

Test Agreement

Supporting Document for nbn™ HFC Test Sandpit

Service Description: **nbn**™ HFC Test Sandpit

Changes in this document are marked up against version 2.2 of the Sandpit Service Description that was issued as part of the Wholesale Broadband Agreement standard form of access agreement on NBN Co's website on 4 September 2015.

This document is being provided for the purposes of the Test Agreement for the **nbn**™ HFC Test Sandpit only. It should not be regarded as an offer to amend the Service Description for the Sandpit under the Wholesale Broadband Agreement.

NBN Co Limited

Service Description - nbn™ HFC Test Sandpit

Supporting Document for **nbn™** HFC Test Sandpit

NBN Co Networks: Fibre, Wireless, FTTB, FTTN and HFC



Version	Description	Effective Date
1.0	Supporting Document for Test Agreement for nbn™ HFC Test Sandpit, issued on 30 October 2015	Execution Date of nbn™ HFC Sandpit: Test Description

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Environment

NBN Co asks that you consider the environment before printing this document.



Introduction

This document describes the Sandpit testing service provided by NBN Co to its customers.

The Sandpit enables customers to test their configuration and products with the NBN Co Network, including prior to formal certification with NBN Co. The Sandpit capability involves NBN Co providing test services from a portion of NBN Co's network that is quarantined from NBN Co's production network and a portion of NBN Co's platform that is quarantined from NBN Co's production platform.

Any Charges payable for the Sandpit are set out in the [Price List](#).

Sandpit Service Description Roadmap

A roadmap describing the structure of this Sandpit Service Description follows for the assistance of NBN Co customers.

Part A: Sandpit Description

Part A describes the testing activities which can be performed and sets out the connectivity requirements for use of the Sandpit.

Part A: Sandpit Description		Page
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2	Use of the Sandpit	6

Part B: General conditions of supply

Part B sets out general conditions (including exclusions) governing the supply of the Sandpit to customers.

Part B: General conditions of supply		Page
3	Customer obligations	14
4	Availability and exclusions	16

