

TRANSPORT

2022 INTERCONNECTION, ACCESS AND INFRASTRUCTURE-SHARING CATALOGUE

OFFER FOR LICENSED OPERATORS

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I. INTRODUCTION

I.1. Background

This catalogue is developed and published by Cameroon Telecommunications (CAMTEL) in implementation of the Concession Agreement for Transport services, and in accordance with the provisions of Law No. 2010/013 of 21 December 2010 governing electronic communications in Cameroon, as amended and supplemented by Law No. 2015/006 of 20 April 2015, Decree No. 2012/1640/PM of 14 June 2012 to lay down conditions for interconnection, access to public electronic communications networks, and infrastructure-sharing, Decree No. 2017/2580/PM of 6 April 2017 to amend Decree No. 2012/1638 of 14 June 2022 to lay down conditions for the deployment or operation of networks and the supply of electronic communications services subject to the regime of authorisation. All the foregoing is underpinned by Concession Agreement No. 3 of 4 March 2020 for the deployment and operation of an electronic communications transport network.

I.2. Definitions

For the purposes of this catalogue, the following terms shall have the definitions hereunder:

1. **Submarine cable:** physical cable infrastructure for electronic communications signals built in the marine environment. It is termed "international" when it connects two or more countries;
2. **Circuit:** Half circuit, or a circuit that operates with unidirectional transmission.
3. **Terminal equipment:** Any device, installation or set of installations meant to be connected to a network termination point, and which transmits, receives or processes electronic communications signals. This does not include equipment that enables access to audio-visual communication services broadcast over the air or distributed by cable, except where such equipment also enables access to other electronic communications services;
4. **Provider:** Any person or legal entity that establishes, operates, supervises or provides an electronic communication network;
5. **Full circuit:** Full circuit, or a circuit that operates with bidirectional transmission;
6. **Certification:** Expert assessment and verification exercise conducted by an approved body to certify that the prototype of electronic communications equipment and systems complies with the regulations and technical specifications in force;
7. **Interconnection:** Particular method of access that involves physically and logically linking the public electronic communications networks used by the same or different operators to allow users to communicate with each other or to access services provided by another operator;
8. **Radio installation, station or equipment:** Any electronic communication installation, station or equipment that uses radio frequencies for wave propagation in free space. Radio installations notably include networks that use satellite capacities;
9. **NCSCS:** Nigeria-Cameroon Submarine Cable System. CAMTEL submarine cable system (TRANSMISSION) connecting Kribi in Cameroon to Lagos in Nigeria;
10. **Prepayment:** Advance payment.
11. **Electronic communications network:** Active or passive transmission systems and, where applicable, switching and routing equipment and other resources, which make it possible to transmit signals by wire, by radio, by optical means or by other electromagnetic means: including satellite networks; fixed (circuit-switched or packets, including the Internet) and mobile terrestrial networks; systems using the electrical network, provided they are used for transmitting

signals; networks used for radio and television broadcasting; and cable television networks, irrespective of the type of information broadcast;

12. **SAIL: South Atlantic Inter Link (SAIL):** A submarine cable system connecting Kribi in Cameroon to Fortaleza in Brazil;
13. **SAT-3/WACS/SAFE:** South Africa Transit 3/West Africa Submarine Cable/South Atlantic Far East. Submarine cable system starting at Sesimbra in Portugal and connecting several countries on the West Coast of Africa with a landing point in Douala in Cameroon and ending in Penyang in Malaysia;
14. **Electronic communications service:** Service consisting wholly or mainly in the provision of electronic communications;
15. **Telecommunications service:** Service consisting wholly or mainly in the provision of electronic communications;
16. **Internet Service:** Solution offered by CAMTEL (TRANSPORT) that enables the deployment of dedicated Internet links, with a dedicated speed of $n \times 1$ Mbps, between the customer and CAMTEL's (TRANSPORT) router connected to the Internet backbone. The customer is connected to the router of CAMTEL's (TRANSPORT) Internet Centre via the network of cables;
17. **IP/MPLS Service:** Interconnection solution based on the IP/MPLS (Internet Protocol/ Multi-Protocol Label Switching) cloud;
18. **Global Mobile Personal Communication by Satellite (GMPCS):** Any existing or planned fixed or mobile, broadband or narrowband, global or regional, geostationary or non-geostationary satellite system providing electronic communications services directly or indirectly to end users via a constellation of satellites;
19. **Telecommunications:** Any transmission, emission or reception of signs and signals, text, images, sounds or intelligence of any kind, by wire, optical, radio means or any other electromagnetic system;
20. **USSD: (Unstructured Supplementary Service Data):** Communication protocol used in a mobile network to exchange data between the client and the Operator's or Value-Added Service Provider's server;
21. **WACS:** West African Cable System; Starting point: United Kingdom; Landing point: Cameroon-Limbe;
22. **STMx:** Synchronous Transport Module. (X= 1, 4, 16, 64...). STM1=155 Mbps, STM4=622 Mbps, STM16=2,5 Gbps, STM64=10 Gbps.
23. **Tower:** A structure, usually metal, that carries telecommunications antennas.
24. **Infrastructure-sharing:** Making services, equipment, rights-of-way, buildings, routes, pipes, and high points available to legal entities governed by public law and operators of electronic communications networks for the installation and operation of equipment.

