SINGAPORE TELECOMMUNICATIONS LIMITED AND SINGTEL MOBILE SINGAPORE PRIVATE LIMITED

RESPONSE TO PUBLIC CONSULTATION ON THE REVIEW OF THE CODE OF PRACTICE FOR INFO-COMMUNICATION FACILITIES IN BUILDINGS ("COPIF")

1. CONTENTS

1.1. This submission is structured as follows:

2. INTRODUCTION

2.1. Singapore Telecommunications Limited and Singtel Mobile Singapore Private Limited (collectively **Singtel**) are licensed to provide info-communications services in Singapore. SingTel is committed to the provision of state-of-the-art info-communications technologies and services in Singapore.

2.2. Singtel has a comprehensive portfolio of services that includes voice and data services over fixed, wireless and Internet platforms. Singtel services both corporate and residential customers and is committed to bringing the best of global info-communications to its customers in the Asia Pacific and beyond.

2.3. In August 2016, Singtel submitted our responses to the Ministry of Communications and Information (**MCI**) in response to the consultation paper issued in relation to the Review of the Telecommunications Act (**TA Review**). The Telecommunications Amendment Bill (**Bill**) was subsequently passed in Parliament on 10 November 2016 and came into effect on 1 February 2017.

2.4. Singtel welcomes the opportunity to make this submission on the Consultation Paper.

2.5. Singtel would be pleased to clarify any of the views and comments made in this submission, as appropriate.

3. EXECUTIVE SUMMARY

Section 1

3.1. Singtel supports the proposed changes to designate building rooftops as the preferred Mobile Deployment Space (**MDS**) location and to allow the use of MDS to not only serve the property development itself, but also allow mobile network operators (**MNOs**) to use the MDS to house equipment to serve External Areas.

3.2. However, Singtel submits that there is no basis for IMDA's statement that "*MNOs may pay building owners for costs in providing access to rooftops and other associated costs (e.g. electricity charges of running mobile equipment) that are reasonably and efficiently incurred."* Consistent with the existing COPIF (**COPIF 2013**), Singtel submits that costs should be limited to utilities directly incurred for the purpose of our installations only. The developer or owner should not impose any charge or rent on the licensee (e.g. administrative charges, security escort charges, reinstatement costs etc.) or impose any additional requirements on the licensee (e.g. requiring any insurance policy or additional insurance coverage) in connection with the grant of access to, and use of, the space and facilities under the revised COPIF arising from this Consultation Paper (**revised COPIF**). There is no basis for amending the revised COPIF to include the aforementioned overly broad and general statement, as this may serve as an avenue to impose additional and undue costs on MNOs and result in increased disputes.

3.3. Singtel also submits that the right afforded to MNOs allowing the use of the MDS to serve the property development itself as well as neighbouring buildings should be extended to the MDF room for fixed Licensees for the same reasons cited by Minister (MCI) Dr Yaacob Ibrahim – Singapore has a dense urban environment and it is more efficient for Licensees to rollout fibre infrastructure to a property development that can also serve the neighbouring buildings.

Section 2

3.4. Singtel submits that the revised COPIF should amend the MDS allocation in view of the introduction of a 4th MNO, upwards to a minimum of 12 square metre (**sqm**) of disaggregated space per MNO for the smallest applicable development, and adjusted proportionally upwards for larger developments. All other remote radio unit (**RRU**) mountings, such as antennas, should not be included within the calculation of the MDS. In addition, sufficient, non-rent chargeable space should be provided for these items.

3.5. While Singtel recognises that existing agreements and arrangements will be allowed to run their course, Singtel submits that contracts without a specified term (if any) should no longer be allowed to continue in perpetuity. Singtel reasonably proposes that any such contracts be ceased 12 months from the commencement of the revised COPIF.

3.6. To facilitate future technologies, deployment of solutions such as small cell technology will also be necessary. Singtel submits that IMDA should extend the application of the revised COPIF requirements to non-commercial locations and public facilities such as lampposts, monopoles, bus stops, ventilation buildings and substations etc.

3.7. Under existing and future initiatives, in line with the MCI's Infocomm Media 2025 plan[1], Heterogeneous Network (**HetNet**) is acknowledged as *"the next advance for our communications infrastructure*" and the plan recognises that Singapore *"must start enhancing our infrastructure now"*, that Singapore will need *"nationwide deployment"* and to build *"an integrated network of sensors across the island"* to achieve this. It is crucial that the revised COPIF set aside clear, unambiguous provisions to require additional space for purpose of HetNet deployment.

3.8. Singtel proposes that IMDA define a minimum number of working hours, as well as minimum frequency of access per MNO that assures MNOs of building owners' guaranteed approval. Such a minimum requirement will assure MNOs of a basic quality of access, while assisting building owners obtain committee approvals and provide proper justification to account to their residents.

3.9. Singtel is of the view that non-safety related reasons such as aesthetics should not be permitted as a reason to restrict or deprive MNOs of its rightful MDS. Any "reservations" of rooftop space by building owners for "potential projects" should also be subject to "proof of documentation" requirements.

3.10. Singtel has encountered multiple disputes with building owners and residents against allowing MNO deployment, or requiring Singtel to shift their equipment, due to alleged health concerns. This is despite Singtel adhering to IMDA's compliance guidelines on telecommunications equipment, as well the National Environment Agency (**NEA**)'s certified test reports. Singtel submits that IMDA should consider including remarks in the revised COPIF that further emphasises the credibility of IMDA and NEA's assessments.

[1] https://www.mci.gov.sg/portfolios/infocomm-media/infocomm-media-2025

3.11. Singtel seeks further clarification from IMDA regarding the measuring of mobile coverage area. IMDA can be clearer as to how coverage area/floor space is calculated, specifically the type of land space that is included, failing which there may be confusion or disputes arising regarding how space is calculated.

Section 3

3.12. Singtel does not object to the proposal to remove the obligation on building developers or owners to provide the necessary means for Licensees to access cable distribution systems or other Space and Facilities which are located above the Height Limit. However, in relieving building developers and owners of this responsibility and placing the burden on Licensees, the revised COPIF must require that building developers and owners facilitate Licensees' access to the building with such machinery; building developers and owners should not unilaterally or unreasonably impede Licensees' access or otherwise impose conditions.

3.13. Singtel does not support the requirements for Licensees and building owners/managers to secure pre-agreed emergency access for service restoration during emergencies or the recommended timelines.

3.14. Singtel proposes the following timelines which would be more reasonable for emergency access:

a. for a manned building: immediate access should be granted when a Licensee presents a company access/ security pass with picture identification to the security guards or management personnel stationed at the building; and

b. for an unmanned building: the building owner/ manager is to provide at least 2 contact persons to IMDA to be published online and access to the building is to be granted within 1 hour upon request in view of the Telecom Service Resiliency Code 2016 safe harbour period.

Section 4

3.15. Singtel submits that 2 sets of lead-in pipes at different locations in the building are sufficient for resiliency purposes.

3.16. Singtel supports IMDA's proposal to recommend that vital services buildings have 2 MDF rooms, 2 telecom risers and separate cable distribution systems.