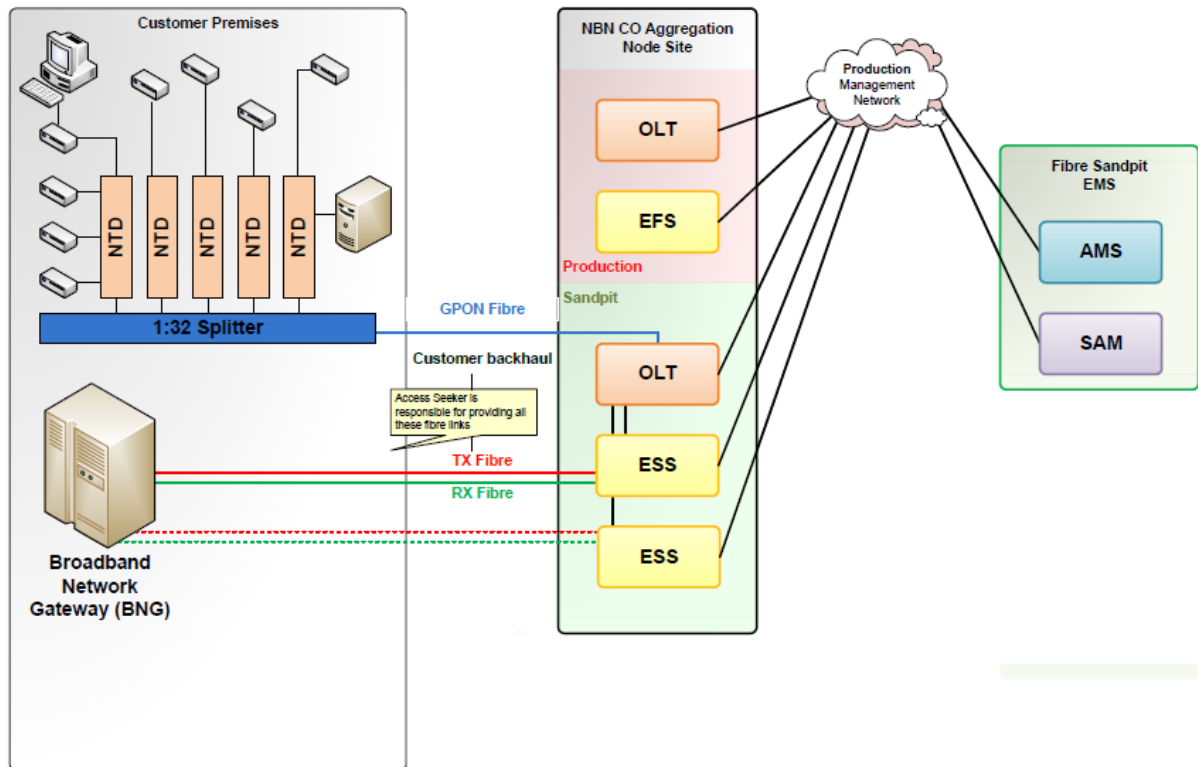
Part A: Sandpit Description

1. Testing activities

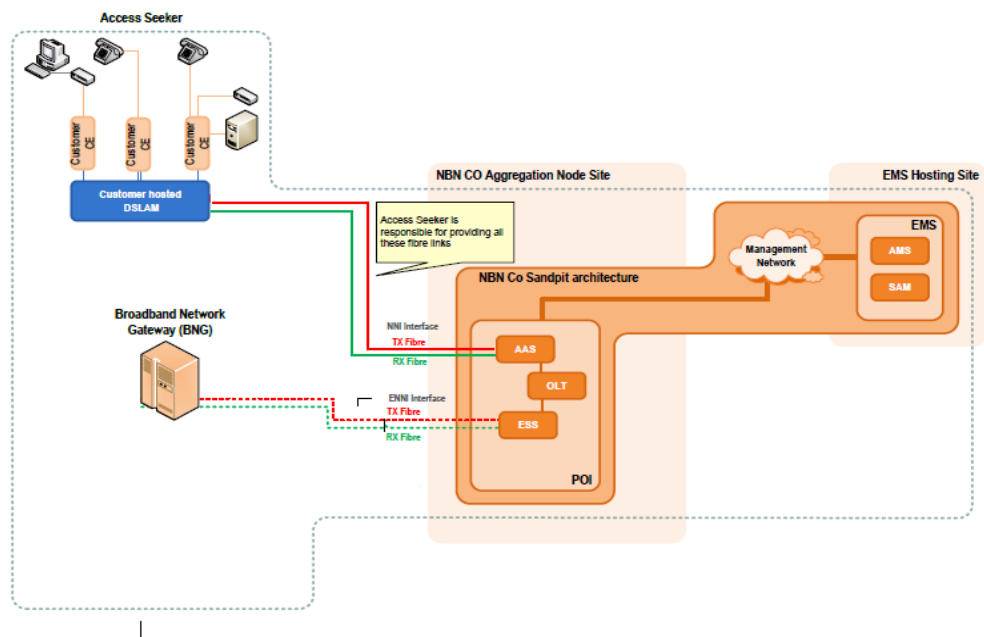
This section 1 sets out the testing activities which Customer may perform using the Sandpit.

1.1 Function of the Sandpit

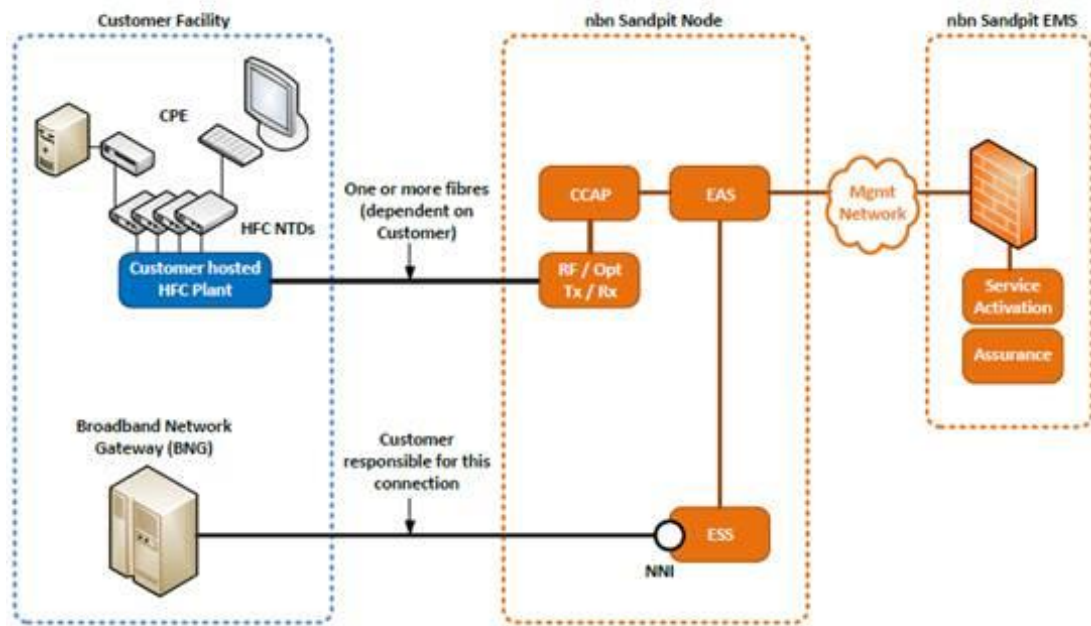
- (a) The Sandpit is a service made available by NBN Co to Customer to conduct the testing and verification activities set out in this section 1.
- (b) A diagram of the Fibre Sandpit elements that support NEBS Testing and Development Activities follows:



