



City of Tacoma, WA

**TACOMA POWER  
REQUEST FOR BIDS**

**OUTDOOR WALK-IN METAL-CLAD SWITCHGEAR 15KV**

**PT14-0749F**



Purchasing Insert Cover Page

Request for Bids

Spec Number PT14-0749F

Spec Title OUTDOOR WALK-IN METAL-CLAD SWITCHGEAR 15KV

Respondents are advised that the City reserves the right to cancel award of this Contract at any time before execution of the Contract by both parties if cancellation is deemed to be in the City's best interest. In submitting a Bid, Respondents agree that the City is not liable for any costs or damages for the cancellation of an award. The Respondent assumes the sole risk and responsibility for all expenses connected with the preparation of this Bid.



City of Tacoma  
Department of Public Utilities / Tacoma Power

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REQUEST FOR BIDS  
PT14-0749F  
Outdoor Walk-In Metal-Clad Switchgear 15kV

**Submittal Deadline:** 11:00 a.m., Pacific Time, Tuesday, April 21, 2015

**Submittal Delivery:** Sealed submittals will be received and time stamped at this location only:

City of Tacoma Procurement and Payables Division  
Tacoma Public Utilities - Administration Building North, Main Floor  
3628 South 35<sup>th</sup> Street, Tacoma, WA 98409

**Submittal Opening:** Sealed submittals in response to a RFB will be opened by a Purchasing representative and read aloud during a public bid opening held in Conference Room M-1, located on the main floor in the same building. Submittals in response to an RFP or RFQ are recorded as received but are not typically opened and read aloud. After 1:00 p.m. the day of bid opening, the names of vendors submitting proposals are posted to the website for public viewing.

**Solicitation Documents:** An electronic copy of the complete solicitation documents may be viewed and obtained by accessing the City of Tacoma Purchasing website at [www.TacomaPurchasing.org](http://www.TacomaPurchasing.org).

- [Register for the Bid Holders List](#) 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:** This specification will establish one or more contracts with qualified vendors to fulfill the City's needs for outdoor walk-in metal-clad switchgear 15kV on an as-needed basis for up to five years.

**Estimate:** \$4,000,000

**Additional Information:** Requests for information regarding the specifications may be obtained by contacting Kimberlie Kerner, senior buyer, by email to [kkerner@cityoftacoma.org](mailto:kkerner@cityoftacoma.org).

**Protest Policy:** City of Tacoma protest policy, located at [www.tacomapurchasing.org](http://www.tacomapurchasing.org), 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 CHECK LIST**

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.

**Please do not include the entire specification document with your submittal. Doing so may render your submittal as non-responsive.**

Sealed 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. See also Section 3.03 Submittal Package Requirements.

Respondents are encouraged to use recycled/recyclable products and both sides of paper for printed and photocopied materials, wherever possible.

<p><b>The following items, in this order, make up your submittal package:</b>  <i>(Please do not include the entire specification document with your submittal.)</i></p>		
1	<p>Signature Page (Appendix A) with <b><u>ink signature</u></b>, including acknowledgement of any addenda                      This form is intended to serve as page 1 of your submittal. Do not alter it in any way or add to letterhead paper or present cover letters or blank pages ahead of it.</p>	
2	Price Proposal Form (Appendix A) – no substitutions or alterations	
3	Record of Prior Contracts (Appendix A) – no substitutions or alterations	
4	Additional Information in Section 3.01 – Content to be Submitted	
5	Confidential information identified and indexed as indicated in 3.02	
<p><b>Provide the following in a sealed envelope or package labeled with the specification number, specification title, and Respondent name and address as indicated in Section 3.03:</b></p> <ul style="list-style-type: none"> <li>• <b>One original with ink signature</b> (not an electronic or Xeroxed signature) of your complete submittal, arranged as indicated in Section 3.01.</li> <li>• <b>One copy</b> of your complete submittal.</li> <li>• <b>One electronic copy</b> (USB drive, labeled with company name) in either Word or PDF format, arranged as indicated in Section 3.01.</li> </ul> <p style="text-align: center;"><b>Clearly identify original and copies.</b></p>		

<b>After award approval, the following documents will be required (or issued):</b>		
1	Contract (Appendix B) – Vendor required to enter into a contract incorporating terms and conditions contained herein.	
2	Performance Bond (Appendix B)	
3	Certificate of Insurance and required endorsements (Appendix B)	
4	Purchase Order(s)	
5	City of Tacoma Business License	
6	Washington State Business License	

## SECTION 1 – PROJECT OVERVIEW / CALENDAR / INQUIRIES

Items that are lined out (strikethrough) do not apply to this solicitation.

### 1.01 PROJECT OVERVIEW AND PURPOSE

- A. The City of Tacoma (City) / Tacoma Public Utilities (TPU), Tacoma Power is soliciting bids to establish one or more contracts with qualified vendors to fulfill the City's needs for outdoor walk-in metal-clad switchgear 15kV on an as-needed basis for up to five years.

This specification establishes a supply contract, with the option for renewal, for power switchgear and associated spare parts, F.O.B. destination, freight prepaid and allowed, unloaded on an owner-prepared switchgear foundation within the Tacoma Power service area. Technical supervision of final assembly of the switchgear by City personnel shall be included in the bid prices. Tacoma Power will accept fixed price bids for switchgear with price adjustment according to the conditions specified in Section 1.06.

- B. The preference is to award a single contract. However, the City reserves the right to split the award if it is in the City's best interest. Tacoma Power also accepts that not all bidders will be capable of bidding every item. Bidders will NOT be automatically disqualified for failure to bid all switchgear construction alternatives and pricing methods.
- C. New and unused equipment shall be supplied per this contract.
- D. This product is used by Tacoma Power Substations located throughout its service area. The estimated annual usage is one unit. This is an estimated quantity only and does not guarantee a specific volume or dollar amount.
- E. Respondents may be required to submit samples of their product for evaluation prior to award. Products that fail to meet City standards or any of the Specifications herein may be rejected. Should a contracted vendor fail to meet quality and/or availability requirements contained in these Specifications, the City may move to terminate the contract with 10 days written notice.
- F. Note that the provisions found in Section 1, Section 2, Section 3, and Section 4 will prevail over any conflicting provisions found in the Standard Terms and Conditions of this RFB.
- G. This Specification may be found at [www.tacomapurchasing.org](http://www.tacomapurchasing.org): Navigate to *Contracting Opportunities / Supplies Solicitations*, and then click *Specification* for this RFB.



## 1.02 CALENDAR OF EVENTS

The anticipated schedule of events concerning this RFB is as follows:

Publish and issue RFB	Week of March 26, 2015
Questions due: 3:00 p.m.	April 9, 2015
Questions and answers posted	April 13, 2015
Submittal deadline: 11:00 a.m.	April 21, 2015
Public Utility Board consideration of award	May 13, 2015

This is a tentative schedule only and may be altered at the sole discretion of the City.

Contract may be issued after Public Utility Board approval, if required.

## 1.03 PRE-BID CONFERENCE / QUESTIONS AND REQUESTS FOR CLARIFICATION

- A. A pre-submittal bid conference will not be held.
- B. Questions and requests for clarification of these specifications may be submitted in writing by **3:00 p.m., Pacific Time, April 9, 2015**, to Kimberlie Kerner, Purchasing Division, via email to [kkerner@cityoftacoma.org](mailto:kkerner@cityoftacoma.org). Please include specification number and title in email subject line. Questions received after this date and time may not be answered.
  1. Please indicate the RFB 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.
- C. Written answers to questions will be posted with the Specification on or about **April 13, 2015**, on the Purchasing website at [www.TacomaPurchasing.org](http://www.TacomaPurchasing.org): Navigate to *Contracting Opportunities / Supplies Solicitations / then scroll to this RFB*)
- D. To receive notice of the posted answers, you must register as "[bid holder](#)" for this solicitation.
- E. The answers are not typically considered an addendum. (See Section 4.01 for Addenda)

## 1.04 ACCEPTANCE AND RESPONSIVENESS

- A. Respondents agree to allow a minimum of 60 days from the submittal deadline for the RFB to be accepted by the City.
- B. Submittals will be reviewed by the City to determine compliance with the requirements and instructions specified in this RFB. The Respondent is specifically notified that failure to comply with any part of this RFB may result in rejection of the submittal as non-responsive. The City reserves the right, in its sole discretion, to waive irregularities deemed to be immaterial.
- C. The final selection, if any, will be that submittal which, after review and in the sole judgment of the City, best meets the requirements set forth in this RFB.

#### **1.05 CONTRACT TERM**

The initial contract shall be for a period of two years from date of award, with the option to extend up to three additional one-year periods upon mutual consent of both parties and subject to the price increase/decrease provisions in Section 1.06 below.

#### **1.06 PRICING AND PRICE ADJUSTMENTS**

- A. Unit or lump sum prices shall be all inclusive and submitted as FOB destination, freight pre-paid and allowed (freight included in price).
- B. If the unit price does not compute to the extended total price, the unit price shall govern.
- C. Prices must remain firm for each contract period.
- D. Bid submittal prices will establish a base price against which contractors may request price adjustments at contract renewal.
- E. Submitted prices shall include costs of bid preparation, servicing of the account, all contractual requirements during contract period such as transportation, permits, labor, insurance costs, wages, materials, tools, components, equipment, and appurtenances necessary to complete the work, which shall conform to the best practice known to the trade in design, quality, material and workmanship and be subject to these Specifications in full.

- F. The City may consider price adjustments for each twelve-month contract period, under the following conditions:
1. Contractor submits proposed price changes in writing 30 days prior to end of each available renewal period. Written requests for price changes should be directed to the contract administrator.
  2. Any proposed price increase to contract line items must be beyond the control of the contractor and supported by written documentation from the manufacturer or wholesale distributor, indicating new higher cost adjustments in effect.
  3. Price increases will be adjusted only to the amount of cost increase to contractor.
  4. No adjustment will be made for contractor profit margin.
  5. The City is entitled to any promotional pricing during the contract period which is lower than pricing provided in the bid submittal.
  6. Price decreases shall be immediately passed on to the City.
  7. Prices shall remain firm for each contract period, however, nothing in this contract will prevent the contractor from charging a lower than quoted price.
  8. Price increases may be passed along during a contract period if the increase is due to federally mandated regulations.
  9. The City reserves the right to accept or reject all such price adjustments.
- G. Increase requests may be evaluated against various market conditions, including but not limited to, Consumer Price Index for Seattle - Tacoma - Bremerton, All Items 1982-84=100, for the comparable period, state/federal regulations affecting production costs of the materials, volatile commodity market conditions, various producer price or commodity indices, or minimum wage adjustments.
- H. Consumer Price Index for All Urban Consumers (CPI-U) for the U.S. City Average Index for All Items, 1982-84=100, unadjusted (<http://www.bls.gov/ro9/ro9news.htm>).

### **1.07 FREIGHT / SHIPPING**

The items to be supplied by the award of this contract shall be delivered F.O.B. destination, freight prepaid and allowed, to the Purchase Order designated locations, with or without a switchgear pad.

The City reserves the right to redirect delivery to another address within the Tacoma Power Service Area. The Vendor will be notified of any changes to delivery location at least one (1) month before scheduled delivery. Tacoma Power's Service Area includes delivery within Pierce County which includes the communities of University Place, Fife, Fircrest, Spanaway, Parkland, Graham, Lakewood, Summit, Frederickson and Puyallup.

The City will not pay handling charges for shipping any order. However, the City may occasionally authorize the Supplier to invoice freight costs for special orders when next day air

shipment or special handling is requested. Likewise, if the Supplier is requested by the City to ship materials from a factory that charges the Supplier a handling charge, upon approval of the City staff person placing the order, the handling charge may be passed through to the City at net cost. Supplier shall invoice special order freight charges at actual cost of transportation. Supplier shall upon request provide documentation of actual freight/shipping charges.

## **1.08 DELIVERY INSTRUCTIONS**

Delivery shall include unloading of shipping sections onto a provided foundation inside Tacoma Power Substations. Technical supervision of final assembly of the switchgear by City personnel shall be included in the bid prices. New and/or existing substations will take delivery of this material or equipment. Vendor shall place equipment on a City-provided foundation. City will weld or epoxy anchor switchgear in place. The bidder must address site issues at substations. Such issues include, but are not limited to, road access to the substation and clearance to energized equipment inside the substation. No known unusual site conditions exist.

All items called for in this specification, including, but not limited to, the necessary instruction books, written test results and approved drawings must be delivered to the City before the invoice will be processed for payment.

Vendors must deliver 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, produce a hazardous material.

### **PREPARATION FOR SHIPMENT**

The following steps shall be followed by the Vendor to prepare equipment for shipment:

- All heavy parts shall be provided with skids to facilitate handling.
- All heavy parts shall be securely boxed and identified as to content.
- All exterior electrical receptacles shall be properly covered for protection.
- All hollow external bracings shall have drain holes.
- The Vendor will be responsible for all damage to the shipment incurred in transit.
- The equipment shall be equipped with travel recorder(s) designed to register shocks in the following three dimensions: in line of travel, vertical and transverse side-sway and shall record the entire transit time of the equipment from manufacturer to final setting on City-prepared foundation.
- The bill of lading shall indicate that shipping car must be located not more than five (5) cars from the front of the engine if transporting by train.
- A complete packing list shall be included in the shipment.

### **QUALIFICATIONS OF EQUIPMENT MOVER AND PLAN**

It is the City's position that the safe and efficient delivery and placement of equipment requires specialized equipment, technical expertise and substantial relevant experience. To ensure successful placement of equipment, the City requires the successful bidder to provide a written plan to the City detailing their plans for moving and placement of the equipment.

The written plan shall include the following:

- If applicable, the name of the subcontractor that will be moving the equipment, including the name of the designated site foreman.

- A record of vendors, or vendor's subcontractor's, relevant experience for the most recent five (5) years.
- A detailed work plan showing the equipment to be used and any shoring or similar materials to be furnished and placed by vendor or vendor's subcontractor.
- A detailed, step-by-step description of the process for placing the equipment, beginning from its arrival in the State of Washington.

The City shall be the sole determiner of the acceptability of the subcontractor and/or the proposed work plan and equipment.

#### **1.09 DELIVERY PERFORMANCE / RESPONSE TIME –**

Respondents are required to submit a delivery timeline to which they commit. Purchase order delivery dates will reflect this timeline. In the event a delivery date is not met, Tacoma Power reserves the right to purchase these products from another source. The City may terminate the contract if late deliveries persist.

#### **SCHEDULE OF ACTIVITIES**

This Schedule of Activities shall be followed by the successful bidder unless revised by mutual agreement of the City and Vendor.

<b>Vendor Design/Submittal Activity Required</b>	<b>Days after Purchase Order Received</b>
Submit Vendor's Manufacturing and Delivery Schedule to City	30
Submit Electronic Approval Drawings: <ul style="list-style-type: none"> <li>• foundation loading</li> <li>• equipment outline/layout</li> <li>• anchor bolt patterns</li> </ul>	30
Submit Electronic Approval Drawings showing: <ul style="list-style-type: none"> <li>• control schemes</li> <li>• wiring diagrams</li> </ul> Any other information required for engineering the equipment's installation (anchoring requirements, etc.)	60
Submit Outline of Organization of instruction manuals	60

Vendor Testing/Delivery Activity Required	Required By
Submission of Vendor's test plan & Mover Qualifications and Plan	Four (4) calendar weeks prior to testing date
Inspection/Test Notification	Six (6) calendar weeks prior to inspection and/or test
Test Reports	One (1) week after completion of tests
Vendor to deliver instruction manuals	One (1) week after receiving shipment
Vendor to deliver shipping notices	Three (3) days prior to equipment arrival
Shipper to notify Engineer via phone/email	48 hours prior to equipment arrival

### 1.10 ESTIMATED USAGE

The items and quantities listed on the Price Proposal Form are a sample based on past usage and are not a guarantee for any particular order, quantity, item, or dollar volume.

Any contract issued as a result of this solicitation is not exclusive. The City reserves the right to purchase from other suppliers if the successful bidder cannot provide the required parts in a timely manner. This contract is estimated at \$1,000,000.00 annually, based on past history and potential customer projects.

## **SECTION 2 – PROJECT SCOPE / TECHNICAL PROVISIONS**

### **2.01 BACKGROUND**

This specification establishes a two (2) year supply contract, with the option for three (3) one-year renewals, for power switchgear and associated spare parts, F.O.B. destination, freight prepaid and allowed, to owner-prepared switchgear foundation within the Tacoma Power service area.

### **2.02 TECHNICAL REQUIREMENTS**

Please refer to T&D Material Standard 2101.01

### **2.03 SCOPE OF WORK**

The switchgear shall be designed, manufactured, and tested in compliance with the latest revision of applicable ANSI, NEMA, and IEEE standards, unless otherwise specified. If a conflict between standards exists, the more stringent shall be applied. The switchgear must meet the minimum requirements as to quality, function and capacity as outlined in this specification.

Switchgear purchased under this contract, including transformer throat (bus duct) or underground cable enclosure, shall be unloaded ~~and assembled~~ on the foundation in a substation. Technical supervision of final assembly of the switchgear by City personnel shall be included in the bid prices.

### **2.04 DELIVERABLES**

Any and all design, procurement, engineering, testing and other services required of the Vendor to fulfill this specification shall be the sole responsibility of the Vendor and shall be included in the bid price.

- Double-ended walk-in metal-clad switchgear complete with thirteen sections (two main, two auxiliary, one tie and four feeders on each side of the tie), bus work, instruments, relays, associated equipment and all internal wiring.
- Single-ended walk-in metal-clad switchgear with seven sections (one main, one auxiliary, one tie and four feeders on one side of the tie), bus work, instruments, relays, associated equipment and all internal wiring.
- Transformer Throat (bus duct) or transformer 15kV underground cable termination enclosure for connection to city's transformers.
- Vacuum circuit breakers (main, tie, feeder)

### **2.05 MINIMUM REQUIREMENTS OR DESIRED QUALIFICATIONS**

The Bidder shall be experienced in the design, manufacture, direct sale, warranty service and support of this type of material or equipment (power switchgear 2000A and above, 15kV min) to electrical power utilities in the United States. The Bidder shall have a record of successful delivery and performance over a period of five (5) years or more in the United States. The City shall be the sole judge of the bidder's ability to meet the requirements of this paragraph.

## **2.06 BID BOND**

- A. ~~The attached Bid Bond must be executed by the person legally authorized to sign the bid, and must be properly signed by representatives of the surety company unless the bid is accompanied by a certified check or cashier's check.~~
- B. ~~If a Bid Bond is used, the form furnished by the City must be followed; no variations from the language thereof will be accepted. The amount of the Bid Bond must be not less than five percent (5%) of the total amount bid; and, if shown in dollars and cents, the amount of said Bid Bond must be not less than the required five percent; or in lieu of dollars and cents, the bond may be completed by inserting therein, "five percent of the amount of the accompanying proposal." Bid Bonds will not be returned.~~
- C. ~~If a certified or cashier's check is provided by the successful Respondent(s), the amount of their check will be refunded after award of the Contract, City's receipt of the signed Contract, and acceptance of the Performance Bond, if applicable. Unsuccessful Respondents providing certified checks will be refunded the amount of their check upon award of the Contract.~~

## **2.07 PREVAILING WAGES**

~~Contractor shall comply with the law regarding prevailing wages. Contractor shall pay and require any contractors and subcontractors to pay prevailing wages in accordance with the provisions of RCW 39.12, as amended, relating to prevailing wages and fringe benefits. These rules apply to any contractor doing business with the City, including owner/operators. A Statement of Intent to Pay Prevailing Wages must be filed with the Washington Department of Labor & Industries upon award of contract. Affidavits of Wages Paid must be filed with the Washington Department of Labor & Industries upon job completion. Payments cannot be released by the City until certification of these filing are received. Additional information regarding these requirements can be obtained by contacting the Department of Labor & Industries, Prevailing Wage at 360-902-5335 or visiting their website at <http://www.lni.wa.gov/TradesLicensing/PrevailingWage/default.asp>.~~

## **2.08 SURETY / PERFORMANCE BOND**

A performance bond, including power of attorney, for this project is required in the amount of 100 percent of the contract total, excluding sales tax.

- A. The City's performance bond form must be used (see Appendix B).
- B. The performance bond must be executed by a surety company licensed to do business in the state of Washington.
- C. The cost of a performance bond must be included in submittal prices. Bonds will not be paid as a separate line item.
- D. For a supply-type contract, a certified or cashier's check or cash may be substituted for the bond; however, this cash or check must remain with the City through the guarantee period and any interest on said amount shall accrue to the City.



## 2.09 CITY CONTACT INFORMATION

The person listed below shall be known as the Engineer, or City Contact, within these specifications, unless noted otherwise during the course of the contract period. Contacting the Engineer directly is not allowed until after award of contract. All pre-award communication must go through the City's Purchasing contact, per Section 1.03

Name	Phone Number	Email
Mike Allen	253.396.3126	<a href="mailto:mallen@cityoftacoma.org">mallen@cityoftacoma.org</a>

## SECTION 3 – SUBMITTAL FORMAT, CONTENT, EVALUATION, AWARD

### 3.01 CONTENT TO BE SUBMITTED

Respondents are to provide complete and detailed responses to all items in the order, using the same numbering format, in which they are presented below. Submittals that are incomplete or conditioned in any way that contain alternatives or items not called for in this RFB, or not in conformity with law, may be rejected as being non-responsive. The City will not accept any submittal containing a substantial deviation from the requirements outlined in this RFB.

Organization of the submittal should follow the sequence of contents below so that essential information can be located easily during evaluation.

#### A. Required Forms

1. Signature Page
2. SBE Forms
3. Price Proposal Form
4. Record of Prior Contracts

\*Do not alter these forms in any way or substitute letterhead paper for them. Do not present cover letters or blank pages ahead of these forms. The Signature Page must be signed by a person authorized to make proposals and enter into contract negotiations on behalf of your agency. This individual must be at least 18 years of age.

#### B. Additional Information to be Submitted

1. Data Sheet from T&D Material Standard 2101.01 for Items 1, 2, 3 and 4; which shall include layout drawings.

### 3.02 CONFIDENTIAL OR PROPRIETARY INFORMATION

Information that is confidential or proprietary must be clearly marked. Further, an index must be provided indicating the affected page number(s) and location(s) of all such identified material. Information not included in said index will not be reviewed for confidentiality or as proprietary before release. See items 1.17 and 1.18 of the Standard Terms and Conditions Section 1 – Solicitation (Appendix C).

### **3.03 SUBMITTAL PACKAGE REQUIREMENTS**

Submittals must be sealed in an envelope or package labeled with the specification number, specification title and Respondent name and address, and received by the City of Tacoma Purchasing Division by the date and time specified in the Request for Bids page or subsequent addenda.

### **3.04 EVALUATION CRITERIA**

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.

The City may also take into consideration other criteria for determining award, including evaluation factors set forth in Municipal Code Section 1.06.262. 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.

### **3.05 AWARD**

The City reserves the right to award the contract to the responsible bidder or bidders with the lowest responsive bid whose submittal is the most advantageous to the City, price and other factors considered.

### **3.06 ADDITIONAL CONTRACTS / INTERLOCAL PURCHASES**

The initial award will be for Transmission & Distribution; however, other City locations/departments may be added to this Contract or develop their own separate contract from these Specifications during the contract term.

Other agencies or entities may enter into a separate contract based on these Specifications per RCW 39.34. (See Standard Terms and Conditions Section 2 – Supplies)

### **3.07 PAYMENT METHOD – CREDIT CARD ACCEPTANCE – EFT/ACH ACCEPTANCE**

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 1.06 B. of the Standard Terms and Conditions Section 1 – Solicitation.

The City's preferred method of payment is by Visa credit card (aka procurement card). Respondents may be required to have the capability of accepting the City's authorized procurement card as a method of payment. **The City of Tacoma will not pay increased prices or additional fees when the procurement card is used.**

The City, in its sole discretion, will determine the method of payment for supplies and/or services as part of this agreement.

## **SECTION 4 – PROJECT REQUIREMENTS / SPECIAL PROVISIONS**

### **4.01 REVISIONS TO RFB – ADDENDA**

In the event it becomes necessary to revise any part of this RFB, addenda will be issued to registered bid holders/planholders and posted on the Purchasing website at [www.TacomaPurchasing.org](http://www.TacomaPurchasing.org): Navigate to *Contracting Opportunities / Supplies Solicitations*, and then click the word *Addendum* for this RFB. Failure to acknowledge addenda may result in a submittal being deemed non-responsive.

Answers in response to RFB inquiries are not typically provided as an addendum. (See Section 1.03 for Questions and Requests for Clarifications)

### **4.02 DELIVERY OF PRODUCTS AND SERVICES – IDLING PROHIBITED**

The City of Tacoma has a commitment to the reduction of unnecessary fuel emissions and improving air quality by reducing unnecessary air pollution from idling vehicles. Limiting car and truck idling supports cleaner air, healthier work environments, the efficient use of city resources, the public's enjoyment of City properties and programs, conservation of natural resources, and good stewardship practices.

Vehicles and/or diesel fuel trucks shall not idle at the time and location of the delivery to the City for more than three minutes. The City requires contractors to utilize practices that reduce fuel consumption and emission discharge, including turning off trucks and vehicles during delivery of products to the City. Exceptions to this requirement include when associated power is necessary to make a delivery or provide the service, when the engine is used to provide power to another device, and when a running engine is required for proper warm-up and cool-down of the engine.

### **4.03 ENVIRONMENTALLY PREFERABLE PROCUREMENT**

The City has interest in measures used by its contractors to ensure sustainable operations with minimal adverse impact on the environment. The City seeks to do business with vendors that value community and environmental stewardship that help us meet our sustainable purchasing goals.

In accordance with the City's Sustainable Procurement Policy, it is the policy of the City of Tacoma to encourage the use of products or services that help to minimize the environmental and human health impacts of City operations. Respondents are encouraged to incorporate environmentally preferable products or services into their responses wherever possible. "Environmentally preferable" means products or services that have a lesser or reduced effect on human health and the environment when compared with competing products or services that serve the same purpose. This comparison may consider raw materials acquisition, production, manufacturing, packaging, distribution, reuse, operation, maintenance, or disposal of the product or service. To view the above City policies, go to Section XXIV.A. of the [Purchasing Policy Manual](#).

#### **4.04 SUSTAINABILITY**

The City of Tacoma encourages the use of sustainability practices and desires any awarded contractor(s) to assist in efforts to address such factors when feasible for:

- A. Pollutant releases
- B. Toxicity of materials used
- C. Waste generation
- D. Greenhouse gas emissions, including transportation of materials and services
- E. Recycle content
- F. Energy consumption
- G. Depletion of natural resources
- H. Potential impact on human health and the environment

The supplier shall package orders, preferably in environmentally friendly packaging such as reduced packaging and recyclable packing materials.

#### **4.05 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.

#### **4.06 SUBMITTAL CLARIFICATION**

Respondents may be asked to clarify their submittal. This action shall not be construed as negotiations or any indication of intentions to award. If called upon, the Respondent must respond to such requests within two business days or the timeframe set forth by the City in its request for clarification. A Respondent's failure to respond to such a request may result in rejection of its submittal. (See Standard Terms and Conditions Section 1 – Solicitation 1.05.)

#### **4.07 CONTRACT OBLIGATION / ACCEPTANCE OF SUBMITTAL CONTENTS**

The bid submittal contents of the successful Respondent will become contractual obligations if a contract ensues.

#### **4.08 TERMINATION OF CONTRACT**

The City reserves the right to cancel the contract for any reason and/or without cause with written notice to the contractor.

#### **4.09 ADDITIONAL PRODUCTS AND SERVICES**

Any related additional services or products of benefit to the City not specifically required in this RFB, but which the Contractor offers to provide, may be outlined on a separate page and included with the submittal.

#### **4.10 EXPANSION CLAUSE**

Any resultant contract may be further expanded in writing to include other related services or products normally offered by the Contractor, as long as the price of such additional services or products have a profit margin equal to or less than that in place at the time of original submittal. Such additions and prices will be established in writing. (By written addendum to the contract.) New items not meeting these criteria will not be added to the contract. Contractor profit margins are not to increase as a result of contract additions.

Any new products or services accepted by the City may be added to this contract and/or substituted for discontinued products or services. New products and services shall meet or exceed all specifications of original award.

#### **4.11 ACCEPTANCE / REJECTION OF SUBMITTALS**

The City reserves the right and holds at its discretion the following rights and options:

- To waive any or all informalities
- To award one or more contracts
- To award by line item or group of line items
- To not award one or more items
- To not award a contract
- To issue subsequent bids

#### **4.12 RESERVED RIGHTS**

In addition to other rights in this RFB, the City reserves, holds, and may exercise at its sole discretion, the following rights and options:

- A. To supplement, amend, or otherwise modify or cancel this RFB with or without substitution of another solicitation.
- B. To issue additional or subsequent solicitations.
- C. To conduct investigations of Respondents and their proposals, including inspection of their facilities.
- D. To award a contract or contracts resulting from this solicitation to the responsible Respondent(s) whose submittal conforming to this solicitation will be most advantageous to the City.
- E. If an award is made, and prior to entering into a contract, subsequent information indicates that such award is not in the best interest of the City, the City may rescind the award without prior notice to the Respondent and either award to another Respondent or reject all submittals or cancel this solicitation.
- F. Respondents are advised that the City reserves the right to cancel award of this Contract at any time before execution of the Contract by both parties if cancellation is deemed to be in the City's best interest. In submitting a proposal, Respondents agree that the City is not liable for any costs or damages for the cancellation of an award. The Respondent assumes the sole risk and responsibility for all expenses connected with the preparation of this proposal.

#### **4.13 WARRANTY**

All equipment shall be of the kind and quality specified in the Proposal and shall meet all contract performance requirements including, but not limited to, those specified in Section 2.13 of the Standard Terms and Conditions. Said equipment shall be delivered free from defects in materials or workmanship and shall meet all specified performance requirements for a period of twelve (12) months from date of field energization or eighteen (18) months from date of shipment. These warranties shall include the cost of repair and/or replacement of any defect or failure of the equipment to meet specified performance requirements, together with all costs to remove, transport and reinstall equipment as necessary to correct deficiencies.

In all instances wherein the Respondent is not the manufacturer of the equipment, the specified warranty requirements and responsibility shall be backed by, but not relieved by, the manufacturer's warranty for said equipment. The terms and conditions of any submitted manufacturer warranties must be consistent with the warranty requirements of this Section. Any conditions, qualifications or additions that vary from the warranty requirements of this Section may result in rejection of the bid. See Standard Terms and Conditions – Section 1 – Solicitation, Subsection 1.10.

#### **4.14 QUALITY ASSURANCE**

The Vendor shall have a quality assurance program in place that conforms to the requirements of ISO 9001, ISO 9002 and ANSI/ASQC Q91, ANSI/ASQC Q92 or equivalent acceptable to the City. The quality assurance program may be audited by the City or its representative. The Vendor shall provide access to and copies of quality assurance documents, when requested, such as material certificates, inspection and test results obtained in the course of quality assurance, control charts and other quality documents compiled during the work.

#### **4.15 INSURANCE REQUIREMENTS**

The successful bidder shall provide and keep current an insurance certificate naming the City as additional insured – with a 30 day notice of cancellation of the coverage minimums. See Appendix C.

The Vendor is supplying the crane, and delivery could expose Tacoma Power to liability. The Insurance Certificate Requirements for the Commercial General Liability (CGL) coverage shall be \$5,000,000 per occurrence and in the aggregate. The City of Tacoma shall be named as an additional insured, and the policy would be primary and non-contributing to the City's insurance program. As an alternative to the CGL, the Vendor could provide an Owner's and Contractor's Protective Liability Coverage Form ISO form CG 99 90 10 01 or a later version of the same form, with the \$5,000,000 policy limits and primary/non-contributing status, on which the City of Tacoma is a named insured. Because the switchgear would become Tacoma Power property upon arrival on site, and therefore the Vendor would be handling property in which Tacoma Power has a financial interest, Builder's Risk coverage for the switchgear shall be required, insured up to its full value. The Builder's Risk coverage required by this section shall not be subject to a deductible in excess of \$5,000. The City of Tacoma should be an insured and loss payee under the Builder's Risk coverage.

#### **4.16 INSPECTION AND WITNESS TESTING**

All items delivered by the Vendor are subject to final inspection and acceptance by the City's Engineer. This may include witness testing of the equipment at the factory. Material failing to meet the requirements of this contract will be held at the Vendor's risk and may be returned to Vendor. If so returned, the cost of transportation, unpacking, inspection, repacking, reshipping, or other like expenses are the responsibility of the Vendor.

#### **4.17 LIQUIDATED DAMAGES**

Materials are to be delivered within the maximum time frame specified by the contractor on the Price Proposal Form and contract or purchase order.

Contractor agrees to pay liquidated damages for any delay in delivery beyond the required delivery date in the amount of \$1000 per working day (Monday through Friday, excluding legal holidays). Any such assessment will be deducted from the contractor's invoices prior to payment. Maximum liquidated damages to be imposed would be five percent (5%) of the value of the purchase order.

The contractor shall not, however, 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 contractor 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.

#### **4.18 INSTRUCTION BOOKS**

In addition to the paper manual shipped inside the equipment/material control cabinet, an additional three (3) paper manuals shall be supplied for each unit purchased.

#### **REQUIREMENTS (HARD COPY and ELECTRONIC)**

Each instruction book shall include the following:

- Complete set of approved final drawings, including schematics, point-to-point wiring diagrams and completed nameplate drawings.
- Detailed instructions for the shipping, receiving, handling, storing and installation, including assembly instructions if field assembly required.
- Description of all component parts and accessories.
- Complete instructions covering operation and maintenance of equipment.
- Drawings showing dimensional details of bushings, connections and terminations.
- A clear and readable photo of completed nameplate including all fill-in data.
- Torque requirements for all bolts and nuts for assembly.
- Final test reports.
- Instrument transformer excitation and over current ratio curves.
- Mechanical adjustment and timing.

#### **ELECTRONIC FORMAT**



In addition, the Vendor shall furnish to the City one (1) electronic copy of the instruction book, which shall be formatted as follows:

- Complete set of approved final drawings, including schematics, point-to-point wiring diagrams and completed nameplate drawings.
- Electronic manuals shall be submitted in .PDF format and be compatible with the latest version of Adobe Acrobat Professional.
- Manuals shall be scanned at 300 DPI.
- Color originals shall be scanned to color.
- Manuals with different page sizes shall be scanned in the exact size and pagination as the original hard copy.
- Manuals shall be scanned to .PDF files with the Optical Character Recognition (OCR) function enabled.
- Manuals shall be submitted as a single .PDF file; addendums and attachments (may or may not include drawings) should not be submitted separately, or in different file formats.
- Manuals that consist of multiple volumes shall be submitted as individual files.
- Manuals comprised of several sections or chapters shall be electronically bookmarked in the .PDF format by the Vendor.

#### **4.19 MANUFACTURER’S DRAWINGS**

Drawings shall comply with the Tacoma Power CAD drawings, standards and approval process.

#### **4.20 ENGLISH LANGUAGE REQUIREMENTS**

The English language shall be used in all drawings, bulletins and catalog information submitted with the bid, as well as in all subsequent correspondence and submittals by the successful Bidder. Items to include but not limited to packaging lists, paints, labels, etc.

Factory test personnel or engineering field personnel, if required on customer’s premises during delivery, shall speak technical and conversational English without need for an interpreter.

#### **4.21 POST-AWARD MEETING**

If the Engineer deems it necessary, a post-award meeting or “design meeting” will be scheduled for this bid. The City typically requests a design meeting for each type of equipment.

#### **4.22 PROGRESS PAYMENTS**

This Section modifies subsection 2.06 (Payment Terms) found in the Standard Terms and Conditions Section 2 – Supplies by adding the following:

For Item No’s 1, 2, 3, and 4 of this contract the following progress payment schedule will be used. Invoices will not be processed until the required milestones are verified by the City’s Engineer.

Milestone	% of Net Price
Approval of Manufacturer’s Drawings by City	20%
Release for Fabrication	30%
Manufacturing Complete	30%
Approved Factory Acceptance Tests	10%
Shipment	10%

## **APPENDIX A**

**Signature Page**

**SBE Forms**

**Price Proposal Form**

**Record of Prior Contracts**

**SIGNATURE PAGE**

**CITY OF TACOMA DEPARTMENT OF PUBLIC UTILITIES – TACOMA POWER**

All submittals must be in ink or typewritten and must be executed by a duly authorized officer or representative of the bidding/proposing entity. 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.

Submittals will be received and time stamped only at the City of Tacoma Purchasing Division, located in the Tacoma Public Utilities Administration Building North, Main Floor, at 3628 South 35<sup>th</sup> Street, Tacoma, WA 98409. **See the Request for Bids page near the beginning of the specification for additional details.**

**REQUEST FOR BIDS SPECIFICATION NO. PT14-0749F**

**Outdoor Walk-In Metal-Clad Switchgear 15kV**

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 into Contracts for Bidder/Proposer

\_\_\_\_\_  
Date

\_\_\_\_\_  
Address

\_\_\_\_\_  
Printed Name and Title

\_\_\_\_\_  
City, State, Zip

\_\_\_\_\_  
(Area Code) Telephone Number / Fax Number

\_\_\_\_\_  
E-Mail Address

\_\_\_\_\_  
State Business License Number  
in WA, also known as UBI (Unified Business Identifier) Number

\_\_\_\_\_  
E.I.No. / Federal Social Security Number Used on Quarterly  
Federal Tax Return, U.S. Treasury Dept. Form 941

\_\_\_\_\_  
State Contractor's License Number  
(See Ch. 18.27, R.C.W.)

Addendum acknowledgement #1 \_\_\_\_\_ #2 \_\_\_\_\_ #3 \_\_\_\_\_ #4 \_\_\_\_\_ #5 \_\_\_\_\_

***THIS PAGE MUST BE SIGNED AND RETURNED WITH SUBMITTAL.***

# SBE GOAL UTILIZATION FORM

## **SMALL BUSINESS ENTERPRISE REQUIREMENTS & PROCEDURES:**

All bidders must complete and submit with their bid the following solicitation forms contained in the bid submittal package:

City of Tacoma – Prime Contractor’s Pre-Work Form

## **IMPORTANT NOTE:**

It is the bidder’s responsibility to insure that the SBE subcontractor(s) listed on the SBE Utilization Form are currently certified by the City of Tacoma at the time of bid opening. This may be verified by contacting the SBE Program Office at (253) 591-5224 between 8 AM and 5 PM, Monday through Friday. This form must have clear expression of SBE participation your company will use on this project. Ordinance 27867, passed by the City Council on December 15, 2009, establishes the overall SBE goal of 22%, except where modified through appropriate procedures. Please refer to the City of Tacoma SBE Provisions included elsewhere in these Special Provisions.

SBE GOAL: The SBE Office determines this project to be a “**Single Trade Project**” with no SBE goal requirements!

