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May 24, 2004

Via E-Mail
and Fedex Overnight Mail

Ms. Carole J. Washburn, Executive Secretary
Washington Utilities & Transportation Commission
1300 S. Evergreen Park Drive SW
P.O. Box 47250
Olympia, WA 98504-7250

Re: Docket No. UT-023003

Dear Ms. Washburn:

Enclosed with this letter are errata correcting a small number of typographical errors, citations, and minor omissions in Verizon Northwest Inc.'s ("Verizon NW's") rebuttal panel testimony and the rebuttal testimony of James H. Vander Weide, both filed on May 12, 2004, the reply testimony of Willett G. Richter, filed on April 20, 2004, and the VzLoop Cost Manual, filed with Verizon NW's supplemental panel testimony on January 26, 2004. Verizon NW has also discovered minor errors and omissions of data in one of the workpapers filed with that supplemental panel testimony (Document Set 2 in VzCost Document Sets folder of CD No. 2) and is therefore sending a corrected version of that pdf file with the electronic version of this letter.

Respectfully submitted,

Marc J. Blitz

Enclosures

cc: Service List

BEFORE THE WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

In the Matter of the Review of: Unbundled Loop and Switching Rates; the Deaveraged Zone Rate Structure; and Unbundled Network Elements, Transport and Termination (Recurring Costs)	**Docket No. UT-023003**
In the Matter of the Review of: Unbundled Loop and Switching Rates; the Deaveraged Zone Rate Structure; and Unbundled Network Elements, Transport and Termination (Nonrecurring Costs)	**Docket No. UT-033034**

CERTIFICATE OF SERVICE

I hereby certify that I have this 24th day of May 2004, served Verizon Northwest Inc.'s Errata to previously filed testimony upon all parties of record in this proceeding by Federal Express and by e-mail:

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Exhibit No. ___ (RRP-1T)
Docket No. UT-023003

BEFORE THE WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

In the Matter of the Review of Unbundled Loop and Switching Rates; the Deaveraged Zone Rate Structure; and Unbundled Network Elements, Transport, and Termination	))))))	**DOCKET NO. UT-023003**

REBUTTAL PANEL TESTIMONY OF VERIZON NORTHWEST INC. ON VzCOST

Witnesses:
Gerald Harris
John Hinton
William Jones
Thomas Mazziotti
Willett Richter
David Tucek

May 12, 2004
ERRATA (May 24, 2004)

Page 7, Line 12: Replace "languages" with "language."

Page 19, Line 2: Strike out "deliver."

Page 21, Lines 14-16: Move right parentheses on line 15 to end of sentence.

Page 54, Line 20: Replace "may be" with "he may."

Pages 55, 56, 59, and 63:

Change reference in following footnotes from "RRP-4" to "RRP-5C" and add reference to relevant file within "RRP-5C" as follows:

Page 55, Footnote 88: Replace "RRP-4" with "RRP-5C (2003_0056_OSP-REV-12-04-03, ATT CSA Design 915-715-110, PR-A96-086 Elimination of 26 Gauge Distribution Cables)."

Page 56, Footnote 91: Replace "RRP-4" with "RRP-5C (NAL_2W_VZ_BIC_V7_WA_26GA_SENS_RUN.xls)."

Page 59, Footnote 98: Replace "RRP-4" with "RRP-5C (WA Sensitivity- Fill Sens. Run.xls)."

Page 59, Footnote 102: Add citation to "RRP-5C (2003_0056_OSP-REV-12-04-03)."

