
Progressive Engineering Consultants, Inc.

**CONTRACT DOCUMENTS
FOR
115 kV - 24.94 / 14.4 kV SUBSTATION
& SWITCHING FACILITIES
FOR
DELIVERY #7 – ALEX COOPER PARK
1500 FIFTH ST., STATESVILLE, NC 28677**

**CITY OF STATESVILLE
STATESVILLE, NORTH CAROLINA**

DOCUMENTS PREPARED BY



October 21, 2026

A handwritten signature in black ink, appearing to read "Robert F. Thomas, Jr.", written in a cursive style.

P.O. Box 690638 Charlotte, North Carolina 28227-7011
Telephone (704) 545 - 7327
progress@pecinc.net

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ADVERTISEMENT FOR PROPOSALS

SECTION AP



ADVERTISEMENT FOR PROPOSAL

**The City of Statesville
P.O. Box 1111
Statesville, North Carolina 28677**

Sealed proposals for furnishing **115 kV - 24.94/14.4 kV Substation & Switching Facilities for Delivery #7 – Alex Cooper Park** as specified, shall be received by the City of Statesville, 1107 Winston Ave., Statesville, North Carolina 28677 on or before **2:30 p.m. local time Tuesday, November 24, 2026**, at which time and place the sealed proposals shall be publicly opened and read.

Proposals should be addressed to the City of Statesville at the above address to the attention of Mr. Cody Leis. Copies of the bidding documents, notifications, and/or instructions may be obtained by contacting Cody Leis at the above address, calling (704) 832-3831, or by visiting our website at:

<https://www.statesvillenc.net/bid-postings>

Contract documents may be examined at the following locations:

City of Statesville

Progressive Engineering Consultants, Inc.

Statesville, North Carolina

Charlotte, North Carolina

A certified check or cashiers' check payable to the City of Statesville or a satisfactory Bid Bond executed by a corporate surety licensed under the laws of North Carolina to execute such bonds in the amount equal to five percent (5%) of the total bid, shall be submitted with each bid in a separate sealed envelope. Bid proposals may not be withdrawn for ninety (90) days after the date of receipt.

The successful bidder shall be required to furnish a separate one hundred percent (100%) Performance Bond on the forms included as a part of the Contract Documents. The Performance Bond shall be in full force and effect for one (1) year from the date of final acceptance of the equipment by the City of Statesville, North Carolina. Contract and Performance Bond are not to be completed at the time of this proposal and are included in order to advise the Bidder as to form.

The bid deposit shall be retained by the City of Statesville if the successful bidder fails to execute the contract or fails to provide the required bonds as stated above, within ten (10) days after award of the contract.

Pursuant to General Statute 143-48 and Executive Order #150, the City of Statesville invites and encourages participation in this procurement process by businesses owned by minorities, women, disabled, disabled business enterprises, and non-profit work centers for the blind and severely disabled.

The City of Statesville reserves the right to reject any or all bid proposals and to accept any proposal which is deemed to be in the best interest of the City of Statesville, North Carolina.

**CITY OF STATESVILLE
STATESVILLE, NORTH CAROLINA**

By

Title

NOTICE AND INSTRUCTIONS TO BIDDERS

SECTION NIB

NOTICE AND INSTRUCTIONS TO BIDDERS

The City of Statesville, North Carolina (hereinafter called the “Purchaser”) will receive sealed proposals for furnishing **115 kV - 24.94/14.4 kV Substation & Switching Facilities for Delivery #7 - Alex Cooper Park** as specified. Proposals will be received, opened, and read at the time and location as follows:

Location: City of Statesville
1107 Winston Avenue
Statesville, NC 28677
Attn: Mr. Cody Leis

Time: 2:30 p.m., local time

Date: **Tuesday, November 24, 2026**

Proposals received after the date and time specified for the opening will be returned unopened.

INSTRUCTIONS

1. Proposals and supporting documentation shall be submitted in a sealed envelope addressed to the City of Statesville, North Carolina no later than **2:30 p.m. local time on Tuesday, November 24, 2026**, at which time and place they shall be publicly opened and read.

Mailing Address (USPS)

City of Statesville
PO Box 1111
Statesville, NC 28677
Attn: Mr. Cody Leis

Physical Address (FedEx, UPS)

City of Statesville
1107 Winston Avenue
Statesville, NC 28677
Attn: Mr. Cody Leis

2. The name and address of the Bidder as well as the date and hour of the opening of the Proposals must appear on the *outside of the* envelope in which the Proposal is submitted. Proposals shall also be marked "**SEALED PROPOSAL FOR THE PURCHASE OF 115 kV - 24.94/14.4 kV SUBSTATION & SWITCHING FACILITIES FOR DELIVERY #7 - ALEX COOPER PARK**".
3. Bidders will be required to comply with all applicable statutes, regulations, etc., as set forth by the State of North Carolina and those attached to and made a part of these bid documents.
4. Each proposal must be accompanied by a certified check on a bank that is a member of the FDIC, payable to the order of the Purchaser, or a Bidder's Bond acceptable to the Purchaser and running in favor of the Purchaser, in an amount equal to five percent (5%) of the maximum bid price. If a proposal is accepted, the Bidder agrees that by filing its proposal together with such check or Bidder's Bond in consideration of the Purchaser's receiving and considering such proposal, said proposal shall be firm and binding upon each such Bidder and such check or Bidder's Bond shall be held by the Purchaser for a period not to exceed ninety (90) days from the date set for the opening of the proposals.
5. The successful Bidder will be required to enter into a contract with the Purchaser and to furnish a one hundred percent (100%) Performance Bond, on the forms included as a part of these documents, in a penal sum equal to the contract price and with Surety satisfactory to the Purchaser's Attorney. Contract and Performance Bonds are not to be completed at the time of this proposal and are included in order to advise the Bidder as to form. The Performance Bond shall be in full force and effect for one (1) year after the date of final acceptance of the equipment by the Purchaser.

6. Any conditions, requirements or restrictions included as part of the Bidder's Proposal as set forth in these Notice and Instructions to Bidders may result in the Proposal being deemed non-responsive.
7. North Carolina sales tax is applicable to the purchase of this equipment. Each Bidder shall show, as a separate item, the amounts which will be payable by the successful Bidder as a result of taxes imposed by any taxing authority for the sale, purchase or use of these materials, supplies and equipment included in the taxable items furnished.
8. The Purchaser reserves the right to make a contract for the lump sum price to one Bidder or to award contracts to multiple Bidders by section. The Purchaser also reserves the right to award contracts to multiple vendors based on pricing and experience.
9. The Purchaser reserves the right to waive minor irregularities or minor errors in the Proposal which appear to have been made through inadvertence, provided such irregularities or errors so waived are corrected on the Proposal prior to its acceptance by the Purchaser. The Purchaser also reserves the right to reject any and all Proposals or to accept a bid other than the lowest submitted if such action is deemed to be in the best interest of the Purchaser.
10. The Proposal shall include transportation charges for all equipment to the substation site located in the City of Statesville, North Carolina.
11. The quantities shipped shall be the same as the quantities bid. Any items received in excess of the bid quantities shall not increase the bid price.
12. The proposal form shall be completed exactly as presented with all prices, terms and signatures as required. Any proposal which is not properly completed shall be deemed non-responsive and shall not be considered for contract award.
13. The City prefers to receive a firm, non-escalated bid. In the event a bid is quoted as "non-firm," the Engineer will adjust the quoted price by considering the proposed delivery date and any monetary impacts affecting the bidder's proposal. The adjusted evaluated bid price shall be used for bid comparison purposes. The methods utilized by the City or its agents in the evaluation of bids shall be solely at the discretion of the City.
14. Payment terms shall be Net 30 days following the successful completion of all specified tasks by the Bidder.
15. It is the policy of the Purchaser to provide minorities and women equal opportunity for participating in all aspects of the City's contracting and procurement programs, including but not limited to employment, construction projects, and lease agreements consistent with the laws of the State of North Carolina.
16. It is further the policy of the Purchaser to prohibit discrimination against any person or business in pursuit of these opportunities on the basis of race, color, national origin, religion, sex, age, handicap, or veteran status. It is the policy of the Purchaser to conduct its contracting and procurement programs so as to prevent such discrimination and to resolve any and all claims of such discrimination.

