SINGAPORE TELECOMMUNICATIONS LIMITED

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

1. INTRODUCTION

1.1. Singapore Telecommunications Limited (**SingTel**) is a leading provider of fixed telecommunications services over various platforms and has a comprehensive portfolio of services that includes voice and data services. SingTel services both corporate and residential customers..

1.2. SingTel is committed to the provision of state-of-the-art telecommunications technologies and services in Singapore and welcomes the opportunity to respond to the consultation paper issued by the Info-communications Development Authority of Singapore (**IDA**) in relation to the review of the Code of Practice for Info-Communication Facilities in Buildings (**COPIF**) (**Consultation Paper**).

1.3. This submission is structured as follows:

Section 1 – Introduction
Section 2 – Executive Summary
Section 3 – General Comments
Section 4 – Specific Comments

2. EXECUTIVE SUMMARY

2.1. SingTel's view on the Consultation Paper can be summarised as follows:

General Comments

2.2. SingTel believes that it is timely for the COPIF to be revised to support the delivery of telecommunications services to end-users over the Next Gen NBN.

2.3. SingTel is of the view that the proposed amendments to the COPIF are insufficient and inadequate to address the requirements for info-communication services in both the short and medium term. Accordingly, SingTel submits that further amendments are necessary.

2.4. SingTel submits that OpenNet Pte Ltd (**OpenNet**) must be required to deploy its fibre infrastructure to the FDB prior to the residential Development obtaining TOP status. This is critical for the timely provision of a basic telephony service to end-users using fibre infrastructure within the IDA QOS timeframe and any other fibre-based services.

2.5. SingTel submits that additional information should be provided by Development owners or developers as part of its submission to the Telecommunication Facilities Coordination Committee (**TFCC**).

2.6. SingTel submits that the COPIF be amended such that PTLs are allowed to use a Development MDF room to serve external premises in the event that the external premises does not have the requisite telecommunication facilities available.

2.7. SingTel submits that the COPIF be amended to prohibit Development owners or developers from imposing unreasonable demands on PTLs and to require that Development owners or developers or management extend their full cooperation to PTLs in providing the necessary access to the Development MDF rooms and cable distribution system.

2.8. SingTel submits that the COPIF be amended to require Development owners or developers of non-residential Developments to provide for dedicated conduits with draw ropes or air blown tubes from the riser to each non-residential unit to facilitate the provision of telecommunication infrastructure from the riser to each non-residential unit in non-residential Developments.

Specific Comments

2.9. SingTel generally supports the proposed replacement of the twisted copper 4-pair cables from the telecommunication riser/gate pillar to each residential unit with a two-core optical fibre cable to a fibre termination point within the residential unit.

2.10. SingTel submits that the FDB be provided and maintained by OpenNet. This mirrors the current arrangement for copper distribution point (**DP**) where the DP is provided and maintained by SingTel.

2.11. SingTel generally supports the proposed replacement of twisted copper 4-pair cables (Category 3 or better) to each living room and bedroom with the provision of one (1) unshielded twisted pair cable (Category 6 or better) to the living room and each of the bedrooms.

2.12. SingTel submits that the RJ11/45 combination outlets to the living room and each of the bedrooms should be located next to the TV points.

2.13. SingTel submits that it is more prudent and forward-looking to provide for at least two (2) unshielded twisted pair cable (Category 6 or better) to the living room and each of the bedrooms, with the cables terminating in an RJ45 patch panel on one end (which may be located in a utility room or closet) and in a pair of RJ11/45 combination outlets at the other end. In particular, special consideration needs to be given to provide for additional RJ11/45 (i.e. more than 2) combination outlets in the living room.

2.14. SingTel supports the installation of RJ11/45 combination outlets instead of RJ11 outlets.

2.15. SingTel supports the proposed replacement of the block terminal with an RJ45 patch panel.

2.16. SingTel submits that it is critical that the fibre from the FDB to FTP in the residential unit be tested by accredited parties.

2.17. SingTel supports the proposal to locate the MDF rooms and TERs on the first storey (street-level) in Developments even if these Developments may have basement levels.

2.18. SingTel does not support the proposal to remove the designation of cable trays/metal trunking in telecommunication risers for either telecommunication (non-broadband coaxial) or broadband coaxial system.

2.19. SingTel supports the proposal for new Developments that the developer seals all underground pipes prior to the handing over of such pipes to telecommunication licensees.

2.20. SingTel does not support the proposal that telecommunication licensees seal their respective underground pipes in existing Developments and to complete such work within a specified timeframe.

