FINAL (EXECUTION VERSION)

EQUIPMENT LEASE/PURCHASE AGREEMENT
BETWEEN
CENTURY ALUMINUM OF SOUTH CAROLINA, INC., AS LESSOR
AND
CITY OF GOOSE CREEK, SOUTH CAROLINA AS LESSEE

FINAL (EXECUTION VERSION)

STATE OF SOUTH CAROLINA	)	
	)	
COUNTY OF BERKELEY	)	**EQUIPMENT LEASE/PURCHASE**
	)	**AGREEMENT**
CITY OF GOOSE CREEK	)	

This Equipment Lease/Purchase Agreement (this "Agreement") is made as of the Effective Date (as defined herein) by and between CENTURY ALUMINUM OF SOUTH CAROLINA, INC., a Delaware corporation ("Century Aluminum" or "Lessor"), and THE CITY OF GOOSE CREEK, SOUTH CAROLINA, a South Carolina municipal corporation ("Goose Creek", "City" or "Lessee" and together with Lessor, the "Parties").

WHEREAS, in pursuance of the powers granted to the City and a successful referendum held on December 3, 2019, the City has created a municipal electric utility (the "System") by ordinance and desires to obtain operational control through initial construction and/or purchase of electrical utility facilities to provide electric power through the System to retail customers;

WHEREAS, the Parties intend to enter into one or more agreements in which Goose Creek will deliver and sell electric power from the System to the Mt Holly aluminum smelter ("Mt Holly Smelter') owned by Century Aluminum (the "Electric Service Agreement");

WHEREAS, Goose Creek desires to obtain operational control through this Agreement of the Delivery Facilities (as defined herein) owned by Century Aluminum that are necessary for the delivery of all such power and are located on property in and around the Mt Holly Smelter ("Premises") as more fully shown on Exhibit B attached hereto;

WHEREAS, leasing of the Delivery Facilities under this Agreement, which includes certain purchasing options for the Delivery Facilities, presents the most reasonable means of facilitating the creation and operation of the System and conforms to the provisions of the Constitution of the State of South Carolina 1895, as amended;

WHEREAS, the Electric Service Agreement will include the imposition of a charge that includes all costs Goose Creek incurs under this Agreement for leasing, operating, maintaining, replacing and improving such facilities as necessary for the delivery of power to the Mt Holly Smelter; and

NOW, THEREFORE, in consideration of the mutual covenants and promises of the Parties hereto, Lessor and Lessee have agreed and do hereby agree as follows:

ARTICLE 1.
Leased Equipment; Easement; Representations

Section 1.1. Leased Equipment. Lessor hereby leases to Lessee, and Lessee hereby leases from Lessor, the electric substation, switching gear, distribution equipment, meters, and additional equipment (spares and stores) described in Exhibit A (one line diagram and narrative description) (collectively "Delivery Facilities").

Section 1.2. Easement.

Section 1.2.1. Lessor grants Lessee an easement across, over, under and through the Premises and all necessary rights over all of Lessor's property for ingress, egress and access to such Delivery Facilities for the purpose of performing its responsibilities under this Agreement. The easement will be non-exclusive such that Goose Creek and assigns shall be afforded access to the Delivery Facilities and any Delivery Facilities Additions (as defined in Section 5.1 herein) at all times and shall terminate with this Agreement, except as provided herein.

Section 1.2.2. The Easement in Section 1.2.1 shall, as necessary, be amended or supplemented or additional easements shall be granted to (i) insure sufficient ingress, egress and access to the Delivery Facilities and any Delivery Facilities Additions (at all times), and (ii) include any additional property adjacent to the Premises that Lessee requires to interconnect Lessee-owned facilities to the Delivery Facilities or Delivery Facilities Additions for a Compatible Use (as defined in Section 8.1 herein).

Section 1.2.3. A description of the Premises, which includes all other properties incorporated by the Easement as necessary to ensure all required access by the Lessee to the Delivery Facilities, is described in Exhibit B attached hereto and will be updated as required under section 1.2.2.

Section 1.2.4. Should this Agreement not be recorded, a separate recordable document shall be prepared and filed as necessary with the Register of Deeds of Berkeley County (or any similar entity) to effectuate the access and other rights provided herein.

Section 1.3. Representations and Covenants of Lessor.

Section 1.3.1. The Lessor hereby makes the following representations, warranties and covenants, each of which is limited to the knowledge of the Lessor, which are true and correct as of the date of this Agreement and the Effective Date. As used in this Agreement, the term "material adverse effect" means any effect, change, development, event or circumstance that, considered together with all other effects, changes, developments, events or circumstances, is or could reasonably be expected to become materially adverse to, or has or could reasonably be expected to have a result in a material adverse effect on, (a) the business, assets (including intangible assets), liabilities, financial condition, property or results of operations of the System, (b) the ability of Goose Creek to consummate the transactions

contemplated by this Agreement or to perform any of its obligations under the this Agreement or the Electric Service Agreement, or (c) the rights or benefits explicitly granted to Goose Creek in this Agreement or the Electric Service Agreement.

A. The Lessor is the sole owner of good and marketable fee simple title to all of the Premises and the Delivery Facilities, subject only to those liens, claims, options, encumbrances, rights-of-way, easements, conditions, covenants and restrictions that would not have a material adverse effect.

B. No options or other contracts have been granted or entered into that are still outstanding giving any other party a right to purchase any interest in the Premises or the Delivery Facilities and no options or other contracts will be granted or entered into by the Lessor giving any other party a right to purchase any interest in the Premises and the Delivery Facilities, except to the extent that such options or other contracts would not be reasonably expected to have a material adverse effect.

C. The Lessor is not in violation of and has not received notice of the violation of any applicable building, zoning or other ordinances, resolutions, statutes or regulations of any government or governmental agency in respect to operation, use, maintenance or condition of the Premises and the Delivery Facilities or any part thereof or requiring any repairs or alterations thereto except for any such violation that would not have a material adverse effect.

D. There are no condemnation or eminent domain proceedings pending or contemplated against the Premises and the Delivery Facilities or to the best of the Lessor's knowledge pending or contemplated against the Premises and the Delivery Facilities or any part thereof, and the Lessor has not received a notice, oral or written, of any public authority or other entity to take or use the Premises and the Delivery Facilities or any part thereof.

E. The Lessor is current in all material respects with all real and personal property taxes and the Premises and the Delivery Facilities are free from special taxes or assessments. All roll back taxes accrued against the Premises and the Delivery Facilities shall be paid by the Lessor.

F. The Lessor has the right, power and authority to enter into this Agreement and to convey the Delivery Facilities in accordance with the terms and conditions of this Agreement. This Agreement, when executed and delivered by the Lessor, will be a valid and binding obligation of the Lessor in accordance with its terms.

G. There has not been a release of Hazardous Materials (as defined herein) on or around the Premises and the Delivery Facilities that would be classified as a violation of federal, South Carolina or local laws or regulations.

Section 1.3.2. The Lessor agrees to timely notify the Lessee in writing of any event or condition that occurs during the Term and that causes a change in the facts related to or the

truth of any of the representations in Section 1.3.1 above. The Lessor has disclosed to the Lessee, and will continue to disclose to the Lessee, any and all facts necessary to prevent the statements in Section 1.3.1 from being misleading.

Section 1.4. Representations of Lessee. This Agreement, when executed and delivered by Lessee, will be a valid and binding obligation of Lessee in accordance with its terms.

ARTICLE 2.
Term

Section 2.1. Effective Date, Initial Term. The initial term of this Agreement shall commence on the later of January 1, 2021 or the commencement of service date under the Electric Service Agreement (the "Effective Date") and expire at midnight on the twenty-fifth (25th) anniversary of the Effective Date ("Initial Term") unless this Agreement is terminated earlier as provided in Section 2.3. The Initial Term and any extension period pursuant to Section 2.2 hereof is referred to as the "Term." If the Electric Service Agreement is not executed, delivered and effective by December 31, 2020 then this Agreement shall be automatically terminated and thereafter deemed null and void and not effective as to either of the Parties.

Section 2.2. Extension Periods. This Agreement shall be automatically extended for successive five year periods unless either party provides written notice to the other party by no later than one year before the end of the Initial Term or any subsequent extended term of such party's intention not to extend this Agreement. Upon any such renewal, the Annual Rental Amount (as defined herein) and the Purchase Price (as defined herein) shall be supplemented as necessary to reflect the then-existing value and useful life of the Delivery Facilities.

Section 2.3. Termination And Extension of Effective Date.

Section 2.3.1. This Agreement will terminate if the Lessor provides Lessee with no less than one-year's written notice of its intention to terminate this Agreement, provided, Lessor shall have a one-time right to withdraw such notice by informing Lessee of such withdrawal by written notice any time prior to the 90th day before the termination is effective. Termination under this Section 2.3.1 shall not change or affect the Lessor's payment obligations under the Electric Services Agreement.

Section 2.3.2. Upon no less than 210 day's written notice, this Agreement will terminate if the Lessor and Lessee mutually agree to terminate this Agreement.

Section 2.3.3. This Agreement will terminate if Lessor provides Lessee with 60 days written notice that Lessor intends to cease smelting operations at the Mt. Holly Smelter; such termination shall become effective upon the later of the 60th day following the Lessee's receipt of such written notice, or the date upon which the Mt. Holly Smelter ceases operations.

Section 2.3.4. This Agreement shall terminate if Goose Creek provides the Lessor with one-year written notice of its intention to sell the System, or cease providing electrical power for sale to all retail customers. No termination under this Section 2.3.4 shall be permitted unless and until the City secures an alternative electric provider and services at rates, terms and conditions acceptable to Lessor in its sole discretion.

Section 2.3.5. In the event of any termination under Sections 2.2 (only with respect to a termination by the Lessor), 2.3.1, 2.3.2 or 2.3.3 above, Lessee may exercise the Option (as defined and described in Section 12.4) and Lessor may exercise those rights provided under Section 12.9 hereof.

Section 2.3.6. Further, nothing herein prohibits the Lessor from providing Lessee with additional notice of a planned or anticipated termination under Sections 2.2, 2.3.1, 2.3.2 or 2.3.3. In such event, and in lieu of waiting for the actual termination to occur and in order avoid any requirement to stay or delay a termination under Section 12.1.3, Lessor may provide Lessee with an executed copy of the Certificate as to Conditions Precedent, the form of which is attached hereto as Exhibit F, as necessary to exercise the Option earlier than may otherwise be permitted under Section 12.4.1(c) hereof.

Section 2.4. Payment for Delivery Facilities Additions upon Termination. Upon termination of this Agreement under Sections 2.3.1, 2.3.2, or 2.3.3 and excluding a purchase of the Delivery Facilities by Lessee under Article 12 herein, Lessor shall be required to purchase all Delivery Facilities Additions to the extent such Delivery Facilities Additions are solely necessary for the continued provision of electric service to the Mt. Holly Smelter. Any Deliver Facilities Additions shall be purchased under this Section 2.4 by the Lessor at a cost equal to the greater of the (i) fair market value of all such Delivery Facilities Additions (as defined in Section 5.1), (ii) the principal balance, plus accrued interest and any redemption penalties associated with any Delivery Facilities Additions to the extent such Delivery Facilities Additions have been financed by Goose Creek, or (iii) a combination of items (i) and (ii)) to the extent only a portion of the Delivery Facilities Additions have been financed by Goose Creek.

Section 2.5. Compatible Uses upon Termination. Upon termination, unless Lessee purchases the Delivery Facilities under Article 12 herein, Lessee shall terminate the connection of any Third Party Distribution Lines (as defined in Section 8.1 herein) to the Delivery Facilities, provided that the Parties shall work in good faith prior to termination of the such interconnections to make arrangements for the City's use of the Delivery Facilities and Delivery Facilities Additions to continue service to the City's other Compatible Use customers.

ARTICLE 3.
Rent

Section 3.1. Annual Rental Amount. Lessor shall charge Lessee an annual rental amount calculated to recover the net book value of the Delivery Facilities amortized over the remaining useful life of such facilities (the "Annual Rental Amount"), as shown on Schedule 1 attached hereto.

Section 3.2. Payment. Goose Creek covenants and agrees to pay the annually assessed Annual Rental Amount in the monthly installments as shall be invoiced by the Lessor. The monthly components of the Annual Rental Amount due and payable by Lessee may be paid as a credit to Lessor under the terms of the Electric Service Agreement.

ARTICLE 4.
Permitted Uses of Delivery Facilities

Section 4.1. Permitted Uses. Except as provided for Compatible Uses, Goose Creek shall use the Delivery Facilities and any Delivery Facilities Additions solely for delivery of electricity to the Mt Holly Smelter ("Permitted Uses"). Except as necessary to repair or replace Delivery Facilities or Delivery Facilities Additions, in no event shall Goose Creek remove the Delivery Facilities or Delivery Facilities Additions from the Premises.

ARTICLE 5.
Delivery Facilities Additions

Section 5.1. Delivery Facilities Additions.

Section 5.1.1. Goose Creek shall promptly notify Lessor of such replacements or additions to the Delivery Facilities ("Delivery Facilities Additions") that are necessary for reliable delivery of power to Goose Creek customers, including the Mt. Holly Smelter.

Section 5.1.2. Goose Creek shall timely submit the plans, specifications and other information pertaining to the proposed Delivery Facilities Additions, as necessary to fully inform the Lessor as to the nature of, need for and estimated cost of such proposed Delivery Facilities Additions. Thereafter, Lessee may construct, or cause to be constructed, such Delivery Facilities Additions only after consultation with, and subject to the prior written consent of, the Lessor, which consent shall not be unreasonably withheld. All Delivery Facilities Additions shall be undertaken in a good and workmanlike manner and in compliance with the laws, regulations and requirements of all governmental authorities having jurisdiction.

Section 5.1.3. Any and all Delivery Facility Additions, including any replacements, will be owned by and titled in the name of the City.

Section 5.1.4. Plans and schematics for the Delivery Facility will be made available to the Lessee as necessary and as available to permit the proper design and development of Delivery Facility Additions to the Delivery Facility.

Section 5.2. Cost of Delivery Facilities Additions.

Section 5.2.1. The cost of any Delivery Facilities Additions will be paid by Goose Creek and not included in the Annual Rental Amount. This cost will be amortized over the useful life of the Delivery Facilities Additions and recovered by Goose Creek from its customers based on those customers' proportionate use of the Delivery Facilities Additions. Any such charges to Lessor associated with its proportionate usage of the Delivery Facilities Additions will be reflected in an adjustment to the delivery charge component of the rates charged to Lessor in the Electric Service Agreement.

Section 5.2.2. Respecting any Delivery Facilities Additions necessary to continue providing electric service to the Mt. Holly Smelter, the cost of which exceeds $500,000 (a "Major Addition"), the Lessor shall be required to provide and maintain: (a) a subdivision bond, or (b) a performance bond to ensure completion of the Delivery Facilities Additions; such bonds must be executed by a surety company licensed to do business in the State of South Carolina, having an "A" of better rating by A.M. Best or Standard and Poor's, and included on the list of surety companies approved by the Treasurer of the United States; provided, that if the Major Addition is needed to serve both the Mt. Holly Smelter and the City's other customers, then the amount of the bond shall be reduced to the Lessor's proportionate share.

Section 5.2.3. Once any Major Addition is completed, the Lessor shall be required to maintain further surety or bonding coverage with a company meeting the standards above in order to fully protect the Lessee from any bankruptcy by Lessor or cessation of business operations by Lessor at the Mt. Holly Smelter.

ARTICLE 6.
Operation and Maintenance of the Delivery Facilities and Delivery Facilities Additions

Section 6.1. Goose Creek Operation and Maintenance Obligations. Goose Creek shall be solely responsible for operating and maintaining the Delivery Facilities and Delivery Facilities Additions; provided that (i) Goose Creek will coordinate operations and maintenance with the requirements of the Mt Holly Smelter, including the requirements for normal and emergency operations in Exhibit C, "Substation Configuration in Normal Operating Conditions and Emergency Transfer Bus Installation", and (ii) Goose Creek will coordinate operations and maintenance with the requirements of the South Carolina Public Service Authority ("Santee Cooper") substation that is connected to the Delivery Facilities.

Section 6.2. Qualified Personnel. Goose Creek operations and maintenance shall be performed only by personnel who are qualified to operate high voltage equipment and meet and

comply with the requirements in Exhibit D, "High Voltage Electrical Safety". Goose Creek must have at least one operator present on-site during all regular business hours and at least one operator on call during non-business hours.

Section 6.3. Safety. Goose Creek operations must comply with all applicable safety requirements, including but not limited to the safety requirements in Exhibit D.

Section 6.4. Maintenance Schedule. Goose Creek will perform maintenance to the Delivery Facilities in accordance with the schedule in Exhibit E, "Maintenance Requirements and Schedule Matrix". Exhibit E shall be updated and supplemented as necessary to include maintenance requirements for any Delivery Facilities Additions.

Section 6.5. Compliance with Applicable Law. Goose Creek shall keep, maintain and operate the Delivery Facilities and Delivery Facilities Additions in a structurally and operationally safe condition and manner and shall keep the same in a state of repair complying with all requirements of National Electrical Safety Code ("NESC") and any other law, ordinance, rule or regulation applicable to the Delivery Facilities and Delivery Facilities Additions, including any Reliability Standards adopted by the Federal Energy Regulatory Commission and enforced by the North American Electric Reliability Corporation ("Applicable Laws") that may apply to the Delivery Facilities and Delivery Facilities Additions. Goose Creek shall, throughout the Term, promptly obtain and maintain all required permits for the Delivery Facilities and Delivery Facilities Additions and shall comply, or cause compliance, with all Applicable Laws and all orders, rules, regulations and requirements of duly constituted public authorities relating to the Delivery Facilities and Delivery Facilities Additions.

Section 6.6. Emergency Maintenance. In the event of an emergency on the System or on the Santee Cooper's delivery facilities that impact the System, Goose Creek shall have the right to take action that Goose Creek may deem necessary or appropriate consistent with applicable safety and reliability requirements and good utility practice, to engage in any maintenance or repair to the Delivery Facilities or any Delivery Facilities Additions that Goose Creek reasonably believes to be necessary to correct the problem causing the emergency. Any such action shall be limited to the period and equipment in the Delivery Facilities and Delivery Facilities Additions necessary to correct the problem causing the emergency. Goose Creek shall promptly notify Lessor of the occurrence of any such emergency and the status of Goose Creek's remedial actions.

Section 6.7. Subcontract. Goose Creek may subcontract operation and maintenance of the Delivery Facilities to a qualified entity, provided Lessor consents, which such consent will not be unreasonably withheld, to such entity and such entity agrees in writing to comply with all the terms of this Agreement. Any subcontractor shall comply with all responsibilities and requirements owed by Goose Creek under this Article VI and Sections 7.1, 8.4, 8.5, 9.1.3 and 11.9 herein. Lessee shall use all reasonable commercial efforts to require the subcontractor to assume the responsibilities and requirements owed to Goose Creek under section 9.1.2.

ARTICLE 7.

Lessor's Right To Capacity

Section 7.1. Lessor's Capacity Rights. At all times during the Term of this Agreement, Goose Creek shall reserve for Lessor sufficient capacity in the Delivery Facilities and Delivery Facilities Additions to serve the estimated maximum hourly consumption of the Mt Holly Smelter at full operation plus additional capacity to maintain service to the Mt Holly Smelter in the event of a planned or forced outage of one of the three Santee Cooper lines or transformers, one of the three 34.5 kV feeders from the Santee Cooper substation or one of the three leased transformers under this Agreement.

