



INCORPORATED COUNTY OF LOS ALAMOS SERVICES AGREEMENT

This **SERVICES AGREEMENT** ("Agreement") is entered into by and between the **Incorporated County of Los Alamos**, an incorporated county of the State of New Mexico ("County"), and **Western United Electric Supply**, a Colorado corporation ("Contractor"), to be effective for all purposes January 5, 2021.

WHEREAS, County requires a transformer suitable for use at the El Vado Hydroelectric Plant, 3070 NM State Rd 112, mile 30.7 El Vado, NM 87575, and supporting field services; and

WHEREAS, the County Purchasing Officer determined in writing that the use of competitive sealed bidding was either not practical or not advantageous to County for procurement of the Services and County issued Request for Proposals No. 22-36 ("RFP") on October 10, 2021, requesting proposals for Transformer and Field Services for El Vado Hydroelectric Plant ("the Project"), as described in the RFP; and

WHEREAS, Contractor timely responded to the RFP by submitting a response dated October 28, 2021 ("Contractor's Response"); and

WHEREAS, based on the evaluation factors set out in the RFP, Contractor was the successful Offeror for the services listed in the RFP; and

WHEREAS, Contractor is a distributor for Virginia Transformer Corporation ("Manufacturer" or "VTC") which provides transformers, required field services, and warranties for equipment and services; and

WHEREAS, the Board of Public Utilities approved this Agreement at a public meeting held on December 15, 2022; and

WHEREAS, the County Council approved this Agreement at a public meeting held on January 4, 2022; and

WHEREAS, Contractor shall provide the Services, as described below, to County.

NOW, THEREFORE, for and in consideration of the premises and the covenants contained herein, County and Contractor agree as follows:

SECTION A. SERVICES: Contractor's shall provide the below described electrical transformer and specified field services and which shall include a 60-month warranty as provided herein.

1. **Equipment.** Contractor shall furnish to the County a new 8200/10250 OA/FA KVA, 4.160kV Delta step up to 69kV Wye, 3 phase, 60Hz Substation Transformer ("Transformer") which meet the specifications as provided in the County's RFP which is hereby incorporated herein by reference. The Transformer to be provided by Contractor to County shall meet the

specifications and performance parameters as provided in **Exhibit “A”** (“Transformer Specifications”).

2. **Drawing Approval and Inspection.** As provided in the County's RFP, after Contractor and the Transformer manufacturer submits design drawings to County pursuant to the Project Schedule as provided herein, County shall review, approve or provide comments to the design drawings before Transformer manufacturing commences.
 - a. Contractor shall notify the County of the date and times for it to inspect Transformer's completed core and coil assembly prior to tanking or shall coordinate a “video visit” for of the completed core and coil assembly prior to tanking. Contractor shall provide County at minimum 30 days advance notice of the date of tanking to allow the County the right to be present for the inspection.
3. **Factory Acceptance Tests.** Contractor shall notify County of the performance dates and time for all routine tests listed in ANSI C57.12.00-2000, plus any additional, required tests at least 30 days prior to the date of all tests to provide County the opportunity to witness the Transformer Facility Acceptance Testing (“FAT”). Contractor may also coordinate a “video visit” for County to witness the FAT if County is unable to provide staff to attend the FAT in person.
 - a. Contractor shall notify County of any unusual event or damage occurring during the fabrication of the transformer and of all tests which do not meet the specified or guaranteed values. County reserves the right to inspect such damages or test failures. County shall review corrective measure to overcome such damage or failure.
4. **Shipping.** Contractor is responsible for the Freight (Shipping and Handling), FOB Destination, El Vado Hydroelectric Plant Substation Site, of the Transformer as provided under State law (see e.g., NMSA 1978, Chapter 55, Article 2). Contractor affirms that it has been provided all required shipping and delivery instructions including dates for delivery as agreed herein. County will cooperate with Contractor to ensure the timely delivery of the Transformer.
5. **Offloading.** Contractor shall be solely responsible for the offload the Transformer and all associated apparatus upon arrival of the Transformer to the County's El Vado Hydroelectric Plant. Contractor affirms that it has been made aware of the offloading location and understands that the price for offloading included in **Exhibit “C”** for the offloading service is sufficient to cover all costs. Contractor shall provide to the County's Project Manager all delivery dates, times, and required County staff to ensure that necessary County staff are present at the time of the offloading of the Transformer.
6. **Field Services.** As provided in the RFP, incorporated by reference herein, and pursuant to **Exhibit “A”**, Section 10, Contractor shall:
 - a. provide a qualified manufacturer's field services engineer to be onsite at the El Vado Hydroelectric plant to direct the dress out of the transformer after it has been placed on the foundation by the County's installation contractor. The Contractor's field services engineer shall direct the assembly, filling, and connection of any equipment such as, but

- not limited to, bushings, radiators, nitrogen systems, drying and vacuum filling with oil, which were removed or modified for shipping and are required for transformer operation.
- b. The field service engineer shall also conduct a complete visual and mechanical inspection and shall submit a written report to the County and Contractor containing the following information, at a minimum:
 1. Compare equipment nameplate data with the drawings and specifications.
 2. Inspect physical and mechanical condition including documented readings or observations from manufacturer supplied Sweep Frequency Response Testing and Impact recorders.
 3. Inspect anchorage, alignment, and grounding.
 4. Verify the presence of PCB content labeling.
 5. Verify removal of any shipping bracing after placement.
 6. Verify the bushings and transformer is clean.
 7. Verify that alarm, control, and trip settings on temperature and level indicators are as specified.
7. **Schedule.** The parties hereby agree to the following schedule as related to performance under this Agreement:
- a. Within one week of the date of last signature of the Agreement, the County shall issue a written Purchase Order to Contractor via email and followed by mailing of the Purchase Order to the address in Section U of this Agreement for the Transformer and services of Contractor.
 - b. Within one (1) week from the date of the last signature of the Agreement, County shall provide to Contractor, via email and mail, a tax exemption certificate.
 - c. Contractor shall provide to County written confirmation of the receipt of the County's Purchase Order within two (2) business days from the date of receipt.
 - d. Within 14 days from the receipt of the County's Purchase Order, the Contractor, in consultation with the County's designated Project Manager, shall hold an initial Project Kickoff meeting to designate respective contacts and project staff, timelines as provided herein, and additional and related concerns.
 - e. Contractor shall submit design drawings to County within 9 weeks from the receipt of the county's Purchase Order.
 - f. Contractor upon final design shall notify county Project Manager of the final design and date/time for manufacturing test.
 - g. Contractor shall ship the Transformer no later than 28 weeks of confirmed receipt of the Purchase Order.
 - h. Contractor shall notify the County's Project Manager at least 14 calendar days prior to shipping of the Transformer and expected dates of delivery and offloading.
 - i. Contractor shall deliver and offload the Transformer at El Vado Hydroelectric Plant within 30 weeks of confirmed receipt of the Purchase Order.
 - j. Contractor shall complete all required manufacturing, production, delivery, and conduct of the final Field Services including commissioning of the Transformer as described herein within 48 weeks of the receipt of the Purchase Order.

SECTION B. TRANSFORMER WARRANTY. Contractor shall transfer, assign, or grant any and all rights to the warranty provided by the Transformer's manufacturer Virginia Transformer Corporation to the County. Contractor and manufacturer is providing to the County the 60-month Extended Warranty with the In/Out Coverage as provided in **Exhibit "B"** as part of the purchase price of the Transformer.

1. As a condition of the Extended Warranty and In/Out Coverage, County shall provide to the manufacturer annual Dissolved Gas Analysis ("DGA") reports for the Transformer within 180 days of each year's anniversary installation date for each year of the warranty period. County shall submit the DGA reports to: fieldservice@vatransformer.com, unless otherwise notified in writing by Contractor or manufacturer. DGA testing for the initial year shall be conducted by the Manufacturer as a component of field services.
2. County shall give Contractor and manufacturer prompt notice of any observed defects.
3. County shall not pay for any costs associated with correcting defects during the warranty term, including, but not limited to shipping, travel, labor and parts to repair and or replace defective component(s), up to and including complete replacement of the Transformer.

SECTION C. TERM: The term of this Agreement shall commence January 5, 2022, and shall continue through December 7, 2022, unless sooner terminated, as provided herein.

SECTION D. COMPENSATION:

1. **Amount of Compensation.** County shall pay compensation to Contractor for performance of the Services in an amount **Not To Exceed FOUR HUNDRED THIRTY-TWO THOUSAND FIVE HUNDRED EIGHTY-SEVEN DOLLARS (\$432,587.00 US)**, which amount does not include applicable New Mexico gross receipts taxes ("NMGRT"), if applicable. Compensation shall be paid in accordance with the Compensation Rate Schedule and Payment Schedule set out in **Exhibit "C"** attached hereto and made a part hereof for all purposes.
2. **Invoices.** Contractor shall submit itemized invoices to County's Project Manager, in accordance with the Payment Schedule, set out in **Exhibit "C"** showing amount of compensation due, amount of any NMGRT, and total amount payable. Payment of undisputed amounts shall be due and payable thirty (30) days after County's receipt of the invoice.

