

City of Tacoma, WA

Tacoma Power / Transmission and Distribution REQUEST FOR BIDS Distribution Transformers SPECIFICATION NO. PT22-0078F

100





City of Tacoma Tacoma Power / Transmission and Distribution

REQUEST FOR BIDS PT22-0078F DISTRIBUTION TRANSFORMERS

Submittal Deadline: 11:00 a.m., Pacific Time, Tuesday, March 22, 2022

Submittals must be received by the City's Procurement and Payables Division prior to 11:00 a.m. Pacific Time. For electronic submittals, the City of Tacoma will designate the time of receipt recorded by our email, <u>bids@cityoftacoma.org</u>, as the official time of receipt. This clock will be used as the official time of receipt of all parts of electronic bid submittals.

Submittal Delivery: Sealed submittals will be received as follows:

By Email:

bids@cityoftacoma.org Maximum file size: 35 MB. Multiple emails may be sent for each submittal.

Bid Opening: Held virtually each Tuesday at 11AM. Attend <u>via this link</u> or call 1 (253) 215 8782. Submittals in response to a **Choose an item**. will be recorded as received. As soon as possible, after 1:00 PM, on the day of submittal deadline, preliminary results will be posted to <u>www.TacomaPurchasing.org.</u>

Solicitation Documents: An electronic copy of the complete solicitation documents may be viewed and obtained by accessing the City of Tacoma Purchasing website at <u>www.TacomaPurchasing.org</u>.

- <u>Register for the Bid Holders List</u> to receive notices of addenda, questions and answers and related updates.
- Click here to see a list of vendors registered for this solicitation.

Pre-Proposal Meeting: A pre-proposal meeting will not be held.

Project Scope: One time supply of single phase pole mounted, single phase pad mounted, and three phase pad mounted distribution transformers.

Estimate: \$1,540,500

Paid Sick Leave: The City of Tacoma requires all employers to provide paid sick leave as set forth in Title 18 of the Tacoma Municipal Code. For more information, visit <u>our Minimum Employment Standards Paid Sick Leave webpage</u>.

Americans with Disabilities Act (ADA Information: The City of Tacoma, in accordance with Section 504 of the Rehabilitation Act (Section 504) and the Americans with Disabilities Act (ADA), commits to nondiscrimination on the basis of disability, in all of its programs and activities. Specification materials can be made available in an alternate format by emailing Gail Himes at <u>ghimes@cityoftacoma.org</u>, or by calling her collect at 253-591-5785.

Title VI Information:

"The City of Tacoma" in accordance with provisions of Title VI of the Civil Rights Act of 1964, (78 Stat. 252, 42 U.S.C. sections 2000d to 2000d-4) and the Regulations, hereby notifies all bidders that it will affirmatively ensure that in any contract entered into pursuant to this advertisement, disadvantaged business enterprises will be afforded full and fair opportunity to submit bids in response to this invitation and will not be discriminated against on the grounds of race, color, national origin in consideration of award.

Additional Information: Requests for information regarding the specifications may be obtained by contacting Tisha Rico, Senior Buyer by email to trico@cityoftacoma.org

Protest Policy: City of Tacoma <u>protest policy</u>, located at <u>www.tacomapurchasing.org</u>, specifies procedures for protests submitted prior to and after submittal deadline.



Meeting sites are accessible to persons with disabilities. Reasonable accommodations for persons with disabilities can be arranged with 48 hours advance notice by calling 253-502-8468.



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SUBMITTAL CHECKLIST

This checklist identifies items to be included with your submittal. Any submittal received without these required items may be deemed non-responsive and may not be considered for award. <u>Please do not include the entire specification document with your</u> <u>submittal.</u>

Submittals must be received by the City of Tacoma Purchasing Division by the date and time specified in the Request for Bids page at the front of this Specification or subsequent addenda. Respondents are encouraged to use recycled/recyclable products and both sides of paper for printed and photocopied materials, wherever possible.

The following items, in this order, make up your submittal package:							
1	One electronic copy of your complete submittal package in PDF format.						
	Signature Page with <u>signature</u> , including acknowledgement of any addenda.						
2	This form is intended to serve as the first page of your submittal after the Title Page. Do not alter it in any way or add it to letterhead paper or present cover letters or blank pages ahead of it.						
3	Proposal Sheets						
4	Supplemental Information - Section 1.09 Product Data Sheets and Drawings DOE Compliance Certification 						



SUBMITTAL INSTRUCTIONS

PRE-SUBMITTAL QUESTIONS

- A. Questions and requests for clarification of these Specifications may be submitted in writing by 3:00 p.m., Pacific Time, March 10, 2022, via email addressed to the Purchasing contact below. Questions received after this date and time may not be answered.
 - 1. Please indicate the specification number and title in the email subject line.
 - 2. Present your questions in MS Word format or directly in the body of the email message. If applicable, cross reference the specific section of the RFB.
 - 3. Questions will not be accepted by telephone or fax.
 - 4. Questions marked confidential will not be answered.
 - 5. Individual answers will not be provided directly to Respondents.
 - 6. The City reserves the discretion to group similar questions to provide a single answer or not to respond when the requested information is confidential.
 - 7. The City will not be responsible for unsuccessful submittal of questions.
- B. Written answers to all questions will be posted on the Purchasing website at <u>www.TacomaPurchasing.org</u> on or about March 15, 2022. Navigate to *Contracting Opportunities* / *Supplies*, and scroll to this RFB. A notice will not be posted with the Specification if no questions are received.
- C. The answers are not typically considered an addendum.
- D. To receive notice of the posted answers, you must register as "bid holder" for this solicitation.

Communication	Addressee
For all questions regarding Specification PT22-0078F	Tisha Rico Senior Buyer <u>trico@cityoftacoma.org</u> - email

REVISIONS TO SPECIFICATION

A. All revisions to this specification will be in the form of written addenda, and no oral revision should be relied upon for any purpose. In the event it becomes necessary to revise any part of this RFB, addenda will be issued to registered planholders and posted on the Purchasing website at <u>www.TacomaPurchasing.org</u>: Navigate to Current Contracting Opportunities / Supplies Solicitations, and scroll to this RFB. Failure to acknowledge addenda may result in a submittal being deemed non-responsive.

SIGNATURE PAGE

CITY OF TACOMA TACOMA POWER / TRANSMISSION AND DISTRIBUTION

All submittals must be in ink or typewritten, executed by a duly authorized officer or representative of the bidding/proposing entity, and received and time stamped as directed in the **Request for Bids page near the beginning of the specification**. If the bidder/proposer is a subsidiary or doing business on behalf of another entity, so state, and provide the firm name under which business is hereby transacted.

REQUEST FOR BIDS SPECIFICATION NO. PT22-0078F DISTRIBUTION TRANFORMERS

The undersigned bidder/proposer hereby agrees to execute the proposed contract and furnish all materials, labor, tools, equipment and all other facilities and services in accordance with these specifications.

The bidder/proposer agrees, by submitting a bid/proposal under these specifications, that in the event any litigation should arise concerning the submission of bids/proposals or the award of contract under this specification, Request for Bids, Request for Proposals or Request for Qualifications, the venue of such action or litigation shall be in the Superior Court of the State of Washington, in and for the County of Pierce.

Non-Collusion Declaration

The undersigned bidder/proposer hereby certifies under penalty of perjury that this bid/proposal is genuine and not a sham or collusive bid/proposal, or made in the interests or on behalf of any person or entity not herein named; and that said bidder/proposer has not directly or indirectly induced or solicited any contractor or supplier on the above work to put in a sham bid/proposal or any person or entity to refrain from submitting a bid/proposal; and that said bidder/proposer has not, in any manner, sought by collusion to secure to itself an advantage over any other contractor(s) or person(s).

Bidder/Proposer's Registered Name	Signature of Person Authorized to Enter Date into Contracts for Bidder/Proposer
Address	Printed Name and Title
City, State, Zip	(Area Code) Telephone Number / Fax Number
Authorized Signatory E-Mail Address	State Business License Number
E.I.No. / Federal Social Security Number Used on Quarterly Federal Tax Return, U.S. Treasury Dept. Form 941	in WA, also known as UBI (Unified Business Identifier) Number
	State Contractor's License Number (See Ch. 18.27, R.C.W.)
E-Mail Address for Communications	
ddendum acknowledgement #1	#2 #3 #4 #5

THIS PAGE MUST BE SIGNED AND RETURNED WITH SUBMITTAL.



PROPOSAL SHEET

NOTES:

- 1. All prices shall be submitted as F.O.B. Destination, freight prepaid and allowed (included in the unit price).
- 2. Respondents may bid on any combination of items. Partial bids will be accepted.
- 3. The City reserves the right to award to one or more Respondents, or make now award, in the best interest of the City.
- 4. Award may include a combination of items based on lead times, oil types, and optional item groups.
- 5. Determination as to acceptable equivalent items shall be at the City's sole discretion.

VENDOR INQUIRY

- Does your firm accept payment by EFT/ACH? _Y __N (Electronic Funds Transfer (EFT) by Automated Clearing House (ACH))
- Does your firm accept payment by credit card (Visa)? ___Y __N <u>NOTE</u>: The City of Tacoma will not accept price changes or pay additional fees when a credit card is used.
- 3. **Prompt Payment discount offered** ____%, ____ days. Only discounts offered of 20 days or more will be considered for bid evaluation purposes.



Group 1 – PROPOSAL PRICING SHEETS – Pole Mounted

LEAD TIME: 52 WEEKS OR LESS ARO

12470GrdY/7200 - 120/240 VOLT - 1 PHASE - 1 BUSHING

ltem	MID #	kVA	Estimated Quantity	Oil Type	Unit Price	Total Price FOB Destination (Quantity x Unit Price)
1	35775	25	100	МО	\$	\$
2	57013	25	100	FR3	\$	\$
3	35777	50	50	МО	\$	\$
4	57014	50	50	FR3	\$	\$
5	35778	75	6	МО	\$	\$
6	57015	75	3	FR3	\$	\$
				S	Sub-Total	\$

ltem	kVA	Height (in.)	Diameter (in.)	Weight Incl. Oil (Ib.)	Gallons of Oil	No- Load Loss (Watts) @ 20°C	Load Loss (Watts) @ 85°C	%Z	Represented Efficiency per DOE 10 CFR Part 431
1	25							%	%
2	25							%	%
3	50							%	%
4	50							%	%
5	75								
6	75								



<u>Group 1 – PROPOSAL PRICING SHEETS – Pole Mounted Mineral</u> <u>Oil Filled</u>

LEAD TIME: 52 WEEKS OR LESS ARO

7200/12470Y - 277 VOLT - 1 PHASE - 2 BUSHING

ltem	MID #	kVA	Estimated Quantity	Unit Price	Total Price FOB Destination (Quantity x Unit Price)
7	35799	25	3	\$	\$
				Sub-Total	\$

ltem	kVA	Height (in.)	Diameter (in.)	Weight Incl. Oil (Ib.)	Gallons of Oil	No- Load Loss (Watts) @ 20°C	Load Loss (Watts) @ 85°C	%Z	Represented Efficiency per DOE 10 CFR Part 431
7	25							%	%



Group 2 – PROPOSAL PRICING SHEETS – Pole Mounted

LEAD TIME: 53-78 WEEKS OR LESS ARO

12470GrdY/7200 - 120/240 VOLT - 1 PHASE - 1 BUSHING

ltem	MID #	kVA	Estimated Quantity	Oil Type	Unit Price	Total Price FOB Destination (Quantity x Unit Price)
8	35775	25	100	МО	\$	\$
9	57013	25	100	FR3	\$	\$
10	35777	50	50	МО	\$	\$
11	57014	50	50	FR3	\$	\$
12	35778	75	6	МО	\$	\$
13	57015	75	3	FR3	\$	\$
				S	Sub-Total	\$

ltem	kVA	Height (in.)	Diameter (in.)	Weight Incl. Oil (Ib.)	Gallons of Oil	No- Load Loss (Watts) @ 20°C	Load Loss (Watts) @ 85°C	%Z	Represented Efficiency per DOE 10 CFR Part 431
8	25							%	%
9	25							%	%
10	50							%	%
11	50							%	%
12	75								
13	75								



