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**No. 414 — TELECOMMUNICATIONS ACT (CHAPTER 323)**

**CODE OF PRACTICE FOR COMPETITION  
IN THE PROVISION OF TELECOMMUNICATION SERVICES  
(RIO REQUIREMENTS)  
NOTIFICATION 2005**

It is hereby notified for general information that, pursuant to subsection 6.3.2 of the Code of Practice for Competition in the Provision of Telecommunication Services 2005 (G.N. No. S 87/2005) (the “Code”), the Info-communications Development Authority of Singapore hereby specifies the following Interconnection Related Services and Mandated Wholesale Services, and their applicable requirements, that a Dominant Licensee must offer under its Reference Interconnection Offer (“RIO”).

**Citation and commencement**

**1.** This Notification may be cited as the Code of Practice for Competition in the Provision of Telecommunication Services (RIO Requirements) Notification 2005 and shall come into operation on 4th March 2005.

**List of Services and Requirements**

**2.** The list of Interconnection Related Services and Mandated Wholesale Services, and the applicable requirements governing the Dominant Licensee’s offer of these services, are specified in the Schedule.

**SCHEDULE OF INTERCONNECTION RELATED SERVICES AND  
MANDATED WHOLESALE SERVICES THAT MUST BE OFFERED  
BY A DOMINANT LICENSEE UNDER THE RIO**

**1. INTRODUCTION**

1.1 This Schedule describes the terms and conditions on which a Dominant Facilities-based Licensee must offer to provide certain key Interconnection Related Services and Mandated Wholesale Services to Facilities-based Licensees and Services-based Licensees that use switching or routing equipment to provide telecommunication services to the public. The Dominant Facilities-based Licensee must include these terms and conditions in its RIO.

1.2 In this Schedule:

- (a) “Dominant Licensee” means a Facilities-based Licensee that IDA has classified as dominant;
- (b) “Facilities-based Licensee” means a Licensee to which IDA has granted a Licence to Provide Facilities-based Operations under Section 5 of the Telecommunications Act (Cap. 323);

- (c) “Licensee” means a Facilities-based Licensee or a Services-based Licensee;
- (d) “Services-based Licensee” means a Licensee to which IDA has granted a Licence to Provide Services-based Operations under Section 5 of the Telecommunications Act (Cap. 323) and which uses switching or routing equipment to provide telecommunication services to the public; and
- (e) “Requesting Licensee” means a Licensee that seeks to obtain Interconnection Related Services and/or Mandated Wholesale Services from a Dominant Licensee.

Terms used but not otherwise defined in this Schedule shall bear the same meaning as defined in the Code.

- 1.3 A Dominant Licensee must offer to provide all categories of Interconnection Related Services and Mandated Wholesale Services to Facilities-based Licensees. The Dominant Licensee need only offer to provide specified categories of Interconnection Related Services to Services-based Licensees. The Dominant Licensee must offer the same prices, terms and conditions for such services to all Licensees.
- 1.4 The terms and conditions specified in this Schedule will remain effective until reviewed and revised by IDA.
- 1.5 As part of its review, IDA will determine whether to:
  - (a) require Dominant Licensees to continue to comply with any or all of the requirements specified in this Schedule;
  - (b) require Dominant Licensees to continue to offer Interconnection Related Services and Mandated Wholesale Services, but allow the Dominant Licensees to set the prices within specified price floors and/or ceilings;
  - (c) require Dominant Licensees to continue to offer Interconnection Related Services and Mandated Wholesale Services, without specifying price floors or ceilings; or
  - (d) otherwise add to, modify or eliminate the requirements specified in this Schedule, or take any other appropriate action.
- 1.6 IDA reserves the right to review and add to, modify or eliminate the applicable requirements specified in this Schedule at any time.

