TESTING AND COMMISSIONING PROCEDURE

FOR

BROADCAST RECEPTION INSTALLATION

IN

GOVERNMENT BUILDINGS

OF

THE HONG KONG SPECIAL ADMINISTRATIVE REGION

2007 EDITION

ARCHITECTURAL SERVICES DEPARTMENT
THE GOVERNMENT OF THE HONG KONG SPECIAL ADMINISTRATIVE REGION

PREFACE

This Testing and Commissioning (T & C) Procedure aims to lay down the minimum testing and commissioning requirements to be carried out on broadcast reception installation in Government Buildings of the Hong Kong Special Administrative Region (HKSAR). Such requirements are applicable to both new installations upon completion and existing ones after major alteration.

The present edition was developed based on its 2002 edition by the Electrical Specialist Support Group that was established under the Building Services Branch Technical Information and Research & Development Committee. With the benefit of information technology, electronic version of this new edition is to be viewed on and free for download from the Architectural Services Department (ArchSD) Internet homepage. As part of the Government's efforts to limit paper consumption, hard copies of this T & C Procedure will not be put up for sale.

The Architectural Services Department welcomes comments on its contents at anytime since the updating of this T & C Procedure is a continuous process to tie in with technological advances.

DISCLAIMER

This T & C Procedure is solely compiled for use on burglar broadcast reception installation carried out for or on behalf of the ArchSD in Government buildings of the HKSAR.

There are no representations, either expressed or implied, as to the suitability of this T & C Procedure for purposes other than that stated above. The material contained in this T & C Procedure may not be pertinent or fully cover the extent of the installation in non-government buildings. Users who choose to adopt this T & C Procedure for their works are responsible for making their own assessments and judgement of all information contained here. The Architectural Services Department does not accept any liability and responsibility for any special, indirect or consequential loss or damage whatsoever arising out of or in connection with the use of this T & C Procedure or reliance placed on it.

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1. Introduction

The procedures stated in this document cover the activities in preliminary tests and inspections, functional performance tests and the commissioning of newly completed installations and existing ones after major alteration. They are so complied to facilitate the work of Project Building Services Engineer (PBSE) and Project Building Services Inspector (PBSI) in the following aspects of work with respect to testing and commissioning (T & C): -

1.1 To vet and approve the T & C procedures proposed and submitted by the Contractor.

1.2 To witness those T & C procedures as specified; and

1.3 To accept the T & C certificate and other supporting data.

The Contractor shall carry out the T & C works as detailed in this document. Supplementary T & C plans may be proposed by the Contractor as appropriate and agreed by PBSE, e.g. for special equipment supplied and/or installed by the Contractor.

The administrative requirements for T & C works are in general as specified in the latest General Specification for Broadcast Reception Installation (the General Specification) issued by the Architectural Services Department. If there is any discrepancy between this procedure and the General Specification, the General Specification shall take precedence.

2. Objectives of the Testing and Commissioning Works

The objectives of the T & C are: -

2.1 To verify proper functioning of the equipment/system after installation; and.

2.2 To verify that the performance of the installed equipment/systems meet with the specified design intent through a series of tests and adjustment; and

2.3 To capture and record performance data of the whole installation as the baseline for future operation and maintenance.

For the avoidance of doubt, depending on the specific demands of individual installation, the PBSE may require additional or substitute T & C works in regard to any elements in the installation other than those indicated in this procedure.

3 Scope of the T & C Works

3.1 Tests and Inspections during Construction

The purpose of these tests is to ensure that all components and systems are in a satisfactory and safe condition before start up. Preliminary adjustment and setting of equipment at this stage shall also be carried out at the same time to pave way for the coming functional performance tests.

Before carrying out any test, the Contractor shall ensure that the installation complies with all relevant statutory requirements and regulations. The T & C works shall also comply with all site safety regulatory requirements currently in force namely: -

3.1.1 Telecommunication Ordinance, Chapter 106, and other subsidiary legislation made under the Ordinance;

3.1.2 Electricity Ordinance, Chapter 406, and other subsidiary legislation made under the Ordinance;

3.1.3 Code of Practice for the Electricity (Wiring) Regulations published by the Electrical and Mechanical Services Department, the Government of the HKSAR;

3.1.4 Occupational Safety and Health Ordinance, Chapter 509, and other subsidiary legislation made under the Ordinance;

3.1.5 Factories and Industrial Undertakings Ordinance, Chapter 59, and other subsidiary legislation made under the Ordinance;

3.1.6 Construction Site (Safety) Regulations;

3.1.7 Construction Site Safety Manual issued by the Environmental, Transport and Works Bureau, the Government of the HKSAR.

3.2 Functional Performance Tests

The purpose of functional performance tests is to demonstrate that the equipment/installation can meet the functional and performance requirements as specified in the General/Particular Specifications. Functional performance test should proceed from the testing of individual components to the testing of different systems in the installation.

The Contractor may have to make temporary modifications as the test proceeds. The specific tests required and the order of tests will vary depending on the type and size of systems, number of systems, sequence of construction, interface with other installations, relationship with the building elements and other specific requirements as indicated in the General/Particular Specifications. The testing of systems may have to be carried out in stages depending on the progress of work or as proposed by the Contractor.

Part of the tests may be required to be carried out in suppliers' premises in accordance with the provisions in the General/Particular Specification.

Any performance deficiencies revealed during the functional performance tests must be evaluated to determine the cause and whether they are part of the contractual obligations. After completion of the necessary corrective measures, the Contractor shall repeat the tests.

If any test cannot be completed because of circumstances that are beyond the control of the Contractor, it shall be properly documented and reported to the PBSE, who shall then liaise with the relevant parties to resolve the situation. The Contractor shall resume his testing work immediately upon the attainment of a suitable testing environment.

3.3 Statutory Inspection/Commissioning

Commissioning is the advancement of an installation from the stage of static completion to full working conditions and to meet the performance requirements as specified in the General/Particular Specification. This will include setting into operation and regulation of the installation. It is expected that fine-tuning of the commissioned system shall be done by the Contractor to match system performance to the actual needs of the building occupier more closely.

Where necessary, after the proper testing and commissioning of the Broadcast Reception Installation, the Contractor shall notify the appropriate authority, through the PBSE of the completion of the installation and its readiness for final inspection.

3.4 Documentation and Deliverables

The Contractor shall submit his proposed T & C procedures together with the Testing and Commissioning Progress Chart shown in Annex B to PBSE for approval.

All inspection and T & C results shall be recorded by the Contractor in the appropriate test record forms, the reference of which is shown against each individual test. A complete set of these forms can be found in Part 3 and 4 of Annex A.

Data recorded in other formats may also acceptable subject to agreement between the PBSE and the Contractor. Upon completion of all the required T & C works, the Contractor's project engineer shall complete and sign a testing and commissioning certificate as shown in Part 1 and 2 of Annex A to the effect that the agreed T & C works have been duly carried out.

