National Information & Communication Technology Authority

GUIDELINE ON DEPLOYMENT OF COMMUNICATIONS TOWER (Draft 2021)

made under section 218 of the NICT Act 2009

Doc Ref#

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1 EXECUTIVE SUMMARY

The National Information and Communications Technology Authority under section 218 of the Act, has the mandate to make rules and guidelines relating to ICT industry for the purpose of regulatory compliance and fulfillment of the Act's objectives.

This Guideline is developed purposely to ensure operators, tower owners, and/or entity comply with all relevant standards and regulations when designing, constructing and/or modifying towers, antenna structures and/or associated facilities without compromising the public health, safety and impacting the environment and the appearance of the surrounding landscape.

Relevant mandatory Instrument as outline in Clause 11, are to be read with this Guideline, purposely to further the understanding of the objectives and application of this Guideline and the Act.

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2 INTRODUCTION

The demand for wireless technologies in terms of its services and applications have led to rapid deployment and expansion of towers and related infrastructure and/or facilities all across the country. Such wireless technologies include GSM, 4G LTE, WiMAX, and Wi-Fi which require the antennas to be mounted on a supporting structure at an appropriate height to achieve maximum coverage and throughput.

In the absence of a proper tower and/or related structure/facility regulation in place, operators, tower owners and/or entity have been deploying towers and antenna structures anywhere as they please without any consideration for the environment, aeronautical and public safety at the same time creating a visual impact on the skyline in cities and towns.

Siting of antenna structures in residential areas and close to public amenities like bus-stops, schools and hospitals have raised a lot of concern from the general public on the potential health risks that may arise from EMF radiation from the antenna systems mounted on these towers and related antenna structures/facilities.

The purpose of this Guideline is to provide guidance and encourage compliance to relevant technical standards and regulatory requirements by the operators, tower owners and/or entity and ensure tower and/or structure/facility are constructed in a well-coordinated manner without adversely affecting the environment and compromising the health and safety of the public.

3 SCOPE

3.1.1 Scope

This Guideline applies to operators, tower owners and/or entity who are:

- Installing;
- intending to install;
- operating; or
- contracting or arranging for the installation of

tower, base station and/or alternative structure/facility which is used, intended to be used, or capable of being used to supply mobile phone communications services and other high-speed broadband services.

4 OBJECTIVES

4.1.1 Objectives:

The objectives of this Instrument are to:

- protect the public from EMF exposure resulting from RF sources from the tower and/or alternate structure/facility;
- ensure operators of EMF sources like radio, cellular base stations, tower and related RF equipment comply with EMF exposure limits as per the ICNIRP public exposure limits;
- ensure the operators cause less destruction to the natural environment and that deployment of the towers and related structures/facilities blend with the surrounding landscape;

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- encourage and promote tower and/or alternate structure/facility sharing between operators;
- ensure towers, and/or alternate structure/facility design, construction, and operation complies in relevant international Standards recognised by NICTA;
- ensure relevant stakeholders are informed and consulted before siting/construction of a tower or related facility;
- ensure operators, tower owners or entity comply with other state permitting agencies Standards and Procedures including relevant laws;

- follow proper and legal processes guided by this guideline when erecting tower and/or alternate structure/facility.;

- ensure community understanding of the issues involved in the design and construction of towers and provide opportunities for community input in the decision making process.

4.2 Mandate

This Guideline is developed in accordance with section 218 of the Act which mandates NICTA to develop guidelines to regulate the conduct and operations of an ICT Licensee and/or an individual and entity involved in ICT business in PNG.

4.3 Application

The application of this Guideline is not limited only to licensed operators but to any entity and/or person intending to construct and/or site a tower or related structure/facility within PNG, except those structures outlined in *Clause 7*.

5 ABBREVIATIONS AND INTERPRETATIONS

CASA PNG *means* Civil Aviation and Safety Authority of Papua New Guinea

PNG CEPA *means* PNG Conservation Environment Protection Authority

EMF *means* electromagnetic fields

ICAO *means* International Civil Aviation Organisation

entity *means* a contractor constructing or intending to construct a tower on behalf of an operator or tower owner.

Act *means* National Information and Communications Technology Act 2009

alternate structure *means* non tower structure such as rooftop, water utility or any form of physical structure that can be used to mount antenna systems

antenna system *means* antennas and radio systems

base station *means* a cellular base station that comprise of a tower and/or antenna structure and cellular switching, RF equipment.

default process *means* public consultation process outlined in subclause 9.2 which an operator or entity must follow in circumstances where there is an absence of consultation process by the local authority.

