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SPECIFICATIONS FOR NEW ELECTRICITY UNDERGROUND RESIDENTIAL DISTRIBUTION SYSTEMS

1.0 PURPOSE AND INTRODUCTION

This document defines the minimum requirements and specifications for the installation of an underground residential electrical distribution system to be transferred to ATCO ownership. It is intended for the specific use of Developers and their agents (Consultants and Contractors) who design and construct a new underground electrical distribution system within their subdivision.

ATCO Electricity is an electric utility whose distribution facilities must be compliant with the provisions of the Alberta Electric Utility Code (AEUC) and is subject to all the regulations and standards described therein. All electrical facilities that are engineered, designed and constructed by a Developer and/or its agent(s) must comply with the same requirements and associated regulations of all local and provincial governing authorities, and any municipal, provincial or federal agencies or authorities having jurisdiction over the site or the installation. Where ATCO's standards exceed regulatory and industry standards, ATCO standards must be followed.

1.1 Definitions

Wherever used in these specifications, the following words and phrases shall have the meanings set forth below.

"Acceptance" means ATCO's acknowledgement, through its formal reviews and processes, that the electrical design and installation, or any intermediate project deliverable, as presented and provided by the Developer and/or its agent(s), complies with the stated requirements, technical specifications and Contract documents, and the items presented for acceptance are satisfactory for ATCO's purposes.

"Act" means the Electric Utilities Act, S.A. 2003, c. E-5.1, as amended from time to time.

"AEUC" means the current and adopted Alberta Electric Utility Code and any amendments thereto, under the Alberta Safety Codes Act.

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"Area Structure Plan" means a plan developed by a municipality which outlines all subdivision phases and zoning designations within an area or neighborhood.

"As-built" means a drawing which fully describes the actual, constructed Developed Distribution Facilities, in accordance with the drawing requirements identified within these specifications and authenticated by the Consulting Engineer.

"ATCO's Electricity Engineering Representative" means ATCO's Distribution Engineering Planning representative and/or the design representative for Distribution projects, or their designate(s), for any or all of the purposes of these specifications.

"ATCO's Electricity Expeditor means the ATCO Distribution representative specifically assigned as the key contact for any Developer-initiated URD project.

"ATCO's Electricity Representative" means a representative from ATCO's Distribution Operations group or their designate(s), for any or all of the purposes of these specifications (e.g., Inspectors).

"Authentication" means the application of the professional stamp of a responsible member of the Association of Professional Engineers and Geoscientists of Alberta (APEGA), signed and dated, and complete with the Permit to Practice Number (or signed and dated Permit Stamp).

"Bare Land Residential Development" means a multiple dwelling developed as a single entity on a single parcel of land on which the individual building lots and structures on those lots are privately owned and titled.

"Business day" means any day other than a Saturday, a Sunday or a Statutory holiday in Edmonton, Alberta.

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Civic address means the street name and dwelling, lot, block and plan number assigned to a specific location and approved by the municipal authority.

“Apartment and/or Commercial feeder” means primary distribution cable whose main function is to provide power to the three phase transformers utilized in providing service within an URD boundary (see Appendix D, Drawing D.2.4). Services may include an apartment, gas station, grocery store, convenience store, etc., or any combination thereof. Recreation centres and schools shall be sourced from Apartment/Commercial feeders and must be identified to ATCO’s Planning and Design Representative in the Preliminary Design stage of the project (Step 3, as per Appendix A).

“Construction Completion Certificate (CCC)” means the certificate issued to ATCO by the Consulting Engineer stating that all the Developed Distribution Facilities provided by the Developer and/or its agent(s) have been constructed, installed and inspected in conformance with the Contract.

“Construction Completion Inspection” means an inspection of the Developed Distribution Facilities by **ATCO’s Electricity Representative** prior to energization, for the purpose of identifying any defects, deficiencies and/or non-conformances.

“Connected load” means the sum of the capacities or ratings of all the electric energy-consuming apparatus connected to the supplying system.

“Contract” means any document related to the agreement between the Developer and/or its agent(s) and ATCO. The Contract includes, but is not limited to, the Customer Proposal Letter, Notice of Disclaimer and the Underground Electrical Distribution Subdivision Service Agreement.