ARTICLE 8.
Compatible Uses and Conflicting Uses

Section 8.1. Compatible Uses. Goose Creek shall provide Lessor with written notice of its intention to interconnect distribution facilities to the Delivery Facilities or Delivery Facilities Additions for the purpose of serving other customers of Goose Creek. Goose Creek shall furnish Lessor such plans and specifications and other information regarding the proposed interconnection as Lessor may reasonably request in order to evaluate the nature and extent of the proposed interconnection and to ensure Goose Creek's continued compliance with its service obligations to the Mt Holly Smelter and other obligations set forth herein. Within 30 days of the receipt of such plans and specifications, Lessor shall make a determination whether the proposed uses of the Delivery Facilities or Delivery Facilities Additions to serve other Goose Creek customers are consistent with Goose Creek's performance of its service obligation to the Mt Holly Smelter and its other obligations herein; such uses of the Delivery Facilities or Delivery Facilities Additions to serve other Goose Creek customers, that conform to and are consistent with Goose Creek's performance of its obligations herein, are referred to as "Compatible Uses". Any facilities interconnected to, or added to, the Delivery Facilities or Delivery Facilities Additions to serve a Compatible Use are referred to as "Third Party Distribution Lines".

Section 8.2. Costs. Goose Creek shall recover all costs associated with Compatible Uses, including an allocation of Goose Creek's overhead costs, from Compatible Use customers. In addition, Goose Creek shall charge Compatible Use customers for their proportional use of the Delivery Facilities and, as specified in Section 5.2, Delivery Facilities Additions. Any revenues received by Goose Creek from Compatible Use customers for charges associated with their use of the Delivery Facilities shall be credited to Lessor.

Section 8.3. Conflicting Uses. Any use by Goose Creek of the Delivery Facilities or Delivery Facilities Additions that is not determined to be a Compatible Use pursuant to Section 8.1 and any Compatible Use that is not in compliance with NESC or Applicable Laws, is a conflicting use and shall not be permitted.

Section 8.4. Repair Obligations for Compatible Use. Goose Creek shall promptly cause any damage to the Delivery Facilities, Delivery Facilities Additions or the Premises resulting from

activities associated with Compatible Uses to be repaired to a condition at least substantially equivalent to that existing prior thereto.

Section 8.5. Maintenance Obligation for Compatible Uses. Goose Creek shall be solely responsible for maintenance and repair of all Delivery Facilities, Delivery Facilities Additions, Third Party Distribution Lines, and any other equipment that may impact the operation of the Delivery Facilities and Delivery Facilities Additions, and shall keep and maintain the same in a structurally and operationally safe condition consistent with NESC, Applicable Laws and good utility practice.

ARTICLE 9.
Environmental Matters

Section 9.1. Hazardous Material.

9.1.1. As used herein, the following defined terms shall apply:

9.1.1.1. “Environmental Laws” means all present and future laws (including common law), ordinances, rules, regulations, requirements, orders, directives, injunctions or decrees of any governmental authority, relating to Hazardous Materials or the protection of human health, safety or the environment in the jurisdictions where the Premises is located or where any Hazardous Materials used, generated or disposed of by Lessor are located.

9.1.1.2 "Hazardous Material" means any hazardous or toxic substance, material or waste which is or becomes regulated by any governmental authority, including without limitation, any material or substance which is defined or listed as a "hazardous waste," "extremely hazardous waste," "restricted hazardous waste," "hazardous substance" or "hazardous material" under any Environmental Laws and shall include petroleum or any derivative thereof, asbestos, PCBs, or lead.

9.1.1.3 “Release” means any release, spill, emission, leaking, pumping, injection, deposit, disposal, discharge, dispersal, leaching or migration into or out of the premises of any Hazardous Material, including the movement of Hazardous Materials through or in the air, soil, surface water or groundwater.

9.1.1.4 “Remediation” means the investigation, removal, or clean-up of contamination, environmental degradation, or damage caused by, related to or arising from a Release or presence of any Hazardous Materials on or from the Premises, as required by Environmental Law or any governmental authority, including any actions to prevent, cure or mitigate any Release, any pre-remedial studies and investigations or post remedial care; and any action to comply with Environmental Law or environmental permits.

9.1.2. Lessor shall indemnify, hold harmless and defend Lessee and its agents (each, an "Indemnified Party") for, from and against all liabilities and costs of Remediation (whether or not performed voluntarily) that may be imposed on, incurred by or asserted against any such Indemnified Party in any matter relating to or arising out of, in connection with or as a result of any of the following: (i) the presence of any Hazardous Materials that are or were located on the Premises prior to or after the Effective Date; (ii) the Release, treatment, transportation, storage, arranging for disposal or disposal of any Hazardous Materials that are or were located on the Premises prior to or after the Effective Date; (iii) any past, present or threatened non-compliance with or violations of Environmental Law in connection with activities, operations or Hazardous Material or other substances on the Premises; (iv) the imposition, recording or filing or the threatened imposition, recording or filing of any environmental lien encumbering the Premises; or (v) any administrative processes or proceedings or judicial proceedings in any way connected with any matter addressed in this Article (collectively, the "Environmental Indemnified Matters").

9.1.3. After the Effective Date, Goose Creek shall not cause or permit any Hazardous Material to be brought, Released or disposed of on, in, under or about Lessor's property by Goose Creek, its agents, employees, contractors or invitees, except in compliance with applicable Environmental Laws. After the Effective Date, as may be required by Environmental Laws and subject to the Environmental Indemnified Matters provided in Section 9.1.2 above, Goose Creek shall be responsible for removal of any and all Hazardous Material directly attributable to the Delivery Facilities, Delivery Facilities Additions and Third Party Distribution Lines as a result of actions by Goose Creek, its agents, employees, contractors or invitees.

ARTICLE 10.
Indemnification

[Reserved]

ARTICLE 11.
Equipment Lease Insurance Requirements

Section 11. Lessee's Insurance Requirements. Lessee shall procure and maintain insurance against claims or damages which may arise from or in connection with this Agreement. Coverage shall be at least as broad as indicated below. If the Lessee maintains broader coverage and/or higher limits than the minimums shown below, the Lessor requires and shall be entitled to the broader coverage and/or higher limits maintained by the Lessee.

Section 11.1. Property. "All Risk" Property insurance (including flood, fire, equipment damage, earthquake, earth movement and windstorm) with a limit providing full replacement cost valuation.

Section 11.2. Commercial General Liability. Insurance Services Office Form CG 00 01 covering CGL on an "occurrence" basis, including products and completed operations, bodily injury, property damage and personal & advertising injury with limits no less than **$3,000,000** each occurrence and **$3,000,000** aggregate.

Section 11.3. Automobile Liability. Covering any owned, hired, and/or non-owned vehicles with a limit no less than **$3,000,000** combined single limit.

Section 11.4. Workers' Compensation. Covering all employees with limits as per the State statute. Lessee shall also provide coverage for liability under federal acts, as applicable. An Alternate Employer Endorsement shall be provided in favor of Lessor.

Section 11.5. Employer's Liability. With limit of no less than **$2,000,000** per accident for bodily injury or disease.

Section 11.6. Umbrella/ Excess Liability. With limits of **$3,000,000** each occurrence and **$3,000,000** aggregate and following form of underlying General Liability, Auto Liability and Employers Liability.

Section 11.7. Other Insurance Provisions. The insurance policies are to contain, or be endorsed to contain, the following provisions:

Section 11.7.1. Loss Payee Status. The Lessor, including its employees, are to be named as loss payees with respect to all Delivery Facilities insured under this Article.

Section 11.7.2. Primary and Non-Contributory Coverage. For any claims related to this Agreement, the Lessee's insurance coverage shall be primary and non-contributory insurance coverage as respects the Lessor, its subsidiaries, affiliates, directors, officers, officials, employees, and volunteers. Any insurance or self-insurance maintained by the Lessor, its officers, officials, employees, or volunteers shall be excess of the Lessee's insurance and shall not contribute with it.

Section 11.7.3. Notice of Cancellation. Each insurance policy required above shall provide that coverage shall not be canceled, except with thirty (30) days advance notice to the Lessor.

Section 11.8. Acceptability of Insurers. Insurance is to be placed with insurers authorized to conduct business in the state with a current A.M. Best's rating of A VII or better, unless otherwise acceptable to the Lessor.

Section 11.9. Subcontractors. Lessee shall require all subcontractors who will perform services or provide goods to obtain the same insurance and limits of liability as apply to Lessee as provided herein.

Section 11.10. Verification of Coverage. Lessee shall furnish the Lessor with certificates and amendatory endorsements or copies of the applicable policy language effecting coverage required by this clause. All certificates and endorsements are to be received and approved by the Lessor before work commences. However, failure to obtain the required documents prior to the work beginning shall not waive the Lessor's obligation to provide them. The Lessor reserves the right to require complete, certified copies of all required insurance policies, including endorsements required by these specifications, at any time.

ARTICLE 12.
Option to Purchase

Section 12.1 Option to Purchase; Price.

12.1.1. The Lessor hereby bargains, grants, sells and conveys to the Lessee an exclusive option (the "Option") to purchase the Delivery Facilities subject to the terms and conditions contained in this Article 12 of the Agreement. During the Term of this Agreement, as may be extended under Section 12.1.3 below, the Lessee shall have the exclusive right to purchase the Delivery Facilities, subject to the provisions of this Agreement, for a purchase price equal to the value of the Delivery Facilities (as to the time of acquisition) as described and provided on Schedule 2 attached hereto (the "Purchase Price").

12.1.2. In the event the Lessee exercises the Option, the easement granted in Section 1.2.1 and 1.2.2 related to the Premises is intended to and shall expressly survive the termination of this Agreement.

12.1.3. Further, in the event the Lessee timely exercises the Option, any termination of this Agreement under Sections 2.2 (only with respect to a termination by the Lessor), 2.3.1, 2.3.2 or 2.3.3 shall automatically stayed and extended until the Closing Date (as defined below).

Section 12.2. Consideration for Option. In consideration for the grant of the Option, in addition to the mutual covenants and promises contained in this Agreement, the Lessee hereby agrees to pay the Lessor the amount of One Dollar ($1.00) per month (the "Option Price"). The Option Price may be deducted as a credit against the Annual Rental Amount paid under Article V herein. In the event that the Lessee chooses to exercise the Option, all amounts paid toward as the Option Price shall be applied to and credited against the Purchase Price.

Section 12.3. Exclusivity. The Lessor agrees, warrants and represents that the Option granted and conveyed pursuant to this Agreement is and shall remain the only option to purchase granted by the Lessor for the Delivery Facilities during the Term, and that the Lessor shall not take any action, or fail to take any necessary action, that will result in the further encumbrance of the Delivery Facilities during the Option Term.

Section 12.4 Exercise of Option.

Section 12.4.1. Conditions Precedent to Exercise of Option. Lessee's authorization to exercise the Option shall be expressly limited to the occurrence of one of the following conditions (the "***Conditions Precedent***"):

(a) Lessor's express written consent to exercise the Option, which consent shall be at Lessor's sole discretion and memorialized in a written document separate and distinct from this Agreement; or

(b) If a court, administrative body or tribunal of competent jurisdiction determines that a purchase of a fee interest is required for the City to have the rights to use the Delivery Facilities under the terms of this Agreement; or

(c) Upon the receipt of any notice of termination of this Agreement under Section 2.2 (only with respect to a termination by the Lessor), 2.3.1, 2.3.2 or 2.3.3 hereof.

Section 12.4.2. Fulfillment of Condition.

Section 12.4.2.1. Upon the occurrence of the Conditions Precedents under 12.4.1(a) or (b) above, such Conditions Precedent shall be certified and acknowledged by the Lessor through the delivery of that certain Certificate as to Conditions Precedent, the form of which is attached hereto as Exhibit F. The Option granted herein must be exercised by the Lessee within 90 days of the date of such certificate or the receipt of notice of such termination under Section 12.4.1(c) (as may be extended or stayed under Section 12.1.3 herein); however, respecting a termination under Section 2.3.3, the Option must be exercised within 60 days of the receipt such notice of termination.

Section 12.4.2.2. Thereafter, the Lessee shall deliver written notice (the "Notice") to the Lessor under Section 15.1 of this Agreement of its intention to exercise the Option. The Notice shall set forth the deadline for closing on the conveyance of the Delivery Facilities (the "Closing Date"), which shall not be less than 30 days, nor greater than 120 days, after the date upon which the Option is exercised by receipt of the Notice; provided, however, in the event of a termination under Section 2.3.1 Lessee shall not give the Notice until after Lessor's right to withdraw has expired.

Section 12.4.2.3. In the event that the Lessee fails to exercise the Option as provided above, neither Party shall have any further liability or obligations under this Article 12.

Section 12.4.3. Survey. Upon notice to exercise the Option and request, the Lessor shall prepare (or cause to be prepared), at Lessee's sole expense, a physical boundary survey(s) of the Premises to be performed and completed by a licensed surveyor, and which shall include any recombination or subdivision of the Premises (if and only to the extent such recombination or subdivision is required by, and in accordance with, all applicable laws, regulations, and ordinances and as reasonably necessary for recording the easement), including without limitation, obtaining all necessary governmental approvals for recording such survey (whether one or more).

Section 12.5 Representations of Lessor. Upon exercise of the Option, the Lessor agrees to confirm all representations, covenants and warranties recited herein, excluding Section 1.3.1(G) for all periods where the Lessee was leasing the Delivery Facilities under the terms of this Agreement, as of the Closing Date; to the extent any such representations, covenants and warranties cannot be made, confirmed or sustained within 45 days of the Closing Date, Lessor agrees to take all commercially reasonable and necessary action to be able to unequivocally deliver such representations, covenants and warranties. On or before the Closing Date, the Lessor will do, make, execute and deliver all such additional and further acts, deeds, instruments and documents as may be reasonably required by the Lessee to completely vest in and assure to the Lessee full rights in or to the Delivery Facilities.

Section 12.6 Representations of Lessee. The undersigned representative of the Lessee has the requisite power and authority to deliver the Option on behalf of Goose Creek. In the event that the Lessee elects to exercise the Option upon the completion of the Conditions Precedent, the Lessee will have taken such action necessary to authorize the purchase of the Delivery Facilities pursuant to the terms of this Agreement.

Section 12.7 Pro-Rated Items and Adjustments. The Lessor shall pay for the cost of all deed stamps and transfer taxes and the Lessee shall pay for the recording fees of this transaction. The Parties shall each pay their own legal fees related to the transaction contemplated hereby. The Lessor shall be responsible for payment of all expenses applicable to the Delivery Facilities which are incurred prior to the Closing Date. The Lessee shall be responsible for payment of all expenses applicable to the Delivery Facilities which are incurred from and after the Closing Date including, but not limited to, real estate taxes and assessments and fire, hazard, theft and liability insurance premiums. The adjustments and prorations required under this Agreement shall be computed as of the Closing Date and the Purchase Price paid to the Lessor hereunder shall be adjusted to reflect such prorations. The Lessee shall be responsible for any rollback taxes relating to the Delivery Facilities. The Lessor represents to the Lessee that the Delivery Facilities is not classified as agricultural property. Lessee shall be responsible for paying any shortfall due on rollback taxes immediately upon receipt by the Lessor of the actual tax or rollback tax bill.

Section 12.8 Closing Documents. In addition to other conditions precedent set forth elsewhere in this Article 12, the Lessor shall deliver to the Lessee on the Closing Date all of the following documents, the delivery and accuracy of which shall further condition the Lessee's obligations to consummate the purchase and sale herein contemplated:

A. A Limited Warranty Deed and/or Bill of Sale, as applicable, satisfactory in form and substance to counsel for the Lessee, conveying good and marketable fee simple title to the Delivery Facilities, free and clear of all liens, encumbrances, easements and restrictions of every nature and description, except those previously approved in writing by the Lessee.

B. The Lessor's affidavit or lien waiver satisfactory for the purpose of removing any mechanic's lien exception from any title insurance policy to be issued in connection with the purchase of the Delivery Facilities.

C. An affidavit of the Lessor providing the Lessor's federal identification number and certifying that this transaction is not subject to withholding taxes in accordance with the laws of the State.

D. Evidence the authority of the persons signing the deed, bill of sale and other documents to be executed by the Lessor at closing and the power and authority of the Lessor to convey the Delivery Facilities to the Lessee in accordance with this Agreement.

E. Such other documentation as may be reasonably required in the opinion of the Lessee or its counsel to consummate and close the transaction contemplated herein pursuant to the terms and conditions of this Agreement.

Section 12.9. Post-Purchase Delivery Service to Lessor. By giving written notice to Lessee at any time up to 24 months after the Closing Date, the Lessor shall have the right to reserve capacity in the Delivery Facilities and Delivery Facilities Additions in an amount up to the amount reserved for Lessor under Section 7.1 hereof; commensurate with the then-remaining term of this agreement, such capacity arrangement shall conform to the rates, terms and conditions consistent with those in place at the date of termination.

ARTICLE 13.
Default Provisions

Section 13.1. Events of Default. This Agreement and the Term hereof are subject to the limitation that if, at any time during the Term, Goose Creek shall fail to perform or observe any requirement of this Agreement and such failure shall continue for thirty (30) days after receipt of written notice thereof from Lessor to Goose Creek, an event of default will be deemed to have occurred (herein called an "Event of Default"). In an Event of Default, Lessor shall have the right, then or at any time thereafter, and while such default or defaults shall continue, to give Goose Creek thirty (30) additional days to cure such Event of Default.

ARTICLE 14.
Cumulative Remedies, Waiver

Section 14.1. Remedies.

14.1.1. If an Event of Default is declared and such default continues beyond any applicable cure period, the Lessor shall have all rights and remedies provided at law or in equity as a result of Lessee's material breach or material default under this Agreement. Lessor shall be entitled to a mandamus action (as necessary to require the Lessee to comply with any provisions herein) or the restraint by injunction of any violation or attempted or threatened violation of any of the terms, covenants, condition, provisions or agreements of this Agreement.

14.1.2. If an Event of Default has occurred and is continuing, Lessor may terminate this Agreement by providing written notice to Lessee specifying a termination date, which shall not be less than 30 days after the date of such notice. On the effective date of such notice, Lessee's right to possession of the Delivery Facilities and Delivery Facilities Additions shall cease and Lessee shall peaceably and quietly yield to and surrender the same to Lessor, shall coordinate the transfer and operations of the same to Lessor or a new operator, this Agreement will terminate, and all Lessee's right, title and interest hereunder shall expire.

14.1.3 The specified remedies to which Lessor may resort under the terms of this Agreement are cumulative and are not intended to be exclusive of any other remedies or means of redress to which Lessor may be lawfully entitled in case of any breach or threatened breach by Goose Creek of any provision of this Agreement.