Page 63, Footnote 117: Replace "RRP-4" with "RRP-5C (Underground sharing in WA State.xls)."

use of information concerning the real locations actually available for the placement of the necessary distribution terminals, SAIs, and DLCs in its modeled network, in contrast to HM 5.3 – which simply disregards the inconveniences of the real world and places these in locations that may be in the middle of a river, a parking lot, or in some other location for which it is either unlawful, impracticable or exorbitantly costly to acquire the necessary rights of way.[10]

Q. YOU HAVE EXPLAINED THAT VZCOST FORMULAS ARE NOT WRITTEN IN COMPUTER CODE. WHAT ABOUT VZLOOP?

A. The VzLoop code is written in the Pascal programming language. This language has been in existence for approximately 30 years, and it is a widely-used programming language~~s~~. Indeed, Pascal was the programming language in which the FCC's synthesis model was written, as well as AT&T's modified version of this model. Mr. Turner presents no basis for his claim that code written in such a familiar and established programming language, which was used in prior cost models, should be "impossible to understand" for an experienced cost model expert who has devoted any significant time to learning it. AT&T is perfectly capable of hiring experts well-versed in this programming language. One such

[10] As Mr. Richter noted in his Reply Testimony, AT&T's engineering guidelines acknowledge the importance of real world constraints. Mr. Richter's citations to the page numbers of AT&T guidelines should be corrected as follows: page 6 should refer to page 10-1 (not pages 9-17 and 10-39) and to page 6-1 (not 3-4 to 3-5). Page 37 should refer to Section 18.1.2.11 (rather than 18.1.5.1) and page 60 to page 3-8 (rather than 3-9). Additionally, the reference to the "West Richland" wire center on page 19 should be to "Woodland."

require him to overnight a CD: as Verizon has told AT&T's affiliate in California (where Mr. Turner is also an expert), users can also ~~deliver~~ "zip" large files and send them to the database administrator via e-mail.

Q. WHAT ARE THE BENEFITS OF AN INTERNET-BASED COST MODEL?

A. Contrary to Mr. Turner's suggestion, providing access in this way provides very useful enhancements. First, Verizon could not have designed a model sophisticated enough to process real world data about its modeled network in a user-friendly manner except by placing the necessary data on a server; in order to design a PC-based platform, such a model would require substantially more software and processing time. Second, Verizon's Internet-based system allows parties to share work instantaneously and distribute information from different parts of the country. Third, because the data that users draw upon is saved to a central location, it is easy to re-use source data and easily retrieve historical information, and also to coordinate the work of multiple people working simultaneously on many different portions of a filing. The system also reduces mismatches and other errors that arise when users are drawing on data from numerous different sources. Finally, as noted above, an Internet-based system, provides easy access to user and model enhancements.

control points as a way of reflecting real world constraints on placement of outside network plant in its modeled network. While the modeled feeder routes will generally follow the routes in Verizon NW's existing network, VzLoop employs a minimum spanning tree algorithm to model distribution routes through the distribution terminal locations. Consequently, the degree to which the modeled distribution plant follows the existing right-of-way will depend on the spacing between the distribution terminals. Second, as Mr. Tucek made clear, VzLoop only *starts* with these data points. It makes forward-looking adjustments to the modeled network that include the use of the latest technology, such as all-fiber feeder routes, the addition of DLCs necessary to comply with the generally accepted 12,000 foot restriction on copper loop length, and the elimination of copper for service to all premises with greater than 160 lines. Finally, cables are sized for total demand (so that a 400-pair cable is modeled when, for example, the existing network might have one 300-pair and one 100-pair~~)~~, because demand developed incrementally).

Q. HOW IS MR. TURNER'S ARGUMENT INCONSISTENT WITH THE FCC'S TELRIC PRINCIPLES?

A. In its *Local Competition Order*, the FCC defined embedded costs as those "incurred in the past for providing a good or service and . . . recorded as

splices of 1-50 pairs at $2.60 per pair, which is much lower than the $6.25 (for aerial and buried) and $11.26 (underground) that HM 5.3 assumes for the average of this range (25 pairs).[86] However, as the splice sizes increase, and HM 5.3's prices become lower than Verizon NW's, Mr. Turner reverts to his use of HM 5.3. This "pick-and-choose" approach is not an acceptable method of determining inputs for a cost study and he provides no explanation for it anywhere in the testimony.