Licensed Structural Engineer *means* A structural civil engineer with license from a relevant recognised certifying authority

local authority *means* local city/town council, local government council and/or local village councillor

local media *means* any of the recognised local radio, TV and newspaper.

modify or modification *means* the existing tower height is increased by 25%.

operator *means* a NICTA licensed operator as defined in the NICT Act.

RF Engineer *means* A qualified RF engineer with relevant certificates and with more than 5 years of experience in the RF field.

tower *means* any form of communications tower, structure, and/or its associate facility.

City/Town council *means* a local municipal authority which is in charge of town physical planning.

tower owner *means* an operator, individual, or entity that have ownership of the tower.

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6 REQUIREMENTS FOR CONSTRUCTION OF TOWER, ALTERNATIVE STRUCTURE AND ASSOCIATED FACILITIES

6.1 General Siting Criteria

All tower, and/or related facility, constructed or intended to be constructed in the State of Papua New Guinea must comply with the following requirements, except those mentioned under the *clause 7* of this Guideline.

6.1.1 Tower Sharing and Use of Alternate Structure

a) An operator, tower owner or entity is advised to explore the opportunity for tower sharing with the existing towers within 200m radius of the interested site before considering a proposal for a new tower.
b) An operator, tower owner, or entity should consider the use of alternate structures within the vicinity of the site, like building rooftops, water or power utility to mount their antenna systems but with the permission from the building/utility owner.
c) The owner of any existing tower and/or alternate structure including the relevant facility is required to make the tower/structure/facility available, at a reasonable cost relative to construction and maintenance, to any operator/entity including a competitor(s), seeking approval to co-locate on the existing tower/structure/facility given the tower/structure/facility has the capacity to accommodate the additional equipment.

6.1.2 Tower Design and Construction

a) The design and siting of tower and/or relevant facility must blend with the surrounding environment and/or landscape without creating any visual impacts.
b) All tower and/or facility intended to be constructed must have sufficient space and loading capacity that can accommodate the tower owner's antenna system and additional comparable antenna systems for other intending operator/entity in the spirit of co-location and tower sharing.
c) New Tower design should be structurally secure and can withstand harsh environmental conditions, like strong winds, floods or seismic activity.
d) A new Tower design should have adequate power supply, necessary lightings and incorporate safety features like steps, strap hooks etc.
e) An operator and/or entity must avoid construction of large base stations or towers close to 'public –sensitive areas/buildings' like schools, hospital, residential areas, public amenities or national heritage sites. If an operator find its network configuration cannot avoid locating transmitting antenna near such locations, then the minimum distance should not be less than 200m in all cases.
f) All tower design and construction must comply with ANSI/TIA-322 and ANSI/ASSE A10.48 Standards and/or other equivalent international standard recognised by NICTA.

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6.1.3 Construction Requirement of a New Tower

An operator, tower owner or entity may consider construction of a new tower given the existing tower and/or alternate structure within 200m radius cannot accommodate the installation of additional antenna system due to one or more of the following reasons;

a) installing new antenna system to the existing tower/alternate structure may exceed the structural capacity of the tower/alternate structure, as verified by a licensed structural engineer. Furthermore, the reinforcement or modification of the existing tower to accommodate the additional antenna system cannot be achieved at an economical cost.

b) installing new antenna system may cause interference to the existing antenna system or other planned antenna system impacting their performance as verified by a qualified RF engineer, and the interference cannot be prevented at a reasonable cost.

c) The existing tower or building cannot provide the necessary height for the antenna system to provide adequate coverage within the geographical service area as verified by a qualified RF engineer.

6.1.3.1 The owner of an existing tower within the 200m radius, refusing to share a tower must provide written evidence that one of the above criteria is the reason tower sharing with other operator and/or entity is not possible.

7 COMPLIANCE REQUIREMENTS

7.1 An operator, tower owner or entity intending to construct or modify a tower, except those in *clause 7*, must comply with the following guidelines before any form of construction or modification work can begin.

a) consult relevant authorities; local city/town Authority/Council, CASA and CEPA (refer to clause 5)
b) ensure tower design complies with structural standards as verified by a qualified structural engineer.
c) ensure tower facilities are electrically compliant and adequate power supply available for the planned antenna system as verified by an electrical engineer.
d) ensure antenna system(s) complies with the EMF radiation exposure limits as certified by a qualified RF engineer.
e) ensure to have legal land title or lease agreement with the rightful land owner.
f) engage in public land use and/or public consultation as stipulated in clause 11 (*11.1 and 11.2)*.