I.3. Purpose and Validity

This catalogue presents the technical offering and tariffs of CAMTEL's Transport Business Unit to enable all users of interconnected networks to communicate freely with each other.

It covers the following interconnection offers:

- Connection services;
- Infrastructure-sharing offers.

Each interconnection arrangement with CAMTEL shall be subject to an interconnection agreement describing the technical and financial terms and conditions of the services offered. It is understood that:

- the rates listed in this catalogue are exclusive of tax;
- the access fees for offers or services shall be those in force on the date such offers or services are made available;
- the services covered by this catalogue are offered within the limits of the technical conditions and capacities of CAMTEL's infrastructure.

It shall be valid for 2022 and shall enter into effect on the date of signature.

II. SWITCHED TRAFFIC ROUTING SERVICE

II.1. Description of Points of Interconnection

Locations and Types of Signals

The points of interconnection **CAMTEL** offers to Public Electronic Communications Network Operators are:

Description	Site	Type of Signal	Type of Interconnection
Yaounde ICTN	Technical Building, CAMTEL Head office	Code No. 7 ISUP SIP Protocol	National and International Transit
DOUALA ICTN	CAMTEL building, Douala-Bepanda	Code No. 7 ISUP SIP Protocol	National and International Transit
MGW YAOUNDE	Yaounde CAMTEL Training Centre	Code No. 7 ISUP SIP Protocol	Mobile voice traffic termination
MGW DOUALA	CAMTEL building, Douala-Bepanda	Code No. 7 ISUP SIP Protocol	Mobile voice traffic termination

II.2. Technical Terms

II.2.1. Switched Traffic Routing Service

The technical connection offer presented in this catalogue makes it possible to deliver voice and data communications from or to public electronic communications network operators under the same conditions of quality and technical availability as for all communications delivered on **CAMTEL**'s network.

All of this traffic is brought by the public electronic communications network operators to a point of interconnection of operator networks and distributed over one or two beams of circuits operated on a load-sharing basis. These beams must be carried by 2Mbit/s links. Where the traffic is carried by two separate beams, the 2Mbit/s links must be separate.

II.2.2. Direct interconnection offer

CAMTEL routes traffic originating from a customer of the public electronic communications network operator from the point of interconnection to **CAMTEL**'s network up to one of its subscribers (**CAMTEL** subscriber) serviced by or available via its network.

II.2.3. Indirect interconnection offer

CAMTEL carries the traffic of a subscriber on its network to the point of interconnection to a public electronic communications network operator's network so that the said subscriber can use the services of the operator in question;

II.2.4. National Transit Interconnection Offer

A public electronic communications network may route its national traffic via **CAMTEL**'s network to a similar operator's network.

II.2.5. Incoming or Outgoing International Transit Offer

The incoming or outgoing international transit offer enables **CAMTEL** to route international traffic to or from other public electronic communications network operators.

II.2.6. Support for portability

This system allows any subscriber to keep their mobile phone number while changing mobile operators.

Number portability shall be taken into account in the technical processes relating to interconnection as soon as this service is effectively implemented.

II.2.7. Evolution of Offer:

CAMTEL frequently redevelops areas serviced by subscriber switches.

The list of numbers accessible from the transit switches of a point of interconnection of the operator's network varies over time. **CAMTEL** shall inform the TRB and public electronic communications network operator in advance of any redevelopment of transit areas.

Some switches originally open for interconnection may, in the short or medium term, cease to be operational or be subject to technical limitations. **CAMTEL** shall inform the TRB and public electronic communications network operators of the closure of such switches or of their technical limits in accordance with regulatory provisions.

CAMTEL may:

- redevelop the areas served by points of interconnection of the operator network;
- change the number of points of interconnection of the operator network.

CAMTEL shall inform the TRB and public electronic communications network operators in accordance with regulatory provisions.

II.2.8. Organisation of Interconnection Traffic

The connection capacity is defined for each point of interconnection of the operator network to which the operator wishes to connect. The basic unit is the 2Mbps link.

The mode chosen for interconnection with **CAMTEL**'s network is the bidirectional link operating mode.