17. Questions regarding the specifications and/or requirements of the Request for Proposal or requests for documentation shall be directed to Progressive Engineering Consultants, Inc., PO Box 690638, Charlotte, NC 28227; by calling (704) 545-7327 or via email to progress@pecinc.net.

18. **Shipping**

The structure shall be shipped with columns and trusses completely assembled and marked for field erection. Individual material items shall be marked with item numbers corresponding to the item numbers shown as on the general arrangement drawings and material summary lists. All material and equipment shall be delivered in a maximum of three (3) shipments.

The successful Bidder shall furnish equipment F.O.B. to the City of Statesville, NC Utility Warehouse, located at 939 Winston Ave. for unloading by others or to the **City of Statesville, NC, Delivery No. 7 located at 1500 Fifth St., Statesville, North Carolina**. City will inform trucking company as to where each shipment will be delivered. Shipment shall be by truck, and the cost of delivery shall be included in the cost of the units. All equipment shall be delivered in an **open top** vehicle.

- Each shipment shall include a detailed packing list identifying all items by part number, including hardware. Deliveries will be accepted only between the hours of 8:30 a.m. to 2:30 p.m. Monday through Friday, excluding Holidays.
- All material shall be carefully loaded for protection during shipment. Small parts and fasteners shall be carefully boxed, crated, bagged, or otherwise containerized and protected for shipment. Larger parts and assemblies shall be handled, loaded, blocked, and secured in such a manner to prevent damage, including damage to the finish. Blocks and straps shall be rust proof and properly padded to minimize abrasion. The supplier shall be responsible for all remedies for damage caused to materials during shipment.

All material shall be arranged to allow safe unloading at the site.

- The manufacturer shall notify the City no less than seventy-two (72) hours prior to the delivery of any materials. Any claims for delays made as a result of the manufacturer or driver's failure to make such notification shall be the responsibility of the supplier.
- Freight that is obviously damaged on arrival will be refused. Any necessary action regarding replacement of materials or equipment delivered in unacceptable condition shall be the responsibility of the supplier, including concealed freight damage. The supplier shall be fully responsible for all action necessary for replacement or repair of such damage in a timely manner.

**CITY OF STATESVILLE
STATESVILLE, NORTH CAROLINA**

(Purchaser)

PROGRESSIVE ENGINEERING CONSULTANTS, INC.

(Engineer)

Date: October 21, 2026

BIDDERS PROPOSAL

SECTION BP

BIDDERS PROPOSAL

**To: City of Statesville
 Statesville, North Carolina**

Gentlemen:

The undersigned has carefully examined the attached Notice and Instructions, Contract, Bond, and Specifications and hereby declares that he will furnish the material, equipment, and services as specified for the following price:

<u>Section 1</u>	<u>Extended Price</u>
115 kV Deadend Structure, High Side Bus and Switches as specified	\$ _____
<u>Section 2</u>	
25 kV Switching Station as specified	\$ _____
Spare Switches	\$ _____
TOTAL PROPOSAL \$ _____	

	<u>MANUFACTURER</u>	<u>DELIVERY</u>
Steel:	_____	_____
115 kV Switches:	_____	_____
25 kV Switches:	_____	_____

APPLICABLE PRICE TERMS:**EXCEPTIONS:**

_____			_____	
Bidder			By	
_____			_____	
Address			Print Name	
_____			_____	
City	State	Zip	Title	
_____			_____	
Telephone			Email	
_____			_____	
Date				

COMPLIANCE STATEMENT

The Bidder shall attach a Statement of Compliance including a list of any and all exceptions referenced by paragraph to the Specifications. If no exception is taken to a paragraph, it shall be deemed that the Bidder meets or exceeds the requirements as stated therein.

CONTRACT

SECTION C

**CONTRACT FOR
115 kV – 24.94/14.4 kV SUBSTATION & SWITCHING FACILITIES
FOR DELIVERY #7 – ALEX COOPER PARK**

THIS AGREEMENT made and contracted this _____ day of _____, 20____
between the City of Statesville, North Carolina (hereinafter called the Purchaser), party of the first
part, and _____
_____ hereinafter called the Materialman, party of the second part.

ITEM 1. WITNESSETH: That for and in consideration of the payments and agreements
to be made and performed by the Purchaser, under penalty expressed in the bond bearing even date
with these presents, and hereunto annexed, the Materialman at its own proper cost and expense,
with skill and diligence, will furnish 115 kV Deadend Structure, High Side Bus and Switches, 25
kV Switching Station and Spare Switches as specified for the total sum of _____
_____ US Dollars (\$) _____) exclusive of state and local taxes, and furnish same in
accordance with the Notice and Instructions to Bidders, Bidder's Proposal and Specifications
attached in full compliance with the agreement.

ITEM 2. And the said Materialman agrees to accept the price stated under Item 1 above
in full compensation for the performance of this contract.

ITEM 3. This contract together with the aforementioned documents constitutes the entire
agreement between the Purchaser and the Materialman.

ITEM 4. On completion of this contract by the Materialman and acceptance by the
Purchaser as being in accordance with all portions of this contract, the Purchaser shall pay the
above-named contract price as follows: _____

ITEM 5. The Materialman shall be responsible for all fees or claims for any patented
invention used by him and shall defend any suit or proceeding for infringement of any patent or
patents covering materials purchased hereunder which may be brought against the Purchaser and
shall hold said Purchaser harmless for use or infringement of any patented thing or method used
in connection with any article, equipment, device or thing furnished or constructed hereunder.

IN WITNESS, WHEREOF, the parties hereto have caused this contract to be signed and sealed, all as of the date and year first written:

Executed in three (3) counterparts.

ATTEST:

Signature

Print Name

Title

(Materialman)

Signature

Print Name

Title

**AFFIX
SEAL**

**CITY OF STATESVILLE
STATESVILLE, NORTH CAROLINA**

(Owner)

ATTEST:

Signature

Print Name

Title

Signature

Print Name

Title

**AFFIX
SEAL**

BOND

SECTION B

BOND

KNOW ALL MEN that we, _____ of _____,
County of _____, State of _____, hereinafter called the Principal, and
_____,
hereinafter called the Surety or Sureties, are held and firmly bound to the City of Statesville, North
Carolina, hereinafter called the Purchaser, in the sum of _____
_____ **US Dollars (\$** _____ **)** *exclusive of state and*
local taxes, for payment whereof the Principal and the Surety or Sureties bind themselves, their
heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these
presents.

WHEREAS, the Principal has, by means of a written Agreement, dated the _____ **day**
of _____, **20**_____ entered into a contract or agreement with the Purchaser
to furnish **115 kV Deadend Structure, High Side Bus and Switches, 25 kV Switching Station**
and Spare Switches as specified a copy of which Agreement is hereto attached and made a part
hereof:

NOW THEREFORE, the condition of this obligation is such, that if the Principal shall
faithfully perform the said Contract on his, its, or their part and satisfy all claims and demands
incurred for the same, shall fully indemnify and save harmless the Purchaser from all cost and
damage which the Purchaser may suffer by reason of failure to do so, and shall fully reimburse
and repay the Purchaser all outlay and expense which the Purchaser may incur in making good
any such default, and shall pay all persons who have contracts with the Principal, or any sub-
contractor of the said Principal for labor or material, or both, then this obligation shall be null and
void, otherwise, it shall remain in full force and effect.

And said Surety, for value received, hereby stipulates and agrees that no change, extension
of time, alteration or addition to the terms of the contract or to the work to be performed thereunder
or the specifications accompanying the same shall in any wise affect its obligations on this bond,
and it does hereby waive notice of any such change, extension of time, alteration or addition to the
terms of the contract of to the work or to the specifications.

IN TESTIMONY WHEREOF witness the hands and seals of the parties hereto on this _____ day of _____, 20____.

Executed in three counterparts.

ATTEST:

_____	_____
Signature	(Materialman)
_____	_____
Print Name	Signature
_____	_____
Title	Print Name
_____	_____
	Title

**AFFIX
SEAL**

ATTEST:

_____	_____
(Witness as to Surety)	(Surety Company)
_____	_____
	Signature
Countersigned:	_____
	Print Name
_____	_____
(Licensed Resident Agent)	Title

**AFFIX
SEAL**

INSTRUCTIONS

Bonds must be executed by a Surety Company authorized to conduct business in the State of incorporation of the Owner, acknowledged before a Notary Public, and accompanied by Power of Attorney or other authority satisfactory to the Owner.