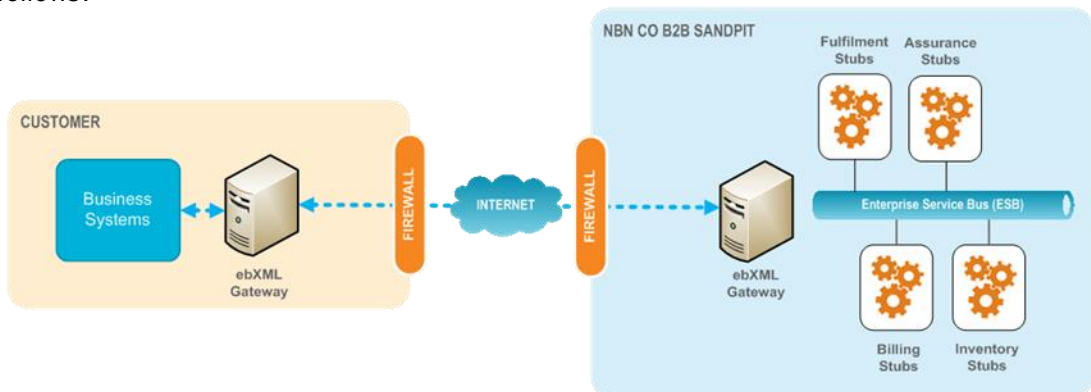
- (c) A diagram of the VDSL Sandpit elements that support NEBS Testing and Development Activities follows:



- (d) A diagram of the HFC elements that support the NEBS Testing and Development Activities follows:



- (e) A diagram of the NPIS Sandpit elements that support NPIS Testing and Development Activities follows:



- (f) The Sandpit is made available by NBN Co only for the specific testing and development purposes set out in this section 1 and Customer must not use the Sandpit to supply any products or services to Downstream Customers or End Users without the prior written consent of NBN Co.

1.2 NEBS testing activities

Customer may use the Fibre, VDSL or HFC Sandpit to:

- (a) prepare for and perform Pre-Certification Testing, Customer Equipment testing, development activities and any related or ancillary activities, in respect of the NEBS delivered by means of the NBN Co Fibre Network, NBN Co FTTB Network, NBN Co FTTN Network or NBN Co HFC Network (**NEBS Testing and Development Activities**); and

- (b) conduct any other activities which NBN Co undertakes in an SAU to provide to Customer in the Sandpit.

1.3 NPIS testing activities

Customer may use the NPIS Sandpit to perform the following Pre-Certification Testing activities, development activities and any related or ancillary activities, in respect of the NBN Co Platform Interfacing Service:

- (a) business process interoperability activities and Key Business Transaction testing related to the development of the Customer B2B Gateway; and
- (b) ebMS interoperability functional testing activities in accordance with the B2B Sandpit ebXML Collaboration Profile Agreement,

(NPIS Testing and Development Activities).

2. Use of the Sandpit

This section 2 sets out the locations at which the Sandpit is available, the requirements for performing testing activities and the support NBN Co will provide to Customer.