Section 14.2. No Waiver. The failure of Lessor to insist in any one or more cases upon the strict performance of any of the terms, covenants, conditions, provisions or agreements of this Agreement or to exercise any option herein contained shall not be construed as a waiver or a relinquishment for the future of any such term, covenant, condition, provision, agreement or option. A receipt and acceptance by Lessor of any credits or any other payment, or the acceptance of any performance of anything required by this Agreement to be performed, with knowledge of the breach of any term, covenant, condition, provision or agreement of this Agreement, shall not be deemed a waiver of such breach, nor shall any acceptance of any payment in a lesser amount than is herein provided for (regardless of any endorsement on any check, or any statement in any letter accompanying any payment) operate or be construed either as an accord and satisfaction or in any manner other than as payment on account of the amounts then unpaid by Goose Creek, and no waiver by Lessor of any term, covenant, condition, provision or agreement of this Agreement shall be deemed to have been made unless specifically acknowledged as such in a writing signed by Lessor.

ARTICLE 15.
Miscellaneous

Section 15.1. Notices. Any and all notices upon receipt when required or permitted under this Agreement shall be in writing and shall be deemed sufficiently given (a) upon receipt when the same is delivered in person or by courier or (b) as of the third business day after the same has been deposited with the United States Postal Service, postage prepaid for certified or registered mail, addressed as follows:

To Lessor:

Century Aluminum of South Carolina, Inc
One South Wacker Drive, Suite 1000
Chicago IL 60606
Attention: General Counsel

To Lessee:

City of Goose Creek
Attn: City Administrator
519 N. Goose Creek Blvd (in-person)
P.O. Drawer 1768 (by-mail)
Goose Creek, SC 29445

or to such other address or addresses as either Lessor or Goose Creek by notice to the other may designate from time to time in the manner herein provided.

Section 15.2. Survival: The provisions of Section 2.4 (including all subsections thereto), 2.5, 5.2 (including all subsections thereto), Article 6, Section 7.1 (as incorporated into the provisions of Section 12.9), Article 9, Section 12.1 (including all subsections thereto), Section 12.4 (including all subsections thereto), Section 12.9, and Section 15.8 shall expressly survive the termination of this Agreement.

Section 15.3. Invalidity of Particular Provisions. If any term or provision of this Agreement or the application thereof to any person or circumstance shall to any extent be invalid or unenforceable, the remainder of this Agreement, or the application of such term or provision to persons or circumstances other than those as to which it is invalid or unenforceable, shall not be affected thereby, and each term and provision of this Agreement shall be valid and may be enforced to the fullest extent permitted by law.

Section 15.4. Successors and Assigns. The terms, conditions, covenants, provisions and agreements herein contained shall be binding upon and inure to the benefit of Lessor, its successors and assigns, and Goose Creek, its successors and assigns.

Section 15.5. Amendments: Modifications. This Agreement may be modified only by written agreement signed by Lessor and Goose Creek with the same formalities attendant as upon

the execution of this Agreement, it being the express intention of the parties hereto that no provision, term or condition of this Agreement may be amended or varied in any way by an oral understanding or by any document not executed in accordance with this section.

Section 15.6. Governing Law. This Agreement is binding upon the Parties' representatives, assigns and successors. This Agreement shall be taken and deemed to have been fully executed and made by the Parties herein and governed by the laws of the State of South Carolina. The Parties agree that any dispute will be heard exclusively in federal courts of the State of South Carolina. In the absence of federal court jurisdiction, any disputes hereunder shall be heard in the Court of Common Pleas for Berkeley County, South Carolina.

Section 15.7. Entire Agreement. This Agreement sets forth the entire agreement and understanding between Lessor and Goose Creek to the subject matter hereof.

Section 15.8. Confidentiality. From time to time during the Term of this Agreement, either party may learn information about the other party's business affairs and other sensitive or proprietary information about such party (collectively, "Confidential Information"). Confidential Information shall not include information that: (i) is or becomes generally available to and known by the public other than as a result of, directly or indirectly, any breach of this Section 15.8; (ii) is or becomes available to the receiving party on a non-confidential basis from a third-party source, provided that such third party is not and was not prohibited from disclosing such Confidential Information; (iii) was known by or in the possession of the receiving party before being disclosed in connection with this Agreement and the performance of obligations hereunder; (iv) was or is independently developed by the receiving party without reference to or use, in whole or in part, of any of the Confidential Information; or (v) is required to be disclosed under applicable federal, state or local law, regulation or a valid order issued by a court or governmental agency of competent jurisdiction. Each party shall: (A) protect and safeguard the confidentiality of the other party's Confidential Information with at least the same degree of care as such party would protect its own Confidential Information, but in no event with less than a commercially reasonable degree of care; (B) not use the Confidential Information, or permit it to be accessed or used, for any purpose other than to exercise its rights or perform its obligations under this Agreement; and (C) not disclose any such Confidential Information to any person or entity, except to its employees or agents who need to know such information to assist in the performance of obligations under this Agreement. Each shall be responsible for any breach of this Section 15.8 caused by any of its employees, agents or other representatives. In addition to all other remedies available at law, the parties may seek equitable relief (including injunctive relief) against the other party to prevent the breach or threatened breach of this Section 15.8. Notwithstanding the foregoing, either party may make an executed copy of this Agreement publicly available.

Section 15.9 Recording. Either Party may record this Agreement or a memorandum of this Agreement (including the authorization for the Option) in the Office of the Register of Deeds for Berkeley County.

Section 15.10 Counterparts. This Agreement may be executed in multiple counterparts, each of which shall constitute one and the same instrument.

Section 15.11 Severability: In the event that any term or provision of this Agreement is held to be unenforceable by a court of competent jurisdiction, the remainder shall continue in full force and effect to the extent the remainder can be given effect without the invalid provision.

Section 15.12. Further Assurances. Subject to the terms and conditions of this Agreement, each of the parties hereto, including without limitation subsidiaries and affiliates of the parties, will use their best efforts to take, or cause to be taken, all actions, and to do, or cause to be done, all things necessary, proper or advisable to consummate the transactions contemplated by this Agreement and to fully effect the intent of this Agreement.

[signature page follows]

IN WITNESS WHEREOF, the Parties hereto have caused this Agreement to be duly executed as of this 25th of August 2020 and effective as of the Effective Date.

CENTURY ALUMINUM OF SOUTH CAROLINA, INC.

By: DPH

Print Name: Dennis P. Harbath

Title: MT Holly Century Aluminum PM

Date: 8/24/2020

CITY OF GOOSE CREEK, SOUTH CAROLNA

By: _____

Print Name: _____

Title: _____

Date: _____

IN WITNESS WHEREOF, the Parties hereto have caused this Agreement to be duly executed as of this 25th of August 2020 and effective as of the Effective Date.

CENTURY ALUMINUM OF SOUTH CAROLINA, INC.

By: _____

Print Name: _____

Title: _____

Date: _____

CITY OF GOOSE CREEK, SOUTH CAROLNA

By: _____

Print Name: GREG HABEB

Title: MAYOR

Date: 8/25/20

FINAL (EXECUTION VERSION)

SCHEDULE 1

Annual Rental Amount – Schedule of Payments under the Agreement

	Annual Rent	Monthly Rent
Equipment	$32,600.00	$2,717.00
Spare Parts	$2,376.68	$198.06
Total	**$34,976.68**	**$2,915.06**

Rental Calculation Methodology

EQUIPMENT

ASSET	QUANTITY	REPLACEMENT COST	TOTAL	USEFUL LIFE (yrs)	DISCOUNT	EST. ORIGINAL COST	ANNUAL DEPRECIATION	MONTHLY DEPRECIATION
POWER TRANSFORMER, AUX. PLT POWER 34.5 / 13.8 KV - 15 MVA	3	$650,000	$1,950,000	50	50%	$ 975,000	$ 19,500	$ 1,625
DISTRIBUTION TRANSFORMER,STATION SERVICE, 34.5 / 0.48 kV; 500 KVA	3	$85,000	$255,000	30	50%	$ 127,500	$ 4,250	$ 354
OIL CIRCUIT BREAKER,34.5KV / 1200 Amp	3	$125,000	$375,000	25	50%	$ 187,500	$ 7,500	$ 625
ISOLATION SWITCH 34.5KV / 4000 AMP	3	$18,000	$54,000	20	50%	$ 27,000	$ 1,350	$ 113
	TOTAL	**$878,000**	**$2,634,000**			**$ 1,317,000**	**$ 32,600**	**$ 2,717**

SPARE PARTS

ASSET	DESCRIPTION	QUANTITY	COST/UNIT	TOTAL	USEFUL LIFE (yrs)	ANNUAL DEPRECIATION	MONTHLY DEPRECIATION
M-160, OIL CIRCUIT BREAKER,34.5KV	CONTACT,CIRCUIT BRKR MCGRAW STAT CGH-50	17	$392.68	$6,675.56			
M-260, OIL CIRCUIT BREAKER,34.5KV	CONTACT,CKT BRKR MCGRAW MOVEABLE CGH-50	4	$99.60	$398.40			
M-560, OIL CIRCUIT BREAKER,34.5KV	RELAY,GENERAL 10 A 600V DC 115 DC COIL V	1	$43.18	$43.18			
	SWITCH,SUBSTA PRESSURE 3 UNIT OCB MECH	1	$118.28	$118.28			
SAME B.O.M. FOR ALL THREE	RESISTOR,ADJUSTABLE 100 OHM 160 WATT	1	$6.19	$6.19			
	FILTER,OIL CARTRIDGE DISK TYPE "SULATING	1	$323.99	$323.99			
	COUNTER,MECHANICAL RATCHET DRIVE 5 DIGIT	0	$0.00	$0.00			
	COUNTER,MECHANICAL 5 DIGIT	0	$0.00	$0.00			
	COIL,OPERATING 2000 A 125VDC TRIP W/RES	1	$276.35	$276.35			
	COIL,OPERATING 2000 A 125 VDC CLOSING	1	$601.77	$601.77			
	PUMP,CIRCUIT BRKR MCGRAW-EDISON W/MTR	1	$1,275.95	$1,275.95			
	KIT,CIRCUIT BREAKER MCGRAW-EDISON O-RING	1	$334.80	$334.80			
	RELAY,GENERAL 10 A 600V DC 115/125 DC	1	$170.02	$170.02			
	RELAY,GENERAL 125 DC COIL V 1NO 1NC	1	$119.31	$119.31			
	HOSE,CIRCUIT BRKR MCGRAW HYD PRESS LINE	1	$35.28	$35.28			
	BUSHING,O PLUS C-69.0kV,P/N-069W1800VM	6	$4,803.00	$28,818.00			
			SUBTOTAL	$39,197.08	25	$1,567.88	$130.66

ASSET	DESCRIPTION	QUANTITY	COST/UNIT	TOTAL	USEFUL LIFE (yrs)	ANNUAL DEPRECIATION	MONTHLY DEPRECIATION
SWITCH 34.5KV,M249,4000 AMP,ISOLATION SW							
SWITCH 34.5KV,M549,4000 AMP,ISOLATION SW							
SWITCH 34.5KV M159, ISOLATION SWITCH							
SWITCH 34.5KV M259, ISOLATION SWITCH							
SWITCH 34.5KV M559, ISOLATION SWITCH							
SWITCH EMERGENCY TRANSFER M147							
SWITCH EMERGENCY TRANSFER M247							
SWITCH EMERGENCY TRANSFER M547							
SWITCH M148 34.5 KV, PRIMARY DISCONNECT							
SWITCH M248 34.5 KV, PRIMARY DISCONNECT							
SWITCH M548 34.5 KV, PRIMARY DISCONNECT							
	BUSHING,O PLUS C-69.0kV,P/N-069W1800VM	6	$4,803.00	$28,818.00			
15 MVA TRANSFORMER,LINE 2 AUX. PLT POWER	RELAY,XMFR GE 15000/16800 KVA LOCKOUT	1	$630.00	$630.00			
15 MVA TRANSFORMER,LINE 5 AUX. PLT POWER	HEATER THERMAL OL. ELEMENT NO.CR123C163A	3	$4.84	$14.52			

FINAL (EXECUTION VERSION)

ASSET	DESCRIPTION	QUANTITY	COST/UNIT	TOTAL	USEFUL LIFE (yrs)	ANNUAL DEPRECIATION	MONTHLY DEPRECIATION
	BUSHING,O PLUS C-69.0kV,P/N-069W1800VM	6	$4,803.00	$28,818.00			
SAME B.O.M. FOR ALL THREE	RESISTOR,FIXED 4.7 K OHM 5 W PWR XMFR	1	$0.48	$0.48			
	BUSHING,XMFR 46KV OCB1200 BIL KV250 GRAY	1	$3,290.00	$3,290.00			
	THERMOMETER,GENERAL LIQUID TEMP"DICATOR	1	$1,151.00	$1,151.00			
	ARRESTER,SURGE 15 KV RMS ALUGARD GE H79	1	$375.00	$375.00			
	GAUGE,XMFR GE 15000/16800 KVA MAIN TANK	1	$1,655.12	$1,655.12			
	HEATER THERMAL OL. ELEMENT NO.CR123C097A	3	$5.41	$16.23			
	MOTOR,ELECTRIC 1/2HP 1750RPM 460V 3PH	1	$338.69	$338.69			
	MONITOR,ELECTRICAL TRIP DELAY 340-480V	1	$71.20	$71.20			
	VALVE,XMFR GE15000/16800 KVA BLEED PRESS	1	$161.29	$161.29			
	RELAY,XMFR GE15000/16000 KVA FAULT PRESS	1	$228.26	$228.26			
	RELAY,POWER REED TYPE 48VDC COIL	1	$20.35	$20.35			
	CONTACTOR,FULL VOLTAGE 120 AC COIL V	2	$56.59	$113.18			
	RELAY, GENERAL GE#CR2790E100A2 115 V	1	$32.88	$32.88			
			SUBTOTAL	$12,567.36	50	$251.35	$20.95

FINAL (EXECUTION VERSION)

ASSET	DESCRIPTION	QUANTITY	COST/UNIT	TOTAL	USEFUL LIFE (yrs)	ANNUAL DEPRECIATION	MONTHLY DEPRECIATION
TRANSFORMER,STATION SERVICE,500KVA,LINE2	RELAY,VOLTAGE IAV TYPE 199 VAC 60 HZ	1	$1,915.85	$1,915.85			
	BUSHING,O PLUS C-69.0kV,P/N-069W1800VM	6	$4,803.00	$28,818.00			
TRANSFORMER,STATION SERVICE,500KVA,LINE5	GAUGE,XMFR PORTER 500 KVA LEVEL OIL	1	$1,270.00	$1,270.00			
	GAUGE,TRANSFORMER PORTER 500 KVA VACUUM	1	$66.85	$66.85			
SAME B.O.M. FOR ALL THREE	VALVE,TRANSFORMER PORTER BLEEDER DEVICE	1	$24.60	$24.60			
	FUSE,REFILL 15E A 34.5 KV TCC #153-1	9	$862.00	$7,758.00			
	INTERRUPTER,CIRCUIT 34.5 KV LOAD BREAK	8	$425.83	$3,406.64			
	GASKET,XMFR PORTER 500 KVA CVR 50-1/2"	2	$6.78	$13.56			
	ARRESTER,SURGE 36 KV TRANQUELL	1	$1,733.33	$1,733.33			
	XMFR,CURRENT TYPE CMF 600V PR 100 PR A	1	$0.00	$0.00			
	THERMOMETER,DIAL TYPE ABB 8633C35H01	1	$527.00	$527.00			
			SUBTOTAL	$16,723.40	30	$557.45	$46.45
TOTAL			**TOTAL**	**$68,487.84**		**$ 2,376.68**	**$ 198.06**

SCHEDULE 2

Purchase Price under Option

	Equipment	$658,500		$ 355,590	2020
	Spare Parts	$ 68,488		$ 68,488	
	Total	$726,988	58.33%	$ 424,078	
		ORIGINAL VALUE	CURVE	PURCHASE PRICE	YEAR
Annual % Reduction		$726,988	56.40%	$ 410,023	2021
1.93%		$726,988	54.47%	$ 395,968	2022
		$726,988	52.53%	$ 381,912	2023
		$726,988	50.60%	$ 367,857	2024
		$726,988	48.67%	$ 353,802	2025
		$726,988	46.73%	$ 339,747	2026
		$726,988	44.80%	$ 325,692	2027
		$726,988	42.87%	$ 311,637	2028
		$726,988	40.93%	$ 297,581	2029
		$726,988	39.00%	$ 283,526	2030
		$726,988	37.07%	$ 269,471	2031
		$726,988	35.13%	$ 255,416	2032
		$726,988	33.20%	$ 241,361	2033
		$726,988	31.27%	$ 227,306	2034
		$726,988	29.33%	$ 213,250	2035
		$726,988	27.40%	$ 199,195	2036
		$726,988	25.47%	$ 185,140	2037
		$726,988	23.53%	$ 171,085	2038
		$726,988	21.60%	$ 157,030	2039
		$726,988	19.67%	$ 142,975	2040
		$726,988	17.73%	$ 128,919	2041
		$726,988	15.80%	$ 114,864	2042
		$726,988	13.87%	$ 100,809	2043
		$726,988	11.93%	$ 86,754	2044
		$726,988	10.00%	$ 72,699	2045

ANNUAL DEPRECIATION
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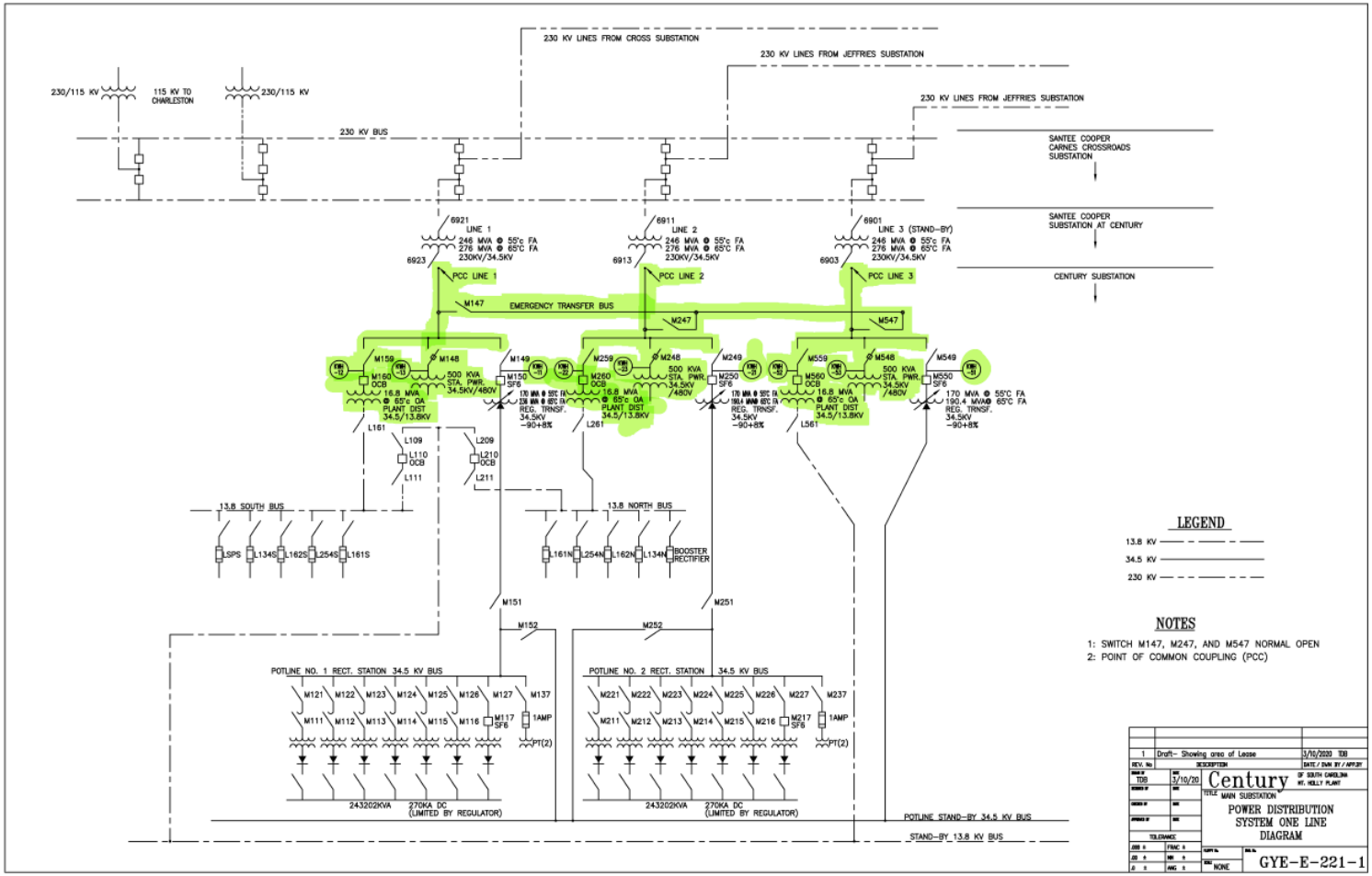
EXHIBIT A

