



**SERENGETI GOLF AND WILDLIFE ESTATE
PROPERTY OWNERS ASSOCIATION
(SPOA)**

**IT & COMMUNICATIONS
INSTALLATION GUIDELINES**

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OVERVIEW

S.A. Digital Villages has been appointed by Serengeti Golf & Wildlife Estate as the Communications and Information Technology Consultants to install the infrastructure and to supply and operate the full range of “**Triple Play**” Services as described below.

“**Triple Play**” is described in some detail below but to summarize the services that Serengeti is providing for its homeowners, we will be installing a fibre optic connection to each and every home at Serengeti. This Fibre Optic connection, which connects each home to the data centre at the Estate Management Complex, provides the network to enable us to provide a whole range of services.

These services include:

- A Telephone in your home – Free calls within Serengeti
- An always on Internet Connection with different packages available
- Distribution of the TV signal over the Fibre (Which means you do not need a DSTV Dish)
- The ability to view your Visitors at the Gate
- The Serengeti Portal – which has lots of relevant content including games, weather, news and some great apps

The term generally used for these services is “**Triple Play**” which refers to **Voice, Video and Data** Services.

Voice in terms of “**Triple Play**” could be defined as the provision of Communications services including Intercom and Telephone services internally as well as to the outside world.

Video in terms of “**Triple Play**” could be defined as the provision regular TV Signal distribution including HD TV or High Definition TV, IP TV meaning Digital TV signal distribution which will be in place in South Africa by 2010, optional Video on Demand or VOD giving the End User the ability to view their own choice of movies on demand.

Data in terms of “**Triple Play**” is defined as the provision of a data network for the provision of Internet services as well as a host of IT related content and services to the End User.

Our mission is to provide a world-class infrastructure platform to enable all the services that will be provided to the homeowners at Serengeti.

It is with these services in mind that we encourage all homeowners to embrace the technology provided and to design their homes to take full advantage of the services. The Estate will provide the backbone for these services that will be terminated in an **ONU** (Optical Network Unit) Box situated in the IT distribution box in your garage (*as indicated in Figure 1 below*). The homeowner will need to design their internal cabling layouts to take these services and distribute them into the home.

SA Digital Villages, reserves its’ right, to have access to the IT Distribution Box in the garage for maintenance purposes at a time convenient to the Home owner. Once installed, the IT Distribution Box, Serengeti ONU and Home Gateway become fixed fixtures of the House and cannot be removed when the home is sold. Note that it is the responsibility of SA Digital Villages to ensure that services to the IT Box are maintained. The distribution of these services from the IT box into the home is the responsibility of the homeowner and their installer. As per SADV’s standard terms and conditions, customers are liable for an unnecessary callout charge if a technician is dispatched on a reported failure and the fault is proved to be associated with the customer own equipment and cabling.

Please read and familiarise yourself with this document. SA Digital Villages provides a free 1 hour session with all homeowners and it is mandatory that all homeowners book for this session prior to starting to build their homes. The session will inform you on the various options and procedures that need to be followed to enable you to get the exciting services provided by SA Digital Villages.

The following Serengeti Residents IT Check List must be followed:

Item	Description	Check
1	Received IT Guidelines	
2	Booked 1 Hour Session with SADV	
3	Request IT Box from SADV	
4	SPOA invoices Resident for IT Box (R1,750)	
5	Builder digs trench for Fibre tube from Road curb to IT Box	
6	Builder requests SADV Fibre Tube installation into trench	
7	Resident gives 3 weeks notice prior to Occupation Date	
8	Resident confirms all Telephone, Data, TV Cabling is installed	
9	Resident chooses SADV Service Package	
10	SADV installs fibre to IT Box	
11	SADV Install CPE Equipment into IT Box	
12	SADV Test Fibre levels	
13	SADV Test RF Levels	
14	SADV Test Phone Lines	
15	SADV Test Internet Connection	
16	SADV Starts Residents' Services (Go-Live)	
17	SADV sends SPOA final completion certificate	
18	SPOA invoices Resident for final IT commissioning (R3,250)	

There are numerous options available to the homeowner, which we briefly discuss below:

Option 1:

The first option is to install a structured cabling solution in the home to provide the Voice, TV and Data Points. This requires you to identify all the Telephone, PC (Data) and TV Points in your home. The structured cabling is then installed in your home using a star topology as shown in the document below. Note that the RF cabling must feed from the DSTV decoder location to the other TV Locations. All this cabling is terminated to a central distribution box "distributor" as shown in Figure 1 below.

We strongly advise the homeowner to install as many of these "conduits" as possible during the building process, even if the cabling will only be installed at a later date, or by the next Homeowner. The initial cost of at least installing the conduits is very low compared to the difficulty and cost in trying to retro fit this cabling.

