

**RIO ANNEXURES**

## TABLE of CONTENTS

[ANNEX A - DEFINITIONS 3](#_bookmark0)

[ANNEX B - BILLING AND PAYMENT 8](#_TOC_250000)

[ANNEX C - MANAGEMENT OF INTERCONNECTION 15](#_bookmark2)

[ANNEX D - TECHNICAL INFORMATION 17](#_bookmark3)

[ANNEX E - INTERCONNECTION PROCESSES 26](#_bookmark4)

ANNEX F - INTERCONNECTION SERVICE SCHEDULES…………………………………………………………………………..………………35

# ANNEX A - DEFINITIONS

A.1 In this Offer, the following words and expressions shall have the meaning assigned to them in the list below:

|  |  |
| --- | --- |
| **Term** | **Definition** |
| Access Codes | Short codes which allow end-users to access specific services as defined in the National Numbering Plan. |
| Autonomous System (AS) | The administrative domain relevant to a given IP Network or set of Networks that share common resources such as an IP addressing plan and a common policy withrespect to Internet access. |
| ATM Asynchronous Transfer Mode | Billing Information That information which must be provided by the Billing Licensee, in accordance with the Interconnection Guidelines, in support of invoices issued under an acceptance of this Offer, as agreed by BTC and the Licensee to enable the billed Licensee tovalidate an invoice. |
| Billing Licensee | The Licensee requiring payment from the other Licensee for the provision of interconnect services to that Licensee. |
| Border Gateway | The routing equipment that connect an IP Network with other IP Networks. |
| Border Gateway Protocol (BGP) | Inter-autonomous system routing protocol, designed to exchange network access information with other BGP systems. The information includes data on the list of Autonomous Systems (AS) which is sufficient to construct a graph of AS connectivity from which routing loops maybe pruned and some policy decisions at the AS level may be enforced. |
| Call | A transmission path through telecommunications networks for the sending of messages within the voice band, and a reference to conveyance of a Call by a Licensee means the establishment by that Licensee of a transmission path through that Licensee's Network and the conveyance by that Licensee in accordance with an acceptance of this Offer of a message (if any) oversuch transmission path. |
| CCITT | Abbreviation for International Telegraph and Telephone Consultative Committee; a predecessor organization of the ITU-T. |

|  |  |
| --- | --- |
| CLI | Calling Line Identification as defined by the ITU-T. |
| Customer Number Range | Any number range, either geographic or non-geographic, from which individual numbers or groups of numbers are assigned to specific end user customers. |
| Data Management Amendment | Such data reconfiguration of the BTC Network or theLicensees Network as is necessary for the access, routing and charging of Calls. |
| Day | The 24-hour period during which the Earth completes one rotation on its axis. |
| Digital DistributionFrame | A device on which a jumper cable is connected toestablish a connection between two separate Networks. |
| Disclosing Licensee | A Licensee disclosing to the Receiving Licensee information under the Interconnect Agreement. |
| Each Licensee BTC | BTC and the other Licensee |
| External BorderGateway Protocol (eBGP) ... | Routing protocol designed to connect large networks which are mainly Autonomous Systems (AS). |
| other Licensee | BTC or the other Licensee |
| Grade of Service | The collective term for a series of metrics that measure for example transmission loss and Answer seize ratios.These measures are intended to define the overall grade of service levels intended on a given service. |
| Intellectual Property Right | Any patent, copyright, design, trade name, trademark, service mark or other intellectual property right (whether registered or not) including without limitation ideas, concepts, know-how, techniques, designs, specifications, drawings, blueprints, tracings, diagrams, models and other information relating to any suchintellectual property. |
| Interconnect or Interconnection | The physical linking of the Telecommunications Systems in order to allow the Users of one Telecommunications Systems to communicate with Users of the same or another Telecommunications Systems or to access services provided by another Licensee. |
| Interconnect Node | An exchange at which Interconnect Services can be installed between the BTC and the Licensee networks. |
| Interconnect orInterconnection Agreement | An agreement to be signed by and between BTC and the Licensee for the purposes of Interconnection. |

|  |  |
| --- | --- |
| Interconnection Guidelines | The Interconnection Guidelines - Final, dated 14th October 2002, as approved by the BOCRA Board of Commissioners on 25th of November 2002, as amended from time to time. |
| Interconnect Link | A single 2 Mbps circuit between a BTC Interconnect Node and the Licensees Interconnect Node. |
| Interconnect Path | A physical route over which a minimum 1x2 Mbps Interconnect Links between a BTC Interconnect Node and a Licensee Interconnect Node are installed |
| Interconnect Service | A telecommunications service provided in accordance with an Interconnection Agreement, which may include link services, call conveyance services, data services and collocation facilities, all of which being provided for the purpose of Interconnection. |
| IP International Gateway | The routing equipment which connects the BTC IP Network to global Internet exchanges |
| Internet | The worldwide interconnection of private and public Router-based Networks via Gateways and exchange points, and which all utilize the Internet Protocol (IP). |
| IP | Internet Protocol |
| IP Network | A Network using the Internet Protocol for data transmission. |
| IP Traffic | Data traffic conveyed using Internet Protocol ITU-The International Telecommunications Union, Telecommunications sector |
| BTC Network | The total infrastructure operated by BTC to provide telecommunications services |
| BTC VoiceInterconnect Node | An exchange at which Interconnect Services for the conveyance of calls in the voice band can be installed between the BTC and a Licensees network. |
| ITU-T | The International Telecommunications Union, Telecommunications sector |
| License Agreement | The License Agreement signed by and between BOCRA and BTC on the 23rd of January 2000. |
| Licensees | BTC and the Licensee |
| Licensee | Any legal person granted a Licence by BOCRA pursuantto the Telecommunications Law and entitled for Interconnection under the Interconnection Guidelines. |
| Licensee Network | The total infrastructure operated by the Licensee to provide telecommunications services. |