## **2. SERVICES THAT MUST BE OFFERED UNDER THE RIO**

- 2.1 The RIO must specify the prices, terms and conditions on which the Dominant Licensee will provide:
  - (a) the following Interconnection Related Services:
    - (i) Physical Interconnection;
    - (ii) Origination, Transit and Termination;
    - (iii) Essential Support Facilities;
    - (iv) Unbundled Network Elements;

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- (v) Unbundled Network Services; and  
(b) Mandated Wholesale Services.

**3. PHYSICAL INTERCONNECTION**

- 3.1 A Dominant Licensee must offer to allow Facilities-based and Services-based Licensees to physically and logically interconnect their respective networks with the Dominant Licensee's network for the purpose of exchanging telecommunication traffic.
- 3.2 The RIO must specify the prices, terms and conditions on which the Dominant Licensee will allow interconnection to occur. These must include:
- (a) a list and description of the physical locations at which a Requesting Licensee may physically and logically interconnect with the Dominant Licensee's network and the means by which interconnection may be achieved; and
- (b) a description of the physical and logical interfaces to the Dominant Licensee's network that are necessary to allow physical and logical interconnection and the procedures to be used if the Dominant Licensee chooses to alter those interfaces.
- 3.3 Subject to Sub-paragraph 3.4 below, a Dominant Licensee must offer to allow interconnection to occur at any technically feasible point. At a minimum, a Dominant Licensee must offer to allow interconnection to occur at the following Points of Interconnection ("POI"):
- Interconnect gateway switches ("IGS"); and
  - Local switches (line side and trunk side).
- 3.4 A Dominant Licensee need only interconnect with a Services-based Licensee on a virtual (distant) basis. In a virtual (distant) interconnection arrangement, the network nodes are not located at the same site. In this arrangement, the Services-based Licensee may obtain the transmission link between the 2 nodes from either the Dominant Licensee or any other Facilities-based Licensee, with the costs of the link borne by the Services-based Licensee.
- 3.5 The transmission links used for interconnection must connect at mutually agreed points and support applicable technical standards and transmission protocols. Unless the Dominant and Requesting Licensee agree otherwise, the Dominant and Requesting Licensee will each be responsible for the provision and maintenance of the link on its "side" of the POI.
- 3.6 A Dominant Licensee must provide, and may require the Requesting Licensee to provide, reasonable capacity to meet forecast traffic flow.
- 3.7 A Dominant Licensee must provide all relevant signalling plans, including the technical specifications, interconnection test plans and the corresponding test schedules, to any Requesting Licensee.

**4. ORIGINATION, TRANSIT AND TERMINATION**

- 4.1 Origination, transit and termination (“O/T/T”) services involve the switching, routing and/or transmission of telecommunication traffic between Licensees. O/T/T services allow traffic originating from one Licensee’s network to terminate on or transit through another Licensee’s network. A Dominant Licensee must offer to provide O/T/T services to Facilities-based and Services-based Licensees.
- 4.2 The RIO must specify the prices, terms and conditions on which the Dominant Licensee will provide O/T/T services. In particular, the RIO must contain:
- (a) a list and description of all the O/T/T services to be provided; and
  - (b) the prices, terms and conditions on which the Dominant Licensee and the Requesting Licensee will be compensated for such services.
- 4.3 The Dominant Licensee need only offer to provide transit services between Licensees interconnected to the Dominant Licensee’s IGS. The Dominant Licensee need not offer to route transit traffic between the IGS and a local switch. In the case of transit traffic, the Dominant Licensee may require the Licensee originating the call to pay the Dominant Licensee for the cost of transit, irrespective of the type of traffic and payment between the End Users and the Licensees that are using the transit service.
- 4.4 At a minimum, the Dominant Licensee must provide the following O/T/T services:
- Line side (local exchange) origination;
  - Line side (local exchange) termination;
  - Trunk side (local exchange) origination;
  - Trunk side (local exchange) termination;
  - IGS origination;
  - IGS termination; and
  - IGS transit.

