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Technical Publication

Installation Supplier Quality Workmanship Assessment Guidelines

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NOTICE

This document describes Qwest's methodology for assessing the workmanship competence of Suppliers of COE Installation Services. The information provided in this document includes Qwest Installation Quality Assurance responsibilities, assessment and audit methodology, and Service Supplier competency rating criteria.

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CONTENTS

1. Introduction

1.1 General

The purpose of this document is to identify and define Qwest's parameters for assessing the quality of workmanship for suppliers of telecommunications installation services within any Qwest owned or leased facility.

This publication provides policy information with respect to the methodology by which Qwest determines acceptable levels of workmanship quality for central office installation services. These assessment guidelines are applicable to anyone of the following entities*:

- Qwest Technical Installation (QTI)
- Any Qwest-approved contracted supplier
- A Competitive Local Exchange Carrier (CLEC)
- A Competitive Local Exchange Carrier subcontracted Service Supplier

***Note:** The term "Service Supplier" that is used in this document is intended to include all four of these entities.

1.1.1 Requirements

Service Suppliers doing business with QWEST for a product type shall show a level of expertise in that discipline, based on past history and/or specific training in that technology. Installation personnel representing the Service Supplier shall be qualified to work on the equipment that they have been contracted to install (Refer to TP 77350 Par. 2.6.2). The suppliers shall be required to comply with all local, state, and Federal Fire, Life, Safety standards, manufacturers' and QWEST standards.

All equipment placed in Qwest-owned or leased facilities will be subjected to quality and safety examinations (typically referred to as "quality audits" or "quality assessments") conducted by Qwest management personnel. These audits will determine the level of compliance with Qwest standards and technical requirements. Qwest shall provide written notice of any non-compliance or deviation from acceptable work practices to the responsible party within 90 days of notification of job completion. Such notice will include identification of the specific installation requirement or guideline not in compliance.

Violation of NEBS Level 1 safety standards as identified in SR-3580, GR-63-CORE, and GR-1089-CORE must be corrected within 24 hours after written notification from Qwest. If there is an immediate threat to the safety of Qwest employees, the physical integrity of the conduit system, cable facilities, other equipment on the premises, or interference with the performance of Qwest's service obligations, Qwest may perform such work and/or take such action as Qwest deems necessary to mitigate risk at the responsible party's expense. If, during installation, Qwest determines that the activities and/or equipment of any Service Supplier, contractor, or CLEC do not comply with the NEBS Level 1 safety standards or are in violation of any applicable laws or regulations all equally applied to Qwest, Qwest has the right to stop all installation work until the situation is remedied.

Note: Any Service Supplier performing contracting work in a QWEST facility shall comply with all

requirements within Qwest Technical Publication 77350, and be in compliance with the requirements of this standard.

1.2 Reason for Reissue

Whenever this publication is reissued, the reason(s) will be listed in this paragraph.

- Changed name and scope of document – Title Page
- Updated all sections – Chapter 1
- Changed name of chapter and updated content– Chapter 2
- Changed name of chapter and updated content– Chapter 3
- Updated definitions – Chapter 4
- Updated references – Chapter 5

1.3 Purpose and Definition

This publication is intended to familiarize the Service Supplier with the processes surrounding measurements and auditing procedures needed to perform and quantify all aspects of installation and removal functions. The guidelines described in this publication are applicable to all types of central-office based telecommunication equipment installations and removals (i.e., switching, power, radio and toll/Inter-Office Facilities (IOF)/transmission products, etc.)

This publication along with associated publications listed herein, provides the procedures necessary for Service Suppliers who have been qualified, approved and contracted with QWEST to provide central office-based equipment installation services.

This publication is intended to familiarize the Service Supplier with the QWEST workmanship assessment guidelines by:

- Outlining the general requirements.
- Explaining the methodology by which workmanship quality is quantified and assessed.
- Defining the necessary publications required to support the Service Supplier.
- QWEST shall audit and measure all aspects of products, productivity, or services provided by the Service Supplier. These measurements shall be based on established expectancies developed by Telcordia Technologies, Inc. (formerly Bell Communications Research - Bellcore) and the Service Supplier's performances within QWEST.
- QWEST shall measure Service Suppliers by utilizing stand-alone audits, joint in-process audits, Central Office Operations (COO) feedback, Central Office Equipment – Facility Management (COE-FM) data, and the supplier's own quality data.
- The measurements stipulated in this publication are intended to support assessment of overall installation workmanship quality. With this publication and Corrective Action Reporting (CAR) feedback from QWEST, the Service Supplier shall be able to set targets and goals to establish

continuous quality improvement. These measurements shall be used to evaluate performance against targets and goals set by QWEST.

1.3.1 Organization of this Publication

The information presented in this manual has been organized to provide the Service Supplier with requirements that satisfy installed product and/or service standards of QWEST.

Table 1-1: Document Organization

Chapter	Contents
Chapter 1:	Introduction.
Chapter 2:	Audits and Measurements. This chapter is structured to provide the Service Supplier (and CLEC Service Suppliers) with the methodology by which Qwest assesses installation workmanship quality based on TP 77350 guidelines.
Chapter 3:	Provides the Service Supplier and CLEC with an explanation of the process regarding what their roles and responsibilities are with respect to corrective action items discovered during the workmanship assessment.
Chapter 4:	Definitions
Chapter 5:	References

1.4 QWEST Policy

1.4.1 Policy Statement

To establish long term, mutually-beneficial relationships between QWEST Quality Managers and Service Suppliers, focused on adhering to acceptable installation workmanship quality and maintaining the viability of the Qwest public switched telephone network.

1.5 QWEST Installation Quality Assurance Responsibilities

1.5.1 Functions

- Provide leadership and direction for the installation Service Suppliers to meet QWEST objectives relating to properly installed or removed telecommunications equipment.
- Provide workmanship guidelines and instructions to enable Service Suppliers to meet the requirements of QWEST Technical Publications and Architecture, Models and Configurations (AMCs).
- Provide assistance to Service Suppliers in the education and interpretation of Qwest technical requirements.
- Measure results and work with Service Suppliers to reduce installation-related defects.