For any questions or concerns, please call the SBE Program Manager at (253) 591-5224

**MATERIAL MISSTATEMENTS CONCERNING COMPLETED ACTIONS BY THE BIDDER IN ANY SWORN STATEMENT OR FAILURE TO MEET COMMITMENTS AS INDICATED ON THE SBE UTILIZATION FORM MAY RENDER THE BIDDER IN DEFAULT OF CITY ORDINANCE 27867.**

CCD/SBE/Single Trade: RFB PT14-0749F 15kV Switchgear SBE Goal  
Date of Record: 03/25/15



City of Tacoma  
 Community & Economic Development  
 Office of Small Business Enterprise  
 747 Market Street, Room 900  
 Tacoma, WA 98402  
 253-591-5224 or 253-573-2435

## PRIME CONTRACTOR'S PRE-WORK FORM

Company Name \_\_\_\_\_

Telephone \_\_\_\_\_

Address/City/State/Zip Code \_\_\_\_\_

Specification Number \_\_\_\_\_

Specification Title \_\_\_\_\_

JOB CATEGORIES SPECIFY	TOTAL EMPLOYEES		TOTAL MINORITY EMPLOYEES		BLACK		ASIAN		AMERICAN INDIAN		HISPANIC	
	M	F	M	F	M	F	M	F	M	F	M	F
Officer / Managers												
Supervisors												
Project Managers												
Office / Clerical												
Apprentices												
Trainees												
<b>TOTALS</b>												

### CONTRACTOR'S PROJECTED WORK FORCE - THIS PROJECT

Superintendent												
Foreman												
Operators												
Laborers												
Apprentice												
Trainee												
<b>TOTALS</b>												

\_\_\_\_\_  
 Type or Print Name of Responsible Officer / Title

\_\_\_\_\_  
 Signature of Responsible Officer

\_\_\_\_\_  
 Date

## INSTRUCTIONS FOR COMPLETING PRIME CONTRACTOR'S PRE-WORK FORM

***This form only applies to employees who will be working on this specific project.***

1. "Heading" the company name and address should reflect the subcontractor actually doing business with the City of Tacoma. If this address is different from that of the Equal Employment Opportunity Officer that administers the EEO programs of the company, the Equal Employment Opportunity Officer's address should be noted in the "Comments" section at the bottom of the form. "Telephone" should contain the area code, telephone number and extension (if any) for the Equal Employment Officer or the responsible official.
2. "Job Categories" at the extreme left hand column of the form specifying "Job Categories" lists "Officials & Managers." You are to list in addition to Officials & Managers any appropriate job titles such as Sales Workers, Office/Clerical, Professionals, Technical, etc., as they apply to your own company and only as pertains to this specific project.
3. The "M" and "F" headings at the top of each column refer to "Male" and "Female."
4. The "Total Employees" column should list the total number of male employees under "M" and the total female number of female employees under "F" for each job category listed. They should be listed in a similar manner in the "Total" category at the bottom of the form. The "Total Employees" column should include all those employees listed under "Non-Minority" and "Total Minorities." "Non-Minority" should include all employees not listed in the minority columns.
5. "Total Minorities" should include all employees listed under the "Black," "Asian," "American Indian," and "Hispanic" columns. These columns should include only employees who are members of that particular minority group. Designation and definitions of ethnic/national origin status follow the instructions and definitions of the Federal EEO-1 Form of the U. S. Equal Employment Opportunity Commission.
6. "Totals" this line should reflect the total of all lines in each of the above columns.
7. The signature of your company's designated responsible official or similar official responsible for equal employment opportunity must appear in the designated space at the bottom of the form. Please PRINT OR TYPE the person's name on the top line across from the signature. This is required since some signatures are difficult to read.
8. "Comments" this section is to be used as needed for explanations to under utilization rate or lack of turnover, proposed expansion or reduction of staff or any other pertinent information you believe will help clarify or explain the data presented on the form. If you need additional space, please explain on a separate sheet of paper.
9. If you need assistance or have questions regarding the completion of this form, please call the SBE Office at 253-591-5224 or 253-573-2435

## Chapter 1.07

## SMALL BUSINESS ENTERPRISE

## Sections:

- 1.07.010 Policy and purpose.
- 1.07.020 Definitions.
- 1.07.030 Discrimination prohibited.
- 1.07.040 Program administration.
- 1.07.050 Certification.
- 1.07.060 Program requirements.
- 1.07.070 Evaluation of submittals.
- 1.07.080 Contract compliance.
- 1.07.090 Program monitoring.
- 1.07.100 Enforcement.
- 1.07.110 Remedies.
- 1.07.120 Unlawful acts.
- 1.07.130 Severability.
- 1.07.140 Sunset and review of program.

**1.07.010 Policy and purpose.**

It is the policy of the City of Tacoma that citizens be afforded an opportunity for full participation in our free enterprise system and that historically underutilized business enterprises shall have an equitable opportunity to participate in the performance of City contracts. The City finds that in its contracting for supplies, services and public works there has been historical underutilization of small businesses located in certain geographically and economically disfavored locations and that this underutilization has had a deleterious impact on the economic well-being of the City. The purpose of this chapter is to remedy the effects of such underutilization through use of reasonably achievable goals to increase opportunities for historically underutilized businesses to participate in City contracts. It is the goal of this chapter to facilitate a substantial procurement, education, and mentorship program designed to promote equitable participation by historically underutilized businesses in the provision of supplies, services, and public works to the City. It is not the purpose of this chapter to provide any person or entity with any right, privilege, or claim, not shared by the public, generally, and this chapter shall not be construed to do so. This chapter is adopted in accordance with Chapter 35.22 RCW and RCW 49.60.400.

(Ord. 27867 Ex. A; passed Dec. 15, 2009)

**1.07.020 Definitions.**

Terms used in this chapter shall have the following meanings unless defined elsewhere in the Tacoma Municipal Code ("TMC"), or unless the context in which they are used clearly indicates a different meaning.

- A. "Base Bid" means a Bid for Public Works to be performed or Supplies or Services to be furnished under a City Contract, including additives, alternates, deductives, excluding force accounts, and taxes collected separately pursuant to Washington Administrative Code ("WAC") 458-20-171.
- B. "Bid" means an offer submitted by a Respondent to furnish Supplies, Services, and/or Public Works in conformity with the Specifications and any other written terms and conditions included in a City request for such offer.
- C. "Bidder" means an entity or individual who submits a Bid, Proposal or Quote. See also "Respondent."
- D. "City" means all Departments, Divisions and agencies of the City of Tacoma.
- E. "Contract" means any type of legally binding agreement regardless of form or title that governs the terms and conditions for procurement of Public Works and Improvements and/or Non-Public Works and Improvements Supplies and Services. Contracts include the terms and conditions found in Specifications, Bidder or Respondent Submittals, and purchase orders issued by the City. A "Contract" as used in this chapter shall include an agreement between the City and a non-profit entity to perform construction-related services for Public Works. A "Contract" does not include: (1) awards made by the City with federal/state grant or City general funds monies to a non-profit entity where the City offers assistance, guidance, or supervision on a project or program, and the recipient of the grant awards uses the grant moneys to provide services to the community; (2) sales transactions where the City sells its personal or real property; (3) a loan transaction where the City is acting as a debtor or a creditor; (4) lease, franchise; (5) agreements to use City real property (such as Licenses, Permits and Easements) and, (6) banking and other financial or investment services.

## Tacoma Municipal Code

F. "Contractor" means any Person that presents a Submittal to the City, enters into a Contract with the City, and/or performs all or any part of a Contract awarded by the City, for the provision of Public Works, or Non-Public Works and Improvements, Supplies or Services.

G. "Evaluated Bid" means a Bid that factors each Respondent's Base Bid including any alternates, deductive and additives selected by the City that will result in a weighed reduction based on that Respondent's percentage of SBE participation, as defined by formula set forth in this chapter or in the SBE Regulations adopted pursuant to this chapter.

H. "Goals" means the annual level of participation by SBEs in City Contracts as established in this chapter, the SBE Regulations, or as necessary to comply with applicable federal and state nondiscrimination laws and regulations. Goals for individual Contracts may be adjusted as provided for in this chapter and shall not be construed as a minimum for any particular Contract or for any particular geographical area.

I. "Lowest and Best Responsible Bidder" means the Bidder submitting the lowest Bid received that is within the range of acceptable bids, that also has the ability to timely perform the Contract bid upon considering such factors as financial resources, skills, quality of materials, past work record, and ability to comply with state, federal, and local requirements, including those set forth in the SBE Regulations.

J. "Non-Public Works and Improvements" means all competitively solicited procurement of Supplies and/or Services by the City not solicited as Public Works.

K. "Person" means individuals, companies, corporations, partnerships, associations, cooperatives, any other legally recognized business entity, legal representative, trustee, or receivers.

L. "Proposal" means a written offer to furnish Supplies or Services in response to a Request for Proposals. This term may be further defined in the Purchasing Policy Manual and/or in competitive solicitations issued by the City.

M. "Public Works (or "Public Works and Improvements)" means all work, construction, alteration, repair, or improvement other than ordinary maintenance, executed at the cost of the City, or that is by law a lien or charge on any property therein. This term includes all Supplies, materials, tools, and equipment to be furnished in accordance with the Contract for such work, construction, alteration, repair, or improvement.

N. "Quote" means a competitively solicited written offer to furnish Supplies or Services by a method of procurement that is less formalized than a Bid or a Proposal. This term may be further defined in the Purchasing Policy Manual.

O. "Respondent" means any entity or Person, other than a City employee, that provides a Submittal in response to a request for Bids, Request for Proposals, Request for Qualifications, request for quotes or other request for information, as such terms are defined in Section 1.06.251 TMC. This term includes any such entity or Person whether designated as a supplier, seller, vendor, proposer, Bidder, Contractor, consultant, merchant, or service provider that; (1) assumes a contractual responsibility to the City for provision of Supplies, Services, and/or Public Works; (2) is recognized by its industry as a provider of such Supplies, Services, and/or Public works; (3) has facilities similar to those commonly used by Persons engaged in the same or similar business; and/or (4) distributes, delivers, sells, or services a product or performs a Commercially Useful Function.

P. "SBE Certified Business" (or "SBEs") means a business that meets the criteria set forth in Section 1.07.050 of this chapter and has been certified as meeting that criteria by the Community and Economic Development Department – SBE Program Coordinator.

Q. "SBE Program Coordinator" means the individual appointed, from time to time, by the City's Community and Economic Development Director to administer the SBE Regulations.

R. "SBE Regulations" means the written regulations and procedures adopted pursuant to this chapter for procurement of Supplies, Services, and Public Works.

S. "Services" means non-Public Works and Improvements services and includes professional services, personal services, and purchased services, as such terms are defined in Section 1.06.251 TMC and/or the City's Purchasing Policy Manual.

T. "Submittal" means Bids, Proposals, Quotes, qualifications or other information submitted in response to requests for Bids, Requests for Proposals, Requests for Qualifications, requests for Quotations, or other City requests for information, as such terms are defined in Section 1.06.251 TMC.

U. "Supplies" means materials, Supplies, and other products that are procured by the City through a competitive process for either Public Works procurement or Non-Public Works and Improvements procurement unless an approved waiver has been granted by the appropriate authority.

(Ord. 28141 Ex. A; passed Mar. 26, 2013; Ord. 27867 Ex. A; passed Dec. 15, 2009)



## Tacoma Municipal Code

**1.07.030 Discrimination prohibited.**

A. No person that is engaged in the construction of public works for the City, engaged in the furnishing of laborers or craftspeople for public works of the City, or is engaged for compensation in the provision of non-public works and improvements supplies and/or services to the City, shall discriminate against any other person on the basis of race, religion, color, national origin or ancestry, sex, gender identity, sexual orientation, age, marital status, familial status, or the presence of any sensory, mental or physical disability in employment. Such discrimination includes the unfair treatment or denial of normal privileges to a person as manifested in employment upgrades, demotions, transfers, layoffs, termination, rates of pay, recruitment of employees, or advertisement for employment.

B. The violation of the terms of RCW 49.60 or Chapter 1.29 TMC by any person that is engaged in the construction of public works for the City, is engaged in the furnishing of laborers or craftspeople for public works of the City, or is engaged for compensation in the provision of non-public works and improvements supplies and/or services shall result in the rebuttable presumption that the terms of this chapter have also been violated. Such violation may result in termination of any City contract the violator may have with the City and/or the violator's ineligibility for further City Contracts.

(Ord. 27867 Ex. A; passed Dec. 15, 2009)

**1.07.040 Program administration.**

A. The Community and Economic Development Director, or his or her designated SBE Program Coordinator, shall be responsible for administering this chapter and obtaining compliance with respect to contracts entered into by the City and/or its contractors. It shall be the duty of the Director to pursue the objectives of this chapter by conference, conciliation, persuasion, investigation, or enforcement action, as may be necessary under the circumstances. The Director is authorized to implement an administrative and compliance program to meet these responsibilities and objectives.

B. The Director is hereby authorized to adopt and to amend administrative rules and regulations known as the SBE Regulations to properly implement and administer the provisions of this chapter. The SBE Regulations shall be in conformance with City of Tacoma policies and state and federal laws and be designed to encourage achievement of the SBE goals set forth herein. The SBE Regulations shall become effective following public notice and an opportunity to comment by the public.

C. The SBE Regulations adopted pursuant to this section are for the administrative and procedural guidance of the officers and employees of the City and are further expressions of the public policy of the City. The SBE Regulations, when adopted, shall not confer an independent cause of action or claim for relief cognizable in the courts of the state of Washington or the United States of America to any third parties, and such provisions shall not be used as the basis for a lawsuit in any court of competent jurisdiction challenging the award of any contract by the City.

(Ord. 28141 Ex. A; passed Mar. 26, 2013; Ord. 28110 Ex. B; passed Dec. 4, 2012; Ord. 27867 Ex. A; passed Dec. 15, 2009)

**1.07.050 Certification.**

A. The SBE Program Coordinator shall approve a person as a SBE Certified Business if all of the following criteria are satisfied:

1. Each person with an ownership interest in the company has a personal net worth of less than \$375,000, excluding one personal residence and the net worth of the business;
2. The company's total gross receipts for any consecutive three year period within the last six years is not more than \$8,000,000 for public works companies and not more than \$4,000,000 for non-public works and improvements companies;
3. The owner(s) of the company executes an affidavit and files it with the City which states that all information submitted on the SBE application is accurate, that the business has sought or intends to do business with the City and/or within the Pierce County area and has experienced or expects to experience difficulty competing for such business due to financial limitations that impair its ability to compete against larger firms; and
4. The company can demonstrate that it also meets at least one of the following additional requirements:
  - a. The company's business offices, or the personal residence of the owner, is located within a City of Tacoma designated Community Empowerment Zone, prior to designation as a SBE, or
  - b. The company's business offices, or the personal residence of the owner, is located within the City of Tacoma for at least six months prior to designation as a SBE; or
  - c. The company's business offices are located in a federally designated HUBZone in Pierce County or any adjacent county for at least 12 months prior to designation as a SBE; or

**Tacoma Municipal Code**

d. The company's business offices are located in a federally designated HUBZone in a County wherein the work will be performed, or an adjacent county, for at least 12 months prior to designation as a SBE.

B. Application Process. The SBE Program Coordinator shall make the initial determination regarding certification or recertification. Each SBE applicant shall provide the following documents; as such documents are more fully described in the SBE Regulations, to the SBE Program Coordinator:

1. A completed Statement of Personal Net Worth form;
2. A completed Declaration of SBE Status Affidavit form;
3. Tax returns for the business for six (6) years prior to the date of application for SBE certification, or from the date of inception of the business if the business has been in existence less than six (6) years;
4. List of equipment and vehicles used by the SBE;
5. Description of company structure and owners;
6. Such additional information as the SBE Program Coordinator or designee may require.

When another governmental entity has an equivalent SBE classification process the City may enter into an interlocal cooperative agreement for mutual recognition of certifications.

C. Recertification. A SBE qualified business shall demonstrate annually to the satisfaction of the SBE Program Coordinator that the following SBE qualifications are still in effect for such business:

1. That the company still meets all of the criteria set forth in subsection 1.07.050.A. TMC, and
2. That the company has maintained all applicable and necessary licenses in the intervening period, and
3. That the company demonstrates that the owner and/or designated employees have completed the minimum annual continuing business education training requirements set forth in the SBE Regulations.

D. Appeals. The applicant may appeal any certification determination by the SBE Program Coordinator under this chapter to the Director. The appeal must be made in writing and must set forth the specific reasons for the appeal. The Director shall make a decision on the appeal request within a reasonable time, which decision shall be final unless further appeal is made to the Hearing Examiner. In that event, the Hearing Examiner Rules of Procedure for Hearings, Chapter 1.23 TMC, shall be applicable to that appeal proceeding.

(Ord. 28147 Ex. A; passed May 7, 2013; Ord. 28141 Ex. A; passed Mar. 26, 2013; Ord. 28110 Ex. B; passed Dec. 4, 2012; Ord. 27867 Ex. A; passed Dec. 15, 2009)

#### **1.07.060 Program requirements.**

A. Establishment of Annual SBE Goals. The SBE Regulations adopted pursuant to this chapter shall state reasonably achievable cumulative annual goals for utilization of SBEs in the provision of supplies, services, and public works procured by the City. Cumulative annual goals for the participation of SBEs in City contracts shall be based on the number of qualified SBEs operating within Pierce County or in a county that is adjacent to Pierce County or in a HUBZone in a county where the supplies, services and/or public works will be delivered or performed. The dollar value of all contracts awarded by the City to SBEs in the procurement of supplies, services, and public works shall be counted toward the accomplishment of the applicable SBE goal. The initial cumulative annual SBE goal for all public works, non-public works and improvements supplies and services procured by the City of Tacoma is 22 percent.

B. Revision of Annual SBE Goals. SBE utilization goals for supplies, services, and public works shall be reviewed annually to determine the total level of SBE participation reasonably attainable. If no certified SBEs are available to provide supplies, services, and/or public works, the dollar value of such supplies, services, or public works shall be exempt from the calculation of the cumulative annual goals set forth in the SBE Regulations. Proposed reduction of the cumulative annual SBE goals shall be in accordance with the SBE Regulations.

C. Application of SBE Goals to Contracts. The SBE Program Coordinator shall consult with City departments/divisions to establish the SBE goal for competitively solicited contracts of \$25,000 and above, in accordance with this chapter and the SBE Regulations. No SBE goal will be established if no certified SBEs are available to provide supplies, services and/or public works.

D. Waivers. City departments/divisions or the SBE Program Coordinator may request to waive one or more of the requirements of this chapter as they apply to a particular contract or contracts. Waivers may be granted in any one or more of the following circumstances:

## Tacoma Municipal Code

1. **Emergency:** The supplies, services and/or public works must be provided with such immediacy that neither the City nor the contractor can comply with the requirements herein. Such emergency and waiver must be documented by the department/division awarding the contract.

2. **Not Practicable:** Compliance with the requirements of this chapter would impose an unwarranted economic burden or risk to the City after consideration of existing budgetary approvals.

3. **Sole source:** The supplies, services, and/or public works are available from only one source, and subcontracting possibilities do not reasonably exist as determined by the finance purchasing manager.

4. **Government purchasing.** The City is a party to or included in a federal, state or inter-local government purchasing agreement as approved by the finance purchasing manager.

5. **Lack of SBEs:** An insufficient number of qualified SBE contractors exist to create SBE utilization opportunities.

6. **Best interests of the City:** Waiver of SBE goals is in the best interests of the City due to unforeseen circumstances, provided that said circumstances are set forth in writing by the requestor.

**E. Review of Waivers.** A waiver determination by the finance purchasing manager may be reviewed by the Board of Contracts and Awards (C&A Board). The C&A Board may also review a request to reduce or waive the SBE utilization goals based on Not Practicable or Best Interests of the City circumstances. The C&A Board shall determine whether compliance with such goals would impose unwarranted economic burden on, or risk to, the City of Tacoma as compared with the degree to which the purposes and policies of this chapter would be furthered by requiring compliance. If the determination of the C&A Board does not resolve the matter, a final determination shall be made by the City Council or Public Utility Board, as the case may be.

(Ord. 28141 Ex. A; passed Mar. 26, 2013; Ord. 27867 Ex. A; passed Dec. 15, 2009)

### **1.07.070 Evaluation of submittals.**

A. All submittals for a supplies, services, or public works and improvements contract valued at \$25,000 or more shall be evaluated for attainment of the SBE goal established for that contract in accordance with this chapter and the SBE Regulations.

B. The determination of SBE usage and the calculation of SBE goal attainment per this section shall include the following considerations:

1. **General.** The dollar value of the contract awarded by the City to a SBE in the procurement of supplies, services, or public works shall be counted toward achievement of the SBE goal.

2. **Supplies.** A public works and improvements contractor may receive credit toward attainment of the SBE goal for expenditures for supplies obtained from a SBE; provided such SBE assumes the actual and contractual responsibility for delivering the supplies with its resources. The contractor may also receive credit toward attainment of the SBE goal for the amount of the commission paid to a SBE resulting from a supplies contract with the City; provided the SBE performs a commercially useful function in the process.

3. **Services and Public Works subcontracts.** Any bid by a certified SBE or a bidder that utilizes a certified SBE shall receive credit toward SBE goal attainment based on the percentage of SBE usage demonstrated in the bid. A contractor that utilizes a SBE-certified subcontractor to provide services or public works shall receive a credit toward the contractor's attainment of the SBE goal based on the value of the subcontract with that SBE.

4. **Brokers, Fronts, or Similar Pass-Through Arrangements.** SBEs acting as brokers, fronts, or similar pass-through arrangements (as such terms are defined in the SBE Regulations) shall not count toward SBE goal attainment unless the activity reflects normal industry practices and the broker performs a commercially useful function.

C. Evaluation of competitively solicited submittals for public works and improvements and for services when a SBE utilization goal has been established for the contract to be awarded shall be as follows:

1. When contract award is based on price. The lowest priced bid submitted by a responsive and responsible bidder will be reviewed to determine if it meets the SBE goal. Such low bid shall be determined to meet the SBE goal if the bidder is a certified SBE.

a. If the low bidder meets the SBE goal, the bid shall be presumed the lowest and best responsible bid for contract award.

Tacoma Municipal Code

b. If the lowest priced bid does not meet the SBE goal, but the bid of any other responsive and responsible bidder does, and such other bid(s) is or are priced within five percent of the lowest bid, then the following formula shall be applied to each such other bid:

$$\text{(Base Bid)} \left[ \frac{\text{SBE Usage Percentages}}{\text{SBE Goal Percentages}} \times (.05 \times \text{Low Base Bid}) \right] = \text{Evaluated Bid}$$

c. The lowest evaluated bid after applying said evaluation formula shall be presumed the lowest and best responsible bid for contract award.

d. In no event shall a bidder's evaluated bid price be adjusted more than 5 percent from its base bid price for purposes of contract award.

2. When contract award is based on qualifications or other performance criteria in addition to price. Solicitations shall utilize a scoring system that promotes participation by certified SBEs. Submittals by respondents determined to be qualified may be further evaluated based on price using the formula applicable to price based contract awards above. The SBE Regulations may establish further requirements and procedures for final selection and contract award, including:

- a. Evaluation of solicitations for Architectural and Engineering (A&E) services;
- b. Evaluation and selection of submittals in response to requests for proposals; and
- c. Selection of contractors from pre-qualified roster(s).

D. Evaluation of competitively solicited submittals for supplies when no SBE utilization goal has been established for the contract to be awarded shall encourage SBE participation as follows:

1. A submittal from a responsive certified SBE that is priced within five percent of the otherwise lowest responsive bid shall be recommended for award. Otherwise, the lowest responsive bidder shall be recommended for contract award.

E. The SBE Regulations may establish further SBE goal evaluation requirements and procedures for award of contracts between \$5,000 and \$25,000.00 and for non-competitively solicited contracts. City departments/divisions shall use due diligence to encourage and obtain SBE participation for supplies, services, and public works contracts under \$5,000.

(Ord. 28141 Ex. A; passed Mar. 26, 2013; Ord. 27867 Ex. A; passed Dec. 15, 2009)

**1.07.080 Contract compliance.**

A. The contractor awarded a contract based on SBE participation shall, during the term of the contract, comply with the SBE goal established in said contract. To ensure compliance with this requirement following contract award, the following provisions apply:

- 1. Any substitutions for or failure to utilize SBEs projected to be used must be approved in advance by the SBE Program Coordinator. Substitution of one SBE with another shall be allowed where there has been a refusal to execute necessary agreements by the original SBE, a default on agreements previously made or other reasonable excuse; provided that the substitution does not increase the dollar amount of the bid.
- 2. Where it is shown that no other SBE is available as a substitute and that failure to secure participation by the SBE identified in the solicitation is not the fault of the respondent, substitution with a non-SBE shall be allowed; provided, that, the substitution does not increase the dollar amount of the bid.
- 3. If the SBE Program Coordinator determines that the contractor has not reasonably and actively pursued the use of replacement SBE(s), such contractor shall be deemed to be in non-compliance.

B. Record Keeping. All contracts shall require contractors to maintain relevant records and information necessary to document compliance with this chapter and the contractor's utilization of SBEs, and shall include the right of the City to inspect such records.

(Ord. 28141 Ex. A; passed Mar. 26, 2013; Ord. 27867 Ex. A; passed Dec. 15, 2009)

**1.07.090 Program monitoring.**

A. The SBE Program Coordinator shall monitor compliance with all provisions of this chapter and the SBE Regulations. The SBE Program Coordinator shall establish procedures to collect data and monitor the effect of the provisions of this chapter to assure, insofar as is practical, that the remedies set forth herein do not disproportionately favor one or more racial, gender, ethnic, or other protected groups, and that the remedies do not remain in effect beyond the point that they are required to

## Tacoma Municipal Code

eliminate the effects of under utilization in City contracting. The SBE Program Coordinator shall have the authority to obtain from City departments/divisions, respondents, and contractors such relevant records, documents, and other information as is reasonably necessary to determine compliance.

B. The SBE Program Coordinator shall submit an annual report to the Community and Economic Development Director, Director of Utilities, and the City Manager detailing performance of the program. The report shall document SBE utilization levels, waivers, proposed modifications to the program, and such other matters as may be specified in the SBE Regulations.

(Ord. 28141 Ex. A; passed Mar. 26, 2013; Ord. 28110 Ex. B; passed Dec. 4, 2012; Ord. 27867 Ex. A; passed Dec. 15, 2009)

### **1.07.100 Enforcement.**

The Director, or his or her designee, may investigate the employment practices of contractors to determine whether or not the requirements of this chapter have been violated. Such investigation shall be conducted in accordance with the procedures established in the SBE Regulations.

(Ord. 28141 Ex. A; passed Mar. 26, 2013; Ord. 28110 Ex. B; passed Dec. 4, 2012; Ord. 27867 Ex. A; passed Dec. 15, 2009)

### **1.07.110 Remedies.**

A. Upon receipt of a determination of contractor violation by the SBE Program Coordinator, the City Manager or Director of Utilities, as appropriate, may take the following actions, singly or together, as appropriate:

1. Forfeit the contractor's bid bond and/or performance bond;
2. Publish notice of the contractor's noncompliance;
3. Cancel, terminate, or suspend the contractor's contract, or portion thereof;
4. Withhold funds due contractor until compliance is achieved; and/or
5. Recommend appropriate action including, but not limited to, disqualification of eligibility for future contract awards by the City (debarment) per Section 1.06.279 TMC;

B. Prior to exercise of any of the foregoing remedies, the City shall provide written notice to the contractor specifying the violation and the City's intent to exercise such remedy or remedies. The notice shall provide that each specified remedy becomes effective within ten business days of receipt unless the contractor appeals said action to the Hearing Examiner pursuant to Chapter 1.23 TMC.

C. When non-compliance with this chapter or the SBE Regulations has occurred, the SBE Program Coordinator and the department/division responsible for enforcement of the contract may allow continuation of the contract upon the contractor's development of a plan for compliance acceptable to the Director.

(Ord. 28141 Ex. A; passed Mar. 26, 2013; Ord. 28110 Ex. B; passed Dec. 4, 2012; Ord. 27867 Ex. A; passed Dec. 15, 2009)

### **1.07.120 Unlawful acts.**

It shall be unlawful for any Person to willfully prevent or attempt to prevent, by intimidation, threats, coercion, or otherwise, any Person from complying with the provisions of this chapter.

(Ord. 27867 Ex. A; passed Dec. 15, 2009)

### **1.07.130 Severability.**

If any section of this chapter or its application to any Person or circumstance is held invalid by a court of competent jurisdiction, then the remaining sections of this chapter, or the application of the provisions to other Persons or circumstances, shall not be affected.

(Ord. 27867 Ex. A; passed Dec. 15, 2009)

### **1.07.140 Sunset and review of program.**

This chapter shall be in effect through and until December 31, 2014, unless the City Council shall determine at an earlier date that the requirements of this chapter are no longer necessary. If this chapter has not been repealed by July 1, 2014, the City Council shall determine by the end of that year whether substantial effects or lack of opportunity of SBEs remain true in the relevant market and whether, and for how long, some or all of the requirements of this chapter should remain in effect.

(Ord. 28141 Ex. A; passed Mar. 26, 2013; Ord. 27867 Ex. A; passed Dec. 15, 2009)

**CITY OF TACOMA**  
**\* PRICE PROPOSAL FORM \***  
**Request for Bids PT14-0749F**  
**OUTDOOR WALK-IN METAL-CLAD SWITCHGEAR 15KV**

**Bidder Name** \_\_\_\_\_

**Bidder shall submit one original bid and one copy.** If Bidder wishes to submit alternate bids, copy the appropriate bid pages and submit alternate bids.

All prices are to be in U.S. dollars and include all associated fees. The City will not pay any additional fees, tariffs, add-ons or surcharges.

We agree to furnish the following items F.O.B. Destination, freight prepaid and allowed (included in unit price).

<u>ITEM NO.</u>	<u>DESCRIPTION</u>	<u>ESTIMATED QUANTITY</u>	<u>UNIT</u>	<u>UNIT PRICE</u>	<u>EXTENDED PRICE</u>
1.	Single-ended Walk-in Metal-Clad Switchgear, 2000A, without breakers	1	EA	\$_____	\$_____
2.	Double-ended Metal-Clad Switchgear, 2000A, without breakers	1	EA	\$_____	\$_____
3.	Single-ended Metal-Clad Switchgear, 3000A, without breakers	1	EA	\$_____	\$_____
4.	Double-ended Metal-Clad Switchgear, 3000A, without breakers	1	EA	\$_____	\$_____
5.	15kV Transformer Throat (Bus Duct), for use with Item Nos. 1 & 2	20	FT	\$_____	\$_____
6.	15kV Transformer Throat (Bus Duct), for use with Item Nos. 3 & 4	20	FT	\$_____	\$_____
7.	15kV Transformer Cable enclosure, for use with Item Nos. 1 & 2	2	EA	\$_____	\$_____
8.	15kV Transformer Cable enclosure, for use with Item Nos. 3 & 4	2	EA	\$_____	\$_____
9.	Feeder Breaker 1200A, for use with Item Nos. 1, 2, 3 & 4				

	a) ABB AMVAC	24	EA	\$_____	\$_____
	b) GE PowerVAC	24	EA	\$_____	\$_____
10.	Main OR Tie Breaker 2000A, for use with Item Nos. 1 & 2				
	a) ABB AMVAC	5	EA	\$_____	\$_____
	b) GE PowerVAC	5	EA	\$_____	\$_____
11.	Main OR Tie Breaker 3000A, for use with Item Nos. 3 & 4				
	a) ABB AMVAC	5	EA	\$_____	\$_____
	b) GE PowerVAC	5	EA	\$_____	\$_____
12.	Set of Spares (Per T&D Material 2101.01 Section 1.18)				
		1	EA	\$_____	\$_____

SubTotal:

Sales Tax (9.5%): \$\_\_\_\_\_

**TOTAL:** \$\_\_\_\_\_

**PROPOSAL ITEMS – UNIT PRICE ADDERS**

The following unit price adders are being requested for possible addition to the items purchased per this contract. These items and the percent price adder will not be included in the evaluation for award.

<u>DESCRIPTION</u>	<u>Per unit Price Adder</u>
Arc-Resistant Switchgear, IEEE C37.20.7, Type 2BC, for Item No's 1, 2,3 & 4	_____%

**Note:** The unit price and extended price are to be shown in the spaces provided. Extended price shall be determined by multiplying the unit price by the quantity.

**Prompt Payment Discount \_\_\_\_\_% \_\_\_\_\_ days, net 30.**

Payment discount periods of 20 calendar days or more will be considered in determining lowest responsive bid.

If a **volume discount** is offered, provide the quantities at which the price break will be given and the corresponding percentage:

Quantity \_\_\_\_\_ Discount \_\_\_\_\_%

Quantity \_\_\_\_\_ Discount \_\_\_\_\_%

Quantity \_\_\_\_\_ Discount \_\_\_\_\_%

**Does your firm accept payment by Visa credit card? \_\_\_Y \_\_\_N**

NOTE: The City of Tacoma will not accept price changes or pay additional fees when a credit card is used.

**Does your firm accept payment by EFT/ACH? \_\_\_Y \_\_\_N**

(Electronic Funds Transfer (EFT) by Automated Clearing House (ACH))

Are you a City of Tacoma SBE company \_\_\_\_\_Yes \_\_\_\_\_No



**Bidder’s Statement of Delivery Time** (provide your proposed delivery time following receipt of purchase order and all subsequent purchase orders during the term of the Contract).

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**Bidder’s Statement of Warranty Terms.** Provide details of warranty coverage, including whether provided by manufacturer or Bidder. Provide additional pages if needed.

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**Manufacturer’s/Bidder’s Guarantees and/or Warranties of Products.** Indicate whether proposed guarantees and/or warranties “equal or exceed” those specified in Standard Terms and Conditions – Supplies 2.13 & Section 4.13. Provide additional pages if needed.

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**State Whether Exception “IS” or “IS NOT” Taken to This Specification\*.** A statement here that exception “IS NOT” taken will create a conclusive presumption that you accept and will comply with all Specification requirements. Provide additional pages if needed.

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\*NOTE: The City cannot legally accept a substantial deviation from the Specification. Bids/Proposals containing any substantial deviation will be rejected as non-responsive. If you state exception “IS NOT” taken to this Specification, but include statements or attach materials deviating from the standards established by this Specification, it is agreed that you will perform according to the highest standard indicated in this Specification.

Has your firm incorporated sustainability measures into its everyday business practices?  
\_\_\_Y \_\_\_N Please describe:

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Has your firm taken measures to minimize impacts to the environment in the delivery of supplies and services? \_\_\_Y \_\_\_N Please describe:

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**RECORD OF PRIOR CONTRACTS**

**NAME** \_\_\_\_\_ **ADDRESS** \_\_\_\_\_

**Type of Work** \_\_\_\_\_ **Specification No.** \_\_\_\_\_

<b>Beginning Date</b>	<b>Completion Date</b>	<b>Contract With</b>	<b>Contact Person Phone #</b>	<b>Amount of Contract</b>

**Remarks:** \_\_\_\_\_  
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## **APPENDIX B**

Sample Contract

Standard Certificate of Insurance and Endorsement Requirements

Sample Performance Bond

# CONTRACT

Resolution No.  
Contract No.

THIS AGREEMENT made and entered into in triplicate by and between the City of Tacoma, a Municipal Corporation hereinafter called the "City", and  
Enter vendor name herein after called the "Contractor."

WITNESSETH:

That in consideration of the terms and conditions contained herein and attached and made a part of this Agreement, the Parties hereto covenant and agree as follows:

- I. The Contractor shall do all work and furnish all tools, materials, and equipment in accordance with and as described herein and in the attached plans, drawings, and the below referenced Specifications of the City of Tacoma included in the solicitation of Bids for this Agreement, which are by this reference incorporated herein and made a part hereof, and shall perform any alteration in or additions to the work provided under this Agreement and every part thereof.

Specification No. enter spec number

Project: enter spec name

Contract Total: \$ , Select applicable tax information

The Contractor shall provide and bear the expense of all equipment, work and labor of any sort whatsoever that may be required for the transfer of materials and for constructing and completing the work provided for in this Agreement and every part thereof, except such as are mentioned in the Specifications to be furnished by the City of Tacoma.

- II. The Contractor acknowledges, and by signing this Agreement agrees, that the Indemnification provisions set forth in the Specifications, including the Industrial Insurance immunity waiver (if applicable), are totally and fully part of this Agreement and, within the context of the competitive bidding laws, have been mutually negotiated by the Parties hereto.
- III. The Contractor, for him/herself, and for his/her heirs, executors, administrators, successors, and assigns, does hereby agree to the full performance of all the covenants herein contained upon the part of the Contractor.
- IV. It is further provided that no liability shall attach to the City by reason of entering into this Agreement, except as expressly provided herein.
- V. The Contractor agrees to accept as full payment hereunder the amounts specified in the Submittal, and the City agrees to make payments at the times and in the manner and upon the terms and conditions specified in said Submittal and in the attached plans, drawings, and Specifications.

IN WITNESS WHEREOF, the Parties hereto have caused this Agreement to be executed, with an effective date for bonding purposes of Enter date day of Enter month, 20year.

CITY OF TACOMA:

PRINCIPAL: Enter vendor name

By: \_\_\_\_\_  
*Title of dept or div staff w/auth to sign for this \$ amt*

By: \_\_\_\_\_  
*Signature*

By: \_\_\_\_\_  
*Select one (for contract totals over \$50K or NA)*

\_\_\_\_\_  
*Printed Name*

By: \_\_\_\_\_  
*Director of Finance*

\_\_\_\_\_  
*Title*

APPROVED AS TO FORM:

By: \_\_\_\_\_  
*City Attorney*

## INSURANCE CERTIFICATE REQUIREMENTS

Please furnish the Purchasing Division with a Certificate of Insurance with the following liability limits based on the contract amount:

<u>CONTRACT AMOUNT</u>	<u>LIABILITY LIMITS</u>
\$ 25,000 and Under	\$ 500,000 Combined Single Limit
\$500,000 and Under	\$1,000,000 Per Occurrence / \$2,000,000 Aggregate
Over \$500,000	\$5,000,000 Total Coverage

- A. Umbrella excess liability may be used to reach the limits stated above. Coverage must include:
  - 1. Comprehensive General Liability
  - 2. Automobile Liability - Hired and Non-Owned
  - 3. Contractual Coverage
  - 4. Broad Form Property Damage
  - 5. Underground Explosion and Collapse Hazard (if necessary by the nature of the work)
  - 6. Any additional coverage specifically required by the City's specification
  
- B. The following general requirements apply:
  - 1. Insurance carrier must be authorized to do business in the State of Washington.
  - 2. Coverage must include personal injury, protective and employer liability.
  - 3. Contractor must provide with the certificate (a) evidence of the amount of any deductible or self-insured retention under the policy, and (b) policy endorsement(s) that verify compliance with the additional insured and the primary/non-contributory requirements specified in Section C. 1 and C. 2. below.
  - 4. It is the contractor's responsibility to keep an up-to-date Certificate of Insurance on file with the City throughout the contract.
  - 5. Contractor's insurance must be primary and non-contributory over any insurance the City may maintain, that is, any such City insurance shall be excess to limits stated in the certificate.
  
- C. The following statements are required on the Certificate of Insurance:
  - 1. *"The City of Tacoma is named as an additional insured"* ("as respects a specific contract" or "for any and all work performed with the City" may be included in this statement).
  - 2. *"This insurance is primary and non-contributory over any insurance or self-insurance the City may have"* ("as respects a specific contract" or "for any and all work performed with the City" may be included in this statement).
  - 3. *"Should any of the above described policies be canceled before the expiration date thereof, the issuing company will mail 30 days written notice to the Certificate Holder named."* Language such as, "endeavor to" mail and "but failure to mail such notice shall impose no obligation or liability of any kind upon the company, its agents or representative" is not acceptable and must be crossed out. **See example below.**

DESCRIPTION OF OPERATIONS/LOCATIONS/VEHICLES/EXCLUSIONS ADDED BY ENDORSEMENT/SPECIAL PROVISIONS  
 The below listed certificated holder is added as an additional insured as respects any and all work performed with the City (or as respects project \_\_\_\_\_). This insurance is primary over any insurance or self-insurance the City may have for any and all work performed with the City (or as respects project \_\_\_\_\_).

