

COE Construction Equipment Check/Verification and Generic Feature and Functional Acceptance Test Forms

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1. General

1.1 Purpose

This practice contains GTE generic forms used to prepare test, check, and verification for:

- Central Office (CO) type equipment.
 - Switching.
 - Transmission.
 - Peripheral.
- Remote switching equipment.
- Other switching equipment.

1.2 Filing Instructions and Supersedures

Discard all previous issues and associated addenda of this practice and file this issue numerically in your GTE Telephone Operations practices set.

This practice supersedes and cancels:

- All policies, procedures, general instructions, letters, and memoranda which address this subject.
- Any document which provides information contrary to the information contained in this practice.

1.3 Reason for Reissuing

This practice has been reissued to incorporate multiple changes in the content. Read this entire practice to ensure your familiarity with the new information.

This practice has also been reissued to:

- Eliminate references to acceptance activities.
- Provide information to complete Construction Check and Verification activities.
- Update GTE's Check and Verification forms.
- Update the Work Completion Summary form.
- Include Acceptance Test Functional forms.

1.4 Responsibility

This practice was published by the GTE Telephone Operations Administrative Services Department. For more information about this practice, contact the GTE Telephone Operations Headquarters COE Construction Department.

1.5 Disclaimer

This practice was prepared solely for the use of GTE Telephone Operations. It must be used only by its employees, customers, and end users when installing, operating, maintaining, and repairing GTE Telephone Operations' equipment, facilities, and services. Any other use of this practice is forbidden. The information contained in this practice may not be applicable in all circumstances and is subject to change without notice. By using this practice the user agrees that GTE Telephone Operations will have no liability (to the extent permitted by applicable law) for any consequential, incidental, special, or punitive damages that may result.

2. Overview

2.1 Introduction

All work performed under the direction of Central Office Equipment (COE) Construction must have documented results showing completion of work. All projects require the use of a Work Completion Summary and Check/Verification Forms (see Exhibits 1 and 2). The Check/Verification forms, manufacturer provided forms, or contractor forms which are approved by Headquarters staff can be used as documented results showing that the process has been completed.

2.2 Definitions

The following chart provides definitions for the acronyms used in this practice.

Acronym or Term	Definition
AC	Alternating Current
ACTS	Automated Coin Telephone Service
ALIT	Automatic Line Insulation Test
AMA	Automatic Message Accounting
ANA	Automatic Number Announcer
ANI	Automatic Number Identification
AWG	Automatic Wire Gauge
CAMA	Centralized Automatic Message Accounting
CCS	Calling Card Service
CDF	Combined Distribution Frame
CLASS	Customer Local Area Signaling Service
CLI	Common Language Identifier
CO	Central Office
COE	Central Office Equipment
CQR	Circuit Query Response
CVGB	Cable Vault Ground Bar
CVT	Call Validation Request
CXF	Carrier/Transmission Frame
CXR	Carrier
dBrnc	C-Message Weighted noise power in dBm

(continued)

3. Overview

2.2 Definitions, continued

Acronym or Term	Definition
DC	Direct Current
DDD	Direct Distance Dialing
DID	Direct Inward Dialing
DSX	Digital Signal Cross Connect
DTMF	Dual Tone Multifrequency
DTUF	Digital Trunk Unit Frame
EA	Earthquake Area
ECD	Engineering Configuration Drawing
EL	Equipment Location
FGB	Floor Ground Bar
GTEDS	GTE Data Services
HVC	High Volume Call
IC	Interexchange Carrier
IGZ	Integrated Ground Zone
INWATS	Inward WATS
IXC	Interexchange Carrier
JIM	Job Information Memorandum
LVT	Line Verification Test
MCM	Marker Connect Matrix per thousand circular mils
MDF	Main Distribution Frame
MF	Multifrequency
MGB	Master Ground Bar
MR	Multifrequency Receiving
MXU	Multiplex Unit

(continued)

4. Overview

2.2

Definitions, continued

Acronym or Term	Definition
NEA	Non-Earthquake Area
NOC	Network Operations Center
NO-OX	No-Oxide
NPA	Number Planning Area
ONI	Operator Number Identification
OPCEN	Operation Center
OSP	Outside Plant
OSPS	Operator Services Position System
PABX	Private Automatic Branch Exchange
PCM	Pulse Code Modulation
PCU	Power Control Unit
PDU	Power Distribution Unit
PVC	Polyvinyl Chloride
PWC	Printed Wiring Card
SCS	Selective Calling Service
ss7	Signaling System 7
SVR	System Version Release
SXS	Step-by-Step Central Office
TSD	Traffic Sending Desk
TSPS	Traffic Service Position System
TWX	Teletypewriter Exchange
UCR	Unsatisfactory Condition Report
VDC	Volts Direct Current
WATS	Wide Area Telephone Service

2. Overview, continued

2.3 References

Refer to the GTE COEC "HQ.COEI.NEWS" electronic bulletin board for the latest:

- CH-110 Handbook Index of GTE Telephone Operations Practices.
- OEM Index which lists other manufacturer installation practices.
- COEC Alerts.

Refer to the electronic bulletin board "COEC.GTEP" for COEC:

- Draft GTE Telephone Operations Practices.
- COECxxx prefixed forms (see Section 2.4).

NOTE: Contractors who do not have access to GTE electronic bulletin boards will need to get this information from their GTE counterpart, normally at the preconstruction meeting.

The following chart provides sources of supplementary information relating to this practice. The documents could be required for performing certain tasks.

See...	For Information About...
004-200-001	Quality Assurance Operational Review – COE Construction
007-005-015	Handling Static-Sensitive Materials
007-009-012	Input Pro to the Product Standardization Process
007-220-001	COE Bar Code Methods and Procedures
026-100-500	Grasshopper Fuse Operation/Inspection
026-220-300	Central Office Distribution Fuse Allowable Voltage Drop
075-170-100	Cable and Support Ties Description and Use
1 00-000- 100	Test Equipment Calibration Guidelines
108-850-505*	Lorain Test Load Unit Models Y1 , Y2 -Test Procedures
117-200-005	Safety Hats Description, Use and Maintenance
117-300-002	First Aid Kit – Description, Placement, and Inspection
180-303-001	CPMS JIM/PSN Process
200-000-007	Minimum Alarm Configuration New Switching Equipment
200-001-000	Safety Precautions – Central Office

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2. Overview, continued

2.3 References, continued

See...	For Information About...
200-002-010	Acceptance Test General Plan
200-002-700	Acceptance Test Basic Equipment Forms
200-050-101	Special Service Circuits – Safeguarding and Marking
200-050-203	Central Office Equipment Painting and Cleaning
205-000-000	Equipment Alarms Overview
205-000-004	Alarms for Carrier and Radio Facilities
205-000-500	Power Equipment Power Connections CO Inspection and Tightening Procedures
205-001-500	Power Complex- Installation Test Procedure
205-005-1 00	Battery Maintenance Safety Board
205-005-200	Batteries – Central Office and Remote – Installation and Maintenance
205-005-201	Battery Cells Enclosed Type – Floor Mounted Installation
205-1 00-200	Battery Charger Installation
205-502-700	Generator DC Using AC Prime Movers- Lubrication and Inspection
205-502-701	Engine-Driven Emergency Power Unit Functional Tests
205-605-501	Alarms, Audible, and Visual (Excluding SATT Alarms) Testing Procedures
205-605-502	Alarm Audible and Visual-Power Equipment – Test Procedures
205-605-503	Central Off ice Alarms – Functional Testing Requirements
205-705-201	Power Plant Bus Bar – Installation
220-001-001	Central Off ice Equipment Installation Activity Procedures

(continued)

2. Overview, continued

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References, continued

See...	For Information About...
220-014-007	Quiescent Test Load Simulator (TLS) Test Criteria – GTD-5 EAX
220-220-002	Printed Wiring Card Repair and Return and Inventory Control Procedure
220-220-501	Printed Wiring Cards Test Procedures
224-100-100*	GTD-5 EAX Power and Alarm Equipment
237-050-201	Erection Methods CO Laying Out the Floor
237-050-204	Erection Methods CO Bay and Frame Uprights
237-050-206	Erection Methods – AGCS Central Off ice Cable Runway
237-050-207	Erection Methods – Central Office Cable Grid
237-050-209	Erection Methods-CO Shelf Cable Brackets and Auxiliary Terminal Block Supports
237-050-211	Erection Methods Central Off ice Equipment Shelves
237-050-212	Erection Methods CO Equipment Shelves – Using Unit and Shelf Hoist GTC-3015
237-050-213	Erection Methods CO Equipped Relay Racks
237-200-202	Ladder Rolling -Assembly and Installation
237-200-203	Ladder Rolling – Equipped with WECO Type Brakes-Alignment
237-200-204	Ladder Rolling – Lubrication and Inspection
237-224-214*	Engineering and Installation of Ground isolation
243- 100-200	Protector Central Off ice – Mounting
243-110-100	Connector Central Office – Cook Electric Type 6800
243-I 20-200	Cook Electric Protectors-Description and Installation
243-I 28-200	Connector Reliable Electric 303, 305, and 710

(continued)

2. Overview, continued

2.3 References, continued

See...	For Information About...
244-01 O-202	Numbering and Lettering CO Equipment Distributing Frames
244-200-I 00	Numbering and Lettering of Switch Equipment
244-251-200	Numbering and Lettering Power and Lighting
244-261-I00	Numbering and Lettering Transmission Equipment
256-010-201	Cabling Methods Soldering-General
256-050-202"	Switchboard Cable Tags and Labels
256-050-203	Cabling Methods – Installation Planning and Safeguards
256-050-204	Cabling Methods – Running and Securing Switchboard Cable
256-050-205	Cabling Methods- Butting, Stripping, and Fanning Switchboard Cables
256-050-206	Cabling Methods – Running and Securing Power Cable
256-050-207	Terminating Power Cables Using Compression Connectors and Lugs
256-050-208	Cabling Methods Switchboard Cables – (Wrap and Solder Methods)
256-050-211	Cable Methods Connecting Wires – Solderless Wrap Method
256-050-213	Cabling Methods Spares and Unused Wires
256-050-215	Cabling Methods Installing Shield Terminations with IR-550 Heating Tool
256-150-200	Procedures for Cross-Connecting (Jumpering) CO Distributing Frames
256-150-201	Cabling Methods – Distributing Frames
256-152-200	Distributing Frames Electronic Systems-Quick Connect Procedures for Cross-Connecting (Jumpering)

