IT-SIMPLICITY SOLUTIONS BV

ITSimplicity Solutions BV
FTTH engineering services:
From Survey => Turn-key projects
Brown-field & Green-field
High-level & Detailed design
Conceptual designs & calculations

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Telecom & FTTH engineering services since 1994

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IT-SIMPLICITY

About us, history

Turn-key projects.
The Fibre optic FTTH / FTTX network design software was originally made by and used internally by: NKF (Nokia / Philips) / Draka (Prysmian Group) and their project offices with local staff. Simple to use software to: design, engineer, plan, build and complete turn-key OSP Telecommunication projects.

History.
In 1994 a first version of the network design software was implemented in project offices in Sri-Lanka & Zimbabwe for the creation of: fundamental -and detailed network designs for large Telecom networks. Since then the software has been renewed every year and has been used intensively in several countries in: Africa, Asia, Europe, The Middle-East & The Caribbean for several millions of home connections in Telecom networks.
The Draka/Prysmian project & software engineering team took over all OSP software tools & solutions, rights and ownerships, from Draka / Prysmian and became an independent company called ITSimplicity Solutions BV in February 2013.

IT-SIMPLICITY

About us, services

Services.

We provide FTTH design & engineering services for projects all over the World.
We offer high quality design services for very attractive prices for the engineering of: FTTH, business parks, industrial complexes etc. We create all FTTH designs, plans & documents in Dutch, German and English. This way we engineer large amounts of homes each year.
We have detailed survey examples and survey checklists available for customers.

We provide:

- business case support with network calculations & network concepts
- survey drawing examples, survey checklists & software tools
- high-level network design and quantities (automatically generated)
- installer ready, detailed network designs (duct-plans & drawings, cable-drawings)
- fibre schematics
- quantities reporting

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About us, software

Software.

Our main software focus is the design and project management of Telecom networks. For the design part we made an application as add-on to Autocad/AutocadMap3D. (ITS-NetDesign)

For the reporting & building part we made an extensive project planning software. (ITS-NetProject)

For certain engineering activities (grouping of homes, positioning of manipulation points, cable routing, trench optimization) we made an automatic design tool with cost optimization.(ITS-NetOptimus)

As simplified registration tool, for the creation of splicing schematics and as bridge/interface to certain Operator GIS software we made ITS-NetID.

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Services

Our engineering services, best results:

Fibre optic FTTH / FTTX ITS-Software Suite™
For the **best results**, network design should be approached from the top down and built from the bottom up.

ITSimplicity Solutions BV helps select the most appropriate technology and create a solid business case, and **provides tools** to design, engineer, build, test and maintain the network, right down to creating an accurate Bill of Materials (BoM).

Years of practical experience in turn-key **projects of all sizes**, our knowhow of best-in-class materials and installation techniques allow us to get future-proof networks up and running in no time, even when there are sudden changes in plan or customer requirements.

IT-SIMPLICITY

Services

Our experience with network engineering & turn-key projects:

ITSimplicity Solutions BV covers the entire path from local exchange to the doorstep. With our software tools and services, and decades of experience in deploying **cost-effective networks** around the globe, we're committed to giving you expert advice on maximising performance and minimising cost.

Relying on **over 20 years' experience** in Telecom OSP network engineering, ITSimplicity Solutions BV's engineering and consultancy team can help you cut the cost of planning, designing, optimising, costing and implementing a superfast broadband network. Our engineering services combine extensive knowledge and advanced software tools to design, engineer and optimise your passive optical fibre networks.
Our design and planning tools **remove the guesswork** out of material requirements, eliminating the need to redo preliminary drawings and cost calculations when a project gets the go ahead.

IT-SIMPLICITY

Services

Detailed & high level design, engineering services:

Create a detailed network design.
By automating, sequencing and simplifying components and processes, our design and planning software helps analyse and visualise scenarios easily and quickly, information needed to support financial business case scenario planning. Using site survey findings, initial estimations of BoQ, BoL and BoM can be enhanced as part of a highly detailed design (issues such as the accessibility of existing ducts and poles will then be taken into account).

Build a winning business case.
Relying on our design & engineering solutions is the quick and easy way to build a solid business case for the topology and deployment options for your network and to be certain of investing in a robust, future-proof, cost efficient, high performance network.

IT-SIMPLICITY

Services

Detailed & high level design, engineering services:

From concept to detailed design.
From concept to design, development, building and maintenance of networks for **crowded cities or rural regions**, with our integrated software solutions you have everything covered.

Our design software maps, configures, optimises and calculates costs of network concepts in seconds. Changes and variations are **easy to implement** whilst designing and even after installation. Expert engineering and consultancy services, plus professional support for building a winning business case.

Our services output:

Full range of services:

- Network definition, general technical business case
- Topology choice (P2P or P2MP) or a mix of legacy/new build
- Technology choice (PoN or Ethernet)
- Number of homes (Multi Dwelling Units (MDUs),single dwelling, etc.)
- Alternative Rights of Way (RoW)
- FTTH in MDUs (e.g. flats)
- Financial scenario planning based on detailed designs
- Bill of Quantities (BoQ)
- Bill of Materials (BoM)
- Bill of Labour (BoL)
- Detailed network engineering, including as-built documentation (BoQ, BoM, BoL) and:
- Fibre, Splicing schemes
- Duct-labelling plans
- Connection lists for distribution points
- Drawings for implementing and/or permitting
- Drawings for household connections

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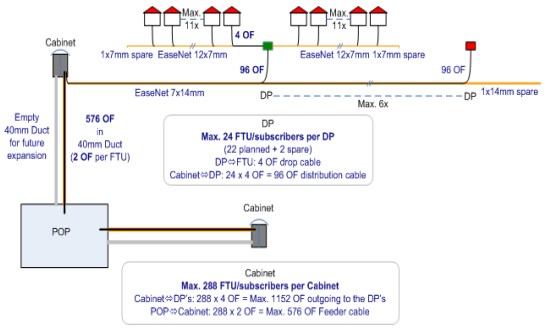
Services

Network concepts:

- Developing network concepts, P2P / PON / Ducts / Micro-ducts
- Creating cost optimized network-designs
- Full service, from design to network concept documents
- Business case support with detailed costs & quantities
- High packing density data-centres (space saving)



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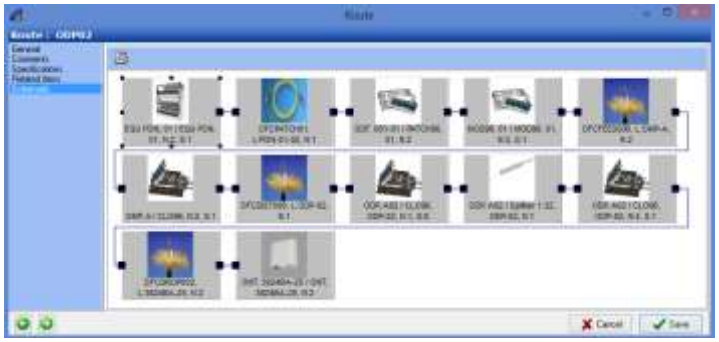
Services

Service references 2013/2014/2015

- FTTH, FTTB,
- FTTX: Tunnels/Metro/Railway
- Hybrid: Copper/Power/ Optical

In: Mid-Africa & North-Africa, South America, The Middle East, Europe.



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Software, summary

Our FTTH / FTTX network design & engineering solutions:

Design *Build* *Operate & Maintain*

ITS-NetDesign

Network design

Design of detailed FTTH-networks

►*AutoCAD® based creation of all required drawings and network related quantities.*

ITS-NetOptimus

Automatic optimization

Cost optimized network design

►*Automatic, based on material & installation costs*

ITS-NetProject

Project Management

Simplifies complex networks

► *Managing of all labour, quantities & costs. Material management & process control*

ITS-NetID

Network Registration

Registration & Documentation

►*Creation of fibre connections / jointing reports. Integrated GIS.*

IT-SIMPLICITY

Software, summary

ITS-Software Suite™, summary:

FTTH / FTTX ITS-Software Suite™
Is a **proven software solution** to Design, Build & Maintain FTTX networks.

The ITS-Software Suite™ has designed, registered and installed **several millions** of connections.

