# SPECIFICATIONS

AND

# BID DOCUMENTS

FOR

# THREE PHASE PAD MOUNTED TRANSFORMERS

FOR

# CITY OF OAK RIDGE, TN

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## 1.0 INVITATION TO BIDDERS

Sealed bids will be received by the City of Oak Ridge, Tennessee at its office in Oak Ridge, Tennessee, until the date and time indicated, and immediately thereafter will be opened, and publicly read.

The City of Oak Ridge reserves the right to reject any or all bids and to waive any informalities or technicalities therein. The bid will be awarded to the lowest and best responsive bidder as determined by the Owner and Engineer.

No bidder may withdraw a bid for a period of sixty (60) days after the date set for opening of bids.

Specifications may be obtained from the Engineer. Only bids from approved manufacturers will be opened. Contact the Engineer for approval standards. Specifications may be examined at the office of the Engineer and at the office of the City of Oak Ridge, Tennessee.

OWNER/ENGINEER: City of Oak Ridge, Tennessee
Electric Department
100 Woodbury Lane
Post Office Box 1
Oak Ridge, TN 37831-0001
ATTN: Keith Atkins
TEL: (865) 425-1842
FAX: (865) 482-8313
Email: katkins@oakridgetn.gov

PROJECT / PACKAGE: THREE PHASE PAD MOUNT TRANSFORMERS – RFQ #158456
BID DATE: 2:00 PM, Thursday, July 19th, 2018

## 2.0 INSTRUCTIONS TO BIDDERS

2.1 You are invited to submit a Proposal for three phase pad mount transformers for the City of Oak Ridge, Tennessee.

2.2 The Owner does not obligate itself to accept the lowest or any other bid and specifically reserves the right to reject any and all bids. Partial award of units listed may be made at the Engineers discretion.

2.3 The Bidder shall provide all information requested. The Bidder shall take care to complete all portions of the Proposal documents and to provide all required submittals. Failure to comply may result in the rejection of the bid.

Bidder shall return two (2) signed and priced copies of the Proposal documents and all submittals required at the time of the Proposal to:

City of Oak Ridge
100 Woodbury Lane Oak Ridge, Tennessee 37830 (Use for overnight/hand delivery)
P.O. Box 1, Oak Ridge, Tennessee 37831 (Use for mail delivery)

**ATTN: Lyn Majeski, Materials Management**

Sealed and marked in the lower left corner :

**"SEALED BID for THREE PHASE PAD MOUNT TRANSFORMERS**
**Confidential - To be delivered to addressee unopened"**

***WARNING: FAILURE TO FOLLOW THESE SIMPLE INSTRUCTIONS REGARDING LABELING AND SEALING OF YOUR BID WILL RESULT IN AUTOMATIC REJECTION OF THE BID. DO NOT FAX BIDS. DO NOT EMAIL BIDS. DO NOT SEND BIDS IN OVERNIGHT SERVICE ENVELOPES, WITHOUT THE PROPER OUTSIDE LABELING.***

2.4 No proposal security will be required to accompany proposals.

2.5 The Owner invites cost saving and schedule improving alternatives. **A Bidder shall first complete the Proposal as issued by the Owner**; Bidder may then submit the alternatives referenced to the base proposal.

2.6 If the Bidder requires additional information or is in doubt as to the meaning of any part of the Contract documents, Bidder may telephone or submit a written request to the Engineer for such information or clarification. For questions to be answered, they must be received by July 12th, 2018 at 12:00pm. Addenda may be issued as deemed necessary by the Engineer.

2.7 For further information, Bidders shall contact the Engineer.

2.8 The Engineer will represent the Owner in all matters pertaining to the project, including but not limited to, answering technical questions of prospective bidders, bid evaluation and recommendation, review and approval of fabrication drawings and similar documents, and approval of invoices prior to payment by the Owner.

2.9 The terms Purchaser and Owner shall refer to the City of Oak Ridge. The terms Bidder, Seller and Manufacturer shall refer to the supplier of the equipment described by the documents.

2.10 If these specifications call for material, equipment or manufacturing procedures different from the Manufacturer's standard, the Manufacturer shall clearly identify all deviations or substitutions in this bid. When possible, the Manufacturer should bid according to the specifications with the Manufacturer's standard as an option.

2.11 Equal shall mean a satisfactory equivalent as approved solely by the Engineer.

2.12 Proposals should include Manufacturer's best delivery date for each type unit.

2.13 The Bidder shall clearly state all exceptions to this specification. Unless specifically stated otherwise, the Bidder shall furnish equipment, material and services in exact accordance with this specification, and any modifications to equipment, material and services necessary to comply with this specification shall be made by the Bidder at no additional cost to the Purchaser.

2.14 The Bidder shall include on the proposal form firm pricing, firm delivery ARO, and guaranteed loss information.

2.15 The cost to furnish any and all prints, drawings, diagrams, instruction manuals, cutsheets, AutoCad electronic files, reports, and certified test reports shall be included in the bid process and shall not be listed as a separate item.

2.16 All requested options, devices, and equipment are required and expected per the specifications, and the cost to furnish fully operational equipment with explanatory documentation shall be included in the bid process and shall not be listed as separate items.

2.17 The engineer may award the contract(s) based on overall low price (all units) or break up award into the lowest priced individual units.

2.18 Each Bidder shall complete the following Drug-free workplace affidavit as part of the submitted proposal.

## DRUG-FREE WORKPLACE AFFIDAVIT

STATE OF_____)
)
COUNTY OF _____)

The undersigned principal officer of _____, an employer of five (5) or more employees, contracting with the City of Oak Ridge, Tennessee, to provide construction services, hereby states under oath as follows:

1. That the undersigned is a principal officer of _____, hereinafter referred to as the "Company," and is duly authorized to execute this Affidavit on behalf of the Company.

2. The Company submits this Affidavit pursuant to Tennessee Code Annotated § 50-9-113, which requires each employer with no less than five (5) employees receiving pay who contracts with the state or any local government to provide construction services or who is awarded a contract to provide construction services or who provides construction services to the state or local government to submit an affidavit stating that such employer has a drug-free workplace program that complies with Title 50, Chapter 9 of the Tennessee Code.

3. The Company is in compliance with Tennessee Code Annotated § 50-9-113.

***Further affiant sayeth naught.***

_____

***Principal Officer***

State of _____)
)ss.
County of _____)

Before me personally appeared _____ with whom I am personally acquainted (or proved to me on the basis of satisfactory evidence) and who acknowledged that such person executed the foregoing affidavit for the purposes therein contained.

Witness my hand and official seal this _____ day of _____, 2015.

_____
Notary Public

My Commission Expires:_____.

## 3.0 TERMS AND CONDITIONS

3.1 Acceptance; Entire Agreement

Acceptance of this order by acknowledgement, shipment or other performance shall be expressly limited to the terms and conditions contained in this order. Any additional or different terms or conditions proposed by the Seller are objected to and are hereby rejected. Upon acceptance, the terms contained in this order shall constitute the entire agreement between Seller and Purchaser with respect to the subject matter of this agreement (hereinafter referred to as the "Agreement") and may not be modified, added to, or rescinded except by a written document signed by Seller and Purchaser. Refer to Section 5.11 for details regarding inspection and acceptance of the units subsequent to delivery.