(continued)

2. Overview, continued

2.3 References, continued

See...	For Information About...
256-224-216"	Cabling Methods
256-600-201	Cabling Methods – Forming and Dressing Miscellaneous Wire
331-310-510	Transmission Testing Battery Supply Circuit in Central Offices Message Noise Measurements
392-342-500	Fiber Optics Acceptance Test Procedures
624-632-000	Splicing Optical Fiber Cable
740-500-070	Remote Equipment Buildings Land & Buildings Engineering Guidelines
742-100-100	Fire Prevention and Protection Guide
742-100-101	Building Fire Fighter Apparatus – Description, Use, Placement, and Maintenance
742-100-103	Fenwal Low Voltage
742-200-070	Sealing Cable Openings and Penetrations – Fire Protection Measures
742-205-070	Battery Room or Area Ventilation Engineering Application
743-200-070	Emergency Generators Engineering Applications
780-740-070*	Central Office Equipment Earthquake Bracing – Engineering and Installation Applications
788-405-075	Order and Application of Central Office Equipment Lighting Fixtures
EP 795-000-072**	DC Power Plant Design Engineering Considerations
795-805-071	Central Office Grounding Systems – Engineering Applications
795-805-072	AC Service Grounding Engineering Applications
795-805-073	Transmission Equipment-Central Office Grounding

(continued)

2. Overview, continued

2.3 References, continued

See...	For Information About...
795-805-074	Inspecting Central Office Grounding and Electrical Protection
808-210-070	Environmental Control Atmospheric - Central Office Switching Systems
835-000-071	TI PCM Repeated Line -Transmission Considerations for Engineering
887-903-026	Five-Pin Protector Module-Application
903-101-070	Protection - Bonding and Grounding Cable
938-624-000	Optical Fiber Cable General Outside Plant Design Considerations
H-440000*	Ironwork Assemblies
NEC 210-4 (a), (c)t	National Electric Code

* Published by AG Communication Systems

** Engineering Procedures (EPs) are published by the Headquarters Engineering Department.

† The NEC is published by the National Fire Protection Association (NFPA), Quincy, MA.

2.4 Forms

Inspection - CO Grounding and Electrical Protection, Form 90001528, should be completed by Protection Engineering, Support Assets, and COE Construction before placing equipment in service. Order this form through normal supply channels.

The following forms are referenced in this practice:

- Work Completion Summary, COECVOI A, Exhibit 1.
- Central Office Construction Equipment Check/Verification Forms, COECV02A through COECV02G, Exhibit 2.
- Central Office Construction Generic Feature and Functional Acceptance Test Forms, COECV03A through COECV03D), Exhibit 3.
- Central Office Construction Equipment Check and Verification Practice Reference, COECVO4A, Exhibit 4.

NOTE: For other product line specific forms, refer to the appropriate acceptance practices listed in GTE Telephone Operations Practice 200-002-xxx and 200-400-xxx series of practices.

2. Overview, continued

2.4 Forms, continued

The following chart describes the basic subject matter of the forms shown in Exhibits 1 through 3.

Form	Exhibit
Work Completion Summary	1
Check and Verification form COECV02A-G which consists of the following parts: "A" Superstructure "B" Cables and Wire "C" Power Installation "D" Safety and Housekeeping "E" Equipment Erecting "F" Administration "G" Grounding, Isolation, and Protection	2
Functional Testing form COECV03A-D which consists of the following parts: "A" Features Basic System and Billing "B" Line Test Verification "C" Trunk System "D" Trunk Span Testing	3

Order these forms via any of the following methods:

- Contact the Regional Network Construction Support Center.
- Access telemail bulletin board COECGTEP
- Send an e-mail to COEI.Quality requesting a diskette containing the forms in ASCII or WordPerfect format.

Contractor's test and acceptance forms can be used instead of GTE's forms. These forms must be approved by the COE Construction Headquarters staff.

When work assigned to a contractor has been completed, a Work Completion Summary should be issued by the contractor. This form should be provided to COE Construction management who will be identified at the preconstruction meeting.

When all work has been completed on a work order, a Work Completion Summary will be sent from COE Construction via electronic mail or electronic FAX to Network Reliability/Operations Manager. This notification indicates ready-for-service and that the equipment will be placed in-service.

COE CONSTRUCTION WORK COMPLETION SUMMARY

Work Completion Summary
Form COECVOIA
Ref. 200-002-700 (03/02/95)

Distribution:
 Contractor Performed Work to Construction MGR
 GTE All Work Complete - T&mail/Electronic FAX to
 Network Reliability/Operations Manager

GTE Construction Manager: _____
 Region: _____ state: _____ Central office: _____
 Plant Code: _____ Sub Plant Code: _____ Work Order Number: _____
 Installation Firm: _____ Firm Representative: _____
 Contractor Work Authorization Number: _____
 Installation Work Completion Date: - / - / -

Description of work covered:

This Work Completion Summary indicates work has been completed and appropriate test have been performed to meet or exceed established standards. Items are to be marked to reflect activities performed, enter Yes, or NA (not applicable to work assigned).

Completion Summary:	Yes or NA
Marked copy of Work Order Specification:	_____
Marked copy of Office Drawings:	_____
Office Logs:	_____
Spare Cards:	_____
Bar Coding:	_____
GTE's Physical Check and Verification:	
"A" - Superstructure	_____
"B" - Cable and Wiring	_____
"C" - Power Installation	_____
"D" - Safety and Housekeeping	_____
"E" - Equipment Erecting	_____
"F" - Administration	_____
"G" - Grounding, Isolation, and Protection	_____
Other Companies Physical Check and Verification	_____
Functional Testing:	
<input type="checkbox"/> Assessment/Operational Verification and Test. (Product Specific)	_____
Features Testing:	
<input type="checkbox"/> Basic System and Billing	_____
<input type="checkbox"/> Line Test - Verification	_____
<input type="checkbox"/> Trunk System Testing (features)	_____
Trunk Testing	_____
Transmission/Span Testing	_____

Exhibit 1 - Work Completion Summary (Page 1 of 2)

Exhibits, continued

NOTE: Copies of all test results, check/verification forms, and marked documentation must be part of the Work Completion package. Work Completion is when all assigned work has been completed. In the case of a contractor, it is when the activities that were awarded are complete. The Construction Manager (or representative) must submit electronically a work completion summary to Network Reliability/Operations Manager at "Ready For Service".

EXCEPTION ITEMS

The following items are outstanding toward this work order and have no impact on service. The items listed reflect activities or materials due and will be completed on or before the commitment date listed.

Outstanding Item	Reason For Not Completing	Commitment Date
1		
2		
3		
;		

Exhibit 1 - Work Completion Summary (Page 2 of 2)

03/02/95

(Form COECV02A)

Page 1 of 3

**CENTRAL OFFICE CONSTRUCTION
EQUIPMENT CHECK AND VERIFICATION
SUPERSTRUCTURE**

ITEMS TO BE CHECKED AND VERIFIED

CHECKED VERIFIED
Initial/Date Initial/Date

I. CONFIGURATION AND DOCUMENTATION

- 1.1 All Ironwork located per. the engineered specifications and job drawings.
 - o Changes **are** to be reflected on appropriate documents.

- 1.2 Shipping and manufacturer tags and labels are removed.

NOTE: Manufacturers and GTE's documentation can be **used in all** installation applications. where substantial differences exist between documents COE Headquarters Staff support is to be notified.

2. MISCELLANEOUS REQUIREMENTS

- 2.1 The **length of each** bolt or rod must be flush to not more than the thickness of the nut below the bottom of the nut The nut should be the thickness of the bolt stock.

NOTE: The length of the bolt or threaded rod beyond the nut is **a** safety requirement. There are some applications where the length of a threaded rod or bolt could be longer without creating a safety hazard. Good judgement should prevail. If in doubt, protective caps should be used or the bolt/rod should be cut.

- 2.2 All bolts and rods that **are** cut must be filed or protective end caps used.

- 2.3 **Lock** washers and flat washers are installed per the assembly provided Most applications in earthquake zones require the use of lock washers.

- 2.4 Cable rack panning (when used) must be appropriately secured to prevent roiling of the ends. Manufacturers vary in hardware to accomplish this activity.

- 2.5 All securing hardware is tight.
 - o Most hardware assemblies in earthquake zones require torquing.

Exhibit 2 - CO Construction Equipment **Check Verification Forms (COECV02A-G) (Page 1 of 31)**

03Jomf5

(Form COECV02A)

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**CENTRAL OFFICE CONSTRUCTION
EQUIPMENT CHECK AND VERIFICATION
SUPERSTRUCTURE**

ITEMS TO BE CHECKED AND VERIFIED

CHECKED VERIFIED
Initial/Date Initial/Date

2. MISCELLANEOUS REQUIREMENTS (continued)

2.6 Threaded rods should be placed straight in a line and without bows and bends.

2.7 Floor stanchions are placed to provide support where threaded rods can not be installed and equipment frames are not in place to provide support

3. PAINTING AND GENERAL APPEARANCE

3.1 All cut ironwork requires filing or protective covers placed.
 o Bolts and threaded rods
 o Angle iron
 o Cable rack and grid
 o Channel braces

3.2 All cut or scratched ironwork requires painting with like colored paint.

4. WALL ANGLES AND WALL MOUNTED SUPPORT BRACKETS

4.1 Wall anchors should be placed per assembly instructions of the equipment manufacturer. Hollow walls should have anchors placed in grout or at wall studs.

NOTE: Refer to Hilti application charts for appropriate fastening devices.