<u>Group 2 – PROPOSAL PRICING SHEETS – Pole Mounted Mineral</u> <u>Oil Filled</u>

LEAD TIME: 53-78 WEEKS OR LESS ARO

7200/12470Y - 277 VOLT - 1 PHASE - 2 BUSHING

ltem	MID #	kVA	Estimated Quantity	Unit Price	Total Price FOB Destination (Quantity x Unit Price)
14	35799	25	3	\$	\$
				Sub-Total	\$

ltem	kVA	Height (in.)	Diameter (in.)	Weight Incl. Oil (Ib.)	Gallons of Oil	No- Load Loss (Watts) @ 20°C	Load Loss (Watts) @ 85°C	%Z	Represented Efficiency per DOE 10 CFR Part 431
14	25							%	%



Optional Group 1 – PROPOSAL PRICING SHEETS – Pole Mounted (REFURBISHED)

LEAD TIME: 52 WEEKS OR LESS ARO

12470GrdY/7200 - 120/240 VOLT - 1 PHASE - 1 BUSHING

ltem	MID #	kVA	Estimated Quantity	Oil Type	Unit Price	Total Price FOB Destination (Quantity x Unit Price)
15	35775	25	100	МО	\$	\$
16	57013	25	100	FR3	\$	\$
17	35777	50	50	МО	\$	\$
18	57014	50	50	FR3	\$	\$
19	35778	75	6	МО	\$	\$
20	57015	75	3	FR3	\$	\$
				S	Sub-Total	\$

ltem	kVA	Height (in.)	Diameter (in.)	Weight Incl. Oil (Ib.)	Gallons of Oil	No- Load Loss (Watts) @ 20°C	Load Loss (Watts) @ 85°C	%Z	Represented Efficiency per DOE 10 CFR Part 431
15	25							%	%
16	25							%	%
17	50							%	%
18	50							%	%
19	75								
20	75								



Optional Group 1 – PROPOSAL PRICING SHEETS – Pole Mounted Mineral Oil Filled (REFURBISHED)

LEAD TIME: 52 WEEKS OR LESS ARO

7200/12470Y - 277 VOLT - 1 PHASE - 2 BUSHING

Item	MID #	kVA	Estimated Quantity	Unit Price	Total Price FOB Destination (Quantity x Unit Price)
21	35799	25	3	\$	\$
				Sub-Total	\$

ltem	kVA	Height (in.)	Diameter (in.)	Weight Incl. Oil (Ib.)	Gallons of Oil	No- Load Loss (Watts) @ 20°C	Load Loss (Watts) @ 85°C	%Z	Represented Efficiency per DOE 10 CFR Part 431
21	25							%	%



PROPOSAL PRICING - SUMMARY SHEET 1PH POLE MOUNTED

	Mineral Oil Units										
ltem No.	Description	Delivery Time (in weeks)	Sub-Totals								
1-7	Group 1 - 12470GrdY/7200 - 120/240 VOLT - 1 PHASE - 1 BUSHING (52 weeks or less ARO)	Wks	\$								
8-14	Group 2 - 12470GrdY/7200 - 120/240 VOLT - 1 PHASE - 1 BUSHING (53- 78 weeks or less ARO)	Wks	\$								
15-21	Optional Group 1 - 12470GrdY/7200 - 120/240 VOLT - 1 PHASE - 1 BUSHING (Refurbished – 52 weeks or less ARO)	Wks	\$								
		Sub-Total	\$								



Group 3 – PROPOSAL PRICING SHEETS – 1PH Pad Mounted

LEAD TIME: 52 WEEKS OR LESS ARO

12470GrdY/7200 - 120/240 VOLT - 1 PHASE - 2 BUSHINGS

ltem	MID #	kVA	Estimated Quantity	Oil Type	Unit Price	Total Price FOB Destination (Quantity x Unit Price)
22	35673	50	75	МО	\$	\$
23	40982	50	75	FR3	\$	\$
24	35675	100	5	МО	\$	\$
25	40983	100	5	FR3	\$	\$
26	35676	167	8	МО	\$	\$
27	40984	167	8	FR3	\$	\$
				S	Sub-Total	\$

tem	kVA	Weight Incl. Oil (Ib.)	Gallons of Oil	No- Load Loss (Watts) @ 20°C	Load Loss (Watts) @ 85°C	%Z	Represented Efficiency per DOE 10 CFR Part 431
22	50					%	%
23	50					%	%
24	100					%	%
25	100					%	%
26	167					%	%
27	167					%	%



Group 4 – PROPOSAL PRICING SHEETS – 1PH Pad Mounted

LEAD TIME: 53-78 WEEKS OR LESS ARO

12470GrdY/7200 - 120/240 VOLT - 1 PHASE - 2 BUSHINGS

ltem	MID #	kVA	Estimated Quantity	Oil Type	Unit Price	Total Price FOB Destination (Quantity x Unit Price)
28	35673	50	75	МО	\$	\$
29	40982	50	75	FR3	\$	\$
30	35675	100	5	МО	\$	\$
31	40983	100	5	FR3	\$	\$
32	35676	167	8	МО	\$	\$
33	40984	167	8	FR3	\$	\$
		\$				

tem	kVA	Weight Incl. Oil (Ib.)	Gallons of Oil	No- Load Loss (Watts) @ 20°C	Load Loss (Watts) @ 85°C	%Z	Represented Efficiency per DOE 10 CFR Part 431
28	50					%	%
29	50					%	%
30	100					%	%
31	100					%	%
32	167					%	%
33	167					%	%



Optional Group 2 – PROPOSAL PRICING SHEETS – 1PH Pad Mounted (REFURBISHED)

LEAD TIME: 52 WEEKS OR LESS ARO

12470GrdY/7200 - 120/240 VOLT - 1 PHASE - 2 BUSHINGS

ltem	MID #	kVA	Estimated Quantity	Oil Type	Unit Price	Total Price FOB Destination (Quantity x Unit Price)
34	35673	50	75	МО	\$	\$
35	40982	50	75	FR3	\$	\$
36	35675	100	5	МО	\$	\$
37	40983	100	5	FR3	\$	\$
38	35676	167	8	МО	\$	\$
39	40984	167	8	FR3	\$	\$
				S	Sub-Total	\$

tem	kVA	Weight Incl. Oil (Ib.)	Gallons of Oil	No- Load Loss (Watts) @ 20°C	Load Loss (Watts) @ 85°C	%Z	Represented Efficiency per DOE 10 CFR Part 431
34	50					%	%
35	50					%	%
36	100					%	%
37	100					%	%
38	167					%	%
39	167					%	%



PROPOSAL PRICING - SUMMARY SHEET 1PH PAD MOUNTED

	Mineral Oil Units									
ltem No.	Description	Delivery Time (in weeks)	Sub-Totals							
22-27	Group 3 - 12470GrdY/7200 – 120/240 VOLT – 1 PHASE – 2 BUSHINGS (52 weeks or less ARO)	Wks	\$							
28-33	Group 4 - 12470GrdY/7200 – 120/240 VOLT – 1 PHASE – 2 BUSHINGS (53-78 weeks or less ARO)	Wks	\$							
34-39	Group 4 - 12470GrdY/7200 – 120/240 VOLT – 1 PHASE – 2 BUSHINGS (Refurbished – 52 weeks or less ARO)	Wks	\$							
		Sub-Total	\$							



Group 5 – PROPOSAL PRICING SHEETS – 3PH Pad Mounted

LEAD TIME: 52 WEEKS OR LESS ARO

12470GrdY/7200 - 208Y/120 VOLT - WITH TAPS AND LBOR SWITCH

Item	MID #	kVA	Estimated Quantity	Unit Price	Extended Price (Quantity x Unit Price)
40	35690	150	8	\$	\$
41	35693	500	10	\$	\$
42	35695	1000	8	\$	\$
				Sub-Total	\$

Item	kVA	Weight Incl. Oil (lb.)	Gallons of Oil	No-Load Loss (Watts) @ 20°C	Load Loss (Watts) @ 85ºC	%Z	Represented Efficiency per DOE 10 CFR Part 431
40	150					%	
41	500					%	
42	1000					%	



Group 5 – PROPOSAL PRICING SHEETS – 3PH Pad Mounted

LEAD TIME: 52 WEEKS OR LESS ARO

12470GrdY/7200 - 480Y/277 VOLT - WITH TAPS AND LBOR SWITCH

Item	MID #	kVA	Estimated Quantity	Unit Price	Extended Price (Quantity x Unit Price)
43	35703	300	3	\$	\$
44	35704	500	6	\$	\$
45	35706	1000	3	\$	\$
46	35707	1500	5	\$	\$
47	35708	2000	2	\$	\$
48	35709	2500	3	\$	\$
				Sub-Total	\$

Item	kVA	Weight Incl. Oil (lb.)	Gallons of Oil	No-Load Loss (Watts) @ 20°C	Load Loss (Watts) @ 85°C	%Z	Represented Efficiency per DOE 10 CFR Part 431
43	300					%	
44	500					%	
45	1000					%	
46	1500					%	
47	2000					%	
48	2500					%	



Group 5 – PROPOSAL PRICING SHEETS – 3PH Pad Mounted

LEAD TIME: 52 WEEKS OR LESS ARO

$13800\Delta - 480Y/277$ VOLT – WITH TAPS AND LBOR SWITCH

Item	MID #	kVA	Estimated Quantity	Unit Price	Extended Price (Quantity x Unit Price)
49	35732	500	2	\$	\$
50	35735	1500	1	\$	\$
				Sub-Total	\$

Item	kVA	Weight Incl. Oil (lb.)	Gallons of Oil	No-Load Loss (Watts) @ 20°C	Load Loss (Watts) @ 85°C	%Z	Represented Efficiency per DOE 10 CFR Part 431
49	500					%	
50	1500					%	



Group 6 – PROPOSAL PRICING SHEETS – 3PH Pad Mounted

LEAD TIME: 53-78 WEEKS OR LESS ARO

12470GrdY/7200 - 208Y/120 VOLT - WITH TAPS AND LBOR SWITCH

Item	MID #	kVA	Estimated Quantity Unit Price		Extended Price (Quantity x Unit Price)
51	35690	150	8	\$	\$
52	35693	500	10	\$	\$
53	35695	1000	8	\$	\$
				Sub-Total	\$

Item	kVA	Weight Incl. Oil (lb.)	Gallons of Oil	No-Load Loss (Watts) @ 20°C	Load Loss (Watts) @ 85°C	%Z	Represented Efficiency per DOE 10 CFR Part 431
51	150					%	
52	500					%	
53	1000					%	



Group 6 – PROPOSAL PRICING SHEETS – 3PH Pad Mounted

LEAD TIME: 53-78 WEEKS OR LESS ARO

12470GrdY/7200 - 480Y/277 VOLT - WITH TAPS AND LBOR SWITCH

Item	MID #	kVA	Estimated Quantity	Unit Price	Extended Price (Quantity x Unit Price)
54	35703	300	3	\$	\$
55	35704	500	6	\$	\$
56	35706	1000	3	\$	\$
57	35707	1500	5	\$	\$
58	35708	2000	2	\$	\$
59	35709	2500	3	\$	\$
				Sub-Total	\$

Item	kVA	Weight Incl. Oil (lb.)	Gallons of Oil	No-Load Loss (Watts) @ 20°C	Load Loss (Watts) @ 85ºC	%Z	Represented Efficiency per DOE 10 CFR Part 431
54	300					%	
55	500					%	
56	1000					%	
57	1500					%	
58	2000					%	
59	2500					%	