A functional performance test report covering all measured data, data sheets, and a comprehensive summary describing the operation of the system at the time of the functional performance tests shall be prepared and submitted to the PBSE. Deviations in performance from the General/Particular Specifications or the design intent should be recorded, with a description and analysis included.

Where required in the General Specification, the Contractor shall conduct a final evaluation of the performance of the Broadcast Reception Installation, the results of which shall be included in the commissioning report.

4 T & C Procedures

The Contractor shall carry out the tests and inspections as shown in Part 3 and record the test results on Part 4 of Annex A and as agreed between the PBSE and the Contractor.

4.1 General Requirements

The Contractor shall submit the T&C procedures together with the Testing and Commissioning Progress Chart in Annex B to the PBSE for approval. The submission shall be made at least one month before the commencement of T&C.

Where tests are required to be witnessed by the PBSE/PBSI, the Contractor shall give due advance notice (usually not less than three days) and provide details of date, time and type of tests to be performed.

Upon completion of such T & C procedure, the Contractor shall complete and sign a testing and commissioning certificate as Annex A, to the effect that agreed T & C procedures have been duly carried out.

Before carrying out any test, the Contractor shall ensure that the installations comply with the statutory requirements and regulations.

4.2 Tests and Inspections during Construction

4.2.1 Visual Inspection

When the installation is completed and ready for acceptance test, visual inspection is to be carried out by the Contractor to check if there is any visual damage to the installation.

As shown in Annex A, Part 3.1 is a check list for visual inspection to be carried out and the form shall be filled-in by the Contractor for the Terrestrial Master Antenna Television System.

If the BRI is the Satellite Master Antenna Television System, the Contractor shall complete the additional checklist in Annex A Part 3.2 for visual inspection to be carried out.

4.2.2 Signal Level Measurement

The contractor is required to measure the signal levels, check and identify the best locations before locating the TV antennas / satellite dishes.

4.3 Functional Performance Tests

The functional performance tests include the following :-

4.3.1 Signal Level Measurement of Terrestrial TV Headend and Trunk Distribution Equipment

4.3.1.1 Measure the input and output signal levels of each headend and trunk distribution equipment item with the signal level meter, starting from the antenna side. All the TV channels to be distributed shall be measured. For FM signals, three of the principal programmes to be distributed, namely those with the lowest, middle and highest frequencies, shall be measured.

4.3.1.2 Record the test results in Annex A Part 4.2 of the Performance Test Report.

For systems where strong FM signals other than the principal programmes to be distributed are received by the FM antenna, these strong FM signals shall also be measured and recorded for each equipment item in the FM signal path of the system headend. All signals having a level equal or greater than the weakest principal programme at the FM antenna output shall be recorded. Signal levels of these FM signals, including the principal FM programmes, shall be entered in a separate table similar to that in Annex A Part 4.2 of the Performance Test Report. It should be shown in this table that these strong FM signals have been properly rejected or levelled off at the headend output.

4.3.1.3 The input and output signal levels shall agree with the calculation done by the Contractor on the endorsed System Schematic Diagram(s).

4.3.1.4 If the above test fails the Contractor shall make necessary adjustment to the equipment and repeat steps 4.3.1.1 to 4.3.1.3 until step 4.3.1.3 is satisfied.

4.3.2 The Automatic Gain Control (AGC) Performance of TV Channel Amplifiers

4.3.2.1 If the TV channel amplifiers are fitted with AGC facilities, the AGC functions shall be tested. The input signal of each AGC channel amplifier shall be varied by +10 dB and -10 dB from its nominal value as recorded in Annex A Part 4.2 of the Performance Test Report. External amplifier and attenuator shall be temporarily inserted at the channel amplifier input for this test.

4.3.2.2 Variation of the channel amplifier output shall be measured and the results recorded in Annex A Part 4.2 of the Performance Test Report. Variation of the channel amplifier output shall be measured and the results recorded in Annex A Part 4.2 of the Performance Test Report.

4.3.2.3 For proper AGC function, the channel amplifier output shall not vary by more than $\pm$1dB.

4.3.2.4 If the channel amplifier output varies more than +1dB, the Contractor shall replace the equipment and repeat steps 4.3.2.1 to 4.3.2.2 until step 4.3.2.3 is satisfied.

4.3.3 Measurement of FM/TV Signal Levels at FM/TV/Data Outlets

4.3.3.1 The FM/TV signal level at FM/TV/Data outlets shall be measured by the signal level meter for each TV channel and three of the principal FM programmes to be distributed, namely those with the lowest, middle and highest frequencies. The results recorded in Annex A Part 4.2 of the Performance Test Report or in Annex 4 Part 4.3 if it is the SMATV system.

4.3.3.2 The FM/TV signal levels shall, unless otherwise specified, fall within the following items.

Outlet	Minimum Signal Level (r.m.s.)	Maximum Signal Level (r.m.s.)	"Tilt"
Terrestrial TV	1.000mV (60 dBμV)	7.08mV (77 dBμV)	12 dB
Satellite TV	1.000mV (60 dBμV)	7.08mV (77 dBμV)	12 dB
FM	0.316mV (50 dBμV)	3.16mV (70 dBμV)	15 dB

Note: "Tilt" is the difference in signal level between the strongest and the weakest TV signal.

4.3.3.3 A total of 20 outlets shall be measured for systems with up to 150 outlets. For larger systems, a sampling rate of 15% is recommended. The outlets shall be chosen with the following guidelines :-

i) the outlets likely to have the strongest and weakest signals judging from the schematic,

ii) not more than one outlet connected to the same tee unit shall be chosen normally.

4.3.3.4 If the above test fails the Contractor shall make necessary adjustment to the equipment and repeat steps 4.3.3.1 until step 4.3.3.2 is satisfied.

4.3.4 Mutual Isolation between FM/TV/Data Outlets

4.3.4.1 The mutual isolation between FM/TV/Data outlets from the same tee unit shall be measured and the results recorded in Annex A Part 4.2 of the Performance Test Report. The mutual isolation shall not be less than 36 dB for terrestrial TV signal, 36 dB for satellite TV and 42 dB for FM signal.

4.3.4.2 About 3 pairs of outlets shall be tested for each type of tee unit.

4.3.4.3 The procedure for testing shall be as follows :-

i) Connect UHF signal generator to the signal level meter.

ii) Tune the signal level meter to a channel (470-606MHz) other than the channels for reception.

iii) Tune the signal generator to the same channel.

iv) Record the output level of the signal generator (x dBμV).

v) Disconnect the signal generator and connect it to the FM/TV/Data socket of an outlet.

vi) Connect the signal level meter to the FM/TV/Data socket of another outlet which is tapped off from the same tee unit as the one connected to the signal generator.

vii) Note down the signal level of the "test" signal from the signal level meter (y dBμV).

viii) Mutual isolation between these two outlets is (x-y) dB.

ix) Tune the signal level meter to a new channel (606-862MHz) which is different from the channels being distributed. Repeat steps 4.3.3.3 (iii) to 4.3.3.3 (viii) above.