2.21. SingTel supports the proposed requirement for the Development owner or developer of an existing Development to provide, install and test electrical distribution panels and accessories, in the event that charges for utility usage in the MDF room and TER are to be borne by telecommunication licensees.

3. GENERAL COMMENTS

3.1. With the deployment of the Next Gen NBN expected to achieve coverage of 95% of Singapore by mid-2012, SingTel believes that it is timely for the COPIF to be revised to support the delivery of telecommunications services to end-users over the Next Gen NBN.

3.2. SingTel is of the view that the proposed amendments to the COPIF are insufficient and inadequate to address the requirements for info-communication services in both the short and medium term. Accordingly, SingTel submits that further amendments are necessary.

OpenNet Pte Ltd required to deploy fibre to the fibre distribution box prior to the residential Development obtaining temporary occupation permit

3.3. While SingTel generally supports the proposed replacement of the twisted copper 4-pair cables from the telecommunication riser/gate pillar to each residential unit with a two-core optical fibre cable to a fibre termination point within the residential unit, as a Public Telecommunications Licensee (**PTL**), SingTel's key concern is to ensure that it is able to meet the Universal Service Obligation (**USO**) and deliver a basic telephony service to customers within the IDA Quality of Service (**QOS**) i.e. within five (5) working days or date specified by customers.

3.4. With the proposed amendments to the COPIF, copper infrastructure will not be available from the telecommunication riser to each residential unit. Therefore, for the timely provision of a basic telephony service to end-users using fibre infrastructure within the IDA QOS timeframe, OpenNet, the Next Gen NBN network operator, must be required to deploy its fibre infrastructure to the fibre distribution box (**FDB**) prior to the residential Development obtaining temporary occupation permit (**TOP**) status.

3.5. If OpenNet's fibre infrastructure is not deployed prior to the residential Development obtaining TOP status, it will result in substantial delays in the provision of a basic

telephony service (and any fibre-based services) to end-users. For example, when an end-user in a new Development requests for a basic telephony service (or any fibre-based service) and OpenNet has not yet deployed its fibre infrastructure to the Development, it may take up to forty (40) working days (i.e. 2 months) under the OpenNet Interconnection Offer (**ICO**) to deploy its fibre infrastructure to the Development upon receipt of a valid request from a requesting licensee, such as a PTL. SingTel does not believe that this is acceptable or reasonable.

3.6. In light of the above, SingTel submits that OpenNet must be required to deploy its fibre infrastructure to the FDB prior to the residential Development obtaining TOP status.

Additional information required in TFCC submissions

3.7. Currently, Development owners or developers do not indicate the postal address and unit address in their Development plans when submitting to the TFCC. The intended date when TOP status is secured is also not provided. Usually, Development owners or developers only specify the land lot number and this has made the planning for the provision of telecommunication infrastructure and maintaining of network infrastructure records very difficult.

3.8. Furthermore, Development owners or developers only provide such information to the PTLs when the Development is near to obtaining its TOP status. This has resulted in last minute rush to deploy telecommunication infrastructure to the Development. SingTel has also encountered circumstances where the Development's telecommunication facilities and cable distribution system (e.g. MDF room, riser and cable tray etc.) are handed over very late and SingTel has been given very little time to deploy its telecommunication infrastructure. In some cases, it could be as short as one (1) to two (2) months before the Development obtains its TOP status. This is despite the fact that Development owners or developers are required to handover the necessary facilities at least six (6) months before it obtains its TOP status as stated in COPIF 2008.

3.9. SingTel submits that the TFCC submission be accompanied with the following information:

(a) The postal address of each of the Development and the unit addresses with the associated floor plan;

(b) The planned TOP schedule. Any change of TOP schedule should be made known to TFCC no less than six (6) months before the revised TOP date; and

(c) Proposed handover schedule of the telecommunication facilities. It should be no less than six (6) months before TOP status is obtained.

PTLs right to use Development MDF rooms to serve external premises

3.10. Currently, SingTel, as a PTL, faces substantial obstacles in providing telecommunication services and undertaking maintenance works when using an existing Development MDF room to serve external premises. In many instances, using an existing Development MDF room to serve external premises is unavoidable as they do not have any MDF room. These are existing Developments that were constructed prior the publication of the COP-TEL and COPIF by the IDA (and previously the TAS). As a result, this has adversely affected SingTel's ability to provide services to end-users. Further, the end-user experience has been adversely affected as we may not be able to deliver the service on the date requested or to resolve faults in a timely and efficient manner.

3.11. SingTel submits that the COPIF be amended such that PTLs are allowed to use a Development MDF room to serve external premises in the event that the external premises does not have the requisite telecommunication facilities available.