II.2.9. Responsibility for Sizing of Links

A public electronic communications network operator interconnecting to **CAMTEL**'s network shall be responsible for the sizing of the interconnection links needed to deliver its traffic to **CAMTEL**'s network.

Similarly, **CAMTEL** shall be responsible for the sizing of its links towards the public electronic communications network operator.

The opening of a link with a public electronic communications network operator shall be preceded by a series of validation and compatibility tests following the provisions of the interconnection agreement and the routing of calls to emergency, security and police services.

III. SWITCHED TRAFFIC ROUTING RATES

The rates for the links made available for interconnection to **CAMTEL**'s network are the same as those for the national links set out in II above.

IV. TRUNK LINKS/MANAGED CAPACITIES

IV.1. Description and Technical Terms

For any of the potential customer's points of presence, **CAMTEL's Transport Business Unit** proposes a leased link offer between the centre of its trunk network closest to the point of origin and the centre of its trunk network closest to the point of destination.

The requester shall provide the means of transmission to the interface with **CAMTEL's** trunk network centre. Multiplexing (2 Mbps demultiplexing) must be provided where there are several destinations.

The centres of the trunk network open to the offer of national connections are the trunk and urban transmission stations of CAMTEL.

The minimum capacity required is 2 Mbps.

IV.2. Pricing

The price for national connections is made up of two parts:

IV.2.1. Access Costs

THROUGHPUT	2 Mbps	34 Mbps	45 Mbps	STM1	STM4	STM16	STM64 or more
COST (in CFAF, T.E.)	3,000,000	4,000,000	4,000,000	4,500,000	5,000,000	5,000,000	6,000,000

IV.2.2. Monthly charge

This monthly charge is made up of two components:

- Fixed cost: CFAF 50 000 (TE)/month;
- Monthly charge based on the distance between the nearest **CAMTEL** trunk centre network, and the customer's remote site.

Throughput (Mbps)	Monthly flat rate in CFAF (TE) for a Distance ≤ 300 KM	Monthly flat rate in CFAF (TE) for a Distance > 300 KM
2	299	102 683
6	861	292 230
10	957	430 480
20	1 283	860 960
34	1 425	1 019 030
45	2 566	1 103 515
75	4 459	1 437 733
100	4 626	1 612 049
155	5 674	1 811 486
622	17 417	5 160 581
1 024	32 450	10 359 851
STM16	69 666	22 241 025
STM64	222 932	71 171 282

The commercial offer for throughputs above STM64 (10Gbps), established following specific request, will be detailed in interconnection agreements.

Discounts on national links and Internet bandwidth.

- Leasing several identical circuits on the same link, starting from a capacity of 1 Gbps, as well as prepayment on the Internet bandwidth, shall entitle the provider to a discount at the following rates:
 - **8%** on the price of 2 (two) to 5 (five) circuits; **4%** on 3-month prepayments;
 - **15%** on the price of 6 (six) to 10 (ten) circuits; **8%** on 6-month prepayments.

NB: The above discounts shall not be cumulative (number of circuits/prepayment).

V. SATELLITE SERVICES/LINKS

Taking into account the specific needs of each customer, the pricing conditions applicable shall be detailed in interconnection agreements.

VI. INTERNATIONAL SUBMARINE OPTICAL FIBRE CABLE LINKS
VI.1. Description and Technical Terms

The international leased line offer makes it possible to connect the customer to their counterparts abroad via an international broadband dedicated link on the SAT3/WASC/SAFE, WACS, NCSCS and SAIL submarine optical fibre cables.

IV.2. Pricing

The price for submarine cable links is made up of two parts:

VI.2.1. Access costs:

THROUGHPUT	2 Mbps	34 Mbps	45 Mbps	STM1	STM4	STM16	STM64
COST (in CFAF, T.E.)	3,000,000	4,000,000	4,000,000	5,000,000	5 000 000	5,000,000	6,000,000

VI.2.2. Monthly charges
VI.2.2.1. Monthly charge for SAT3/WASC/SAFE submarine cables

SAT3/WASC/SAFE starting point: Douala Cable Landing Station.

SAT3/WASC/SAFE half-circuit

Capacities	STM1 ½ circuit	STM4 ½ circuit	1G ½ circuit	STM16 ½ circuit	STM64 ½ circuit
Destinations					
Central Africa	1 077 695	2 424 815	4 041 358	10 390 161	16 838 991
West Africa	1 847 148	4 156 064	6 926 774	10 390 161	28 861 557
Southern Africa	2 420 602	5 446 355	9 077 257	13 615 886	37 861 905
Europe	3 490 364	7 853 319	13 088 864	19 633 297	54 853 935
Asia (SAFE)	4 780 065	11,950,162	17,925,243	29,875,406	74 688 514

SAT3/WASC/SAFE full-circuit

Capacities Destinations	STM1 Circuit	STM4 Circuit	1G Circuit	STM16 Circuit	STM64 Circuit
Central Africa	1 939 851	4 364 667	7 274 444	18 702 289	30 310 184
West Africa	3 324 866	7 480 915	12 468 193	18 702 289	51 950 803
Southern Africa	4 357 084	9 803 438	16 339 063	24 508 594	68 151 429
Europe	6 282 655	14 135 974	23 559 955	35 339 934	98 737 083
Asia (SAFE)	8 604 117	21 510 292	32 265 437	53 775 731	134 439 325

VI.2.2.2. Monthly charge for WACS submarine cable

WACS starting point: Batoke (Limbe) landing station.