CERTIFICATE HOLDER	ADDITIONAL INSURED; INSURER LETTER: _____	CANCELLATION
CITY OF TACOMA PO BOX 11007 TACOMA WA 98411-0007		<del>"Should any of the above described policies be cancelled before the expiration date thereof, the issuing company will endeavor to mail 30 days written notice to the certificate holder named to the left, but failure to do so shall impose no obligation or liability of any kind upon the company, its agents or representatives."</del>



# PERFORMANCE BOND TO THE CITY OF TACOMA

Resolution No.  
Bond No.

**KNOW ALL MEN BY THESE PRESENTS:**

That we, the undersigned, Enter vendor name  
as principal, and \_\_\_\_\_  
a corporation organized and existing under the laws of the State of \_\_\_\_\_  
as a surety corporation, and qualified under the laws of the State of Washington to become surety upon bonds of  
contractors with municipal corporations, as surety, are jointly and severally held and firmly bound to the CITY OF  
TACOMA in the penal sum of \$ Enter contract amount Choose tax info, for the payment of  
which sum on demand we bind ourselves and our successors, heirs, administrators or personal representatives,  
as the case may be.

This obligation is entered into in pursuance of the statutes of the State of Washington, the Ordinances of the  
City of Tacoma.

Dated at Tacoma, Washington, this date day of Enter month, 20 Enter year.

Nevertheless, the conditions of the above obligation are such that:

WHEREAS, under and pursuant to the City Charter and general ordinances of the City of Tacoma, the said  
City has or is about to enter with the above bounden principal, a certain contract, providing for

Specification No. Enter Specification Number

Enter Specification Title

Contract No. Enter Contract Number

(which contract is referred to herein and is made a part hereof as though attached hereto), and

WHEREAS, the said principal has accepted, or is about to accept, the said contract, and undertake to perform  
the work therein provided for in the manner and within the time set forth;

NOW, THEREFORE, if the said Enter vendor name  
shall faithfully perform all of the provisions of said contract in the manner and within the time therein set forth, or  
within such extensions of time as may be granted under said contract, and shall pay all laborers, mechanics,  
subcontractors and materialmen; the claims of any person or persons arising under the contract to the extent  
such claims are provided for in RCW 39.08.010; the state with respect to taxes imposed pursuant to Titles 50, 51,  
and 82 RCW which may be due; and all persons who shall supply said principal or subcontractors with provisions  
and supplies for the carrying on of said work, and shall indemnify and hold the City of Tacoma harmless from any  
damage or expense by reason of failure of performance as specified in said contract or from defects appearing or  
developing in the material or workmanship provided or performed under said contract after its acceptance thereof  
by the City of Tacoma and all claims filed in compliance with Chapter 39.08, RCW are resolved, then and in that  
event this obligation shall be void; but otherwise it shall be and remain in full force and effect.

Approved as to form:

Principal: Enter vendor name

\_\_\_\_\_  
*City Attorney*

By: \_\_\_\_\_

Surety:

By: \_\_\_\_\_

Agent's Name: \_\_\_\_\_

Agent's Address: \_\_\_\_\_

## **APPENDIX C**

Standard Terms and Conditions – Solicitation – Section 1

Standard Terms and Conditions – Supplies – Section 2

**CITY OF TACOMA  
STANDARD TERMS AND CONDITIONS  
SECTION 1 – SOLICITATION**

THE FOLLOWING TERMS AND CONDITIONS ARE PART OF THIS SPECIFICATION AND ARE BINDING ON ALL RESPONDENTS SUBMITTING RESPONSES TO REQUESTS FOR BIDS, PROPOSALS, QUALIFICATIONS AND INFORMATION.

**1.01 DELIVERY OF SUBMITTALS TO THE CITY'S PURCHASING DIVISION**

Submittal packages must be received by the City's Purchasing Division, Tacoma Public Utilities Administration Building, Main Floor, 3628 South 35<sup>th</sup> Street, Tacoma, WA 98409-3115, prior to the scheduled time and date stated in the solicitation announcement. Each submittal, intact and bound, shall be completely sealed, with the name of the submitting party (hereinafter "Respondent"), the specification number and title clearly marked on the exterior of the package. City offices are not open for special mail or other deliveries on weekends and City holidays.

Submittals may be delivered to the City by mail or in person; however, **the Respondent is solely responsible for timely delivery of its submittal to the Purchasing Division.**

Facsimile (fax) copies of submittals for requests for sealed bids, requests for proposals, requests for qualifications and requests for information will not be accepted at any City fax machine.

Submittals received after the time stated in the solicitation announcement will not be accepted and will be returned, unopened, to the Respondent.

For purposes of determining whether a submittal has been timely received, the City's Purchasing Division may rely on Universal Coordinated Time from the National Bureau of Standards as reported by <http://www.greenwichmeantime.com/>

**1.02 WITHDRAWAL OF SUBMITTALS**

**A. Prior to Submittal Deadline (Bid Opening)**

Submittals may be withdrawn prior to the scheduled submittal deadline by providing written notice to the City's Purchasing Division. The notice may be submitted in person or by mail; however, it must be received by the City's Purchasing Division prior to the submittal deadline.

**B. After Submittal Deadline**

No submittal can be withdrawn after having been opened as set forth in the solicitation announcement, and before the actual award of the contract, unless the award is delayed more than 60 calendar days beyond the date of opening. If a delay of more than 60 calendar days does occur, the Respondent must submit written notice to the purchasing manager that Respondent is withdrawing its submittal.

**1.03 SUBMITTAL IS NON-COLLUSIVE**

The Respondent acknowledges that by its delivery of a submittal to the City in response to this solicitation it represents that the prices in such submittal are neither directly nor indirectly the result of any formal or informal agreement with another Respondent.

**1.04 OPENING AND ACCEPTANCE OF SUBMITTALS**

Submittals, unless previously withdrawn, will be read aloud, irrespective of any irregularities or informalities in such submittal, at the time and place specified in the solicitation announcement.

All submittals must remain open for acceptance by the City for a period of at least 60 calendar days from the date of opening.

**1.05 RIGHT TO REJECT**

The City of Tacoma reserves the right to reject any and all submittals, waive minor deviations or informalities, and if necessary, call for new submittals.

**A. Requests for Proposals (RFP)**

By submitting a proposal in response to a City RFP, the Respondent acknowledges and consents to the below City rights and conditions. With regard to this procurement process, the City reserves, holds



without limitation, and may exercise, at its sole discretion, the following rights and conditions:

1. To terminate the procurement process or decide not to award a contract as a result thereof by written notice to the Respondents for any reason whatsoever.
2. To waive any defect, technicality, or any other minor informality or irregularity in any submittal, or any other response from Respondents.
3. To make minor or major changes or alterations to the evaluation, selection and/or performance schedule(s) for any events associated with this procurement process upon notice to the Respondents.
4. To supplement, amend or otherwise modify the RFP specifications, at any time upon prior notice to Respondents, including but not limited to modifications to the description of services and/or products contained in the RFP, by omitting services/products and/or including services/products not currently contemplated therein.
5. To request clarifications, additional information, and/or revised submittals from one or more Respondents.
6. To conduct investigations with respect to the qualifications and experience information for each Respondent included in a submittal and to request additional evidence to support any such information.
7. To eliminate any Respondent that submits an incomplete or inadequate response, or is non-responsive to the requirements of the RFP specifications, or is otherwise deemed to be unqualified during any stage of the procurement process.
8. To select and interview a single finalist or multiple finalists for the purpose of promoting the City's evaluation of submittals provided in response to the RFP specifications. The City may, in its sole and exclusive discretion as to what is in the City's best interest, elect not to conduct interviews of any or all respondents in connection with this RFP process.
9. To discontinue contract negotiations with a selected Respondent and commence such negotiations with another respondent, except as otherwise provided in Chap. 39.80, RCW.
10. To select and enter into a contract with one or more Respondents whose submittal best satisfies the interests of the City and is most responsive, in the sole judgment of the City, to the requirements of the RFP specifications.
11. To take any other action affecting the RFP specifications or the procurement process that is determined to be in the City's best interests.
12. In the event the City receives questions concerning RFP specifications from one or more Respondents prior to the deadline for response, the City reserves the right to provide such questions, and the City's responses, if any, to all Respondents.
13. Neither the City, its officials, staff, agents, employees, representatives, nor consultants will be liable for any claims or damages resulting from any aspect of this procurement process.

#### **1.06 EVALUATION OF SUBMITTALS**

The City of Tacoma reserves the right to award to the lowest and best responsible Respondent(s) delivering a submittal in compliance with the specification documents, provided such submittals are reasonable and are in the best interest of the City to accept. The City may use a number of criteria for determining award, including evaluation factors set forth in Municipal Code Section 1.06.262. Respondents who are inexperienced or who fail to properly perform other contracts may have their submittal rejected for such cause.

##### **A. Evaluation Factors**

In addition to the factors set forth in Municipal Code Section 1.06.262, the following may be used by the City in determining the lowest and best responsible submittal:

1. Compliance with the Specification and with applicable City requirements, including by not limited to, the City's Ethics Code and its Small Business Enterprise and Local Employment and Apprenticeship programs.
2. Submittal prices, listed separately if requested, as well as a lump sum total (if the unit price does not compute to the extended total price, the unit price shall govern).
3. Time of delivery and/or completion of performance (delivery date(s) offered).
4. Warranty terms.
5. Quality of performance of previous contracts or services, including safety requirements and past compliance with the City's Ethics Code.
6. Previous and existing compliance with laws and ordinances relating to contracts or services.
7. Sufficiency of financial resources.
8. Quality, availability and adaptability of the supplies or services to the particular use required.
9. Ability to provide future maintenance and service on a timely basis.
10. Location of nearest factory authorized warranty repair facility or parts dealership.
11. Ability, capacity, experience, stability, reputation, integrity, character, judgment, technical qualifications and skill to perform the contract or provide the services required.

All 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.

#### **B. Cash Discount**

Payment discount periods of 20 calendar days or more, if offered in the submittal, will be considered in determining the apparent lowest responsible submittal. Discounts will be analyzed in context of their overall cumulative effect.

#### **1.07 COMPLETION OF CITY FORMS**

All submittals must be completed in ink or typewritten using the forms included with this Specification, and submitted exactly as specified.

City forms requiring signature must be signed in ink by an authorized officer, employee or agent of the Respondent.

Prices must be stated in figures. Corrections shall be initialed in ink by the person signing the submittal. Prices having erasures or interlineations (cross outs) will not be accepted unless initialed in ink by the Respondent.

#### **1.08 CORRECTION OF AMBIGUITIES AND OBVIOUS ERRORS**

The City reserves the right to correct obvious errors in the Respondent's submittal. In this regard, if the unit price does not compute to the extended total price, the unit price shall govern.

#### **1.09 CLARIFICATION OF SPECIFICATION**

Questions regarding this Specification and/or any included terms, conditions, forms, plans or drawings are to be submitted in writing to the City staff person identified as the contact for this Specification. All requests for interpretation must be received by the City no later than five business days prior to the opening date. Any interpretation of this Specification will be made by addendum duly issued and posted to the Purchasing website at [www.TacomaPurchasing.org](http://www.TacomaPurchasing.org). Such addendum must be acknowledged in the submittal. The City of Tacoma will not be responsible for any other explanation or interpretation of the specification documents.

#### **1.10 ALTERATIONS NOT ALLOWED**

Except as otherwise specifically provided in the specification documents, submittals that are incomplete or conditioned in any way, contain erasures, alternatives or items not called for, or not in conformity with law, may be rejected as being non-responsive. Any attempt to condition the submittal by inserting exceptions to the Specification or any conditions, qualifications or additions that vary its terms may result in rejection of the

submittal. The City cannot legally accept any submittal containing a material deviation from the Specifications.

**1.11 INSERTION OF MATERIAL CONFLICTING WITH SPECIFICATIONS**

Only material inserted by the Respondent to meet requirements of the specification documents will be considered. Any other material inserted by the Respondent will be disregarded by the City of Tacoma as being non-responsive and may be grounds for rejection of the submittal.

**1.12 FIRM PRICES/ESCALATION**

Except as specifically allowed elsewhere in the specification documents, only firm prices will be accepted.

**1.13 SHIPPING**

Prices must be quoted FOB destination (the place of destination as defined in RCW 62A.2-319, as that statute may hereafter be amended), with freight prepaid and allowed (shipping costs included in unit prices), and risk of loss remaining with Respondent until delivery is tendered.

**1.14 LEGAL HOLIDAYS**

The City of Tacoma observes the following holidays, which shall apply to performance of all contracts awarded from this solicitation:

New Year's Day	January 1
Martin Luther King's Birthday	3rd Monday in January
Washington's Birthday	3rd Monday in February
Memorial Day	Last Monday in May
Independence Day	July 4
Labor Day	1st Monday in September
Veteran's Day	November 11
Thanksgiving Day	4th Thursday of November
Day after Thanksgiving	4th Friday of November
Christmas Day	December 25

When any of these holidays occur on Saturday or Sunday, the preceding Friday or the following Monday, respectively, is a legal holiday for the City of Tacoma.

**1.15 TAXES**

Unless otherwise required in this Specification, applicable federal, state, city and local taxes shall be included in the submittal as indicated below. The total cost to the City, including all applicable taxes, may be the basis for contract award determination. As used herein, the term "taxes" shall include any and all taxes, assessments, fees, charges, interest, penalties, and/or fines imposed by applicable laws and regulations in connection with the procurement of goods and/or services hereunder.

**A. Federal Excise Tax**

The City of Tacoma is exempt from federal excise tax. The City will furnish a Federal Excise Tax Exemption certificate, if required. If the Respondent fails to include any applicable tax in its submittal, then Respondent shall be solely responsible for the payment of said tax.

**B. State and Local Sales Tax**

The City of Tacoma is subject to Washington state sales tax. It is the Respondent's obligation to state the correct sales tax percentage and include the applicable Washington state, city and local sales tax as a separate line item(s) in the submittal.

### C. City of Tacoma Business and Occupation Tax

It is the Respondent's obligation to include City of Tacoma Business and Occupation tax in the unit and/or lump sum prices submitted; it shall not be shown separately on the submittal.

Per Sub-Title 6A of the City of Tacoma Municipal Code, transactions with the City of Tacoma may be subject to the City's Business and Occupation Tax.

It is the responsibility of the Respondent awarded the contract to register with the City of Tacoma's Tax and License Division, 733 South Market Street, Room 21, Tacoma, WA 98402-3768, telephone 253-591-5252, website <http://www.cityoftacoma.org/Page.aspx?nid=201>.

### D. Any or All Other Taxes

Any or all other taxes are the responsibility of the Respondent unless otherwise required by law.

#### 1.16 WASHINGTON BUSINESS LICENSE REQUIREMENT

All submittals should include a Washington State Business License number in the space provided on the Submittal Signature Page. If the recommended respondent does not have a Washington State Business License at the time of submittal, it must obtain such license and provide proof thereof to the City of Tacoma prior to contract award. Failure to include a Washington State Business License may be grounds for rejection of the submittal. Information regarding Washington State Business Licenses may be obtained at <http://www.dol.wa.gov/businesses.htm>.

#### 1.17 PUBLIC DISCLOSURE

Washington State Public Disclosure Act (RCW 42.56 et seq.) requires public agencies in Washington to promptly make public records available for inspection and copying unless they fall within the specified exemptions contained in the Act. Documents submitted under this Specification are considered public records and, unless exempt from disclosure under the Act, will be made available for inspection and copying by the public in response to a public records request.

#### 1.18 PROPRIETARY OR CONFIDENTIAL TRADE SECRET INFORMATION

If the Respondent considers any submittal document to be exempt from disclosure under the law, the Respondent shall clearly mark on the specific page(s) affected such words as "CONFIDENTIAL," "PROPRIETARY" or "TRADE SECRET." The Respondent shall also submit an index with its submittal identifying the affected page number(s) and location(s) of all such identified material. **Failure to provide an index identifying the location of the material in the submittal that Respondent considers to be protected from disclosure will result in the records being released in response to a request for those records without further notice to Respondent. Marking the entire submittal as "confidential" or "proprietary" or "trade secret" is not acceptable and is grounds to reject such submittal.**

If a public records request is made for disclosure of all or any part of Respondent's submittal, **and** Respondent has (i) properly marked and (ii) indexed the material it asserts to be exempt from disclosure, the City will determine whether the material is exempt from public disclosure. If, in the City's opinion, the material is subject to a possible exemption to disclosure, the City will notify Respondent of the request and impending release and allow the Respondent ten (10) business days to take whatever action Respondent deems necessary to protect its interests. The City will reasonably cooperate with any legal action initiated by the Respondent to prevent release; provided that all expense of such action shall be borne solely by the Respondent, including any damages, penalties, attorney's fees or costs awarded by reason of having opposed disclosure and Respondent shall indemnify City against same. If the Respondent fails to take such action within said period, the City will release all materials deemed subject to disclosure. Submission of materials in response to this solicitation shall constitute assent by the Respondent to the foregoing procedure and the Respondent shall have no claim against the City on account of actions taken pursuant to such procedure.

#### 1.19 TITLE VI OF THE CIVIL RIGHTS ACT OF 1964

The City of Tacoma ensures full compliance with Title VI of the Civil Rights Act of 1964 by prohibiting discrimination against any person on the basis of race, color, national origin or sex in the provision of benefits and services resulting from its federally assisted programs and activities. Contact Tacoma's Title VI coordinator at 253-591-5224 for additional information.

**1.20 LEGAL DISPUTES**

Respondent agrees and stipulates that in the event any litigation should occur concerning or arising out of this solicitation or any submittal delivered in response hereto, the sole venue of any such legal action shall be the Pierce County Superior Court of the state of Washington and the interpretation of the terms of the solicitation and submittal shall be governed by the laws of the state of Washington.

**1.21 PURCHASE ORDER TERMS AND CONDITIONS**

Terms and conditions of City of Tacoma purchase orders, if issued, shall apply to contracts and awards resulting from this solicitation.

**1.22 RESPONDENT'S REFUSAL TO ENTER INTO CONTRACT**

Any Respondent who refuses to enter into a contract after it has been awarded to the Respondent will be in breach of the agreement to enter the contract, and the Respondent's certified or cashiers check or bid bond, if any, shall be forfeited.

**1.23 AWARD**

The City reserves the right to award contracts for any or all items to one or more respondents in the best interests of the City.

**1.24 FINAL AWARD DETERMINATION**

The Tacoma City Council or Public Utility Board, for awards over \$200,000, shall be the final judge as to which submittal(s) is/are the lowest and best responsible, and best meets the interest of the City of Tacoma to accept. The purchasing manager makes the determination for awards of \$200,000 and less.

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**CITY OF TACOMA  
STANDARD TERMS AND CONDITIONS  
SECTION 2 – SUPPLIES**

UNLESS OTHERWISE REQUIRED BY THE SPECIFICATION OR AGREED TO IN WRITING, THE FOLLOWING TERMS AND CONDITIONS SHALL GOVERN THE RIGHTS, RESPONSIBILITIES AND OBLIGATIONS OF THE PARTIES TO THE CONTRACT.

**2.01 SUPPLIER**

As used herein, the "Supplier" shall be the Respondent(s) awarded a contract pursuant to this Specification, whether designated as a Respondent, Seller, Vendor, Proposer, Bidder, Contractor, Merchant, Service Provider or otherwise.

**2.02 ENTIRE AGREEMENT**

This Specification, purchase orders issued by the City pursuant hereto, and the Supplier's submittal, in that order of precedence, shall constitute the "Contract" between the parties. Said documents represent the entire agreement between the parties and supersede any prior oral statements, discussions or understandings between the parties, and/or subsequent Supplier invoices. No modification of this Contract shall be effective unless mutually agreed in writing.

**2.03 APPROVED EQUALS**

Unless an item is indicated as "No substitute," special brands, when named, are intended to describe the standard of quality, performance or use desired. Equal items will be considered by the City, provided that the Supplier specifies the brand and model, and provides all descriptive literature, independent test results, specification sheets, schematic drawings, photographs, product samples, local servicing, parts availability, etc., to enable the City to evaluate the proposed equal. Performance testing in the field may be required.

The decision of the City as to what items are equal shall be final and conclusive. If the City elects to purchase a brand represented by the Supplier to be an "equal," the City's acceptance of the item is conditioned on the City's inspection and testing after receipt. If, in the sole judgment of the City, the item is determined not to be an equal, the item shall be returned at the Supplier's expense.

When a brand name or level of quality is not stated in the Supplier's submittal, it is understood the Supplier's submittal shall exactly confirm with those required in this Contract. If more than one brand name is stated in this Specification, Supplier(s) must indicate the brand and model/part number to be supplied.

**2.04 PRICE, RISK OF LOSS, DELIVERY**

**A. Firm Prices/Risk of Loss**

All prices shall remain firm during the term of this Contract. All prices shall be FOB, the place of destination (as defined in RCW 62A.2-319, as that statute may hereafter be amended), with freight prepaid and allowed (shipping costs included in unit prices), and risk of loss remaining with Supplier until delivery is tendered.

**B. Delivery**

Delivery will be to the designated addresses set forth in this Contract. Deliveries shall be between 9:00 a.m. and 3:30 p.m., Monday through Friday only, except holidays. Failure to make timely delivery shall be cause for termination of the order and return of all or part of the items at Supplier's expense except in the case of force majeure.

**2.05 PACKING SLIPS, SHIPPING NOTICES AND INVOICES**

Packing slips and shipping notices shall be sent to the specific City Division or Department receiving the item(s) and include complete description of items, contents of items if crated or cased, quantity, shipping point, carrier, bill of lading number and City of Tacoma purchase order.

Each invoice shall show City of Tacoma purchase order number, release number if applicable, quantity, unit of measure, item description, unit price and extended price for each line. Line totals shall be summed to give a grand total to which sales tax shall be added, if applicable. Invoices shall be sent in duplicate to:

Accounts Payable  
 City of Tacoma  
 P. O. Box 1717  
 Tacoma Washington 98401-1717

Any terms, provisions or language in Supplier's invoice(s) that conflict with the terms of this Contract shall not apply to this Contract unless expressly accepted in writing by the City.

**2.06 PAYMENT TERMS**

Payment shall be made through the City's ordinary payment process, and shall be considered timely if made within 30 days of receipt of a properly completed invoice. Payment will not be considered late if mailed or electronically disbursed within the time specified. Payment(s) made in accordance with this Contract shall fully compensate the Supplier for all risk, loss, damages or expense of whatever nature, and acceptance of payment shall constitute a waiver of all claims submitted by Supplier. All payments shall be subject to adjustment for any amounts, upon audit or otherwise, determined to have been improperly invoiced.

Invoices will not be processed for payment, nor will the period of cash discount commence, until all invoiced items are received and satisfactory performance of the Contract has been attained, and a properly completed invoice is received by the City. If an adjustment in payment is necessary due to damage or dispute, the cash discount period shall commence on the date final approval for payment is authorized.

**2.07 INCREASE OR DECREASE IN QUANTITIES**

The City reserves the right to increase or decrease the quantities of any item awarded pursuant to this Contract and pay according to the unit prices quoted in the submittal with no adjustments for anticipated profit.

**2.08 EXTENSION OF CONTRACT**

This Contract shall be subject to extension by mutual agreement per the same prices, terms and conditions.

**2.09 ADDITIONAL CITY CONTRACTS**

During the term of this Contract, other City of Tacoma Departments/Divisions shall have the right to enter into contracts or issue purchase orders based on the unit prices stated in this Contract.

**2.10 COMPARATIVE PRICING**

If at any time during the term of this Contract, the Supplier reduces prices to other buyers purchasing approximately the same quantities stated on this Contract, the Supplier will immediately notify the City of Tacoma purchasing manager of such fact, and the price(s) for future orders hereunder shall be reduced accordingly.

**2.11 CHANGES**

The City at any time by written change order may make reasonable changes in the place of delivery, installation or inspection, the method of shipment or packing, identification and ancillary matters that the Supplier may accommodate without substantial additional expense.

**2.12 COOPERATIVE PURCHASING**

The Washington State Interlocal Cooperation Act RCW 39.34 provides that other governmental agencies may purchase goods and services based on this Contract in accordance with the terms and prices indicated herein if all parties are agreeable. Each public agency shall formulate a separate contract with the Supplier, incorporating the terms and conditions of this Contract with the City of Tacoma. The City shall incur no liability in connection with such contracts or purchases by other public agencies thereunder. It will be the Supplier's responsibility to inform such public agencies of this Contract. Supplier shall invoice such public agencies as separate entities.

**2.13 WARRANTIES/GUARANTEE**

Suppliers warrant that all items: are merchantable; comply with the City's latest drawings and specifications; are fit for the City's intended use; are new and unused unless otherwise stated; comply with all applicable safety and health standards established for such products by the Occupational Safety and Health Administration (OSHA), Washington Industrial Safety and Health Act (WISHA) and/or Consumer Products

Safety Act, and all other applicable state and federal laws or agency regulations; are properly packaged and contain appropriate instructions or warnings, including applicable MSDS sheets.

**2.14 PATENTS, TRADEMARKS AND COPYRIGHTS**

The Supplier warrants that the equipment and/or materials furnished pursuant to this Contract do not infringe on any patent, trademark or copyright, and agrees to indemnify, defend and hold harmless, the City in the event of any infringement or claim thereof.

**2.15 DEFAULT**

In the event of material default by the Supplier on any of the conditions of this Contract, the Supplier agrees that the City may, at its election, procure the goods or services from other sources, and may deduct from the unpaid balance due the Supplier, or collect against the bond or security (if any), or may invoice and recover from the Supplier all costs paid in excess of the price(s) set forth in this Contract. The prices paid by the City in good faith shall be considered the prevailing market price at the time such purchase is made.

**2.16 TAXES, LICENSES, PERMITS**

Unless otherwise required by applicable law, the tax provisions in Section 1 - Solicitation apply to this Contract. Except for state sales tax, the Supplier acknowledges that it is responsible for the payment of all taxes applicable to this Contract and the Supplier agrees to comply with all applicable laws regarding the reporting of income, maintenance of records and all other requirements and obligations imposed pursuant to applicable law.

The Supplier, at its expense, shall obtain and keep in force any and all necessary licenses and permits. The Supplier shall obtain a business license as required by Tacoma Municipal Code Subtitle 6B.20 and shall pay business and occupation taxes as required by Tacoma Municipal Code Subtitle 6A.30.

If the City is assessed, made liable, or responsible in any manner for taxes contrary to the provisions of this Contract, the Supplier agrees to hold the City harmless from such costs, including attorney's fees. In the event the Supplier fails to pay any taxes, assessments, penalties, or fees imposed by any governmental body, including a court of law, other than those taxes the City is required to pay, then the Supplier authorizes the City to deduct and withhold or pay over to the appropriate governmental body those unpaid amounts upon demand by the governmental body. It is agreed that this provision shall apply to taxes and fees imposed by City ordinance. Any such payments shall be deducted from the Supplier's total compensation.

**2.17 FEDERAL, STATE AND MUNICIPAL LAWS AND REGULATIONS**

Supplier shall comply with all federal, state, municipal and/or local laws and regulations in the performance of all terms and conditions of this Contract. The Supplier shall be solely responsible for all violations of the law from any cause in connection with its performance of work under this Contract.

**2.18 SMALL BUSINESS ENTERPRISE (SBE) PROGRAM AND EQUAL OPPORTUNITY**

It is the policy of the City of Tacoma that all citizens be afforded an equal opportunity for full participation in our free enterprise system. In order to implement this policy, the City of Tacoma is committed to ensuring equitable participation of small business enterprises. Contact Tacoma's SBE coordinator at 253-591-5224 for additional information.

**2.19 NONDISCRIMINATION**

The Supplier agrees to take all steps necessary to comply with all federal, state and City laws and policies regarding non-discrimination and equal employment opportunities. The Supplier shall not discriminate in any employment action because of race, religion, color, national origin or ancestry, sex, gender identity, sexual orientation, age, marital status, familial status, or the presence of any sensory, mental or physical handicap. In the event of non-compliance by the Supplier with any of the non-discrimination provisions of this Contract, the City shall be deemed to have cause to terminate this Contract, in whole or in part.

**2.20 PREVAILING WAGES PAID – IF REQUIRED**

If federal, state, local or any applicable law requires the Supplier to pay prevailing wages in connection with this Contract, and Supplier is so notified by the City, then the Supplier shall pay applicable Prevailing Wages.



**2.21 CONFLICT OF INTEREST**

No officer, employee or agent of the City, nor any member of the immediate family of any such officer, employee or agent as defined by City ordinance, shall have any personal financial interest, direct or indirect, in this Contract, either in fact or in appearance. The Supplier shall comply with all federal, state and City conflict of interest laws, statutes and regulations. The Supplier represents that the Supplier presently has no interest and shall not acquire any interest, direct or indirect, in the program to which this Contract pertains that would conflict in any manner or degree with the performance of the Supplier's services and obligations hereunder. The Supplier further covenants that, in performance of this Contract, no person having any such interest shall be employed. The Supplier also agrees that its violation of the City's Code of Ethics contained in Chapter 1.46 of the Tacoma Municipal Code shall constitute a breach of this Contract subjecting the Contract to termination.

**2.22 RIGHT TO AUDIT**

Upon City's request, the Supplier shall make available to City all accounts, records and documents related to this Contract for City's inspection, auditing, or evaluation during normal business hours as reasonably needed by City to assess performance, compliance and/or quality assurance under this Contract.

**2.23 TERMINATION**

The City reserves the right to terminate this Contract at any time upon prior written notice to Supplier. Upon the effective date of termination specified in such notice, and payment by the City, all conforming supplies, materials or equipment previously furnished hereunder shall become its property.

**2.24 INDEMNIFICATION – HOLD HARMLESS**

The Supplier agrees to indemnify, defend and hold harmless the City of Tacoma, its officers, agents and employees, from and against any and all liability which may accrue to or be sustained by the City of Tacoma for any claim, suit or legal action made or brought against the City for the death of or injury to persons (including the Supplier's or subcontractor's employees), or damage to property involving the Supplier or subcontractor(s) and their employees or agents, or for any other cause arising out of and in connection with or incident to the performance of this Contract, except for injuries or damages caused by the sole negligence of the City. In this regard, the Supplier recognizes it is waiving immunity under Industrial Insurance Law, Title 51 RCW. This indemnification includes attorney's fees and the cost of establishing the right to indemnification hereunder in favor of the City of Tacoma. By the Supplier's acceptance of this order, he/she agrees that this subsection has been mutually negotiated.

**2.25 PUBLIC DISCLOSURE**

This Contract and documents provided to the City by Contractor hereunder are deemed public records subject to disclosure under the Washington State Public Records Act, Chapter 42.56 RCW (Public Records Act). Thus, the City may be required, upon request, to disclose this Contract and documents related to it unless an exemption under the Public Records Act or other laws applies.

**2.26 DISPUTE RESOLUTION**

In the event of a dispute pertaining to this Contract, the parties agree to attempt to negotiate in good faith an acceptable resolution. If a resolution cannot be negotiated, then the parties agree to submit the dispute to voluntary non-binding mediation before pursuing other remedies. This provision does not limit the City's right to terminate authorized by this Contract.

**2.27 GOVERNING LAW AND VENUE**

Washington law shall govern the interpretation of this Contract. The state or federal courts located in Pierce County Washington shall be the sole venue of any mediation, arbitration or litigation arising out of this Contract.

**2.28 ASSIGNMENT**

The Supplier shall not assign, subcontract, delegate or transfer any obligation, interest or claim to or under this Contract without the prior written consent of the City.

**2.29 WAIVER**

A waiver or failure by either party to enforce any provision of this Contract shall not be construed as a continuing waiver of such provisions, nor shall the same constitute a waiver of any other provision of this Contract.

**2.30 SEVERABILITY AND SURVIVAL**

If any term, condition or provision of this Contract is declared void or unenforceable or limited in its application or effect, such event shall not affect any other provisions hereof and all other provisions shall remain fully enforceable. The provisions of this Contract, which by their sense and context are reasonably intended to survive the completion, expiration or cancellation of this Contract, shall survive termination of this Contract.

**2.31 CONFLICT WITH CONTRACT**

In the event of any conflict between this document, Standard Terms and Conditions Section 2, Supplies, and the Professional Services Contract or other type of Contract (Contract) ultimately negotiated and entered into between Respondent and the City, the provisions of the Contract shall prevail. However, absent any such conflict the provisions of this document, Standard Terms and Conditions Section 2, Supplies, are fully incorporated into and considered part of the Contract.

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## APPENDIX D

### T&D Material Standard 2101.01

Drawing 2101.01 Sheet 1

Drawing 2101.01 Sheet 2

Drawing 2101.01 Sheet 3

Drawing 2101.01 Sheet 4

Drawing 2101.01 Sheet 5

E-SS-3000 Battery & Charger System Design Standard

### Tacoma Power Drawing Standards & Approval Process

Tacoma Power Drawing Standardization Matrix

Tacoma Power Drawing Standardization One-line

Tacoma Power Drawing Standardization Three-Wire 1

Tacoma Power Drawing Standardization Three-Wire 2

Tacoma Power Drawing Standardization DC Schematic

Tacoma Power Drawing Standardization Wiring 1

Tacoma Power Drawing Standardization Wiring 2

A-SS-0025 Substation Labeling Standard

A-SS-0030 Abbreviations Standard

A-SS-0040 Relay & Control Wiring Design Standard

Tacoma Power Typical Label Details

Drawing XX25-1

Drawing XX25-2

Drawing XX25-3

Drawing XX25-4

**DATA SHEET FOR ITEM NOS 1,2,3,4**

Station Service Transformers	Manufacturer:	Cat #:
AC Panels	Manufacturer:	Cat #:
AC Power Manual Transfer Switches	Manufacturer:	Cat #:
DC Panels	Manufacturer:	Cat #:
Fan Unit	Manufacturer:	Cat #:
HVAC Units	Manufacturer:	Cat #:
Insulators/bus supports: 15kV	Manufacturer:	Cat #:
MV Vacuum circuit breakers:		
ABB AMVAC		
Feeder	Manufacturer:	Cat #:
Tie (2000A)	Manufacturer:	Cat #:
Main (2000A)	Manufacturer:	Cat #:
Tie (3000A)	Manufacturer:	Cat #:
Main (3000A)	Manufacturer:	Cat #:
GE PowerVAC		
Feeder	Manufacturer:	Cat #:
Tie (2000A)	Manufacturer:	Cat #:
Main (2000A)	Manufacturer:	Cat #:
Tie (3000A)	Manufacturer:	Cat #:
Main (3000A)	Manufacturer:	Cat #:

1) Do the breakers require a ramp to roll into the cubicle?      Yes\_\_\_\_\_      No\_\_\_\_\_

2) Maximum primary injection current for testing \* \_\_\_\_\_A

\*If the primary injection current is less than 1200A, please provide the testing method in writing as a part of the bid package. See T&D Material Standard 2101.01 Section 1.19 for details.

3) Is lifting beam required for lifting assembled switchgear?      Yes\_\_\_\_\_      No\_\_\_\_\_

4) Will equipment be removed from the switchgear for shipping?      Yes\_\_\_\_\_      No\_\_\_\_\_

Please describe.

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**Bidder shall provide a layout diagram with their bid proposal.**

**DATA SHEET FOR ITEM NOS 1,2,3,4 (CONT.)**

**Item 1**

Total weight of switchgear, ready for service	_____ Lb. (approx.)
Total height	_____ In (approx.)
Length overall	_____ In (approx.)
Width overall	_____ In (approx.)

**Item 2**

Total weight of switchgear, ready for service	_____ Lb. (approx.)
Total height	_____ In (approx.)
Length overall	_____ In (approx.)
Width overall	_____ In (approx.)

**Item 3**

Total weight of switchgear, ready for service	_____ Lb. (approx.)
Total height	_____ In (approx.)
Length overall	_____ In (approx.)
Width overall	_____ In (approx.)

**Item 4**

Total weight of switchgear, ready for service	_____ Lb. (approx.)
Total height	_____ In (approx.)
Length overall	_____ In (approx.)
Width overall	_____ In (approx.)

**DATA SHEET FOR ITEM NOS 1,2,3,4 (CONT.)**

**FAILURES AND PRICE ADJUSTMENT**

Has any switchgear, coming from the same manufacturer's factory as the units you are bidding, experienced a test floor failure within the last five (5) years? If so, what kind of failure? What was the cause? What corrective action has been taken to prevent future failures? Name of purchaser?

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Has any switchgear, coming from the same manufacturer's factory as the units you are bidding, experienced a field failure within the last five (5) years? If so, what kind of failure? What was the cause? What corrective action was taken to prevent future failures? Name of purchaser?

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What methodology is proposed for Price Adjustments?

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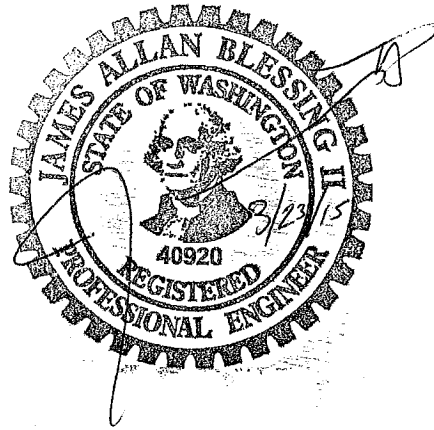
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These Technical Specifications have been prepared under the direction of a licensed Professional Engineer registered in the State of Washington.



### **1.01 - GENERAL**

These specifications cover the furnishing of 15kV power switchgear, switchgear breakers and spares.

The switchgear is described on the following drawings:

- 2101.01 Sheet 1 General Layout
- 2101.01 Sheet 2 One-line
- 2101.01 Sheet 3 Panel Elevations
- 2101.01 Sheet 4 Three-wire\*
- 2101.01 Sheet 5 Schematic\*

\*Note: Sample provided only for basis of design

All equipment, components (including, but not limited to, all threaded fasteners) and materials provided under this specification shall conform to the applicable standards of ANSI, ASME, ASTM, IEEE, and NEMA. All materials and devices shall be in accordance with the applicable requirements of the Federal Occupational Safety and Health Standards.

The switchgear shall be designed, fabricated and tested in accordance with the current revision of the following standards and these specifications:

- National Electrical Manufacturers Association (NEMA) SG-2 Standards for High-Voltage Fuses
- NEMA SG-4 Standards for Power Circuit Breakers
- National Electrical Code (NEC)



- National Electrical Safety Code (NESC)
- American National Standards Institute, Inc. (ANSI) C37.04 A-C Power Circuit Breakers Definitions and Rating Structure
- ANSI C37.06 Preferred Ratings of Power Circuit Breakers
- ANSI C37.07 Interrupting Factors - Reclosing Service
- ANSI C37.09 Test Code for Power Circuit Breakers
- ANSI C37.010 Application Guide for Power Circuit Breaker Control Guide Specifications
- ANSI C37.1 Relays Associated with Electric Power Apparatus
- ANSI C37.2 Automatic Station Control, Supervisory and Associated Telemetering Equipment (Includes Device Function Description)
- ANSI C37.20.2 Standard for Metal-Clad and Station Type Cubicle Switchgear
- ANSI C37.20.7 IEEE Guide for Testing Metal-Enclosed Switchgear Rated Up to 38kV for Internal Arcing Faults
- ANSI C57.13 Standard Requirements for Instrument Transformers

Each switchgear shall be designed and constructed for operation under usual service conditions on a 15kV three-phase, 60 hertz, effectively grounded system with neutral, at a maximum ambient temperature of +104°F (40°C) to -4°F (- 20°C) and an altitude below 3,300 feet (1000 meters) and a medium pollution level.