3.17. Singtel submits that the following buildings should also be added as vital services buildings:

a. Private hospitals – there should not be any distinction made between public and private hospitals for the purpose of providing an enhanced network and service resilience
b. Fire stations – similar to police stations, all locations providing emergency services should be included
c. All major transport hubs including, but not limited to, sea ports, MRT stations and the Singapore-KL high speed rail – these locations should be included in view of the substantial impact to the public and/or economy if telecoms services here are affected

3.18. Singtel would also submit that buildings designated as vital services buildings should not charge Licensees for providing and/or improving the resiliency of telecommunications services in the buildings.

Section 5

3.19. Singtel supports the proposal for an additional 2-core optical fibre termination point. Singtel also recommends that the additional 2-core optical fibre should terminate at a second fibre termination point which itself should terminate at a second fibre interface point in the riser to facilitate ease of provisioning and to prevent congestion at any single point.

3.20. The proposed locations for the additional RJ45 outlets as illustrated in the New Plan View are acceptable.

3.21. Singtel submits that IMDA should also consider removing the requirement for the deployment of a broadband coaxial system in all residential premises. Given the prevalence of "future-proof" fibre, the building developer or owner should have the option of deciding whether a broadband coaxial system is required in buildings constructed pursuant to the revised COPIF.

3.22. The revised COPIF should require that the building owner or tenant install a structured LAN cable infrastructure system which will allow customers to connect their equipment to a patch panel instead of directly to the Licensees' equipment; similar to the residential model.

3.23. In relation to the matter of fire-stop seals, Singtel submits that the revised COPIF should be updated to require the use of fire-stop solutions that do not need to be removed/ reinstated each time the Licensee needs to install additional cables.

3.24. In full consideration of future-ready concerns, as well as the importance to accommodate a 4th MNO, Singtel proposes a Road and MRT MDS size of 80sqm to cater for necessary equipment including 4 MNO radio base stations (**RBS**), tunnel infrastructure equipment, uninterruptible

power supplies (**UPS**), power distribution box, fibre panel, power meter box, common space and to ensure 5G readiness, with further specifications outlined in the detailed comments below.

Other Comments

3.25. IMDA should engage the Housing Development Board (**HDB**), Building & Construction Authority (**BCA**) and relevant public agencies in reviewing the minimum clearing requirements for antennas at development rooftops and finding suitable solutions to improve coverage quality for consumers residing at lower levels of developments.

3.26. Singtel requests that the revised COPIF include the following recommendations to facilitate cable pulling in buildings:

a. install C-channel cable trays instead of U-channel cable trays so that cables can be placed along the tray easily;
b. provide a clearance space of at least 0.5m from the opening of the cable trays; and
c. provide a clearance space of 0.35m between trays where there are multi-tier cable trays.

3.27. Singtel recommends that the security of HDB MDF rooms be upgraded to tighten access through the use of smart locks. Singtel also proposes for IMDA to look into the implementation of smart locks for rooftop MDS access.

3.28. In addition to requiring that the building developer/ owner provide ventilation/ air-conditioning, power, lighting, etc. in the MDF room, the revised COPIF should also make it clear that maintenance (including replacement) of said facilities are to be borne by the building developers/ owners.

3.29. Building developers/ owners should provide a cable distribution system beneath the floor (i.e., a service trench) to non-building address point locations within the building (e.g. kiosks, ATMs or other locations where services may be required on an ad hoc basis, etc.).

3.30. The building owner/ manager should not impose a security deposit if the Licensee is able show that it has the necessary insurance coverage.

3.31. The building developer/ owner should name or number the riser if there are multiple risers in the building for ease of reference when the building developer/ owner/ manager wishes to report any matters concerning a riser(s) and allows the Licensee to easily identify a specific riser(s). Each riser door should be labelled accordingly.

3.32. All building developers/ owners should be required to update the building Temporary Occupation Permit (**TOP**) date by writing to the Telecommunication Facility Co-ordination Committee and/or updating CORENET.

3.33. All building demolition work should be submitted in CORENET so that Licensees can take note of any recovery work that needs to be carried out before demolition works commence.

3.34. Building developers/ owners should provide fibre tubes from the riser to each individual unit. The fibre tube should always be along the corridor and not over the individual units for ease of maintenance as the owner of the unit(s) may not allow Licensees access to their unit(s).

3.35. If a building has 2 x AC power source, the building owner or developer should also provide 2 x AC power source to the MDF room.

3.36. The revised COPIF should require that all buildings use a multi-cable transit (**MCT**) system instead of lead duct seals to reduce the risk of a fire occurring while the Licensee is carrying out works in the building.

4. GENERAL COMMENTS

4.1. Singtel welcomes the additional changes proposed by IMDA to the existing COPIF 2013. This is in keeping pace with advances in telecommunications infrastructure technology, as well as increasing end user requirements in relation to the provision of telecommunication services and coverage in developments. Furthermore, Singtel notes Singapore's Smart Nation initiatives in leveraging technology and technology-enabled solutions.

4.2. Singtel appreciates the changes made to COPIF 2013 in expanding the scope of the rent-free space known as MDS to:

a. designate building rooftops as the preferred MDS location; and
b. allow the use of MDS to not only serve the serve the property development itself, but also allow MNOs to use the MDS to house equipment to serve areas outside the property developments (**External Areas**).

4.3. As IMDA has rightly recognised, in-building mobile coverage for a development may be better served by mobile deployments on rooftops from adjacent buildings. This is due to technical reasons arising from the nature and design of antenna systems which need to be deployed pointing outwards from each rooftop. While such a change helps MNOs obtain permissions to sites which may have been rejected under COPIF 2013, Singtel would like to emphasise the

considerable benefits of enhanced telecommunications services are accrued to end-users, building owners, as well as IMDA's telecommunication initiatives and quality of service (**QOS**) standards.

4.4. Prime Minister Lee Hsien Loong, in his speech at the launch of the EW Barker Centre for Law and Business on 29 May 2017, made clear that "*Singapore's law must change accordingly as globalization and technology are changing how business is done*" and that "*effective, but not onerous regulation has become a new source of economic competitiveness*".[2] Singtel disagrees with IMDA's decision not to increase the MDS space allocation for MNOs. Since COPIF 2013, IMDA has conducted reviews and tightened its 3G mobile telecommunication QOS standards and introduced a 4G QOS framework. IMDA has increased the onus on MNOs to grow its infrastructure development and investment to meet IMDA's stringent standards. In April 2017, IMDA further awarded a new MNO license, introducing a 4th MNO into the Singapore market. The 4th MNO will be required to deploy its own telecommunications equipment and meet IMDA's deployment timelines rapidly over the next few years. In May 2017, IMDA launched its public consultation on 5G mobile telecommunication technology, recognising the necessity to plan for and accommodate increasing needs and requirements of new technology. There is a need to increase the MDS space allocation for MNOs.