Group 6 – PROPOSAL PRICING SHEETS – 3PH Pad Mounted

LEAD TIME: 53-78 WEEKS OR LESS ARO

$13800\Delta - 480Y/277$ VOLT – WITH TAPS AND LBOR SWITCH

Item	MID #	kVA	Estimated Quantity Unit Price		Extended Price (Quantity x Unit Price)
60	35732	500	2	\$	\$
61	35735	1500	1	\$	\$
				Sub-Total	\$

Item	kVA	Weight Incl. Oil (lb.)	Gallons of Oil	No-Load Loss (Watts) @ 20°C	Load Loss (Watts) @ 85°C	%Z	Represented Efficiency per DOE 10 CFR Part 431
60	500					%	
61	1500					%	



Optional Group 3 – PROPOSAL PRICING SHEETS – 3PH Pad Mounted (REFURBISHED)

LEAD TIME: 52 WEEKS OR LESS ARO

12470GrdY/7200 - 208Y/120 VOLT - WITH TAPS AND LBOR SWITCH

Item	MID #	kVA	Estimated Quantity Unit Price		Extended Price (Quantity x Unit Price)
62	35690	150	8	\$	\$
63	35693	500	10	\$	\$
64	35695	1000	8	\$	\$
				Sub-Total	\$

Item	kVA	Weight Incl. Oil (lb.)	Gallons of Oil	No-Load Loss (Watts) @ 20°C	Load Loss (Watts) @ 85°C	%Z	Represented Efficiency per DOE 10 CFR Part 431
62	150					%	
63	500					%	
64	1000					%	



Optional Group 3 – PROPOSAL PRICING SHEETS – 3PH Pad Mounted (REFURBISHED)

LEAD TIME: 52 WEEKS OR LESS ARO

12470GrdY/7200 - 480Y/277 VOLT - WITH TAPS AND LBOR SWITCH

Item	MID #	kVA	Estimated Quantity	Unit Price	Extended Price (Quantity x Unit Price)
65	35703	300	3	\$	\$
66	35704	500	6	\$	\$
67	35706	1000	3	\$	\$
68	35707	1500	5	\$	\$
69	35708	2000	2	\$	\$
70	35709	2500	3	\$	\$
				Sub-Total	\$

Item	kVA	Weight Incl. Oil (lb.)	Gallons of Oil	No-Load Loss (Watts) @ 20°C	Load Loss (Watts) @ 85ºC	%Z	Represented Efficiency per DOE 10 CFR Part 431
65	300					%	
66	500					%	
67	1000					%	
68	1500					%	
69	2000					%	
70	2500					%	



Optional Group 3 – PROPOSAL PRICING SHEETS – 3PH Pad Mounted (REFURBISHED)

LEAD TIME: 52 WEEKS OR LESS ARO

$13800\Delta - 480Y/277$ VOLT – WITH TAPS AND LBOR SWITCH

Item	MID #	kVA	Estimated Quantity	Unit Price	Extended Price (Quantity x Unit Price)
71	35732	500	2	\$	\$
72	35735	1500	1	\$	\$
				Sub-Total	\$

Item	kVA	Weight Incl. Oil (lb.)	Gallons of Oil	No-Load Loss (Watts) @ 20°C	Load Loss (Watts) @ 85°C	%Z	Represented Efficiency per DOE 10 CFR Part 431
71	500					%	
72	1500					%	



PROPOSAL PRICING - SUMMARY SHEET 3PH PAD MOUNTED

Mineral Oil Units						
ltem No.	Description	Delivery Time (in weeks)	Sub-Totals			
40-50	Group 5 – 3PH Pad Mounted (52 weeks or less)	Wks	\$			
51-61	Group 6 – 3PH Pad Mounted (53-78 weeks or less)	Wks	\$			
62-72	Optional Group 3 – 3PH Pad Mounted (Refurbished – 52 weeks or less)	Wks	\$			
		Sub-Total	\$			



PROPOSAL PRICING - TOTAL SHEET

Sub-Total for 1PH Pole Mounted (from summary sheet)	\$`
Sub-Total for 1PH Pad Mounted (from summary sheet)	\$
Sub-Total for 3PH Pad Mounted (from summary sheet)	
TO BE READ @ BID OPENING: Sub-Total for Proposal	\$
Sales Tax @ 10.3%, Location Tax Collected: Tacoma, WA (Note Paragraph 1.41 of Standard Terms and Conditions)	\$
Total for All Items with Tax	\$
PROPOSAL CONDITIONS SHEET

The City requires that Respondents determine the cost of compliance with the City's terms and conditions, and include such costs into the unit prices of the items in the Respondent's submittal. Unless a bid responds to the specification in all material respects, it is not a responsive bid. Acknowledge each question with a checkmark ☑ to indicate your response.

- 1. Does your submittal make any restrictions or take any exceptions to the conditions or provisions outlined in this Specification?
- 2. Do all items submitted per this Specification meet and/or exceed the requirements of the Technical Provisions?
- Indicate the Department of Energy methodology used to certify compliance with the efficiency standards for liquid-filled distribution transformers 10 CFR Part 431.

YES NO

YES	
NO	

Testing	
AEDM	





PROPOSAL - REFERENCES DATA SHEET

(AS DESCRIBED IN SECTION 1.01.3A)

Three (3) Utility references are the absolute minimum allowed

UTILITY NAME AND ADDRESS	YEAR PRODUCT SOLD	CONTACT NAME	TELEPHONE NUMBER

SUB-VENDOR DATA SHEET

(AS DESCRIBED IN SECTION 1.01.4)

SUB-VENDOR NAME AND ADDRESS	CONTACT NAME	TELEPHONE NUMBER	DESCRIPTION OF WORK PROVIDED



SECTION I – SPECIAL PROVISIONS

1.01 - SCOPE OF BID

<u>1.01.1 - PURPOSE</u>

The purpose of these Specifications is to define the scope of supply for Distribution Transformers that meet the minimum requirements as to quality, function, and capacity as outlined in the Special and Technical Provisions that follow.

1.01.2 - DEFINITIONS

For the purposes of this Specification, the following definitions shall apply:

Term	Definition	
RESPONDENT	A potential Supplier offering a submittal to supply equipment in accordance with these Specifications.	
SPECIFICATION	This document, detailing the scope of supply.	
SUPPLIER/CONTRACTOR	The Respondent(s) awarded a contract pursuant to these Specifications.	
SUB-VENDOR	Any Supplier providing parts, materials, and/or services to the Supplier under these Specifications.	
EQUIPMENT/ MATERIAL	A fully functional piece of equipment/material supplied and tested in accordance with these Specifications.	
MANUFACTURER	The original manufacturer of the equipment/material.	
ENGINEER	The project engineer and/or contract administrator.	
CITY	The City of Tacoma, Tacoma Power.	
DELIVERY TIME	The length of time starting at the date of Supplier receipt of a purchase order or notice to proceed and ending at the time that the item(s) are received at Tacoma Power.	



1.01.3 - QUALIFICATIONS

To further detail the requirements of Section 1.20.A.1 of the City Standard Terms and Conditions, only submittals which offer products from manufacturers experienced in the supply of materials as detailed within this Specification over a period of *five (5) years* or more will be considered responsive. A responsive submittal will demonstrate a record of successful completion of contracts similar in scope and size to that outlined in this Specification. The City shall be the sole judge of the Respondent's ability to meet the requirements of this paragraph.

1.01.3A - REFERENCES

Each Respondent shall complete the "References Data Sheet" as required in the proposal section. A minimum of three (3) references over the past five (5) years is required.

1.01.3A.1 - CHANGE OF OWNERSHIP

References are intended to be for material/equipment currently supplied under the proposed manufacturer's name. References for material/equipment that has been previously supplied under a different Company's name shall be clearly noted on the reference list.

1.01.3A.2 - DEFINITION OF REFERENCED UTILITIES

The Respondent shall list as references, only those utilities that have purchased material/equipment as the Respondent proposes to offer to the City, from these Specifications.

<u>1.01.3B - RESPONDENTS ORIGINATING FROM OUTSIDE THE UNITED</u> STATES

Respondents that originate bids from outside the legal jurisdiction of the United States of America will be subject to the City of Tacoma's Legal Department opinion as to the viability of possible litigation pursuant to a supply contract resulting from this Specification. If it is the opinion of the City of Tacoma's Legal Department that any possible litigation would be beyond reasonable cost and/or enforcement the bid may be excluded from evaluation.

1.01.4 - SUB-VENDORS

The Respondent shall list, on the form provided, all sub-vendors it intends to use to fulfill requirements in any part of this Specification. Included in the listing shall be the sub-vendor's name, address, and telephone number; contact name; and description of work they will perform. It shall be the responsibility of the awarded Supplier to police, enforce, and ensure that all work performed by any sub-vendor shall be in accordance with this Specification.

1.02 - CONTACT PERSON

1.02.1 - BID INQUIRIES

Respondent inquiries pertaining to this Specification shall be submitted as directed on the Submittal Instructions Page.

1.03 - PREBID CONFERENCE

A pre-bid conference shall not be required for the acquisition of the material contained in this Specification.

1.04 - POST-AWARD MEETING

A post-award meeting is not scheduled for this bid.



1.05 - CONTRACT

1.05.1 - CONTRACT PERIOD

The contract is intended for a one-time purchase of all items.

1.06 - PRICING AND PURCHASE ORDERS

1.06.1 - PRICES QUOTED

The prices quoted on the Proposal Pricing Sheets shall remain open for acceptance by the City for a minimum of **30** days from the submittal deadline.

1.06.2 - FREIGHT ALLOWANCES

The Respondent shall provide prices including delivery F.O.B. Destination, Pre-Paid and Allowed (included in unit price), as noted on the Proposal Pricing Sheets.

1.06.3 - QUANTITIES AND PURCHASE ORDERS

The quantities listed on the Proposal Pricing Sheets are the City's desired quantities for a onetime purchase. The purchase order will be delivered to the Supplier by email.

1.06.3A - WORKING DAYS

Working days are weekly Monday through Friday. City observed holidays as listed in City Standard Terms and Conditions Section 1.24 would not be included.

1.07 - PERFORMANCE BOND/BID BOND

The Performance and Bid Bonds have been waived for this contract.

1.08 - RESPONDENT'S PROPOSAL

1.08.1 - RESPONDENT REQUIREMENTS

Submittals must be emailed with the Specification number, Specification title, and Respondent name in the subject line, and received by the City of Tacoma Purchasing Division by the date and time specified in the Request for Bids page or subsequent addenda.

The bid package submitted must be returned with the Respondent's proposal filled in as directed, including all data requested by the Provisions of these Specifications. All blank spaces on the Proposal forms will be properly filled in, printed in ink or typewritten.

1.08.1A - SIGNATURE PAGE

The "Signature Page" included with the original submittal shall be **signed in INK** by the responsible company official and include printed or typewritten designation of the office they hold in the company.

1.08.1B - PROPOSAL SHEET DATA REQUIREMENTS

The Proposal Pricing Sheets request the following information to be included with the Respondent's submittal. Submittals that do not include the requested information may be considered non-responsive.



Required Values	Specific Requirement
Height (in.)	The height of a typical unit in inches
Diameter (in.)	The diameter of a typical unit in inches, if applicable
Weight Including Oil (lbs)	The weight of a typical unit in pounds.
Oil Capacity (gal.)	The quantity of oil in a typical unit in gallons.
No-Load Loss (watts)	The maximum guaranteed no-load losses in watts per IEEE C57.12.00 and C57.12.90.
Load Loss (watts)	The maximum guaranteed load losses in watts per IEEE C57.12.00 and C57.12.90.
Impedance	Measured at 85°C per IEEE C57.12.00.
Represented Efficiency	The represented transformer efficiency certified by the manufacturer per DOE 10 CFR Part 431

1.08.2 - ALTERNATE BIDS

All bids including alternates shall include an original Signature Page. Each bid package submitted must be returned with the Respondent's proposal completed as directed, including all data requested.

