

## **SCHEDULE 3B**

## **LINE SHARING**

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### **LINE SHARING**

#### **CONTENTS**

<b>1. SCOPE</b>	<b>1</b>
<b>2. AVAILABILITY OF LINE SHARING</b>	<b>2</b>
<b>3. ORDERING AND PROVISIONING PROCEDURE</b>	<b>3</b>
<b>4. RESPONSE TIME</b>	<b>3</b>
<b>5. DELIVERY</b>	<b>5</b>
<b>6. ACCESS TO DP</b>	<b>6</b>
<b>7. UNAUTHORISED ACCESS TO SHARED LINE</b>	<b>6</b>
<b>8. STANDARD TERMS AND CONDITIONS</b>	<b>7</b>
<b>9. ACCESS AND APPROVALS REQUIRED</b>	<b>9</b>
<b>10. FAULT REPORTING AND CLEARING</b>	<b>9</b>
<b>11. PROTECTION AND SAFETY</b>	<b>11</b>
<b>12. TERM OF LICENCE</b>	<b>11</b>
<b>13. SUSPENSION</b>	<b>12</b>
<b>14. TERMINATION OF LICENCE</b>	<b>12</b>
<b>15. SUB-LICENSING</b>	<b>15</b>

**ANNEX 3B.1: ORDER FOR LINE SHARING**

**ANNEX 3B.2: SPECTRAL COMPATIBILITY OF XDSL SYSTEMS PLAN**

**ANNEX 3B.3: SERVICE LEVEL GUARANTEES**

## **SCHEDULE 3B**

### **LINE SHARING**

#### **1. SCOPE**

- 1.1 This Schedule 3B sets out the terms and conditions under which SingTel will provide the Requesting Licensee with a licence for Line Sharing on a Shared Line for the sole purpose of the Requesting Licensee providing xDSL services using the same Local Loop that SingTel uses to provide POTS. Notwithstanding anything in this Schedule, the Requesting Licensee may use the Shared Line as an input for the provision of any telecommunication product or service to itself or its affiliates where the Requesting Licensee offers or intends to offer that telecommunication product or service (whether or not using the same Shared Line) to non-affiliated third party Customers. For this purpose, any reference in this Schedule to the term “Customer” shall, where appropriate, also refer to the Requesting Licensee or its affiliates.
- 1.2 The Requesting Licensee may seek Line Sharing on the Customer’s existing POTS Local Loop owned by SingTel subject to:
  - (a) the use by the Requesting Licensee of the Shared Line for the purpose of the Requesting Licensee providing xDSL services; and
  - (b) the terms and conditions of this Schedule.
- 1.3 This Schedule only applies to Requesting Licensees who are FBOs.
- 1.4 The timeframes in this Schedule relating to provisioning and fault rectification are subject to delays caused by events outside SingTel’s reasonable control, in which case such failure to fulfil the relevant Service Level Guarantee shall not constitute a breach of this Schedule or this RIO Agreement and clause 1.5 shall not apply, provided that SingTel notifies the Requesting Licensee as soon as practicable upon the occurrence of such delay, stating the cause of the delay and specifying a new date for the completion of the relevant provisioning or fault rectification which is extended for the period of such delays.
- 1.5 SingTel will provide the Service Level Guarantees in respect of Line Sharing as set out in Annex 3B.3. If SingTel fails to meet any Service Level Guarantees applicable to this Schedule and the failure to meet the Service Level Guarantees is

solely caused by SingTel, SingTel will provide a remedy to the Requesting Licensee in accordance with:

- (i) section 1 and 2 of Annex 3B.3 and any terms and conditions contained therein in respect of request and provisioning timeframes;
- (ii) section 3 of Annex 3B.3 and any terms and conditions contained therein in respect of fault rectification timeframes; and
- (iii) section 4 of Annex 3B.3 in respect of claims made under Annex 3B.3.

1.6 The Requesting Licensee acknowledges that the relevant remedy provided under clause 1.5 is a genuine pre-estimate of the Requesting Licensee's loss and will be the sole and exclusive remedy available to the Requesting Licensee for such failure to meet the relevant Service Level Guarantees for Line Sharing and shall be SingTel's sole and exclusive liability to the Requesting Licensee for such failure.

## **2. AVAILABILITY OF LINE SHARING**

2.1 SingTel will provide a licence for Line Sharing on a Shared Line to the Requesting Licensee in individual pairs; however the Requesting Licensee may apply for multiple licences for multiple pairs at the same address per application.

2.2 For the purposes of this Schedule, SingTel may have regard to the following when assessing the availability of a Shared Line:

- (a) whether the Customer has applied to terminate any contract with SingTel for SingTel's xDSL services which are provided using that Shared Line;
- (b) the Requesting Licensee's and other Licensees' requirements which have been ordered but not yet delivered or which have been provided;
- (c) security and confidentiality requirements or restrictions imposed on SingTel by Governmental Agencies; and
- (d) whether SingTel has plans or otherwise proposes to decommission the Local Loop, Sub Loop or POA within six (6) months from the date the Requesting Licensee requests the Shared Line.

### **3. ORDERING AND PROVISIONING PROCEDURE**

- 3.1 The Requesting Licensee may only lodge a Request for Line Sharing in accordance with this Schedule if the Customer of the Requesting Licensee has contracted with SingTel for the provision by SingTel of POTS.
- 3.2 The Requesting Licensee shall submit its Request for Line Sharing to SingTel in the form of Annex 3B.1 on a Business Day containing the following information:
- (a) the technical specifications, including the type of service to be offered and its signal power, frequency and bandwidth of the xDSL service the Requesting Licensee proposes to supply to its Customers;
  - (b) the Customer's name, premises address and telephone number for the Shared Line;
  - (c) authorisation from the lessee of the POTS for the provision of the Requesting Licensee's service over the Shared Line;
  - (d) where applicable, the name and location of the POA, Building MDF Room or Outdoor Cabinet; and
  - (e) where applicable, the POA, Building MDF or Outdoor Cabinet Tie Termination Pair allocated for connection, in relation to the Request for Line Sharing.

