

RUS Technical Publications

RUS has issued a number of technical publications recently. These publications include:

RULES:

- **7 CFR 1710, Subpart H, “Demand Side Management and Renewable Energy Systems.”** This proposed rule, dated April 25, 2001, would eliminate Subpart H in its entirety . The existing subpart H details separate policies and requirements for loans for renewable energy systems and demand side management. Many of these requirements overlap provisions found elsewhere in part 1710. Others do not seem well suited for the smaller scale projects of the type that are becoming increasingly common in the industry. RUS believes that it is more appropriate to consider such small scale projects in this rapidly developing segment of the energy industry by proceeding on a case-by-case basis.

For more information, please contact Georg Shultz of ESD at 202-720-1920 or gshultz@rus.usda.gov.

- **7 CFR 1724, “Electric Engineering, Architectural Services and Design Policies and Procedures.”** This final rule, published October 23, 2000, revised the requirements regarding RUS approval of plans and specifications for buildings. The requirement for RUS approval of architectural plans and specifications for buildings has been eliminated and instead the borrower’s architect or engineer is required to state that the design complies with certain specific standards.

For more information, please contact Fred Gatchell at 202-720-1398 or fgatchel@rus.usda.gov.

- **Bulletin 1728F-806, “Specifications & Drawings for Underground Electric Distribution”** (incorporated by reference). The final rule covering the revision of this bulletin was published on May 26, 2000. This is an update of an existing bulletin, which was known as Bulletin 50-6 with the same title.

This bulletin provides the specifications and drawings that are to be used by borrowers in the construction of underground distribution facilities. It is one of the RUS standards that help borrowers build safe, reliable, and economical electric facilities in rural America.

We have made a number of changes to this bulletin, including the addition of two new drawings (UC2-1 and UC2-2) which provide alternative construction arrangements for the interface between overhead and underground facilities. We have also deleted 23 drawings and the URD Inspection Form, which are obsolete and no longer needed.

We have also incorporated a number of design changes in the drawings, including some that were recommended by the Underground Subcommittee of the NRECA T & D Committee and some suggestions that we received through the public comment process. We have also revised some of the clearances to conform to the latest code requirements.

We have updated the references to the referenced codes, specifications and standards to reflect the latest editions of these documents. Changes to a number of drawings showing caution, warning, and danger signs were needed to reflect the latest codes and standards concerning signs. Finally, we have revised or redrawn a number of drawings for greater clarity and ease of use.

For more information, please contact Trung Hiu of ESD at 202-720-1877 or thiu@rus.usda.gov.

- **7 CFR Part 1792, Subpart C, “Seismic Safety of Federally Assisted New Building Construction.”** This final rule, published December 8, 2000, revised the existing regulations concerning seismic safety. This revision updated and simplified the seismic safety requirements for new building construction using RUS or Rural Telephone Bank (RTB) loan, grant, or guaranteed funds or funds provided through lien accommodations or subordinations approved by RUS or RTB.

The Earthquake Hazards Reduction Act of 1977 and its associated Executive Order require that federally assisted new building construction meet certain seismic safety standards. These requirements are intended to reduce risk of loss of life and property damage caused by earthquakes. The Interagency Committee on Seismic Safety in Construction and the National Earthquake Hazards Reduction Program (NEHRP) have been created to coordinate these efforts. 7 CFR Part 1792, Subpart C, which was originally issued in 1993, implements these requirements for RUS.

This revision changes the list of acceptable model codes and standards that new buildings need to conform to in order to meet seismic provisions. In order for a model building code to be acceptable, the code must contain requirements equivalent to the 1994 NEHRP Recommended Provisions. The 1997 ICBO Uniform Building Code (UBC) and ASCE 7-95, Minimum Design Loads for Buildings and Other Structures, have been found to be acceptable for seismic safety purposes.

This revision also eliminates the post-construction seismic certification and simplifies the requirements concerning the acknowledgement that the seismic safety provisions of the applicable model code are incorporated in the design of the building.

For more information, please contact Don Heald at 202-720-9102 or dheald@rus.usda.gov.

GUIDANCE DOCUMENTS:

- **RUS Bulletin 1724D-101B, “System Planning Guide, Construction Work Plans,”** dated October 31, 2000. This bulletin provides guidance to borrowers and engineers in the preparation of Construction Work Plans (CWP's) for electric distribution systems. A CWP is the documented results of an engineering study which has determined all of the new construction required to provide adequate and reliable electric service during the planning period. A CWP is used as an engineering support document for a loan application, as a component of ongoing integrated system planning, and as means for specifying and documenting plant requirements for the next 2 to 4 years.