4.2 Required number of anchors have been used per assembly drawings.

4.3 Located at the correct height as specified in office drawings.

Exhibit 2 - CO Construction Equipment Check Verification Forms (COECV02A-G) (Page 2 of 31)

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CENTRAL OFFICE CONSTRUCTION EQUIPMENT CHECK AND VERIFICATION SUPERSTRUCTURE		
ITEMS TO BE CHECKED AND VERIFIED	CHECKED Initial/Date	VERIFIED Initial/Date
5. CHANNEL BRACES		
5.1 Spaced no more than five feet apart.	_____	_____
5.2 Level and at the correct height with no bows or bends.	_____	_____
5.3 Bolted together with correct hardware. o Earthquake areas require shear connecting application	_____	_____
5.4 Earthquake areas require special bracing and two-channel configuration.	_____	_____
6. CABLE RACK AND GRID		
6.1 Properly spaced, joined, secured. o Earthquake areas require shear connecting systems	_____	_____
6.2 Cable rack placed to allow for cable drop into equipment frames_	_____	_____
6.3 Cable rack supported every five feet or less.	_____	_____
6.4 Earthquake brace suspended cable rack and grid using 5/8 inch threaded rods or equivalent every five feet or less. Braces should form a 'V' when placed.	_____	_____
6.5 Protective end caps placed or finishing bars installed.	_____	_____
7. SIGNAL BRACKETS, CABLE RETAINING BRACKETS, GOAL POST BRACKETS, ETC.		
7.1 Placed straight down the runway and not staggered.	_____	_____
7.2 Spaced 12 to 18 inches so as not to allow sag in the cables and wires.	_____	_____
7.3 Assembled to ensure proper locking and fastening.	_____	_____
7.4 Protective caps place where potential safety hazard exist.	_____	_____

Exhibit 2 - CO Construction Equipment Check Verification Forms (COECV02A-G) (Page 3 of 31)

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(Form COECVOZB)

Page 1 of?

**CENTRAL OFFICE CONSTRUCTION
EQUIPMENT CHECK AND VERIFICATION
CABLES AND WIRE**

ITEMS TO BE CHECKED AND VERIFIED

CHECKED
Initial/Date

VERIFIED
Initial/Date

I. CONFIGURATION AND DOCUMENTATION

- 1.1 All cables and wires are run per engineering specifications and drawings,
 - o Changes must be marked on office copy for acceptability

2. MISCELLANEOUS REQUIREMENTS

- 2.1 Cable tie usage
 - o No excessive use
 - o No sharp edges
 - o **Eye of cable tie** rotated to inconspicuous or out-of-the way position.
 - o Spaced 6 to 12 inches
- 2.2 Cable running **tags** removed prior to job completion
 - o Paper and temporary
 - o Approved permanent tags are not to be removed.
- 2.3 Heat shrink end caps or a manufacturer approved method are to be use on all dead ended power cables.
- 2.4 All wires and cables must be protected from sharp edges by use of an approved method.
- 2.5 No damage to the **sheath of a cable**
 - o Acceptable repair procedures used.
 - o Damage to sheath involving damaged wires require the replacement of the cable.

02/06/95

(Form COECVOZB:)

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**CENTRAL OFFICE CONSTRUCTION
EQUIPMENT CHECK AND VERIFICATION
CABLES AND WIRE**

ITEMS TO BE CHECKED AND VERIFIED	CHECKED initial/Date	VERIFIED Initial/Date
3. Labeling		
3.1 DC power cables labeled <ul style="list-style-type: none"> o Positive and negative cables identified for source of distribution and usage on equipment end. o Positive cables labeled at distribution point to reflect paired negative cable assignment. (i.e. panel A fuse 1) 		
3.2 Ground cables labeled on both ends <ul style="list-style-type: none"> o Indicate GTE lead number per 795-805-071 assignments. o Lead names and usage when more than one run with the same number. 	_____	
4. CABLE RUNNING		
4.1 Routing and placement <ul style="list-style-type: none"> o No cable sag below the runway or grid o Contained within the confines of the runway o Slack evenly distributed not blocking future work 		
4.2 Zoning of cable maintained with correct separations <ul style="list-style-type: none"> o DC Power (min. 3 inches from all other cables) o Ground cable restrictions met o AC Power (min. 3 inches from all other cables) o Switch manufacturers separation requirements maintained. 	_____	
4.3 Switchboard cable radius maintained (minimum) <ul style="list-style-type: none"> o 6 in. for coaxial cables and over 102 conductors o 3 in. for cables between 50 and 102 conductors o 1 in. for cables between 8 and 50 conductors. o Fiber optic cables - 10 times the cable diameter 	_____	

Exhibit 2 - CO Construction Equipment Check Verification Forms (COECV02A-G) (Page 5 of 31)

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(Form COECVO2B)

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**CENTRAL OFFICE CONSTRUCTION
EQUIPMENT CHECK AND VERIFICATION
CABLES AND WIRE**

ITEMS TO BE CHECKED AND VERIFIED

CHECKED

VERIFIED

Initial/Date

Initial/Date

4- CABLE RUNNING (continued)

4.4 Power cable minimum radius maintained

- o 16AWG 1/8 in. radius
- o 14AWG 1/4 in. radius
- o 12-10 AWG 1/2 in. radius
- o 8-4AWG 1 in. radius
- o 2-1/0 AWG 1-1/2 in. radius
- o 2/0-4/0 AWG 3-1/2 in. radius
- o 25oMCM 4-1/2 in. radius
- o 350-500 MCM 5 in. radius
- o 600-750 MCM 7 in. radius

4.5 Ground cable should be run straight and directly to the point of connections. When bends cannot be avoided then the following radius must be maintained

- o 6AWG 6 in. minimum radius
- o 4/0AWG 12 in. minimum radius
- o Greater than 4/0 24 in. minimum radius

4.6 DC power cable polarity control maintained except where specified by manufacturers on equipment feeders.

5- SECURING

5.1 Secure cables to a cable bracket before entering equipment frames.

5.2 Vertical cables run between floors are sewn on every strap.

- o No cable ties

NOTE: Switchboard cable entering equipment or distribution frames must be secured within three feet of leaving the cable rack.

- o All cable types running between floors must be sewn no less than every foot.

5.3 Horizontally run cables and wires should be adequately supported

- o All cables types are to be supported to prevent sag and potential of cable damage.

Exhibit 2 - CO Construction Equipment Check Verification Forms (COECV02A-G) (Page 6 of 31)

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(Form COECV02B)

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**CENTRAL OFFICE CONSTRUCTION
EQUIPMENT CHECK AND VERIFICATION
CABLES AND WIRE**

ITEMS TO BE CHECKED AND VERIFIED

CHECKED VERIFIED
Initial/Date initial/Date

5- SECURING (continued)

5.4 Cables should be secured to keep weight off PWCs

5.5 Loose wires are to be secured separate from sheath type cables and power cables with either cable ties or twine.

- o Loosely as not to form an indentation on the wires
- o Ties should be loose enough to allow movement of the tie.

5.6 DC Power cables and ground cables must be secured:

- o With lacing twine on vertical runs and drop offs.
- o With cable ties or stitching on horizontal runs except at break offs and at corners.
 - Sew cables two straps before and after the bends and throughout the break off.
- o To allow for maintaining polarity for DC power cables
- o Within 36 inches of break off from the cable rack or conduit when going to a connection point.

5.7 Distribution frame cables are to be secured to allow OSP cable entrance.

- o No intermixing of switchboard cables and OSP cables.

5.0 Transmission and Fiber cables must not be secured tightly.

- o An indentation to the cable is not acceptable

6. BUTT, STRIP, AND FAN WIRES, SWITCHBOARD TYPE CABLES, AND HIGH FREQUENCY TYPE CABLES

6.1 Cables requiring butting:

- o Butted 1 inch after securing point
- o No cut wires
- o Binder materials will be trimmed

6.2 Wires will be fanned to the bottom or right of the pin to be connected.

6.3 Maintenance loops are formed and maintained.

6.4 Heat shrink or gray tape is applied at the butt of high frequency cables.

02/06/95		(Form COECV02B Page 5 of 7)
<p>CENTRAL OFFICE CONSTRUCTION EQUIPMENT CHECK AND VERIFICATION CABLES AND WIRE</p>		
ITEMS TO BE CHECKED AND VERIFIED	CHECKED Initial/Date	VERIFIED Initial/Date
7- TERMINATING SWITCHBOARD TYPE CABLES		
<p>7.1 Screw type wire connections must have insulated spade type connectors.</p>		
<p>7.2 Plug ended cables (amp, cinch, piggyback, etc.) must be properly connected.</p> <ul style="list-style-type: none"> o Screws, dips, cable ties, etc. (as per approved application). o Cinch type connectors require a moderate tug to assure fastening. 		
<p>7.3 Wire wrap connections are correctly made.</p> <ul style="list-style-type: none"> o Proper number of wraps <ul style="list-style-type: none"> - 22AWG 5 turns - 24AWG 6 turns - 26-28AWG 7 turns o 18 AWG or larger must be soldered o No open spiral, straddled, shiner, or bunched connections 		
<p>7.4 Manual wrap connections</p> <ul style="list-style-type: none"> o Smooth continuous wraps with less than 1/8 inch shiner. o Soldered 		
<p>7.5 Spare and unused wires are to be bundled/contained with no protruding ends.</p> <ul style="list-style-type: none"> o Spare leads should be identified to indicate future use. 		

Exhibit 2 - CO Construction Equipment Check Verification Forms (COECV02A-G) (Page 8 of 31)

02/06/95		(Form COECV02B)
		Page 6 of 7
CENTRAL OFFICE CONSTRUCTION EQUIPMENT CHECK AND VERIFICATION CABLES AND WIRE		
ITEMS TO BE CHECKED AND VERIFIED	CHECKED	VERIFIED
	Initial/Date	Initial/Date
8 JUMPERS AND MISCELLANEOUS WIRES		
8.1 Jumpers require slack		
0 Standard frame 5 inches		
0 Modular frame 1 O-I 3 inches		
8.2 Miscellaneous wires should have:		
0 a five inch maintenance loop		
0 all wires contained		
a.3 Special circuits identified with protector guards and/or terminal guards.		
8.4 Fiber jumpers require special protection to prevent damage.		
9- BUTTING AND TERMINATING POWER and GROUND CABLES		
9.1 Cables are to be butted to the correct length:		
o Cable must be viewed in the terminal connector and seated at the base.		
o No more than 1/8 inch wire exposed beyond the end of the compression lug or splice.		
- Heat shrink or linerless tape must be used if greater than 1/8 inch.		
9.2 Compression connectors and splices must be used.		
NOTE: Where a mechanical connector is provided by an equipment manufacture and a compression connector can be substitute, then the compression connector is to be used. No internal modifications are to be performed to change out a mechanical connector.		