Q. DOES MR. TURNER PROVIDE ANY MORE EXPLANATION FOR REJECTING VZCOST'S INPUTS IN THE MATERIAL TABLE?

A. No. He simply asserts that Verizon's material costs are "generally . . . significantly overstated." But except for his challenge to the use of 24-gauge copper cable, he provides no reason to explain why he is rejecting materials prices that Verizon NW derived from its actual costs. Instead, he uses copper cable prices from 5 years ago, without addressing the steady increase in copper cable prices during this time or providing support for AT&T's claim that these are installed costs.[87] Mr. Turner also follows the same "pick-and-choose" approach described above for placement costs: for example, he uses Verizon NW's SAI prices, which are up to 57.2% lower than those of HM 5.3. He also zeroes out Verizon NW's costs for central office terminals. While he may ~~be~~ have spread

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[86] Even if one instead assumed the 50 pairs at the upper end of this range, HM 5.3's price would still be 125% higher (at $3.50) for aerial and buried splices, and 225% higher (at $5.85) for underground splices.

[87] See AT&T's response to Verizon Data Request No. 7-21 (Sept. 24, 2003).

some of the cost to the remote terminals, this does not explain why his proposed remote terminal costs remain lower than Verizon NW's (which do not include these central office terminal costs).

Q. WHAT PROBLEMS WOULD ARISE IF VERIZON NW INSTEAD FOLLOWED MR. TURNER'S RECOMMENDATION THAT "ALL OF THE COPPER CABLE IN THE LOOP PLANT COULD BE INSTALLED AS 26-GAUGE CABLE"?

A. This statement is entirely at odds with accepted engineering practice, which recognizes that the thinner 26-gauge cable is plagued by numerous maintenance problems.[88] While Verizon NW's existing network does include cable of this gauge, engineers today try to minimize its use and it is appropriate to assume that a forward-looking network would make ubiquitous use of 24-gauge cable, which is significantly less vulnerable to environmental damage and damage from handling. Mr. Turner cites no example of any local exchange network that reflects his assumption.

Contrary to what Mr. Turner asserts, such maintenance problems in 26-gauge cable would not be limited only to "cable sizes of 200-pairs and less . . . near the end of distribution runs [that] will have more manual work performed on them in distribution terminals and pedestals."[89] Such thinner cable is vulnerable to the environment everywhere it exists, not just at the

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[88] See Exhibit No. ___ (RRP-45C) (2003_0056_OSP-REV-12-04-03, ATT CSA Design 915-715-110, PR-A96-086 Elimination of 26 Gauge Distribution Cables).

[89] Turner Rebuttal at 23.

end of the cable runs. Mr. Turner' statement that "there is no engineering basis for 24-gauge cable with a maximum copper loop length" also makes no sense. If 26-gauge cable were to be used, loop length would have to be reduced from Mr. Turner's 18,000 feet to 7,700 feet in order to be used for high capacity DS1 over copper.

Q. WHAT IMPACT WOULD MR. TURNER'S SUGGESTION OF SUBSTITUTING 26-GAUGE CABLE HAVE ON VERIZON'S PROPOSED COSTS?

A. Virtually none at all. Verizon NW performed a sensitivity run using exclusively 26-gauge cable. Contrary to Mr. Turner's expectation that this would make a significant difference in costs,[90] Verizon NW's loop investment decreased by only .09%.[91]

Q. IS THE EFFECTIVE FILL RESULTING FROM VERIZON'S DISTRIBUTION CABLE SIZING FACTORS "INCREDIBLY LOW," AS MR. TURNER CLAIMS?

A. No. Such fills result from efficient sizing in part because of the need (described in Mr. Richter's testimony) to build enough cable to absorb unpredictable spikes in demand, but also because of "breakage" that results from the fact that cable only comes in fixed sizes. For example, even if demand required is only 401 pairs, engineers would have to use

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90 Turner Rebuttal at 23.