The following significant changes were made during the update of this bulletin:

- * The “Model Construction Work Plan,” a simplified sample work plan included in the previous issue, was deleted so that writers of CWP's will not be influenced to limit the creativity, scope, content or format of their studies and reports.
- * Distribution system design criteria advocated by RUS relating to voltage, thermal loading, and reliability were added to this bulletin.
- * RUS advocates that alternative solutions to large, costly, construction projects recommended in CWP's be economically evaluated and compared using a procedure such as is described in RUS Bulletin 1724D-104, “An Engineering Economics Computer Workbook Procedure.”

For more information, please contact Jim Bohlk of ESD at 202-720-1967 or jbohlk@rus.usda.gov.

- **Bulletin 1724D-112, “The Application of Shunt Capacitors to the Rural Electric System,”** dated April 27, 2001. This bulletin examines the application of shunt capacitors on rural distribution systems and serves as a general guide for capacitor applications to RUS borrowers and others. The System Planning Subcommittee of NRECA's T&D Committee has been instrumental in the development of this bulletin. This is an update of an existing bulletin, which was known as Bulletin 169-1 with the same title.

For more information, please contact Chris Tuttle of ESD at 202-205-3655 or ctuttle@rus.usda.gov.

- **Bulletin 1724E-153, “Electric Distribution Line Guys & Anchors,”** dated April 25, 2001. This guide bulletin provides information needed to properly design guying for conductors attached to wood distribution poles. To this end, the bulletin contains data, equations, and sample calculations. The bulletin also

contains information regarding standard RUS anchor and guying assemblies and their component parts to assist the user in the proper selection and installation of these assemblies. This bulletin is an update of a portion of Bulletin 160-2, "Mechanical Design Manual for Overhead Distribution Lines."

For more information, please contact Jim Bohlk of ESD at 202-720-1967 or jbohlk@rus.usda.gov.

- **Bulletin 1724E-214, "Guide Specification for Standard Class Steel Transmission Poles,"** dated July 2, 2001. This guide specification provides a basis for procuring direct embedded standard class steel poles for transmission lines.

This purchase specification covers the technical aspects of design, materials, manufacturing, inspection, testing, and delivery of direct embedded standard class steel poles. This guide specification is primarily for use with unguayed tangent structures. For steel poles that are guyed, subjected to unbalanced lateral loads, or have deflection or other special limitations, RUS recommends that RUS Bulletin 1724E-204, "Guide Specification for Steel Pole and H-Frame Structures," be used.

RUS Bulletin 1724E-214 and the specifications it includes were developed to establish a standard classification system and to assist the owner in procuring a standard class steel pole that is properly designed for the intended loading criteria. Since it has become a widespread practice in the industry to design and manufacture poles that are based on the wood pole classification system of the American National Standards Institute (ANSI 05.1), the steel pole classifications developed in this specification generally follow the wood pole classification system. However, to avoid confusion with the wood pole classifications, the steel pole classifications have been assigned a unique naming system.

In some cases, the owner may design a transmission line based on wood pole classifications as described in ANSI 05.1 and then wish to order steel poles which meet the wood pole equivalent loadings. Because of the differences in overload factors applied to wood poles in comparison to steel poles, the owner must be sure that the overload factors are properly accounted for in the design of the steel poles.

"Wood pole equivalency" is a term that may be defined in a number of ways. For purposes of this commentary, the term "wood pole equivalent" is defined as a standard class steel pole, which is equated by the required ultimate loading to an ANSI 05.1 standard class wood pole. The equation is made by a ratio of the overload factors applicable for each pole type and loading criteria.

For more information, please contact Don Heald of ESD at 202-720-9102 or dheald@rus.usda.gov.

- **Bulletin 1724E-216, “Guide Specification for Standard Class Spun Prestressed Concrete Poles,”** dated July 6, 2000. This guide specification provides a basis for procuring direct embedded standard class spun prestressed concrete poles. If poles are competitively bid, use of this specification will help to eliminate ambiguities which might arise in the evaluation process.

This purchase specification covers the technical aspects of design, materials, manufacturing, inspection, testing, and delivery of direct embedded standard class spun prestressed concrete poles. It is recommended that this specification (1724E-216) be limited to poles that are not guyed, not subjected to unbalanced lateral loads, or do not have deflection limitations or other special limitations. For concrete pole applications that are subject to these considerations, it is recommended that the owner use RUS Bulletin 1724E-206, “Guide Specification for Spun, Prestressed Concrete Pole and Concrete Pole Structures.”

For more information, please contact Don Heald of ESD at 202-720-9102 or dheald@rus.usda.gov.

- **Bulletin 1724E-300, “Design Guide for Rural Substations,”** dated June 7, 2001. This bulletin provides basic information for the design engineer concerning all aspects of substation design. This is an update of an existing bulletin, which was known as Bulletin 65-1 with the same title. For more information, see the paper of the same title included in this Engineering Seminar or contact Mike Eskandary of ESD at 202-720-5082 or meskanda@rus.usda.gov.
- **“Summary of Items of Engineering Interest,”** published in October, 2001, continues the practice of furnishing annually, on an informal basis, engineering information and developments related to the rural electrification program.