Prohibition of unreasonable practices adopted by Development owners

3.12. SingTel has encountered many instances whereby the Development owner or developer or management impose unreasonable terms and conditions for access to the Development MDF room and cable distribution system for the purpose of providing telecommunication services to occupant/tenants in the Development. For example, Development owners or developers or management have demanded rent and administrative fees when a request is made for access to the MDF rooms and/or the cable distribution systems (e.g. risers) to install new cables to serve the occupant/tenants in the Development.

3.13. SingTel submits that the COPIF be amended to prohibit such unreasonable demands and to require that Development owners or developers or management extend their full cooperation to PTLs in providing the necessary access to the Development MDF rooms and cable distribution system.

Provision of dedicated conduits with draw ropes or air blown tubes from the riser to each non-residential unit in non-residential Developments

3.14. Under the current COPIF 2008, while the cable tray is provided by the Development owner or developer, the provision of telecommunication infrastructure from the riser into each non-residential units are often hampered by unfavourable site conditions (e.g. false ceilings with downlights or no access panels near the non-residential units, high ceilings requiring scaffoldings or scissors lifts to access etc.).

3.15. To facilitate the provision of telecommunication infrastructure from the riser to each non-residential unit, SingTel submits that the COPIF be amended to require Development owners or developers to provide for dedicated conduits with draw ropes or air blown tubes from the riser to each non-residential unit. This should be provided for during the Development construction to reduce any unnecessary disturbance to the public, occupant/tenants during telecommunication service provisioning.

4. SPECIFIC COMMENTS

Section 2 – Provision of Cables for Telecommunications (Non-Broadband Coaxial Cable) System in all Residential Properties

Question (i): The proposed replacement of the twisted copper 4-pair cables from the telecommunication riser/gate pillar to each residential unit with a two-core optical fibre cable to a fibre termination point within the residential unit;

4.1. As indicated above, SingTel generally supports the proposed replacement of the twisted copper 4-pair cables from the telecommunication riser/gate pillar to each residential unit with a two-core optical fibre cable to a fibre termination point within the residential unit.

4.2. However, SingTel submits that:

(a) OpenNet, the Next Gen NBN network operator, must be required to deploy its fibre infrastructure to the FDB prior to the residential Development obtaining TOP status. This is critical for the timely provision of basic telephony service within the IDA QOS and any fibre-based service to end-users using fibre infrastructure;

(b) The FDB does not need to be constrained/limited to be made of metallic material;

(c) The compartment accessible by Development owners or developers shall be utilised for storing the 2-Core optical fibre cable with each terminated to an angled polished Subscriber Connector (**SC**) connector before the Development obtains TOP status. The connector shall be stored in a SC adaptor panel serving as a docking panel when not in service; and

(d) The cross-wire connection (i.e. patching) across the two compartments of the FDB shall be performed by OpenNet, the Next Gen NBN network operator, during service activation.

Question (ii): The proposed installation of a fibre distribution box at the telecommunication riser on each residential floor of high-rise residential buildings;

4.3. SingTel submits that the FDB be provided and maintained by OpenNet. This mirrors the current arrangement for copper distribution point (**DP**) where the DP is provided and maintained by SingTel.

Question (iii): The proposed replacement of twisted copper 4-pair cables (Category 3 or better) to each living room and bedroom with the provision of 1 unshielded twisted pair cable (Category 6 or better) to the living room and each of the bedrooms;

4.4. SingTel generally supports the proposed replacement of twisted copper 4-pair cables (Category 3 or better) to each living room and bedroom with the provision of one (1) unshielded twisted pair cable (Category 6 or better) to the living room and each of the bedrooms.

4.5. SingTel submits that the RJ11/45 combination outlets to the living room and each of the bedrooms should be located next to the TV points.

4.6. The proposed RJ11/45 combination outlet allows a cable with either an RJ11 or RJ45 plug to be connected at any one time. Given that 1000 Base-T transmission requires the use of all 4-pairs of the unshielded twisted pair cable (Category 6 or better), it will not be possible for a RJ11/45 combination outlet to support both voice and data services at the same time.

4.7. This will be an issue for end-users that require both voice and data services. Furthermore, with the increasing number of connected devices in the home (e.g. set-top boxes, game consoles, network-enabled television, network attached storage devices etc.) it is insufficient to provide for only one (1) RJ11/45 combination outlet to the living room and each bedroom; especially the living room.