1.08.2A - ALTERNATE BID PROPOSALS

Alternate bid proposals must be submitted as a separate bid package and identified as **"ALTERNATE**".

1.08.2B - ALTERNATE MATERIALS

Complete data must be submitted with the bid, including the information as requested in Section 1.11.1A "Required Materials". The data shall demonstrate that the alternative item is of a quality equal to or better than that specified and has the required characteristics for the intended use. Failure to submit such data will render the bid **non-responsive**.

1.08.2C - ALTERNATE EVALUATION

Upon request, the Respondent shall furnish to the City, within five (5) working days, additional information relating to such alternative items as the City may require. In the event that the equivalency is not readily ascertained from the information supplied by the Respondent, the City may test the material/equipment or have it tested. The Respondent shall bear all expenses of the City's determination of whether or not alternative equipment, materials, or processes are equal to those designated.

1.08.3 - ENGLISH LANGUAGE REQUIREMENTS

All drawings, correspondence, catalogs, submittals, nameplates, etc., shall be in the English language as used in the U.S. Dimensions and tolerances shall conform to ANSI Y14.5M and shall be in the U.S. customary units. If units are fabricated utilizing SI units (metric system), both units shall be shown on the drawings, nameplate, etc. U.S. units shall be shown above the SI units. Conversion tolerances shall have a maximum tolerance of 1/32-inch (2.70 mm) and/or one ounce (28.4 grams).



1.08.4 - COSTS TO PREPARE SUBMITTAL

The City is not liable for any costs incurred by the Respondent for the preparation of materials or a proposal submitted in response to this RFB, conducting presentations to the City, or any other activities related to responding to this RFB.

1.09 - ITEMS TO BE INCLUDED WITH BID

1.09.1 - PRODUCT DATA SHEET AND DRAWINGS

The Respondent shall include <u>with</u> their submittal manufacturer product data sheets (cut sheets) and drawings of the transformers to be supplied. Drawings shall include overall dimensions, bushings and ground connections. Drawings will be accepted for bid evaluation purposes that do not contain extensive details of construction.

1.09.1A - CERTIFIED DRAWINGS

Following evaluation of the bid submittals and prior to final approval of a contract, the firm(s) identified for award will be required to provide certified manufacturer drawings consistent with the Technical Provisions of this Specification. A detailed one-page drawing of each unit (MID #) shall be submitted. The drawings shall include the following;

- Tacoma Power MID #
- Primary and Secondary Voltages
- kVA
- Dimensions
- Weights
- Insulating Fluid
- Standard features (especially Tacoma Power requirements not included in the IEEE Standards, etc.)

Pad mounted transformer drawings shall include the following;

- Bushing Well
- Pressure Relief Valve
- Nitrogen Valve
- Ground Provisions

Information furnished **shall be sufficient in detail and clarity** to enable making a complete and positive check with the requirements listed in this Specification. Approval of a certified drawing by Tacoma Power does not relieve the manufacturer of any requirements of this Specification, unless previously documented by written agreement. Regardless of the content of the drawings the manufacturer is required to supply transformers to Tacoma Power meeting the Technical Provisions of this Specification or be subject to rejection per Section 1.19.1.

1.09.2 - DOE COMPLIANCE CERTIFICATION

Respondents shall provide a copy of their latest on-line compliance certification done through the U.S. Department of Energy's on-line Compliance Certification Management System (CCMS).

1.10 - SAFETY AND STANDARDS

The Items supplied shall meet appropriate ANSI, OSHA, WISHA, and all federal, state, and local standards for its intended use. Refer to the Technical Provisions for specific industry standards that apply to the Specifications of this bid.



1.11 - APPROVED EQUAL

The term "approved equal" shall mean that the quality and characteristics of equipment or materials intended for use must be equal to the listed items.

1.11.1 - DETERMINATION OF EQUALITY

The City or its designee will determine the suitability, reliability, and serviceability of a proposed substitute. Refer to Section 1.33 of the City Terms and Conditions.

1.11.1A - REQUIRED MATERIALS

To be considered by the City, the request for substitution shall be accompanied with the complete physical data, technical data, certified test results, manufacturer's catalog data, photographs, user's lists, and failure data. Any other information, as required by the Engineer, shall be promptly provided upon request. The City shall be the sole arbiter in the determination of equality.

1.12 - EVALUATION & AWARD

Respondents are to provide unit or lump sum pricing for each line item, which will be summed for a subtotal price. Subtotals will be compared amongst each Respondent, including any offered payment discount terms of 20 days or more.

1.12.1 - AWARD OF CONTRACT

The Contract will be awarded to the lowest responsible Respondent(s) delivering a responsive submittal in compliance with these Specifications, provided such submittal is reasonable and it is in the best interests of the City to accept. The City, however, reserves the right to reject any and all bids and to waive any informalities in bids received. The award of this contract will not be based on cost alone, as other factors will be considered in the evaluation criteria

1.12.1B - OTHER ELEMENTS

The City may also take into consideration other criteria for determining award. Other elements or factors, whether or not specifically provided for in this Specification, which would affect the final cost to and the benefits to be derived by the City, may be considered in determining the award of the contract. The final award decision will be based on the best interests of the City.

1.13 - DELIVERY DATE

Respondents must guarantee delivery times as stated on their Proposal Pricing Summary Sheet.

1.13.1 - NOTIFICATION

Notification to deliver product will be by the issuance of a City of Tacoma purchase order (per Section 1.06.3) for the materials described in this Specification.

1.13.1A - DELAYS BEYOND THE CONTROL OF THE SUPPLIER

Delays caused by problems beyond the control of the Supplier, if fully documented and submitted to the city, may be excused. This allowance shall in no way be construed to apply to or excuse delays caused by negligence on the part of the Supplier. (For additional information, refer to the Force Majeure portion below.

1.13.2 - FORCE MAJEURE

Unavoidable delays in the prosecution of the work shall include only delays from causes beyond the control of the Supplier and which he/she could not have avoided by the exercise of due care, prudence, foresight and diligence.



The Supplier shall not, be responsible for delays in delivery due to acts beyond his/her or manufacturer's reasonable control, or due to act of god, fire, strikes, epidemics, war, riot, unavoidable delay in transportation or rail car/transport shortages, or documented unavoidable material shortages, provided the City is notified in writing by the Supplier of such pending or actual delay and the reasons therefore. If deemed excusable, the City shall authorize an extension of time. In the event of such an excusable delay, the date of delivery shall be extended for a period equal to the time lost due to the reason for delay. Any damage assessment or extensions of time are to be authorized by written purchase order changes issued by the City of Tacoma.

1.13.2A - TERMINATION OF PURCHASE ORDER RELEASE(S)

If the delay will extend beyond 10 working days, the City may exercise the right to terminate any and all purchase order releases that are affected by the delay and obtain the items required materials from other sources.

1.13.2B - TERMINATION OF CONTRACT

If the delay will extend beyond 60 working days the City may exercise the right to terminate the contract and obtain the items required from other sources.

1.13.2C - DUE DILIGENCE

It shall be the responsibility of the Supplier to supply the City with adequate documentation to demonstrate that the Supplier exercised due diligence in endeavoring to avoid the delay.

1.14 - PACKING AND SHIPPING

The Supplier shall be responsible for industry standard packing that conforms to the requirements of the carrier's tariffs and the ICC regulations.

1.14.1 - PACKING REQUIREMENTS

The material/equipment must be clearly marked as to lot number, destination, address, and purchase order number.

1.14.1A - PALLETS

All transformers will be delivered using one (1) pallet per transformer. **DO NOT STACK or Ship on Racks.**

Pallets shall be designed for movement by pallet jack or forklift with a minimum of 3 rails @ $3 \frac{1}{2}$ " inches of vertical clearance for forks.

1.14.1A.1 - ATTACHMENT TO PALLETS

Each transformer shall be bolted to the pallet or banded to the pallet by the lifting lugs. If banding is used, nonmetallic banding material is preferred to protect the painted surfaces of the lifting lugs. If metal banding is used, nonmetallic inserts shall be used to isolate the banding material from the painted surface.

1.14.1B - BAR CODING

A bar code label shall be provided with each transformer that meets the requirements of IEEE Standard C57.12.35.

1.14.1C - TRANSFORMER TRANSPORT & CONDITION

Transformers shall be shipped in a condition that will guard against paint damage and prevent the necessity for make-ready work or cleaning prior to testing and acceptance.



1.15 - DELIVERY

Notice of Shipment is required and shall be received by the City at least 10 working days prior to delivery.

1.15.1 - TRANSFORMER DELIVERY LOCATION

The shipper shall notify the Tacoma Power Transformer Shop Supervisor, to obtain final delivery information, a maximum of 72 hours and a minimum of 12 hours, prior to delivery.

The completed transformers shall be delivered F.O.B. between 9:00 a.m. and 3:00 p.m., Monday through Friday excluding City observed holidays (refer to section 1.24 of the Standard Terms and Conditions)	Tacoma Power T&D Transformer Shop 3628 South 35th Street (rear) Tacoma, Washington 98409 Attention: Transformer Shop
Phone Number	253-502-8671

1.15.2 - SHIPPING NOTICES

Shipping notices shall be emailed to:	
Shipping Notices shall include City of Tacoma Purchase Order Number.	TransformerDesk@cityoftacoma.org

1.16 - DOCUMENTATION REQUIRED FOR DELIVERY OF EQUIPMENT

The successful Respondent will furnish a data report for each Tacoma Power transformer. The data shall be submitted to the Tacoma Power contract manager prior to or at the time of shipment from the factory.

1.16.1 - TEST PROCEDURES

All units supplied shall be tested per the routine production tests for liquid filled distribution transformers, including no-load and load losses, as defined in IEEE C57.12.00 and IEEE C57.12.90, latest revisions. Production test results are required for the data report.

1.16.2 - DATA REPORT CONTENT

The following information is required to be included with the report:

- Serial Number
- Year of Manufacture
- Month of Manufacture
- Weight Including Oil (lbs)
- Oil Capacity (gal)
- Oil Type
- PCB Content
- % Z at 85°C
- Maximum L.V. Short Circuit Current (kA)
- Maximum L.V. Short Circuit Current is at: (Specify L-L or L-N)
- No-Load Losses at 20°C (watts)
- Load Losses at 85°C (watts)
- % Efficiency (per DOE 10 CFR Part 431, the represented efficiency determined by testing or AEDM)
- HV Bushing Mounting Hardware Installation Torque Value (if applicable)
- LV Bushing Mounting Hardware Installation Torque Value (if applicable)



1.16.3 - DELIVERY OF DATA REPORT

The steps identified in the table below will be followed concerning the delivery of the data report.

Step	Action
1	Upon issuance of a purchase order the Tacoma Power contract manager will email the appropriate representative of the Supplier and/or manufacturer a Microsoft Excel spreadsheet that includes the number of transformers and their pre-assigned Tacoma SAP Equipment numbers.
2	The manufacturer will populate the spreadsheet with the data content per Section 1.18.2 and email to the contract manager prior to delivery of the units.

1.16.3A - DISTRIBUTION OF DATA REPORT

Data reports shall be submitted via email to:	Joe Parris jparris@cityoftacoma.org

1.16.4 - MATERIAL SAFETY DATA SHEETS (MSDS)

The successful Respondent must submit a manufacturer's Material Safety Data Sheet (MSDS) that complies with OSHA and WISHA guidelines for Hazard Communications Standard WAC 296-62-054 requirement for items identified as hazardous materials or items in whose normal use produces a hazardous material.

1.17 - INSPECTION & WARRANTY

All goods are subject to final inspection and acceptance by the Tacoma Power engineer and the appropriate shop foreman.

1.17.1 - FAILURE OF INSPECTION

Upon delivery, transformers will be inspected for defects and conformance to this Specification. The Supplier will be notified of all compliance issues and mutual arrangements shall be made for correcting the defects at no expense to the City. The City reserves the right to reject and return transformers failing to pass inspection. If so returned, the cost of transportation, unpacking, inspection, repacking, reshipping, or other like expenses are the responsibility of the Supplier.

