

Executive Overview Report

Inspection of Broadstripe Cable in the City of Seattle

Winter 2009

I. Purpose

At the request of the City of Seattle (“City”), and in response to customer complaints to the City regarding picture quality and Internet connectivity, Kramer.Firm, Inc. conducted an inspection of the Broadstripe Cable system within the City of Seattle, Washington.

Kramer.Firm conducted the entire inspection of the system operated within the City of Seattle by Broadstripe Cable during the months of November and December, 2009.

The purpose of this inspection is to permit us to determine:

- A. Whether Broadstripe’s outside plant complies with applicable plant safety codes set out in the National Electrical Code and National Electrical Safety Code, and
- B. Whether Broadstripe’s transmission quality complies with the FCC signal quality rules, and
- C. The technical explanation for the of customer complaints regarding picture quality outages, and slow Internet service.

Kramer.Firm, Inc. has conducted these types of technical investigations on behalf of approximately 600 governments around the United States over the past 26 years.

II. Method

To determine the physical condition and code compliance of the Broadstripe system in Seattle, we conducted an extensive driving/walking investigation of the outside cable plant within the City. That inspection covered street segments exceeding 100 miles in length.

In order to determine Broadstripe’s picture quality, we conducted tests to compare Broadstripe’s signal transmission against the FCC’s cable TV tech-



Kramer.Firm Inc.

Telecommunications Technology
Counsel for Government Agencies
and Private Institutions
Since 1984

www.KramerFirm.com

Main Office:
Kramer@KramerFirm.com
Tel +1 (310) 473 9900
Fax +1 (310) 473 5900

Suite 306
2001 S. Barrington Avenue
Los Angeles, California
90025-5379

nical standards. We selected widely scattered test locations within Broadstripe's system that were not disclosed to the cable operator in advance.

III. Code Requirements

Broadstripe is required to comply with two electrical safety codes, and one signal quality transmission code: The National Electrical Safety Code ("NESC"); the National Electrical Code ("NEC"); and the FCC Technical Standard Rules for cable television systems.

The NESC governs outside plant construction safety related to the Broadstripe system at and between utility poles, and in underground areas. Broadly, the NESC establishes the minimum safety standards related to cable height above ground; underground main line construction; separations from other utility lines.

The NEC regulates how cable lines are to be attached to a structure (typically a subscriber's home); bonded to the structure electrical ground system to reduce electrical shock and fire hazards; and routed on and within the structure to minimize interference with the use of the building and to protect the safety of those who might come into contact with the cable system.

The FCC signal quality rules for cable TV systems establish the minimum standards for picture quality, and are designed to promote the delivery of good quality television pictures to cable subscribers.

IV. Observations

Our observations regarding Broadstripe's systems are contained in two reports to the City. Our physical plant report spans 170 pages, while our signal quality report spans 97 pages.

a. Outside Plant Construction and Reliability

The outside plant portion of the Broadstripe cable system is generally in good condition and code compliance.

The major types of problems noted with the outside plant relate to Broadstripe's failure to:

1. Protect the public from contacting 'down guy' wires (used to anchor utility poles so that they remain upright); and
2. Remove hanging (disconnected) subscriber drop cables which can interfere with vehicular and pedestrian traffic; and
3. Install its overhead lines to follow the 'sag' of the existing pole-to-pole lines (failure to follow sag reduces reliability of both the sagged line and the unsagged line as they will rub and wear against each other in one or more places).

b. Picture Quality

The picture quality leaving Broadstripe's headend (the place where they receive and insert their programming on to the cable system) and on the main line fiber and cable portions of the system are very good.

Broadstripe's use of fiber distribution equipment maximizes signal quality and reliability on its backbone system.

c. Cable Drop Construction, Maintenance, Safety and Picture/Internet Unreliability

The cable drop portion of the system, the thin coaxial cables connecting the cable plant out on the poles to individual subscriber locations, and then on to the TV sets, are in poor condition, and are not consistently compliant with the NEC safety code.

Broadstripe does not uniformly bond their subscriber drops to the structure electrical ground system. This type of failure promotes electrical shock and fire dangers, and is a violation of the National Electrical Code.

A significant number of the cable drops violate the NEC safety code as to their poor installation and lack of maintenance. Broadstripe's practice of attaching its cable drops to the electrical power masts on subscriber homes is both illegal as against the NEC, and unsafe. In various cases, the cable drop is physically rubbing against the electrical service lines from the pole to the house.

Our inspection of this system revealed that the cable drops to and on homes are not adequately maintained. This is the weakest portion of any cable system, and Broadstripe's cable drop system was not upgraded with the rest the plant in 1999.

Poor installation techniques and a lack of maintenance promote picture quality problems and slow Internet speed connectivity. In this system, our observation of pictures before they reach subscriber homes starkly contrasts with the intermittent pictures displayed on many subscriber TV sets (as reported to the City). The degraded subscriber cable drops are also apparent cause of the slow Internet speed complaints reported to the City.

When a cable drop lacks adequate signal shielding, or when the shielding degrades over time, or when the cable connectors become loose, outside world radio frequency signals (called 'ingress') can and do enter the cable system and interfere with cable channels and Internet transmissions. This is a common occurrence in cable systems such as the Broadstripe plant in Seattle, which are subject to very high level over-the-air signals that leak into the drop cables.

Our observation of the cable signals and pictures on the main plant system make it clear that the drop cables are the key source of the subscriber complaints regarding picture reliability and Internet speed impairments.

V. Key Conclusions

The main portions of the cable system (the headend; and the outside plant fiber and coax systems) are in adequate to good condition, but in need of some repairs to become code compliant.

The subscriber drops and the cable construction on homes are materially in violation of the NEC, and sorely in need of repair both to achieve safety code compliance, and to resolve the inferior picture and Internet speed complaints.

VI. Recommendations

a. Safety

Paramount is public safety. We recommend that the City direct Broadstripe to make its entire system (outside plant and subscriber drops) NESC and NEC code compliant.

This process should be guided by a plan developed by Broadstripe and acceptable to the City to ensure that all of the code violations are logged and evaluated and that coordinated repair plans be put into place and monitored on a frequency basis by the City to verify progress and then completion of the required work.

b. Picture Quality and Internet Speeds

Every subscriber drop (whether active or not) should be individually evaluated by Broadstripe for compliance with the NEC. All drops should be tested to determine whether ingress is entering the cable plant and thus interfering with the pictures and Internet signals. Failing drops should be entirely replaced. All drops (whether active or not) should be made fully code compliant with the NEC.

This process should be guided by a plan developed by Broadstripe and acceptable to the City to ensure that all of the code violations are logged and evaluated and that coordinated repair plans be put into place and monitored on a frequency basis by the City to verify progress and then completion of the required work.

* * *