SECTION E. TAXES: Contractor shall be solely responsible for timely and correctly billing, collecting and remitting all NMGRT levied on the amounts payable under this Agreement.

SECTION F. STATUS OF CONTRACTOR, STAFF, AND PERSONNEL: This Agreement calls for the performance of services by Contractor as an independent contractor. Contractor is not an agent or employee of County and shall not be considered an employee of County for any purpose. Contractor, its agents or employees shall make no representation that they are County employees, nor shall they create the appearance of being employees by using a job or position title on a name plate, business cards, or in any other manner, bearing County's name or logo. Neither Contractor nor any employee of Contractor shall be entitled to any benefits or compensation other than the compensation specified herein. Contractor shall have no authority to bind County to any agreement, contract, duty or obligation. Contractor shall make no representations that are intended to, or create the appearance of, binding County to any agreement, contract, duty, or obligation. Contractor shall have full power to continue any outside employment or business, to employ and discharge its employees or associates as it deems appropriate without interference from County; provided, however, that Contractor shall at all times

during the term of this Agreement maintain the ability to perform the obligations in a professional, timely and reliable manner.

SECTION G. MODIFICATION OF CONTRACT AND CHANGE ORDERS: This Agreement shall be modified only by mutual written consent of the parties. County may at any time, as the need arises, order changes within the Project without invalidating this Agreement. If such changes increase or decrease the costs of the Project within the not-to-exceed compensation amount provided herein, or the time required for completion of the Project, then an equitable adjustment to the amount of compensation due and/or times for completion of the Project shall be authorized by the *Change Order* as mutually agreed to by County and Contractor. Only the Utility Manager shall have authority to authorize such Change Orders on behalf of the County under this Agreement. If such changes increase the costs of the Project beyond the not-to-exceed compensation amount provided herein, such an increase must be approved and authorized by an Amendment to this Agreement.

SECTION H. STANDARD OF PERFORMANCE: Contractor agrees and represents that it has and shall maintain the personnel, experience and knowledge necessary to qualify it for the particular duties to be performed under this Agreement. Contractor shall perform the Services described herein in accordance with a standard that meets the industry standard of care for performance of the Services.

SECTION I. DELIVERABLES AND USE OF DOCUMENTS: All deliverables required under this Agreement, including material, products, reports, policies, procedures, software improvements, databases, and any other products and processes, whether in written or electronic form, shall remain the exclusive property of and shall inure to the benefit of County as works for hire; Contractor shall not use, sell, disclose, or obtain any other compensation for such works for hire. In addition, Contractor may not, with regard to all work, work product, deliverables or works for hire required by this Agreement, apply for, in its name or otherwise, any copyright, patent or other property right and acknowledges that any such property right created or developed remains the exclusive right of County. Contractor shall not use deliverables in any manner for any other purpose without the express written consent of County.

SECTION J. EMPLOYEES AND SUB-CONTRACTORS: Contractor shall be solely responsible for payment of wages, salary or benefits to any and all employees or contractors retained by Contractor in the performance of the Services. Contractor agrees to indemnify, defend and hold harmless County for any and all claims that may arise from Contractor's relationship to its employees and subcontractors.

SECTION K. INSURANCE: Contractor shall obtain and maintain insurance of the types and in the amounts set out below throughout the term of this Agreement with an insurer acceptable to County. Contractor shall assure that all subcontractors maintain like insurance. Compliance with the terms and conditions of this Section is a condition precedent to County's obligation to pay compensation for the Services and Contractor shall not provide any Services under this Agreement unless and until Contractor has met the requirements of this Section. County requires Certificates of Insurance or other evidence acceptable to County that Contractor has met its obligation to obtain and maintain insurance and to assure that subcontractors maintain like insurance. Should any of the policies described below be cancelled before the expiration date thereof, notice shall be delivered in accordance with the policy provisions. General Liability Insurance and Automobile Liability Insurance shall name County as an additional insured.

1. **General Liability Insurance:** ONE MILLION DOLLARS (\$1,000,000.00) per occurrence; TWO MILLION DOLLARS (\$2,000,000.00) aggregate.
2. **Workers' Compensation:** In an amount as may be required by law. County may immediately terminate this Agreement if Contractor fails to comply with the Worker's Compensation Act and applicable rules when required to do so.
3. **Automobile Liability Insurance for Contractor and its Employees:** ONE MILLION DOLLARS (\$1,000,000.00) combined single limit per occurrence; TWO MILLION DOLLARS (\$2,000,000.00) aggregate on any owned, and/or non-owned motor vehicles used in performing Services under this Agreement.

SECTION L. RECORDS: Contractor shall maintain, throughout the term of this Agreement and for a period of six (6) years thereafter, records that indicate the date, time, and nature of the services rendered. Contractor shall make available, for inspection by County, all records, books of account, memoranda, and other documents pertaining to County at any reasonable time upon request.

SECTION M. APPLICABLE LAW: Contractor shall abide by all applicable federal, state, and local laws, regulations, and policies and shall perform the Services in accordance with all applicable laws, regulations, and policies during the term of this Agreement. In any lawsuit or legal dispute arising from the operation of this Agreement, Contractor agrees that the laws of the State of New Mexico shall govern. Venue shall be in the First Judicial District Court of New Mexico in Los Alamos County, New Mexico.

SECTION N. NON-DISCRIMINATION: During the term of this Agreement, Contractor shall not discriminate against any employee or applicant for an employment position to be used in the performance of the obligations of Contractor under this Agreement, with regard to race, color, religion, sex, age, ethnicity, national origin, sexual orientation or gender identity, disability or veteran status.

SECTION O. INDEMNITY: Contractor shall indemnify, hold harmless and defend County, its Council members, employees, agents and representatives, from and against all liabilities, damages, claims, demands, actions (legal or equitable), and costs and expenses, including without limitation attorneys' fees, of any kind or nature, arising from Contractor's performance hereunder or breach hereof and the performance of Contractor's employees, agents, representatives and subcontractors.

SECTION P. FORCE MAJEURE: Neither County nor Contractor shall be liable for any delay in the performance of this Agreement, nor for any other breach, nor for any loss or damage arising from uncontrollable forces such as fire, theft, storm, war, or any other force majeure that could not have been reasonably avoided by exercise of due diligence.

SECTION Q. NON-ASSIGNMENT: Contractor may not assign this Agreement or any privileges or obligations herein without the prior written consent of County.

SECTION R. LICENSES: Contractor shall maintain all required licenses including, without limitation, all necessary professional and business licenses, throughout the term of this Agreement. Contractor shall require and shall assure that all of Contractor's employees and subcontractors maintain all required licenses including, without limitation, all necessary professional and business licenses.

SECTION S. PROHIBITED INTERESTS: Contractor agrees that it presently has no interest and shall not acquire any interest, direct or indirect, which would conflict in any manner or degree with the performance of its services hereunder. Contractor further agrees that it shall not employ any person having such an interest to perform services under this Agreement. No County Council member or other elected official of County, or manager or employee of County shall solicit, demand, accept or agree to accept a gratuity or offer of employment contrary to Section 31-282 of the Los Alamos County Code.

SECTION T. TERMINATION:

1. **Generally.** County may terminate this Agreement with or without cause upon ten (10) days prior written notice to Contractor. Upon such termination, Contractor shall be paid for Services actually completed to the satisfaction of County at the rate set out in Section D. Contractor shall render a final report of the Services performed to the date of termination and shall turn over to County originals of all materials prepared pursuant to this Agreement.
2. **Funding.** This Agreement shall terminate without further action by County on the first day of any County fiscal year for which funds to pay compensation hereunder are not appropriated by County Council. County shall make reasonable efforts to give Contractor at least ninety (90) days advance notice that funds have not been and are not expected to be appropriated for that purpose.

SECTION U. NOTICE: Any notices required under this Agreement, unless otherwise provided herein, shall be made in writing, postage prepaid to the following addresses, and shall be deemed given upon hand delivery, verified delivery by telecopy (followed by copy sent by United States Mail), or three (3) days after deposit in the United States Mail:

County:

DPU Project Manager
Incorporated County of Los Alamos
1000 Central Avenue, Suite 130
Los Alamos, New Mexico 87544

Contractor:

Pat Valdez
Western United Electric Supply
7311 La Morada N.E.
Albuquerque, New Mexico 87120

SECTION V. INVALIDITY OF PRIOR AGREEMENTS: This Agreement supersedes all prior contracts or agreements, either oral or written, that may exist between the parties with reference to the services described herein and expresses the entire agreement and understanding between the parties with reference to said services. It cannot be modified or changed by any oral promise made by any person, officer, or employee, nor shall any written modification of it be binding on County until approved in writing by both County and Contractor.

SECTION W. NO IMPLIED WAIVERS: The failure of the County to enforce any provision of this Agreement is not a waiver by the County of the provisions or of the right thereafter to enforce any provision(s).

SECTION X. SEVERABILITY: If any provision of this Agreement is held to be unenforceable for any reason: (i) such provision shall be reformed only to the extent necessary to make the intent of the language enforceable; and (ii) all other provisions of this Agreement shall remain in effect.

