



EARTH OPTIC

Fibre Installations

Integrity Beams
With Quality.



**COMPANY
PORTFOLIO**

Company Registration: 2016/186432/07



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EARTH OPTIC PTY/LTD

Fibre Optic Fibre Installations

5 Pikkewyn Avenue

Three Rivers - East

1941

Contact : +27 64 236 4885 / +27 74 332 1777

Email : info@earthoptic.co.za

Internet : www.earthoptic.co.za

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All designs and edits done by,
Yvonne Pretorius (Livox)
www.livox.co.za.





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ABOUT US

Earth Optic has built a formidable reputation of being a dependable fibre optic company. Having secured the appreciation of customers, suppliers and peers for quality execution, integrity, efficiency and abilities.

Driven by the commitment and conviction of its dynamic and forward-thinking directors; Mr. Jaco Pretorius, Mr. Nico Pretorius and Mr. Willie Pretorius, distinguished new generation business icons of a renowned business family.

Earth Optic, delivers on it's promise across a wide regional footprint with well-qualified, well-equipped, continually improving and enthusiastic team selectively recruited from several parts of the country.

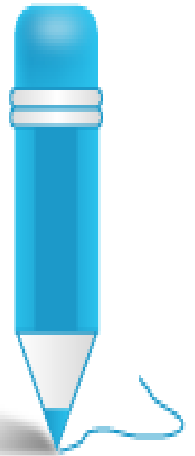
It has been a continuous endeavour that while in the pursuit of achieveing to satisfy an esteemed clientele, to consistently raise the quality bar and also while in the pursuit of installation excellence, modernisation, safety and customer satisfaction, Earth Optic remains focused on consistently raising the standards of quality, accountability, care and experience through continuous improvement in operations and workmanship.

OUR MISSION STATEMENT

Our mission is to perform for our customers the highest level of fibre quality services.

To ensure the longevity of our company through repeat and referral business achieved customers satisfaction in all areas including timeliness, attention to detail and service minded attitudes.

To maintain the highest levels of professionalism, integrity, honesty and fairness in our relationships with our suppliers, subcontractors, professional associates and customers.



- Quality
- Integrity
- Honesty



SERVICES

Providing our services to the Telecommunication industry with rapid growth and contribution to the Fibre Optic roll-out within Gauteng and surrounding areas.

CALL TODAY TO ARRANGE A MEETING OR SPEAK TO ONE OF OUR EXPERTS:

064 236 4885
074 332 1777

WHAT WE DO

We plan, deploy and manage client's optical networks covering project management, operational support, customer care management, systems integration, value added service platforms and Competence Solutions.

We help you plan your optical network with quality and performance to meet your long-term business goals.

Our extensive experience in optical network planning gained in the implementation of networks, coupled with advance planning tools, will assure you that your optical network has the necessary coverage, capacity, hierarchy and topology characteristics to suit your development plans.

OUR VALUES

- Quality**
 We believe in Quality and deliver the same. Our Quality is never an accident, it is always the result of our intelligent effort.
- Integrity**
 We believe in doing the right thing, even when no one is watching and are willing to live by our beliefs and standards. We also stand firm in the choices we make between what's convenient and what's right.
- Honesty**
 In our opinions honesty is the foundation for trust, one of them cant be excluded from the other.

OUR VISION

To be recognized industry wide by our customers and peers for our integrity, efficiency and our ability to perform on a professional manner.





ABOUT FIBRE OPTICS

Much of the Internet's content travels via fibre optic cables, particularly for long-haul transmissions. Fibre optic cable provides closed circuit transmissions with very large bandwidth and at very high transmission speeds. These two complementary features occur because these cables, made of thin strands of coated glass, can transmit signals modulated over laser-generated beams of light.

Rather than transmit using lower frequency radio waves, fibre optic cables operate at the frequencies (the visible spectrum contains more than 100,000 gigahertz, GHz), making it possible to carry large volumes of traffic of up to several hundred gigabits per second (Gbit/s) or even terabits per second (Tbit/s). Additionally, carriers can transmit traffic at several different frequencies using a technology called Dense Wave Division Multiplexing (DWDM). Multiplexing makes it possible for carriers to aggregate traffic onto a shared channel.

Demultiplexing unpacks and separates the aggregated traffic back into separate transmission streams for delivery to the intended recipients.

