AITI
Authority for
Info-communications
Technology
Industry of Brunei Darussalam

TELECOMMUNICATIONS ORDER, 2001

CODE OF PRACTICE
ON THE DEVELOPMENT, OPERATION, INSPECTION AND MAINTENANCE OF THE WIRELESS COMMUNICATIONS STRUCTURES
(WCS)

NO.	REVISION RECORD	EFFECTIVE DATE
1	First Issue	5 November 2021

TELECOMMUNICATIONS ORDER, 2001

CODE OF PRACTICE ON THE DEVELOPMENT, OPERATION, INSPECTION AND MAINTENANCE OF THE WIRELESS COMMUNICATION STRUCTURE (WCS)

In exercise of the powers conferred by section 26 of the Telecommunications Order, 2001, the Authority for Info-communications Technology Industry of Brunei Darussalam ("Authority") hereby issues the following Code of Practice on the Development, Operation, Inspection and Maintenance of the Wireless Communications Structures (WCS) in the Telecommunication Sector **effective 5 November 2021**.

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1. PRELIMINARY

1.1 Citation and Commencement

The Code of Practice for the Development, Operation, Inspection and Maintenance of the Wireless Communications Structures 2020 (WCS) may be cited as the (hereinafter referred as "WCS Code"). The WCS Code shall commence on a date to be appointed by the Authority.

1.2 Purpose of the WCS Code

1.2.1 The WCS Code specifies:

(a) the duties that must be observed by the AITI's Licensees who deploys and operates its installation, plant or systems within the telecommunications structures pursuant to the WCS Code;
(b) the technical regulatory practices, procedures, standards and criteria to be adopted in relation to the operation, inspection and maintenance of the WCS;
(c) the means of safeguarding public health and safety from possible hazards posed by the WCS through precautionary approach of the design and siting of the structures;
(d) the measures to be taken to ensure minimum impact to the surrounding environment due to the WCS development; and
(e) the goals of minimising the total number of WCS throughout Brunei Darussalam by strongly encouraging the co-location and infrastructure sharing amongst the telecommunications licensees.

1.3 Definitions

1.3.1 As used in the WCS Code:

(a) *"**Antenna**"* refers to any apparatus designed for telephone, data, radio, or television communications through the sending and/or receiving of electromagnetic waves;
(b) *"**Authority**"* refers to the Authority for Info-communications Technology Industry of Brunei Darussalam established under Section 3 of the AITI Order, 2001. Also known by the acronym as AITI;
(c) ***"AITI Order, 2001"*** refers to the Authority for Info-communications Technology Industry of Brunei Darussalam Order, 2001;
(d) *"**Co-location**"* refers to the placement of transmission equipment owned by a telecommunications provider in the premises of another telecommunications provider for interconnection to that telecommunications provider's network;
(e) *"**Compliance**"* refers to conformity with the requirements;
(f) *"**Construction**"* refers to a building or structure, means the earthworks, erection, extension of, alteration and/or addition to the building or structure, and "construct" and "constructed" shall be construed accordingly;
(g) "***Development***" refers to the process of converting land to a new purpose by constructing buildings or making use of its resources;

(h) ***"EMF"*** refers Electromagnetic Field whereby the waves of electric and magnetic energy moving together through space;

(i) "***Equipment"*** refers to any appliance, apparatus or accessories used or intended to be used for telecommunication purposes;

(j) *"**Height**"* refers to the distance measured from the finished grade of the parcel of land to the highest point on the wireless communications structure, including the base pad and any antenna or lightning rod;

(k) ***"ICNIRP"*** refers to the International Commission on Non-Ionising Radiation Protection, who is an independent scientific body, which has produced an international set of procedures and standards for public exposure to radio frequency waves;

(l) ***"Infrastructure"*** refers to the underlying systems, networks and facilities which enable the provision of info-communications services. This may include access to other related utility services as per referred to **Appendix A**;