### **4. RESPONSE TIME**

- 4.1 SingTel shall process all Requests for Line Sharing on a 'first come, first served' basis up to the maximum amount specified in clause 4.3.
- 4.2 Within one (1) Business Day of the date on which SingTel receives the request for Line Sharing (**Request Date**), SingTel must notify the Requesting Licensee whether its application is accepted or rejected. The Requesting Licensee shall pay SingTel the application fee specified in Schedule 9 for the costs incurred by SingTel in processing the Request regardless of whether the Request for Line Sharing is successful or not. For the purposes of this Schedule 3B, the Request Date shall be determined as follows:
- (a) if the Request for Line Sharing is received before 12:00 noon on a Business Day, the Request Date is the Business Day the Request for Line Sharing is received; or

- (b) if the Request for Line Sharing is received at or after 12:00 noon on a Business Day, the Request Date is the next Business Day after the Business Day on which the Request for Line Sharing is received.
- 4.3 For each Business Day, SingTel shall process a combined total of no more than two hundred (200) wire pairs for Local Loop, Sub Loop, Line Sharing and Internal Wiring under Schedules 3A, 3B and 3C from all Licensees. Subject to clause 4.2, subsequent Requests shall overflow to the next Business Day and SingTel shall inform the Requesting Licensee of that overflow within one (1) Business Day of the Request Date.
- 4.4 SingTel may reject a Request for Line Sharing if:
- (a) the Requesting Licensee is not a FBO;
  - (b) the Request for Line Sharing is not in the prescribed form;
  - (c) the Request for Line Sharing does not contain all the required information;
  - (d) the information in the Request is incorrect or inaccurate;
  - (e) the equipment (including the splitters) and services that the Requesting Licensee proposes to use to provide the xDSL services may interfere with, or cause deterioration to, POTS supplied by SingTel; or
  - (f) the Shared Line requested will be used by the Requesting Licensee as an input for the provision of any telecommunication product or service to itself or its affiliates, and it is shown that the Requesting Licensee has no intention of offering that telecommunication product or service (whether or not using the same Shared Line) to non-affiliated third party Customers.
- 4.5 Where SingTel rejects the Request for Line Sharing, SingTel shall provide reasons explaining the basis for rejection.
- 4.6 SingTel shall provide a list of all equipment and services it currently knows to interfere with, or cause deterioration to, POTS supplied by SingTel within five (5) Business Days of receiving a request for that list from the Requesting Licensee. SingTel may amend the list of prohibited equipment and services from time to time.

- 4.7 If SingTel notifies the Requesting Licensee that SingTel has accepted the Request for Line Sharing, SingTel must complete its detailed processing and inform the Requesting Licensee within three (3) Business Days of the Request Date whether or not it is able to provide the Line Sharing, taking into account the following:
- (a) whether the Shared Line is available under clause 2;
  - (b) whether the Customer has contracted POTS from SingTel;
  - (c) whether the line is capable of supporting Line Sharing; and
  - (d) whether the Co-Location Equipment or the Subscriber Tie-Cable is operational at the point in time of SingTel's provisioning of Line Sharing.
- 4.8 Where SingTel notifies the Requesting Licensee that the Shared Line is unavailable under clause 4.7, SingTel shall provide an explanation of why it has determined the Shared Line to be unavailable.
- 4.9 If SingTel notifies the Requesting Licensee that Line Sharing is available, SingTel shall further notify the Requesting Licensee of the corresponding Circuit Reference number.

## **5. DELIVERY**

- 5.1 SingTel shall provide the Shared Line by the end of four (4) Business Days from the Request Date. SingTel shall notify the Requesting Licensee upon providing the Shared Line. If it cannot meet this date, SingTel shall notify the Requesting Licensee of the delay in installation. SingTel's obligation to provide Line Sharing under this clause 5.1 shall be conditional on the Requesting Licensee's Co-Location Equipment being installed and operational.
- 5.2 Unless otherwise stated, SingTel shall retain the responsibility for working at the SingTel Exchange MDF, Building MDF, SingTel Outdoor Cabinet and DP, including jumpering works at the SingTel Exchange Building, MDF, SingTel Outdoor Cabinet and Exchange MDF as well as termination of Internal Wiring to SingTel DP. The Requesting Licensee shall bear the Charges for such work carried out by SingTel.
- 5.3 SingTel will only use Jumper Wires conforming to CW6000 series with a nominal gauge of 0.5mm and use the proper tools for installing Jumper Wires at the Requesting Licensee's Termination Block.

- 5.4 The Jumper Wires shall be installed horizontally either left or right out from its starting Termination Block and then across the jumper field and vertically up or down to the destination Termination Block. Jumper Wires shall not be installed with any slack nor will they be left dangling to cause obstruction to the jumper field.
- 5.5 SingTel shall first verify any jumpering points assigned before recovering any unused Jumper Wire for the running of the new Jumper Wire for the connection of licensed Line Sharing.
- 5.6 SingTel shall promptly notify the Requesting Licensee on the completion of provisioning the Shared Line under clause 5.1.

## **6. ACCESS TO DP**

- 6.1 The Requesting Licensee shall not, and shall ensure that its employees, agents and contractors do not, at any time access the SingTel MDF, SingTel Outdoor Cabinet or SingTel's DP.
- 6.2 Where required, the Requesting Licensee shall submit an application requesting SingTel to jumper to a new Tie Cable pair. Subject to clause 4, SingTel will perform the jumpering within three (3) Business Days from the receipt of request. For the avoidance of doubt, the grant of a licence in respect of Line Sharing does not provide the Requesting Licensee with a licence to access SingTel's Distribution Point, Building MDF or Outdoor Cabinet that is associated with the Line Sharing.

## **7. UNAUTHORISED ACCESS TO SHARED LINE**

- 7.1 Without prejudice to any other rights SingTel may have (whether under contract, at law, or in equity), where SingTel identifies that the Requesting Licensee has accessed Shared Line without having obtained a licence in accordance with this Schedule 3B, SingTel may do any one or more of the following:
- (a) notify the Authority that a material breach of this Schedule 3B has occurred and request that the Authority grant its approval under clause 12.2 or 13.2 of the RIO Agreement (as the case may be) for SingTel to suspend or terminate this Schedule 3B;
  - (b) direct the Requesting Licensee to, within five (5) Business Days of the notice, remove its equipment that permits Line Sharing; and/or