SPECIFICATIONS

SECTION S

SPECIFICATIONS FOR
115 kV - 24.94/14.4 kV SUBSTATION & SWITCHING FACILITIES

SECTION 1 : 115 kV DEADEND STRUCTURE, HIGH SIDE BUS, AND SWITCHES

1.1 RATING

These specifications cover one (1) outdoor, lattice structure, deadend bypass structure for use on a system rated 115 kV nominals, 121 kV maximum, 550 kV BIL, designed for one incoming 3 wire circuit, support of the 115-kV bus, overhead shield wires, and additional equipment as specified.

1.2 ARRANGEMENT

The arrangement of the 115 kV deadend structure shall be as shown on the drawings included in the attached Appendix and shall consist of equipment as specified herein.

1.3 STANDARDS

The latest revision of the ANSI, IEEE, and NEMA standards shall apply to all equipment supplied as a part of these specifications. The Purchaser reserves the right to reject any and all equipment, material or design that, in the opinion of the Engineer, fails to meet the requirements of these specifications.

1.4 FEATURES

These specifications cover one (1) - 115 kV deadend bypass structure, complete, including the necessary structure, bus supports, bus work, connectors, insulators, three-phase gang operated switches, incoming line dead-ending equipment, terminals, anchor bolts, grounding equipment and lightning arresters. The specifications do not include foundations, installation, fencing, conduit, station lighting or control wiring.

1.5 DRAWINGS AND INSTRUCTIONS

Subsequent to notification of award of contract, the successful Bidder shall, within four weeks, furnish for approval two (2) sets of Drawings and Instructions covering the physical size, weight, dimensions, arrangement, electrical characteristics, wiring diagram and other pertinent data for structure, lightning arresters, switches, and all other equipment furnished as a part of these specifications. Drawings for approval shall include an itemized material list with catalog numbers, overall wiring diagrams, anchor bolt plan, steel erection drawings, and general arrangement drawings. Steel erection drawings shall show member sizes and connections. All material item numbers shall be shown on the arrangement drawings. The Supplier shall also furnish four (4) prints of the final approved issue of each drawing, along with four (4) sets of written instructions and renewal parts lists, suitably illustrated, covering the operation and maintenance of the equipment applying specifically to this installation. The supplier shall also furnish digital copies of all drawings for use in AutoCAD. The Bidder shall also furnish all drawings in printed format and in digital format for use in AutoCAD^(R) and for use in Adobe Acrobat (.pdf) on CD and thumb drive. The Bidder shall also supply four (4) sets of printed instructions and renewal parts lists suitably illustrated, covering the operation and maintenance of the equipment furnished. All drawings, documentation, information, test reports, operating and maintenance instructions and other correspondence and like items shall be in the English language printed and on a CD and/or thumb drive.

1.6 STRUCTURAL DESIGN

The 115 kV deadend structure shall be constructed of lattice type columns and trusses, bracing as required, and shall be designed as a completely self-supporting (non-guyed) structure. The arrangement of the A-frame structure shall be as shown in the plans as part of the Appendix.

Structural steel shall conform to the latest revision of ASTM Specification A-36. Bolts shall conform to the latest revision of ASTM Specification A-394. All structural steel shall be hot dipped galvanized after fabrication in accordance with the latest revision of ASTM Specification A-123-59. The structure shall be designed to withstand a maximum tension of 2000 pounds per incoming 115 kV conductor for conductor attachment, and 1500 pounds maximum tension for each incoming overhead shield wire. Structure and internal busses shall be designed to withstand the mechanical forces associated with symmetrical short circuit currents of 20,000 amperes at 115 kV.

Complete design calculations and base reactions for the entire deadend structure shall be submitted with the drawings for approval. No fabrication of steel shall be undertaken until shop drawings have been approved. All final drawings and design calculations shall bear the seal of a registered professional engineer licensed to practice in the State of Incorporation of the Purchaser.

1.7 BUS AND CONNECTIONS

All internal bus material shall be either UABC or a minimum of 3" IPS Aluminum as required to meet the minimum ampacity and strength requirements. Flat bus bar shall not be used.

The current carrying capacity of the 115-kV rigid bus and connections shall be 600 amperes minimum.

Fixed or slip type connections shall be used to support bus as required for stress relief on the bus system components.

Bell end caps shall be furnished for all exposed 115 kV tubular bus ends.

The supplier shall also furnish the necessary 336.4 ACSR damper wire for insertion into the 115-kV main bus.

The necessary 556.4 MCM (OSPNEY) bare aluminum conductor and connectors for the 115 kV jumpers shall be furnished for all equipment. The supplier shall include wire and connections for lightning arresters mounted on the high and low sides of the transformers.

The supplier shall include a cut schedule for all bus to be furnished as a part of these specifications. All connections shall be of the bolted or compression type. Welded type connections are not acceptable. If compression type bus connections are furnished, the Bidder shall furnish the necessary tools and factory personnel for installation assistance.

The incoming 115 kV strain type phase conductor and overhead shield wire deadend assemblies and insulators shall be furnished by the substation manufacturer. The structure shall include the necessary fittings for attachment of the deadend assemblies to the structure. The incoming circuit will be constructed of 556.5 ACSR (OSPNEY) conductor and 3/8" EHSS overhead shield wire.

The supplier shall furnish the proper type of electrical joint compound for all electrical connections made within the requirements of these Specifications.

1.8 CLEARANCES

The following clearances shall be provided:

1. A minimum attachment height of 38 feet and 30 feet above ground line for the overhead shield wires and the incoming 115 kV phase conductors, respectively.
2. A minimum attachment height of 14 feet above ground line for the 115 kV tubular bus.
3. A minimum height of 14 feet above ground line for any exposed part which is energized at 115 kV.
4. Minimum phase spacing at point of attachment of 10 feet for 115 kV conductors.

1.9 GROUNDING

Material shall be furnished for a suitable grounding system. Steel columns, bus supports, trusses, overhead shield wires, lightning arresters, switches, switch handles, ground plates, the steel interconnecting members of the precast concrete walls, including gates and any other necessary equipment shall be grounded. Every below grade grounding connector shall be of the thermoweld type and shall have the same current carrying capability as the grounding conductor. All intersections of ground conductors shall be bonded with thermoweld type connectors. All above ground connections shall be of copper compression type.

The structure shall be shielded by overhead static peaks and bayonets on each column. Each static bayonet, peak, and overhead shield wire shall be bonded to the 4/0 ground grid by a 4/0 copper conductor. Clamp type connectors shall be provided at each column base and along each column and truss at approximately four-foot intervals. The connectors shall be of a size that will accept the No. 4/0 stranded copper ground conductor.

A completely buried 4/0 stranded copper grounding loop shall be located not less than six (6) feet outside the column center lines. The ground loop shall also include 3/4" x 10'0" ground rods at a maximum spacing of ten (10) feet apart. Each column and item of equipment shall be connected to the ground loop by means of a 4/0 stranded copper conductor.

A second 4/0 copper ground loop shall be furnished with connectors. Adequate 4/0 copper conductor with clamp type supports and compression type connectors shall be furnished to allow a complete upper grounding loop to be installed around the inside top of the structure along the channel flanges for equipment connection. The upper ground loop shall also be connected to the ground grid by means of compression type copper connectors via the 4/0 risers on each column. All equipment and neutral conductors and shield wires shall be bonded to both ground grids.

A ground plate shall be supplied for each group operated switch location. The 4/0 ground loop shall be connected to the ground plate by a 4/0 copper conductor at two (2) locations. Each plate shall be located at the base of the column beneath the switch operating handle. The group operated switch handle shall also be bonded to the 4/0 copper ground grid.

1.10 INSULATORS

All bus support insulators shall be porcelain, grey, station post type, including insulators furnished as part of the air break switches.