Charges for dismantling and reinstallation of materials furnished pursuant to this Contract will be the responsibility of the Supplier only when a change out or replacement is required because of a suspected or known design defect or large scale failure of manufacturer's quality control system.



1.17.2 - WARRANTY

Unless a longer period is specified, the Supplier and/or manufacturer of the supplies, materials and/or equipment furnished pursuant to this Contract agrees to correct any defect or failure of the supplies, materials and/or equipment which occurs within *six months* from the date of commencement of use, however, said warranty period shall not extend beyond *twelve months* after date of receipt by the City.

When the Supplier is not the manufacturer of the item of equipment, Supplier agrees to be responsible for this warranty and Supplier is not relieved by a manufacturer's warranty.

1.17.2A - WARRANTY PERIOD EXTENSION

The Contract warranty period shall be suspended from the time a significant defect is first documented by the City until the work or equipment is repaired or replaced by Supplier and accepted by the City. In addition, in the event less than thirty (30) days remain on the warranty period (after recalculating), the warranty period shall be extended to allow for at least thirty (30) days from the date the work or equipment is repaired or replaced and accepted by the City.

1.17.2B - WARRANTY WORK

The City has determined that the repair of material/equipment, under warranty, can best be done at the manufacturer's facility that makes this style or similar material/equipment, or at a mutually agreeable local repair facility. All material/equipment requiring warranty work will be returned to the Supplier at the Supplier's expense, or the manufacturer may replace the defective material/equipment(s) with new units.

1.17.2B.1 - MINOR WARRANTY WORK

Minor warranty work may be done on Tacoma Power's property if, in the opinion of Tacoma Power and in agreement with the Supplier, the useful life of the transformer is not affected by doing this work on site.

1.17.2B.2 - RETURN TIME FRAME

All warranty repair work on returned material/equipment shall be accomplished within the specified lead-time for delivery listed in the Supplier's bid submittal. Warranty repair time will be calculated from the time the material/equipment defect or failure is reported to the Supplier.

1.18 - INVOICES & PAYMENT

All items called for in these Specifications, including, but not limited to, the necessary drawings and test results, must be supplied to the City before the final invoice can be processed.

1.18.1 - INVOICES

Invoices shall be emailed, per Section 1.36 of the Standard Terms and Conditions, to

AccountsPayable@cityoftacoma.org

1.18.2 - PAYMENT

Upon certification by the Engineer and/or appropriate warehouse personnel that the items have been received in accordance with the Specifications and are in satisfactory condition, a 100 percent payment will be made. Payment methods include:



- A. Credit card. Tacoma's VISA procurement card program is supported by standard bank credit Suppliers and requires merchants abide by the VISA merchant operating rules.
 - 1. Vendors must be PCI–DSS compliant (secure credit card data management).
 - 2. Vendors must be set up by their card processing equipment provider (merchant acquirer) as a minimum of a Level II merchant with the ability to pass along tax, shipping and merchant references information.
- B. Electronic Funds Transfer (EFT) by Automated Clearing House (ACH).
- C. Check or other cash equivalent.
- D. The City may consider cash discounts when evaluating submittals. See 1.20.2 of the Standard Terms and Conditions.

1.20.2A - UNSATISFACTORY PERFORMANCE

In the case of unsatisfactory performance, the payment shall be made after the Supplier has made the necessary repairs and/or modifications and satisfactory performance is obtained, or the unit is replaced.

1.19 - CONTRACT EXCEPTIONS

1.19.1 - NON-RESPONSIVE

Bid proposals that claim exceptions to the terms and conditions stated within these Specifications may be declared non-responsive and the bid proposal may be rejected.

1.19.2 - COST OF COMPLIANCE

The City prefers that the Respondents determine the cost of compliance, with the City's terms and conditions, and include such costs into the unit prices, of the items, in the Respondent's proposal.

1.19.3 - MULTIPLE PROPOSALS

Respondents may submit multiple bid proposals to demonstrate the cost savings associated with acceptance of the Respondent's proposed terms and conditions. Refer to Section 1.08.2 for "Alternate Bids".

1.20 - EQUITY IN CONTRACTING

The City of Tacoma is committed to encouraging firms certified through the <u>Washington State Office</u> <u>of Minority and Women's Business Enterprise</u> to participate in City contracting opportunities. See the TMC 1.07 Equity in Contracting Policy at the City's <u>Equity in Contracting Program website</u>.

1.21 - STANDARD TERMS AND CONDITIONS

City of Tacoma Standard Terms and Conditions apply.



THESE TECHNICAL SPECIFICATIONS HAVE BEEN PREPARED BY A LICENSED PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF WASHINGTON.

SECTION II - TECHNICAL PROVISIONS – SINGLE PHASE POLE MOUNTED TRANSFORMERS

2.01 - TERMINOLOGY

Terminology used in this Specification is consistent with IEEE C57.12.80 unless otherwise noted.

2.01.1 - STANDARDS

All units shall meet the most recent editions of the following standards and all others that are applicable:

Standard Number	Standard Title
DOE 10 CFR Part 431	Energy Conservation Standards for Distribution Transformers
IEEE C57.12.00	General Requirements for Liquid-Immersed Distribution, Power, and Regulating Transformers
IEEEC57.12.20	Overhead-Type Distribution Transformers 500 kVA and Smaller: High Voltage, 34 500 V and Below; Low Voltage, 7970/13 800Y V and Below
IEEE C57.12.31	Pole-Mounted Equipment—Enclosure Integrity
IEEE C57.12.35	Bar Coding for Distribution Transformers and Step-Voltage Regulators
IEEE C57.12.80	Terminology for Power and Distribution Transformers
IEEE C57.12.90	Test Code for Liquid-Immersed Distribution, Power, and Regulating Transformers
IEEE C57.91	Guide for Loading Mineral-Oil-Immersed Transformers
IEEE C57.147	Guide for Acceptance and Maintenance of Natural Ester Fluids in Transformers
ANSI/ISO/ASQ Q9001	Quality Management Systems - Requirements
ASTM D-3487	Mineral Insulating Oil Used in Electrical Apparatus
ASTM D-6871	Natural (Vegetable Oil) Ester Fluids Used in Electrical Apparatus

2.01.1A - SUITABILITY

The units submitted per this Specification shall be suitable for banking with all other standard makes of single phase, single position transformers that meet the requirements of IEEE C57.12.20.



2.02 - TRANSFORMER EFFICIENCY

Only units that meet or exceed the U.S. Department of Energy efficiency standards for liquidfilled distribution transformers 10 CFR Part 431 will be considered for this bid. All units shall have represented efficiencies that meet or exceed the efficiency values in the following table.

Transformer Efficiencies per DOE 10 CFR Part 431		
kVA	Efficiency (%)	
15	98.82	
25	98.95	
50	99.11	
75	99.19	
100	99.25	
167	99.33	

2.03 - ENCLOSURE SPECIFICATONS

2.03.1 - DIMENSIONS AND WEIGHT

Maximum dimensions and weight permitted shall be defined as a cylindrical shape having the height, diameter and weight restrictions listed below. The maximum size restrictions shall include all protuberances including bushings, cooling fins, mounting brackets, etc.

kVA	HEIGHT (in.)	DIAMETER (in.)	WEIGHT (Ibs.)
15	40	24	350
25	45	24	450
50	45	30	650
75	50	32	825
100	50	32	1300
167	55	41	1675

2.03.2 - ENCLOSURE MATERIAL

The tank shall be of welded construction free from leaks and seepage.

2.03.3 - ENCLOSURE COATING

The tank and cover shall have a uniform corrosion-resistant finish, of a minimum of 3.0 mil thick, that shall be capable of meeting the functional Specifications listed below and shall meet or exceed IEEE C57.12.20 and C57.12.31.



2.03.3A - COLOR

Transformer tank and cover shall be Light Gray No. 70, Munsell Notation 5BG 7.0/0.4.

2.03.4 - COMPATIBILITY WITH CLUSTER MOUNT BRACKET

All units shall be capable of an unrestricted three phase installation on cluster mount bracket AlumaForm model 12MW-24A.

2.03.5 - PRESSURE RELIEF

- Units shall include a pressure-relief device per IEEE C57.12.20.
- Units that would include mineral insulating oil shall have a pressure-relief device Qualitrol Model 202-032-1, or approved equal.
- Units with natural ester-based insulating fluids shall have a green capped pressure-relief device (Viat Model 302-070-01I, Heartland Model HPV-1230, or approved equal), and shall be lubricated with Krytox prior to shipping.

2.03.6 - NAMEPLATE INFORMATION

The nameplate shall meet the requirements of IEEE C57.12.00 with the following exceptions/additions:

- For mineral oil items, the nameplate shall state "Contains no detectable level of PCB (less than 1PPM) at the time of manufacture" or similar statement as approved by Tacoma Power.
- For FR3 items, the nameplate shall state "Natural Ester Fluid when manufactured contained less than 1PPM PCB" or similar statement as approved by Tacoma Power.
- The nameplate shall state if it is DOE 10 CFR Part 431 compliant.
- The nameplate shall include the approximate volume of oil in gallons.
- The listed weights shall be in pounds (lbs).

2.03.7 - COVER

- The cover shall be crowned at a minimum of 3 degrees.
- Only units with covers secured by cover band ring and bolt or center-bolt type covers shall be acceptable.

2.03.8 - SUPPORT LUGS

In accordance with IEEE C57.12.20, for single-position mounting, two support lugs shall be attached to the back of the transformers with the following separation:

kVA	Support Lug Type	Vertical Separation (in.)	
15-50	А	11-1/4	
75-167	В	23-1/4	

2.03.9 - FASTENERS

All exterior bolts and washers shall be AISI Type 304 stainless steel. All associated nuts shall be bronze to eliminate corrosion problems and to avoid galling.



2.04 - INSULATION LEVEL

The insulation class and basic lightning impulse insulation levels (BIL) for the windings, bushings and terminals shall be as shown below.

Components	Item Nos.	Insulation Class	BIL
High-voltage bushings1 thru 135 thru		15 kV	95 kV
High-voltage bushings 20 thr 54 thr		25 kV	125 kV
High-voltage winding and terminals		15 kV	95 kV
Low-voltage windings, bushings and terminals		1.2 kV	30 kV
Secondary neutral bushing and terminal		1.2 kV	30 kV

2.05 - APPARATUS SPECIFICATIONS

2.05.1 - ARRANGEMENT

The general arrangement of apparatus on the transformer enclosure shall be as shown in Figure 1 of IEEE C57.12.20 for single-position mounting.

2.05.2 - HIGH-VOLTAGE AND LOW-VOLTAGE BUSHINGS/TERMINALS

The mechanical, electrical, and structural characteristics and physical arrangement of the high-voltage and low-voltage terminals shall be per IEEE C57.12.20, except for the following.

- High-voltage bushings for items 20 thru 34 and items 54 thru 68 shall be 125 kV BIL and have a creepage distance of 15in minimum per IEEE C57.12.20.
- The base of the high-voltage terminal caps shall be of a size to accept the wildlife/bird guard in section 2.05.6 with a tight fit so that the guard will not easily rotate or slip of the high voltage terminal.
- Low-voltage terminals on 15 through 75 kVA units shall be copper or copper alloy connectors.
- Low-voltage terminals on 100 and 167 kVA units shall be 4-bolt hole NEMA H tinned copper alloy one-piece spades with the flat surfaces parallel or nearly parallel to each other. Extensions from one or two-hole spades are not acceptable.

2.04.2A - HIGH-VOLTAGE BUSHING ARRANGEMENT

The physical arrangement of the high-voltage bushings shall be per IEEE C57.12.20 as follows:



Bushing Arrangement	Refer to Figure No.	
Single Bushing Transformers	8	
Two Bushing Transformers	11	

2.05.3 - GASKETS

Gaskets for the terminations shall be reusable Nitrile or Viton material.

