

Datacom Case Study: An OSP Installation Story

PART ONE

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**Want to
achieve
polished fiber
end faces that
are consistent
and perfect?
Read on.**

Imagine the setting five years ago. It's a project management meeting, with the following attendees:

- ◆ two members represented the campus end-user;
- ◆ three persons from the general contractor's staff;
- ◆ the low-voltage installer's project manager and ops manager;
- ◆ the design consultant who wrote the spec (hired by the customer from a state far from the local area),
- ◆ the local cabling sales rep and his fiber optic cabling principal (district manager);

- ◆ a representative from the distributor;
- ◆ the city's traffic control engineer;
- ◆ the local telephone OSP representative;
- ◆ a member from the city's Planning Commission; and
- ◆ the out-of-state facility director from a national data com center.

That's who was in the room; two commercial and residential developers could not make the meeting.

A lot hinged on the success of this campus project—more than just the end-user's mission-critical data support and SAN (storage area network) requirements!

This fiber network was linking campus video surveillance, a direct interlink to the city's traffic control system, and precabing for a forthcoming large data center.

THE STORY SO FAR

Eight comprehensive proposals had been presented to the customer. The end-user chose to include those other members that, together, comprised a 10-member decision "team."

Over six months of meetings and discussion, the consultant



had provided them with a competitive (pricing) analysis, juggled budgetary considerations, and was constantly involved in an endless exchange of negotiations via emails. This included more-or-less weekly meetings with the semi-finalists.

After consulting with the team the week before, the consultant presented his findings and recommendations; the bid was awarded (finally!). The fiber optic cabling manufacturer and sales rep were chosen and invited to the meeting. The installation contract was subsequently awarded to the GC and the datacom subcontractor.

What was the cabling manufacturer's policy with regard to performance specifications? That was a question for the district manager for that company—who, in response, presented references from proven installations worldwide, expanded on their warranty, and ensured everyone of their elite technical support team.

Monitoring of the installation would be the responsibility of the manufacturer's local sales rep; the district manager would schedule monthly visits.

As-needed inventory schedules, availability of near-by storage, shipment methods, delivery drop-off points, and requirement documentation (needed to satisfy corporate "bean counters") were the distributor's concern.

Installation schedules were the concern of the GC and the datacom contractor.

Thanks to quite a bit of experience, the contractor led discussions of possible "hiccups" that occur during installation: National holidays, parking passes, scheduled ship-



ments, other trade concerns, union OT issues, and forecasted weather (pumps) concerns.

KEY ISSUES

Along with the detailed project schedule and the need for weekly progress reports, the group covered security issues, access points, rights-of-way, man-holes, conduit runs, demarcation points, splicing, innerduct, Ditch Witches, tunnels, rodent protection, and high-voltage EMI.

Future development, both commercial and residential, was also on the table. It was thought these build-outs would intersect or even share the pathways, and perhaps cause subsequent signaling disruptions.

Local codes all but eliminated aerial support. Therefore, all cabling (except in remote areas of the campus) would be in direct-buried or in conduit.

During the competitive analysis phase, the concerns for longevity, reliability, and warranty issues were discussed. For the past 50 years, this geographic location *typically* exhibited mild winters with average rainfall and above-freezing temperatures, and mostly dry, hot summers. Environmental considerations were not the priority; as the area did not experience extreme temperature swings experienced in the northern climates of the Mid-West and East Coast.

Instead, the emphasis was on the total cabling project costs of both material and labor.

...AND UNFORESEEN EVENTS

Three years later, the unthinkable happened. The area experienced its worse rainfall in more than 100 years. As if Noah's experience was

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being recreated, it rained continuously for 40 days and 40 nights(!).

Over this period, and following weeks, as much as 15 inches of rain fell. Every creek and valley turned into a torrent. Those raging rivers rendered useless all drainage systems. Mudslides clogged the highways.

Water flooded the tunnels and the streets. Truly "biblical" in proportions, the unforeseen rainfall caused the lifting of 80-pound manhole covers—which left their moorings to float down the street like plastic coffee cup covers!

IMPACT ON THE INSTALLATION

Amazingly, the fiber optic cabling system—most of it installed in conduits and innerduct—survived, with all its related services. The traffic control system was maintained and could guide traffic around flooded areas. Surveillance cameras kept sensitive security areas in check; the new central office experienced little if any down time.

Then, a few months later, the ground-breaking took place for the anticipated data center.

Small problems soon developed. At first, a few of the most-remote traffic control cameras went down. Soon, the problems increased (and

escalated); suddenly, numerous campus backbone fiber links were going off-line, without warning.

It was about a year and a half since the flooding. The nights were getting colder.

At first, the fingers pointed at the datacom subcontractor who installed and terminated the cable. Then, liability issues dragged the GC into the situation.

A third-party investigation team—independent and also licensed—looked at the problems. Conclusion: The cable conduits, fiber terminations, splices, and NEMA enclosures were properly installed and secured.

Findings: Active equipment was in working condition. In the now dried-out manholes, there was no evidence of damage caused by other trades. No evidence could be found of problems caused by the extreme flooding of more than one year ago.

An OTDR test was conducted and compared to a test taken at the time of the original installation. It revealed what some thought obvious: The fiber optic cable was failing.

In fact, the fiber cabling was failing more so at different times of day, and different days of the week—varying with temperature and wind conditions.

Fingers started pointing. The situation degenerated into what can be described, accurately, as "a standoff." What came next? A legal battle, to be described in the next issue of *Power Outlet*. ⚡

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