For more information, please contact Fred Gatchell of ESD at 202-720-1398 or fgatchel@dus.usda.gov.

- **IP 202-1, “List of Materials Acceptable for Use on Systems of RUS Electrification Borrowers,”** published in July, 2001, and its quarterly supplements. This document provides a convenient listing of the materials and equipment that have been accepted by RUS.

For more information, please contact Harvey Bowles of ESD at 202-720-0980 or hbowles@rus.usda.gov.

If you need any of these publications, please contact RUS' Program Development and Regulatory Analysis staff at 202-720-8674. Many RUS publications are also available via the Internet at:

For Rules: **<http://www.usda.gov/rus/electric/regs.htm>**

For Bulletins: **<http://www.usda.gov/rus/electric/bulletins.htm>**

PUBLICATIONS IN PROGRESS

Timber Specifications: RUS is in the process of revising the following three bulletins that cover pressure treating of poles and crossarms, and their respective quality control:

- **Bulletin 1728F-700, “RUS Specification for Wood Poles, Stubs and Anchor Logs,”**
- **Bulletin 1728H-701, “RUS Specification for Wood Crossarms (Solid and Laminated) Transmission Timbers and Pole Keys” (7 CFR 1728.201), and**
- **Bulletin 1728H-702, “RUS Specification for Quality Control and Inspection of Timber Products” (7 CFR 1728.202).**

Topics currently being considered for revision include:

- * Elimination of the requirement for borrowers to notify RUS of their timber product purchases during the previous year,
- * Reinstatement of the acceptance and listing of inspection agencies in the RUS List of Materials,
- * Requirement for a heat sterilization during kiln drying or steam conditioning of poles,
- * Requirement for inspection agencies to have their company designation branded or tagged on the pole face,
- * Requirement for all independent inspectors and plant quality control personnel to be trained and certified by x-ray fluorescence instrument manufacturer,
- * Requirement for treating plants and inspection agencies to maintain certain levels of liability insurance and errors and omission insurance, and
- * Include butt treating of cedar poles as an acceptable method of treatment for poles.

RUS is soliciting input from electric borrowers and others as to necessary changes to these bulletins. Comments or suggestions should be sent to H. Robert Lash, Chief, Transmission Branch, RUS, Stop 1569, 1400 Independence Ave SW, Washington, DC 20250-1569, E-mail: blash@rus.usda.gov. All comments are welcome.

RUS is also working on the following publications:

- **Bulletin 1724D-114, “Voltage Regulator Application on Rural Distribution Systems.”** This bulletin will examine the application of voltage regulators on rural distribution systems and serve as a general guide for voltage regulator applications to RUS borrowers and others.

For more information, please contact John Pavek of ESD at 202-720-5082 or jpavek@rus.usda.gov.

- **Bulletin 1724E-151, “Crossarm Loading.”** This bulletin will present equations, data, and other information needed to determine the permitted mechanical loading on wood distribution crossarms. Sample problems and permitted crossarm loading will be presented to help apply the information included in the bulletin. This bulletin is an update of a portion of Bulletin 160-2, “Mechanical Design Manual for Overhead Distribution Lines.”

For more information, please contact Jim Bohlk of ESD at 202-720-1967 or jbohlk@rus.usda.gov.

- **Bulletin 1724E-152, “Distribution Line Conductors.”** This bulletin will present and explain:
 - * The equations needed to calculate ruling spans and conductor sags and tension,
 - * Guidelines for preparing or selecting sag tension tables,
 - * The characteristics, behavior, and methods of installing distribution line conductors, and
 - * Methods for mitigating aeolian vibration.

This bulletin is an update of a portion of Bulletin 160-2, “Mechanical Design Manual for Overhead Distribution Lines.”

For more information, please contact Jim Bohlk of ESD at 202-720-1967 or jbohlk@rus.usda.gov.

- **Bulletin 1728F-U1, RUS Specifications for 15 kV, 25 kV, and 35 kV Primary Underground Power Cable.”** This bulletin will present and explain the requirements for single phase power cable for use in underground distribution systems. This revision will add requirements for 35 kV power cable and cross-linked polyethylene with tree retardant. This bulletin is an update of Bulletin 50-70, “REA Specifications for 15 kV and 25 kV Primary Underground Power Cable.” For more information, see the paper titled “Underground Cable Specification (1728F-U1)” included in this Engineering Seminar. or contact Trung Hiu of ESD at 202-720-1877 or thiu@rus.usda.gov.

