BENTLEY® FIBER USED TO DELIVER BROADBAND SERVICES TO METRO AREAS

DESIGN AND INSTALLATION OF A 145-KILOMETER FIBER OPTIC RING NETWORK CONNECTING 3 CITIES IN SOUTHERN NETHERLANDS

PROJECT SUMMARY

Organization
Nacap Telecom BV

Location
Zuid-Limburg, The Netherlands

BE Awards Category
Geospatial Communications

Project Objective
Design and install a €5.5 million fiber-optic network to bring broadband service to municipal, educational and non-profit institutions in Zuid-Limburg, The Netherlands

Products Used
- MicroStation
- Bentley Fiber

FAST FACTS

- Dark-fiber network built in southern Netherlands to bring high-speed internet, cable television and digital voice to the Zuid-Limburg region
- Completed in May 2006, the first phase connected 56 sites to the Isilinx network
- Since then, more than 50 new sites have been connected
- Using Bentley Fiber, Nacap Telecom was able to design the network with two engineers instead of ten

Municipal, educational, and non-profit institutions in the southern-most part of The Netherlands have joined together to deliver broadband services through an innovative business model. Incorporated as Stichting Isidoor, five participants commissioned the design and installation of a 145-kilometer fiber optic ring network connecting the cities of Heerlen, Sittard-Geleen, and Maastricht in Zuid-Limburg.

The 5.5 million euro Isilinx network already serves more than 100 members – including city governments, colleges, hospitals, police and fire departments – and that number is growing.

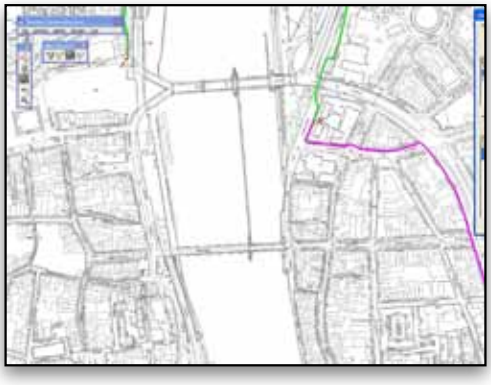
Nacap Telecom, a Dutch company specializing in the rollout of broadband services, designed and installed the Isilinx network in about a year using MicroStation® and Bentley Fiber. The application was a first for the company, which is a business unit of managing contractor Nacap, employing 3,000 people worldwide."We started using Bentley during the project for managed fiber in Zuid-Limburg, so I am very well able to see the results," said Julien Beenakkers, manager of operations for Nacap Telecom. "Instead of designing a network with ten engineers without Bentley, we were able to do so with just two engineers using Bentley. We were able to do more work with less human capacity, significantly reducing human capital."

The project began in May 2005 at the initiative of the Heerlen municipality, Leeuwenborgh Opleidingen polytechnic school, Licom Training Academy, Zuyd University, and Arcus College. As part of a movement to improve the region's image as an innovation center, they formed Isidoor to build the technology infrastructure that would provide a better business climate and bring broadband communications to local government and to non-profit organizations. The goal of this project was to provide the dark-fiber network that could be provisioned to deliver integrated high-speed Internet, digital telephone, television services and other customized IT services on a regional basis.

The fiber optic ring network was designed based on the open network provisioning model, which allows new members to join the network and sign on for just the services they need.

The initial backbone ring was routed to link the three metropolitan areas in south Limburg, and sub-rings in each city were routed to connect new participants in the Isidoor initiative. Completed in May 2006, the first phase connected 56 sites to the Isilinx network. Since then, more than 50 new sites have been connected.

Nacap Telecom network in Maastricht published to Google Earth.



Fiber cross-section showing optical system assignment .