- Evaluate Service Supplier workmanship performance via the Product Assessment Report (PAR). Monitor the corrective action efforts and provide monthly performance feedback to the Service Suppliers via Qwest Procurement vendor scorecard meetings.
- Implement disciplinary action based on a Service Supplier's failure to meet or respond to QWEST requests, or meet quality expectations.

1.5.2 Objectives

To ensure the highest quality and productivity from installation Service Suppliers, QWEST shall incorporate established telecommunications industry standards of acceptable installation workmanship to ensure that QWEST receives quality products and services.

CONTENTS

Tables

2. Audits and Measurements

The Service Supplier shall be in compliance with the requirements and guidelines listed in TP 77350. QWEST shall perform frequent audits of the Service Supplier's competency levels to maintain their status as an approved supplier.

2.1 Assessment Process

2.1.1 Overview

A workmanship assessment (commonly referred to as a "quality audit") is a review that evaluates the installed products or installations of a particular Service Supplier. This function examines the Service Supplier's ability to install central office equipment against the referenced standards or specifications required by QWEST.

The Service Supplier has the responsibility of utilizing the appropriate Job specifications, publications, appendices, drawings, QWEST Technical Publications 77350, 77351, 77355, 77368, 77369, 77385 and any other publication relating to engineering, installation practices and manufacturing requirements.

Qwest Installation Quality Assurance provides quality measurements for the Service Supplier's rating assessment (Refer to Par. 2.4.1 and 2.4.2). Feedback to the Service Supplier shall be formalized in a written report generated by the Qwest Quality Manager for Qwest-contracted Service Suppliers and via the State Interconnect Manager (SICM) for CLEC Service Suppliers.

The Service Supplier shall have knowledge of and proficiency in conducting and reporting the results of their subsequent improvement efforts based upon the feedback provided by the quality audit.

2.1.2 Notification of Impending Job Completions

All Service Suppliers that perform COE installation-related work on behalf of Qwest will notify the Qwest Quality Manager located in their region (refer to Table 2-1) a minimum of one week before both their proposed Job Start and Job Completion dates. This requirement also applies to the Service Suppliers contracted to perform installation work on behalf of Competitive Local Exchange Carriers (CLECs) and/or those CLEC employees performing the installation function themselves.

The notification shall consist of an electronic mail transmission made directly to each Quality Manager. In the notification, the Service Supplier should refer to the assigned Billing Verification And Processing for Payment (BVAPP) order number (or CLEC BAN tracking number), central office Common Language Location Identifier (CLLI) code, a brief description of the nature of the work and the proposed Start and Completion dates.

It's Qwest's policy to audit 100% of all Qwest-contracted installation work*. Audits of CLEC- controlled installation work will be dictated by the following:

- No auditing of CLEC-controlled installation work performed within CLEC cages.
- All installation work that is the first appearance of the CLEC installation force within any Qwest central office will be audited 100%.
- All installation work that is considered CLEC-to- CLEC within any Qwest central office will be audited 100%.

- All work that consists of installing Unbundled Network Elements (UNE's) from the CLEC collocation space to a Qwest-controlled termination point (e.g., Intermediate Combined Distributing Frame, etc.) will be audited 100%.
- Failure to adhere to this policy will be noted on the Product Assessment Report and forwarded to Qwest Procurement and the Qwest State Interconnect Managers via the Work Management Center (WMC) for follow-up.

***Note:** After the CLEC installation Service Supplier has established a presence, additional augmentation work performed on behalf of the CLEC (and/or within the CLEC's footprint) will be exempted from audit.

Table 2-1: Qwest Quality Manager List

QWEST QUALITY MANAGER	AREA	PHONE	PAGER	EMAIL ADDRESS
Robert Bieth	AZ, NM	(602) 541-0678	-	Robert.Bieth@qwest.com
Jeff Bostow	MN, ND, SD	(612) 798-2460 (w) (651) 276-9018 (c)	877 426 1576	Jeff.Bostow@qwest.com
Butch Columbus	OR	(503) 242-8555 (w) (503) 990-1201 (c)	503 306 3361	Butch.Columbus@qwest.com
Don Noffsinger	CO	(303) 707-7590 (w) (720) 940-6645 (c)	303 852 6337	Don.Noffsinger@qwest.com
Cheryl Pedersen	WA	(206) 345-5044 (w) (206) 406-7759 (c)	877 603 3880	Cheryl.Pedersen@qwest.com
John Perkins	IA, NE	(712) 279-4566 (w) (712) 326-8894 (c)	888 533 0020	John.Perkins@qwest.com
Tom Tanna	MT	(406) 543-2039 (w) (406) 544-2529 (c)	406 241 0049	Tom.Tanna@qwest.com
Dale Titus	UT, ID	(801) 237-7546 (w) (801) 259-6638 (c)	877 604 4667	Dale.Titus@qwest.com
Tom Wilkinson	CO, WY	(970) 679-7030 (w) (303) 946-8760 (c)	877 406 2340	Thomas.Wilkinson@qwest.com