### **1.02 - VOLTAGE RATINGS**

The 15kV rated switchgear will be connected to a 13.8kV or 12.47kV nominal voltage system, as specified on the purchase order. Switchgear shall have a fully insulated neutral.

### **1.03 - CURRENT RATINGS**

The switchgear bus, and main & tie breakers shall have ratings as follows:

<b>Item #</b>	<b>Rated continuous current</b>
1&2	2000A
3&4	3000A

All feeders shall be rated 1200A continuous. A fully insulated neutral and ground bus shall be provided the full length of the switchgear. Neutral bus rating shall be 1000A minimum. Ground bus rating shall be 600A minimum.

### **1.04 - INSULATING LEVEL**

All switchgears shall be insulated for 13.8kV nominal voltage, a 60Hz 1 minute withstand of 36kV and a BIL of 95kV.

## **1.05 - ENCLOSURE**

The base shall be designed to be flexible to the City's site requirements. The equipment shall have provisions to anchor to the foundation by welding to steel beams embedded in the foundation and by anchor bolts. City will weld or epoxy anchor switchgear in place. Only one method will be required to be performed by the City during the installation. There shall be sufficient clearance above the anchors to allow installation of the anchor bolts after the switchgear has been placed on the foundation. Manufacturer mounting pads shall accommodate the drilling of holes for anchor bolts into the foundation with the equipment in place.

The switchgear shall be enclosed in a rigid, self-supporting, outdoor, weatherproof, dust tight, metal structure that shall include the following features:

- a) Sheltered aisle for operation and maintenance of switchgear.
- b) Aisle floor and door thresholds to be 8 inches from slab.
- c) Minimum 11 gauge steel shall be used for exterior walls and roof. Minimum 14 gauge steel interior panels.
- d) Enclosure shall meet the rain test performance requirements of IEEE C37.20.2. Manufacturer shall be able to furnish documentation showing the design meets this requirement.
- e) HVAC Units
  - o Heating sized to maintain an internal temperature of 65°F @ 32°F outdoor ambient, to be installed on wall opposite the breakers in the aisle, wired to station service supply and complete with built-in thermostat.
  - o An air conditioning system sized to maintain an inside temperature of 80°F given an outdoor ambient temperature of 100°F, considering the dimensions and heat retention of the enclosure and the heat dissipated by the electrical equipment within the enclosure.
  - o The air conditioning unit shall be wall mounted on the aisle wall of the enclosure complete with a thermostat.
  - o Any forced air ducts provided shall not interfere with or reduce a minimum of 8 feet of head room within the switchgear aisle.
  - o Exhaust fan for battery compartment.
  - o The switchgear walls, roof, bottom, and doors shall be insulated with fiberglass insulation to R-11 minimum.
- f) Door
  - o Access door at each end of enclosure.
  - o Each access door to be equipped with panic bar to permit opening door from interior even though locked from exterior.
  - o Doors to have exterior locking provision, with hardware consisting of BEST No. 1E62 x 612 cylinder (**no substitute**) to accept a Tacoma Power furnished BEST core. Doors to have exterior hardware for latching when unlocked.
  - o Cable entrance compartments shall have hinged doors with single latch handle with provision for padlocking.

- g) Building design and installation shall be in accordance with applicable IBC regulations.
- Design members to withstand dead load and design loads with all bays open due to pressure and suction of wind calculated in accordance with International Building Code (IBC), latest edition.
  - Design members to withstand the following minimum loads:
    - Dead Load: Actual plus ceiling hung lights and racks (15 psf and/or 200# concentrated)
    - Snow Load: 35 psf
    - Wind Load: Basic Wind Speed =80 MPH, Exposure "C", Importance Factor 1.0
    - The structural base shall be designed to withstand all loads, including shipping, erection and in service live and dead loads.
    - Enclosure foundation design shall accommodate a strip footing slab design and provide that the conduit entrance sections of the cable entrance compartments shall be in cantilever, extending beyond the City's concrete support slab, thus giving unobstructed conduit entrance access to the substation yard rock below.
- h) Miscellaneous Electrical
- Fluorescent lights shall be installed to illuminate the aisle and behind the control and relay racks.
  - Outdoor Convenience outlets: Two (2) Hubbell receptacles, Catalog No. HBL20403, 30 amp, 600 volt AC or approved equal, installed near each door.
  - Outdoor Convenience GFCI outlets: Two (2) 20 amp, 120 volt AC or approved equal, installed near each door.
  - Indoor Convenience GFCI outlets: Three (3) 20 amp, 120 volt AC or approved equal, installed near each door and the center of the enclosure.
  - A manual transfer switch for station service power shall be provided and installed for each set of control power transformers and AC panels. The preferred mounting location is on the outside of the aisle wall. The preferred source shall be from the station service transformer provided with the switchgear. A mechanical interlock should be provided so that the station service transformer high-side fuse cannot be removed when the switch is in preferred position. Tacoma Power will provide the alternate source. The manual transfer switch shall be Square D DTU224NRB.
  - Signs on each high-voltage compartment that read:
    - DANGER**
    - HIGH VOLTAGE**
    - KEEP OUT**
  - Two (2) 150-watt exterior weatherproof floodlights over each door on top of the switchgear. Install weatherproof switches at each door for these lights. A motion detector on each end of the switchgear that switches the floodlight over each door on top of the switchgear. Units to turn "on" at night with motion detected. An indoor bypass switch to be installed to force lights "on".
  - Two (2) Emergency lights, one (1) over each door on top of the switchgear.
  - Control cable risers, enclosures and cable tray shall be provided.
  - Folding drawing table to accommodate 24" x 36" drawings.
  - Remote Racking Device for 15kV breakers.

## **1.06 - METAL-CLAD CONSTRUCTION**

Circuit breakers shall be one high only; breakers stacked two high will not be acceptable.

Panels, doors and compartment barriers shall be 11 gauge cold-rolled steel or suitable equivalent stretcher-leveled hot-rolled steel. The minimum thickness of floor metal shall be 3/8 inches.

Each cubicle shall be completely and individually enclosed, resulting in two thicknesses of painted steel between cubicles.

The interior and exterior surfaces of the instrument panels and the removable circuit breaker units shall be furnished in accordance with the latest applicable NEMA standards.

Outgoing feeder circuits shall leave the rear of the cubicles to underground conduits. Openings for power circuit shall be large enough to accommodate two 6-inch steel conduits in each feeder cubicle and four or six 6-inch conduits in each main cubicle. See Section 1.24.

### **ITEM 1 & 3:**

The single-ended switchgear shall consist of seven (7) cubicle sections as follows. See drawing 2101.01, Sheet 1.

- One (1)-Auxiliary section
- One (1)-Main breaker section
- Four (4)-Feeder breaker sections
- One (1)-Tie breaker section
- Accessories per Section 1.18

### **ITEM 2 & 4:**

The double-ended switchgear shall consist of thirteen (13) cubicle sections as follows. See drawing 2101.01 Sheet 1. In addition to shipping purposes, physical separation at the tie breaker shall accommodate City's desire for flexibility in the future.

- Two (2)-Auxiliary sections
- Two (2)-Main breaker sections
- Eight (8)-Feeder breaker sections
- One (1)-Tie breaker section
- Accessories per Section 1.18

## **1.07 - MAIN BREAKER SECTION & TIE BREAKER**

See drawing 2101.01, Sheet 3 for bill of materials and layout. These preliminary drawings are representative of City's needs as to the type and quantity of equipment required, **no substitute**. Each section shall be equipped with the following:

- One (1)-Hinged, approximately 90 inch high steel panel, mounting control and relay components, and providing access to the main circuit breaker. Sufficient clearance shall be provided between the back of this panel and the front of the circuit breaker to allow complete freedom in locating relays, instruments and control components at convenient and accessible levels.

- Door shall be able to be secured with breaker in the test/disconnected position. It must be able to close securely with one handle.
- One (1)-Vacuum circuit breaker, rated per Section 1.11
- Six (6)-Current transformers (CT) per section 1.13. All leads from a CT shall be wired to a current-shorting terminal block in the control panel side of cubicle (not the cable compartment).
- Three (3)-Potential transformers per main breaker, 8400/120V or 7200/120V, 60 hertz, metering accuracy class 0.3 for W, X, Y, Z burdens, 110kV BIL, thermal rating 1500 VA at 30°C ambient, draw-out type, connected GROUNDED wye-wye with bus-side current limiting fuses and secondary fused disconnect.
- One (1)-Space heater, minimum 250 watts total, with thermostat, in the control/BREAKER compartment sufficient to prevent condensation.
- One (1)-Space heater, minimum 250 watts total, in the cable compartment sufficient to prevent condensation.
- One (1)-Terminal block available for City connection to SCADA RTU control and status inputs. Terminal block to be wired by manufacturer with connection to: breaker control switch relay trip command, close command, and common; and one 52a contact from vacuum circuit breaker.
- Five (5)-Auxiliary breaker “a” contacts, wired to a terminal block in the control panel side of the cubicle.
- Five (5)-Auxiliary breaker “b” contacts, wired to a terminal block in the control panel side of the cubicle.
- Two (2)-Terminal blocks, with a minimum of twelve (12) spare positions.
- Remote Racking of circuit breaker

### **1.08 - FEEDER BREAKER SECTIONS**

See drawing 2101.01, Sheet 3 for bill of materials and layout. These preliminary drawings are representative of City’s needs as to the type and quantity of equipment required, **no substitute**. Each feeder section shall be equipped with the following:

- One (1)-Hinged, approximately 90 inch high steel panel, mounting control and relay components, and providing access to the main circuit breaker. Sufficient clearance shall be provided between the back of this panel and the front of the circuit breaker to allow complete freedom in locating relays, instruments and control components at convenient and accessible levels.
- Door shall be able to be secured with breaker in the test/disconnected position. It must be able to close securely with one handle.
- One (1)-Vacuum circuit breaker, 1200 ampere, see Paragraph 1.11.
- Six (6)-Current transformers (CT) per Section 1.13. Leads from each CT shall be wired to a current-shorting terminal block located in the control panel side of cubicle (not cable compartment).
- One (1)-Space heater, minimum 250 watts total, with thermostat, in the control/breaker compartment.
- One (1)-Space heater, minimum 250 watts total, in the cable compartment.
- One (1)-Terminal block available for City connection to SCADA RTU control and status inputs. Terminal block to be wired by manufacturer with connection to: breaker control switch relay trip command, close command, and common; and one 52a contact from vacuum circuit breaker.

- Five (5)-Auxiliary breaker “a” contacts, wired to a terminal block in the control panel side of the cubicle.
- Five (5)-Auxiliary breaker “b” contacts, wired to a terminal block in the control panel side of the cubicle.
- Two (2)-Terminal blocks, with a minimum of twelve (12) spare positions.
- Remote Racking of circuit breaker

### **1.09 - AUXILIARY SECTIONS**

See Drawing No. 2101.01, Sheet 3 for required bill of materials and layout. Auxiliary sections shall be equipped with the following:

- One (1)-Hinged, approximately 90 inch high steel panel, mounting control and relay components. Sufficient clearance shall be provided allow complete freedom in locating relays, instruments and control components at convenient and accessible levels. It must be able to close securely with one handle.
- One (1)-Station Service transformer, per Paragraph 1.14 STATION SERVICE TRANSFORMER, with low-side, two-pole, circuit breaker, mechanically interlocked with the primary drawout-type current limiting fuse.
- One (1)-Space heater(s), minimum 250 watts total, with thermostat, in the control compartment.
- One (1)-Terminal block, with a minimum of twelver (12) spare positions.

### **1.10 – CONTROL, PROTECTION, AND COMMUNICATION RACKS**

See Drawing No. 2101.01, Sheet 3 for required bill of material and layout. Vendor to furnish and install 23 inch wide empty racks for City use for protective relays and equipment.

Vendor to furnish and install two 19 inch wide empty racks for City use for SCADA and communications equipment.

### **1.11 - VACUUM CIRCUIT BREAKERS**

Only vacuum type draw-out circuit breakers shall be furnished, General Electric PowerVac or ABB AMVAC type, **no substitutes**. The vacuum circuit breakers shall be of the following rating and shall include the following features:

<b>Performance Criteria</b>	<b>Rating</b>
Application	Breakers to be used throughout Tacoma Power's metal-clad switchgear to provide: Bus, Transformer & Feeder Switching & Protection
General Application	Indoor metal-clad
Minimum Requirements	Preferred Ratings: C37.06 "General Purpose"
Rated maximum voltage	15kV rms
Rated full-wave withstand voltage	95kV peak
Rated continuous current	1200, 2000, or 3000 amps rms
Rated short-circuit current	31.5kA rms
Duty Cycle	O-0.3s-CO-15s-CO
Rated interrupting time	5 cycles

Rated reclosing time	20 cycles
Circuit X/R > 17	Applicable. Tacoma's 3LG fault < 80% & 1LG < 70% for 31.5kA applications OR Tacoma will follow Breaker Selection per IEEE C37.010

- a) The breaker shall be closed by a charged spring operated from 120 volts AC. A 125-volt DC coil operated from the battery circuit shall trip the breaker. No rectifier will be allowed anywhere in the trip or closing circuits. A rectifier-solenoid operator will not be acceptable. ABB AMVAC controls are acceptable.
- b) The breakers shall be horizontal draw-out type (roll-out design) and shall be equipped with positive acting interlocks to prevent removal or replacement when the breaker is in the closed position.
- c) The breaker, switchgear and enclosure shall be designed so the circuit breakers can be inserted and removed from the cubicles from the aisle floor without a lifting device. If a ramp is required, one designed for use with each ITEM in bid shall be provided with each item purchased along with storage provisions inside the switchgear.
- d) Devices must be supplied on the circuit breakers in order to prevent insertion of an improperly rated breaker.
- e) The breakers shall be provided with a test position and shall be plainly marked. The test position shall be so designed that the breaker can be operated electrically by all devices as in the connected position.
- f) The breaker and switchgear shall be designed so the breaker can be operated, opened and closed, in the connected and test positions, with the cubicle door in the closed position.
- g) The breaker position shall be indicated and visible with the door closed.
- h) The breaker shall be capable of racking in or out of position with the door closed.
- i) Automatically operated shutters shall be provided to prevent accidental entry into the live stationary bus contacts when breaker is withdrawn.
- j) The breaker cubicle shall comply with the following Washington Administrative Code requirement to Tacoma Power's interpretation:
 

WAC 296-45-335 De-energizing lines and equipment for employee protection.  
 "Metal-clad, draw-out switchgear of over 600 volts in which the physical separation of the disconnecting parts is not visible may be used to clear a line or equipment, provided the switchgear is equipped with:

  - A positive positioning means to insure that the disconnecting contacts are separated;
  - An isolating shutter which moves into place between the separated contact for circuit isolation; and
  - A mechanically-connected indicating means to show that the shutter is in place."
- k) The manufacturer shall describe the means for manual charging and operation of the breaker and shall state (in the space provided on the SWITCHGEAR DATA SHEET) whether manual operation is restricted to test only.
- l) All springs shall automatically be discharged when breaker is removed from or inserted into cell.
- m) Breaker shall be mechanically and electrically trip-free during levering breaker into or out of the cell.

- n) Motor cut-off switch or other city approved mean shall be installed so that motor circuit shall automatically be disconnected when racking breaker into cell.
- o) Breaker shall automatically trip when "racking-in" crank is inserted or interlock is lifted.
- p) The interlock mechanism shall prevent insertion of the "racking-in" crank unless the interlock bar is lifted.
- q) Breaker shall have lifting eyes or points.

### **1.12 – FUTURE USE**

Intentionally left blank for future use.

### **1.13 - BUSHING CURRENT TRANSFORMERS**

The following CT's shall be provided on each switchgear:

<b>Location</b>	<b>Qty per breaker</b>	<b>Ratio</b>	<b>Class</b>
FEEDER	3	1200:5 multi ratio Installed at 800:5 tap	C400
FEEDER	3	2000:5 or 3000:5 multi ratio	C400
MAIN	6	2000:5 or 3000:5 multi ratio	C400
TIE	6	2000:5 or 3000:5 multi ratio	C400

Multi ratio transformer size shall match the switchgear rating size per Section 1.03. Thermal rating of at least 2.0 @ 30°C. Vendor shall provide excitation and overcurrent ratio curves with instruction books for each CT provided, indexed by serial number.

### **1.14 - AC STATION SERVICE**

Provide a dry-type, self-cooled transformer, rated 25 kVA minimum, 120/240 volts secondary single phase, suitable for nominal phase-ground primary voltage for 13.8kV or 12.47kV three-phase system and shall be sized to meet the loads. Transformer shall include high voltage 2.5 percent taps (two above nominal and two below). A transfer switch and an AC circuit breaker panel shall be supplied for each control power transformer supplied.

Vendor shall provide a 225 amp, minimum, AC circuit breaker panel board with appropriately sized main breaker and shall be sized to meet all the switchgear loads. The panel shall be located in the aisle at a convenient and accessible location, containing molded case branch circuit breakers (thermal magnetic trip, minimum duty 18,000 amps interrupting current) for the following loads:



Material	Load
15 kV breaker control power (one circuit per MV BREAKER) as required	Provide required rating and size of circuit breakers for each material
Cubicle heaters	
HVAC Units	
Aisle lights	
Receptacles	
Exhaust fan	
RTU control power	1 pole, 20 amp
SCADA rack	1 pole, 20 amp
Transformer cooling and controls	2 pole, 30 amp (City to wire from breaker)
Two (2) 240V Outdoor receptacles	2 pole, 30 amp
Two (2) 120V Outdoor GFCI receptacles	2 pole, 30 amp
Battery charger	2 pole, 30 amp
Three (3) 115 kV breaker control power	1 pole, 30 amp (City to wire from breaker)
Communications rack	1 pole, 20 amp
Yard lights	1 pole, 20 amp (City to wire from breaker)
Spare (minimum of 1)	2 pole, 30 amp
Spare (minimum of 1)	1 pole, 30 amp
Spares (minimum of 2)	1-pole, 20 amp
Blanks Spaces	4 minimum

### **1.15 - DC STATION SERVICE**

DC system shall meet the requirement of Tacoma Power Construction Standard E-SS-3000 - Battery & Charger System Design. In addition, an exhaust fan shall be installed with an Intermatic GM40 24 hour timer with a 3-Way OFF/AUTO/ON manual override switch, **no substitute**.

The following equipment shall be supplied and wired with the switchgear:

Material	Description	Notes
Battery, 200AH, 125V(60 cell)	Energys 3CC-9M <b>*No Substitutions*</b>	Include battery lifting device
Seismic Rack, 2 tier/2 step, 125V(60 cell)	Per Section 1.25 EARTHQUAKE STRENGTH REQUIREMENTS	Provide a copy of assembly drawing & verification of Seismic Rating.

Charger, 25A, 125V(60 cell) 60 Hz 1 phase, 120/208/240VAC	C&D Micro-Are <b>*No Substitutions*</b>	<b>To include the following Equipment:</b> Alarm Board w/Individual Form C Contacts For Summary, Gnd+, Gnd-, LVA, HVA, Remote Temperature Probe.
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A DC power terminal block shall be provided near the battery to isolate the battery bank for routine testing. Vendor shall provide a 225 amp, minimum, DC circuit breaker panel board with appropriately sized main breaker and shall be sized to meet all the switchgear loads. The panel shall be located in the aisle at a convenient and accessible location, containing molded case branch circuit breakers (thermal magnetic trip, minimum duty based on battery short circuit capability per manufacturer) for the following loads:

Material	Load
15kV breaker trip circuit (one circuit each)	Provide required rating and size of circuit breakers for each material
Six 115kV breaker trip circuit	2-pole, 30 amp (City to wire from breaker)
Battery	2-pole, 225 amp
Battery charger	2-pole, 30 amp
Test breaker	2-pole, 60 amp
Spare (minimum of two)	2-pole, 20 amp
Spare (minimum of two)	2-pole, 30 amp
Control and Protection Rack Power Supply (total of six)	2-pole, 20 amp
SCADA Rack Power Supply	2-pole, 10 amp
Communications Rack Power Supply	2-pole, 10 amp
Blank Spaces	4 minimum

### **1.16 - BUS**

The 15kV switchgear bus shall be rated at 2000 OR 3000 amperes per order based on Section 1.03, shall be constructed from electrical grade copper and shall be mounted in a removable, grounded, metal, non-segregated-phase enclosure. The bus conductors shall be covered with a homogeneous, void-free, flame-retardant epoxy resin insulation. Insulation shall be applied using the fluidized-bed process. Bus support points shall be of porcelain. All bus joints shall be covered. All bus joint covers shall be easily removable without damage to covers or bus insulation. Bus joint surfaces shall be silver plated.

### **1.17 - WIRING AND MISCELLANEOUS EQUIPMENT**

All wiring and device labeling shall comply with Tacoma Power Standard A-SS-0040 Relay & Control Wiring Design, A-SS-0025 Substation Labeling and A-SS-0030 Abbreviations. The Vendor shall completely wire item.

Wiring shall be neatly arranged in tied wire bundles or run in wire duct. Wire terminals shall be full eye ring-type copper with insulated sleeves overlapping wire insulation. Pre-insulated ringtype terminal connectors shall be used on all terminal blocks and throughout the current circuits. Spade-type connectors are not acceptable. Adhesive type wire bundle hold-down clamps shall not be used. All hold-downs shall be bolted or welded. Wiring and cables entering/exiting enclosures or raceway shall be protected from damage.

Splices shall not be used.

Wire labels shall be provided and installed at both ends of all internal wires. Wire labels shall be machine embossed black lettering on white plastic heat shrink sleeves.

Inter-section wire openings shall be 3-inches by 12-inches (3"x12") or larger and shall be filled less than 50 percent (50%). All inter-section wiring shall terminate on terminal blocks on both ends. In addition, a dedicated space for communication cable with appropriate barriers shall be provided.

Outdoor, weatherproof, dust-resistant equipment enclosures with hinged doors shall be provided and mounted on the equipment frame. Enclosure door handles shall include provisions for padlocking. These enclosures shall provide a connecting means between the internal wiring for the equipment and the City's equipment. Customer connection to the equipment enclosures shall be via removable aluminum plates which are accessed from the inside of the enclosure.

Auxiliary equipment such as terminal blocks, auxiliary relays, or contactors shall be readily accessible. Auxiliary equipment shall be located in compartments, enclosures or junction boxes in such arrangement that a wire electrician will have direct access to all equipment without removal of barriers, cover plates or other wiring. Auxiliary Relays shall be standard 8-pin octal plug-in relays, unless otherwise specified.

Terminal blocks for external connections shall be grouped in this enclosure for easy accessibility unrestricted by interference from structural members and instruments. Sufficient space shall be provided on each side of each terminal block to allow an orderly arrangement of all leads to be terminated on the block. Arrangement of circuits on terminal blocks shall be such that all connections for one circuit, plus any spare conductors, shall be on adjacent terminals. Raceway covers shall not be blocked by any other equipment and shall allow access after full assembly.

All control switches, push buttons, fuses, shorting-type terminal blocks and other devices requiring City interface shall be mounted at a height and location as to be easily accessible. All strip heaters shall be rated 240VAC, wired to a 120VAC source and sized to prevent condensation. Heaters shall be Chromalox Model OT or approved equal. Wire loops for clamp-on ammeter shall be provided for each heater at terminal blocks.

Terminal blocks shall be furnished with white labeling strips and, where permitted by safety codes and standards, shall be without covers. The terminal block numbers shall be marked by the manufacturer one (1) through twelve (12) and shall correspond to the terminal numbers. Spare, unused terminals shall be furnished on each terminal block for circuit modifications and

for termination of all conductors in a multi-conductor control cable. Not less than two (2) spare, unused terminals shall be furnished for every ten (10) terminals used.

Fuses shall not be mounted on terminal blocks unless fused switch is provided – Phoenix UK10, 3HESI, 3048386, **no substitute**. Step-type terminal blocks and angle mounting of terminal blocks are not acceptable.

All terminal blocks shall be rated 600 volts minimum and shall have strap screw terminals. Terminal blocks for 10 AWG and smaller 600 volt insulated conductors shall be Marathon 1512STD, **no substitute**. Terminal blocks shall be appropriately sized for larger wire size or higher voltage, insulated, incoming conductors as necessary.

A shorting-type terminal block shall be installed at an accessible location for each set of current transformer, supplied with the equipment furnished under these specifications. The terminal block nearest to the current transformers shall be a shorting terminal block. Shorting screws are not to be used for normal grounding of CT circuit.

All current transformer terminal blocks shall have shorting provisions of the positive contact type. Short circuiting the terminals of any one current transformer shall not short circuit the terminals of any other current transformer, unless specified on the drawings. A six-position Marathon 1506SC shall be provided, **no substitute**.

All control/indication lights shall be LED, GE ET-16.

It shall not be necessary to reach beyond any exposed, energized terminals to plug into receptacle for GFCI receptacles that are accessible from inside a cabinet.

### **1.18 - ACCESSORIES AND SPARES**

The Vendor shall provide the following set of accessories included with each ITEM 1, 2, 3, and 4 with a dedicated space for storage:

<b>Quantity</b>	<b>Item</b>
One (1)	Emergency hand closing lever or closing spring crank for circuit breakers
One (1)	Removable hand crank for circuit breaker racking
One (1)	Breaker test jumper, complete with necessary plug & receptacle, to allow operation of breaker when removed from cubicle
One (1)	Fuse for station service transformer
One (1)	Set of primary and secondary Fuses for potential transformer
One (1)	Closed door remote racking device shall be provided which shall include a motor operator, push button control, and enough cable to activate the breakers from outside the switchgear.

The Vendor shall provide the following set of spares to be purchased as Item 12.

Quantity	Item
Two (2)	MV Fuses for station service transformer
Three (3)	MV Fuses for potential transformer
Three (3)	LV Fuses for potential transformer
Two (2)	Breaker trip coils or equal
Two (2)	Breaker close coils or equal
Two (2)	Complete breaker secondary disconnect connector (both the breaker and stationary portions)
One (1)	SHOP TEST EQUIPMENT - In order to service breakers in the shop, auxiliary electrical equipment is required to electrically close and trip breaker. Normally, this equipment consists of control power fuses or circuit breaker, auxiliary control relays, trip and close buttons and suitable multi-conductor test cable to connect breaker to test components. The necessary components shall be mounted and wired in a steel cabinet with hinged door suitable for wall mounting, City connection for supply voltage, and a receptacle for connecting to test cable.

### **1.19 - TESTING**

The Vendor shall perform all routine tests and accompanying notes that are standard for a power switchgear with the ratings of this specification and in accordance with methods and procedures set forth in ANSI C37.20.2. In addition to the routine tests, the following tests shall also be performed in accordance with methods and procedures set forth in this specification.

If the testing shows the equipment has failed to meet any requirements of these specifications, shipment shall be deferred until modifications to the equipment have been made to conform to the requirements of this specification and the City has reviewed retest results and approved.

The manufacturer shall verify, at the factory, the correctness of the control wiring of the completely assembled switchgear by actual electrical operation of the component control devices. Each feeder section with breaker installed shall be tested to establish it is in functioning order. The operation of the control devices, relays and breaker shall be initiated by primary injection of the outgoing feeder.

If the Vendor cannot inject up to 1200 amp test current, indicate on the SWITCHGEAR DATA SHEET and provide in writing how equivalent functionality and type of test results will be provided. Depending upon the testing method specified as a bid submittal, the Bidder may not qualify as a responsive bidder.

Testing shall include, but not be limited to, the following procedure:

a) **FEEDER SECTION**

- 1) Connect the load test set on one phase of the feeder and the main bus to produce current flow in bus under test. Input current at a test value of 1200 amps. To verify the current transformer circuitry to the relay, measure current at each secondary device. To verify the ammeter/voltmeter circuit, record displayed readings at each test position. Test reports shall show input current/voltage value, ammeter/voltmeter reading and current/voltage measured at each device for each phase of each feeder.
- 2) Control circuitry test shall include tripping and closing every vacuum circuit breaker by all devices on the control schematic, including control switches/buttons, relays, and reclosing devices.
- 3) Verify block operation by functional tests.

b) **MAIN BUS, MAIN BREAKER AND TIE BREAKER**

- 1) Connect a load test set to produce current flow in main breaker, main bus, and tie breaker. Input current at three test values: 400 amps, 800 amps and 1200 amps. Measure current at every test switch and take ammeter readings. Test report shall show recordings for each phase of main bus.
- 2) Control circuitry test shall include tripping and closing every vacuum circuit breaker by all devices on the control schematic, including control switches/buttons, relays, and reclosing devices.
- 3) Verify block operation by functional tests.

## **1.20 - SHORT-CIRCUIT CAPABILITY**

The switchgear furnished under this specification shall be designed and constructed according to the requirements of the breaker fault capability.

Conformance to short-circuit mechanical requirements shall be proven by submission of certified test reports containing data from short-circuit tests performed on prototype or production units of similar design.

Where the Bidder is unable to furnish certified test reports and data obtained from prototype or production units, the Bidder shall submit the method and steps now being taken to eliminate mechanical switchgear failure due to short circuit, as required in the preceding paragraph.

The City may reject any bid, when in the judgment of the City's Engineer, the Bidder has not taken sufficient steps to meet the mechanical short-circuit requirements as listed in the paragraph above.

## **1.21 - REPRESENTATIVE**

The Engineer shall be permitted to have an authorized representative present to witness factory testing of the completely assembled switchgear per Section 1.19.

The English language shall be used in all subsequent correspondence and submittals. The factory shall provide personnel that speak technical and conversational English.

## **1.22 - NAMEPLATE**

A stainless steel nameplate shall be furnished which shall include the information listed in C37.20.2 Section 7.4.1 **and** the City's purchase order number.

## **1.23 - PAINTING OF ENCLOSURE**

All surfaces shall be cleaned and rinsed prior to painting. Surfaces shall be rust free prior to painting.

Exterior surfaces shall be painted ANSI No. 70 Light Gray. The interior surfaces of the enclosure and switchgear control and relay cabinet, excluding the panel door interior surface, shall be painted white. Panels shall be painted light gray.

The final coating average thickness shall be between 1.5 and 2.0 mils. The finish shall pass the ASTM B117 salt spray test for a minimum of 200 hours. Coating test reports shall be available upon request by the City.

The base and the lowest six (6) inches of the enclosure exterior shall be coated with an epoxy coating (Dupont 25-P high solid epoxy mastic LFL 3225 or approved equal) to protect against rust and moisture.

All metal surfaces shall be shot blasted and thoroughly cleaned before the primer is applied.

### **1.23.1 – Exterior Initial Coat**

The initial coat of paint shall be a rust-inhibiting primer which does not contain lead-based material. It can be either red zinc or preferably a red epoxy coat.

### **1.23.2 – Exterior Finish Coat**

The exterior finish coat of paint shall be ANSI No. 70 Light Gray, low-gloss, alkyd resin enamel.

The bottom and the lowest six (6) inches up the sides shall be painted with a rust-preventive material.

### **1.23.3 – Interior Finish Coat**

The interior of all control cabinets shall have a white finish coat.

### **1.23.4 – Touch-up Paint**

One pint of matching spray exterior finish paint shall be supplied to the City for touch-up after installation. Paint shall be shipped with a material safety data sheet (MSDS) and with instructions (in the English language) for use.

## **1.24 - SWITCHGEAR 15KV EXTERNAL CONNECTIONS**

### **1.24.1 - Feeder cubicles**

Shall have three (3) terminal pads and necessary supports for air termination of six (two per phase) 750 MCM copper, single conductor, 15 kV rubber or polyethylene insulated,

shielded power cables entering from below. Terminal height shall be a minimum of 48" from the conduit access plate. Provide pads with 9/16" diameter holes on 1-3/4" x 1-3/4" NEMA spacing for cable connection.

The City will provide connector lugs. Ground studs and covers shall be installed on each phase and ground bus, freely accessible by hotstick from outside the back of the cubicle with cables in place for grounding. The studs shall be Chance #C6002102, **no substitute** and the covers shall be Chance #C4060416, **no substitute**.

Cable to bus insulated covers shall be provided. Insulboot PDM 8107, or approved equal.

#### **1.24.2 - Main cubicle to Transformer Connections**

Tacoma Power's transformers (15/20/25 and 24/32/40 MVA) will be connected to the switchgear by throat (bus duct) or 15kV underground cable termination enclosure provided by the switchgear manufacturer. The throats shall enter the side of the switchgear. Reference attached equipment layout drawings for dimensions from the transformers to the switchgear.

The specified transformer secondary bushing configuration is shown on 2101.01, Sheet 1. The switchgear manufacturer shall incorporate a bus transition to accommodate the different phasing on either end of the bus.

The buses shall meet all applicable electrical ratings of the switchgear. The buses will be sized to carry the rated current continuously without exceeding a temperature rise of 65°C above an ambient temperature of 40°C. The bus shall include all three (3) phases plus a neutral. The bus shall be full round edge copper and silver-plated at connection points. The bus shall be insulated with fluidized bed epoxy. Bus joints shall be insulated with removable boots. All bus conductors shall be supported with high strength porcelain post supports or flame retardant, track resistant cycloaliphatic epoxy.

All connection hardware from transformer secondary bushing terminals to outdoor metal-clad switchgear via a throat or underground power cable termination enclosure shall be provided by the vendor, including braided conductors. Ampacity of throat and cable termination enclosure conductor shall be no less than the continuous current rating of the low voltage bushings. All current carrying conductors shall be copper material and shall be epoxy insulated bus. All bus supports shall be wet process porcelain. Enclosures shall be weatherproof, dust-resistant and painted per Section 1.23.

Heaters with thermostats shall be installed. Vendor is invited to examine an existing installation of switchgear prior to design. Such pre-design inspection shall be coordinated through the City's Engineer.

All connections to power cables shall accommodate 15kV rubber or polyethylene insulated, 750 MCM copper shielded power cables entering from below. For 2000A applications, terminal pads and necessary supports for power cable air terminations shall accommodate twelve (four per phase) cables. For 3000A applications, terminal pads and necessary supports for power cable air terminations shall accommodate eighteen (six per phase) cables. Terminal height shall be a minimum of 48" from the



conduit access plate. Provide pads with 9/16" diameter holes on 1-3/4" x 1-3/4" NEMA spacing for cable connection.

The City will provide connector lugs. Ground studs and covers shall be installed on each phase and ground bus, freely accessible by hotstick from outside the back of the cubicle with cables in place for grounding. The studs shall be Chance #C6002102, **no substitute** and the covers shall be Chance #C4060416, **no substitute**.

Cable to bus insulated covers shall be provided. Insulboot PDM 8107, or approved equal.

#### **1.24.2.1 – Throat (Bus Duct)**

The transformer may connect to 15kV switchgear via throat (bus duct). Vendor shall provide all bus duct material, outdoor enclosure and structural support necessary to mate transformer to 15kV switchgear. The per unit cost shall be determined by using the average length of throat to be 10 linear feet and often includes two (2) 90 degree transitions to accommodate different elevations at the switchgear and transformer connections.

Transformer manufacturer drawings shall be provided by the City's Engineer at PO issue.

The throat enclosure shall be constructed with 11 gauge steel, shall be weatherproof and dust proof, and shall include bolt-on removable covers. The throat shall be designed to be supported from below by structural supports. The Vendor shall design and provide appropriate structural supports and supply anchoring and foundation requirements to the City.

A termination box at the transformer shall be furnished, providing bottom access to the flexible connectors between the transformer terminals and the throat. The throat shall include flexible silver plated copper braid connectors from the phase and neutral buses to the transformer secondary bushings and all connecting hardware necessary for the connection to the transformer bushings.

#### **1.24. 2.2 – 15kV Underground Cable Termination Enclosure**

The transformer may connect to switchgear via 15kV underground power cable. Vendor shall provide all bus, outdoor enclosure and structural support necessary to terminate four 750kcmil copper 15kV power cables for Item No. 7 and six 750 kcmil copper 15kV power cables for Item No. 8 for each phase at the transformer.

A ground bus for shall be provided by the Vendor.

A termination box at the transformer shall be furnished, providing bottom access to the flexible connectors between the transformer terminals and the throat. The throat shall include flexible silver plated copper braid connectors from the phase and neutral buses to the transformer secondary bushings and all connecting hardware necessary for the connection to the transformer bushings.

## **1.25 - EARTHQUAKE STRENGTH REQUIREMENTS**

The completely assembled switchgear shall meet the High Seismic Qualification Level, as defined in IEEE Standard 693-2005. All applicable seismic identification plates, drawings, calculations and required test reports shall be provided as specified in IEEE Standard 693.

## **1.26 - ACCESSORY DEVICES**

### **1.26.1 – Ground Pads**

- a) The switchgear shall be provided with two (2) copper faced NEMA 2-hole ground pads at opposite corners of the switchgear.
- b) The ground bus shall be provided with two (2) copper faced NEMA 2-hole ground pads at opposite ends of the switchgear.

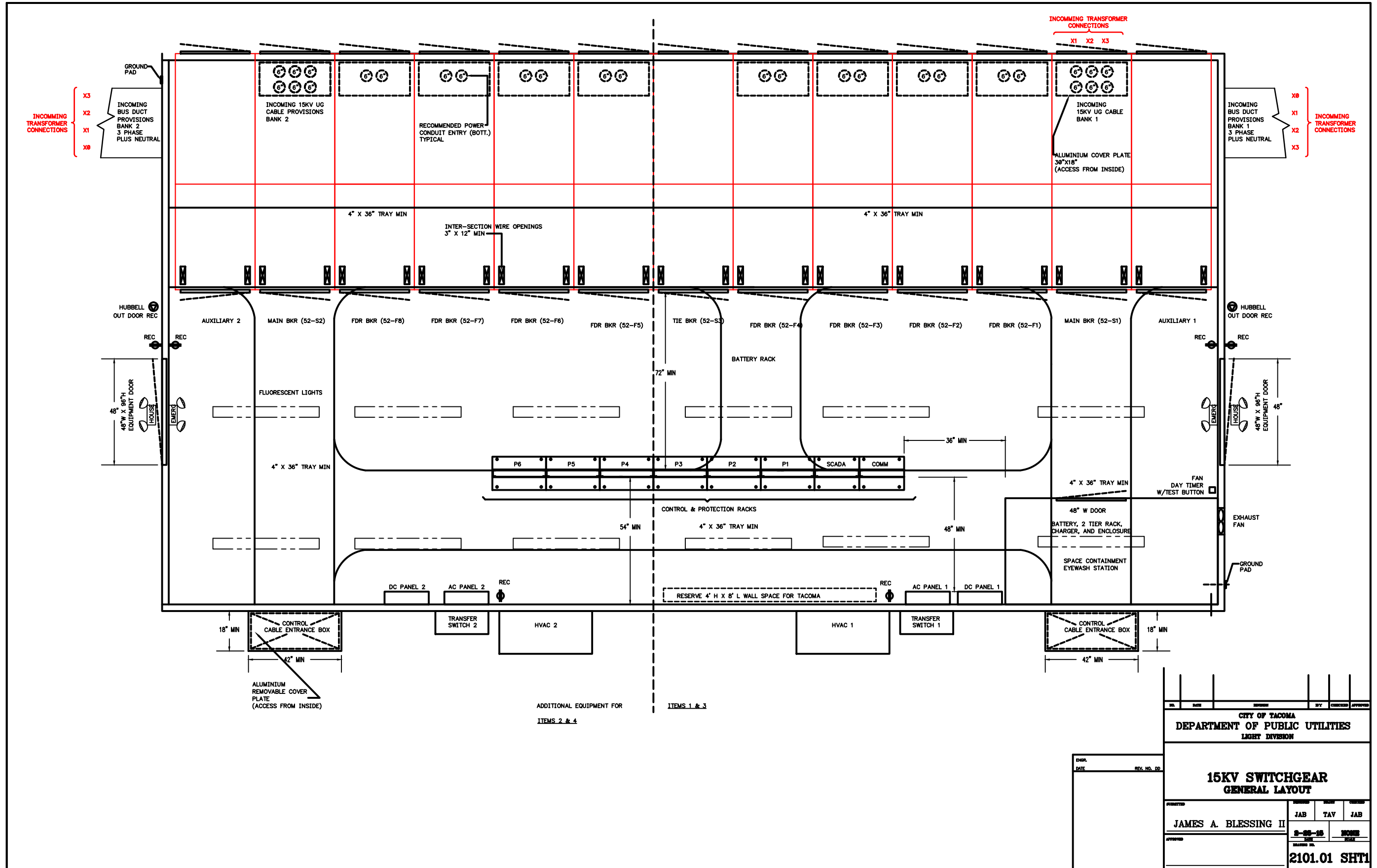
### **1.26.2 – Terminal Pads**

NEMA hole pads shall be provided at each feeder, main, or throat termination. Pads shall be compatible for connection to either copper or aluminum. NEMA 2 hole pads shall be provided on the neutral bus for neutral connections from distribution system.