- **Standard Contract Forms.** RUS is planning to update, consolidate, and streamline our standard forms of contracts. This would include the elimination of unneeded forms, making forms suitable for “subject to” or “not subject to” RUS approval, making construction contract forms suitable for “labor only” or “labor and material,” standardizing tables and information pages and incorporate them as separate attachments, maximizing consistency among forms, and updating and clarifying contract provisions as necessary. These changes are being made to improve the usefulness of the standard forms of contract.

For more information, please contact Fred Gatchell of ESD at 202-720-1398 or fgatchel@dus.usda.gov.

RUS 2002 ELECTRIC ENGINEERING SEMINAR

RUS TECHNICAL PUBLICATIONS

**Fred Gatchell
Deputy Director
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RUS TECHNICAL PUBLICATIONS - RULES

7 CFR 1710, SUBPART H

DEMAND SIDE MANAGEMENT AND RENEWABLE ENERGY SYSTEMS

- ◆ **Eliminate Special Requirements for these Projects**

RUS TECHNICAL PUBLICATIONS - RULES

7 CFR 1724

ELECTRIC ENGINEERING, ARCHITECTURAL SERVICES AND DESIGN POLICIES AND PROCEDURES

- ◆ **Eliminated RUS Approval of P & S for Buildings**

RUS TECHNICAL PUBLICATIONS - RULES

BULLETIN 1728F-806 (IBR)

SPECIFICATIONS & DRAWINGS FOR UNDERGROUND ELECTRIC DISTRIBUTION

- ◆ **Added Two New Drawings (UC2-1 & UC2-2)**
- ◆ **Eliminated 23 Drawings & Inspection Form**

RUS TECHNICAL PUBLICATIONS - RULES

7 CFR 1792, SUBPART C

SEISMIC SAFETY OF FEDERALLY ASSISTED NEW BUILDING CONSTRUCTION

- ◆ **Eliminated Post-Construction Seismic Certification**
- ◆ **Updated list of Acceptable Model Codes**

RUS TECHNICAL PUBLICATIONS - GUIDES

BULLETIN 1724D-101B

SYSTEM PLANNING GUIDE CONSTRUCTION WORK PLANS

- ◆ **Eliminated “Model Construction Plan”**
- ◆ **Added Distribution System Design Criteria**
- ◆ **Economic Evaluation - Bulletin 1724D-104**

RUS TECHNICAL PUBLICATIONS - GUIDES

BULLETIN 1724D-112

THE APPRICATION OF SHUNT CAPACITORS TO THE RURAL ELECTRIC SYSTEM

- ◆ **Update of Old Bulletin 169-1**
- ◆ **Thanks to NRECA System Planning Subcommittee**

RUS TECHNICAL PUBLICATIONS - GUIDES

BULLETIN 1724E-153

ELECTRIC DISTRIBUTION LINE GUYS & ANCHORS

- ◆ **Contains Data, Equations, & Sample Calculations**
- ◆ **Update of Part of Bulletin 160-2**

RUS TECHNICAL PUBLICATIONS - GUIDES

BULLETIN 1724E-214

GUIDE SPECIFICATION FOR STANDARD CLASS STEEL TRANSMISSION POLES

- ◆ Establishes Standard Classification System for Steel Poles
- ◆ For Non-Standard Poles, use 1724E-204

RUS TECHNICAL PUBLICATIONS - GUIDES

BULLETIN 1724E-216

GUIDE SPECIFICATION FOR STANDARD CLASS SPUN PRESTRESSED CONCRETE POLES

- ◆ Provides Standard Basis for Purchase
- ◆ For Non-Standard Poles, use 1724E-206

RUS TECHNICAL PUBLICATIONS - GUIDES

BULLETIN 1724E-300

DESIGN GUIDE FOR RURAL SUBSTATIONS

- ◆ **Provides Basic Information for Substation Design**
- ◆ **Update of Bulletin 65-1**

RUS TECHNICAL PUBLICATIONS - GUIDES

◆SUMMARY OF ITEMS OF ENGINEERING INTEREST

- ◆**LIST OF MATERIALS ACCEPTABLE FOR
USE ON SYSTEMS OF RUS
ELECTRICIFICATION BORROWERS**

RUS TECHNICAL PUBLICATIONS - COMING

TIMBER SPECIFICATIONS

- ◆ **POLES - 1728F-700**
- ◆ **CROSSARMS - 1728H-701**
- ◆ **QUALITY CONTROL - 1728H-702**

RUS TECHNICAL PUBLICATIONS - COMING

- ◆ **VOLTAGE REGULATORS - 1728D-114**
- ◆ **CROSSARM LOADING - 1724E-151**
- ◆ **DISTRIBUTION LINE CONDUCTORS -
1724E-151**
- ◆ **SPECIFICATION FOR UNDERGROUND
CABLE - 1728F-U1**
- ◆ **STANDARD CONTRACT FORMS**