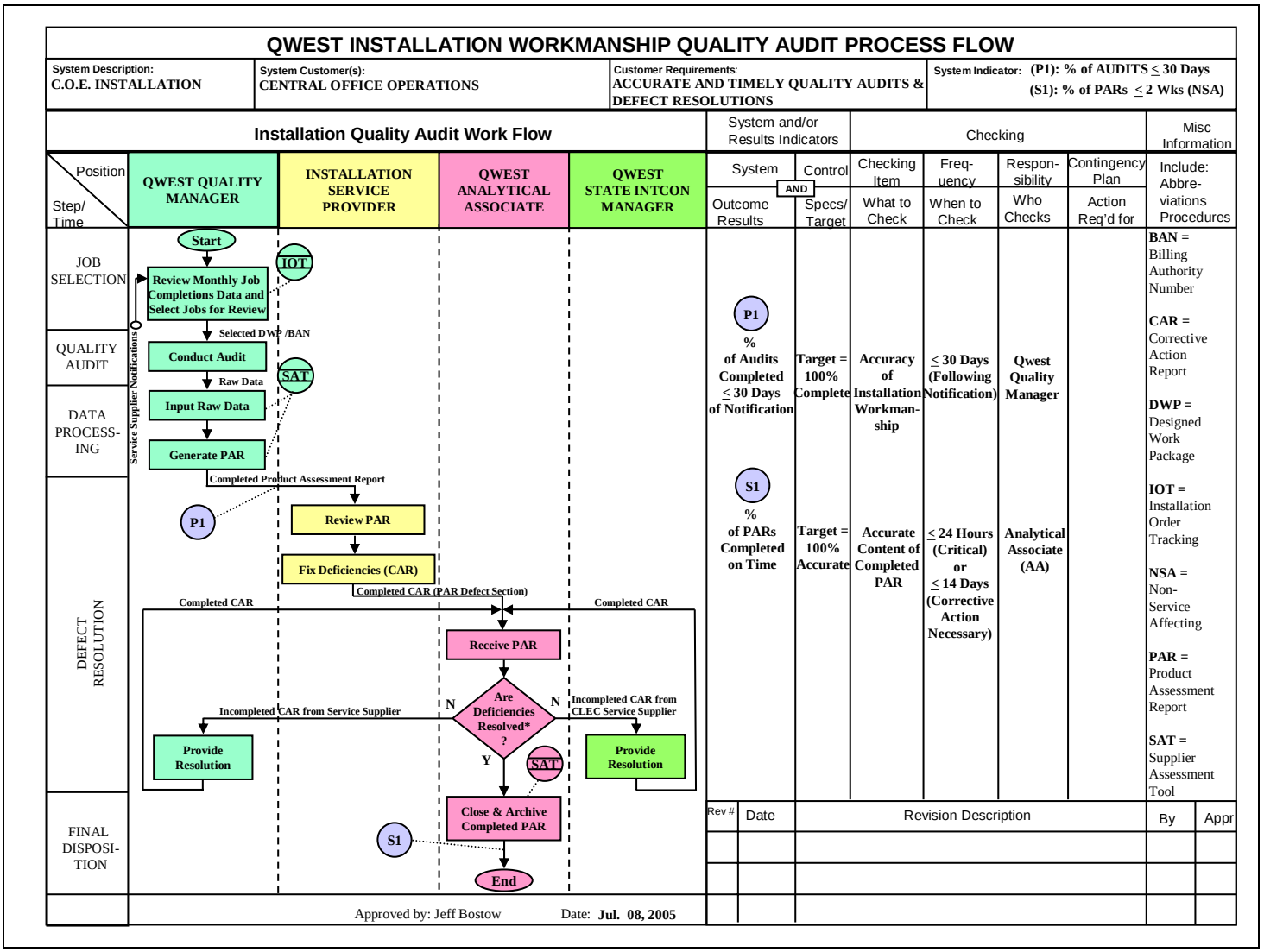
2.1.3 Workmanship Assessment (Quality Audit Process) Overview

The workmanship assessment or quality audit is an evaluation of the intent and purpose of the Service Supplier's installation and/or removal performance. The audit shall assess the Service Supplier's workmanship quality. The audit will consider safety and workmanship requirements outlined in TP 77350.

The workmanship assessment consists of a visit by a Qwest Installation Quality Assurance Manager to the Qwest central office location where the work was performed. The Quality Manager visually inspects the scope of work identified via the BVAPP or CLEC-related work Billing Authority Number (BAN) and

determines a rating based on both the content of the available job documentation (administrative) and the workmanship (technical) reviewed.

2.1.4 Quality Audit Activity Process Flow



2.2 Workmanship Assessment Reporting

2.2.1 General

QWEST Audit Reports are the means by which Qwest Installation Quality Assurance informs Qwest Design Engineering, and Qwest Central Office Operations that a work assessment has been completed and, where warranted, that corrective action has commenced. The QWEST Quality Manager shall be responsible for completing the Product Assessment Report and forwarding it to the Work Management Center or State Interconnect Manager for distribution to the applicable entities.

2.2.2 Product Assessment Report (PAR) Overview

The Product Assessment Report is a written notification by the Qwest Installation Quality Assurance Manager that an audit has been performed on a specific job. Refer also to Exhibit 3-1. The Product Assessment Report consists of the following:

- **Report Number** - This number is generated by the internet-based Qwest Supplier Assessment Tool and assigns report numbering based on Month/Report Sequence/Year/Quality Manager format.
- **Supplier** - The name of the Service Supplier who performed the actual work.
- **Issue** - This is the current version of the PAR.
- **City** - Qwest central office location where the installation effort was performed.
- **BVAPP** - The Qwest Billing and Verification And Processing for Payment number that provided the authority for the Service Supplier to perform the work.

Note: For work performed by CLECs (or their contracted Service Suppliers), a Billing Authority Number (**BAN**) should be provided.

- **State** - Any one of the 14 states that comprise the Qwest public switched telephone network.
- **General Job Information** – Brief narrative regarding the nature and scope of the work.
- **Corrective Action Report** – The Service Supplier's representative will enter their information on the "Corrected by (Please Print)" line along with their respective contact phone number.
- **General Job Description** - In addition to the above also lists, the Common Language Location Identifier (CLLI) for the central office, any Service Supplier's reference or order number(s), and the existence of an additional subcontracted or "secondary" supplier.
- **Audit Distribution** - Lists contact names for the Qwest Design Engineer, the Service Supplier's contact, and the Central Office Supervisor for that office)
- **Critical Defects** - Lists observations during the course of the workmanship audit that reveal conditions that are considered unsafe, potentially service-impacting, and/or in violation of a national or local code or standard. Refer also to Par. 2.3.1.
- **Job Statistics** - Provides quantifiable data relating to the size of the job, administrative, technical and total defect expectancies, assessed defect quantities, the quality index, the rating, the rating assessment, the major category of work performed, and, if any, a due date for corrective action(s) to be resolved. Refer to Par. 2.3.2, 2.3.3, 2.3.4, 2.4.1 and 2.4.2).