3.2 Assignment and Setoff

The Seller shall not assign any right or interest under this Agreement nor delegate any work or other obligation to be performed or owned under this Agreement without the prior written consent of Purchaser. Any attempted assignment or delegation in contravention of this provision shall be void. Purchaser shall be entitled to set off any amounts owed by Seller to Purchaser against any amounts payable to Seller.

3.3 Delivery Terms

All goods ordered hereunder **shall be shipped F.O.B. destination**, unless otherwise agreed. No charge will be allowed for packing, crating, freight, express, or cartage, unless agreed to and specified on this order. This order shall not be filled at prices higher than last quoted or charged without proper authorization.

3.4 Payment

Upon the shipment of any material hereunder, the Seller shall submit to the Purchaser a detailed invoice duplicate of the materials shipped. Within 30 days after written acknowledged receipt, the Purchaser shall make payment thereof to the Seller. No payment will be made for incomplete items or where invoicing does not comply with the requirements of 5.11.3, titled ‘Payment’.

3.5 Time of Performance

Time is of the essence of this Agreement. If tender of conforming goods is not made by the delivery date quoted or services are not completed by the completion date quoted, Purchaser may treat such failure as a breach hereof and will have all remedies afforded to it by law including, but not limited to, the rights to recover. Failure to keep commitments made in the proposal will have a direct bearing on manufacturer’s status on the approved supplier list.

3.6 Identification; Risk of Loss

Identification of the goods ordered herein shall occur at the moment this order is accepted by Seller. Risk of loss shall pass to the Purchaser at the time that conforming goods to the Agreement are confirmed received at the Delivery Site.

3.7 Infringement

Seller shall indemnify Purchaser and Purchaser's customers for any and all loss, damage, expense, (including but not limited to attorney's fees) claims or liability arising out of any infringement or claim of infringement of any patent, trademark, copyright, trade secret or other proprietary interest based on the manufacture, installation, normal use, lease, or sale of any service of material furnished to Purchaser under this Agreement. Purchaser shall notify Seller promptly of any such claim or infringement and Seller shall, at its own cost, defend, compromise, or settle, any such action or actions to satisfy and discharge the same without any cost or expense whatsoever to the Purchaser.

3.8 Warranties

Seller warrants to Purchaser that material furnished will be merchantable, fit for Purchaser's intended purposes and free from defect in design, material and workmanship and will conform to and perform in accordance with Purchaser's drawings and specifications and will be safe for its intended use. Seller also warrants to Purchaser that services will be performed in a first class workmanlike manner consistent with accepted industry standards. In addition, if material furnished contains one or more manufacturers' warranties, Seller hereby assigns such warranties to Purchaser. All warranties shall survive inspection, acceptance and payment. Material not meeting the warranties shall at Purchaser's option be repaired, adjusted or replaced by Seller at no cost to Purchaser. Services not meeting the warranties shall at Purchaser's option be reperformed by Seller at no cost to Purchaser. Such remedies shall be available to Purchaser in addition to all others afforded to it at law or equity. The manufacturer shall provide a guaranteed warranty that covers the unit a minimum of 12 months from delivery date.

3.9 Rejected Goods

Purchaser shall give notice to Seller of any rejection of goods, and goods rejected will, at Seller's expense, be returned to Seller or otherwise disposed of as Seller may reasonably request. Payment for the goods prior to inspection and approval shall not constitute acceptance thereof. Neither Purchaser's inspection nor its failure to inspect the goods delivered hereunder shall release Seller from its warranties and obligations under this Agreement.

3.10 Termination

A) Purchaser may terminate this Agreement for default upon notice to Seller if: 1) Seller fails to comply with any of the terms and conditions of this Agreement, including failure to deliver goods or perform services required within the time specified in this Agreement; 2) at any time reasonable grounds for insecurity arise

with respect to Seller's expected performance and Seller fails to furnish adequate assurance of due performance within ten (10) days after a written demand by Purchaser for such adequate assurance; 3) Seller shall become insolvent or make an assignment for the benefit of creditors; or 4) Seller shall file a voluntary petition in bankruptcy or insolvency or shall be involuntarily petitioned into bankruptcy or insolvency.

B) Purchaser may terminate this Agreement, in whole or in part, for its convenience, at any time by giving written notice to Seller, and Seller shall promptly comply with the directions contained in such notice. In such event, Purchaser shall make payment to Seller for all costs incurred by Seller prior to such termination reasonably allocable to this Agreement under recognized accounting practice, less any scrap or salvage value.

3.11 Liens

Seller shall promptly pay for all materials, supplies and labor employed by it in manufacturing the ordered goods to the end that such goods may be kept free from Materialmen's, Warehousemen's and Mechanics' liens. Seller shall promptly discharge any such liens arising from the performance of this Agreement.

3.12 Indemnity of the Purchaser

The Seller shall indemnify and hold Purchaser and its officers, employees, and agents harmless from and against all suits or claims that may be based upon any alleged injury to or the death of any person or damage to property that may occur or that may be alleged to have occurred in the course of performance of this Agreement whether or not such claim is made by a third person, except when it shall be proved that the alleged injury was caused solely by a negligent act or omission of the Purchaser. Seller shall, at its own cost and expense, pay all costs and expenses or such suit or claim, including attorney's fees in connection therewith, and if any judgement shall be rendered against the Purchaser in any such action or actions the Seller shall satisfy and discharge the same without cost or expense to Purchaser.

3.13 Compliance with Laws

Seller and all material furnished by Seller shall fully comply with all federal, state, and local laws, ordinances, regulations, orders and codes, including identification and procurement of required permits, certificates, approvals and inspections in performance hereunder. Any provision required to be included in this Agreement by any such law, rule or regulation shall be deemed to be included herein. The Equal Opportunity Clause contained in Executive Order 11246 as amended, relating to equal employment opportunity for all persons without regard to race, color, religion, sex or national origin, the Affirmative Action Clause contained in 41 C.F.R. Chapter 60.250 relating to affirmative action obligations to disabled veterans and to veterans of the Vietnam Era, and the Affirmative Action Clause contained in 41 C.F.R. Chapter 60.741 relating to affirmative action obligations to handicapped workers, are incorporated herein by reference. The Seller also certifies that it does not engage in and requires that its subcontractor's (if any)

employees or agents not engage in, any form of discrimination based on race, color, religion, sex or national origin. Seller agrees to indemnify Purchaser for any loss or damage that may be sustained by reason of any failure to do so.

3.14 Labeling

All goods and materials to be supplied by Seller under this Agreement shall be labeled in accordance with the requirements of the Federal Occupational Safety and Health Act Hazard Communication Standard (29 CFR 1910.1200) and/or applicable State law or standard of similar effect. Seller shall immediately send to the Purchaser, referencing this purchase order number, all required written safety information materials including without limitation, Material Safety Data Sheets, required under said standards.

3.15 Non-Waiver

No course of dealing or failure of either party to strictly enforce any term, right or condition of this Agreement shall be construed as a waiver of such term, right, or condition.

3.16 Choice of Law

The construction, interpretation and performance of this Agreement and all transactions under it shall be governed and resolved in accordance with the laws of the State of Tennessee.

3.17 Notification

The Manufacturer shall acknowledge in writing to the Engineer that the Owner's Purchase Order or acceptance has been received within 5 days ARO. The acknowledgement shall include the date that the Purchase Order or acceptance is received and the date that equipment delivery is expected.

3.18 Terminology

The terms "shall" and "will" which appear in the Proposal and specifications place an absolute obligation on the Manufacturer to do that which is designated and/or specified.