WACS half-circuit

Capacities Destinations	STM1 ½ circuit	STM4 ½ circuit	1G ½ circuit	STM16 ½ circuit	STM64 ½ circuit
Central Africa	1 023 810	2 559 527	3 839 290	10 967 392	15 997 041
West Africa	1 754 791	4 386 957	6 580 435	10 967 392	27 418 479
Southern Africa	2 299 572	5 748 930	8 623 394	14 372 324	35 968 810
Europe	3 315 846	8 289 615	12 434 421	20 724 035	52 111 238

WACS full-circuit

Capacities Destinations	STM1 Circuit	STM4 Circuit	1G Circuit	STM16 Circuit	STM64 Circuit
Central Africa	1 842 858	4 607 149	6 910 722	19 741 305	28 794 675
West Africa	3 158 623	7 896 522	11 844 784	19 741 305	49 353 262
Southern Africa	4 139 229	10 348 074	15 522 109	25 870 183	64 743 858
Europe	5 968 522	14 921 306	22 381 957	37 303 264	93 800 229

VI.2.2.3. Monthly charge for NCSCS submarine cable

Starting point: Kribi Cable Landing Station

Capacity Destination	STM1 full circuit	STM4 full circuit	1G full circuit	STM16 full circuit	STM64 full circuit
Nigeria (Lagos)	2,508,091	6,270,228	9,405,342	15 675 570	40 193 770

VI.2.2.4. Monthly charge for SAIL submarine cable

Starting point: Kribi Cable Landing Station

Capacities Destination	STM1 full circuit	STM4 full circuit	1G full circuit:	STM16 full circuit	STM64 full circuit
Brazil (Fortaleza)	1,113,927	2,784,816	4,177,225	6 962 041	17 405 103

N.B.:

- For any SAT-3 and WACS circuit terminating in Cameroon, **CAMTEL** shall provide at least a half circuit for the SAT3. In this case, the offer shall be double the rates in the table above with a 10% discount;
- **CAMTEL** shall offer full circuits at the customer's request.
- All circuits on NCSCS and SAIL are provided as full circuits;
- Beyond the end-points of the submarine cable, **CAMTEL** may negotiate, on behalf of the requesting customer, an interconnection and the extension of the circuit requested.

VI.3. Circuit Recovery Charges on SAT-3, WACS and NCSCS

Recovery is a security measure to ensure continuity of service in the event of a scheduled or unscheduled interruption. It is provided via constant redundant circuits, the costs of which are borne by **CAMTEL** within the consortium. It is optional.

Taking into account the specific needs of each customer, the pricing conditions applicable to the circuit recovery service shall be detailed in interconnection agreements.

VI.4. Submarine Cable Landing Station Crossing Fee

The crossing fee is a monthly charge applied to circuits for which **CAMTEL** does not provide at least a half circuit.

The rates for crossing fees are as follows: 30% of the full-circuit tariff.

VI.5. National Extension

The costs of the interconnection and extension shall be borne by the customer. Access fees shall only be paid once for the activation of the Cable Landing Station at the customer's PoP.

The tariffs for the national extension of international optical fibre links shall be same as those for national links.

VII. IP TRANSIT

VII.1. Pricing

The pricing of the Internet service is made up of non-recurring and monthly fees.

VII.1.1. Non-Recurring Fees

Non-recurring fees, excluding taxes for Internet services, are as follows:

- Civil engineering charges: based on estimate and borne by the customer;
- Terminal equipment charges: taking into account the specific needs of each customer, the pricing conditions applicable shall be detailed in interconnection agreements;
- Access costs: CFAF 240,000 (T.E.)