**5. ESSENTIAL SUPPORT FACILITIES**

- 5.1 Essential Support Facilities (“ESF”) are passive support structures, for which no practical or viable alternatives exist, that enable the deployment of telecommunication infrastructure. A Dominant Licensee must offer to provide ESF to Facilities-based Licensees.
- 5.2 The RIO must specify the prices, terms and conditions on which the Dominant Licensee will provide ESF. In particular, the RIO must contain:
- (a) the prices, terms and conditions on which a Facilities-based Licensee can physically co-locate and access its equipment within the Dominant Licensee’s network, including:
    - (i) the locations at which physical co-location is available;

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- (ii) any reasonable restrictions or procedures that the Dominant Licensee intends to impose due to space, safety or security concerns; and
  - (iii) the situations in which virtual (distant) co-location will be required.
- (b) the prices, terms and conditions on which the Dominant Licensee will provide Facilities-based Licensees with access to and the use of lead-in ducts and lead-in manholes.

### **5.3 Co-Location**

- 5.3.1 A Dominant Licensee must offer to allow Facilities-based Licensees to co-locate equipment at any technically feasible location within its network. In particular, the Dominant Licensee must allow co-location at the following facilities (when controlled by the Dominant Licensee):
- Exchange buildings housing tandem, local, interconnection and international switches and facilities;
  - Telecommunication equipment rooms located in commercial buildings;
  - Telecommunication equipment rooms located in residential buildings;
  - Submarine cable landing stations;
  - Radio towers and tower sites; and
  - Roof spaces.
- 5.3.2 A Dominant Licensee must offer to provide equipment space, power, security and site maintenance at each co-location site.
- 5.3.3 A Dominant Licensee may decline to provide co-location space in any currently unused network location if it can demonstrate that, as a result of its reasonably projected growth, the Dominant Licensee will use that space to locate equipment used to provide its own telecommunication service.
- 5.3.4 In cases where the Dominant Licensee cannot offer physical co-location due to space limitations or any other legitimate reasons, the Dominant Licensee must take reasonable measures to find an alternative solution. An alternative solution may include options such as virtual co-location, conditioning additional equipment space, optimising the use of existing space or finding adjacent space. The Dominant Licensee is not required to offer to construct additional buildings to accommodate co-location requests.
- 5.3.5 A Dominant Licensee must not restrict the type of equipment co-located so long as it is telecommunication equipment of a type customarily located in a telecommunication operator's exchange building or other network locations. However, this space cannot be used for the co-location of a specific End User's equipment (e.g., a PABX) or general purpose computing equipment that is not required for operation or management of the co-located equipment (e.g., a billing system). The equipment footprint space made available by the Dominant Licensee to each Facilities-based Licensee at each exchange building or submarine cable landing station must be no less than 1 square metre and no more than 10 square metres, provided that where a Facilities-based Licensee reasonably requests for

footprint space exceeding 10 square metres, the Dominant Licensee must grant the request unless the Dominant Licensee can demonstrate that the use of more than 10 square metres of footprint space will preclude other Facilities-based Licensees from placing permitted equipment in a given exchange building or submarine cable landing station.

5.3.6 A Dominant Licensee must take all reasonable measures to reduce the costs to be assumed by the Facilities-based Licensees. In particular, the Dominant Licensee may not require the use of co-location cages or equivalent structures or impose any unnecessary or excessive minimum space requirements. The Dominant Licensee must incur the cost of preparing co-location space, which it can recover through non-discriminatory, pro-rata prices to be paid by the Facilities-based Licensees.

5.3.7 A Dominant Licensee must offer Facilities-based Licensees access to their co-located equipment on a 7-days-a-week, 24-hours-a-day basis. The Dominant Licensee can require reasonable security precautions. These can include escorted access, provided the escort is available 7 days a week, 24 hours a day. The Dominant Licensee must make escort available on the following basis:

- for service-affecting emergencies, within 1 hour of notification;
- for non-service affecting emergencies, within 4 hours of notification; and
- in all other cases, within 24 hours of notification.