(m) *"**Infrastructure Sharing**"* refers to the joint use of network facilities by two or more Licensees subject to agreement specifying relevant technical and commercial conditions;

(n) ***"InTi"*** refers to Infrastructure Provider for the Telecommunication Industry;

(o) ***"Licensee(s)"*** refers to an entity to whom a licence has been granted under the Telecommunication Order, 2001;

(p) ***"MoD"*** refers to the Ministry of Development;

(q) ***"Non-ionising radiation"*** refers to any type of electromagnetic radiation at frequencies below the UV band due to the lack of energy to liberate electrons, i.e. ionise or effect changes in atomic structure. Radio frequency fields are non-ionising radiation;

(r) *"**Previous codes**"* means any previously issued codes of practice which specified the guidance and control placement of wireless communications structures for the purpose of providing comprehensive nationwide coverage and telecommunications services;

(a) ***"QP"*** refers to a Qualified Person who is appointed by the Ministry of Development under the Building Control Order(BCO), 2014 to prepare plans of any building works in accordance with the 'Fourth Edition of Piawai Brunei Darussalam (PBD): BUILDING Guidelines and Requirements (4th Edition 2017)' developed by the Ministry of Development;

(s) ***"SAR"*** refers to Specific Absorption Rate whereby it measures of the rate at which energy is absorbed by the body when exposed to a radio frequency electromagnetic field;

(t) *"**Relevant authority**"* refers to any other external authority appointed from time to time pursuant to any guidelines or any existing committee who has the responsibility for approving any matters pertaining to WCS code.

(u) *"**Telecommunications**"* refers to a transmission, emission or reception of signs, signals, writing, images, sounds or intelligence of any nature by wire, radio, optical or other electro-magnetic systems whether or not such signs, signals, writing, images, sounds or intelligence have been subjected to rearrangement, computation or other processes by any means in the course of their transmission, emission or reception;

(v) *"**WCS**"* refers to Wireless Communications Structures where it denotes any structure, including base and foundation components, designed and constructed primarily for the purpose of supporting one or more antennas,

including monopoles, guyed masts, towers, rooftop pole and mast, mounting structures and others. Also known by the acronym as WCS.

1.4 Legal Effect of the WCS Code

1.4.1 Every Licensees involving the development, operation, inspection and maintenance of the WCS, duly licensed in Brunei Darussalam or otherwise must comply with the applicable provisions of the WCS Code.

1.4.2 The obligations contained in the WCS Code are in addition to those contained in the Telecommunications Order, 2001, as well as any other regulations, licences or codes of practices issued by the Authority.

1.4.3 To the extent that any provision of the WCS Code is inconsistent with the provisions of the Telecommunications Order, 2001, the provisions of the Telecommunications Order, 2001 shall prevail.

1.4.4 To the extent that the WCS Code is inconsistent with the provisions of any other codes or practice or standards of performance or additional licence's terms and conditions issued by the Authority, whether currently in force or implemented in the future, the terms of the WCS Code shall prevail.

1.4.5 Nothing in this WCS Code will limit the Authority's power to issue a direction under the Telecommunications Order, 2001.

1.4.6 If any provision of this WCS Code is held to be unlawful, all other provisions will remain in full force and effect.

1.5 Application of WCS Code to the Licensees

1.5.1 Unless otherwise stated, the provisions of the WCS Code shall apply only to AITI's InTi Licensees and such other undertakings or enterprises as the Authority may designate, given the impact in Brunei Darussalam.

1.5.2 All Licensees who develop, operates, inspect and maintain wireless communications structures (WCS), either for permanent or temporary use, and or modify existing WCS pursuant to this Code or any previous codes shall use its reasonable endeavours to comply with WCS Code.

1.5.3 For the avoidance of doubt, the Licensee shall not be excused from any failure to observe the requirements of the WCS Code arising from acts or omissions of any consultant or contractor whom he engages to design and construct the development.