|  |  |
| --- | --- |
| Network Alteration | A physical change, including modifications to the technical standards related to Interconnection interfaces, within one Licensees Network which is necessitated, to ensure continued efficient operation of the Interconnect, by a change made by the other Licensee to any acceptance of this Offer without bi-lateral agreement. |
| Network Plan | The specific agreement of the characteristics of reciprocal interconnection services between BTC and the Licensee including, but not limited to, target grade of service, traffic routing principles, active number ranges, capacity and traffic forecasts. |
| Network | The BTC Network or the Licensee Network as the case may be |
| Numbering Plan | The Numbering Plan of Botswana as amended from time to time by BOCRA |
| Offer | This Reference Interconnect Offer |
| Operations and Maintenance Manual | A separate document that sets out the processes and principles by which BTC and the Licensee shall maintain and operate the capacity and traffic that makes up theNetwork Interconnection between their respective Networks |
| Patch Panel | The interface provided by BTC to the Licensee for the connection of its routing equipment. |
| Radial | Radiating from or converging to a common centre,which shall be the BTC Interconnect Node. |
| Receiving Licensee | A Licensee receiving any information from the Disclosing Licensee, under the Interconnect Agreement. |
| Reference Interconnect Offer | A Reference Interconnection Offer (RIO) is a publicly available document published by a Designated Licensee defining a standard set of technical and commercial terms by which the Designated Licensee offers interconnection services to other Licensees. It forms the basis of a transparent offer by the Designated Licensee to contract with another Licensee through a standard interconnection agreement. |

|  |  |
| --- | --- |
| Requested Licensee | Either BTC or the Licensee who has been requested by the other, under the Interconnection Agreement, to carry out some activity in relation to the Interconnect or Interconnect Services. |
| Requesting Licensee | Either BTC or the Licensee requesting the other, under the Interconnection Agreement, to carry out some activity in relation to the Interconnect or Interconnect Services. |
| RIPE database | The independent register of allocation and assignment of IP address space and Internet routing information. |
| Router | The equipment which performs the routing function in an IP Network, i.e. the process of setting Network path and processing IP packets, based on the addressing information contained in IP packets. |
| SDH | Synchronous Digital Hierarchy |
| Telecommunications System | Any transmission or switching device or other device or instrument used to convey, receive or transmit telecommunications signals for the purpose of providing Public Telecommunications Services. |
| Third Party | Any Party, other than BTC and the Licensee |
| BOCRA | Botswana Communications Regulatory Authority |
| Voice | Shall mean the conveyance of traffic in the voice band. |

Terms or expressions that are not defined in the above list shall have the same meanings assigned to them in the BOCRA Guidelines on Interconnection.

# ANNEX B - BILLING AND PAYMENT

**B.1 DEFINITIONS**

B.1.1. In this Annex B, a reference to a clause unless stated otherwise, is to a clause of this Annex B. Words and expressions have the meaning given in Annex A.

* 1. **RECORDING OF BILLING INFORMATION**
		1. Subject to paragraph B.2.2, BTC and the Licensee shall, for each individual Call for which the Billing Licensee collects end user payments, record (whether in bulk or on an itemized Call basis) and process in accordance with paragraph B.2.2, the Billing Information.
		2. The following shall be recorded for each Call type for which there is a Service Schedule and shall be based upon call data records:
			1. Interconnect switch identifier; and
			2. the dialed digits and/or such other information as may be agreed; and
			3. CLI and
			4. the date and the time when the Answer Signal is received by the Licensee providing the Billing Information; and
			5. Chargeable Call Duration (whether measured or derived); and
			6. The service type involved to the level of detail specified in the relevant Service Schedule.
		3. The Billing Licensee shall provide with the invoice appropriate support Billing Information, as outlined in clause B.3, to enable the non-billing Licensee to validate the invoice.
	2. **EXCHANGE OF BILLING INFORMATION**
		1. The Billing Licensee shall process the information specified in paragraph

B.2.2 so as to produce the matrix outlined below in Table 1, which shall be referred to as the Interconnect Usage Report.

Table 1: Interconnect Usage Report

|  |  |
| --- | --- |
| **Call Type** | **Peak/Off Peak** |
| Service Type | Number of call (N) | Number of Minutes (M) | Rate per Minute | Revenue (R) |
| Total | ∑N | ∑M |  |  | ∑R |

or such other form of Interconnect Usage Report as the Licensees may from time to time reasonably agree.

Where: N = the total number of Calls

M = the total Chargeable Call Duration

R = the total Revenue Charge which shall comprise of:

M x Rate per minute; or N x Rate per call; or M x Rate per minute plus N x Rate per call

* + 1. For the avoidance of doubt, the Interconnect Usage Report table shall be produced for all traffic.
		2. For charging and accounting purposes, calls shall be considered to fall entirely within the charge period in which they started.
		3. The Interconnect Usage Report shall be provided by the Billing Licensee to the other Licensee together with the resulting invoice within 4 weeks from the end of the Billing Period.
		4. The Billing Period for Interconnect Traffic shall be monthly commencing from 00.00 hours on the 1st day of each Calendar month or such other time as may be agreed from time to time between the Licensees. The end of each Billing Period shall be 24 hours on the last day of each Calendar month, or such other time as may be agreed from time to time between the Licensees.
		5. The Billing Licensee shall, for a period of 24 (twenty-four) months after each Billing Period, store the Billing Information in such summary format and in such amounts as shall be sufficient to recalculate the amounts due from one Licensee to the other to take account of changes in the relevant prices.
		6. If the Network or the Billing System of either BTC or the Licensee malfunctions and fails to provide all of the Billing Information necessary for the Billing Licensee to prepare an invoice, the other Licensee shall at

the request and reasonable expense of the Billing Licensee use its reasonable endeavours to supply the missing Billing Information to the Billing Licensee. There shall be no legal liability on the Billing Licensee for the preparation of an incorrect invoice resulting from inaccuracies in such Billing Information provided by the other Licensee to the Billing Licensee. BTC and the Licensee acknowledge that Billing Information supplied by the other Licensee pursuant to this clause B.3.7 shall have been supplied via a suitable system and that neither BTC nor the Licensee can warrant that the information is free of error.