1.11 115 kV INCOMING GROUP OPERATED SWITCH

Three (3), three-phase, group operated, air break switches rated 115 kV nominal, 121 kV maximum, 550 kV BIL, 600 amperes continuous, 40,000 amperes momentary, shall be furnished. Switch shall be group operated, vertical air break, triple pole, single throw, manually operated, rotating insulator, three insulators, horizontal mounting. The manual operating mechanism, including pipe and pipe guides, shall be of the rotating type, with position indicator and provision for padlocking either in the open or closed position.

Terminal pads shall be furnished and shall be suitable for either copper or aluminum terminal connectors. All steel furnished as a part of the switches shall be hot dipped galvanized and have welded mounting flanges for mounting to the steel structure. Connectors for both the hinge and jaw ends shall be furnished.

The switch shall be designed and tested in accordance with the latest applicable ANSI, NEMA, and ASME standards.

1.12 115 kV MOTOR OPERATED TRANSFORMER DISCONNECT SWITCHES

Two (2), motor operated, three phase, vertical break switches rated 115 kV nominal, 121 kV maximum, 550 kV BIL, 600 amperes continuous, 40,000 amperes momentary shall be furnished. The switches shall be group operated, vertical air break, triple pole, single throw, rotating insulator, horizontal mounting. The switch operator, including pipe and pipe guides, shall be of rotating type, with position indicator and provision for padlocking in either the open or closed position. Switches shall be furnished with arcing horns or equivalent to allow unloaded, energized operation of the power transformer.

The motor operated switches shall be designed and tested in accordance with the latest applicable ANSI, NEMA, and ASME standards.

Switch height shall be such that a 600-ampere rigid bus connection shall be at the same height as the jaw end of the switch. The rigid bus shall be connected to the jaw end of the switch with 556.5 MCM bare aluminum conductor.

The hinge end of the switch shall be connected to the circuit breaker with 556.5 MCM bare aluminum conductor. All tubular bus, conductor, and connectors shall be furnished. Connectors for the 115 kV circuit breakers shall be furnished and shall be aluminum compression type to NEMA four-hole spade. Transformer high side bushing terminals shall be NEMA four-hole spade, furnished by others.

As a minimum, the motor operator shall include the following detailed features:

1. Stainless steel weatherproof and dustproof enclosure
2. Padlockable hinged access door
3. Remote/Local selector switch
4. Local close-off-open push button or pistol grip switch
5. 48 Volt DC motor
6. Permanently lubricated gears
7. Chain drive from motor to gear box
8. Dynamic braking
9. Detachable hand crank for manual operation

10. Motor electrically disconnected during hand cranking
11. Additional terminal block points for customer use
12. 5 N.O., 5 N.C. internal auxiliary switch contacts for customer use
13. Removable conduit plate
14. 2" IPS galvanized vertical operating pipe
15. Tin-plated 4/0 ground strap
16. Bolted pipe to motor connection
17. Uncoupling pin at pipe-to-motor connection with provision for padlocking in either position
18. 48 Volt DC operating voltages
19. 240 Vac cabinet heater with thermostat and heater control breaker
20. Drawings and instruction book holder
21. Ice breaking handle
22. Key interlocks as recommended by manufacturer
23. Viewing access for status indicators and counter
24. Nameplate

The mechanism compartment shall be wired and tested for proper operation.

The following functions shall be wired to a terminal board that is independent of any terminal board which might be used for switch control and status wiring. The separate terminal board shall be mounted in the control compartment of the unit for customer interconnection.

Loss of DC: Connected to provide two (2) dry form "c" contact outputs for loss of control DC supply.

Loss of AC: Connected to provide two (2) form "c" dry contact outputs to indicate loss of AC supply.

Remote Close: Wired for momentary customer contact input which shall close the device.

Remote Open: Wired for latched or momentary customer contact input which shall open the device. The internal open circuit shall be connected such that an open limit switch shall de-energize the circuit once the switch is open.

Device Position: Connected to provide two (2) standard form "c" dry contact outputs to indicate device position. This function shall be provided by spare auxiliary switch contacts.

Local/Remote Switch Position: Connected to provide two (2) form "c" dry contact outputs to indicate position of local/remote selector switch.

Block Close: Electrical interlock to block opening/closing of the switch depending on position of the downstream circuit breaker.

Any and all accessories required for the functions specified herein shall be included as a part of the proposal. Proper operation of the unit shall not require customer connection to any of the remote features.

1.13 LIGHTNING ARRESTERS

Three (3) lightning arresters, station type, gapless, metal oxide varistor, with gray porcelain housing, with a duty cycle rating of 110 kV and maximum continuous operating voltage suitable for use on a 108 kV three wire system on which the terminal voltage may vary ± 10 percent shall be furnished.

Lightning arresters shall be mounted on the high side dead end structure and connected on the load side of the main disconnect switch.

1.14 115 kV SWITCHES

All switches must include adjustable stops which will not allow the handle to rotate beyond the open or closed position.

SPECIFICATIONS FOR
115 kV - 24.94/14.4 kV SUBSTATION & SWITCHING FACILITIES

SECTION 2 : 25 kV SWITCHING STATION AND EQUIPMENT

2.1 RATING

These specifications cover one (1) outdoor switching station rated 25 kV nominal, designed for two (2) incoming circuits and six (6) outgoing overhead circuits. Each circuit shall consist of the necessary insulators, disconnect switches, and bypass equipment as specified.

2.2 ARRANGEMENT

The arrangement of the switching station shall be as shown on the drawings included in the attached Appendix A and shall consist of equipment as specified herein.

2.3 STANDARDS

The latest revision of the ANSI, IEEE, and NEMA standards shall apply to all equipment supplied as a part of these specifications. The Purchaser reserves the right to reject any and all equipment, material, or design that, in the opinion of the Engineer, fails to meet the requirements of these specifications.

2.4 FEATURES

These specifications cover one (1) 25 kV switching station, complete, including the necessary structure, buswork, connectors, insulators, switches, fuses, line deadending terminals, anchor bolts, grounding equipment, lightning arresters, control power transformers, instrument transformers, AC and DC control power panels, automatic transfer switch, DC batteries, and charger. The specifications do not include foundations, installation, fencing, conduit, station lighting, or control wiring.

2.5 DRAWINGS AND INSTRUCTIONS

Subsequent to notification of award of contract, the successful Bidder shall, within four weeks, furnish for approval two (2) sets of Drawings and Instructions covering the physical size, weight, dimensions, arrangement, electrical characteristics, wiring diagram and other pertinent data for structure, control power transformers, lightning arresters, switches, fuses, AC and DC panels, automatic transfer switch, DC batteries and charger, and all other equipment furnished as a part of these specifications. Drawings for approval shall include itemized material list with catalog numbers, overall wiring diagrams, anchor bolt plan, steel erection drawings, and general arrangement drawings. Steel erection drawings shall show member sizes and connections. All material item numbers shall be shown on the arrangement drawings. The Supplier shall also furnish four (4) prints of the finally approved issue of each drawing, along with four (4) sets of written instructions and renewal parts lists, suitably illustrated, covering the operation and maintenance of the equipment applying specifically to this installation. The supplier shall also furnish digital copies of all drawings for use in AutoCAD. The Bidder shall also furnish all drawings in printed format and in digital format for use in AutoCAD^(R) and for use in Adobe Acrobat (.pdf) on CD and thumb drive. The Bidder shall also supply four (4) sets of printed, written instructions and renewal parts lists suitably illustrated, covering the operation and maintenance of the equipment furnished. All drawings, documentation, information, test reports, operating and maintenance instructions and other correspondence and like items shall be in the English language printed and on CD and thumb drive.

2.6 STRUCTURAL DESIGN

The switching station structure shall be constructed of steel lattice columns and trusses with angular bracing as required. Structural steel shall conform to the latest revision of ASTM Specification A-36. Bolts shall conform to the latest revision of ASTM Specification A-394. All structural steel shall be hot dipped galvanized after fabrication in accordance with the latest revision of ASTM Specification A-123-59.

The structure shall be designed to withstand a maximum tension of 2000 pounds per conductor for external conductor attachment. Structure and internal busses shall be designed to withstand the mechanical forces associated with symmetrical short circuit currents of 25,000 amperes at 25 kV.