This will also allow the homeowner maximum flexibility when designing the placement of all the Telephone, Data and TV Points.

Option 2:

The second of the two options is if the homeowner would like to install a full home automation system. Imagine your home lighting up as you walk through the front door, the alarm disarming itself, the temperature set precisely to your personal preference, your favourite music playing in every room, with crystal clear digital sound and when you leave again each morning, at a simple touch of a button, the security system reactivating itself, the temperature reverting to daytime ambience and unneeded lights turning off...

This is one possible scenario in the unbelievable but very real world of Home automation where whole house automation systems place the ultimate in comfort, luxury and convenience at your fingertips.

All of the basic IT and Communications guidelines explained in option 1 still apply. However, for this full home automation solution, you would require some specialist input from your Home Automation Supplier. SA Digital Villages will have approved Home Automation and Audio Video (AV) suppliers that will understand the special cabling requirements for Serengeti.

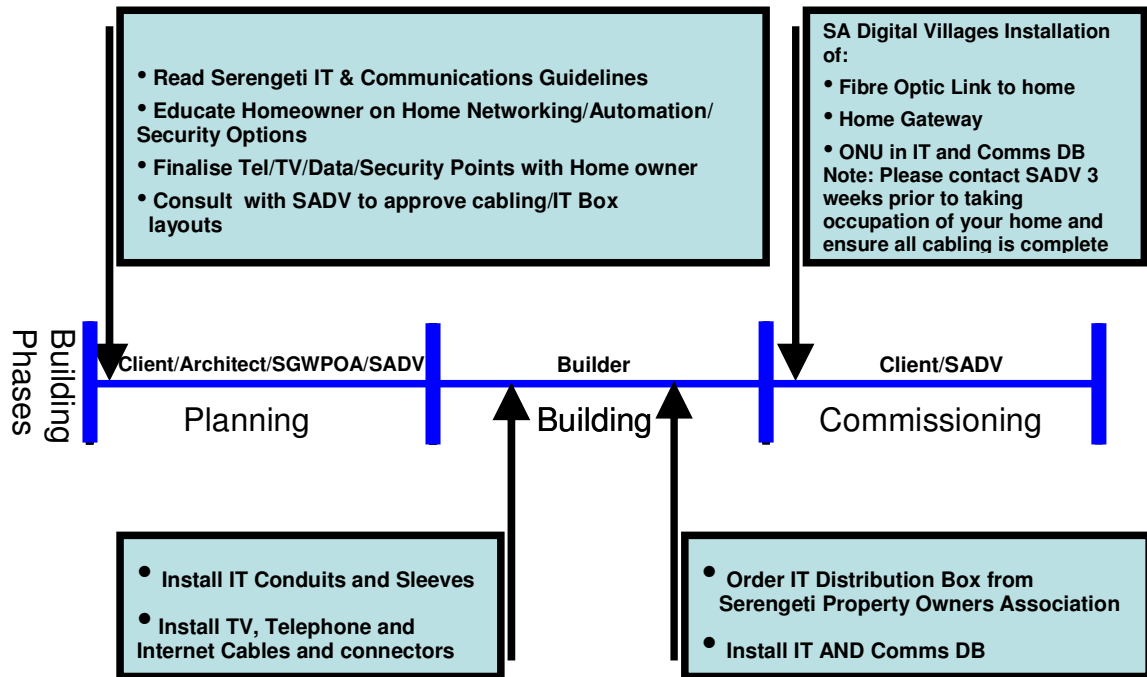
Please send an email to homeautomation@sadigitalvillages.co.za to request more info or ask your Home Automation supplier to call us to confirm the cabling requirements.

We would also like to draw your attention to the fact that the option exists for Home Alarms to be monitored by the Serengeti Central Control Room with the possibility of response from the Serengeti Security Team. We have a recommended supplier who is able to integrate their systems with the Serengeti infrastructure provided and who will assist with any design and layout considerations in this regard. If you want your Home Alarm to be monitored by the Serengeti Control room then you need to install one of these approved alarm systems.

Don't forget to take the conduit requirements for your alarm system into consideration when doing your conduit layouts!

Please send an email to security@sadigitalvillages.co.za for more info on your Alarm System and monitoring requirements.

IT & Communications Procedure Timelines



Once-off Setup Costs

There are a number of items that are compulsory and are required to be installed at the time of building your home. Some are supplied by SADV or the SPOA and others will need to be purchased by the homeowner. A Once off Fee of **R 5250.00** will be charged to the home owner. A summary of items received for this fee is indicated below:

- Standardized "IT Distribution Box" as described in 2.1.2 in the Structured Cabling Guidelines below.
- The supply and installation of the fibre optic cable from the road curb to be terminated inside your "distribution box" as described above.
- The installation and commissioning by SADV of an **ONU** connecting your home to the Serengeti Infrastructure.
- The supply, installation and commissioning of a Home Gateway to connect to the SADV installed **ONU**.
- A one hour consultation with the home owner and/or architect to give advice, recommendations on any of the items described above or to approve your cable layouts.