2.2.3 PAR Job Statistics - Equivalent Frames

In the "Job Statistics" category of the PAR, QWEST Installation Quality Assurance shall build frame values based on the total installed product. Tables 2-2 through 2-4 provide the reference that shall be used to calculate the number of equivalent 7' frames.

The following is a list of components, mathematical constants and formulas used to derive each supplier's relevant job statistics. These data shall be obtained during the assessment process to provide consistency in determining workmanship quality:

- ESE = Electronic Switch Equipment (in inches)
- TEI = Transmission Equipment (in inches)
- PEI = Power Equipment (in inches)
- EEF = Empty Equipment Frame
- FRM = Empty Frame(s) Removed
- BSS = Battery String (24) Cells & Stand
- PBS = Partial Battery String (Input # of Cells)
- IWF = Feet in Ironwork
- COS = COSMIC Modules
- DFV = Distribution Frame Verticals
- CBL = Distributing Frame Connecting Blocks
- GCA = Grounding Connections
- SWC = Solderless Wire wrapped Connections
- BRN = Battery / Ground Connections No. 2 AWG and Larger
- FCC = Fiber/Coax Connections
- OTHER = Cable Holes

2.2.4 Equivalent Frame Expectancies

To ensure that all Service Suppliers are measured consistently and accurately, an "Equivalent Frame Expectancy" value shall be assigned based on the size of the job being assessed. An expectancy value is determined depending on the number of Frames Added (FA) and Equivalent Frames Added (EFA).

In addition to the frame expectancy, values are given for Empty Equipment Frames (EEF), Frame Removals (FRM), Battery String (24) Cells and Stand (BSS), Partial Battery String (PBS), Feet in Ironwork (IWF), COSMIC Modules (COS), Distribution Frame Verticals (DFV), DF Connecting Blocks (CBL), Grounding Connections (GCA), Solderless Wirewrap Connections (SWC), Battery / Battery Return Connections (BRN), and Fiber / Coax Connections (FCC).

The Equivalent Frames Added expectancy mathematically equalizes any installation work step into an overall percentage of the addition of one standard 7-ft. framework. It also provides Qwest with a common approach in fairly assessing any Service Supplier based on the nature and scope of the type of central office-based work operation.

Note: On installation removals relative to the equipment type descriptions listed in Par. 2.2.3, those values are computed at a factor of 50% (0.5) of the installed values.

Tables 2-2 through 2-5 have been developed to calculate equivalent 7' frames:

Table 2-2: Frame Equivalency (FE) Constants*

FE	=BRN_EFA	= (0.05) * (Battery Ground Connections)
	TEI_EFA	= (0.0125) * (Transmission Equipment)
	BSS_EFA	= (2) * (Battery Strings)
	COS_EFA	= (1) * (COSMIC Modules)
	CBL_EFA	= (0.025) * (DF Connecting Blocks)
	DFV_EFA	= (0.1) * (Distribution Frame Verticals)
	ESE_EFA	= (0.0075) * Electronic Switch Equipment
	EEF_EFA	= (0.1) * (Empty Equipment Frames Added)
	IWF_EFA	= (0.025) * (Feet of Ironwork)
	FCC_EFA	= (0.0025) * (Fiber Coax Connections)
	FRM_EFA	= (0.5) * (Frames Removed)
	GCA_EF	= (0.05) * (Grounding Connections)
	PBS_EFA	= (0.042) * (Individual Battery Cells)
	PEI_EFA	= (0.0125) * Power Equipment
	SWC_EFA	= (0.001)* Solderless Wirewrapped Connections)

* Developed by Telcordia Technologies, Inc.

Table 2-3: Equivalent Frames Added (EFA) Calculations

Equivalent Frame(s) Added (EFA)	ESE_EFA + TEI_EFA + PEI_EFA + EEF_EFA + FRM_EFA + BSS_EFA + PBS_EFA + IWF_EFA _+ COS_EFA + DFV_EFA + CBL_EFA + GCA_EFA + SWC_EFA + BRN_EFA + FCC_EFA
EFA =	ESE_EFA + TEI_EFA + PEI_EFA
FE =	(EFA) + (EEF*.1)+ (FRM*.5)+ (BSS * 2) + (PBS * .042) + (IWF *.025)+ (COS * 1) + (DFV *.1) + (CBL * .025) + (GCA * .05) + (SWC *. .00025) + (BRN * .05) + (FCC*.0025)

Table 2-4: Frame Equivalency (Inch/Multiplier Calculations)

Available Mounting Space	Multiplier	Equivalent Frame(s)
7’ Frame 72 Inches	72”/8*.1	.9
9’ Frame 96 Inches	96”/8*.1	1.2
11’.6” Frame 120 Inches	120”/8*.1	1.5

Note: Equivalent Frame .9 (7’ Frame) plus Empty Frame value of .1, will result in (1) frame value.

Table 2-5: Equivalent Frame Conversion Examples

Equipment Type	Conversion to Equivalent Frames 7' Frames
Battery/Battery Return Connections - No. 2 AWG STRD and Larger (BRN)	Total Number of Major Connections x (.05) this compensates for preparing, connecting, cabling, mounting, and drilling of bars.
Battery Strings and Stands, Individual Batteries (BSS)	1 Battery String (Consisting of 24 battery cells, battery stand, and cabling associated with the string) = (2) x Equivalent 7' Frame
Connecting Blocks (CBL)	Total Number of Blocks x (0.025)
COSMIC Frame Modules (COS)	1 Cosmic Module = 1 Equivalent 7' Frame
Distribution Frame Verticals (DFV)	1 Vertical/Horizontal = (0.1) x Equivalent 7' Frame
Electronic Switches in Inches (ESE)	72" = Equivalent 7' Frame EFA = 72" x (0.0075) = 0.54 FE
Empty Equipment Frame(s) (EEF)	EEF = Equivalent 7, 9 and 11".6' Frame x (0.1)
Fiber/Coax Connections (FCC) Installed	Total Number of Fiber / Coax connections x (0.0025)
Frame(s) Removed (FRM)	1 Frame removed = 72" x (0.5) = 36" Equivalent 7' Frame = 96" x (0.5) = 48" Equivalent 9' Frame = 120" x (0.5) = 60" Equivalent 11" 6" Frame
Grounding Connections (GCA)	Total Number of Major Connections x (0.05) this does not include chassis grounds, foreign object, or relay rack grounds.
Ironwork (in Feet) (IWF)	1 Foot of ironwork (includes cable rack and auxiliary framing) = (0.025) Equivalent Frames
Partial Battery String (PBS)	Partial Battery String = .042 per cell 24 cells x (0.042) = 1 EFA
Power Equipment in Inches (PEI)	4" fuse panel x (0.0125) = 0.05 FE
Solderless Wire Wrap Connections (SWC)	Total Number of SWC x (0.001)
Transmission in Inches	72" = Equivalent 7' Frame EFA = 72" x (0.0125) = 0.9 FE 96" = Equivalent 9' Frame EFA = 96" x (0.0125) = 1.2 FE 120" = Equivalent 11'6" Frame EFA = 120" x (0.0125) = 1.5 FE