The ITS-Software Suite™:

- **Cost optimized** automatic CAD design
- **Dedicated software** for FTTH / FTTX **Project-Management**
- Simple conversion from pre-registration to As-built **network registration**
- Offers **full process control** over your projects

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Software, network design

ITS-Software Suite™, network design:

ITS-NetDesign™
Flexible solution for FTTH / FTTX design, based on **Autocad**® & AutocadMap3D ®
Automatic: costing, cabling, labelling, easy switch from P2P to GPON.
Fast output as: schematics, installer ready & as-built designs. Easy to learn.

Picture: FTTH network design Amsterdam including labelling, calculations, project management and registration

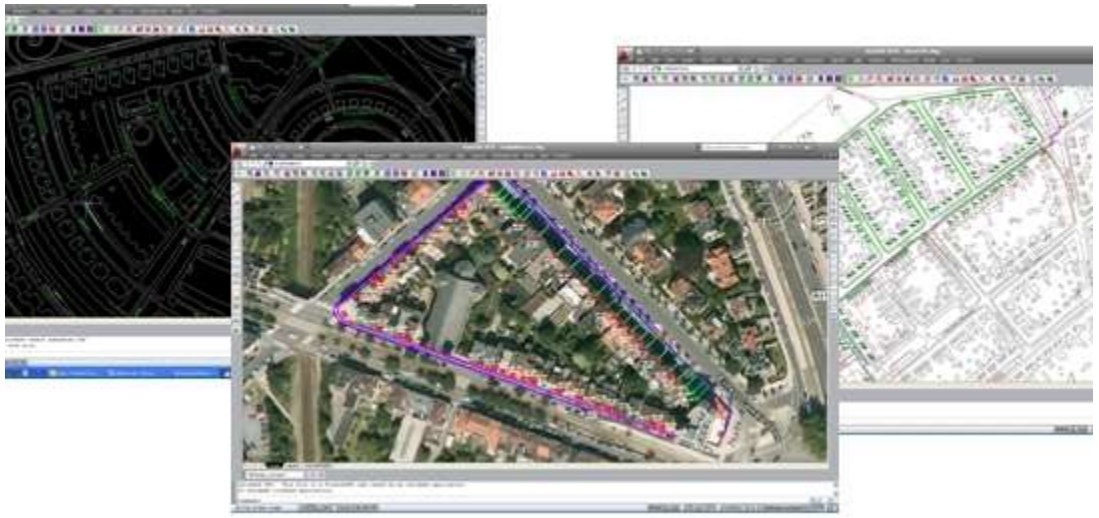
IT-SIMPLICITY

Software, network design

ITS-NetDesign supports various drawing background formats:

- Import multiple customer locations, cadastral Geo data. ITS-NetDesign can use a satellite image, aerial photograph or scanned background drawings to make a quick estimate of the cost of FTTH network materials and labour.
- Various common formats can be imported as external references or underlays.

Picture: FTTH network design , cadastral design, area photo, network design



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Software, network design

ITS-NetDesign adds Fibre optic FTTH / FTTX network design / engineering functions and items to standard Autocad® / AutocadMap3D ® (full version).

ITS-NetDesign supports:

- Manual design and modification of network items
- (Semi-) automatic network design and network modelling
- Fully-automatic cost optimized network design

(see also our website for the ITS-NetOptimus planning & optimization software)

Easy manipulation of the network design with:

- Menu's, toolbars with FTTH network items
- Data-editor: easy text and quantities dialog screen
- Easy switch from Draft / Imported data to a real network design

The ITS-NetDesign Engine:

Multiple users, large projects:

- Unique ID code generator
- Automatic: **Jobs / work-orders** creation (layers & quantities per area / activity)
- Drawings contain all **Extended data**. (No links to an external database)
- Unlimited amount of concurrent designers / engineers
- No project size limits

Automatic and customizable (multiple settings) creation of: .

- Layers
- Fibre optic network items (cables, ducts, trenches, manipulation-points etc.)
- Labelling and colouring
- Dynamic text (address, colouring, length and quantities related)
- Material & Installations items and quantities
- Dynamic quantities (**Standard functions** and **Complex calculations** related)

Complex Fibre optic FTTH / FTTX calculations, summary:

Summary of a number of more complex calculation functions:

- The Data-editor: calculates all dynamic quantities and dynamic text
- Auto-cable: calculates fibres requirements and creates all required cables
- Auto-labelling: creates the customizable cable labelling
- Manual-calculation: per single manipulation-point, checks all connections, calculates all material & installation requirements, amount of connected customer-connection / FTU (ONT), passive fibres amount, active fibre requirements per bandwidth, splitter-types and quantities
- **‘Spider-calculation’:** with a single click, enforcing all **P2P / GPON** settings, the whole network is re-calculated & re-designed. The dynamic text / labelling will automatically show: splitter-types and quantities per manipulation-point
- Concept area info: shows all quantities of connections, cable & trench types

Fibre optic FTTH / FTTX P2P / GPON, summary:

The ITS-NetDesign software is capable of searching for all ‘down’ nodes and can determine the number of fibres required in the cables to the nodes.

In addition, the software calculates the number of splices, splice cassettes and cable inlet grommets for the selected nodes. In PON networks, it also calculates the number and type of optical splitters required with a single click. If needed, splices, cassettes and splitters can be assigned to capacity limits, with warnings indicating if the limits have been exceeded.

With ITS-NetDesign it is possible to perform P2P & PON **‘Spider Calculations’** on all ‘down’ nodes, or ‘select all’ and **let the program calculate** and decide for the whole network.

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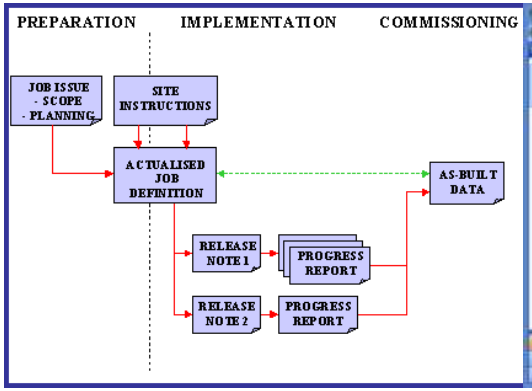
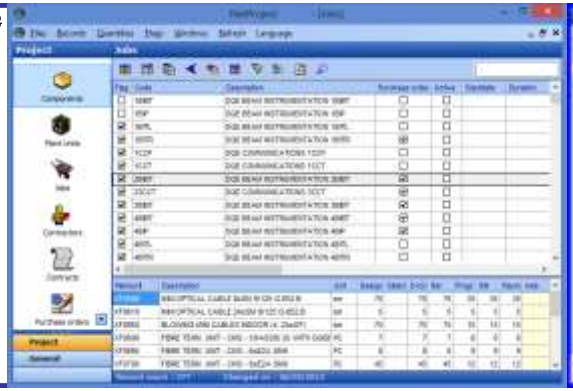
Software, project management

ITS-Software Suite™, project management:

ITS-NetProject™
Extensive system for: **Material, Contract and Project management**.
Lego-like structure: three project levels with ‘building blocks’.
Total process control, including: purchasing, contractors, progress reports.
Completely customizable and simple to operate.

Picture: FTTH project preparation, implementation and commissioning, project info, supplier info, datasheets





ITS-NetProject uses only three ABC levels to define a project:

1. Area-activity Job level
2. Building-block Plant-unit level
3. Component Component level

1. Job level (work-order / activity): plant-unit codes with job-specific quantities

2. Plant-unit level (installation unit): material and/or labour, combination of components

3. Component level: a material or labour element

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Software, project management

ITS-NetProject is developed as a multi-user system with a central MySQL database. This project planning software offers, per project:

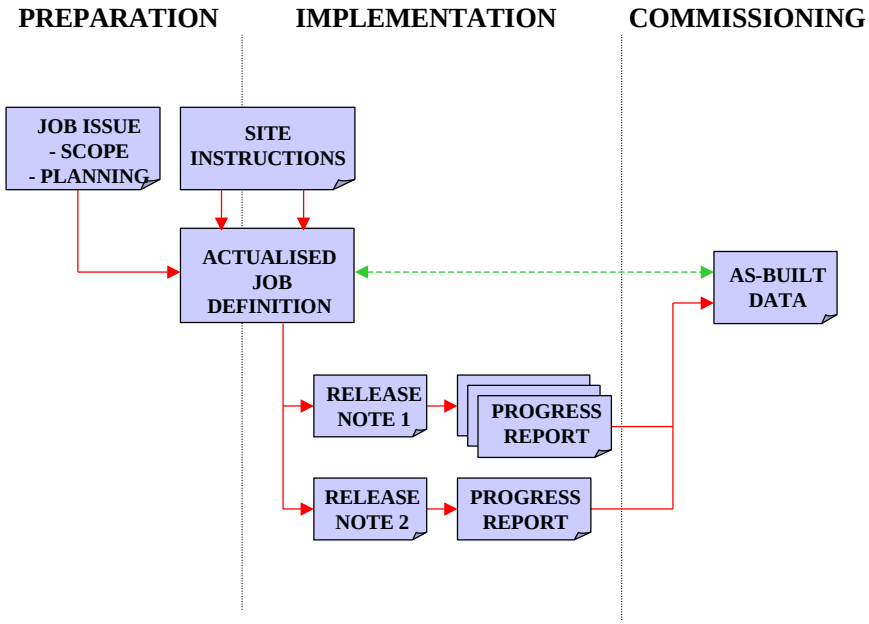
Material management
- Product management (Component & Supplier management)
- Purchasing
- Store management (store content, incoming and outgoing materials, etc.)