## **1.27 - THREADED FASTENERS**

Screw threads for screws, bolts, nuts and other threaded parts shall conform to the applicable American National Standards Institute Standards for unified threads.

The manufacturer standard threads and construction may be used on small parts which, in the opinion of the City's Engineer, are integrally replaceable, except that the threads for external connections to these parts shall meet the requirements outlined above.



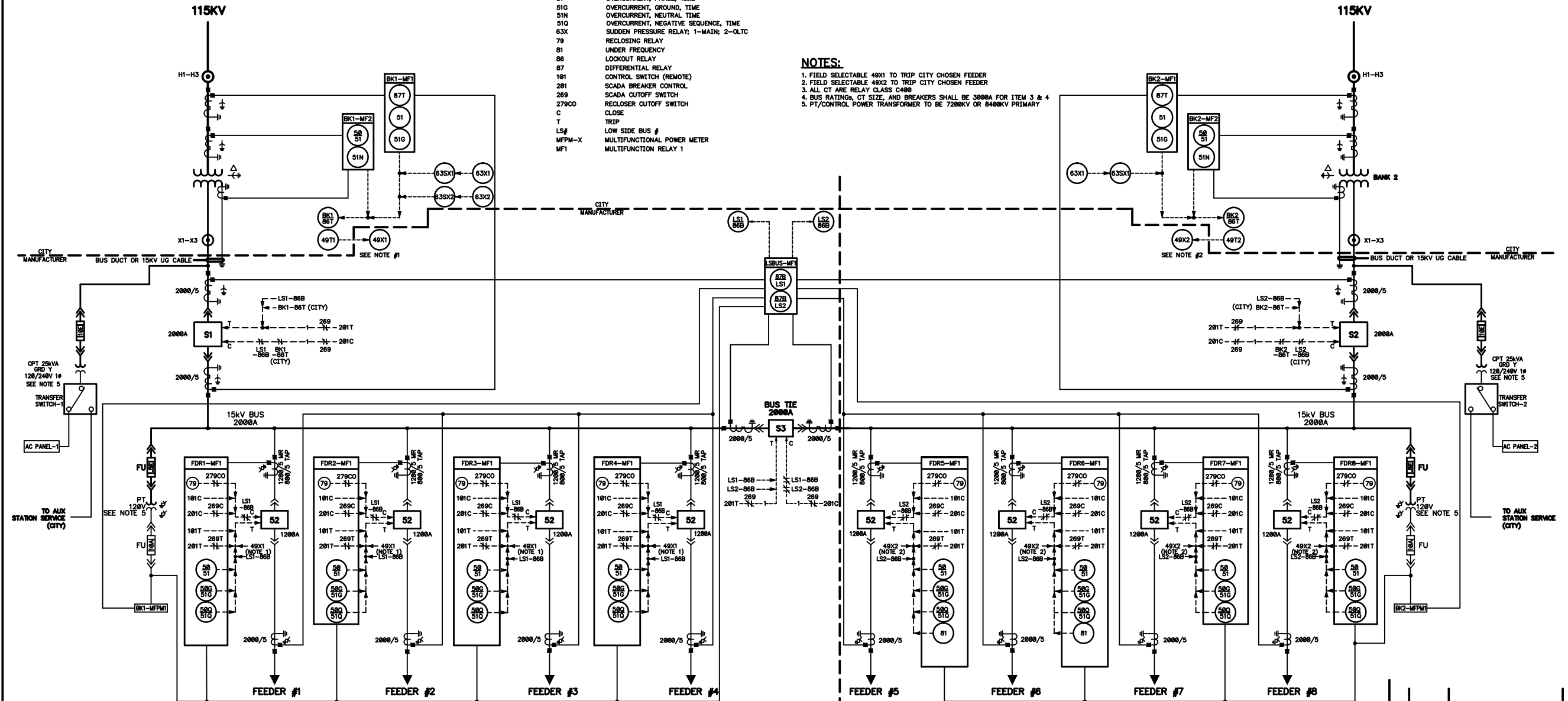
NO.	DATE	ISSUED	BY	CHECKED	APPROVED
CITY OF TACOMA DEPARTMENT OF PUBLIC UTILITIES LIGHT DIVISION					
<b>15KV SWITCHGEAR GENERAL LAYOUT</b>					
DESIGNED BY	JAB	TAY	JAB		
DATE	9-25-15		ISSUED		
REV. NO.	01		BY		
<b>2101.01 SHT1</b>					

**LEGEND:**

- T - TRIP; C - CLOSE
- 43 LOCAL/REMOTE SWITCH
- 49T TRANSFORMER TEMP. MONITORING RELAY
- 49X BANK WINDING TEMPERATURE AUXILIARY RELAY
- 50 OVERCURRENT, PHASE, INSTANTANEOUS
- 50G OVERCURRENT, GROUND, INSTANTANEOUS
- 50Q OVERCURRENT, NEGATIVE SEQUENCE, INSTANTANEOUS
- 51 OVERCURRENT, PHASE, TIME
- 51G OVERCURRENT, GROUND, TIME
- 51N OVERCURRENT, NEUTRAL, TIME
- 51Q OVERCURRENT, NEGATIVE SEQUENCE, TIME
- 63X SUDDEN PRESSURE RELAY; 1-MAIN; 2-OLTC
- 79 RECLOSING RELAY
- 81 UNDER FREQUENCY
- 86 LOCKOUT RELAY
- 87 DIFFERENTIAL RELAY
- 101 CONTROL SWITCH (REMOTE)
- 201 SCADA BREAKER CONTROL
- 269 SCADA CUTOFF SWITCH
- 279CO RECLOSER CUTOFF SWITCH
- C CLOSE
- T TRIP
- LS# LOW SIDE BUS #
- MFP#-X MULTIFUNCTIONAL POWER METER
- MF1 MULTIFUNCTION RELAY 1

**NOTES:**

1. FIELD SELECTABLE 49X1 TO TRIP CITY CHOSEN FEEDER
2. FIELD SELECTABLE 49X2 TO TRIP CITY CHOSEN FEEDER
3. ALL CT ARE RELAY CLASS C400
4. BUS RATINGS, CT SIZE, AND BREAKERS SHALL BE 3000A FOR ITEM 3 & 4
5. PT/CONTROL POWER TRANSFORMER TO BE 7200KV OR 8400KV PRIMARY

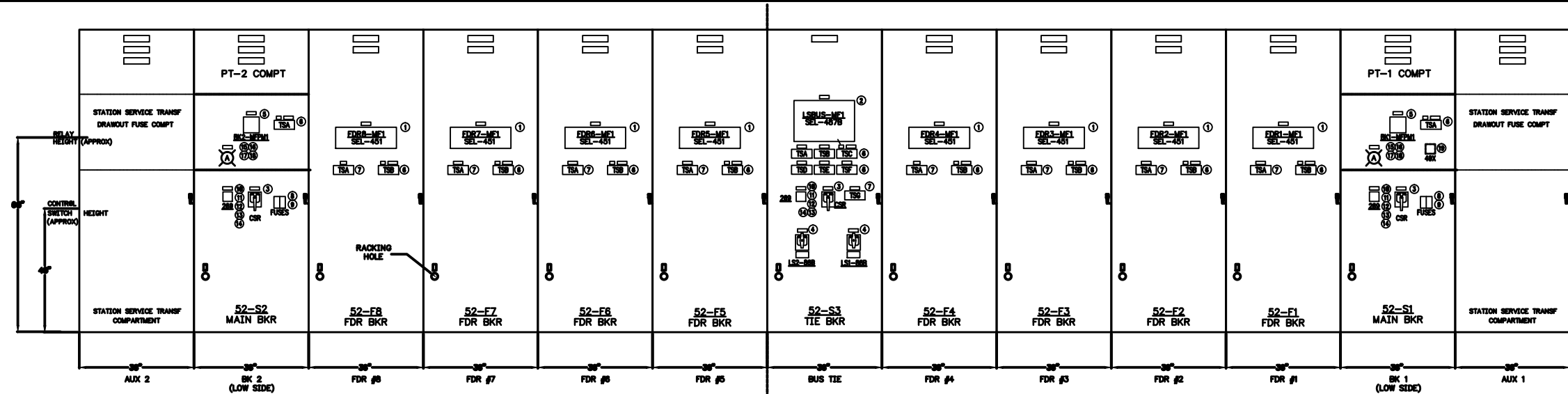


ITEMS 1 & 3  
(SEE NOTE 4)

ADDITIONAL EQUIPMENT FOR  
ITEMS 2 & 4  
(SEE NOTE 4)

<b>CITY OF TACOMA</b>				
<b>DEPARTMENT OF PUBLIC UTILITIES</b>				
<b>LIGHT DIVISION</b>				
<b>15KV SWITCHGEAR</b>				
<b>ONE-LINE</b>				
<b>DIAGRAM</b>				
PREPARED BY <b>JAMES A. BLESSING II</b>	DRAWN BY <b>JAB</b>	CHECKED BY <b>TAV</b>	REVIEWED BY <b>JAB</b>	
DATE <b>2-25-15</b>		REVISION <b>NONE</b>		
DRAWING NO. <b>2101.01 SHT2</b>				

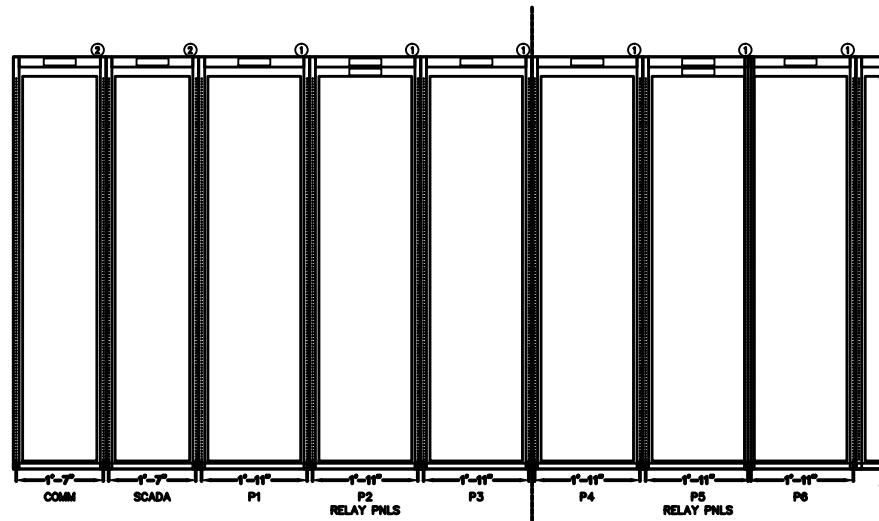
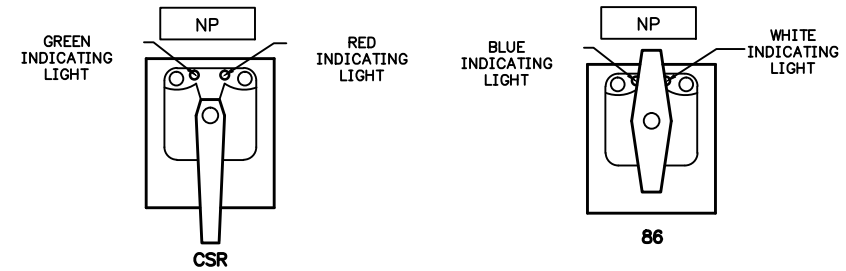
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SWITCHGEAR ELEVATION VIEW

ADDITIONAL EQUIPMENT FOR  
ITEMS 2 & 4

ITEMS 1 & 3



RELAY RACKS ELEVATION VIEW

ITEMS 1 & 3

ADDITIONAL EQUIPMENT FOR  
ITEMS 2 & 4

BILL OF MATERIALS (RELAY RACK):

#	QTY.	DESCRIPTION	MID
1.	6	CHATSWORTH UNIVERSAL 23" RACK 46363-585, 7.5' TALL	
2.	2	CHATSWORTH UNIVERSAL 19" RACK 46353-585, 7.5' TALL	

BILL OF MATERIALS (SWITCHGEAR):

SWITCHGEAR SPECIFICATIONS 125VDC			
#	QTY.	MFR DESCRIPTION	PART NUMBER
1	8	SCHWEITZER ENGINEERING LABORATORIES SEL451 RELAY	0451541EXB4X433B4XXX
2	1	SCHWEITZER ENGINEERING LABORATORIES SEL487B RELAY	0487B1X4X52XB4XE37EEXXX
3	3	ELECTROSWITCH SERIES 24 CONTROL SWITCH RELAY	88P857DC (GREEN & RED LEDS)
4	2	ELECTROSWITCH SERIES 24 LOCKOUT RELAY	78PB050-007 (BLUE & WHITE LEDS)
5	2	SATEC MULTIFUNCTION POWER METER	PM174-60HZ-5-AC/DC-00-ETH
6	16	AVO STATES AC TEST SWITCH	FMS-10E1-ST
7	9	AVO STATES DC TEST SWITCH	FMS-10A1-ST
8	4	PHOENIX FUSED SWITCH UK10, 3-HESI	3048306
9	4	BUSSMAN FUSES	LP-CC-5
10	3	SQUARE D 269 SWITCH ASSEMBLY	9001KS11FWH2
11		CONTACT BLOCK	9001KA1
12		LEGEND PLATE	9001KN244
13		SELECTOR SWITCH	9001KS11B
14		GLOVE-HAND KNOB	9001W24
15	2	GE LED LAMP RECEPTACLE	ET-18
16	2	GE RESISTOR FOR LED LAMP	125VDC
17	2	GE CLEAR LENS FOR LED LAMP	
18	2	GE LED LAMP - AMBER 125VDC	
19	2	ABB TYPE SG AUX RELAY	293B255A29

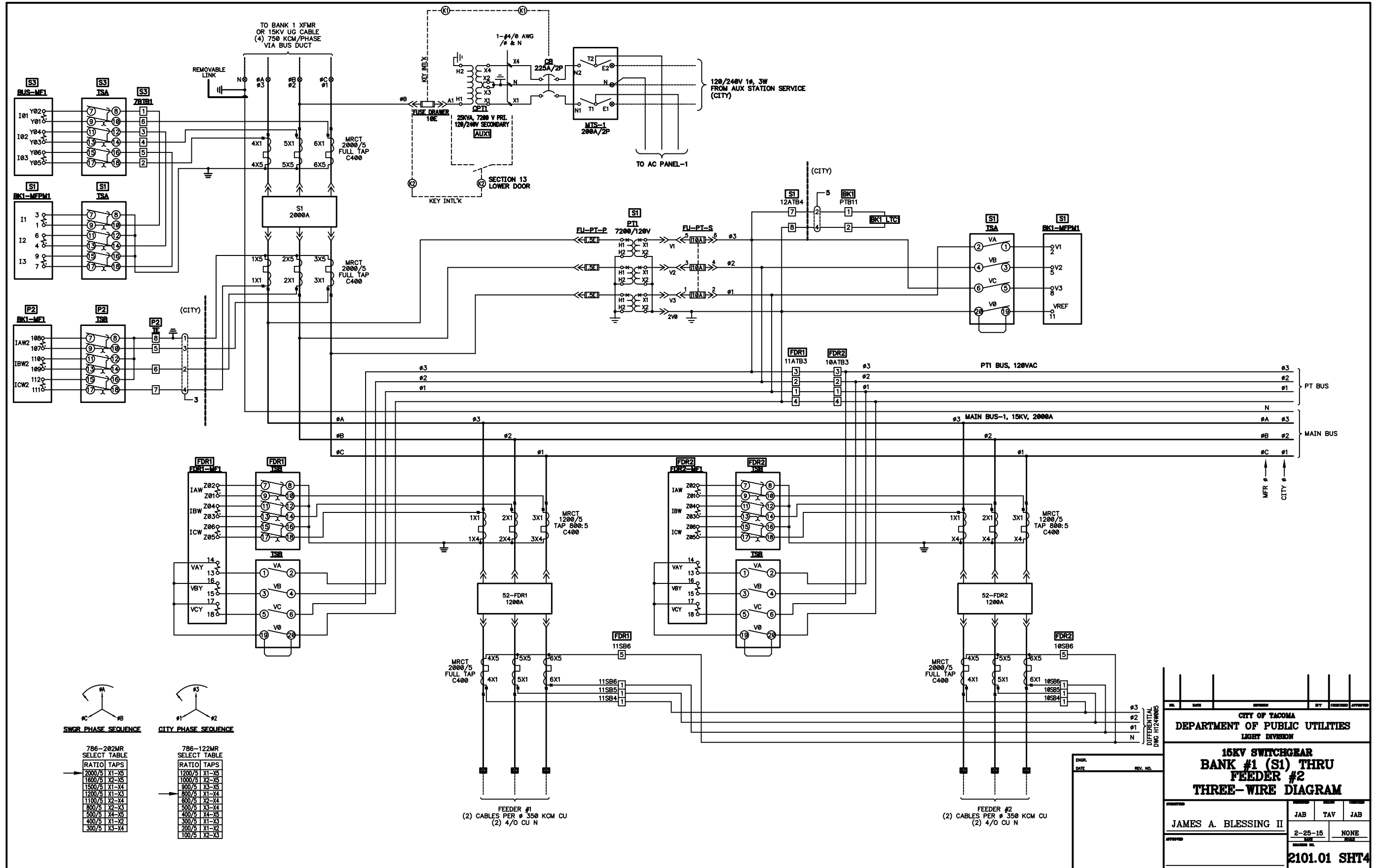
ASSUMES INSTALLATION OF SUBSTATION SERVER WHICH POLLS THE RELAYS FOR DATA.  
TOTAL QUANTITIES LISTED ARE FOR AN 8 FEEDER DOUBLE ENDED SWITCHGEAR INSTALLATION.

DWG FILED IN: A-STANDARDS

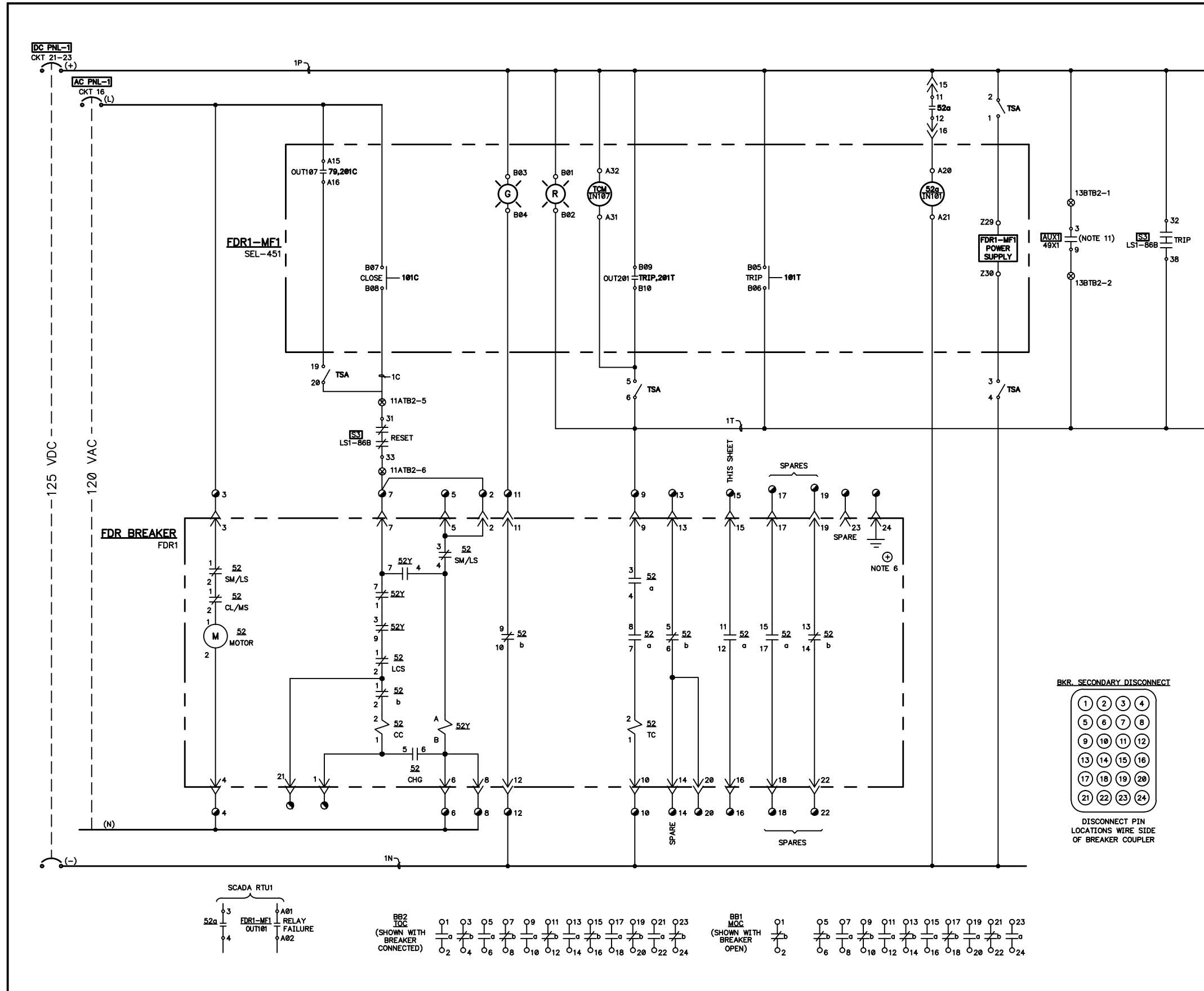
ENGR. DATE

REV. NO.

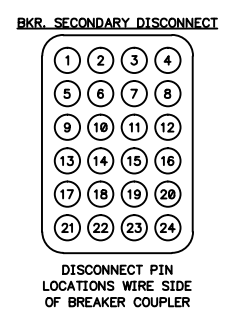
DL	DATE	ISSUED	BY	CHECKED	APPROVED
CITY OF TACOMA DEPARTMENT OF PUBLIC UTILITIES LIGHT DIVISION					
<b>15kV SWITCHGEAR PANEL ELEVATION DIAGRAM</b>					
DESIGNED <b>JAMES A. BLESSING II</b>	DRAWN JAB	CHECKED TAV	TESTED JAB		
		DATE <b>2-25-15</b>	SCALE NONE		
DRAWING NO. <b>2101.01 SHT3</b>					



DWG FILED IN: A-STANDARDS



- NOTES:**
- 1) BREAKER SHOWN "OPEN" AND WITH CLOSING SPRING "DISCHARGED"
  - 2) 52 CL/MS = CLOSING LATCH MONITORING SWITCH IS CLOSED WHEN LATCH IS CAPABLE OF BLOCKING FULLY CHARGED CLOSING SPRING
  - 3) 52 SM/LS = LIMIT SWITCH FOR SPRING CHARGING MOTOR. CONTACTS (1-2) (3-4) OPEN WHEN SPRINGS ARE FULLY CHARGED
  - 4) 52 CHG = CONTACTS CLOSED WHEN CLOSING SPRINGS ARE FULLY CHARGED
  - 5) 52 CC = SPRING RELEASE COIL OPERATES LATCH WHICH RELEASES CLOSING SPRING TO CLOSE CIRCUIT BREAKER
  - 6) ⊕ = GROUND PIN USED FOR INSPECTION BOX ONLY
  - 7) 52 LCS = TRIP LATCH CHECKING SWITCH CLOSED WHEN LATCH IS RESET
  - 8) 52Y = ANTI-PUMP RELAY PREVENTS RECLOSING ON A SUSTAINED CLOSE COMMAND
  - 9) ⊗ = TB AVAILABLE FOR CUSTOMER OR FIELD CONNECTION
  - 10) ● = TB BREAKER INTERNAL CONNECTION
  - 11) 49X1 FIELD SELECTABLE FROM AUX CUBICLE BY TACOMA POWER



NO.	DATE	ISSUED	BY	REVISION	APPROVED
CITY OF TACOMA DEPARTMENT OF PUBLIC UTILITIES LIGHT DIVISION					
<b>15kV SWITCHGEAR FEEDER #1</b> <b>SCHEMATIC DIAGRAM</b>					
DESIGNED BY	JAMES A. BLESSING II	JAB	TAV	JAB	
DATE	2-25-15		NONE		
PROJECT NO.	2101.01 SHT5				

DWG FILED IN: A STANDARDS

## Purpose

This standard describes the requirements for designing a DC battery & charger system for one of three configurations:

1. DC supply for substation equipment only
2. DC supply for communication equipment only
3. DC supply for communication and substation equipment

The main objective is to develop a reliable system that will allow system maintenance on any device while still providing DC power.

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## Design

### Seismic Protection

Battery racks shall meet IEEE 693 “High” seismic qualification requirements, or equivalent.

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### Connections

In a communication-only system, a reliable DC power system is accomplished by installing two battery chargers, each individually protected by a circuit breaker at its AC input. The second load center will be the common ground point for the positive ground lead. See Figure 1.

In a substation-only system, floating DC systems will have the ground bus in the load center grounded to the nearest ground source but not connected to either main supply bus. See Figure 2.

Where the communication system is served by the substation DC system, the DC output of each charger will feed a load center that will act as a disconnect switch, or a separate disconnect switch will be employed that connects to the load center. The load center will be the common point for the charger(s) and battery, as well as the distribution point for the load. When a second load center is required, as determined by the Engineer, it shall be fed from the common point through a separate breaker. When communications equipment **must** share a battery with substation equipment, a balanced DC filter will be installed in the leads that supply power to the communications equipment. The filter will have at least 30 DB of filtering at 120 HZ. See Figure 3.



## Design (continued)

**Battery size** All batteries will be sized to a minimum of 8 continuous hours of standby power delivery. Remote sites, i.e. mountain tops, should be sized for at least 24 hour standby service.

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**Spill Control, Neutralization and Ventilation** 2009 International Fire Code (IFC) Section 608, "Scope", states that battery systems having an electrolyte capacity of more than 50 gallons require spill control, neutralization and ventilation.

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**Battery Charger** Dual battery chargers will be capable of load sharing and sized together to maintain the existing load plus recharge the battery bank in 24 hours or less. A failed charger lengthens the recharge time, but is acceptable because of the short time required for repair. Single chargers will be sized to support load and recharge the battery in 24 hours.

As a minimum, battery chargers will have local indication for the following:

- AC power on
- AC power failure
- Low DC voltage
- High DC voltage
- Charger failure
- Positive ground fault
- Negative ground fault

As a minimum, battery chargers will have contacts for remote alarms for the following:

- Low DC voltage
- High DC voltage
- AC power failure

Other alarm requirements include:

- All chargers will have both AC & DC re-settable circuit breakers, fuses will not be acceptable
  - Ferro resonant chargers are preferred
  - Chargers shall be filtered to maximum 30 millivolts RMS ripple when connected to a battery with an amp-hour capacity four times the ampere output rating of the charger, and maximum 100 millivolts RMS when not connected to a battery.
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## Design (continued)

### Inter-connection

Circuits and conduit systems for AC and DC shall be as independent per charger as possible. Connections to the battery chargers will employ flexible conduit.

### Low voltage disconnect relay (optional)

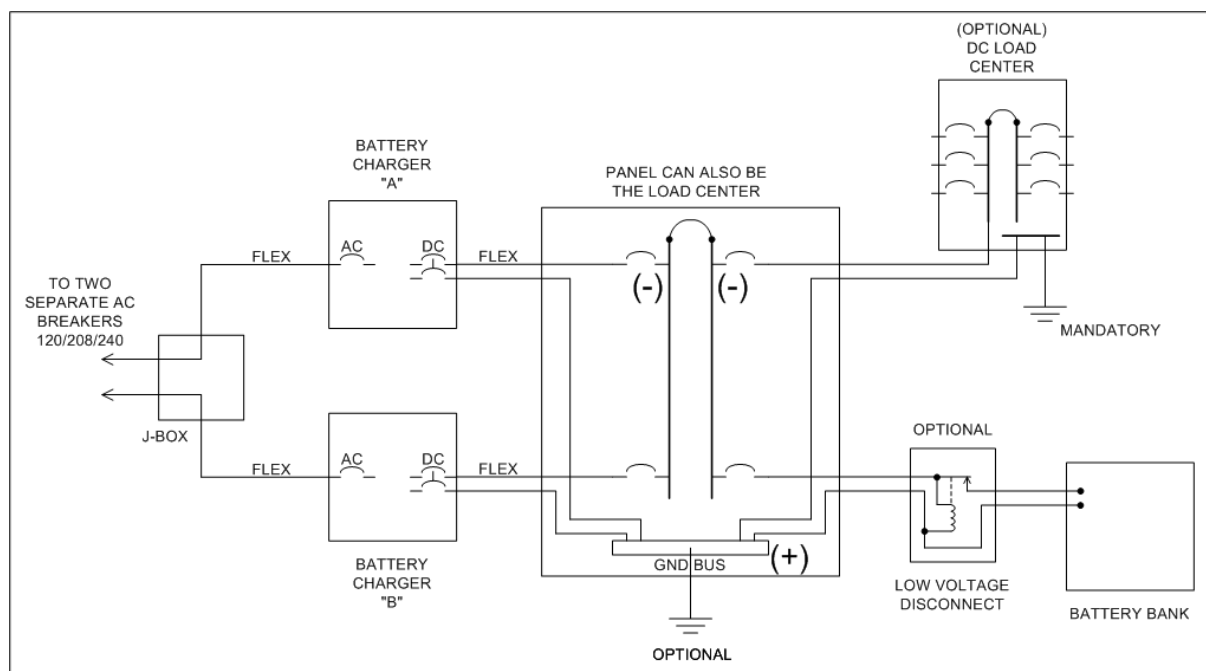
**Low voltage disconnect relay** (optional), when utilized, will monitor the DC voltage and disconnect the battery when the potential drops to no less than 20 volts for a 24 volt system, 40 volts for a 48 volt system, or 100 volts for a 120 volt DC system (1.67 volts/cell). The disconnect relay will reconnect the battery when the source voltage rises to the nominal DC system voltage.

### Load Centers

The Square D QO brand of load center, or approved equivalent, is recommended. It is readily available for maintenance needs and future requirements. The 250 Volt AC rating can be used for voltages up to 60 Volts DC and the 600 Volt AC rating for the 120 Volt DC system.

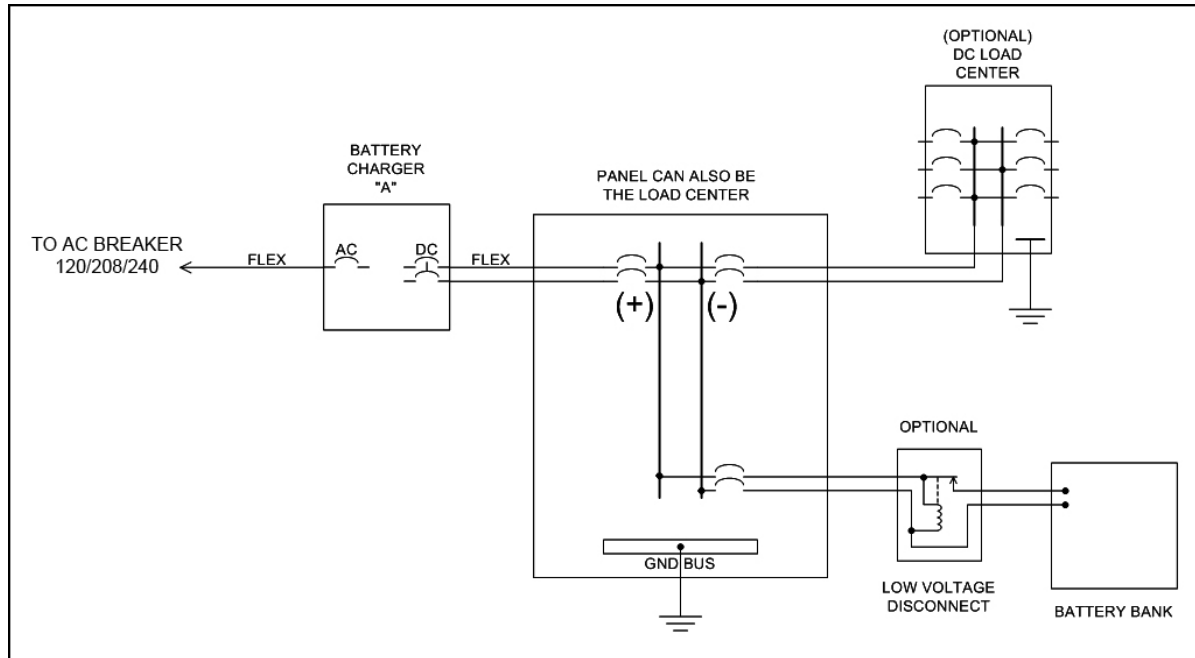
## Drawings

**Figure 1** Example of Battery & Charger System for Communications System.

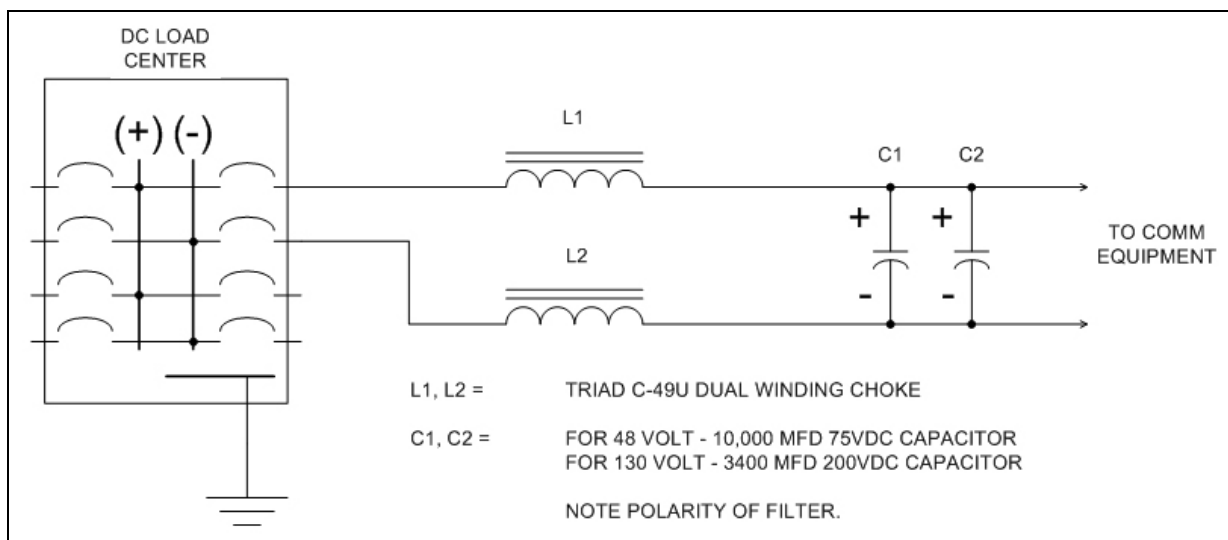


## Drawings (continued)

**Figure 2** Example of Battery & Charger System for Substation System.



**Figure 3** Example of Battery & Charger System for Substation & Communication Shared System.



## Sources

- IEEE Standard 450, "IEEE Recommended Practice for Maintenance, Testing, and Replacement of Vented Lead-acid Batteries for Stationary Applications"
- IEEE Standard 693, "Recommended Practice for Seismic Design of Substations"
- IFC Section 608, "Stationary Storage Battery Systems"

## TACOMA POWER DRAWING STANDARDS

### GENERAL

City shall expect that all drawings will be in computer files that conform to the standards set forth in this section. Drawings shall be prepared electronically on IBM PC using Autodesk AutoCAD Version 2000 for Windows or greater, saved in a .DWG or .DXF file format, and submitted per Tacoma Power Approval Process.

### CAD STANDARDS

~~All drawings must be created using City title borders. These will be available to the Vendor after award of contract.~~

#### ENTITY PROPERTY ASSIGNMENT STANDARD

All entity colors and line types shall be BY LAYER.

All text should be on text layers and all lines should be on line layers.

Entity Property to **Ink Jet Plotter**-Pen Assignment Standard

Entity colors and line types shall be assigned to pens 1 through 8 PLOT setup menu as follows:

ENTITY COLOR	PEN NO.	PEN ASSIGNMENT WIDTH (MM)	COLOR
1 (RED)	1	0.012	RED
2 (YELLOW)	7	0.010	BLACK
3 (GREEN)	3	0.012	GREEN
4 (CYAN)	7	0.013	BLACK
5 (BLUE)	5	0.012	BLUE
6 (MAGENTA)	7	0.015	BLACK
7 (WHITE)	7	0.020	BLACK
8 (GRAY)	8	0.012	BLACK

#### LAYER NAMING STANDARD

The layer name convention shall be a four-part hyphenated name.

Examples of standard layer names:

Layer Name	Description
DRWG-BRDR-LIN-LIGHT	Border - continuous line will plot with (*or 0.020 mm width)
DRWG-LINE-000-LIGHT	Lines - continuous lines will plot with (*or 0.010 mm width)
DRWG-TEXT-THN-LIGHT	Drawing text - text will plot with (*or 0.013 mm width)
DRWG-LINE-DSH-LIGHT	Lines - dashed lines will plot with (*or 0.010 mm width)

As many layers as needed may be defined as long as layer convention format is followed.

### LINE TYPES

BASIC	DESCRIPTION	LAYER COLOR	PEN WIDTH (IN MM)
HVY	BROAD LINE	WHITE	(* .025)
MED	MEDIUM LINE	MAGENTA	(* .020)
THN	THIN LINE	CYAN	(* .014)
000	NARROW LINE	YELLOW	(* .010)
DSH	NARROW LINE	YELLOW	(* .010)

\*DENOTES INK JET PLOTTER PEN SETTINGS

### SIGNATURES

Each drawing submitted shall be identified by a drawing number and be dated, signed and stamped by a licensed engineer from the consulting firm. A City engineer will stamp the drawings as reviewed.

### DIMENSIONS AND UNITS

Dimensions and tolerances shall conform to ANSI Y14.5. Dimensions shall be complete and in U.S. customary units. If the manufacturer fabricates in the SI unit system (metric system), both units shall be shown on the drawings; ~~U.S. units above the dimension line and SI units below the line.~~ Conversion tolerance shall be within a maximum of 1/32 inch (0.79 mm).