#### **5.4 Lead-in ducts and lead-in manholes**

5.4.1 Lead-in ducts and lead-in manholes are ESF that house the telecommunication transmission cables (e.g. copper, coaxial and fibre cables) that connect to buildings.

5.4.2 A Dominant Licensee must offer to lease the lead-in ducts and lead-in manholes to Facilities-based Licensees for the purpose of placing their own telecommunication transmission cables. The Dominant Licensee must maintain the lead-in ducts and lead-in manholes, and also be responsible for any right of way fees payable, where applicable.

### **6. UNBUNDLED NETWORK ELEMENTS**

6.1 Unbundled network elements (“UNE”) are physical telecommunication plant and equipment and the associated service functionality that Facilities-based Licensees need to have access to in order to provide a competing telecommunication service. IDA will find that telecommunication plant or equipment are UNE if they:

- (a) are technically or operationally required to provide a competing service; and
- (b) cannot be replicated, or obtained from a source other than the Dominant Licensee, at commercially reasonable rates.

A Dominant Licensee must offer to provide UNE to Facilities-based Licensees.

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- 6.2 The RIO must contain the prices, terms and conditions on which the Dominant Licensee will offer to provide UNE, including:
- (a) a list and description of the UNE to be provided;
  - (b) any modification that the Dominant Licensee is prepared to make; and
  - (c) the extent to which the Dominant Licensee is prepared to combine individual elements.
- 6.3 A Dominant Licensee may not place any restriction on a Facilities-based Licensee as to the End Users or Licensees to which any telecommunication service provided using the UNE may be offered. For example, a Facilities-based Licensee can lease copper local loop for the provision of Digital Subscriber Line (“DSL”) services, for resale to other Facilities-based or Services-based Licensees.
- 6.4 At a minimum, a Dominant Licensee must offer to provide the following UNE:
- Local loops;
  - Sub-loops;
  - Line sharing; and
  - Distribution frame access.
- 6.5 A Dominant Licensee must also offer to provide Facilities-based Licensees with access to UNE at the following points of access (“POA”) in its exchange MDF, building MDF and outdoor cabinets (if controlled by the Dominant Licensee):
- Distribution frames;
  - Fibre distribution frames; and
  - Digital cross connect frames.
- 6.6 Local loops — including loop feeder, loop distribution, distribution point, and inside wiring (where applicable)**
- 6.6.1 A Dominant Licensee must provision the loops in a timely and non-discriminatory manner, and must take all feasible actions to provision loops that are suitable for digital signal transmission. The Dominant Licensee will retain responsibility for the maintenance and administration of the loops.
- 6.6.2 A Dominant Licensee must provide loops that are of the same quality and are capable of supporting the same transmission characteristics as those it supplies to its own End Users. The Dominant Licensee must also provide maintenance and repair services on the unbundled loops that are equivalent to the services it would provide to itself on loops serving its own End Users.
- 6.6.3 To maintain the integrity of the loop and associated equipment, a Dominant Licensee may retain responsibility for performing the necessary cross-connections and circuit-grooming activities required at the distribution frames to connect the Facilities-based Licensee’s equipment to each loop

provided. However, the Dominant Licensee must not use this authority in a manner that restricts supply. If the Dominant Licensee performs these functions, it must recover the cost through the loop prices.

6.6.4 Where the Facilities-based Licensee plans to use the loop to provide a DSL type service, the loop performance should be typical of those used by the Dominant Licensee for its own DSL services. This requires the Dominant Licensee to “condition” a loop pair. Typically, this will require the Dominant Licensee to remove any impediments to DSL service (such as bridge taps and loading coils) and to choose a pair that is unlikely to suffer from interference caused by other DSL services. In so far as the Dominant Licensee uses loops for its own DSL services, the Dominant Licensee must supply loops to other Facilities-based Licensees for DSL that perform at a level equivalent to the loops the Dominant Licensee uses for its own DSL services.