* + 1. If the Licensees monitoring of their respective Billing Information indicates a persistent inconsistency in reconciling Billing Information provided by the Licensees respective Billing Systems, the Licensees shall use their reasonable endeavours to ascertain the cause of such inconsistency, including, subject to the agreement between BTC and the Licensee, the reference of the matter for investigation and resolution by such appropriate independent consultant as BTC and the Licensee may agree, or in default of agreement, as may be nominated by BOCRA. Such independent consultant shall act as an expert and not as arbitrator and whose decision, in the absence of manifest error, shall be final and binding. The Licensees shall co-operate in such investigation. The independent consultants’ costs for such investigation shall be paid by the Licensees in such proportions as the independent consultant shall decide.
		2. In the event of undetected errors in the Billing Information which result in either under or over invoicing and payment, BTC or the Licensee may request a review of the Billing Information for any Billing Period within 6(six) months of the date of the end of that Billing Period.
		3. In the event of the Billing Information not being available to BTC or the Licensee in time to produce the monthly invoice, BTC and the Licensee shall agree that an invoice may be produced based on estimated Billing Information. This estimate shall be derived using the following formula for the required detail of each separate traffic stream in the Services Schedules;
* Traffic Month N = Traffic Month (N-1)
* This method of estimating invoices shall not be used for consecutive months.
	+ 1. The Billing Licensee must advise the Billed Licensee of the fact that any invoice is estimated together with the reasons for using estimates.
		2. Final clearing of estimated Invoices must take place within three (3) months of the date of issue of the estimated invoice.
		3. For the avoidance of doubt, where the discrepancy between billing records is less than three percent (3%), the Licensee shall pay the invoiced amount in full.
		4. Reconciliation of traffic flows between the Licensees shall occur monthly before invoicing, while payment of invoices shall occur within one (1) calendar month of the invoice date.
	1. **BILLING RECONCILIATION**
		1. During an interconnection Billing Reconciliation Process, Licensees shall work together in good faith, taking more frequent measurements and exchanging detailed information if necessary.
		2. In the event that there is a marginal difference of more than 3% in the traffic billed the parties are to:
			+ - Exchange daily traffic measurements for the month in question
				- Identify the days with the largest traffic and amount variances
				- Exchange Call data records (CDRs) for the identified days
				- Furthermore, the parties agree to provide each other with reasonable and appropriate access to their technical support staff to investigate and rectify the cause of the variance.
		3. Time to reach a final reconciliation of any invoice in dispute is three (3) months from the date of receipt of the request for calculation subject to

Botswana Tax Regulations. If a resolution is not reached, the matter shall then be resolved according to the formal dispute process referred to herein.

* 1. **VIOCE INTERCONNECT, TRANSMISSION AND VOICE INTERCONNECT EXTENSION LINK BILLING**
		1. This Clause refers to the Services defined in Service Schedules 1and 4.
		2. Billing shall be carried out in accordance with the charging structure as outlined in the Price List and shall conform to the terms and conditions provided in clause B 9 hereof.
		3. The commencement of charging shall be from the moment of Handover for the services set out in Service Schedule 1 and 4. The Billing Period for each of these services shall be monthly with each month commencing on the 1st day of that Calendar month unless otherwise agreed.
		4. Billing shall involve an initial invoice for Installation Costs and Rental Costs from the Commencement Date of Charging to the start of the next Billing Period. Thereafter invoicing shall be monthly in advance.
		5. The Billing Information for the services defined in Service Schedules 1 and 4 shall be based on the information provided for in the table below.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| PW Number | Billing Period | Product | Quantity | Amount per Unit | Installation Charge | Monthly Rental Charge |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |

* 1. **INVOICES**
		1. At the end of each Billing Period the Billing Licensee shall submit to the other Licensee, invoices for charges for Calls as outlined in clause B.3, the services stipulated in Service Schedules 1 and 4 as outlined in clause B.5 and other services provided as part of this Offer for which the Billing Licensee is entitled to charge the other Licensee during such Billing Period.
		2. BTC and the Licensee shall each hand-deliver two (2) copies of any invoice pertaining to Interconnection Services to the other. The Licensee receiving the invoice shall sign and date one of the aforementioned copies as proof of delivery, which shall be returned to the invoicing Licensee.
		3. All charges payable under the Interconnect Agreement shall be calculated in accordance with this Annex B and at the rates specified in the Price List and amended from time to time. Invoices raised pursuant to the Interconnect Agreement shall be paid in accordance with clause 8 of the Main Offer document.
		4. For the avoidance of doubt, an invoice (including an invoice based on estimated information) shall be dated as of the date of dispatch of that invoice.
		5. For services (other than Call traffic and the services stipulated in Service Schedules 1, 2 and 4) the Billing Licensee shall provide with the invoice appropriate Billing Information to enable the non-billing Licensee to accurately process the invoice for such services.
	2. **PAYMENT**
		1. Subject as stated below, all charges due by one Licensee to the other shall be payable by the Due Date.
		2. Payment (settlement) of all Interconnect traffic invoices shall be done on a net basis within thirty (30) days of the invoice date and as per the agreed prepayments. All payments shall be made to the Receiving Party’s bank account indicated on the invoice
		3. If, pursuant to a dispute between the Licensees, either Licensee has notified the other of a dispute relating to such invoice and such dispute has not been resolved before the Due Date, and if the amount in dispute represents less than three percent (3%) of the total amount (excluding taxes), of the relevant invoice, the amount shall be due and payable on the Due Date.
		4. If, pursuant to a dispute between the Licensees, either Licensee shall have notified the other of a dispute relating to such invoice and such dispute shall not have been resolved before the Due Date, and if the amount in dispute is equal to or more than three percent (3%) of the total amount (excluding taxes), of the relevant invoice, the amount, less the disputed amount, shall be due and payable on the Due Date.
		5. Notwithstanding notification of a dispute, if a Licensee fails to pay on the Due Date any amount due under the Interconnect Agreement or shall overpay any amount, the payee or, as the case may be the over-payer, shall pay or be paid interest at the Prime Rate as at the Due Date or date of the overpayment in respect of any such amount outstanding.
		6. If such overpayment results from information provided by the over-payer (which is not attributable to information provided by the payee Licensee), the payee Licensee shall be under no obligation to pay any interest on the amount overpaid.
		7. Interest at the Prime Rate shall be payable (for late payment) from and including five (5) days after the Due Date or (in the case of a refund) the later of the date of payment of the original amount to be refunded and the Due Date, in each case ending on the date of payment or, as the case may be, refund in full. Such interest at the Prime Rate shall accrue day by day from and including the Due Date and shall not be compounded.
		8. Relevant taxes shall be added to all or any part of the charges under the Interconnect Agreement and shall be paid by the Licensee responsible for making such payment.
	3. **DISPUTES**
		1. Billing disputes between the Licensee and BTC shall be resolved according to this Annex B in the first instance and in any event in accordance with clause 17 of the Main Offer document.
	4. **SAMPLE INTERCONNECT TRAFFIC BILL**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Destination | Tariff | Band Type | Calls | Duration | Rate | Amount  |
| Fixed termination |  |  |  |  |  |  |
| Mobile termination |  |  |  |  |  |  |
| Toll free |  |  |  |  |  |  |
| Directory Enquiries |  |  |  |  |  |  |
| Emergency Services |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| International |  |  |  |  |  |  |
| A-Z |  |  |  |  |  |  |
| Total |  |  |  |  |  |  |

# ANNEX C - MANAGEMENT OF INTERCONNECTION

**C.1. DEFINITIONS**

C.1.1 In this Annex, a reference to a clause or Appendix unless stated otherwise, is to a clause or Appendix of this Annex. Words and expressions have the meaning given in Annex A.

**C.2 MANAGEMENT OF INTERCONNECTION**

* + 1. Account management
			1. BTC shall appoint an Account Manager to deal with the Licensee from the initial request for interconnection with the BTC network, to coordinate communication on interconnection matters.
			2. BTC and the Licensee shall agree to hold a meeting within ten (10) working days of a meeting being formally requested by either Licensee.
		2. Joint Technical Committee
			1. BTC shall establish a Joint Technical Committee with the Licensee.
			2. The joint technical committee shall discuss and agree on the technical, operational, planning, billing and service aspects, with authority to take decision on these matters.
			3. The Joint Technical Committee shall consist of equal representatives, including technical and commercial staff, from both parties to be agreed upon between BTC and the Licensee; the committee may be amended from time to time upon mutual agreement as appropriate.

**C.3. RECORDS OF LINKS**

C.3.1 Both Licensees shall maintain a database of all in-service Links in order to facilitate the management of the Interconnect. These databases contain the following information, as applicable, for each link and shall be reviewed and reconciled if necessary, from time to time:

* Private Wire Number
* Service type (Interconnect Link (CSI or collocated), Transmission Link, Interconnect Link Extension)
* In-service date
* A-end exchange name, location, manufacturer, software release
* B-end exchange name, location, manufacturer, software release
* Transmission path direction designation, type
* Capacity
* Associated signaling link(s)

# ANNEX D - TECHNICAL INFORMATION

* 1. **IP Interconnection**
		1. **Connectivity**
			1. IP Interconnection shall be as per ITU and BOCRA specifications
			2. All traffic shall be carried using the Internet Protocol as the most preferred Transport Network using SIP (Session Initiation Protocol) as the signaling protocol
			3. Interconnect connectivity can shall either be over the internet via a firewall (SBC) OR point-to-point ethernet and shall be used for the sole purpose of terminating voice traffic only
			4. BTC has 2 SBC’s for resiliency purposes
			5. eBGP is recommended as an IP routing protocol
		2. **Link capacity**
			1. On Interconnect Links designated as Fully Provisioned, the Licensee shall provision in advance sufficient capacity to achieve the Target Grade of Service with number of sessions enough to cater for concurrent calls within the acceptable congestion standard as documented in the Network Plan.
		3. **IP Signaling**
			1. SIP signaling must confirm to RFC3261
			2. Remote Party ID (RPID) should not be present in the INVITE. The INVITE message should contain the P-asserted identity.
			3. The Preferred number format should be E.164 complaint with +CC NDC CC, however CC NDC CC format is also allowed. The National number format shall have a number length of: 8 for mobile and 7 fixed
			4. SIP over UDP is required and ISUP body version should conform to the ITU-T92+ standard with default port 5060.
		4. **Supported Codecs**
			1. The Licensee must conform to RFC2833 and support for the following codecs used by BTC (in order of preference)
				+ G.711 (preferred)
				+ G.722
				+ G.726
				+ G.729
				+ T.38
		5. **Call Admission control**
			1. Call admission control shall be enforced at the network edge.
			2. SIP code “503 Service Unavailable” shall be returned for rejected Calls.
			3. Continuous option messages should be exchanged between the 2 nodes of the active link with error code “503 server Unavailable” in case one of the nodes is unreachable.
		6. **SIP Commands**
			1. The following SIP commands shall be used.