4.8. SingTel submits that it is more prudent and forward-looking to provide for at least two (2) unshielded twisted pair cable (Category 6 or better) to the living room and each of the bedrooms, with the cables terminating in an RJ45 patch panel on one end (which may be located in a utility room or closet) and in a pair of RJ11/45 combination outlets at the other end. In particular, special consideration needs to be given to provide for additional RJ11/45 (i.e. more than 2) combination outlets in the living room.

4.9. The RJ45 patch panel should be co-located with the fibre termination point (**FTP**) within the residential unit. SingTel also submits that additional power sockets be provided at the patch panel to supply power to the various devices that may be located in the patch panel e.g. Optical Network Terminal (**ONT**), Residential Gateway (**RG**) etc.

Question (iv): The proposed installation of RJ11/45 combination outlets instead of RJ11 outlets;

4.10. SingTel supports the installation of RJ11/45 combination outlets instead of RJ11 outlets.

4.11. SingTel requests the IDA's confirmation that the RJ11/45 combination socket will be configured to facilitate both voice or data services and that there is no change in the wiring scheme.

Question (v): The proposed replacement of the block terminal with an RJ45 patch panel;

4.12. SingTel supports the proposed replacement of the block terminal with an RJ45 patch panel.

4.13. SingTel submits that the COPIF specify the minimum dimensions required of the closet to sufficiently mount an ONT and RG. Proper mounting facilities should also be incorporated in the patch panel. In addition, multiple power sockets will need to be constructed in the patch panel to supply power to the various devices that may be located in the patch panel.

Question (vi): Whether the COPIF should require cabling and RJ11/45 combination outlets in addition to those proposed. If so, where should these be located and why;

4.14. SingTel submits that an additional RJ11/45 combination outlets be provided at the following locations:

(a) Dining Room: Telephone points may be required in the dining room especially for larger houses; and

(b) Key activity rooms e.g. study room, granny room, maid's room etc

Question (vii): Any other relevant considerations that IDA should take into account in its review of this section.

4.15. SingTel submits that it is critical that the fibre from the FDB to FTP in the residential unit be tested by accredited parties.

4.16. The optical test report, distance of fibre cable from the FDP to the FTP should be submitted to OpenNet, the Next Gen NBN network operator, before the Development obtains its TOP status.

Section 3: Location of Main Distribution Frame Room and Telecommunication Equipment Room

Question (i): The proposal to locate MDF rooms and TERs on the first storey (street-level) in buildings; and

4.17. SingTel supports the proposal to locate the MDF rooms and TERs on the first storey (street-level) in Developments even if these Developments may have basement levels.

Question (ii): What are the alternatives or measures that should be implemented by the developers or owner of buildings, in the event that it is not possible to locate the MDF room or TER on the first storey (street-level) of the buildings.

4.18. SingTel submits that Development owners or developers consider locating the MDF rooms and TERs on next higher floor available. In the event that higher floors are not available, the Development owners or developers should propose alternative locations to site the MDF rooms and TERs and undertake responsibility for any telecommunication equipment damaged as a result of such incidents e.g. flood.

Section 4: Usage of Cable Trays/Metal Trunking in Buildings

Question (i): The proposed removal of the designation of cable trays/metal trunking in telecommunication risers for either telecommunication (non-broadband coaxial cable) system or broadband coaxial cable system;

4.19. SingTel does not support the proposal to remove the designation of cable trays/metal trunking in telecommunication risers for either telecommunication (non-broadband

coaxial) or broadband coaxial system. The current COPIF 2008 requirement that the Development owner or developer provide separate trays for different telecommunications licensees is necessary for a clear demarcation of responsibilities and eliminates any claims of fault/damage that may arise due to subsequent activities. However, in the event that the cable trays/metal trunking are not utilised, any other licensees shall be allowed to use the tray.

Question (iii): Whether the existing cable tray/metal trunking size requirements for telecommunication (non-broadband coaxial cable) systems should be increased in view of potential additional systems that may be deployed to provide telecommunication services to Developments, such as better mobile coverage; and

4.20. In view of potential additional systems that may be deployed, SingTel submits that it is even more critical that separate cable trays be provided to SingTel and other licensees in order to ensure a clear demarcation of responsibilities.

Question (iv): Whether there are any issues that may arise following the removal of the designation of cable trays for specific systems, such as possible interference issues arising from sharing of cable trays/metal trunking, priority of access to the cable trays/metal trunking amongst the various types of licensees, or measures to ensure efficient use of the cable trays/metal trunking. If so, what are the measures that may be implemented to address these issues.