3.19 Taxes

City of Oak Ridge, Tennessee is exempt from sales tax.

## 4.0 EQUAL OPPORTUNITY PROVISIONS

4.1 This Contract is subject to the provisions of Section 202 of Executive Order Number 11246 of September 24, 1965 as amended relating to Equal Opportunity and to the Affirmative Action requirements of 41CFR60. The Contractor will at all times abide by the equal opportunity provisions of the Civil Rights Act of 1964 as amended.

4.2 No Respondent to this request shall in any way, directly or indirectly, discriminate against any person because of race, creed, color, national origin, religion, age, sex, sexual orientation, disability or other legally protected status. This requirement includes the process for selection and retention of subcontractors, procurements of materials and leases of equipment. The City of Oak Ridge encourages the utilization of minority and women-owned businesses in its contracting and subcontracting projects and the Contractor is encouraged to actively solicit the participation of these businesses. The Contractor shall inform its subcontractors and vendors of this requirement and shall ensure compliance therewith.

4.3 Each Bidder shall complete the following Equal Opportunity Compliance Certificate as part of the submitted proposal.

# EQUAL OPPORTUNITY
# COMPLIANCE CERTIFICATE

We hereby certify:

As a(n):_____ Division of Parent Company _____

_____ Subsidiary

_____ Affiliate Address_____

_____ Separate Corporation _____

And being: _____ a Small Business (Ref: ASPR-1-701-1)

_____ Minority Owned Business (Ref: 41CFR-1.701-1)

_____ from a Labor Surplus Area (Ref: 41CFR 1-1.801-1);

Having _____ employees in all divisions, subsidiaries, affiliates and parent (number) company;

That we shall comply with the applicable portions of the Equal Opportunity Clause as promulgated under Executive Order 11246. September 24, 1965 as amended, and all other federal laws and regulations pertaining to the Equal Employment Opportunity and Affirmative Action obligations of Federal Government Contractors, and shall submit the required compliance reports, and shall maintain non-segregated facilities.

Supplier _____

Address _____

_____

Signature of Authorized Representative_____

Date of Signing _____

## 5.0 THREE PHASE PAD MOUNTED TRANSFORMERS

5.1 Standards:

The primary standards to which this equipment shall be constructed and tested are:

1.1 National Electric Code

1.2 American National Standards Institute

1.3 National Electric Safety Code

1.4 American Society for Testing Materials

1.5 Institute of Electrical and Electronic Engineers

1.6 National Electrical Manufacturers Association

1.7 All applicable local codes

5.2 Drawings and Data

The Manufacturer shall submit a **complete schedule** within ten (10) days ARO to the Engineer. This schedule will reflect the commitments submitted with the proposal. This schedule shall indicate the starting dates, dates of completion, and date the unit(s) will ship. The timely submission of Manufacturer's record drawings and test data is as important as manufacture and delivery of equipment and hardware, and shall be considered in determining the award.

5.2.1 Each drawing and instruction book furnished shall be clearly marked to identify the Owner's location as follows:

City of Oak Ridge, Tennessee
Three Phase Pad Mounted Transformer

5.2.2 Submittals shall consist of, but are not limited to, the following:

1. Net weight of transformer
2. Dimensions or dimensioned drawing of transformer
3. Transformer impedance
4. No load losses
5. Full Load losses
6. Total losses at rated KVA
7. Exciting current at 100% and 110% voltage
8. Transformer regulation at 1.0 and 0.8 PF
9. Nameplate Data / Ratings
10. Installation Instructions
11. Operating Instructions
12. Maintenance Instructions

**The bidder shall submit with bid, nameplate data, general outline dimensions and other standard information for the transformer proposed, including the guaranteed values of Items No. 3 through No. 6, listed above.**

Two sets of the certified test reports shall be supplied for each unit and shall include as minimum the information defined in section 5.9.2 of this specification. Shipment is not considered complete until we receive certified test report.

5.2.3 Submittal Process

The Manufacturer shall submit to the Engineer two (2) copies of shop drawings of the specified equipment with his proposal. Each submittal shall be clearly marked with the project name, date, and accompanied by a letter of transmittal listing all items included in the submittal.

1. The Engineer will review, mark and date all submitted shop drawings. One (1) set will be returned to the Manufacturer with the purchase order and the remaining set will be retained by the Engineer. Manufacturer shall make corrections and changes as indicated.

2. The Manufacturer shall resubmit shop drawings as required until satisfactory review has been obtained. Corrections and/or changes indicated on shop drawings by Engineer/Owner shall not be considered as an extra work order.

3. After satisfactory "Reviewed" or "Reviewed As Noted" has been obtained for all shop drawings, two (2) copies of shop drawings marked "FOR CONSTRUCTION" shall be furnished to the Engineer/Owner within 10 days of receipt of approval drawings by Manufacturer.

4. Review of shop drawings by the Engineer will be general only, and such review will not relieve the Manufacturer of responsibility for accuracy of such shop drawings, proper fitting, coordination, construction of work, and furnishing of materials required by the specifications but not indicated on shop drawings. Review of shop drawings shall not be construed as approving departures from the Specifications.

5. Prints, exclusive of reproducibles, shall be folded to 8 /12" x 11" for submittal.

6. All technical correspondence shall be sent to the Engineer.

5.2.4 Final instruction books **(two sets)** shall be provided to the Engineer, and as a minimum shall contain the following information:

1. The items listed in Section 5.2.2.

2. All drawings approved by Purchaser for the particular unit(s) furnished.

3. Bill of Material, indicating model number of EVERY item.

4. Instruction Leaflets and Cutsheets, with pertinent model numbers clearly indicated.

5. Information for ordering parts.

6. Certified test reports shall be shipped simultaneous to shipping of the unit(s).

7. One (1) electronic copy of all drawings shall be provided in AutoCAD. Mylars of all final drawings and data shall be provided.

8. Instruction books shall be enclosed in an adequately sized **three ring binder.**

5.3 Shipping

5.3.1 Unit(s) shall be furnished F.O.B. Destination, Freight Prepaid and Allowed at the destination indicated. Unloading will be provided by the Owner.

5.3.2 Manufacturer shall be responsible for obtaining necessary permits, providing and verifying routing and, in general, making all the necessary arrangements for transporting the equipment provided to Purchaser's destination.

5.3.3 Any material to be mounted in the field shall be packed in a separate box with a packing list attached outside. Another packing list shall be placed inside the box. Lists shall clearly identify components contained in the box.

5.3.4 No incomplete or partial or unfinished shipments shall be accepted or received without written permission from the Engineer.

5.3.5 Manufacturer shall provide twenty four (24) hours advance notice to the Engineer of the exact time delivery will be made at destination, along with information listed in 5.3.6 below.

5.3.6 The manufacturer shall, at the time arrangements for delivery are to be made, inform the Engineer of:

a. Purchase Order Number
b. Number of items being shipped per purchase order
c. Weight of each item (heaviest)
d. Estimated time of arrival
e. Location of use ("to be used for:" not "ship to:")
f. Serial Number

5.3.7 Units shall be placed on hardwood pallets with skids sized to facilitate handling with forklifts.

5.3.8 Units shall be loaded from the rear of the trailers for shipment to facilitate unloading onto receiving docks with forklifts.