Contract management
- Contractor definition
- Contract definition (scope, labour components, prices, etc.)

Project management
- Job / work-order definitions
- Implementation scheduling with Job release & material issue notes
- Progress & as-built reporting, billing & payments

Project management

A job can be so large or complex that it has to be implemented in parts or sections. For this purpose release notes are issued to inform the contractor when he is allowed to do a certain portion of the job / work. On these release notes the progress is reported, as well as the as-built data.



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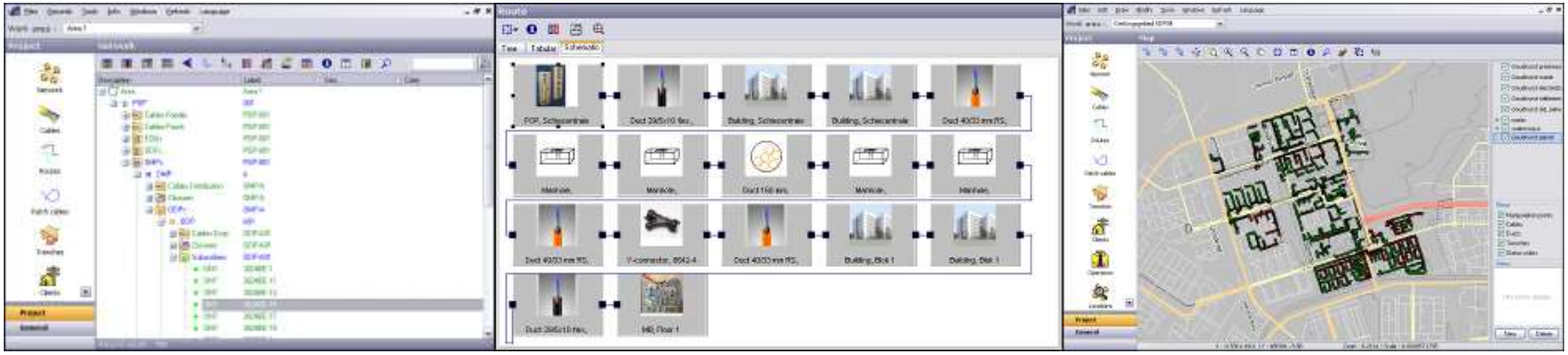
Software, registration

ITS-NetID™, network registration:

ITS-NetID™
Optical fibre network registration with easy tree structure en integrated GIS.
All information directly available for multiple users.
All network details are direct available in multiple views and GIS.
Lego-like customizable building blocks. Easy to operate.

Picture: FTTH network documentation, registration views: tree, cable route, interactive map, GIS



ITS-NetOptimus™, automatic cost optimized network design:

ITS-NetOptimus™
Our **automatic network design** solution.

Creates the highest quality FTTH / FTTX network-designs by using complex optimization algorithms within a user friendly graphical interface.

Cost optimized network designs are made in minutes instead of days.

Optimization parameters:

- Civil costs
- Material costs
- Installation costs

IT-SIMPLICITY

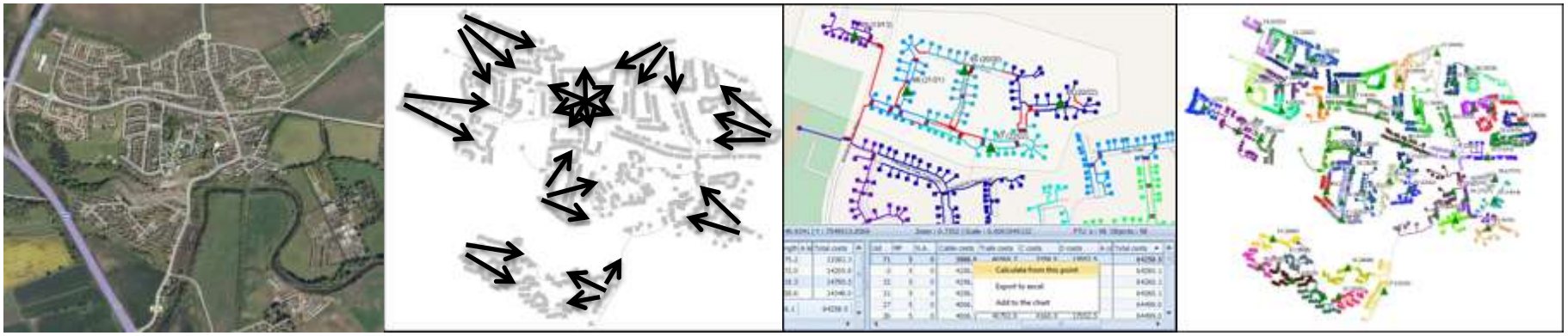
Software, optimization

ITS-NetOptimus™, automatic cost optimized network design:

ITS-NetOptimus™ offers substantial benefits in terms of **reducing** the **engineering time and network building costs**.

The best network designs are listed with costs and made visible within minutes

Picture: FTTH project photo, multiple calculations, alternative designs listed, best DP area's



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Software, optimization

ITS-NetOptimus™, automatic cost optimized network design:

Network designs and costs are directly available per area.

Multiple levels and network concepts.

Substantial savings (approx):
20 % less drop cable by improved grouping homes
2 % less distribution cable by best DP positioning
2% less trenching costs by improved routing

100 times faster than manual / alternative engineering

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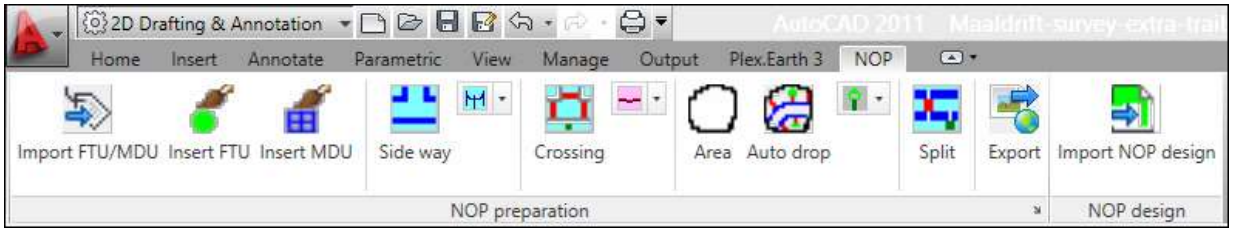
Software, survey data => CAD



From Brown-field & Green-field survey data preparation => network design:

1: Insertion of the building entry points for FTU (ONT) / MDU (MNT) and GPS data

2: Insertion of lines per trench/trail type and GPS data

3: Prepare and finalize the survey data for automatic network optimization & design

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Examples, FTTX

In Phase one, the addition of 190 dish antennas will expand the 64-dish precursor array. South Africa and eight African partner countries will host the dish array in Phase two and will also host the Phase two mid frequency aperture array antennas