2.3 Installation-Related Defects

2.3.1 Classifications of Defects

Any departure from acceptable installation quality workmanship practices is considered a substandard effort and is classified as a "defect." A defect, depending upon its impact to the overall work effort, is categorized as Critical (safety, service-impacting, and "Other" Standards – e.g., NEC, UL, OSHA, etc.) administrative, technical, major or minor." All defects assessed require corrective action (e.g., rework) upon completion of the final installation quality audit. A description of each defect category is listed below:

2.3.1.1 Administrative Defects

Defects categorized as "Administrative" are attributable to the Service Supplier's handling of all job-related documentation needed to complete the work effort per TP 77350 Chapters 13 and 14. Administrative defects are used to compute the Service Supplier's overall rating assessment (Refer to Par. 2.4.2).

2.3.1.2 Technical Defects

Defects referred to as "Technical" are relative to the Service Supplier's workmanship competence based on the guidelines established by the following chapters of TP 77350:

Chapter	Title
1	Introduction
2	General Requirements
3	Assembly & Ironwork
4	Cable Holes, Penetrations, and Fire/Smoke Protection
5	Cabling, Forming, Running, and Securing
6	Wiring
7	Connecting
8	Equipment Designations
9	Power
10	Storage Batteries
11	Bonding and Grounding
12	Hazardous Material Handling
13	Documentation*
14	Forms*
15	Methods Of Procedure (MOPs) *
16	Competitive Local Exchange Carrier
17	Definitions
18	References

* Used in the calculation of Administrative Defects.

2.3.1.3 Major Defects

Defects categorized as "Major" indicate a substandard installation effort that did not meet Qwest's technical requirements, is service and/or safety-affecting, and reflects poor workmanship.

2.3.1.4 Minor Defects

Defects categorized as "Minor" indicate a general lack of attention to detail but are not considered to significantly impact service and/or safety.

2.3.1.5 Defects Found

All defects observed through the course of a final audit are assigned to a chapter and paragraph reference of TP 77350 and other impacted Qwest Technical Publications (and/or a "critical" and/or "Safety" related category). Defects attributable to TP 77350 Chapters 13 and 15 are categorized as administrative.

2.3.1.6 Defects Assessed

Not all defects found are assessed in the scoring calculations. If the same type of defect is observed having multiple occurrences during the audit, the number of defects assessed can be reduced using defect reduction tables (Refer to Par. 2.3.2 and Tables 2-6 through 2-10).

Note: The purpose of these reductions is to minimize the likelihood that a problematic condition (e.g., defective tool, lack of training, undeveloped competency) in one isolated area will result in a disproportionately low rating for the entire installation.

2.3.2 Defect Counting / Reduction

Counting rules are used to determine the number of defects to record on the Service Supplier's PAR report to differentiate between the number of defects found and the number of defects assessed. Reduction rules provide a means of translating an observed count of defects into some lesser count. Reductions are permitted only for groups of identical defects.

Note: Once a reasonable count of defect reductions has been calculated (and the number of observed defects continues to exceed that threshold), the reduction rule terminates and a one-for-one count resumes and is added cumulatively to the total assessed defects up to that point. Refer to Tables 2-6 through 2-10:

Table 2-6

Electronic Switching Equipment, Power Equipment, Transmission / Toll-IOF Equipment, Empty Frames Added, Frames Removed, Ironwork, Distribution Frame Verticals, Connecting Blocks

Defects Found	Defects Assessed
3-5	2
6-8	3
9-12	4
13-20	5
20-35	6
>35	Not Reduced

Table 2-7
Fiber Optic Cable / Coaxial Cable Connections

Defects Found	Defects Assessed
3-6	2
7-9	3
10-12	4
13-24	5
>25	Not Reduced

Table 2-8
Individual Battery Cells, Grounding Connections, Battery / Grounding Connections

Defects Found	Defects Assessed
3-5	2
6-8	3
9-12	4
>12	Not Reduced

Table 2-9
Solderless Wire wrapped Connections

Defects Found	Defects Assessed
3-8	2
9-14	3
15-25	4
25-30	5
>50	Not Reduced

Table 2-10

Equipment Designations

Defects Found	Defects Assessed
3-4	3
5-7	4
8-10	5
>10	Not Reduced

2.3.3 Defect Points

Before the data derived from the Defects Assessed is used in the rating calculations, it is converted to defect points. This conversion takes into account the severity of the defects being assessed.

- **Major** defects result in **1.0** defect point.
- **Minor** defects result in **0.25** defect points.

Note: As an example, assume that an installation audit reveals 5 major and 5 minor defects per Table 2-6. Both of these groups of defects are reduced, leaving 2 major and 2 minor defects. This would result in a total of 2.50 defect points for the installation.

2.3.4 Defect Expectancy (DE)

The defect expectancy is the maximum number of defect points that can be assessed for the installation Service Supplier to obtain a "Meets Requirements" rating (90 or higher). Refer also to Par. 2.4.2 and Table 2-11.