**6.7 Sub-loops — loop feeder or loop distribution, distribution point and inside wiring (where applicable)**

A Dominant Licensee must also offer to provide sub-loops and the associated distribution points to Facilities-based Licensees on the same terms and conditions as loops.

**6.8 Line sharing (loop spectrum) — loop feeder, and/or loop distribution, distribution point and inside wiring (where applicable)**

6.8.1 A Dominant Licensee must offer to provide Facilities-based Licensees with line sharing (loop spectrum). The Dominant Licensee must provide a DSL-capable loop (in the same manner as described in Sub-paragraph 6.6.4 above). The Dominant Licensee must offer to allow each Facilities-based Licensee to attach its own transmission equipment.

6.8.2 A Dominant Licensee must provide timely information to Facilities-based Licensees to assist their deployment of DSL services. The information will be the same as that provided to its own operations in order to assess the capability of providing DSL on a loop.

6.8.3 Facilities-based Licensees must adhere to a spectrum management and deployment plan, which the Dominant Licensee must include in its RIO. The plan must be no more restrictive than necessary to minimise cross-talk and to ensure the integrity of the voice network.

**6.9 Distribution frame access — exchange MDF, building MDF and outdoor cabinets**

6.9.1 A Dominant Licensee must offer to provide Facilities-based Licensees with access to its distribution frames in order to allow the Facilities-based Licensees to place the terminal blocks and cabling required to cross-connect loops to the Facilities-based Licensee’s equipment.

6.9.2 A Dominant Licensee must offer to provide Facilities-based Licensees with pins on the Dominant Licensee’s distribution frames for the purposes

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of connecting their cables. The Dominant Licensee must develop a reasonable process for allocating pins to Facilities-based Licensees and for updating plant records. Where physical space is available, the Dominant Licensee must offer to construct additional distribution frame capacity to meet requests for access. The Dominant Licensee must detail the process for allocating pins in its RIO.

## **7. UNBUNDLED NETWORK SERVICES**

7.1 Unbundled network services (“UNS”) are telecommunication network services that Facilities-based and Services-based Licensees need to have cost-based access to in order to provide a competing telecommunication service. IDA will find that telecommunication network services are UNS if the services:

- (a) are technically or operationally required to provide a competing service; and
- (b) cannot be self-provisioned, or obtained from a source other than the Dominant Licensee, at commercially reasonable rates.

Dominant Licensees must offer to provide all UNS to Facilities-based Licensees, but only need offer to provide specified UNS to Services-based Licensees.

7.2 The RIO must contain the prices, terms and conditions on which the Dominant Licensee will offer to provide UNS, including:

- (a) a list and description of the UNS to be provided;
- (b) any modification that the Dominant Licensee is prepared to make; and
- (c) the extent to which the Dominant Licensee is prepared to combine individual elements.

7.3 At a minimum, a Dominant Licensee must offer to provide the following UNS to Facilities-based and Services-based Licensees:

- Emergency services

7.4 In addition, a Dominant Licensee must offer to provide the following UNS to Facilities-based Licensees:

- Connection services at submarine cable landing stations.

### **7.5 Emergency Services**

A Dominant Licensee must offer to provide Facilities-based and Services-based Licensees with access to emergency services call centres and the ability to add local telephone location data to the emergency services database.

### **7.6 Connection services at submarine cable landing stations**

7.6.1 A Dominant Licensee must offer to provide services at its submarine cable landing stations to Facilities-based Licensees in order for them to connect and access capacity on any submarine cable system that lands at those stations.

7.6.2 A Dominant Licensee must offer to provide Facilities-based Licensees with access to connection services at the following POA (when controlled by the Dominant Licensee):

- Digital or fibre distribution frames; and
- Digital cross-connect frames.