5.3.9 Units may be unloaded with overhead cranes and shall be shipped on flat-bed trailers without sides. Canvas-topped trailers are **NOT** acceptable. **Any transformer shipments not meeting this requirement may be returned to the manufacturer at CORED's discretion without cost to the City of Oak Ridge.**

5.5 **GENERAL REQUIREMENTS**

5.4.1 This specification covers electrical characteristics, mechanical features, and basic requirements for a three-phase, 60 Hertz, oil immersed, self-cooled, pad-mounted compartmental type distribution transformer with separable insulated high voltage connectors. All transformers shall be of the five-legged core type design. All transformers shall be used on a 13,200GRDY/7620 volt system. Typical low voltages include 208Y/120, 480Y/277, 240Delta/120 MT, and other voltages as may be specified in invitation to bid.

5.4.2 Distribution transformers for outdoor service, pad-mounted, three phase, 60 HZ, oil-immersed, self cooled, compartmental type, loop feed, ANSI C57.12.26 (latest revision), dead front, supplied with 200 ampere ESNA type bushing wells and load-break inserts. The kVA and voltage(s) shall be as specified in 6.0, proposal form.

5.4.3 The transformer shall have fused primary per Section 5.6 of this Specification.

5.4.4 Units with a low voltage rating of 208Y/120 or 480Y/277 shall have a high voltage rating of 13,200 GRDY/7620.

5.4.5 Units with a low voltage rating of 240 Delta/120 MT (240 Volts Delta connected with a 120 Volt Mid-tap) shall have a high voltage rating of 13,200Y.

5.4.6 Per recommendation of IEEE 57.105, latest revision, units with a low voltage rating of 240 Delta/120 MT shall have a switch capable of isolating the primary WYE connection to avoid a grounded wye-delta connection, yet be capable of temporarily grounding $H_o$ for energization.

5.4.7 The manufacturer shall perform a production line impulse test of each unit prior to shipment. A detailed description of procedures and test method for the production line impulse test shall be submitted to CORED Engineering Division for approval. **Test results for these impulse tests should be identified and included with each unit's certified test report**.

5.4.8 The manufacturer shall provide certified proof that each individual transformer design conforms to the short circuit requirements outlined in ANSI Standard C57.12.00, latest revision, section 7, and ANSI Standard C57.12.90, latest revision, section 12.

5.4.9 The impedance shall be between 2.0% - 5.0% for units with a rating of 75 - 500 kVA. Otherwise, the impedance shall meet the requirements of C57.12.26, latest revision.

5.4.10 Each transformer shall be equipped with manufacturer's standard pressure relief device.

5.4.11 **Copper (Cu) conductor shall be utilized in the primary windings. Either Copper or Aluminum shall be utilized in the secondary voltage windings and the secondary voltage leads, which connect to bushings. Any deviations to the winding and lead material must be submitted as an alternate.**

5.4.12 Labels and/or ID's shall be included on the outside portion of the front compartment door. Locations are as follows:

1. The "NON-PCB" label shall be affixed directly above the Pentahead security system.

2. Shock in a Box labels shall be affixed to the transformer both outside and inside of the secondary compartment door.

5.4.13 The instruction nameplate shall be Type C for all units. Additionally, decoded date as to when the unit is manufactured (Example: MFR DATE 4/84) and notation of current limiting and Bay-O-Net fuses in the circuit diagram shall be included on the nameplate. The instruction nameplate shall be located such that it can be easily read with the low voltage cables and terminations in place.

5.4.14 The nameplate shall show the Bay-O-Net draw out fuse and current limiting fuse arrangement in the transformer circuit one-line. It shall also show the type, size, and make of current limiting fuse and shall identify the manufacturer of the draw-out fuse.

5.4.15 The color of the unit shall be ANSI 70, and the paint process shall meet the latest EEI guidelines.

5.4.16 Provisions shall be provided for lifting entire unit including total weight of tank, core and coil assembly while filled with oil.

5.4.17 All transformers shall be provided with an insulating oil magnetic dial type liquid level gauge located on the tank wall inside the low voltage terminating compartment.

## 5.5 **CONSTRUCTION**

5.5.1 Suitable means shall be provided for padlocking the compartment door, including a Pentahead security system.

5.5.2 The pad-mounted transformer shall have compartmental doors that are attached to the unit with stainless steel hinges. The doors shall be removable when in the open position.

5.5.3 Each door shall be provided with a hold-open device, which is held captive at one end, for latching the door in the open position.

5.5.4 No gummed labels or signs, excluding those specifically called for in this specification, shall be attached to the exterior surface of the transformer.

5.5.5 The transformer tank shall be welded sealed tank construction. Bolted tops will be allowed if properly gasketed.

5.5.6 A 10" by 18" clear inside dimension hand hole shall be provided in the top of the transformer tank. The hand hole shall be strategically located so as to provide access to fuses, bushings, etc. The hand hole shall be covered with a steel plate and welded or bolted to the tank as per Drawing No. XFMR-CVR, Revision 01 dated 1-29-90. A bolted hand hole cover will be allowed if gasketed properly.

5.5.7 The removable tank covers and the bolted hand-hole covers shall be made tamper-proof by providing false covers which are secured inside the terminating compartments.

5.5.8 A barrier wall shall be furnished to separate the primary and secondary compartments. This

barrier shall be capable of supporting typical potential transformers used for secondary metering applications.

5.5.9 All units shall be supplied with standard pad-mounted transformer accessories as per ANSI Standard C.57.12.26, Table No. 5, and shall also include 1" drain valve with sampling valve installed in line with the gate valve instead of on the side of the gate valve which will be located in the high voltage terminating compartment. A dial type thermometer shall be installed on 500 kVA and above only. Any accessory whose position is not specifically shown on Drawing XFMR-LF may be placed at any safe and convenient location.

5.5.10 The secondary compartment shall be furnished with a minimum width of thirty (30) inches as shown on Drawing XFMR-LF, Revision 02 dated 12-17-01.

5.5.11 The primary and secondary compartments shall be furnished with a minimum depth of eighteen (18) inches as shown on Drawing XFMR-LF, Revision 02 dated 12-17-01.

## 5.6 **BUSHINGS, FUSING AND TERMINALS**

5.6.1 The unit shall have two high voltage externally replaceable bushing wells per phase, which shall be ESNA or an approved equal. The bushing wells shall be externally clamped type. Additionally, 2 - COOPER POWER SYSTEM 200A, 15KV class one piece bushing inserts meeting ANSI standard 386 with ablative arc interrupter shall be supplied per phase

5.6.2 The number, location, markings, and arrangement of the high-voltage connectors and low-voltage terminals shall be as per ANSI C57.12.26, latest revision, Figures 6A ,7, and 8(a).

5.6.3 The line terminal arrangement (bushing and spade X1, X2 and X3) shall be suitable for mounting a General Electric Co. Type JAB-O, JAD-O, or Westinghouse Type CMV (depending upon application and voltage), Grecian urn shape, current transformer over each bushing as shown on Drawing XFMR-SPD. One current transformer may be inverted if necessary. Mounting brackets shall be furnished if required.

5.6.4 The three low voltage phase and one neutral terminal shall be tinned copper and shall be drilled as shown on Drawing XFMR-SPD, Revision 00 dated 1-25-90.

5.6.5 Dimensional requirement, location of barrier, doors, oil drain, sampling valve, ESNA (or approved equal) high voltage bushing wells, high voltage bushings, draw-out fuses, and low voltage bushings shall be as shown on Drawing XFMR-LF, Revision 02 dated 12-17-01.