Please note that SADV and SPOA reserve the right to revise these prices from time to time.

For the purposes of comparing costs with a traditional home versus a home built at Serengeti we have done a cost comparison of the typical services that a home owner would need to install when building a home.

See below the table comparing these costs...

Telephone, Internet and Security Cost Comparisons Traditional Residence vs Serengeti

	Standard
Traditional	Costs
DSTV Dish and Installation (Not required at Serengeti)	R 1 299.00
Telkom Phone Line Installation	R 380.00
ADSL Line Installation	R 490.00
ADSL Router	R 1 500.00
Traditional Home Alarm Response Fee (Monthly)	R 280.00

Total	R 3 949.00
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	Standard
Serengeti	Costs
IT Distribution Box	R 1 750.00
Supply, Installation and Commissioning of Home Gateway	R 2 500.00
Supply, Installation and Commissioning of Fibre Optic Cable to IT Distribution Box	R 1 000.00
Installation and Commissioning of Serengeti ONU inside IT Distribution Box	(incl. above)
1 hour Consultation with Resident /or Architect (Onsite)	Free
Distribution of Video feed of Visitors at Main Gates to Home TV	Free

Total	R 5 250.00
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If you have any questions with regard to any of the above, please do not hesitate contact us:

Tel: 086 110 4000 or alternatively call Anton Strauss on 083 388 5477
or Email info@sadigitalvillages.co.za

See below the summary for structured cabling guidelines...

IT & Communications Installation Guidelines

1. HOME NETWORKING

1.1. Description

“Home Networking” describes a cabling system designed to support flexible distribution and interconnection of Triple Play Services and equipment within the home. These are sold as complete systems by various suppliers, but they may also comprise generic components. SADV will provide an approved list of Home networking suppliers of cabling and systems.

1.2. Application

Home networking can be provided to varying levels of sophistication for:

- Connection of multiple telephone points;
- Interconnection of PCs and peripheral equipment (printers, scanners, etc.);
- Intercom/paging;
- Audio and Video Distribution;
- Remote control of Audio or TV equipment;
- TV and closed circuit television (CCTV) distribution.

Note that home networking is not a full home automation system and does not provide the “total cabling solution” required for full Home Automation systems.

For this full home automation solution, you would require some specialist input from your Home Automation Supplier. SA Digital Villages will have approved Home Automation and Audio Video (AV) suppliers that will understand the special cabling requirements for Serengeti, or ask your Home Automation supplier to contact us for more info.

Please send an email to homeautomation@sadigitalvillages.co.za to request more info.

1.3. TV/VIDEO/DUAL VIEW/PVR Decoder Cabling

The reticulation of all Video/TV cabling must be cabled back to the central IT and Comms DB as described in this Guideline. Note that the SADV ONU has one RF/TV output which can be connected to an RF Splitter and then cabled to your TV's from this central point. Please note that no home will require the installation of a DSTV Dish. The signal is distributed via the entire Estate from the central Head End situated in the Data centre where the DSTV dish will be situated. The installation of a Dual View decoder is standard as (1) one LNB is required. Where the installation of a PVR decoder is applicable, please see figure 4 which illustrates the necessary cabling thereof requiring (2) two LNB ports. Please note that specialist input is required for the cabling of HD Decoders. Additional splitters and signal boosters may also need to be installed by your installer depending on your AV requirements.

It must be noted that in the future, should the TV Satellite service operators (Multichoice, etc) change their technologies or services that would require changes to the equipment in the IT Distribution box in your home, then these cost will be bourn by the Resident.

1.4. Cabling Method

Cabling for a home network cannot be cabled directly from the ONU due to its limited capacity. The network must be cabled from your internal distribution box as described above and in figure 1.

1.5. Telecommunications Outlets

1.5.1. Socket Type

8P8C (“RJ45”) sockets should be used for the outlets, designated as either “VOICE” or “DATA”, and may be wired differently at the distribution box according to their designation. VOICE sockets are mainly used for connection of voice frequency equipment such as telephones, answering machines, fax machines and dial-up modems.

1.5.2. Installation

The positioning of VOICE/DATA outlets will be according to the customers own requirements within his home. It is common practice to place at least One Voice, One TV and One Data point in each bedroom. The average for the Lounge and Living area would be to have at least 4 points for Voice/Video and Data. Other areas that should be considered for a combination of the points would be the Entertainment area, Pool area and even perhaps the Kitchen.