SECTION Y. CAMPAIGN CONTRIBUTION DISCLOSURE FORM: A Campaign Contribution Disclosure Form was submitted as part of the Contractor's Response and is incorporated herein by reference for all purposes.

SECTION Z. LEGAL RECOGNITION OF ELECTRONIC SIGNATURES: Pursuant to NMSA 1978 § 14-16-7, this Agreement may be signed by electronic signature.

SECTION AA. DUPLICATE ORIGINAL DOCUMENTS: This document may be executed in two (2) counterparts, each of which shall be deemed an original.

IN WITNESS WHEREOF, the parties have executed this Agreement on the date(s) set forth opposite the signatures of their authorized representatives to be effective for all purposes on the date first written above.

ATTEST

INCORPORATED COUNTY OF LOS ALAMOS

NAOMI D. MAESTAS
COUNTY CLERK

BY: _____
PHILO S. SHELTON, III **DATE**
UTILITIES MANAGER

Approved as to form:

J. ALVIN LEAPHART
COUNTY ATTORNEY

WESTERN UNITED ELECTRIC SUPPLY, A COLORADO CORPORATION

BY: _____
DAVE MELE **DATE**
CHIEF OPERATIONS OFFICER

Exhibit "A"
Transformer Specification
AGR22-36

***TRANSFORMER AND FIELD
SERVICES FOR EL VADO
HYDROELECTRIC PLANT***

October 2021

***RFP 22-36
LOS ALAMOS COUNTY – NEW MEXICO***

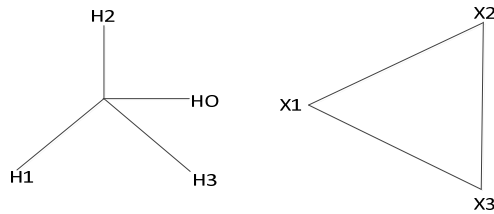
1. STANDARDS:

- 1.1. The transformer shall be designed, constructed, and tested in accordance with the latest revision of the applicable IEEE, ANSI, and NEMA standards, except where specific requirements of these specifications conflict with these standards. In such cases, these specifications shall take precedence.
- 1.2. It is assumed that the equipment provided by the manufacturer will be in strict compliance with these specifications unless specific exception is taken and explanation provided.

2. RATINGS:

- | | |
|---|----------------------------|
| 2.1. Number of Phases | Three |
| 2.2. Capacity HV@ 65 Deg C Rise | 8.2/10.25 MVA |
| 2.3. Cooling Class | OA/FA |
| 2.4. Coolant | Mineral Oil per ASTM D3487 |
| 2.5. Frequency | 60 Hertz |
| 2.6. High Voltage | 69kV Volts, GRDY |
| 2.7. High Voltage Basic Impulse Level (BIL) | 350 kV |
| 2.7.1 HV Neutral BIL | 110 kV |
| 2.8. Low Voltage | 4160 Volts, DELTA |
| 2.9. Low Voltage Basic Impulse Level (BIL) | 60 kV |
| 2.10 Impedance | 7.38% @ 8.2 MVA |
- Manufacturer shall state the guaranteed impedance at nominal voltage ratings, HV @ C tap, LV @ Neutral, in the quotation and percentage of tolerance range.
- 2.10.1 Transformer design and construction shall ensure that a short circuit test of the transformer will not result in an impedance change exceeding 2% of the impedance value measured prior to short circuit testing.
 - 2.10.2 Impedance tolerance is $\pm 7.5\%$ for two winding transformers
 - 2.10.3 De-Energized Taps (DETC): 2 1/2% steps, 1 below and 3 above nominal 69 kV, full capacity taps. Tap changer for de-energized operation with operating handle brought outside the tank. The operating handle for the de-energized tap changer shall be, pad lockable, located at a convenient height for operation by a person standing on the transformer pad, and shall include a position indicator with the highest voltage tap designated as "A" or (1).
- 2.11 Load Tap Changing is not required.

2.12 Vector Relationship:



2.13 Elevation: The transformer shall be located at 7000 Ft above sea level and shall be rated for continuous operation at the specified altitude without derating.

2.14 Ambient temperature shall be 30°C daily average, 40°C maximum, -20°C minimum.

3. TRANSFORMER LOSS EVALUATION

The guaranteed no-load and load losses shall be stated in the Proposal. An amount in dollars shall be added to the quoted price for loss evaluation according to the following factors:

- 3.1. No-Load Losses @ 20°C \$6000/kW
- 3.2. Load Losses @ 85°C \$4500/kW at 8.2 MVA
- 3.3. Auxiliary Losses \$4500/kW at 10.25 MVA
- 3.4. Test system accuracy must be verified for conformance with the requirements of C57.12.00-2000, Section 9.4. The proposal shall include documentation, which verifies the accuracy of the loss measurement system in accordance with the method of NIST Technical Note 1204, or in accordance with the method of Dr. Eddie So of the National Research Council of Canada. The documentation provided with the proposal shall include sufficient identification of the test system to enable the purchaser to confirm that it is the same system used to test the transformer.
- 3.5. Reported losses shall use ANSI reference temperatures of 20 degrees C for No Load Losses and 85 degrees C for Full Load Losses.

4. ACCESSORY EQUIPMENT:

- 4.1. The transformer shall be equipped with all accessories required by ANSI Standards. Indicators shall have alarm and trip contacts rated for 125 VDC for customer use in addition to required contacts for fan control or indication. All available contacts shall be wired to identified terminal points in the main control cabinet and shall be suitable for use in the transformer protection scheme. As a minimum, indicators shall include:
 - 4.1.1. Magnetic liquid level indicator
 - 4.1.1.1 With form "C" alarm contacts (Qualitrol Model No. CAS 797-1 or approved equal)
 - 4.1.2. Liquid temperature indicator
 - 4.1.2.1 With form "C" alarm contacts (Qualitrol Series 104-411-01 or approved equal)
 - 4.1.3. Winding temperature indicator
 - 4.1.3.1 With form "C" alarm contacts (Qualitrol Series 104-405-01 or approved equal)
 - 4.1.4. Pressure/Vacuum indicator
 - 4.1.3.1 With form "C" alarm contacts (Qualitrol Series 104-405-01 or approved equal)
 - 4.1.5. Fault Pressure Relay System
 - 4.1.5.1. The control system shall be sensitive to the rate of pressure increase. (Qualitrol Model Number 900-014-02) mounted under oil with an auxiliary relay assembly for seal-in operation having both dry alarm and trip contacts. (Qualitrol Model Number 909-300-01 or approved equivalent).
 - 4.1.6. Cover-mounted mechanical pressure relief device (Qualitrol XPRD00-0016609 or approved equivalent)
 - 4.1.6.1 With automatic resealing operation
 - 4.1.6.2 Qualitrol seal-in device with form "C" alarm contacts and trip contact.
 - 4.1.6.3 Mechanical signal for indication of device operation.
 - 4.1.6.4. With downpipe to direct flow to containment area. Pipe shall be suitably located on the transformer with screened opening located ~18" above ground.
- NOTE: Indicators with dial readouts shall have minimum 6" diameter dials with the exception of the pressure gauge which can be smaller but readable from the ground. Resettable indicators shall be mounted no higher than 6' above ground with the exception of the mechanical pressure relief device which will be cover mounted.
- 4.1.7. Drain valve and the oil sampling valve
 - 4.1.7.1. Located to allow complete draining or sampling from the bottom of the tank.
- 4.1.8. Lifting lugs for lifting complete oil filled transformers.
- 4.1.9. Lifting eyes for lifting the cover only.
- 4.1.10. Facilities for lifting core and coil assembly from tank.
- 4.1.11. Jacking facilities at four corners of the base.
- 4.1.12. Diagrammatic aluminum nameplate for both the transformer and load tap changer. Information provided on the nameplate shall be included with the bid documents.
- 4.1.13. A minimum of two circular, bolted manhole covers shall be provided. They shall be located such that they are accessible without the removal of any other

equipment. Manholes shall be constructed with flush handles to reduce tripping hazard when working on the transformer cover.

- 4.1.14. Core shall be grounded at only one point, brought to a convenient location for testing and be accessible.
 - 4.1.12.1 All hardware necessary for removing the ground lead for testing shall utilize captive hardware.
 - 4.1.12.2 Removable without either entry into the tank or removal of any transformer oil.
 - 4.1.12.3 Brought out on the cover through suitable bushing and grounded externally.
- 4.1.15. A device suitable for mounting a safety device in the approximate center of the tank cover and capable supporting hardware including harnesses utilizing gravity brakes shall be provided.

