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Info-communications Media Development Authority ("IMDA")
10 Pasir Panjang Road
#03-01 Mapletree Business City
Singapore 117438
Via email: Consultation@imda.gov.sg

Attention: Ms Aileen Chia
Director-General (Telecoms & Post) &
Deputy Chief Executive (Connectivity Development & Regulation)

Dear Ms Chia

PUBLIC CONSULTATION ON THE REVIEW OF THE CODE OF PRACTICE FOR INFO-COMMUNICATION FACILITIES IN BUILDINGS

1. NetLink Trust welcomes IMDA's review of the Code of Practice for Info-communication Facilities in Buildings ("COPIF") and the opportunity to share our operational insights on how the Code is applied in practice.

2. Drawing on NetLink Trust's experience as the owner/operator of the passive infrastructure that underpins the Nationwide Broadband Network ("NBN"), this submission focuses on areas where clearer, planning-stage expectations under COPIF would materially improve service readiness, reduce recurring coordination issues, and support more consistent outcomes for end-users.

3. At its core, COPIF is intended to function as a planning-based framework—providing predictability and durability for the design, deployment and long-term operation of telecommunication infrastructure within developments. In practice, however, gaps in upfront clarity have increasingly led to downstream disputes, compressed rollout timelines, avoidable retrofitting and service delays, notwithstanding technical compliance with the Code. These outcomes weaken the effectiveness of COPIF and shift it away from its planning-based intent towards case-by-case resolution after completion.

4. NetLink Trust's comments focus on the following key themes:

   (a) **First, greater certainty at the planning stage on core telecommunication assumptions is essential to improving service readiness.** This includes clearer expectations on: (i) the scope of locations requiring connectivity within developments;

(ii) the treatment of non-standard development configurations; (iii) the continued recognition of designated telecommunication space and facilities over the building lifecycle; and (iv) where such locations form part of a common or managed development environment, the provision of neutral passive pathways through which fibre connectivity can be extended on a non-discriminatory basis. Notably, where foreseeable connectivity needs are not anticipated (and provided for) upfront, fibre deployment can only be carried out after buildings have obtained Temporary Occupation Permit ("TOP"), leading to retrofitting works, disruptions to occupants, and longer provisioning timelines.

(b) **Second, clearer policy guidance is needed on the use of COPIF-designated space and facilities for serving properties outside a development.** In the absence of a default position for fixed-line infrastructure, such use is often subject to objections, delayed access and discretionary charging, even where the infrastructure was planned and deployed in compliance with COPIF. This creates structural asymmetry with the Mobile Installation Space ("MIS") framework, introduces planning uncertainty into long-lived network designs, and has direct downstream impacts on end-users through delayed service activation, maintenance and fault restoration.

(c) **Third, predictable deployment outcomes depend on timely coordination and effective management of shared telecommunication space and facilities.** Operational experience continues to highlight issues such as late or incomplete handover of infrastructure, inaccurate TOP declarations, inadequate coordination for Additional and Alteration ("A&A") works, and challenges relating to the usage, upkeep and capacity of Main Distribution Frame ("MDF") rooms. These issues compress rollout timelines, complicate resource planning, and undermine service readiness at the point of occupation.

(d) **Fourth, as developments become more digitally enabled, connectivity requirements increasingly extend beyond the principal building entry point to ancillary buildings, common facilities and shared operational infrastructure within the same development boundary.** In NetLink Trust's view, COPIF should preserve a neutral passive infrastructure model in such environments, particularly in residential and common-property settings. Future-proofing measures should not inadvertently enable fragmented or operator-specific first-mover fibre deployments into common facilities that could create lock-in, duplication of infrastructure and reduced downstream choice.

5. NetLink Trust strongly supports measures that reinforce COPIF's planning-based foundations, including clearer planning assumptions, continuity of access rights over the building lifecycle, avoidance of discretionary access charging for essential telecommunication access, and stronger baseline expectations for coordination and facility management. Where appropriate, NetLink Trust has also provided concrete technical observations and planning-stage guidance, based on recurring implementation issues encountered in practice, to support clearer and more consistent outcomes for end-users.

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6. Please do not hesitate to contact the undersigned if IMDA should require any clarification or additional information on this submission.

Yours sincerely,

Lee Khoon Aik
Director (Regulatory & Interconnect)
NetLink Trust
(managed by NetLink Management Pte Ltd as its trustee)

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

INTRODUCTION

1. NetLink Trust supports IMDA's objectives of developing a more future-ready, resilient and efficient telecommunication infrastructure within buildings. By strengthening planning-stage clarity, preserving neutral and non-discriminatory passive infrastructure, and reducing reliance on post-completion negotiation and dispute resolution, COPIF can more effectively deliver predictable service readiness, minimise disruption, and better safeguard end-user interests as Singapore's digital needs continue to evolve.

2. This submission sets out NetLink Trust's views and comments, drawing on our extensive operational experience, with respect to areas where clearer planning-stage expectations under COPIF could help reduce recurring issues during service activation, maintenance and fault restoration.

3. While a number of consultation questions are framed around issues relating to the use of Mobile Installation Space ("MIS"), NetLink Trust's comments focus on the planning and coordination of fixed-line infrastructure (including through the Telecommunication Facility Co-ordination Committee ("TFCC")) into and within building premises, the use of shared telecommunication space and facilities, access arrangements (including impediments), and the need for policy clarity to minimise downstream impact on service readiness and end-user outcomes.

4. In NetLink Trust's view, this is particularly important where fibre connectivity is required not only for the principal building, but also for ancillary buildings, common facilities and shared operational infrastructure within a development boundary. Where such facilities are functionally part of a residential or managed development, COPIF should support their connection through shared, neutral passive pathways rather than through fragmented or operator-specific deployments. This would better preserve open access, reduce duplicative civil works, and support a common passive platform available to all downstream operators and users.

5. This submission is structured as follows:

   (a) **Part A** sets out NetLink Trust's responses to selected sections of IMDA's consultation paper that are relevant to NetLink Trust's role and operational experience;

   (b) **Part B** sets out Additional Comments on planning and coordination issues that fall outside IMDA's proposed consultation topics but which, from NetLink Trust's perspective, would benefit the industry in helping to enable the development of a more future-ready telecommunication infrastructure to support Singapore's digital economy; and

(c) The Annexes provide supporting materials for reference: **Annexes A and B** set out issue-specific illustrations and scenarios relevant to particular aspects of the submission, while **Annex C** consolidates selected technical observations and associated practical guidance, based on NetLink Trust's operational experience, which highlight recurring implementation challenges and set out practical technical considerations for addressing these challenges at the planning stage.

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PART A: RESPONSES TO SELECTED CONSULTATION SECTIONS

A. Provision of Mobile Installation Spaces ("MIS") in New Developments

1. NetLink Trust supports IMDA's objective of strengthening future-ready mobile network infrastructure and agrees that early, design-stage planning of telecommunication spaces and pathways is critical to coordinated deployment.