1.6. Internal IT and Communications Distribution box (see figure 3.)

1.6.1. General

A distribution box is an enclosure used to interconnect cables. It may comprise wiring modules (“punch-down” blocks) using jumpers for cross-connections, a patch panel using patch cords for cross-connections, or a combination of these.

A distribution box is required with home networking to cross-connect lines to outlets and outlets to each other. This distribution box must incorporate a patch panel or switch for interconnection of the DATA outlets. A patch panel may be used instead of jumper able wiring modules for the VOICE outlets to enable the customer to alter cross-connections without engaging a cabling provider.

Proprietary “home networking” systems are available with distributors that incorporate jumper able terminations and patch panels, and which provide guidelines for configuring the installation to meet a customer’s specific needs.

An Example of this IT and Comms DB with the required wiring can be viewed at the Serengeti Sales Office. Its dimensions are 610mm (H) x 355mm (W) x 140mm (D)

Patch cords used for cross-connection of cable pairs at the distributor should meet at least category 5/5e requirements.

1.6.2. Distribution box Location

The distribution box should be located in your garage as per figure 1 unless the cable distance limit of 90 meters between the distributor and any VOICE/DATA outlet is likely to be exceeded.

The distributor should not be located within 1 meter of likely sources of electromagnetic interference (EMI), for example:

- Electrical switchboard or electricity supply meters;
- Fluorescent lights and halogen down-lights;
- Transformers;
- Motors or generators (e.g. a work bench where electric drills, jigsaws, etc. May be used);
- Arc welders;
- air-conditioning units;
- Refrigerators or freezers; and
- Radio transmitters.

When mounting the distribution box please ensure any cable entry holes are open and are arranged or sealed to minimise the entry of moisture from the wall cavity.

1.6.3. Power Outlet

One 220/240 V single power outlet (socket-outlet) should be provided inside the distribution box. (See figure 3.)

1.7. Testing

All category 5/5e cabling should be tested to Class D requirements.

2. INSTALLATION OF INTERNAL EQUIPMENT

2.1. Location

The ONU will be installed inside the IT distribution box or enclosure. Please ensure easy access to the distribution box at all times for installation and maintenance purposes.

2.1.1. General

Please ensure the location of the distribution box is away from any source of moisture. If the distribution box is mounted on the inside of one of the outer walls, make sure that adequate damp proofing has been installed in this area.

2.1.2. Combined Enclosure

The use of a suitable combined communications enclosure is not recommended. It is imperative that the homeowner use this standardized enclosure for the reason that it simplifies any access, installation and maintenance that would be required on this equipment. These enclosures have been approved and are available from the SPOA.

3. HOME ALARMS

We would also like to draw your attention to the fact that the option exists for Home Alarms to be monitored by the Serengeti Central Control Room with the possibility of response from the Serengeti Security Team. We have a recommended supplier who is able to integrate their systems with the Serengeti infrastructure provided and who will assist with any design and layout considerations in this regard. If you want your Home Alarm to be monitored by the Serengeti Control room then you need to install one of these approved alarm systems

4. DEFINITIONS

The following words, acronyms and abbreviations are referred to in this Document

Term Definition

AC Alternating current

ADSL Asymmetric Digital Subscriber Line — a digital telecommunications network service that provides high speed access to digital services (eg. The Internet)

BNC The abbreviation for “Bayonet Neil Concelman” — a coaxial cable connector named after its inventor and commonly used for connection of closed circuit TV (CCTV), coaxial LAN connections, etc.

Broadband A general term used to describe signal transmission at a bandwidth higher than the normal voice bandwidth (eg. high-speed data and video services)

Cabler/cabling provider - The holder of a cabling license or a person registered as a cabling provider

Category 5 (or 5e) Cable or connecting hardware that is designed and manufactured to support data transmission of at least 100 Mbps

CET Communications Earth Terminal (formerly called a bonding terminal) — a terminal block required as a testing and isolation point to connect the building electrical earthing system to an earth cable used for telecommunications purposes

Combined utilities enclosure An electrical meter panel/switchboard enclosure that has a separate compartment for telecommunications equipment and, optionally, additional compartments for other utilities such as gas and water

Customer cabling - Cabling connected on the customer's side of the network boundary

dB Decibels

DB/m Decibels per meter

d.c. / DC - Direct current

Digital video service A subscription broadcast video service that can be controlled by the endorser by means of signals transmitted to the digital decoder

Distributor A collection of components used to terminate cables and cross-connect them by means of jumpers or patch cords

Ethernet - A standard for interconnecting computers via a LAN. The most popular Ethernet technologies for home networking are Traditional Ethernet (10 Base-T), which supports a maximum data speed of 10 Mbps, and Fast Ethernet (100 Base-T), which supports a maximum data speed of 100 Mbps

Ethernet switch/hub - A device that provides connectivity between several computers and peripheral equipment (eg. printer, scanner, etc.)