## **8. MANDATED WHOLESALE SERVICES**

8.1 Mandated Wholesale Services are services that IDA finds are:

- (a) necessary inputs for the provision of competitive telecommunication services in Singapore; and
- (b) sufficiently costly or difficult to provide in that requiring other Licensees to do so would create a significant barrier to the provision of competitive telecommunication services in Singapore by an efficient Licensee.

A Dominant Licensee must offer to provide Mandated Wholesale Services to Facilities-based Licensees.

8.2 The RIO must specify the prices, terms and conditions on which the Dominant Licensee will offer to provide Mandated Wholesale Services (where specified by IDA).

8.3 A Dominant Licensee must offer to provide the following Mandated Wholesale Services on a “retail-minus” price basis:

- Local leased circuits

### **8.4 Local Leased Circuits**

8.4.1 A Dominant Licensee must offer the following local leased circuits to Facilities-based Licensees for such period as specified in Sub-paragraph 8.4.2 below, commencing from 15 October 2004 (“Commencement Date”):

- (a) full local leased circuits (for multipoint-to-point connection);
- (b) full local leased circuits (for point-to-point connection); and
- (c) tail local leased circuits.

8.4.2 The specified periods are:

- (a) in relation to a full local leased circuit (for multipoint-to-point connection) terminating at multiple End Users’ sites which are all located within the Central Business District (“CBD”) proxy-region, 18 months from the Commencement Date;
- (b) in relation to a full local leased circuit (for point-to-point connection) terminating at an End User’s site located within the CBD proxy-region, 18 months from the Commencement Date;
- (c) in relation to a tail local leased circuit terminating at an End User’s site located within the CBD proxy-region, 18 months from the Commencement Date; and
- (d) for all other local leased circuits, 24 months from the Commencement Date.

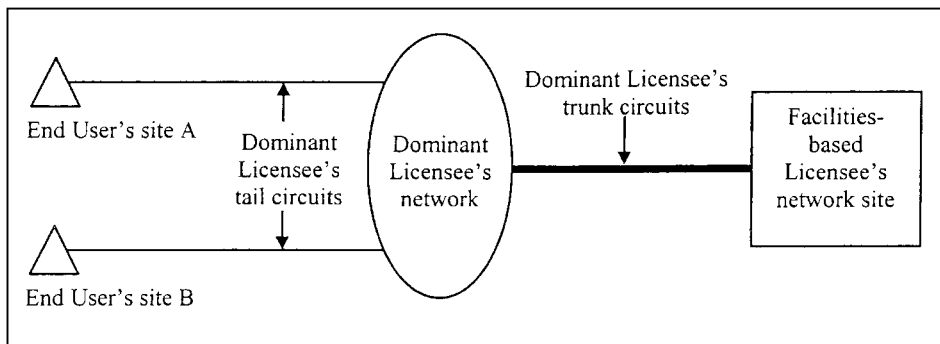
In this sub-paragraph, “CBD proxy-region” means the area within the CBD containing the locations where the Dominant Licensee, as at 20 July 2004, offers retail local leased circuits pursuant to its retail tariff for local leased circuits in the CBD area, as approved by IDA. The Dominant Licensee must provide clear and sufficient information, including the boundaries of the CBD proxy-region, to enable Facilities-based Licensees to ascertain the CBD proxy-region.

- 8.4.3 For the avoidance of doubt, a Dominant Licensee is only required to provide local leased circuits under Sub-paragraph 8.4 for the purpose of enabling a Facilities-based Licensee to establish a connection between the Facilities-based Licensee’s network sites (which may include point-of-presence, data hubs and exchanges) and End Users’ sites. The Dominant Licensee must not prevent the Facilities-based Licensee from reselling the local leased circuits to other Licensees for the purpose of enabling the Licensees to connect to End Users’ sites.