Because of the high expense incurred when installing cable across an ocean floor or buried underground, carriers deploying fibre optic cables typically install dozens of glass strands into one cable. Initially, not all of these individual fibres will be used: carriers can activate ("light") individual strands as demand grows. Installed but unused "dark fibre" can be activated later, as required. In addition to installation costs, the comparative disadvantages of using fibre optic cables over copper lie primarily in the cost of the equipment and labor. While this technology can interconnect with existing copper networks, additional cross-connect switching equipment must be installed.





THE CARRIERS

Carriers with a large installed copper wire network may undertake a cost-benefit analysis and conclude that simply retrofitting and upgrading the existing network may help to conserve capital in the short run.

Carriers opting to upgrade will install replacement fibre optic cable first on backbone routes with high volumes of traffic. As demand for bandwidth grows and investments can be justified, fibre progressively replaces copper cables throughout the network, reaching closer to the end users.

At present, most backbone networks are fibre based, even in developing economies, and the use of fibre in metropolitan and “middle-mile” links is rapidly increasing as well, particularly in developed countries. As the demand for wireless broadband grows, there is also increasing use of fibre to provide backhaul from cell sites to mobile carrier switching facilities.

Fibre penetration in the local access network is still very limited, even in developed countries. But the emerging trend, especially for building out new housing and commercial developments, is to install fibre from the outset.



OPTICAL FIBRE SPEED

For short distance application, such as a network in an office building, fibre-optic cabling can save space in cable ducts. This is because a single fibre can carry much more data than electrical cables such as standard category 5 Ethernet cabling, which typically runs at 100 Mbit/s or 1 Gbit/s speeds. Fibre is also immune to electrical interference; there is no cross-talk between signals in different cables, and no pickup of environmental noise. Non-armoured fibre cables do not conduct electricity, which makes fibre a good solution for protecting communications equipment in high voltage environments, such as power generation facilities, or metal communication structures prone to lightning strikes.

SEVERAL DEPLOYMENT SCENARIOS ARE POSSIBLE FOR FIBRE OPTIC CABLE :

- International Connectivity
- International undersea networks and international terrestrial networks.
- National Backbones
- National undersea networks and national overland backbone networks.
- Metropolitan rings and cellular backhaul
- Subscriber access - fibre to the premises



OUR SERVICES

DUCT INTEGRATION TESTING (DIT)

After backfilling ducts shall be tested for integrity (air tightness and kink-free shape).

Air tightness test is done by pressurizing 2 km duct stretches at a time.

One end of duct will be closed and compressed air at 5-6kg/cm² is sent from the other end. At about 5kg/cm² pressure the inlet of compressed air will be closed.

Fall in pressure should not be more than 50% in 1(one) hour.

To check that duct has not collapsed or kinked a wooden cylindrical piece (shuttle) is blown into the duct with far end fitted with Flexible wire grip/stocking.

The wooden shuttle should pass through duct at far end without any obstruction and within approx. 10 minutes or less.

DUCT PULLING

A common cable installation technique for fibre cables remains cable pulling.

After the duct is placed, a high-strength pull line is blown into the duct (if one has not already been pre-installed by the duct manufacturer).

The pull line is attached to one end of the cable and is used to pull the cable through the duct.

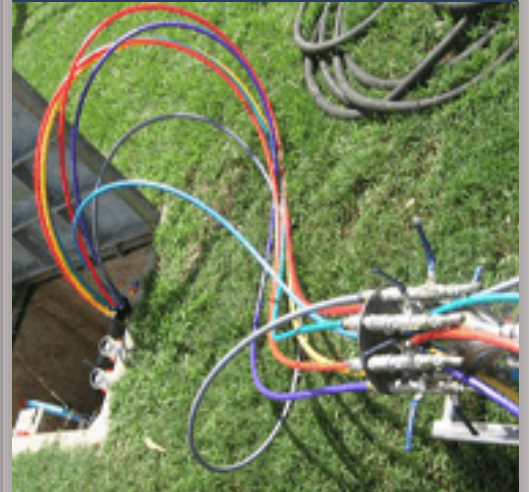
REINSTATEMENT

The definition of reinstatement is to put back the usage that had been taken away during the installation process.

For example: Grass, Pavement, tar etc.



DIT Testing



DIT Testing



Duct Pulling



Reinstatement

FIBRE FLOATING

We have a fully equipped, qualified team for the installation need of a fibre floating machine of micro and bare floating, hauling and blowing.

Cable floating is the process of blowing a cable through a duct while simultaneously pushing the cable into the duct.