F connector A threaded connector used for connection of coaxial cables and cords

FTTP - Fiber To The Premises

GHz Gigahertz (a thousand million Hertz)

Home Gateway – Device used to distribute and manage Voice, Video and Data Services into the customer's home

HV High Voltage — for the purpose of this Guideline, this means single-phase or three-phase electrical power exceeding LV

ID Inside Diameter (conduit size)

ISDN Integrated Services Digital Network — a digital telecommunications network service that allows connectivity to various public or private networks for either voice or data transmission

Isolator - A passive device that electrically isolates both the inner and outer conductors of coaxial lead-in cable from the building coaxial cabling jumper one or more insulated conductors (usually a twisted pair) without connectors used to make a cross-connection within a distributor

IT Distribution Box An enclosure in the garage used for housing the ONU, PSU and Home Gateway

IT Junction Box A small standard electrical enclosure (300mm x 300mm x 150mm) linking the IT conduits between the two floors

LAN Local Area Network — cabling that enables linking of computers within a building or premises

Lead-in cabling SADV cabling from the last distribution joint (typically in the street) and the network boundary in the customer's premises

LV Low Voltage — for the purpose of this Guideline, this means single-phase or three-phase electrical power

Mbps Megabits per second (one million bits per second)

NTD Network Termination Device

OD Outside Diameter (conduit size)

ONU Optical Network Unit

Outlet Either a telecommunications outlet or a power outlet, as applicable

Passive Non-amplifying, non-switching and not requiring power to function

Patch cord - A flexible cord terminated with a plug or plugs to make a cross-connection to a socket or sockets within a distributor or on a patch panel without the need for a tool

Patch panel An array of sockets that may be cross-connected by means of patch cords

PC Personal Computer

Plug The male part of a two-part connector (plug/socket) that is normally connected at the end of the equipment connecting cord

PSU Power Supply Unit

Quadshield - A coaxial cable with an outer conductor comprising four layers of shielding — an inner foil, an inner braid, an outer foil and an outer braid

RF Radio Frequency

RF outlet A fixed connecting device to which an end-user may connect a DSTV Decoder. An RF outlet includes an F connector and associated mounting hardware (eg. wall plate)

RF splitter A device Used to split an RF signal evenly into more than one output. Only 2 or 3 output configurations are recommended

RF video amplifier An amplifier is used to increase the RF signal level from the ONU to ensure the correct signal levels are present at all wall plates in the customer's premises. Particularly suited to providing more than 3 outlets or for outlets located an extended distance from the ONU.

RG6 High performance coaxial cable typically used for cable and satellite TV

RG11 High performance coaxial cable typically used for cable and satellite TV It is generally used instead of RG6 cable for long cable runs.

RJ45 Registered Jack No. 45 — commonly used to describe an 8P modular plug or socket but actually a misnomer as the USOC "RJ" codes describe the wiring arrangement as well as the physical socket format

Socket Often also described as a "jack", a socket is the female part of a two-part connector (plug/socket), and is that part of the connector that terminates the fixed cabling. See also "telecommunications outlet"

Socket-outlet A 220 V a.c. domestic power outlet (formerly called a "General Purpose Outlet" or "GPO")

Splitter A passive device used to divide RF signals with minimum signal loss and distortion to support more than one video outlet

Telecommunications outlet A fixed connecting device to which an end-user may connect customer equipment to telecommunications cabling. A telecommunications outlet includes the socket(s) and associated mounting hardware (eg. wall plate)

TO - Telecommunications Outlet — sometimes interchangeable with "socket"

Trishield - A coaxial cable with an outer conductor comprising three layers of shielding — an inner foil, an inner braid and an outer foil

V - Volts

Video outlet - An outlet containing at least one RF socket (F connector) for connection of a DSTV Decoder. A video outlet may also include a telephone socket and/or a TV antenna socket.