2.1 Locations of the Fibre, VDSL and HFC Sandpit

- (a) The Fibre Sandpit is available at the following locations, or such other locations notified by NBN Co to Customer from time to time:

Facility	Location	Facility owner
NBN Co aggregation node	Sydney, New South Wales	Global Switch
NBN Co data centre	Sydney, New South Wales	Global Switch
NBN Co aggregation node	Melbourne, Victoria	NextGen Networks
NBN Co aggregation node	Brisbane, Queensland	NextGen Networks
NBN Co aggregation node	Adelaide, South Australia	NextGen Networks
NBN Co aggregation node	Perth, Western Australia	NextGen Networks

- (b) The VDSL Sandpit is available at the following locations with the following variants, or such other locations notified by NBN Co to Customer from time to time:

Facility	Location	Facility owner	Variant
NBN Co aggregation node	Sydney, New South Wales	Global Switch	Customer hosted
NBN Co aggregation node	Melbourne, Victoria	NextGen Networks	Customer hosted
NBN Co aggregation	Brisbane, Queensland	NextGen Networks	Customer hosted

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node			
NBN Co aggregation node	Adelaide, South Australia	NextGen Networks	Customer hosted
NBN Co aggregation node	Perth, Western Australia	NextGen Networks	Customer hosted
National Test Facility	Melbourne, Victoria	NBN Co	NBN Co hosted

- (c) The HFC Sandpit is available at the following locations with the following variants, or such other locations notified by NBN Co to Customer from time to time:

Facility	Location	Facility owner	Variant
NBN Co aggregation node	Sydney, New South Wales	NBN Co	Customer hosted
NBN Co aggregation node	Melbourne, Victoria	NBN Co	Customer hosted
NBN Co aggregation node	Brisbane, Queensland	NBN Co	Customer hosted
NBN Co aggregation node	Adelaide, South Australia	NextGen Networks	Customer hosted
NBN Co aggregation node	Perth, Western Australia	NBN Co	Customer hosted
NBN Co Test Facility	Melbourne, Victoria	NBN Co	NBN Co hosted
NBN Co Test Facility	Sydney, NSW	NBN Co	NBN Co hosted

- (d) Customer is responsible for arranging building entry services and physical access to each facility listed in sections 2.1(a) and 2.1(b) at which NBN Co supplies the Fibre Sandpit, VDSL Sandpit or HFC Sandpit to Customer.

2.2 Sandpit variants

- (a) The VDSL Sandpit is available in the following variants:

Variant	Features / conditions
Customer hosted	Customer hosts the DSLAM and provides or acquires backhaul transmission to establish connectivity between the DSLAM and a facility listed in section 2.1(b) where the Customer hosted variant is available. NBN Co may, in its discretion, provide the DSLAM to Customer for a fixed term or an indefinite term.
NBN Co hosted	NBN Co hosts the DSLAM and provides a UNI-DSL at the National Test Facility.

(b) The HFC Sandpit is available in the following variants:

Variant	Features / conditions
Customer hosted	Where the Customer hosted variant has been made available: Customer hosts the HFC Transmission Equipment and provides or acquires RF Backhaul Transmission and backhaul transmission to establish connectivity between the Customer environment and a facility listed in section 2.1(b) or section 2.1(c). NBN Co may, in its discretion, provide the HFC Transmission Equipment to Customer for a fixed term or an indefinite term in accordance with section 3.3.
NBN Co hosted	Where the NBN Co hosted variant has been made available by NBN Co: NBN Co hosts the HFC Transmission Equipment and provides the UNI-D access on the NTD at the NBN Co Test Facilities.

2.3 Establishing connectivity and use of the Sandpit

(a) The following table sets out the responsibilities of each party concerning use of the Fibre Sandpit for NEBS Testing and Development Activities at each location:

Facility location	Activity	Party responsible
All locations	Provide or acquire backhaul transmission to establish connectivity between the Customer Network and the Fibre Sandpit	Customer
	Use of the NNI, CVC and AVC must take place remotely over backhaul transmission connecting the Customer Network and the Fibre Sandpit	Customer
	Access to and use of the UNI must take place at a place nominated and arranged by Customer without assistance from NBN Co	Customer
NBN Co aggregation node, West Melbourne	Terminate Customer backhaul transmission at the ODF port specified by the facility owner	Customer
NBN Co aggregation node, Brisbane	Procure or provide cross connects and patches from ODF port to the OLT and ECS ports	NBN Co
NBN Co aggregation node, Adelaide		
NBN Co aggregation node, Perth		
NBN Co aggregation node, Sydney	Terminate Customer backhaul transmission at a tray location in a "meet me room" as specified by NBN Co	Customer
	Procure or provide cross connects, tie cables and patches from tray port to the OLT and ECS ports	NBN Co