1.5.4 Every Licensees must comply with the provisions outlined in WCS Code. Any contravention of the WCS Code will result in penalties imposed in accordance with the Telecommunications Order, 2001 and other applicable relevant laws of Brunei Darussalam.

1.6 Guidelines

1.6.1 Licensees shall refer to "**Advisory Guidelines for the Application Process of Wireless Communications Structures 2021"** for the technical specifications for the Application Process of the WCS and its general practices in relation thereof.

1.7 Modification of Provisions

1.7.1 The Authority may modify the provisions of this WCS Code in the following manners to reflect changing market conditions:

(a) The Authority may review the WCS Code at regular intervals after the issuance of the WCS Code. Once a review is conducted, the Authority may amend or modify relevant Sections of the WCS Code; or

(b) The Authority may modify the WCS Code on its own initiative at any time.

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2. WCS DEVELOPMENT AND OPERATIONAL REQUIREMENTS

2.1 General

2.1.1 The Licensee must perform regular site clean-up and maintenance to prevent safety hazards to the surrounding environment.

2.1.2 The WCS and its associated infrastructures must be designed and constructed in a way to allow co-location and sharing of additional telecommunication equipment from other additional telecommunication licensees.

2.1.3 The Licensees must have an enquiry and complaint handling process for the members of the public to highlight issues pertaining to the WCS and its associated infrastructures.

2.1.4 Any non-compliance within the WCS Code may result towards removal of all associated WCS's infrastructures and/or re-instatement of the site back to its original state at the expense of the Licensee.

2.2 WCS and the Associated Infrastructure

2.2.1 The Licensee must obtain prior relevant approval from the Authority and/or other relevant authorities during the development and before operation of the WCS Sites and its associated infrastructure.

2.2.2 Regular clean-up and maintenance of the WCS site must be performed to ensure that there are no safety hazards at the WCS site or the surrounding environment.

2.2.3 Where required, WCS site located on a slope or part of it, must have a proper site development with drainage system, structural site re-enforcement or other measures to stabilise the WCS site and its surrounding from soil erosion.

2.2.4 Any non-compliance within the WCS Code, which under the Authority's instruction may result towards the removal of the WCS and its associated infrastructure. The process of removal of the WCS may also involve the re-instatement of the site to its original condition and with other related works shall be at the expense of the Licensee.

2.3 WCS Co-location and Infrastructure Share

2.3.1 The design, construction and installation of WCS must be done in such a way as to accommodate additional Licensee(s) to be able to co-locate and share the same infrastructure with a reasonable cost and non-discriminatory basis, and modalities and conditions for such shared usage.

2.3.2 Where it is not possible to co-locate or share the WCS, the Licensee who owns or wishes to share or co-locate on the same WCS and/or its associated infrastructure, should demonstrate to the Authority with valid justifications.

2.3.3 Where required, all co-location and/or Infrastructure sharing activities must have a contractual agreement by the Licensee(s) defining ones' technical and commercial requirements, responsibilities and/or liabilities, and may not be limited as the mentioned.

2.3.4 Where any serious disagreement or dispute arises, that threatens the shared use of the WCS, the matter shall be presented to the Authority for direction[1].

2.3.5 Where existing WCS is incapable of supporting co-location, the option of decommissioning the old WCS and the erection of a new one or any modification of existing WCS capable of accommodating other antennas should be considered.

2.4 Complaint Handling

2.4.1 The Licensee must inaugurate processes to respond to complaints and enquiries from the public about the WCS, addressing any complaints and resolving such complaints within a reasonable period.

2.5 Removal of Damaged, Decommissioned and/or Abandoned Structure

2.5.1 In the event that the use of a WCS is discontinued due to damage, decommissioned and/or abandoned, the structure shall be dismantled, removed and the site be re-instated and with other related works shall be at the expense of the Licensee.

2.5.2 The Licensee must provide written notice and obtain prior approval from the Authority and/or other relevant authorities of its intent to dismantle, remove and/or decommission of the existing WCS.