Figure 1 (Typical Home Networking Cabling Layout double storey)

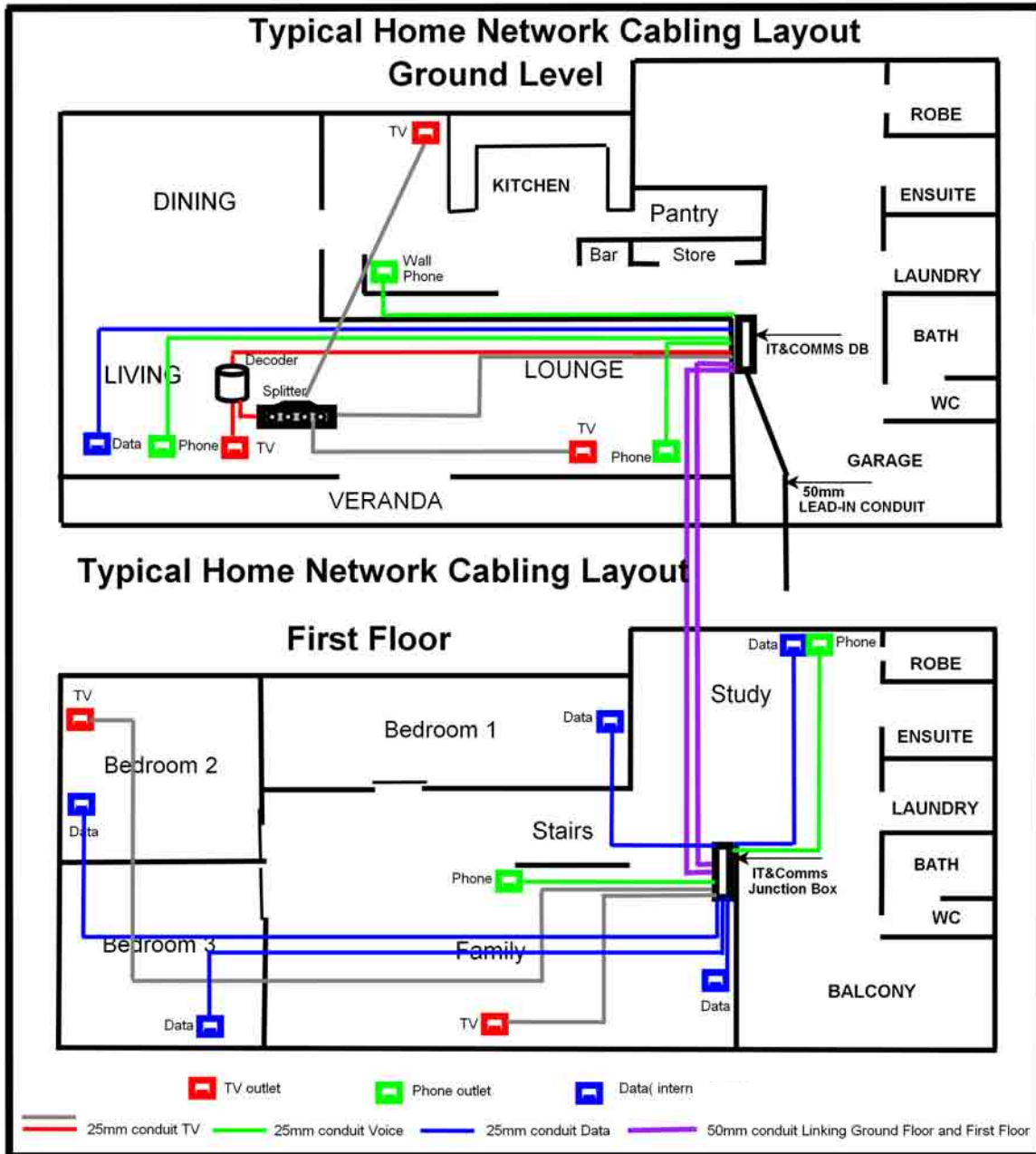


Figure 2 (Building Entry conduit positioning for IT & Communications DB)