91 See Exhibit No. ___ (RRP-45C) (NAL_2W_VZ_BIC_V7_WA_26GA_SENS_RUN.xls).

A. Even if Verizon NW used Mr. Turner's sizing factors, the total loop investment would decrease by only 1.48%, and total loop cost would decrease by only 1.45%. The decrease produced by using the 2 pairs per living unit minimum endorsed by Mr. Riolo would be even smaller.[98]

Q. IS MR. TURNER CORRECT IN PROPOSING AN 18,000 FOOT CUT-OFF ON COPPER DISTRIBUTION LENGTH?[99]

A. No. As Mr. Richter pointed out in his reply testimony, this assertion puts him at odds with widely-accepted engineering practice. It is also inconsistent with the decisions of this and other commissions. See Richter Testimony at 15-17. In its Eighth Supplemental Order, this Commission agreed with GTE's proposed 12,000 foot maximum copper loop length.[100] The California ALJ, in her recent proposed SBC decision, adopted 12,000 feet as the maximum cooper loop length.[101] As noted above, Mr. Turner's insistence that copper loop lengths should be greater than 12,000 feet is even more absurd in light of his suggestion that engineers use 26-gauge cable, which can provide HDSL service only up to a maximum copper loop length of 7,700 feet.[102]

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98 *See* Exhibit No. __ (RRP-45C)(WA Sensitivity - Fill Sens. Run.xls).

99 Turner Rebuttal at 58.

100 *Eighth Supplemental Order* ¶ 198.

101 *Duda Proposed Decision* at 184.

102 See Exhibit No. ___ (RRP-5C) (2003_0056_OSP-REV-12-04-03)

A. Mr. Turner's cursory examination of this issue does not offer any evidence beyond the unsupported assertions offered by Mr. Donovan. In contrast, Mr. Richter's reply testimony contains a detailed analysis of the reasons for Verizon NW's sharing percentages and shows why cost studies that assume extensive sharing of such structure without supporting evidence are, as the Florida Commission stated, "severed from reality."[116] In fact, Verizon NW's records of every segment of all 22.5 million duct feet of conduit in its Washington network and show that less than 80,000 feet are shared with other utilities.[117] Thus, its actual underground sharing is less than 1%.[118]

Q. PLEASE ADDRESS STAFF'S CLAIM THAT VZCOST'S APPROACH TO STRUCTURE SHARING DOES NOT COMPLY WITH PRIOR COMMISSION ORDERS.

A. Staff's testimony is not clear on this point, but it appears to be taking the position that (as with other inputs and assumptions) the parties are bound in this proceeding to adopt the structure sharing inputs arrived at on the

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116 Final Order, *Investigation into Pricing of Unbundled Network Elements, Docket No. 990649A-TP*, Order No. PSC-02-1311-FOF-TP, (Fla. P.S.C. 2002), at 39 (emphasis added) ("Florida 2002 Decision").

117 See Exhibit ___ (RRP-~~4T~~5C)(Underground sharing in WA State.xls). As Verizon NW indicated in a data request response to AT&T, dated November 10, 2003, the 9.22% underground sharing estimate, submitted in June 26, 2003 filing, was based on erroneous information. The new study shows that the Verizon's total duct feet (22.5 million) are larger than the 5.7 million erroneously reported, and thus that the amount shared is a smaller portion of the total.

118 Id.

Exhibit No. ___ (JHV-5T)
Docket No. UT-023003

BEFORE THE WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

In the Matter of the Review of Unbundled Loop and Switching Rates; the Deaveraged Zone Rate Structure; and Unbundled Network Elements, Transport, and Termination	))))))	DOCKET NO. UT-023003

REBUTTAL TESTIMONY OF DR. JAMES H. VANDER WEIDE ON BEHALF OF VERIZON NORTHWEST INC.

COST OF CAPITAL

MAY 12, 2004
ERRATA (May 24, 2004)

Page 32, Lines 1-5: Replace Table 1 with the revised Table 1 below.