2.05.4 - TANK GROUNDING PAD AND CONNECTOR

All transformers tanks shall be provided with a silicon bronze or copper eyebolt connector that accepts a minimum wire range of #8 AWG to #2 AWG stranded conductor per IEEE C57.12.20.

2.05.5 - LOW-VOLTAGE GROUNDING STRAP

An external copper strap connection shall be provided between the low-voltage neutral bushing connector and the low-voltage grounding provision for units of items 1 thru 10; 20 thru 25; 35 thru 44 and 54 thru 59 per IEEE C57.12.20.

2.05.6 - HIGH VOLTAGE BUSHING – WILDLIFE/BIRD GUARD

The following wildlife/bird guard shall be included and tied to each primary bushing on each unit:

• Cooper p/n 26-00229-C-06 or Tacoma Power approved equivalent.

2.06 - CORE/COIL SPECIFICATONS

2.06.1 - CORE CONSTRUCTION

Amorphous core transformers are not acceptable for this Specification.

2.06.2 - DESIGN TERMPERATURES

Units shall be rated and designed for 65°C average winding rise per IEEE C57.12.00. The performance of each unit shall allow for the use of Table 2 of IEEE C57.91 to estimate loading levels and loss of life characteristics. Units rated and designed for 65/75°C or 75°C average winding rise that meet or exceed the IEEE/ANSI/ASTM/NEMA standards of this Specification can also be considered.

2.06.3 - LIFTING ATTACHMENTS

Lifting eyes or suitable attachments shall be included to assist in the removal and installation of cores.

2.06.4 - SECONDARY LEAD MARKING

Internal secondary leads shall be identified with appropriate markings permanently embossed in the lead that corresponds with lead marking on the nameplate.

2.07 - INSULATING FLUIDS

2.07.1 - MINERAL OIL

The mineral insulating oil shall meet the specifications of ASTM D-3487 and contain no detectable Polychlorinated Biphenyl (PCB). The transformer oil shall be new, clear in appearance, and have a dielectric strength of over 30 kV.



2.07.2 - NATURAL ESTER-BASED INSULATING FLUID

Units that contain natural ester-based insulating fluids will be considered and shall meet the requirements of IEEE C57.147 and ASTM D-6871.

• The fluid shall be Envirotemp FR3 fluid or MIDEL eN 1215.

2.08 - EQUIPMENT NUMBERS & STENCILING

The following labeling requirements are required to be applied on units delivered to Tacoma Power.

2.08.1 - VOLTAGE AND KVA LABELING

The Supplier shall apply voltage and kVA stenciling per the following requirements. Refer to "Figure 2.08.1".

2.08.1A - VOLTAGE STENCILS

The voltage shall be 3/4" stencils in the color of standard black as used with other identifying markings applied by the Supplier.

2.08.1A.1 - PRIMARY VOLTAGE LOCATION

The primary voltage shall be stenciled on the cover slightly behind the two primary bushing locations.

2.08.1A.2 - SECONDARY VOLTAGE LOCATIONS

The secondary voltage shall be stenciled on the cover above the secondary primary bushing locations.

2.08.1B - KVA STENCILS

The unit KVA size shall be 2-1/2" stencils in the color of standard black as used with other identifying markings applied by the Supplier. The kVA shall be centered approximately 6" to 8" below the secondary bushings.



FIGURE 2.08.1



2.08.2 - CITY OF TACOMA TRACKING NUMBERS (SAP#) - OPTIONAL

Units shall have unique tracking numbers (SAP Equipment Number), supplied by Tacoma Power's data management section, stenciled on the units as shown in "Figure 2.08.2" if supplier is able to provide this service without delaying shipment.

2.08.2A - SIZE AND COLOR OF NUMBERS

The seven digit numbers shall be 2" stencils in the color of standard black as used with other identifying markings applied by the Supplier.

2.08.2B - LOCATION OF NUMBERS ON UNITS

The numbers shall be applied to both sides of the transformer approximately centered on the tank.



Material Specification PT22-0078F Distribution Transformers

FIGURE 2.08.2



2.08.3 - LABELING OF NATURAL ESTER FLUID TRANSFORMERS

Units that are filled with natural ester insulating fluid shall be labeled as described below

Location of Label	Requirement	Reference Figure
Cover	NATURAL ESTER - 3/4" stencils in the color of standard black as used with other identifying markings applied by the Supplier.	2.08.1
Front of Tank and Beneath kVA Label	NATURAL ESTER - 3/4" stencils in the color of standard black as used with other identifying markings applied by the Supplier.	2.08.1



SECTION III - TECHNICAL PROVISIONS – SINGLE PHASE PAD MOUNTED TRANSFORMERS

3.01 - STANDARDS & TERMINOLOGY

Terminology used in this specification is consistent with IEEE C57.12.80 unless otherwise noted.

<u>3.01.1 - STANDARDS</u>

All units shall meet the most recent editions of the following standards and all others that are applicable:

Standard Number	Standard Title
DOE 10 CFR Part 431	Energy Conservation Standards for Distribution Transformers
IEEE C57.12.00	General Requirements for Liquid-Immersed Distribution, Power, and Regulating Transformers
IEEE C57.12.28	Pad-Mounted Equipment - Enclosure Integrity
IEEE C57.12.35	Bar Coding for Distribution Transformers and Step-Voltage Regulators
IEEE C57.12.38	Pad-Mounted - Type, Self-Cooled, Single-Phase Distribution Transformers; High Voltage 34 500 GrdY/19 920 V and Below; Low Voltage, 240/120 V; 167 kVA and Smaller
IEEE C57.12.80	Terminology for Power and Distribution Transformers
IEEE C57.12.90	Test Code for Liquid-Immersed Distribution, Power, and Regulating Transformers
IEEE C57.91	Guide for Loading Mineral-Oil-Immersed Transformers
IEEE C57.147	Guide for Acceptance and Maintenance of Natural Ester Fluids in Transformers
ANSI Z535	Safety Sign and Label Standards
ANSI/ISO/ASQ Q9001	Quality Management Systems - Requirements
ASTM D-3487	Mineral Insulating Oil Used in Electrical Apparatus
ASTM D-6871	Natural (Vegetable Oil) Ester Fluids Used in Electrical Apparatus
Western Underground Committee Guide 2.13	Security for Pad-mounted Equipment Enclosures



3.02 - TRANSFORMER EFFICIENCY

Only units that meet or exceed the U.S. Department of Energy efficiency standards for liquid filled distribution transformers 10 CFR Part 431 will be considered for this bid; all others will be rejected. All units shall have represented efficiencies that meet or exceed the efficiency values in the following table:

Transformer Efficiencies per DOE 10 CFR Part 431		
kVA Efficiency (%)		
15	98.82	
25	98.95	
50	99.11	
75 99.19		
100	99.25	
167 99.33		

3.03 - ENCLOSURE SPECIFICATIONS

3.03.1 - DIMENSIONS

The minimum and maximum dimensions of the pad-mount transformers shall be as shown below. These dimensions do not include cooling fins.

3.03.1A – TYPE 2 TRANSFORMERS

	25 – 50 kVA (in.)	100 – 167 kVA (in.)
Height	29	32
Width	36	36
Depth	35	40

3.03.1 - DEPTH OF DOOR

The depth of the door shall be a minimum of 17 inches from face of tank to the front of the cover when in a closed position.

3.03.2 – DOOR COMPATIBLE WITH CITY OF TACOMA SUPPLIED SECONDARY TERMINAL CONNECTORS (ALSO SEE 3.05.09A)

Tacoma Power has experienced problems in the past with the transformer door contacting the secondary connectors upon closure. The door shall be able to close without any interference to installed Tacoma Power secondary stud connectors (with right hand mounting) listed below:



- Connector Manufacturing Company (CMC), p/n SHB10-500SLRAXBUH
- Polaris Electrical Connectors, p/n PTLEZ500-10SLRHAP
 Example Connector:



3.03.3 – MINIMUM CABLE ACCESS OPENING

The minimum cable opening width is 28.75 in.

3.03.4 - ENCLOSURE MATERIAL

- The tank and door shall be made of a minimum of #13 U.S. gauge sheet steel, except the underside of the transformer, to include the cabinet sill, the tank riser and the tank bottom, shall be constructed of AISI Type 304 stainless steel.
- The stainless steel shall extend a minimum of 1.5 in. up the enclosure side.

3.03.5 - HINGE AND FASTENING HARDWARE

All hinges and hinge pins shall be AISI Type 304 Stainless Steel.

3.03.6 - ENCLOSURE COATING

- The unit shall have a uniform corrosion-resistant finish of a minimum of 3.0 mil thick.
- The color shall be Munsell 7GY-3.29/1.5 (Padmount Green).

<u>3.03.7 – CROWNING</u>

The tank roof shall be crowned so as to shed water and the door shall be constructed such that water does not pool on top.

3.03.8 – LOCKING SYSTEM

The locking system shall incorporate a two-lock system using a Pentahead bolt and standard padlock as the locking devices. The Pentahead bolt shall be captive-spring assisted within a recessed blind hole. The padlock cannot be applied until the Pentahead bolt has been completely recessed. With the padlock installed, the Pentahead bolt cannot be removed. The locking system shall be shown to be simple to use and resistant to misalignment. Manufacturer does not provide padlock.

3.03.9 – LIFTING BOLT ATTACHMENT

- The unit shall be sling balanced and include 5/8 in. 11 UNC captive nuts welded to the sides of the tank for temporary lifting bolts to be attached.
- Two (2) 5/8 in. X 2 in. lifting bolts shall be included with the unit bagged/taped/tied to a parking stand.

<u>3.03.10 – SILL</u>

- The sill shall be removable.
- The fastening hardware shall not be removable from exterior to the unit.
- Sill shall have rubber bumpers (Bumper Specialties, Inc., p/n BS-32) located on sides and front of sill where the sill interfaces with the door.



3.03.11 - OIL FILL AND DRAIN PLUGS

• There shall be no pet cocks or drain valves (pipe plug is acceptable).

3.03.12 - NAMEPLATE INFORMATION

The nameplate shall meet the requirements of IEEE C57.12.00 with the following exceptions/additions:

- For mineral oil items, the nameplate shall state "Contains no detectable level of PCB (less than 1PPM) at the time of manufacture" or similar statement as approved by Tacoma Power.
- For FR3 items, the nameplate shall state "Natural Ester Fluid when manufactured contained less than 1PPM PCB" or similar statement as approved by Tacoma Power.
- The nameplate shall state "DOE 10 CFR Part 431 compliant".
- The nameplate shall include the approximate volume of oil in gallons.
- The listed weights shall be in pounds (lbs.).

3.04 - INSULATION LEVEL

The insulation class and basic lightning impulse insulation levels (BIL) for the windings and terminals shall be as shown below:

Components	Insulation Class	BIL
High-voltage winding and terminals	15 kV	95 kV
Low-voltage windings and terminals	1.2 kV	30 kV
Secondary neutral terminal	1.2 kV	30 kV

3.05 <u>– APPARATUS SPECIFICATIONS</u>

3.05.1 - TYPE 2 TRANSFORMERS

The physical arrangement of items shall be of a Type 2 transformer as shown in Figure 3 of IEEE C57.12.38 except for the additional specifications as listed in these technical specifications.

3.05.2 - GROUNDING PROVISIONS

- Two grounding pads (1/2 in. 13 UNC nuts, 7/16 in. deep) shall be welded to the case in the locations shown in Figures 1 and 3 of IEEE C57.12.38.
- Provide a minimum of one ground connector AB Chance GC-207.