5.6.6 The three low voltage and the one neutral terminals shall be adequately braced to withstand the maximum short circuit forces. Bracing supports required for 8 and 10 hole spades on XFMR-SPD shall be as shown on XFMR-LVBS, Revision 00 dated 1-25-90 attached, and shall be constructed using an insulating board such as "Glastic" with thickness not less than 1/2".

5.6.7 The secondary neutral shall be brought out through separate fully insulated bushing and shall be grounded externally to the tank wall with the removable strap. A removable copper ground strap or cable shall be connected between the neutral bushing and a ground pad located on the exterior tank wall. This strap shall be sized for the rating of the transformer. The transformer shall be shipped with the ground strap connected to the tank pad.

5.6.8 The high and low voltage terminals and designations shall be as shown in XFMR-LF and shall be indicated on the tank wall with oil resistant yellow paint.

5.6.9 The transformer shall be furnished with a Kearney, Cooper or General Electric Company current limiting fuse in series with an RTE Bay-O-Net type draw out fuse holder and a Kearney **or Cooper** Dual Element fuse link of size and type listed below in Table A. The current limiting fuse shall be attached to the loop feed bus and ahead of the dual element fuse feeding the primary winding.

| Trans-former Size | CURRENT LIMITING FUSE | | | | | | BAY-O-NET FUSE | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Kearney | | General Electric | | Cooper Power Systems | | Cooper Power Systems | | Kearney | |
| KVA | Fuse Size | Catalog Number | Fuse Size | Catalog Number | Fuse Size | Catalog Number | Fuse Size | Catalog Number | Fuse Size | Catalog Number |
| 45 | 30 | 150608-30 | 40 | 9F59TBC040 | 30 | 3544030M61M | 3 | 4038108C03 | 5 | 124080-5 |
| 75 | 40 | 150608-40 | 40 | 9F59TBC040 | 30 | 3544030M61M | 8 | 4038108C05 | 5 | 124080-5 |
| 112.5 | 50 | 150608-50 | 50 | 9F59TBC050 | 50 | 3544050M61M | 15 | 4038108C08 | 8 | 124080-8 |
| 150 | 50 | 150608-50 | 50 | 9F59TBC050 | 80 | 3544080M51M | 15 | 4038108C08 | 12 | 124080-12 |
| 225 | 50 | 150608-50 | 65 | 9F59TBC065 | 100 | 3544100M51M | 25 | 4038108C10 | 15 | 124080-15 |
| 300 | 80 | 150608-80 | 100 | 9F59TBC100 | 100 | 3544100M51M | 25 | 4038108C10 | 25 | 124080-25 |
| 500 | 100 | 150608-100 | 125 | 9F59TCC125 | 100 | 3544100M51M | 50 | 4038108C12 | 30 | 124080-30 |
| 750 | | | | | 150 | 3544150M51M* | 65 | 4000358C14 | | |
| 1000 | | | | | 160 | 3544080M61M* | 65 | 4038361C03CB | | |
| 1500 | | | | | 300 | 3544150M51M* | 100 | 4038361C04CB | | |
| 2000 | | | | | 250 | 3544125M61M* | 125 | 4038361C05CB | | |
| 2500 | | | | | 350 | 3544175M51M* | 125 | 4038361C05CB | | |

5.6.10 RTE Bay-O-Net fuse holder shall be equipped with flapper type valve to insure oil is not lost should fuse be removed while transformer tank is under positive pressure.

5.6.11 Each unit shall be equipped with oil drip guard mounted under Bay-O-Net fuse holder to protect high voltage terminations from oil leakage.

5.6.12 The hand hole cover shall be designed and situated so as to allow replacement of a defective current limiting fuse.

5.6.13 The Bay-o-net fuse size, current limiting fuse size, voltage rating and KVA rating for each unit shall be indicated with oil resistant yellow paint on the inside surface of the low voltage terminating compartment door of all units.

| | | |
|---|---|---|
| EXAMPLE: | 150 kVA | 120/208 volt |
| | Bay-O-Net fuse | 8 amp |
| | Current limiting fuse | 40 amp |

5.6.14 Bay-O-Net fuse assemblies shall be located so as to allow replacement of fusing without having to open or remove primary or secondary compartment cover.

5.6.15 The current limiting fuses shall be mounted horizontally in the immediate vicinity of the high voltage bushings and ahead of the dual element fuses feeding the primary windings. The current limiting fuses shall be rigidly mounted to eliminate shifting of the fuses and the possibility of fuse to ground contact.

## 5.7 TRANSFORMER OIL

The transformer shall be filled with Type II mineral oil. The oil shall be certified to contain less than one part per million (1 PPM) Polychlorinated Biphenyl's (PCB's) as measured on a dry weight basis. A notice to this effect (compliance with EPA's regulations regarding PCB content of dielectric oil) shall be included on the transformer nameplate. A non-PCB label shall be attached to the unit, just below the Voltage rating of the unit.

## 5.8 TAP CHANGERS

5.8.1 All transformers shall have tap changers with two 2-1/2% taps above and two 2-1/2% taps below rated voltage.

5.8.2 All tap changers shall be designed for operation using hot line tools and be externally operated.

5.8.3 All external components shall be constructed of corrosion resistant material and have a permanent clearly marked indicator plate showing tap positions.

5.8.4 All tap changers shall be designed to prevent accidental operation by requiring a preliminary step such as loosening a set screw before the tap position can be changed. This positive locking device shall be clearly visible to field personnel operating the tap changer.

5.8.5 The tap changers shall rotate in a clockwise direction from the high tap voltage to a lower tap voltage in the high voltage winding and be provided with positive stops to identify the highest and lowest tap positions.

5.8.6 The tap changer shall be located in the high voltage terminating compartment above the high voltage bushing wells as shown in drawing XFMR-LF, Revision 01 dated 1-19-99.

## 5.9 TESTING

**5.9.1** The transformers furnished under the specification shall be manufactured and tested in accordance with the current issues of NEMA and ANSI standards for distribution transformers, except as may otherwise be specified herein, and shall be in all respects manufactured in accordance with good practice.

**5.9.2** Two copies of the certified test reports, which shall include both quoted and actual values, shall be provided prior to or with the shipment of each transformer. Minimum information to be included in each Certified Test Report shall follow that listed as Appendix to Part 1 of ANSI C57.12.90, latest revision.

## 5.10 EVALUATION OF LOSSES AND DELIVERY

**5.10.1** Losses shall be evaluated in the appraisal of the bids on self-cooled basis as follows:

Evaluated Cost = Quoted Unit Price + $NL Value X No Load Losses (Watts) + $LL Value X Full Load Losses (Watts). Manufacturer is required to extend each unit price utilizing the above formula on the proposal form. An electronic copy of "Attachment: PROP-FORM" is available upon request.

Transformers which are delivered with no load or total losses higher than quoted may be rejected at the pleasure of CORED. If we choose to keep the unit, failure to meet guaranteed losses (no load or total) will result in application of a deduct on the invoice in accordance with the following :

**$250 per unit which fails to meet manufacturer's guarantee.**

**5.10.2** $NL Value = $5.65 and $LL Value = $1.80.

**5.10.3** The transformer loss data desired is the guaranteed value of each unit of each voltage class and kVA size. This specification prevails over ANSI C57. The Engineer will not go through the exercise of averaging loss values by unit type or shipment. Manufacturers are strongly encouraged to quote loss values they are confident will be met by each unit. There shall be no tolerance value associated with exceeding the quoted loss value.