- The Administrative Defect Expectancy is the same for all installations (equivalent to 2 minor defects). A constant administrative defect expectancy (rather than variable) was developed with the premise that the relative magnitude of administrative work is not significantly impacted by the size of the installation. The Administrative Defect Expectancy is constant regardless of the size of the job.
- The Technical Defect Expectancy is based on the total calculated frame equivalencies by the Quality Manager. Consequently, larger installations warrant larger defect expectancies.
- The Total Defect Expectancy is the sum of the technical and administrative aspects: Defect Expectancy $_{TOTAL}$ = Defect Expectancy $_{TECHNICAL}$ + Defect Expectancy$_{ADMIN.}$

Table 2-11: Administrative / Technical Defect Expectancy Calculations

Defect Expectancy Type	Formula	Expectancy (Defect Points)
Administrative	Defect Expectancy $_{ADMIN}$ = No. of assessed defects	Assume 2.0 minor defects: Defect Expectancy $_{ADMIN}$ = 0.5
Technical (FE = 0-10 EFA)	Defect Expectancy $_{TECHNICAL}$ = 6.67 + (0.667) x (FE)	Assume 2.0 FE: Defect Expectancy $_{TECHNICAL}$ = 6.67 + (0.667) x (2.0) = 8.004
Technical (FE > 10 EFA)	Defect Expectancy $_{TECHNICAL}$ 6.67 + (FE – 10) x [0.667 – (0.5) x EXP(-1/FE)] **	Assume 12.0 FE: Defect Expectancy $_{TECHNICAL}$ = 8.08

** **Note**: An exponential distribution is used in the Defect Expectancy equation for FE > 10 to mitigate the possibility of excessive defect reduction resulting in inordinately high scores for large installations.

2.4 Service Supplier Measurements

2.4.1 Quality Index and Rating Calculation

Based on the size of the job, two separate ratings are computed at the completion of the audit function:

- **Quality Index:** The quality index is the ratio of the defect points to the defect expectancy. A quality index is calculated for both the administrative and technical areas. A perfect installation will have a quality index of 0.00, with lower quality installations reflected by increasing quality indices.
- **Quality Index$_x$** = (Defect Points$_x$) / (Defect Expectancy$_x$) for x = administrative or technical
- **Rating:** The final rating is calculated by combining the administrative and technical ratings, based on their respective weights. The first equation below shows how the administrative and technical ratings are calculated. The second equation shows how these ratings are then weighted and used in calculating the final rating.
- **Rating$_x$** = 100 – 10 (Quality Index$_x$) for x = administrative or technical

- **Final Rating** = (Admin %) x (Admin Rating) + (Tech %) x (Tech Rating)

2.4.2 Rating Assessment

After the final rating is calculated, a corresponding rating assessment is assigned to the job. The rating assessments and scoring divisions are listed below:

Table 2-12: Final Rating / Assessment

Final Rating	Rating Assessment
90-100	Meets Requirements
60-90	Marginal
<60	Poor

Note: Job packets not found at time of audit result in an automatic rating of 0% (audit function cannot be performed). If the job packet is found (and it can be determined that the supplier is accountable), then the audit is rescored with a 20% penalty. Therefore in this instance, even with perfect workmanship, the maximum rating attainable is 80%. If another party is found to have taken the job packet, no penalty to the supplier is assessed.

2.5 Appealing Qwest Quality Audits

2.5.1 The Appeals Process

In the event that the Service Supplier disagrees with the findings of any particular audit, the following Appeals Process can be invoked to ensure that the concerns of the Service Supplier are heard and understood.

2.5.1.1 The Service Supplier directly notifies, in writing, the Qwest Quality Manager of the disagreement/discrepancy (include BVAPP, central office location, and nature of discrepancy). The Qwest Quality Manager will address the Service Supplier's concerns within a reasonable time frame (generally within 5 business days). The Service Supplier may request, in writing, for an extension if an appeal resolution cannot be reached before the defect corrective action deadline is reached (e.g., 24 hours for "Critical" defects and 14 days for general workmanship defects). All appeals will be resolved within 14 days unless an extension is granted. Any appeal that originates on or after the final day of the 14-day deadline will be automatically denied.

2.5.1.2 If the Service Supplier is dissatisfied with the Qwest Quality Manager's response, he/she will then escalate the unresolved issue(s) to their supervisor or directly to the Qwest Installation Quality Assurance Supervising Manager for resolution.

2.5.1.3 If a resolution is unattainable, the Service Supplier may then escalate the unresolved issue(s) to the Director - Qwest Installation Quality Assurance for a final resolution.

2.5.1.3 Formal responses to audit appeals will be done via electronic mail. If the Service Supplier's appeal is upheld, the Qwest Quality Manager will reissue the initial Product Assessment Report (PAR) with the appealed defects removed. Subsequent site visits may be required for appeal resolution but are determined at the discretion of the Qwest Quality Manager.

CONTENTS

3. Corrective Action Reporting (CAR)

3.1 Definition

Any deviation from acceptable workmanship practices is considered “defective” and requires corrective action (e.g., rework or modification) so that the defective condition complies with Qwest’s stated requirements.

3.2 Corrective Action Report Criteria

The following information is an explanation of the fields listed on the last page of the Product Assessment Report (PAR) that constitutes the “Corrective Action Required” information that is forwarded to the Service Supplier for resolution.

3.2.1 TP 77350 Par. No. Column

The numeric reference listed here pertains to the technical publication reference that explains why the noted condition is defective.

3.2.2 “Requirement Type” Column (RT)

The numeric reference listed in this column denotes the type of category of defective condition.

1 - Fails to meet a QWEST requirement.

2 - Fails to meet manufacturer's requirements.

3 - Fails to meet engineering or installation Service Supplier's requirement.

4 - Fails to meet regulatory bodies requirement, (NFPA, OSHA, NEC, etc.)

3.2.3 “Level” Column (LV)

The notation listed signifies the reference of defective condition.

1 - Fails to meet a QWEST requirement.

2 - Fails to meet manufacturer's requirements.

3.2.4 “Defects Found” Column (DF)

The quantity listed here is an indication of the number of occurrences of the defective item observed during the audit. Refer also to Par. 2.3.1.5.