|  |  |
| --- | --- |
| **SIP Method** | **Description** |
| INVITE | Invites a user to a Call |
| ACK | Used to facilitate reliable message exchange for INVITEs |
| BYE | Terminates a connection between users or declines a Call |
| CANCEL | Terminates a request, or search, for a user |
| OPTIONS | Solicits information about a server's capabilities |
| REGISTER | Registers a user's current location |
| INFO | Used for mid-session signaling |

* + 1. **SIP Responses**
			1. The following SIP responses (which closely resemble HTTP responses) shall be used
				- 1xx Informational (e.g 100 Trying, 180 Ringing)
				- 2xx Successful (e.g 200 OK, 202 Accepted)
				- 3xx Redirection (e.g 302 Moved Temporarily)
				- 4xx Request Failure (e.g 404 Number not Found, 482 loop Detected, 484 Incomplete, 487 Normal call Clearing, 486 Busy, 480 temporary Unavailable)
				- 5xx Server Failure (e.g 501 Not Implemented)
				- 6xx Global Failure ( e.g 603 Decline)
	1. **COLLOCATION SERVICES**
		1. **Collocation Facilities**
			1. The list in Appendix D.1 details the BTC exchanges where collocation facilities are available. The list includes details of switching equipment and to which the Licensee may interconnect, as well as the space available (in square meters) at the specified location.
			2. The list is deemed correct at the time of issue. An up-to-date list can be requested at any time upon request to the Technical Account Manager (see C.2.1.1.), who shall respond within five (5) working days of receipt of a request
			3. Collocations services ordered or reserved by the Licensee under Service Schedule 3 shall be detailed in the Network Plan.
		2. Collocation Environment
			1. The Licensee may install the following equipment in collocated facilities: - Carrier grade switching and transmission equipment, for the purpose of Interconnection - Voice equipment, such as ADM, ODF, DDF, MUX (Antennae and radio equipment subject to configuration of the premises) - Internet routing equipment
			2. Access to collocation facilities shall be granted in accordance with the procedure set out at Section 8 of the Operation and Maintenance Manual.
			3. Where the Licensee hires space in a secure room, the Licensee will choose and install the key system restricting access to the room. The Licensee must however provide BTC with a key to access the room which may be used for essential site maintenance or in the event of an emergency.
			4. Power options at the BTC Data Centre are as follows: - Permanent 230/240V AC - Permanent 48V DC
			5. The environment in collocation space (Data Centre) includes the following automated and monitored features:
				+ Lighting system
				+ Fire system
				+ Air conditioning
				+ Temperature control
				+ Humidity level control

### APPENDIX D.1 BTC INTERCONNECT NODES FOR INTERCONNECTION

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Exchange Name | Location | Function | Hardware Supplier | Switch Type | Software Version | Collocation |
| MSU 1 |  | Voice  |  |  |  |  |
| MSU 1 |  | International Voice Gateway |  |  |  |
|  MSU 2 |  | Voice  |  |  |  |  |
|  |  |  |  |  |  |

**ANNEX E -INTERCONNECTION PROCESSES**

* 1. PLANNING OF NEW POINTS OF INTERCONNECTION
		1. Interconnection of New Switching Equipment
			1. Prior to making Interconnection available on new switching facilities, BTC or the Licensee, whichever is the equipment owner, shall have completed all commissioning and testing activities in accordance with the recommendations of the switch vendor and industry best practice,

including but not limited to inter-working testing within its own network, and activated the SS7 Point Code assigned by BOCRA.

* + 1. Route Forecasting Form
	1. RESERVATION OF COLLOCATION SPACE
		1. Collocation space may be reserved up to one (1) year in advance, provided the request for reservation is reasonable and the space is available. Payment shall be made for the reserved space in accordance with Service Schedule 3 and the BTC Interconnection Price List.
		2. Requests for reservation should be addressed in writing to the BTC Account Manager, who shall respond within four (4) weeks to confirm whether the order is accepted or rejected.
		3. In the event that a reservation is rejected on grounds of insufficient space, BTC may propose an alternative solution.
		4. Details of reserved collocation services shall be included in the Network Plan.
	2. ORDERING PROCESS
		1. Request for services
			1. A request for Interconnection services detailed in Service Schedule 1 and 4 shall be placed by the Licensee using the Order Form provided in Appendix E.1 and sent to the respective BTC Account Manager by hand, or e-mail.
			2. Requests for services other than those listed in E.4.1.1 above shall be made by letter addressed to the respective BTC Account Manager. Requests for new services shall be made in accordance with the procedure outlined in Clause 6 of the Main Offer document

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* + 1. Order Processing
			1. All the relevant sections of the Order Form must be completed for an order to be valid. The Form should be sent to the BTC Account Manager by mail or fax.
			2. Upon receipt of the order, the BTC Account Manager shall review the form for validity. A response shall be sent to the Licensee within 5 working days of receipt of an order, stating whether the order is accepted or rejected.
			3. In case of rejection in whole or in part, the Account Manager shall state the reason for rejection in writing to the Requestioning Licensee together with a proposed alternative solution if available. A copy should be addressed to BOCRA. The Licensee has the right to start a dispute under clause 17 of the offer. BOCRA shall investigate with the co-operation of both Licensees and may make a determination on the subject.
			4. Accepted orders may require a feasibility study, which may cover any aspects of service implementation, including but not limited to civil works and constructions, rights of way and planning permissions from the relevant government authorities, with the cooperation of the Licensee if required. A site survey may be necessary. In any event, within twenty

(20) working days of receipt of a valid order the Account Manager shall fill in the Order Confirmation section on the Order form, indicating the planned delivery date to the Licensee, and return it to the Requesting Licensee.

* + - 1. The Licensee and BOCRA have the right to request a progress report within five (5) working days at any time following the notification of the delivery date.