- (c) direct the Requesting Licensee to, within two (2) Business Days of the notice, submit a Request for Line Sharing in accordance with clause 3.
- 7.2 The Requesting Licensee must pay SingTel's reasonable costs incurred in investigating the unauthorised use.
- 7.3 If the Requesting Licensee does not remove its equipment within five (5) Business Days of the notice under clause 7.1(b), SingTel may remove the equipment and the Requesting Licensee shall be liable for any reasonable costs associated with its removal.
- 7.4 If the Requesting Licensee is directed to submit a Request for Line Sharing under clause 7.1(c), the Requesting Licensee must provide documentary evidence of the date of installation as part of the Request for Line Sharing. If the Requesting Licensee is unable to provide credible documentary evidence substantiating the date of installation, the date of access shall be deemed to be the Effective Date of this RIO Agreement. The Requesting Licensee must pay the Charges in arrears calculated from the date of access in accordance with Schedule 9.
- 7.5 Where SingTel approves the Request for Line Sharing under clause 7.1(c), the Requesting Licensee must pay, within five (5) Business Days from the date of approval, SingTel's reasonable costs incurred in investigating the unauthorised use and the Charges in arrears calculated from the date of access (including the date of deemed access under clause 7.4) in accordance with Schedule 9.
- 7.6 If the Requesting Licensee fails to pay the arrears after five (5) Business Days from the date of approval, the Requesting Licensee must discontinue use and remove its equipment from the Shared Line within five (5) Business Days.
- 7.7 If SingTel rejects the Request for Line Sharing under clause 7.1(c), the Requesting Licensee must pay, within five (5) Business Days from the date of rejection, SingTel's reasonable costs incurred in investigating the unauthorised use and the Charges in arrears calculated from the date of access in accordance with clause 7.4 and the Requesting Licensee must discontinue use and remove its equipment from the Shared Line within ten (10) Business Days.

## **8. STANDARD TERMS AND CONDITIONS**

- 8.1 SingTel will be responsible for the maintenance and administration of the Shared Line and POTS under this Schedule.

- 8.2 SingTel shall provision Shared Lines in a timely and non-discriminatory manner, and take all feasible actions to provide Shared Lines that are suitable for digital signal transmission. For the avoidance of doubt, this clause 8.2 does not require SingTel to act in a manner that is over and above what SingTel provides to itself, its affiliates or its Customers.
- 8.3 At the minimum, SingTel must provide Shared Lines that are of the same quality, capable of supporting the same transmission characteristics, and perform at a level equivalent to the lines that it uses for its own Digital Subscriber Line services.
- 8.4 Except to the extent strictly necessary to accurately describe the service to actual or potential Customers, the Requesting Licensee shall not use SingTel's name, any SingTel's trademarks or the fact that any service is supplied using SingTel's Network in promoting the Requesting Licensee's service.
- 8.5 The Parties shall in good faith co-operate with each other and take reasonable measures to ensure that there is no interference with or deterioration to SingTel's existing services or those of a Third Party as a result of the Requesting Licensee's use of the Shared Line.
- 8.6 The Requesting Licensee shall be responsible to the Requesting Licensee's Customers for all aspects of operations and maintenance of the Requesting Licensee's services.
- 8.7 The Requesting Licensee shall not make physical contact with or otherwise interfere, change or damage SingTel's Building MDF, SingTel's Outdoor Cabinet, MDF Termination Block, Termination Pin, Jumper Wires, DP, or DP Termination Pin that is used to provide the SingTel POTS.
- 8.8 The Requesting Licensee shall be responsible for the installation and connection of a Tie Termination Block to access the licensed Shared Line. The Requesting Licensee may request to licence SingTel's Distribution Frame Mounting or Cabinet Distribution Frame Mounting subject to availability. For the avoidance of doubt, licence of Distribution Frame Mounting is not covered under this Schedule and is covered in Schedule 3D and Schedule 3E.
- 8.9 The Requesting Licensee acknowledges that if SingTel's and the Requesting Licensee's plant is damaged by a Third Party at the same location, SingTel has priority over the Requesting Licensee to work in SingTel's Building MDF, SingTel's Outdoor Cabinet, DP or damaged site.

- 8.10 The Parties acknowledge that licences in respect of:
- (a) SingTel's Distribution Frame Mounting is governed by Schedule 3D;
  - (b) Cabinet Distribution Frame Mounting is governed by Schedule 3E; and
  - (c) Co-Location for POA is governed by Schedule 8B.
- 8.11 Nothing in this Schedule vests in the Requesting Licensee any right, title or proprietary interest in the Shared Line or Jumper Wire.
- 8.12 The Requesting Licensee shall comply with the Spectral Compatibility of xDSL Systems Plan in Annex 3B.2 as developed and modified by SingTel from time to time and as approved by the Authority.
- 8.13 The Requesting Licensee shall provide both splitters at each end of the Shared Line to separate the Shared Line into two independent channels to avoid interference between the signals of the services on each channel.

## **9. ACCESS AND APPROVALS REQUIRED**

- 9.1 The Parties shall comply with clause 16.5 of the main body of this RIO Agreement in relation to the obtaining of all licences, permits, consents, waivers, authorisations and intellectual property or other rights required for the provision of the licensed Shared Lines.

## **10. FAULT REPORTING AND CLEARING**

- 10.1 Each Party must have or establish a Fault Reporting and Control Centre (FCC) to act as a single point of contact for the reporting and management of fault reporting and clearing. The FCC must be available twenty-four (24) hours a day, seven (7) days a week.
- 10.2 Each Party will perform fault analysis to determine the source of the fault and check that the fault does not lie within its Network before reporting the fault to the other Party.
- 10.3 Where a Party's use of the Shared Line interferes with the other Party's service, the other Party shall report the fault to the first mentioned Party.

- 10.4 Upon receipt of a fault report from SingTel under clause 10.3 with respect to interference by the Requesting Licensee's service with POTS or a SingTel or Third Party service which pre-existed the Requesting Licensee's service, the Requesting Licensee shall remove the cause of the interference within two (2) Business Days.
- 10.5 If the Requesting Licensee fails to remove the cause of the interference as required by clause 10.4, SingTel may immediately terminate the licence of the Shared Line under this Schedule and remove the Requesting Licensee's service. The Requesting Licensee shall pay SingTel for the cost incurred in the investigation and removal of the interference.
- 10.6 Upon receipt of a fault report from the Requesting Licensee under clause 10.3 with respect to interference by SingTel's service with a Requesting Licensee service which pre-existed SingTel's service, SingTel shall use its reasonable endeavours to investigate the cause of the interference experienced by the Requesting Licensee.
- 10.7 If SingTel determines that equipment of SingTel or a Third Party is the cause of the interference reported by the Requesting Licensee, then within a response time that is subject to the QoS standards for fault rectification specified in Annex 3B.3, SingTel shall either:
- (a) remove the cause of the interference; or
  - (b) where removal is not practicable, make reasonable arrangements to stop or ameliorate the impact of the interference on the Requesting Licensee.
- 10.8 Each Party shall maintain and store its own records of faults and repairs.
- 10.9 The Requesting Licensee shall compensate SingTel for the cost incurred in responding to a fault that is caused by the Requesting Licensee.
- 10.10 The Requesting Licensee acknowledges that SingTel may temporarily disconnect the Requesting Licensee's xDSL services at either the Exchange MDF, Outdoor Cabinet or Building MDF for SingTel to perform reasonable fault analysis and line testing on the Shared Line for up to three (3) hours. SingTel will use its reasonable endeavours to provide the Requesting Licensee with prior notice of any such disconnection.