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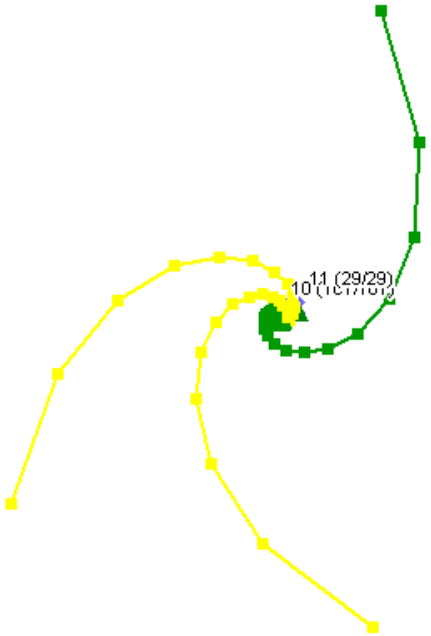
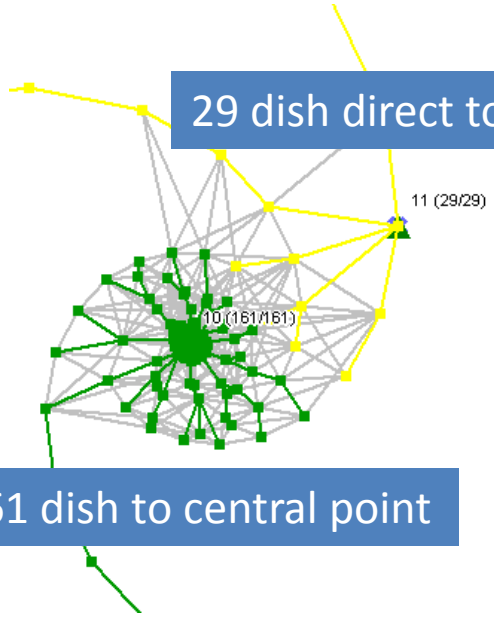
Examples, FTTX

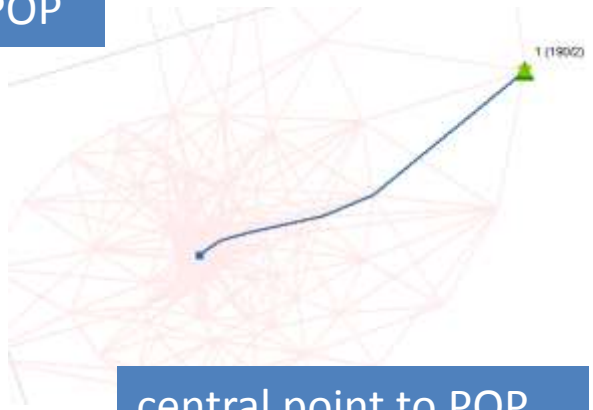
Cost optimized 190 dish network design by ITS-NetOptimus with 2 POP's
One central point for certain dishes and POP at separate location approx. 7000m from 0,0





29 dish direct to POP

161 dish to central point



central point to POP

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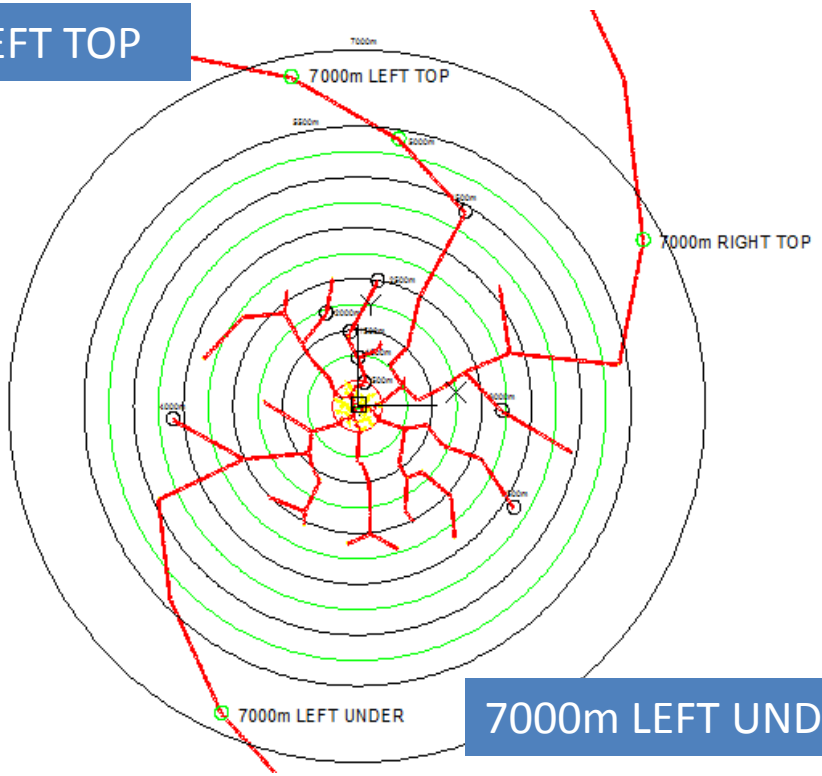
Examples, FTTX

Cost optimized 190 dish network designs by ITS-NetOptimus for 3 POP locations
Total of cable & trench costs for three POP locations near 7000m from coordinate 0,0.

7000m LEFT TOP



7000m RIGHT TOP

7000m LEFT UNDER

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Examples, FTTX

Phase one, the addition of 190 dish antennas in South Africa
Total of cable & trench costs for different POP locations near 7000m from coordinate 0,0.

		Cable & Trench costs, for different POP locations						
		Distance (approx) from POP to 0,0	Total costs	Cable	Trench	Cable	Trench	Total
	Cost/m	Meters	Millions	Meters	Meters	Costs	Costs	Costs
Cable	[redacted]	7000 lt-left top	[redacted]	2.952.447	487.815	[redacted]	[redacted]	[redacted]
Trench	[redacted]	7000 rt-right top		2.785.266	486.633			
		7000 lu-left under		3.188.042	485.933			
		7000 lt-left top auto		2.952.447	487.815			
		7000 lt-Further optimized (Trench=1 & trail blocking)		2.605.917	495.352			
		Auto - Optimized		346.530	-7.537			
		Price per meter		[redacted]				
		Cost difference				[redacted]	Total cost difference	

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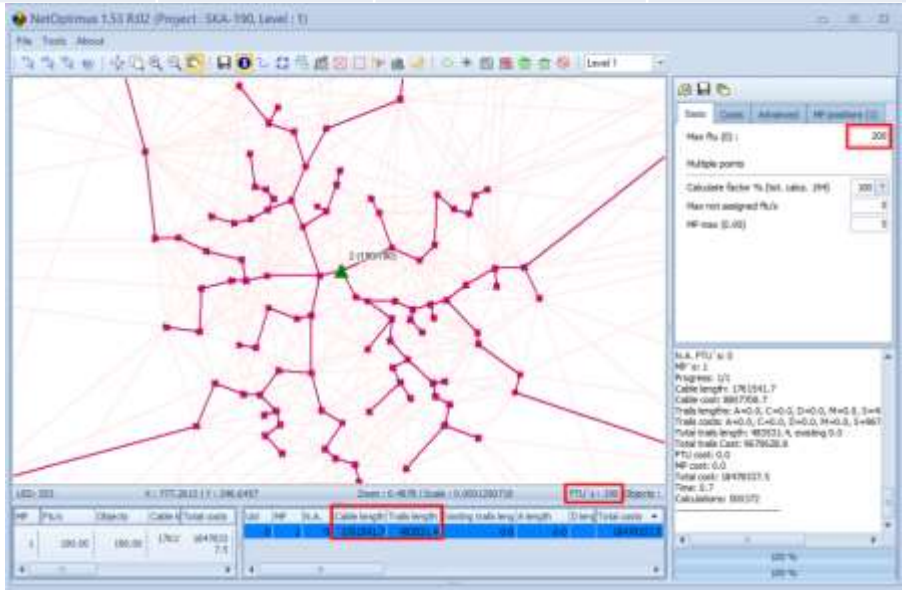
Examples, FTTX

Cost optimized 190 dish network design by ITS-NetOptimus
Minimum costs design with the POP location at coordinate 0,0.