Description of Delivery Facilities



EQUIPMENT

ASSET	QUANTITY
POWER TRANSFORMER, AUX. PLT POWER 34.5 / 13.8 KV - 15 MVA	3
DISTRIBUTION TRANSFORMER,STATION SERVICE, 34.5 / 0.48 kV; 500 KVA	3
OIL CIRCUIT BREAKER,34.5KV / 1200 Amp	3
ISOLATION SWITCH 34.5KV / 4000 AMP	3
	TOTAL

SPARES

ASSET	DESCRIPTION	QUANTITY
M-160, OIL CIRCUIT BREAKER,34.5KV	CONTACT,CIRCUIT BRKR MCGRAW STAT CGH-50	17
M-260, OIL CIRCUIT BREAKER,34.5KV	CONTACT,CKT BRKR MCGRAW MOVEABLE CGH-50	4
M-560, OIL CIRCUIT BREAKER,34.5KV	RELAY,GENERAL 10 A 600V DC 115 DC COIL V	1
	SWITCH,SUBSTA PRESSURE 3 UNIT OCB MECH	1
SAME B.O.M. FOR ALL THREE	RESISTOR,ADJUSTABLE 100 OHM 160 WATT	1
	FILTER,OIL CARTRIDGE DISK TYPE "SULATING	1
	COUNTER,MECHANICAL RATCHET DRIVE 5 DIGIT	0
	COUNTER,MECHANICAL 5 DIGIT	0
	COIL,OPERATING 2000 A 125VDC TRIP W/RES	1
	COIL,OPERATING 2000 A 125 VDC CLOSING	1
	PUMP,CIRCUIT BRKR MCGRAW-EDISON W/MTR	1
	KIT,CIRCUIT BREAKER MCGRAW-EDISON O-RING	1
	RELAY,GENERAL 10 A 600V DC 115/125 DC	1
	RELAY,GENERAL 125 DC COIL V 1NO 1NC	1
	HOSE,CIRCUIT BRKR MCGRAW HYD PRESS LINE	1
	BUSHING,O PLUS C-69.0kV,P/N-069W1800VM	6
SWITCH 34.5KV,M249,4000 AMP,ISOLATION SW		
SWITCH 34.5KV,M549,4000 AMP,ISOLATION SW		
SWITCH 34.5KV M159, ISOLATION SWITCH		

ASSET	DESCRIPTION	QUANTITY
SWITCH 34.5KV M259, ISOLATION SWITCH		
SWITCH 34.5KV M559, ISOLATION SWITCH		
SWITCH EMERGENCY TRANSFER M147		
SWITCH EMERGENCY TRANSFER M247		
SWITCH EMERGENCY TRANSFER M547		
SWITCH M148 34.5 KV, PRIMARY DISCONNECT		
SWITCH M248 34.5 KV, PRIMARY DISCONNECT		
SWITCH M548 34.5 KV, PRIMARY DISCONNECT		
	BUSHING,O PLUS C-69.0kV,P/N-069W1800VM	6
15 MVA TRANSFORMER,LINE 2 AUX. PLT POWER	RELAY,XMFR GE 15000/16800 KVA LOCKOUT	1
15 MVA TRANSFORMER,LINE 5 AUX. PLT POWER	HEATER THERMAL OL. ELEMENT NO.CR123C163A	3
	RELAY,XMFR GE 15000 KVA TRIP CKT 125 VDC	1
	BUSHING,O PLUS C-69.0kV,P/N-069W1800VM	6
SAME B.O.M. FOR ALL THREE	RESISTOR,FIXED 4.7 K OHM 5 W PWR XMFR	1
	BUSHING,XMFR 46KV OCB1200 BIL KV250 GRAY	1
	THERMOMETER,GENERAL LIQUID TEMP"DICATOR	1
	ARRESTER,SURGE 15 KV RMS ALUGARD GE H79	1
	GAUGE,XMFR GE 15000/16800 KVA MAIN TANK	1
	HEATER THERMAL OL. ELEMENT NO.CR123C097A	3
	MOTOR,ELECTRIC 1/2HP 1750RPM 460V 3PH	1
	MONITOR,ELECTRICAL TRIP DELAY 340-480V	1
	VALVE,XMFR GE15000/16800 KVA BLEED PRESS	1
	RELAY,XMFR GE15000/16000 KVA FAULT PRESS	1
	RELAY,POWER REED TYPE 48VDC COIL	1
	CONTACTOR,FULL VOLTAGE 120 AC COIL V	2
	RELAY, GENERAL GE#CR2790E100A2 115 V	1
TRANSFORMER,STATION SERVICE,500KVA,LINE1	THINNER,PAINT REDUCER CLEANUP	1
TRANSFORMER,STATION SERVICE,500KVA,LINE2	RELAY,VOLTAGE IAV TYPE 199 VAC 60 HZ	1
	BUSHING,O PLUS C-69.0kV,P/N-069W1800VM	6

ASSET	**DESCRIPTION**	**QUANTITY**
TRANSFORMER,STATION SERVICE,500KVA,LINE5	GAUGE,XMFR PORTER 500 KVA LEVEL OIL	1
	GAUGE,TRANSFORMER PORTER 500 KVA VACUUM	1
SAME B.O.M. FOR ALL THREE	VALVE,TRANSFORMER PORTER BLEEDER DEVICE	1
	FUSE,REFILL 15E A 34.5 KV TCC #153-1	9
	INTERRUPTER,CIRCUIT 34.5 KV LOAD BREAK	8
	GASKET,XMFR PORTER 500 KVA CVR 50-1/2"	2
	ARRESTER,SURGE 36 KV TRANQUELL	1
	XMFR,CURRENT TYPE CMF 600V PR 100 PR A	1
	THERMOMETER,DIAL TYPE ABB 8633C35H01	1

FINAL (EXECUTION VERSION)

EXHIBIT B

Map of the Premises and Property Subject to Easement

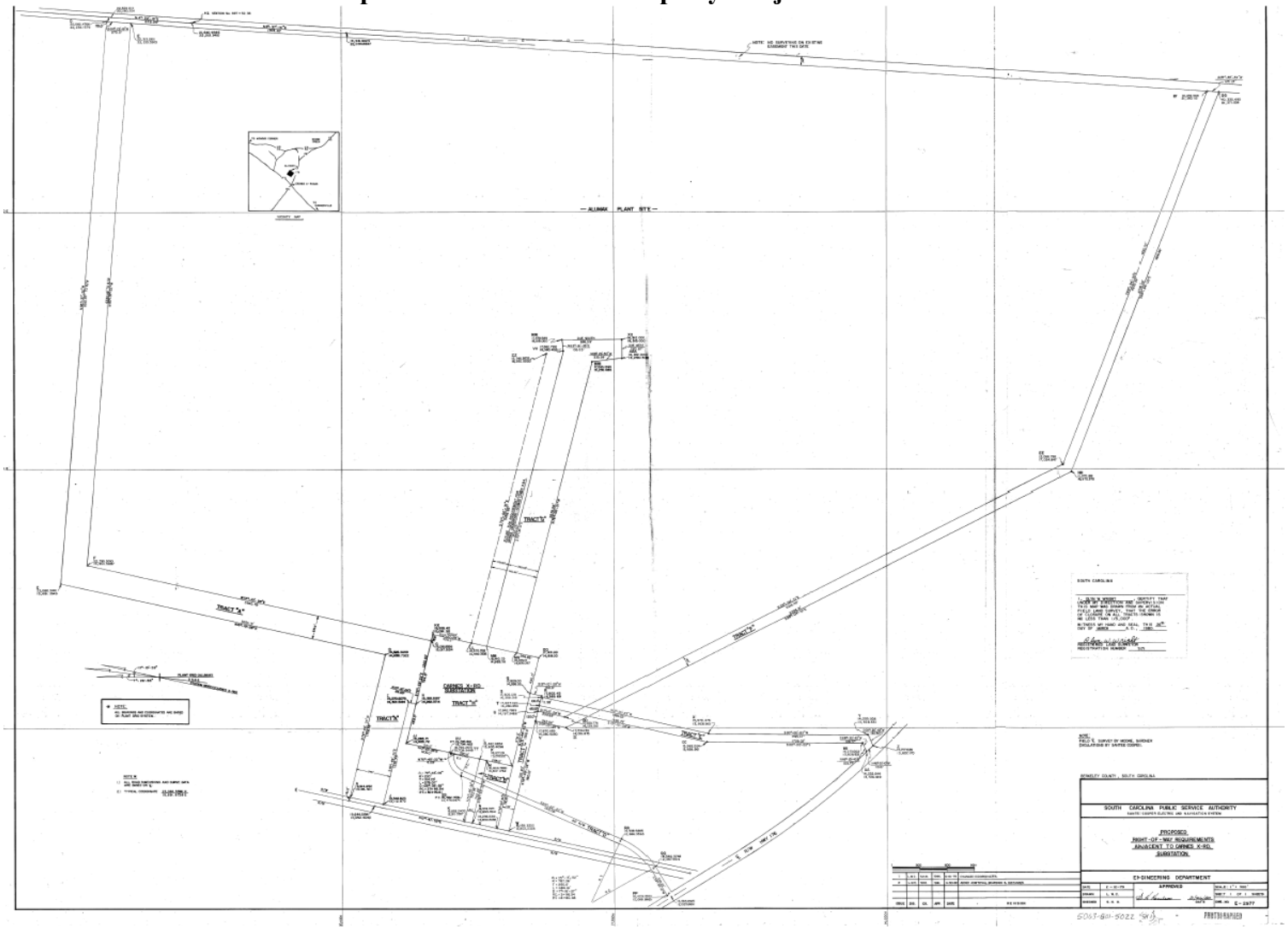


EXHIBIT C

Substation Configuration in Normal Operating Conditions and Emergency Transfer Bus Installation

Substation Configuration in Normal Operating Conditions

Normal configuration of the main substation consists of Santee Cooper #1 transformer sourcing the common 34.5 kV common bus tower #1 that supplies potline one, the south 13.8 kV plant distribution bus and #1 station service 480 volt transformer.

Santee Cooper #2 transformer sources the common 34.5 kV common bus tower #2 that supplies potline two, the north 13.8 kV plant distribution bus and #2 station service 480-volt transformer.

Santee Cooper #3 or the spare sources the common 34.5 kV common bus tower #3 that supplies power to a spare regulator, a spare 13.8 kV plant distribution feed, and #3 spare station service 480-volt transformer. This spare regulator can supply either potline one or potline two. Regulator one normally supplies potline one; regulator two normally supplies potline two. There is no capability for regulator one to supply potline two and there is no capability for regulator two to supply potline one.

Emergency Transfer Bus Installation

Because of this limitation in design configuration, a circumstance exists where if Santee Cooper has equipment problems and Mt Holly has a problem with their equipment in certain configurations, they could lose a potline for lack of being able to alternately source 34.5 kV to other racks for potline needs. Hence, the 34.5 kV emergency transfer bus was installed to remedy this design inadequacy by enabling the Mt. Holly Smelter to route power from Santee Cooper transformers to different 34.5 kV common racks described in various scenarios for potline power restoration. The scenarios do not include switching for the 13.8 kV plant distribution or station service. If problems result with Santee Coopers transformers, these loads will have already been transferred.

EXHIBIT D

High Voltage Electrical Safety

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EXHIBIT D – High Voltage Electric Safety

1.0 SCOPE

This document applies to all Delivery Facilities and Delivery Facilities Additions (as such terms are used in the Equipment Lease Purchase Agreement between the City of Goose Creek and Century Aluminum of South Carolina, Inc. dated August 24, 2020, and together, the "Delivery Facilities") that contain high voltage electrical systems and to all personnel contractors, subcontractors, contracted services, vendors and visitors that can be exposed to high voltage electrical systems. This document describes the minimum requirements for the safe design, operation, and maintenance requirements of high voltage electrical systems.

As additional components and improvements are added to the City of Goose Creek's (the "City") municipal electric system, such components shall be governed and controlled by this standard and the provisions hereof.

2.0 PURPOSE

This standard contains the minimum safety requirements for all persons working in the vicinity of high voltage electrical sources and for designing high voltage electrical systems or equipment. This document shall be used, along with National Electrical Safety Code ("NESC"), Occupational Safety and Health Administration ("OSHA") standards, local regulations and consensus standards, to develop location-specific safety practices to be used as part of the electrical safety program for the Delivery Facilities. Nothing in this document is intended to not meet the requirements of OSHA and the NESC.

3.0 DEFINITIONS

3.1 **Barricades** are physical obstructions such as tapes, ropes, cones, or A-frame type wood or metal structures intended to warn about and limit access to a hazardous area. Barricades are temporary and not to be used as permanent guarding.

3.2 **Bus** is a conductor or group of conductors that serve as a common connection for two or more circuits.

3.3 **Circuit** is a conductor or system of conductors through which an electric current is intended to flow.

3.4 **City Designee** is a qualified person assigned by the City to take on the responsibilities of insuring compliance with all applicable safety standards and requirements including at a minimum the National Electrical Safety Code ("NESC"), Occupational Safety and Health Administration ("OSHA") standards, local regulations and consensus standards. The written appointment of the designee allows the designee to act on the City's behalf.

3.5 **Close proximity** is close enough to reach, fall into, or otherwise accidentally contact a high voltage source. Close proximity may also be the minimum approach distance as defined by OSHA.

3.6 **Conductor** is a material suitable for carrying electric current, usually in the form of a wire, cable or bus bar.

3.7 **Dielectric testing** is a controlled method used to test the electrical insulation integrity of personal protective and live-line equipment.

3.8 **Dimensional clearance** is the necessary space for one object to safely clear another without coming into contact.

3.9 **Disconnected** means not connected to any source of electrical supply but not necessarily isolated. De-energized does not mean isolated, grounded or safe to work on.

3.10 **Energy isolating device** is a physical device that prevents the transmission or release of electrical energy, such as a draw-out circuit breaker, disconnect switch, or other similar device with a visible indication of the position of the device.

3.11 **Escort** is a qualified person who accompanies an unqualified person in high voltage areas.

3.12 **Exposed** is not insulated or guarded.

3.13 **Exposed or bare conductor** is a conductor which is not covered or insulated and has no insulating properties other than air.

3.14 **Flagging** is a form of marking used on distinct components, equipment, or area to prevent misidentification with other components, equipment or areas similar in appearance or close in location.

Before energy isolation is complete, flagging is used to identify isolation devices, valves, components or equipment to be worked on or manipulated. Flagging used before energy isolation is complete does not indicate proof of positive isolation and does not eliminate the need for independent verification of isolation. The most common application of flagging used before completing energy isolation is to identify isolation devices, valves, components or equipment not conspicuously marked or labeled with the associated process, equipment, or function.

After completing energy isolation, flagging is used to define and mark the safe work zone if equipment is similar in appearance or close in location. Flagging used after energy isolation is complete requires proof of positive isolation and independent verification of isolation. The most common application is high voltage electrical situations where flagging is used to identify de-energized equipment from barricaded energized equipment.

3.15 **Grounding or earthing** is the act of providing an intentional connection to earth through a ground connection of sufficiently low impedance and having sufficient current carrying capacity to prevent the buildup of voltage which could result in undue hazard to connected equipment or to persons.

3.16 **High voltage** means voltage 1000 volts A.C. phase-to-phase or 1500 volts D.C. to ground (earth) and above. For each location, local regulations or consensus standards shall establish the lower limit of high voltage. If local regulations or consensus standards establish the lower limit of high voltage as greater than 1000 volts A.C. phase-to-phase, the lower limit of high voltage shall be 1000 volts A.C. phase-to-phase. If local regulations or consensus standards establish the lower limit of high voltage as less than 1000 volts A.C. phase-to-phase, the lower limit of high voltage shall be that limit established by the local regulations or consensus standards.

3.17 **High voltage safety audit** is an intensive review periodically conducted by high voltage qualified employees or electrically qualified personnel from an outside service with knowledge of the City's high voltage safety requirements.

3.18 **IEC is an abbreviation for** International Electrotechnical Commission.

3.19 **IEEE** is an abbreviation for Institute of Electrical and Electronic Engineers.

3.20 **Insulated** is a separation from other conducting surfaces by a dielectric substance, including air space, which offers a high resistance to the passage of current.

3.21 **Isolated** is physically separated, both electrically and mechanically, from all sources of electrical energy including possible potential devices and other low voltage sources. To be isolated, all separation devices shall be locked open or otherwise secured to prevent inadvertent restoration. Since such separations may not eliminate the effects of electrical induction, isolated does not mean grounded or safe to work on.

3.22 **Job Safety Analysis** (aka JSA or SWI) is a documented, step-by-step analysis of a task, including hazard identifications, methods of controlling or eliminating hazards, and all information needed to complete the task safely and with no undue health risks.

3.23 **Line disconnect/switch** is a device designed to connect or disconnect machines, equipment and/or other installations from a high voltage electrical energy source.

3.24 **Live-line tools** are fiberglass rods, handles, or poles rated for the voltage involved and used to touch or come in close proximity to exposed, energized conductors.

3.25 **Lockout** is the placement of a lockout device on an energy isolating device to ensure that the energy isolating device and the equipment being controlled cannot be operated until the lockout device is removed.

3.26 **Lockout device** is used to lock an energy isolating device in the safe position to prevent the machine or equipment from being energized. A keyed lock is an example.

3.27 **Minimum Approach Distance** is the closest distance a qualified or authorized person is permitted to approach an exposed, energized object. Minimum approach distances differ for qualified and authorized personnel. See Sections 6.1 and 6.2 for tables.

3.28 **Mobile equipment** is equipment with the ability to violate the ten-foot rule. This includes cranes, bucket trucks, aerial lifts, and similar types of equipment.

3.29 **Operating system lock** is a keyed lock used to prevent the unintentional operation of a disconnect / switch during normal plant operation.

3.30 **Personal safety lock** is a unique one-key lock or unique one-key lock group used for personal protection during maintenance activities.