#### 8.4.4 Full Local Leased Circuits (for multipoint-to-point connection)

- 8.4.4.1 A full local leased circuit (for multipoint-to-point connection) allows a Facilities-based Licensee to collect traffic from multiple End Users’ sites using several circuits of lower bandwidths obtained from the Dominant Licensee (“tail circuits”) and to aggregate that traffic using circuits of higher bandwidth obtained from the Dominant Licensee (“trunk circuits”) to connect to the Facilities-based Licensee’s network site (please see illustration in Diagram 1A below).

*Diagram 1A — Illustration of full local leased circuit  
(for multipoint-to-point connection)*



- 8.4.4.2 A Dominant Licensee must offer to provide full local leased circuits (for multipoint-to-point connection) at the following bandwidths:

(a) in relation to tail circuits:

- (i) 64Kbps;
- (ii) 128Kbps;
- (iii) 192Kbps;
- (iv) 256Kbps;

- (v) 384Kbps;
- (vi) 512Kbps;
- (vii) 768Kbps;
- (viii) 1024Kbps;
- (ix) 1536Kbps; and
- (x) 1984Kbps;

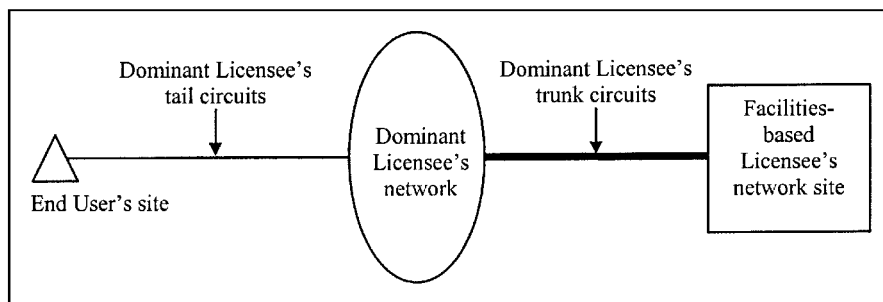
(b) in relation to trunk circuits, 1984Kbps.

8.4.4.3 The applicable wholesale prices for full local leased circuits (for multipoint-to-point connection) shall be based on a 30% discount off the prevailing standard retail prices of the Dominant Licensee's applicable retail tariff for full local leased circuits (for multipoint-to-point connection) in the CBD area, as approved by IDA. For the avoidance of doubt, these prices shall apply to circuits obtained in both CBD and non-CBD areas.

#### **8.4.5 Full Local Leased Circuits (for point-to-point connection)**

8.4.5.1 A full local leased circuit (for point-to-point connection) provides a dedicated link from an End User's site to the Facilities-based Licensee's network site at a single bandwidth (please see illustration in Diagram 1B below).

*Diagram 1B — Illustration of full local leased circuit  
(for point-to-point connection)*



8.4.5.2 The Dominant Licensee must offer to provide full local leased circuits (for point-to-point connection) at the following bandwidths:

- (a) 64Kbps;
- (b) 128Kbps;
- (c) 192Kbps;
- (d) 256Kbps;
- (e) 384Kbps;
- (f) 512Kbps;
- (g) 768Kbps;
- (h) 1024Kbps;