4.21. As indicated in 4(i) above, SingTel does not support the proposal to remove the designation of cable trays for specific systems. Other than potential interference arising from co-locating copper and broadband coaxial cables within the same cable tray/metal trunking; there is also issue of damage to adjacent cables during cable installation. For example, the physical construction of copper and broadband coaxial cables is physically stronger in terms of it mechanical tensile strength unlike indoor optical fibre cables which are physically weaker as they are only protected by Kevlar. When copper and broadband coaxial cables are pulled over the delicate indoor optical

fibre cables, the indoor optical fibre cables may be damaged or broken when subjected to the weight of copper or broadband coaxial cables. Hence, SingTel submits that it is critical that the designation of cable trays/metal trunking for specific systems be maintained.

Section 5 - Sealing of underground pipes entering the Main Distribution Frame Rooms, Telecommunication Equipment Rooms and Telecommunication Risers

Question (i): For new Developments, the proposed sealing of all underground pipes by developers prior to the handing over of such pipes to telecommunication licensees;

4.22. SingTel supports the proposal for new Developments that the owner or developer seals all underground pipes prior to the handing over of such pipes to telecommunication licensees.

4.23. The method of sealing shall be specified by the PTL and complied with by the new Development owner or developer. The installation and maintenance of the seal system should be undertaken by the Development owner or developer. For example, if the Multi-Cable Transit (**MCT**) seal system is provided by the Development owner or developer for SingTel's use, SingTel will be responsible to seal the lead-in ducts allocated to SingTel each time SingTel pulls in new cables. However, if the MCT seal system needs to be replaced in future, the Development owner or developer should be responsible to replace the seal system. For each sealing system, there is a maximum number of cables can be sealed for a pipe, this specification should be made clear in the COPIF.

Question (ii): For new Developments, the proposed sealing of underground pipes by telecommunication licensees after cable installation works in buildings;

4.24. SingTel supports the proposal that once a sealed underground pipe has been handed over to a telecommunication licensee, it is the responsibility of that

telecommunication licensee to seal the underground pipe(s) after cable installation works in the Development. The proposed sealing technology to be adopted is MCT seal system, and this may be revised by the PTL in the event better or alternative seal systems are available.

Question (iii): For existing Developments, the proposed sealing by telecommunication licensees of their respective underground pipes and the timeframe for which such works shall be completed;

4.25. SingTel does not support the proposal that telecommunication licensees seal their respective underground pipes in existing Developments and to complete such work within a specified timeframe.

4.26. For existing Developments with seal system such as lead duct seal, MCT or foam seal, they should remain as these ducts are already sealed. If the existing seal systems exceed their life span and become ineffective, the Development owners or developers shall replace the seal systems.

4.27. For the remaining MDF rooms that use bend-up lead-in ducts with caps which were designed against water ingress but not gas penetration, it will require a substantial amount of resources, effort, time and cost to seal such ducts in view of vast number of MDF rooms and the numerous ducts occupied with cables.

4.28. There is also the added complexity of determining the party responsible for sealing the existing ducts especially ducts housing different licensees' cables and how the cost will be borne amongst the various licensees.

4.29. Further, SingTel submits that the method of sealing the duct shall be specified by the PTL on a case-by-case basis in view of the different site conditions.

4.30. Given the challenges highlighted above, SingTel does not support the proposal that telecommunication licensees seal their respective underground pipes in existing

Developments and to complete such work within a specified timeframe. A schedule cannot be stated at this moment as the scope, cost and site conditions cannot be ascertained.

Section 7: Provision of electrical distribution panels and accessories in the relevant space and facilities

Question (i): The proposed requirement for the developer or owner of an existing Development to provide, install and test electrical distribution panels and accessories, in the event that charges for utility usage in the MDF room and TER are to be borne by telecommunication licensees.

4.31. SingTel supports the proposed requirement for the Development owner or developer of an existing Development to provide, install and test electrical distribution panels and accessories, in the event that charges for utility usage in the MDF room and TER are to be borne by telecommunication licensees.

4.32. The Development owner or developer shall provide, but is not limited to the following:

(a) A power gauge meter to allow measurement of electrical consumption;

(b) A 3-phase and a single-phase AC power supply (230V) to be provided from the switch room and terminated into an electrical distribution panel dedicated for a PTL;

(c) There should be 8 circuit breaker points per panel. The circuit breakers will be allocated for lighting, ventilation (air-con, exhaust fan), an isolator (32A or 63A) and the remaining are spares i.e. 2 spare 20A circuit breakers.

(d) A 30mA earth leakage circuit breaker of appropriate electrical current rating; and

(e) A single-line diagram provided for the panel.