3.31 **Personnel** include all employees, contractors, subcontractors, contracted service, vendors or visitors. All personnel fall into one of the following classifications:

(1) **Authorized personnel** are instructed persons assigned the authority and responsibility to perform a specific task in a high voltage area. Authorized personnel, through experience and training, shall be able to demonstrate the ability to recognize potentially hazardous high voltage electrical parts. Authorized personnel could include electricians, mechanics, supervisors, operators, engineers, custodians, and painters.

(2) **Qualified personnel** are, in general, skilled persons knowledgeable, trained, and experienced in the construction, operation and hazards of electrical power generation, transmission, and distribution equipment. A qualified person shall have the knowledge, training, and experience to perform tasks on high voltage equipment and systems. A qualified person shall have an in-depth knowledge of electrical high voltage work, the equipment involved, the potential hazards, and the required safe work practices. A qualified person shall know, understand and, possess skills for performing the operations required of the job, understand basic electrical system operation and know the location-specific electrical work procedures, job safety analyses, and switching processes. A person undergoing on-the-job training to be a qualified person and who has demonstrated an ability to perform those duties safely, is also considered qualified when under the direct

supervision of a qualified person.

(3) **Unqualified personnel** are all ordinary persons not recognized by location management as being High Voltage Qualified or High Voltage Authorized.

3.32 **Safe work zone** is an area where energy sources have been isolated, de-energized, grounded, tagged, locked and verified. A safe work zone is barricaded and, when needed, appropriately flagged.

3.33 **Self-assessment audit** is a yearly audit sponsored by the location manager or designee to determine how well personnel are complying with the requirements of the City's Safety Policy

3.34 **Switching order** is a detailed, step-by-step written instruction describing the order in which switches and circuit breakers will be operated to isolate a specific set of energy sources.

3.35 **Tagout** is the placement of a tagout device on an energy isolating device in accordance with an established procedure. The tagout device indicates that the energy isolating device and the equipment being controlled may not be operated until the tagout device is removed.

3.36 **Tagout device** is a prominent warning device, such as a tag, and a means of securing the attachment to an energy isolating device. The device indicates that the energy isolating device and the equipment being controlled may not be operated until the tagout is removed.

3.37 **Task supervisor or person in charge** is a qualified person in charge of a high voltage task and the assigned personnel.

3.38 **Temporary** is an installation or installations permitted during emergencies or periods of construction, remodeling, maintenance, repair, or demolition of buildings, structures, equipment, or similar activities. Temporary installations shall be removed immediately upon completion of construction or the purpose for which they were installed.

3.39 **Ten-Foot Rule or Three-Meter Rule** is the minimum distance unqualified personnel, equipment, conductive objects and loads shall stay from a high voltage energy source rated 50kV or below. This distance increases four inches or 10 centimeters for every 10kV above 46kV to a maximum of 169kV. For voltages above 169kV add ten feet or three meters to the Minimum Approach Distance.

4.0 REQUIREMENTS

4.1 GENERAL

As used in this document, high voltage means voltage 1000 volts AC phase-to-phase and above. For each location, local regulations or consensus standards establish the lower limit of high voltage.

Knowledge of this document does not make a person qualified or authorized. Management at each location shall develop informal and formal training programs incorporating the contents of this document and other necessary information. Management shall determine the appropriate level of experience needed for personnel to be authorized or qualified for electrical workers and for others whose job functions expose them to high voltage electrical hazards. All persons working with or around high voltage must know, understand, and follow the rules contained in this standard.

4.2 RESPONSIBILITIES

(1) Location Manager or City Designee

The location manager may appoint in writing a qualified person as a City Designee to manage the responsibilities of this document. However, only the location manager approves energized work and the accompanying required job safety

analysis (JSA).

(2) Task Supervisors or Persons in Charge

A. Must be qualified.

B. Assume responsibility for the safety of all personnel under their direction.

C. Determine the necessary safety precautions.

D. Obtain the authorization to implement additional safety precautions deemed necessary but not within their authority to enforce.

E. See that personnel follow location safety rules, have fulfilled training requirements, and adhere to operating procedures.

F. Compile all necessary documentation, such as switching orders, confined space entry permits, and the applicable job safety analysis.

G. Make sure no unescorted, unqualified persons enter an area where qualified personnel are performing electrical work.

H. Determine what tools or devices are required for each task and that those tools or devices have been inspected and tested before work begins.

I. Ensure a safe work zone is created, de-energized equipment within the safe work zone is clearly identified with flagging, and energized equipment is segregated with barricades.

J. Describe and identify the safe work zone, isolation devices, flagging, and barricades to each person involved in the task.

K. Confirm electrical equipment and systems have been maintained to ensure conditions are safe for operation.

(3) Personnel

A. All Personnel

(1.) Must be aware of electrical hazards and how these hazards may impact safety.

(2.) Shall watch out for the safety of others and keep unescorted, unqualified persons away from areas where electrical work is being performed.

(3.) Shall report to the appropriate person anyone (employee, contractor, vendor, or visitor) not following the required safe work practices.

B. Unqualified Personnel

(1.) Shall always be aware of possible electrical hazards even when their tasks do not involve electrical work, such as the operation of mobile cranes, use of ladders or handling construction materials.

(2.) Shall only enter high voltage areas with a qualified escort.

C. Qualified and Authorized Personnel

(1.) Follow the proper safety precautions and applicable job safety analysis.

(2.) Know the appropriate tools and devices for each task assigned and how to inspect and test those tools and devices before beginning work.

(3.) Follow all applicable safety concerns associated with their tasks as

contained in this or other specifications.

(4.) Remain knowledgeable and current on the applicable specifications and rules applying to their jobs.

(4) Escorts

Escorts shall be qualified, safeguard the people in their care, and ensure safety regulations are observed.

(5) Contractors, Subcontractors and Contracted Services

A. Enforce all rules.

B. Understand the potential electrical hazards associated with their work. Report any unique hazards associated with their work or any unexpected hazards encountered during progression of the task.

C. Notify the appropriate City representative of changing work conditions that relate to potential hazards.

D. Advise new employees or subcontractors on all electrical safety considerations that apply under this or other specifications.

E. Inform the City of any corrective actions taken in response to reports of contractor employees violating any safe work practices.

F. Train onsite employees on applicable City safety requirements, local regulations, and known hazards associated with their work. If the contractor wants to use a training program other than City's electrical safety training, the alternate program must be provided to the City Designee for approval. If the City Designee determines the contractor, subcontractor or contracted service training program does not meet the requirements of the City's Safety Policy, that decision is final.

(6) Electric Utility Workers

Electric utility employees and their contractors, subcontractors and contracted services shall not be required to comply with City Safety Policies when working on equipment owned and maintained by the utility company providing all the following are met:

A. Compliance with legislated codes applicable to the work being performed.

B. Have a documented safety program, which includes the method by which they create a safe work zone.

C. City has granted an easement to the utility company or they have a pre-existing agreement for installation, operation, and/or maintenance of the equipment.

D. The work will not compromise the safety of City employees or City contractors, subcontractors and contracted services at any time.

If work conducted on City property does not comply with all of the requirements above, electric utility employees and their contractors, subcontractors and contracted services shall comply with City Safety Policy.

4.3 TRAINING

All persons shall receive job-specific safety training on the hazards associated with working on or near electrical installations and equipment. Training consists of classroom and/or on-the-job training. Training shall be documented and records maintained for the duration of employment or job assignment.

(1) Qualified Persons

To obtain and hold the classification of qualified, a high voltage electrical worker

must be trained, tested, observed, and retrained on a regular basis. The training, skill assessment, observations, and retraining must be documented.

To be qualified for high voltage electrical work, individuals shall be trained and competent in all safety related work practices, procedures, and requirements regarding their respective job assignments. Training shall include the following topics.

A. Emergency response training for persons working at a site without medical assistance available within approximately four minutes, including:
   (1.) Cardiopulmonary resuscitation (CPR),
   (2.) Automatic external defibrillator (AED), and
   (3.) Emergency first aid.
B. Skills and techniques needed to distinguish exposed, energized parts from the non-energized parts of structures and other items in the environment.
C. Skills and techniques needed to determine the nominal voltage of exposed, energized parts.
D. Knowledge and understanding of the required distances that must be maintained from high voltage parts.
E. Proper use of personal protective equipment, insulating and shielding materials, and insulated tools associated with working on or near exposed parts of electrical equipment.
F. Skills and techniques needed to apply flagging and barricades.
G. Skills and techniques needed to understand induced and static voltages, grounding integrity, condition of poles and structures, and circuit and equipment location.
H. Location-specific skills and rules required of qualified personnel.
I. Choosing and properly using voltage detectors. Qualified persons must understand the limitations of varying detectors and demonstrate how to choose, test, and verify the absence of voltage with a voltage detector.

(2) Authorized Persons

Only qualified personnel may come closer than ten feet to exposed, energized conductors or parts shall receive training to be authorized. Authorized training includes:

A. The ability to recognize potentially hazardous energy and its potential impact on workplace conditions.
B. Knowledge and understanding of the various barricading and flagging techniques used at the location.
C. Skills and techniques needed to distinguish exposed, energized parts from the other parts of electrical equipment and how to work safely around them.
D. Knowledge and understanding of the required distances to be maintained.
E. On-the-job training from a qualified person that covers the specific requirements needed for the job or task assigned to the authorized person.

(3) Unqualified Persons

All unqualified personnel who may be exposed to high voltage systems shall receive training on:

A. High voltage awareness.
B. The requirement for having an escort in high voltage areas.

C. The ten-foot rule.
D. To whom high voltage safety matters are reported.

(4) Retraining For All Personnel

Retraining shall be provided at least every two years. Retraining includes:

A. Review of standard safe work practices.
B. Maintaining skills and reviewing types of tasks.
C. Refresher training for those individuals requiring CPR, AED and First Aid as outlined in 4.3(1)(A) above.

(5) When to perform retraining more frequently:

A. Annual inspections and audits indicate non-compliance with work practices.
B. In response to electrical incidents.
C. Personnel need to perform a task undertaken less than once a year.
D. As a result of new technology, work techniques, or procedural changes.

(6) Observations and reviews

A. To verify personnel understand the training they receive and apply the knowledge and skills to their assigned tasks, an annual documented supervisory observation is required.
B. All persons working exposed to electrical hazards must demonstrate the proficiency with assigned tasks

4.4 PERSONAL PROTECTIVE EQUIPMENT

Personnel shall wear the appropriate clothing and personal protective equipment when working around high voltage systems. This section outlines the clothing and personal protective equipment necessary to provide personnel with adequate protection from electrical hazards.

(1) Clothing/Apparel

Personal protective equipment must provide adequate protection against the hazards associated with a task. At a minimum, personnel working in close proximity or within an arc flash boundary must wear required arc-rated clothing and equipment.

(2) Conductive Articles

Personnel shall not wear articles containing conductive material such as rings, metal watch bands, metal-framed eyewear, and dangling metal jewelry when in close proximity to exposed, energized parts.

(3) Head Protection

Electrically non-conductive hard hats rated and tested in accordance with local regulations are required at all times when in areas with exposed, energized conductors. Personnel shall keep hard hats clean and in good condition. Hard hats shall not be altered or defaced. Company-approved markings are acceptable.

(4) Foot Protection

Footwear with "Electrical Hazard" rated soles must be worn when in areas with exposed, energized conductors. Line technicians may wear reinforced line technician boots when climbing towers and wooden poles.

(5) Eye Protection

Approved eyewear with electrically nonconductive side shields and frames are required when in areas with exposed, energized conductors.

(6) Hand Protection

Voltage-rated, rubber-insulating gloves must be rated 17kV or higher and meet ASTM International (f//k/a American Society for Testing and Materials) ("ASTM") D120 or equivalent, with leather protectors, meeting ASTM F696 or equivalent. Gloves are mandatory when working with or on any of the following:

A. Live-line tools.
B. Manually operated high voltage switches.
C. Installing and removing grounds on lines and high voltage equipment.

Personnel shall use the appropriate gloves for the electrical voltage task involved. Personnel shall never wear gloves turned inside out. Only gloves meeting ASTM F496 or equivalent and that have been dielectrically tested within the previous six months are allowed. New rubber-insulating gloves must be dielectrically tested before first use. The dielectric testing of insulating rubber gloves shall be in accordance with ASTM standards or equivalent. Personnel shall always inspect and air test their gloves before each day's use. To air test gloves, trap air in the glove and examine it for pinholes or other apparent leakage. If any damage is suspected, gloves must be removed from service until dielectrically tested and approved for further use. Gloves may only be stored in an approved canvas glove bag or equivalent protective location.

(7) Sleeves

New rubber-insulating sleeves shall be dielectrically tested according to ASTM standards or equivalent before use and then again once every 12 months. Rubber-insulating sleeves shall be visually inspected for damage each day before use. When not in use, sleeves shall be stored in containers designed for the purpose. If sleeves may have been damaged, dielectrically test them before using again. Refer to ASTM F496 and D1051.

4.5 TOOLS

Personnel shall use insulated tools or handling equipment if the tools or handling equipment might accidentally contact exposed, energized conductors or circuit parts. Test records must be maintained on all equipment and line tools that require testing. This includes test records on equipment and line tools owned or leased by the City, contractors, subcontractors and contracted services. On owned equipment and tools, test records shall be kept for the life of the equipment and tools or for a minimum of three years. On leased equipment, test records or certificates shall be kept for the period of the lease. When inspecting and testing tools and equipment, personnel complete the following tasks:

(1) Use And Care Of Live-Line Tools

A. Visually inspect live-line tools for defective hardware attachments, cracks, deformities, contamination, and proper operation before using and/or testing them.
B. Ensure tool was dielectrically tested within 12 months.
C. Electrically test fiberglass and epoxy sticks every 12 months. Refer to IEEE 978.
D. Wipe and dry tools that get wet as soon as possible.
E. Remove damaged tools from service.
F. Store tools in a clean, dry location.
G. Do not place tools where they can be damaged or contaminated.

(2) Protective Ground Sets

A. Protective ground sets shall be tested at least once each year to insure maximum voltage drop values for the short circuit rating of the ground sets are not exceeded. Testing shall also be completed before new, repaired or modified ground sets are used. Refer to the manufacturers' specifications for rating of the ground sets and testing guidelines.

B. Protective ground sets must be inspected for cuts in the protective sheath, damage to conductors, and tightness of clamps and connector strain relief devices. Inspections should be made at regular intervals and as conditions require, but no less than once each year.

C. Labels with the inspection, testing, or testing expiration dates must be affixed to protective ground sets.

(3) Insulating Equipment

A. Visually inspect this equipment for defects before use and installation on exposed, energized conductors, devices, or equipment, and at other times, if damage is suspected. Do not use damaged or possibly damaged equipment until it has passed an electrical retest. This equipment is not designed for permanent installation. Follow the manufacturer's specifications for use as exposure may result in ozone checking, corona cutting, or excessive weathering.

B. Electrically test insulating blankets, covers, matting, and rubber insulating line hoses according to ASTM D178, ASTM F479, ASTM F478, ASTM D1048, ASTM D1049, and ASTM D1050. This equipment shall be tested before using it the first time and then at least once every 12 months thereafter.

(4) Mechanized Equipment

Inspect and test insulated vehicle-mounted elevating and rotating aerial devices used for high voltage work, such as bucket trucks, before first use and then at least once each year as outlined by the manufacturer, ANSI/SIA A92.2, and ASTM F914. If a basket liner is used, it must be dielectrically tested per ANSI/SIA A92.2 at least once every 12 months.

4.6 PERFORMING WORK SAFELY

(1) Ten-Foot Rule or Three-Meter Rule

All persons in the area of high voltage systems must understand and adhere to the ten-foot rule or three-meter rule. Unqualified personnel, un-insulated equipment, conductive objects and loads shall remain at least 10 feet or three meters from high voltage energy sources rated 50kV or less. Qualified personnel may work up to the minimum approach distances listed in Section 6.1. Above 50kV, the distance for unqualified personnel, equipment and loads increases four inches or 10 centimeters for every 10kV to a maximum of 169kV. For voltages above 169kV add ten feet or three meters to the Minimum Approach Distance found in. Required distances for authorized and qualified personnel are listed in Sections 6.1 and 6.2.

(2) The appropriate personal protective equipment is required when working in areas containing high voltage parts. Within the arc flash boundary, personnel shall wear the personal protective equipment.

(3) Always consider electrical equipment and lines energized until grounded.

(4) Working Near High Voltage

When a task requires working near high voltage conductors or equipment,

personnel shall comply with the following:

A. A conductor covered with a material having a rated insulating strength less than the voltage of the circuit shall be treated as exposed.

B. Unqualified persons (persons not qualified or authorized) obey the ten-foot rule.

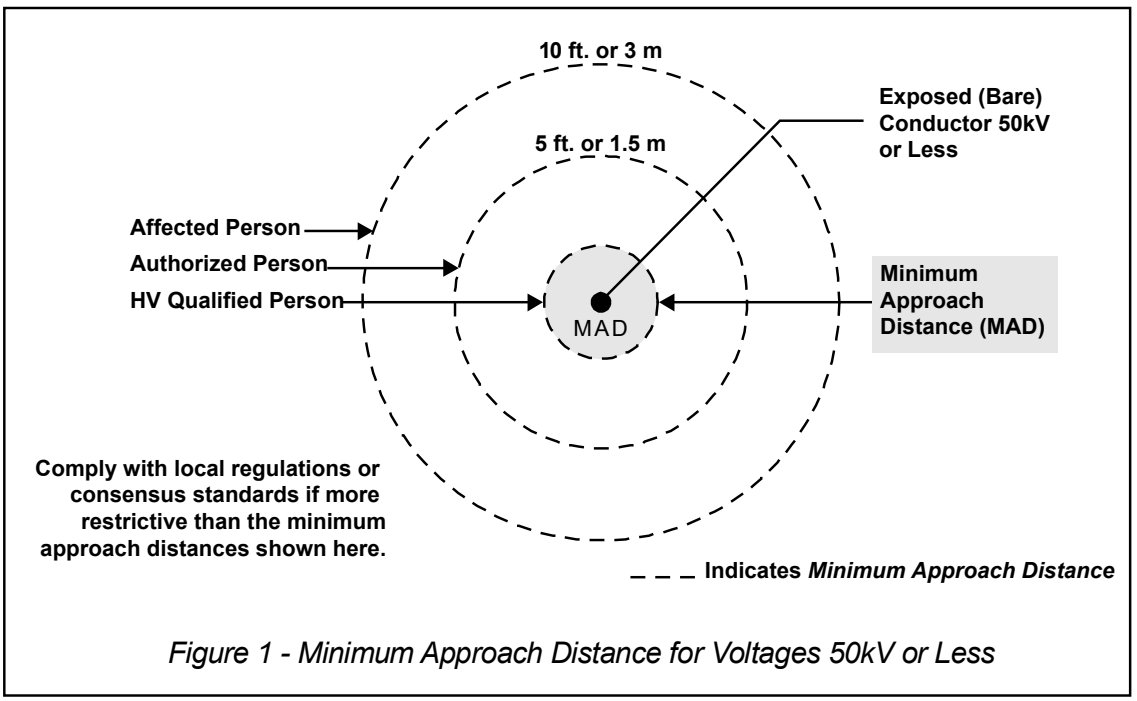


Figure 1 - Minimum Approach Distance for Voltages 50kV or Less

C. Authorized persons follow the ten-foot rule unless specifically trained for a task and the associated hazards. This training includes hazard awareness conducted by a qualified person and an explanation of the boundaries of the area the authorized person may access. Only after receiving such training may an authorized person work inside the ten-foot rule. For voltages 50kV or less, an authorized person may work no closer than five feet to exposed, energized parts. For voltages above 50kV, an authorized person shall not work closer than the minimum approach distances listed in Section 6.2.