### SCHEMATIC AND WIRING DIAGRAMS

Schematic and wiring diagrams furnished by the Vendor shall be on a per-circuit-breaker basis. All graphic symbols for electrical diagrams shall be represented as shown in IEEE 375, with the exclusion of IEC symbols. Device connection shall have near each termination the conductor identification consisting of the opposite end destination. Function information and wire run codes are not required. The wiring diagrams shall be drawn with all devices indicated in their relative physical locations and shall represent the equipment and terminals arranged as they would appear to a person wiring the equipment.

Where interconnecting wiring from different items of equipment or sectional wiring diagrams of the same item of equipment appear on different wiring diagram sheets, all interconnections shall be clearly identified. Where sectional wiring diagrams are required for a single item of equipment, such as a relay panel or control panel, that section of the panel that is represented by each individual wiring diagram sheet shall be keyed on that sheet in a manner acceptable to the City.

Information indicated on the Vendor's drawings shall include wiring of the individual panel items as they will actually appear in the panel, contact arrangements of switches, and internal wiring of relays and instruments.

Schematic diagrams shall be cross-referenced to terminal markings on the wiring diagrams, but need not indicate complete terminal to terminal details of circuits. Each item of panel-mounted equipment indicated on the diagrams shall be identified by item number and/or name.

Sufficient space shall be left on the City's side of outgoing terminal blocks for adding cable color codes and circuit numbers.

### **COMPLIANCE WITH THIS STANDARD**

Contact engineer for questions concerning drafting conventions. A preliminary electronic copy of drawings shall be sent to the Project Engineer for review with our Lead Engineering Technician prior to approval. (See Tacoma Power Approval Process)

The following are samples of drawing content, drawings examples, labeling and abbreviations standards that represent compliance with this standard:

Tacoma Power Drawing Standardization Matrix

Tacoma Power Drawing Standardization One-line

Tacoma Power Drawing Standardization Three-Wire 1

Tacoma Power Drawing Standardization Three-Wire 2

Tacoma Power Drawing Standardization DC Schematic

Tacoma Power Drawing Standardization Wiring 1

Tacoma Power Drawing Standardization Wiring 2

A-SS-0025 Substation Labeling

A-SS-0030 Abbreviations

A-SS-0040 Relay & Control Wiring Design

Electronic versions of the attachment drawings will be available to the Vendor after award of contract.

## **TACOMA POWER APPROVAL PROCESS**

All new drawings created by the Vendor or by manufacturers shall be electronically created using AutoCAD Version 2000 or greater. Drawings shall utilize Tacoma Power Drawing Standards. ~~The drawings shall be design stamped by a licensed engineer and review stamped by a City engineer.~~

### **GENERAL CONSIDERATIONS**

Only certified drawings shall be submitted. Certified drawings shall mean drawings fully completed and certified by the Vendor as to the compliance of the information contained thereon with the requirements of this specification and documents. Certified drawings will be reviewed by City and processed as specified in this Section. Each drawing submitted, regardless of origin, shall be stamped with the approval of the Vendor and clearly marked with the name of the project, the specification title, the specification number, and the Vendor's name.

The Vendor's stamp of approval will be representation to the City that the Vendor has assumed full responsibility for determining and verifying all applicable information (i.e. quantities, dimensions, field construction criteria, materials, catalog numbers) and/or similar data, and that the Vendor has reviewed or coordinated each submittal with the requirements of the work and the contract.

If drawings submitted by the Vendor show variations from the contract requirements, the Vendor shall describe such variations in writing, separate from the drawings, at the time of submission.

### **DRAWING SUBMITTAL**

Five (5) hardcopy prints of each drawing and one (1) electronic copy on CD shall be submitted for review purposes. Prints shall be black line on white background. Print size shall not exceed 30 inches by 42 inches. Drawings shall be folded to 8-1/2 inches by 11 inches.

All drawings shall be clearly legible, even when reduced to 11 inches by 17 inches in size.

### **DRAWING PROCESSING**

A copy of each drawing reviewed will be returned to the Vendor as stipulated in this Section. Copies of drawings returned to the Vendor will be in the form of a print with City's marking.

When a drawing is revised and resubmitted, the Vendor shall include an issue number and revision description in the drawing revision block. All revisions pertaining to that particular drawing issue shall be back-circled or otherwise clearly noted on the drawing.

Any work performed before City has approved the drawings shall be at the Vendor's own risk and responsibility. Work may proceed when the drawings have been returned marked ACCEPTANCE, provided the work is performed in accordance with City's notations.

If changes are made at the project site, revised drawings indicating the changes made shall be prepared by the Vendor and submitted to City.

## **MODIFICATION OF AUTOCAD DRAWINGS**

~~If the Vendor is modifying an existing AutoCAD City drawing, modifications shall be made in AutoCAD using the criteria and standards established in this Section.~~

## **REVIEWS AND SUBMITTALS**

The Vendor shall provide required project documents for review consistent with the submittal dates per this Section or mutual agreement of the City and Vendor. The City will provide timely review and comment on all required submittals in order not to delay the progress of the work. Unless otherwise specified herein or waived by the City during the course of the project, the City will review all submittals and return consolidated comments to the Vendor within 14 calendar days of receiving the submittal.

## **DRAWING/DESIGN REVIEWS**

The City will review design documents for consistency with City requirements and CAD standards. All submittals shall require City approval. Acceptance of a specific item shall not include acceptance of an assembly or more general part of the work of which the item is a component. The City will respond to all elements of review as itemized below within fourteen (14) working days of receipt of the complete information from the Vendor. The City's response may include ACCEPTANCE, REQUEST FOR RESUBMISSION WITH CHANGE, or REJECTION.

"ACCEPTANCE" shall constitute acceptance of the specific items reviewed with or without comment. It shall not imply acceptance of any items or matters inferred or extrapolated from the accepted elements, nor relieve the Vendor from the requirement to provide designs that comply with this specification.

A "REQUEST FOR RESUBMISSION WITH CHANGE" shall be provided with a description of the reason for lack of acceptance. The description shall serve the purpose of assisting the Vendor in understanding the reason for change and resubmission requirement. A "REQUEST FOR RESUBMISSION WITH CHANGE" shall be issued when the submitted elements are reasonably close to acceptable but require modification and are not worthy of complete rejection.

A "REJECTION" response shall occur when the submitted design is not in compliance with the specifications. A written description of the noncompliance will be provided.



## T&D Engineering Substation & Communication Drawing Standard

Last Update: 03/16/2010 (Red text denotes current matrix change)

Content	Drawing Type					
	One-Line Diagram	Three-Wire Diagram	DC Schematic	Comm Block Diagram	Wiring Diagram	Reference Drawing
*Purpose*	Single line high-level representation of power system equipment schemes and electrical order.	Three-wire representation of rotation, instrument transformer circuits, and station service source.	DC schematic assists in understanding the functional relationship between devices. It is a branch style representation of the trip, close and indication schemes among substation devices and it is not intended to necessarily follow wiring order or duplicate the wiring diagram purpose.	Communications block diagrams function similarly to the schematic diagrams produced by substation, protection and control engineers and technicians. They are logical representation showing the function and relationships between equipment.		
Breaker Trip/Close Sources	In general, show the following: -Dashed line with arrows indicating the flow of control -Initiating devices shown in-line with the dashed line -Supervising (blocking) contacts shown in-line with the dashed line with their label nearby and contact positions in normal state -"T" or "C"  For multi-function relays capable of three or more functions, underline abbreviated label with show relevant IEEE designations below, separated by commas.  For single or two-function relays, show IEEE designation(s).	X	✓ See <u>Circuit Designations</u> .	X	✓ See <u>Circuit Designations</u> .	X
Cable Numbers	X	Show only for AC current and voltage circuits between instrument transformer location and panel or between panels. Include conductor numbers in lasso.	X	X	✓ All cables are to be represented.	X
Capacitor Banks	✓ Show symbol & rating.	✓ Show symbol & rating.	X	X	✓	X
Circuit Breakers (Low-Voltage)	✓ For Station Service w/ ratings	✓ For Station Service w/ ratings	✓ Include symbol, dashed line between poles (for DC breakers), source voltage and type (AC or DC) & continuous amp rating.	X	Generally, station service breakers are not shown on wiring diagrams.  ✓ DC breakers shown on DC panel wiring diagram.	X

Content	Drawing Type					
	One-Line Diagram	Three-Wire Diagram	DC Schematic	Comm Block Diagram	Wiring Diagram	Reference Drawing
Circuit Breakers and Switchers	<p>For 110 or 230kV breakers, show breaker operations # within a box. Outside the box, show the continuous current rating.</p> <p>✓ For 12.5kV or 13.8kV breakers, show "52" within a box, feeder number clearly shown elsewhere &amp; in-line double arrows on both sides of box (if draw-out type). Outside the box, show the continuous current rating.</p>	<p>For 110kV or 230kV breakers/circuit switchers, show breaker/circuit switcher operations # within a box. A dashed box should be shown adjacent to the breaker/circuit switcher box symbol to represent the breaker control cabinet location in relation to the bushings. Bushing numbers and symbol shall be shown beyond the bushing CTs.</p> <p>✓ For 12.5kV or 13.8kV breakers, show "52" within a box, feeder number clearly shown elsewhere, and in-line double arrows on both sides of box (if draw-out type).</p>	<p>✓ Breaker/circuit switcher operations # to be included on the breaker wiring diagram title block.</p>	X	<p>✓ Breaker/circuit switcher operations # to be included on the breaker or circuit switcher wiring diagram title block.</p>	X
Circuit Designations	X	X	<p>✓ Show only breaker/circuit switcher DC positive, negative, trip, and close designations and also P&amp;C SX designations for polarity verification into relay/IED. A lasso will be used to indicate which portion of the circuit is labeled.</p>	X	<p>✓ Show only breaker/circuit switcher DC positive, negative, trip, and close and also P&amp;C SX designations for polarity verification into relay/IED. Show only on terminal blocks.</p>	X
City Phasing	X	✓	X	X	<p>✓ See <u>Current Transformers</u> and <u>Voltage Transformers</u>.</p>	X
Contact Development Charts	X	X	✓	X	X	X
Contacts	<p>✓ Refer to <u>Breaker Trip/Close Sources</u>.</p>	X	<p>Show contacts in de-energized or reset state, except for the following:</p> <ol style="list-style-type: none"> <li>1. Show 279CO contacts in the ON (Normal) position.</li> <li>2. Show 269 contacts in the REMOTE position.</li> <li>3. Show 101 contacts in the open position. Use the contact development chart to determine the state.</li> <li>4. Show 43L/R contacts in the REMOTE state.</li> <li>5. Show 243S contacts open. Use the contact development chart to determine the state.</li> </ol> <p>✓</p>		<p>Show contacts in de-energized or reset state, except for the following:</p> <ol style="list-style-type: none"> <li>1. Show 279CO contacts in the ON (Normal) position.</li> <li>2. Show 269 contacts in the REMOTE position.</li> <li>3. Show 101 contacts in the open position. Use the contact development chart on the DC schematic to determine the state.</li> <li>4. Show 43L/R contacts in the REMOTE state.</li> <li>5. Show 243S contacts open. Use the contact development chart to determine the state.</li> </ol> <p>✓</p>	
Current Transformers	<p>✓ Show symbol, ratio used, wye/delta connection &amp; polarity dots.</p>	<p>✓ Show symbol, ratio at full tap, ratio used, winding connection(s), ground connection, class, polarity dots &amp; phasing</p>	X	X	<p>✓ Included on breaker, circuit switcher, or transformer wiring diagram</p>	X

Content	Drawing Type					
	One-Line Diagram	Three-Wire Diagram	DC Schematic	Comm Block Diagram	Wiring Diagram	Reference Drawing
Device Location	X	✓ Show in a box above terminal blocks where cables land.	<p>✓ If the drawing includes the relay, RTU, meter, or switch operating coil or power supply, show in a box adjacent to the operating coil or power supply only.</p> <p>✓ If the drawing does not include the relay, RTU, or switch operating coil or power supply, show in a box adjacent to each output contact or input.</p>	X	✓ Location to be included on title block.	X
Fiber	✓ Show line with arrow & ultimate destination.	X	X	✓ Use label to indicate use of optical fibers. 10BaseFL, 100BaseFX are Ethernet optical port standards.	✓ Include line with cable number and destination.	
Fuses	<p>✓ Show symbol and continuous current rating.</p> <p>✓ If draw-out, show in-line double arrows on both sides of fuse.</p>	<p>✓ Show symbol and continuous amp rating.</p> <p>✓ If draw-out, show in-line double arrows on both sides of fuse.</p>	✓ Include symbol & continuous amp rating.	X	✓ Include symbol & continuous amp rating.	X
Inductors	✓ Show symbol only.	✓ Show symbol, series reactance & current rating.	X	X	X	X
Legend	✓ Include only IEEE designations that are shown on the specific drawing.	X	✓ Include only IEEE designations that are shown on the specific drawing.	X	X	X
Manufacturer, Model, and Part Information	✓ Show breaker, transformer, switchgear, or other if available manufacturer reference number.	X	X	X	<p>✓ Included only if neither a stock number nor an SAP number has been assigned and if <u>not</u> included in an SME database. Abbreviated model numbers for RTUs and relays are allowed (e.g., D25, SEL-587).</p>	X
Meters	✓ Show in a box. Include the abbreviated label.	<p>✓ In a box, show AC current and voltage inputs with device-specific label (e.g., IA, V1, IA87), terminal numbers &amp; polarity marks.</p> <p>✓ While not desirable, it may be cleaner to represent one set of AC current or voltage inputs within a separate box than another set, even on the same drawing.</p> <p>✓ Show the abbreviated label above each box.</p>	✓ Include power supply connection with terminals.	<p>✓ Show in a box. Use identical abbreviated label as others. Show Serial data, time format, or ethernet communications to source.</p>	✓ Include a backplane of the meter.	X
Power Transformers	✓ Show symbol, ratio(s), capacity(ies) & delta/wye connection(s).	✓ Show symbol, phasing, ratio(s), capacity(ies), winding connection(s) & bushing designations beyond bushing CTs.	X	X	✓ Included on transformer wiring diagram.	X
Reference Drawings	X	X	X	X Only reference to Comm system drawings outside of substation	X	✓
Reference to Adjacent Substation	✓	✓	X	✓	X	X

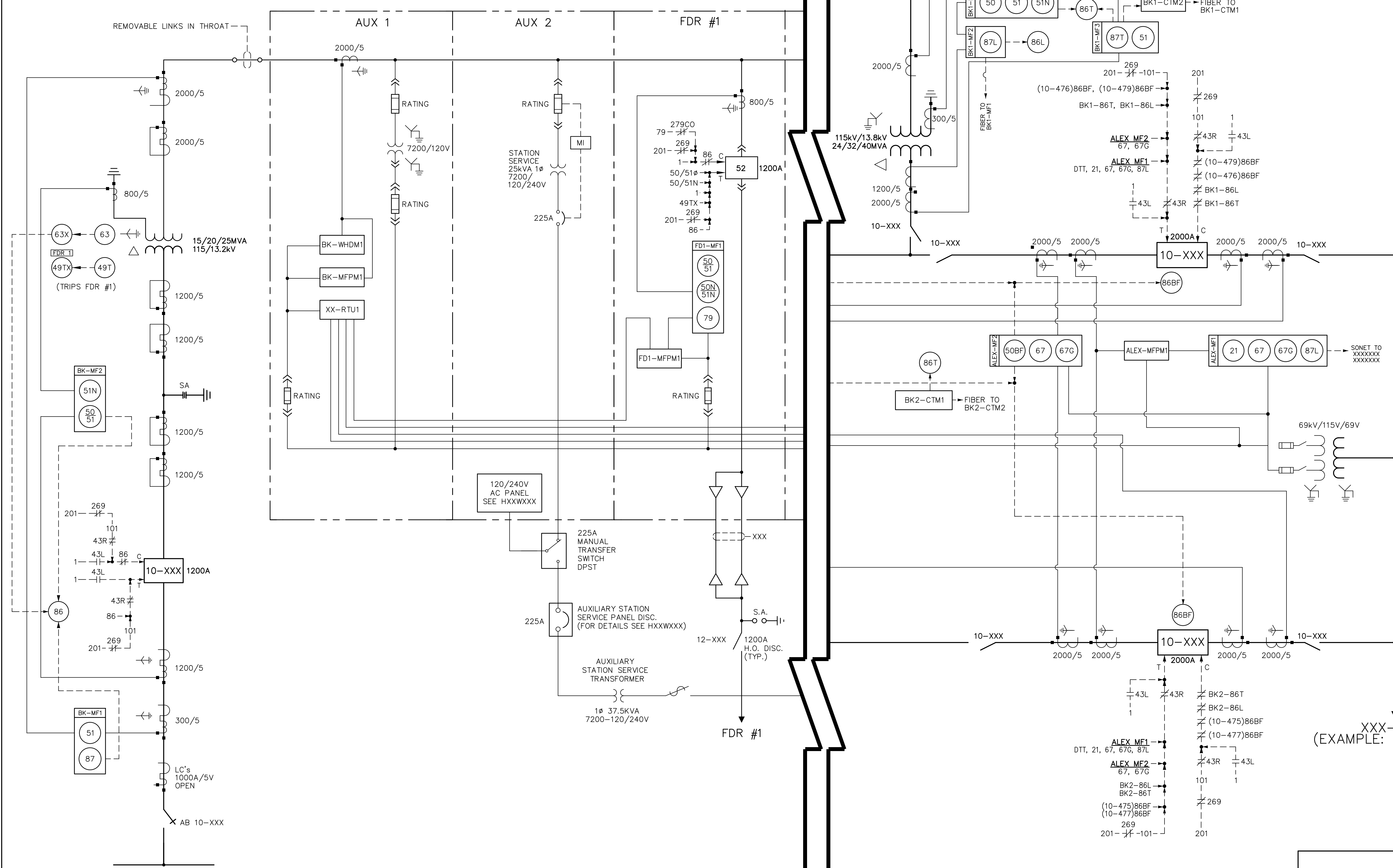
Content	Drawing Type					
	One-Line Diagram	Three-Wire Diagram	DC Schematic	Comm Block Diagram	Wiring Diagram	Reference Drawing
Relays	<p>For single-function relays, show IEEE designation within a circle.</p> <p>For two-function relays, show IEEE designations with a slash between them, all within a circle.</p> <p>✓ For multi-function relays capable of three or more functions, show a partitioned box. In one partition, show the abbreviated label. In the other partition, show all IEEE designations used by the relay, each within a circle. Use this representation even if only one or two functions are used.</p>	<p>In a box, show AC current and voltage inputs with device-specific label (e.g., IA, V1, IA87), terminal numbers &amp; polarity marks.</p> <p>While not desirable, it may be cleaner to represent one set of AC current or voltage inputs within a separate box than another set, even on the same drawing.</p> <p>✓</p> <p>Show the abbreviated label (for multi-function relays) or the IEEE designation above each box.</p>	<p>For single-function or two-function relays, show the IEEE designation next to the contact with terminal numbers. Include any seal-in circuits with terminal numbers.</p> <p>For multi-function relays capable of three or more functions, show DC output contacts and inputs with device-specific label (e.g., OUT101, IN203) and terminal numbers. Also, include a very brief description (e.g., TRIP, 79, 87L) of the purpose of the output contact or input and the abbreviated label.</p> <p>✓</p> <p>If two or more output contacts and/or inputs can be grouped in the same area of the drawing, show a dashed box around the output contacts and/or inputs. Include the abbreviated label (and location, if applicable) outside the box.</p> <p>Show power supply connection with terminal numbers</p>	<p>✓</p>	<p>✓ Include a backplane of the relay.</p>	<p>✗</p>
RTUs/ Integration Servers	<p>✓ Show only if an RTU collects AC analogs directly. Then, show a box with the abbreviated label.</p> <p>Show 201 for supervisory control (from an RTU) in trip/close circuits.</p>	<p>✓ Include only if RTU collects AC analogs directly. Then, show AC current and voltage inputs and terminal numbers, all within a box. Include the abbreviated label adjacent to the box.</p>	<p>Include power supply connection with terminals.</p> <p>✓ Show output contacts (controls) with device-specific label (e.g., 201C/C1C) and terminal numbers. If two or more output contacts can be grouped in the same area of the drawing, show a dashed box around the output contacts. Include abbreviated label outside the box.</p>	<p>✓ Include devices. Show Ethernet and serial connectivity.</p>	<p>✓ Include a backplane of the RTU/server.</p>	
Station Service Transformers	<p>✓ Show symbol, "STATION SERVICE", ratio, capacity, 1ph or 3 ph &amp; phase connection.</p>	<p>✓ Show symbol, "STATION SERVICE", ratio, capacity &amp; phase connection.</p>	<p>✗</p>	<p>✗</p>	<p>✗</p>	<p>✗</p>
Surge Arrestors	<p>✓ Show symbol with "S.A."</p>	<p>✓ Show symbol with "S.A." and rating.</p>	<p>✗</p>	<p>✗</p>	<p>✗</p>	<p>✗</p>
Switches	<p>✓ Show operations number &amp; symbol (different for MOD, gang-operated (GO) switch &amp; hook-operated (HO) switch).</p> <p>For distribution, include continuous current rating.</p>	<p>✓ Show symbol &amp; operations number. (MODs, GO switches, and HO switches are shown the same.)</p>	<p>✗</p>	<p>✗</p>	<p>✗</p>	<p>✗</p>
Terminal Blocks	<p>✗</p>	<p>✓ Include only where AC current or voltage circuits first land in a panel or where there is inter-panel wiring. Show terminal block label and terminal numbers</p>	<p>✗</p>	<p>✗</p>	<p>✓</p>	<p>✗</p>

Content	Drawing Type					
	One-Line Diagram	Three-Wire Diagram	DC Schematic	Comm Block Diagram	Wiring Diagram	Reference Drawing
Test Switches	X	<p>Show only AC current and voltage test switches.</p> <p>Show symbol(s) and terminals all within a box. Include the label adjacent to the box.</p> <p>While not desirable, it may be cleaner to represent one set of AC current or voltage test switches within a separate box than another set, even on the same drawing.</p>	<p>Include only DC test switches.</p> <p>Show symbol and terminals with label.</p>	X	✓	X
Voltage Transformers	✓ Show symbol, ratio(s) & wye/delta connection.	✓ Show symbol, ratio(s), power rating, winding connection(s), ground connection & phasing.	X	X	✓ Include on PT wiring diagram.	X

# DISTRIBUTION ONE-LINE

(EXAMPLE: COW-CAN1)  
XXX-XXX1

# TRANSMISSION ONE-LINE



**MFR REFERENCES:**

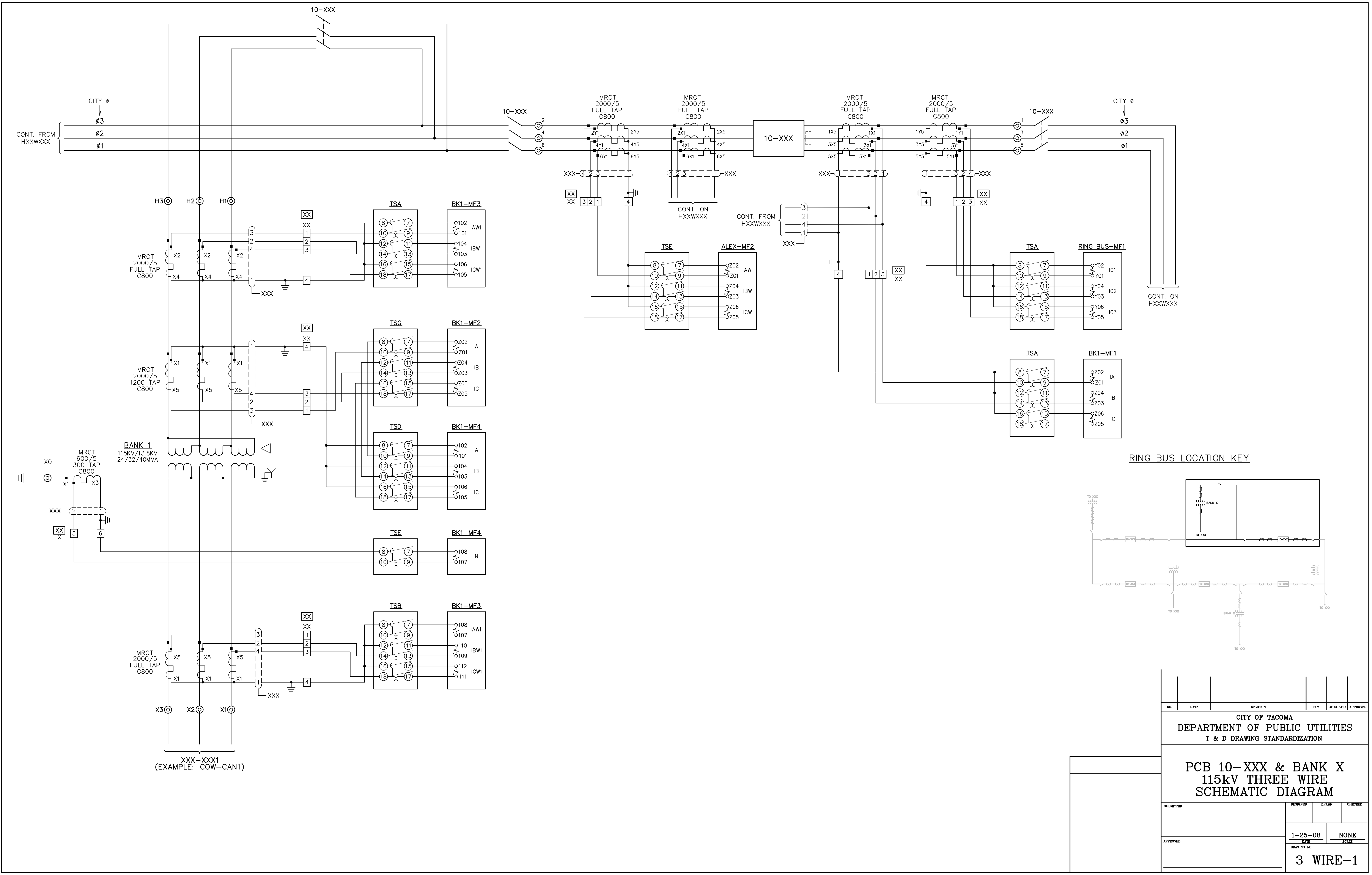
EQUIPMENT	CITY MFR#	CONTRACT #	MFR
XXXX	XX	XXXX	XXXXXX

**LEGEND:**

MI	MECHANICAL INTERLOCK
DDT	TRANSFER TRIP
21	DISTANCE RELAY
43	MANUAL TRANSFER SWITCH, L-LOCAL, R-REMOTE
49	TRANSFORMER TERMINAL RELAY, X-AUX
50BF	BREAKER FAILURE
50/51	OVERCURRENT RELAY, N-NEUTRAL
52	CIRCUIT BREAKER
52T2	PUSHBUTTON FOR TRIP 2 CIRCUIT
52Y	ANTI-PUMP RELAY
63	SUDDEN PRESSURE RELAY, RS-RESET, X-SEAL IN
67	DIRECTIONAL OVERCURRENT, G-GROUND
79	RECLOSEING RELAY
86	T-TRANSFORMER, L-LINE, BF-BREAKER FAILURE
87	CONTACTOR FOR 63GL
101	BREAKER CONTROL SWITCH, C-CLOSE, T-TRIP
	NAC-CLOSED IN "NORMAL AFTER CLOSE" POSITION
	NAT-CLOSED IN "NORMAL AFTER TRIP" POSITION
	SCADA CONTROL: C-CLOSE, T-TRIP
	SCADA CUTOFF SWITCH

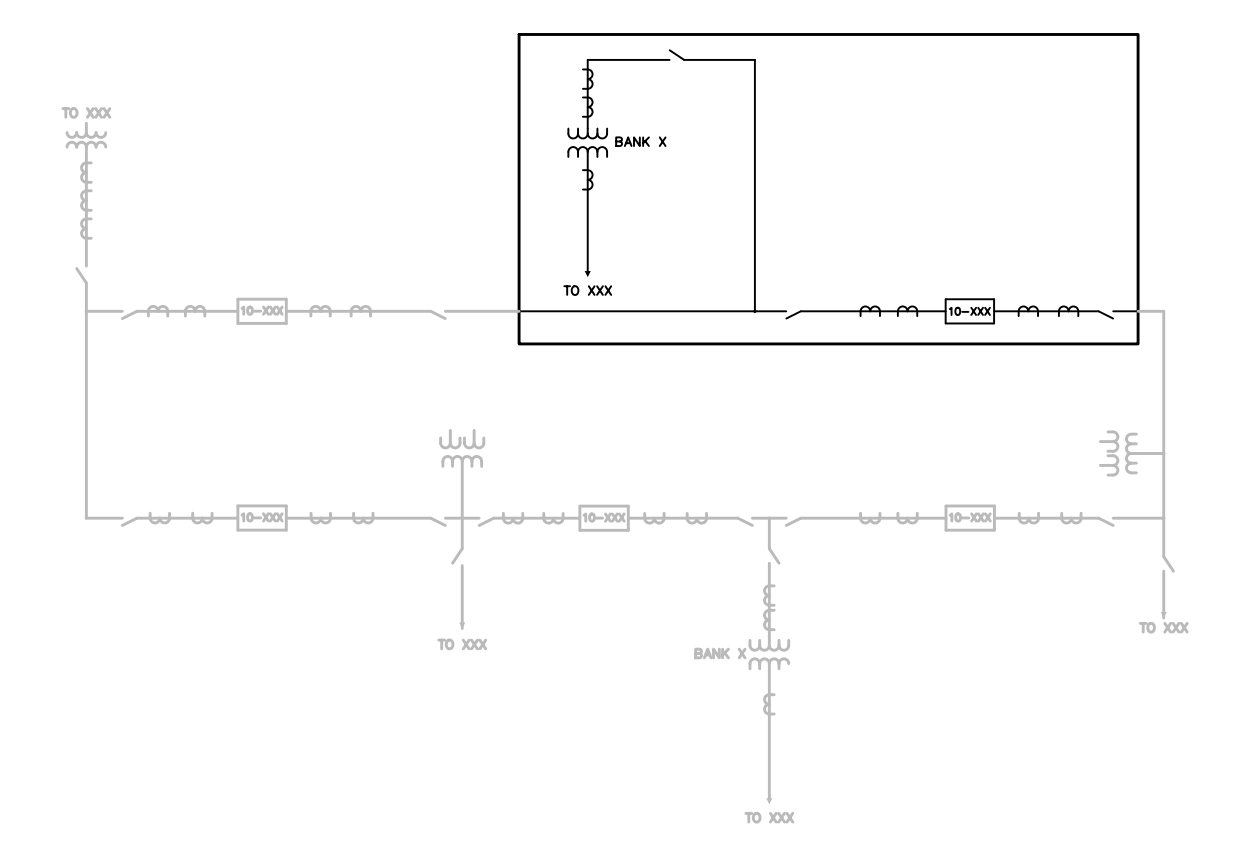
NO.	DATE	REVISION	BY	CHECKED	APPROVED
CITY OF TACOMA DEPARTMENT OF PUBLIC UTILITIES T & D DRAWING STANDARDIZATION					
<b>ONE-LINE DIAGRAMS</b>					
DESIGNED	DRAWN	CHECKED			
1-25-08		NONE			
DATE		SCALE			
<b>ONE LINE</b>					

DWG: ONE LINE

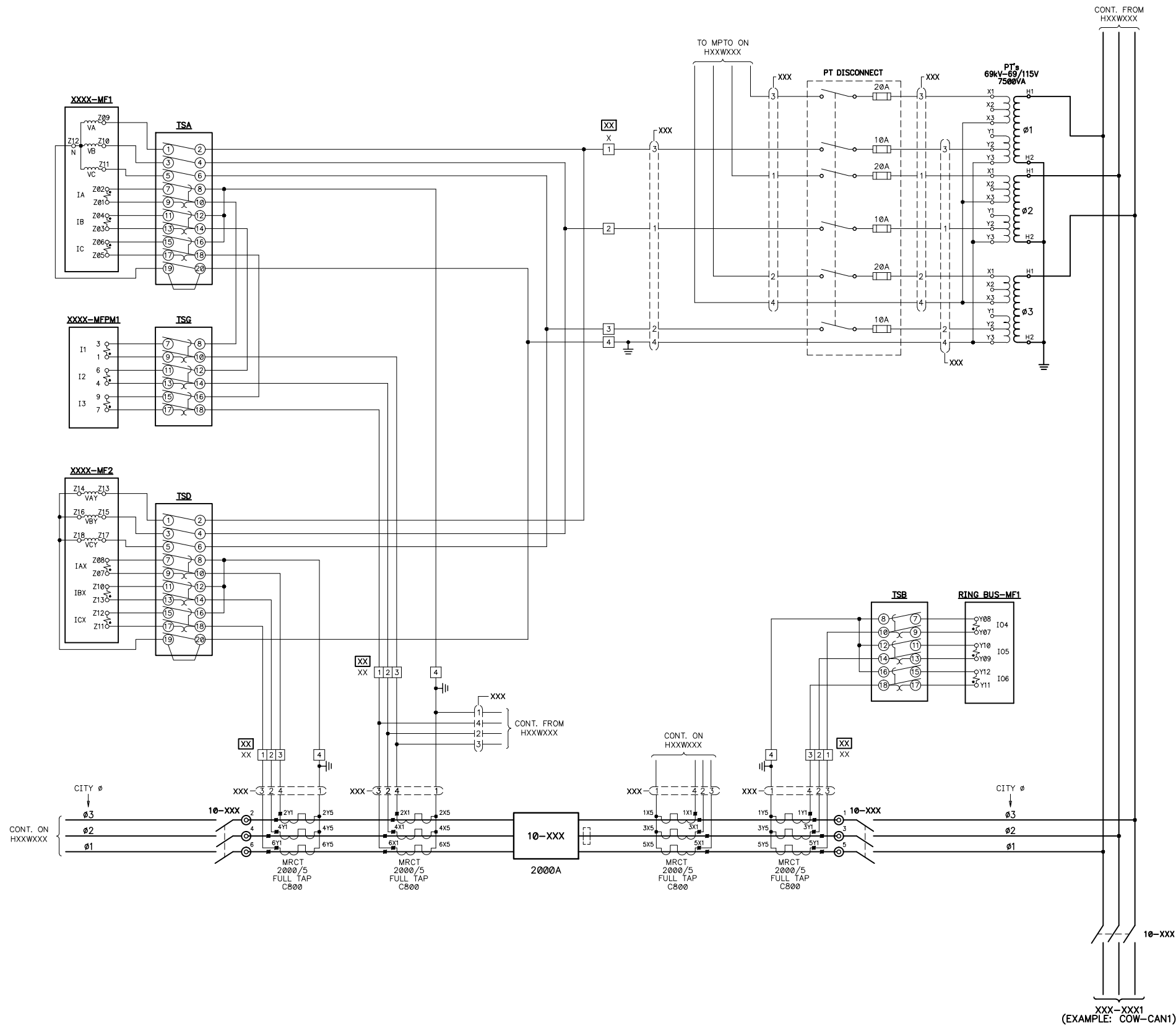


XXX-XXX1  
(EXAMPLE: COW-CAN1)

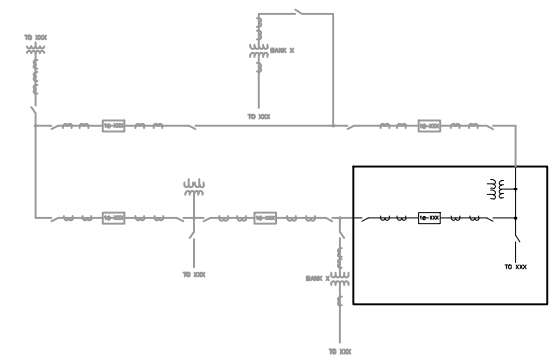
RING BUS LOCATION KEY



NO.	DATE	REVISION	BY	CHECKED	APPROVED
CITY OF TACOMA DEPARTMENT OF PUBLIC UTILITIES T & D DRAWING STANDARDIZATION					
<b>PCB 10-XXX &amp; BANK X 115kV THREE WIRE SCHEMATIC DIAGRAM</b>					
SUBMITTED		DESIGNED	DRAWN	CHECKED	
APPROVED		DATE	SCALE		
		1-25-08	NONE		
DRAWING NO. <b>3 WIRE-1</b>					



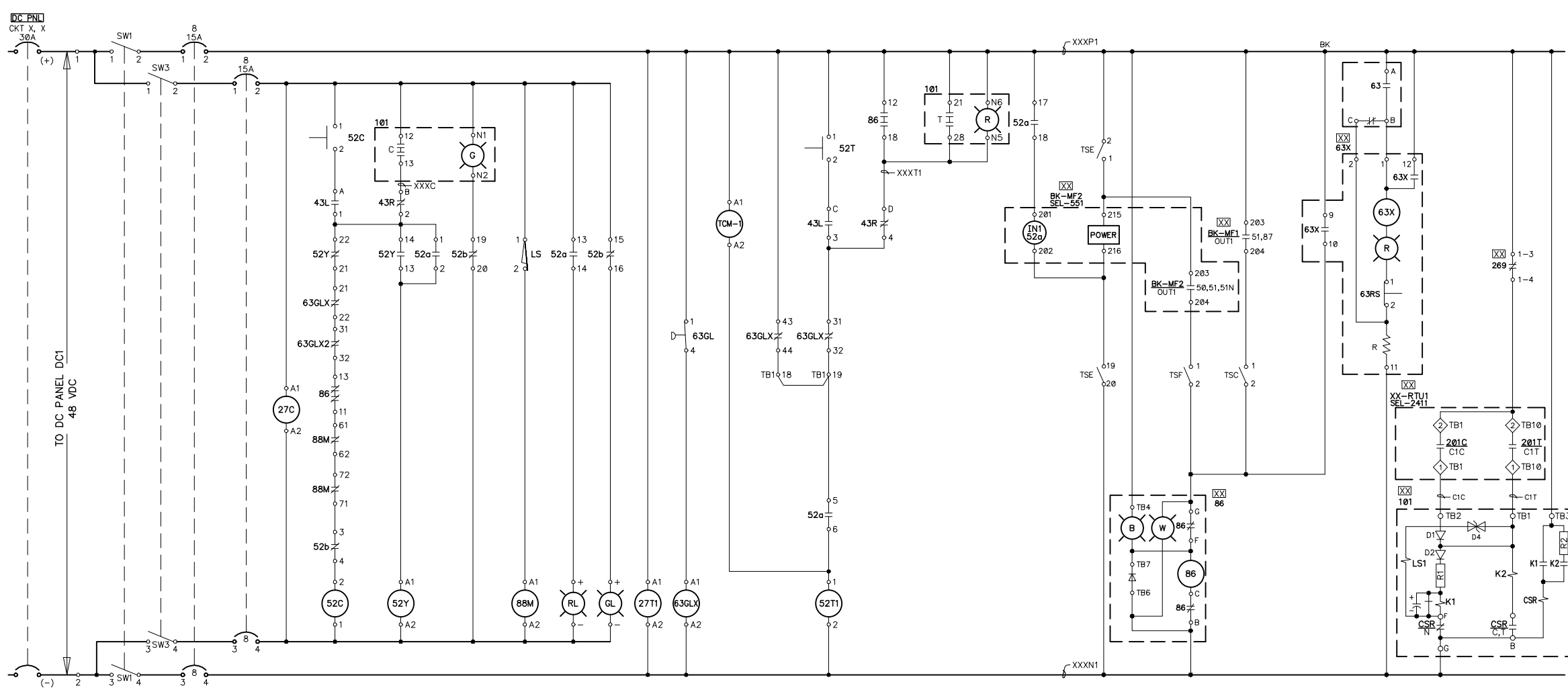
RING BUS LOCATION KEY



NO.	DATE	REVISION	BY	CHECKED	APPROVED
CITY OF TACOMA DEPARTMENT OF PUBLIC UTILITIES T & D DRAWING STANDARDIZATION					
PCB 10-XXX & XXXXX LINE 115kV THREE WIRE SCHEMATIC DIAGRAM					
DESIGNED		DRAWN		CHECKED	
APPROVED		DATE	1-25-08	NONE	SCALE
DRAWING NO. 3 WIRE-2					