2. From TFCC coordination experience, where MIS, shared pathways and cable routing are not clearly defined upfront, subsequent installations frequently require re-routing or abortive works during implementation. This has resulted in delays and service readiness issues during TOP stage, even in developments that are technically compliant.

B. Provision of Telecommunication Infrastructure in Basement Carparks in New Buildings

3. NetLink Trust supports the early provision of telecommunication infrastructure within basement carparks in new buildings to facilitate coordinated planning and predictable fibre routing. From operational experience, the absence of planned pathways in such areas has constrained routing options and led to late-stage works or surface reinstatement after TOP, resulting in disruption to residents and estate operations.

4. More broadly, NetLink Trust observes that similar planning and routing challenges increasingly arise at other common and ancillary locations within developments that are not currently mandated under COPIF. As developments become more digitally enabled, fibre connectivity is often required at locations supporting estate operations, shared services and emerging applications. Where such foreseeable connectivity needs are not anticipated and provided for at the design stage, fibre deployment typically occurs only after completion, resulting in retrofitting works, longer provisioning timelines, and disruptions and inconveniences to residents and tenants.

5. In this regard, NetLink Trust considers that the provision of telecommunication infrastructure at basement carparks should be viewed as part of a wider planning-based and future-proofing approach under COPIF, focused on reasonably foreseeable connectivity needs rather than reactive provision after TOP. To that end, NetLink Trust provides in Annex A representative examples of common locations where fibre connectivity has increasingly been required in practice, for IMDA's reference and consideration.

C. Implementing Street-Level Mobile Connectivity Using Street Lampposts

6. NetLink Trust supports IMDA's proposal to enable street-level mobile connectivity using lampposts and agrees that greater clarity and coordination at the inter-agency level would facilitate deployment.

7. In practice, street-level installations often depend on shared passive infrastructure and fixed-line backhaul connectivity. The laying of these fixed network infrastructure (which may involve civil works) typically requires detailed pre-planning and coordination with multiple

agencies and other stakeholders, such as owners of premises through which the telecommunication plant and installations will traverse. Where such dependencies are not anticipated and coordinated upfront, rollout challenges arise during ad-hoc deployment, including fragmented routing and duplicated civil works. Early alignment through existing COPIF and TFCC planning processes would mitigate these issues.

D. Clarity on Requirements under COPIF to Facilitate Faster Mobile Deployments into Buildings

Relocation of Mobile Equipment

8. NetLink Trust notes IMDA's proposal to facilitate flexibility in the use of MIS, including through the proposed allocation of MIS relocation costs to MNOs.

9. NetLink Trust respectfully disagrees with the proposed cost-shifting approach as a means of addressing deployment challenges. Based on operational experience, reallocating costs after relocation occurs does not reduce disputes or long-term inefficiency. Instead, it embeds uncertainty into infrastructure planning by treating COPIF-designated telecommunication spaces as conditionally available rather than as permanent planning assumptions.

10. Telecommunication infrastructure is long-lived and designed on the basis that designated spaces will remain available throughout the building lifecycle. Where such spaces are treated as subject to relocation with costs allocated downstream, deployments become provisional, increasing the likelihood of redesign, re-installation and dispute. Clearer COPIF guidance reinforcing the permanence of telecommunication spaces would therefore better support predictable deployment outcomes than relying on cost reallocation to resolve access disputes.

11. Notably, telecommunication licensees (including MNOs and NetLink Trust) are subject to stringent IMDA-imposed network coverage and service performance obligations, such as the Universal Service Obligation ("USO") and Quality of Service ("QoS") frameworks. These regulatory requirements place licensees at a structural disadvantage in relocation negotiations, as building owners are aware that licensees have little practical choice but to accept the owners' proposed alternative locations in order to avoid breaching IMDA's coverage and service obligations.

Resources Incurred by Building Owners for MNOs' Access into Buildings

12. While this question is framed with reference to MNOs, NetLink Trust observes that similar access issues arise for fixed-line infrastructure deployments, including where rooftop or common area access is required for service activation, maintenance or fault restoration.

13. NetLink Trust respectfully disagrees that access to COPIF-designated telecommunication space and facilities should be treated as a cost-recoverable activity. From an operational perspective, access for telecommunication works is an inherent, essential component of network rollout and ongoing service provisioning, rather than an ancillary service provided at the discretion of building owners.

14. In practice, allowing access charges or cost recovery as a condition for entry has led to delays, disputes and prolonged provisioning timelines, with the impact ultimately borne by residents and tenants. This is inconsistent with COPIF's planning-based framework, under which telecommunication space and access are intended to be provided upfront and maintained over the building lifecycle. Clear COPIF guidance that access to designated telecommunication space and facilities should not be subject to discretionary charging would therefore better support predictable service provision, reduce disputes, and align telecommunication access with the treatment of other essential utilities.

15. More fundamentally, allowing access charges risks treating access to COPIF-designated telecommunication space as a discretionary service rather than as essential infrastructure, which is inconsistent with how access for other critical utilities such as water and electricity is treated.

Change of Building Owner and Expiry of MIS Agreement

16. NetLink Trust supports IMDA's proposal to ensure the automatic continuation of MIS designation upon a change in building ownership, or upon the expiry or termination of any MIS agreement, unless otherwise directed by IMDA.

17. From an operational and planning perspective, continuity of access rights is critical. Fixed-line and mobile network infrastructure is designed and deployed on the basis that COPIF-designated spaces will remain available over the building lifecycle, regardless of changes in ownership or management.

18. Where access rights are treated as contingent on agreements that may lapse or be renegotiated upon ownership change, this undermines planning certainty, creates opportunities for post-deployment disputes, and increases the risk of service disruption. Clear continuity provisions therefore directly support a planning-based COPIF framework and are consistent with the principle of assured access critically important for efficient network design and operations.

E. Upgrade of In-Building Cabling to Support Fixed-Line Broadband Speed Beyond 10Gbps

19. NetLink Trust considers Cat 6 and Cat 6A cabling sufficient to support 10 Gbps services within typical building layouts.

20. While more future-proof solutions such as Cat 8 may offer higher theoretical performance, these remain largely untested in the real-world operating environment and implementation challenges including routing constraints, cable rigidity (i.e. lack of flexibility hindering cable-laying), and higher installation costs may arise. Any move towards mandating such solutions should therefore carefully balance future needs against practical deployability and cross-industry impact.

21. In addition to Cat 8, IMDA may also wish to consider fibre-based in-building cabling, which is starting to gain traction in some countries.