Exhibit 2 - CO Construction Equipment Check Verification Forms (COECV02A-G) (Page 9 of 31)

Exhibits, continued

02/06/95		(Form COECV02B) Page 7 of 7
<p>CENTRAL OFFICE CONSTRUCTION EQUIPMENT CHECK AND VERIFICATION CABLES AND WIRE</p>		
ITEMS TO BE CHECKED AND VERIFIED	CHECKED Initial/Date	VERIFIED. Initial/Date
<p>9. BUTTING AND TERMINATING POWER and GROUND CABLES (continued)</p>		
<p>9.3 Connections made to positive battery or ground bars are to be two hole short or long barrel.</p>		_____
<p>9.4 Heat shrink or linerless tape must be used on negative battery lugs where the potential of short circuit exist. (rule of thumb is 1/2 inch)</p>		_____
<p>9.5 Compression lugs are to be placed on power board connector studs to allow for an additional lug and nut. o Allow connection of a jumper cable in the event maintenance of the housing and fuse is needed.</p>		_____
<p>9.6 All power and ground terminations are torqued to specified values.</p>		_____ _____

Exhibit 2 - CO Construction Equipment Check Verification Forms (COECV02A-G) (Page 10 of 31)

03/02/95		(Form COECV02C) Page 1 of 6
<p>CENTRAL OFFICE CONSTRUCTION EQUIPMENT CHECK AND VERIFICATION POWER INSTALLATION</p>		
ITEMS TO BE CHECKED AND VERIFIED	CHECKED Initial/Date	VERIFIED Initial/Date
1 CONFIGURATION AND DOCUMENTATION		
<p>1.1 All power frames/relay racks and equipment is located per the engineered specifications and job drawings.</p> <ul style="list-style-type: none"> o Changes must be reflected on appropriate documents. <p>1.2 Battery records complete on form 90002546 or equivalent</p> <ul style="list-style-type: none"> o Initial readings upon battery receipt <ul style="list-style-type: none"> - Specific gravity - Voltage 0 Interconnecting Strap readings o Water added o Charge cycles o Readings of total battery strings <p>NOTE: See battery manufacturers documentation and GTE practice for required readings.</p>	<p>_____</p> <p>_____</p>	
2 SAFETY		
<p>2.1 Power room safety board installed with all required items.</p> <ul style="list-style-type: none"> o Neutralizing solution o Rubber gloves 0 Protective Aprons o Goggles o Baking soda <p>Note: Emergency spill kits must be available on site while handling Flooded Cell batteries.</p>	<p>_____</p> <p>_____</p>	
3 NOISE READINGS		
<p>3.1 Office battery noise readings are recorded on form 90002546 or equivalent and are within limits.</p> <ul style="list-style-type: none"> o Max. limits: +/- 24VDC +48VDC = 32 DBRNC o +/- 130VDC = 47 DBRNC 	<p>_____</p>	

Exhibit 2 - CO Construction Equipment Check Verification Forms (COECV02A-G) (Page 11 of 31)

Exhibits, continued

03/02/95

(Form COECV02C)
Page 2 of 6

**CENTRAL OFFICE CONSTRUCTION
EQUIPMENT CHECK AND VERIFICATION
POWER INSTALLATION**

ITEMS TO BE CHECKED AND VERIFIED

CHECKED VERIFIED
Initial/Date Initial/Date

1 LABELING

- | | | | |
|-----|---|-------|-------|
| 4.1 | Batteries are labeled to reflect:
o Cell position number
o Cell polarity
o Installation date and initial charge date | | |
| 4.2 | Power equipment frames/racks are labeled to reflect office layout identification. | _____ | _____ |
| 4.3 | All office dependent power and alarm values are labeled:
o Controller equipped offices
- All alarm and control values are to be labeled on the controller.
- Rectifier charge values listed on controller
o Non-Controller equipped offices
- All rectifier charge values listed on #1 rectifier
- Alarm information listed on Power distribution monitor panel | _____ | _____ |
| 4.4 | Meters have check stickers indicating calibration check. | _____ | _____ |
| 4.5 | All fuses, fuse housings, and breakers are labeled indicating destination, usage and rating. | _____ | _____ |
| 4.6 | Unused wired fused positions must be marked reflecting spare or future. | _____ | _____ |
| 4.7 | Splice bars labeled to indicate polarity | _____ | _____ |
| 4.6 | AC must be labeled to indicate its power source and usage
o receptacles and lights are to be labeled to indicate the power source.
o Power panels must be labeled to indicate the load location. | _____ | _____ |

Exhibit 2 - CO Construction Equipment Check Verification Forms (COECV02A-G) (Page 12 of 31)

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(Form COECV02C)
Page 3 of 6

**CENTRAL OFFICE CONSTRUCTION
EQUIPMENT CHECK AND VERIFICATION
POWER INSTALLATION**

ITEMS TO BE CHECKED AND VERIFIED

**CHECKED VERIFIED
Initial/Date Initial/Date**

5 EQUIPMENT INSTALLATION

NOTE: EA: indicates standard applies to Earthquake Areas only.
NEA: Indicates standard applies to Non-Earthquake areas only.

- 5.1 Power distribution frames and other power equipment related relay racks mounted to the floor:**
- o Double sided tape (check procedure for thickness) - NEA
 - o Red-head or equivalent floor anchors (Min of two per frame) - NEA
 - o Require isolation if mounted within transmission or switching equipment areas.
 - o M12 or larger floor anchors in all holes - EA

- 5.2 Battery racks**
- o Minimum red head or equivalent per battery rack manufacturers recommendations. - NEA
 - o No double sided tape
 - o M12 or larger floor anchors in all holes. - EA

- 5.3 Equipment mounting**
- o Standard mounting hardware.
 - o Isolation materials can be nylon unless weight is an issue then steel core hardware is required. - NEA
 - o Steel core isolation materials where isolation is required - EA

Exhibit 2 - CO Construction Equipment Check Verification Forms (COECV02A-G) (Page 13 of 31)

03/02/95		(Form COECVO2C) Page 4 of 6
CENTRAL OFFICE CONSTRUCTION EQUIPMENT CHECK AND VERIFICATION POWER INSTALLATION		
ITEMS TO BE CHECKED AND VERIFIED	CHECKED Initial/Date	VERIFIED Initial/Date
6. BATTERY INSTALLATION		
6.1 Appropriate battery tests have been completed and documented.		
6.2 Inter-connecting straps and terminals		
o Clean with no signs of being scrubbed v@h steel wool or wire brush.		
o Moderately coated at contact points with "No Oxide Grease"		
o Torqued to manufacturer's specifications.		
o Torqued two times at "initial" torque values		
- Second torque is 24 hours or later from the first torque.		
6.3 Thermometer in the pilot cell.		
6.4 Electrolyte level within acceptable range		
7.0 RECTIFIERS, CONTROLLERS, AND MONITORING UNITS		
7.1 Correctly installed with appropriate hardware.		
7.2 Rectifiers are load sharing/balancing within acceptable limits		
7.3 Controllers are adjusted to meet office specific values based on charge rates.		
7.4 Monitoring units are programmed to office specific values based on charge rates.		
7.5 Alarms have been tested to specified demarcation point:		
o Final test is functional to the NOC center, office print outs, and to the host office when a remote.		
o recorded on daily log (functional alarm test Jog)		
7.6 All visual alarm indicators function properly.		

Exhibit 2 - CO Construction Equipment Check Verification Forms (COECV02A-G) (Page 14 of 31)

03/02/95		(Form COECV02C) Page 5 of 6
<p>CENTRAL OFFICE CONSTRUCTION EQUIPMENT CHECK AND VERIFICATION POWER INSTALLATION</p>		
<p>ITEMS TO BE CHECKED AND VERIFIED</p>	<p>CHECKED</p>	<p>VERIFIED</p>
	<p>Initial/Date</p>	<p>Initial/Date</p>
<p>B BUSS BARS AND SPLICE BARS</p>		
8.1	Buss bars are correctly erected, prepared, bent, spaced, and supported with correct hardware.	_____
8.2	Joints and connections are moderately coated with appropriate electrical joint compound.	_____
8.3	All connections are torqued .	_____
<p>9 DISTRIBUTION EQUIPMENT</p>		
9.1	All fuse studs and screws are torqued.	_____
9.2	Fuse dips and switch connections are aligned and tight.	_____
9.3	Fuses are correct size and assigned correctly.	_____
9.4	Spare fuses are readily available.	_____
<p>10 INVERTERS</p>		
10.1	Proper output voltages	_____
10.2	<p>AC free environment maintained within IGZ.</p> <p>0 Sometimes requires special strapping to assure continuity of AC Common lead when designed for AC back up and not used.</p>	_____
10.3	When mounting inverters in relay racks within an IGZ isolation hardware is required.	_____

Exhibit 2 - CO Construction Equipment Check Verification Forms (COECV02A-G) (Page 15 of 31)

03/02/95		(Form COECV02C:) Page 6 of 6
<p>CENTRAL OFFICE CONSTRUCTION EQUIPMENT CHECK AND VERIFICATION POWER INSTALLATION</p>		
ITEMS TO BE CHECKED AND-VERIFIED	CHECKED Initial/Date	VERIFIED Initial/Date
11 ACPOWER		
11.1	Lights, receptacles, and switches are mounted using correct hardware and support.	_____
11.2	Receptacles tested for polarity.	_____
11.3	All light fixtures illuminate and can be controlled by light switches.	_____
11.4	Correct number of wires per circuit. Common neutral between circuits can only be used for phase wiring.	_____
11.5	Use of non-metallic conduit and boxes used to maintain single point grounding and isolated power requirements. NOTE: Metal conduit can be used as long as single point grounding and isolated power requirements are met. This usually requires special isolation materials.	_____
11.6	All AC wiring requires the use of a green wire ground. The metallic connection of conduits and boxes is considered secondary to GTE specifications.	_____
11.7	Lights require a green wire ground to the fixture and the ballast must be deliberately grounded to the green wire or fixture.	_____
11.8	Low voltage (24-V) and high voltage (120+ v) are not in the same conduit.	_____
11.9	Low voltage wire is shielded and grounded at the control relay and transformer end. The transformer should be external to the switch.	_____

Exhibit 2 - CO Construction Equipment Check Verification Forms (COECV02A-G) (Page 16 of 31)