"Bentley enhances our professional reputation and ability to ensure that future work is commissioned"

ABOUT BENTLEY

Bentley Systems, Incorporated is the global leader dedicated to providing comprehensive software solutions for sustaining infrastructure. Architects, engineers, constructors, and owner-operators are indispensable in improving our world and our quality of life; the company's mission is to improve the performance of their projects and of the assets they design, build, and operate. Bentley sustains the infrastructure professions by helping to leverage information technology, learning, best practices, and global collaboration – and by promoting careers devoted to this crucial work.

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As the customer base expanded, designing flexibility into the ring network remained paramount. Nacap Telecom used Bentley products to automate the design and production process, delivering exceptional efficiency and superior quality control. To ensure a high quality of service throughout the network, the design minimized the distance of connector locations from the main ring. This was accomplished by using a spread facility level in combination with a spread of man holes near connector sites and at other strategic locations.

Nacap Telecom has also been awarded a five-year contract to manage and maintain the network. "We see to it that the network owners and their customers have access to reliable connections day and night," Beenakkers said. "Bentley enhances our professional reputation and ability to ensure that future work is commissioned."

THREE-LAYERED DESIGN

Building out the Isilinx network required close coordination among all project participants. The open network model consists of three layers, with each layer being owned and operated by a different party. The Isidoor corporation is responsible for the "service layer," which provides all services. Stichting Isilinx, a technology infrastructure company, owns and manages the "active layer," which includes the equipment for provisioning and maintaining the network; and the "physical layer," which includes the fibers, cables, and connectors.

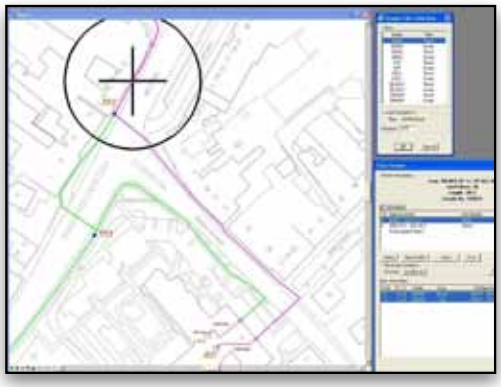
Though Isidoor and Isilinx are affiliated, Nacap Telecom was responsible for designing the dark fiber network for Isilinx. Bentley offered a comprehensive solution for designing, documenting, and maintaining the fiber network. It enabled Nacap Telecom to connect the different types of layers within the network, and to connect the specific data about each layer on a detailed level. A collaborative working environment guaranteed a fully coordinated and integrated design.

"Since there are more parties involved now than when constructing the network initially, it has been a challenge to cooperate and communicate successfully with all stakeholders," said Hans van Waas, Nacap Telecom's project manager for the Isilinx network. "We not only had to fine tune communications interfaces between the three layers, but also communicate with sub-contractors and other third parties who needed to contribute and agree on construction procedures."

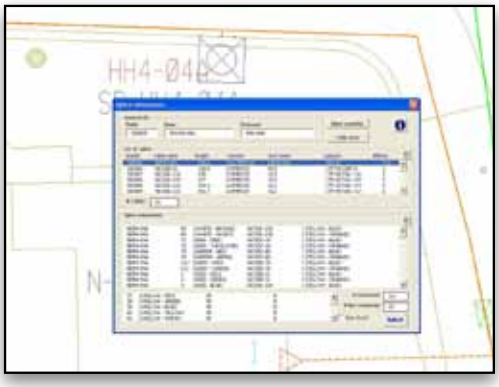
According to Van Waas: "Time is always an enemy if you're pushed for time, but when both the soft skills and the hard skills of people and systems come together in the right way, you're able to deliver something unique."

Since completion of the backbone network in 2006, Isidoor has expanded its mission to bring fiber to more organizations with the strategic placement of connectors at street level. The Netherlands already has the highest broadband penetration in the European Union – broadband is available to 90 percent of the population and of that approximately 10 percent is through fiber to the home or premises. As more dark fiber is lit in Zuid-Limburg, this southern region will continue to set the pace for bringing broadband to government, businesses and educational establishments.

Optical system trace.



Conduit cross-section.



Fiber splice report .

Bentley Sustaining Infrastructure