- 10.11 If it is necessary to carry out any planned repair or upgrade to any equipment or facility forming part of the SingTel Shared Line, SingTel shall provide the Requesting Licensee with at least fourteen (14) Calendar Days written notice of such repairs or upgrades. SingTel shall take reasonable measures to minimise any service disruption to the Requesting Licensee. SingTel shall not be liable for any loss caused by such repair or upgrading.

## **11. PROTECTION AND SAFETY**

- 11.1 Each Party is responsible for the safe operation of its Network and in particular the safe operation of equipment within its Network on its side of the connection at the Subscriber Tie Cable Termination Pin or DP Termination Pin.
- 11.2 Each Party shall, so far as reasonably practicable, take all necessary steps to ensure that the licence of the Shared Line, its operations and its implementation of this Schedule:
- (a) do not endanger the safety or health of any person, including the employees and contractors of the Parties;
  - (b) do not damage, interfere with or cause any deterioration in the operation of the other Party's Network provided that SingTel's POTS and SingTel and Third Party services which pre-existed the Requesting Licensee's services shall take precedence; and
- 11.3 The Requesting Licensee shall not deploy any hazardous power feed onto the Shared Line licensed to it under this Schedule.

## **12. TERM OF LICENCE**

- 12.1 The term of a Line Sharing licence granted under this Schedule shall commence on the date that SingTel provides the Line Sharing and continues for the term of the RIO Agreement until the earlier of any of the following events:
- (a) either party terminates the Line Sharing licence in accordance with clause 14 of this Schedule;
  - (b) the SingTel RIO is revoked by the Authority under clause 13.7 of the RIO Agreement;

- (c) the Authority removes the requirement for SingTel to supply Line Sharing under the SingTel RIO or exempts SingTel from supplying Line Sharing under clause 13.8 of the RIO Agreement; or
- (d) subject to clause 12.2, the Requesting Licensee terminates the Line Sharing licence by giving SingTel not less than one (1) month prior written notice.

12.2 The Requesting Licensee may terminate the licence of the Line Sharing on less than one (1) month written notice, provided that the Requesting Licensee shall be liable for all recurring charges for the licence for Line Sharing for the period between the date of termination and the date that is one (1) month after the notice of termination.

### **13. SUSPENSION**

13.1 SingTel may suspend the Requesting Licensee's licence to Line Sharing at any time until further notice to the Requesting Licensee if the Line Sharing licence causes or is likely to cause physical or technical harm to any telecommunications network, system or services (whether of SingTel or any other person) including but not limited to causing damage, interfering with or causing deterioration in the operation of the SingTel Network.

13.2 Without limiting the exclusions or limitations of liability in this RIO Agreement, SingTel shall not be liable to the Requesting Licensee for any Loss resulting from, or in connection with, suspension of a licence under this Schedule under this clause 13.

### **14. TERMINATION OF LICENCE**

14.1 The Requesting Licensee may terminate its licence within five (5) Business Days from the date on which SingTel notifies the Requesting Licensee of delivery of the Shared Line under clause 5.1 of this Schedule, if the line condition is not suitable for the provision of xDSL service. The Requesting Licensee will be liable for all charges payable up to the date of termination but not for ongoing charges payable beyond the date of termination.

14.2 SingTel may immediately terminate a licence of Shared Line under this Schedule if:

- (a) the Requesting Licensee is no longer an FBO;

- (b) in SingTel's reasonable opinion, the Requesting Licensee is using the Shared Line in contravention of an applicable law, licence, code, regulation or direction and SingTel has the necessary confirmation from the relevant Governmental Agencies that the Requesting Licensee is in contravention of the applicable law, licence, code, regulation or direction;
  - (c) the Shared Line is:
    - (i) used for a purpose other than for the purpose of the Requesting Licensee providing xDSL services; or
    - (ii) used by the Requesting Licensee as an input for the provision of any telecommunication product or service to itself or its affiliates, and it is shown that the Requesting Licensee has no intention of offering that telecommunication product or service (whether or not using the same Shared Line) to non-affiliated third party Customers;
  - (d) the licence in respect of Co-Location Space to which the Shared Line is connected is terminated or expires;
  - (e) the Shared Line has become unsafe for its purpose;
  - (f) SingTel's right to own, maintain or operate the Shared Line is revoked or terminates or expires; or
  - (g) use of the Shared Line causes or is likely to cause physical or technical harm to any telecommunications network, system or services (whether of SingTel or any other person) including but not limited to causing damage, interfering with or causing deterioration in the operation of SingTel's Network.
- 14.3 SingTel may terminate the licence in respect of Line Sharing after giving the Requesting Licensee ten (10) Business Days prior written notice if the Requesting Licensee abandons its Shared Line or fails to activate service to an end user using the Shared Line within a reasonable period of obtaining it, and the Requesting Licensee did not dispute such written notice by SingTel.
- 14.4 If the supply of POTS by SingTel to the Customer to whom the Requesting Licensee is supplying its services is cancelled, expires or terminates, SingTel shall migrate the Requesting Licensee's licence for a Shared Line to a licence for a Local Loop or Sub Loop. If that Customer should subsequently require SingTel to re-supply POTS, SingTel may migrate the Requesting Licensee's licence for a

Local Loop or Sub Loop back to a licence for a Shared Line. For the avoidance of doubt, in either case, SingTel shall undertake the migration in such a manner that minimises disruption to the Requesting Licensee's provision of DSL services to its customers and the Requesting Licensee shall not be subject to the application process under Schedule 3A or 3B (as the case may be) in order to effect the migration.