Table 1

Dr. Selwyn's Data Underlying his Regression Analysis
("Data Underlying Appendix 1")

Company	Year	Beta	FB_Comp	Non_ILEC	Leverage
BellSouth	1H00	0.825	0.0186	0.4719	0.1593
BellSouth	2H00	0.825	0.0207	0.4260	0.1967
BellSouth	1H01	0.825	0.0238	0.4170	0.2108
BellSouth	2H01	0.800	0.0260	0.3868	0.1931
BellSouth	1H02	0.775	0.0192	0.3861	0.2244
BellSouth	2H02	0.850	0.0199	0.3670	0.3141
BellSouth	1H03	0.900	0.0240	0.3641	0.2557
Qwest	**2H00**	**0.750**	**0.0122**	**0.1415**	**0.2582**
Qwest	**1H01**	**1.600**	**0.0255**	**0.6892**	**0.2458**
Qwest	2H01	1.475	0.0322	0.6644	0.4206
Qwest	1H02	1.475	0.0393	0.6603	0.6490
Qwest	2H02	1.675	0.0449	0.6557	0.8614
SBC	1H00	0.825	0.0124	0.3904	0.1274
SBC	2H00	0.850	0.0208	0.4317	0.1391
SBC	1H01	0.825	0.0276	0.4375	0.1542
SBC	2H01	0.800	0.0296	0.6150	0.1452
SBC	1H02	0.775	0.0326	0.6119	0.1692
SBC	2H02	0.900	0.0342	0.6145	0.2557
SBC	1H03	0.975	0.0351	0.6328	0.2366
Verizon	1H00	0.850	0.0171	0.3184	0.1773
Verizon	2H02	1.025	0.0480	0.4483	0.4349
Verizon	1H03	1.000	0.0478	0.4472	0.3680

("1H00" means first half of 2000; "2H00" means second half of 2000.)

Page 36, Lines 1-4: Replace Table 3 with the revised Table 3 below.

Table 2

Dr. Selwyn's Regression Results without Incongruous US West Data Point[1]

	Standardized Coefficient	t	Sig.
(Constant)		11.145	.000
Non-ILEC assets	**.023**	**.237**	.818
QWEST	.924	5.467	.001
SBC	-.081	-.889	.400
BellSouth	-.077	-.829	.431
Facilities Competition	**.091**	**.715**	.495
2H00	-.008	-.151	.884
1H01	-.010	-.220	.832
2H01	-.094	-.2.036	0.76
1H02	-.113	-2.534	0.35
2H02	0.70	1.215	.259
1H03	.084	1.764	.116
Leverage	**-.028**	**-.215**	.835
Dependent variable:	Beta		

Page 37, Line 12: Strike out "only," "first," replace "observation" with "observations," and replace "is" with "are."

Page 37, Line 13: Replace "10%" with "5%."

Page 37, Footnote 9: After "In particular," insert "the number .035," strike out ".074," and replace "7.4%" with "3.5%."

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[1] The time and company variables in the left-hand column of this table are dummy variables that control for differences in time and company. The important coefficients for the purposes of Dr. Selwyn's conclusions are: (1) non-ILEC assets; (2) facilities competition (labeled "FB_Comp in the CLECs" data shown in Table 1); and (3) leverage. The insignificance of the coefficients for these three variables is indicated by the fact that their associated t values are less than 2.

Page 37, Line 15: Replace "YOUR" with "DR. SELWYN'S" and replace "DR. SELWYN'S" with "HIS."
Page 38, Line 1: Replace "My re-stated" with "Dr. Selwyn's."

Page 38, Lines 6-9: Replace Table 4 with the revised Table 4 below.