Complete design calculations and base reactions for the entire switching station shall be submitted with the drawings for approval. No fabrication of steel shall be undertaken until shop drawings have been approved. All final drawings and design calculations shall bear the seal of a registered professional engineer licensed to practice in the State of Incorporation of the Purchaser.

2.7 BUS AND CONNECTIONS

All internal bus material shall be either UABC or a minimum of 3" IPS Aluminum as required to meet the minimum ampacity and strength requirements. Flat bus bar shall not be used.

The current carrying capacity of the main bus and connections shall be 1600 amperes minimum.

The current carrying capacity of the transfer bus and connections shall be 1200 amperes minimum.

The current carrying capacity of the outgoing circuit taps and connections shall be 600 amperes minimum.

Fixed or slip type connections shall be used to support bus as required for stress relief on the bus system components.

Connectors between the disconnect switches and vacuum bus breakers shall be sized to accommodate two (2) 4/0 to 1000 MCM copper conductor. Bushing terminals for the vacuum bus breakers shall be NEMA 4-hole spade, furnished by others.

Connectors between the disconnect switches, vacuum circuit breakers and voltage regulators shall be sized to accommodate 4/0 to 500 MCM copper conductor. The necessary 350 MCM bare copper conductor for these connections shall be furnished. Bushing terminals for the vacuum circuit breakers and voltage regulators shall be clamp type, furnished by others.

The supplier shall include a cut schedule for all bus to be furnished as a part of these specifications. All connections shall be of the bolted type. Welded type connections are not acceptable.

The outgoing 25 kV strain type phase conductor and neutral deadend assemblies and insulators shall be furnished by others. The structure shall include the necessary eye bolts for attachment of the assemblies to the structure. The outgoing circuits will be constructed of 477 ACSR.

The supplier shall furnish the proper type of electrical joint compound for all electrical connections made within the requirements of these Specifications. The supplier shall also include one (1) spare compression type terminal for each size.

2.8 CLEARANCES

The following clearances shall be provided:

1. A minimum attachment height of 23 feet above ground line for the outgoing 25 kV phase conductors.
2. A minimum attachment height of 18 feet above ground line for the outgoing neutral conductors.
3. A minimum height of 10 feet above ground line for any exposed part which is energized at 25 kV.
4. A minimum structure clear space of 20 feet horizontally and 14 feet vertically for each 25-kV circuit.

2.9 GROUNDING

Material shall be furnished for a suitable grounding system. Steel columns, trusses, circuit breakers, voltage regulators, control power transformers, lightning arresters, instrument transformers, switches, switch handles, ground plates, the steel interconnecting members of the precast concrete walls, including gates and any other necessary equipment shall be grounded. Every below grade grounding connector shall be of the thermoweld type and shall have the same current carrying capability as the grounding conductor. All intersections of ground conductors shall be bonded with thermoweld type connectors. All above ground connections shall be of copper compression type.

The station shall be shielded by overhead static bayonets and peaks on each column. Each incoming overhead shield wire, static bayonet, and peak shall be bonded to the 4/0 ground grid by a 4/0 copper conductor. Clamp type connectors shall be provided at each column base and along each column and truss at approximately four-foot intervals. The connectors shall be of a size that will accept the No. 4/0 stranded copper ground conductor.

A completely buried 4/0 stranded copper grounding loop shall be located not less than six (6) feet outside the column center lines. The ground loop shall also include 3/4" x 10'0" ground rods at a maximum spacing of ten (10) feet apart. As a minimum, ground rods shall be installed as shown on the drawings included in the Appendix. Each column and item of equipment shall be connected to the ground loop by means of a 4/0 stranded copper conductor.

A second 4/0 copper ground loop shall be furnished with connectors. Adequate 4/0 copper conductor with clamp type supports and connectors shall be furnished to allow a complete upper grounding loop to be installed around the inside top of the structure along the channel flanges. The upper ground loop shall also be connected to the ground grid by means of compression type copper connectors via the 4/0 risers on each column. All equipment and neutral conductors shall be bonded to both ground grids.

An additional ground loop of 1/0 stranded copper shall be buried not less than four (4) feet outside the substation fence. All gate posts and corner posts shall be connected to both the 1/0 ground loop and the 4/0 ground loop with 1/0 stranded copper. Fence line posts shall be connected at intervals not to exceed 20 feet. The ground loop shall also include 3/4" x 10'0"

ground rods at a maximum spacing of twenty (20) feet apart. The switching station fenced perimeter will be as shown on the enclosed drawing. Material shall be included to ground at least two (2) double swing gates and one (1) single swing gate.

A ground plate shall be supplied for each group operated switch location. The 4/0 ground loop shall be connected to the ground plate by a 4/0 copper conductor at two (2) locations. The plate shall be located at the base of the column beneath the switch operating handle. Each group operated switch handle shall also be bonded to the 4/0 copper ground grid.

2.10 INSULATORS

All bus support insulators shall be porcelain, grey, station post type, including insulators furnished as part of the air break switches and disconnect switches.

2.11 LIGHTNING MAST

One (1) galvanized steel lightning mast shall be furnished and shall be designed for direct burial. The lightning mast shall be eighty (80) feet in length and shall be embedded to a length of ten (10) feet. The lightning mast shall include provisions for attachment of two (2) NEMA type two-hole spade grounding pads. The lightning mast shall be supplied with below grade coating treatment which shall extend from the ground line of the pole to a point 18 inches above and below ground line. The below grade treatment shall be minimum of a 16 mil DFT coating of two component hydrocarbons extended polyurethane.

Lightning mast shall be designed to withstand the forces associated with a 110 MPH wind loading.

2.12 25 kV INCOMING BUS BREAKER DISCONNECT SWITCHES

Twelve (12), bus breaker disconnects switches, single phase, rated 25 kV, 150 kV BIL, 2000 amperes continuous, 100,000 amperes momentary, shall be furnished. Switches shall be hookstick operated, with ninety-degree blade stops. All steel furnished as a part of the switch shall be hot dipped galvanized and have welded mounting flanges for mounting to the steel structure. Connectors shall be furnished for both hinge and jaw ends and shall be suitable for either copper or aluminum.

2.13 25 kV BUS BREAKER BYPASS GROUP OPERATED SWITCHES

Two (2), three phase group operated vertical break disconnect switches rated 25 kV, 150 kV BIL, 2000 amperes continuous, 100,000 amperes momentary, shall be furnished. Switches shall be group operated, air break, triple pole, single throw, manually operated, rotating insulator, three insulators, vertical break. The manual operating mechanism, including pipe and pipe guides, shall be of the rotating type, with position indicator and provision for padlocking either in the open or closed position.

Terminal pads shall be furnished and shall be suitable for either copper or aluminum terminal connectors. All steel furnished as a part of the switch shall be hot dipped galvanized and have welded mounting flanges for mounting to the steel structure. Connectors for both the hinge and jaw ends shall be furnished.

2.14 25 kV INCOMING GROUP OPERATED BYPASS METERING SWITCHES

Two (2), three phase group operated vertical break disconnect switches rated 25 kV, 150 kV BIL, 2000 amperes continuous, 100,000 amperes momentary, shall be furnished. Switch shall be group operated, air break, triple pole, single throw, manually operated, rotating insulator, three insulators, vertical break. The manual operating mechanism, including pipe and pipe guides, shall be of the rotating type, with position indicator and provision for padlocking either in the open or closed position.

Terminal pads shall be furnished and shall be suitable for either copper or aluminum terminal connectors. All steel furnished as a part of the switch shall be hot dipped galvanized and have welded mounting flanges for mounting to the steel structure. Connectors for both the hinge and jaw ends shall be furnished.

2.15 25 kV INCOMING METERING DISCONNECT SWITCHES

Twelve (12), metering disconnect switches, single phase, rated 2000 amperes continuous, 25 kV, 150 kV BIL, 100,000 amperes momentary, shall be furnished. Switches shall be hookstick operated, with ninety-degree blade stops. All steel furnished as a part of the switch shall be hot-dipped galvanized and have welded mounting flanges for mounting to the steel structure. Connectors shall be furnished for both hinge and jaw ends and shall be suitable for either copper or aluminum.