Compressed air is injected at the duct inlet and flows through the duct and along the cable at high speed.

The high speed air propels the cable due to drag forces and pressure drop.

Advantages of blowing compared to pulling:

- Longer installation distances can be reached.
- Installation distance less dependent on bends and undulations in duct.
- Forces exerted on the cable are lower.
- Easier use blowing in tandem operation.
- The step of installing a winch rope is avoided.
-

Equipment is needed only at one end of the duct route.

MANHOLE INSTALLATIONS

A manhole (alternatively utility hole, cable chamber, maintenance hole, inspection chamber, access chamber, sewer hole, smellhole, flabhole, ding-dong or confined space) is the top opening to an underground utility vault used to house an access point for making connections, inspection, valve adjustments or performing maintenance on underground and buried public utility and other services including sewers, telephone, electricity, storm drains, district heating and gas.



Manhole Installations

5 FLOATING TECHNIQUE REQUIREMENTS

09

The choice of the floating technique depends mainly on:

1. Type of cable (diameter, weight, stiffness);
2. Duct diameter and duct characteristics vs. pressure;
3. Water availability;
4. Duct joints characteristics vs. inner pressure;
5. Shape of the route (number of bends, location of the bends, gradient).

The maximum length of installed cable, as well as the maximum speed of installation, depend on the aforesaid factors and the equipment used.

For uphill routes, the weight of the water pushing the cable towards the upper side should be taken into account. It is recommended increasing water pressure of about 1 bar per 10m drop level.

If the drop is relevant, the water pressure or increase may be incompatible with maximum pressure to be used with the duct and joints; in such a case, it is convenient to proceed with a downhill laying using a limited water quantity in order to get the allowed range.



Fibre Floating



MULTI DWELLING UNIT (MDU)

Introduction

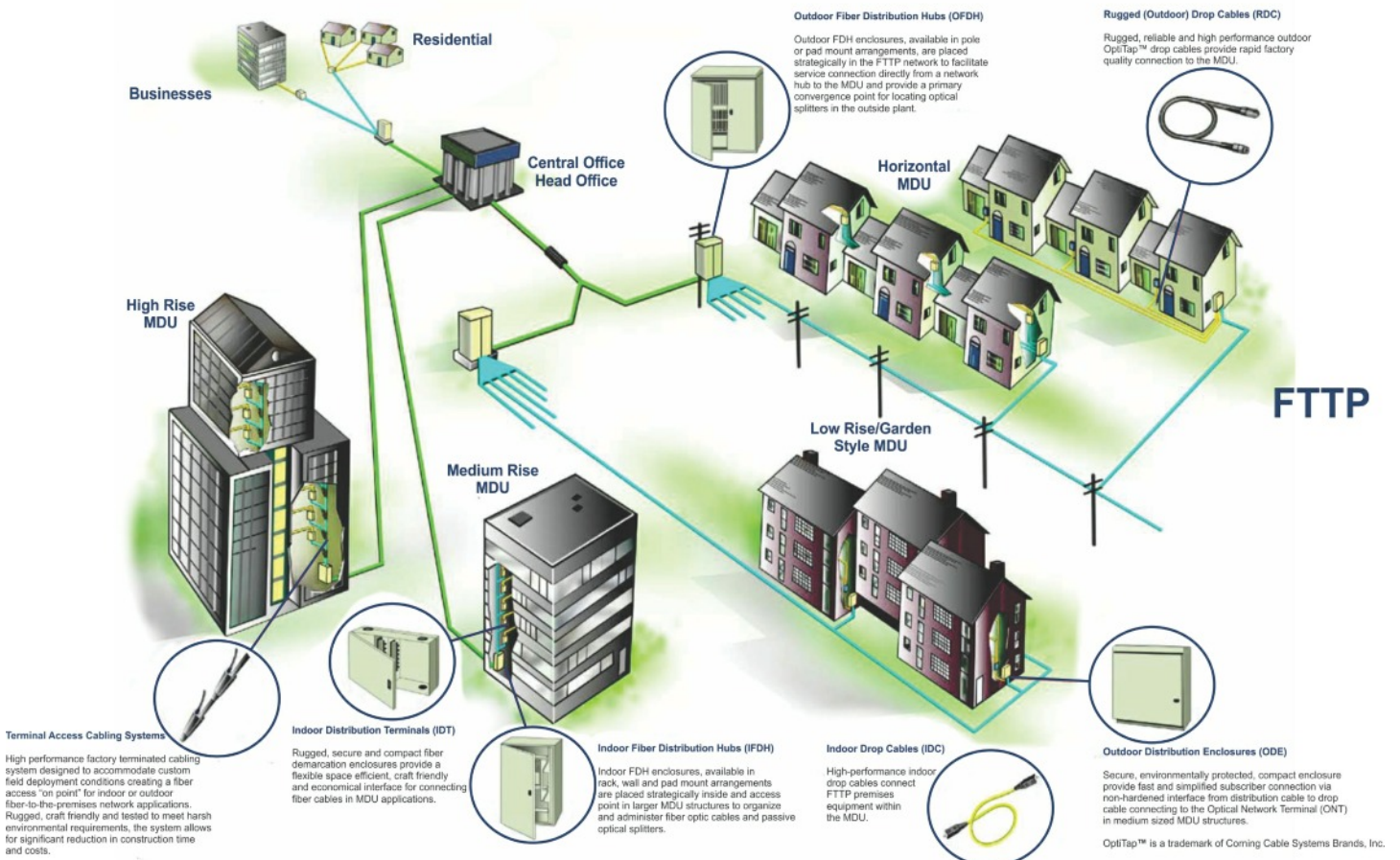
FTTx harnesses the power and speed of light to bring multi-play services to the consumer with incredible possibilities and total convenience. When every home is connected with FTTx, the communication usage will increase tremendously. From lightning-fast downloads, to seamless video conferencing, FTTx brings the world to the home through Fibre-To-The-Home (FTTH). MDU's, such as apartments, condominiums, residential hotel, and townhouses, play a huge part in the FTTH networks increase.