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8 AUTHORISING AGENCIES

5.1 Operator or entity intending to construct or modify tower within an urban area must consult the following authorities:

5.1.1 Civil Aviation and Safety Authority (CASA) PNG

An operator, or entity intending to construct or modify a tower must first obtain a clearance from CASA PNG certifying that the proposed tower will not obstruct or pose a hazard to air navigation.

5.1.2 PNG Conservation Environment Protection Authority (CEPA)

An operator or entity who intends to construct a tower, except those excluded on *Clause 7* must seek approval or permit from the PNG CEPA before any form of work can be done. This is to ensure the construction of the tower does not have a detrimental effect on the environment.

5.1.3 Local City/Town Authority

An operator or entity who intends to construct a tower within city or town boundaries must first seek approval or permit from the local town authority. In remote areas, where there is absent of a local Town Authority, the applicant must seek approval/permit from the local level government or a councillor.

5.2 Operator or entity intending to construct or modify tower in a rural area must consult the local authority and/or the landowner before constructing or modifying the tower.

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9 OPERATIONAL REQUIRMENTS

9.1 Inspection of Tower Structures

9.1.1 All permitting agencies named in this Guideline may inspect the tower and/or facility at any time to ensure the construction, modification or operation of the tower/facility complies with their respective requirements.

9.1.2 The owner of the tower will notify the permitting agencies upon the completion of the construction and/or modification.

9.1.3 NICTA may carry out necessary inspections during the construction and/or modification and after the completion to ensure the construction, modification and operation complies with the applicable regulatory requirements.

9.1.4 The operator, tower owner, or an entity must notify NICTA once the tower construction is completed. NICTA may carryout site inspections to ensure the tower and/or the relevant facilities comply with regulatory requirements as outline in this Guideline.

9.1.5 Inspections on Structural integrity, Electrical compliance, Environmental impacts and/or Aeronautical compliance will be the responsibility of the respective authorising agencies.

9.1.6 NICTA may from time to time carryout unscheduled inspections on the site to ensure the tower and its facilities remain complaint with all guidelines and regulatory requirements.

9.2 Markings

9.2.1 An approved aerial tower will be marked or painted in accordance with CASA PNG, ICAO and/or the respective Town or City Authority requirement.

9.3 Lighting of Aerial Towers

9.3.1 Light placement on the aerial towers shall be in accordance with the CASA PNG and ICAO lighting requirements.

9.4 Signage

9.4.1 The operator, tower owner or entity should install appropriate warning signs that is visible to the workers and members of the public of the relevant dangers pose by the site/base station.

9.4.2 The sign should include information such as, name of the operator or owner of the base station, site name, site identification code (if any) and emergency telephone number.

9.4.3 An operator and/or tower owner should refrain from installing any form of commercial signage on the tower structure, facility or around the fencing perimeters of the tower.

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9.5 Safety

9.5.1 The operator or tower owner should ensure appropriate safety equipment is accessible on site/base station that includes fire extinguishers and first aid equipment.

9.5.2 The operator or tower owner should ensure the workers have access to appropriate safety equipment when working on site.

9.6 Site Beautification

9.6.1 An operator, tower owner or entity involve in the construction of a tower, alternate structure and/or related facility must comply with the existing urban beautification policies and/or laws as defined by the local Town Authority.

9.6.2 An operator, tower owner or entity should take into account the following considerations during site/base station construction;

(a) Installed telecommunication equipment should as much as possible conceal from the public view

(b) Installed telecommunications equipment on road side or on roof top should be painted or camouflaged in a manner that it is less visible and/or does not appear as an 'eye-sore' to the public.

9.6.3 An operator, tower owner, or entity must take into account the local street patterns, and spaces, building traditions, skyline and the ecology when planning for a base station and tower site. The scale, mass and height of the proposed base station site should blend with the adjoining buildings, topography and general height pattern of surrounding area without causing any visual impact on the skyline of the area.

9.7 Compliance to EMF Exposure Limits

9.7.1 All antenna systems installed on a tower and/or alternate structure/facility must comply with the specified EMF exposure limits as set out in NICTA EMF Exposure Guideline.

9.7.2 EMF measurement and/or modelling may be carried in accordance with the measurement standards as outlined in the EMF Exposure Guideline.