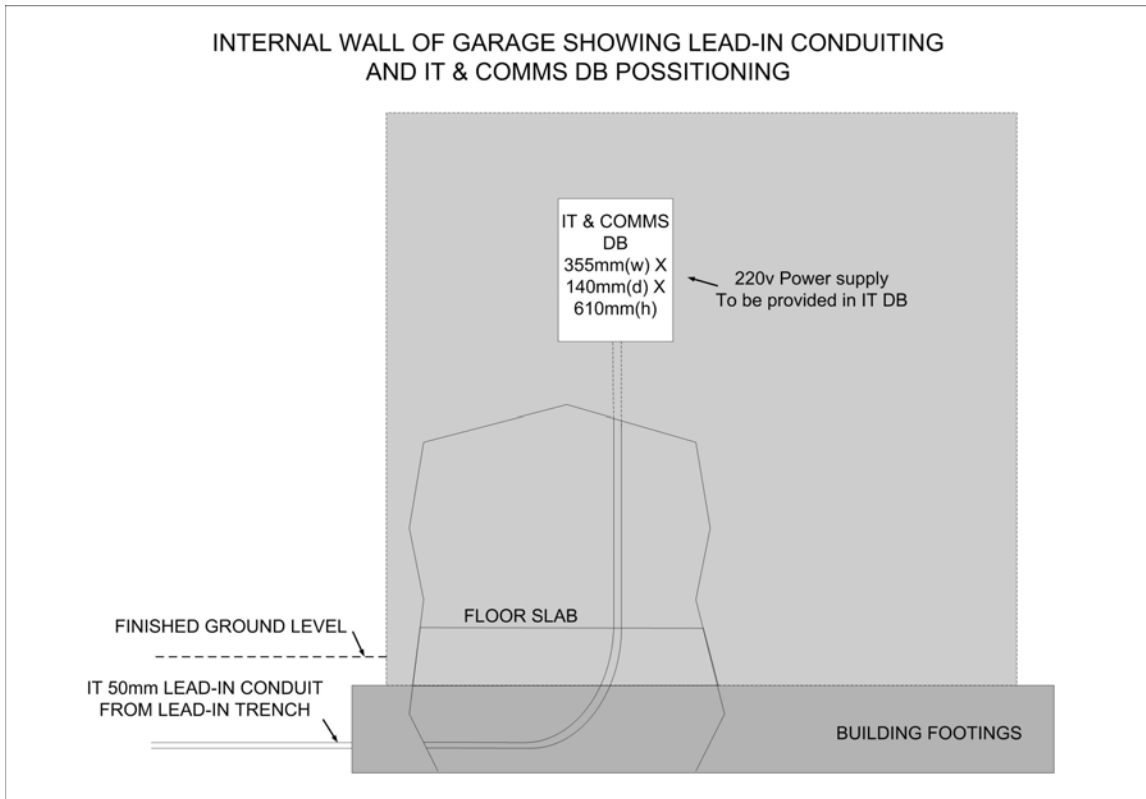


Figure 3 (IT & Communications Distribution Box Layout)