4.5. As Minister (MCI) Dr Yaacob Ibrahim duly recognised in his speech on the Bill, "t*o meet these rising demands, IMDA must have the ability to facilitate the continued deployment of telecoms infrastructure.*" Based upon existing MDS specifications, it is not practicable for IMDA to expect 4 MNOs to maintain the ability to facilitate deployment of telecoms infrastructure to meet both existing and emerging technology needs. Existing MDS specifications are allocated for 3 MNOs under COPIF 2013, and IMDA would be aware that under COPIF 2013, MNOs are clearly of the view that MDS space allocated was already tenuous. A revision upwards for MDS space is necessary to keep the specifications relevant – this is even before taking into consideration new technology and end-user demands that necessitate increased physical infrastructure deployment. Singtel would like to clarify that, on contrary, the introduction of new mobile telecommunication technology does <u>not</u> imply a reduction of space required by MNO's equipment.

4.6. To facilitate future technologies, deployment of solutions such as small cell technology will also be necessary. Singtel is of the view that IMDA should extend the application of the revised COPIF requirements to non-commercial locations and public facilities such as lampposts, monopoles, bus stops, ventilation buildings and substations etc., to expand deployment options available, which will quicken the development and deployment of future technology. These

[2] https://www.reach.gov.sg/participate/discussion-forum/2017/05/30/law-and-lawyers-must-keep-pace-with-changes

facilities should be equipped with 24x7 power supply and fibre patch points incorporated necessary for deployment of such technology - in particular facilities such as lampposts, where it is beyond the purview of the MNO to implement. It is reasonable that public agencies that oversee these facilities support the Government and IMDA's Smart Nation initiatives when building developers and owners are already required to support COPIF 2013. There should also be greater educational efforts and initiatives to reach out to the public on IMDA's drive in this area.

4.7. In the latest global Speedtest study published on May 24, 2017, Singapore was reported to possess amongst the fastest mobile and broadband speeds in the world, with the fastest average mobile upload speed in the world at 17.46Mbps[3]. Singtel submits that a failure to increase MDS allocation and expand its scope to non-commercial locations will directly affect existing QOS standards and performance. This is in addition to critically undermining IMDA's ability to future-proof its regulations in anticipation of future initiatives. Such a failure to increase an outdated space allocation will also negate gains made under this Consultation Paper. Singtel also submits additional technical recommendations and comments in response to IMDA's questions.

5. SPECIFIC COMMENTS

SECTION 1 – Use and Scope of Mobile Deployment Space provided within a development to provide mobile coverage

Question 1

i.	Any procedural issues (e.g. physical access or implementation matters) arising from IMDA's proposed amendments to the COPIF on the scope and use of the MDS on building rooftops to provide coverage to External Areas.

5.1. Singtel appreciates the proposed changes to designate building rooftops as the preferred MDS location and to allow the use of MDS to not only serve the property development itself, but also allow MNOs to use the MDS to house equipment to serve External Areas. However, Singtel is concerned that the implementation may be flawed.

5.2. As IMDA has recognised in its Consultation Paper, *"IMDA sets QOS requirements to regulate the performance of mobile service provided by MNOs such that they achieve reasonable standards, and to ensure that nationwide mobile coverage, including in-building mobile*

[3] Internet speeds in Singapore among world's fastest: http://www.channelnewsasia.com/news/singapore/internet-speeds-in-singapore-among-world-s-fastest-report-8879516

coverage, is provided to the public." In June 2015, IMDA reduced the rectification period accorded to MNOs from 6 months to 4 months for sites of non-compliance with its stringent QOS standards. This is despite the fact that time required for the various permissions, procurement and actual on-site installation works and testing amounts to at least 6 months on average. In June 2016, IMDA announced new 4G QOS standards for compliance to ensure mobile phone users experience an acceptable level of service quality in Singapore, which runs concurrently with its existing 3G QOS standards. IMDA requires MNOs to cover at least 99% of outdoor areas from 1 July 2017, and implemented standards for tunnels as well as building premises. Since 2015, IMDA has also implemented additional, stringent requirements requiring speedy deployment of mobile coverage at HDB and private housing developments. In May 2017, IMDA launched its public consultation on 5G mobile telecommunication technology, recognising the necessity to plan for and accommodate increasing needs and requirements of new technology.

5.3. It is thus clear that both the demands of end-users in Singapore, as well as the standards imposed by IMDA on MNOs, have consistently increased over the years – this necessitates the IMDA changes to the COPIF to support MNOs, in particular the designation of MDS to overcome space constraints.

5.4. Under Paragraph 11, IMDA referenced the MCI's TA Review, stating *"MNOs may pay building owners for costs in providing access to rooftops and other associated costs (e.g. electricity charges of running mobile equipment) that are reasonably and efficiently incurred."* Singtel submits that consistent with the COPIF 2013, costs should be limited to utilities directly incurred for purpose of our installations only and cannot be used as an avenue to levy additional and undue charges on MNOs.

5.5. Singtel submits that costs should be limited to utilities directly incurred for purpose of our installations only. The developer or owner should not impose any charge or rent on the licensee (e.g. administrative charges, security escort charges, reinstatement costs etc.) or impose any additional requirements on the licensee (e.g. requiring any insurance policy or additional insurance coverage) in connection with the grant of access to, and use of, the space and facilities under the revised COPIF. IMDA itself further noted in its Consultation Paper that "*MNOs have to spend significant resources in protracted negotiations with building developers or owners and may be asked to pay high charges…even where MNOs already have existing installations on a rooftop."* There is no basis for amending the revised COPIF to include the aforementioned overly broad and general statement, as this may serve as an avenue to impose additional and undue costs on MNOs and result in increased disputes. This proposed revision also directly contradicts the goal of its Consultation Paper to eliminate such charges.

5.6. Singtel reiterates its support for IMDA's MDS revision and justifications detailed in Paragraphs 15 to 17. Singtel fully concurs with IMDA's decision in allowing the MDS to serve External Areas, as well as designating rooftops as the preferred location from MDS. This is grounded in scientific, technical justifications that ensure owners and end-users enjoy optimal coverage.

5.7. Singtel suggests that IMDA ensure the amendments are clearly and formally communicated in writing to all building owners upon its implementation. This is in view of protracted negotiations experienced by Singtel in 2013, which arose due to building owners being unaware of communication from IMDA regarding COPIF changes.

5.8. Singtel also submits that the right afforded to MNOs allowing the use of the MDS to serve the property development itself as well as neighbouring buildings should be extended to the MDF room for fixed Licensees for the same reasons cited by Minister (MCI) Dr Yaacob Ibrahim – Singapore has a dense urban environment and it is more efficient for Licensees to rollout fibre infrastructure to a property development that can also serve the neighbouring buildings. In supporting the move towards greater fibre adoption, the revised COPIF should no longer require that Licensees negotiate commercial arrangements with the respective building owner/ manager; Licensees should be allowed to serve a property development and neighbouring buildings without any additional charge(s).