**5.10.4** Delivery times shall be as soon as possible and will be a factor considered in the evaluation.

## 5.11 QUALIFICATIONS, INSPECTION , ACCEPTANCE, AND PAYMENT

**5.11.1** Qualifications

In order for a supplier to receive consideration, it will be necessary to furnish and submit the information listed in the letter of Pre-Approval and Qualification. Pre-approved, qualified bidders must comply with and pass all of CORED's requirements for transformer manufacturers. Contact the Engineer for the above information, if you are not on the approved list. At this time, the following companies are on the approved list: Virginia Transformer, ABB/Power Partners, G.E., Howard, Ermco, Cooper, Pauwels and Maloney Electric.

**5.11.2** Inspection and Acceptance

**5.11.2.1** All transformers furnished under this specification will be inspected and tested upon delivery. CORED shall, at all times, have the right to inspect the transformers during manufacture and witness such tests from time to time as CORED may deem advisable and or necessary.

**5.11.2.2** Delivery of the units shall not be considered complete, nor shall the unit be considered accepted, without Certified Test Reports.

**5.11.2.3** After the transformer designs have been approved by CORED, no transformer shall be furnished or accepted if changes are made by the manufacturer in any respect.

**5.11.3** Payment

**5.11.3.1** All invoices submitted to CORED for payment shall include as a minimum the following information:

1. The City of Oak Ridge Purchase Order Number,
2. The City of Oak Ridge Transformer ID Number, and
3. The manufacturer's serial number.

CORED will not approve payment of any invoice which is submitted without the above information.

**5.11.3.2** No payment shall be considered or approved until delivery of the unit is complete and the unit is accepted.

## 5.12 ALTERNATE ARRANGEMENTS OR EXCEPTIONS TO SPECIFICATIONS

**5.12.1** Bidders shall state all exceptions to these specifications. **An exception to the specification is grounds for rejection of the bid.** CORED may choose to review and consider alternate arrangements, provided complete information for evaluation is included with the alternate bid.

**5.12.2** No bid will be accepted from an approved manufacturer without complete information for evaluation, including drawings and other information requested herein.

**5.12.3** The terms and conditions of this specification shall prevail. Substitution of manufacturers terms and conditions shall not be entertained. If manufacturer has a specific term or condition that is not in compliance with those specified in this document, he shall list each under 'exceptions to the specification'. Exception to the specification is grounds for rejection of the bid.

## 5.13 DEVIATIONS

**5.13.1** CORED shall inspect and test each shipment of transformers to ensure that each transformer received conforms to this specification.

**5.13.2** Any transformers received that do not comply with this specification in its entirety shall be rejected and returned at the manufacturer's expense.

**5.13.3** Failure to comply with this specification in its entirety shall result in the manufacturer's immediate removal from CORED approved manufacturers listing.

## 6.0 PROPOSAL

In submitting this Proposal, the Manufacturer agrees as follows:

The prices set forth herein are firm if accepted by the Owner within sixty (60) days and shall include the F.O.B. cost of delivery to the job site or warehouse (Delivery Site).

Owner will provide unloading at the site, provided units are shipped in accordance with this specification.

**PROPOSAL FORM**

TO: CITY OF OAK RIDGE, TENNESSEE

Project / Package: Three Phase Pad Mounted Transformers

Delivery Site: City of Oak Ridge warehouse at 100 Woodbury Lane, Oak Ridge, TN 37830.

**Failure to fill out the form is grounds for rejection of bid!**

| | | |
|---|---|---|
| Did you take any exceptions? | Yes_____ | No____ |
| Shipment is F.O.B point of delivery? | Yes _____ | No ___ |
| EEO form included? | Yes _____ | No ___ |
| Drug-free workplace affidavit included? | Yes _____ | No ___ |
| Two copies of all submittal drawings included? | Yes____ | No ____ |
| Warranty Description included? | Yes _____ | No ____ |
| Proposal Valid for 60 days? | Yes _____ | No ____ |

List Addenda Received: No. _____ Dated _____

No. _____ Dated _____

## 2018 Three Phase Pad Mounted Transformer Order

**Prop-Form**

| Item | Quantity | Transformer ID# | kVA | Unit Price | Guaranteed Losses (watts) No Load | Load | No load X $5.65 | Load x $1.80 | *Extended Price | Delivery Weeks ARO |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 5 | 3-PAD-75-208/120 | 75 | | | | 0 | 0 | 0 | |
| 2 | 3 | 3-PAD-112.5-208/120 | 112.5 | | | | 0 | 0 | 0 | |
| 3 | 3 | 3-PAD-150-208/120 | 150 | | | | 0 | 0 | 0 | |
| 4 | 1 | 3-PAD-150-480/277 | 150 | | | | 0 | 0 | 0 | |
| 5 | 1 | 3-PAD-225-208/120 | 225 | | | | 0 | 0 | 0 | |
| 6 | 5 | 3-PAD-300-208/120 | 300 | | | | 0 | 0 | 0 | |
| 7 | 5 | 3-PAD-500-480/277 | 500 | | | | 0 | 0 | 0 | |
| 8 | 2 | 3-PAD-500-208/120 | 500 | | | | 0 | 0 | 0 | |
| 9 | 1 | 3-PAD-1000-480/277 | 1000 | | | | 0 | 0 | 0 | |
| 10 | 3 | 3-PAD-1500-480/277 | 1500 | | | | 0 | 0 | 0 | |
| 11 | 2 | 3-PAD-2500-480/277 | 2500 | | | | 0 | 0 | 0 | |
| Total | 23 | | | | | | | | | |

*** Extended Price =(Unit Price + (No load losses x $5.65) + (load losses X $1.80)) x Quantity**

**Guaranteed losses are for each unit, not an average by type or shipment !**
**$250 will be deducted for any unit accepted that does not meet guaranteed losses.**
**Units may be delivered as they become available. There is no requirement for simultaneous delivery of all units.**