The MDU market is growing rapidly due to the fact that it provides a densely concentrated service area for the communications service providers. The MDU business segment is also attracting property owners as a source of additional revenue generating areas.

Challenges - Fibre Deployment in MDU's

Connecting MDU's into the FTTP network requires an understanding of the wide diversity of structures and conditions found worldwide. MDU installations require special consideration, specifically for fibre cable interconnection to terminal equipment, located at the premises.

A variety of solutions are required to support the many different connection scenarios. In some cases, the connection may be via a feeder fibre directly from the central office / head-end connected to a splitter hub on the premises. Solutions for larger MDU structures may involve splitter hubs (located inside the premises) and subtending riser and drop cable networks with intermediate fibre terminals located strategically throughout the building.

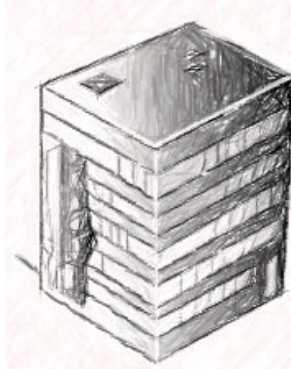




- High-Rise MDU**
- Condo or Apartment
 - Leased or Owned
 - 10+ Floors/Stories
 - 128+ LU
 - Internal Residential Entry



- Medium-Rise MDU**
- Condo or Apartment
 - Leased or Owned
 - Up to 10 Floors/Stories
 - 12 to 128 LU
 - Internal Residential Entry



MDU'S CLASSIFIED

Telecommunication services distribution in shared residential buildings requires an understanding of the wide diversity of structures and conditions that may be encountered.

There are a variety of MDU's available globally.

Some may classify them based on the number of Living Units (LU's) and others may categorize them with reference to the building / real-estate construction type.



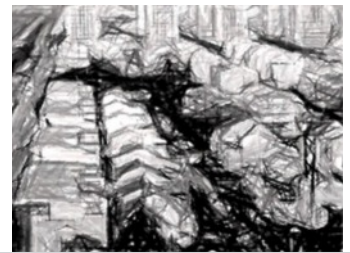
- Low-Rise MDU**
- Condo, Townhome or Apartment
 - Also called Garden Style or Horizontal Style
 - Leased or Owned
 - Up to 3 Floors/Stories
 - Up to 12 LU
 - External Residential Entry



- Horizontal**
- Two or more adjoining premises
 - A single common building entrance
 - All premises have a ground floor



- Vertical**
- Two or more premises where at least one does not have a ground floor
 - A multi-storey apartment, block or flat



- Hybrid (Mixed) or Garden Style**
- A combination of horizontal and vertical buildings
 - Retirement village or walled garden estate