22. Fibre-based in-building cabling offers inherent advantages over copper-based solutions in supporting ultra-high-speed services beyond 10 Gbps, including greater reach, scalability and being less susceptible to signal degradation over distance. For example, higher-category copper cabling (e.g. Cat 7/8) may be constrained by effective length limitations in larger dwelling layouts where cabling routes traverse multiple walls or extended pathways.

23. From a technology maturity perspective, NetLink Trust recognises that end-user device ecosystems and in-home networking practices remain predominantly copper-based today, and that fibre-based in-home connectivity may require additional customer-premises equipment and adaptation. Seen in this light, NetLink Trust would recommend that COPIF includes a proviso to accommodate fibre-based in-building cabling as an optional future-ready solution available to residential dwellers where appropriate (e.g. large dwelling units), supported by evolving device availability and market readiness.

F. Reduced Telecommunication Space and Facilities to Allow Optimisation of Space in Single-User Buildings

24. NetLink Trust cautions that proposals to reduce telecommunication space and facilities for single-user developments deserve careful lifecycle deliberation. While a building may be designated as single-user at the time of completion, operational experience shows that changes in tenancy, subdivision or building use are common over time.

25. Where the provision of telecommunication space and/or facilities is reduced or waived based on point-in-time assumptions, subsequent increases in demand – for example, due to change in ownership/tenancy or subdivision of building space – will be difficult and disruptive to accommodate, as COPIF does not provide a clear mechanism to reinstate or reconfigure space or facilities after completion. Conservative baseline requirements would therefore better safeguard long-term service readiness, preserve network scalability, and avoid costly retrofitting that undermines IMDA's policy intent for COPIF.

26. NetLink Trust further notes that any reduction in telecommunication space or facilities for the principal building should not inadvertently result in a fragmented connectivity model within the same development boundary. Even where a single-user building has modest initial requirements, associated facilities within the development may later require fibre connectivity for security, building operations, estate management systems, shared services or other smart infrastructure. Where such facilities are functionally part of the same development, COPIF should continue to support the provision of adequate passive pathways so that fibre connectivity can be extended through common, neutral infrastructure rather than through ad-hoc or operator-specific direct builds.

G. Minimise Public Disruption with Advance Laying of Lead-In Pipes ("LIPs")

27. NetLink Trust supports IMDA's proposed approach for the construction and interim ownership of advance LIPs, under which the appointed interim LIP owner constructs the LIPs and subsequently hands them over to the developer or building owner, with the developer or

building owner bearing the costs associated with the transfer of ownership and the connection of the development to nearby telecommunication networks.

28. NetLink Trust recognises the importance of Government Land Sale ("GLS") tender documents (such as the Technical Conditions of Tender ("TCOT") and the Conditions and Requirements of Relevant Competent Authorities and Public Utility Licensees ("CA")), in giving effect to the proposed approach at the developmental phase. In particular, such documents help to ensure that future developments will be planned and designed with reference and in anticipation of connecting to pre-laid telecommunication LIPs, and that developers or building owners connect their properties to (and assume ownership of) these LIPs as part of the development process.

29. To improve certainty and continuity in the management of such infrastructure, clear demarcation as to the point at which ownership and responsibility for advance LIPs transfer from the interim LIP owner to the developer or building owner—for example, by linking the transfer of ownership to the issuance of TOP or the formal acceptance of telecommunication facilities through the TFCC process—should be properly documented.

30. NetLink Trust further considers it important that the framework for advance LIPs and related passive pathways preserve the integrity of neutral and non-discriminatory passive access within developments. In particular, where such infrastructure is provided for ancillary or common facilities within a residential or managed development, COPIF should avoid outcomes in which operator-specific first-mover deployments create practical exclusivity over shared facilities. A clearer expectation that such pathways should support common, neutral passive connectivity would better preserve downstream choice, reduce duplicative works, and support more orderly long-term infrastructure planning.

H. Enhance Resilience and Diversity for Buildings Providing Critical Services

31. NetLink Trust supports extending enhanced telecommunication space and facility requirements to Special Developments ("SD") and Special Infrastructure ("SI").

32. From a network design perspective, resilience is most effective when diversity and physical separation are planned upfront. Embedding such requirements at the design stage would better support reliable connectivity for critical services and reduce reliance on disruptive retrofitting.

I. Other Future-Ready Enhancements

33. NetLink Trust considers that, as developments become more digitally enabled, COPIF should more clearly support planning-stage provision of passive pathways to ancillary buildings, common facilities and shared operational infrastructure within development boundaries where fibre connectivity is reasonably foreseeable. Where such facilities are functionally part of a residential or managed development, a neutral passive infrastructure approach would better preserve downstream choice, reduce duplicative works, and avoid fragmented or operator-specific first-mover deployments into common facilities.

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PART B: ADDITIONAL COMMENTS AND PROPOSED COPIF AMENDMENTS

Additional Comment 1 – Proposal to Allow Use of Space and Facilities Within a Development for the Provision of Fixed Telecommunication Services to Properties Outside of the Development by Default

1. NetLink Trust proposes that Chapter 17 of the COPIF be clarified to provide that space and facilities designated for fixed-line telecommunication infrastructure within a development may be used by default to serve properties outside the development, subject to priority being accorded to the immediate and foreseeable needs of the host development.

2. Such default access should not be contingent on case-by-case objections or discretionary charging. As an added assurance to developers and building owners, where it is subsequently discovered that the use is genuinely unreasonable or exceptional, IMDA continues to retain the right to intervene.

Structural Asymmetry with the MIS Framework

3. IMDA has previously recognised that land scarcity and deployment realities necessitate the shared and multi-purpose use of telecommunication infrastructure, particularly for mobile networks. This recognition underpinned IMDA's policy decision, following the 2017–2018 COPIF review, to allow MNOs to use MIS to serve areas outside a development by default, in order to avoid protracted negotiations, duplication of infrastructure and disruption to users.

4. Paragraph 2.2.2 of the COPIF expressly provides that a developer or owner shall not refuse the provision of MIS on the ground that it will be used to serve areas outside the development. On the other hand, Chapter 17 of the COPIF contains no equivalent protection for fixed-line infrastructure, and instead allows such use to be subject to objections and retrospective assessments of reasonableness.

5. Fixed fibre networks face similar land-use constraints and play an equally critical role in Singapore's digital infrastructure. The absence of a corresponding default-access position for fixed-line infrastructure therefore creates a structural asymmetry with material operational consequences.

Network Design Realities and the Need for Planning Certainty

6. COPIF was intended to function as a planning framework, providing predictable and durable outcomes for telecommunication infrastructure deployment within developments. While Chapter 17 of the COPIF refers to the concept of "reasonableness", it does not prescribe quantitative proportionality thresholds or hierarchy rules. In practice, assessments of reasonableness have emerged largely ex post through IMDA's resolution of individual disputes.