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(Form COECV02D)
Page 1 of 2

**CENTRAL OFFICE CONSTRUCTION
EQUIPMENT CHECK AND VERIFICATION
SAFETY AND HOUSEKEEPING**

ITEMS TO BE CHECKED AND VERIFIED	CHECKED Initial/Date	VERIFIED Initial/Date
I- CONFIGURATION AND DOCUMENTATION		
1.1 Job drawings, specifications and similar items (combustible materials) stored in metal file cabinets when not in use.	_____	_____
2- SAFETY		
2.1 Installation equipment/materials/hazards are marked to prevent accidents and allow easy access to exits. Tiger tape, safety cones, rope used as barriers when necessary.	_____	_____
2.2 Storage of equipment <ul style="list-style-type: none"> o Combustible materials must be covered with an approved flame retardant or waterproof tarpaulin. o Empty packing containers are removed from switchroom daily. o Paints solvents and cleaning agents are stored in approved containers and locations. 	_____	_____
2.3 Spare card cabinets are secured to the walls in earthquake areas. <ul style="list-style-type: none"> o Correct fasteners are used based on wall composition. o Anchors must be placed at wall stud locations, brick/cinder block grout seams. 	_____	_____
2.4 All necessary caution signs installed for site and equipment_	_____	_____
2.5 "A" type ladders adjusted to prevent movement while occupied.	_____	_____
2.6 Cable openings are properly closed. <ul style="list-style-type: none"> o Must be dosed at the end of the work shift and at completion of cable running. 	_____	_____

Exhibit 2 - CO Construction Equipment Check Verification Forms (COECV02A-G) (Page 17 of 31)

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Page 2 of 2	
CENTRAL OFFICE CONSTRUCTION EQUIPMENT CHECK AND VERIFICATION SAFETY AND HOUSEKEEPING	
ITEMS TO BE CHECKED AND VERIFIED	CHECKED VERIFIED Initial/Date Initial/Date
3. HOUSEKEEPING	
3.1 Work areas are dean and free of installation debris, tools and equipment.	_____
3.2 Fire extinguishers are not obstructed.	_____
3.3 No floor tiles damaged or anchors protruding. o Floors are to be protected from damage when moving or storing equipment/materials	_____
3.4 Cable rack/grid free of all foreignmaterial	_____

Exhibit 2 - CO Construction Equipment Check Verification Forms (COECV02A-G) (Page 18 of 31)

Exhibits, continued

02/06/95

(Form COCOECV02E)

**CENTRAL OFFICE INSTRUCTION
EQUIPMENT CHECK AND VERIFICATION
EQUIPMENT ERECTING
INCLUDING MXU PAD/HUT AND OTHER REMOTE FACILITIES**

ITEMS TO BE CHECKED AND VERIFIED

**CHECKED VERIFIED
Initial/Date Initial/Date**

I- CONFIGURATION AND DOCUMENTATION

- 1.1 All equipment frames, distribution frame, and equipment are located per the engineered specifications and job drawings.
 - o Changes must be reflected on appropriate documents.
- 1.2 All equipment must be bar coded to GTE specifications.
- 1.3 Correct quantity of spares and a log listing the spares is to be provided.
- 1.4 All equipment functional tests have been performed.
 - o Documentation supporting the test performed and results are required.
- 1.5 All alarms have been tested and are functional
 - o Alarms must function to the NOC.
 - o Documentation supporting alarm testing and results are required.
- 1.6 Designation and circuit documentation has been completed and properly mounted.
 - o Transmission equipment
 - o Older technology equipment

Exhibit 2 - CO Construction Equipment Check Verification Forms (COECV02A-G) (Page 19 of 31)

Exhibits, continued

02/06/95		(Form COECV02E) Page 2 of 6
<p>CENTRAL OFFICE CONSTRUCTION EQUIPMENT CHECK AND VERIFICATION EQUIPMENT ERECTING INCLUDING MXU PAD/HUT AND OTHER REMOTE FACILITIES</p>		
ITEMS TO BE CHECKED AND VERIFIED		CHECKED VERIFIED Initial/Date Initial/Date
2- MISCELLANEOUS REQUIREMENTS		
<p>2.1 All scratches or bare metal must be touched with paint. o Cut bolts and iron must be filed and touched up.</p>		_____
<p>2.2 Equipment, terminal blocks, protectors, etc. must be protected with guard rails. o Extending guard rails may be necessary if new equipment is installed in an existing frames.</p>		_____
<p>2.3 Special safeguard marking/labeling is required on special service equipment, circuits, and terminal blocks.</p>		_____
<p>2.4 Labeling of equipment, shelves, repeaters, span lines, and cross-connect panels is complete. o Refer to appropriate GTE practice and manufacturer documentation.</p>		_____
<p>2.5 Frame and relay rack powering has been completed per work order specifications and GTE/manufacturers practices.</p>		_____
<p>2.6 Office supervisory equipment has been installed and tested when office is so equipped.</p>		_____
<p>2.7 Equipment fans must be functional o Filters are clean</p>		_____
<p>NOTE: All equipment frames, distribution frame, relay racks and equipment require grounding. These checks are covered in the grounding review section..</p>		

Exhibit 2 - CO Construction Equipment Check Verification Forms (COECV02A-G) (Page 20 of 31)

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(Form COECV02E)

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**CENTRAL OFFICE CONSTRUCTION
EQUIPMENT CHECK AND VERIFICATION
EQUIPMENT ERECTING
INCLUDING MXU PAD/HUT AND OTHER REMOTE FACILITIES**

ITEMS TO BE CHECKED AND VERIFIED

CHECKED VERIFIED
initial/Date Initial/Date

3- DISTRIBUTING FRAMES

- 3.1 Assembly is complete and hardware is tight.
 - o Proper alignment and junction materials
 - o Special mounting materials may be required

- 3.2 Frame designation labels have been correctly placed.
 - o Name of the frame (i.e.. CDF-1)
 - o Vertical and Horizontal labels
 - o Modular designation requirements met.

- 3.3 Terminal blocks mounted in correct locations with correct hardware and hardware is tight.
 - o Work order specifications and frame layout drawings.

- 3.4 Terminal blocks are labeled and include manufacture decals where applicable.
 - o Per frame layout drawing
 - o Pins marked to prevent possible wiring errors
 - At least every 5th circuit

- 3.5 Protectors are mounted in correct locations with correct hardware and hardware is tight.
 - o Some protectors require special mounting brackets to adapt to the frame configuration.

- 3.6 Correct protector modules have been installed in all positions.

Exhibit 2 - CO Construction Equipment Check Verification Forms (COECV02A-G) (Page 21 of 31)

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(Form COECV02E)

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**CENTRAL OFFICE CONSTRUCTION
EQUIPMENT CHECK AND VERIFICATION
EQUIPMENT ERECTING
INCLUDING MXU PAD/HUT AND OTHER REMOTE FACILITIES**

ITEMS TO BE CHECKED AND VERIFIED

**CHECKED VERIFIED
Initial/Date Initial/Date**

4 EQUIPMENT FRAMES AND RELAY RACKS

- 4.1 Correct hardware has been used for fastening the frames/relay racks to the floor and superstructure.
- o Double **sided tape can be used** in non-earthquake areas.
 - o Redhead or equivalent floor anchors (minimum of two per frame) or double sided tape.
 - o M12 or larger floor anchor in all mounting holes in **earthquake zones.**

NOTE: Refer to manufacturers documentation for instructions on size, location, and quantities of floor anchors required in earthquake areas.

- 4.2 All equipment frames and relay racks require isolation hardware.
- o Between the floor and base
 - o Between the top Of the frame and supporting superstructure
 - o Between frames when differences in isolated and integrated power exist.

- 4.3 Equipment frames and relay racks are to be labeled on both front and rear. End panels are to be labeled to reflect frames in lineup.

- 4.4 Guard rails, end panels, doors, door stops, guides, and cable management hardware are correctly installed and adjusted when required.

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(Form COECV02E)

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**CENTRAL OFFICE CONSTRUCTION
EQUIPMENT CHECK AND VERIFICATION
EQUIPMENT ERECTING
INCLUDING MXU PAD/HUT AND OTHER REMOTE FACILITIES**

ITEMS TO BE CHECKED AND VERIFIED

**CHECKED VERIFIED
Initial/Date Initial/Date**

5. EQUIPMENT MOUNTING

- 5.1 Equipment shelves mounted with correct hardware and **hardware** is tight.
 - o Isolation materials are required when equipment will violate single point grounding requirements.
 - Isolation materials can be nylon unless weight is an issue then steel core hardware is required.
 - Steel Cole isolation materials are required in earthquake zones where isolation is needed.

- 5.2 Correct size fuses have been installed and labeled per appropriate fuse location drawing.
 - o All wired fuse positions installed require either **a fuse, or blank fuse.**

- 5.3 **Circuit number and/or** model designation for **PWCs have been labeled and are at the correct release** level.
 - o Must be on the PWC's
 - o On the designation strip.

NOTE: Reference "Configuration Management" document or equivalent to assure the minimum workable **issues are installed per the site release level.**

- 5.4 **Card locks & restraints are installed and functional**
 - o **Manufacturers requirements are to be met to assure proper locking of PWC's**

- 5.5 **Backplane** protection has been properly installed where required.

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(Form COECV02E)

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**CENTRAL OFFICE CONSTRUCTION
EQUIPMENT CHECK AND VERIFICATION
EQUIPMENT ERECTING
INCLUDING MXU PAD/HUT AND OTHER REMOTE FACILITIES**

ITEMS TO BE CHECKED AND VERIFIED	CHECKED VERIFIED Initial/Date Initial/Date
5- ROLLING LADDERS AND LADDER TRACK	
6.1 Ladder track installation <ul style="list-style-type: none"> o Properly installed, straight, and creep/stop bolts are installed. o Track does not extend more than 3 feet past the last hanger bracket. o Ladders move without binding. 	<hr style="border: 0.5px solid black;"/>
6.2 Rolling ladders <ul style="list-style-type: none"> o Slopes in the correct direction. o Handrails are mounted away from the equipment o Look before moving signs installed o Brakes function correctly when equipped. o Steps are grooved or have abrasive surface. 	<hr style="border: 0.5px solid black;"/>
7. MXU PAD/HUT AND OTHER REMOTE FACILITIES SPECIFICS	
7.1 MXU pad/hut cooling fans are operational.	<hr style="border: 0.5px solid black;"/>
7.2 Required line(s) had a ring, talk and busy test completed on	<hr style="border: 0.5px solid black;"/>
7.3 The order wire, when required, is operational.	<hr style="border: 0.5px solid black;"/>
7.4 All alarms have been checked and are functional.	<hr style="border: 0.5px solid black;"/>
7.5 Emergency generator operation available and functional.	<hr style="border: 0.5px solid black;"/>
7.6 Associated cabinet/hut, cross-connect boxes, and AC disconnect boxes have the proper locks.	<hr style="border: 0.5px solid black;"/>
7.7 Doors, vents, conduit holes, etc., are properly sealed from the elements.	<hr style="border: 0.5px solid black;"/>
7.8 Silicon seal exists between MXU cabinet and pad.	<hr style="border: 0.5px solid black;"/>
7.9 Correct size and clean air filters exist.	<hr style="border: 0.5px solid black;"/>
7.10 Cabinet is marked to identify the MXU site.	<hr style="border: 0.5px solid black;"/>

Exhibit 2 - CO Construction Equipment Check Verification Forms (COECV02A-G) (Page 24 of 31)

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(Form COECV02F)
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**CENTRAL OFFICE CONSTRUCTION
EQUIPMENT CHECK AND VERIFICATION
ADMINISTRATION**

ITEMS TO BE CHECKED AND VERIFIED

**CHECKED VERIFIED
Initial/Date Initial/Date**

1 - CONFIGURATION AND DOCUMENTATION

1.1 Proper filing provisions are used for drawings, Telops Practices, and manuals.

1.2 All current issue prints/documents required to install and maintain equipment on this work order are on-site at the completion of the job (Remote locations may have stored/maintained at base unit) including:

- o Telops Practices per Documentation Plan Practice in 792 spec.
- o Updated copies of all:
 - Specifications
 - Job drawings
 - Users Guide/Administrative Maintenance Documentation
 - Manufacturer's manuals/Practices/Bulletins
 - Circuit drawings (H, FB, etc.)
 - Circuit explanations (E, FE, etc.)
 - Engineering configuration drawings (ECDs,etc.)
 - Hardware drawings and equipment locations (ELs,etc.)