VII.1.2. Monthly Bandwidth Charge

Throughput (Mbps)	Cost of Mbps (CFAF, T.E.)
$2 \leq C \leq 10$	81,531
$25 \leq C \leq 75$	69 301
$110 \leq C \leq 155$	57 850
$250 < C \leq 620$	42 392
$750 < C \leq 1 024$	36 855
$1 500 < C \leq 2 540$	31 157
$3 000 < C \leq 5 100$	27 902
$6 200 < C \leq 7 668$	23 672
$8 500 < C \leq 10 240$	20 087
$12 232 < C \leq 15 320$	18 581
$17 320 < C \leq 20 000$	17 169
$22 572 < C \leq 25 500$	15 280
$27 500 < C \leq 30 500$	14 058
$34 000 < C \leq 35 812$	12 652
$40 000 < C \leq 40 940$	11 386
$45 500 < C \leq 50 000$	10 248
$C > 51 000$	10 000

Intermediate throughputs shall be billed based on the offer from the previous tier.

VIII. INFRASTRUCTURE

CAMTEL (Transport) offers its customers the possibility of hosting their equipment on its sites. This hosting is multifaceted:

- Land;
- Power supply;
- Building;
- Tower.

This offer shall be reorganised where **CAMTEL** does not benefit from similar hosting conditions with the partner.

VIII.1. Terminal Equipment Hosting

Where possible, the terminal equipment used for transmission may be installed in a space reserved for the customer and located in **CAMTEL**'s building or in a space built by the customer on **CAMTEL**'s site. In both cases, the customer shall be responsible for the operation and maintenance of their equipment. The connection of the customer's equipment to **CAMTEL**'s PCM distribution frame shall be implemented by a joint **CAMTEL**/customer team.

In exceptional cases, terminal equipment used for transmission may be installed in a **CAMTEL** transmission room. The said equipment must be installed in a watertight cabinet that also contains the secondary power supply equipment and air conditioning. **CAMTEL** may, under terms to be negotiated, handle the first level operation and maintenance of the equipment housed in its rooms.

VIII.2. Towers

With regard to towers, the requesting customer shall provide, in particular:

- ✓ the characteristics (radio and mechanical) of the antenna;
- ✓ the installation height on the tower, the weight and size of the antenna.

The hosted equipment must comply with the latest ITU-T and ITU-R technical standards, as well as any other technical standards set by **CAMTEL** in the interconnection agreement, including those related to environmental compliance.

The list of towers proposed for sharing by **CAMTEL** is provided in the appendices and shall be updated constantly.

VIII.3. Power supply

The infrastructure sharing agreement shall specify the terms for the provision of power by **CAMTEL**, the terms of access to the equipment, the terms and conditions of maintenance, the documentation, the material to be provided by the customer and additional services.

VIII.4. Pricing

The table below sets out the fee structure for the use of the infrastructure.

NATURE OF SERVICE	RATE in CFAF, T.E.
Use of a chamber	Based on estimate.
Use of CAMTEL ducts (penetration into a cell)	Based on estimate.
Installation, cable, cabling and testing	Based on estimate. (cost of equipment + hour-based services)

NATURE OF SERVICE	RATE in CFAF, T.E.
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Towers	Based on a cost estimate according to the calculation formula below. $C = a_i(R_j * M_k + E_n)$ a_i : coefficient pertaining to the category of the tower. R_j : radio characteristics of the antenna M_k : mechanical characteristics of the antenna E_n =Characteristics of the footprint on the tower
Land	Based on a cost estimate according to regions, price per m2, surface area required (surveys, surveys, miscellaneous research). Undeveloped land: . Yaounde, Douala, Kribi, Limbe: CFAF 7,000/m2/yr . Other towns: CFAF 5,000/m2/yr . Rural areas: CFAF 3,000/m2/yr
Building	. Douala, Yaounde, Kribi, Limbe: CFAF 90,000/m2/yr . Other urban areas: CFAF 60,000/m2/yr . Rural areas: CFAF 40,000/m2/yr
Back-up power supply	CFAF 100/KWH/Month + fixed premium of CFAF 2,865/KW/month
Air-conditioning	On the basis of equipment installed and capacity requested.
Use of CAMTEL 's transmission network, civil engineering & cables	Based on estimate according to capacity

VIII.5. LEASING RATES FOR SUBMARINE CABLE LANDING STATION

NATURE OF SERVICE	RATE in CFAF, T.E.
Land	CFAF 20,000/m2/yr
Building + Air-conditioning +Emergency power supply (max 1KW)	CFAF 1,200,000/month/lease (footprint)
Security	CFAF 400,000/month
Additional back-up power supply	CFAF 99/KWH + fixed premium of CFAF 2,865/KW/month
Maintenance (visual monitoring and first-level intervention)	CFAF 12,000,000/yr

IX. MAXIMUM TIME-LIMITS FOR THE COMMISSIONING OF INTERCONNECTION AND INFRASTRUCTURE SHARING

Subject to the availability of all interface equipment, interconnection shall be established within 30 days of receipt of the request.