SECTION 2 – Requirements of Space and Facilities to be provided to MNOs

Size of MDS; Determining and Ascertaining the Size of MDS

5.9. In our response to the TA Review in August 2016, Singtel submitted that the minimum MDS allocation must be increased and that access to locations required for the deployment of small cells and new technologies be specifically included as part of the MDS (akin to the proposals for rooftop space). This amendment would future-proof the COPIF and prevent the need for further amendments regarding new technologies for mobile deployments. Singtel sought confirmation from MCI that the subsequent review of the COPIF will: increase the minimum allocation for MDS; provide specific access to spaces required for the deployment of small cells and other new technologies (alongside specific access to rooftop space, as proposed by MCI); ensure that access to MDS, including access to specific spaces (such as rooftop space or space for the deployment of small cells), is provided on a rent-free basis. In addition, Singtel considers that amendments in relation to rooftop space and spaces for the deployment of new technologies should be incorporated directly in sections 19 and 21 of the TA, rather than only in the COPIF.

5.10. It is thus critical that the COPIF set-out clearly the requirements and specifications. Singtel submits that the revised COPIF amend the MDS allocation in view of the introduction of a 4th MNO. Singtel is gravely concerned that the MDS space has not been revised upwards.

5.11. As aforementioned, in April 2017 IMDA awarded a new MNO license, introducing a 4th MNO into the Singapore market. The 4th MNO will be required to deploy its own telecommunications equipment and meet IMDA's deployment timelines over the immediate few years. Singtel seeks further clarification as to how a retention of existing MDS space originally catered for 3 MNOs can be justified for retention.

5.12. IMDA itself accurately identified two critical areas in its Consultation Paper – "*with the increasing demand for pervasive mobile services in land scarce Singapore, IMDA notes that it is not feasible for MNOs to rely solely on public areas to deploy equipment to External Areas"* and that "*MNOs face many on-site challenges that have delayed timely deployment of mobile coverage by the MNOs".* IMDA goes on to explain that *mobile deployments on building rooftops have been rejected by some building owners, particularly where these do not primarily serve the property developments even when there is space available on the rooftops; MNOs have to spend significant resources in protracted negotiations with building developers or owners and may be asked to pay high charges for the use of space in the developments to provide mobile coverage to External Areas. Even where MNOs already have existing installations on a rooftop, they may not be allowed to retain the same site unless MNOs pay the rental charges required by building developers or owners. These events may result in MNOs having to remove their installations or re-locate elsewhere, thus causing disruption to mobile services and affecting the overall mobile experience of users.*

5.13. It is thus clear that the Consultation Paper must address the issue of land scarcity and eliminate protracted negotiations arising from high charges and rental charges that are not permitted under COPIF. The retention of existing MDS space, despite the addition of an additional operator, however, is a direct contradiction to this goal. It creates an artificial space shortage that results in MNOs being subjected to additional high charges and rental charges that the Consultation Paper is seeking to eliminate.

5.14. Singtel disagrees with the retention of current MDS space allocation and submits that an increase in MDS allocation is necessary. Singtel reiterates that growing end-user demand, as well as tightening IMDA regulations such as QOS standards, place increasing onus on MNOs to enhance capacity and deploy infrastructure. Newer technology such will require future-proofing – such as capacity expansion; 5G and beyond - and will greatly increase the equipment required

to achieve the boost in capacity. MTOs will also need to invest to build foundation works (e.g. C-channels) to cater for future expansion. The current space requirement shortage would require re-work at such sites which will effect existing mobile experience.

5.15. IMDA's goal of ensuring optimal coverage by allowing adjacent buildings to serve External areas will also require MNOs to deploy additional equipment to enhance coverage – this already causes a strain on existing MDS provisions even before taking a 4th operator into consideration. IMDA would also be aware that new developments in technology do not imply a reduction in equipment and equipment size. Telecommunication infrastructure deployment is subject to technical measurements and design by vendors, who are required to adhere to safety load limits. The equipment cannot simply be "stacked", "packed" or "easily rearranged" to save space.

5.16. An artificial shortage created by existing MDS allocation will cause protracted negotiations for the increased amount of operators, which will result in operators having to remove or re-locate their equipment and affecting the overall mobile experience of end-users in contradiction to IMDA's concerns. Singtel submits that the revised COPIF should amend the MDS allocation in view of the introduction of a 4th MNO, upwards to a minimum of 12sqm of disaggregated space per MNO for the smallest applicable development, and adjusted proportionally upwards for larger developments. Singtel emphasises all other RRU mountings, such as antennas, should not be included within the calculation of the MDS. In addition, sufficient, non-rent chargeable space should be provided for these items.

5.17. Singtel also wishes to emphasise that in view of IMDA's Smart Nation initiatives, HetNet programmes, as well as the development of future mobile technology, there will be a need for pillar and wall mounted small cell technology. These technologies enable capacity expansion and enhancements, while according greater flexibility of locations and space management to the benefit of the building owners. Furthermore, they do not restrict access or occupy floor space in the same regard as base station equipment. As such, it is important that the deployment of such RRUs must not be counted under MDS allocation.

5.18. Under existing and future initiatives, in line with the MCI's Infocomm Media 2025 plan[4], HetNet is acknowledged as *"the next advance for our communications infrastructure*" and seeks to *"provide the best connectivity for Everyone, Everything, Everywhere, All the Time, even when users move between different places"*. More importantly, the plan recognises that Singapore *"must start enhancing our infrastructure now"* and recognises that there are barriers to *overcome including enabling "seamless LTE/Wi-Fi handovers, IP preservation,pre-mature Wi-*

[4] https://www.mci.gov.sg/portfolios/infocomm-media/infocomm-media-2025

Fi selection, and "ping pong" effects". Singapore will need *"nationwide deployment"* and to build *"an integrated network of sensors across the island"* to achieve this. IMDA is also urged to ensure Singapore is *"at the forefront of solving problems related to HetNet, and become the lead adopter of HetNet".*

5.19. It is crucial that the revised COPIF set aside clear, unambiguous provision to require additional space for purpose of HetNet deployment. HetNet solutions can require deployments of up approximately 45 antennas per commercial building, depending on enhancement areas, in addition to back-end equipment and backhaul links. In addition to MNOs requiring several months to achieve deployments, the nature of small cell deployment in specific areas and units mean MNOs require multiple approvals and negotiations (such as multiple owners within a single commercial building or shopping mall), as there is no existing provision to require building owners to do so. Given the burgeoning initiatives by government agencies, HetNet deployments now and in the future will include locations beyond commercial and residential buildings, extending to hawker centres; schools and educational institutions; as well as public transport locations. It is clear that MCI and IMDA support leading edge efforts to grow HetNet deployment and this will require the revised COPIF to be future proofed, so as to enable speedy nationwide deployment of HetNet networks through COPIF provisions.

5.20. Singtel is of the view that IMDA should extend the application of the revised COPIF requirements to non-commercial locations and public facilities such as lampposts, monopoles, bus stops, ventilation buildings and substations etc., to expand deployment options available, which will quicken the development and deployment of future technology. These facilities should be equipped with 24x7 power supply and fibre patch points incorporated necessary for deployment of technology (e.g. small cell) - in particular facilities such as lampposts, where it is beyond the purview of the MNO to implement. It is reasonable that public agencies that oversee these facilities support the Government and IMDA's Smart Nation initiatives when building developers and owners are already required to support COPIF. There should be greater educational efforts and initiatives to reach out to the public on IMDA's drive in this area.