1.3 All job drawings, specifications or equipment layout changes must be concurred by GTE Engineering, two copies red lined, one returned to Engineering via OPCEN, and one maintained on site to reflect office configuration. GTEP 220-001-001.

1.4 All changes requiring additional work, material and/or cost of quality impacts must be documented and sent to engineering via the Job Information Memorandum (JIM),

Exhibit 2 - CO Construction Equipment Check Verification Forms (COECV02A-G) (Page 25 of 31)

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(Form COECV02F)
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**CENTRAL OFFICE CONSTRUCTION
EQUIPMENT CHECK AND VERIFICATION
ADMINISTRATION**

ITEMS TO BE CHECKED AND VERIFIED

CHECKED **VERIFIED**
Initial/Date Initial/Date

2 TEST AND VERIFICATION

2.1 Test equipment must be marked as being calibrated.

- 2.2 Site generic data base tape loaded and available:
- o Verify System Software tape is on site and properly identified.
 - o Verify that systems backup tapes are being created and rotated.
 - o Verify tape storage and tap availability, (Le., Certified Billing tapes and Systems Dump tapes).

2.3 Successful load volume tests/quiescent 24-hour TLS has been completed and documented results verified (when required).

2.4 All required test have been completed and supporting documentation is available.

3- FORMS

3.1 Manufacturer's Functional Test/System Version Test Plan has been completed, verified and documented.

3.2 Office ground inspection form covered in 795-805-074 has been completed for COE Construction identified items. This also includes huts, MXUs and Remote Switching Unit

3.3 Site specific test and verification records complete.

3.4 Check and verification forms are being utilized on "ALL" work orders. Also, vendor acceptance forms where applicable.

- 3.5 Sites Daily logs initiated on forms provided by Switching Services:
- o PWC repair log and/or spare inventory control record (90003098/90003099 or similar) being used and available.
 - o Daily, SVR, Patch, etc. available and used as required

Exhibit 2 - CO Construction Equipment Check Verification Forms (COECV02A-G) (Page 26 of 31)

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(Form COECV02G)

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**CENTRAL OFFICE CONSTRUCTION
EQUIPMENT CHECK AND VERIFICATION
GROUNDING, ISOLATION, AND PROTECTION**

ITEMS TO BE CHECKED AND VERIFIED

CHECKED VERIFIED
Initial/Date Initial/Date

I- CONFIGURATION AND DOCUMENTATION

1.1 Master Ground Bar lead connections must be recorded according to practice 795-805-074.

1.2 Any changes or deviations to the work order specifications or General System Practice series 795-805-XXX must be approved in writing by Regional T&P Administrator or HQ Grounding and Protection Administrator.

2- MISCELLANEOUS REQUIREMENTS

2.1 If the Master/Floor ground is isolated from the mounting surface the bar must be zoned.

2.2 Two-hole compression lugs, proper hardware and NO-OX type grease or similar on all ground connections (one-hole type are only acceptable if the termination point will not accept a two hole lug).
 o All connections must be deliberate.
 - Paint removed and screws used
 - Star washers
 - Ground straps

2.3 No current should be read at ground bars on isolated zoned cables (i. e. lead 41).

2.4 Spare card cabinet and work bench where static sensitive circuits might be stored or handled are grounded properly (Lead 54). Use No. 6 AWG insulated copper wire and compression lug.
 o If surface is painted, be sure paint was scraped off under lug.
 o Proper size lug used.
 o No multiples between cabinets.

2.5 Shielded cable is to grounded on equipment end only (i.e., CXR, DTUF) unless specified for a particular cable run.

2.6 All ground cable connections must be torqued

Exhibit 2 - CO Construction Equipment Check Verification Forms (COECV02A-G) (Page 27 of 31)

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**CENTRAL OFFICE CONSTRUCTION
EQUIPMENT CHECK AND VERIFICATION
GROUNDING, ISOLATION, AND PROTECTION**

ITEMS TO BE CHECKED AND VERIFIED

CHECKED **VERIFIED**
Initial/Date Initial/Date

2- MISCELLANEOUS REQUIREMENTS (continued)

- 2.7** Use of metallic and/or nonmetallic conduit:
- o Run grounds in non-metallic conduit.
 - Do not encircle with metal clamps or run through metal walls, metal plates, short sections of metal conduit.
 - o With the use of PVC conduit, any break of metallic conduit from the circuit box to the circuit requires a green wire ground to any downstream metal raceway/conduit and the AC system apparatus.

Note: If metallic outlets or conduit is used, they must be isolated from the equipment and equipment frame ironwork.

- 2.8** Ground lead 30 must be connected to light fixtures.
- o Painted lights require lead 30 to connect to each light fixture. Non-painted lights can have lead 30 to the first light and the fixture acting as an extension of lead 30 to the others.

3. LABELING

- 3.1** All ground cables must be labeled to reflect usage.
- o At **MGB**, and **FGB**
 - o On both ends of the cables.

- 3.2** Ground bars must be labeled to reflect usage (i.e. **MGB**, **FGB**, **CVGB**)

- 3.3** Zoned ground bars must be labeled to reflect zone split and name of zones.

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CENTRAL OFFICE CONSTRUCTION EQUIPMENT CHECK AND VERIFICATION GROUNDING, ISOLATION, AND PROTECTION

ITEMS TO BE CHECKED AND VERIFIED

CHECKED VERIFIED
Initial/Date Initial/Date

4- DISTRIBUTION FRAMES (CDF, MDF AND CXF)

- 4.1 CDF/MDF protector ground bar should not be isolated (unless "grandfathered" under old scheme).

Note: If existing office has protectors and ground bar isolated, follow existing pattern Do not mix methods.

- 4.2 Protector frame - (i.e., CDF, MDF) ground lead 23 to MGB/FGB:
- o Where the ground bar exceeds 8.5 feet, a minimum of two leads are required.
 - o Every 17 feet on frame ground bar and so that no protector vertical is more than 8.5 feet from any lead 23.
 - o **Use No. 1 AWG** insulated copper wire
 - o Never route below superstructure or within 3 feet of processor/memory frames.
 - o Maintain at least 1 foot separation from all cables once leaving **distribution frame**.
 - o **Modular frames require a lead 23 at each OSP modular section.** (see manufacture recommendations for grounding recommendations).

- 4.3 **Protectors** are not isolated (unless "grandfathered" under old scheme) and properly grounded. Note correct assembly of ground straps,
- o Straps between protectors (Lead 24A) are secured tightly (Factory straps of No. 6 AWG insulated copper wire).
 - o The lowest protector on vertical, is strapped (Lead 24) to distributing frame ground bar.

- 4.4 Carrier/Transmission Frame (CXF)
- o Carrier/transmission HF line protector.
 - Grounded via lead 23A to the master or floor ground bat.
 - o Protectors must be isolated from the frame.
 - o Ground bar (if provided) must be isolated from the frame.

Exhibit 2 - CO Construction Equipment Check Verification Forms (COECV02A-G) (Page 29 of 31)

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**CENTRAL OFFICE CONSTRUCTION
EQUIPMENT CHECK AND VERIFICATION
GROUNDING, ISOLATION, AND PROTECTION**

ITEMS TO BE CHECKED AND VERIFIED

CHECKED **VERIFIED**
INITIAL/DATE **INITIAL/DATE**

5- EQUIPMENT FRAMES

5.1 Equipment frames must be isolated from floor, superstructure, and all other ground sources.

5.2 Equipment frames are properly grounded (Leads 41,41A,47-50,58,58A,59,59A)
o Leads 59 & **59A** are not to exceed 5 feet.

5.3 Miscellaneous equipment shelves are grounded properly (channel banks, DSX panels, ringing machines, recorder announcer, etc.):
o Ground lead size must be equal to or larger than the power input wire gauge.
o Manufacturer's specifications and/or Engineer's specifications must be followed.
o Chassis ground connected on miscellaneous equipment mounted within digital and **analog switching systems**.
o All shelves with power require a deliberate ground source on the **chassis**.

6- POWER EQUIPMENT

6.1 Power Complex Grounds:
o Master Ground **Bar (MGB)** cable (Lead 31) No. 2/0 AWG insulated copper wire should connect to all Power Equipment frames **via** Leads 32-36 using No. 6 AWG insulated copper wire:
- **Battery rack ground lead 33.**
- PCU/PDU leads 34-36.

6.2 + Battery terminal or splice bar ground to MGB lead 37, 2/0 AWG.

Exhibit 2 - CO Construction Equipment Check Verification Forms (COECV02A-G) (Page 30 of 31)

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**CENTRAL OFFICE CONSTRUCTION
EQUIPMENT CHECK AND VERIFICATION
GROUNDING, ISOLATION, AND PROTECTION**

ITEMS TO BE CHECKED AND VERIFIED

**CHECKED VERIFIED
Initial/Date Initial/Date**

6. POWER EQUIPMENT (continued)

6.3 Charger ground (Lead 32) is properly terminated:
 o Is a compression fitting,
 o Terminates to same place as charger frame ground Lead 29. Leads 29 8 32 **are to** be two separate ground connectors (i.e., lead 32 at chargers can only accept single hole lug).