7. Where access to COPIF-designated space is not provided by default, such assessments necessarily occur after infrastructure has already been designed, deployed and integrated

into the wider network. Serving arrangements that were lawful, operationally sound and consistent with planning assumptions at the time of deployment may subsequently become contestable, even though the underlying network topology was not designed to be provisional or reversible.

8. This is particularly acute for fixed fibre networks, which are engineered using hub-and-spoke topologies. Certain developments are intentionally selected to function as aggregation or serving points for surrounding properties based on historical land availability, engineering constraints, routing options and regulatory oversight at the time of rollout. These configurations are long-lived by design and embedded in the broader network.

9. When access to such serving locations becomes contingent on ongoing agreement or retrospective reassessment, compliant infrastructure is rendered effectively provisional. This shifts COPIF away from a planning-based regime towards one dependent on negotiation and dispute resolution, increasing uncertainty in long-term network planning and weakening the original function of the Code.

10. From an operational perspective, having a clear default position on access helps reduce recurring disputes and uncertainty in practice. Such a default position does not preclude IMDA from addressing genuinely unreasonable or exceptional cases, but provides a more predictable baseline for planning and deployment.

<u>Discretionary Access to Utility-Like Fixed Fibre Infrastructure Has Direct Impact on End-Users</u>

11. From an operational perspective, fixed fibre infrastructure increasingly functions as essential, utility-like building infrastructure, underpinning everyday activities such as work, education, commerce and access to digital services. In practice, end-users expect fibre connectivity to be activated, maintained and restored with a level of reliability comparable to other essential services provided within buildings.

12. For utilities such as water and electricity, access to designated service rooms, risers and utility spaces is typically treated as a baseline requirement. Authorised service providers are able to access these spaces for activation, maintenance and fault rectification without being subject to ad-hoc negotiation, discretionary approval or charging at each instance. This enables timely service provision and restoration, and avoids disputes that would otherwise directly affect occupants.

13. By contrast, access to COPIF-designated telecommunication space and facilities is, in practice, sometimes treated as discretionary. Where access is delayed or denied due to objections or prolonged negotiations, the impact is immediate and borne directly by end-users. Service activation may be delayed, faults may persist longer than necessary, and routine maintenance activities may be disrupted. End-users have no visibility of, and no ability to influence, disputes between infrastructure operators and building management, yet directly experience the resulting loss or degradation of service.

14. Treating access to fixed fibre infrastructure—which performs an increasingly utility-like function—as negotiable on a case-by-case basis is therefore misaligned with how essential building services are expected to operate in practice. Predictable access arrangements are fundamental to supporting service continuity and meeting end-user expectations.

Default Access without Discretionary Charging Is Operationally Appropriate

15. Operationally, where telecommunication space and facilities within a development are provided under COPIF as part of the developer's baseline obligations, allowing their use to serve external properties by default should not give rise to discretionary access charges. Such space and facilities are already planned, constructed and maintained for telecommunication use, and their availability is not dependent on the incremental serving of external properties.

16. In practice, discretionary charging introduces friction into access arrangements, prolongs negotiations and delays service activation, notwithstanding that no additional space is consumed and no material incremental burden is imposed on the building owner. These delays are operationally inefficient and ultimately borne by end-users through slower service provisioning and restoration.

17. From an operational standpoint, the use of MDF rooms to serve external properties does not give rise to opportunity costs for developers or building owners. MDF rooms are purpose-built telecommunication spaces that are required under COPIF, reserved exclusively for telecommunication use, and cannot be repurposed for alternative commercial or amenity uses. Once constructed, the cost of providing such space is a sunk obligation that does not vary based on how the telecommunication network is logically configured.

18. This differs materially from other types of space—such as rooftops—which may have competing commercial or recreational uses and may require additional accommodation by building owners. In the case of fixed-line infrastructure, allowing external serving from existing MDF rooms does not reduce usable space, displace other activities, or impose additional construction or maintenance costs.

19. Accordingly, providing default access to fixed-line telecommunication space and facilities under COPIF without discretionary charging is operationally appropriate and consistent with the nature of the infrastructure. It removes unnecessary transactional friction, supports predictable deployment outcomes, and better aligns telecommunication access arrangements with those applicable to other essential building utilities.

Additional Comment 2 – Issues Related to TFCC

20. NetLink Trust highlights recurring challenges relating to the coordination of telecommunication space and facilities through the TFCC, which affect service readiness at different stages of a development's lifecycle. The issues outlined below reflect operational gaps that have persisted despite existing COPIF provisions and would benefit from targeted clarification and stronger planning discipline.

Late Handover of Telecommunication Infrastructure

21. Under the COPIF, developers and building owners are required to ensure that the relevant telecommunication space and facilities (including MDF rooms, telecommunication risers, lead-in pipes and associated infrastructure) are ready for use by telecommunication licensees at least six months prior to the TOP date for non-landed developments, and three months prior to the TOP date for developments consisting of one or more landed dwelling-houses.

22. In practice, NetLink Trust continues to encounter situations where telecommunication space and facilities are handed over significantly later than the COPIF-prescribed timelines. In some cases, the infrastructure provided by developers or building owners is defective or incomplete at the point of handover, requiring multiple rounds of rectification and re-inspection before it can be accepted for use.

23. These late handovers materially reduce the time available for telecommunication licensees to carry out necessary works prior to the TOP date. Such works include site surveys, planning and design, seeking approvals from relevant authorities and utility providers, road excavation for pipe construction, cable installation, testing and commissioning. As a result, telecommunication rollout timelines are compressed beyond what is operationally reasonable, increasing the risk that developments may not be fully telecom-ready when residents or tenants move in.

24. NetLink Trust is concerned that such late handovers may have downstream implications for service readiness and, in certain circumstances, may affect our ability to meet USO obligations under our Facilities-Based Operator ("FBO") licence. Notwithstanding this, concerns regarding telecommunication readiness are sometimes attributed to licensees, even where the underlying cause is late or incomplete handover of COPIF-mandated facilities. This creates misaligned accountability and undermines the effectiveness of the COPIF framework as a planning tool.

Inaccurate TOP Declarations and Compressed Coordination Timelines

25. In addition to late handovers, NetLink Trust has observed instances where TOP dates declared during TFCC submissions are materially earlier than the actual project readiness. In some cases, TFCC approvals are obtained based on these declared timelines, following which the same projects are subsequently escalated as urgent for telecommunication works, citing anticipated early move-ins or operational pressure.

26. Such practices artificially compress rollout timelines and create avoidable coordination challenges, notwithstanding that the underlying telecommunication infrastructure has not been handed over within the COPIF-prescribed timeframe. This undermines the integrity of the TFCC coordination process and complicates resource planning for telecommunication licensees. NetLink Trust encourages IMDA to reinforce the importance of accurate and realistic TOP declarations as part of the TFCC submission process, so that coordination timelines remain credible and aligned with the COPIF's planning-based intent.