(b) The following table sets out the responsibilities of each party concerning use of the VDSL Sandpit for NEBS Testing and Development Activities at each location:

Facility location	Variant(s)	Activity	Party responsible
All locations	NBN Co hosted	Provide or acquire backhaul transmission to establish ENNI connectivity between the Customer Network and the VDSL Sandpit, unless Customer supplies a broadband network gateway, in which case, this requirement is not applicable	Customer
	Customer hosted	Provide or acquire backhaul transmission to establish both INNI and ENNI connectivity between the Customer Network and the VDSL Sandpit	Customer
	Customer hosted	Provide rack space and power for the Customer hosted DSLAM variant at a place nominated and arranged by Customer	Customer
	Customer hosted	Install DSLAM in Customer premises at a place nominated and arranged by Customer	NBN Co
	NBN Co hosted Customer hosted	Use of the NNI and CVC must take place remotely over backhaul transmission connecting the Customer Network and the VDSL Sandpit, unless Customer supplies a broadband network gateway, in which case, this requirement is not applicable	Customer
	Customer hosted	Use of the UNI-DSL and AVC must take place at a place nominated and arranged by Customer without assistance from NBN Co	Customer
	NBN Co hosted	Use of the UNI-DSL and AVC must take place at the National Test Facility	Customer/ NBN Co
	NBN Co hosted Customer hosted	Provisioning of the UNI-DSL must be arranged by Customer with assistance from NBN Co (NBN Co may make B2B integration of the VDSL Sandpit UNI-DSL available at a later date)	NBN Co / Customer
NBN Co aggregation node, West Melbourne	Customer hosted	Terminate Customer backhaul transmission at the ODF port specified by the facility owner	Customer
NBN Co aggregation node, Brisbane	Customer hosted	Procure or provide cross connects and patches from ODF ports to the ECS ports	NBN Co
NBN Co aggregation node, Adelaide			
NBN Co aggregation node, Perth			
NBN Co aggregation	Customer	Terminate Customer backhaul transmission at a tray location in a	Customer

Facility location	Variant(s)	Activity	Party responsible
node, Sydney	hosted	"meet me room" as specified by NBN Co	
	Customer hosted	Procure or provide cross connects, tie cables and patches from tray ports to the ECS ports	NBN Co

(c) The following table sets out the responsibilities of each party concerning use of the HFC Sandpit for NEBS Testing and Development Activities at each location:

Facility location	Variant(s)	Activity	Party responsible
All locations	Customer hosted	Provide or acquire RF Backhaul Transmission to establish DOCSIS connectivity and backhaul transmission for NNI connectivity between the Customer Network and the HFC Sandpit, unless Customer supplies a broadband network gateway, in which case, this requirement is not applicable	Customer
	NBN Co hosted	Provide or acquire RF Backhaul Transmission to establish NNI connectivity between the Customer Network and the HFC Sandpit	Customer
	Customer hosted	Provide rack space and power for the Customer hosted HFC Transmission Equipment and NTD at a place nominated and arranged by Customer	Customer
	Customer hosted	Install RF Passive Equipment and NTDs in Customer premises at a place nominated and arranged by Customer	NBN Co
	NBN Co hosted Customer hosted	Use of the NNI and CVC must take place remotely over backhaul transmission connecting the Customer Network and the HFC Sandpit, unless Customer supplies a broadband network gateway, in which case, this requirement is not applicable	Customer
	Customer hosted	Use of the UNI-D on NTD and AVC must take place at a place nominated and arranged by Customer without assistance from NBN Co	Customer
	NBN Co hosted	Use of the UNI-D on NTD and AVC must take place at the National Test Facility	Customer/ NBN Co
	NBN Co hosted Customer hosted	Provisioning of the UNI-D on NTD must be arranged by Customer with assistance from NBN Co (NBN Co may make B2B Access to the HFC Sandpit	NBN Co / Customer