Option 1: Minimum costs calculation (default)				
	Parameter	Price	Total length	
Trench	--	€ --/m	483.531 m	€ --
Cable	--	€ --/m	1.761.542 m	€ --
Total				€ --



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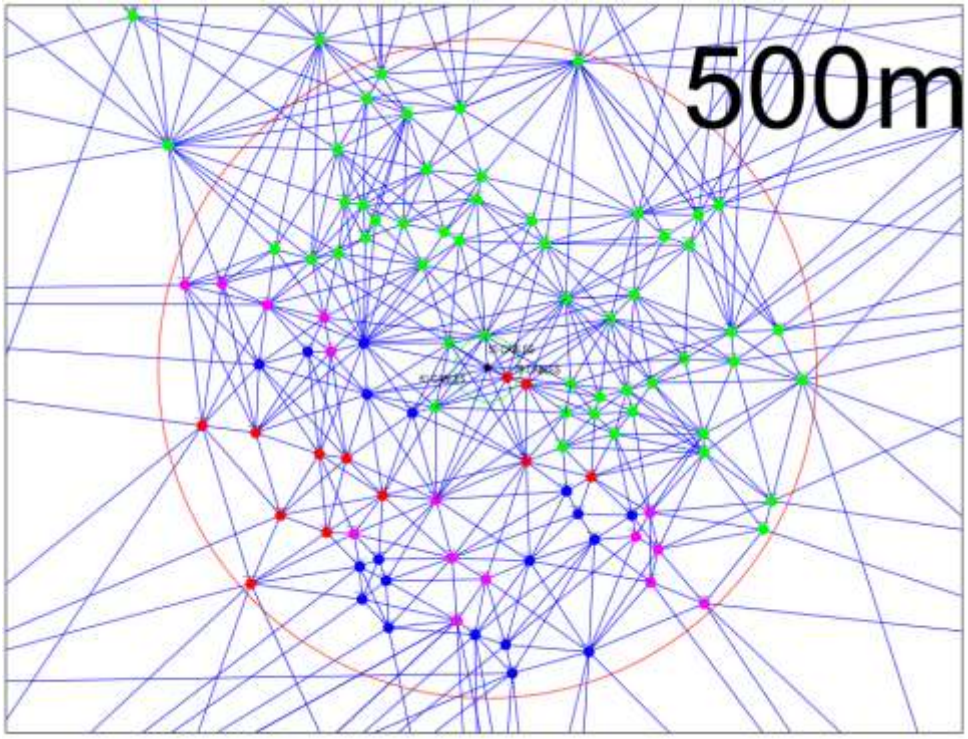
Examples, FTTX

Phase one, the addition of 190 dish antennas in South Africa
Dish locations and optional cable routes within 500m from coordinate 0,0.



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Examples, FTTX

Phase one, the addition of 190 dish antennas in South Africa
Micro ducts and cable jetting: extra costs ⇔ advantages

The total of the costs per meter of Micro-duct + installation + Jetting cable + installation is typically more than the total costs per meter of Direct buried cable + installation.

Still micro-duct systems offer big advantages which have to do with:

- Limited risks of cable damage/ theft, a cable can be blown in from end => end point with limited cable exposure
- Timing, the investment in cable installation can be delayed until the last moment
- No additional digging at a later stage by using extra / spare micro-duct space
- Proven systems

Spliceless links of up to 12 km by placing jetting equipment in tandem

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Examples, FTTX

Phase one, the addition of 190 dish antennas in South Africa
Plug & Play & Reduced space solutions

96x LC duplex ports on 1U (192 fibres)

Modules for every connector type

FO cables preterminated in all lengths
MPO connectors for 12x FO

Reduced space need in cable trays and racks
Quick and simple „plug and play“ installation

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Examples, FTTX

Reference project ITS-Software Suite™ : CERN.
The 27-kilometer LHC is the world's largest particle accelerator.(Located about 100m deep)

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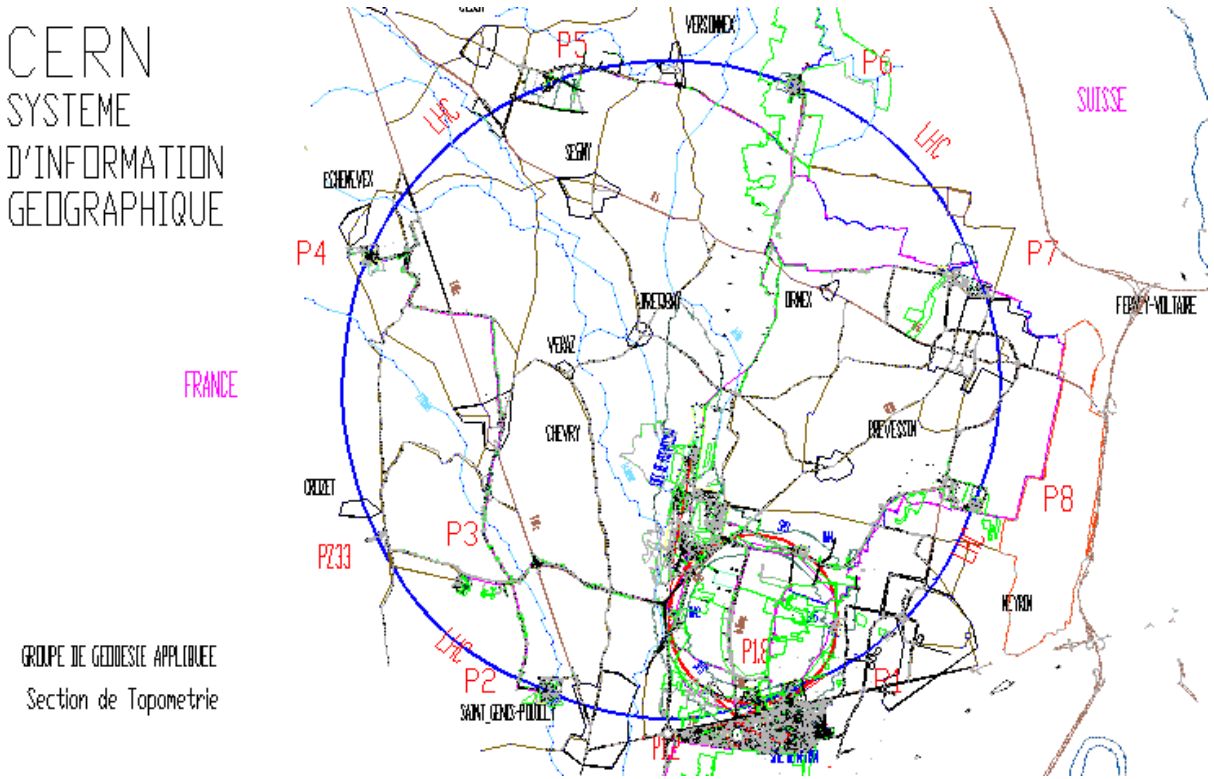
Examples, FTTX

Reference project ITS-Software Suite™ : CERN.
The 27km circular tunnel, shafts and CERN sites in France & Switzerland