2.5.3 WCS that has not been used for a continuous period of twelve (12) months, without the Licensee's notification, is deemed to have been abandoned unless earmarked for future use.

2.5.4 The Licensee must remove the decommissioned and/or abandoned WCS within ninety (90) calendar days after the date of discontinuance of use. If more time is required, the Licensee shall write in to the Authority to request for a time extension.

[1] In accordance to Sections 22(1) and/or 27(1) of the Telecommunications Order, 2001.

3. WCS INSPECTION AND MAINTENANCE REQUIREMENTS

3.1 General

3.1.1 The Licensee must ensure that the structural integrity of the WCS by conducting site inspections, structural inspections and maintenance annually or in-accordance to international standards and best practices. However, location and environmental factors may be taken into consideration for the increase in the frequency of such inspections.

3.1.2 All inspection or preventive maintenance performed must be validated by a certification report in-compliance with the relevant authorities' requirements, where applicable.

3.1.3 The Licensee must perform its inspection or preventive maintenance to ensure the structural and operational safety of the WCS, otherwise the Authority may itself, or appoint a third party organisation of the related field, to conduct the inspection, which shall be at the expense of the Licensee.

3.1.4 Any non-compliance within the WCS Code may result towards removal of all associated WCS's infrastructures and/or re-instatement of the site back to its original state at the expense of the Licensee.

3.2 Inspection and Maintenance

3.2.1 The Licensee must perform inspection and maintenance on all WCS and its associated infrastructure, as frequently as may be necessary, to ensure the WCS and its associated infrastructure is safe to operate.

3.2.2 Best practices must be taken into consideration:

(a) Structures require inspection for purposes of early detection of deterioration and followed by a maintenance to prevent breakdowns and the attendant consequences.
(b) Inspection and maintenance are especially important for the purposes of public safety, network availability, environmental aesthetics and lifetime quality of the structures.
(c) Inspection and maintenance of steel structures and antenna supporting structures must be performed on a routine basis.
(d) Ground and aerial procedures must be performed only by authorised personnel, experienced in climbing and tower adjustments.
(e) All structures must be inspected after severe climatic conditions and after the installation of an additional load like antennas on the structure loading conditions.

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3.2.3 Both inspection and maintenance checks must be carried out during the service life of the WCS, which shall not be limited on the followings below:

(a) WCS Main Structure.
(b) Structure Base Foundation.
(c) Guy wires.
(d) Bolting Parts.
(e) Verticality.
(f) Antennas and Accessories.
(g) Safety components.
(h) Electrical components, Earthing and Lightning Protection system.
(i) Aviation Obstruction Lights.
(j) Paints, Coating and Anti-corrosion protection.
(k) Tower loading

3.2.4 When carrying out the inspection and maintenance of the WCS, such factors must be taken into consideration:

(a) The worst-case scenario of a total mechanical failure is assumed in the WCS design.
(b) Mechanical failure can be caused by stress, extreme overload, use of defective and poor quality materials, fatigue, corrosion, poor workmanship, insufficient maintenance, sabotage, as well as any combination of these factors.
(c) Every design must attempt to foresee all possible combinations of these that can occur in the installation environment and incorporate protective answers to them in the design.

3.2.5 Regular intervals of inspection and maintenance are to be performed[2]:

(a) Three (3) year intervals for guyed masts and five (5) year intervals for self-supporting structures.
(b) After severe climatic conditions, severe seismic events or other extreme conditions.
(c) Shorter intervals may be required for WCS sites located in coastal regions, in corrosive environments and in areas subject to frequent vandalism.
(d) Intervals of inspection and maintenance may vary based on factors such as age of the structure and/or how often the WCS sites and its associated infrastructure are assessed and maintained.

3.2.6 The Licensee must perform inspection and maintenance on the WCS to prevent potential risks to the WCS site and its surrounding. Any non-compliance may result the Authority itself, at its own discretion or at any time, or appoint any third party organisation of the related field to conduct the inspection. The costs of inspection shall then be borne by the Licensee.