6.4 Inverters **are** properly grounded to ensure ground continuity to the equipment location.

6.5 Power equipment mounted within an Isolated Ground Zone requires isolation.
 - Outside of IGZ does not require isolation.

6.6 Power boards fed from a Power Control Frame (fused) requires a lead 53A from the MGB/FGB.

7. EQUIPMENT SHELVES

7.1 All equipment shelves that are not integrated in design requires a shelf ground either using a strap, star type washer, or by scraping the paint and using the mounting screw.
 o Must be a deliberate ground path.

7.2 Equipment **shelves that are integrated** in design (battery on chassis) must be mounted using isolation materials and **have its chassis connected to positive battery.**

Exhibit 2 - CO Construction Equipment Check Verification Forms (COECV02A-G) (Page 31 of 31)

Exhibits, continued

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 (Reference Practice 200-002-700)

(Form COECV03A)
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CENTRAL OFFICE CONSTRUCTION
 GENERIC FEATURE AND FUNCTIONAL
 ACCEPTANCE TEST
 BASIC SYSTEM AND BILLING

ITEMS TO BE TESTED AND CHECKED

TEST PERFORMED
 INITIAL & DATE

1- CONFIGURATION AND DOCUMENTATION

1.1 **All test** supporting documentation provided as part of Work Completion package.

2- DIALING PLAN FEATURES VERIFICATION

- 2.1 **All** NPA codes
- 2.2 All non-toll codes
- 2.3 All toll codes
- 2.4 0 +, 0- dialing
- 2.5 1X, 11X, 1XX, X11 service codes
- 2.6 International direct distance dialing (DDD) codes
- 2.7 911 dialing
- 2.8 Directory Assistance
- 2.9 Repair Calls

3- SPECIAL SYSTEM FEATURE VERIFICATION

- 3.1 **Proper access to all recorded announcements**
- 3.2 Reverting call features
- 3.3 Annoyance call and alarm facilities
- 3.4 Permanent
- 3.5 Emergency trace, hold, and printout

4- TONE LEVELS VERIFICATION

- 4.1 Dial tone levels
- 4.2 Low tone output checked
- 4.3 High tone output checked
- 4.4 Howler tone level
- 4.5 Precise tone (dial tone)
- 4.6 1000 Hz tone
- 4.7 Digitone receiver tone

**Exhibit 3 - CO Construction Generic Feature and Functional Acceptance Test Forms
 (COECV03A-D) (Page 1 of 9)**

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(Form COECVO3A)
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CENTRAL OFFICE CONSTRUCTION
GENERIC FEATURE AND FUNCTIONAL
ACCEPTANCE TEST
BASIC SYSTEM AND BILLING

ITEMS TO BE TESTED AND CHECKED

TEST PERFORMED
INITIAL & DATE

5. BILLING VERIFICATION (GTEP 209-331-000)

- 5.1 Verify **billing** plan features
 - remote polling capabilities
 - Data management transmission module or equivalent back-up operation
- 5.2 Billing mag tape sent to GTEDS for verification
- 5.3 Various lengths of time on **billing verified**
- 5.4 Each type of **toll billing call made**

6. EQUAL ACCESS

- 6.1 Verify equal access routing to interexchange carrier (IC)
 - 00 dialing
 - 1 Oxxx casual calling capabilities for each IXC
 - 1+ call from a **pre-subscribed line to IXC**
 - 1+ call from a pre-subscribed coin line to IXC

7. METERING VERIFICATION

- 7.1 Traffic data administration/trunk facility metering packages for base **units and** remotes

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8. NETWORK AND SWITCH MANAGEMENT

- 0.1 Verify network switch management is is operational

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9. LINE INSULATION TEST

- 9.1 Perform ALIT test or equivalent

--

10. CLOCK SYNCHRONIZATION TEST

--

Exhibit 3 - CO Construction Generic Feature and Functional Acceptance Test Forms
(COECVO3A-D) (Page 2 of 9)

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(Form COECV03A)
Page 3 of 3

**CENTRAL OFFICE CONSTRUCTION
GENERIC FEATURE AND FUNCTIONAL
ACCEPTANCE TEST
BASIC SYSTEM AND BILLING**

ITEMS TO BE TESTED AND CHECKED

**TEST PERFORMED
INITIAL & DATE**

II. SYSTEM POWER-UP/POWER-DOWN TEST

- 11.1 Perform data **dump/backup** (ref **GTEP 220-227-500**,
forms 90002848/49)
- 11.2 **Power down AMA billing device**
- 11.3 **Power down switching system**
- 11.4 **Restore power to switching system**
- 11.5 **Reload switching system**
- 11.6 **Power up AMA billing system**

12 Other if Required

**Exhibit 3 - CO Construction Generic Feature and Functional Acceptance Test Forms
(COECV03A-D) (Page 3 of 9)**

Exhibits, continued

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(Reference practice 200-002-700)

(Form COECV03B)

Page 1 of 2

**CENTRAL OFFICE CONSTRUCTION
GENERIC FEATURE AND FUNCTIONAL
ACCEPTANCE TEST
LINE TEST VERIFICATION**

ITEMS TO BE TESTED AND CHECKED

**TEST PERFORMED
INITIAL & DATE**

1- CONFIGURATION AND DOCUMENTATION

1.1 All test supporting documentation provided as part of Work Completion package.

2- LINE CALL THROUGH TEST (one of the following methods)

- 2.1 Originate a call from each subscriber and terminate to a test phone
- 2.2 Line verification test (LVT)

3- VERIFY THE OPERATION OF TYPES OF LINE SERVICES

- 3.1 Individual automatic number identification (ANI)
- 3.2 Operator number identification (ONI)
- 3.3 Coin telephone
- 3.4 PABX rotary line - all numbers
- 3.5 PABX auxiliary stop hunt feature
- 3.6 Non-dial line
- 3.7 Wide area telephone service (WATS)
- 3.0 Inward WATS (INWATS)
- 3.9 Teletypewriter exchange (TWX)
- 3.10 Party Marking - Two party
- 3.11 Mobile Telephone
- 3.12 Marine Radio

4- ORIGINATING CALL FEATURES

- 4.1 Denied origination
- 4.2 Temporary disconnect intercept
- 4.3 Dual tone multi-frequency (DTMF) receiving
- 4.4 Toll denial
- 4.5 Operator recall
- 4.6 Calling party disconnect

Exhibit 3 - CO Construction Generic Feature and Functional Acceptance Test Forms
(COECV03A-D) (Page 4 of 9)

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**CENTRAL OFFICE CONSTRUCTION
GENERIC FEATURE AND FUNCTIONAL
ACCEPTANCE TEST
LINE TEST VERIFICATION**

ITEMS TO BE TESTED AND CHECKED

**TEST PERFORMED
INITIAL & DATE**

5- TERMINATING CALL FEATURES

- 5.1 Denied termination
- 5.2 Ringing, scheme (as required)
- 5.3 Calling party release
- 5.4 Called party disconnected

6- CUSTOM CALLING FEATURES

- 6.1 Speed calling 8,800# test calls to all IXC's
- 6.2 Speed calling -30
- 6.3 Call waiting
- 6.4 Three-way calling
- 6.5 Call forwarding - fixed
- 6.6 Call forwarding - variable
- 6.7 Call forwarding - remote
- 6.8 Series completing

7- SPECIAL LINE FEATURES

- 7.1 Hotel/Motel message registration
- 7.2 Screened service

8. CENTREX

- 8.1 Verify feature tests per switch manufacturer practice
- 8.2 Tie line testing/call thru's

9. CUSTOM LOCAL AREA SIGNALING SERVICE (CLASS)

- 9.1 Verify feature operation per manufacturer practices
- 9.2 Class recordings

10. Other If Required

**Exhibit 3 - CO Construction Generic Feature and Functional Acceptance Test Forms
(COECV03A-D) (Page 5 of 9)**

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 [Reference Practice 200-002-700]

(Form COECV03C)
 Page 1 of 2

**CENTRAL OFFICE CONSTRUCTION
 GENERIC FEATURE AND FUNCTIONAL
 ACCEPTANCE TEST
 TRUNK SYSTEM**

ITEMS TO BE TESTED AND CHECKED

**TEST PERFORMED
 INITIAL & DATE**

I- CONFIGURATION AND DOCUMENTATION

1.1. All test supporting documentation provided as part of Work Completion package.

2- INCOMING TRUNK CALL FEATURES

- 2.1 Start dial signaling
- 2.2 Immediate dial
- 2.3 Interdigital dial
- 2.4 No dial timing (permanent sequence)
- 2.5 2/6 multi-frequency (MR) receiving
- 2.6 Sending answer supervision
- 2.7 Dial pulse receiving
- 2.6 PABX direct outward dialing (COD)
- 2.9 Hotel/Motel message registration
- 2.19 Receiving centralized automatic message accounting (CAMA)

**3. OUTGOING TRUNK CALL FEATURES
 (Testing during trunk turn up)**

- 3.1 Trunk hunting methods
- 3.2 Alternate routing
- 3.3 Response to start dial signaling
- 3.4 Dial pulse sending
- 3.5 Early outpulsing
- 3.6 2/6 multi-frequency (MF) sending
- 3.7 Sending standard centralized automatic message accounting (CAMA) format
- 3.0 Receiving answer supervision
- 3.9 Busy guard
- 3.10 Sending to automatic number announcer (ANA)
- 3.11 Sending to traffic service position system (TSPS)/(OSPS) or telephone sending desk (TSD) format
- 3.12 PABX direct inward dialing (DID)
- 3.13 High volume call (HVC) 900 NPA

**Exhibit 3 - CO Construction Generic Feature and Functional Acceptance Test Forms
 (COECV03A-D) (Page 6 of 9)**

Exhibits, continued

(Form COECV03D)
Page 2 of 2

CENTRAL OFFICE CONSTRUCTION
GENERIC FEATURE AND FUNCTIONAL
ACCEPTANCE TEST
TRUNK/SPAN TESTING

ITEMS TO BE TESTED AND CHECKED

TEST PERFORMED
INITIAL & DATE

3- SPAN TESTING

- 3.1 Verify span acceptance has been completed on all spans
- 3.2 Attach a copy of office **PCM span** line checklist T! **acceptance form for each span or Host/Remote link (GTEP 200-002-725/331-350-550)**
- 3.3 **Fault each span on Host/Remote to ensure proper recovery action occurs**
- 3.4 **Fault each span on Host/remote to ensure spare span switching activities**
- 3.5 Ensure **each unused span** from the **Digital Trunk Unit is looped at the DSX**
- 3.6 **Verify Fiber Optic Cable** Acceptance is complete **(GTEP 392-342-500)**