4.3.4.4 If the above test fails the Contractor shall make necessary adjustment to the equipment and repeat steps 4.3.4.3 until step 4.3.4.1 is satisfied.

4.3.5 FM/TV Functional Testing of FM/TV/Data outlets

4.3.5.1 The FM/TV picture quality at FM/TV/Data outlets shall be measured by the portable TV monitor C/W sound monitoring loudspeaker for each TV channel. The results recorded in Annex A Part 4.2 of the Performance Test Report or in Annex A Part 4.3 if it is the SMATV system.

4.3.5.2 The picture quality of TV reception shall be noted and recorded in the test report.

4.3.5.3 A total of 20 outlets shall be measured for systems with up to 150 outlets. For larger systems, a sampling rate of 15% is recommended. The outlets shall be chosen with the following guidelines :-

i) the outlets likely to have the strongest and weakest signals judging from the schematic,

ii) not more than one outlet connected to the same tee unit shall be chosen normally.

4.3.5.4 If the picture quality is not satisfactory, the Contractor shall make necessary adjustment to the equipment and repeat steps 4.3.5.1 to 4.3.5.3 until step 4.2.5.4 is satisfied.

4.3.6 Measurement of Return Path Amplifier Setting at Test Outlet of the Headend using A Reference Digital Test Signal (e.g. QPSK 3,088Mbit/s)

4.3.6.1 Determine the reference digital test signal to be injected and determine output level of the test outlet of the Headend.

4.3.6.2 Inject a signal to the amplifier closest to the Headend, measure the level at the Headend and adjust the output of the amplifier so that the output level at the Headend is according to 4.3.6.1.

4.3.6.3 Repeat the step 4.3.6.2 with the following amplifier in the downstream direction.

4.3.6.4 The output of the amplifier shall be noted and recorded in the test report.

4.3.7 Measurement of Return Path Amplitude Response Variation between the Test Outlet of the Headend and the Farthest FM/TV/Data Outlet

4.3.7.1 Set the sweep generator to cover the frequency range 5 MHz to 54 MHz and the output to the reference level. Sweep time shall be set to 50ms or less.

4.3.7.2 Connect the sweep output from the generator to the input of the spectrum analyser. Adjust the analyser display such that the sweep is on the screen with the vertical resolution set to 1 dB per division.

4.3.7.3 Set the resolution bandwidth (RBW) of the spectrum analyser to 1 MHz and the video bandwidth to 100kHz. Reduce the analyser sweep time to 50 sec. or greater.

4.3.7.4 Set the display to “maximum hold” and single sweep. Clear the screen.

4.3.7.5 Trigger the analyser and capture the reference sweep on screen. Record the result.

4.3.7.6 Repeat step 4.3.7.5 after increasing the path loss by 1 dB until the path loss reaches -10 dB.

4.3.7.7 Connect the analyser to the Test Outlet of the Headend and the the sweep generator to the farthest FM/TV/Data outlet. Repeat steps 4.3.7.5 and 4.3.7.6.

4.3.7.8 The Contractor shall make necessary adjustment to the equipment and repeat steps 4.3.7.1 through 4.3.7.7 until the measured amplitude response variation is equal or less than 8 dB.

4.3.8 Measurement of Return Path Signal to Noise Ratio (S/N) using a Reference Digital Test Signal (e.g. QPSK 3,088Mbit/s)

4.3.8.1 The Contractor shall carry out the Return Path Amplifier Measurement prior to this test.

4.3.8.2 Connect the spectrum analyser to the test outlet of the Headend and inject the reference digital signal into the farthest end of the FM/TV/Data outlet.

4.3.8.3 Set the resolution bandwidth (RBW) of the spectrum analyser to 30 kHz and the video bandwidth to 1kHz.

4.3.8.4 Record the signal level (S) at the centre frequency of the channel.

4.3.8.5 Switch off the channel at the farthest end of the FM/TV/Data outlet and record the noise level (N) in dBµV.

4.3.8.6 Calculate the signal to noise ration (S/N) by
$(S/N)_{dB} = S_{dB\mu V} - N_{dB\mu V}$

4.3.8.7 If the S/N is not greater than 22 dB, the Contractor shall make necessary adjustment to the equipment and repeat steps 4.3.8.2 to 4.3.8.6 until step 4.3.8.7 is satisfied.

4.3.9 Data Functional Testing of FM/TV/Data Outlets

4.3.9.1 The quality of the Data outlets shall be found by injecting a test signal at the Data outlet and measured by the monitor at the test outlet at the headend. The results recorded in Annex A Part 4.2 of the Performance Test Report.

4.3.9.2 The quality of Data at the test outlet at the Headend shall be noted and recorded in the test report.

4.3.9.3 A total of 20 outlets shall be measured for systems with up to 150 outlets. For larger systems, a sampling rate of 15% is recommended. The outlets shall be chosen with the following guidelines :-

i) the outlets likely to have the strongest and weakest signals judging from the schematic,

ii) not more than one outlet connected to the same tee unit be chosen normally.

4.3.9.4 If the quality of data received at the test outlet is not satisfactory, the Contractor shall make necessary adjustment to the equipment and repeat steps 4.3.9.1 to 4.3.9.3 until step 4.3.9.4 is satisfied.

4.3.10 Measurement of the Optical Output Power and the Optical Power Budget of the Fiber Optical Transmitter/transceiver

4.3.10.1 Where the fiber optical cable system is provided, the measurement of the optical output power and the optical power budget of the fiber optical transmitter/transceiver shall be measured.

4.3.10.2 Measure the optical output power and the optical power budget of the fiber optical transmitter/transceiver using the fiber optical cable fault & power meter. .

4.3.10.3 The measured values shall be better than the value quoted in the manufacturer's literature.

Where the SMATV system is provided, the measurement of Az-El angles, signal levels and C/N ratio measurements shall be carried out by the Contractor and witnessed by PBSB/PBSI. The Performance Test Report as shown in Annex A Part 4.3 shall be used to record the results.

4.3.11 Measurement of Azimuth-Elevation (Az-El) Angles of SMATV Antenna(e)

4.3.11.1 Confirm that the SMATV antenna is at the best reception position.

4.3.11.2 Record the Az-El angles in Annex A Part 4.3 of the Performance Test Report of SMATV System.

4.3.12 FM/TV Signal Level Measurements of SMATV System Equipment

4.3.12.1 The Contractor shall refer to Section 4.3.3 for test procedure.

4.3.13 The C/N Ratio Measurements of SMATV System Equipment

4.3.13.1 Connect the spectrum analyser at the input side of the satellite receiver.

Set the centre frequency same as the desired satellite IF carrier frequency.

Disconnect the satellite input signal and measure the noise floor level of the spectrum analyser.

Re-connect the satellite signal and measure the noise level. If the noise level is lower than the noise floor of the spectrum analyser, then, a line amplifier is necessary.

Measure the difference between the peak of the desired satellite carrier and the noise level.