E.4.3 Lead times for delivery

E.4.3.1 Lead times for delivery vary according to the type of service and requirements. Lead times for delivery are detailed in the Service Level Agreement.

E 6. IMPLEMENTATION

* + 1. Voice Interconnect Link Implementation
			1. The delivery of Customer Sited Interconnect is subject to the commissioning of a physical transmission path to the Licensees Node.
			2. Once the transmission is installed, BTC shall perform the following tests to bring the CSI Link into service:
				1. End-to-End test " 24-hour BER test to reach target level of BER < 10-8
				2. Commissioning Tests: " Connection and testing of power " Stand alone commissioning tests - Optical tests - Tributary cards and cabling tests -

Alarm Tests " On Line Tests " Stability Tests " Setting options on multiplexers

* + - * 1. Fibre tests " Attenuation tests " Power tests
			1. The delivery of Interconnect Links to the Licensees equipment collocated on a BTC site is subject to the prior physical connection of the Licensee DDF to the BTC DDF. The Licensee should provide the 0.5 gauge cable which shall be installed by BTC.
			2. The following test shall be performed as appropriate on all Interconnect links (CSI or collocated) " Loop test " Bit Error Rate test " MTP Test Q.781 " MTP Test Q.782 " ISUP Test Q.784

E.6.2 Transmission Link commissioning

E.6.2.1 When commissioning a Transmission Link, BTC shall perform the following qualification tests: " Attenuation " Loop resistance " Insulation " SNR (Signal to Noise Ratio) " Impulse noise

* 1. SERVICE HANDOVER
		1. Once the requested service is implemented, the BTC Account Manager shall fill the Service Handover section on the order form, stating the handover date. The form should be sent to the Licensee together with a report detailing the result of testing.
		2. The Licensee should confirm receipt of delivery and acceptance of the service by signing and returning the order form within twenty-four (24) hours of receipt of the Form.

E.8. ORDER CANCELLATION

E.8.1 Order cancellations must be notified to BTC by the Licensee in accordance with clause 26 of the Main Offer and shall incur charges as per the relevant Service Schedule for the specific service.

APPENDIX E.1 SERVICE ORDER FORM (to be developed) (Licensees are advised to fill one form per requested service)

# ANNEX F - INTERCONNECTION SERVICE SCHEDULES

# SERVICE SCHEDULE 1: BTC VOICE INTERCONNECT LINK SERVICE

## DESCRIPTION OF SERVICE

* + - 1. BTC Voice Interconnect Link Service is defined as a service where BTC provides one or more links over which voice traffic between its Network and the Network of another Licensee flows. An Interconnect Link shall be terminated at one end on the network of BTC and at the other end on the network of the Licensee and may carry signaling information in accordance with Annex D
			2. BTC Voice Interconnect Link Service can be configured as either unidirectional or bi-directional.
			3. BTC Voice Interconnect Link Service is delivered at a Customer Sited Interconnect or Collocated, as described in Annex D.
			4. The boundary between the BTC and Licensee Network shall be the Digital Distribution Frame (DDF) of the CSI equipment sited by BTC at the Licensees' site, or, in the case of Collocation, at a designated DDF at the BTC Interconnect Node.
			5. BTC Voice Interconnect Link Service for Interconnection is available at the BTC Interconnect Nodes detailed at Appendix D.1 of Annex D.

## TERMS AND CONDITIONS

* + - 1. The minimum capacity of a BTC Voice Interconnect Link Service shall be 2 Mbps.
			2. The Licensee wishing to interconnect with BTC is required to establish Interconnect Links with a minimum two Interconnect Nodes. The minimum number of Interconnect Nodes required on a Licensee’s Network to interconnect with the BTC Network shall be two.
			3. The minimum term under which an individual BTC Voice Interconnect Link Service is provided is one year from the date of handover.
			4. Planning of BTC Voice Interconnect Link Service transmission paths, including civil engineering works will be the responsibility of BTC. However, the Licensee shall collaborate in such planning exercises in accordance with clause 1.5 of the Main Interconnection Offer.
			5. The Licensee may cancel the BTC Voice Interconnect Link Service upon written notice at least one (1) month prior to the date of termination, subject to clause 1.2.3 above.

## CHARGES

* + - 1. BTC Voice Interconnect Link Service charging shall consist of the following elements:
1. Installation charge
2. Fixed monthly Rental charge for the interconnect Link(s)
	* + 1. The installation charges and fixed rentals of each BTC Voice Interconnect Link Service shall be agreed at contracting stage.
			2. For the avoidance of doubt, neither BTC nor the Licensee shall be obliged to convey traffic to the other over a bi-directional path.
			3. The cancellation of a request for services stipulated in this Interconnection SERVICE SCHEDULE shall incur a full connection charge. Monthly rental charges shall not be applied to the cancelled service.
			4. For any cancellation of a service before its end of life, then BTC will charge and be entitled to rental equivalent to the remaining contract period.
			5. For the avoidance of doubt, a request by the licensee for the relocation of one or both termination points of the service shall be treated as a ceasing of the service and a new provision subject to the charges set out in this clause 1.

# SERVICE SCHEDULE 2: BTC COLLOCATION

## DESCRIPTION OF SERVICE

* + - 1. BTC Collocation shall be defined as facilities, in a BTC site provided exclusively for the Licensee in order for them to install their own network equipment for the purposes of interconnection with the BTC network or another Licensee’s network.
			2. The facilities offered may include, but will not be limited to, equipment space in cabinets, shared or secure rooms and antenna space on masts or towers.
			3. BTC may lease to Licensees Collocation facilities subject to availability of space at time of request.
			4. BTC may lease to Licensees, on a non-discriminatory basis, facilities (ground space, rooms, towers, etc.) under the control of BTC and required for use by Licensees, it being understood that BTC shall not be required to construct new facilities for lease to such other Licensees.
			5. A list of BTC sites where Collocation facilities may be available can be found at Appendix D.1 to Annex D.