In addition, the following equipment will be supplied:

4.2. **Bushings:**

- 4.2.1. High voltage line bushings will be located on the transformer Top in ANSI Segment 3; and shall be rated 400 Amps, 69 kV, 350 kV BIL (min) at station elevation. Bushings shall include NEMA 4-hole pads and threaded studs.
- 4.2.2. Low voltage line bushings will be located on the transformer sidewall compartment in ANSI Segment 1; and shall be rated 2000 Amperes, 15 kV, 110 kV BIL (min). (See also transition compartment details). If located below oil they shall be rated for this type of service and sealed accordingly.
- 4.2.3. High voltage neutral bushing will be located on the cover in the corner between ANSI Segment 1 and 2; and shall be rated 600 Amperes, 15 kV, 110 kV BIL (min).
- 4.2.4. All high voltage bushings shall be Sky Gray (ANSI 70), shall have provisions for power factor testing and be oil-filled condenser type. Low side bushings shall be porcelain, including bus support type bushings, and shall have threaded studs and suitable 4-hole connector pads for customer connections.
- 4.2.5. Use draw lead type bushings for all bushings not shipped factory installed.
- 4.2.6. Supports shall be included for bus to extend the bushing terminal into the transition compartment as shown in the transition compartment details.

4.3. **Current Transformers:** Bushing type current transformers for relaying service shall be furnished as described below and be cover mounted internal to the transformer tank:

- 4.3.1. Each high voltage bushing:
 - 4.3.1.1. Qty 1 , 600/5 MRCT, C800
 - 4.3.1.2. Qty 1 , 600/5 MRCT, C800
- 4.3.2. Each low voltage bushing:
 - 4.3.2.1. Qty 1 , 1500/5 MRCT, C800
 - 4.3.2.2. Qty 1 , 1500/5 MRCT, C800
- 4.3.3. low voltage neutral bushing:
 - 4.3.3.1. Qty 1 , 100/5 MRCT, C800
- 4.3.4. All Current Transformers shall have fully distributed windings and a minimum Thermal Rating Factor of 2.0
- 4.3.5. Hot Spot CTs shall be provided as needed to support manufacturer control schemes and indicators. Suitable wells shall be utilized that do not require the oil level to be dropped for servicing elements.

4.4. **Surge Arresters:** There shall be provided six metal-oxide, polymer housed station type surge arresters.

- 4.4.1. Three 42 kV MCOV rated surge arresters mounted near and connected to the high voltage bushings. Provide mounting for arresters such that connector pads are same level.
- 4.4.2. Three 5.1 kV MCOV rated surge arresters mounted near and connected to the low voltage bushings inside the transition cable compartment.
- 4.4.3 The transformer shall be equipped with a ground bus & cabling for connection of all surge arresters to ground pad(s) at the base of the transformer. Provide stainless steel 2-hole pads on all four corners of transformer as well as suitable bronze connectors for one or two 4/0 to 500 MCM ground conductor connections for use by the Owner.
- 4.4.4 Arresters shall meet the requirements of ANSI C62.1. and be provided with NEMA 4-hole pads for line connections and eyelet grounds. Present layout for transition compartment mounting of arresters and buswork.

5. ELECTRICAL DESIGN:

- 5.1. The transformer, including all core and coil assemblies, shall be power class, round core/circular coil design and construction. High voltage and low voltage windings for the main core/coil assembly shall be either disk or helical construction, layer/barrel windings are not acceptable. All windings shall be copper conductor and either rectangular magnet wire or continuous transposed cable.
 - 5.1.1 The purchaser reserves the right to inspect the completed core and coil assembly prior to tanking. The manufacturer shall notify the purchaser not less than five days prior to the date of tanking to allow the customer to witness tanking, if so desired. Alternatively, a video visit shall be coordinated for customer review if travel is not possible.
- 5.2. The transformer design shall be adequate to withstand short circuits, with the fault current limited only by the impedance of the transformer itself.
- 5.3. Internal surge arresters or non-linear resistors shall not be included as part of the internal insulation system.
- 5.5 Insulation on all conductors used in the coil winding process shall be cellulose insulating paper. It shall be wound onto the conductor employing a spinning process. The paper insulation shall be applied in single or multiple strands such that a minimum of 30% of the paper surfaces are overlapped to provide for a continuous insulating surface. Sufficient tension shall be maintained on the paper strands so as to prevent loose wraps. If clamping rings are utilized in the transformer design, full circumference rings shall be used. Core and coils shall be dried using a "vapor phase" system prior to filling.
- 5.6 Provide layout for transition compartment and required phase-to-phase and phase-to-ground clearance distances. Supporting insulators, grounding, bus bar connections, flex leads, etc. shall be provided to facilitate connection by the customer to their existing cable terminations. PVC boots and fasteners shall be included with transformer accessories. Termination lengths shall be included in determination of boot physical dimensions.

6. COOLING EQUIPMENT AND CONTROLS

- 6.1. Cooling equipment shall be furnished as required to provide the transformer's rated capacity without exceeding the guaranteed temperature rise.
- 6.2. Forced cooling capacity shall be provided by the use of fans for forced air cooling. Temperature control shall be provided by winding temperature equipment, including a temperature indicator and relay contacts to automatically actuate forced cooling equipment in proportion to the transformer load.

- 6.3. Cooling equipment fan motors shall be rated for service on a 208, three-phase power supply. Control circuit devices shall be rated 120 volt single phase or 208 V single phase. Alarm circuit devices shall be rated for 125 volts DC.
- 6.4. Manual control switches shall be provided in the control cabinet to allow testing and maintenance of the cooling fans, and to enable selection of which group of fans is used for the first forced cooled stage. Transformer cooling equipment shall be designed for continuous self-cooled/force-cooled operation.
- 6.5. Removable radiators will be supplied with individual shut-off valves at each tank connection. Each radiator will be supplied with means for draining and venting.
- 6.6 All radiators shall be interchangeable and shall be provided with a galvanized finish.
- 6.7 All fans shall have galvanized fan guards and be provided with one-piece fan blades.

7. MECHANICAL CONSTRUCTION

- 7.1. The tank, and radiators shall be fabricated from steel with sufficient strength to withstand normal service stresses without distortion or damage.
 - 7.1.1. The tank shall be designed to withstand an internal operating pressure of 8 psi with margin for a minimum of 25% over pressure, and full vacuum. All joints in the tank and radiators shall be made oil tight and gas tight by welding inside and outside.

All tank seams shall be double welded (inside and outside) and shall be a minimum of six (6) inches from the corner. Corner welds are not acceptable.
 - 7.1.2. Cover shall be domed or sloped to shed water and welded to the tank. During welding of the transformer cover, an inorganic gasket will be permanently located between the cover and the tank flange to prevent the entrance of weld spatter into the tank.
 - 7.1.3. All gasketed openings shall be designed with means provided for controlled compression of the gasket, utilizing metal-to-metal stops, and re-usable gaskets of oil resistant material (nitrile butadiene or Engineer approved alternative). All gasketed joints on top of the transformer shall utilize flanges, which are raised at least 3/4 inch above the cover surface & have recessed grooves for proper placement.
 - 7.1.4. Radiators shall be constructed to withstand tank operating pressure and full vacuum.
 - 7.1.5 All external tank supports or stiffeners shall be box beam construction and continuously welded.
 - 7.1.6. Tank centerlines and center of gravity shall be clearly marked on all four segments.
 - 7.1.7. Tank shall not be welded on corners and sealed tubular bracing will be utilized for additional head space expansion volume.
- 7.2. **Paint:**
 - 7.2.1. Transformer tank and all auxiliary equipment shall be painted with a rust-inhibiting primer and top coat to provide a minimum 3 mil dry film thickness. External paint color shall be Sky Gray, ANSI 70.

Accelerated aging test must be performed on the paint to be used inside the tank. A plate steel sample coated with the white paint shall be submerged in transformer insulating oil and heated to 130 degrees C. After 1,000 hours, there may not be any change in the painted surface, or in the power factor of the oil used for the test.

7.3. Oil Preservation System:

- 7.3.1. Sealed-tank construction with inert gas system for transformer head space. Manufacturer shall provide inert gas system with suitable two or three stage regulation assembly, enclosure with suitable bottle and tank gauges. Enclosure shall fully enclose bottle and be provided with low/high gas pressure and low bottle alarms. 120 VAC enclosure heaters shall be provided to facilitate use of assembly at site conditions, as required. Locate enclosure base within 3" of transformer of base.
- 7.3.2. The tank shall be equipped with a pressure vacuum gauge, pressure vacuum bleeder (regulator) and needle valve for the addition of nitrogen, when required.
- 7.3.3. INSULATING LIQUID: A sufficient quantity of inhibited mineral oil shall be furnished for the transformer to fill it to the normal operating level. The insulating liquid shall meet all requirements as defined by ANSI Standards, shall be chemically stable, free from acidity or other corrosive ingredients, and shall be certified "Non-PCB" in accordance with current EPA Regulations.