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Facility location	Variant(s)	Activity	Party responsible
		UNI-D available at a later date)	
NBN Co aggregation node, Melbourne	Customer hosted	Terminate Customer HFC Transmission Equipment at the ODF port specified by NBN Co	Customer
NBN Co aggregation node, Sydney	Customer hosted	Provide cross connects and patches from ODF ports to the ECS ports	NBN Co
NBN Co aggregation node, Brisbane			
NBN Co aggregation node, Adelaide			
NBN Co aggregation node, Perth			

(d) To use the NPIS Sandpit for NPIS Testing and Development Activities, Customer must:

- (i) access the NPIS Sandpit through a secure Internet connection between the Customer B2B Gateway and Sandpit B2B Gateway; and
- (ii) establish and maintain a secure Internet connection between the Customer B2B Gateway and Sandpit B2B Gateway utilising the digital certificates and Collaboration Protocol Agreement (XML) referred to in section 2.5(a).

2.4 Performance of NEBS testing

(a) NBN Co will make available to Customer for NEBS Testing and Development Activities:

Capability	Description	NBN Co Network
NNI	Mirrors type and structure of NNIs available as a Product Component of the NEBS provided over the NBN Co Fibre Network, the NBN Co FTTB Network, the NBN Co FTTN Network or the NBN Co HFC Network, as the case may be	Fibre, FTTB, FTTN and HFC
CVC	Mirrors type and structure of CVCs available as a Product Component of the NEBS provided over the NBN Co Fibre Network (including the Multicast Domain Product Feature), the NBN Co FTTB Network, the NBN Co FTTN Network or the NBN Co HFC Network, as the case may be	Fibre, FTTB, FTTN and HFC
AVC	Mirrors type and structure of AVCs available as a Product Component of the NEBS provided over the NBN Co Fibre Network (including the Multicast AVC Product Feature), the NBN Co FTTB Network or the NBN Co FTTN Network or the NBN Co HFC Network, as the case may be	Fibre, FTTB, FTTN and HFC
UNI	UNI capability through provision of fibre-specific NTDs and fibre splitters	Fibre
	Mirrors type and structure of the UNI-DSL available as a Product Component of the NEBS supplied by means of the NBN Co FTTB	FTTB and FTTN

Capability	Description	NBN Co Network
	Network or the NBN Co FTTN Network, as the case may be	
	UNI capability through provision of NTDs and RF Passive Equipment	HFC

- (b) NBN Co will provide the following items to Customer for NEBS Testing and Development Activities:

Item	Description	Quantity	NBN Co Network
NTD	NTD pre-configured by NBN Co (with labelling and AC power cables)	5	Fibre
Fibre splitter	1:32 fibre splitter	1	Fibre
Contact details	Contact details for Sandpit support	1	Fibre, FTTB, FTTN and HFC
DSLAM	DSLAM for use with the VDSL Sandpit	See section 3.2	FTTB and FTTN
HFC Transmission Equipment	HFC Transmission Equipment	See section 3.3	HFC
NTD	Single service NTDs with power supply provided	8	HFC
RF Passive Equipment	RF Passive Equipment.	1	HFC

- (c) Customer is responsible for:
- (i) installing and operating the five fibre-specific NTDs and 1:32 fibre splitter (Fibre, FTTB, FTTN) or HFC-specific NTD in Customer's premises in accordance with the setup guide and NBN Co's instructions;
 - (ii) installing and operating all Customer Equipment connected to the UNI-DSL in the case of NEBS Testing and Development Activities in respect of the NEBS supplied by means of the NBN Co FTTB Network or the NBN Co FTTN Network, as the case may be; and
 - (iii) the physical security of the DSLAM or HFC Transmission Equipment where Customer hosts the Sandpit pursuant to section 2.2.
- (d) Customer must not reconfigure, or attempt to reconfigure, the fibre or HFC-specific NTDs or the DSLAM or HFC Transmission Equipment.
- (e) Customer is responsible for, and assumes risk in, the fibre-specific NTDs, 1:32 fibre splitter and, where Customer acquires the Customer hosted variant of the VDSL Sandpit, the DSLAM, from the time Customer receives delivery of those items until the time those items are returned to NBN Co. Customer must return these items to NBN Co in good working condition.
- (f) Customer is responsible for, and assumes risk in, the HFC Transmission Equipment and RF Passive Equipment (including NTDs), where Customer acquires the Customer hosted variant of the HFC Sandpit, from the time Customer receives delivery of those items until the time those

items are returned to NBN Co. Customer must return these items to NBN Co in good working condition.