<u>Treatment of existing agreements or arrangements for use of rooftop MDS</u>

5.21. Singtel requests that IMDA clarify its definitions of "*agreements or contracts with unique considerations*". While Singtel recognises that existing agreements and arrangements will be allowed to run their course, Singtel submits that contracts without a specified term (if any) should no longer be allowed to continue in perpetuity. Singtel reasonably proposes that any such contracts be ceased 12 months from the commencement of the revised COPIF.

5.22. Contracts without a specified term are inflexible and often resistant to commercial negotiations. This is because they are by nature archaic and does not take into consideration current deployment conditions and technological developments, which will necessitate re-negotiation. Specifically, the perpetual contracts will fail to take into account not only changes arising from this Consultation Paper, but also changes since 2013. Singtel reasonably proposes that perpetual contracts be ceased 12 months from the implementation of the revised COPIF. This is in addition to the window period already enjoyed by building owners since COPIF 2013, as well as the subsequent period between completion of this Consultation Paper and the eventual implementation of the revised COPIF.

5.23. Contracts without a specified term do not reflect terms and conditions that would have taken place under COPIF 2013 negotiations. Singtel submits that IMDA places a time limit by which any such contracts without a specified term will cease.

Question 2

ii.	The proposal to allow MNOs to determine the location of the MDS, in consultation with building developers or owners; and
iii.	The proposed definition of "Mobile Coverage Area" using GFA + site/land area.

5.24. Singtel notes an increase in building owners utilising rooftop space for gardens, aesthetic installations, as well as solar panel farms. Building owners may claim without evidence, an intention to use potential MDS space for future installations, while "aesthetic reasons" are extremely subjective and may cause disagreements between building owners and MNOs. Singtel is of the view that safety should be the paramount concern – reasons such as aesthetics should not be permitted as a reason to restrict or deprive MNOs of its rightful MDS. Any "reservations" of rooftop space by building owners should be subject to "proof of documentation" requirements.

5.25. With regard to safety concerns, Singtel has encountered multiple disputes with building owners and residents against allowing MNO deployment, or requiring Singtel to shift their equipment, due to alleged health concerns. This is despite Singtel adhering to IMDA's compliance guidelines on telecommunications equipment, as well the NEA's certified test reports. Singtel submits that IMDA consider including remarks in the revised COPIF that further emphasises the credibility of IMDA and NEA's assessments.

5.26. The rooftop is being designated as the preferred deployment area due to technical reasons to enable efficiency and quality of deployment. However, Singtel expresses concern that building

owner may rigidly interpret the revised COPIF and limit deployment to the rooftop only – this is a concern as there may be future requirements arising from programmes and initiatives such as those arising from IMDA's Smart Nation initiatives and HetNet programmes which will require deployment of small cell solutions. There may also be a need for more than one MDS location due to requirements arising from new technology and the necessary expansions required. As such, although IMDA has scaled the size of MDS subject to the coverage area, while MNOs will duly consider building owner's constraints and plan the MDS location enhancements accordingly (such as placements and concealment away from public access/view for aesthetic reasons), it will be important for the revised COPIF to expressly word that flexibility should be accorded if the need arises due to capacity or technology requirements of the MNOs.

5.27. Singtel would also request that IMDA clarify the building owners' obligation to provide access to MDS space – this obligation should reasonably cover at minimum the route from building entrance to the MDS space. Singtel submits that MNOs often encounter instances where obstructions due to structures on the ground, as well as the ceiling (such as air-con ducts, gas pipes) can often deviate from the floor plan provided to the MNOs. These instances are common and results in considerable costs required to re-locate works, of no fault of MNOs. Singtel submits that these costs should not assigned to the MNOs indiscriminately – building owners should be obligated to ensure access to the MDS space is not unreasonably obstructed and must not deviate from initial floor plans provided, failing which costs to rectify or reroute access should not be borne by MNOs.

5.28. In some cases, building owners were wary of installing new technology like HetNet. MNOs seek IMDA support to require building owners to allow the installation of mobile antenna within the premise of the building, including but not limited to common areas and tenant units. This would support such new rollout techniques and minimise protracted negotiations with building owners.

5.29. Singtel submits the following instances: where the proposed equipment is wall mounted, or takes up dead space unsuitable for any use, such as: mounted small cell solutions; antenna boom near building edge; feeders, space used for work, safety and health such as safety enhancements, grab bars, floorboard installation required for safety loading; walkways and service areas for equipment access (e.g. cabinet access). It is reasonable that in these aforementioned instances the equipment area shall not be considered as part of the allocated MDS space.

5.30. Singtel seeks further clarification from IMDA regarding the measuring of mobile coverage area. IMDA can be clearer as to how coverage area/floor space is calculated, failing which there may

be confusion or disputes arising regarding how space is calculated. For example, IMDA explains that coverage area includes outdoor areas and open space within a development. IMDA may need to make clear as to types of outdoor open space that apply (e.g. swimming pools and carpark) as well as definitional limits of calculation.

SECTION 3 – Use of and Access to Space and Facilities by Licensees

Use of Space and Facilities: Rules of Usage

5.31. Access to rooftops are controlled and limited at times by building owners for various reasons, in particular noise and safety complaints raised by their residents. Singtel proposes that IMDA define a minimum number of working hours, as well as minimum frequency of access per MNO that assures MNOs of building owners' guaranteed approval. Such a minimum requirement will assure MNOs basic quality of access, while assisting building owners obtain committee approvals and provide proper justification to account to their residents. Guaranteed access should not be limited to new site deployment, but also cover enhancement, maintenance, as well as survey works.

5.32. As IMDA will be aware, in-building access will normally require permissions beyond that of the building owner, as there may be several tenants within the development, resulting in an impasse as neither party is willing to consolidate permissions. As building owners possess a direct, contractual, relationship with and manage their tenants, it would be reasonable for MNOs to request assistance from the building owner to facilitate the access to tenant units for installation of MNOs' infrastructure. Furthermore, tenants may be less inclined to communicate with MNOs directly and leave the responsibility to building owners. IMDA should clarify under revised COPIF the building owner's responsibility to facilitate communication and approvals. Singtel also requests that IMDA clarify under the revised COPIF that building owners are required to provide building information (e.g. floor plans, existing building infrastructure routings) to MNOs to facilitate design works and deployment for benefit of residents in the building.