7.4. Auxiliary Power and Control Circuits:

- 7.4.1. All auxiliary power and control circuits which are supplied for connection to external circuits shall be brought to suitable terminal blocks located in a common, weather-resistant, vibration free, NEMA 3R rated control cabinet (min). All contacts on auxiliary devices shall be wired to terminal blocks in the same cabinet for Owner's use. Terminal blocks shall be with washer head binding screws and white circuit identification marking strips. Shorting type terminal blocks shall be used on current transformer leads (GE type EB25 and/or 27 for controls type terminal blocks; AC/DC Power blocks shall be Marathon 1422123 or approved equivalent.)
- 7.4.2. Cabinet shall be equipped with a stainless steel 3-point latching mechanism(s), a continuous stainless steel hinge and convenience outlet and service lighting.
- 7.4.3. All welds on all enclosures shall be continuous to prevent moisture from entering.
- 7.4.4. Wire for control and power circuits shall be rated for use in conduits as well as cabinets, and shall utilize insulation which is both fire resistant and resistant to transformer insulating oil. Manufacturer shall utilize #14 AWG minimum for controls and #12 or #10 for CT circuits. Insulated ring lugs shall be used for wire terminations in the control cabinet.
- 7.4.5. Control Cabinet shall have 120 VAC heaters to minimize condensation, PTC type or similar.
- 7.4.6. AC and DC power circuits shall be furnished with under-voltage relays with alarm contacts wired out to the terminal blocks for Owner's annunciation purposes. Final control voltage(s) of 48 or 125 VDC will be confirmed during the drawing submittal process.
- 7.4.7. Flex conduit connections shall be limited to short lengths for connections to fans.

8. FACTORY TESTS

- 8.1. All routine tests listed in ANSI C57.12.00-2000, plus additional tests as specified herein, are required. The transformer shall be fully assembled, including all permanent radiators and bushings, during test with serial numbers of bushings noted in each mounting position.
- 8.2. Five certified copies of the certified test report shall be delivered to the purchaser not later than 10 days after completion of all factory tests.

- 8.3. Insulation power factor tests shall be performed on all winding-to-winding and winding-to-ground insulation. Measured values exceeding 0.5% (corrected to 20 C) will not be accepted.
- 8.4. Sweep Frequency Response Testing (SFRA) shall be performed on the unit at the factory for use in comparison with field testing.
- 8.5. The purchaser reserves the right to witness testing. The manufacturer shall notify the purchaser of the performance dates for all tests not less than five days prior to the date of a test to allow the purchaser to witness testing if so desired. Coordination of a 'video visit' shall also be allowed should the Owner not be able to attend in person.
- 8.6. The manufacturer shall notify the purchaser of any unusual event or damage occurring during the fabrication of the transformer and of all tests which do not meet the specified or guaranteed values. The purchaser reserves the right to inspect such damages or test failures. Corrective measures to overcome such damage or failure shall be reviewed with the Owner.
- 8.7. Dissolved Gas Analysis of insulating oils (DGA) shall be provided after each factory test in accordance with manufacturer practices.
- 8.8. Dielectric testing shall be performed on the unit.
- 8.9. A heat run shall be required on the unit to confirm performance as compared to the transformer nameplate ratings.

9. SHIPPING REQUIREMENTS

9.1. The manufacturer is responsible to ship the transformer **F.O.B. destination, El Vado Hydroelectric Plant, substation site, freight prepaid and add to invoice.**

9.1.1. For truck shipment the destination shall be the substation site.

9.2. The transformer shall be shipped from the factory oil-filled if weight limitations allow.

9.3. Fans shall be mounted on and shipped with appropriate radiator bank(s).

10. FIELD SERVICES

- 10.1. Seller shall provide a field services engineer to direct the dress out of the transformer after it has been placed on the foundation by the contractor performing the installation. The field services engineer shall direct the assembly, filling, and connection of any equipment such as, but not limited to, bushings, radiators, nitrogen systems, drying and vacuum filling with oil, which were removed or modified for shipping and are required for transformer operation.
- 10.2. Field Service Engineer shall conduct a complete visual and mechanical inspection and shall submit a written report containing the following, at a minimum:
 - 10.2.1. Compare equipment nameplate data with the drawings and specifications.
 - 10.2.2. Inspect physical and mechanical condition including documented readings
or
observations from manufacturer supplied SFRA and Impact recorders
 - 10.2.3. Inspect anchorage, alignment, and grounding.
 - 10.2.4. Verify the presence of PCB content labeling.
 - 10.2.5. Verify removal of any shipping bracing after placement.
 - 10.2.6. Verify the bushings and transformer is clean.
 - 10.2.7. Verify that alarm, control, and trip settings on temperature and level indicators are as specified.

- 10.2.8. Verify that cooling fans and/or pumps operate correctly, and that fan and pump motors have correct over-current protection.
- 10.2.9. Verify correct liquid level in tanks and bushings.
- 10.2.10. Verify that positive pressure is maintained on gas-blanket transformers.
- 10.2.11. Perform inspections and mechanical tests as recommended by the manufacturer.
- 10.2.12. Confirm radiator valves are locked in the open position.
- 10.2.13. Take oil sample and have complete oil test report completed.
- 10.2.14. Any other inspections normally performed by the Seller

11. ACCEPTANCE TESTING AFTER INSTALLATION

- 11.1 The following tests will be performed by an independent testing company contracted by the Buyer:
 - 11.1.1. Winding and core ground resistance
 - 11.1.2. Winding Ratio of high and low voltage on all taps
 - 11.1.3. SFRA Testing
 - 11.1.4. Polarity and phase relation of winding
 - 11.1.5. Polarity and ratio tests of Current Transformers
 - 11.1.6. Insulation power factor and excitation current test of all windings
 - 11.1.7. H.V. and L.V. bushing insulation power factor, C1 and C2 tap tests
 - 11.1.8. H.V. and L.V. arresters power factor
 - 11.1.9. Functional testing of all alarms to terminal blocks B. The transformer shall be accepted based on the results of the field tests.

12. LV Transition Compartment

- 12.1 The transformer shall be supplied with a low voltage transition compartment or throat located in Segment 1 with general dimensions and location as noted below. The compartment shall house the 4.16 kV connections that will allow for connection to the existing non-segregated bus duct sections. Transformer manufacturer shall accommodate this connection location and details in their design to facilitate replacement of the unit in the field.
- 12.2 Cabinet size (See also Appendix 2 for details)
 - 12.2.1. LV Transformer Transition Compartment (with removable cover):
 - 38" wide
 - 24-1/2" deep
 - 38-1/2" tall
 - 12.2.2. Transition Boot (to include metal connection flanges):
 - 27" wide
 - 16" deep
 - 12-1/2" tall

Please complete the following information to help us evaluate your proposal more thoroughly:

- 1) Main Coil Design: Round or Rectangular?
- 2) Type of windings:
 HV: Disk or Helical:
- LV: Disk or Helical:
- 3) Warranty:
 * State the length of the warranty period:
- * Is in/out coverage included & for how long?
- * Does the warranty cover all accessories as well as the core & coil?
- 4) Will transformer ship oil filled?
- 5) Shipment:
 * F.O.B. destination: Yes / No
- * Proposed destination: Rail Siding / Site / Pad
- 6) Does the winding design assume an infinite buss limited only by the impedance of the transformer?
- 7) Where will the transformer be manufactured?
- 8) Provide reference list of similar units?
- 9) Are all parts for transformer sourced domestically?
- 10) Max. 125/48 V DC power requirements?
- 11) Max 120/208, 3Ø VAC power requirements?
- 12) Will unit ship with impact recorder(s)?
- 13) Will positive/zero sequence impedance models be provided with the factory testing results?
- 14) Is site assembly/testing by the manufacturer required to validate the transformer warranty?

APPENDIX 1
69 kV – 4.16 kV 8.2/10.25 MVA
TRANSFORMER BID DATA SECTION

MANUFACTURER OF TRANSFORMER: _____

In addition to other data and descriptive material requested, the Manufacturer shall fill in all spaces of the following Data Section. The specifically listed items are in no way intended to limit the data submitted, and the Manufacturer is invited to submit all material believed necessary to provide a complete description of the transformer.

1.0 COST DATA

a. Cost of transformer, oil, accessories F.O.B. to transformer foundation, El Vado Station, near Chama, New Mexico including field engineer to oversee the assembly and testing of transformer at the site.

b. Cost of all required factory tests (if not included above)

c. Price for a 5 yr. warranty

d. Price for field testing (if not included above)

e. Price for complete field assembly

2.0 Dates

Estimated Shipping Date Transformer

Estimated Arrival Date Transformer

3.0 RECEIVING AND INSTALLATION DATA

3.1 Weights (Pounds)

Transformer

Shipping: _____ lbs.

Installed: _____ lbs.

With oil, installed: _____ lbs.

Core and coil assembly, net: _____ lbs.

Tank and fittings, net: _____ lbs.

Heaviest shipping assembly, as shipped _____ lbs.

3.2 Oil, gallons

Main Tank: _____ gals

3.3 Largest shipping section (Inches)

Overall height: _____ in.

Overall length: _____ in.

Overall width: _____ in.

3.4 Transformer installed dimensions (Inches)

Overall height: _____ in.

Overall length: _____ in.

Overall width: _____ in.

Minimum untanking height, base to crane hook: _____ in.

3.5 Tank only dimensions (Inches)

Overall height: _____ in.

Overall length: _____ in.

Overall width: _____ in.

3.6 Maximum AC power requirements (Amps):

3.7 Maximum DC power requirements (Amps):

3.8 Electronic format of drawings:

3.9 Electronic format of manuals:

3.10 Size of control compartment and location (HxWxD):

_____ in.

3.11 Provide scale outline drawing(s) of transformer including height and location of control compartment, radiators, fans, bushings, pumps, and other accessories.