[2] In accordance with Section 14 on Maintenance and Condition Assessment of Telecommunication Towers under ANSI/TIA-222H or other equivalent international standards and best practices.

3.2.7 Any non-compliance within the WCS Code, which under the Authority's instruction may result towards the removal of the WCS and its associated infrastructure. The process of removal of the WCS may also involve the re-instatement of the site to its original condition and with other related works shall be at the expense of the Licensee.

3.2.8 Any findings deemed unsatisfactory, upon notice, the Licensee shall inform the Authority and other relevant authorities, in which shall be within ninety (90) calendar days to bring the WCS and its associated infrastructures into compliance, unless a time extension has been granted for good cause by the Authority.

3.3 Certification Report and Inspection/Maintenance Record

3.3.1 Every inspection/maintenance conducted must be validated by a Certification Report in-compliance with the Authority and/or other relevant authorities' requirement, where applicable. If required and without any delay, the Licensee must submit a copy of the Certification Report to the Authority.

3.3.2 Any inspection/maintenance performed for each WCS site must be properly documented. The information may be stored in a digital format and shall be readily accessible to the Authority or any authorised person, with the following information:

i. Installation/Inspection date.
ii. Inspection due dates.
iii. Painting due dates.
iv. Description of Minor Maintenance and its due dates.
v. Description of Major Maintenance and its due dates.
vi. Name, Organisation and Date of Inspection and Maintenance Personnel involved.
vii. Any other findings.

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4. WCS ON-SITE HEALTH AND SAFETY REQUIREMENTS

4.1 General

4.1.1 To ensure the Health, Safety and Environment (HSE) aspect, it is important that everyone should remember to be responsible in keeping and maintaining safe and healthy working environment.

4.1.2 In light of the COVID-19 situation globally, the Licensee shall strictly adhere to any guidelines issued in Brunei Darussalam by the Ministry of Health.

4.1.3 All WCS sites and its associated infrastructure must have a security fencing and warning signage installed to prevent any unauthorised access and provide visual notification to indicate presence of radio emission.

4.1.4 All installation and operation of the telecommunication equipment emitting EMF within the WCS site must comply to the ICNIRP's standards.

4.2 Safety Precautions at WCS Sites

4.2.1 The Licensee undertaking any WCS's works must ensure that appropriate and adequate safety measures and equipment is easily made available on the site at all times, which is in accordance with best industry practices and standards.

4.2.2 The Licensee must strictly comply, in-relation to any associated works at the WCS site, to all HSE aspects in accordance to the MoD's Health Safety and Environment requirements and/or any other safety requirements/procedures from other relevant authorities.

4.3 Security Fencing and Warning Signage

4.3.1 All WCS sites and its associated infrastructure must have security fencing and warning signage installed.

4.3.2 Security fencing must be installed within the perimeter of the land boundary to prevent unauthorised access. Whereas warning signage provides visual notification to indicate the WCS sites are off-limit to the general public and the presence of radio emission, in-which RF compliance requirements must be strictly adhered within the WCS site.

4.3.3 In the event of WCS installed on the building development, warning signage must be installed at the main entrance towards the site to notify the presence of radio emission. Doors at the main entrance must also be restricted and locked at all times to prevent any unauthorised access.

4.3.4 Where it is not possible to install security fencing on a WCS site such as on building rooftop with limited space area, then appropriate warning signage shall be installed.

4.4 International Safety Standards for the Emission of EMF

4.4.1 The Licensees must continue to follow prescribed national standards and any endorsed international guidelines to ensure public health and safety during any installation exercise, operations, inspections, and usage of any telecommunication equipment installed on the WCS.

4.4.2 Licensee must ensure that the general public are not exposed to non-ionising EMF (in excess), emitted by any telecommunication equipment, installed on the WCS. If any non-compliance is identified, the Licensee must immediately remediate in accordance to the ICNIRP's standards as per **Appendix B**.