3.2.5 “Defects Assessed” Column (DA)

The quantity listed here is the total number of defects that will be used to compute the overall quality rating after counting /reduction rules have applied. Refer also to Par. 2.3.1.6, 2.3.2, and 2.4.2.

3.2.6 “Assessed Group” Column (AG)

The letter placed in this column pertains to the entity responsible for the defective condition and its subsequent resolution:

A – Installation Service Supplier (Documented in WMC database)

B – Engineering

C – Real Estate/Building Engineer

D – Procurement/ Network Procurement Center (NPC)

E – Network Operations

F – Other

3.2.7 "Description of Defects/Location" Column

The information provided here is specific in nature and clarifies the necessary details to accurately describe the defective condition and it's location within the central office.

3.2.8 Additional Information (Column AT)

Any attached supplementary information used by the Quality Manager to accurately explain the defective condition in the PAR (e.g., sketch, digital picture, etc.) is denoted in this column with an "X."

3.2.9 Date Cleared/Installer's Initials Column

In this column, the Service Supplier's representative certifies (by signing and dating) that the corrective action for the referenced defective item has been rectified.

3.3 Corrective Action Report (CAR) Service Supplier's Responsibilities

Qwest's expectations of the Service Supplier's responsibilities for resolving corrective action items identified by Qwest Installation Quality Assurance shall include:

- The effective handling of all defects identified on the Product Assessment Report (PAR) and the prompt return of the Corrective Action Report (CAR) portion within 14 days of initial notification.
- Any items designated "Critical Requirement" shall be corrected within 24 hours.
- If the job is identified as "Corrective Action Necessary," the Service Supplier is expected to verify the entire job in order to bring it into compliance with TP 77350 (and any other associated standards).
- Information regarded as "confidential" or "proprietary" shall not be disclosed to unauthorized personnel.
- Report on the audit results clearly, accurately and without delay.

Note: The Service Supplier is responsible for the distribution and resolution of the CAR within their organization.

3.4 Corrective Action Report Procedural Flow

The following sequence of steps illustrates the proper interaction between the Qwest Quality Manager and the Service Supplier in the resolution of corrective action items:

- Qwest Quality Manager conducts workmanship assessment (quality audit) of Service Supplier within a Qwest central office environment.

Note: The Service Supplier can be a representative of anyone of the following entities:

- Qwest Technical Installation (QTI)
- Any Qwest-approved contracted supplier
- A Competitive Local Exchange Carrier (CLEC) representative
- A Competitive Local Exchange Carrier (CLEC) subcontracted Service Supplier

If the Quality Manager deems the workmanship as "Corrective Action Necessary," those notations are recorded on the PAR and forwarded to the Qwest Work Management Center for distribution.

- The Service Supplier receives the PAR from the WMC and is expected to verify the entire job in order to bring it into compliance with TP 77350 (and any other associated standards).
- The Service Supplier performs the required corrective action or rework and promptly returns the Corrective Action Report (CAR) portion of the PAR within 14 days of the initial notification.
- Any items designated "Critical Requirement" shall be corrected within 24 hours.
- Information regarded as "confidential" or "proprietary" shall not be disclosed to unauthorized personnel.
- The Qwest WMC receives the completed CAR from the Service Supplier and closes out the CAR in the Supplier Assessment Tool database.

Exhibit 3-1

Sample Product Assessment Report (PAR)

Attached is a copy of an audit report conducted by Qwest Quality Assurance. It is required that all items listed on this audit report be corrected by the Service Supplier, and the Corrective Action Report (CAR) be returned to the specified person listed below under the Corrective Action Report (CAR) section within 14 days. Any items designated "Critical Requirement" shall be corrected within 24 hours. If the job is identified as "Corrective Action Necessary," the Service Supplier is expected to verify the total job in order to bring it into compliance with the "Telecommunications Equipment Installation Guidelines" (Technical Publication 77350) and associated documents. The Design Engineer may withhold a percentage of payment from the Service Supplier until the corrective action is completed. The Service Supplier is responsible for the distribution of this audit within their organization.

Quality, Access and Certification Manager	**Quality Manager**	
Jane Manager	Joe Auditor	
700 W. Mineral	301 W 65 St 1 st	
Littleton, CO 80120	Anywhere, USA	
E-mail: Jane.Manager@qwest.com	E-mail:	Joe.Auditor@qwest.com
Office: (303) 707-1234	Office:	+1 (123) 456-7890
Fax: (303) 707-5678	Fax:	+1 (123) 456-4567

GENERAL JOB INFORMATION	
Job Description:	RKM, CSPEC 03 NOV 03: 1. HOT SLIDE THE TWO POSITIVE 130V CONVERTER BAYS IN THE 107 LINE UP APPROXIMATELY 2.5` TOWARD THE WALL AND AWAY FROM THE BATTERY STIRNGS. 2. REMOVE ALL THE 1680 STRINGS AND BATTERY CELLS EXCEPT P0102.00 3.
Additional Notes:	Extremely nice workmanship and attention to detail. Note 1: Above BAT STRG A & B, observe that there were several nicks to the power conductors. This may have occurred in either shipping/transit or during installation. The insulation was NOT cut through to the conductor. Note 2: Above BDFB PO118.00, the Installer should have run continuous leads to the RTN BUS without H-tapping in (unless a bending radius violation could not have been avoided).

CORRECTIVE ACTION REPORT (SAMPLE)

PLEASE SEND CORRECTED INSTALLATION CARs VIA EMAIL TO: **Qwest Analytical Associate,** Analytical.Associate@qwest.com PLEASE SEND CORRECTED ENGINEERING CARs VIA EMAIL TO: No Name Available @qwest.com The Installation Supplier shall fill out the "Corrected By" information below and return this audit to the person specified above.