9.7.3 Before official commissioning of the antenna system, the operator or tower owner must perform necessary EMF measurement test to ensure the antenna system complies with the EMF Exposure Limits. The test result will be kept and made available upon NICTA's request.

9.7.4 In a situation where the antenna system fails to comply with the EMF exposure limits as stipulated in EMF Exposure Guideline, NICTA may ask the operator or tower owner to rectify the problem at their own cost.

6.7.5 NICTA shall carry out random audits to ensure conformity to EMF exposure limits.

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9.8 Unused Tower Removal and Waste Management

9.8.1 Any unused and/or decommissioned tower including relevant facility must be removed immediately within 3 months of the decommissioned date at the operator's or tower owner's own cost.

9.8.2 All waste and/or e-waste accumulated in the event of construction, modification or removal of a tower or facility, will be disposed in accordance with appropriate city/town authority waste management regulation.

10 EXCLUSIONS

10.1 The following towers and/or alternate structure will be excluded from seeking consultation from authorising agencies;

a) *New Towers*: where the antenna height is less than 15 metres above the ground level. However, this exclusion does not apply to antenna systems intending to operate on licensed bands.

b) *Existing Towers*: where the modification made to the tower either to replace or to facilitate tower sharing, provided the total height increase is no greater than 25% of the initial tower height.

c) *Alternate Structure*: antennas on building, water utilities, etc. may be excluded from consultation given the height of the tower excluding the antenna system is not increased by 25%.

d) *Temporary Tower*: any form of structure or object temporarily setup for use as tower for special events or emergency. The temporary structure must be removed immediately after the emergency or event is over.

PUBLIC CONSULTATION: Please Make Your Comments and/or Inputs

11 LAND USE & PUBLIC CONSULTATION

11.1 An operator, tower owner or entity intending to construct or modify a tower on a new site in the city or town must comply with the local town authority land use application and/or public consultation process.

11.2 If there is absence of local authority land use and/or consultation process, than the operator, tower owner or entity must follow the *default process* as outlined below;

a) seek the approval from the land owner, local authority and the relevant permitting agencies.

b) publish a written notice on the local media informing the relevant authorities and communities of its intention to construct or modify a Tower and/or alternate structure on the proposed site.

c) engages the public and the local authority in order to address the relevant questions, comments and concerns regarding the new tower/base station proposal.

d) provide an opportunity for the public and the town authority to formally respond in writing to the operator, tower owner or entity regarding measures taken to address reasonable and relevant concerns.
e) The construction of the tower or base station can only proceed if the local authority and/or community gives its approval.

12 DISPUTE RESOLUTION ON CO-LOCATION

12.1 An operator or entity intending to install an antenna system on an existing tower and/or an alternate structure/facility must do so by negotiating with the tower/alternate structure/facility owner in issues relating to site access, security access, fair rates, damage insurance and compensation.

12.2 Any disputes or disagreements which arises from co-location and/or tower, alternate structure/facility sharing must be resolved through amicable means by the disputing parties or by court of law

13 VIOLATIONS

13.1 An operator, tower owner or entity is required to comply with the guidelines and respective procedures and Standards as outlined in this document.

13.2 Failure to comply with the procedures and standards outlined or mentioned in this document will result in penalties being imposed in accordance with NICT Act and other relevant PNG laws.

14 MANDATORY INSTRUMENTS

These mandatory instruments will be used for reference purposes when reading this Guideline.

- The Guideline on EMF Exposure Limits
- Type Approval Guideline
- Cabling Guideline
- Repeater Site Management Guideline

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15 DOCUMENT ADMINISTRATION

15.1 This Guideline shall be in force, effective on the date of publication in the *Government gazette*.

15.2 NICTA shall review the Guideline and/or conditions in this Guideline from time to time in accordance with changes in ITU recommendations, International Standards and the trends in the ICT industry.

15.3 NICTA will inform the industry and the concern parties on any such amendments made to this Guideline through the relevant media sources.

15.4 Complaints and Enquiries

Complaints or inquiries maybe lodged in writing to the:

Director Engineering & Resource Planning

PO BOX 8227,

BOROKO, NCD.

Phone: 325 8633,

Facsimile: 3004829

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PUBLIC CONSULTATION: Please Make Your Comments and/or Inputs

16 ANNEXES

A – ATTACHMENTS – Consultation Guidelines

In reference to clause 11, this guideline will serve as a guide to assist Operators in developing and implementing appropriate consultation for individual tower structures.