Calculate the C/N ratio at 30MHz bandwidth as follow:-

C/N(30MHz) = Difference of reading - 10

4.3.13.2 Measure the input and output signal levels of satellite receivers, modulators, splitter/combiner equipment with signal level meter. All the Satellite TV channels to be distributed shall be measured.

4.3.13.3 Record the test results in Annex A Part 4.3 of the Performance Test Report of SMATV System.

4.3.13.4 The measured C/N ratios shall not be less than 11 dB.

4.3.13.5 If the above test fails, the Contractor shall make necessary adjustment to the equipment and repeat steps 4.3.13.1 to 4.3.13.4 until step 4.3.13.4 is satisfied.

4.4 Commissioning Inspection

Other than the functional tests carried out for the systems, the Contractor shall also check the following for the commissioning inspection of completion of work:

(a) All necessary works, such as the blanking off openings by fire barrier/thermal insulation, painting and sign boards are completed by the builder;

(b) All necessary works by other Contractors such as normal electrical supply, etc. are completed;

5. Calibrated Equipment

5.1 The contractor shall supply calibrated equipment as stipulated in the Specification of the Contract for the inspection, measuring and testing of the installation. The equipment shall be calibrated by laboratories accredited by the Hong Kong Laboratory Accreditation Scheme (HKLAS) or other recognised accredited laboratories.

5.2 The following equipment are required for the acceptance test of a terrestrial broadcast reception system :-

i) TV/Radio signal strength meter*

ii) Portable TV monitor C/W sound monitoring loudspeaker*

iii) TV pattern generator (for poor TV reception case, such as serious ghosting, external system interference)*

iv) VHF/UHF signal generator (if not already incorporated in item iii)*

v) Frequency Counter*

vi) Connection cords with suitable plugs at both ends

5.3 The following equipments are required for acceptance test of a fiber optical cable system: -

i) Fiber Optical Cable Fault & Power Meter *

5.4 The following additional equipment are required for the acceptance test of a SMATV system: -

i) Spectrum Analyser*

ii) Compass

iii) Inclinometer

iv) Measuring tape

The Contractor shall make available to the PBSE the calibration certificate of the testing equipment marked with * and the associated calibration records etc. one (1) month before the relevant test is performed.

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Building Services Branch	

Testing and Commissioning Certificate on Broadcast Reception Installation

Part 1 :	**Detail of Project**
1.1	Project title (with location) :
1.2	* P.W.P. / Project No. :
1.3	* Contract/Sub-contract/Quotation No. :
1.4	* Contractor/Sub-contractor :
1.5	PBSE :
1.6	PBSI :

Part 2 :	**Declaration**
2.1	I certify that the Broadcast Reception Installation as specified in the*Contract/Sub-Contract/Quotation at the above location has been inspected, tested and commissioned in accordance with this procedure and/or any other procedures agreed between the PBSE and the Contractor. The results are satisfactory in the aspects as mentioned in *Part 3 and/or as recorded in Part 4 of this Certificate, except as indicated in the COMMENTS items.
2.2	I also certify that site tests have been performed in accordance with the requirements set out in Annex A of this procedure and that the results are satisfactory. A record of the tests has been prepared and submitted to the PBSE
*2.3	I certify that I have made application to the Office of the Telecommunications Authority (OFTA) for *Addition/Amendment to Schedule to Satellite Master Antenna Television (SMATV) Licence and receive acceptance from OFTA on _____. A copy of endorsed OFTA forms is enclosed for confirmation.

(Name of Contractor's Representative)	Signature -	Post :	
		Tel. No. :	
	( )	Date :	
(Designation of Contractor's Representative)	Signature -	Post :	
		Tel. No. :	
	( )	Date :	
(Name and Stamp of Contractor)	Signature -	Post :	
		Tel. No. :	
	( )	Date :	

Note : This certificate must be signed by a person authorized by the Firm/Company
* Delete if not applicable

Part 3.	**Items Inspected and Tested**			
			Items tested / Checked by : Contractor	Items Witnessed by : PBSE/PBSI
3.1	Terrestrial Broadcast Reception System			
3.1.1	Summary of Visual Inspection			
3.1.1.1	Roof level		*Yes/No	*Yes/No
3.1.1.2	Meter rooms		*Yes/No	*Yes/No
3.1.1.3	Corridor/riser ducts		*Yes/No	*Yes/No
3.1.1.4	Flats/rooms		*Yes/No	*Yes/No
3.1.1.5	Acceptance Tests			
3.1.2	Roof Level (where aerial is installed)			
3.1.2.1	The Mast for the terrestrial TV/FM aerial is properly installed.		*Yes/No/N.A.	*Yes/No/N.A.
3.1.2.2	Position of the terrestrial TV/FM mast installed at the best reception position.		*Yes/No/N.A.	*Yes/No/N.A.
3.1.2.3	If the terrestrial TV & FM aerials are mounted on the same mast, the separation is NOT less than 1.8 m apart.		*Yes/No/N.A.	*Yes/No/N.A.
3.1.2.4	The signal cable from the terrestrial TV/FM aerials are properly secured on the mast.		*Yes/No/N.A.	*Yes/No/N.A.
3.1.2.5	Pre-amplifiers, combining units etc. are properly and securely mounted on the mast.		*Yes/No/N.A.	*Yes/No/N.A.
3.1.2.6	The conduit for the co-axial cables is available near the aerial mast.		*Yes/No/N.A.	*Yes/No/N.A.
3.1.2.7	The aerial and its supporting structures are provided with durable coating.		*Yes/No/N.A.	*Yes/No/N.A.
3.1.3	Meter Room (where active equipment is installed)			
3.1.3.1	The power supply point for HEAD-END equipment is properly installed and power supply is available.		*Yes/No/N.A.	*Yes/No/N.A.

Tested / Checked by : (Name of Contractor's Representative)	Signature - ( )	Post :	
		Tel. No. :	
		Date :	
Witnessed by : (Name(s) of *PBSE/PBSI)	Signature - ( )	Post :	
		Tel. No. :	
		Date :	