D. Qualified persons may work up to the minimum approach distances listed in 6.1. If a person is working near the minimum approach distance, special precautions, such as insulating and barricading, should be used. If work requires approach distances less than the minimum, it is live-line work.

E. In areas where the ten foot rule cannot be maintained, a qualified person shall escort unqualified persons. These areas generally include all secured electrical installations and the minimal conductor/bus clearance from buildings, rooftops, and other structures. Examples of persons needing an escort would be unqualified personnel, visitors, vendors, and contractors.

F. A second qualified person must be present when a qualified person works in close proximity to exposed, energized parts.

(5) Identifying The Work Zone

During maintenance, testing, renovations to existing installations and additions to installations where high voltage equipment or conductors are present, appropriate

barricades or other identification shall be erected. The types and sizes of the conductive materials, the electric arc flash boundary and the equipment used in the area determine the work zone boundaries.

A. Appropriate warning signs and barricades identify the work area, restrict personnel from entering, and prevent accidental contact with exposed, energized parts. At a minimum, the following protective measures shall be taken:

(1.) Personnel restricted from entering the area through the use of danger signs and barricades.

(2.) Everyone entering a work zone must comply with the location lockout/tagout program.

(3.) The safe work zone clearly identified.

a. Flags mark de-energized electrical equipment to ensure personnel do not work on or manipulate the wrong electrical equipment or components, especially in areas where equipment is similar in location and appearance. Flagging does not eliminate the need for independent verification of energy isolation.

b. Barricades and warning signs differentiate and separate energized equipment from de-energized equipment and lead personnel to the equipment safe for work or to the safe work zone.

(4.) Personnel protected from accidental contact by barricades erected around exposed, energized parts in adjacent sections.

B. In areas where the safety of vehicles and unqualified pedestrian traffic may be compromised, appropriate warning signs and/or barricades shall be used to identify where work on high voltage equipment is being conducted.

C. Use of electrical hazard barricade tape and rope and flagging tape and rope.

(1.) Electrical hazard barricade tape and rope are temporary and not to be used to identify a permanent hazard. The tape and rope shall be a distinctive color, such as red, or as defined by local regulations or consensus standards. Use tape imprinted with an appropriate warning.

(2.) Flags, signs, tape or other objects identify electrically safe equipment or areas. Flagging material shall be a distinctive color that contrasts with the barricade tape and rope. For example, if red flags, signs and tape warn personnel of electrical hazards, green flags, signs and tape are used to indicate electrically safe equipment.

(6) Specific Rules & Policies For Working Around High Voltage Equipment

A. Insulated, armored high voltage cable.
Work may be performed adjacent to this type of cable while it is energized. Do not disturb or move energized cable without a job safety analysis approved by the City Designee. This applies to cable constructed with a jacket made of an abrasion resistant material such as high density XLPE and with shield tape or screen rated to carry the maximum available short circuit current for the required interrupting time.

B. Insulated, non-armored high voltage cable.

Insulated, non-armored high voltage cable shall not be disturbed or moved while energized. A job safety analysis and City Designee approval are required to work around insulated, non-armored high voltage cable. When personnel perform work adjacent to insulated, non-armored high voltage cable, the condition of the insulation shall be examined since this cable does not have the added protection of armor. These requirements do not apply to special applications such as mining draglines and other moveable substation cables, ship unloader cable reels, and equivalent applications for mobile equipment.

C. Live-line work policy.

No maintenance or installation work shall be performed on high voltage conductors and/or exposed, energized parts except for the following tasks performed by a qualified person:

(1.) Using high voltage detectors. (e.g. testing for voltage)
(2.) Attaching grounds.
(3.) Performing high voltage phasing.
(4.) Using Live-Line tools for switching operations.

No tasks other than those listed above may be performed on energized equipment unless proven infeasible to complete on de-energized equipment. Only the location manager shall approve proceeding with the live-line work and approve the job safety analysis specifically prepared for the task. When a qualified person performs any live-line work including the four exceptions listed above, a second qualified person trained in live-line work shall be present.

D. Normal operation of energized electric equipment such as circuit breakers and switches shall be permitted only when the following conditions are satisfied:

(1.) The equipment is properly installed per industry codes, standards and manufacturer recommendations.
(2.) The equipment is properly maintained per City requirements, industry standards or manufacturer recommendations.
(3.) There is no evidence of impending failure such as arcing, overheating, loose or bound equipment parts, visible damage, or deterioration.
(4.) If the electrical equipment is of enclosed switchgear design, equipment covers must be in place and doors closed and secure.

Exception to these conditions requires a risk assessment and authorized based on the risk level (refer to appendix 6.8 Switching Risk Assessment example) or plant manager approval.

E. Equipment access interlock systems.

Equipment access interlock systems shall not be bypassed or otherwise rendered inoperative while the equipment is energized except when phasing conductors following new or revised installations or when performing infrared testing. Temporarily bypassing the interlock system to perform testing requires a job safety analysis and City Designee approval. Upon completion of testing, the interlock system shall be restored to full operable condition. Under no other circumstances shall the

interlock system be bypassed or otherwise rendered inoperable.

F. Pre-work briefing.

Before a high voltage electrical work operation begins, personnel shall be briefed on the safety concerns and precautions regarding the task. Additional briefings are held whenever work conditions or methods change that could potentially compromise personnel safety. Pre-work briefings include the following information:

(1.) Hazards.
(2.) What personal protective equipment is required.
(3.) Coverage of the safe work zone.
(4.) Lock/tag/verify process.
(5.) Work procedures involved.
(6.) Groups and/or personnel involved and their tasks.

For frequently performed high voltage electrical tasks with up-to-date job safety analyses available, pre-work briefings may be less detailed. If a person is working alone and has a current job safety analysis, the pre-work briefing may be waived.

G. Working overhead.

A fall control assessment shall be completed on high voltage equipment before any task begins.

(1.) Small equipment and tools used aloft shall be raised and lowered by a non-conductive handline, canvas bucket, or other suitable method. Nothing shall be thrown or intentionally dropped. Personnel working overhead must take care to prevent dropping tools and materials. Personnel below are to stay clear of overhead work to avoid being struck by falling objects.

H. Working in confined spaces.

Confined space entry shall comply with the requirements of the City's Safety Policy, local regulations and consensus standards.

I. Working in areas with limited visibility.

If poor lighting or obstructions limit visibility, portable lamps or other types of illumination must be provided. Personnel are not to blindly reach into an area that might contain exposed, energized equipment.

4.7 CREATING A SAFE WORK ZONE

Each location shall have a written procedure for creating a safe work zone or its equivalent. The procedure shall detail the steps listed below and the personnel responsible for completing each step. Until these steps are completed, a safe work zone is not established. The steps in creating a safe work zone follow.

(1) Isolate and Confirm

Switching orders and confirmation of energy isolation completed to protect personnel and equipment, and to minimize disruption to plant operation.

(2) Tag and Lock Isolation Devices

A. Isolation devices tagged and locked during or after switching completed and confirmed. Refer to the location tag/lock/verify program.

B. All equipment locks associated with a group lockbox identified with the group lockbox by color or other unique identifier.

C. When generating and switching locations are influenced by distance, ownership, or organizational structure, a formal written agreement

outlining the agreed upon lockout/tagout procedure between parties completed

(3) Verify by Testing and Ground

A qualified person tested and verified that all energy sources have been isolated and de-energized and then applied grounds. All ground sets must be uniquely identified and included in the lock/tag/verify process.

(4) Identify the Safe Work Zone

Safe work zone identified with appropriate barricading and flagging.

(5) Document the Safe Work Zone

Personnel document that the safe work zone has been established. The documentation includes all isolation points and the number of ground sets applied.

(6) Releasing the Safe Work Zone

Upon completing the work, the task supervisor or person in charge shall release the safe work zone by completing the following steps in the order required by the location:

A. Removing flagging and barricades;
B. Removing personal locks and tags;
C. Removing and accounting for all ground sets; and
D. Releasing the safe work zone for restoration of power.

Power shall be restored to the safe work zone in a controlled, safe way through a properly issued switching order.

4.8 OPERATION AND MAINTENANCE

Consider electrical equipment and lines energized until isolated, tested for absence of voltage or otherwise determined to be de-energized, and grounded. Personnel shall comply with all personal protective equipment requirements when switching, testing for voltage, and grounding

(1) Switching

(a) Switching orders shall be prepared by a qualified, knowledgeable person and when possible, reviewed for accuracy by a second knowledgeable person. No switching operation may begin until the written order is completed. Personnel confirm each step of the order as the operation progresses by marking it as completed. Using lock/tag/verify in lieu of a switching order is acceptable in situations involving simple, one-switch operation. This is the only exception to not using a switching order.

(b) Fixed or standing switching orders are *only* acceptable for routine or straight forward events. If fixed or standing switching orders are used, an up to date hard copy must be available to the person(s) doing the switching. All fixed or standing switching orders must be reviewed by the City Designee or the responsible person for the power system annually.

(2) Testing and Verifying Equipment is De-energized

To test and verify equipment is de-energized, qualified personnel perform the following actions:

A. Visually confirm all energy sources within the work zone are open and an air gap exists.
B. Test circuit elements and exposed electrical parts to verify all elements and

parts are absent of voltage.

C. Verify no energized condition exists or may exist as a result of accidentally induced voltage or back-feed.

D. Check the test equipment for proper operation immediately before and after the test.

(3) Grounding Lines and Equipment

Personnel visually inspect the grounding equipment before installing the grounds to confirm it is in working order and good condition. Personnel use an approved live-line tool when attaching or removing a grounding connection to a circuit or to equipment. In areas where live-line tools cannot be effectively used, the City Designee may grant exceptions to the grounding policy through a job safety analysis. Exceptions must offer an equivalent level of protection and in no way compromise personnel safety.

Equipotential grounding is required. Personnel shall place protective grounding equipment at designated locations and arranged in a manner that will prevent each employee from being exposed to hazardous differences in potential. Single point grounding is an acceptable means of grounding. When equipment is fully enclosed and designed with a ground switch, it may not be possible to test for voltage before grounding. In these cases, the City Designee must approve an alternative safe method for grounding. Examples of such equipment include gas-insulated voltage bus and switchgear.

A. When grounding lines or equipment, personnel shall:

(1.) Attach the grounding device to an effective ground connection.

(2.) Then attach the grounding device to the circuit or equipment.

(3.) A method to account for each applied ground set shall be used. One acceptable method is providing a unique identification number for each ground set and include in lock/tag/verify process documentation when creating safe work zone.

B. When removing grounds, personnel shall:

(1.) Remove the grounding device from the circuit or equipment.

(2.) Then remove the grounding device from the ground connection.

(3.) Safety ground leads and clamps shall be capable of conducting the maximum fault current that could flow at the point of grounding for the time necessary to clear the fault. This grounding equipment shall have an ampacity greater than or equal to that of No. 2 AWG (33 square millimeter) copper. Refer to ASTM F855.

(4) Grounding or Shorting Static Capacitors

A five-minute waiting period is required between isolating static capacitors and then testing and grounding or shorting. This time allows trapped charge to bleed off the capacitors.

(5) Diagnostic Testing

A. When testing, never exceed the Basic Impulse Insulation Level rating of the isolation devices. Exceeding the Basic Impulse Insulation Level could cause a flashover hazard.

B. In field testing or at a temporary test site, the following grounding

requirements shall apply:

(1.) Test trailers and vehicles shall be grounded.

(2.) All conductive parts accessible to the test operator shall be grounded except those portions of the equipment isolated from the operator by guarding.

(3.) Ungrounded terminals of test equipment shall be treated as energized until proven de-energized.

(4.) Common ground connections shall be attached to test equipment and to the apparatus under test.

(5.) If control wiring, meter connections, test leads or cables must be run outside of the test area, they shall be contained in grounded metallic sheaths and terminated in grounded metallic enclosures unless other equivalent safety precautions are taken.

(6.) If someone must enter a test area after equipment has been de-energized, high voltage and other exposed terminals shall be grounded.

C. Grounds may be temporarily removed during testing. If grounds are removed, the test equipment and the equipment under test shall be treated as energized until proven otherwise by test. The person in charge of testing shall take precautions to protect personnel in case the previously grounded lines or equipment become energized. These precautions may include:

(1.) Wearing high voltage safety gloves when within the minimum approach distance.

(2.) Physically disconnecting the high voltage leads to the equipment.

(3.) Grounding the circuit at a point adjacent to the test area between the isolated equipment and the voltage source.

During the test procedure, the person in charge of testing shall ensure that everyone uses insulated equipment and is isolated from any hazards. If an unqualified person must be present within the test area, an escort must be present.

D. Barricading and guarding. In field testing or at a temporary test site where permanent fences and gates are not provided, the test area shall be barricaded or guarded to limit access to the area and to ensure hazard recognition. Additional barricades may be required to control personnel access to test equipment or to apparatus that may become energized as part of the testing. Added precautions to prevent accidental contact with energized parts may include:

(1.) Barricading the test area by the use of safety tape or equivalent. The safety tape or equivalent must be about waist high and have safety sign(s) attached.

(2.) Restricting access to the test area by a barrier or barricade approximately waist high and having sign(s) attached.

(3.) Guarding the test area by one or more persons. These individuals shall be stationed so that the entire test area is under observation.

(6) Substations and Switchgear Facilities

A. Substation enclosures, switchgear room entrances, and other locations with exposed, energized parts shall be kept locked at all times except when work is being performed.

B. Only materials and equipment necessary for distribution and transmission system repair and maintenance may be stored in substation lots or switchgear facilities. Storage locations established for distribution and transmission repair and maintenance materials shall be specifically identified, approved, and periodically inspected. The City Designee must approve this storage area. Materials and equipment are not to be stored in front of high voltage distribution equipment. Storage practices must comply with local regulations and consensus standards.

C. Keep substation lots and switchgear facilities free of debris.

D. Qualified personnel shall periodically inspect substations to determine the general condition of all equipment, including the integrity of grounding systems.

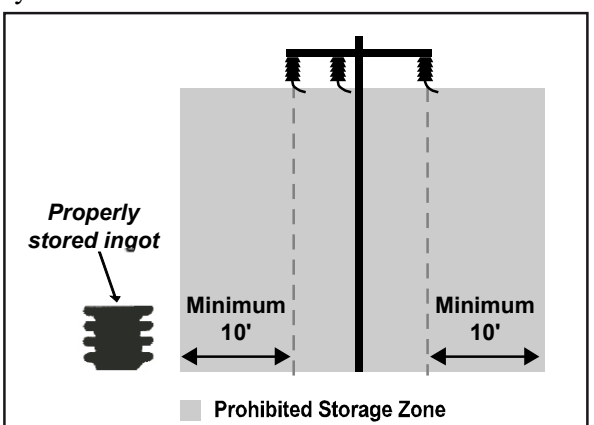


Figure 2 - Storage of Materials with Power System Rights-of-Way

(7) Power System Rights-Of-Way

Rights-of-way shall be maintained in a clear and orderly condition. Keep trees and brush clear of overhead lines. Do not allow material or equipment to be stored in City controlled rights-of-way any closer than ten feet horizontal under exposed high voltage lines. Any mobile equipment that could violate the ten-foot rule while in the right-of-way shall be prohibited from parking in this area. Examples of mobile equipment include aerial lifts, mobile cranes, dump trucks, dumpsters and fork lift trucks. See Figure 2.

(8) Buildings and Structures

Temporary buildings and structures, such as trailers, shall not be placed in the prohibited storage zone of City controlled rights-of-way. See Figure 2. Permanent buildings and structures shall not be placed in rights-of-way. Any exceptions shall require the approval of the City Designee.

(9) Signage

Signs provide information regarding a potential electrical hazard and display information regarding operations or maintenance details. Signs shall be:

A. Constructed of a durable material consistent with the anticipated environmental conditions and expected length of exposure.

B. Consistent with regulatory requirements in color and shape.

C. Highly visible with large letters and easily seen in darkened, low-light

situations.

D. Designed with internationally accepted symbols as much as is practical.

E. Bi-lingual in areas where two languages are common.

F. Located to provide the necessary information or warnings at the following locations:

(1.) On all substation doors, gates, and fences.

(2.) On all doors to switchgear rooms or other similar compartments where exposed, energized electrical parts are located.

(3.) On all transmission or distribution structures where unqualified persons or the public may be present. In the case of multi-support structures, signs shall be located on all sides so that a sign is seen from any approach direction. See Figure 3.

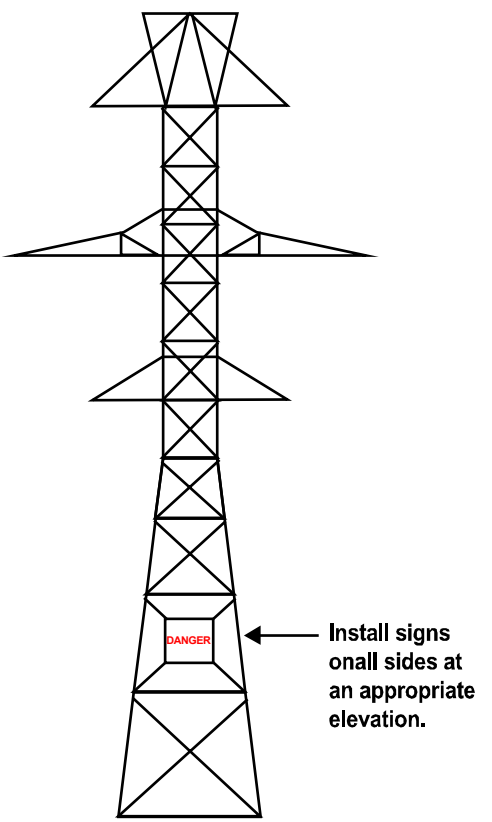


Figure 3 - Signage on Tower

(4.) Conspicuously displayed where a low voltage bus is supplied from two or more sources and an interlock system is not provided thereby creating a backfeed opportunity to the high voltage supply system.

(5.) Conspicuously displayed if temporary alterations made to the secondary voltage supply system may backfeed the high voltage supply system. Display the warning of this potential problem until the need for the temporary alteration is abated.

(6.) At roadways or railways where low horizontal or vertical

clearances from energized sources exist. See 5.3

(7.) At all low-profile electrical equipment installations where physical distance requirements for personnel and/or handling of conductive material cannot be met or is marginal.

(8.) At all overhead pipes, bridges, etc., where adjacent energized electrical conductors and parts pose potential electrical shock hazards to maintenance or construction personnel.

(9.) Where inadvertent electrical contact is possible and can reasonably be anticipated.

(10) Operating System Locks

Operating system locks shall be used to prevent unauthorized operation of the following:

A. Switch handles accessible to the public or unqualified personnel.
B. Non-load break switches.
C. Ground switches unless interlocked with the operating switch.
D. Switches used for power distribution (switches feeding more than a single load).