2.16 25 kV MAIN BUS TIE SWITCHES

Three (3), three-phase, group operated, vertical break disconnect switches rated 25 kV, 150 kV BIL, 2000 amperes continuous, 100,000 amperes momentary shall be furnished for main bus tie switches as shown on the single line diagram. Switches shall be group operated, air break, triple pole, single throw, manually operated, rotating insulator, three insulators, vertical or side break. The manual operating mechanism, including pipe and pipe guides, shall be of the rotating type, with position indicator and provision for padlocking in either the open or closed position. All steel furnished as a part of the switch shall be hot dipped galvanized and have welded mounting flanges for mounting to the steel structure. Connectors for both the hinge and jaw ends shall be furnished.

2.17 25 kV CIRCUIT DISCONNECT SWITCHES

Thirty-six (36), circuit breaker and voltage regulator disconnect switches, single phase, rated 25 kV, 150 kV BIL, 600 amperes continuous, 40,000 amperes momentary, shall be furnished. Switches shall be hookstick operated, with ninety-degree blade stops. All steel furnished as a part of the switch shall be hot dipped galvanized and have welded mounting flanges for mounting to the steel structure. Connectors shall be furnished for both the hinge and jaw ends and shall be suitable for either copper or aluminum conductor.

2.18 25 kV TRANSFER BUS SWITCHES

Six (6), three-phase, group operated, air break switches rated 25 kV, 150 kV BIL, 600 amperes continuous, 40,000 amperes momentary, shall be furnished. Switches shall be three-pole, group operated, three insulator, single throw, manually operated, rotating insulator, vertical break. The manual operating mechanism, including pipe and pipe guides, shall be of the rotating type with provision for padlocking either in the open or closed position. All steel furnished as a part of the switch shall be hot dipped galvanized and have welded mounting flanges for mounting to the steel structure. Connectors for both the hinge and jaw ends shall be furnished. Switch operating handle shall be mounted on the inside column face of the associated circuit.

2.19 25 kV LIGHTNING ARRESTERS

Eighteen (18), distribution type, metal oxide, surge arresters, direct connected, rated for use on a 24.9/14.4 kV multi-grounded system shall be furnished for the outgoing circuits. The Bidder is advised that the terminal voltage may reach 15.1 kV. Standard line and ground terminals shall be furnished along with mounting hardware to mount the arresters to the steel structure and provide a minimum of fifteen (15) inches of clearance from the structure. Provisions shall be made for removal of the lightning arresters from service by means of hot line clamps and stirrups. All mounting hardware, conductor, and necessary connectors shall be furnished for all outgoing circuits.

2.20 STATION SERVICE PANELS

Two (2) indoor circuit breaker load centers shall be furnished in a NEMA 3R enclosure for control and protection of the station service power. The load centers shall be rated single-phase, three-wire, 120/240 volts AC, 200 amperes continuous, 10,000 amperes symmetrical short circuit rating. The load centers shall be furnished with a main breaker and a minimum of thirty-six (36), single-pole breaker positions. Twelve (12), two-pole breakers rated 30 amperes and six (6), single-pole breakers rated 20 amperes shall be furnished for each load center. Each center shall be provided with sufficient knockouts to connect the incoming and outgoing conduits. The outgoing conduits shall be 2-inch PVC.

2.21 AUTOMATIC TRANSFER SWITCH

One (1) transfer switch suitable for switching between station service panels shall be included.

The transfer switch shall be double pole, double throw, break before make, with an enclosure suitable for indoor mounting.

The open transition transfer switch shall be furnished with a lockable enclosure and shall be rated 120/240 volt, 200 amperes.

Transfer switch shall meet or exceed the requirements of UL 1008 and shall bear a UL label indicating same.

Transfer switch shall be designed for transfer in either direction in a maximum of six (6) cycles. Failure of the normal utility source output shall cause transfer to alternate utility source.

The transfer switch shall incorporate a mechanically held, solenoid operated mechanism. Inspection of all contacts shall be possible from the front of the switch without disassembly or disconnection of the conductors. All units shall be listed in accordance with UL1008 and labeled in accordance with the 1½ cycle, 3 cycle, and long-time ratings.

The transfer switch shall at a minimum include the following accessories:

- Time delay adjustable from 1 to 60 seconds on transfer.
- Time delay adjustable from 2 to 25 minutes on retransfer.
- Test switch for automatic load transfer testing.
- One auxiliary contact indicating position of switch (closed in emergency position).
- Transfer inhibit for utility source output less than 95% of rated voltage or frequency.

- Red and green pilot lights indicating switch position.
- Three (3) N/O and three (3) N/C spare contacts shall be provided for customer use.

Connectors shall be supplied to accommodate aluminum or copper conductors. Load terminals shall accommodate two (2) 2/0 copper conductors per phase.

2.22 FUSING

Eight (8), single phase, 100 ampere, open type, distribution fuse cutouts with fuse links shall be furnished along with eight (8), cartridge type, for protection of the potential transformers and the station service transformers. Fuse links and CLF's shall be of a speed and voltage rating adequate to protect the particular transformer to which it is connected. Fuse links for the station service transformer shall be rated 2 amperes and fuse links for the potential transformers shall be rated 0.5 amperes. Two spare 2 ampere fuse links, three spare 0.5 ampere fuse links and four spare CLF's shall be furnished.

All necessary conductor and connectors shall be furnished.

2.23 BATTERIES AND BATTERY CHARGER

The batteries shall be lead calcium designed to supply 48 volts DC at a capacity not less than 150 ampere hours at 77 degrees F with final discharge to 1.75 volts per cell. The batteries shall be suitable for indoor, non-vented float charging in standby service. All racks, inter-rack, and intercell connectors shall be furnished.

The battery charger shall be of the float/equalize type and suitable for an input voltage of 240 volts, + 10 percent, 60 hertz, single phase, 10 amps and capable of charging and maintaining a full charge on the 48-volt lead calcium batteries. Two magnetic breakers shall be provided to switch and protect the AC input voltage and the DC output of the charger. The unit shall be provided with adjustable float and equalize charging rate, automatic and manual equalizing with timer, and shall be complete with DC output Ammeter and Voltmeter, AC power failure alarm contacts for external customer connection, and DC ground detection alarm. The unit shall be furnished with a minimum of one uniquely addressable Ethernet port capable of communication with DNP 3.0 protocol to furnish the following specified functions:

1. DC Volts
2. DC Amps
3. Loss of AC alarm
4. DC Ground Detection

2.24 DC POWER PANEL

One (1), DC power panel shall be furnished. The DC power panel shall be mounted in an indoor enclosure suitable for wall mounting and shall provide control and protection for the control power circuits to two (2) power transformers, two (2) relay panels, one (1) SCADA Server rack, eight (8) vacuum circuit breakers, two (2) SF6 circuit breakers, and two (2) motor operated switches. The panel shall be rated 125 volts DC minimum, and shall, as a minimum, be provided with 100 ampere main lugs, and twenty (20) 30 ampere, double pole, bolt-in, branch circuit breakers for the necessary tripping circuits. The power panel shall be furnished with a minimum of 40 poles.

The DC power panel shall be provided with sufficient knockouts to connect the incoming and outgoing conduits. The outgoing conduits shall be 2-inch PVC.

2.25 METERING TRANSFORMERS

2.25.1 POTENTIAL TRANSFORMERS

Six (6), potential transformers shall be supplied by others. Potential transformers are rated 25 kV, 150 kV BIL, 14,400 volts primary and 120 volts secondary with a ratio of 120:1 and a thermal rating of 1500 VA. Transformers shall be outdoor type encapsulated in an insulating compound with two fully insulated high-voltage line terminals. Transformer shall have an ANSI accuracy classification of 0.3 with burdens, W, X, M and Y at rated primary voltage.

Primary terminals shall be clamp-type copper or cast bronze and shall accommodate a #6 to 4/0 copper conductor.

Secondary terminals shall be screw-type with binding heads. The secondary terminals shall be enclosed in a detachable conduit box secured to the base of the transformer. Conduit box shall be furnished with a 1" NPT threaded conduit opening at each end. A secondary grounding terminal shall also be provided. Transformer shall have a stainless-steel nameplate illustrated in accordance with ANSI standards. The polarity markings shall be permanently molded into the transformer housing and painted white. Transformers shall be tested in accordance with the ANSI standards with certified copies of the test reports supplied with the units.