3.05.3 – PRESSURE RELIEF

- Units with mineral insulating oil shall have a pressure-relief device (Qualitrol Model 202-032-1 or approved equal) that can be operated by a standard highvoltage switch stick or clamp-stick and shall be installed between the H1B and X3 above the high temperature oil level.
- Units with natural ester-based insulating fluids shall have a green capped pressure-relief device (Viat Model 302-070-01I, Heartland Model HPV-1230, or approved equal) that can be operated by a standard high-voltage switch stick or clamp-stick and shall be installed between the H1B and X3 above the high temperature oil level, and shall be lubricated with Krytox prior to shipping.



<u> 3.05.4 – "NITROGEN" VALVE</u>

- Units shall have a "nitrogen" valve that will allow air pressure to be induced into the air space of the tank.
- This valve shall be a Grainger Inline Brass Ball Valve, FNPT x MNPT, 1/4 in. or approved equivalent with a plug in the female end.



<u>3.05.5</u> <u>– GASKETS</u>

Gaskets for the conductor terminations and bayonet fuse holder shall be reusable Nitrile or Viton material.

3.05.6 – BAY-O-NET FUSE HOLDER

Units shall be protected with a Bay-O-Net fuse holder that will accept a Cooper Power Dual Sensing Bay-O-Net Fuse Link Style No. 358C and has a device that will prevent transformer oil from being expelled when the fuse is removed.

Approved Fuse Holders:

- Cooper Power Systems p/n 4000361C99FV
- ABB Inc., p/n 1C10775G02

305.7A - DRIP SHIELD

The fuse holder shall also include a removable drip shield.

3.05.7 B - ISOLATION LINK

Bay-O-Net Fuse holders shall include isolation links, matched to the transformer size and Dual Sensing Bay-O-Net Fuse Link, attached to the load connector.

3.05.8 – HIGH-VOLTAGE TERMINALS

The following is required for the primary terminals.

3.05.8 A – BUSHING WELL

• The two bushing wells shall be Cooper BW150R 200A, 35KV class triclamp.

3.05.8B - LOAD-BREAK BUSHING INSERT

The bushing insert shall be a 15 kV, 200A load-break bushing insert. It shall be a Cooper Power Systems p/n LBI215, or equivalent, that includes a molded-in, bright yellow "Latch Indicator Ring."

3.05.8B.1 - BLEED WIRE

A bleed wire shall be attached to the clamping ring bail and bushing insert per manufacturer's recommendations.

<u>3.05.8 B.2 – DUST COVER</u>

The bushing insert shall be shipped with a red dust cover.

3.05.9 – LOW-VOLTAGE TERMINALS

The following is required for the secondary terminals:



3.05.9A – SECONDARY TERMINAL LOCATION

To prevent door contact onto Tacoma Power installed secondary stud connectors, these specifications suggest the following:

Type 2 Transformers	The X2 bushing shall be <u>4.5 in</u> . horizontally from the inside edge of the transformer door. The X1 and X3 bushings shall be adjusted accordingly to keep the same spacings as shown in Figure 3 of IEEE C57.12.38
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The dimensions in bold above are a best estimate to prevent interference with an installed secondary connector and your style of transformer door. In any case, it is the responsibility of the manufacturer to insure the door will be able to close without any interference to installed Tacoma Power secondary transformer stud connectors (with right hand mounting) as listed in 3.03.3.

3.05.9B – LOW-VOLTAGE TERMINAL DIMENSIONS

The dimensions of the secondary terminal studs shall be as per the table below. In any case, there must be a minimum 1.5 in. of threads after installation of brass jam nuts and ground strap.

kVA Rating	Thread Size	Minimum Overall Length
25 - 50	5/8 in 11 UNC-2A	1.75 inches
100 - 167	1 in 14 UNS-2A	1.75 inches

3.05.9C - TERMINAL INSULATING MATERIAL

The insulating material may be porcelain, epoxy, or High Temperature Nylon.

3.05.9D - VERTICAL SEPARATION

The distance between bushings shall be no less than 5.0 inches on vertical centers.

3.05.9 E – GROUND STRAP AND BRASS JAM NUTS

- A ground strap shall be included to the neutral bushing and it shall be removable.
- The stud of each terminal will come with one brass jam nut installed.
- The brass jam nut on X2 bushing shall be installed behind the ground strap

3.06 - CORE/COIL SPECIFICATIONS

3.06.1 - CORE CONSTRUCTION

Amorphous core transformers are not acceptable for this specification.



3.06.2 – DESIGN TEMPERATURES

Units shall be rated and designed for 65°C average winding rise per IEEE C57.12.00. Units rated and designed for 65/75°C or 75°C average winding rise that meet or exceed the IEEE/ANSI/ASTM/NEMA standards of this specification can also be considered.

3.06.3 - CORE/COIL SCHEMATICS



3.07 - INSULATING FLUIDS

<u>3.07.1 – MINERAL OIL</u>

- The mineral insulating oil shall meet the specifications of ASTM Standard D-3487 and contain no detectable Polychlorinated Biphenyl (PCB).
- The transformer oil shall be new, clear in appearance and have a dielectric strength of over 30 kV.

3.07.2 - NATURAL ESTER-BASED INSULATING FLUID

- Units that contain natural ester-based insulating fluids will be considered and shall meet the requirements of IEEE C57.147 and ASTM D-6871.
- The fluid shall be Envirotemp FR3 fluid or MIDEL eN 1215.

3.08 - STENCILING AND LABELS

The following stenciling and labeling requirements are to be applied on units delivered to Tacoma Power.

3.08.1 – KVA AND VOLTAGE DESIGNATIONS

The KVA and voltage designations are to be stenciled on the units as identified below.

	Stencil	Size (in.)	Color
kVA Size	25 50 100 167	3	
	7200 240/120		White
Voltage Designation	7200 480/240	3/4	
	13800 240/120		



<u>3.08.1 A – LOCATION</u>

The kVA and voltage designations of the units shall be located as follows (refer to Figures 3.08.5, 3.08.6, 3.08.7 and 3.08.8):

- The front exterior of the door (kVA only)
- Top of the tank facing the right side (kVA, primary and secondary voltage)
- Inside the door (should be legible with the door open) (kVA and primary voltage)

3.08.2 - TRACKING NUMBERS (SAP #) - OPTIONAL

Tracking numbers unique to Tacoma Power (seven digit SAP equipment number to be supplied by Tacoma Power's data management section) shall be stenciled on the units as identified below if supplier is able to provide this service without delaying shipment.

3.08.2 A - SIZE, COLOR AND LOCATION

The numbers shall be applied as follows (refer to Figures 4.08.5, 4.08.6, 4.08.7 and 4.08.8):

- White color and 2 in. size stenciling
- The front exterior of the door
- Top of the tank facing the right side
- Inside the door (should be legible with the door open)
- On the face of the tank next to the secondary terminals

3.08.3 – NATURAL ESTER FLUID TRANSFORMERS

Units that are filled with natural ester insulating fluid shall have "**Natural Ester Fluid**" stenciled with 3/4 in. letters, white in color, located:

- On the top of the tank, above the tracking (SAP) number (see Figure 3.08.6)
- On the face of the tank above the oil drain plug (see Figure 3.08.8)

3.08.4 – SAFETY LABELS

Current ANSI Z535 approved "DANGER" labels, free of wrinkles and air bubbles, shall be provided on each unit as follows:

3.08.4A – APPROVED SYMBOL ON LABEL

The following symbols are approved for use on DANGER labels applied to Tacoma Power transformers. All other DANGER symbols are not allowed.





3.08.4B - LOCATION

- On the face of the tank between the primary and secondary bushings
- Inside the door (should be right side up and legible with the door open)
- Do not apply any "DANGER" or "WARNING" labels on the exterior of the

unit

FIGURE 3.08.5



FIGURE 3.08.6

FIGURE 3.08.7

FIGURE 3.08.8

SECTION IV - TECHNICAL PROVISIONS – THREE PHASE PAD MOUNTED TRANSFORMERS

4.01 - TERMINOLOGY

Terminology used in this specification is consistent with IEEE C57.12.80 unless otherwise noted.

4.01.1 - STANDARDS

All units shall meet the most recent editions of the following standards and all others that are applicable:

Standard Number	Standard Title
DOE 10 CFR Part 431	Energy Conservation Standards for Distribution Transformers
IEEE C57.12.00	General Requirements for Liquid-Immersed Distribution, Power, and Regulating Transformers
IEEE C57.12.28	Pad-Mounted Equipment - Enclosure Integrity
IEEE C57.12.35	Bar Coding for Distribution Transformers and Step-Voltage Regulators
IEEE C57.12.34	Requirements for Pad-Mounted, Compartmental-Type, Self-Cooled, Three-Phase Distribution Transformers, 5 MVA and Smaller; High Voltage, 34.5 kV Nominal System Voltage and Below; Low Voltage, 15 kV Nominal System Voltage and Below
IEEE C57.12.80	Terminology for Power and Distribution Transformers
IEEE C57.12.90	Test Code for Liquid-Immersed Distribution, Power, and Regulating Transformers
IEEE C57.91	Guide for Loading Mineral-Oil-Immersed Transformers
IEEE C57.147	Guide for Acceptance and Maintenance of Natural Ester Fluids in Transformers
ANSI Z535	Safety Sign and Label Standards
ANSI/ISO/ASQ Q9001	Quality Management Systems - Requirements
ASTM D-3487	Mineral Insulating Oil Used in Electrical Apparatus
ASTM D-6871	Natural (Vegetable Oil) Ester Fluids Used in Electrical Apparatus
Western Underground Committee Guide 2.13	Security for Pad-mounted Equipment Enclosures

4.02 - TRANSFORMER EFFICIENCY

Only units that meet or exceed the U.S. Department of Energy efficiency standards for liquid filled distribution transformers 10 CFR Part 431 will be considered for this bid. All units shall have represented efficiencies that meet or exceed the efficiency values in the following table.

Transformer Efficiencies per DOE 10 CFR Part 431				
kVA	Efficiency (%)			
75	99.03			
150	99.16			
300	99.27			
500	99.35			
1000	99.43			
1500	99.48			
2000	99.51			
2500	99.53			

4.03 - ENCLOSURE SPECIFICATIONS

4.03.1 - DIMENSIONS

The minimum and maximum dimensions of the pad-mount transformers shall be as shown below. These dimensions do not include cooling fins.

	75 to 300	500	1000 to 1500	2000 to 2500
	kVA	kVA	kVA	kVA
Width	46" min	62" min	74" min	74" min
	64" max	82" max	82" max	94" max
Depth	54" max	88" max	88" max	92" max

4.03.2 - DEPTH OF APPARATUS COMPARTMENT – FRONT CABINET

The minimum depth of the apparatus compartment shall be 24 inches.

4.03.3 - COOLING FINS

Cooling fins shall not extend further than 12 inches beyond the dimensions shown above.

4.03.4 - BOLTED ACCESS

Methods incorporating bolted covers shall be such that significant paint damage to the cover or tank should not occur upon removal. Bolts shall be AISI Type 304 stainless steel or better with bronze nuts.

4.03.5 - HINGE AND FASTENING HARDWARE

All hinges and hinge pins shall be AISI Type 304 stainless steel or better.

4.03.6 - ENCLOSURE COATING

The tank and cover shall have a uniform corrosion-resistant finish, a minimum of 3.0 mil thick, which shall be capable of meeting the functional specifications listed below and meet or exceed IEEE C57.12.28.

4.03.6A - PAINT COLOR

4.03.6A.1 - EXTERIOR

The exterior transformer tank, sills, and door lids, shall be painted (Pad-mount Green) Munsell 7GY-3.29/1.5.

4.03.6A.2 - INTERIOR

Interior portions of sills, doors and terminal compartments may be either (Pad-mount Green) Munsell 7GY-3.29/1.5 or Light Gray No. 70, Munsell Notation 5BG 7.0/0.4.