If the above high voltage switches are not kept locked, the City Designee shall review the location's program to determine the appropriate policy for the safety of location personnel. This review shall be documented.

(11) Specific High Voltage Area Tasks

A. Personnel shall comply with the personal protective equipment requirements when performing any task or test on metal-clad, enclosed switchgear where open doors expose energized high voltage parts. This includes performing infrared testing and inspections.

B. The preferred energy state for cleaning insulators, bushings, and similar equipment shall be de-energized and grounded. Some operational limitations may require cleaning energized insulators, bushings, or similar equipment during routine maintenance procedures. If individual locations allow this practice, following these safety precautions:

(1.) Treat the task as live-line work. This requires approval from the location manager.

(2.) Allow only personnel with the proper training and qualifications to perform such tasks as cleaning energized insulators, bushings, or similar equipment.

(3.) Follow all manufacturers' safety requirements for equipment located in close proximity to exposed, energized electrical sources. If this safety information is not available, contact the manufacturer of the equipment before proceeding.

(4.) Instruct personnel to stay at least the minimum approach distance from energized parts. See Sections 6.1 and 6.2.

(5.) Require personnel to wear the personal protective equipment necessary for working in close proximity to exposed, energized high voltage electrical sources. Because of static buildup, the use of insulated rubber gloves may be excluded from this task.

(6.) If the cleaning equipment falls into the mobile category, follow the appropriate grounding requirements. See Section 4.9(1)D.

C. If qualified and authorized personnel are performing tree trimming

operations and cannot comply with the ten-foot rule, they follow established safety regulations. Locations in the United States refer to CFR 29, 1910.269(r). Unqualified personnel shall always follow the ten-foot rule.

D. If personnel work in close proximity to high voltage parts while servicing auxiliary equipment, a safe work method, such as de-energizing and/or wearing the appropriate personal protective equipment, shall be used. Auxiliary equipment located in close proximity to high voltage parts should be moved to a safer location.

Permanent grounds shall be inspected on a yearly basis. Equipment, fence, structure, bonding, and other visible grounding shall be inspected on a yearly basis and tested on a five year basis. Inspections and testing of grounding must be documented.

4.9 MOBILE EQUIPMENT

(1) Operation

Personnel follow these safety practices, at a minimum, whenever mobile equipment is operated in the general vicinity of exposed, energized high voltage parts.

A. General Safety Guidelines

(1.) If through accident or equipment failure, mobile equipment could violate the ten-foot rule, the equipment shall be grounded. Two examples are equipment working on a grade sliding into the restricted zone or equipment failure allowing a boom to swing and violate the ten-foot rule.

(2.) If the equipment is located where good grounding capabilities are limited, barricading is acceptable. When equipment is barricaded but not grounded, all personnel except the equipment operator shall keep away from the area any time a boom is elevated. If mobile equipment cannot be operated without violating the ten-foot rule, the task shall be completed under the requirements of live-line work.

(3.) If non-insulated mobile equipment enters the restricted zone or will enter the restricted zone if operation continues, the operator shall immediately stop all equipment movement and notify appropriate qualified personnel for safety instructions.

(4.) Personnel operating mobile equipment that could accidentally enter the ten-foot restricted zone shall have received training on the potential electrical shock hazards associated with equipment operation under these conditions.

(5.) Personnel operating mobile equipment that could accidentally enter the ten-foot restricted zone shall be familiar with proper equipment grounding techniques.

(6.) When mobile equipment is operated near exposed, energized conductors, an observer shall assist the equipment operator to ensure the ten-foot rule is not violated.

(7.) No equipment or material shall be lifted over exposed, energized high voltage conductors or equipment. Exceptions shall require a Job Safety Analysis and approval from the City Designee.

B. Performing Non-electrical Work with Mobile Equipment in the Vicinity of High Voltage Equipment

(1.) Mobile equipment shall be operated so that no part of it or its load purposely violates the ten foot rule. See Figure 4.

(2.) If the equipment is a crane or derrick performing construction work, its operation must comply with the requirements of Item E below.

C. Performing High Voltage Work with Mobile Equipment

(1.) Insulated and tested mobile equipment shall be used when testing and grounding high voltage equipment. If non-insulated equipment must be used to perform this task, the City Designee must provide written approval.

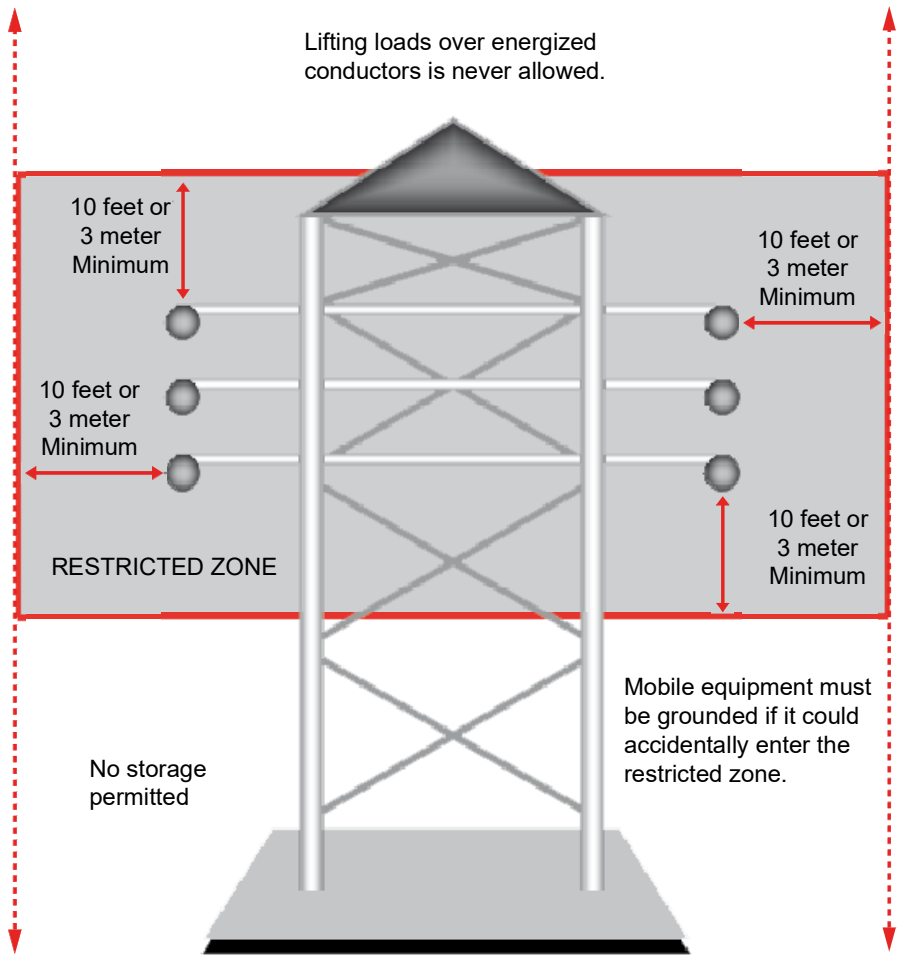
(2.) When performing high voltage work with non-insulated mobile equipment in close proximity or within the ten-foot restricted zone, the following apply:

a. Personnel and equipment remain outside the ten-foot restricted zone if possible. See Figure 4

b. If the ten-foot rule cannot be maintained, a risk assessment shall be performed. Under no condition can non-insulated mobile equipment violate the appropriate minimum approach distances listed in Appendix 6.2.

c. A job safety analysis shall be completed, and if acceptable, approved by the City Designee.

(3.) If a mobile equipment operator performs high voltage work and is not qualified, the operator must be authorized and work under the direction of a qualified person. A job safety analysis is also required.



The restricted zone for mobile equipment around energized conductors 50kV or less is ten feet or 3 meters. This zone increases four inches (10 cm) for every 10kV over 50kV.

Figure 4 - Restricted Zone for Mobile Equipment

D. Mobile equipment grounding guidelines.

Protective grounding equipment (safety ground leads) shall be applied to mobile equipment. Grounding shall be done before raising a crane or derrick boom or similar equipment in the area of exposed, energized conductors. The ground device shall be removed only after the crane or derrick boom, or similar parts of the equipment have been removed from the area of the exposed, energized conductors or equipment. Ground cables shall be capable of handling the fault current. It is strongly recommended that safety ground leads not be less than insulated 2/0 (67 square millimeter) flexible stranded copper cable to provide physical strength. The cable insulation is for mechanical protection of the conductor only. Only qualified or authorized personnel trained in the proper grounding techniques shall be permitted to attach or detach grounds to mobile equipment. The use of high voltage rubber gloves to install or remove

grounds to mobile equipment is optional if equipment is not violating the ten-foot rule. A ground connection source shall be made from a suitable ground plate or stud on the vehicle or other portable equipment to the best ground available in the immediate work area. If the mobile equipment has a permanently installed ground cable reel, all cable on the cable reel shall be removed. Do not leave excess cable on the reel. On distribution circuits, the ground grid system, if available, shall be used as the ground source. A driven ground rod shall only be used as a final alternative. Barricades shall be used to restrict personnel from entering the area around the ground rod and the equipment.

E. Safe guarding cranes in the vicinity of power lines. When cranes used in construction are within 20 feet of power lines, the task supervisor must contact the City Designee to insure any necessary safety precautions are put in place to keep the crane from contacting the power lines.

F. Operating zone for insulated, armored high voltage cable. The ten-foot rule does not apply to working around this cable. Do not disturb or move the cable while energized.

G. Operating zone for insulated, non-armored high voltage cable. The ten-foot rule applies to mobile equipment operated around insulated, non-armored cable except for the following situations where it may be treated as insulated, armored cable:

(1.) If the conductor is in a covered raceway, metallic conduit, or is otherwise barricaded.

(2.) If the conductor is in an elevated, uncovered raceway, it may be treated as insulated, armored cable from below.

(3.) Special applications such as mining dragline and other moveable substation cables, ship unloader cable reels, and equivalent applications for mobile equipment.

(2) Mobile Equipment in Transit

A. The following mobile equipment in transit is allowed to encroach upon the area defined by the ten-foot rule as long as it and any load it carries maintains the minimum clearances listed in Item B. below.

(1.) Non-elevating vehicular and mechanical equipment.

(2.) Cranes with no load and with the boom lowered.

(3.) All other lifting and elevating mobile equipment with or without load that have their elevating mechanism lowered.

B. Mobile equipment in transit shall maintain the following clearances for safe transit.

(1.) Four feet for voltages less than 50kV.

(2.) Ten feet for voltages over 50kV and up to 230kV.

(3.) Sixteen feet for voltages over 230kV and up to 410kV.

4.10 INCIDENT INVESTIGATION

All high voltage electrical contacts, near misses, and switching errors shall be investigated by the City.

4.11 HIGH VOLTAGE SAFETY ASSESSMENTS

The City Designee shall ensure an annual self-assessment of the high voltage systems and operating practices for compliance requirements is conducted and documented. Each location shall receive an initial external assessment within twelve months of acquisition or

commissioning. If a location receives a good or excellent on an external assessment, another external assessment shall be performed periodically, not to exceed once every three years. Personnel performing these assessments must be knowledgeable and qualified in high voltage safety.

4.12 DESIGN AND CONSTRUCTION

These specifications apply to both new and modified high voltage installations. The City Designee shall approve all new designs and modifications to high voltage systems to ensure compliance.

(1) Substation Design and Construction

A. On a case by case basis and where determined technically feasible within a given substation, insulated, armored cable on new and upgraded lines and equipment shall be used.

B. New switchgear shall be Gas Insulated and contained so as to have no exposed live parts. Where GIS is infeasible for technical reasons, switchgear shall be contained and arc-resistant.

C. All efforts shall be made to equip new switchgear with an interlocked integral grounding (earthing) switch.

D. All new switchgear bus designs that could be exposed to personnel for maintenance and testing shall achieve a 25 cal/cm^2 or less incident energy level.

E. Connect all equipment and structures to a common ground grid.

F. Locate all exposed, energized parts, including the energized racks of static capacitors so they provide personnel clearance in accordance with Table 1.

Phase to Phase Nominal Voltage	Vertical Clearance of Unguarded Parts and Minimum Height of Guards from Floor		Horizontal Clearance from Unguarded Parts		Minimum Distance of Guards to Exposed, Energized Parts	
kV	Feet-Inch	Meters	Feet-Inch	Meters	Feet-Inch	Meters
1.0 – 2.4	8’-9”	2.67	3’-4”	1.02	0’-3”	.076
2.5 – 7.2	8’-10”	2.69	3’-4”	1.02	0’-4”	.101
7.3 – 15	9’-2”	2.74	3’-5”	1.07	0’-6”	.152
15.1 – 25	9’-3”	2.82	3’-8”	1.14	0’-9”	.228
25.1 – 35	9’-6”	2.90	4’-1”	1.22	1’-0”	.304
35.1 – 48	9’-10”	3.00	4’-4”	1.32	1’-3”	.406
48.1 – 72.5	10’-5”	3.18	4’-9”	1.50	1’-10”	.584
72.6 – 121	11’-7”	3.53	6’-1”	1.85	3’-1”	.939
121.1 – 145	12’-2”	3.71	6’-7”	2.03	3’-7”	1.12
145.1 – 169	12’-10”	3.91	7’-4”	2.24	4’-4”	1.32
169.1 – 242	14’-10”	4.52	9’-4”	2.84	6’-4”	1.93
242.1 - 362	20’-2”	6.10	14’-8”	4.50	11’-19”	3.6
362.1 – 550	28’-4”	8.60	23’-1”	7.00	19’-10”	6.0
550.1 – 800	38’-9”	11.80	33’-3”	10.00	30’-3”	9.20

Table 1 Clearance from Exposed, Energized Parts

G. All new static capacitor banks shall have a permanently installed shorting/grounding switch that is key or mechanically interlocked with the main line disconnect switch. The interlock shall prevent both the line disconnect and the grounding switches from being closed simultaneously. Place conspicuous signage warning that the capacitor bank frame is energized on all sides of the frame accessible to personnel.

H. Identify all equipment and devices subject to operation or manipulation with easy to read lettering of appropriate size and location.

I. Substations not totally enclosed and having exposed, energized parts or needing protection from vehicle traffic shall be completely enclosed by fences at least eight feet in height and with gates secured by suitable locks.

(1.) If any portion of the fence is within ten feet (3 meters) of electrical equipment or substation structure, connect the entire fence to the station ground grid in several locations.

(2.) If the entire fence is more than ten feet (3 meters) from any electrical equipment or substation structure, the fence shall be

grounded. However, the ground may be separate from the station ground grid so long as step and touch potentials at or near the fence are within safe limits.

(3.) Use bridging or bonding conductors between the fence and both sides of all gates to keep electrical continuity to the fence and to the gates.

J. Install substation auxiliary systems so maintenance personnel cannot come within close proximity to any exposed or unguarded energized parts.

(2) Line Design and Construction

A. Spacing and dimensional clearance shall be as follows:

(1.) Electrical supply stations and substations shall be in accordance with Table 1.

(2.) Vertical clearance of wires, conductors and cables above ground, rails, and water shall be in accordance with 6.3.

(3.) Lines adjacent to, but not attached to, buildings shall be in accordance with 6.6.

(4.) Where multiple circuits are located on a common structure, communication circuits shall be located below supply circuits. Lower voltage circuits shall be located below higher voltage circuits, and clearances shall comply with 6.4. Fiber optics in static wire are exempt from this rule.

(5.) Where conductors supported on different structures cross each other, the vertical clearances shall be those listed in 6.5.

B. Open, un-insulated lines and equipment are prohibited for new and upgraded designs for in-plant distribution systems.

C. Do not locate non-electrical equipment on electrical structures with exposed conductors.

D. Supply circuits shall not be designed to use the earth as a conductor for any part of the circuit.

E. Equip all guy wires with guy guards constructed from high visibility material. Guys shall also be insulated or grounded as well as properly tensioned.

F. All circuit neutral conductors and non-current-carrying parts of metal or metal-reinforced supporting structures shall be effectively grounded.

G. Every effort shall be made to install lighting and other auxiliary systems on poles or structures so they can be maintained without violating the ten-foot rule. Under no condition shall lighting and other auxiliary systems be closer than the minimum approach distances listed in Section 6.2.

H. Step-bolts shall be more than 15 feet or 5 meters above ground on structures, towers, and poles unless other precautions are taken to prevent unauthorized climbing.

I. If ladders on towers or structures can be accessed from the ground, secure the ladders by a gate, cover, or other lockable means.

J. Install underground services in accordance with local regulations and consensus standards and identify them on drawings and with physical marking signs.

K. Protect low voltage conductors adjacent to high voltage conductors from the possibility of induced voltage.

(3) Fence grounding under high voltage lines – Effective fence grounding and gate bonding designs shall limit touch, step, and transferred voltages. Management personnel at each location shall evaluate their specific exposures to ensure that at least minimum local regulations and consensus standards are met. Follow local regulations and consensus standards for height and grounding requirements for lines over fencing outside the boundaries of the plant.

(4) Pipeline, conveyor, and metal structure grounding – If pipelines, conveyors, or metal structures run parallel to or pass under high voltage power lines, design proper grounding similar to the fence grounding described above.

(5) Guarding of energized parts – Place permanent guards around all exposed, energized parts where the vertical and horizontal clearances listed in Table 1 cannot be met. Table 1 shows the clearances required from exposed, energized parts. Column one of Table 1 lists voltage. Columns two and three list the vertical clearances required for unguarded parts. Columns four and five list the horizontal clearances required for unguarded parts. Columns six and seven indicate the minimum distance guards must be placed from the energy source.

(6) Figure 5 shows an example of where guarding is required to protect personnel from exposed, energized parts. Areas that may require guarding include elevated walkways, passageways, corridors, storerooms, and boiler rooms, or any area where personnel may travel through a narrow space or where materials carried through may violate the required clearance. Exposed, energized parts in these and other areas must be guarded unless extra dimensional clearances beyond those listed in Table 1 are provided. The guards must meet the following requirements:

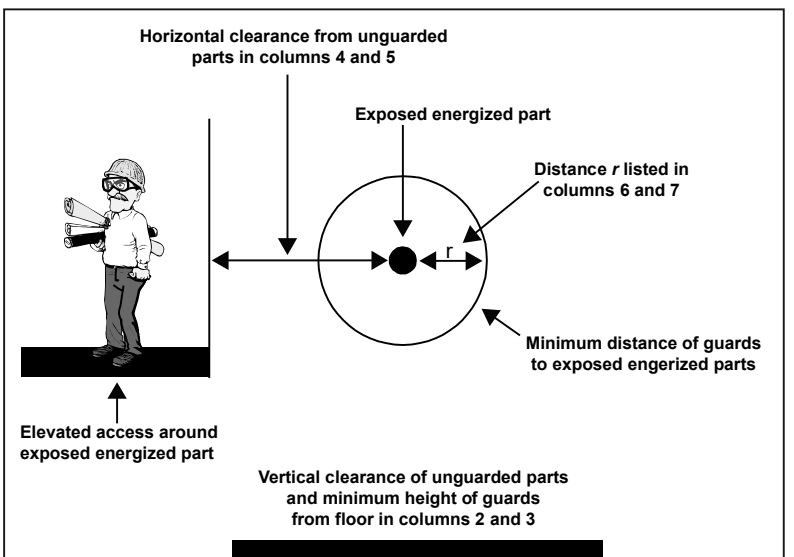


Figure 5 - Guarding of Energized Parts

A. To prevent accidental contact, guards shall be substantial and completely shield the exposed, energized part.

B. Use guards designed and installed to only be removed with a key or tools.

C. Guards shall be designed so that when removed, they cannot readily contact the exposed, energized part.

D. Guards shall not be placed closer than the minimum distance listed in Table 1. For circuits less than 2500 volts to ground, the guard may be placed closer if suitable insulation is used.