Base assembly shall be furnished by the supplier and shall be either fabricated steel, cadmium-tin plated or cast aluminum. Mounting diagram shall be furnished to the successful bidder. All exposed metallic surfaces shall be protected by two coats of baked enamel. The base framework shall support the core, and windings shall contain a grounding pad and provisions for mounting the detachable secondary terminal box. The clamp-type ground connector shall be suitable for No. 6 to 4/0 copper grounding cable.

2.25.2 CURRENT TRANSFORMERS

Six (6) current transformers shall be provided by others for metering the incoming bus as shown on the attached circuit diagram. Current transformers shall be rated 25 kV, 150 kV BIL, 600/1200:5 amperes with a continuous thermal current rating of 1.5 times rated current at 30 degrees' Centigrade ambient temperature and an ASA accuracy class of 0.3 with B2.0 burden.

Current transformers shall be outdoor window type, encapsulated in an insulating compound with screw-type secondary terminals and binding heads. The secondary terminals shall be enclosed in a detachable conduit box secured to base of the transformer. The terminal box shall be furnished with a 1" threaded conduit opening at each end and a 1" knockout in the bottom. A secondary grounding terminal shall also be provided.

A fabricated metal base assembly shall be furnished by the supplier for mounting the current transformer. Mounting diagram shall be furnished to the successful bidder.

Base assembly shall support the windings and shall contain a grounding pad and provisions for mounting the detachable secondary box. All exposed metallic surfaces shall be protected by two coats of baked enamel. The clamp-type ground connector shall be suitable for No. 2 to 4/0 MCM copper ground cable.

2.26 SWITCHES

All switches must include adjustable stops which will not allow the handle to rotate beyond the open or closed position. One (1) complete spare set of each kind of disconnect and group operated switch to be installed in the station shall be furnished as part of the Bidders Proposal.

2.27 ACCESSORIES

One set of station accessories shall be furnished, including the following:

1. Two (2) switch sticks
2. Two (2) outdoor switch stick housings, non-metallic type, with fence mounting brackets
3. Eighteen (18) "Danger-High Voltage" signs

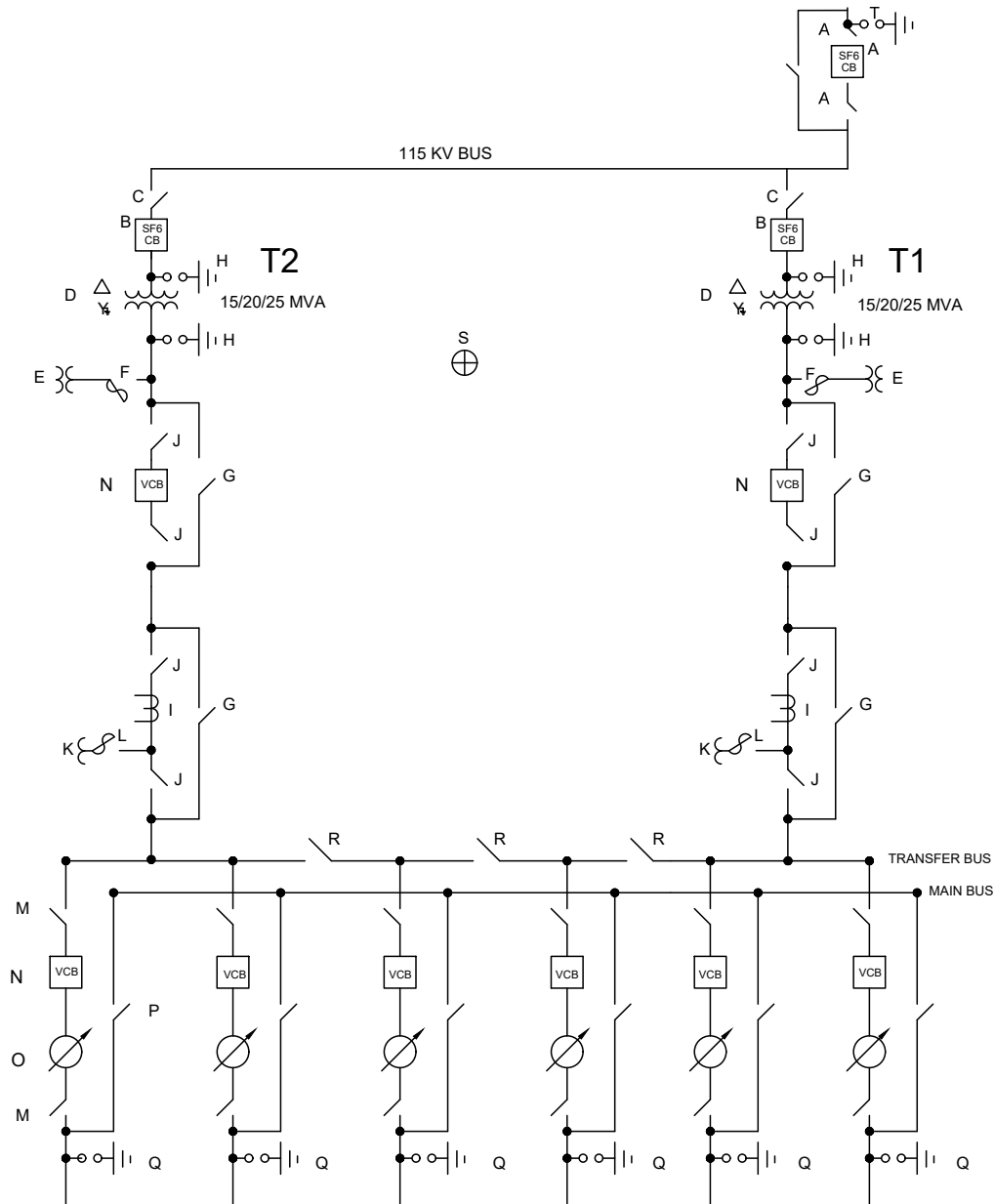
APPENDIX

ONE-LINE DIAGRAM

GENERAL ARRANGEMENT

GROUNDING PLAN

GROUNDING DETAILS



LEGEND

- | | |
|--|---|
| A. 115KV CIRCUIT BREAKER (BY OTHERS) AND BYPASS SWITCHES | K. POTENTIAL TRANSFORMERS |
| B. 115KV CIRCUIT BREAKER (BY OTHERS) | L. FUSED CUTOUT/CURRENT LIMITING FUSE COMBINATION |
| C. 115KV MOTOR OPERATED SWITCH | M. KOOKSTICK DISCONNECT SWITCH |
| D. POWER TRANSFORMER (BY OTHERS) | N. VACUUM CIRCUIT BREAKER (BY OTHERS) |
| E. STATION SERVICE TRANSFORMER | O. VOLTAGE REGULATOR (BY OTHERS) |
| F. FUSED CUTOUT/CURRENT LIMITING FUSE COMBINATION | P. GROUP OPERATED BYPASS SWITCH |
| G. GROUP OPERATED SWITCH | Q. DISTRIBUTION TYPE LIGHTNING ARRESTER |
| H. STATION TYPE LIGHTNING ARRESTERS | R. GROUP OPERATED TIE SWITCH |
| I. CURRENT TRANSFORMERS | S. GALVANIZED STEEL STATIC MAST |
| J. HOOKSTICK DISCONNECT SWITCHES | T. STATION TYPE LIGHTNING ARRESTERS |

NOTES

REFER TO SPECIFICATIONS FOR EQUIPMENT DESCRIPTIONS.



Robert F. Thomas, Jr.