Question 3

Access to Space and Facilities located at a height of more than 4 metres above floor level

iii.	The proposed removal of the obligation on building developers or owners to provide the necessary means for Licensees to access cable distribution systems or other Space and Facilities which are located above the Height Limit, i.e. it is recommended that Licensees will be obliged to secure their own means of access to Space and Facilities beyond the Height Limit; and

5.33. The proposal and recommendation above does not address the matter at hand – that, as IMDA has noted in paragraph 41 of the Consultation Paper, there is an increasing trend in buildings with high ceilings beyond the Height Limit with cable distribution systems usually attached to these ceilings. While building developers and owners are currently required to provide a means for Licensees to access the cable distribution systems at no cost to the Licensees, whereupon the building developers or owners could recover the costs from their tenants, IMDA's recommendation now passes the responsibility of providing the means of accessing these cable distribution systems or other Space and Facilities and the ensuing costs to the Licensees. This absolves the building developer or owner from the responsibility of providing a reasonably accessible location for cable distribution systems and other Space and Facilities or providing a means to access said location.

5.34. In view of the difficulties faced in negotiating the provision of a means to access Space and Facilities beyond the Height Limit with building developers and owners and the delays arising from these difficulties, Singtel has increasingly been providing its own means of access and consequently borne the costs. As such, Singtel does not object to the proposal and recommendation as stated above. However, in relieving building developers and owners of this responsibility and placing the burden on Licensees, the revised COPIF must require that building developers and owners facilitate Licensees' access to the building with such machinery; building developers and owners should not unilaterally or unreasonably impede Licensees' access or otherwise impose conditions.

5.35. Singtel submits that while the intention is for IMDA to enhance the COPIF 2013, with regard to workplace safety and health, it is important to state clearly that reasonable access (e.g. staircases and walking ramps) must be provided for the MDS, common access cable distribution systems, as well as related spaces and facilities and not result in unreasonable costs and delays to deployment imposed on MNOs.

Access to Space and Facilities – Emergencies

iv.	(a) The proposed requirement for Licensees and building owners/managers to secure pre-agreed emergency access for service restoration during emergencies, particularly where the Licensee is using the space and facilities for Springboarding; (b) The recommendation for managed buildings to have pre-agreed emergency access to be provided with two (2) hours' notice and for unmanned buildings to have pre-agreed emergency access provided soonest possible upon notification; and

(c) Any specific details that should be included in such pre-agreed emergency access requirements.

5.36. Singtel does not support the requirements and recommendations as stated above.

5.37. The proposed requirement for Licensees and building owners/ managers to secure pre-agreed emergency access for service restoration during emergencies is not feasible – it requires emergency access agreements between Licensees and potentially thousands of building owners/ managers in Singapore which would be a difficult and lengthy process not only to complete but also to maintain.

5.38. Telecommunications services are not considered essential services by building owners/ managers unlike electricity and water services. As a result, access to the building to restore telecommunications services is not equally prioritised and licensees' continue to face delays. Emergency access to buildings for the purpose of restoring telecommunications services should be a COPIF requirement instead of being based on individual agreements negotiated between the Licensees and building owners/ managers.

5.39. Furthermore, the timelines proposed are not reasonable considering that the Telecom Service Resiliency Code 2016 only provides a safe harbour of 1 hour with a goal of restoring services to customers as quickly as possible. All building owners/ managers should have in place processes for the purpose of allowing emergency access – a 2-hour window to approve access into a 24/7 manned building is excessive. Singtel also disagrees with the proposed 'flexibility' to provide access to unmanned buildings "soonest possible upon notification". As the purpose is to provide emergency access to a building to restore services during emergencies[5], the timelines to allow Licensees access should convey and support the urgency of this requirement. It follows that longer waiting times for access to a building will affect restoration time.

5.40. The COPIF 2013 should be amended to oblige building owners/ managers to provide access to Licensees. Building owners/ managers should not block access to the building except on reasonable grounds such as safety; in such instances, unless otherwise indicated by emergency services such as the Singapore Civil Defence Force or Police, the Licensee will assess the worksite safety before commencing work. Singtel proposes the following timelines which would be more reasonable for emergency access:

[5] Paragraph 48 of the Consultation Paper

a. for a manned building: immediate access should be granted when a Licensee presents a company access/ security pass with picture identification to the security guards or management personnel stationed at the building; and
b. for an unmanned building: the building owner/ manager is to provide at least 2 contact persons to IMDA to be published online and access to the building is to be granted within one (1) hour upon request in view of the Telecom Service Resiliency Code 2016 safe harbour period. Notwithstanding this proposal, Singtel recognises that it may be difficult for the contact person(s) to attend at an unmanned building within such a short period of time. Therefore, in the event that IMDA disagrees with the 1 hour timeline, Singtel proposes that access be granted within 2 hours upon request.

5.41. Singtel also seeks clarification as to whether IMDA will act against any building owner and/or manager that do not provide emergency access within the stipulated timeframe, and what type of action(s) it may take.

SECTION 4 – Requirements to Enhance Network and Service Resilience

Resilience of networks and services

Question 4

i.	Whether the current requirement of 2 sets of lead-in pipes (i.e. one set in vital services buildings and essential facilities, with an additional set at a different location) is sufficient for resilience purposes;

5.42. Singtel submits that 2 sets of lead-in pipes at different locations in the building are sufficient for resiliency purposes.

ii.	Whether an additional MDF room, telecom riser and set of cable distribution system should be provided as mandatory requirements or included as recommendations under the COPIF guidelines; and

5.43. Singtel supports IMDA's proposal to recommend that vital services buildings have 2 MDF rooms, 2 telecom risers and separate cable distribution systems.

iii.	Any other types of developments (besides those stated in this Section) that should be included in the list of vital services buildings and essential facilities, and the reasons for doing so.

5.44. Singtel submits that following buildings should also be added as vital services buildings:

a. Private hospitals – there should not be any distinction made between public and private hospitals for the purpose of providing an enhanced network and service resilience
b. Fire stations – similar to police stations, all locations providing emergency services should be included
c. All major transport hubs including, but not limited to, sea ports, MRT stations and the Singapore-KL high speed rail – these locations should be included in view of the substantial impact to the public and/or economy if telecoms services here are affected

5.45. Singtel would also submit that buildings designated as vital services buildings should not charge Licensees for providing and/or improving the resiliency of telecommunications services in the buildings. For example, some data centres impose significant costs on Licensees for the use of infrastructure which the data centres have built for resiliency purposes including the second lead-in pipe and cable facilities (i.e., cable tray, etc.). Licensees should not be charged for enhancing the resiliency of telecommunications services at vital services buildings. Singtel requests that this be clearly stated in the revised COPIF.

SECTION 5 – Provision of Cables for Telecommunication (Non-Broadband Coaxial Cable) Systems in all Developments

Question 5

Residential Developments

i.	Whether the current requirement of one 2-core optical fibre is sufficient to meet future home communication needs and if one more 2-core optical fibre termination point should be provided;

5.46. Singtel supports the proposal for an additional 2-core optical fibre termination point. Singtel also recommends that the additional 2-core optical fibre should terminate at a second fibre termination point which itself should terminate at a second fibre interface point in the riser to facilitate ease of provisioning and to prevent congestion at any single point.

ii.	Whether the current requirements of: - 2 RJ45 outlets for each living/dining room in a residential property; and - 1 RJ45 outlet for each bedroom in a residential property are sufficient. If not, where else should such RJ45 outlets be located; and

iii.	Whether any other requirements ought to also be included for in-building cabling for residential developments.