Proposed Adjustment to Handover Timeline for Landed Developments

27. NetLink Trust proposes that, for developments consisting of one or more landed dwelling-houses, telecommunication space and facilities be handed over to the TFCC at least four months prior to the TOP date, instead of the current three-month requirement.

28. This additional lead time would allow sufficient time for the subsequent stages of coordination and implementation, including site surveys, planning, obtaining approvals from relevant authorities and utility providers, road excavation for pipe construction, cable installation, testing and data loading. Based on operational experience, the current three-month handover period for landed developments is often insufficient to accommodate these activities without undue compression of timelines.

29. For the avoidance of doubt, NetLink Trust is not proposing any changes to the existing six-month handover timeline for non-landed developments, which should continue to apply.

No TFCC Submission for A&A Works

30. NetLink Trust also observes that telecommunication infrastructure is sometimes affected by A&A works carried out on completed developments, without the required submission to the TFCC. This typically occurs where developers, owners or their consultants assume that the proposed A&A works do not impact existing telecommunication infrastructure and therefore omit TFCC from the coordination process.

31. In practice, the absence of TFCC submissions for A&A works has resulted in situations where telecommunication pathways are modified, obstructed or inadequately provided, leading to the unavailability of fibre services when residents or occupants move in. NetLink Trust has received feedback from homeowners, particularly in landed developments that have undergone A&A works, who are unable to obtain fibre connectivity upon occupation due to the lack of prior TFCC coordination.

32. This has, in some cases, led to occupants moving into completed properties where fibre services could not be provisioned, due to telecommunication pathways being altered or inadequately provided during A&A works without prior TFCC coordination.

33. While IMDA and the Building and Construction Authority (“BCA”) have taken steps to remind industry stakeholders of their obligations, NetLink Trust is of the view that general email circulars alone may not be sufficient to ensure consistent compliance. Given that A&A works are typically submitted through BCA’s CORENET system, there may be merit in strengthening process-level reminders at the point of submission.

34. In particular, NetLink Trust suggests that clearer prompts or reminders be incorporated within the CORENET submission workflow (for example, through guidance in the CORENET Frequently Asked Questions or on-screen prompts during submission) to remind developers, architects and owners of the need to assess and notify TFCC where A&A works may affect telecommunication infrastructure.

35. In addition, providing clearer guidance on supporting information that facilitates TFCC planning could improve coordination outcomes. This may include the submission of relevant documents (where applicable), such as provisional or written permission from the Urban Redevelopment Authority ("URA") to facilitate determination of the applicable COPIF version, and Inland Revenue Authority of Singapore ("IRAS") correspondence that assists in telecommunication facility planning.

36. To further improve end-user experience and reduce avoidable delays in fibre service provisioning, NetLink Trust also encourages IMDA to consider making it explicit in the COPIF that developers, architects or owners are required to inform TFCC when A&A works are submitted through CORENET and may affect telecommunication facilities.

37. Such measures would strengthen alignment between building plan submission processes and telecommunication coordination, reduce inadvertent omissions, and help ensure that developments undergoing A&A works remain fibre-ready for occupants.

Additional Comment 3 – MDF Room Usage

38. NetLink Trust observes that the effective use and management of MDF rooms is critical to the deployment, maintenance and future expansion of telecommunication infrastructure within developments. As COPIF-designated facilities, MDF rooms are intended to support multiple telecommunication licensees over the full lifecycle of a building and must therefore remain accessible, fit for purpose and efficiently utilised.

<u>Inefficient Use of MDF Room Space – Legacy Copper Infrastructure</u>

39. The shared use of MDF rooms continues to present operational challenges for NetLink Trust in managing shared telecommunication facilities over the building lifecycle. While COPIF entitles licensees to install and maintain equipment within MDF rooms, constraints arise where legacy access infrastructure occupies a disproportionate amount of shared space, limiting the ability to deploy or expand fibre-based networks within the same facilities.

40. In practice, NetLink Trust encounters situations where legacy copper access infrastructure continues to occupy substantial MDF room space long after new copper deployment has ceased and fibre-based alternatives have become the dominant access technology. In many such cases, the continued presence of copper infrastructure is justified by the existence of a limited number of residual subscribers. However, the space footprint required to maintain this legacy equipment is often disproportionate to the level of active usage and materially constrains NetLink Trust's ability to deploy new fibre equipment, expand aggregation capacity or carry out network upgrades within the same shared MDF room. These constraints are particularly acute in developments with limited MDF room footprints, where available space is shared among multiple licensees and cannot be readily expanded.

41. While NetLink Trust recognises the need to maintain service continuity for residual users, the operational issue is not the continued provision of service to these users per se, but the absence of clear COPIF-level expectations governing how transitional legacy infrastructure

should be managed within shared MDF facilities. In the absence of such guidance, legacy copper equipment may persist on an open-ended basis even where its space occupation significantly exceeds what is operationally necessary to support the remaining demand. This results in recurring congestion within MDF rooms, inefficient use of regulated shared telecommunication space, and increased friction where multiple licensees seek access to limited shared facilities.

42. These constraints have direct operational implications for NetLink Trust. Where MDF rooms are saturated by legacy infrastructure, planned fibre deployments may need to be deferred, re-engineered or staged, increasing coordination complexity and affecting service provisioning timelines. Over time, this undermines the predictability, scalability and resilience that COPIF-designated facilities are intended to provide, and weakens the planning assumptions on which network design and long-term rollout decisions are based.

43. Industry experience in Singapore demonstrates that legacy access networks can be managed in a structured and orderly manner where clear regulatory transition expectations exist. Following the cessation of Hybrid Fibre-Coaxial ("HFC") network rollout, defined regulatory expectations enabled residual services to be managed over time and the legacy access network to be progressively rationalised, rather than persisting indefinitely as a parallel platform. The key distinction lies not in the underlying access technology, but in the presence of clear transition principles that balance continuity of service for remaining users with the orderly evolution of the network. In the absence of comparable COPIF-level guidance for copper infrastructure, legacy equipment risks persisting on an open-ended basis, with knock-on implications for the efficient governance of shared MDF facilities.

44. In practice, the issues described above relate to how shared MDF facilities are managed over time, rather than to any particular access technology or individual operator. The absence of clear, common expectations around the use and rationalisation of shared MDF space has made long-term planning and coordination more uncertain. Greater clarity in this area would provide a more predictable baseline for licensees when planning network upgrades and managing shared facilities, reduce reliance on ad-hoc or case-specific arrangements, and help preserve service continuity for residual users.

<u>Misuse and Inadequate Upkeep of the MDF Room by Building Management</u>

45. NetLink Trust also observes recurring issues relating to the misuse and inadequate upkeep of MDF rooms by building management, which have direct and material impacts on service provisioning timelines and service continuity for end-users.