4.4.3 Any telecommunication equipment installed on the WCS, established next to any buildings or places largely visited by the general public, the Licensee must at its best endeavour minimise the intensity of EMF emitted to those areas.

4.4.4 In the event where the Licensee requires assistance to perform the EMF inspection, as to ensure the limits of EMF does not exceed as per the ICNIRP's standards, the Licensee may either engage the Authority[3] directly or appoint a third party organisation to conduct the inspection at their own expense.

4.4.5 Any violation of the obligatory limits, arising during the operation of the telecommunication equipment, shall result to an immediate deactivation, by notice, from the Authority.

4.4.6 The operation of the telecommunication equipment shall not be re-activated until the Licensee is able to produce a certification report to the Authority. The certification report shall be in-compliance with the ICNIRP's standards.

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[3] The expenses related to the inspection of the EMF by the Authority can be referred to under *Section 83 of the Telecommunications (Radio-Communication) Regulations 2013*.

5. COMPENSATION

5.1 General

5.1.1 All WCS Sites and its associated infrastructures must be insured by the Licensee against any third party claims in the event of collapse. However, the responsibility for accidents during the development period shall be under the installer, and shall only revert to the Licensee upon the completion and handover of the WCS Site and its associated infrastructure.

5.1.2 In the event of WCS collapsed or any accidental damages caused by the WCS and/or any of the associated infrastructure that resulted in the loss of property and/or human injuries, the Licensee shall bear responsibility to:

i. immediately inform the Authority and other relevant authorities;
ii. provide compensation to the affected parties.

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APPENDIX A

Infrastructure consists of the underlying systems, networks and facilities, which enable the provision of info-communications services shall include access to other related utility services, but not limited to, as per listed below:

i. physical sites;
ii. right of way;
iii. poles, masts, monopoles and towers;
iv. antenna structures;
v. ducts, manholes and trenches;
vi. buildings, shelters and containers;
vii. general lighting, aviation obstruction lightings and air-conditioning;
viii. electrical components, earthing and lightning protection system;
ix. access tracks and paths;
x. signboard, warning signs;
xi. security fencing.

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APPENDIX B

The Licensee shall refer to the following table where operational limits for International Safety Standards for the Emission of EMF arising out of the use of radio telecommunication equipment have been prescribed:

Table 1: For general public exposure:

List of Frequency (f) Range	Measurement of Time Varying Electric Field in Volts/metre (V/m)	Measurement of Equivalent Power Density in Watts/square meter (W/m^2)	Remarks
1 – 25 Hz	10000	-	Measurement notes as per ICNIRP shall remain applicable
250 – 3000 Hz	250/f	-	
3 kHz – 1 MHz	87	-	
1 – 10 MHz	$87/f^{1/2}$	-	
10 – 400 MHz	28	2	
400 – 2000 MHz	$1.375\ f^{1/2}$	f/200	
2 – 300 GHz	61	10	

Table 2: For Specific Absorption Rate (SAR):

	List of Frequency (f) Range	Occupational Exposure	General Public Exposure
Field Power Density (as per frequency (f) range in Hz)	Up to 1 Hz	40	8
	1 – 4 Hz	40/f	8/f
	4 Hz – 1 kHz	10	2
	1 – 100 kHz	f/100	f/500
	100 kHz – 10 MHz	f/100	f/500
	10 MHz – 10 GHz	-	-

Table 3: Guidelines for Limiting Exposure to Time-Varying Electric Magnetic and EMF (Up to 300 GHz) by ICRNIP:

		Measurement of Occupational Exposure in watt/kilogram (w/Kg)	Measurement of General Public Exposure in watt/kilogram (w/Kg)
Specific Absorption Rate (measured over minimum of 6-minutes for averaging purposes) Frequency range: 100 kHz to 10 GHz	**For whole Body**	0.4	0.08
	Localised (Head and Trunk)	10	2
	Headphones	Not exceeding 0.94 (as per ICNIRP)	Not exceeding 0.94 (as per ICNIRP)

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