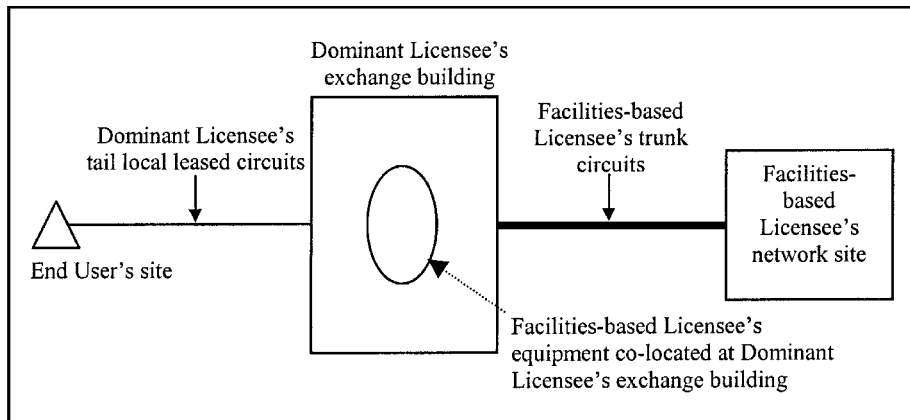
- (i) 1536Kbps;
- (j) 1984Kbps;
- (k) 2Mbps;
- (l) 45Mbps; and
- (m) 155Mbps.

8.4.5.3 The applicable wholesale prices for full local leased circuits (for point-to-point connection) shall be based on a 30% discount off the prevailing standard retail prices of the Dominant Licensee's applicable retail tariff for full local leased circuits (for point-to-point connection) in the CBD area, as approved by IDA. For the avoidance of doubt, these prices shall apply to circuits obtained in both CBD and non-CBD areas.

#### 8.4.6 Tail Local Leased Circuits

8.4.6.1 A Dominant Licensee must offer to allow a Facilities-based Licensee to obtain tail local leased circuits between an End User's site to the exchange building controlled by the Dominant Licensee nearest to and serving the End User's site (please see illustration in Diagram 2 below).

*Diagram 2 — Illustration of tail local leased circuit connection*



8.4.6.2 The Dominant Licensee must offer to provide tail local leased circuits at the following bandwidths:

- (a) 64Kbps;
- (b) 128Kbps;
- (c) 192Kbps;
- (d) 256Kbps;
- (e) 384Kbps;
- (f) 512Kbps;
- (g) 768Kbps;
- (h) 1024Kbps;

- (i) 1536Kbps;
- (j) 1984Kbps;
- (k) 2Mbps;
- (l) 45Mbps; and
- (m) 155Mbps.

8.4.6.3 The applicable wholesale prices for tail local leased circuits shall be based on a 50% discount off the prevailing standard retail prices of the Dominant Licensee's applicable retail tariff for local leased circuits in the CBD area, as approved by IDA. For the avoidance of doubt, these prices shall apply to circuits obtained in both CBD and non-CBD areas.

8.4.6.4 In offering to allow a Facilities-based Licensee to obtain tail local leased circuits between an End User's site to the exchange building controlled by the Dominant Licensee nearest to and serving the End User's site, the Dominant Licensee must also offer to provide co-location space at the exchange building for the purpose of enabling the Facilities-based Licensee to access the tail local leased circuits served by that exchange building, pursuant to Sub-paragraph 5.3.1 above. Should the Dominant Licensee be unable to offer co-location space at the exchange building due to actual space constraints or technical or operational considerations, the Dominant Licensee must allow virtual (distant) co-location, pursuant to Sub-paragraph 5.3.4 above.

#### **8.4.7 Other Applicable Requirements**

The Dominant Licensee must provide the local leased circuits to Facilities-based Licensees in a timely and non-discriminatory manner. The Dominant Licensee must provide the local leased circuits to Facilities-based Licensees that are of the same quality and capable of supporting the same transmission characteristics as those that it supplies to its End Users. The Dominant Licensee will retain responsibility for the maintenance and administration of the local leased circuits. The Dominant Licensee must provide maintenance and repair services on the local leased circuits to Facilities-based Licensees that are equivalent to the services that it provides to its End Users. To maintain the integrity of the local leased circuits and associated equipment, a Dominant Licensee may retain responsibility for performing the necessary cross-connections required to connect the Facilities-based Licensee's equipment to each local leased circuit provided.

Made this 18th day of February 2005.

LAM CHUAN LEONG  
*Chairman,*  
*Info-communications Development*  
*Authority of Singapore.*