Corrected by (Please Print):	
Contact Phone Number:	
Date:	___/___/____
Comments:	

GENERAL JOB DESCRIPTION			
Report:	120104JWB	**Issue Date:**	12/01/2004
Issue:	1	**BVAPP:**	BVMA23989
CLLI:	MPLSMNTF	**SON:**	
Supplier:	QTI	**Secondary Supplier:**	
City:	MINNEAPOLIS	**State:**	MN

AUDIT DISTRIBUTION	
Design Engineer:	Qwest Design Engineer
Supplier Contact:	Contracted Vendor Representative
CO Supervisor:	Qwest CO Operations Rep

CRITICAL DEFECTS	
Critical Defects Safety:	0
Critical Defects Service:	0
Critical Defects Other Standards:	0

JOB STATISTICS	
Frame Equivalency:	13.15
Administrative Defect Expectancy:	0.5
Technical Defect Expectancy:	7.5
Total Defect Expectancy:	8
Administrative Defects Assessed:	0
Technical Defects Assessed:	1
Total Defects Assessed:	1
Quality Index:	0.12
Rating:	98.83%
Rating Assessment	Meets Requirement
Major Work Category	POWER
CAR Due Date	12/15/2004

TP: 77369 3.2.2, "Requirement Type" Column "RT"	
1 - Fails to meet a Qwest requirement	
2 - Fails to meet manufacturer's requirement	
3 - Fails to meet engineering or installation service supplier's requirement	
4 - Fails to meet regulatory bodies' requirements (NFPA, OSHA, NEC, etc.)	
TP: 77369 3.2.3, "Level" Column "LV"	
1 - Additional effort necessary "Critical" (Service or Safety)	
2 - Additional effort necessary	
TP: 77369 3.2.4 Defects Found - Column "DF"	
TP: 77369 3.2.5 Defects Assessed – Column "DA"	
TP: 77369 3.2.6 Assessed Group - Column "AG"	
A - Installation supplier	D - Procurement/NPC
B – Engineering	E - Network Operations
C - Real Estate/Building Engineer	F - Other
Additional Information (attachment) - Column "AT"	

Item	TP 77350 Par. No.	RT	LV	DF	DA	AG	Description of Defects/Location	AT	Date Cleared/ Instr. Init.
1	05.05.01	1	2	1	1	A	BDFB PO118.00 (overhead cable rack): Installer did not securely stitch the -48V RTN leads prior to break-off at RTN BUS ASSY. Please re-stitch securely (cables are loose).		

CONTENTS

4. Definitions

4.1 Acronyms

AG	Assessed Group
AMC	Architectures, Models, Configurations
AT	Additional Information (Attachment)
BAN	Billing Authority Number
BVAPP	Billing Verification And Processing for Payment
BRN	Battery / Ground Connections No. 2 AWG and Larger
BSS	Battery String (24) Cells & Stand
CAR	Corrective Action Report
CBL	Connecting Blocks
CDSA	Common Defect “Safety”
CDSV	Common Defect “Service”
CLEC	Competitive Local Exchange Carrier
CLLI	Common Language Location Identifier
COO	Central Office Operations
COE	Central Office Equipment
COE-FM	Central Office Equipment – Facilities Management
COO	Central Office Operations
COS	COSMIC Modules
DA	Defects Assessed
DE	Defect Expectancy
DF	Defects Assessed
DFV	Distribution Frame Verticals
EEF	Empty Equipment Frames
EF&I	Engineer, Furnish & Install
EFA	Equivalent Frames Added
ESE	Electronic Switch Equipment in Inches
ESS	Electronic Switch System
FA	Frames Added

FCC	Fiber/Coax Connections
FE	Frame Equivalency
FRM	Equipment Frames Removed
GCA	Grounding Connections Added
ICDF	Intermediate Combined Distributing Frame
IOF	Inter-Office Facilities
IWF	Ironwork in Feet
LV	Level Column
MOP	Method of Procedure
NPC	Network Procurement Center
OSHA	Occupational Safety and Health Act
NEBS	Network Equipment Building System
PAR	Product Assessment Report
PBS	Partial Battery String (number of cells)
PEI	Power Equipment in Inches
PSTN	Public Switched Telephone Network
QI	Quality Index
RA	Rating Assessment
RT	Requirement Type Column
RTN	Battery Return Lead
SWC	Solderless Wire Wrap Connections
TEI	Transmission Equipment in Inches
TP	Technical Publication
UNE	Unbundled Network Element
WMC	Work Management Center

CONTENTS

5. References

5.1 QWEST Technical Publications

77350 *Telecommunications Equipment Engineering, Installation and Removal Guidelines,* Issue M, April 2003.

77351 *QWEST Communications, Inc. Engineering Standards General Equipment Requirements*, Module 1 Issue F, June 2001 and Modules 2 and 3 Issue C, January 1993.

77352 *Central Office Telecommunications Equipment Standard Drawing Requirements*, Issue A, April 1985.

77353 *QWEST Central Office Drawing Standards*, Issue C, September 1990.

77354 *Guidelines for Product Change Notices*, Issue G, September 2001.

77355 *Grounding - Central Office and Remote Equipment Environment*, Issue F, December 2003.

77361 *COMMON LANGUAGE® Equipment Classification and Bar Code Labeling*, Issue C, September 2001.

77362 *QWEST Communications International Inc. Documentation Requirements for Suppliers*, Issue F, September 2001.

77385 *QWEST Communications International Inc. Power Equipment and Engineering Standards*, Issue H, September 2003.

5.2 Telcordia Publications

GR-63-CORE *Network Equipment-Building Systems (NEBS) Requirements: Physical Protection*, Issue 2, April 2002.

GR-1089-CORE *Electromagnetic Compatibility and Electrical Safety-Generic for Network Telecommunications Equipment*, Issue 3, October 2002.

SR-3580 Network Equipment-Building System (NEBS) Criteria Levels, Issue 2, January 2005.

5.2 Miscellaneous Publications

General Procurement Agreement (GPA) or General Service Agreement (GSA) Contract and Individual Job Contracts.

5.3 Ordering Information

All documents are subject to change and their citation in this document reflects the most current information available at the time of printing. Readers are advised to check status and availability of all documents.

Ordering Information for Employees of QWEST. Submit form RG 31-0033 to:

Central Distribution Center (CDC)
1005 17th St. S-30
Denver, CO 80202
Telephone: (303) 896-9446
Fax: (303) 965-8652

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Telcordia documents can be ordered from URL: http://www.telcordia.com/

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