Note: References in the tables in sections 2.4(a) and 2.4(b) to "Fibre" mean NEBS Testing and Development Activities in respect of the NEBS supplied by means of the NBN Co Fibre Network and references to "VDSL" mean NEBS Testing and Development Activities in respect of the NEBS supplied by means of the NBN Co FTTB Network or the NBN Co FTTN Network, as the case may be and references to "HFC" mean NEBS Testing and Development Activities in respect of the NEBS supplied by means of the NBN Co HFC Network.

2.5 Performance of NPIS testing

(a) NBN Co will make available to Customer for NPIS Testing and Development Activities:

Deliverable	Description
Digital certificates	Digital certificate(s) to enable Customer to establish a secure connection between the Customer B2B Gateway and the NPIS Sandpit
Collaboration Protocol Agreement	Collaboration Protocol Agreement (XML) defining the published services and ebXML-compliant gateway message service handler configuration applicable to the NPIS Sandpit
Testing guide	B2B Sandpit Test Scenarios Document for Key Business Transaction testing

(b) Digital certificates issued by NBN Co to Customer in connection with the NPIS Sandpit are Confidential Information of NBN Co.

Part B: General conditions of supply

3. Customer obligations

This section 3 sets out the requirements which apply to use of the Sandpit by Customer.

3.1 General conditions of use

Customer:

- (a) must comply with any technical and test specifications notified by NBN Co to Customer from time to time in relation to the activities described in sections 1.2 and 1.3;
- (b) must on request by NBN Co, use reasonable endeavours to make available to NBN Co, Customer Personnel who are subject matter experts to support any root cause analysis and incident resolution that may be performed by NBN Co in connection with Customer's access to or use of the Sandpit;
- (c) must keep secure and protect from unauthorised use any usernames, passwords and digital certificates provided by NBN Co to or used by Customer in connection with the Sandpit; and
- (d) is responsible for use of the Sandpit by any person accessing the Sandpit with the permission of Customer.

3.2 VDSL Sandpit conditions of use

- (a) Subject to section 3.2(b), if requested by Customer, NBN Co will make a total of one Customer hosted DSLAM available to Customer at no charge for the purposes of conducting all NEBS Testing and Development Activities associated with the VDSL Sandpit.
- (b) NBN Co may reject any request by Customer under section 3.2(a) if a Related Body Corporate of Customer has a Customer hosted DSLAM that NBN Co has made available to it at no charge.
- (c) If Customer requests one or more additional Customer hosted DSLAMs for use with the VDSL Sandpit, NBN Co may, in its discretion, make one or more additional Customer hosted DSLAMs available to Customer:
 - (i) at no charge; or
 - (ii) in accordance with the Charges set out in the [Price List](#).
- (d) Customer must:
 - (i) comply with any reasonable conditions of use of the VDSL Sandpit (including any DSLAM) notified by NBN Co to Customer from time to time; and
 - (ii) make any NBN Co Equipment (including any DSLAM) supplied to it by NBN Co for use with the VDSL Sandpit available for collection by NBN Co within a reasonable period after:
 - (A) the expiry or termination of any agreed fixed period of use of the VDSL Sandpit by the Customer; or
 - (B) Customer's receipt of a notice from NBN Co pursuant to section 3.2(e).

- (e) NBN Co may notify Customer in writing that any NBN Co Equipment (including any DSLAM) supplied to it by NBN Co for use with the Customer hosted variant of the VDSL Sandpit must be returned to NBN Co:
 - (i) if Customer fails to maintain backhaul transmission connectivity between the DSLAM and a facility listed in section 2.1(b); or
 - (ii) for any reason, by giving at least 60 Business Days' notice.

