



Above or Below Grade – You Now Have a Choice
The FieldSmart Makwa Fiber Delivery Hub

By: Steve Knudtson
Clearfield OSP Product Manager

As the demand for broadband services continues to grow exponentially, the importance of improved network design and layout, as well as constructing the physical plant and fiber backbone to provide those services, continues to challenge the industry. Driving these challenges is the need to accomplish the network design and build in the most cost effective manner while maximizing the revenue potential once the networks have been deployed and are operational.

In many of the new “fiberhoods” that are currently under construction or in development, communities are mandating that the products providing service to the area be hidden or out of site, primarily to maintain a high level of aesthetic appeal. Additionally, many of these above grade products are placed in areas where they can be easily damaged (hit by vehicle or snow plow), vandalized (tagged or painted) or cause customer complaints. Any one of these could contribute to potential lost revenue if the fiber is damaged or if the closure needs to be relocated.

Many of the current products that are available today cannot be utilized (to meet these new aesthetic and safety concerns) because they are designed to be located above ground or pole mounted. So what does that leave? The need for a solution that can be placed either above or below ground and is environmentally protected, but also provides the benefits of being versatile, scalable, damage resistant, small form factor, easily accessible and is cost effective.

An essential element in delivering cost effective service is the plug and play concept that was behind the development of the Clearview Cassette. These cassettes are the building block for the entire Clearfield delivery platform and provide the ability to store slack, perform fiber splicing and allow fiber access all within a single well protected housing. Since all fiber activities can be performed inside of the cassette, need for large, space consuming (and expensive) splice cases is eliminated, while still providing protection from accidental human damage and bend radius protection of the individual fibers.

Clearfield’s new product offering, the FieldSmart Makwa Fiber Distribution Hub, has been designed to deliver all of these items plus the ability to decrease service turn up time and increase overall revenue to the service providers

But first...why can’t we just put the current cabinets underground? There have been attempts in the past to place similar types of cabinets below grade. Most of which have not been successful due to:

- 1) These boxes are not designed to be placed underground. The majority of them require venting and are not truly “sealed” from the environment, particularly if is placed below ground in an area where water can intrude into the box. Plus the limited options that have been available have been very cost prohibitive compared to above ground cabinets.
- 2) The size and weight of most telecommunication boxes make it prohibitive to accomplish this without special lifts or tools.
- 3) The additional real estate needed to bury them in a vault or hand hole would require additional permitting and right of ways that the service-provider would have to pay and eventually end up charging the customer in their monthly fee.
- 4) The majority of these cabinets are made of metal and will eventually corrode and rust over time.

If we can't put cabinets underground, what does go underground?

Currently there are vaults or hand holes that are placed in almost every service area. Inside of those vaults you typically see some sort of Splice closure. These splice closure products have been used for many years in the service provider's networks. Most of the enclosures are a long narrow tube shape and do provide the water intrusion protection that is required. Unfortunately they are very limited in the amount of equipment and fiber that can be placed inside of them due to their small size. While they do provide the ability to splice and access the fibers, they are a very costly alternative to some of the new "plug and Play" products that are available today. Every time a splice case needs to be accessed, a fiber technician, specializing in fiber splicing, needs to enter the splice case and perform "hard splicing" in order to turn up or change existing service to the customer. While splicing costs have dramatically decreased over the years, they are still an expensive alternative when comparing it to a solution that has been pre-wired for growth and change and can be turned up by simply installing a pre-connectorized fiber cable to complete the circuit. The cost of sending out a non-specialized technician is significantly less than that of the splicing technician, which in turn, saves the service provider unnecessary costs.

We have identified the reasons why above ground cabinets don't work well in this application, but what are some essential features needed from the above ground cabinet that we need in the below ground product?