- 14.5 Either Party (**Terminating Party**) may terminate a licence of Line Sharing if the other Party is in breach of this Schedule and such breach remains unremedied for a period of:
- (a) seven (7) Calendar Days after receiving notice from the Terminating Party to do so, if the breach is a service-affecting breach; or
  - (b) fourteen (14) Calendar Days after receiving notice from the Terminating Party to do so, if the breach is a non-service-affecting breach (including but not limited to failure to pay any sum for which the Requesting Licensee has been Invoiced).
- 14.6 If during the term of the Line Sharing licence, SingTel has plans to decommission any Shared Line licensed to the Requesting Licensee, SingTel may provide the Requesting Licensee with at least six (6) months prior notice of its intention to terminate such Shared Line licence.
- 14.7 If at any time during the term of a licence in respect of the Shared Line that the licence is to be terminated because of the closure of a POA or Building MDF room or Outdoor Cabinet, SingTel must give the Requesting Licensee at least six (6) months prior notice before such event, and if SingTel is unable to give such notice for circumstances beyond SingTel's reasonable control, SingTel must notify the Requesting Licensee as soon as practicable upon being aware of any pending closure of the POA or Building MDF room or Outdoor Cabinet. SingTel shall take reasonable measures to minimise the disruptions to the Requesting Licensee's operations that may result from the termination of access to the Shared Line. The Requesting Licensee shall bear its own cost associated with the closure of the POA or Building MDF room or Outdoor Cabinet and the termination of the licence to the Shared Line, and the Requesting Licensee shall be solely responsible for making such alternative arrangements as are necessary to continue to provide its Customers with the services it provided to them using the Shared Line. In the event that the Requesting Licensee requests assistance from SingTel within thirty (30) Business Days after receiving a notice under this clause to provide an alternative solution to the Co-Location Space which is being terminated SingTel shall use its reasonable endeavours to assist the Requesting

Licensee in finding suitable alternatives to the Shared Line that is the subject of termination provided that nothing in this clause shall restrict SingTel's right to terminate under this clause 14 and that the ultimate responsibility to find an alternative lies with the Requesting Licensee.

14.8 Upon expiry or termination of the licence of Shared Line:

- (a) the Requesting Licensee must immediately discontinue the use of the Shared Line; and
- (b) the Requesting Licensee must immediately disconnect all equipment connected to the Shared Line; and
- (c) SingTel will be responsible for removing jumpering.

14.9 Upon termination of the licence of Shared Line, the Requesting Licensee shall be liable to SingTel for the relevant termination Charge as specified in Schedule 9 other than in circumstances where the Requesting Licensee's discontinuation of the use of the Shared Line is a direct result of SingTel's decommissioning of the Shared Line under this Schedule 3B.

14.10 If the Requesting Licensee fails to disconnect its equipment from the Shared Line under clause 14.8(b), SingTel shall remove the Requesting Licensee's equipment. The Requesting Licensee shall pay to SingTel all reasonable costs associated with the work undertaken by SingTel including the disposal of the Requesting Licensee's equipment. The Requesting Licensee shall have no claim whatsoever against SingTel in connection with the removal of the Requesting Licensee's equipment from the Shared Line.

## **15. SUB-LICENSING**

15.1 The Requesting Licensee must not assign the licence in respect of or sub-let the Shared Line. For the avoidance of doubt, nothing in this clause places any restriction on the end users to whom the Requesting Licensee may resell services provided using the Shared Line.

# ANNEX 3B.1: ORDER FOR LINE SHARING

## ORDER FOR LINE SHARING

### The Requesting Licensee

Date of Application : \_\_\_\_\_ Application Reference Number : \_\_\_\_\_

POA/Building MDF Room/Outdoor Cabinet name and address:

☐ Request for Local Loop

POA Tie Termination Assigned : \_\_\_\_\_

☐ Request for Sub Loop

Building MDF Tie Termination Assigned : \_\_\_\_\_

Outdoor Cabinet Tie Termination Assigned : \_\_\_\_\_

### Technical Specification

Type of xDSL Service to Share Bandwidth : \_\_\_\_\_

Signal Power : \_\_\_\_\_

Frequency and Bandwidth : \_\_\_\_\_

Customer Name : \_\_\_\_\_

Customer Address : \_\_\_\_\_

Customer Telephone Number : \_\_\_\_\_ Singapore : \_\_\_\_\_

### On Behalf of the Requesting Licensee

Sign : \_\_\_\_\_ Name of Requesting Licensee: \_\_\_\_\_

Name : \_\_\_\_\_ (Company Name)