3.3 HFC Sandpit conditions of use

- (a) Subject to section 3.3(b), if requested by Customer, NBN Co will make a total of one Customer hosted HFC Transmission Equipment and RF Passive Equipment available to Customer at no charge for the purposes of conducting all NEBS Testing and Development Activities associated with the HFC Sandpit.
- (b) NBN Co may reject any request by Customer under section 3.3(a) if a Related Body Corporate of Customer has a Customer hosted HFC Transmission Equipment and RF Passive Equipment that NBN Co has made available to it at no charge.
- (c) If Customer requests one or more additional Customer hosted HFC Transmission Equipment for use with the HFC Sandpit, NBN Co may, in its discretion, make one or more additional Customer hosted HFC Transmission Equipment available to Customer:
 - (i) at no charge; or
 - (ii) in accordance with the Charges set out in the Price List.
- (d) Customer must:
 - (i) comply with any reasonable conditions of use of the HFC Sandpit (including any HFC Transmission Equipment) notified by NBN Co to Customer from time to time; and
 - (ii) make any NBN Co Equipment (including any HFC Transmission Equipment) supplied to it by NBN Co for use with the HFC Sandpit available for collection by NBN Co within a reasonable period after:
 - (A) the expiry or termination of any agreed fixed period of use of the HFC Sandpit by the Customer; or
 - (B) Customer's receipt of a notice from NBN Co pursuant to section 3.3(e).
- (e) NBN Co may notify Customer in writing that any NBN Co Equipment supplied to it by NBN Co for use with the Customer hosted variant of the HFC Sandpit must be returned to NBN Co:
 - (i) if Customer fails to maintain RF Backhaul Transmission connectivity between the HFC Transmission Equipment and a facility listed in section 2.1(b) or 2.1(c); or
 - (ii) for any reason, by giving at least 60 Business Days' notice.

3.4 Unauthorised use

Customer must not:

- (a) access or use the Sandpit to perform testing activities other than those:
 - (i) set out in sections 1.2 and 1.3 of this Service Description which Customer has specified in its Sandpit Order and Configuration Form; or
 - (ii) otherwise approved in writing by NBN Co from time to time;

- (b) use the Sandpit for any non-functional testing, such as performance/volume testing or reliability/disaster recovery testing;
- (c) use any equipment supplied by NBN Co to Customer under section 2.4 for any purpose other than the performance of NEBS Testing and Development Activities;
- (d) use the Sandpit to provide any products or services to any person, except in connection with the performance of activities authorised by this Service Description; and
- (e) re-sell or re-supply to any third party:
 - (i) the Sandpit or Customer's rights to access or use the Sandpit; or
 - (ii) any other services or capabilities that are provided by NBN Co to Customer in connection with the Sandpit,

without prior written consent from NBN Co.

4. Availability and exclusions

This section 4 includes general terms in relation to the availability of the Sandpit and sets out exclusions to the supply of the Sandpit.

4.1 Availability

- (a) The Sandpit is a shared resource and access to the Sandpit is subject to availability.
- (b) Customer acknowledges that use of the Sandpit may not be continuous or free of faults and that NBN Co may interrupt use of the Sandpit at any time.

4.2 Exclusions

- (a) The Sandpit is one element required for Customer to perform the activities referred to in section 1 of this Service Description.
- (b) Customer is responsible for providing or acquiring other elements necessary to perform the activities referred to in section 1 of this Service Description.
- (c) The Sandpit does not include the supply of:
 - (i) any backhaul transmission, interconnecting broadband infrastructure, such as dark fibre or Ethernet links, or other connections for the purposes of backhaul from the Sandpit to the Customer Network;
 - (ii) the premises (or part of any premises) in which Customer is required to install the fibre-specific NTDs, 1:32 fibre splitter, DSLAM or HFC Transmission Equipment and RF Passive Equipment (as the case may be);
 - (iii) any content or applications, including IP transit, Internet gateway connection, any Customer Equipment (other than the fibre or HFC-specific NTDs), BGP routing, soft switching infrastructure and all international connectivity;
 - (iv) any other end user equipment, such as personal computers and network attached storage solutions;
 - (v) direct access to or direct use of NBN Co's core systems or the functionality of NBN Co's core systems;
 - (vi) building entry services or physical access to the facility in which Sandpits are based, including for the purposes of establishing connectivity between the Customer Network

and the Sandpit (other than access to the National Test Facility where Customer acquires the NBN Co hosted variant of the VDSL Sandpit); or

- (vii) any connectivity between the Customer B2B Gateway and the Sandpit B2B Gateway.