DETERMINING THE MDU SIZES

- The MDU sizes are defined with reference to various aspects such as shared walls, common floors, number of LU's and house/building groups.
- However, the MDU sizes should be determined based on the number of fibre cable networks.
- This helps the operators to accommodate proper designs and estimate the required infrastructure for the fibre network deployment.
- Considering this as the fundamental rule, below are the MDU size classifications (provided by an APAC operator)

MDU Sizes	Small	Medium	Large	Giant
Number Of Living Units	2 - 20	21 - 50	51 - 100	101 - 200

2G - Second Generation Mobile Telecom Systems
3G - Third Generation Mobile Telecom Systems
3GPP - Third Generation Partnership Project
4G - Fourth Generation Mobile Telecom Systems
ADC - Adaptive Dispersion Compensator
ADSL - Asymmetric Digital Subscriber Line
ALS - Automatic Laser Shut-Down
AON - All Optical Networks
APD - Avalanche Photo Diodes
APR - Automatic Power Reduction
APSD - Automatic Power Shut-Down
ASE - Amplified Spontaneous Emission
ATM - Alternative Test Method
BA - Booster Amplifier
BCH - Bose- Chaudhuri- Hocquenghem Codes
BER - Bit Error Ratio
BOL - Beginning Of Life
B-OTDR - Bidirectional OTDR
BPON - Broadband PON
BU - Branching Unit
CCTV - Closed-Circuit Television
CII - Critical Information Infrastructure
CO - Central Office
CTE - Cable Terminating Equipment
CWDM - Coarse Wavelength Division Multiplexing
DA - Dispersion Accommodation
DA Cable- Double Armoured Cable
DBA - Dynamic Bandwidth Assignment
DC - Direct Current
DCF - Dispersion-Compensating Fibres
DCN - Data Communication Network
DEMUX - Demultiplexer
DFB - Distributed Feedback
DFE - Decision Feedback Equalization
DGD - Differential Group Delay
DIT - Duct Integration Testing
DRA - Distributed Raman Amplifier
DST - Dispersion Supported Transmission
DWDM - Dense Wavelength Division Multiplexing
EDC - Electronic Dispersion Compensation
EDFA - Erbium-Doped Fibre Amplifier
EDGE - Enhanced Data Rates For GSM Evolution
EME - Embedded Monitoring Equipment
EOL - End-Of-Life
EP2P - Ethernet Over Point To Point
EPON - Ethernet passive optical network

ES - Error-ed Seconds
ETT_x - Ethernet To The Home And Business
FEC - Forward Error Correction
FFE - Feed Forward Equalization
FP - Fabry-Perot
FTT_x - Types of access to fibre optic networks, incl;
- **FTTCab**- Fibre To The Cabinet
- **FTTC** - Fibre To The Curb
- **FTTN** - Fibre To The Node
FTTP - Fibre To The Premises, which may be:
- **FTTH** - Fibre To The Home, or
- **FTTB** - Fibre To The Business (Building)
FWM - Four Wave Mixing
G-Pon - Gigabit Capable PON
GPRS - General Packet Radio Service
GRP - Ground Penetrating Radar
GSM - Global System For Mobile Communications
GSMA - GSM Association
HMI - Human Machine Interface
IrDI - Inter-Domain Interfaces
ISDN - Integrated Service Digital Network
ISP - Internet Service Provider
LA - Line Amplifier
LAN - Local Area Network
LED - Light-Emitting Diodes
LTE - Long-Term Evolution
LU - Living Units
LW - Lightweight Cable
LWP - Low Water Peak
LPC - Lightweight Protected Cable
MAC - Media Access Control
MCVD - Modified Chemical - Vapour Deposition
MDU - Multi-Dwelling Units
MFD - Mode Field Diameter
MLM - Multi Longitudinal Mode
MLSE - Maximum Likelihood Sequence Estimation
MTTF - Mean Time To Failure
MUX - Multiplexer
MZ - Mach-Zehnder
NA - Numerical Aperture
NCG - Net Coding Gain
NE - Network Element
NGA - Next Generation Access
NGN - Next Generation Network
NOC - Network Operations Centre
NRZ - Non- Return To Zero