“Consulting Engineer” means a Professional Engineer, Professional Licensee (Engineering) or permit holder, registered and in good standing with APEGA, and entitled to engage in the practice of engineering in the province of Alberta under

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the Engineering and Geoscience Professions (EGP) Act retained by the Developer for the design, inspection and authentication of the construction and installation of the Electrical Distribution System pursuant to the Underground Electrical Distribution Subdivision Service Agreement as specified in these Specifications. The Consulting Engineer is considered to be an agent of the Developer.

"Contractor(s)" means the entities retained by the Developer in accordance with the terms and conditions of this Agreement for the construction and installation of the Electrical Distribution System including, without limitation, electrical construction contractors, site supervisors, excavation contractors and material suppliers. The Contractor is considered to be an agent of the Developer.

"Deep utility" means a utility which has facilities buried at a depth greater than 2.5 metres below surface grade. This includes water, storm water and sanitary sewer utilities.

"Developed Distribution Facilities" means the distribution facilities the Developer has engineered, procured and constructed which, after being commissioned, accepted and energized, will be transferred in ownership to ATCO. These facilities must all be within an ATCO Electric franchise.

"Developer" means the registered owner of the lands and the developer of the lots on the lands in the Development on which the Electrical Distribution System shall be installed pursuant to the terms of the Underground Electrical Distribution Subdivision Service Agreement and these specifications

"Distribution access service" means the service required to deliver electricity to customers by means of an electric distribution system.

"Diversity factor" means the ratio of the sum of the individual peak demands in a system to the peak demand of the whole system. In the context of these specifications, it means a group of transformers connected to a looped primary

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feeder. The diversity factor is greater than one or equal to one (for one customer).

"Distribution Tariff" means a document prepared by ATCO which proposes terms and conditions for offering electric distribution service and charges for system access, in accordance with the Distribution Tariff Regulation, A.R. 162/2003, as amended from time to time.

"Single Family Dwelling" means a private residence, with sleeping and cooking facilities, intended for domestic use and in which the occupants live as a single housekeeping unit that is not part of a multiple family dwelling.

"Easement" is a right acquired by one party from another, permitting use of the other's land for a purpose such as a utility right-of-way. An easement runs with the land.

"Express feeder" means a large, primary distribution cable (350 MCM or larger) utilized to provide the main power supply to and through a subdivision through switching cubicles or underground risers. ATCO has sole responsibility for the planning and design of express feeders. See Appendix D, Drawing D.2.4.

"Facilities" means physical plant including, without limitation, primary and secondary conductor, pre-cast concrete bases, transformers, pedestals, terminations, street lights, street light bases, fault indicators and duct.

"Final Acceptance Certificate (FAC)" means the certificate issued to ATCO by the Developer thirty (30) days prior to the end of the warranty period stating that the Developed Distribution Facilities meet all the requirements for final acceptance (see Appendix F, Form F.15); the FAC serves as a request to ATCO to perform the final acceptance inspection.

"Final acceptance inspection" means an inspection of the Developed Distribution Facilities at the end of the warranty period, requested by the

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Developer in writing (i.e., the FAC) to ATCO's Electricity Expeditor, to substantiate there are no defects, deficiencies and/or non-conformances. If accepted, the Developer is released from all warranty obligations specified in the Contract.

“Final Inspection” means an inspection of the Developed Distribution Facilities by ATCO's Electricity Representative prior to energization, for the purpose of identifying any defects, deficiencies and/or non-conformances.

“Final record” means the most complete, accurate and up-to-date version of all drawings and documents related to the Developed Distribution Facilities, to be committed to ATCO's records after acceptance of the CCC and energization.

“Governing authority” means any municipal, provincial or federal government official, agency or board which has legislative authority or jurisdiction over the work site.

“IFC” means Issued For Construction; IFC designation on a document must be authenticated by the Consulting Engineer. Within ATCO, IFC is synonymous with Work Release Package. IFC drawings should be provided in both paper (colour) and electronic format (Micro Station or AutoCAD). See Section 4.2.8 and Appendix C for details.

“Independent Inspector” means a person or corporation retained and paid by the Developer in accordance with the Contract for the purpose of inspecting the electrical distribution system constructed by the Developer. This person or corporation must be not be affiliated with the Developer and/or its agent(s) and must be qualified to inspect the facilities.

“Joint-use” means shared, generally in relation to facilities such as trenches or secondary pedestals installed to allow several parties to service an area.

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"kcmil" means a unit of measurement for conductor; specifically, an abbreviation for one thousand circular mils. Can be used interchangeably with MCM.

"Load" means the demand and energy delivered to or required at any Point of Service.