Designation : \_\_\_\_\_

Department : \_\_\_\_\_

Contact Number : \_\_\_\_\_ Company Stamp : \_\_\_\_\_

Fax Number : \_\_\_\_\_

### SingTel's Reply to the Requesting Licensee

☐ Application returned - incomplete/illegible

☐ Not Approved Reason for Rejection : \_\_\_\_\_

☐ Approved Circuit identification Number : \_\_\_\_\_

SingTel Approval Code : \_\_\_\_\_

### On Behalf of SingTel

Sign : \_\_\_\_\_ Contact Number : \_\_\_\_\_

Name : \_\_\_\_\_ Fax Number : \_\_\_\_\_

Date : \_\_\_\_\_

### Processing Status

Received Date : \_\_\_\_\_ Queue Status : \_\_\_\_\_ Processed Date : \_\_\_\_\_

## **ANNEX 3B.2: SPECTRAL COMPATIBILITY OF xDSL SYSTEMS PLAN**

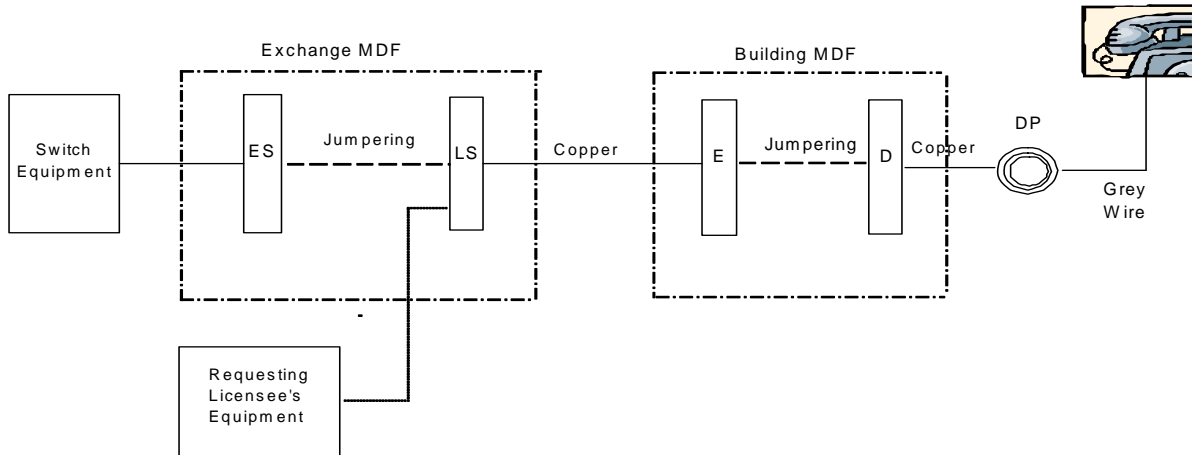
### **1. Scope**

- 1.1 This Annex (the “**Spectral Compatibility of xDSL Systems Plan**”) forms part of this Schedule of SingTel’s Reference Interconnection Offer (**RIO**), which specifies the terms and conditions with which Requesting Licensee must comply when providing services using xDSL technology over SingTel’s UNE.
- 1.2 This Annex covers the technical requirements and the relevant test requirements for Requesting Licensee Equipment and Customer Premise Equipment (**CPE**) for the purpose as stated in clause 1.1 above.
- 1.3 The Annex is intended to minimize the risk of possible Cross-talk interference with existing loop transmission systems and services located in other cable pairs within the same cable sheath. Such undesirable Cross-talk interference could cause unacceptable degradation of performance of the existing loop transmission system and/or services in the SingTel network.
- 1.4 This Annex does not guarantee system performance for any Requesting Licensee’s deployed system.
- 1.5 SingTel will periodically (or where required by the Authority) review this Annex to ensure its validity, and to amend the plan to provide for such other xDSL technologies.

### **2. Requesting Licensee’s Network Reference Configurations**

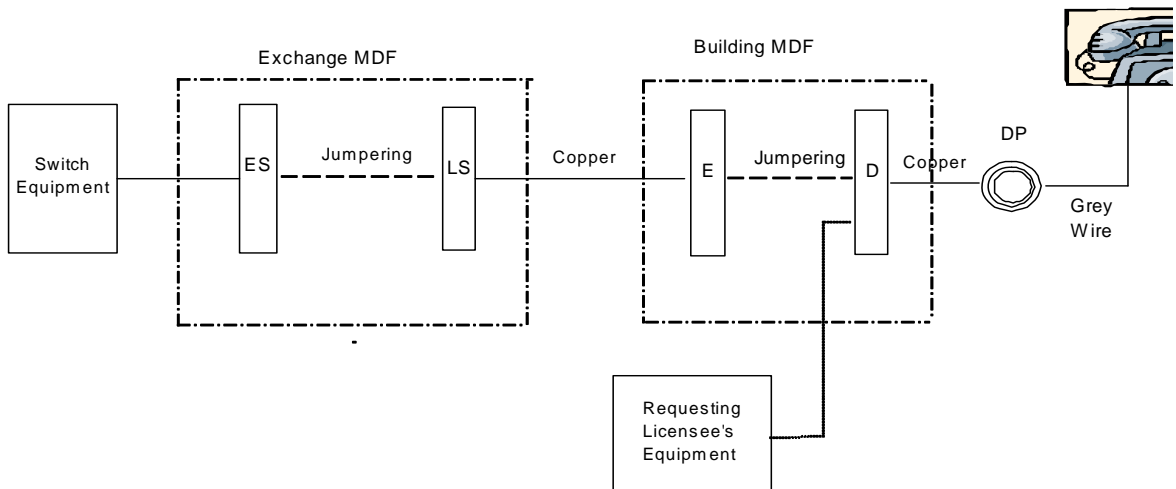
- 2.1 There are two possible configurations.
- 2.2 Figure 1 depicts Configuration 1 in which the Requesting Licensee uses SingTel’s Local Loop between the Exchange MDF and the customer.
- 2.3 Figure 2 depicts Configuration 2 in which the Requesting Licensee uses SingTel’s Sub Loop between the Building MDF room and the customer.

### Network Configuration 1



**Figure 1**

### Network Configuration 2



Note: POTS could also be provided through fibre-based DLC system which is located in Building MDF

**Figure 2**

**3. Cross-Talk information (extract from ANSI T1E1.4/2000, Spectrum Management Draft Standard)**

- 3.1 The electromagnetic energy that couples into a metallic cable pair from services and transmission system technologies in use on other pairs in the same cable unit is unwanted energy, and is called “Cross-talk noise” (“Cross-talk”).
- 3.2 Cross-talk is sensitive to frequency, signal strength, and exposure. High frequency energy couples into other pairs more easily than low frequency energy because as the signal frequency increases, the Cross-talk coupling loss between the pairs of a cable decreases. Hence, for two signals of equal strength, the higher the frequency, the greater the Cross-talk noise which is produced.
- 3.3 A strong signal will therefore transfer more power into other pairs than a weaker signal will. The amount of Cross-talk noise is directly proportional to the power of the disturbing signal. The stronger the signal, the greater the Cross-talk noise.
- 3.4 Exposure is a measure of the proximity of metallic pairs at various points along a cable and the length over which pairs are in close proximity. The greater the exposure, the greater the total Cross-talk noise.

**4. Performance Requirement of Requesting Licensee’s Equipment**

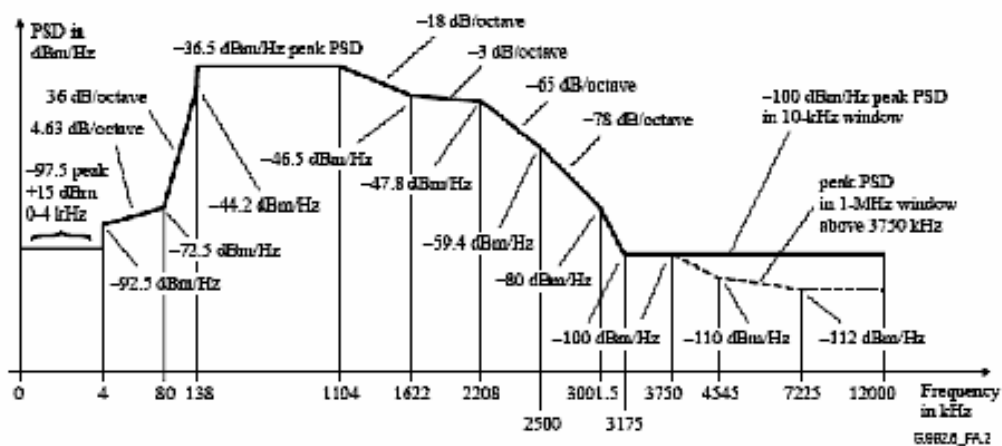
- 4.1 As strong signals create more Cross-talk noise than weaker signals, the most effective and widely used method of controlling Cross-talk interference is through the use of Signal Power Limitation. Signal Power Limitations specify the amplitude, frequency distribution, and total power of electrical signals at the point where the signal enters the subscriber loop cable.
- 4.2 To minimize and control the Cross-talk interference introduced by Requesting Licensee’s Equipment into the existing loop transmission systems and services, the performance requirements in this clause specify power limits in terms of:
- Transmitted Power Spectral Density (PSD); and
  - Total Aggregate Transmit Power.
- 4.3 The Signal Power Limitations apply to signals transmitted by DSL transceiver units located in local exchanges or Building MDF room (ATU-C) or a remote terminal location (ATU-R) that is usually at the customer premises. This Annex specifies both PSD and total average power for both upstream (the signal

travelling away from the customer) and downstream (the signal travelling toward the customer) signals

