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REVISIONS: UPDATED LEGAL ACKNOWLEDGEMENT FORM. FD MAR '16

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| DESIGNED J. AGNOLIN | RECOMMENDED  F. DENNERT | ACCEPTED  G. REIMER | ENGINEER OF RECORD  F. U. DENNERT BRITISH COLUMBIA ENGINEER | NOTICE FROM THE EXECUTIVE VICE PRESIDENT TRANSMISSION AND DISTRIBUTION AND CUSTOMER SERVICE | |
| DISTRIBUTION STANDARDS  | | ISSUED: MAR 2016 REPLACES: MAY 2004 ORIGINALLY ISSUED: NOV 1980 | | PAGE 1 OF 2 | ES43/53/54/55/65 A1-01.01 |
| | | | | | R 4 |

Scope

This manual is one of a series containing standards for construction of the BC Hydro electrical distribution plant within the service area of BC Hydro. A new distribution plant shall be designed, constructed, owned, operated, maintained and repaired to these standards.

Purpose of Standards

BC Hydro objectives require standardization to:

- a) Ensure uniform safety requirements comply with BC statutes and regulations.
- b) Provide uniform system reliability.
- c) Provide uniform operating practices.
- d) Permit economic bulk purchasing of materials.
- e) Achieve optimum life cycle cost of plant construction.
- f) Effect efficient quality assurance.

Responsibility

The Distribution Standards Department prepares these standards and verifies that specified plant and procedures will perform adequately under all normally expected conditions encountered throughout the province of British Columbia. These standards are approved by Professional Engineers. It is the responsibility of BC Hydro Managers to ensure that the standards are followed unless abnormal conditions are encountered that require variations. These variations should be kept to a minimum and their performance shall be the responsibility of the Professional of Record in charge of the project, who will record and seal the variation based on satisfactory qualifications and experience to do so. As per the latest revision of the BC Hydro Distribution Owner's Engineer Guide, these variations must be accepted by BC Hydro's Owner's Engineer.

Use of Stock Materials

The electrical distribution plant covered by these standards is built using stock materials approved by a Professional Engineer as required by law. The use of non-stock materials for special and unusual situations must be approved by Distribution Standards or the BC Hydro Engineer responsible for the project.

Revisions to Manual





These standards are revised from time to time to improve the safety, performance, workability, cost effectiveness or appearance of the plant. The existing plant built to previous standards need not be updated unless so specifically advised by BC Hydro. When maintenance or other work, such as voltage conversion or conductor change is being done, updating plant to current standards is encouraged.

Mailing Addresses

The manual has been issued to a corporation or firm rather than to an individual. The corporation or firm is responsible for the safekeeping of the manual, and for keeping it current. Changes of address or in number of copies required must be reported promptly.

Suggestions for changes in the manual, or required changes of address may be made on the pre-addressed comment sheet included in the Manual and with each issue of revision.

REVISIONS: UPDATED LEGAL ACKNOWLEDGEMENT FORM. FD MAR '16

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**Class of Work Specification for
Construction of Underground Electrical Distribution
Structures by a Customer**

Revisions:

| Clause No. | Description Of Revision | Date |
|------------|--|---------------|
| All | Class of Work was significantly re-written and edited. | July 13, 2016 |
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Table of Contents

| | | |
|------|--|---|
| 1.0 | General | 3 |
| 2.0 | Definitions | 3 |
| 3.0 | Standard of the Work | 3 |
| 4.0 | Laws, Permits and Fees..... | 3 |
| 5.0 | Existing Site Information..... | 3 |
| 6.0 | Design and Record Drawings..... | 4 |
| 7.0 | Control of the Work | 4 |
| 8.0 | Work on BC Hydro Energized Facilities | 4 |
| 9.0 | Protection of Work, Property and Public | 4 |
| 10.0 | Excavation Support Shotcrete and Soil Anchors..... | 5 |
| 11.0 | Temporary Works..... | 5 |
| 12.0 | Material | 5 |
| 13.0 | Survey and Proving Route | 6 |
| 14.0 | Acceptance of the Work | 6 |
| 14.1 | Quality Control (QC) and Quality Assurance (QA)..... | 6 |
| 14.2 | Audit | 6 |
| 15.0 | Warranty..... | 7 |
| 16.0 | Relevant BC Hydro Publications | 7 |

1.0 General

This Class of Work Specification describes the work requirements for the construction or installation of underground Plant by a Customer, in accordance with the Design accepted by BC Hydro.