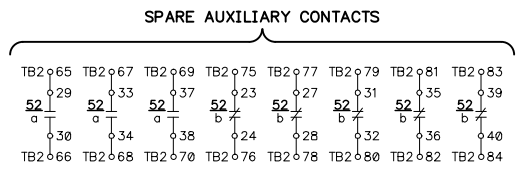
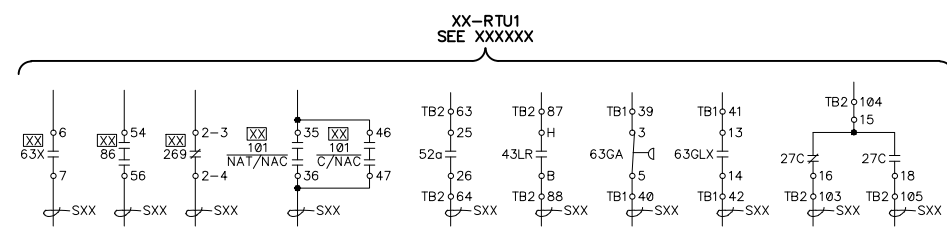
DWG: THREE WIREZ





- LEGEND:**
- 8 CONTROL POWER DISCONNECTING POINT
  - 27C DC CLOSE CIRCUIT AUXILIARY RELAY
  - 27T1 PRIMARY DC TRIP CIRCUIT AUXILIARY RELAY
  - 27T2 SECONDARY DC TRIP CIRCUIT AUXILIARY RELAY
  - 43 MANUAL TRANSFER SWITCH, L-LOCAL, R-REMOTE
  - 50/51 OVERCURRENT RELAY, N-NEUTRAL
  - 52a BEAKER AUXILIARY CONTACT - MAKE
  - 52b BEAKER AUXILIARY CONTACT - BREAK
  - 52C PUSHBUTTON FOR CLOSE CIRCUIT
  - 52T PUSHBUTTON FOR TRIP 1 CIRCUIT
  - 52T2 PUSHBUTTON FOR TRIP 2 CIRCUIT
  - 52Y ANTI-PUMP RELAY
  - 63 SUDDEN PRESSURE RELAY, RS-RESET, X-SEAL IN.
  - 63GA LOW GAS PRESSURE ALARM SWITCH (59 PSIG)
  - 63GL LOW GAS PRESSURE LOCKOUT SWITCH (52 PSIG)
  - 63GL2 LOW GAS PRESSURE LOCKOUT SWITCH-2
  - 63GLX CONTACTOR FOR 63GL
  - 63GLX2 CONTACTOR FOR 63GL2
  - 86 LOCKOUT RELAY
  - 87 DIFFERENTIAL RELAY
  - 88 MOTOR FOR CLOSING SPRING
  - 101 BREAKER CONTROL SWITCH, C -CLOSE, T -TRIP
  - NAC-CLOSED IN "NORMAL AFTER CLOSE" POSITION
  - NAT-CLOSED IN "NORMAL AFTER TRIP" POSITION
  - 201 SCADA CONTROL: C -CLOSE, T -TRIP
  - 269 SCADA CUTOFF SWITCH

**NOTES:**



**269**

DECK	CONTACTS	POSITION		ASSIGN.
		LOCAL	REMOTE	
1	10-1-02	X		CONTROL
2	30-1-04		X	STATUS

**101**  
CONTROL SWITCH

DECK	CONTACTS	POSITIONS				ASSIGNMENT
		TRIP	NAT	NAC	CLOSE	
1	12 O-I-013				X	CLOSE 10-XXX
1	16 O-I-017				X	TRIP 10-XXX
2	21 O-I-028	X				STATUS
2	24 O-I-025	X				STATUS
3	31 O-I-032	X				STATUS
3	35 O-I-036	X				STATUS
4	42 O-I-043	X				STATUS
4	46 O-I-047	X				STATUS
5	51 O-I-052	X				STATUS
5	55 O-I-056	X				STATUS

**86T**  
LOCKOUT RELAY

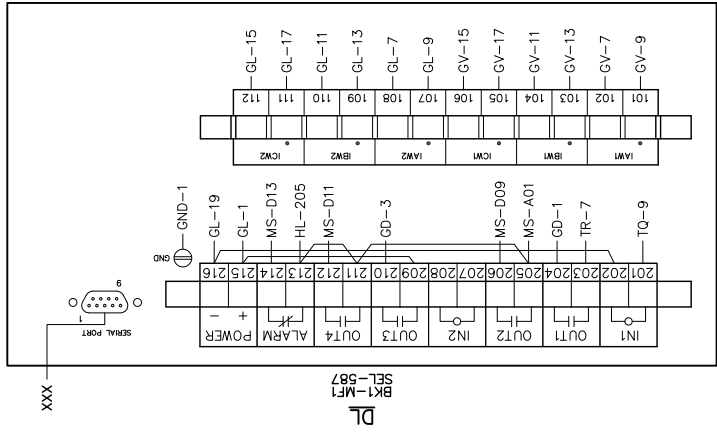
DECK	CONTACTS	POSITION		ASSIGNMENT
		TRIP	RESET	
1	11 +I-13	X		BLOCKS CLOSING OF 10-XXX
	12 +I-18	X		TRIPS 10-XXX
	15 +I-17	X		
	14 +I-16	X		
2	21 +I-23	X		TRIPS FEEDER #1
	22 +I-28	X		TRIPS FEEDER #1
	25 +I-27	X		BLOCKS CLOSING OF FEEDER #1
	24 +I-26	X		
3	31 +I-33	X		TRIPS FEEDER #2
	32 +I-38	X		TRIPS FEEDER #2
	35 +I-37	X		BLOCKS CLOSING OF FEEDER #2
	34 +I-36	X		
4	41 +I-43	X		TRIPS FEEDER #3
	42 +I-48	X		TRIPS FEEDER #3
	45 +I-47	X		BLOCKS CLOSING OF FEEDER #3
	44 +I-46	X		
5	51 +I-53	X		TRIPS FEEDER #4
	52 +I-58	X		TRIPS FEEDER #4
	55 +I-57	X		BLOCKS CLOSING OF FEEDER #4
	54 +I-56	X		
6	61 +I-63	X		
	62 +I-68	X		
	65 +I-67	X		
	64 +I-66	X		
7	71 +I-73	X		
	72 +I-78	X		
	75 +I-77	X		
	74 +I-76	X		
8	81 +I-83	X		
	82 +I-88	X		
	85 +I-87	X		STATUS
	84 +I-86	X		

ENGR. DATE REV. NO.

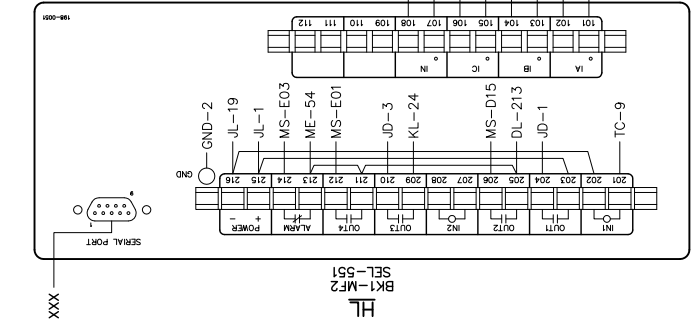
NO.	DATE	REVISION	BY	CHECKED	APPROVED
<b>CITY OF TACOMA</b> <b>DEPARTMENT OF PUBLIC UTILITIES</b> <b>T &amp; D DRAWING STANDARDIZATION</b>					
<b>SUBSTATION</b> <b>DC SCHEMATIC</b>					
DESIGNED	DRAWN	CHECKED	SRB		
APPROVED	DATE	SCALE	1-30-08	NONE	
<b>DC SCHEM</b>					

DWG FILED IN: A-DC SCHEM

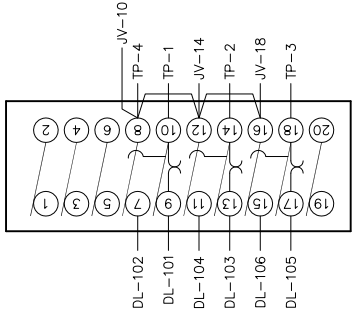
PANEL P1 (DOOR)



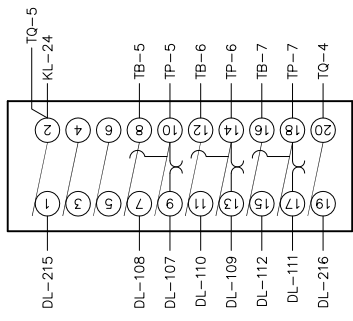
DL BK1-MF1 SEL-587



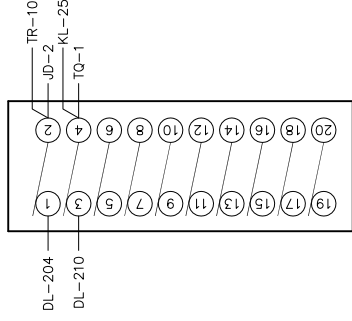
HL BK1-MF2 SEL-551



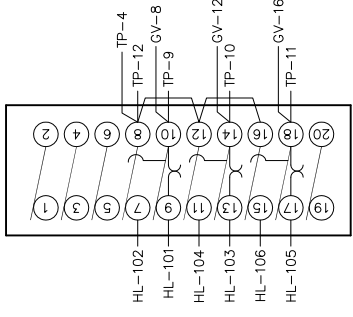
TGA



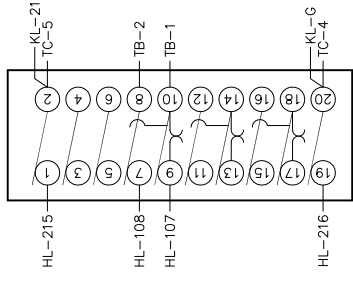
TGB



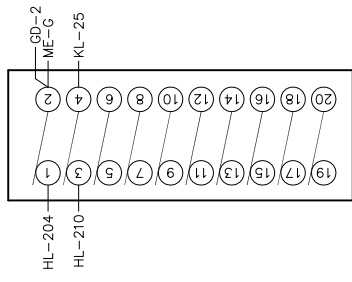
TGC



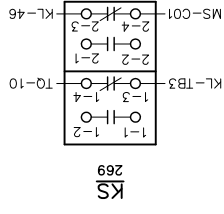
TSK



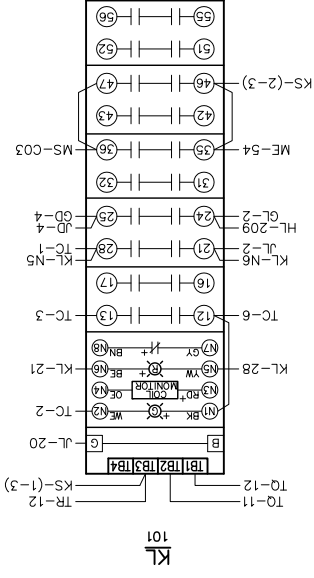
TSL



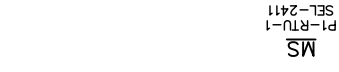
TSD



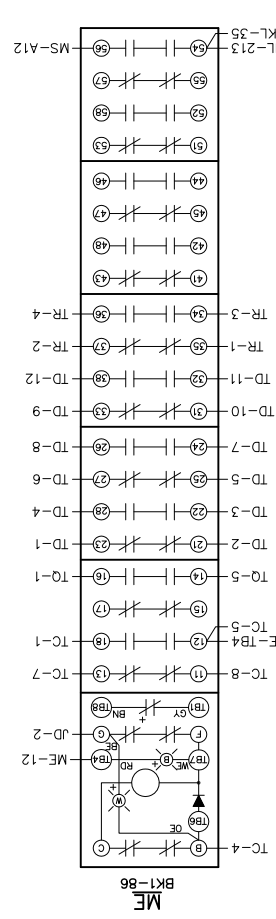
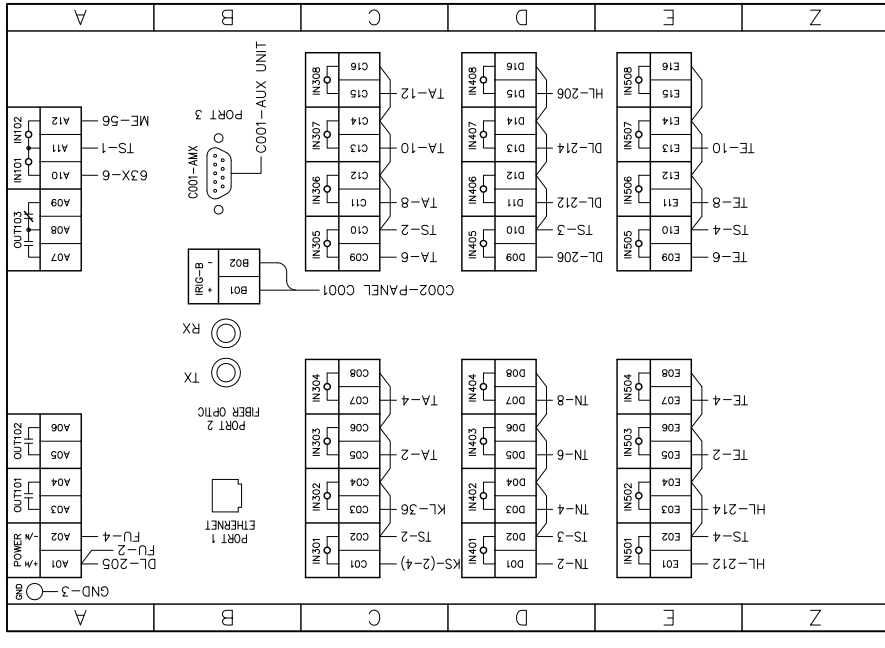
KS



KL 101



MS P1-RV-1 SEL-2411



ME BK1-86

CITY OF TACOMA  
DEPARTMENT OF PUBLIC UTILITIES  
T & D DRAWING STANDARDIZATION

DATE: \_\_\_\_\_ BY: \_\_\_\_\_ CHECKED: \_\_\_\_\_ APPROVED: \_\_\_\_\_

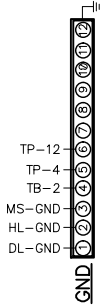
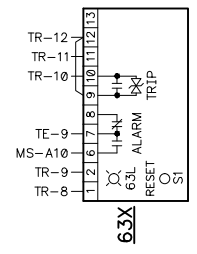
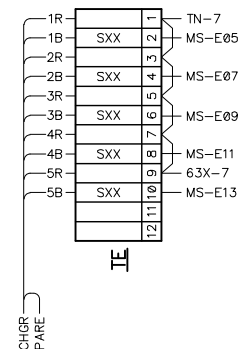
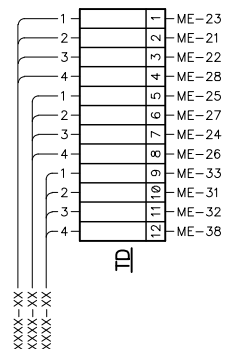
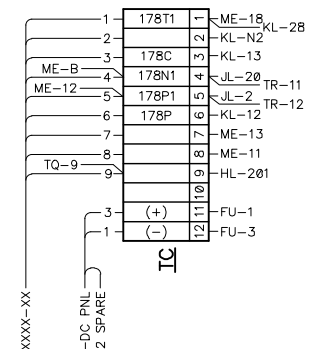
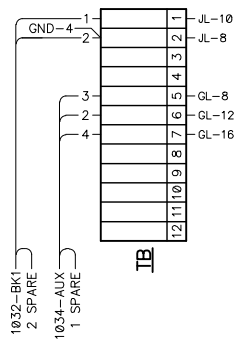
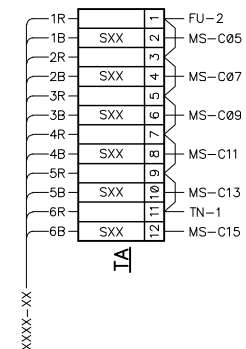
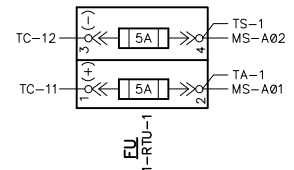
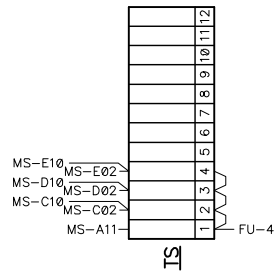
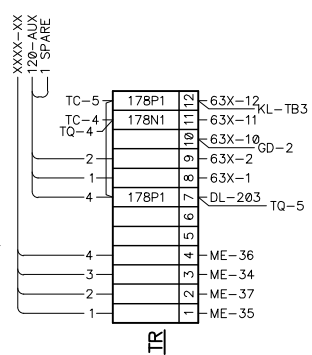
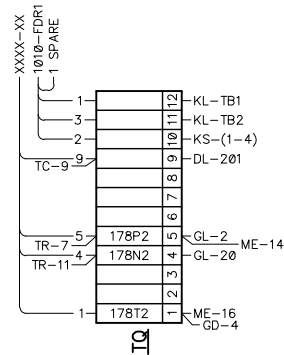
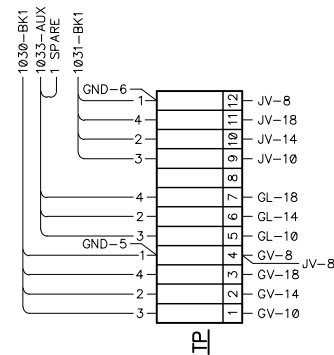
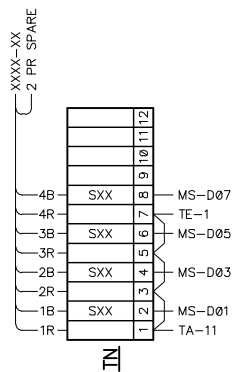
PROJECT: PANEL P1 DOOR (REAR VIEW) WIRING DIAGRAM

DATE: 2-5-08 SCALE: NONE

FIGURE NO: 1 OF 2

REV. NO. 0

# PANEL P1



NOTES:

DWG. FILED IN: WIRE DIAGRAM2

ENGR.	REV. NO. 0
DATE	

NO.	DATE	REVISION	BY	CHECKED	APPROVED
CITY OF TACOMA DEPARTMENT OF PUBLIC UTILITIES T & D DRAWING STANDARDIZATION					
<b>PANEL P1 CELL                  WIRING DIAGRAM</b>					
FORNITED	DESIGNED	DRAWN	CHECKED		
	SRB				
APPROVED	1-31-08	NONE			
	DATE	SCALE			
WIRING DIAG 2 OF 2					

## Purpose

This standard is to identify substation labels and the rules that apply to them. It is **limited to labels on control house equipment** as seen from the front of each panel. They fall into five categories:

- **Panels**
- **Switches**
- **Relays**
- **IEDs**
- **Other Equipment**

---

## General Guidelines

<b>General</b>	Label names will use the guidelines in this standard. They should: <ul style="list-style-type: none"> <li>• be brief and consistent</li> <li>• be operationally relevant</li> <li>• be intuitive - in plain language</li> <li>• have matching SCADA alarm text (alarm text abbreviated if necessary)</li> <li>• have characters large enough to be easily read (larger on certain controls)</li> <li>• have a single label at top if the panel/rack is dedicated to single purpose</li> <li>• have additional labels (as needed) if controls/relays are for more than one line/device on a panel/rack</li> </ul>
<b>Location</b>	Labels should always appear <b>above the device</b> , so tags will not block view. Refer to standard <b>A-SS-0020 “Relay &amp; Control Panels Layout, 110/230 kV Substations”</b> , Figure A, for examples of label locations.
<b>Label Characteristics</b>	Refer to standard <b>Drawing XX25</b> , “Typical Label Details” for ordering information, dimensions, and other physical details for labels.
<b>Phase Reference</b>	All phase information will be in the form of City Phase 1, Phase 2, and Phase 3. Manufacturer phasing can be kept on drawings for future reference and troubleshooting purposes, but City phase references should be included and clearly marked. “A, B, C” designation should be used for manufacturer references only.

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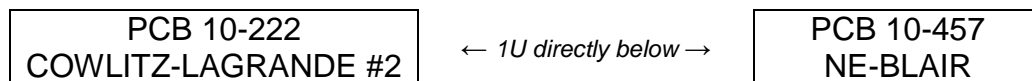
## Panel Labels

**Panel Labels** For panels placed within any substation, the Panel # should be placed on the angled front & back portion of each panel. The panel name is to be placed on the front on the 1U panel below the angled portion of the panel. The back of the panel will have the matrix wiring labeling. Refer to these examples:

**Panel Numbers** Distribution panels should be numbered Panel P1, Panel P2, Panel P3, etc. Replaced transmission panels will keep their original panel number. New transmission panels will be assigned on a station by station basis based on the slot number. 110kV panels will utilize the format AR1XX and 230kV panels will utilize the format AR2XX, where XX is the slot number and AR is defined by A = Control, R = Relay, B = Miscellaneous (example DFR panels), and C = Communications. Examples of this:



**Panel Names** Panel names are to be the primary equipment for which the panel contains the relaying and control. When this includes transmission line relaying and control, the format for the Panel name is to be BREAKER NUMBER followed by LINE NAME. Example of this:



### Line Names

All line names should be Source-Load based on the power flow from dispatch under normal or historical circumstances, for example Cowlitz – Southwest #1. In the case of a radial line, the line name shall be from the source terminal to the first substation, for example Southwest - Orchard. Exceptions to this rule are the three-terminal Potlatch and LaGrande lines which would have a complex three-terminal designation.

## Panel Labels (continued)

### Panel Names (continued)

#### Bus Names

Bus names will be developed on a station by station basis. The names will be developed in conjunction with the protection scheme so that in-station labels and prints will be as similar as possible to SCADA descriptions.

#### High Side Breaker Names

High side breaker numbers are assigned by Operations. The high side breaker names will always be of the format PCB XX-XXX where the XX-XXX number is assigned by Operations. No reference to VCB, OCB, ACB, etc. will be used. If there are space constraints for labels the PCB can be dropped and only the breaker number used if necessary.

#### Low Side Switchgear Names

For low side switchgear cubicles, the names, as shown below, are to be assigned from the factory and are to be used for all references. Cubicle number references are not to be used for any items (drawings, SCADA descriptions, labels, etc.). Examples:

<b>BANK #X PCB</b>
--------------------

<b>BUS TIE</b>
----------------

<b>FEEDER #X</b>
------------------

<b>AUX UNIT #X</b>
--------------------

*(drop "#x" if one aux)*

---

## Switches

**Handle Switches** Switches are to be labeled using a descriptive label and not the IEEE numbers.

**Test Switches** All test switches are to have a unique name. For test switches used for metering or relay purposes, an additional descriptive label is to be added for further clarity and safety purposes.

### Test Switch Names

Test switch labels will be unique to each panel, and restart on each panel, following the format TSX where X is an alphabetical designation.

### Test Switch Descriptions

Test switches for specific purposes have customized labels including extra descriptors and phasing indication as described below. Some of these specific types are current, potential, relay, MFPM and WHDM test switches. See label examples on Standards Labels Drawing, XX25.

Test switches used for **metering** shall use the individual potential and/or current descriptive label.

For the **potential** descriptive label, the bus potential magnitude and where the PT is located are to be included as the first line. For example, 13kV Bank #1 or simply 13kV if there is only one transformer at the station will be the first line of text. Because of the different type of test switch used for a QUAD4 meter, the potential label will include the neutral designation as well as the phasing.

For the descriptive label for **current**, the descriptive element of the label and the test switch name will be combined into the first line of text. Therefore the convention for the first line will be CT SOURCE TSX. Examples of this are FDR1 TSX, or 10-250 TSX, or Bank #1 TSX, etc.

Test switches used for **relaying** applications will be one of two formats.

1. Current and potential inputs that follow the labeling format described above for the metering test switches.
  2. For other items, only the test switch name label is to be used.
-

## Relays

### General Rules

For this type relay .....	Use this format
single function	Equipment/Line Relay Function (IEEE Designation number from drawing).
multi-function	Multi-function X Relay where X is a sequential number designation such as 1 or 2. (No IEEE Designation number)
remote relay	<p>The line name, bus name or Bank X should be included. For example:</p> <div style="border: 1px solid black; padding: 2px; margin-bottom: 2px;">LAGRANDE-COWLITZ #1 MULTI-FUNCTION 1 RELAY</div> <div style="border: 1px solid black; padding: 2px;">LAGRANDE-COWLITZ #2 MULTI-FUNCTION 2 RELAY</div>

### **Relay Designation & Manufacturer Name**

Because the relay designation (i.e. the Manufacturer's name) is already on the relay, it is not necessary to include it on the label (SEL 551 for example). Also, keeping the labels generic allows future relay changes without necessitating label changes.

### **Equipment Designation**

When all relays associated with a line or bank are located on the control panel, it is only necessary to have a single label at the top of the panel rather than include the line or bank designation on each label. However, if a relay is located on another panel remote from the control panel it should state the name of the equipment it protects.



## Relays (continued)

### Single Function Relays

Relay labels for single function relays will:

- Include a description of the relay's function and the line/equipment it serves.
- Include the IEEE standard designation number of its function.

For example:

BLAIR-LINCOLN LINE DIFFERENTIAL (87L)

110KV BUS DIFF (87B)

If single phase units are used, the label will include the phase 1, 2, or 3. For example:

BANK #2 PH 1 OVERCURRENT (50/51)

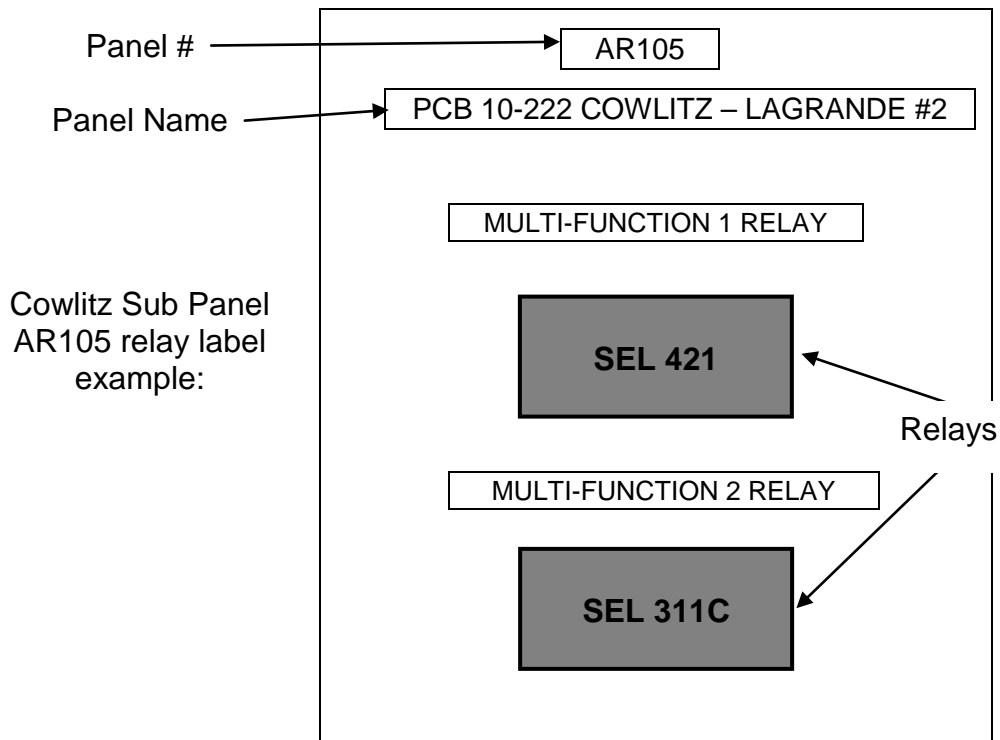
### Multi-Function Relays

Label should read "MULTI-FUNCTION X RELAY" If there is only one relay, X will be a 1 and will always be included. If there are two redundant relays then designate them as 'MULTI-FUNCTION 1 RELAY' and 'MULTI-FUNCTION 2 RELAY'. The label will have **no device number** because it more closely matches the actual relay function (i.e. multi) and the redundant protection scheme of both relays. It also relieves the concern that labels such as 'primary/back-up' may indicate more or less protection.

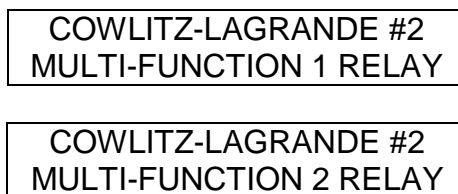
## Relays (continued)

### Example 1, On the Same Panel

The SEL 421 and SEL 311C relays at Cowlitz on the LaGrande #1 and #2 110kV lines are both multi-function relays providing dual, 100% protection for distance, directional and ground faults.



### Example 2, On Different Panel



## IED (Intelligent Electronic Device)

**General Rules** IED names are to follow the EQUIPMENT-DEVICEX convention. There are two exceptions because of historical purposes and the minimum number of future installations expected. D25 and D200 will not be considered IEDs and will continue to utilize D25-X or D200-X for their naming conventions. As new IEDs are added, there are to be no exceptions to the EQUIPMENT-DEVICEX established convention.

Device names are to be generic, non-manufacturer specific. Examples of previously developed device names are as follows:

Device	IED Device Name	Device Example
Distributed Architecture RTU	RTU	GE iBox
		SATEC ez-Pac
		SEL I/O device
Automatic Tap Changer Control	90	Qualitrol 90 device
		ABB 90 device
Transformer Electronic Temperature Monitor	ETM	Qualitrol ETM
Multi-function Power Meter	MFPM	SEL Multi-function Meter
		SATEC PM171/172E/172HA
Watt Hour Demand Meter	WHDM	Quad4

### Multiple Devices, Same Equipment

A 1 or 2 is added to the end of the device so the convention would be EQUIPMENT-DEVICEX.

For example:

BK1-MFPM1  
BK1-MFPM2

FDR1-RTU1  
FDR1-RTU2

note: If there is only one relay, X will be a 1 and will always be included.

---

## Other Equipment

### Battery Chargers

Battery charger labels will be “**XXX VDC Battery Charger**”. If this is readily apparent on the front of the battery charger, a separate custom label is not necessary. Some examples of custom labels are:

125VDC BATTERY  
CHARGER

48VDC BATTERY  
CHARGER

### AC & DC Panels

For substations with .....	Label examples are .....
Single panel	AC PANEL-X DC PANEL-X  note: If there is only one panel, X will be a 1 and will always be included.
Multiple panels	AC PANEL-1 (for main panel) AC PANEL-1A (for sub panels) AC PANEL-1B Etc  DC PANEL-1 DC PANEL-1A (sub panels) DC PANEL-1B Etc  DC PANEL-2 DC PANEL-2A Etc
For multiple DC voltages	125VDC PANEL 48VDC PANEL
For multiple DC voltages with sub panels	125VDC PANEL-1 125VDC PANEL-1A Etc  48VDC PANEL-1 48VDC PANEL-1A 48VDC PANEL-2 48VDC PANEL-2A Etc

---

## Transmission & Distribution Labels

note: XX25 Label # refers to standards Drawing XX25, "Standards, Typical Label Details"

Equipment Description	IEEE #	Transmission & Distribution Description	Label Examples	XX25, Label #	Comment
<b>Panel Labels</b>					
Panel Number	N/A	Panel #	PANEL P1 PANEL AR105	#1-1	<i>Distribution Panels = PX; Transmission Panels=ARXXX</i>
High Side Breaker Panel Name	52	PCB XX-XXX	PCB 10-457 NE-BLAIR  PCB 10-222 COWLITZ- LAGRANDE #2	#1-2	<i>No reference to VCB, OCB, ACB, etc. Short descriptions will drop the PCB and only use the breaker number.</i>
Low Side Switchgear Panel Name	52	Feeder #X Bank #X PCB	BANK#1 PCB  BUS TIE  FEEDER #1	#1-2	<i>The control switch relays will reflect this description.</i>
<b>Switch Labels</b>					
Instantaneous Trip Cutoff Switch	250CO	Inst Trip	INSTANTANEOUS ENABLE	#2-1	<i>The 250CO switch is used on underground feeders.</i>
SPARE				#2-2	
Instantaneous Bypass Timer Switch	69TD	Inst Bypass Timer	See Drawing XX25	#2-3	<i>This switch is not used on feeders with microprocessor relays.</i>
Relay Setting Selector Switch	243S	Relay Setting Switch	See Drawing XX25	#2-4 & #2-5	<i>For distribution feeder label #2-5 will be used and for transmission lines label #2-4 will be used.</i>
Supervisory Switch	269	Spvy Switch	SCADA	#2-6	<i>Always the same.</i>
Recloser Cutoff Switch	279CO	Recloser	RECLOSER	#2-7	<i>None</i>
Control Switch	101	Ctrl Switch	10-456  FEEDER #1  BANK #1 PCB	#2-8	<i>The label for control switches should be the name of the device it controls.</i>

## Transmission & Distribution Labels

note: XX25 Label # refers to standards Drawing XX25, "Standards, Typical Label Details"

Equipment Description	IEEE #	Transmission & Distribution Description	Label Examples	XX25, Label #	Comment
Lockout Relay	86	Lockout Relay	See Drawing XX25	#2-9 & #2-10	Shall reflect the protective zones, not I.E.E.E. references.
Metering Test Switches	N/A	Metering Test Switches	See Drawing XX25	#2-11 & #2-12	<i>Test switches for metering shall use the individual potential and/or current descriptive label.</i>
WHDM Test Switch	N/A	WHDM Test Switch	See Drawing XX25	#2-13	None
Test Switch	N/A	TSX	TSA TSB	#2-14	<i>"X" is alphabetical designation, unique to each panel, restart on each panel</i>
<b>Relay Labels</b>					
Single Function Relay	N/A	Single Function Relay	BLAIR-LINCOLN LINE DIFFERENTIAL (87L)  110KV BUS DIFFERENTIAL (87B)	#3-1	<i>Equipment/Line Relay Function (IEEE Designation from Drawing)</i>
Multi-Function Relay (device on same panel)	N/A	Multi-Function Relay	MULTI-FUNCTION 1 RELAY	#3-2	<i>Instances with a single multi-function relay will keep the number 1 designation; multiple relays will be incrementally numbered.</i>
Multi-Function Relay (device on remote panel)	N/A	Multi-Function Relay	LAGRANDE- COWLITZ #2 MULTI- FUNCTION 2 RELAY	#3-3	<i>Line name, Bus name or Bank # will be included on the label for remote relays. Instances with a single multi-function relay will keep the number 1 designation.</i>
<b>IED Labels</b>					
MFPM	N/A	MFPM	FDR5 MFPM1	#4-1	<i>For low side switchgear and bank MFPM's</i>

## Transmission & Distribution Labels

note: XX25 Label # refers to standards Drawing XX25, "Standards, Typical Label Details"

Equipment Description	IEEE #	Transmission & Distribution Description	Label Examples	XX25, Label #	Comment
MFPM	N/A	MFPM	10-457 MFPM1	#4-2	<i>For high side breaker MFPM's</i>
RTU	N/A	RTU	BK1 PCB RTU1	#4-3	<i>For low side switchgear and bank RTU's</i>
RTU	N/A	RTU	10-457 RTU2	#4-4	<i>For high side breaker RTU's</i>
D25	N/A	D25	D25-1	#4-5	<i>For all D25's – even a single D25 station will use the designation 1.</i>
Automatic Tap Changer Control	90	LTC	BK1 LTC1	#4-6	None
Transformer Electronic Temperature Monitor	N/A	ETM	BK1 ETM	#4-7	None
Integration Server	N/A	IS	See drawing XX25	#4-8	Equipment = Substation Name

## References

- Drawing XX25, "Standards, Typical Label Details"
- A-SS-0020 "Relay & Control Panels Layout, 110/230 kV Substations"
- A-SS-0030 "Abbreviations"

## Application

To identify abbreviations used for substation equipment, switches, relays, devices, and controls. **For the sake of clarity, abbreviations should only be used when dealing with space constraints.**

## Abbreviations

Full Text	Abbreviation	Source
Abnormal	ABNL	ASME
Accumulator	ACC or ACCUM	ASME / TPWR
Air Break Switch	AB	TPWR
Air Circuit Breaker	ACB	ASME
Alarm	ALM	ASME
Amps	A	TPWR
Analog	ANLG	ASME
Analog Input	AI	TPWR
Annunciator	ANN or ANNC	TPWR
Auxiliary	AUX	TPWR
BackUp	BU	TPWR
Bank	BK	TPWR
Battery	BATT	TPWR
Bearing	BRG	ASME
Blocked	BLKD	TPWR
Breaker	BKR	TPWR
Breaker Failure	BF	TPWR
Building	BLDG	TPWR
Butterfly Valve	BFV	TPWR
Bypass	BYP or BY(extreme)	TPWR
Bypass Valve	BPV	TPWR
Capacitor	CAP	TPWR
Channel	CH	TPWR
Charge	CHRG	TPWR
Charger	CHGR	TPWR
Circuit	CKT	ASME
Close	CLS	TPWR
Communication	COMM	TPWR
Compressor	CMPRS	TPWR
Condition	COND	TPWR
Configuration	CONFIG	TPWR
Control	CTRL	TPWR
Control Switch Relay	CSR	TPWR
Cooling	COOL	TPWR
Cooling Stage	COOL STG	TPWR

Full Text	Abbreviation	Source
Cooling Water	CW	TPWR
Cooling Water Valve	CWV	TPWR
Corrupt	COR	TPWR
Coupler	CPLR	TPWR
Cubic Feet per Second	CFS	TPWR
Current	CURR	TPWR
Current Transformer	CT	TPWR
Cylinder	CYL	TPWR
De-energized Tapchanger	DETC	TPWR
Demand	DMND	TPWR
Device	DVC	TPWR
Differential	DIFF	TPWR
Digital Fault Recorder	DFR	TPWR
Digital Input	DI	TPWR
Disable(d)	DSBL(D)	TPWR
Disconnect	DISC	ASME
Distance	DIST	TPWR
Elevation	ELEV	TPWR
Emergency	EMER	TPWR
Enable	ENBL	TPWR
Enabled	ENBLD	TPWR
Equipment	EQUIP	TPWR
Event	EVT	TPWR
Existing	(E)	TPWR
Export	EXPT	TPWR
External Wetting	EW	TPWR
Failure	FAIL	TPWR
Fault	FLT	TPWR
Feeder	FDR	ASME
Fuse	FU	TPWR
Future	(F)	TPWR
Generator	GEN	TPWR
Ground	GND	TPWR
Hard wired	HW	TPWR
Hardware	HARDWR	TPWR
Hazardous	HAZ	ASME