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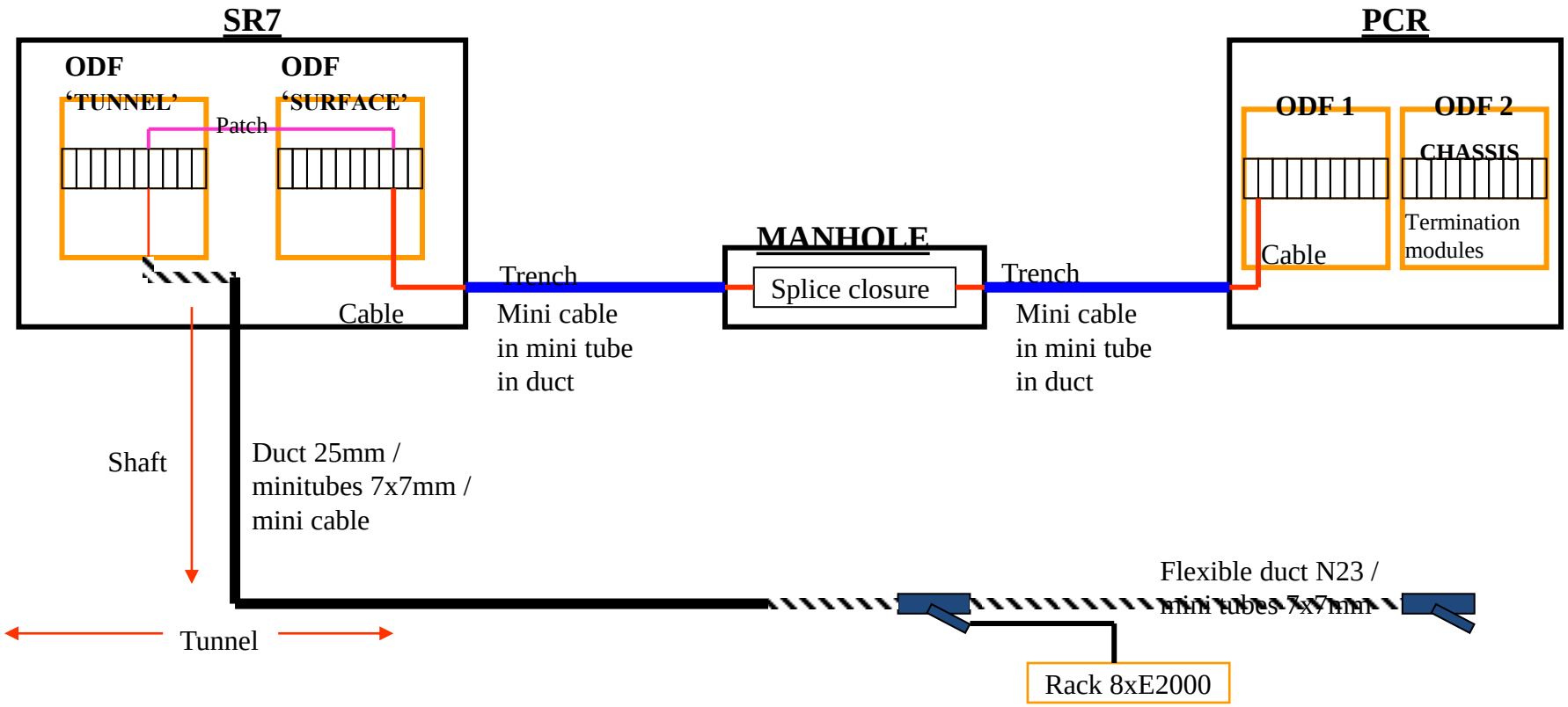
Examples, FTTX

Reference project ITS-Software Suite™ : CERN

The challenge: to design, built and maintain this FTTX network



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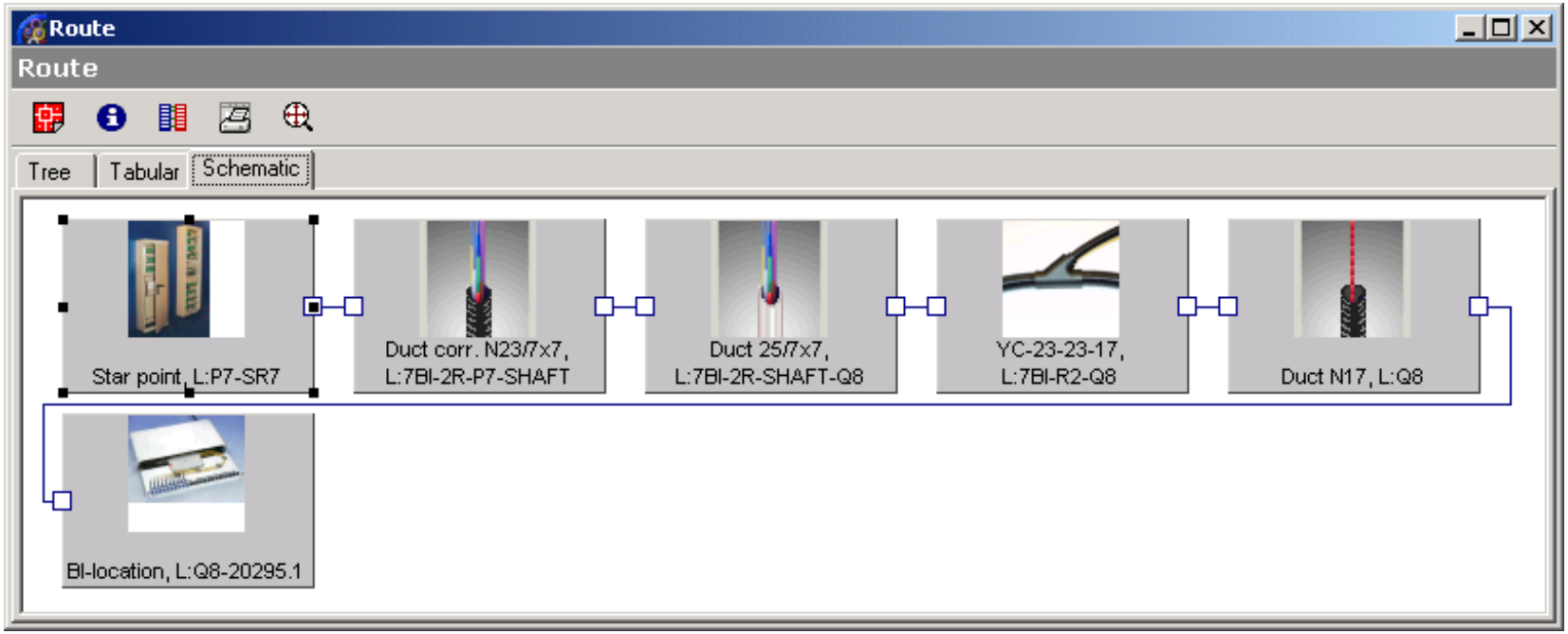
Examples, FTTX

Reference project ITS-Software Suite™ : CERN
ITS-NetID™ the Route/Trace function shows the complete route of any fibre, cable, duct…



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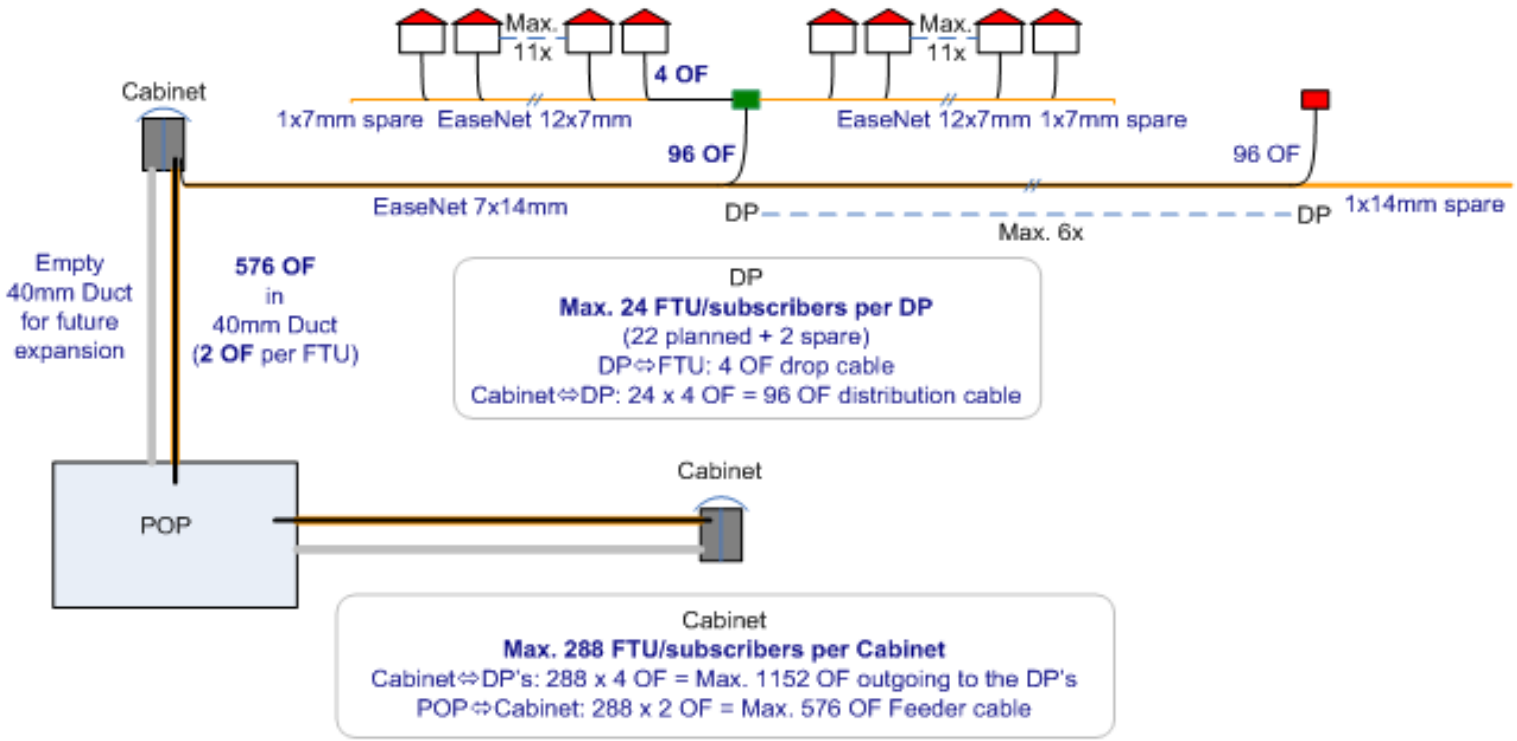
Examples, FTTH business case