Table 3

CLEC Regression Results
Using Total Competition as an Explanatory Variable

	Standardized Coefficient	t	Sig.
(Constant)		9.176	.000
Non-ILEC Assets	-.388	-1.508	.163
Competition	**1.585**	**2.437**	0.35
SBC	.407	1.068	.311
BellSouth	.348	.910	.384
Leverage	.487	1.467	.173
Time Period	-.996	-2.136	.058
Dependent Variable:	Beta		

Exhibit No. _____ (WGR-1T)
Docket No. UT-023003

BEFORE THE WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

In the Matter of the Review of Unbundled Loop and Switching Rates; the Deaveraged Zone Rate Structure; and Unbundled Network Elements, Transport, and Termination	)))))	DOCKET NO. UT-023003

REPLY TESTIMONY OF WILLETT G. RICHTER ON BEHALF OF VERIZON NORTHWEST INC.

OUTSIDE PLANT DESIGN

April 20, 2004
ERRATA (May 24, 2004)

Page 26, Footnote 34: Change "39" to "41-42."

Q. HOW DID THE FLORIDA COMMISSION DEAL WITH MR. DONOVAN'S ARGUMENT ON SHARING BURIED CABLE?

A. In a decision relied upon by Mr. Donovan for other purposes, the Florida Commission noted his argument that "housing development contractors provide free trenches for Bell South" and that Bell South's 6% sharing input "is an extremely low number . . . [b]ased on my experience." The Florida Commission rejected this argument as lacking "any documentation in the record," and agreed that BellSouth's experience showed that "sharing the costs of buried structures is rare because of timing problems and because CATV and power lines are already in place." Citing to its prior determinations on this point, the Florida Commission concluded that placing BellSouth's lines near high voltage lines could cause interference, and that insistence on joint trenching could prompt poor economic decisions. Perhaps most important, it recognized that sharing assumptions are even less realistic in a forward-looking model, because they sweep other utilities into that model: "assuming sharing percentages which require . . . power and cable TV companies to rebuild their networks so that more of the cost of a telephone network can be shifted to other industries, *means a network severed from reality.*"[34]

Q. DON'T LOCAL ORDINANCES THAT LIMIT OR DISCOURAGE STREET CUTS FORCE UTILITIES TO SHARE BURIED STRUCTURE IN SPITE OF THESE OBSTACLES?

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[34] Final Order, Investigation into Pricing of Unbundled Network Elements, Docket No. 990649A-TP, Order No. PSC-02-1311-FOF-TP, (Fla. P.S.C. 2002), at ~~39~~ 41-42 (emphasis added) ("Florida 2002 Decision").

Exhibit No. ___ (SRP-1T)
Docket No. UT-023003

Attachment B

VzLoop Cost Manual
Version 7.0

ERRATA (May 24, 2004)

Pages 38-39: Add omitted items to Material Table Variable Descriptions

Page 58: Add omitted items to Options Table Variable Descriptions.

MATERIAL TYPE CODE	MATERIAL TYPE	SIZES	DESCRIPTION	UNIT
STRAND	10m Strand	1	The steel suspension strand, also referred to as a "messenger", that provides structural support to aerial cable between the poles. The aerial cable is usually attached to the strand by wire wrapped around the cable and strand. **The strand also provides electrical continuity throughout the aerial exchange cable network to protect against direct contacts and lightning hazards when properly attached to the multi-ground neutral.**	Linear foot
SUBDUC	Subduct	1	A 1" or 1 ¼ " PVC pipe through which fiber cables can be passed. Two or three subducts are usually placed in a 4" conduit to allow 2 or 3 fiber cables to be placed in one 4" duct. The subduct can also be buried directly in a trench to facilitate fiber cable placement. **Also called "innerduct".**	Linear foot
TERMB	Pedestal Terminal Buried	25 50	The loop component that serves as the access point between the distribution cable and the drop wire. The distribution terminal, in this case, is located in a pedestal and is spliced to pairs in the distribution cable to make them available for use to serve the customer.	Per terminal
TERMA	Terminal Aerial	25 50	The loop component that serves as the access point between the distribution cable and the drop wire. The distribution terminal, in this case, is an aerial case and is spliced to pairs in the distribution cable to make them available for use to serve the customer.	Per terminal
TERMR	Building terminal	25 400 50 600 100 900 200 1500 300	The loop component that serves as the access point between the distribution cable and the end user's inside wire. The terminal, in this case, is located in the building at the customer premises.	Per terminal
TERMU	Underground terminal	25 50	The loop component that serves as the access point between the distribution cable and the drop wire. The distribution terminal, in this case, is an underground case with a waterproof gasket, used in underground cable vaults (manholes).	Per terminal
XCONNA	Aerial Cross-Connect	100 200 400 600	A pole-mounted cabinet containing termination blocks on which the feeder and distribution cable pairs are both terminated. Each type of cable is usually terminated in a designated area. Jumper wires are used to connect the assigned	Unit