3.12 Describe parts removed for shipment and hours required to install.

4.0 RATING AND PERFORMANCE DATA

4.1 Maximum permissible continuous transformer demand at rated voltage and at rated ambient temperature without exceeding standard hottest-spot or top oil temperature for the following conditions:

	55°C	65°C
	Rise	Rise
At self-cooled rating (ONAN), MVA	_____	_____
At forced-cooled rating (ONAF), MVA	_____	_____

4.2 Positive Impedance, percent (H-X%)

Quoted	_____%
Base MVA	_____MVA
Tolerance, percent	_____%

4.3 Regulation at 100 percent, 55°C rise, ONAN load (percent)

100 percent power factor	_____%
90 percent power factor	_____%
80 percent power factor	_____%

4.4 Exciting current (percent)

95 percent voltage	_____%
100 percent voltage	_____%
105 percent voltage	_____%
110 percent voltage	_____%

4.5 Efficiency at ONAN rating and 75°C winding temperature (percent)

100 percent load 55°C temperature rise rating	_____%
75 percent load	_____%
50 percent load	_____%
25 percent load	_____%

**The following items marked with an * will be used for transformer bid evaluation.
If not filled out, ENGINEER will reject the bid.**

4.6 Guaranteed maximum losses at specified temperatures in kW.

No-load losses at 20°C (kW)

110 percent voltage _____ kW

105 percent voltage _____ kW

100 percent voltage * _____ kW

4.7 Load Losses at specified temperature and taps in kW.

Load losses at 55°C rise over 20°C ambient, assuming sufficient voltage is applied to cause 100 percent of the rated current to flow in the windings with the other windings shorted.

80 percent of ONAN rating (@ 8.2 MVA) _____ kW

100 percent of ONAN rating (@ 8.2 MVA) * _____ kW

100 percent of ONAN/ONAF/ONAF (@ 10.25 MVA) _____ kW

4.8 Cooling equipment demand (kW)

At no-load, if any _____ kW

At ONAN * _____ kW

At ONAN/ONAF _____ kW

4.9 Total losses at 55°C rise (over 20°C ambient) in kW.

Load Loss @ 80% of ONAN Rating + No-Load Loss @ 100% Voltage
= _____ kW

Load Loss @ 100% of ONAN Rating + No-Load Loss @ 100% Voltage
= * _____ kW

Load Loss @ 100% of ONAN/ONAF + No-Load Loss @ 110% Voltage
= _____ kW

4.10 Audible sound levels in dB.

At No Load _____ dB

At ONAN/ONAF (with cooling) _____ dB

4.11 Induced voltage test.

One-hour test voltage level _____ kV

Enhanced test voltage level _____ kV

Maximum expected RIV level _____ μV

Maximum expected partial discharge level _____ pC

4.12 Provide information and traceability concerning the testing equipment and methods used to determine the losses and the expected error.

5.0 NITROGEN GAS OIL PRESERVATION SYSTEM

Type _____

Manufacturer _____

Location of Nitrogen Tank _____

Height of Nitrogen Tank base above transformer base (inches) _____in

6.0 ARRESTERS

High Voltage: Type _____

Manufacturer _____

MCOV RATING _____

Low Voltage: Type _____

Manufacturer _____

MCOV RATING _____

7.0 CONTACTS

For Technical Questions:

Name of Person to contact _____

Telephone Number of that person _____

Address _____

For Sales Questions:

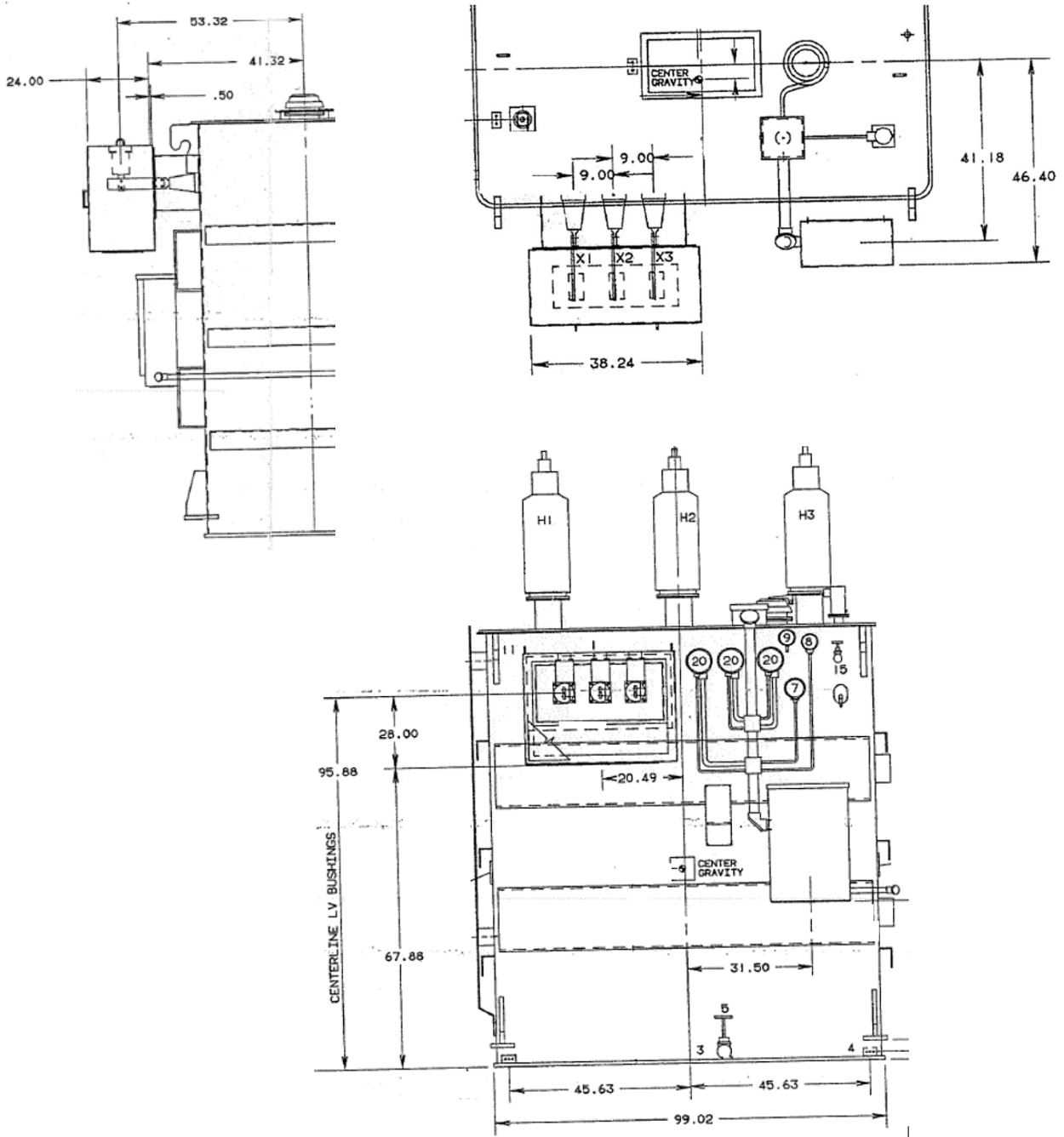
Name of Person to contact _____

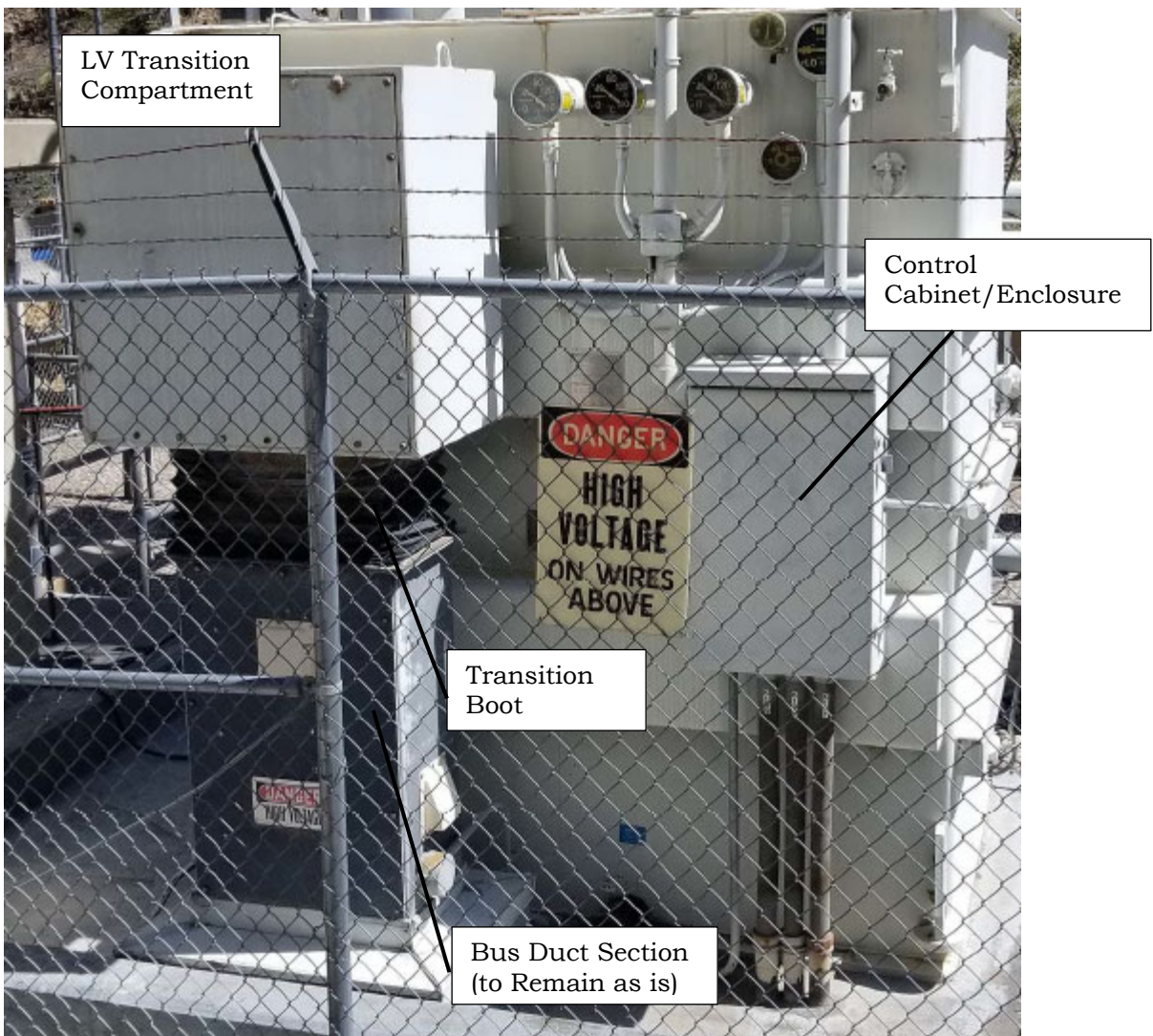
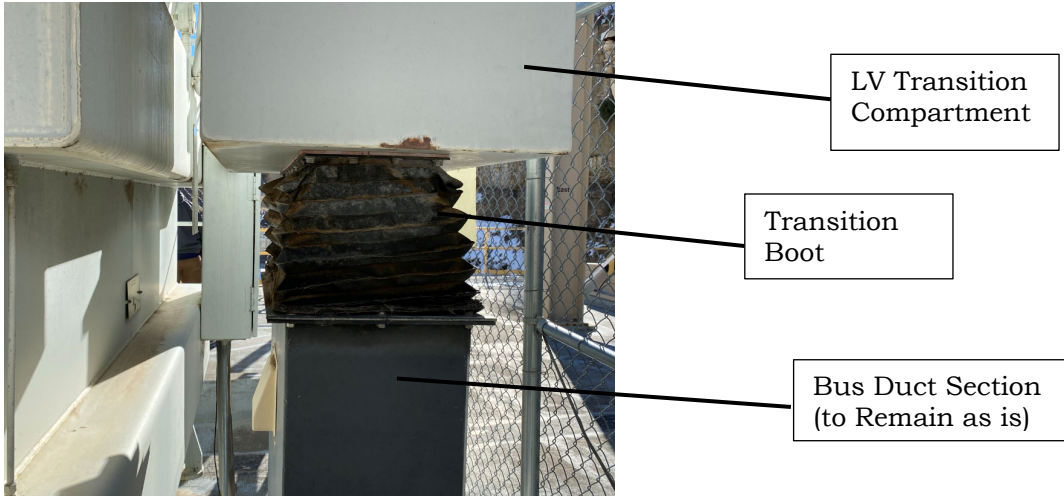
Telephone Number of that person _____

Address _____

APPENDIX 2
69 kV – 4.16 kV 8.2/10.25 MVA
EXISTING LOW VOLTAGE TRANSITION CABINET DETAILS

The 4.16 kV transition compartment shall be located in segment 1 of the transformer with the following general dimensions in order to facility installation into the existing site layout and bus duct section. Similarly, the control enclosure shall also be located in segment 1 as shown in order to facilitate connections to the existing conduit raceways.





Informational measurements to accompany site pictures and outline drawing/details from original manufacturer of transformer:

- LV Transformer Transition Compartment (with removable cover):
 - 38" wide
 - 24-1/2" deep
 - 38-1/2" tall
- Transition Boot (to include metal connection flanges):
 - 27" wide
 - 16" deep
 - 12-1/2" tall
- Bus Duct Section (to remain as is):
 - 25-1/2" wide
 - 15" deep
 - 43-1/4" tall measured from top of the metal flashing on top of the reinforced concrete "curb" roof penetration
- Control Cabinet/Enclosure (to include latchable door):
 - 20-1/4" wide
 - 10-1/2" deep
 - 34-1/2" tall
 - Sits 40-1/2" off the concrete spill containment floor
 - Contains 1 ea. 1/2" and 3 ea. 2" conduit penetrations (to be reused)
- Shortest Distance between LV transition box and control box: 22-3/4"
- Distance Center-to-Center between LV Transition & Control Cabinet: approx. 52"

Additional Pictures To Show Transition, Bus Connections and Bus Duct



LV Transition
Compartment Showing
bus connections and
linkages along with
support insulators and
LV bushings.



LV Transition
Compartment Showing
bus connections and
linkages along with
passage from
compartment to boot
section.



Boot Section and
existing bus duct to be
reused for new LV
transformer connection.

Exhibit "C"
AGR22-36

Please complete the following information to help us evaluate your proposal more thoroughly:

- 1) Main Coil Design: Round or Rectangular? ROUND
- 2) Type of windings:

HV:	Disk or Helical:	<u>DISC OR HELICAL</u>
LV:	Disk or Helical:	<u>DISC OR HELICAL</u>
- 0) Warranty:

* State the length of the warranty period:	60/60 Months Extended Warranty With In/Out
* Is in/out coverage included & for how long?	<u>Included for 5 yr</u>
* Does the warranty cover all accessories as well as the core & coil?	<u>ONLY CORE AND COIL</u>
- 1) Will transformer ship oil filled? Ship oil filled
- 2) Shipment:

* F.O.B. destination: Yes / No	<u>YES</u>
* Proposed destination: Rail Siding / Site / Pad	<u>SITE</u>
- 3) Does the winding design assume an infinite buss limited only by the impedance of the transformer? YES
- 4) Where will the transformer be manufactured? Roanoke, Virginia 24012
- 5) Provide reference list of similar units? Please see attached List
- 6) Are all parts for transformer sourced domestically? Yes Except CT
- 0) Max. 125/48 V DC power requirements? Yes
- 1) Max 120/208, 3Ø VAC power requirements? Yes
- 2) Will unit ship with impact recorder(s)? Yes
- 3) Will positive/zero sequence impedance models be provided with the factory testing results? YES
- 4) Is site assembly/testing by the manufacturer required to validate the transformer warranty? No, 91?X supervisor? is required

APPENDIX 1
69 kV – 4.16 kV 8.2/10.25 MVA
TRANSFORMER BID DATA SECTION

MANUFACTURER OF TRANSFORMER: VIRGINIA TRANSFORMER CORPORATION

In addition to other data and descriptive material requested, the Manufacturer shall fill in all spaces of the following Data Section. The specifically listed items are in no way intended to limit the data submitted, and the Manufacturer is invited to submit all material believed necessary to provide a complete description of the transformer.

1.0 COST DATA

a. Cost of transformer, oil, accessories F.O.B. to transformer foundation, El Vado Station, near Chama, New Mexico including field engineer to oversee the assembly and testing of transformer at the site.

Base unit \$394,888 _____

b. Cost of all required factory tests (if not included above) Included

c. Price for a 5 yr. warranty Included

d. Price for field testing (if not included above) \$11,600

e. Price for complete field assembly NA

2.0 Dates

Estimated Shipping Date Transformer

SHIPMENT 26-28 WEEKS FROM ARO

Estimated Arrival Date Transformer

SHIPMENT 26-28 WEEKS FROM ARO

3.0 RECEIVING AND INSTALLATION DATA

3.1 Weights (Pounds)

(Approx. Weights)

Transformer

Shipping: 46,300 lbs.

Installed: NA lbs.

With oil, installed: 46,300 lbs.
Core and coil assembly, net: lbs.

Tank and fittings, net: 6,638 lbs.

Heaviest shipping assembly, as shipped 9,300 lbs.

1
NA

3.2 Oil, gallons

Main Tank:

1521 gals

3.3 Largest shipping section (Inches)

(Approx. Dimensions)

Overall height: 152 in.

Overall length: 129 in.

Overall width: 135 in.

3.4 Transformer installed dimensions (Inches)

Overall height: 152 in.

Overall length: 129 in.

Overall width: 135 in.
Minimum untanking height, base to crane hook: in.

250

3.5 Tank only dimensions (Inches)

Overall height: 152 in.

Overall length: 129 in.

Overall width: 125 in.