Desired Outcomes

The main objectives of a consultation are to;

(a) Inform and receive feedbacks from the interested and affected parties of the proposed tower site.
(b) Provide adequate time for interested and affected parties to consider and engage in meaningful dialogue on the proposed tower site.
(c) Make available accurate and accessible information about the proposed tower site to the affected residents/communities.
(d) Identify and make attempt to resolve potential issues early in the planning process and;
(e) Accept mutually agreeable outcomes on the proposed tower site

It is understandable that a consultation program will not satisfy all participants nor completely resolves all differences of opinions or values.

Size and Scope of Consultation Plan

The size and scope of a consultation plan depends on the potential impact the proposed site will have on the affected parties, relevant stakeholders, and the community sensitive locations. The Operator's plan for each proposed site should be open and transparent

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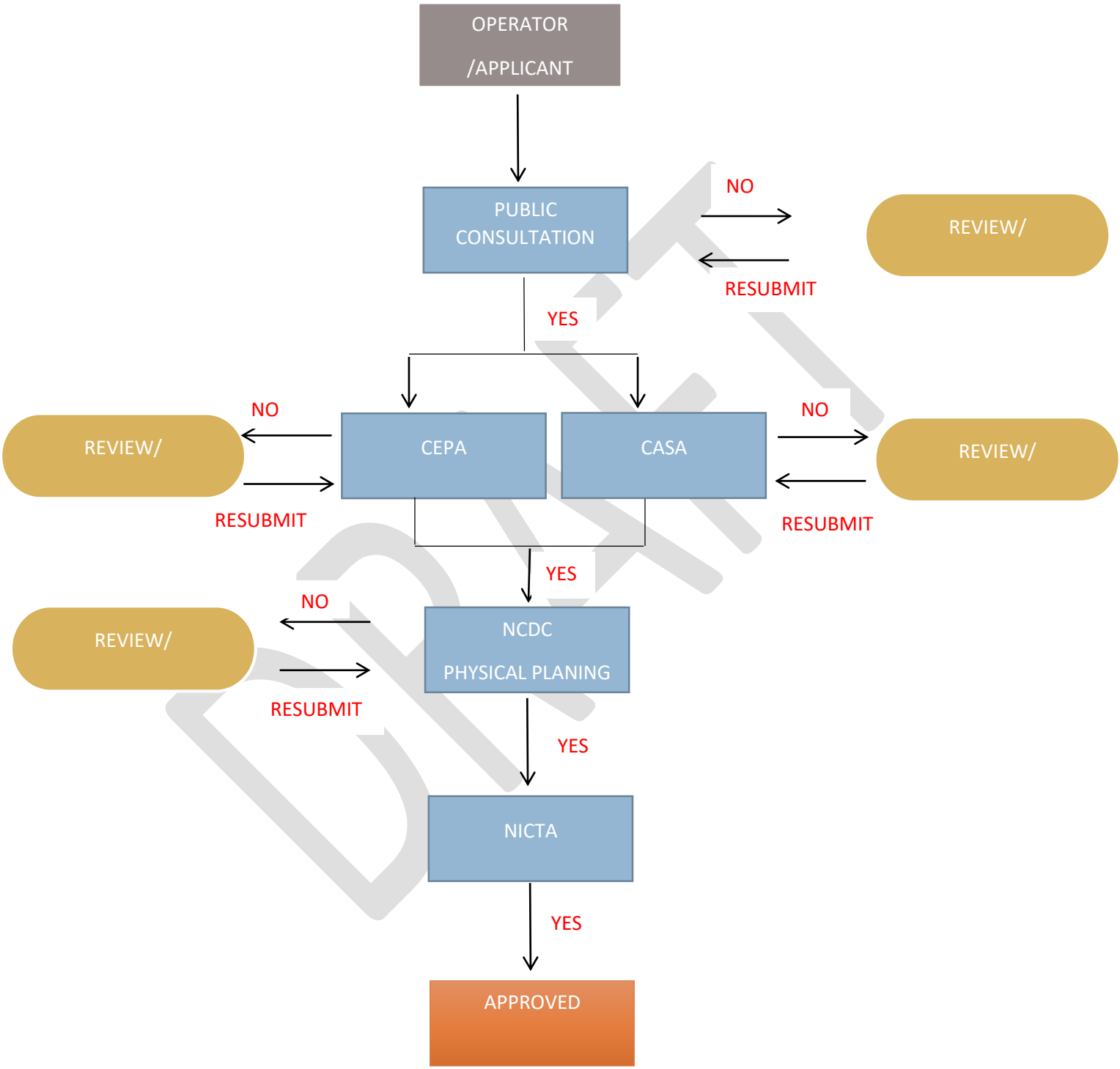
B - RF WARNING SIGNS

In reference to Clause 9 (8.1) Operators or tower owners are required to place RF radiation Caution Signs on tower sites to warn the public of areas the emf exceeds the general public exposure limits. These are examples of signs to be used.