Picture. network concept for a certain project



IT-SIMPLICITY

Examples, FTTH business case

Picture. area with network trunk ring

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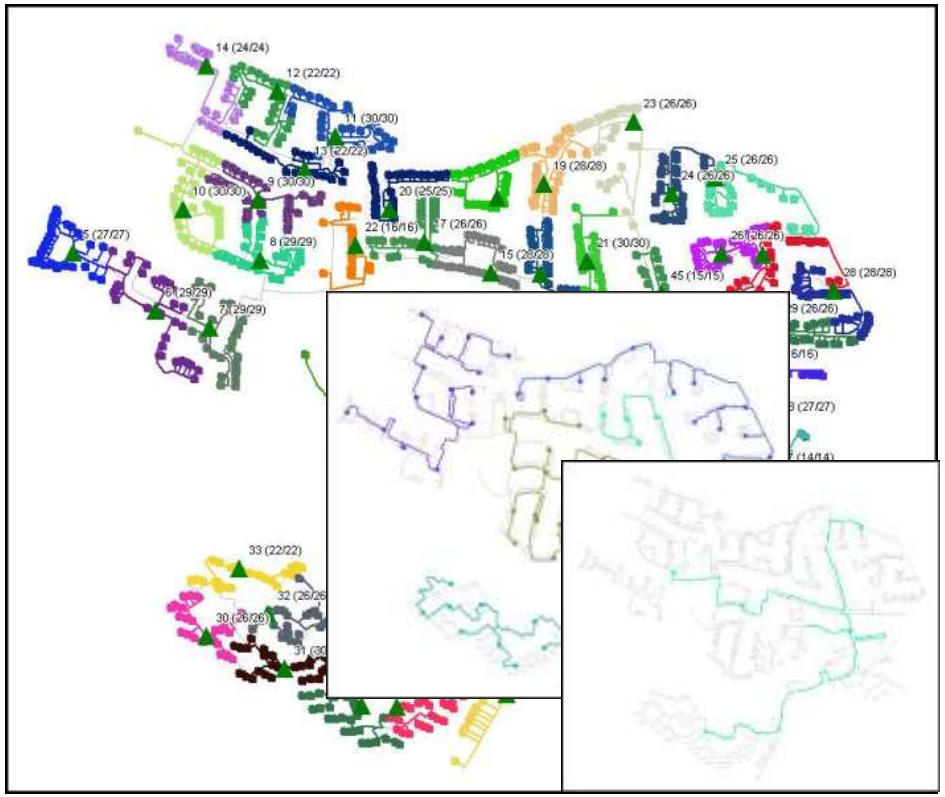
Examples, FTTH business case

Picture: cost optimized DP and/or Cabinet area's, with cost optimized cable routes

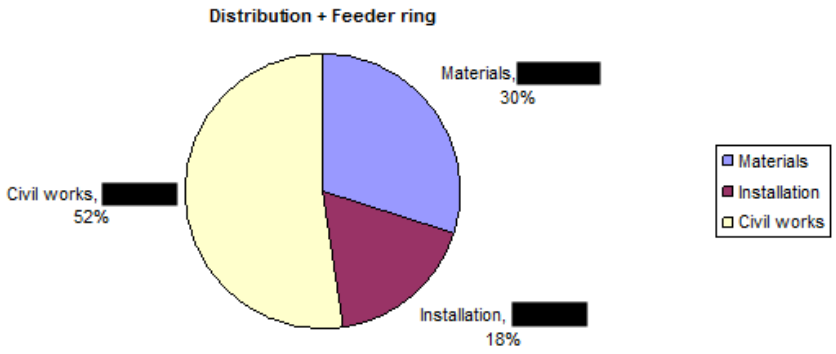
Picture: multiple network levels
DP⇔FTU's & Cabinet⇔DP's & POP⇔Cabinets



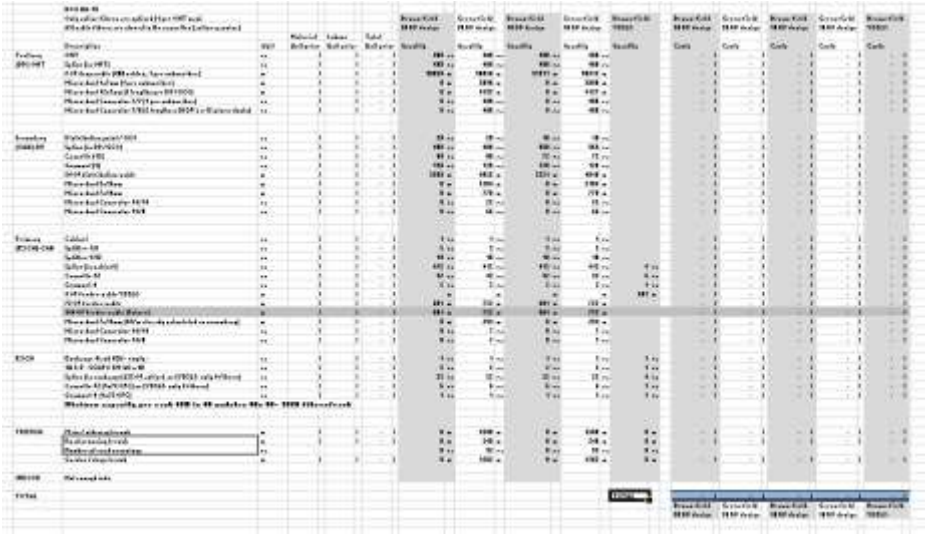
IT-SIMPLICITY

Examples, FTTH business case

Picture: High-level design costs chart

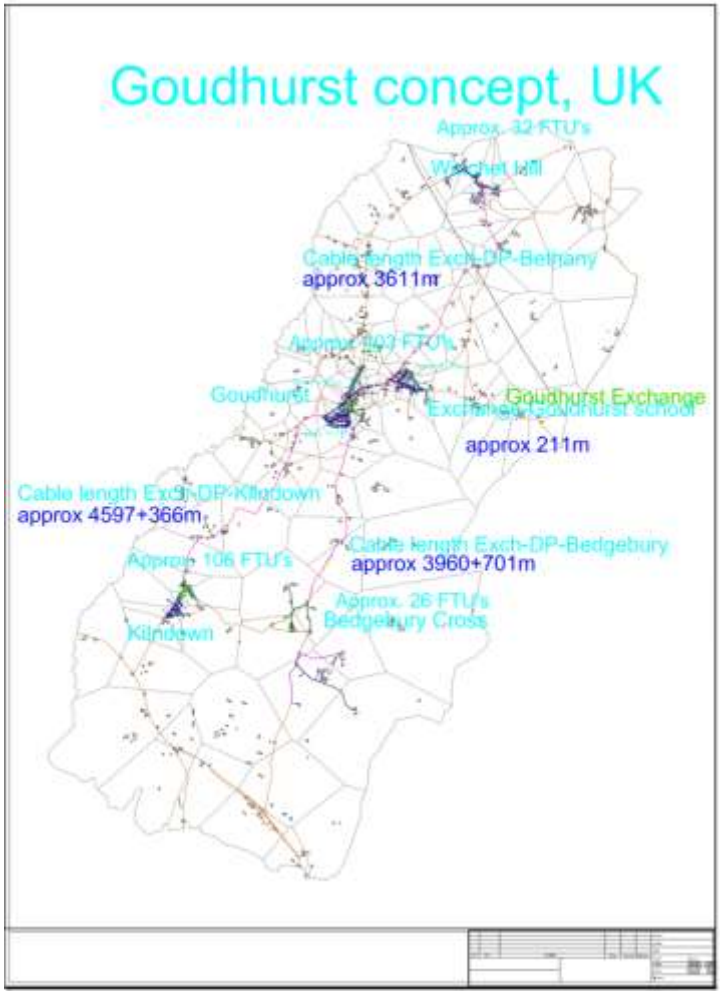


Picture: detailed quantities for high-level & detailed network design Comparison with different network concepts.