46. As COPIF-designated facilities, MDF rooms are required to be reserved exclusively for telecommunication use and kept accessible for licensees. In practice, NetLink Trust has encountered instances where MDF rooms are cluttered with non-telecommunication items or poorly maintained, resulting in obstructed entry, restricted working space and unsafe access conditions. Such misuse directly delays service provisioning and restoration, as licensees and their contractors are unable to access and work effectively within the confined

MDF room environment to carry out routine patching and related activities in response to end-user service requests.

47. Beyond access obstruction, misuse and inadequate upkeep of MDF rooms also create safety, fire and operational risks. Inadequate housekeeping and maintenance—including the absence of routine pest prevention—can result in damage to telecommunication infrastructure, such as fibre cable damage caused by rodent activity, leading to service outages affecting multiple end-users. These outages are operationally disruptive and avoidable, arising from failures in the ongoing management of COPIF-designated facilities rather than from network design limitations.

48. These matters fall squarely within the obligations set out in paragraph 2.6.1(a) of the COPIF, which requires developers or owners to maintain relevant space and facilities in a condition fit for their intended use by licensees. Clearer reinforcement of expectations relating to exclusive use, accessibility and basic upkeep of MDF rooms would reduce avoidable provisioning delays, mitigate outage risks, and support more reliable service outcomes for end-users.

Extension of MDF Capacity Beyond the Designated Room

49. NetLink Trust observes that MDF rooms which are compliant at the point of construction and accepted through TFCC coordination may nevertheless become space-constrained over time. This typically arises from legitimate operational factors, including growth in fibre aggregation requirements, the deployment of additional racks or fibre equipment by multiple licensees, and the continued presence of legacy infrastructure within the same shared MDF room.

50. In such situations, NetLink Trust has encountered practical difficulty in accommodating additional fibre equipment needed to meet service demand, not because the original MDF room was inadequately planned, but because the COPIF does not provide a clear or predictable framework for addressing capacity constraints that arise post-TOP. Proposals to extend MDF capacity beyond the designated room—such as installing additional racks or equipment immediately adjacent to the MDF room—are often subject to ad-hoc approvals and prolonged coordination with building management and relevant public agencies (for example, HDB and Town Councils in the case of public housing estates), resulting in delays to network expansion and service provisioning.

51. NetLink Trust therefore considers that COPIF would benefit from clearer guidance on the controlled extension of MDF capacity beyond the original room footprint, subject to defined technical, safety and access requirements. Providing such guidance would allow capacity constraints arising from legitimate network growth to be addressed in a predictable and orderly manner, reduce reliance on case-by-case approvals across multiple parties, and support continued service readiness over the building lifecycle.

Ventilation and Layout of MDF Rooms

52. NetLink Trust has observed recurring design issues in MDF rooms, particularly in residential developments, where ventilation provisions, air-conditioning units or other building services are planned or installed in a manner that encroaches into usable wall or floor space. In some cases, wall-mounted air-conditioning units or poorly coordinated service layouts reduce the space available for telecommunication equipment or restrict safe access for routine maintenance and service works.

53. NetLink Trust therefore considers that COPIF would benefit from clearer design guidance for MDF rooms, including basic layout principles to ensure that ventilation, power and access provisions are planned in a coordinated manner and do not compromise the effective use of space for telecommunication infrastructure. Such guidance would improve space utilisation, enhance safety, and help ensure that MDF rooms remain accessible and fit for purpose throughout the building lifecycle.

Additional Comment 4 – Smart-Lock Access Control for MDF Rooms

54. NetLink Trust observes that timely and reliable access to Main Distribution Frame ("MDF") rooms is essential for service activation, routine maintenance and fault restoration. In practice, access arrangements for MDF rooms vary widely across developments and are often dependent on manual lock-and-key systems, escorts or ad-hoc approval workflows, which have resulted in avoidable delays and operational inefficiencies.

55. NetLink Trust is of the view that, as a forward-looking measure, providing MDF rooms in all new developments with smart lock–based electronic access control systems would support more predictable and timely access for authorised telecommunication licensees. Such systems enable controlled, auditable access without reliance on manual key management or on-site coordination at the point of access, reducing friction during provisioning and restoration works.

56. Embedding this requirement at the development stage would avoid the need for post-completion retrofitting and help ensure that MDF rooms remain accessible and fit for their intended purpose over the building lifecycle, consistent with COPIF's planning-based intent.

Additional Comment 5 – Non-Standard Development Configurations and Planning Gaps

57. NetLink Trust observes that non-standard development configurations—such as non-residential units within residential developments, converted common spaces and standalone or ancillary structures—are increasingly common across both public and private developments.

58. Where COPIF does not set out clear planning expectations for such configurations, telecommunication infrastructure is often addressed only after completion, resulting in inconsistent outcomes, longer provisioning timelines and avoidable retrofitting works, despite the connectivity needs often being foreseeable at the design stage.

59. Representative operational scenarios illustrating these issues are set out in **Annex B**. Clearer baseline planning expectations would improve planning certainty and support more predictable service readiness outcomes in practice.

Additional Comment 6 – Operational Access Practices and Service Continuity

60. NetLink Trust observes that, even where telecommunication space and facilities are provided in accordance with COPIF, service outcomes in practice are often shaped by how access is administered on the ground. In particular, the absence of baseline expectations for routine provisioning and fault restoration has contributed to avoidable delays and inconsistent outcomes across developments.

Business-As-Usual ("BAU") Provisioning Access

61. From operational experience, routine fibre provisioning and activation works can typically be completed within short working windows once access is granted. However, COPIF currently does not set out any baseline expectations for access arrangements for BAU provisioning, with access instead governed by development-specific house rules that vary widely in practice.

62. NetLink Trust is of the view that access for BAU provisioning within 48 hours is operationally reasonable in most developments. Where access is delayed beyond this timeframe for non-technical reasons—such as approval processes, limited access windows or reliance on escorts—service activation timelines are extended unnecessarily, notwithstanding that the underlying works could otherwise have been completed promptly. The impact of such delays is borne directly by end-users through slower service activation.

Emergency Access for Service Restoration

63. Similar challenges arise during fault restoration scenarios. Where urgent access is required to restore fixed-line services for a development's own residents or tenants, delays in granting access to COPIF-designated telecommunication space and facilities have immediate and tangible consequences.

64. NetLink Trust is of the view that access charges or cost recovery should not apply to emergency access required to restore services for a development's own residents or tenants. Treating emergency access as chargeable or subject to discretionary conditions can delay timely restoration, impede rapid fault resolution and prolong service disruption, notwithstanding that such access is required to reinstate essential services within the development.