2.0 Definitions

Capitalized terms shall have the meaning defined in the ES 54, Section W, and specified as follows:

Customer: means an entity who builds the Plant for BC Hydro use.

3.0 Standard of the Work

ES 54 Series Underground Civil Distribution Standards published by BC Hydro shall apply.

4.0 Laws, Permits and Fees

The Customer is responsible to obtain all necessary permits, pay fees and comply with all applicable laws, ordinances, rules, regulations, codes and orders of the Authority Having Jurisdiction (AHJ) which apply during the performance of the work.

The Customer shall notify property owners affected by the work at least 48 hours in advance of any access restriction to the property.

5.0 Existing Site Information

Type and location of existing structures and utilities shown on the BC Hydro as-built drawings are neither accurate nor complete. The Customer shall make a BC One Call request, and the relevant documents shall be made readily available on site. The Customer shall be responsible for:

- 1) Locating and exposing all buried utility services.
- 2) Building around, under or over other services, and taking proper precautions against accidental damage.
- 3) Temporary works
- 4) Maintaining specified clearances between services and structures.

BC Hydro makes no warranty and accepts no responsibility for the accuracy and completeness of any information relevant to the existing infrastructure or existing utility information. Any use or interpretation of as-built drawings is at a sole risk of the Customer.

6.0 Design and Record Drawings

The Customer shall be responsible for preparation of Design and record (as-built) drawings in accordance to the ES54 Standards. The Customer shall retain the Professional of Record for each engineering discipline and submit all related letters of assurance to BC Hydro. All engineering content including Design and record drawings shall be signed and sealed by the Professional of Record.

The Customer shall submit to BC Hydro the signed and sealed Design for review and acceptance a minimum of two (2) weeks prior to commencement of the work. Upon completion of the work, the Customer shall provide to BC Hydro the complete signed and sealed record (as-built) drawings, both electronically and in original hard copy.

7.0 Control of the Work

The Customer shall have complete control of the work and shall effectively direct and supervise the work so as to ensure conformance with the Design. The Customer shall be solely responsible for construction means, methods, techniques, sequences and procedures and for coordinating the various parts of the work. The Customer shall maintain the work in a tidy condition, free from the accumulation of waste, debris, and waste products.

The Customer shall provide and maintain, at all times, competent supervisory personnel and workforce, sufficient to complete the work, and shall disclose knowledge, skills, prior experience, and professional standing or technical or trade certification of any person appointed, employed or used by the Customer in carrying out any part of the work.

8.0 Work on BC Hydro Energized Facilities

The Customer shall at all times be knowledgeable of and comply with BC Hydro Safety Practice Regulations ("SPR"), Power Systems Safety Protection ("PSSP") and all other relevant regulations, standards, practices, instructions, bulletins, directives or orders issued from time to time by BC Hydro in connection with electrical safety with respect to working on BC Hydro energized facilities.

When the work is expected to occur near existing BC Hydro facilities, the Customer shall notify BC Hydro 48 hours prior to starting of the work. The Customer shall ensure that only BC Hydro approved persons work on energized facilities and a BC Hydro approved safety watcher is on Site to inspect the work at the Customer's cost.

9.0 Protection of Work, Property and Public

The Customer shall protect the work, BC Hydro, private and public property from any damage. The Customer shall be responsible for repair of any damage to BC Hydro, public or private property resulting from the work. The repair shall be completed to a condition equal or better than what existed prior to the damage, to the most current standards, codes and laws, and shall include any betterment necessary to comply with such.

10.0 Excavation Support Shotcrete and Soil Anchors

Soil anchors and/or shotcrete may be required to support deep excavation near BC Hydro Assets. Anchors are often extended beyond the property line into the municipal roads where BC Hydro assets are generally located. The Customer shall be responsible for submitting signed and sealed drawings and a letter report prepared by his POR confirming that the integrity of BC Hydro assets in the area will not be compromised by his operation. The excavation support design shall:

- Include actual location of the BC Hydro Assets in the area including type, arrangement, dimensions, and burial depth.
- Be prepared utilizing the information from the BC one call, underground utility locate, field verification by Hydrovac or hand digging and DAD plots.
- Maintain a minimum of 1.0 m clear separation in all directions between BC Hydro assets and the proposed shotcrete, shoring and soil anchors.