Exhibit 3 - CO Construction Generic Feature and Functional Acceptance Test Forms (COECV03A-D) (Page 9 of 9)

**CENTRAL OFFICE CONSTRUCTION
EQUIPMENT CHECK AND VERIFICATION
PRACTICE REFERENCE
(Form COECV04A)**

A- SUPERSTRUCTURE AND OFFICE CONDITIONS

GTE PRACTICE REFERENCE

- | | |
|--|------------------------------|
| 1- Wall Angles/Support Brackets . | 237-050-204, H440000 |
| 2- The length of bolt or rod | 237-050-204 |
| 3- Superstructure and associated assemblies | 237-050-204 and H440000 |
| 4- Cable rack and/or grid | 237-050-207 |
| 5- Signal brackets, goal posts, runway brackets,
and cable retaining brackets | 256-050-204,237-050-206 |
| 6- Earthquake bracing | 780-740-070 and H440000 |
| 7- Floor condition | 740-500-070 |
| 8- Cable holes | 742-200-070 |
| 9- Power and Generator Area ventilation | 742-205-070,808-210 O-070 |
| 10- Smoke and fire suppression system | 742-100-100/101/103 |
| 11- Emergency generators | 205-502-700/701, 743-200-070 |

B- CABLE AND WIRING

GTE PRACTICE REFERENCE

- | | |
|---|--|
| 1- Switchboard cables running and securing | 075-I 70-I 00,256-050-203/204,256-I50-201,256-224-216, 795-000-072 |
| 2- Vertical cables between floors sewn on every strap
No cable ties | 256-050-204 |
| 3- Unattended cable ends and loose wire ends | 200-001-000,256-050-205 |
| 4- Switchboard cables are property butted,
fanned, and spare wires dressed | 256-050-205/213 |
| 5- Use of cable ties | 075-I70-I00,256-050-204 |
| 6- High frequency cables | 256-050-215,256-224-216,795-805-073,
835-000-071 |
| 7- Cable separation procedures | 256-050-203/206,256-224-216,795-805-073,835-000-071 |
| 8- Power cables separated by a minimum
of three inches | 256-050-206 |
| 9- Cable tag and label procedure | 256-050-202 |
| 10- Jumpers and miscellaneous wires | 256-010-201, 256-050-208/211,256-I 50-200,256-152-200,256-600-201 |
| 11- Special circuits identification | 200-050-I 01 |
| 12 Terminating wires on pins/blocks (wire wrap) | 256-050-211 |
| 13 Terminating wires on pins/blocks (wrap and solder) | 256- 01 O-201, 256-050-208 |
| 14- Plug ended cables (amp, cinch) | 256-I 50-201 |
| 15- Screw type wire connections | 200-001-000, 256-050-205 |
| 16 Power and ground cables installation | 256-050-204/206 |

**Exhibit 4 - CO Construction Equipment Check and Verification Practice Reference
(Form COECV04A) (Page 1 of 4)**

Exhibits, continued

D- SAFETY AND HOUSEKEEPING	GTE PRACTICE REFERENCE
1- First Aid kits	117-300-002
2- Fire extinguisher	200-001-000, 742-100-101
3- Caution signs	007-005-015, 200-001-000
4- Marking installation equipment/material/hazards to prevent accidents	200-001-000
5 Clean work areas	200-001-000/004, 742-1000-100
6- Combustible materials storage in metal file cabinets	200-001-004, 742-100-100
7- No floor tiles damaged or anchors left	200-001-000, 237-050-204
8- Floors protected from damage	200-001-000
9- Insulated tools and protective	200-001-000/004
10- Safety goggles and hard hats	117-200-005, 200-001-000, 205405-1 00
11- Wearing metal objects or jewelry	200-001-000
12- Emergency phone number and addresses	200-001-000
13- "A" type ladders	200-001-000
14- Cable openings are properly closed	200-001-000, 742-200-070
E- EQUIPMENT ERECTING	GTE PRACTICE REFERENCE
1- Distributing frame installation	237-050-204
2- Bare spots and scratches on iron and equipment touched up with paint and cut bolts/iron filed and touched up.	200-050-203
3- Labeling of distributing frame	244-010-202
4- Labeling of distributing frame terminal blocks	237-050-204, 244-010-202
5- Distributing frame modifications for mounting protectors	243-1 20-200
6- Guard rail extensions to protect equipment	237-050-204
7 Us8 of solid state protector modules	887-903-026
8- Protector modules in all positions. Unassigned positions in detent position	243-1 00-200, 243-1 10-1 00, 243-120-200, 243-1 28-200
9- Rolling ladders and tract installation	200-001-000/004, 237-200-202/203/204
10- Placement of equipment frames and brace support within 1/2 inch of the dimensions specified on office drawings	237-050-201
11- Equipment units/shelves mounting,	237-050-211/212
14- Equipment fuses are properly "seated", proper size, installed, and labeled	244-251-200
15- Spare cards are properly stored and tested	220-220-501
16- Supporting or trunk boards, relay racks, cabinets and frames	237-050-204, 780-740-070, and H440000.

**Exhibit 4 - CO Construction Equipment Check and Verification Practice Reference
(Form COECV04A) (Page 2 of 4)**

Exhibits, continued

E- EQUIPMENT ERECTING (continued)	GTE PRACTICE REFERENCE
17- Equipment Junctioning/Protection/Cabling Material	237-050-204, 256-050-205
18- Card locks/restraints	200-050-203
19- Equipment frame labeling on both front, rear, and end panels	244-010-202, 244-200-100, 244-251-200, 244-261-I 00
20- Equipment alarms	200-000-007, 205-000-000
21- Wired fuse positions installed have a fuse, or blank fuse	205-000-500
22- Labeling of repeaters, span lines, and cross-connect panels	244-261-I 00
23- SXS equipment installations	237-050-204/209/211/212/213
F- ADMINISTRATION	
1- Proper filing provisions are used for drawings,	220-001-001
2- Bar code labels placed properly	007-220-001
3- Changes to job drawings, specifications or equipment layout changes concurred by GTE Engineering JIM and UCR	007-009-012, 180-303-001, 220-001-001
5- Test equipment calibration	100-000-100, 200-002-010
6- Anti-static wrist and heel straps	007-005-015
7- Site logs	220-220-002
8- Load and volume test	220-014-007
9- Office ground inspection form	795-805-074
10- Fiber Optic Acceptance	392-342-500
11- Check and Verification forms	200-002-700
G- GROUNDING, ISOLATION, AND PROTECTION	
GTE PRACTICE REFERENCE	
1- General grounding requirements for switching centers	795-805-071
2- Carrier/transmission equipment	795-805-071/073
3- Protector mounting (isolated non-isolated)	243-I 20-200
4- Protector grounding	243-I20-200,795-805-071
5- Spare card cabinet and work bench (Lead 54)	795-805-071
6- Ground bars - Preparation and hardware	256-050-207, 795-805-071
7- Ground lead size for equipment grounding	237-224-214
8- Chassis grounds	795-805-071/073
9- Isolation of power equipment	237-224-214
10- Shielded cable grounding	795-805-071
11- Charger ground (Lead 32 and 29))	795-805-071
12- Circuit breaker panel ground	795-805-072
13- Master/Floor ground bar zoning	795-805-071
14- Metallic and/or non-metallic conduit	795-805-072
15 Light fixture grounding (lead 30)	224-I 00-100,795-805-072

Exhibit 4 - CO Construction Equipment Check and Verification Practice Reference
(Form COECV04A) (Page 3 of 4)

Exhibits, continued

B- CABLE AND WIRING (continued)	GTE PRACTICE REFERENCE
17- Cable radius requirements	256-050-206
18- Power cable labeling	244-251-200, 256-050-206
19- Power/ground cable connections, compression lugs, and compression connectors	205-000-500, 256-050-206/207
20- Heat shrink end caps	256-050-207
21- Ground Cable Requirements	795-805-071
22- Cables and wires	075-170-100, 205-000-500, 256-050-203/204/205/206
23- Fiber optical cables	624-632-000, 938-624-000, 903-101-070
24- Wires must be dressed away from sharp edges	256-050-205
C- POWER	GTE PRACTICE REFERENCE
1- Distribution, supervisory and DC power installation	004-200-001, 205-001-500
2- PCUF, PDUF/BDFB, DSUF rectifiers and battery racks anchoring	205-005-200
3- Earthquake bracing	780-740-070
4- Battery numbering and labeling	244-251-200
5- Battery safety boards	200-001-000, 205-005-100/200
6- Battery thermometer and hydrometer	200-001-004, 205-005-200
7- Battery intercell connecting straps	205-005-200, 205-005-201
8- Battery electrolyte level	205-005-200
9- Storage battery records	205-005-200
10- Office battery noise readings	205-005-200, 331-310-510
11- Rectifier/Charger installation	108-850-505, 205-001-500, 205-100-200, 244-251-200
12- Power Plant Alarms	205-000-004, 205-001-500, 205-100-200, 205-605-501/502/503, 224-100-100
13- Fuse Failure Test	026-100-500
14- Alarm signaling	205-605-501, 224-100-100
15- Power equipment and adjustment labeling	205-001-500
16- Remote sense leads	E-SW-POWER-795-000-072(engineering)
17- Power Board Fuses and Housings - alignment	244-251-200
18- Fuse positions and dummy fuses	026-100-500, 205-000-500
19- Torquing of fuse housing studs	205-000-500
20- Heat/voltage drop at power connections	026-220-300
21- Spare fuses availability	026-100-500
22- Bus bar/ground bars	205-705-201
23- Bellville washers on power/ground bars	205-705-201
24- Ringing machines output voltage	224-100-100, 244-251-200
25- AC circuit identification at junction box, lights and receptacles	200-001-000, 244-251-200, 795-805-072
26- Branch AC circuits (receptacles and lights) wiring	224-100-100, NEC 210-4 (a), (c)
27- Low voltage wire for the remote control lighting	224-100-100

Exhibit 4 - CO Construction Equipment Check and Verification Practice Reference
(Form COECV04A) (Page 4 of 4)