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Annex A: List of Locations for Building Developers / Owners to Provide Relevant Space and Facilities for Fibre Connectivity

S/N	Location	Example of infrastructure to be provided by building developer/owners
1	Automated Teller Machine ("ATM") kiosks	• Provide 2-way air-blown fibre ("ABF") microducts from telco riser to ATM kiosks.
2	Non-addressable and addressable non-enclosed booths/stalls	• Dedicated space for under-floor or overhead conduit for future fibre installation using ABF to each booth/stall.
3	Car park ticketing kiosks and Multi Storey Car Park ("MCSP") gantries	• Dedicated space for installation of Fibre Termination Point ("FTP") near car park kiosk/gantries. • Conduit for future fibre extension to each kiosk and gantry using ABF.
4	Electric Vehicle ("EV") charging stations/lots	• Dedicated space for installation of FTP near EV charging station control room. • Conduit for future fibre extension to each charging station using ABF.
5	Commercial units at new train/MRT stations	• Dedicated space within the unit for installation of FTP. • Conduit for easy in-unit fibre installation using ABF.
6	Self-Service Automated Machine ("SAM") and other parcel collection points	• Dedicated space for installation of FTP near parcel collection point. • Conduit for future fibre extension to each machine using ABF.
7	Fire Command Centre ("FCC") room	• Dedicated space for installation of FTP with high-speed and secured internet access. • Conduit for in-room fibre distribution to critical communication equipment (e.g. monitors, servers).
8	Kiosks (e.g. bicycle shops) within commercial buildings	• Dedicated space within the kiosk for installation of a small fibre termination point (micro-FTP) or direct connection point using ABF.
9	Commercial units within Housing Development Board ("HDB") blocks / condominiums	• Conduit for easy in-unit fibre installation using ABF.

10	Precinct pavilions	• Dedicated space for installation of FTP within the pavilion. • Conduit for future fibre distribution to various potential smart applications (signage, Wi-Fi access points, etc.) using ABF.
11	Police Equipment Room	• Dedicated space for installation of FTP with high-speed and secured internet access. • Conduit for in-room fibre distribution.
12	Ground floor of each lift lobby and stairwell	• Dedicated space for installation of FTP on ground floor or wall mounted micro-FTPs. • Conduit for future vertical fibre extension to upper floors using ABF.
13	Gate of a walled/gated compound	• Dedicated space for installation of FTP near the main gatehouse. • Conduit for future fibre extension to each gate using ABF.
14	Storey shelters	• Dedicated space for installation of FTP within the shelter. • Conduit for future fibre distribution to potential communication equipment using ABF.

Annex B: Operational Scenarios for Non-Standard Developments

Purpose of this Annex

1. This Annex sets out representative operational scenarios involving non-standard development layouts that are increasingly encountered in practice. These scenarios are provided to illustrate recurring patterns, rather than isolated exceptions, and to highlight why reliance on case-by-case, post-completion coordination has proven insufficient.

2. Taken together, they underscore the need for clearer COPIF provisions addressing the planning and provision of telecommunication infrastructure for such layouts at the design stage.

Scenario 1 – Non-Residential Units Within Residential Developments (Identified at TOP)

3. In some residential developments, non-residential units (e.g. management offices, guardhouses, clubhouses, fire control centres or other operational spaces) are designated and constructed as part of the development at the point of issuance of TOP.

4. Operationally, these units frequently require fibre connectivity to support essential functions such as estate management systems, security monitoring, access control and building operations. However, in the absence of standardised COPIF requirements, the provision of fibre pathways to such units varies across developments. In practice, this has resulted in inconsistent design approaches, including cases where no protected fibre pathway is provided at all.

5. Where fibre infrastructure is not planned upfront, subsequent provisioning may require retrofitting works, surface trunking or ad-hoc routing, which increases cost, disrupts estate operations and delays service activation.

Scenario 2 – Conversion of Common Spaces to Enclosed Commercial or Service Use After TOP

6. Certain spaces within residential developments may be converted after TOP into enclosed commercial or service uses, such as childcare centres, kindergartens, community facilities or other service spaces (for example, within void decks or common areas).

7. In such cases, fibre provisioning challenges often arise because the original development design did not anticipate enclosed use or provide suitable pathways. Where conversion works proceed without early coordination, fibre services may not be available when the premises become operational, requiring disruptive retrofitting works or external cabling.

8. Operational experience indicates that clearer expectations around coordination and pathway provision in such scenarios would help ensure that converted spaces are fibre-ready upon occupation, while preserving estate aesthetics and minimising disruption.

Scenario 3 – Standalone or Ancillary Buildings Within a Development

9. Some developments include standalone or ancillary buildings (such as pavilions, detached clubhouses or ancillary blocks) that are physically separated from the main residential or commercial building.

10. In practice, fibre connectivity to such structures may be constrained where underground ducts or protected pathways are not provided upfront. Retrofitting connectivity after completion can be complex and disruptive, particularly where excavation or reinstatement works are required within completed estates.

11. These scenarios highlight the importance of considering foreseeable connectivity needs for ancillary structures during the planning stage, even where such buildings are not primary dwelling or commercial units.

Scenario 4: Open-Concept or Standalone Commercial Units within Malls

12. Some commercial developments, particularly shopping malls, include open-concept or semi-enclosed commercial units such as kiosks, basement stalls or common-area retail spaces that operate on a permanent basis.

13. In practice, such units often lack dedicated telecommunication risers or protected pathways, as their open layouts are not treated as requiring fixed infrastructure at the design stage. Where fibre connectivity is subsequently required, provisioning is addressed after fit-out through ad-hoc routing, surface containment or temporary solutions, resulting in inconsistent outcomes, disruption to mall operations and avoidable retrofitting.

14. This scenario illustrates a planning gap where permanent commercial uses are treated as transient from a telecommunication infrastructure perspective, underscoring the need for clearer COPIF planning expectations for such layouts at the design stage.

Observation

15. Across these scenarios, the recurring issue is not technical feasibility, but the absence of explicit COPIF planning assumptions and baseline expectations for non-standard yet increasingly common development configurations. Where such configurations are not addressed upfront in the Code, service readiness depends on post-completion coordination and remedial works, leading to delays, disruption and avoidable retrofitting.

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Annex C: Technical Planning Proposals and Guidance

Purpose of this Annex

Annex C sets out specific technical planning proposals based on NetLink Trust's operational experience, which we invite IMDA to consider for incorporation as COPIF guidance or reference design principles where appropriate. These proposals are intended to complement COPIF's planning-based framework by addressing recurring implementation challenges observed in practice.