E. Guards placed within four inches (10.2 cm) of the minimum distance shall extend to the minimum height of Column two or three.

F. Guards placed four inches (10.2 cm) or more from the minimum distance must extend at least 8' 9" (267 cm) above the floor. Floor height is considered the highest walking elevation around the exposed, energized part. See Figure 6.

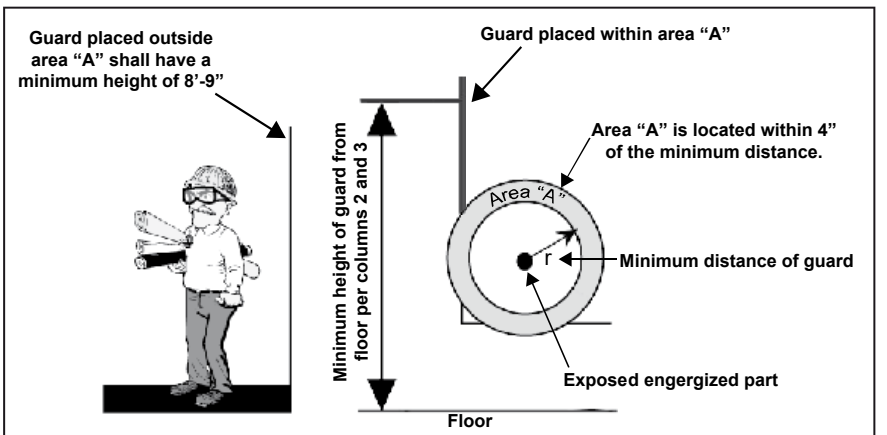


Figure 6 - Placement of Guarding Around Exposed Energized Parts

(7) Responsibility for Design and Construction

Location management is responsible for ensuring:

A. Designs for new construction or for modifications to existing systems comply with the requirements of this document and with the requirements of local regulations and consensus standards.

B. Vendor equipment and system design comply with the requirements of this document and with the requirements of local regulations and consensus standards.

C. All maintenance and construction projects are completed by following the electrical safety requirements of this document.

D. Contractor equipment complies with the requirements of this document.

6.0 APPENDIX

6.1 MINIMUM APPROACH DISTANCE TO ENERGIZED PARTS FOR QUALIFIED PERSONNEL AT LOCATIONS BELOW 900 METERS (3000 FEET) MEAN SEA LEVEL (MSL

For elevations above 900 meters MSL multiply the distances in this table by the altitude correction factor in Table 6.3.

NOMINAL VOLTAGE Phase-to-Phase (kV)	MINIMUM APPROACH DISTANCE	
	Phase-to-Ground	
	(ft-in)	(m)
1.0 – 5	2’ – 1”	0.63
5.1 – 15	2’ – 3”	0.68
15.1 – 36	3’ – 0”	0.89
36.1 – 46	3’ – 3”	1.0
46.1 – 72.5	4’ – 0”	1.2
72.6 – 121	4’ – 8”	1.42
121.1 – 145	5’ – 5”	1.64
145.1 – 169	6’ – 5”	1.94
169.1 – 242	10’ – 1”	3.08
242.1 – 362	18’ – 2”	5.52
362.1 – 420	22’ – 4”	6.81
420.1 – 550	27’ – 0”	8.24
550.1 – 800	37’ – 4”	11.38

This table is based on the IEEE/ANSI C2 National Electrical Safety Code. Differences reflect City minimum standards. Follow local regulations or consensus standards if more stringent.

6.2 MINIMUM APPROACH DISTANCES TO ENERGIZED PARTS FOR AUTHORIZED PERSONNEL AT LOCATIONS BELOW 900 METERS (3000 FEET) MEAN SEA LEVEL (MSL).
For elevations above 900 meters MSL multiply the distances in this table by the altitude correction factor in Table 6.3.

NOMINAL VOLTAGE Phase-to-Phase	**MINIMUM APPROACH DISTANCE**	
	Phase-to-Ground	
(kV)	**(ft-in)**	**(m)**
1.0 – 46	5' – 0"	1.5
46.1 – 169	10' – 0"	3.0
169.1 – 242	15' – 0"	4.5
242.1 – 362	23' – 0"	6.9
362.1 – 550	31' – 0"	9.6

This table is based on the U.S. National Electric Code (NEC). Differences reflect City minimum standards. Follow local regulations or consensus standards if more stringent.

6.3 ALTITUDE CORRECTION FACTOR FOR TABLES 6.1 AND 6.2.

Altitude Above Sea Level in meters	Multiplier
0 to 900	1.0
901 to 1200	1.02
1201 to 1500	1.05
1501 to 1800	1.08
1801 to 2100	1.11
2101 to 2400	1.14
2401 to 2700	1.17
2701 to 3000	1.20
3001 to 3600	1.25
3601 to 4200	1.30
4201 to 4800	1.35
4801 to 5400	1.39
5401 to 6000	1.44

6.4 MINIMUM VERTICAL CLEARANCE OF WIRES, CONDUCTORS, AND CABLES
Voltages are phase-to-ground for effectively grounded circuits.

CLEARANCE CATEGORIES	Open Supply Conductors 1 – 22 kV (>22 kV see note #2)	
	(ft)	(m)
Railroad tracks	26.5	8.1
Roads and other areas subject to truck traffic	18.5	5.6
Farm roads, residential roads and driveways	18.5	5.6
Spaces or ways accessible to pedestrians only	14.5	4.4
Water areas not subject to sailboating	17.0	5.2
Water areas subject to sailboating		
a. Less than 20 acres	20.5	6.2
b. 20 to 200 acres	28.5	8.7
c. 200 to 2,000 acres	34.5	10.5
d. Over 2,000 acres	40.5	12.3
Roads in rural districts where it is unlikely vehicles will cross under the line	16.5	5.0

(1) Based on National Electric Safety Code, Table 232-1. Differences from National Electric Safety Code are because of City minimum standards.
(2) Distances shall increase 0.4 (in) or 10 (mm) for each 1kV over 22 kV
(3) Follow local regulations or consensus standards if more stringent.

6.5 MINIMUM VERTICAL CLEARANCE BETWEEN CONDUCTORS ON SAME STRUCTURE

Voltages are phase-to-ground for effectively grounded circuits.

CONDUCTORS USUALLY LOCATED AT LOWER LEVELS	CONDUCTORS USUALLY LOCATED AT UPPER LEVELS *Open Supply Conductors*					
	1 – 8.7 kV		8.7 – 50 kV			
			SAME UTILITY		DIFFERENT UTILITIES	
	IN	CM	IN	CM	IN	CM
Communication conductors	40	102	40	102	40	102
1.0 – 8.7 kV	16	41	16	41	40	102
Supply conductors			Plus “A”		Plus “A”	
8.7 – 22 kV			16	41	16*	41
22.1 – 50 kV			16	41	16	41

(1) "A" = 0.4 inches or 1.02 cm per kV over 8.7kV
(2) Increase to 40 inches (102 cm) if live-line maintenance is performed and adjacent circuits are neither de-energized nor covered.
(3) Example: If live-line maintenance of a 26.6kV circuit is above a 13.9kV circuit then,

phases may be displaced by 180 degrees therefore voltage difference is considered to be 26.6 + 13.9 = 40.5kV.
A = .04 (40.5 - 8.7) = 12.72" (32 cm)
Clearance = 40 + 13 = 53" (133 cm)

(4) Table is based on National Electric Safety Code, Table 235-5. Follow local regulations or consensus standards if more stringent.

6.6 MINIMUM VERTICAL CLEARANCE OF WIRES, CONDUCTORS AND CABLES CARRIED ON DIFFERENT SUPPORTING STRUCTURES

Voltages are phase-to-ground for effectively grounded circuits.

LOWER LEVEL CONDUCTORS	**UPPER LEVEL CONDUCTORS**			
	OPEN SUPPLY CONDUCTORS			
	1.0 – 22 kV		**22.1 – 50 kV**	
	FEET	METERS	FEET	METERS
Communication conductors, cables and messengers	6 (See Note 1)	1.8	7	2.1
Open supply conductors				
1.0 – 22 kV	2	.6	3	.9
22.1 – 50 kV	4 (See Note 2)	1.2	5	1.5
Trolley and electrified railroad conductors	6	1.8	7	2.1
Guys, span wires, neutral conductors and surge protection wires	4	1.2	5	1.5

(1) This clearance may be reduced to 4 feet or 1.2 meters where supply conductors of 1.0 to 8.75kV cross a communication line more than 6 feet or 1.8 meters horizontally from a communications structure.

(2) This type crossing is not recommended.

(3) Table is based on National Electric Safety Code, Table 233-1. Differences are because of City minimum standards. Follow local regulations or consensus standards if more stringent.

6.7 MINIMUM CLEARANCE OF EXPOSED/NON-INSULATED WIRES, CONDUCTORS, CABLES AND UNGUARDED LIVE PARTS ADJACENT BUT NOT ATTACHED TO BUILDINGS AND OTHER INSTALLATIONS EXCEPT BRIDGES

EXHIBIT D – High Voltage Electric Safety

APPLICATION	Minimum Clearance for 1.0 – 22 kV (phase to ground) (See Notes 1 & 2)	
	(FT)	METERS
Buildings		
Horizontal		
a) To walls, projections, and guarded windows	7.5	2.3
b) To unguarded windows	7.5	2.3
c) To balconies and areas readily accessible to pedestrians	7.5	2.3
Vertical		
a) Over or under roofs or projections not accessible to pedestrians	12.5	3.8
b) Over or under balconies and roofs accessible to pedestrians	13.5	4.1
c) Over roofs accessible to mobile equipment but not subject to truck traffic (trucks greater than 8 ft. or 2.34 m in height)	13.5	4.1
d) Over roofs accessible to truck traffic	18.5	5.6

(1) Distances shall increase four inches (10 centimeters) for each 10kV over 22kV phase to ground.
(2) Table is based on National Electric Safety Code, Table 234-1. Differences are because of City minimum standards.
(3) Follow local regulations or consensus standards if more stringent.
(4) Excludes transformer terminal/bus connections adjacent to switchgear rooms and rectifier stations.

6.8 Switching Risk Assessment

Switching Sheet Number:_____ **Date**:_____

Description of Switching Operation:_____
_____
_____

Refinery Critical Equipment Affected:_____
_____
_____

Power Distribution Equipment Assessment

Criteria	Assessment			
	Poor = 2	**Average = 1**	**Good = 0**	**Score**
Equipment age	> 30 years old	10 – 30 years old	< 10 years old	
Equipment condition **Refer to Note 1**	IR scan – Medium Level alarm(10 to 35°C ΔT)	IR scan - Low level alarm (<10 °C ΔT)	No indication of equipment issues.	
Maintenance history	Inspected and maintained more than 5 years ago	Inspected and maintained within 5 years	Inspected and maintained within 2 years	
Switch room condition	Dusty, signs of rust, hot room.	Some dust, dry, warm room.	Clean, dry, air conditioned room.	
Protection Relays	Mechanical relay Last tested >3 years. Electronic relay Last tested> 6 years.	Mechanical relay Last tested 2 to 3 years. Electronic relay Last tested 4 to 6 years.	Mechanical relay Last tested < 2 years. Electronic relay Last tested<4 years.	
History of failures	2 or more failures on similar equipment	1 failure on similar equipment	No failures on similar equipment	
Note 1: ΔT (temperature rise) is the elevation in temperature above similar components, operating under similar load.			**Total Score =**	

If IR scanning indicates a High or Critical Level alarm (>35°C ΔT), **or equipment has a known issue:** Set Total Score = **10 minimum**

Consequence			**Likelihood**				
Rating	**Safety**	**Production**	**Rare**	**Unlikely**	**Possible**	**Likely**	**Almost Certain**
	Arc energy cal/cm^2		**Power Distribution Equipment Assessment Score**				
			0 to 2	**3 to 5**	**6 to 8**	**9 - 12**	**11 - 12**
Critical	> 40	Loss of 2+ Feeders					**Very High**
Major	25 to 40	Loss of 1 Feeder				**High**	
Moderate	8 to 25	Loss of Substation			**Medium**		
Minor	1.2 to 8	Loss of MCC					
Insignificant	< 1.2 or IAC tested	Negligible Impact	**Low**				

Select **Arc Energy = <1.2** if switchgear is type tested for **Internal Arc Containment (IAC)**

EXHIBIT D – High Voltage Electric Safety

Safety Risk	Low	Medium	High	Very High
Production Risk	Low	Medium	High	Very High

Authorization Levels:

- **Low** = E/I Group Leader
- **Medium** = E/I Supervisor or 32.60 Designee
- **High** = Refinery Production Manager **(formal Alcoa risk assessment may be required)**
- **Very High** **=** Refinery Manager **(formal Alcoa risk assessment may be required)**

Safety Countermeasures:

- □ Operate remotely where ever possible.
- □ Take defensive stance when operating switch.
- □ Wear correct level of arc flash PPE.
- □ Reduce arc energy by lowering the protection relay instantaneous setting.
- □ STOP if equipment does not operate correctly.

_____
_____
_____
_____

Production Countermeasures:

- □ Inform PC before switching.
- □ Review potential affected loads.
- □ Configure loads to reduce impact.

_____
_____
_____
_____

Risk with counter measures in place:

Safety Risk	Low	Medium	High	Very High
Production Risk	Low	Medium	High	Very High

Risk Assessment Sign Off

Requestor

Name :_____ **Sign :_____ Date :_____**

Authorizer

Name :_____ **Sign :_____Date:_____**

Completion Date :_____

7.0 DOCUMENT CONTROL

LAST REVIEWED: 2020 August

LAST UPDATED: 2020 August

EXHIBIT E

Maintenance Requirements and Schedule Matrix

Table 2: Maintenance Requirements and Schedule Matrix

Section #	Critical Equipment	Inspection On-Line	Infrared Survey On-Line; Predictive	Oil Testing On-Line; Predictive	Gas Analysis (DGA) On-Line	Electrical Testing Off-Line; Predictive	Exercising Inspections Off-Line	Adjustment / Calibration Off-Line	Special Requirements	Notes
5.1	**Transformers**									
5.1.A	Oil Filled ≥ 10 MVA (Distribution)	Q	1	B	B	3	3	3		
	Oil Filled ≥ 10 MVA (Potline)	W	1	1	B	3	3	3		
5.1.B	Rectifier Transformers	W	1	1	B	3	3	3	YES	
5.1.C	Oil or Silicone Filled < 10 MVA	Q	1	1	1		5	5	YES	1
5.1.D	Dry or Cast Coil	B				3	3	6	YES	
5.2	**Other Substation Equipment**									
5.2.A	Current Transformers (Outdoor)		1				5			
5.2.B	Potential Transformers >1 kV (Outdoor)		1			5	5			
5.2.C	Reactors		1				5			
5.2.D	Power Capacitors > 1 kV	M	1			5	5		YES	
5.2.E	Surge Arresters > 1 kV		1			5	5		YES	
5.2.F	Cable Connections and Terminations	1	1				5			
5.2.G	Outdoor Bus > 1 kV	1	1				5			
5.2.H	Overhead Lines (Metal Structure Support)	1	1				5			
5.2.I	Overhead Lines (Wood Structure Support)	1	1				5			
5.3	**Circuit Breakers > 1 kV**									
5.3.A	OCB (Distribution)	Q	1	1		3	3	3		
	OCB (Potline)	M	1	1		3	3	3		
5.3.B	Circuit Breaker Bushings (Oil-Filled)		1			5				
5.3.C	Vacuum	1	1			5	5	5		
5.3.D	SF6 breaker	M	1			10	5	5		
5.3.E	GIS switchgear (Distribution)	Q				10	5	5		
	GIS switchgear (Potline)	M				OEM	OEM	OEM		
5.3.F	Air Magnetic		1			3	3	3		
5.3.G	Air Blast	M	1				OEM	OEM		
5.3.H	Switchgear: Metal Enclosed (Indoor)	Q	1			5	5	5		2
5.4	**Switches > 1 kV**									
5.4.A	Manually operated air switches	M	1			5	1	5		3
5.4.B	Vacuum Switches	Q	1			5	5	5		
5.4.C	Air Switches with Vacuum load break	M	1			5	1	5		3
5.5	**Circuit Switchers (SF-6 Gas)**									
5.5.A	Circuit Switcher (Distribution / Potline)	W	1			5	2	5		
5.6	**Circuit Breakers < 1 kV**									
5.6.A	Low-Voltage Power	Q	1				3	3		2
5.6.B	DC Circuit Breakers		1							
5.6.C	Molded Case / Panelboards		1							
5.7	**Switches < 1 kV**									
5.7.A	Bolted Pressure	Q	1				4	4		
5.7.B	DC Disconnects (Rectifier)	1	1				1	1		
5.7.C	AC Disconnect		1				4	4		
5.8	**HV Starters**									
5.8.A	HV Starters		1				5	5		
5.9	**Potline Rectifiers**									
5.9.A	Potline Rectifiers	W	1					1	YES	2, 4
5.1	**Protective Relays**									
5.10.A	Protective Relays (Electro-mechanical)							3		
	Protective Relays (Micro-processor)							6		
5.11	**Control Circuits**									
5.11.A	Substation Protection						5			
5.11.B	DC Metering (DynAmp or equiv.)	1						5		6
5.12	**Batteries / Chargers**									
5.12.A	Batteries / Chargers	B						5		
5.13	**Grounds (Earthing Systems)**									
5.13.A	Equipment Ground and Connections	1								
5.13.B	Ground (Earth) Grids									
5.14	**DC Bus for Potlines**									
5.14.A	Exposed DC Bus	1	3							
5.14.B	DC bus in Trench	B/3/6							Yes	5

D-Daily; W-Weekly; M-Monthly; Q-Quarterly; B-Biannually; OEM-Manufacture suggested; All other in Years

Note 1 - For transformers < 10 MVA if a spare exists, oil testing can be every two years.

Note 2 - Infrared only if switchgear permits it.

Note 3 - In some situations, switches may not be designed to allow safe access.

Note 4 - See Special Requirements listed for that type of equipment.

Note 5 - Continuous temperature monitoring is preferred to infrared.

Note 6 - Channel voltage measurements taken while rectifier is operating

EXHIBIT F

Form of the Certificate as to the Conditions Precedent

Date: _____

TO: City of Goose Creek

Consistent with the terms of that certain Equipment Lease Agreement by and between the City of Goose Creek, South Carolina (the "City") and Century Aluminum Company of South Carolina, Inc. dated [DATE] (the "Agreement"), it is acknowledged and certified that one of the Conditions Precedent have been met. Consistent with the provisions of Section [2.3.6/12.4] of the Agreement, the City is authorized to exercise the Option.

Terms used herein and not otherwise defined shall have the meanings ascribed thereto in the Agreement.

CENTURY ALUMINUM OF SOUTH CAROLINA, INC.

By: _____

Print Name: _____

Title: _____

Date: _____