**Manufacturer:** _____

**Address:** _____

**Signed By:** _____ **Date:** _____

**Title:** _____

**Telephone Number:** _____ **email:** _____

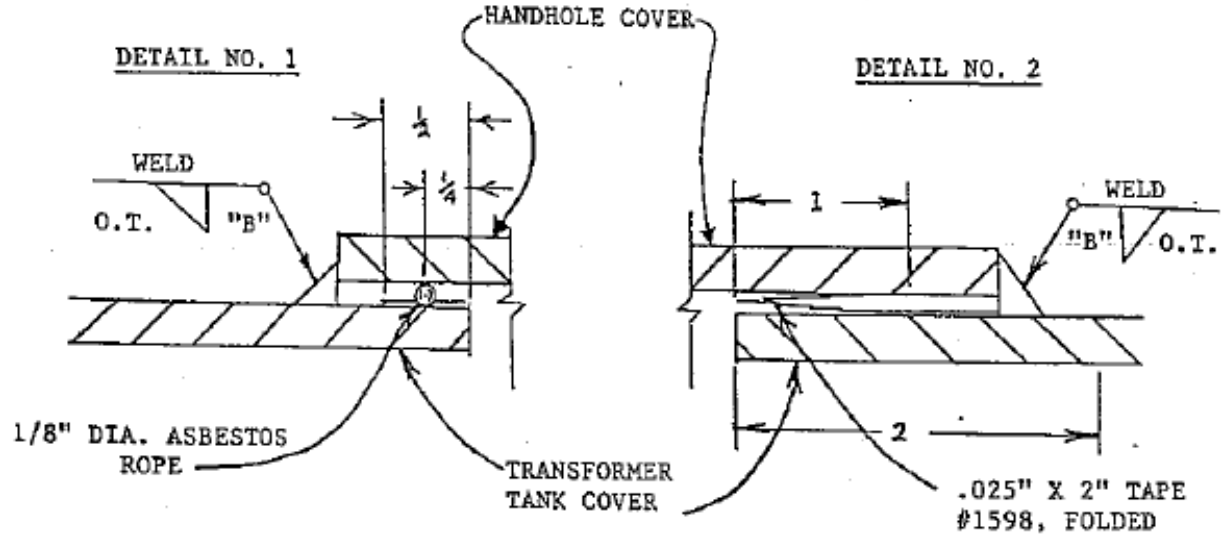
**Fax Number:** _____

**document # 3PHPAD.15.DOC**

We reserve the right to break up the award between several manufacturers. Example: 150 kVA units to manufacturer A, remaining units to manufacturer B.
We reserve the right to increase the quantity of any item when we make the purchase. Example: Instead of buying two of item 4, we might choose to buy six.

A

# ACCEPTABLE METHODS TO WELD HANDHOLE COVER TO TRANSFORMER TANK COVER




## NOTES FOR DETAIL NO. 1

1. APPLY A 1/2" WIDE COATING OF CEMENT TO THE TANK FLANGE.
2. PLACE THE GASKET (ASBESTOS ROPE) IN THE CENTER OF THE STRIP OF CEMENT.
3. PRESS HANDHOLE COVER FIRMLY AGAINST TANK COVER AND WELD.
4. BE SURE THERE IS NO OPEN SPACE NOT FILLED WITH GASKET MATERIAL.
5. HANDHOLE COVER MAY BE BOLTED IF GASKETED PROPERLY.

| WELD NOTE | |
|---|---|
| TOP TANK SECTION THICK-NESS | WELD SIZE "B" |
| 1/4 | 1/4 |
| 5/16 | 1/4 |
| 3/8 | 5/16 |
| 7/16 + 1/2 | 3/8 |

## NOTES FOR DETAIL NO. 2

1. BRUSH A 1½" WIDE COATING OF #7386 CEMENT ON THE FLANGE OF THE BOTTOM TANK SECTION 2" BACK FROM THE TANK EDGE.
2. FOLD THE 2" WIDE ASBESTOS TAPE ALONG ITS CENTER AND PLACE ON THE FRESHLY APPLIED CEMENT WITH THE TAPE EDGES OUTWARD.
3. PRESS HANDHOLE COVER FIRMLY AGAINST TANK COVER AND WELD.
4. BE SURE THERE IS NO OPEN SPACE NOT FILLED WITH GASKET MATERIAL.

| REV. | DATE | BY | CHKD. | APP. |
|---|---|---|---|---|
| | | | | |

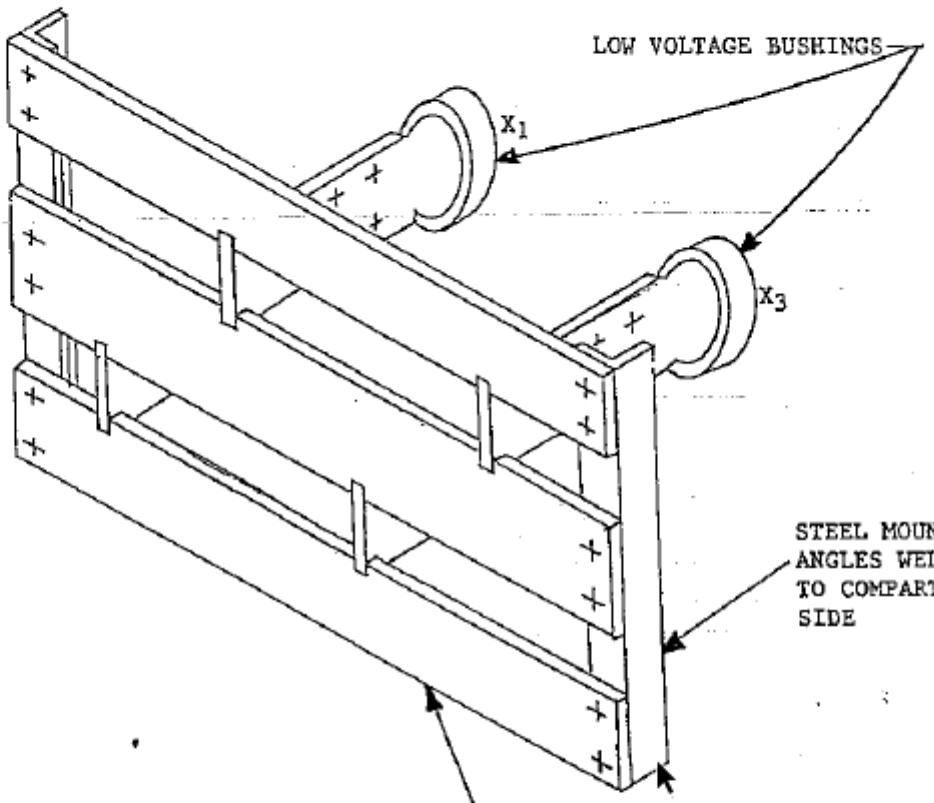
**OAK RIDGE ELECTRIC DEPT.**

SPECIFICATIONS

WELDING DETAILS FOR HANDHOLE COVER WELDED TO TRANSFORMER TANK COVER

SCALE: NTS
DRAWN:
TRACED: DPA
CHECKED:
SUBMITTED: David M Peters
APPROVED:
DATE: 1-29-90
SHEET 1 OF 1 SHTS.

A-XFMR-CVR




NOTE: BUSHING SUPPORTS ARE TO PREVENT DAMAGE TO BUSHINGS RESULTING FROM SHORT CIRCUIT FORCES (HORIZONTAL) BUT ALSO PROVIDE LIMITED VERTICAL SUPPORT