3.6 Maximum AC power requirements (Amps):

230 VOLT

3.7 Maximum DC power requirements (Amps):

125 VDC

3.8 Electronic format of drawings:

AFTER ORDER

3.9 Electronic format of manuals:

AFTER ORDER

3.10 Size of control compartment and location (HxWxD):

48x48x16 in.

3.11 Provide scale outline drawing(s) of transformer including height and location of control compartment, radiators, fans, bushings, pumps, and other accessories.

3.12 Describe parts removed for shipment and hours required to install.

4.0 RATING AND PERFORMANCE DATA

4.1 Maximum permissible continuous transformer demand at rated voltage and at rated ambient temperature without exceeding standard hottest-spot or top oil temperature for the following conditions:

	55°C Rise	65°C Rise
At self-cooled rating (ONAN), MVA		8.2
At forced-cooled rating (ONAF), MVA		10.25
4.2 Positive Impedance, percent (H-X%)		
Quoted	7.38	%
Base MVA	8.2	MVA
Tolerance, percent	7.5	%
4.3 Regulation at 100 percent, 55°C rise, ONAN load (percent)		
100 percent power factor	0.607	%
90 percent power factor	3.726	%
80 percent power factor		%
4.4 Exciting current (percent)		
95 percent voltage	0.221	%
100 percent voltage	0.409	%
105 percent voltage	0.558	%
110 percent voltage		%
4.5 Efficiency at ONAN rating and 75°C winding temperature (percent)		
100 percent load 55°C temperature rise rating	99.51	%
75 percent load	99.56	%
50 percent load	99.57	%
25 percent load	99.42	%

The following items marked with an * will be used for transformer bid evaluation. If not filled out, ENGINEER will reject the bid.

4.6 Guaranteed maximum losses at specified temperatures in kW.

No-load losses at 20°C (kW)

110 percent voltage	12.96 kW
105 percent voltage	* <u>10.8</u> kW
100 percent voltage	* <u>9</u> kW

4.7 Load Losses at specified temperature and taps in kW.

Load losses at 55°C rise over 20°C ambient, assuming sufficient voltage is applied to cause 100 percent of the rated current to flow in the windings with the other windings shorted.

80 percent of ONAN rating (@ 8.2 MVA)	* <u>17.60</u> kW
100 percent of ONAN rating (@ 8.2 MVA)	* <u>17.50</u> kW
100 percent of ONAN/ONAF/ONAF (@ 10.25 MVA)	* <u>42.97</u> kW

4.8 Cooling equipment demand (kW)

At no-load, if any	* <u>0</u> kW
At ONAN	* <u>0</u> kW
At ONAN/ONAF	* <u>1.2</u> kW

4.9 Total losses at 55°C rise (over 20°C ambient) in kW.

Load Loss @ 80% of ONAN Rating + No-Load Loss @ 100% Voltage = 26.6 kW

Load Loss @ 100% of ONAN Rating + No-Load Loss @ 100% Voltage = * 36.5 kW

Load Loss @ 100% of ONAN/ONAF + No-Load Loss @ 110% Voltage = 45.93 kW

4.10 Audible sound levels in dB.

At No Load AS PER NEMA TR 1_ dB

At ONAN/ONAF (with cooling) AS PER NEMA TR 1 dB

4.11 Induced voltage test.

One-hour test voltage level	AS PER ANSI kV
Enhanced test voltage level	AS PER ANSI kV
Maximum expected RIV level	AS PER ANSI μ V
Maximum expected partial discharge level	AS PER ANSI pC

4.12 Provide information and traceability concerning the testing equipment and methods used to determine the losses and the expected error.

5.0 NITROGEN GAS OIL PRESERVATION SYSTEM

Type DETAILS AFTER ORDER RECEIVED _____

Manufacturer VTC CHOICE Location of Nitrogen _____

Tank DETAILS AFTER ORDER RECEIVED _____

Height of Nitrogen Tank base above transformer base (inches) _____ in

6.0 ARRESTERS

High Voltage: Type SC, POLYMER _____

Manufacturer VTC CHOICE _____

_____ M C O V R A T I N G 4 2 K v

Low Voltage: Type SC, POLYMER _____

Manufacturer VTC CHOICE _____

_____ M C O V R A T I N G 5 . 1 K v

7.0 CONTACTS

For Technical Questions:

Name of Person to contact	DAVE CUMMINS
Telephone Number of that person	540-266-2311
Address	<u>220 Glade View Dr., NE, Roanoke, VA 24012</u>

For Sales Questions:

Name of Person to contact	DAVE CUMMINS
Telephone Number of that person	540-266-2311
Address	220 Glade View Dr., NE, Roanoke, VA 24012



The Commitment Company
ISO 9001

VIRGINIA TRANSFORMER CORP.

220 GLADE VIEW DRIVE • ROANOKE, VA 24012

PHONE 540-345-9892 • FAX 540-342-7694

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Standard Warranty Statement

Virginia Transformer provides a standard warranty, as described in our Standard Terms and Conditions of Sale, dated October, 2002. This warranty is for (twelve) 12 months from date of equipment installation or (eighteen) 18 months from date of shipment, whichever occurs first. VTC warrants to repair or replace (FOB factory) any equipment we manufacture due to defective material or workmanship when failure occurs under normal and proper use. Buyer shall make the equipment available to VTC to perform work at the job site without interference or duress. No guarantee, warranty or liability for damage exists other than stated herein. VTC's warranty on purchased components is limited to the warranty provided by the component manufacturer. VTC will not assume any liability of expense for repairs or modifications to equipment unless previously authorized in writing by VTC. VTC will not accept consequential damages under any circumstances.

Warranty Options

Virginia Transformer offers Extended Warranties on the coils and core for time periods beyond the 12/18 months in the Standard Warranty. VTC also offers In/Out coverage on the transformer. The following paragraphs describe both of these added warranties.

Extended Warranty (Optional)

Virginia Transformer Corporation offers extension(s) to the standard warranty. The extended warranty covers only the coils and core against failure that occurs with respect to normal operation of the transformer, and within the parameters for which the transformer was designed. Extended Warranty is valid only if a technical representative of Virginia Transformer Corp. performs, as a minimum, supervision of field assembly and testing of the Transformer. This coverage excludes bolted electrical and mechanical connections, which are to be periodically checked and retightened, as necessary, by the Owner as part of their normal maintenance programs. Available (extended) warranty periods are as follows (equipment installation/shipment):

24/30 months; 36/36 months; 48/48 months; 60/60 months

Extended warranty_____

In/Out Coverage (Optional)

In/Out coverage is a warranty enhancement available during the Standard Warranty and Extended Warranty period. For failures occurring within the stated warranty period, VTC will cover only the expenses to transport the transformer to a repair facility and return the transformer to customer's site. Buyer will make the transformer ready for shipment in the condition it was originally received from VTC (as per outline drawing), with clear and free access by our selected courier. Civil work, disconnect/reconnect, and crane cost are the responsibility of the buyer.

In/Out coverage_____

Exhibit "C"
Compensation Rate Schedule
AGR22-36

A. Contract Pricing.

<u>Description</u>	<u>Cost (\$US)</u>
Transformer 8200 / 10250 kVA 69 - 4.16 kV	\$394,888.00
Field Testing	\$11,600.00
Offloading	\$10,100.00
Freight	\$15,999.00
Not-to-Exceed ("NTE") Total	\$432,587.00

Travel, Lodging, and Meals for Onsite Contractor Services.** Costs for Field Services, including offloading, inspection, and testing, do include travel, transportation, lodging, and meals. Should any Contractor travel outside of the scope of Field Services be required; all Contractor costs for travel, lodging, and meals shall be provided to the County for reimbursement. All travel, lodging, and meal costs shall comply with the County's travel policy, as detailed below.

** Contractor's travel expenses shall be charged at actual cost. Copies of all travel expenses must accompany invoices submitted to County and shall only include the following:

1. The most economical means of transportation shall be used, commercial airlines coach fare rates;
2. Business-related tolls and parking fees;
3. Rental car, taxi service or shuttle services;
4. Mileage shall be reimbursed at the standard mileage rate for business miles driven as established from time to time by the Internal Revenue Service;
5. Hotel or motel lodging;
6. Meals, per Los Alamos County Travel Policy, currently \$60.00 per diem daily;
7. Internet connectivity charges;
8. Any other reasonable costs directly associated with conducting business with County.
9. If reimbursement for lodging or airfare is sought and no receipt is furnished by Contractor showing the actual cost, the travel expense shall be deemed unreasonable and un-reimbursable.

Travel Expenses not allowed are as follows:

1. Entertainment; in-room movies, games, etc. and
2. Alcoholic beverages, mini bar refreshments or tobacco products.

B. Payment Schedule. The parties hereby agree that the invoicing and payment for services rendered under this Agreement shall be made pursuant to the following scheduled events and milestones:

<u>Milestone</u>	<u>NTE Percentage Payment</u>
County Approval of Drawings	30%
Final Factory Acceptance Testing	10%

Delivery of Transformer and Offloaded in El Vado, NM	50%
Field Services (Final Inspection and Commissioning of Transformer)	10%

Payment Notes:

Payments shall be made upon the timely submission of a payment request by Contractor and acceptance of the above services as complete.