- 4.4 The characterization of a transmitted signal by power level and frequency content is called the power spectral density (PSD) of the signal. The primary signal power requirements in this plan are specified through the use of PSD masks and templates. The PSD mask shows the maximum power boundary or limit, in dBm per Hz, for the transmitted signal.
- 4.5 The Requesting Licensee's equipment must not transmit a signal above the PSD Mask or which exceeds the total aggregate power for both upstream and downstream signals.
- 4.6 The PSD masks and templates are drawn from the ANSI T1 E1.417 Spectrum Management and ITU-T G992.5 which is intended for xDSL transmission systems that use ATU-C equipment and operate in the frequency spectrum from approximately 138 kHz to approximately 2208 kHz and ATU-R equipment that operates in the frequency spectrum from approximately 25.875 kHz to approximately 138 kHz.

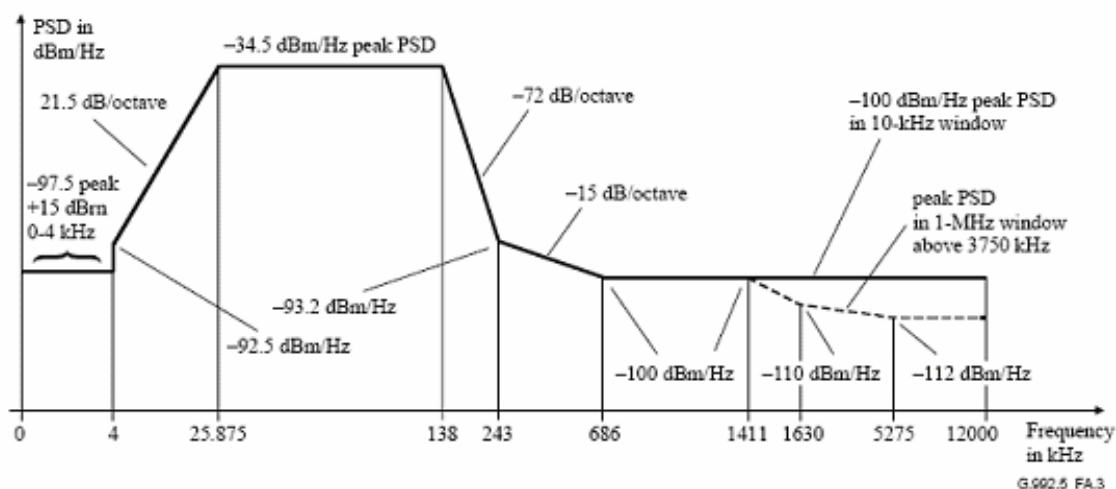
#### 4.7 PSD template (Downstream)

##### PSD template definition for downstream transmission



#### 4.8 PSD template (Upstream)

##### PSD template definition for upstream transmission



#### 4.9 Total aggregate transmit power (Downstream)

Total aggregate transmit power between 138 kHz and 2208 kHz that is transmitted by the ATU-C shall not exceed 20.4 dBm.

#### 4.10 The total aggregate transmit power (Upstream)

The total aggregate transmit upstream power below 138 kHz that is transmitted by the ATU-R shall not exceed 12.5 dBm.

- 4.11 There is a higher potential for Cross-talk in Configuration 2 since the Requesting Licensee's equipment is deployed nearer to the customer than under Configuration 1. To reduce such risk, the Requesting Licensee equipment must have Power Cutback feature as specified in ITU standard G992.1, G992.2, G992.3, G992.4 and G992.5.

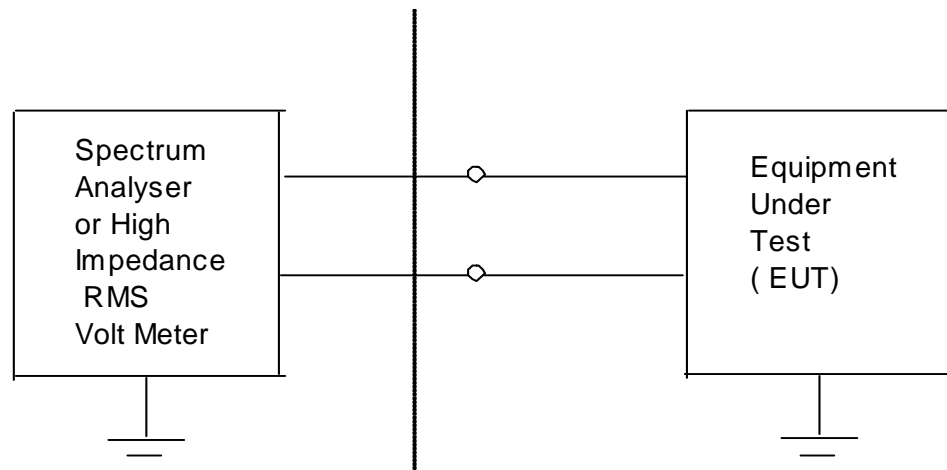
#### 4.12 Reverse Mode operation

- 4.12.1 Reverse Mode Operation occurs when the ATU-C equipment as defined in the relevant Recommendation ITU G992.1, G992.2, G992.3, G992.4 and G992.5 is used to transmit in the reverse direction, that is away from the customer.

4.12.2 Such Reverse Mode Operation will cause unacceptable Cross-talk interference and performance degradation and is not allowed under this Annex.