PRELIMINARY

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DRAWING NO.
175-130-001

SHEET NO.
1 OF 1

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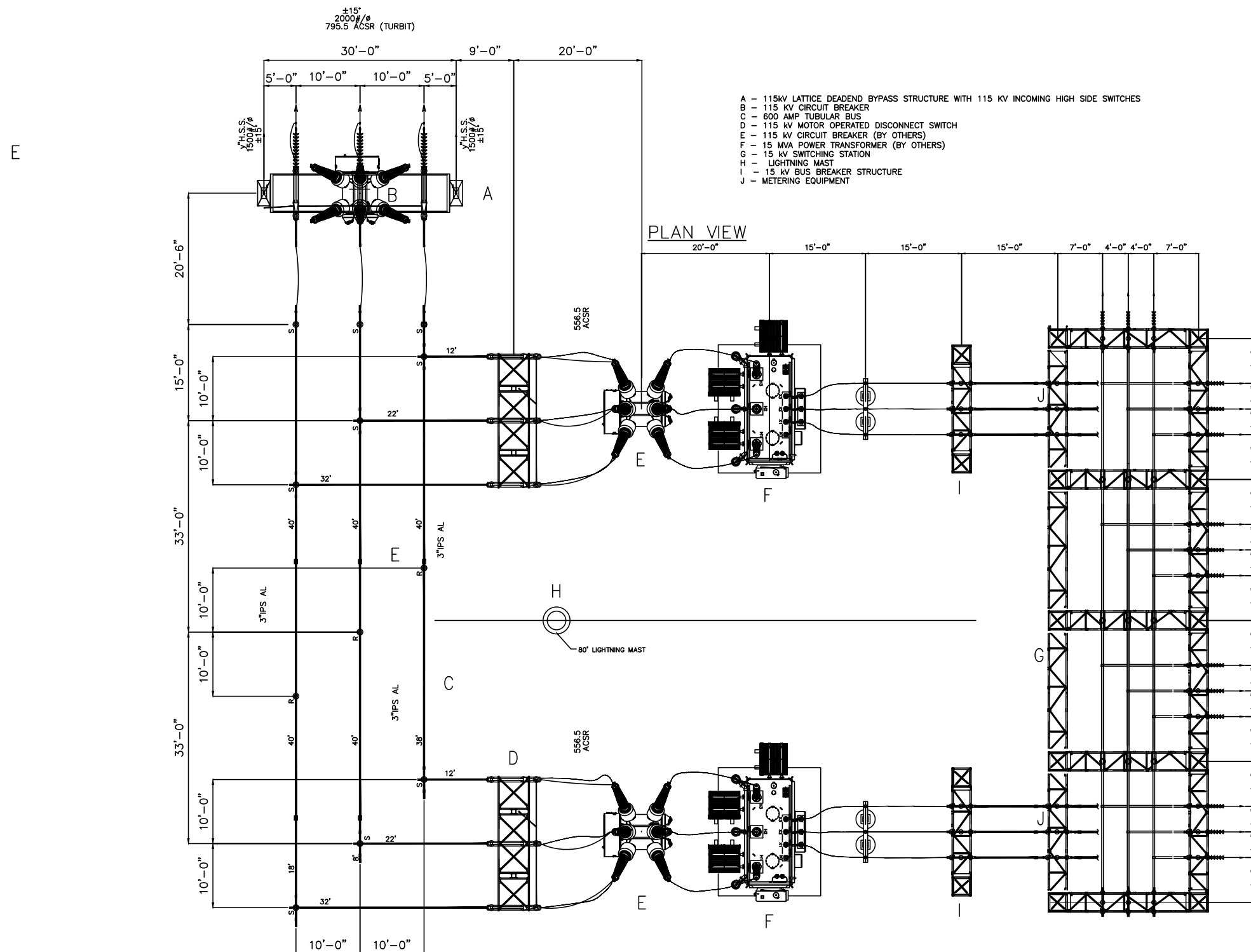
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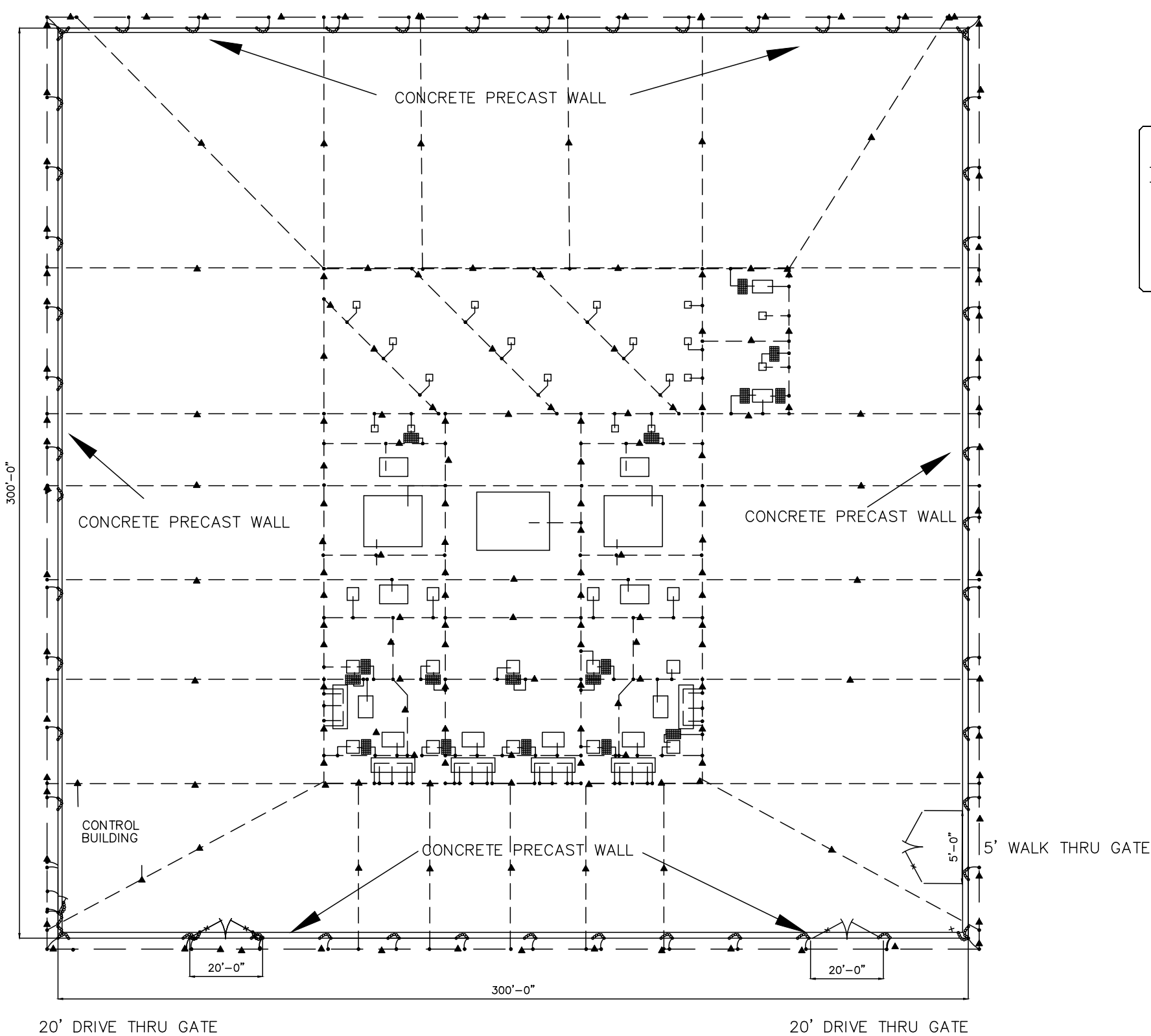
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STATESVILLE, NORTH CAROLINA

24.94/14.4kV SUBSTATION
ONE-LINE DIAGRAM



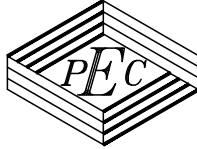
REVISIONS			REVISIONS			<div><div><div>PROGRESSIVE ENGINEERING CONSULTANTS, INC.</div><div>Complete Power Engineering Services P.O. BOX 690638 CHARLOTTE, N.C. 28227</div></div><div><div>OFFICE (704) 545-7327</div><div>FAX (704) 545-2315</div></div></div>	<div><div><div>CITY OF STATESVILLE STATESVILLE, NORTH CAROLINA</div><div>24.94/14.4kV SUBSTATION GENERAL ARRANGEMENT</div></div></div>	<div>DRAWING NO. 175-130-000R1</div> <div>SHEET NO. 1 of 2</div>	
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CITY OF STATESVILLE STATESVILLE, NORTH CAROLINA		DRAWING NO. 175-130-04
24.94/14.4kV SUBSTATION GROUNDING PLAN		SHEET NO. 1 OF 1