Part 3.	**Items Inspected and Tested**			
			Items tested/ checked by Contractor	Items witnessed by PBSE/PBSI
3.1.3.2	*Wideband/Channel amplifier is used at the terrestrial head-end. It is of endorsed type in accordance with the Specification. *Wideband/Channel amplifier is used at the terrestrial head-end. It is of endorsed type in accordance with the Specification.		*Yes/No/N.A.	*Yes/No/N.A.
3.1.3.3	Equipment in Item 3.1.3.2 above is properly installed and wired in accordance with endorsed schematic diagram(s).		*Yes/No/N.A.	*Yes/No/N.A.
3.1.3.4	Equipment in Item 3.1.3.2 is adequately earthed.		*Yes/No/N.A.	*Yes/No/N.A.
3.1.3.5	Tee-units, splitter units are of endorsed type in accordance with Specification.		*Yes/No/N.A.	*Yes/No/N.A.
3.1.3.6	Distribution amplifiers (D.A.) are installed at the correct floor levels/meter rooms.		*Yes/No/N.A.	*Yes/No/N.A.
3.1.3.7	The power supply points for D.A. are properly installed and power supply is available.		*Yes/No/N.A.	*Yes/No/N.A.
3.1.3.8	D.A. is of endorsed type in accordance with the Specification.		*Yes/No/N.A.	*Yes/No/N.A.
3.1.3.9	D.A. is properly installed and earthed.		*Yes/No/N.A.	*Yes/No/N.A.
3.1.3.10	Co-axial cables are of endorsed type in accordance with the Specification.		*Yes/No/N.A.	*Yes/No/N.A.
3.1. 3.11	Fibre optical transmitters/amplifiers/transceivers are installed at the correct floor levels/meter rooms/cable draw pits as shown in Drawings..		*Yes/No/N.A.	*Yes/No/N.A.
3.1. 3.12	The power supply points for fibre optical transmitters/ amplifiers/transceivers are properly installed and power supply is available.		*Yes/No/N.A.	*Yes/No/N.A.
3.1. 3.13	The fibre optical transmitters/amplifiers/transceivers are of endorsed types in accordance with the Specification.		*Yes/No/N.A.	*Yes/No/N.A.
3.1. 3.14	The fibre optical transmitters/amplifiers/transceivers are properly installed and earthed.		*Yes/No/N.A.	*Yes/No/N.A.

Tested / Checked by : (Name of Contractor's Representative)	Signature - ( )	Post :	
		Tel. No. :	
		Date :	
Witnessed by : (Name(s) of *PBSE/PBSI)	Signature - ( )	Post :	
		Tel. No. :	
		Date :	

			Items tested/ checked by Contractor	Items witnessed by PBSE/PBSI
3.1. 3.15	The fiber optical return path transmitters/transceivers are of endorsed types in accordance with the Specification.		*Yes/No/N.A.	*Yes/No/N.A.
3.1. 3.16	The fiber optical return path transmitters/transceivers are properly installed and earthed.		*Yes/No/N.A.	*Yes/No/N.A.
3.1. 3.17	The fiber optical cable is of endorsed type in accordance with the Specification.		*Yes/No/N.A.	*Yes/No/N.A.
3.1. 3.18	The fiber optical cable is properly connected to the fibre optical transmitters/ amplifiers/transceivers.		*Yes/No/N.A.	*Yes/No/N.A.
3.1. 3.19	The fiber optical splitter is installed at the correct location position shown in Drawings.		*Yes/No/N.A.	*Yes/No/N.A.
3.1. 3.20	The fiber optical splitter is of endorsed type in accordance with the Specification.		*Yes/No/N.A.	*Yes/No/N.A.
3.1.4	Corridor Area/Riser Ducts (where distribution cables are installed)			
3.1.4.1	The surface wiring is properly installed and arranged in a neat and tidy manner.		*Yes/No/N.A.	*Yes/No/N.A.
3.1.4.2	The surface wiring is not running at the same parallel route next to the telephone cables.		*Yes/No/N.A.	*Yes/No/N.A.
3.1.4.3	The wire clips and nails for the surface wiring are of endorsed type.		*Yes/No/N.A.	*Yes/No/N.A.
3.1.4.4	Splitter and tee units are installed at the position shown in Drawings.		*Yes/No/N.A.	*Yes/No/N.A.
3.1.4.5	Splitter, tee units and cables are of endorsed type in accordance with the Specification.		*Yes/No/N.A.	*Yes/No/N.A.
3.1.4.6	If splitter and tee units are installed in the adaptable box, the box covers are in position.		*Yes/No/N.A.	*Yes/No/N.A.
3.1.4.7	No sharp bends of co-axial cables (bending radius not smaller than 15 times the outer diameter of the cable).		*Yes/No/N.A.	*Yes/No/N.A.

Tested / Checked by : (Name of Contractor's Representative)	Signature - ( )	Post :	
		Tel. No. :	
		Date :	
Witnessed by : (Name(s) of *PBSE/PBSI)	Signature - ( )	Post :	
		Tel. No. :	
		Date :	

			Items tested/ checked by Contractor	Items witnessed by PBSE/PBSI
3.1.5	Flats/Rooms (where outlets are installed)			
3.1.5.1	The surface wiring is properly installed and arranged in a neat and tidy manner.		*Yes/No/N.A.	*Yes/No/N.A.
3.1.5.2	No sharp bends of co-axial cables (bending radius not smaller than 15 times the outer diameter of the cable).		*Yes/No/N.A.	*Yes/No/N.A.
3.1.5.3	The wire clips and nails for the surface wiring are of endorsed type.		*Yes/No/N.A.	*Yes/No/N.A.
3.1.5.4	Socket outlets are properly installed in positions shown on the Drawings.		*Yes/No/N.A.	*Yes/No/N.A.
3.1.5.5	Socket outlets and plastic pattress are of endorsed materials.		*Yes/No/N.A.	*Yes/No/N.A.
3.1.5.6	Provision of spare conduit box c/w draw wire for future extension, if applicable.		*Yes/No/N.A.	*Yes/No/N.A.
3.1.6	The input and output signal levels at the terrestrial headend and trunk distribution equipment have been checked and tested and were found to be satisfactory.		*Yes/No	*Yes/No
3.1.7	The AGC performance of TV channel amplifiers has been checked and tested and were found to be satisfactory.		*Yes/No	*Yes/No
3.1.8	The signal levels at the FM/TV/DATA outlets have been checked and tested and were found to be within the specified limits.		*Yes/No	*Yes/No
3.1.9	The mutual isolation between socket outlets have been checked and tested the specified requirements and were found to be within specified limit.		*Yes/No	*Yes/No

Tested / Checked by : (Name of Contractor's Representative)	Signature - ( )	Post :	
		Tel. No. :	
		Date :	
Witnessed by : (Name(s) of *PBSE/PBSI)	Signature - ( )	Post :	
		Tel. No. :	
		Date :	

			Items tested/ checked by Contractor	Items witnessed by PBSE/PBSI
3.2	**Satellite Master Antenna Television System**			
3.2.1	Summary of Visual Inspection			
3.2.1.1	Roof level		*Yes/No	*Yes/No
3.2.1.2	Meter rooms		*Yes/No	*Yes/No
3.2.2	Roof Level (where antenna is installed)			
3.2.2.1	The Satellite TV antenna has a clear, unobstructed view of the target satellite.		*Yes/No/N.A.	*Yes/No/N.A.
3.2.2.2	No condensation is in the vicinity of the Satellite TV antenna.		*Yes/No/N.A.	*Yes/No/N.A.
3.2.2.3	The Satellite TV antenna is more than 3 metres clear from fences or enclosure.		*Yes/No/N.A.	*Yes/No/N.A.
3.2.2.4	The dish antenna is not warped. (Sighting along one rim, does the other sides line up perfectly parallel)		*Yes/No/N.A.	*Yes/No/N.A.
3.2.2.5	The dish antenna surface is smooth, not rough or bumpy.		*Yes/No/N.A.	*Yes/No/N.A.
3.2.2.6	The dish antenna does not twist nor rock when it is under stress, i.e. the dish antenna is rigidly fixed/mounted to its support.		*Yes/No/N.A.	*Yes/No/N.A.
3.2.2.7	If steel support is used for the aluminium dish antenna, rubber grommets are inserted to prevent electrolysis action.		*Yes/No/N.A.	*Yes/No/N.A.
3.2.2.8	Satellite TV antenna(e) is/are adequately supported.		*Yes/No	*Yes/No
3.2.2.9	The feedhorn is adequately supported.		*Yes/No/N.A.	*Yes/No/N.A.
3.2.2.10	The recommended gaskets are used between the feedhorn and the LNA/LNB.		*Yes/No/N.A.	*Yes/No/N.A.
3.2.2.11	Sealant between the gaskets is in accordance with the manufacturer's recommendation. (Waveguide must be metal to metal contact)		*Yes/No/N.A.	*Yes/No/N.A.

