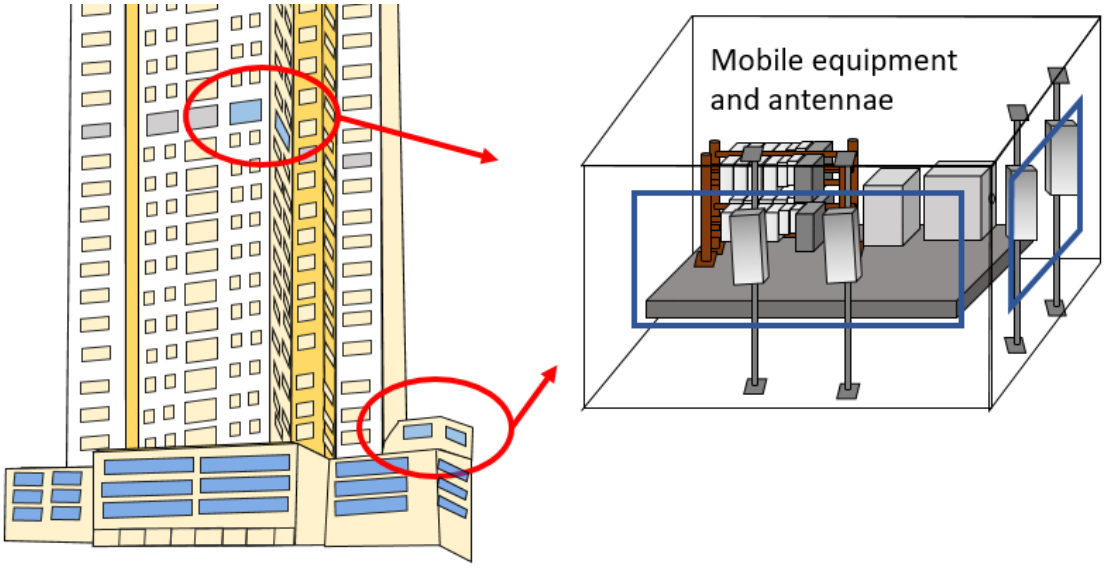
Duct/ trunking for fixed telecom / broadcasting services

Electricity meter by power company

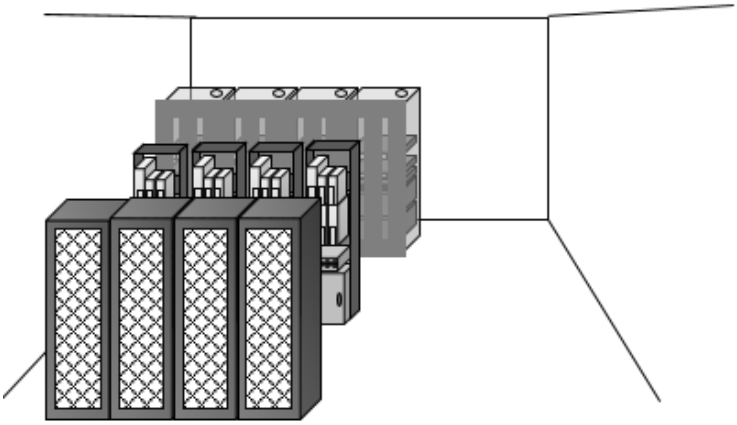
(2) <u>Example layout of mobile communications facilities installed in RTE rooms on rooftop (For illustration only)</u>



(3) <u>Example layout of mobile communications facilities installed in ITE rooms at lower / intermediate floor (For illustration only)</u>



(4) <u>Example layout of mobile communications facilities at TBE room (for illustration only)</u>



Mobile equipment installed in equipment racks