As far as collocation is concerned, the feasibility will be communicated to the service provider within a maximum period of 60 days from receipt of the request for collocation proven by an acknowledgment of receipt. This time-limit may be extended for an identical period, when the site requested for the sharing is occupied by several other users who must be consulted to avoid subsequent technical difficulties in the execution of the contract.

The time-limit for activation of the short codes allocated by the TRB to value-added electronic communications services providers is a maximum of 5 (five) working days upon receipt of a formal request.

X. SCHEDULING OF OPENING OF NEW POINTS OF INTERCONNECTION

To ensure planning of the necessary interconnection resources and to guarantee adequate sizing of traffic management capacities within **CAMTEL**'s network, the terms for planning and scheduling the opening of new point of interconnection may be defined.

The points of interconnection already available are shown on the attached fibre backbone diagram.

NB: The interconnection and access agreement shall comply with interconnection and access catalogues. To this end, the provisions of the catalogues, once approved, shall be taken into account in all interconnection agreements signed between CAMTEL and its partners, after the prior approval of the TRB, in accordance with the regulations in force.

XI. ANNEXES

XI.1. Pricing of Towers

Introduction

The parameters that influence pricing can be grouped into the radio characteristics of the antennas to be installed, the mechanical characteristics, and the tower footprint.

Pricing is for the rental of space for a single antenna. The total cost is got by multiplying by the number of antennas.

Pricing Parameters

XI.1.1. Radio characteristics of antenna

- Frequency or range of frequencies used
- Polarisation of the antenna
- Antenna azimuth and elevation
- Radiation pattern (horizontal and vertical)
- Isotropic gain

XI.1.2. Mechanical characteristics of antenna

- Space requirement (dimensions)
- Weight
- Windward surface (front, side)
- Wind load at a speed of 150 km/h (front, side)
- Permissible wind speed (maximum)

XI.1.3.Characteristics of the footprint on the tower

- Height requested for an antenna
- Number of antennas
- Linear occupation of the tower
- Mounting of the antenna (on one of the 3 sides of the tower or on one of the 3 vertical supports)
- Horizontal cable tray and vertical feeders assignment
- Feeder diameter

XI.1.4. Analysis of pricing parameters

Given:

- R_j , Parameter grouping together the radio characteristics of the antenna, including the use of a single frequency (R1) or a range of frequencies (R2)

$$R1=10/5=2$$

$$R2=20/5=4$$

- M_k , parameter grouping the mechanical characteristics of the antenna, in particular the weight P (kg), the maximum windward surface S (m²), the wind load at 150 km/h, C (N)

$$M_k=ak.P$$

$$a1=20 \text{ where } S \leq 0.5 \text{ m}^2 \text{ or } C \leq 500N$$

$a_2=30$ where $0.5 < S < 1 \text{ m}^2$ or $500 < C < 1000 \text{ N}$

$a_3=40$ where $S \geq 1 \text{ m}^2$ or $C \geq 1000 \text{ N}$

- Parameter grouping the characteristics of the tower footprint, in particular the requested height of the tower h (m), the linear occupation of the tower l (m), the occupancy of the cable tray.

$E_n = b_n \cdot h^2$

$b_1=6$ where $l \leq 1 \text{ m}$

$b_2=8$ where $1 < l < 2 \text{ m}$

$b_3=9$ where $l \geq 2 \text{ m}$

Thus, the monthly cost of renting space on the tower for an antenna is gotten via the general formula below:

$$C = \alpha_i (R_j \cdot M_k + E_n)$$

α_i : Coefficient pertaining to the category of the tower

$\alpha_1= 5$ for category A

$\alpha_2= 5$ for category B

$\alpha_3= 3$ for category C

XI.1.5. Classification of towers

Category A: towers taller than or equal to 120 m;

Category B: towers between 51 m and 119 m tall;

Category C: towers shorter than or equal to 50 m.

XI.2. List of towers

No.	Location of site	Height (m)	Type of tower (S= Self-supporting; G= Guyed)	Category of tower
1	AHALA CHEFFERIE	40	S	C
2	AKIRIBA	40	S	C
3	AKOEMAN	40	S	C
4	AKOM II ancien	30	S	C
5	AKOM II nouveau	50	S	C
6	AKONO	33	G	C
7	AKONOLINGA	40	G	B
8	AKUM	90	G	B
9	AKWA LAQUINTINIE	40	S	C
10	AKWA NORD DLA	28	S	C
11	AKWA CENTRE DLA	84	S	B
12	ASHONG	65.11	S	B
13	ASSIE	70	S	B
14	ASU HILL	125	G	A
15	AWAE	50	S	C
16	BADIONGZOU	32	S	C
17	BADZERE	72	G	B
18	BAFANG ancien	12	S	C
19	BAFANG nouveau	50	S	C
20	BAFIA	60	S	B
21	BAFOUSSAM MUX	40	S	C
22	BAFOUSSAM RADIO	123	S	A
23	BAHAM nouveau	50	S	C
24	BAMBOUTI	96	G	B
25	BAMENDA PTT	30	S	C
26	BAMENDJOU	30	G	C
27	BANDA	96	G	B
28	BANDAL	29	S	C
29	BANDJOUN	36	S	C
30	BANGANGTE	33	S	C
31	BANGOUA montagne	50	S	C
32	BANYO	84	G	B
33	BARDOUT	90	G	B
34	BASSA Logbaba Dla	42	S	C
35	BASTOS ANOR Yde	35	S	C
36	BASTOS SIC Yde	40	S	C
37	BATIBO	38	S	C
38	BATOURI	23	G	C
39	BEMBARA	108	G	B
40	BENGBIS	45	S	C
41	BEPANDA	40	S	C
42	BEPANDA terrasse	25	S	C
43	BEPANDA Yong Yong	40	S	C