Tested / Checked by : (Name of Contractor's Representative)	Signature - ( )	Post :	
		Tel. No. :	
		Date :	
Witnessed by : (Name(s) of *PBSE/PBSI)	Signature - ( )	Post :	
		Tel. No. :	
		Date :	

			Items tested/ checked by Contractor	Items witnessed by PBSE/PBSI
3.2.2.12	The position of the feedhorn has been checked in accordance with the manufacturer's recommendation.		*Yes/No/N.A.	*Yes/No/N.A.
3.2.2.13	The dish antenna has been properly earthed.		*Yes/No/N.A.	*Yes/No/N.A.
3.2.3	Meter Room (where active equipment is installed)			
3.2.3.1	The power supply point for equipment is properly installed and power supply is available.		*Yes/No/N.A.	*Yes/No/N.A.
3.2.3.2	Satellite receivers and modulators shall be of endorsed type in accordance with the Specification.		*Yes/No/N.A.	*Yes/No/N.A.
3.2.3.3	Equipment in Item 3.2.3.2 and wired in accordance with endorsed schematic diagram(s).		*Yes/No/N.A.	*Yes/No/N.A.
3.2.3.4	Equipment in Item 3.2.3.2 is adequately earthed.		*Yes/No/N.A.	*Yes/No/N.A.
3.1.3.5	Splitter/tee units are installed at the position shown in Drawings.		*Yes/No/N.A.	*Yes/No/N.A.
3.1.3.6	Splitter/tee units and cables are of endorsed type in accordance with the Specification.		*Yes/No/N.A.	*Yes/No/N.A.
3.1.3.7	If splitter/tee units are installed in the adaptable box, the box covers are in position.		*Yes/No/N.A.	*Yes/No/N.A.

Tested / Checked by : (Name of Contractor's Representative)	Signature - ( )	Post :	
		Tel. No. :	
		Date :	
Witnessed by : (Name(s) of *PBSE/PBSI)	Signature - ( )	Post :	
		Tel. No. :	
		Date :	

		Items tested/ checked by Contractor	Items witnessed by PBSE/PBSI
3.3 Comments		*Yes/No/N.A.	*Yes/No/N.A.

Note : * Delete if not applicable

Tested / Checked by : (Name of Contractor's Representative)	Signature - ( )	Post :	
		Tel. No. :	
		Date :	
Witnessed by : (Name(s) of *PBSE/PBSI)	Signature - ( )	Post :	
		Tel. No. :	
		Date :	

Part 4 :	**Test Record attached to the Test Certificate**
4.1	Summary of Performance Test
4.1.1	Total number of TV/FM outlets installed _____ Nos.
4.1.2	Total number of TV/FM outlets checked for signal strength _____ Nos.
4.1.3	Total number of TV/FM outlets Pairs checked for mutual isolation _____ Nos.
4.1.4	TV/FM outlets with TV signal level beyond the range of 57 dBμV to 77dBμV _____ Nos.
4.1.5	FM/TV/Data outlets with Data signal level beyond the range as specified _____ Nos.
4.1.6	FM/TV/Data outlets with TV signal level "Tilt" greater than 12 dB _____ Nos.
4.1.7	FM/TV/Data outlets with FM signal levels beyond the range of 50 to 70dBμV _____ Nos.
4.1.8	Broken/defective FM/TV/Data outlets _____ Nos.
4.1.9	Total number of TV/FM outlets out of Specification _____ Nos.
4.2	Record of Test on Terrestrial Broadcast Reception System
4.2.1	General
4.2.1.1	Details of Terrestrial TV Frequency Plan

Channel No.	Programme	Colour System	Carrier Frequency (MHz)	Intermediate Freq. (IF) (MHz)	Distributed Freq. (MHz)
	TVB Chinese	PAL. I			
	ATV Chinese	PAL. I			
	TVB English	PAL. I			
	ATV English	PAL. I			

Tested / Checked by : (Name of Contractor's Representative)	Signature - ( )	Post :	
		Tel. No. :	
		Date :	
Witnessed by : (Name(s) of *PBSE/PBSI)	Signature - ( )	Post :	
		Tel. No. :	
		Date :	

4.2.1.2 Details of FM Broadcast Plan

Programme	Carrier Frequency
CR 1	MHz
CR 2	MHz
RTHK 1	MHz
RTHK 2	MHz
RTHK 4	MHz
	MHz
	MHz

Tested / Checked by : (Name of Contractor's Representative)	Signature - ( )	Post :	
		Tel. No. :	
		Date :	
Witnessed by : (Name(s) of *PBSE/PBSI)	Signature - ( )	Post :	
		Tel. No. :	
		Date :	

4.2.2	Terrestrial TV Headend and Trunk Distribution Equipment
Note:	
(i)	The input and output signal levels for each piece of terrestrial TV headend and trunk distribution equipment shall be measured and recorded.
(ii)	Schematic Diagram(s) shall be attached to this report with the equipment numbered in accordance with the first column of the following table. The design input and output signal levels for each piece of equipment shall also be shown on the Schematic Diagram(s).