## 5. Test and Measurement Methods

5.1 Measurement setup for PSD and total average power measurement is shown in Figure 3 below.



**Figure 3 PSD and Total Average Power measurement set up.**

### 5.2 Total average power measurement

5.2.1 The total average power shall be measured and averaged over a time span of at least 10 seconds.

### 5.3 Power spectral density (PSD) measurement

5.3.1 The PSD is measured by averaging the observed output power of the EUT on each of a number of contiguous, regularly spaced, small frequency bands, with each frequency band having a defined resolution bandwidth as shown in the Table below:

### **Resolution bandwidth for measuring an EUT PSD**

<b>Frequency Band</b>	<b>Resolution Bandwidth</b>
$f \leq 10 \text{ kHz}$	100 Hz
$10 \text{ kHz} < f \leq 25.875 \text{ kHz}$	1 kHz
$25.875 \text{ kHz} < f \leq 3.1 \text{ MHz}$	10 kHz
$3.1 \text{ MHz} < f \leq 30 \text{ MHz}$	100 kHz

- 5.3.2 frequency point of a PSD (corresponding to a measurement in a single resolution bandwidth) shall be measured by averaging the power in the resolution bandwidth of that frequency point for a time period of at least 2.0 seconds. This requirement is equivalent to setting the sweep time for a single sweep of a spectrum analyzer for a duration equal to at least 2.0 seconds per frequency point.
- 5.3.3 The EUT shall be tested while it transmits maximum power and maximum PSD levels at all frequencies over which it can transmit data when deployed. The EUT shall not have any power cutback enabled during testing
- 5.3.4 The EUT input shall consist of a pseudo-random uniformly distributed data sequence, and the EUT output shall be a fully modulated transmitted signal with all overhead, framing, coding, scrambling, modulation, filtering and all other operations performed on the data stream that the modem would normally perform while transmitting data.

## **6. Definitions**

The following definitions apply to this Annex:

**“Cross-talk”** means the unwanted electromagnetic energy that couples into a metallic cable pair from services and transmission system technologies in use on other pairs in the same cable unit.

**“Downstream”** means signals sent using xDSL technology from the network towards the customer.

**“DSL”** means Digital Subscriber Line technology.

**“Signal Power Limitation”** means the specific amplitude, frequency distribution, and total power of electrical signals at the point where the signal enters the subscriber loop cable as specified in this Annex.

**“Upstream”** means signals sent from the customer towards the network.

## ANNEX 3B.3: SERVICE LEVEL GUARANTEES

### 1. REBATES FOR LINE SHARING REQUEST TIMEFRAMES

<b>Missed notification timeframe as to whether Request for Line Sharing is accepted or rejected (clause 4.2) by:</b>	<b>Rebate</b>
1-30 Calendar Days	Number of days of delay x weekly recurring Charge
More than 30 Calendar Days	30 x weekly recurring Charge

<b>Missed notification timeframe as to response to Line Sharing Request following detailed processing (clause 4.7) by:</b>	<b>Rebate</b>
1-30 Calendar Days	Number of days of delay x weekly recurring Charge
More than 30 Calendar Days	30 x weekly recurring Charge

### 2. PROVISIONING TIMEFRAMES

#### (a) QOS STANDARDS

<b>Indicators</b>	<b>QOS Standards (monthly basis per Requesting Licensee)</b>
% of Line Sharing completed:	
(i) within 4 Business Days from the Request Date (clause 5.1)	Business 95% Residential 95%
(ii) within 4 Business Days after time specified in part (i) above	Business 100% Residential 100%

**(b) REBATES FOR LATE PROVISIONING BEYOND THE PROVISIONING TIMEFRAMES  
QOS STANDARDS**

<b>Falling below QOS Standards in section 2(a) by:</b>	<b>Rebate<sup>1</sup></b>
95% (i.e. In any month, SingTel does not provision at least 95% of requests in that month, within 4 Business Days)	Number of calendar days of delay <sup>2</sup> beyond 4 Business Days (in any case, not exceeding the 8 <sup>th</sup> Business Day) from Request Date for services that fall below QOS Standards x weekly recurring Charge
100% (i.e. In any month, SingTel does not provision 100% of requests in that month, within 8 Business Days)	Number of calendar days of delay <sup>2</sup> beyond 8 Business Days from Request Date for services that fall below QOS Standards x weekly recurring Charge

<sup>1</sup> In any case, the total amount of rebate claimable for any one service that falls below the QOS Standards is capped at a maximum quantum of (30 Calendar Days x weekly recurring Charge).

<sup>2</sup> For purposes of determining the number of days of delay, the services that SingTel took the most number of days to deliver will form the basis of computation.

**3. FAULT RECTIFICATION TIMEFRAMES**

**(a) FAULT REPAIR QOS STANDARDS**

<b>Indicators</b>	<b>QOS Standards (monthly basis per Requesting Licensee)</b>
% of faults fixed (from time of fault reported to fault fixed) within:	
(i) 24 hours	Business 90% Residential 90%
(ii) 48 hours	Business 98% Residential 98%
(iii) 72 hours	Business 99.9% Residential 99.9%

**(b) REBATES FOR UNAVAILABILITY BEYOND FAULT REPAIR QOS STANDARDS**

<b>Falling below fault repair QOS standards in section 3(a)</b>	<b>Rebate<sup>3</sup></b>
90% (i.e. In any month, SingTel does not complete at least 90% of the fault rectification requests in that month, within 24 hours)	Weekly recurring Charge x number of faults that fall below QOS Standards
98% (i.e. In any month, SingTel does not complete at least 98% of the fault rectification requests in that month, within 48 hours)	Weekly recurring Charge x number of faults that fall below QOS Standards
99.9% (i.e. In any month, SingTel does not complete at least 99.9% of the fault rectification requests in that month, within 72 hours)	Number of days of delay for faults that fall below QOS Standards x weekly recurring Charge

<sup>3</sup> In any case, the total amount of rebate claimable for any one fault that falls below the QOS Standards is capped at a maximum quantum of (30 Calendar Days x weekly recurring Charge).

**4. CLAIM PROCEDURES**

- (a) A claim by the Requesting Licensee shall be made in writing within fourteen (14) Calendar Days of the completion of the relevant Calendar Month on which the QOS Standards are measured. The amount in respect of any claim shall be paid to the Requesting Licensee in the form of a rebate. The Requesting Licensee acknowledges that a failure to make a claim within the specified timeframes under this paragraph means that the Requesting Licensee waives any entitlement to the Service Level Guarantee payment in respect of that claim.
- (b) If the Requesting Licensee is entitled to a rebate pursuant to the claim made hereunder, then the amount of the rebate will be credited into the Requesting Licensee's account after it has been processed by SingTel and will be reflected in SingTel's bill to the Requesting Licensee in accordance with SingTel's billing cycle.
- (c) The guarantee and rebates provided by SingTel under this Annex are:

- (i) of an ex-gratia nature and personal to the Requesting Licensee and are non-transferable; and
  - (ii) subject to this Schedule.
- (d) Despite anything to the contrary in this section, if the Requesting Licensee qualifies for any claim under this Annex, SingTel shall honour its obligations in respect of that claim but in the event of a dispute as to whether the Requesting Licensee qualifies for a claim or as to the quantum of the claim payable to the Requesting Licensee, the dispute shall be resolved in accordance with the Dispute Resolution Procedures in Schedule 11 of the RIO, or in the case of a Billing Dispute, in accordance with Schedule 10 of the RIO.