Summary of Technical Observations

S/N	COPIF Reference	Observed Operational Issue	Observed Implementation Challenges	Illustrative Technical Guidance
1	*No explicit provision*	Fibre Distribution Frame ("FDF") within telecommunication risers	In the absence of guidance, multiple service providers install individual termination boxes within risers. This results in cluttered layouts, inefficient use of limited riser space, and a higher risk of accidental fibre disruption during subsequent works.	Provide technical guidance on organised or shared termination arrangements (e.g. FDF type solutions) within risers to improve space efficiency and maintainability.
2	Paragraph 6.4	Positioning of telecommunication cable trays	Where telecommunication cable trays are installed above other services, subsequent fibre installation requires removal or rerouting of existing services, increasing coordination complexity and delay.	Telecommunication cable trays to be installed at the lowest tier, below other services, to facilitate future cable laying.
3	Paragraph 12.3.1(d)(i)	Cable ladders in MDF / TER rooms	Where shared cable ladders are not provided, individual licensees install separate ladders. This leads to multiple overlapping structures, congestion and reduced usable space in shared rooms.	Shared cable ladders in MDF and TER rooms regardless of room height, to support common use by all licensees.
4	Paragraphs 5.2.5, 6.2.6, 7.2.6	Layout of electrical distribution panels in MDF rooms	Electrical distribution panels mounted across multiple walls reduce usable wall and floor space	Consolidate electrical distribution panels to designated wall zones to

			available for telecommunication equipment and restrict future expansion.	preserve telecommunication equipment space.
5	Paragraphs 6.3.4, 6.3.5, 11.3.1(r)	Multi-Cable Transit ("MCT") requirements at basements	Ambiguity over MCT type and drainage provisions has resulted in inconsistent installations. In some cases, seepage water accumulates at basement interfaces, creating flooding and service risk.	Where an MCT is required, it shall be of type RGP-150 (or equivalent), and a water discharge drain with grating shall be provided below the MCT to facilitate removal of seepage water.
6	Figure 11.4	Lead-in pipes at gate pillars	Discrepancies in diagrammatic guidance have resulted in developers providing an incorrect number of 50 mm uPVC link pipes and inconsistent labelling of telecommunication compartments. This has caused mismatches with licensee connection requirements, aborted cable pulls and re-work after completion.	Figure 11.4 to indicate provision of two (2) 50 mm uPVC link pipes, and standardise terminology as "Telecommunication compartment".
7	Paragraph 11.4.1(d)	Interface with Common Services Duct ("CSD") / Utility Services Duct ("USD")	Developers are often unaware of advance telecommunication ducts provided by CSD/USD owners, resulting in unconnected or mismatched development lead-in pipes and missed opportunities to utilise pre-built infrastructure.	Where a CSD/USD is provided, developers shall connect all development lead-in ducts to designated telecommunication interface points, in coordination with the TFCC approval process.
8	Paragraphs 6.3.1(a), 7.4.1(a)	Depth of lead-in and underground pipes	Lead-in and underground pipes laid at excessive depths trigger additional regulatory requirements (e.g. ERSS submissions, PE endorsement), increasing safety risk, approval timelines and cost.	Consider specifying a maximum recommended depth for lead-in and underground pipes to avoid unnecessary deep excavation.
9	*No explicit provision*	Location of lead-in pipes relative to other utilities	Pipes installed beneath rigid pavement or in close proximity to High Voltage / Extra High Voltage cables are difficult to access or relocate, resulting in extensive reinstatement works.	Provide guidance on where lead-in pipes should be placed to avoid rigid pavements and maintain adequate separation from HV/EHV services.

10	Paragraph 7.9.1(a)	Fibre termination configuration in risers	Exposed fibres and limited containment within risers increase the risk of accidental damage, particularly where residents store personal items in residential risers.	Consider containment or lockable termination solutions to protect fibres and maintain orderly riser configurations.
11	Paragraph 7.6.2	Serving capacity per telecommunication riser	Radius-based serving criteria may result in excessive unit loading per riser, leading to congestion and reduced service reliability.	Supplement radius-based criteria with guidance on maximum units per riser.
12	Paragraph 7.5.1	Telecommunication Equipment Rooms ("TER") in residential developments	Alternative designs such as small telecommunication closets may be under-sized for fibre aggregation equipment, resulting in early saturation.	Align TER / telecommunication closet sizing with the number of units served to preserve scalability.
13	Paragraph 8.7	Air-Blown Fibre ("ABF") in single-user developments	ABF ducts are sometimes omitted due to waiver assumptions, creating constraints when building use subsequently changes or expands.	Reinforce expectation for ABF provision even in single-user developments to preserve future flexibility.
14	*No explicit provision*	MRT and transport-related developments	Absence of COPIF-level reference designs has resulted in repeated ad-hoc configurations and prolonged coordination for telecommunication infrastructure in MRT developments.	Provide reference configurations for telecommunication infrastructure in MRT and transport-related developments.
15	Paragraph 8.2.2	Location of MDF rooms in multi-basement developments	MDF rooms located in basement levels are exposed to flooding risk, increasing vulnerability of critical telecommunication infrastructure and service recovery complexity.	Consider locating MDF rooms above basement levels where practicable to enhance resilience.
16	Paragraph 7.6.2	Serving capacity of telecommunication risers in residential developments	Where a large number of residential units are served from the same telecommunication riser within a limited serving radius, fibre routing becomes congested and difficult to manage. This affects installation tidiness, increases the risk of accidental fibre damage during subsequent works,	Consider providing planning-stage guidance on a maximum number of residential units served per telecommunication riser, for example around 12 units per floor within a 40-metre serving radius, to

			and complicates future provisioning and maintenance activities.	reduce congestion and improve long-term maintainability.
17	Under COPIF Guidelines	Provision of pipes within telecommunication cable containments	In developments with extended horizontal or vertical telecommunication cable containments, the absence of dedicated pipes can make fibre installation, replacement and future upgrades operationally difficult, particularly where access is limited or where containment routes are shared with other services.	Consider requiring developers to provide pipes sized to match the telecommunication cable tray for: • horizontal telecommunication cable containments exceeding 4 metres in length; and • vertical telecommunication cable containments exceeding 4 metres in height within telecommunication risers.
18	Paragraph 8.5.2	Serving capacity of telecommunication risers in non-residential developments	Non-residential units are frequently subdivided over time, increasing fibre demand beyond initial planning assumptions. Where riser capacity is designed only for the original configuration, subsequent subdivision can result in congestion, reduced accessibility, and increased difficulty in future provisioning and maintenance.	For non-residential developments, consider providing planning guidance to limit the number of units served from a telecommunication riser to approximately 15–20 units per floor within a 40-metre serving radius, to preserve headroom for future subdivision and additional provisioning needs.

19	Under COPIF Guidelines	Accessibility of Multi-Cable Transit (“MCT”) locations	Where MCT locations are more than 4 metres above floor level and are not directly accessible, routine inspection, maintenance and fault rectification activities become operationally difficult and may pose safety risks.	Consider requiring the provision of a permanent walkway or access platform for MCT locations that are more than 4 metres in height and are otherwise inaccessible, to support safe and efficient operations.