Item	Equipment Description	Location	Signal Level (dBμV)							
			Terrestrial TV					FM		
			ch ( )	ch ( )	ch ( )	ch ( )	ch ( )	( ) MHz	( ) MHz	( ) MHz
			In Out	In Out	In Out	In Out	In Out	In Out	In Out	In Out

Tested / Checked by : (Name of Contractor's Representative)	Signature - ( )	Post :	
		Tel. No. :	
		Date :	
Witnessed by : (Name(s) of *PBSE/PBSI)	Signature - ( )	Post :	
		Tel. No. :	
		Date :	

4.2.3	AGC Performance of TV Channel Amplifiers
4.2.3.1	Nominal Input/Output Levels
Note:	Note: These data should match with those recorded in Part 4.2.4 for the channel amplifiers

Channel No.	Nominal Input ($dB_{\mu}V$)	AGC Output ($dB_{\mu}V$)

4.2.3.2	Output Signal Deviation	
Channel No.	Output Signal Deviation (dB)	
	Nominal Input +10dB	Nominal Output - 10dB

Tested / Checked by : (Name of Contractor's Representative)	Signature - ( )	Post :	
		Tel. No. :	
		Date :	
Witnessed by : (Name(s) of *PBSE/PBSI)	Signature - ( )	Post :	
		Tel. No. :	
		Date :	

4.2.4	Signal Levels at TV/FM Outlets
Note:	
(i)	Use Table in Annex A, Part 4.3.2.3, if the installation is the SMATV system.
(ii)	Schematic Diagram(s) shall be attached.
(iii)	The "Tilt" is difference in signal level between the strongest and the weakest TV signal at the same outlet.
(iv)	Insert "X" in "Picture Quality" if reception is poor and unacceptable

Flat/Room No.	TV Signal Level					Tilt	Picture Quality	FM Signal Level		
	Ch ( ) (dBµV)	Ch ( ) (dBµV)	Ch ( ) (dBµV)	Ch ( ) (dBµV)	Ch ( ) (dBµV)	(dB)		MHz (dBµV)	MHz (dBµV)	MHz (dBµV)

Tested / Checked by : (Name of Contractor's Representative)	Signature - ( )	Post :	
		Tel. No. :	
		Date :	
Witnessed by : (Name(s) of *PBSE/PBSI)	Signature - ( )	Post :	
		Tel. No. :	
		Date :	

4.2.5 Mutual Isolation between Socket Outlets

Test Signal 1: Channel_____ (470-606MHz)
Channel_____ (606-862MHz)

Measurement between Flats No.	Model of Tee Unit	Test Signal 1			Test Signal 2		
		Input Signal ($dB_\mu V$)	Output Signal ($dB_\mu V$)	Mutual Isolation (dB)	Input Signal ($dB_\mu V$)	Output Signal ($dB_\mu V$)	Mutual Isolation (dB)
&							
&							
&							
&							
&							
&							
&							
&							
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&							
&							
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&							

Tested / Checked by : (Name of Contractor's Representative)	Signature - ( )	Post :	
		Tel. No. :	
		Date :	
Witnessed by : (Name(s) of *PBSE/PBSI)	Signature - ( )	Post :	
		Tel. No. :	
		Date :	

4.2.6 Return Path Performance of Amplifiers

The type of reference digital test signal to be injected:	
The signal level of reference digital test signal:	$dB_{\mu}V$
The output signal level of the test outlet of the Headend:	$dB_{\mu}V$

Amplifier No.	Nominal Input ($dB_{\mu}V$)	Output ($dB_{\mu}V$)

Tested / Checked by : (Name of Contractor's Representative)	Signature - ( )	Post :	
		Tel. No. :	
		Date :	
Witnessed by : (Name(s) of *PBSE/PBSI)	Signature - ( )	Post :	
		Tel. No. :	
		Date :	

4.2.7 Measurement of Return Path Amplitude Response Variation

Path Loss	The Sweep Generator connected to the Farthest FM/TV/Data Outlet and the Spectrum Analyser to the Test Outlet of the Headend	The Sweep Generator connected to the Spectrum Analyser	The Amplitude Response Variation in dB
	Signal Level measured in $dB_{\mu}V$	Signal Level measured in $dB_{\mu}V$	
		The maximum Amplitude Response Variation	

Tested / Checked by : (Name of Contractor's Representative)	Signature - ( )	Post :	
		Tel. No. :	
		Date :	
Witnessed by : (Name(s) of *PBSE/PBSI)	Signature - ( )	Post :	
		Tel. No. :	
		Date :	

4.2.8 Measurement of Return Path Signal to Noise Ratio (S/N)

The centre frequency of the channel to be measured	=		MHz
The measured signal level (S) at the test outlet	=		$dB_{\mu}V$
The measured noise level (N) at the test outlet	=		$dB_{\mu}V$
The signal to noise ratio (S/N) (S) – (N)	=		dB

Tested / Checked by : (Name of Contractor's Representative)	Signature - ( )	Post :	
		Tel. No. :	
		Date :	
Witnessed by : (Name(s) of *PBSE/PBSI)	Signature - ( )	Post :	
		Tel. No. :	
		Date :	

4.2.9 Data Quality of Return Path Signal At Test Outlet of Headend

Note:

(i) Schematic Diagram(s) shall be attached.

(ii) Insert "X" in "Data Quality" if reception is poor and unacceptable.

Flat/Room No.	FM/TV/Data Outlet No. 1		FM/TV/Data Outlet No. 2		FM/TV/Data Outlet No. 3		FM/TV/Data Outlet No. 4	
	Data signal level at Outlet (dBµV)	Quality at Test Outlet	Data signal level at Outlet (dBµV)	Quality at Test Outlet	Data signal level at Outlet (dBµV)	Quality at Test Outlet	Data signal level at Outlet (dBµV)	Quality at Test Outlet

Tested / Checked by : (Name of Contractor's Representative)	Signature - ( )	Post :	
		Tel. No. :	
		Date :	
Witnessed by : (Name(s) of *PBSE/PBSI)	Signature - ( )	Post :	
		Tel. No. :	
		Date :	

4.2.10 Measurement of the Optical Output Power and the Optical Power Budget of the Fiber Optical Transmitter/Transceiver

Fiber Optical Cable No.	Measured Optical Output Power (μW)	Measured Optical Power Budget (dB)

Tested / Checked by : (Name of Contractor's Representative)	Signature - ( )	Post :	
		Tel. No. :	
		Date :	
Witnessed by : (Name(s) of *PBSE/PBSI)	Signature - ( )	Post :	
		Tel. No. :	
		Date :	

4.3 Record of test on SMATV System

4.3.1 General

The following tables shall be completed by BRI Contractor.

4.3.1.1 Details of Satellite Antenna Frequency Plan

Channel No.	Satellite Name	Polarity	Carrier Freq. (GHz)	Programme	Colour System	Intermediate Freq. (IF) (MHz)	Sound Freq. (MHz)

4.3.1.2 True North

True north is at *+ / - degree of Magnetic North.

Tested / Checked by : (Name of Contractor's Representative)	Signature - ( )	Post :	
		Tel. No. :	
		Date :	
Witnessed by : (Name(s) of *PBSE/PBSI)	Signature - ( )	Post :	
		Tel. No. :	
		Date :	

4.3.2 Performance Tests

(The following tests shall be carried out by BRI Contractor and witnessed by PBSE/PBSI.)

4.3.2.1 Measurements of El-Az and C/N Ratios

Antenna No.	Antenna Location	Dish Dimension (metres)	Orientation				Target Satellite Name	Channel No.	C/N Ratio (At Input to Receiver)
			Calculated		Measured				
			El	Az	El	Az			

4.3.2.2 Signal Level of SMATV Distribution Equipment

Note:

(i) The input and output signal levels for each piece of SMATV distribution equipment shall be measured and recorded.