44	BERTOUA CENTRAL	45	G	C
45	BETARE OYA	60	S	B
46	BIDZAR	97	G	B
47	BISSIANG	50	S	C
48	BIWONG BULU	70	G	B
49	BIYEM ASSI	55	S	B
50	BOKITO	60	G	B
51	BOMONO	22	G	C
52	BONABERI	34	S	C
53	BONALOKA	40	S	C
54	BONAMOUSADI VILLAGE	40	S	C
55	BONANJO	15	S	C
56	BOULEMBE	108	G	B
57	BOUMNYEBEL	30	G	C
58	BUEA	41	S	C
59	BUEA UNIVERSITY	40	S	C
60	CAMTEL HQ	15+36	S	B
61	CARRIERE JEAN VESPA	40	S	C
62	CHINDE HILL BAMENDA	40	S	C
63...	CHUBOH BAMENDA	10	S	C
64	COL BANA	74	G	B
65	DANG UNIVERSITE	40	S	C
66	DIONGO	60	G	B
67	DISSO PATERE	160	G	B
68	DJOUM	82	G	B
69	DOUALA OMNISPORT DGSN	40	S	C
70	DOUALA PK21	40	S	C
71	DSCHANG	25	S	C
72	DZENG	60	S	B
73	EBANGA NGOULOU	100	G	B
74	EBANGA passif	38	S	C
75	EBOLOWA comice	40	S	C
76	EBOLOWA RADIO	100	G	B
77	EDEA PALMERAIE	162	G	A
78	EFOULAN	82	G	B
79	EKIE	40	S	C
80	EKONA	56	S	B
81	ELOM	51	G	B
82	EMANA	40	S	C
83	EMO	140	G	A
84	ESEKA passif	60	G	B
85	ESEKA PT	15	S	C
86	ETOUG-EBE COLLEGE	40	S	C
87	EVODOULA	60	S	B
88	FIGUIL relais	90	G	B
89	FIGUIL Ville	50	G	C
90	FOTOKOL	90	G	B
91	FOUMBAN	91	G	B
92	FOUMBOT	25	S	C

93	GABAN-LARA	15	S	C
94	GANGUI	72	G	B
95	GAROUA BOULAI	10	S	C
96	GAROUA BOULAÏ			
97	GAROUA CENTRAL	25	S	C
98	GAROUA RADIO	50	G	C
99	GOUNA	96	G	B
100	GOUNDAÏ	15	S	C
101	GUIDER	31	S	C
102	GUIDIGUIS 1	25	S	C
103	GUIDIGUIS 2	70	S	B
104	JAMOT	55	S	B
105	KAELE	36	G	C
106	KATARE	120	G	B
107	KOLOFATA	18	G	C
108	KONGA	108	G	B
109	KOUM	50	S	C
110	KOUSSERI PT	80	S	B
111	KOWEIT CITY	40	S	C
112	KRIBI PT	45	S	C
113	KUMBA	39	S	C
114	KUMBA HILL	22	S	C
115	KUMBO	110	G	B
116	KURUME	118	G	C
117	KYE OSSI	90	G	B
118	LABADO	108	G	B
119	LAF	96	G	B
120	LARA	50	S	C
121	LEMBE YEZOUM	54	G	B
122	LERE	64	G	B
123	LIBONG	150	G	A
124	LIMBE	33	G	C
125	LIMBE KIE VILLAGE	40	S	C
126	LOLODORF passif	60	G	B
127	LOUM	168	G	A
128	LYCEE BILINGUE BERTOUA	40	S	C
129	MAGA	90	G	B
130	MALANGUE face HG	40	S	C
131	MAMFE	41	S	C
132	MAMFE	24	S	C
133	MANDASSAK	130	G	A
134	MANJO	50	S	C
135	MAROUA CENTRAL	42	S	C
136	MAROUA PITOARE	40	S	C
137	MAROUA RADIO	90	G	B
138	MATOMB	125	G	A
139	MAYO DJINGA	70	G	B
140	MAYO OULO	25	S	C
141	MAYO TOLERE	155	G	A