B – FLOW CHART

PROPOSED TOWER APPROVAL PROCESS



D – PROPOSE APPLICATION FORM

PROPOSED APPLICATION FOR CONSTRUCTION OR MODIFICATION OF COMMUNICATION TOWER AND/OR ANTENNA STRUCTURE

PART 1 APPLICANT/SITE OPERATOR DETAILS		
1.1 Tower/Structure Owner:		
1.2 Contact Address:		
1.2 Contact Person:	Designation:	
1.4 Tel No.:	Mobile:	Email:
1.5 Operator License (if any):		

PART 2 SITE DETAILS		
2.1 Specify: ☐ New	☐ Modification	
2.2 Base Station ID:		
2.3 Address Location:		
2.4 GPS Coordinates:		
2.5 Height Above Sea Level:		
2.6 If Co-Location or Tower sharing: ☐ YES	☐ NO	
If Yes provide the following info;		
2.7 Name of existing Operator:		
2.8 Address:		
Contact Person:	Designation:	
Tel:	Mobile:	Email:
1. Provide Clearly Marked Site Plan (Annex A) to identify; # Type of Infrastructure #Sector directions for each antenna on site #Buildings		

PART 3 STATION DETAILS
3.1 Type of Structure Installation: ☐ Ground Based Tower ☐ Utility Structure ☐ Rooftop Tower ☐ Pole ☐ Other (Specify):_____
3.2 Please specify the height of the installation, h (m), from center of the antennae to the ground:
3.3 For RT/Pole/Other Installations also specify height of the installation x (m), from center of the antenna to rooftop level:
3.4 For All Type of Structure installations provide the following; ○ Site Plan ○ Picture of the proposed site ○ Front Elevation & Side Elevation of Installation ○ Top View of Installation ○ Landlord or landowner agreement ○ Approvals from City Council, Town Authority, CEPA and CASA

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PART 4 CONSULTATION
This section applicable Only for New Towers; 4.1 Public Consultation: ☐ Yes ☐ No 4.2 Date Performed: _____/_____/20 4.3 Duration: _____ 4.4 Type of Consultation: _____ 4.5 Outcome of consultation: _____ 4.6 Consultation Report Attached:

PART 5 FREQUENCY & SERVICE DETAILS
5.1 Name Of Operator
5.2 Class of Station: ☐ Mobile Base Station ☐ WiFi ☐ Others (Specify):_____
5.3 Frequency Band of Operation:
5.4 Class of Emission:
5.5 Frequency Band:
5.6 Channel Separation:

PART 6 Radio Equipment Details
6.1 NAME OF OPERATOR
6.2 Equipment Brand & Model:
6.3 Type approval reference:
6.4 Max Mean Power to the Antenna (dbm):
6.5 EIRP (dbm):
6.6 Sensitivity (dbm):
6.7 Noise Figure (dbm):

PART 7 Antenna Characteristic
7.1 Equipment Brand & Model:
7.2 Antenna Gain (Dbi):
7.3 Antenna Directivity:
7.4 Polarization:
7.5 Horizontal Beamwidth (deg):
7.6 Vertical Beamwidth (deg);
7.8 Cross Polar Discrimination:
7.9 A_{sl} (dB): (maximum side-lobe amplitude with respect to the maximum)
7.10 Insertion Loss (dB):
7.11Antenna radiation:
7.12 Antenna Radiation Pattern Diagrams Ref: ☐ Horizontal ☐ Vertical

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PART 8 SITE OPERATOR's DECLARATION
I hereby declare that; 8.1 All information contained herein and attached has been verified to be true and accurate 8.2 Additional information requested has been provided as attachment; ☐ Site Plan ☐ Picture of Site ☐ Font elevation ☐ Side Elevation ☐ Top View ☐ Consultation Report with the affected community in the vicinity of the proposed installation site ☐ Building Owner/ Land owner agreement ☐ CEPA Authorization Permit ☐ CASA Authorization Notice Permit ☐ City Council or Local Authority Authorization Permit 8.3 Name: _____Designation:_____ Signature:_____Date:_____/____20

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