## TERMS AND CONDITIONS

* + - 1. BTC offers collocation facilities to Licensees provided;
				1. There is sufficient, available and/or unreserved facilities in the requested Collocation site;
				2. Collocation is technically feasible and will not adversely affect the operational integrity of existing equipment at the Collocation site under the control of BTC or any other Third Party.
			2. BTC offers collocation facilities, unless otherwise stated in writing, solely for the purposes of housing Licensee equipment and the performance of tasks by Licensee staff necessary for the establishment, operation and maintenance of interconnection services between the Licensee and BTC, unless otherwise agreed between BTC and the Licensee.
			3. Collocation facilities are provided for a minimum one (1) year lease, severable by either party on one (1) year notice in writing.

## SERVICE CHARACTERISTICS

* + - 1. The following collocation facilities may be available subject to the provisions of this Service SCHEDULE:
				1. Rack space, in BTC supplied cabinets, subject to confirmation and availability.
				2. Floor space in shared room for a standard 60cm by 90cm by 200cm cabinet.
				3. A secured room for the exclusive use of the Licensee (where available) for the installation of equipment in cabinets provided by the Licensee, or physical collocation outside specified BTC facilities in immediately adjacent buildings, fit for the purpose of housing telecommunications equipment for the purposes of interconnection, under the control of BTC.
			2. For all supplied facilities listed at 3.3.1 above, the following features may be available to the Licensee:
				1. 24 hours per day, 7 days per week access, escorted, if necessary, to the collocation facility for the Licensee for the purposes of installing, operating, maintaining the collocated equipment owned by the Licensee, however prior notice should be made (within a reasonable amount of time);
				2. Both licensees shall be responsible for provisioning of security measures for Licensee equipment at the collocated site (both parties have the obligation to ensure their infrastructure is protected);
				3. Where collocated at BTC Data Centre :

Power supply, including provision for alternative temporary power supply (power supply shall be in increments of 5 Amperes);

Climate and environmental control equipment similar to that deployed by BTC for the operation of the telecommunications equipment.

* + - * 1. Earthing points for equipment.
				2. Maintenance collocation facilities under the control of BTC.
			1. Additional facilities may include:
				1. Standard 60x90 cabinet, for the exclusive use of the Licensee in shared or secure room.
				2. Intra-building cabling
				3. Antenna space, where available on a tower or mast.

**FAULTS AND CHANGES**

* + - 1. In the case of a fault occurring at any facility supplied by and under the control of BTC, BTC shall commence to resolve the fault within four (4) hours of a trouble-ticket be raised by the affected Licensee with BTC.
			2. BTC shall provide six (6) months written notice in the event of circumstances beyond the control of BTC, to the Licensees making use of relevant collocation facilities in the following circumstances.
				1. Decision to close the building where physical collocation is in use.
				2. Maintenance works of the real estate requesting temporary movement of the physical collocation in use.
				3. Redevelopment or civil works affecting the building or immediately adjacent spaces which might reasonably be expected to affect the provision of the collocation facilities.
			3. In the event that BTC reconfigures its Network in order to increase its efficiency, and this reconfiguration requires the reinstallation of equipment at existing or new collocation facilities, the costs of the reinstallation of such equipment shall be borne by BTC, unless the reconfiguration is part of a planned upgrade program in which case the costs shall be settled in accordance with clause 11.2 of the Main Document.

## CHARGES

* + - 1. Fixed Monthly rental charges vary based on the location (Urban, Rural & Data centre) and are available on request from the Licensee as part of the feasibility study.
			2. The licensee may have an option to reserve collocation space up to one (1)year in advance, and shall pay reservation charges.
			3. Cancellations of requests for Collocation shall incur charges that reflect the reasonable costs necessarily incurred by BTC up to the point of formal notification of a cancellation request.

# SERVICE SCHEDULE 3: BTC VOICE INTERCONNECT EXTENSION CIRCUIT

## DESCRIPTION OF SERVICE

* + - 1. BTC Voice Interconnect Extension Circuit service is defined as a service where BTC provides transmission capacity, in multiples of 2 Mbps, between two BTC Interconnect Nodes. At one of these BTC Interconnect Nodes, the Licensee is interconnected by means of Collocated Voice Interconnect Link(s), and BTC provides one or more 2 Mbps exchange ports at the other BTC Interconnect Node.
			2. BTC Voice Interconnect Extension Circuit service may be provided using any appropriate technology.
			3. BTC Voice Interconnect Extension Circuit service shall be paid for by the Requesting Licensee.
			4. The boundary between the BTC and Licensee network shall be the BTC Digital Distribution Frame at the Node where the Licensee is collocated.

## TERMS AND CONDITIONS

* + - 1. The minimum capacity of a BTC Voice Interconnect Extension Circuit service will be 2 Mbps.
			2. The minimum term under which an individual BTC Voice Interconnect Extension Circuit service is provided is one year from the date of handover.
			3. Planning of BTC Voice Interconnect Extension Circuit Service transmission paths, including civil engineering works will be the responsibility of BTC. However, the Licensee shall collaborate in such planning exercises in accordance with clause 1.5 of the Main Interconnection Offer.
			4. The Licensee may cancel the BTC Voice Interconnect Extension Circuit Service upon written notice at least one (1) month prior to the date of termination, subject to clause 4.2.2 above.

## CHARGES

* + - 1. BTC Voice Interconnect Extension Circuit service charging elements include:
1. Installation charge
2. Fixed monthly Capacity/Bandwidth rental charge.
	* + 1. For each BTC Voice Interconnect Extension Circuit service between any two BTC Interconnect Nodes the charges shall be agreed at contracting phase.
			2. The cancellation of a request for services stipulated in this Interconnection SERVICE SCHEDULE shall incur a full connection charge. Monthly rental charges shall not be applied to the cancelled service.
			3. For any cancellation of a service before its end of life, BTC will charge and be entitled to rental equivalent to the remaining contract period.
			4. For the avoidance of doubt, a request by the Licensee for the relocation of one or both termination points of the service shall be treated as a ceasing of the circuit and a re-provision subject to the installation charge.