142	MBALMAYO	70	S	B
143	MBANDJOCK	90	G	B
144	MBANGA	168	G	A
145	MBANKOLO	25	S	C
146	MBANKOLO	60	G	B
147	MBANKOLO	100	G	B
148	MBE	60	S	B
149	MBENGWI	60	S	B
150	MBENGWI ptt	50	S	C
151	MBOMA	70	S	B
152	MBOUDA	31	G	C
153	MBOUDA nouveau	40	S	C
154	MEBA	96	G	B
155	MEIGANGA PT	40	S	C
156	MEKIN	85	G	B
157	MELONG	50	S	C
158	MEMVELE'ELE	65	G	B
159	MENDONG SIC	40	S	C
160	MENGANGME	91	G	B
161	MENGBWA	100	G	B
162	MENGBWA	118	G	B
163	MENGONG	72	G	B
164	MEYOMESSALA	100	G	B
165	MEYOMESSALA SUDCAM	50	S	C
166	MFOU	30	G	C
167	MIMBOMAN VILLAGE	40	S	C
168	MOKOLO	55	S	B
169	MONEKOO	60	G	B
170	MUYUKA	31	S	C
171	MVOULA	70	G	B
172	NANGA EBOKO	110	G	B
173	NDAMUKONG	40	S	C
174	NDEM	98	G	B
175	NDICK	60	G	B
176	NDIKOUM	75	G	B
177	NDJI	96	G	B
178	NDOGPASSI	40	S	C
179	NDOGPASSI 2	40	S	C
180	NDOKAYO	96	G	B
181	NDOUNGUE	45	S	C
182	NEW BELL	60	G	B
183	NGAH	102	G	B
184	NGAOUNDERE CENTRAL	40	G	C
185	NGOA EKELLE PTT	40	S	C
186	NGOASSE	78	G	B
187	NGOMEZAP	60	S	B
188	NGONG	96	G	B
189	NGOUDJEL (Ranch de Fadil)	70	G	B
190	NGUTI TOWN	37	G	C

191	NJOMBE	50	G	C
192	NKILZOCK	72	G	B
193	NKOLADJAP	60	S	B
194	NKOLBISSON	40	S	C
195	NKOLDOBO	40	S	C
196	NKOLFONG	34	G	C
197	NKOLNDONGO	40	S	C
198	NKOLYOP	62	G	B
199	NKOMETOU	40	S	C
200	NKONDJOCK	128	G	A
201	NKONGMEZAP	102	G	B
202	NKONGSAMBA CENTRAL	24	S	C
203	NKONGSAMBA RADIO	115	G	B
204	NKOTENG ADM	18	S	C
205	NKOTENG USINE	15	S	C
206	NKOUMBENT	110	G	B
207	NSIMALEN	30	S	C
208	NTOULA	18	S	C
209	NTUI	115	G	B
210	NYETE CENTRAL OFFICE	40	G	C
211	NYETE V11	60	S	B
212	NYETE V13	50	S	C
213	OBALA Ancien	30	S	C
214	OBALA nouveau	60	S	B
215	OBILI IRIC	40	S	C
216	ODZA, 11 Arrêt	40	S	C
217	OKOLA	30	S	C
218	OLAMZE	30	M	C
219	OMBESSA	70	G	B
220	OVENG	80	G	B
221	OYOMABANG NKOLSOO	40	S	C
222	PALMIERS, LYCEE	40	S	C
223	PANG	155	G	A
224	PETTE	90	G	B
225	POUMA	40	S	C
226	SA'A	30	G	C
227	SANGMELIMA PT	69	S	B
228	SIGNAL HILL	40	S	C
229	SIKWAY	30	S	C
230	SIMBOCK VILLAGE	40	S	C
231	TCHATIBALI	50	S	C
232	TCHOLLIRE	24	S	C
233	TIBATI PT	24	S	C
234	TIBATI			
235	TIGNERE	20	S	C
236	TIKO	38	S	C
237	TIKONDI	67	G	B
238	TINTO	60	S	C
239	TOMBEL	60	G	B

240	WAGURI	96	G	B
241	WAZA	108	G	B
242	WUM	31	S	C
243	YABASSI	50	S	C
244	YAGOUA	91	G	B
245	YAOUNDE CENTRE	60	S	B
246	YASSA VILLAGE	40	S	C
247	YETT	45	G	C
248	ZAMENGOE	53	S	B
249	ZOETELE	72	G	B

XI.3. NATIONAL OPTICAL FIBRE & MICROWAVE BACKBONE