5.47. Singtel shares IMDA's view that additional RJ45 outlets within a residential unit would be beneficial. The proposed locations for the additional RJ45 outlets as illustrated in the New Plan View are acceptable.

5.48. Singtel also proposes the following locations for additional outlets:

a. RJ45 outlet in the closet/ utility room; and
b. fibre termination point in staircases which are used as bomb shelters (i.e., storey shelters).

5.49. Each additional RJ45 outlet and fibre termination point should be accompanied by an AC power socket next to it.

5.50. Singtel submits that it is timely to review the COPIF 2013 requirements to deploy a broadband coaxial system in all residential units. Singtel would note that copper cables to residential units were replaced with optical fibre cables in COPIF 2013 with the introduction of the Next Gen NBN.

5.51. As at March 2017, NetLink Trust has deployed fibre up to the distribution point, gatepost or nearest manhole (where applicable) at more than 1.4 million homes[6]; of which 89.2% have fibre deployed to the first termination point within the premises and 76.3% have an active end-user connection. These statistics are evidence of the prevalence of fibre deployment and adoption in residential developments, and render the COPIF 2013 broadband coaxial system deployment requirements obsolete.

5.52. In line with the government's push towards fibre adoption, further supported by the proposal in the Consultation Paper to provision more optical fibre to each residential unit, Singtel submits that IMDA should also consider removing the requirement for the deployment of a broadband coaxial system in all residential premises. Given the prevalence of "future-proof" fibre, the building developer or owner should instead have the option of deciding whether a broadband coaxial system is required in buildings constructed pursuant to the revised COPIF.

[6] NetLink Trust – Facts and Figures http://www.netlinktrust.com/about-us/about/facts-figures.html

Non-residential Developments

iv.	Whether building developers or owners of new non-residential developments should be required to pre-install additional infrastructure to facilitate the provision of telecommunication services to the units, and reasons for or against doing so.
v.	Where:
a)	internal telecommunication wiring should be pre-installed,
-	whether fibre should be the prescribed option and if so, what requisite number of cores of optical fibre would be appropriate;
-	where these should be terminated given that for non-residential developments, the use and the size of the units within the developments may change from time to time; and
-	what operational issues need to be addressed, including how to manage and monitor the use of the additional facilities/infrastructure (e.g., how to ensure that Licensees remove their cables/connections to the units promptly and what processes should be put in place).
b)	internal telecommunication wiring need not be pre-installed,
-	whether the current cable distribution systems would be sufficient, or should there be additional obligations imposed on building developers or owners of non-residential developments to install other facilities e.g. air blown tubes to facilitate the installation of fibres by Licensees;
-	if other facilities such as air blown tubes were to be pre-installed, where these should be terminated given that, for non-residential developments, the use and the size of the units within the developments may change from time to time; and
-	what operational issues need to be addressed, including how to manage and monitor the use of any other facilities/infrastructure that may be required by additional obligations imposed on building developers or owners (e.g., how to ensure that Licensees remove their cables/connections from the air blown tubes, if air blown tubes are adopted, and what processes should be put in place).

5.53. The revised COPIF should require that the building owner or tenant install a structured LAN cable infrastructure system which will allow customers to connect their equipment to a patch panel instead of directly to the Licensees' equipment; similar to the residential model. This ensures that the customer does not physically handle the Licensee's equipment

5.54. As illustrated in Figure 1, the structured cable system starts from a patch panel (preferably RJ45) with CAT6 cabling to the designated location (e.g. a cubicle) within the unit. The patch panel should have an AC power socket – also similar to the residential model – should be constructed near the air blow tubes [from the MDF room each unit].

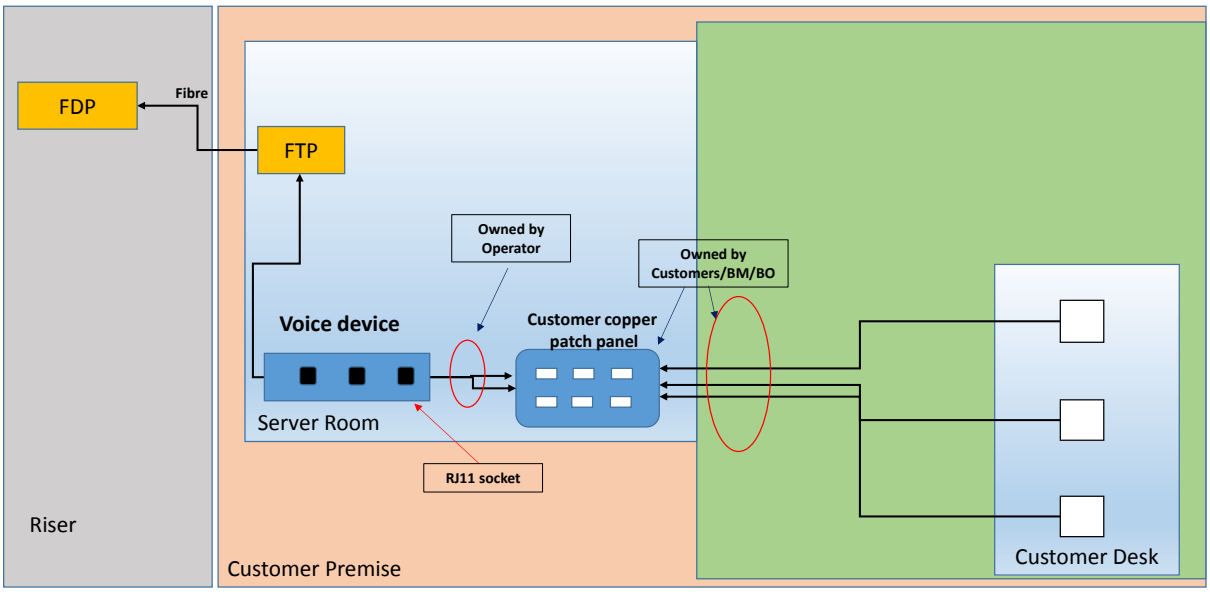

Figure 1 Illustration of proposed structured cable system

5.55. In relation to the matter of fire-stop seals, Singtel submits that the revised COPIF should be updated to require the use of fire-stop solutions that do not need to be removed/ reinstated each time the Licensee needs to install additional cables. There are solutions available which provide mechanical openings or self-sealing mechanisms that allow easy installation of cables without the need to remove/ reinstate the seal with each access.