- The ability to serve all types of network architectures –including PON and cross connect environments. This means having the ability to incorporate ruggedized splitters and parking blocks, WDM's and fiber optic components inside of the cabinet or closure
- Totally configurable by the customer –to meet any network design style
- Easily accessible to the service technicians for maintenance, repair and service turn up. This includes a closure that is not so large that it takes more than one person to access it
- The ability to scale and grow the cabinet with the potential subscribers in the service area. This allows for the service providers to maximize their expenditures with potential customer revenue
- Provide high fiber counts, up to 288 or 576, within the enclosure
- The ability to have the plug and play concept, which will reduce overall deployment and churn costs, utilizing non-specialized labor
- Circuit/customer identification within the closure
- Is a cost effective solution that does not add upfront costs compared to today's above ground cabinets

The Best of Both Worlds

Clearfield has engineered a product that incorporates the functions required in an above grade cabinet with the protection provided in a below grade splice case – designing a product that takes the best of both worlds. The Makwa Fiber Distribution Hub is the latest innovative design from Clearfield, that can be placed either above or below ground, is environmentally protected, versatile, scalable, damage resistant, small form factor, easily accessible and is cost effective.

Using the proven dome shaped design similar to current splice cases; Clearfield has developed the smallest 288 port distribution/access hub in the industry. Made of a Black impact and UV resistant PBT UV material, the product will withstand virtually any environment that it is placed in and has the ability to be mounted either below grade in a vault or above grade, on a vault or on a pole. With a removable top cover, all of the fibers are protected and fully accessible for service changes and maintenance. It is configurable in either a PON or Cross Connect environment and is scalable, utilizing our new Clearfield Black cassettes, which allow you to fully populate this versatile enclosure –or grow as you go, in increments of 12 fibers by adding additional cassettes as the demand for

service increases. With its space saving footprint (50% smaller than our Clearview Blue cassette), the Clearview Black is the heart of the Makwa design, giving it the ability to maximize the fiber port density in the smallest space possible.

Clearfield Makwa Fiber Distribution Hub is designed to be used in any network application:

- Single Family homes
- MDU Environments
- Business class services
- Or any other environment where fiber service needs to be delivered

How does deploying the Makwa in a fiber delivery network benefit the service provider?

As with all of Clearfield's delivery platform products, **plug and play solutions** are being called upon to reduce labor at the time of installation in addition to saving time and expense while turning up new services or performing network maintenance. Current methods of deployment or maintenance, which can take anywhere from one to two weeks can now be accomplished in one day and in many cases, just hours - all of which provides revenue to the providers faster than traditional splicing methods.

Grow as you go, the ability to scale the Makwa anywhere from 12 to 288 fibers, allows the service provider to install only the fibers that are required to be deployed at initial installation. No need to spend additional money for a fully populated cabinet when only a percentage of fiber will be utilized. This allows the customer to minimize their up-front expenses and see revenue generated from those expenditures.

The small footprint allows the Makwa to be deployed either aerially (on a pole), on a vault, or below grade inside of a standard 24"W x 36"L x 36"D vault or hand hole. With this small footprint, the Makwa can be deployed in the right of way, **saving the service provides the additional costs during the permitting process.**

Aesthetics. No cabinet above grade and visible to all = no customer complaints. Plus the additional protection of being deployed below grade reduces or eliminates both damage to existing fiber circuits (cabinet being hit by vehicle) and the possibility of having the cabinet defaced. Both of these save the costs of repair and cabinet maintenance.

Cost effectiveness. The Clearfield Makwa Fiber Distribution Hub is available at a price point that is less than most of the cabinet that exist in the market place today.

As service providers consider different construction options as alternatives to above ground cabinets and pedestals, the option of placing a distribution hub below ground can be realized. Clearfield's Makwa has all the features that are found in an above grade cabinet, in addition to being environmentally protected, versatile, scalable, damage resistant, small form factor, easily accessible and is cost effective.

For a complete description of the FieldSmart Makwa Fiber Distribution Hub and to learn more about the rest of Clearfield's innovative fiber solutions, please contact your local Clearfield sales representative or visit www.SeeClearfield.com