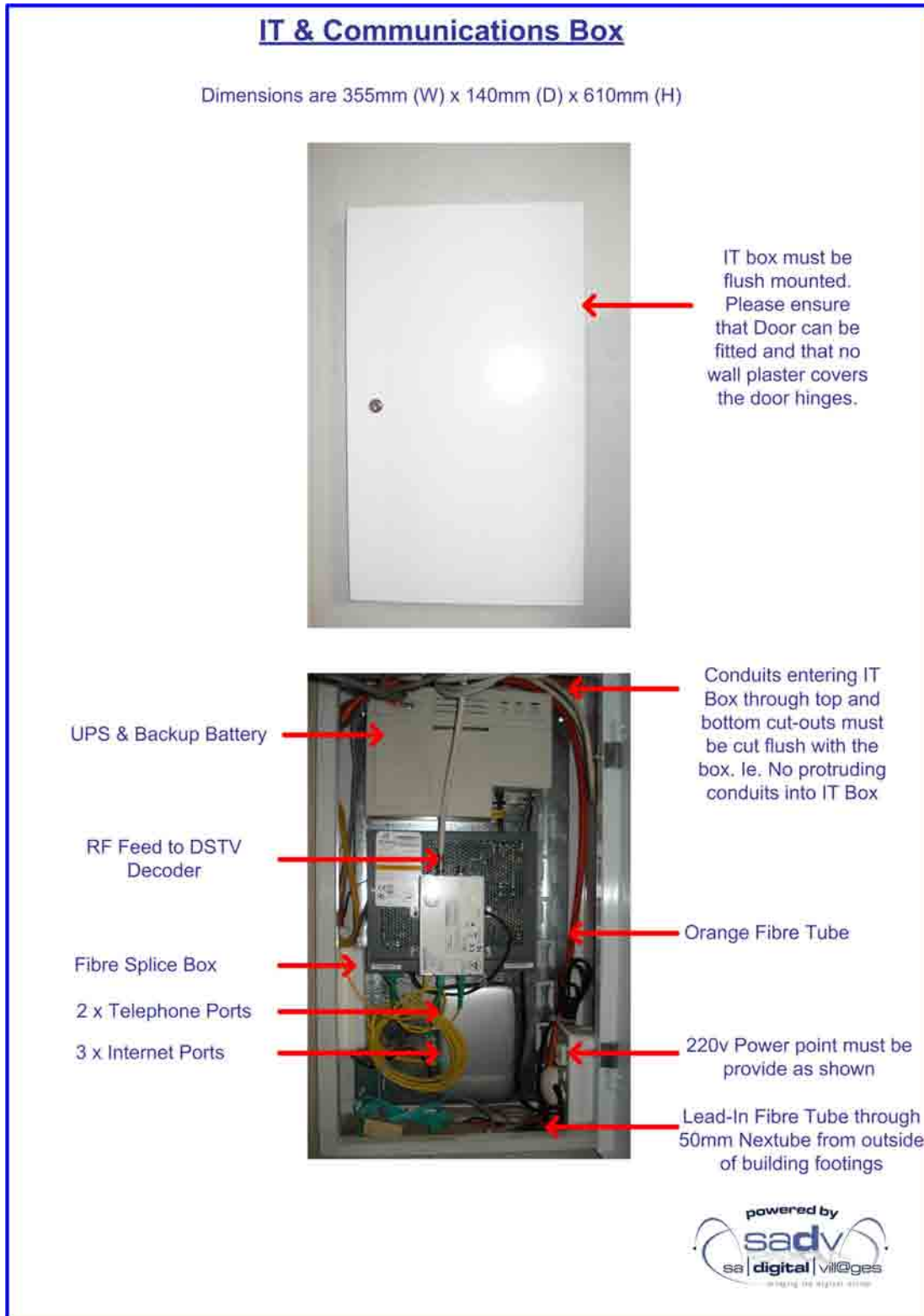
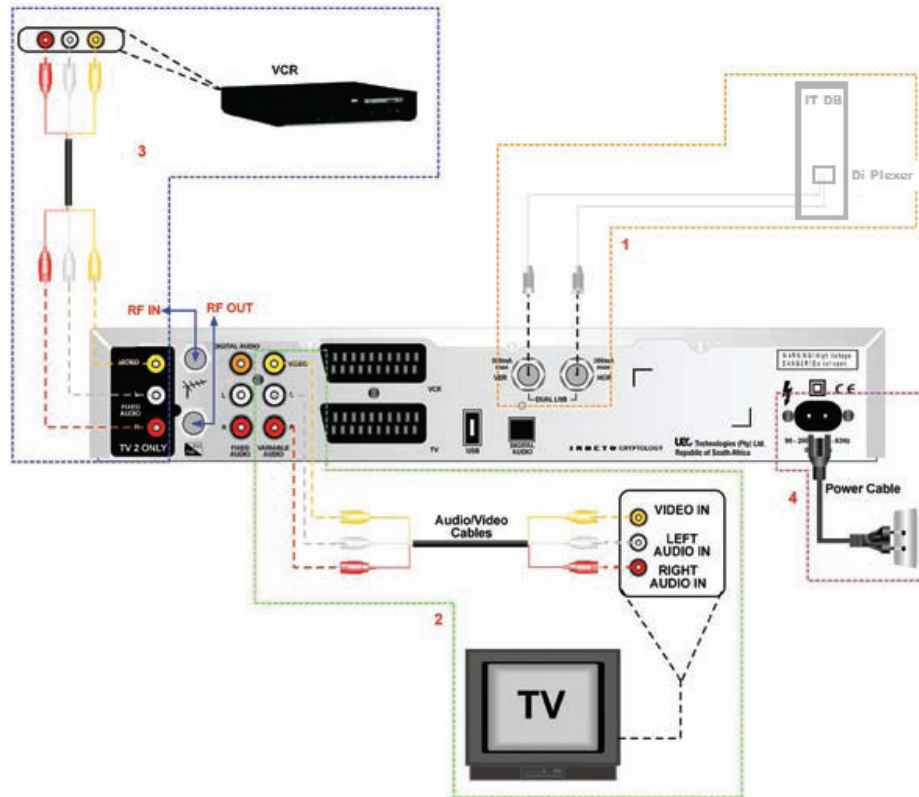


Figure 4 (PVR Decoder Wiring)

Please note that for any HD (High Definition) PVR Decoder installations, we suggest using a Serengeti accredited HD Installer to do your installation as this is a specialised installation that requires unique configurations for your HD Decoder to work in Serengeti. The unique (Non-Standard) Decoder Settings for Single View, Dual View and HD PVR are available from SA Digital Villages



- Connect the satellite feeds from the Diplexer in the IT Distribution Box to the dual LNB inputs of the PVR. **Refer to 1 on the illustration above.**
- Connect the Audio/Video cable supplied from the video and the variable audio connectors on the PVR to the video and audio inputs of your TV. **Refer to 2 on the illustration above.**
- Connect the TV2 Video and Audio outputs of the decoder to the Video and Audio inputs of the VCR. **Refer to 3 on the illustration above.**
- Connect the power cable supplied from the mains connector of the PVR to the mains supply. **Refer to 4 on the illustration above.**

SA DIGITAL VILLAGES provides residential and commercial customers with the infrastructure and services required to enable them to enjoy the full experience of digital living, taking full advantage of the latest technologies, thereby ensuring that their investment is able to take advantage of all the latest digital advances in technology and services for many years to come.