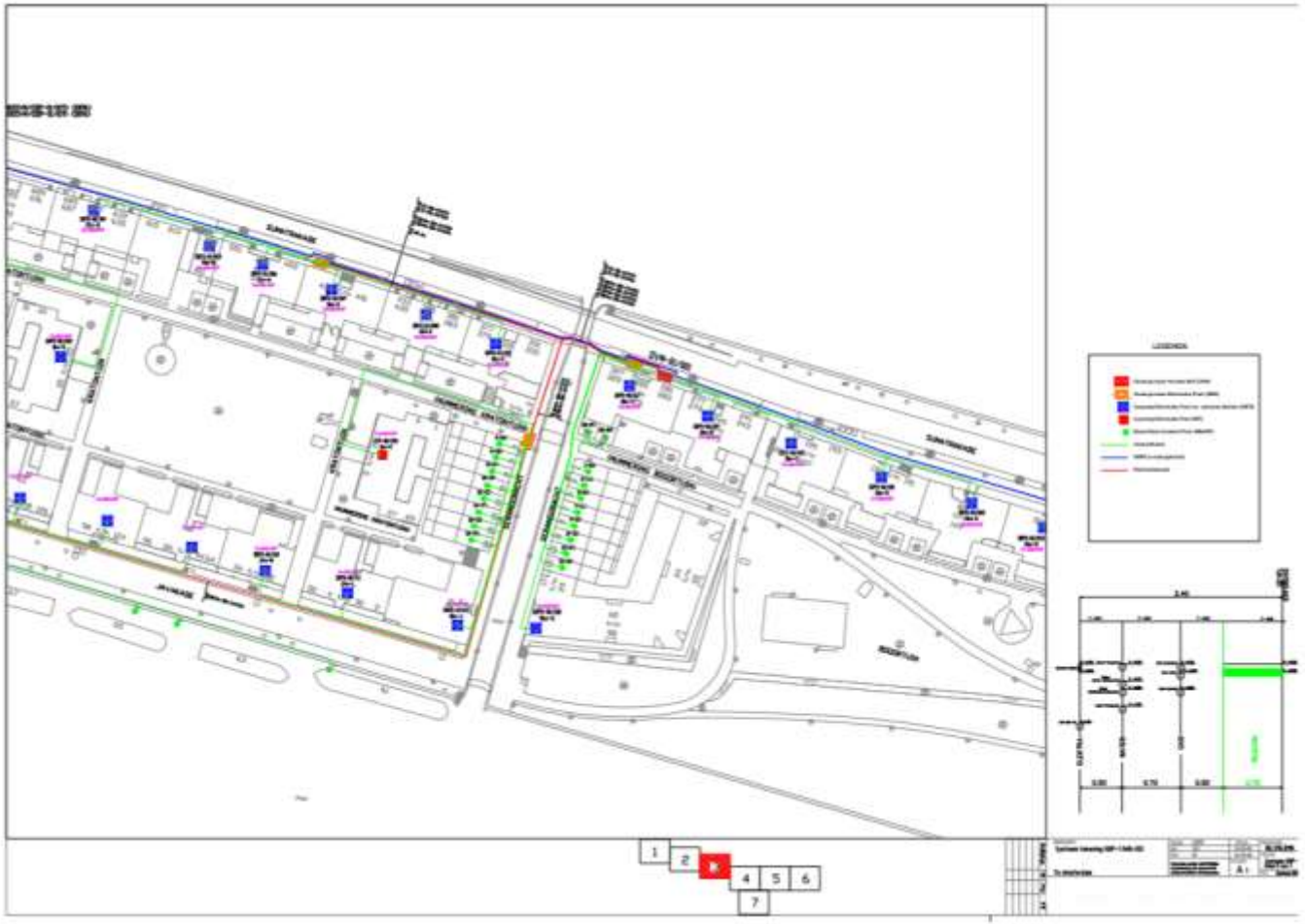
IT-SIMPLICITY

Examples, FTTH design output



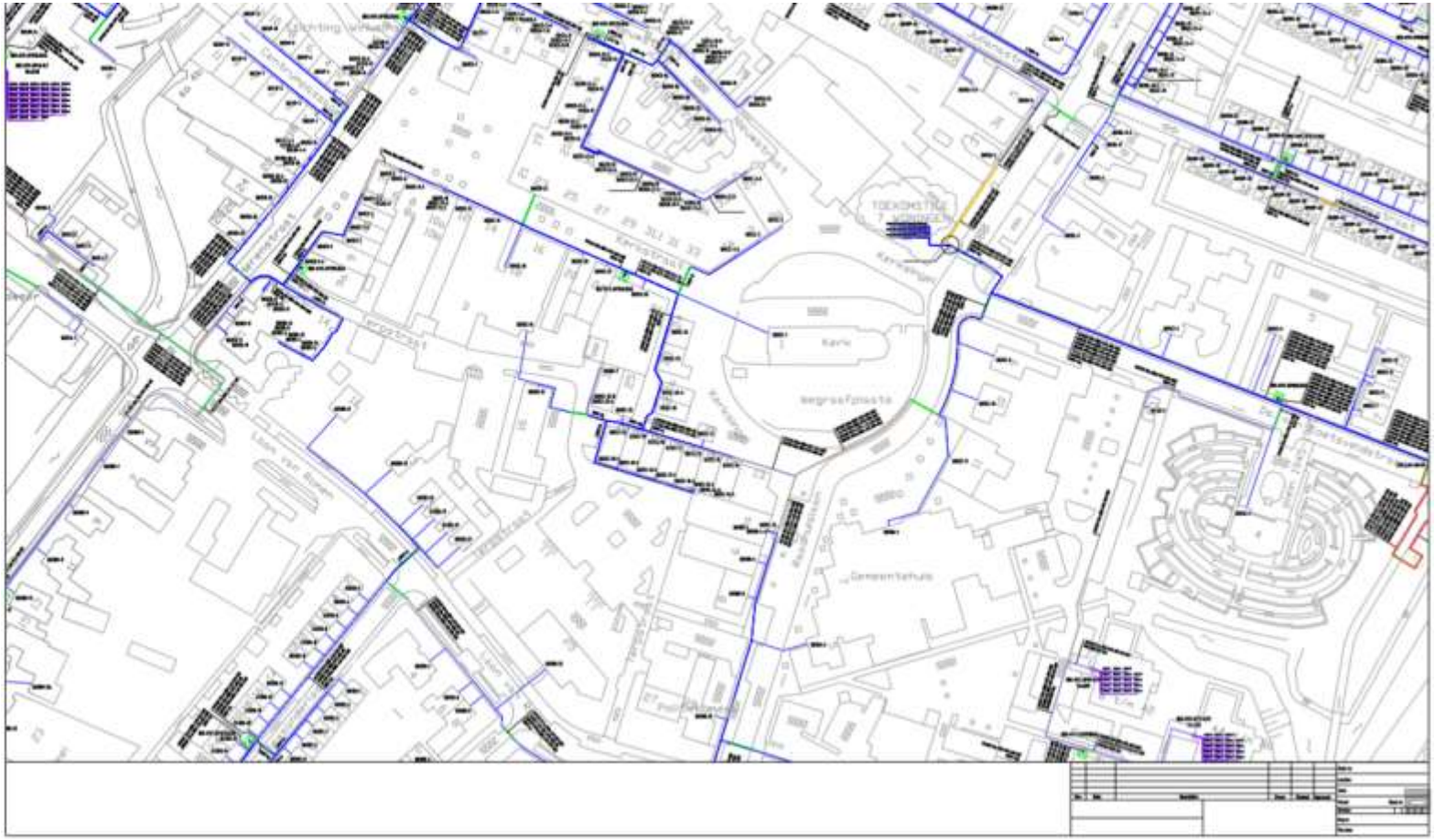
IT-SIMPLICITY

Examples, FTTH design output



IT-SIMPLICITY

Examples, FTTH design output



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Examples, FTTH design output

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