# SERVICE SCHEDULE 4: BTC NATIONAL CALL TERMINATION

## DESCRIPTION OF SERVICE

* + - 1. Subject to the provisions of this Interconnection Service SCHEDULE, BTC shall convey calls handed over from the Licensee Network at an Interconnect Node for termination to number ranges in the BTC Network.
			2. The BTC National Call Termination service shall be limited to call to number ranges allocated to BTC by the BOCRA as per the Numbering Plan The BTC National Call Termination service shall apply to calls that are handed over by the Licensee at a BTC Interconnect Node in order to be routed efficiently to their point of termination.

## TERMS AND CONDITIONS

* + - 1. BTC and the Licensee shall abide by all necessary technical requirements, including Call set-up and clear down sequences, for the conveyance of Calls pursuant to this Interconnection SERVICE SCHEDULE as set out in the Guidelines on Interconnection.
			2. BTC shall convey BTC National Call Termination calls during those periods of time and at the same standard and quality of service as BTC conveys all other Calls conveyed within the BTC Network.
			3. BTC and the Licensee shall correct faults which occur in its Network which affect the conveyance of BTC National Call Termination traffic in accordance with such Licensee’s normal engineering practices. For the avoidance of doubt, neither BTC nor the Licensee warrants that its Network is, or will be, free from faults.
			4. Functionality across the BTC and Licensee Networks relating to Advanced Call Services shall, where available, be made available by each Licensee to the other.

## ROUTING

* + - 1. The conveyance of BTC National Call Termination calls shall be in accordance with the routing principles specified in the Network Plan. All Calls covered by this Interconnection Service SCHEDULE will be carried on installed BTC Interconnection Links.

## CHARGING

* + - 1. For the conveyance of BTC National Call Termination traffic by BTC, the Licensee shall pay BTC a P0.70 charge calculated in accordance with the rates.

## CHARGING ARRANGEMENTS

* + - 1. Traffic charging shall be based on chargeable cumulative seconds for all appropriate BTC National Call Termination traffic in each Billing Period rounded to the nearest minute.

# SERVICE SCHEDULE 6. BTC EMERGENCY SERVICES

## DESCRIPTION OF SERVICE

* + - 1. This service shall include Access code access to emergency services such as police, ambulance and fire services.
			2. BTC shall convey Emergency Service Calls handed over from the Licensee’s Network for delivery to the relevant emergency service connected to the BTC Network. This shall comprise all traffic to the Access codes specified in the Numbering Plan.

## TERMS AND CONDITIONS

* + - 1. BTC and the Licensee shall abide by all necessary technical requirements, including Call set-up and clear down sequences, for the conveyance of Calls pursuant to this Interconnection Service SCHEDULE as set out in the Guidelines on Interconnection.
			2. BTC shall convey BTC Emergency Service Calls during those periods of time and at the same standard and quality of service as BTC conveys similar Calls originated within the BTC Network.
			3. BTC and the Licensee shall correct faults which occur in its Network which affect the conveyance of BTC Emergency Service traffic in accordance with such Licensee’s normal engineering practices. For the avoidance of doubt, neither BTC nor the Licensee warrants that its Network is, or will be, free from faults.
			4. Functionality across the BTC and Licensee Networks relating to Advanced Call Services shall, where available, be made available by each Licensee to the other.
			5. BTC and the Licensee shall cooperate to achieve a technical solution that provides prioritized capacity to connect to public emergency services.

## ROUTING

* + - 1. Calls to emergency service Access codes shall be routed in accordance with the Network Plan.

## CHARGING

* + - 1. For the handling of BTC Emergency Services Calls from the Licensee’s Network by BTC, the Licensee shall pay to BTC the per call charges as set out in the BTC Interconnection Agreement. Traffic charging at each charge shall be based on chargeable cumulative seconds for each Billing Period rounded up to the nearest minute.

# SERVICE SCHEDULE 7. BTC INTERNATIONAL ACCESS

## DESCRIPTION OF SERVICE

* + - 1. BTC shall convey BTC International Access Calls, using the leading dialed digits "00" handed over from the Licensee’s Network for delivery at a BTC Interconnect Node through the BTC International gateway.

## TERMS AND CONDITIONS

* + - 1. BTC and the Licensee shall abide by all necessary technical requirements, including Call set-up and clear down sequences, for the conveyance of Calls pursuant to this SERVICE SCHEDULE as set out in the Interconnection Guidelines.
			2. BTC shall convey BTC International Access traffic during those periods of time and at the same standard and quality of service as BTC conveys similar Calls originated within the BTC Network.
			3. BTC and the Licensee shall correct faults which occur in its Network which affect the conveyance of BTC International Access traffic in accordance with such Licensee’s normal engineering practices. For the avoidance of doubt, neither BTC nor the Licensee warrants that its Network is, or will be, free from faults.
			4. Functionality across the BTC and Licensee Networks relating to Advanced Call Services shall, where available, be made available by each Licensee to the other.

## ROUTING

* + - 1. The conveyance of BTC International Access traffic shall be in accordance with the routing principles specified in the Network Plan.

## CHARGING

* + - 1. BTC International Access traffic will be charged as set out in the BTC Interconnection Rate Offer which will be communicated periodically. Traffic charges shall be based on chargeable cumulative seconds for all appropriate BTC International Access traffic in each Billing Period rounded up to the nearest minute.
			2. Outbound traffic charges represent the per minute amounts payable by the Licensee to BTC for access to international call termination services.