MATERIAL TYPE CODE	MATERIAL TYPE	SIZES		DESCRIPTION	UNIT
		900 1200		feeder pair to the appropriate distribution pair.	
XCONNB	Buried Cross-Connect	600 900 1800	2700 3600 5400	A ground-mounted (pedestal) cabinet containing termination blocks on which the feeder and distribution cable pairs are both terminated. Each type of cable is usually terminated in a designated area. Jumper wires are used to connect the assigned feeder pair to the appropriate distribution pair.	Unit
LOADCOIL	Load coil	1		Load coil.	Per unit
LOADCOILHSE	Load Coil housing	1		Load coil housing.	Per Housing
RPTR	Repeater	1		T-span repeater.	Per Repeater
RTROW	R-O-W	1 2 3		Remote Terminal Right-of-Way 1= small, 2= medium and 3 = large.	Per Remote Termina l
SMARTJACKCARD	**Linecard**	**1**		**Smart Jack plug-in**	**Per Circuit**
SMARTJACK SHELF	**Shelf**	**1**		**Smart Jack shelf**	**Unit**
HDSL4COTSHELF	**Shelf**	**1**		**4 wire HDSL COT Shelf**	**Unit**
HDSL4COTPLUG	**Linecard**	**1**		**4 wire HDSL COT plug**	**Per Circuit**
HDSL4RPT	**Repeater**	**1**		**4 wire HDSL Mid Span Repeater**	**Unit**
HDSL4RPTPLUG	**Linecard**	**1**		**4 wire HDSL RT housing & plug**	**Per Circuit**
HDSL2COTSHELF	**Shelf**	**1**		**2 wire HDSL COT Shelf**	**Unit**
HDSL2COTPLUG	**Linecard**	**1**		**2 wire HDSL COT plug**	**Per Circuit**
HDSL2RT	**Housing**	**1**		**2 wire HDSL RT housing**	**Unit**
HDSL2RTPLUG	**Linecard**	**1**		**2 wire HDSL RT plug**	**Per Circuit**
ISDNCOSHELF	**Shelf**	**1**		**T400 23 INCH CENTRAL OFFICE SHELF**	**Unit**
ISDNTRIUNIT	**Linecard**	**1**		**T400 TRI C LINE UNIT**	**Unit**
ISDNUNITWMFT	**Linecard**	**1**		**TRI C LINE UNIT W PRE WIRED MFT ADAPTER**	**Unit**
ISDNNID	**NID**	**1**		**TRI R 3600 NID**	**Unit**

MATERIAL TYPE CODE	MATERIAL TYPE	SIZES		DESCRIPTION	UNIT
FISUB	Fiber Strand Submarine	6 12 24 48 72	96 144 216 432	Fiber cable enclosed in protective sheathing that is placed underwater.	Sheath Foot

44	**DIST_MAX_U_SIZE**	Same as FEED_MAX_A_SIZE, except that it applies to underground copper distribution cable.
45	**RAF_LEN_F**	**Distance Threshold that controls the application of the RAF_VALUE_F adjustment factor to arclengths.**
46	**RAF_VALUE_F**	**This input represents the percent of adjustment to apply to feeder arclength if the arclength exceeds the RAF_LEN_F (A 10% increase would be represented as 1.10).**
47	**RAF_LEN_D**	**Distance Threshold that controls the application of the RAF_VALUE_D adjustment factor to distribution arclengths.**