(ii) Schematic Diagram(s) shall be attached to this report with the equipment numbered in accordance with the first column of the following table. The design input and output signal levels for each piece of equipment shall also be shown on the Schematic Diagram(s).

Item	Equipment Description	Location	SMATV Signal Level (dBμV)				
			Ch ( )	Ch ( )	Ch ( )	Ch ( )	Ch ( )
			In Out	In Out	In Out	In Out	In Out

Tested / Checked by : (Name of Contractor's Representative)	Signature - ( )	Post :	
		Tel. No. :	
		Date :	
Witnessed by : (Name(s) of *PBSE/PBSI)	Signature - ( )	Post :	
		Tel. No. :	
		Date :	

4.3.2.3. Signal Levels at TV/FM Outlets

Note :

1. Schematic Diagram(s) shall be attached.
2. The “Tilt” is difference in signal level between the strongest and the weakest TV signal at the same outlet.
3. Insert “X” in “Picture Quality” if reception is poor and unacceptable.

Flat/Room No.	Signal Levels										Tilt (dB)	Picture Quality	Signal Levels		
	Satellite TV					Terrestrial TV							FM		
	Ch ( ) (dBµV)	Ch ( ) (dBµV)	Ch ( ) (dBµV)	Ch ( ) (dBµV)	Ch ( ) (dBµV)	Ch ( ) (dBµV)	Ch ( ) (dBµV)	Ch ( ) (dBµV)	Ch ( ) (dBµV)	Ch ( ) (dBµV)			MHz (dBµV)	MHz (dBµV)	MHz (dBµV)

Tested / Checked by : (Name of Contractor’s Representative)	Signature - ( )	Post :	
		Tel. No. :	
		Date :	
Witnessed by : (Name(s) of *PBSE/PBSI)	Signature - ( )	Post :	
		Tel. No. :	
		Date :	

4.4 Testing Equipments

4.4.1 Testing equipments Used in Terrestrial Reception System Test:

Type	Model	Serial No. of Instrument	Date of Calibration

Tested / Checked by : (Name of Contractor's Representative)	Signature - ( )	Post :	
		Tel. No. :	
		Date :	
Witnessed by : (Name(s) of *PBSE/PBSI)	Signature - ( )	Post :	
		Tel. No. :	
		Date :	

4.4.2 Testing equipments Used in SMATV System Test:

Type	Model	Serial No. of Instrument	Date of Calibration

Note: * Delete if not applicable

Tested / Checked by : (Name of Contractor's Representative)	Signature - ( )	Post :	
		Tel. No. :	
		Date :	
Witnessed by : (Name(s) of *PBSE/PBSI)	Signature - ( )	Post :	
		Tel. No. :	
		Date :	

Testing and Commissioning Progress Chart
"Broadcast Reception Installation"

Contract No. : _____

Contract Title : _____

Name of Contractor/Sub-Contractor : _____

Contract Period : / /20 to / /20 * Revised/Actual Completion Date : / /20

	Testing and Commissioning Progress Chart for Broadcast Reception Installation (Rev.)(1)																		
	Dates (2)																		Remark
	Activities	Reference to Annex A	S	A	S	A	S	A	S	A	S	A	S	A	S	A	S	A	
1.	Visual inspection	3.1																	
	G/F																		
	1/F																		
	2/F																		
	3/F																		
	4/F																		
	_____																		
	Roof & head and equipment room																		
	Submission of Record of Test																		
2.	Installation of outlet plate	3.1 & 4.2																	
	G/F																		
	1/F																		
	2/F																		
	3/F																		
	4/F																		
	_____																		
	Submission of Record of Test																		

Tested / Checked by : (Name of Contractor's Representative)	Signature - ( )	Post :	
		Tel. No. :	
		Date :	
Witnessed by : (Name(s) of *PBSE/PBSI)	Signature - ( )	Post :	
		Tel. No. :	
		Date :	

Testing and Commissioning Progress Chart
"Broadcast Reception Installation"

	Testing and Commissioning Progress Chart for Broadcast Reception Installation (Rev.)(1)																		
	Dates (2)																		Remark
	Activities	Reference to Annex A	S	A	S	A	S	A	S	A	S	A	S	A	S	A	S	A	
3.	Installation of splitter unit	3.1 & 4.2																	
	G/F																		
	1/F																		
	2/F																		
	3/F																		
	4/F																		
	_____																		
	Submission of Record of Test																		
4.	Coaxial Cable continuity test	3.1 & 4.2																	
	G/F																		
	1/F																		
	2/F																		
	3/F																		
	4/F																		
	_____																		
	Submission of Record of Test																		
5.	Signal level test	4.2																	
	G/F																		
	1/F																		
	2/F																		
	3/F																		
	4/F																		
	_____																		
	Submission of Record of Test																		

Tested / Checked by : (Name of Contractor's Representative)	Signature - ( )	Post :	
		Tel. No. :	
		Date :	
Witnessed by : (Name(s) of *PBSE/PBSI)	Signature - ( )	Post :	
		Tel. No. :	
		Date :	

Testing and Commissioning Progress Chart
"Broadcast Reception Installation"

	Testing and Commissioning Progress Chart for Broadcast Reception Installation (Rev.)(1)																		
	Dates (2)																		Remark
	Activities	Reference to Annex A	S	A	S	A	S	A	S	A	S	A	S	A	S	A	S	A	
6.	Equipment test	4.2 & 4.3																	
	Antenna and/or feedhorn																		
	Broad Band Amplifier																		
	Channel Amplifier																		
	Distribution Amplifier																		
	Splitters																		
	Submission of Record of Test																		
7.	Record of reception performance	4.2 & 4.3																	
	Signal level at head end																		
	Signal level at outlet																		
	Channels of reception																		
	Name of satellite (for SMATV)																		
	Submission of Record of Test																		

Tested / Checked by : (Name of Contractor's Representative)	Signature - ( )	Post :	
		Tel. No. :	
		Date :	
Witnessed by : (Name(s) of *PBSE/PBSI)	Signature - ( )	Post :	
		Tel. No. :	
		Date :	

Testing and Commissioning Progress Chart
"Broadcast Reception Installation"

	Testing and Commissioning Progress Chart for Broadcast Reception Installation (Rev.)(1)																		
	Dates (2)																		Remark
	Activities	Reference to Annex A	S	A	S	A	S	A	S	A	S	A	S	A	S	A	S	A	
8.	Other test specified by PBSE*																		
	G/F																		
	1/F																		
	2/F																		
	3/F																		
	4/F																		
	_____																		
	Submission of Record of Test																		
9.	Submission of T & C Certificate																		

Notes

* Delete if not applicable

(1) Insert revision no.

(2) Insert additional columns as necessary
S - schedule % completion
A - actual % completion

Tested / Checked by : (Name of Contractor's Representative)	Signature - ( )	Post :	
		Tel. No. :	
		Date :	
Witnessed by : (Name(s) of *PBSE/PBSI)	Signature - ( )	Post :	
		Tel. No. :	
		Date :	