"Loop" means either:

- a) The type of connection for a subdivision primary feeder supplying three phase padmount transformers or single phase transformers (i.e., the feeder is connected to two different source points and a normally open point is established somewhere in the middle of a loop); or
- b) The type of connection for secondary conductors supplying secondary pedestals (i.e., the secondary supply to a pedestal can be sourced from two different single phase padmount transformers, and normally open points are established in the base of secondary pedestals).

"Luminaire" means an outside lighting unit fitted to a pole and consisting of a lamp and parts designed to distribute the light, including a reflector, bulb, lens, ballast and controls.

"Multiple Family Dwelling" means a building comprised of more than one unit or dwelling which share all or part of a service connection.

"Municipality or Municipal Authority" means the municipality, as defined in the Municipal Government Act (Alberta) within whose jurisdiction the Development lies.

"Point of Service" means the point at which ATCO's service conductors are connected to the conductors or apparatus of a customer.

"Power cables" means primary, secondary, street light and service cables.

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"Proctor" means a compaction test named after R.R. Proctor (*Engineering News Record* – September 7, 1933), as defined in the American Standard for Testing Materials (ASTM) D698-07 *Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort*. Standards commonly refer to a % Proctor. For example, a 95% Proctor means a particular soil (e.g., clay, loam or sand) has reached its maximum compaction at its optimum moisture content.

"Red-line" means distinctive markings, in red ink, on as-built and record drawings which indicate the alignments, descriptions and locations of equipment as actually constructed.

"Responsible member" means a registered, professional member of APEGA who satisfies the requirements of a responsible member, as defined in the regulations of the Engineering and Geoscience Professions Act of Alberta.

"Rough grade" means the approximate grade and slope of terrain established prior to the finishing of all landscape and related work in a subdivision. Rough grade is usually expressed in terms of final grade plus or minus a measurement amount (refer to ATCO's Customer Terms and Conditions for Electric Distribution Service, Schedule C, for specific values).

"Service connection" means the apparatus required to physically connect a customer's facilities to ATCO's distribution system to allow the customer to obtain distribution access service.

"Shallow utility" means a utility which has facilities buried at a depth less than 2.5 metres below surface grade. This includes power, gas, cable television and communication utilities.

"Site" means a unique end-use Point of Service.

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"Site ID" means a unique identification number assigned by ATCO to each unique end-use Point of Service on receipt of the municipally-approved civic address assignment from the Developer.

"Source primary feeder" means a system comprised of three separate, aluminum 14.4/24.94 kV underground cable jacketed – encapsulated concentric neutral cables which provide the source of power from ATCO's distribution substations to three phase cubicles located near or adjacent to a Subdivision Development Stage or Phase. See Appendix D, Drawing D.2.4.

"Subdivision Development Stage" means the combination of Phases completed within a subdivision. For example, a Subdivision Development Stage can include Phases 1, 2, 3, 4 and 5. It describes a larger area of development and is consistent with the meanings associated with overall municipal subdivision plans.

"Subdivision Development Phase" means a single, smaller area within a Subdivision Development Stage.

"Subdivision primary feeder" means a single phase primary cable which supplies a number of single phase padmount transformers within an URD. See Appendix D, Drawing D.2.4.

"Ultimate Underground Residential Development" means the underground distribution facilities within a subdivision have achieved a fully looped subdivision primary feeder design (i.e., each padmount transformer servicing load can be supplied from primary subdivision feeders, which are ideally supplied from two separately-sourced distribution feeders).

"Underground Residential Development (URD)" means any development as per ATCO's Electricity Distribution Tariff Schedule C, to meet the electric service requirements of individually-titled single family or duplex family lots and dwellings, in conjunction with other joint-use shallow utility requirements and/or

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deep utility requirements and/or vehicle roadway development requirements, as per an approved municipality's development agreement. Single residential services are single phase 120/240V self-contained services to individual houses or units, designed and constructed in accordance with these specifications and ATCO's Electricity Service and Metering Guide.

"Utility right-of-way (URW)" means an easement acquired to allow the use of land owned by another party for utility purposes. A utility right-of-way remains with the grantee and may be transferred to other corporations or mortgaged.

"Work" means all the services to be performed and provided by the Developer and/or its agent(s) as contemplated within this document, including the professional design, procurement, construction, project management, commissioning and professional authentication of the underground residential distribution system, in conformance with the Underground Electrical Distribution Subdivision Service Agreement and the specifications provided herein.