| REV. | DATE | BY | CHKD. | APP. |
|---|---|---|---|---|
| | | | | |

**OAK RIDGE ELECTRIC DEPT.**

SPECIFICATIONS

LOW VOLTAGE BUSHING SUPPORT FOR PAD-MOUNTED TRANSFORMER

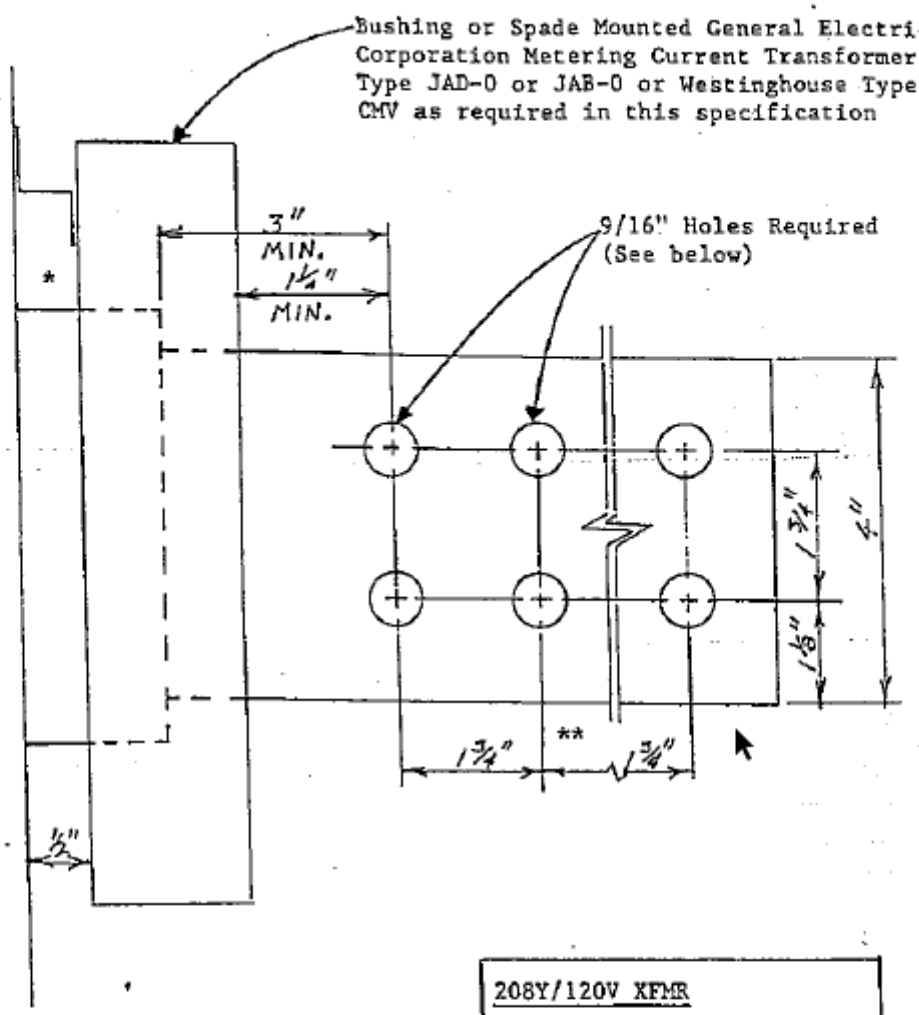
SCALE: NTS
DRAWN:
TRACED: DPA
CHECKED:

SUBMITTED: David M Peters
APPROVED:
EST. W. O.

DATE: 1-25-90
SHEET 1 OF 1 SHTS.

A-XFMR-LVBS

A




| 208Y/120V XFMR | |
|---|---|
| KVA Size | # of 9/16" Holes |
| 75-300 | 4 |
| 500-749 | 6 |
| 750-999 | 8+ |
| 1000- | 10+ |
| **480Y/277V XFMR** | |
| 75-500 | 4 |
| 750-1000 | 6 |
| 1500-2000 | 8+ |
| 2000-3000 | 10+ |

* Typical Current Transformer Support; other methods may be considered.

** In multiples of 1-3/4"

\+ These spades are to have special bracing. (See XFMR-LVBS)

**OAK RIDGE ELECTRIC DEPT.**

SPECIFICATIONS

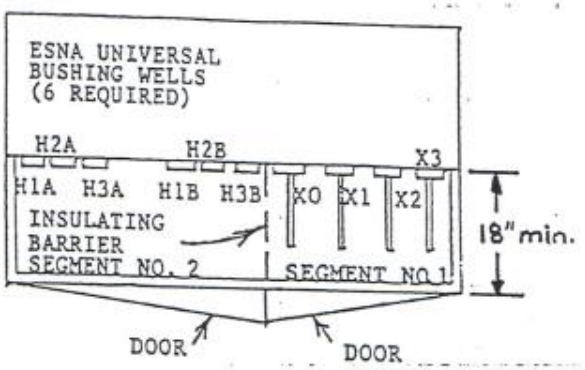
TRANSFORMER LOW VOLTAGE TERMINALS WITH CURRENT TRANSFORMER INSTALLED ON PHASE CONDUCTORS

| | | |
|---|---|---|
| SCALE: NTS | SUBMITTED: David M Peterson | DATE: 1-25-90 |
| DRAWN: | APPROVED: | SHEET 1 OF 1 SHT'S. |
| TRACED: DPAC | | A - XFMR-SPD |

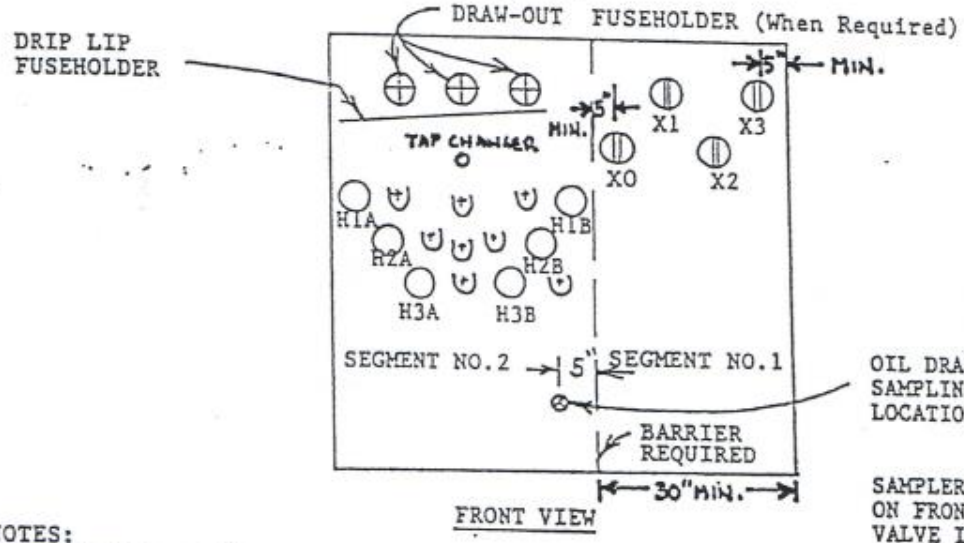
| DEV | DATE | BY | CHKD | APP. |
|---|---|---|---|---|

A-

DEAD FRONT




PLAN VIEW




FRONT VIEW

SAMPLER VALVE LOCATED ON FRONT END OF DRAIN VALVE INSTEAD OF SIDE.

NOTES:

1. SEE FIGURE #6(A), #7, and #8(a) OF ANSI STANDARD C57.12.26 FOR LOCATION OF HIGH VOLTAGE BUSHING WELLS AND PARKING STAND, LOW VOLTAGE BUSHINGS, ETC.
2. SEE APPROXIMATE LOCATION SHOWN FOR DRAW-OUT FUSES AND NEUTRAL BUSHING.
3. ANY ACCESSORY WHOSE POSITION IS NOT SPECIFICALLY SHOWN MAY BE PLACED AT ANY SAFE AND CONVENIENT LOCATION.

| REV. | DATE | BY | CHKD. | APP. |
|---|---|---|---|---|
| 02 | 12-17-01 | VS | VS | VS |
| 01 | 1-17-99 | BW | BW | BW |

OAK RIDGE ELECTRIC DEPT.

SPECIFICATIONS

LOOP-FEED PAD-MOUNTED COMPARTMENTAL, SELF COOLED, THREE PHASE DISTRIBUTION TRANSFORMERS 15 KV AND BELOW 75KVA TO 3000 KVA

SCALE: NTS
DRAWN:
TRACED: DPA
CHECKED:
SUBMITTED: David M Peter
APPROVED:
DATE: 1-30-90
SHEET 1 OF 1 SHTS.
A- XMFR-LF