SECTION 6 – Developments consisting of 1 or more Road or Mass Rapid Transit System ("MRT") Tunnels

Question 6

Space requirements for Road or MRT Tunnels coverage

i.	Whether an increase of the MDS beyond the current provision of 40m^2 for Road and MRT Tunnels is required, to be future-ready, and if so, how much more space in excess of the current 40m^2 MDS for Road and MRT Tunnels is required

5.56. In full consideration of future-ready concerns, as well as the importance to accommodate a 4th MNO, Singtel proposes a Road and MRT MDS size of 80.0m^2 to cater for necessary equipment including 4 MNOs RBS, tunnel infrastructure equipment, UPS, power distribution box, fibre panel, power meter box, common space and to ensure 5G readiness:

- Minimum clear length: 10m
- Minimum clear width: 8m
- To be rectangle shape
- Room clear height shall be 5m
- no column, odd shape and any wall access door opening in the room

ii.	The requirement for suitable specifications for the niches and the distances between the niches and the MDS in Road and MRT Tunnels to be provided;

5.57. Singtel proposes the following niche specifications:

a. Road Tunnel: niche size of 2x (L:3m x H:2m x D:1m) at an interval of 100m with power supply of 20A TPN to be provided;
b. MRT Tunnel: space on the side wall of tunnel track (L:10m x H:0.5m) for wall mount of infrastructure equipment at an interval of 100m with power supply of 20A TPN to be provided.

iii.	The proposal to include requirements for specifications on the leaky cable to be aligned with the height of the MRT train window along MRT Tunnels, and any other considerations which would enhance coverage in the Tunnels; and

5.58. Singtel proposes the follow for LCX mounting location:

a. Road Tunnel: Space on the centre of the road to cater for 4x leaky coaxial cable (LCX) evenly spread
b. MRT Tunnel: Space on tunnel track at the height of the train window to cater for 4x LCX evenly spread

iv.	Any other considerations (e.g. additional power requirements) or suitable specifications to be included for Space and Facilities in Road and MRT Tunnels.

5.59. In order to enable the smooth implementation of the facilities, Singtel proposes the following:

<u>MRT MDS:</u>

i. Shall be classified in line with LTA COMM's Room to be Category B Degree 3 finished, with all other services and room finishes completed, to be ready for the delivery and installation of the Facility For Info-communication Services

(**FCIS**). (e.g. Combiner and Uninterrupted Power Supply Unit, and MTOs' equipment)

ii. Must be a dust free room.
iii. Must not be near, above, or under fuel, pantry, sanitary, or water pump rooms
iv. No Wet Services, including air-con FCU and pipes above all the MNOs' equipment area
v. No water, drainage, refrigerant, sanitary pipes, manholes, floor trap or water pipes in the room
vi. No Wet Wall, Diaphragm Wall and other access door opening
vii. Imposed Load – 8KN/m^2 (Floor)
viii. Must be next to the MDF room
ix. A.C. Power Supply:
    1 x Isolator 150A TPN (MDS)
    1 x Isolator 32A TPN (MDS)
    1 x Isolator 20A TPN (Tunnel)

<u>Road MDS:</u>

i. Shall be classified in line with LTA COMM's Room to be Category B Degree 3 finished, with all other services and room finishes completed, to be ready for the delivery and installation of the FCIS (e.g. Combiner and Uninterrupted Power Supply Unit, and MTOs' equipment) if MDS room provided
ii. Must be a dust free room.
iii. Must not be near, above, or under fuel, pantry, sanitary, or water pump rooms
iv. No Wet Services, including air-con FCU and pipes above all the MNOs' equipment area
v. No water, drainage, refrigerant, sanitary pipes, manholes, floor trap or water pipes in the room
vi. No Wet Wall, Diaphragm Wall and other access door opening
vii. Imposed Load – 8KN/m^2 (Floor)
    1. Must be next to the MDF room
viii. A.C. Power Supply:
    1x Isolator 150A TPN (MDS)
    1x Isolator 32A TPN (MDS)
    1x Isolator 20A TPN (Niche)

6. OTHER COMMENTS

6.1. IMDA should engage the HDB, BCA and relevant public agencies in reviewing the minimum clearing requirements for antennas at development rooftops. A sensible reduction in the clearing requirement, in consultation with MNOs and consultants regarding technical specifications, will enhance deployment and coverage quality without compromising safety.

6.2. Most building developers/ owners install U-channel cable trays. With such trays, the Licensee will place the cable(s) onto the tray between the gaps of the U support channel which increases the time to carry out cable work as there are multiple gaps to navigate. Singtel requests that the revised COPIF include the following recommendations to facilitate cable pulling in buildings:

a. install C-channel cable trays instead of U-channel cable trays so that cables can be placed along the tray easily;
b. provide a clearance space of at least 0.5m from the opening of the cable trays; and
c. provide a clearance space of 0.35m between trays where there are multi-tier cable trays.

6.3. MDF rooms in HDB flats today rely on a basic, small padlock to secure access to the room. There have been security issues in the past where equipment has been stolen from MDF rooms. Singtel recommends that the security of HDB MDF rooms be upgraded to tighten access through the use of smart locks. Singtel also proposes for IMDA to look into implementation of smart locks for rooftop MDS access. For the avoidance of doubt, it is not necessary to use smart locks on MDF rooms in private buildings as these usually have managed security and/or other access restrictions.

6.4. In addition to requiring that the building developer/ owner provide ventilation/ air-conditioning, power, lighting, etc. in the MDF room, the revised COPIF should also make it clear that maintenance(including replacement) of said facilities are to be borne by the building developers/ owners.

6.5. Building developers/ owners should provide a cable distribution system beneath the floor (i.e., a service trench) to non-building address point locations within the building (e.g. kiosks, ATMs or other locations where services may be required on an ad hoc basis, etc.). The cable distribution system can be a cable tray or conduits and shall have accessible pits from which cables can be pulled for work to be carried out.

6.6. The building owner/ manager should not impose a security deposit if the Licensee is able show that it has the necessary insurance coverage. Providing a security deposit is an additional and

unnecessary cost to the Licensee. Furthermore, it may take up to 3 months after the work is completed to recover the deposit.

6.7. The building developer/ owner should name or number the riser if there are multiple risers in the building for ease of reference when the building developer/ owner/ manager wishes to report any matters concerning a riser(s) and allows the Licensee to easily identify a specific riser(s). Each riser door should be labelled accordingly.

6.8. All building developers/ owners should be required to update the building TOP date by writing to the Telecommunication Facility Co-ordination Committee and/or updating CORENET. Singtel notes that TOP dates in CORENET are largely inaccurate which makes tracking the timeline for the purpose of scheduling the Licensees' jobs difficult.

6.9. Additionally, all building demolition work should be submitted in CORENET so that Licensees can take note of any recovery work that needs to be carried out before demolition works commence.

6.10. Building developers/ owners should provide fibre tubes from the riser to each individual unit. The fibre tube should always be along the corridor and not over the individual units for ease of maintenance as the owner of the unit(s) may not allow Licensees access to their unit(s).

6.11. If a building has 2 x AC power source, the building owner or developer should also provide 2 x AC power source to the MDF room.

6.12. The revised COPIF should require that all buildings use a MCT system instead of lead duct seals. This reduces the risk of a fire occurring while the Licensee is carrying out works in the building. As IMDA is aware, Singtel has successfully executed a conversion project at all its exchanges to switch from lead duct seals to MCT. Singtel notes that revisions in the COPIF do not apply retrospectively however it is critical that the conversion process is initiated across all buildings in Singapore given the safety issues that arise from the use of lead duct seals.