4.03.6B - UNDERSIDE CORROSION MITIGATION

To address corrosion and/or rust caused by material and activities adjacent to the transformer, such as fertilizer, landscaping maintenance amongst others, the underside of the transformer shall be treated in one of the following methods:

- The underside of the transformers shall be given a heavy coating of plastic, rubberized, or asphalt compound to prevent rusting. This coating shall extend 3 inches up the exterior sides and sill of the transformer.
- AISI Type 304 or better stainless steel bottom and the bottom 2 inches of the transformer enclosure sides and sill.

4.03.7 - CROWNING

The top of the tank and apparatus compartment shall be crowned or slanted at a minimum of 3 degrees.

4.03.7A - LOCKING SYSTEM

The locking system shall incorporate a two-lock system using a Pentahead bolt and standard padlock as the locking devices. The Pentahead bolt shall be captive spring assisted within a recessed blind hole. The padlock cannot be applied until the Pentahead bolt has been completely recessed. With the padlock installed, the Pentahead bolt cannot be removed. *The locking system shall be shown to be simple to use and resistant to misalignment.*

4.03.8 - OIL FILL & DRAIN PLUGS

- All units shall include fill ports in accordance with IEEE Standard C57.12.34.
- <u>All</u> units shall include a 1 in. NPT oil drain valve <u>without</u> built-in sampling device installed in the LV compartment.

4.03.9 - TEMPERATURE AND OIL LEVEL INDICATORS

An individual dial-type thermometer, with re-settable drag-hand, and an indicating dial-type oil level indicator shall be provided on all transformers.

4.03.9A - LOCATION OF INDICATORS

The indicators shall be mounted within the secondary side of the tank.

4.03.9B - THERMOMETER BULB

The thermometer bulb shall be located in such a way as to measure the maximum free oil temperature. It shall also be able to be removed without loss of oil from the tank.

4.03.10 - PRESSURE RELIEF

- Units with mineral insulating oil shall have a pressure-relief device (Qualitrol Model 202-032-1 or approved equal) that can be operated by a standard high-voltage switch stick or clamp-stick and shall be installed in accordance with IEEE C57.12.34.
- Units with natural ester-based insulating fluids shall have a green capped pressure-relief device (Viat Model 302-070-01I, Heartland Model HPV-1230, or approved equal) that can be operated by a standard high-voltage switch stick or clamp-stick and shall be installed in accordance with IEEE C57.12.34., and shall be lubricated with Krytox prior to shipping.

4.03.11 - "NITROGEN" VALVE

- Units shall have a "nitrogen" valve that will allow air pressure to be induced into the air space of the tank.
- This valve shall be a Grainger Inline Brass Ball Valve, FNPT x MNPT, 1/4 in. or approved equivalent with a plug in the female end.

4.03.12 - GASKETS

Gaskets for the conductor terminations and bayonet fuse holder shall be reusable Nitrile or Viton material.

4.03.13 - NAMEPLATE INFORMATION

The nameplate shall meet the requirements of IEEE C57.12.34 with the following exceptions/additions:

- he nameplate shall state "Contains no detectable level of PCB (less than 1PPM) at the time of manufacture" or similar statement as approved by Tacoma Power.
- The nameplate shall state "DOE 10 CFR Part 431 compliant".
- The nameplate shall include the approximate volume of oil in gallons.
- The listed weights shall be in pounds (lbs).

4.04 - INSULATION LEVEL

The insulation class and basic lightning impulse insulation levels (BIL) for the windings and terminals shall be as shown below:


Components		Insulation Class	BIL
HV winding and terminals		15.0 kV	95 kV
	4160/2400 Volts	5.0 kV	60 kV
LV windings and terminals	600 Volts or less	1.2 kV	30 kV
Secondary neutral terminal		1.2 kV	30 kV

4.05 - APPARATUS SPECIFICATIONS

The following apparatus will be required for the transformers listed in this specification.

4.05.1 - ARRANGEMENT

The physical arrangement of the HV and LV terminations shall be for radial feed construction with "specific" dimensions in accordance with the table below. The "K" dimension shall be 5.0" in the HV compartment. Parking stands shall also be included in accordance with the figures listed below.

Apparatus		Reference Figures of IEEE C57.12.34	
HV Compartment		14	
	600 Volts or Less	8(a)	
LV Compartment	4160/2400 Volts	7	

4.05.1A - ACCESS TO BUSHINGS

Both primary and secondary bushings shall be removable from the front/exterior to the tank. Enough conductor lead shall be provided so that the bolted assembly at the bushing can be separated from outside the tank wall.

4.05.2 - GROUNDING PROVISIONS

- Units shall have grounding provisions, one in the HV compartment and one in the LV compartment, in accordance with IEEE C57.12.34.
- Do not include ground connectors.

4.05.3 - BAYONET FUSE HOLDER

Units shall be protected with Bay-O-Net fuse holders on each phase that will accept a Cooper Power Dual Sensing Bay-O-Net Fuse Link Style No. 358C and has a device that will prevent transformer oil from being expelled when the fuse is removed.

Transformer Sizes	Approved Fuse Holders
75 kVA – 1500 kVA	 Cooper Power Systems P/N
Copper Terminals	4000361C99FV ABB Inc., P/N 1C10775G02
2000 kVA – 2500 kVA	 Cooper Power Systems P/N
Silver Plated Terminals	4000361C89FV ABB Inc., P/N 1C10775G07

4.05.3A - DRIP SHIELD

The fuse holder shall also include a removable drip shield.



4.05.3B - ISOLATION LINK

Bay-O-Net Fuse holders shall include isolation links, matched to the transformer size and Dual Sensing Bay-O-Net Fuse Link, attached to the load connector.

4.05.4 - PRIMARY HV TERMINATIONS (1000 VOLTS & HIGHER)

Units shall come equipped with HV bushing wells with loadbreak inserts for deadfront application as described below.

4.05.4A - BUSHING WELLS

• The three bushing wells shall be Cooper BW150R 200A, 35KV class tri-clamp.

4.05.4B - LOADBREAK BUSHING INSERTS

The bushing inserts shall be 15 kV, 200A loadbreak bushing inserts, Cooper Power Systems Part # LBI215, or equivalent, that includes a molded-in, bright yellow "Latch Indicator Ring".

4.05.4B.1 - BLEED WIRE

A bleed wire shall be attached to the clamping ring bail and bushing insert per manufacturer's recommendations.

4.05.4B.2 - DUST COVER

The bushing insert shall be shipped with a red dust cover.

4.05.5 - SECONDARY AND NEUTRAL LV (0 TO 600 VOLT) TERMINATIONS

The following is required for the secondary terminations.

4.05.5A - SECONDARY AND NEUTRAL TERMINAL DIMENSIONS

The secondary and neutral terminals shall be blades in accordance with the table below.

Transformer Size (kVA)	Minimum Number of Holes on Secondary and Neutral Terminal Blades	
75 to 300	8	
500 to 2500	10	

4.05.5B - TERMINAL INSULATING MATERIAL

The insulating material may be porcelain, epoxy, or High Temperature Nylon.

4.05.5C - GROUND STRAP

A ground strap shall be supplied with each transformer having a secondary rating of under 600 volts. The ground strap shall be attached to the neutral terminal and shall be removable.

4.05.5D - HANGER BRACKETS

All secondary paddles shall be provided with supporting brackets. The brackets must allow for terminal plates to be attached from either side.

4.05.6 - LBOR SWITCH

All units purchased under this specification shall include a loadbreak oil-immersed rotary disconnect (LBOR) switch operated from the HV compartment and used as an "ON-OFF" switch for the primary coil of the transformer.



Characteristic	Rating
Continuous current rating	200A
Momentary symmetrical short circuit rating	10,000A
Nominal voltage	15 kV
BIL	95 kV
Load-interrupting rating	200A @ 70% PF

4.05.7 - HV TAPS

HV taps will be included on each unit with tap ratings as shown in the table below.

4.05.7A - TAPS FOR 75 TO 500 KVA & 750 KVA TO 2500KVA:

75-50	0 kVA		750 – 2500 kVA		
For LV rating 208Y/120, 240∆ 480Y/277, or 480∆ Volts 4160Y/2400 Volts Above HV rating Below HV rating		HV rating (V)	For LV rating 208Y/120, 240∆ 480Y/277, 480∆ 4160Y/2400, or 2400∆ Volts		
2 @ 2.5% each	2 @ 2.5% each	12470	13090 / 12780 / 12160 / 11850		
14400 / 14100 /	/ 13500 / 13200	13800	14400 / 14100 / 13500 / 13200		

4.05.7B - LOCATION OF TAP CHANGER SELECTOR SWITCH

The tap changer selector switch shall be located in the HV compartment and be operable with hot sticks.

4.06 - CORE SPECIFICATIONS

The following are the transformer core requirements for the transformers listed in this specification.

4.06.1 - DESIGN TEMPERATURES

Pad-mount distribution transformers shall be designed for <u>65°C average winding rise</u> in accordance with IEEE C57.12.00. Units rated and designed for 65/75°C or 75°C average winding rise that meet or exceed the IEEE/ANSI/ASTM/NEMA standards of this specification can also be considered.

4.06.2 - CORE COIL ASSEMBLY

The transformers to be furnished under this specification shall have 5-legged-type core construction.

4.06.2A - CORE MATERIAL

Amorphous core transformers are not acceptable for this specification.

4.06.2B - COIL CONSTRUCTION

Transformer coils shall be wound with insulating paper coated on both sides with a thermosetting adhesive that when properly cured will form an effective bond, both turn-to-turn and layer-to-layer, prior to impregnating with oil.



4.06.3 - LIFTING ATTACHMENTS

Lifting eyes or suitable attachments shall be included to assist in the removal and installation of cores.

4.07 - INSULATING FLUIDS

4.07.1 - MINERAL OIL

- The mineral insulating oil shall meet the specifications of ASTM Standard D-3487 and contain no detectable Polychlorinated Biphenyl (PCB).
- The transformer oil shall be new, clear in appearance and have a dielectric strength of over 30 kV.

4.08 - STENCILING AND LABELS (SEE FIGURES 1 - 4)

The following stenciling and labeling requirements are to be applied on units delivered to Tacoma Power.

4.08.1 - KVA AND VOLTAGE DESIGNATIONS

The KVA and voltage designations are to be stenciled on the units as identified below.

Designation	Stencil	Size (in.)	Color
kVA	75 150 300 500 1000 1500 2000 2500	3	
Voltage Designation	12470GrdY/7200 208Y/120 12470GrdY/7200 480Y/277 12470GrdY/7200 240Δ/120 12470GrdY/7200 4160Y/2400 12470GrdY/7200 2400Δ 12470GrdY/7200 2400Δ 13800 4160Y/277 13800 4160Y/2400	1	White

4.08.1A - LOCATION

- LV side (right side) of the tank exterior, not on the face of the door.
- Inside the LV compartment door (should be legible with the door open)



4.08.2 - TRACKING NUMBERS (SAP #) - OPTIONAL

Tracking numbers unique to Tacoma Power (seven digit SAP equipment number) will be supplied by Tacoma Power's data management section. The numbers shall be stenciled on the units as identified below provided supplier is able to do so without delaying shipment.

4.08.2A - SIZE, COLOR AND LOCATION

- White color and 2 in. size stenciling
- LV side (right side) of the tank exterior above kVA and voltage designation
- Inside the LV compartment door above the kVA and voltage designation (should be legible with the door open)
 - On the face of the tank underneath the secondary terminals

4.08.3 - SAFETY LABELS

Current ANSI Z535 approved "DANGER" labels, free of wrinkles and air bubbles, shall be provided on each unit as follows:

4.08.3A - APPROVED SYMBOL ON LABEL

The following symbols are approved for use on DANGER labels applied to Tacoma Power transformers. All other DANGER symbols are not allowed.



4.08.3B - LOCATION

- HV compartment on the face of the tank and on the inside of the door
- LV compartment on the face of the tank and the inside of the door
- Do not apply any "DANGER" or "WARNING" labels on the exterior of the unit.



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FIGURE 1



FIGURE 2





FIGURE 3



FIGURE 4