- OA** - Optical Amplifier
- OADM** - Optical Add/Drop Multiplexer
- OAR** - Optically Amplified Receiver
- OAT** - Optically Amplified Transmitter
- OD** - Optical De-multiplexer
- ODF** - Optical Distribution Frame
- ODN** - Optical Distribution Frame
- ODUk** - Optical Data Unit (k)
- OFA** - Optical Fibre Amplifier
- OLA** - Optical Line Amplifier
- OLT** - Optical Line Termination
- OM** - Optical Multiplexer
- ONE** - Optical Network Element
- ONT** - Optical Network Termination
- ONU** - Optical Network Unit
- OPGW** - Optical Fibre Ground Wires
- OPM** - Optical Power Monitor
- OPm** - Optical Power Meter
- ORL** - Optical Return Loss
- OS** - Operating System
- OSA** - Optical Spectrum Analyser
- OSC** - Optical Supervisory Channel
- OSNR** - Optical Signal To Noise Ratio
- OSP** - Online Service Provider
- OSR** - Optical Submarine Repeater
- OTDR** - Optical Time Domain Reflectometer
- OTF** - Optical Termination Frame
- OTL** - Optical Trunk Line
- OTM** - Optical Testing Module
- OTN** - Optical Transport Network
- OTUk** - Optical Transport Unit (k)
- OVD** - Outside- Vapour Deposition
- PA** - Pre-Amplifier
- PRE** - Prechirp
- PCVD** - Plasma Activated Chemical Vapour Deposition
- PDC** - Passive Dispersion Compensation
- PDF** - Probability Density Function
- PDH** - Plesiochronous Digital Hierarchy
- PDL** - Polarization Dependent Loss
- PE** - Polyethylene
- PFE** - Power Feeding Equipment
- PLMN** - Public Land Mobile Network
- PMD** - Physical Media Dispersion
- PMDC** - Polarization Mode Dispersion Compensators
- PON** - Passive Optical Network
- POTS** - Plain Old Telephone Service
- PSP** - Principal States Of Polarization
- PVC** - Polyvinyl Chloride
- PXC** - Photonic Cross-Connect
- RA Cable**- Rock Armoured Cable
- RCIP** - Regional Communications Infrastructure Program
- RE** - Reach Extender
- ROADM** - Re-configurable Optical Add/Drop Multiplexer
- ROPA** - Remote Optically Pumped Amplifier
- RS Codes**- Reed Solomon Codes
- RTM** - Reference Test Method
- RZ** - Return To Zero
- SA Cable**- Single Armoured Cable
- SBS** - Stimulated Brillouin Scattering
- SDH** - Synchronous Digital Hierarchy
- SES** - Severely Errored Seconds
- SLM** - Single Longitudinal Mode
- SMS** - Short Message Service
- SNI** - Service Node Interface
- SNR** - Signal To Noise Ratio
- SOA** - Semiconductor Optical Amplifiers
- SPM** - Self Phase Modulation
- SRS** - Stimulated Raman Scattering
- STM-N** - Synchronous Transport Module (Order N)
- TC** - Transmission Convergence
- TCM** - Time Compression Multiplexing
- TDM** - Time Division Multiplexing
- TDMA** - Time Division Multiple Access
- TMC** - Terrestrial Marinized Cables
- TS** - Terminal Station
- TTE** - Terminal Transmission Equipment
- UNI** - User Network Interface
- VAD** - Vapour Axial Deposition
- VCSEL** - Vertical Cavity Surface Emitting Lasers
- VDSL** - Very High Speed DSL
- VDSL2** - Very High Speed Digital Subscriber Loop
- VOD** - Video On Demand
- WBF** - Wavelength Blocking Filter
- WDM** - Wavelength Division Multiplexing
- WPNS** - Water Peak Not Specified
- WSON** - Wavelength Switched Optical Network
- WWDM** - Wide WDM
- XDSL** - x Digital Subscriber Line
- XPM** - Cross Phase Modulation





INTEGRITY BEAMS WITH QUALITY

CONTACT US TODAY

One of our highest priorities is making sure our clients receive the best possible results and are completely satisfied with the entire process. Building solid relationships has been the foundation of Earth Optic since we opened our doors for business.

We welcome the opportunity to learn about your project and to discuss the opportunities and possibilities that Earth Optic has to offer you.

TEL: 064 236 4885
TEL: 074 332 1777

EMAIL: INFO@EARTHOPTIC.CO.ZA

5 PIKKEWYN AVENUE
THREE RIVERS -EAST
VEREENIGING, 1941
GAUTENG

FURTHER INFORMATION

The following information is available to view on our website www.company.com

- [Managing Directors](#)
- [Location Map](#)
- [Office Hours](#)
- [PDF of this portfolio](#)

If theres anything else you'd like to see, don't hesitate to get in touch via the contact details above.

www.earthoptic.co.za