The excavation support design shall be submitted to BC Hydro and the Authority Having Jurisdiction (AHJ) for review and acceptance a minimum of fourteen (14) days prior to the excavation.

11.0 Temporary Works

The Customer shall have the sole responsibility for the design, erection, operation, maintenance and removal of temporary works and other temporary facilities and the design and execution of construction methods required in their use, in compliance with WorkSafeBC requirements.

Where ES54 Standards include design of temporary works or specifies method of construction in whole or in part, the Customer will not be held responsible for that part of the design or the specified method of construction. However, the Customer shall be responsible for the execution of such design or specified method of construction.

12.0 Material

The Customer shall supply all material necessary to complete the work except materials supplied by BC Hydro. The Customer shall submit a list of suppliers of all materials incorporated in the BC Hydro Plant, to BC Hydro for acceptance 10 days prior to material ordering and construction.

The Customer shall be responsible for ensuring that all materials supplied by BC Hydro are readily available to complete the work. The Customer shall inspect all material supplied by BC Hydro for any damages and defects prior to receiving the material. By acceptance of the BC Hydro supplied material, the Customer acknowledges that such material is free from any damage and defects. All material supplied by BC Hydro remains the property of BC Hydro at all times. The Customer shall permit and provide access to BC Hydro to inspect all BC Hydro supplied material in the Customer's possession, at no cost or liability to BC Hydro.

The Customer is responsible for transporting, unloading, handling and storing of all materials supplied by BC Hydro.

The Customer shall be responsible for returning all excess new materials supplied by BC Hydro to the appropriate BC Hydro stores, in good order, within 72 hours of completion of the work. All returned material will be subject to inspection and acceptance by BC Hydro.

The Customer shall not alter, modify or misuse any materials supplied by BC Hydro and shall be responsible for replacement or repair of any damaged BC Hydro supplied materials. The repair design shall be submitted to BC Hydro for acceptance. If BC Hydro considers that the damage may affect the structural integrity of the material, the proposed repair design shall be signed by a Professional Engineer.

13.0 Survey and Proving Route

The Customer is responsible for all survey and staking required for the completion of all work, as shown in the Design.

Prior to surface cutting and excavation, the Customer shall mark duct bank alignment and locations of structures on the Site as shown in the Design, and prove the location of any existing utility by digging, hydro-vacuum excavation test holes, or using another equivalent method. The Customer shall report to BC Hydro obstacles found that may affect the duct bank alignment or locations of the structures, and shall submit revised Design to BC Hydro for acceptance.

The Customer shall be responsible for any impacts as a result of obstacles.

14.0 Acceptance of the Work

The work will not be accepted as complete until final acceptance has been given by BC Hydro. Previous acceptance of any materials or work shall not preclude it from rejection prior to acceptance of the complete work

14.1 Quality Control (QC) and Quality Assurance (QA)

The Contractor shall prepare the QC and QA plan and submit to BC Hydro for acceptance a minimum of two weeks prior to commencement of any work covered by the QC/QA plan.

The Customer shall implement a Quality Control (QC) program to meet this COW 1323 and ES 54 Standard requirements. In the event that any of the work is outside the specified quality limits, the Contractor shall propose corrective action to BC Hydro for acceptance and repair such defective or deficient work to the satisfaction of BC Hydro.

The testing laboratories shall be Canadian Council of Independent Laboratories (CCIL) certified for the type of testing being carried out.

14.2 Audit

BC Hydro will, at its discretion, audit the Customer's QC and QA program by inspection, sampling and testing.

15.0 Warranty

The Customer warrants to BC Hydro for period of one (1) year that all work is free from any defect in material and workmanship, and for period of ten (10) years that all Design is free from errors and omissions, and shall remedy any defects upon notification to the satisfaction of BC Hydro. The warranty period starts on the date of final work acceptance.

16.0 Relevant BC Hydro Publications

BC Hydro ES 43 Series Overhead Electrical Distribution Standards;

BC Hydro ES 53 Series Underground Electrical Distribution Standards;;

BC Hydro Power Systems Safety Protection (PSSP) System Operating Order 1T-12, December 2007 (see <http://w3/pssp/pdfs/pssp.pdf>);

BC Hydro Safety Practice Regulations (SPR) Book, dated March 2011 (see <http://w3ecm/safety/ViewByDocument.do?guid={D0D98F06-AD8F-40A9-B0A7-2C243E1AA724}>);