Full Text	Abbreviation	Source
High Side	HS	TPWR
Hot Line	HTLN	TPWR
Hour	HR	TPWR
Import	IMP	TPWR
Indicator	IND	TPWR
Input	INPT	TPWR
Integration Server	IS	TPWR
Intelligent Electronic Device	IED	TPWR
Invalid	INVLD	TPWR
Latching Switch Relay	LSR	TPWR
Level	LVL	TPWR
Linear Coupler	LC	TPWR
Load Tap Changer	LTC	TPWR
Local/Remote	LOC/REM	TPWR
Lockout	L/O	TPWR
Low Side	LS	TPWR
Machine	MACH	TPWR
Main	MN	TPWR
Malfunction	MALF	TPWR
Manual	MAN	TPWR
Meter	MTR	TPWR
Microwave	MWAV	TPWR
Minute	MIN	TPWR
Month	MO	TPWR
Motor Operated Disconnect	MOD	TPWR
Multifunction	MF	TPWR
Multifunction Power Meter	MFPM	TPWR
Negative	NEG	TPWR
Oscillograph	OSC	TPWR
Override	OVR	TPWR
Panel	PNL	TPWR
Phase	PH	TPWR
Phase	PH	TPWR
Pilot Wire	PW	TPWR
Plant Control System	PCS	TPWR
Positive	POS	TPWR
Potential	POT	TPWR
Power	PWR	TPWR
Power Circuit Breaker (also, Oil or Vacuum Circuit Breaker)	PCB	TPWR
Power Factor	PF	TPWR

Full Text	Abbreviation	Source
Power Supply	PS	TPWR
Pressure	PRESS	TPWR
Primary	PRI	TPWR
Progress	PGRS	TPWR
Propagation	PROP	TPWR
Reactive	RECT	TPWR
Received	RCVD	TPWR
Recloser	RECL	TPWR
Redundant	REDNT	TPWR
Reference	REF	TPWR
Regulator	REG	TPWR
Relay	RLY	TPWR
Relay Transfer Switch	RTS	TPWR
Remote	REM	TPWR
Remote I/O	REM I/O	TPWR
Remote Terminal Unit	RTU	TPWR
Request	REQ	TPWR
Response(s)	RESP	TPWR
Restart	RESTRT	TPWR
Schedule(d)	SCHED	TPWR
Second	SCND	TPWR
Secondary	SEC	TPWR
Sectionalizing	SECTION	TPWR
Sequence	SEQ	TPWR
Service	SVC	TPWR
Short & Ground	S&G	TPWR
Solicited	SOLCTD	TPWR
Spare	SP	TPWR
Spillgate	SPLGT	TPWR
Spillway	SPLWY	TPWR
Spring	SPRG	TPWR
Stage	STG	TPWR
State	ST	TPWR
Station	STA	TPWR
Station Service	SS	TPWR
Status	STAT	TPWR
Substation	SUB	TPWR
Successive	SUCC	TPWR
Supervisory	SPVY	TPWR
Surge Arrester	SA	TPWR
Switch	SW	TPWR
Switchgear	SWGR	TPWR
Switchyard	SWYD	TPWR
Synchronizing or Synchronization	SYNC	TPWR

Full Text	Abbreviation	Source
System	SYS	TPWR
Tacoma Power	TPWR	TPWR
Tacoma Public Utilities	TPU	TPWR
Tag/UnTag	TAG/UNT	TPWR
Target	TGT	TPWR
Telemetry	TELEM	TPWR
Temperature	TEMP	TPWR
Test Switch	TS	TPWR
Thousand Circular Mil	kcmil	IEEE
Transaction	XACT	TPWR
Transducer	XDCR	TPWR
Transfer	XFER	TPWR
Transfer Trip	TT	TPWR
Transformer	XFMR	TPWR
Transmission & Distribution	T&D	TPWR

Full Text	Abbreviation	Source
Trip	TRP	TPWR
Trip coil monitor	TCM	TPWR
Trouble	TRBL	TPWR
Turbine	TURB	ASME
Unbalance	UNBAL	TPWR
Underfrequency	UF	TPWR
Undervoltage	UV	TPWR
Unit	UNIT	TPWR
Unsolicited	UNSOLCTD	TPWR
Value	VAL	TPWR
Voltage Device	VD	TPWR
Voltage Phase Angle	VPA	TPWR
Watt-Hour Demand Meter	WHDM	TPWR
Winding	WIND	TPWR
Year	YR	TPWR

## Transmission & Distribution Substations

Station Name	Abbreviation	Old Abbreviation
Alexander	ALE	ALX
Atlas	ATL	---
Blair	BLA	BLR
Bridgeport	BRI	BRD
Browns Point	BRP	BRN
Canyon	CAN	CAN
Cedar	CED	CDR
Clement	CLE	CLM
Clover Park	CLP	CLV
Collins	COL	CLL
Commencement Bay	COB	CMM
Cowlitz	COW	COW
Crandall	CRA	CRN
Crescent	CRE	CRS
Croft	CRO	CRF
Cushman Powerhouse 1	CP1	---
Cushman Powerhouse 2	CP2	---
Cushman Sub	CSH	CUSH
Custer	CUS	CST
Defiance	DEF	DFN

Station Name	Abbreviation	Old Abbreviation
East F	EAF	EAF
Elk Plain	ELP	ELK
Far West	FAW	FRW
Fife	FIF	FIFE
Flett	FLE	FLT
Fort Lewis Central	FLC	FLC
Fort Lewis South	FLS	FLS
Frederickson	FRE	FRD
Ginkgo	GIN	---
Gove	GOV	GV
Graham	GRA	GRH
Hawthorne	HAW	HWT
Highland	HIG	HGH
Hilltop	HIL	HLL
Huson	HUS	HSN
Hylebos	HYL	HLB
Knoble	KNO	KNB
Lacamas	LAC	LCM
LaGrande	LAG	---
Lidford	LID	LDF
Lincoln	LIN	LNC
Madigan	MAD	---

Station Name	Abbreviation	Old Abbreviation
Mayfield	MAY	---
McChord	MCC	MCRD
McNeil	MCN	MCN
Menlo	MEN	MNL
Milwaukee	MIL	MIL
Mobile 1	MO1	MOB1
Mobile 2	MO2	MOB2
Mobile 3	MO3	MOB3
Mobile 4	MO4	MOBX
Mossyrock	MOS	---
Mountain	MOU	---
Nisqually	NIS	NSQ
North Fork	NOF	---
Northeast	NE	NE
Old Town	OLT	OLT
Olympic Pipeline	OLP	---
Orchard	ORC	ORC
Pearl	PEA	PRL
Pioneer	PIO	PNR

Station Name	Abbreviation	Old Abbreviation
Plaza	PLA	PLZ
Polk	POL	PLK
Portland	POR	PRT
Potlatch	POT	---
Praxair	PRA	PRX
Roosevelt	ROO	RSV
Schnitzer	SCH	SCH
Sequalitchew	SEQ	SEQ
Simpson	SIM	SMP
Southwest	SW	SW
St. Paul	STP	STP
Stadium	STA	STD
Sto-Beh-Lah	STO	STB
Sunset	SUN	SNS
Tideflats	TID	TF
Union	UNI	UNN
University	UNV	UNV
Wapato	WAP	WPT
Westgate	WES	WST

## BPA & PSE Interchanges

Station Name	Abbreviation	Old Abbreviation
Artondale	ART	---
Brookdale	BRO	---
Chehalis	CHE	---
Covington	COV	---
Curtis	CUR	---
Elbe	ELB	---
Gig Harbor	GIH	---
Grazzini	GRZ	---
Haakenson	HAA	---
Holmes	HOL	---
Lake Grove	LKG	---
Lakebay	LAK	---
Lodholm	LOD	---
Lynch Creek	LYC	---
Mashel Prairie	MAP	---

Station Name	Abbreviation	Old Abbreviation
Mccullough	MCU	---
Miller	MLL	---
Minter	MIN	---
Narrows	NAR	---
Ohop	OHO	---
Peninsula Light Co.	PLC	PNLT
Purdy	PUR	---
South Tacoma	SOT	BPA S TAC
Starwood	STR	---
Steilacoom	STE	STIL
Surprise Lake	SUL	---
Tacoma	TAC	---
Tyee	TYE	---
Vaughn	VAU	VGHN

## References

- American Society Mechanical Engineer (ASME)
  - Institute of Electrical and Electronics Engineers (IEEE) & American National Standards Institute (ANSI)
    - Std 260.1-2004 or latest, Standard Letter Symbols for Units of Measurement
    - Std 260.4-1996 or latest, Letter Symbols and Abbreviations for Quantities
    - Std C37.2-1996 or latest, Electrical Power System Device Function Numbers and Contact Designations
-

## Scope

This standard provides generalized guidelines for the wiring of relay and control racks in substations. Although the focus is on panels with microprocessor based, multi-function relays, the principles should be applied in any panel that requires new wiring or rearrangement of existing wiring.

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## Viewing Convention

Throughout this standard, any description and/or representation of Control and Relay rack components will be **REAR** views only.

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## Older Substations

### Upgrades and replacements

Many *relay* and *control* functions were installed on separate panels, primarily due to the size of the protective relays. With the advent of the microprocessor based relays, multiple relays for one application are being eliminated and protection and control are being moved into a common panel. In some cases, microprocessor based relays are being blended in with existing controls and legacy equipment.

Due to the potential density of these panels, along with the size of the relay enclosures, it is important to standardize on how wiring is terminated on the back of the panel to promote consistency and safety.

In some cases, a complete set of new panels/terminal blocks will be installed which would easily accommodate the principles outlined here. On smaller projects, acknowledging the intent and doing whatever is reasonable for the situation is the best that can be hoped for. Consistency is the ultimate goal.

---

## New Substations

### New Panel Wiring

In new substations, the expectations will be that the principles outlined here should be followed and the layouts will be consistent from station to station. The wiring layout will be complementary to the panel layout described in standard A-SS-0020, "Relay & Control Panels Layout, Transmission Substations".

In general, field wiring will be terminated on blocks close to where the connections will be made to equipment. Power supplies, CT, PT and status and control circuits will land in the same areas.

## Helpful Wiring Practices

- Whenever possible, wiring should be of the shortest and most direct point to point path possible.
- Avoid having no more than two wires connected to any single point. Crews can use their judgment if it would be easier and possible to land more than two.
- Due to space constraints and wiring difficulties, only one wire should be landed on the terminals of the Square D switches (used for 43LR, 269, 69TD, etc.), 279CO, and all points on the Agastat timing relays.

## Panel Wiring

### CT Wiring

CT wiring is preferred on the left side of each panel, and terminates on the left-most test switch. This is typical for all CT wiring applications.

### Grounding

Panels shall be fitted with a copper ground bus behind each rack at the lowest point possible. The ground bus of each panel shall be connected to both adjacent ground busses. All panel-mounted device grounds shall be wired directly to the ground bus. The interconnected ground busses shall be connected to the station ground grid at two points for safety. The two ground grid connections shall be connected on a row of relay racks at the end.

Exception for Communication Racks – The interconnected ground busses shall be connected to the station ground grid at one point, (roughly midway if possible), so as not to create ground loops.

## Panel Wiring (continued)

### Instrument Transformer Circuits

The point of grounding in the instrument transformer secondary circuit should be located electrically at one end of the secondary winding of each instrument transformer. The point of grounding should be located physically at the first point of application, which is defined to be the first point where the exporting cable lands from the instrument transformer, except (as in the case of some potential transformer secondary circuits) when the grounded conductor of the exporting cable is connected to that of any other exporting cables; in the latter case, the point of grounding should be located physically as close as possible to where the grounded conductor of the exporting cables are connected.

In general, the non-polarity side of the instrument transformer should be grounded and the polarity side should enter the test switch.

In situations when the instrument transformer polarity is reversed due to physical orientation of the instrument transformer and power flow direction is important to the application (i.e. metering circuits, differential relay circuits), every attempt to perform option #1 below should be made. When option #1 is not possible, either due to outage constraints or physical limitations, option #2 should be used to correct the power flow direction.

Option #1 - When at all possible, every reasonable attempt should be made to re-wire the outputs at the instrument transformer. The polarity side of the instrument transformer would then be the grounded side and the non-polarity side would enter the test switch. No other rolling of the circuit into individual devices would be required.

Option #2 - If it is not possible to re-wire the outputs at the instrument transformer, roll the inputs between the test switch and the device to correct the power flow direction. Ensure the drawings appropriately reflect the wiring.

If option #2 is chosen because an outage cannot be obtained to re-wire the instrument transformer (not because it is physically impossible to complete the re-wire), place the item on the System Assessment List (T&D Engineering SharePoint site) so that it can be corrected at a later date when an outage is possible.

## Panel Wiring (continued)

### AC Test Switch Wiring

This section refers to test switches used for rack-mounted meters and relays. For these applications, the current circuit will enter the test switch on the jaw side and star on the blade side. For test switches used in external WHDM metering cabinets, refer to Tacoma Power Construction Standard A-MR-1019. Refer to standard A-SS-0025 for naming conventions and nameplates required for test switches.

Test switch wiring for current and potential circuits for all rack-mounted devices will be the same regardless of application (relaying, metering, DFR, etc.)

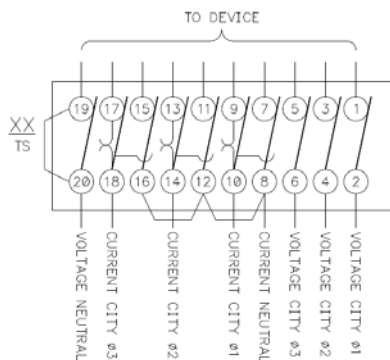
**Current** circuits will enter the test switch as follows:

1. City phase 1 enters on position 10
2. City phase 2 enters on position 14
3. City phase 3 enters on position 18

The circuit then leaves opposite sides 9, 13, & 17, respectively; are then connected to the device; and return on positions 7, 11 & 15, respectively. The star point is on the “entrance side” at positions 8, 12 & 16, respectively, and returns to the CT neutral on position 8.

**Voltage** circuits will enter the test switch on the even numbered side as well. City phase 1 enters on position 2, City phase 2 enters on position 4, and City phase 3 enters on position 6. The circuit then leaves on the opposite sides 1, 3 & 5, respectively, and is then connected to the device. Voltage (grounded) neutral will enter position 20 and go out opposite on position 19 to the device. The neutral position 19 & 20 will also maintain a hard-external jumper.

**Figure 1**  
**AC Test**  
**Switches**





## Panel Wiring (continued)

### Terminal Blocks

Terminal blocks will not be placed adjacent to devices that limit worker's access to equipment. See standard A-SS-0020 for layout explanation.

Field wiring should enter the bottom of the terminal block.

Terminal blocks shall be numbered, starting at 1, from the inside of the panel outward.

On AC terminal blocks, conductors should be landed in order of phase (i.e. phase 1 on terminal block x, phase 2 on terminal block x+1, phase 3 on terminal block x+2 and common/neutral on terminal block x+3).

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## Communication Wiring

Communication wiring should be shown on wiring diagrams. Refer to T&D standard A-SS-0100 for further information.

### Cables

All cables run in a tray or conduit must be at least 600V rated. For communication cables, a required space separation or conduit is required to run in cable trays or conduits with power cables.

Any communication cable that leaves the switchgear or control house should be converted to fiber. This eliminates the possibility of interference or noise on the cable.

## Communication Wiring (continued)

### 4-Wire RS485 Master to 4- Wire RS485 Slave

**Cables shall be twisted pair, shielded, with ground wire**

Be sure to always double check the manufacturer information for port assignments and adjust assignments to pins as necessary. Color codes to functionality should remain the same (i.e. –RX Master to –TX Slave should always be on White/solid pair, i.e. white-orange).

Any multi-dropped slaves will keep the same port assignments and colors (i.e. Slave #1 pin 3 will be –TX with white-blue, Slave #x pin 3 will be –TX on white-blue)

Master Function	Slave Function	Balanced Twisted Pair	Wire Color
-RX	-TX	Pair 1	White-Blue
-TX	-RX	Pair 1	Blue
+TX	+RX	Pair 2	White-Orange
+RX	+TX	Pair 2	Orange
Chassis	Not used	-	Shield
Comm GND	Comm GND	-	Not Used

***All shielded cables; grounded at chassis on one end only.***

### Ethernet 10BaseT 100BaseT Terminals

Copper Ethernet devices shall be wired to conform to the USOC EIA/TIA 568B standards. Category 5 cable, unshielded twisted pair is acceptable for short cable lengths without “power influence” or risk of surges. Device jacks are commonly RJ45.

### RJ45/568B Pinout

Cable End	Color	Pair	Pin
	White-Orange	Pair 2	1
C	Orange	Pair 2	2
A	White-Green	Pair 3	3
B	Blue	Pair 1	4
L	White-Blue	Pair 1	5
E	Green	Pair 3	6
	White-Brown	Pair 4	7
	Brown	Pair 4	8

## Control Wiring

All relevant control wiring should be shown on wiring diagrams.

Description	Control Cable #	Color	Size
Trip	1	Black	#12 or larger cable
Lights	2	White	
Close	3	Red	
Negative	4	Green	
Positive	5	Orange	
Relay Trip	6	Blue	
Annunciator	7	White/Black	
A-1 or X	8	Red/Black	
A-2 or Y	9	Green/Black	
Description	Current #	Color	Size
Phase 1	3	Red	#10 or larger cable
Phase 2	2	White	
Phase 3	4	Green	
Common	1	Black	
Description	AC Potential #	Color	Size
Phase 1	3	Red	#12 or larger cable
Phase 2	1	Black	
Phase 3	2	White	
Ground	4	Green	
Description	DC Potential #	Color	Size
DC Positive	3	Red	#12 or larger cable
DC Negative	1	Black	
DC Ground	4	Green	
Description	Transformer Control #	Color	Size
Power (PLTC#)	4	Green	#12 or larger
Auto (201A)	2	White	
Raise (201R)	1	Black	
Lower (201L)	3	Red	

## Control Wiring (continued)

Description	Power Supply 120/208/240V Cable #	Color	Size
Power (L1)	1	Black	#12 or larger cable
Neutral (N)	2	White	
Power(L2)	3	Red	
Ground (GND)	4	Green	

Status cable should be #18 with an overall shield. The shield should be continuous, and landed on one side only, nearest to the terminating device (i.e. RTU).

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## References

Tacoma Power standards:

- Construction Standard A-SS-0020, "Relay & Control Panel Layout, Transmission Substations"
  - Construction Standard A-SS-0025, "Labeling of T&D Substation Control House Equipment"
  - Construction Standard A-SS-0100, "Drawing Guidelines for Communication Equipment in Electrical Substations"
  - Work Practice W-SS-1020, "Substation Control Panel Wiring"
- 

## Reference Drawings

Refer to these reference drawings for examples of wiring design:

Drawing Standardization Wiring Diagram 1 & 2 of 2

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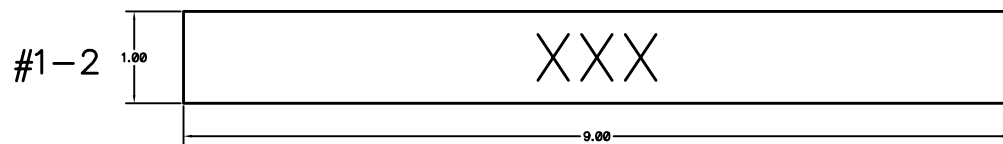
# PANEL LABELS



- WHITE LETTERING ON BLACK BACKGROUND
- TEXT HEIGHT: .50 - CENTER TEXT ON LABEL
- DIMENSIONS: 1" X 9"

EXAMPLES:  
XX = P1  
XX = AR105

LABEL FOR PANEL NUMBER

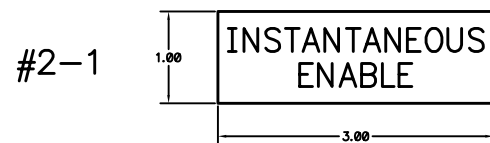


- WHITE LETTERING ON BLACK BACKGROUND
- TEXT HEIGHT: .50 - CENTER TEXT ON LABEL
- DIMENSIONS: 1" X 9" OR IF ADDITIONAL ROOM IS NEEDED 1" X 18"

EXAMPLES:  
XXX = PCB 10-457 NE-BLAIR  
XXX = PCB 10-222 COWLITZ-LAGRANDE #2  
XXX = BANK #1 PCB  
XXX = PCB 10-365  
XXX = FEEDER #1

LABEL FOR PANEL NAME

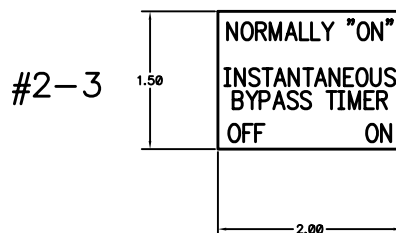
# SWITCH LABELS



- WHITE LETTERING ON BLACK BACKGROUND
- TEXT HEIGHT: .25 - CENTER TEXT ON LABEL
- DIMENSIONS: 1" X 3"

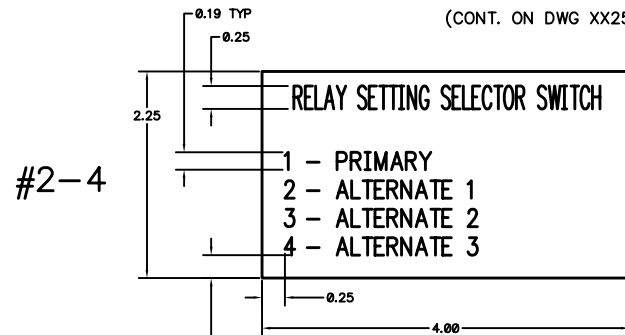


- WHITE LETTERING ON BLACK BACKGROUND
- TEXT HEIGHT: .19
- DIMENSIONS: 1.5" X 2"



# SWITCH LABELS

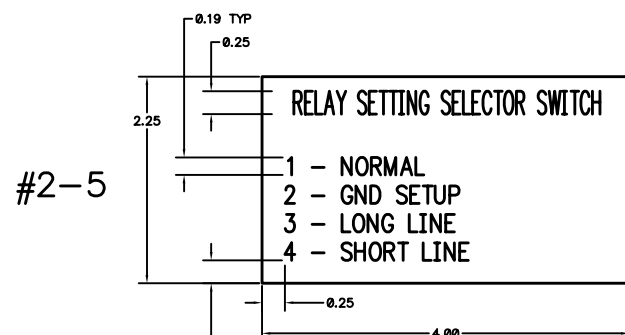
(CONT. ON DWG XX25-2)



- WHITE LETTERING ON BLACK BACKGROUND
- TEXT HEIGHT: AS NOTED
- DIMENSIONS: 2.25" X 4"

NOTE:  
ONLY THE SWITCH POSITIONS THAT ARE IMPLEMENTED ARE INCLUDED ON LABEL

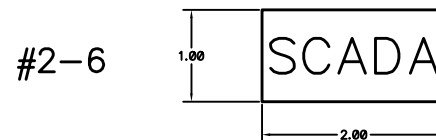
LABEL FOR TRANSMISSION RELAY SETTING SELECTOR SWITCH



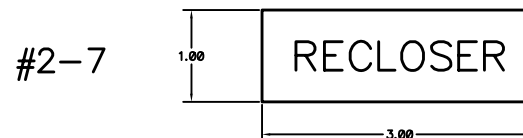
- WHITE LETTERING ON BLACK BACKGROUND
- TEXT HEIGHT: AS NOTED
- DIMENSIONS: 2.25" X 4"

NOTE:  
ONLY THE SWITCH POSITIONS THAT ARE IMPLEMENTED ARE INCLUDED ON LABEL

LABEL FOR DISTRIBUTION RELAY SETTING SELECTOR SWITCH



- WHITE LETTERING ON BLACK BACKGROUND
- TEXT HEIGHT: .38 - CENTER TEXT ON LABEL
- DIMENSIONS: 1" X 2"



- WHITE LETTERING ON BLACK BACKGROUND
- TEXT HEIGHT: .31 - CENTER TEXT ON LABEL
- DIMENSIONS: 1" X 3"



- WHITE LETTERING ON BLACK BACKGROUND
- TEXT HEIGHT: .31 - CENTER ON LABEL
- DIMENSIONS: 1" X 3"

EXAMPLES:  
XXX = FEEDER #1  
XXX = BANK #1 PCB  
XXX = 10-256

LABEL FOR CONTROL SWITCH

### GENERAL ORDERING INFORMATION:

- UNLESS OTHERWISE SPECIFIED:
  - LABELS TO BE BACKED WITH 1/32 ADHESIVE FOAM TAPE.
  - ALL EDGES TO BE BEVELED.
  - LABEL MATERIAL TO BE UV PROTECTED ULTRA-MATTE FINISH OR EQUIVALENT.
- VENDOR CONTACT INFORMATION:
  - DUREN CONTROLS (SAP VENDOR #109407)  
12314 BEVERLY PARK ROAD  
LYNNWOOD WA 98087-1513  
PH 425-745-4887  
FAX 425-355-1630  
• PRICING & FONT INFORMATION AVAILABLE @ WWW.DURENCONTROLS.COM  
• LABELS CAN BE MADE FROM AUTOCAD OR .DXF FILE
  - BIG JOHN'S TROPHY (SAP VENDOR #105671)  
5510 PACIFIC AVE  
TACOMA WA 98408  
PH 253-472-5258
  - PDQ (SAP VENDOR #106416)  
9318 STEELE ST S  
TACOMA WA 98444  
PH 253-536-9433

### REFERENCE DRAWINGS:

- A-SS-0025 LABELING OF SUBSTATION CONTROL HOUSE EQUIPMENT
- XX25-2 TYPICAL LABEL DETAILS SHEET 2
- XX25-3 TYPICAL LABEL DETAILS SHEET 3
- XX25-4 TYPICAL LABEL DETAILS SHEET 4

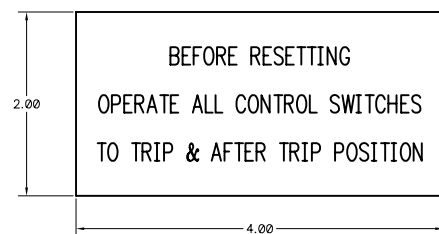
ENGR.	DATE	REV. NO.

CITY OF TACOMA			
DEPARTMENT OF PUBLIC UTILITIES			
LIGHT DIVISION			
STANDARDS			
TYPICAL LABEL			
DETAILS			
SHEET 1			
ISSUED BY	DATE	BY	CHECKED
AMY N. GRICE	3-29-06	ANG	RHC
APPROVED BY	DATE	BY	CHECKED
MICHAEL W. SIMPSON			

# SWITCH LABELS

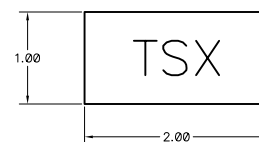
(CONT. FROM DWG XX25-1)

#2-9



- WHITE LETTERING ON RED BACKGROUND
- TEXT HEIGHT: .19 - CENTER TEXT ON LABEL
- DIMENSIONS: 2" X 4"

#2-14



- WHITE LETTERING ON BLACK BACKGROUND
- TEXT HEIGHT: .38 - CENTER TEXT ON LABEL
- DIMENSIONS: 1" X 2"

EXAMPLES:  
X = A  
X = B  
X = C

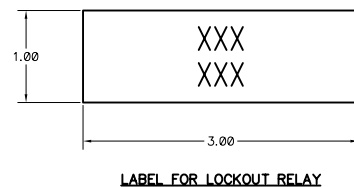
## REFERENCE DRAWINGS:

- A-SS-0025 LABELING OF SUBSTATION CONTROL HOUSE EQUIPMENT
- XX25-1 TYPICAL LABEL DETAILS SHEET 1
- XX25-3 TYPICAL LABEL DETAILS SHEET 3
- XX25-4 TYPICAL LABEL DETAILS SHEET 4

## NOTE:

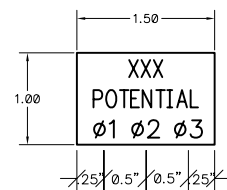
- SEE DWG XX25-1 FOR GENERAL LABEL ORDERING INFORMATION.

#2-10



- WHITE LETTERING ON BLACK BACKGROUND
  - TEXT HEIGHT: .25 - CENTER TEXT ON LABEL
  - DIMENSIONS: 1" X 3" OR IF ADDITIONAL ROOM IS NEEDED 1" X 4"
- EXAMPLES:  
XXX = BANK #1 LOCKOUT  
XXX = 110kV BUS LOCKOUT BANK #1  
XXX = SWGR BUS LOCKOUT BANK #1  
XXX = LS BUS LOCKOUT BANK #1

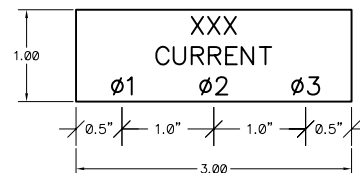
#2-11



LABEL FOR STATES TEST SWITCH FMS-10E1-ST

- WHITE LETTERING ON BLACK BACKGROUND
  - TEXT HEIGHT: .19
  - DIMENSIONS: 1.0" X 1.5"
- EXAMPLES:  
XXX = D25-1 13kV  
XXX = 110kV BK1  
XXX = 13kV BK1  
XXX = 110kV  
XXX = 13kV

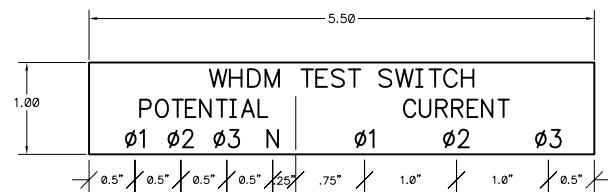
#2-12



LABEL FOR STATES TEST SWITCH FMS-10E1-ST

- WHITE LETTERING ON BLACK BACKGROUND
  - TEXT HEIGHT: .19
  - DIMENSIONS: 1.0" X 3"
- EXAMPLES:  
XXX = FEEDER #1 TSA  
XXX = BANK #1 PCB TSB  
XXX = 10-256 TSA

#2-13



LABEL FOR STATES TEST SWITCH FMS-10A1-ST

- WHITE LETTERING ON BLACK BACKGROUND
- TEXT HEIGHT: .19
- CENTER "POTENTIAL" & "CURRENT" TEXT ABOVE PHASE NUMBERS.
- PHASE NUMBERS (Ø"X") TO BE PLACED AS SHOWN.
- "WHDM TEST SWITCH" TEXT TO BE CENTERED ON LABEL.
- DIMENSIONS: 1.0" X 5.5"

NO.	DATE	REVISION	BY	CHECKED	APPROVED
CITY OF TACOMA DEPARTMENT OF PUBLIC UTILITIES LIGHT DIVISION					
STANDARDS TYPICAL LABEL DETAILS SHEET 2					
ENGR. DATE:			REV. NO.		
SUBMITTED AMY N. GRICE			DESIGNED ANG	DRAWN RHC	CHECKED XXX
APPROVED MICHAEL W. SIMPSON			DATE 3-29-06	SCALE NONE	DRAWING NO. XX25-2

# RELAY LABELS

# IED LABELS

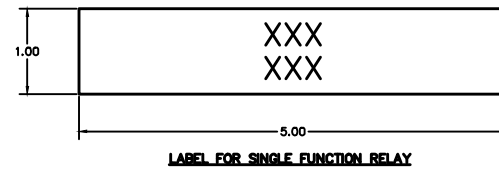
### REFERENCE DRAWINGS:

- A-SS-0025 LABELING OF SUBSTATION CONTROL HOUSE EQUIPMENT
- XX25-1 TYPICAL LABEL DETAILS SHEET 1
- XX25-2 TYPICAL LABEL DETAILS SHEET 2
- XX25-4 TYPICAL LABEL DETAILS SHEET 4

### NOTE:

1. SEE DWG XX25-1 FOR GENERAL LABEL ORDERING INFORMATION.
2. **FOR SINGLE DEVICE:**  
THE "1" DESIGNATOR IS ALWAYS PRESENT
- FOR MULTIPLE DEVICES:**  
THE DESIGNATOR SHOULD REFLECT SEQUENTIAL NUMBERING  
(EXAMPLE: BK1 MFPM1, BK1 MFPM2)

#3-1



- WHITE LETTERING ON BLACK BACKGROUND
- TEXT HEIGHT: .25 - CENTER TEXT ON LABEL
- DIMENSIONS: 1" X 5" (LENGTH MAY VARY DEPENDING ON DESCRIPTION)

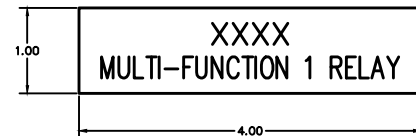
**EXAMPLES:**  
 XXX = BLAIR-LINCOLN LINE DIFFERENTIAL (87L)  
 XXX = 110kV BUS DIFF (87B)  
 XXX = BANK #2 PHASE 1 OVERCURRENT (50/51)

#3-2



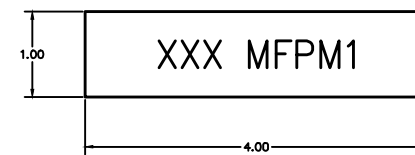
- WHITE LETTERING ON BLACK BACKGROUND
  - TEXT HEIGHT: .25 - CENTER TEXT ON LABEL
  - DIMENSIONS: 1" X 4"
- (SEE NOTE 2)

#3-3



- WHITE LETTERING ON BLACK BACKGROUND
  - TEXT HEIGHT: .25 - CENTER TEXT ON LABEL
  - DIMENSIONS: 1" X 4"
- EXAMPLES:**  
 XXXX = LAGRANDE-COWLITZ #1  
 XXXX = BANK #2
- (SEE NOTE 2)

#4-1

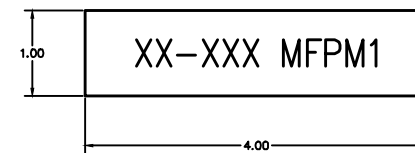


- WHITE LETTERING ON BLACK BACKGROUND
- TEXT HEIGHT: .31 - CENTER TEXT ON LABEL
- DIMENSIONS: 1" X 4"

**EXAMPLES:**  
 XXX = FDR5  
 XXX = BK1

(SEE NOTE 2)

#4-2

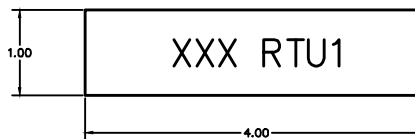


- WHITE LETTERING ON BLACK BACKGROUND
- TEXT HEIGHT: .31 - CENTER TEXT ON LABEL
- DIMENSIONS: 1" X 4"

**EXAMPLES:**  
 XX-XXXX = 10-457  
 XX-XXXX = 12-1663

(SEE NOTE 2)

#4-3

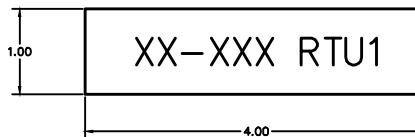


- WHITE LETTERING ON BLACK BACKGROUND
- TEXT HEIGHT: .31 - CENTER TEXT ON LABEL
- DIMENSIONS: 1" X 4"

**EXAMPLES:**  
 XXX = FDR2  
 XXX = BK1PCB

(SEE NOTE 2)

#4-4



- WHITE LETTERING ON BLACK BACKGROUND
- TEXT HEIGHT: .31 - CENTER TEXT ON LABEL
- DIMENSIONS: 1" X 4"

**EXAMPLES:**  
 XX-XXX = 12-1665M  
 XX-XXX = 10-457

(SEE NOTE 2)

#4-5



- WHITE LETTERING ON BLACK BACKGROUND
- TEXT HEIGHT: .50 - CENTER TEXT ON LABEL
- DIMENSIONS: 1" X 4"

(SEE NOTE 2)

#4-6



- WHITE LETTERING ON BLACK BACKGROUND
- TEXT HEIGHT: .31 - CENTER TEXT ON LABEL
- DIMENSIONS: 1" X 4"

**EXAMPLES:**  
 X = 1  
 X = 2

#4-7



- WHITE LETTERING ON BLACK BACKGROUND
- TEXT HEIGHT: .31 - CENTER TEXT ON LABEL
- DIMENSIONS: 1" X 4"

**EXAMPLES:**  
 X = 1  
 X = 2

CITY OF TACOMA DEPARTMENT OF PUBLIC UTILITIES LIGHT DIVISION					
<b>STANDARDS                  TYPICAL LABEL                  DETAILS                  SHEET 3</b>					
<small>DESIGNED BY</small>	<small>DATE</small>	<small>REVISION</small>	<small>BY</small>	<small>CHECKED</small>	<small>APPROVED</small>
AMY N. GRICE			ANG	RHC	XXX
MICHAEL W. SIMPSON			3-29-06	NONE	XX25-3

# OTHER EQUIP. LABELS

## REFERENCE DRAWINGS:

A-SS-0025 LABELING OF SUBSTATION CONTROL HOUSE EQUIPMENT  
 XX25-1 TYPICAL LABEL DETAILS SHEET 1  
 XX25-2 TYPICAL LABEL DETAILS SHEET 2  
 XX25-3 TYPICAL LABEL DETAILS SHEET 3

## NOTE:

1. SEE DWG XX25-1 FOR GENERAL LABEL ORDERING INFORMATION.

#5-1

1.00  
2.00

PHASE 1

- WHITE LETTERING ON BLACK BACKGROUND
- TEXT HEIGHT: .25 - CENTER TEXT ON LABEL
- DIMENSIONS: 1" X 2"

#5-2

1.00  
2.00

PHASE 2

- WHITE LETTERING ON BLACK BACKGROUND
- TEXT HEIGHT: .25 - CENTER TEXT ON LABEL
- DIMENSIONS: 1" X 2"

#5-3

1.00  
2.00

PHASE 3

- WHITE LETTERING ON BLACK BACKGROUND
- TEXT HEIGHT: .25 - CENTER TEXT ON LABEL
- DIMENSIONS: 1" X 2"

#5-4

1.00  
2.00

TRO RESET

- WHITE LETTERING ON BLACK BACKGROUND
- TEXT HEIGHT: .25 - CENTER TEXT ON LABEL
- DIMENSIONS: 1" X 2"

#5-5

3.00  
3.00

FDR TRIPS  
ON BANK  
OVERTEMP

- WHITE LETTERING ON RED BACKGROUND
- TEXT HEIGHT: .50" - CENTER TEXT ON LABEL
- DIMENSIONS: 3" X 3"

#5-6

1.00  
3.00

XXX-CONV

- WHITE LETTERING ON BLACK BACKGROUND
- TEXT HEIGHT: .31 - CENTER TEXT ON LABEL
- DIMENSIONS: 1" X 3"
- EXAMPLES:  
XXX = BK1  
XXX = N2C1

#5-7 SPARE

#5-8

1.00  
3.00

XXX-TERM

- WHITE LETTERING ON BLACK BACKGROUND
- TEXT HEIGHT: .31 - CENTER TEXT ON LABEL
- DIMENSIONS: 1" X 3"
- EXAMPLES:  
XXX = BK1  
XXX = P3

#5-9

1.00  
3.00

SUDDEN PRESSURE  
RESET

- WHITE LETTERING ON BLACK BACKGROUND
- TEXT HEIGHT: .19 - CENTER TEXT ON LABEL
- DIMENSIONS: 1" X 3"

#5-10

1.00  
3.00

SUDDEN PRESSURE  
NORMALLY ON

- WHITE LETTERING ON BLACK BACKGROUND
- TEXT HEIGHT: .19 - CENTER TEXT ON LABEL
- DIMENSIONS: 1" X 3"

#5-11

1.00  
4.00

BANK TEMPERATURE TRIP  
FEEDER #X

- WHITE LETTERING ON BLACK BACKGROUND
- TEXT HEIGHT: .25 - CENTER TEXT ON LABEL
- DIMENSIONS: 1" X 4"

#5-12

1.00  
3.00

XXX  
BATTERY CHARGER

- WHITE LETTERING ON BLACK BACKGROUND
- TEXT HEIGHT: .25 - CENTER TEXT ON LABEL
- DIMENSIONS: 1" X 3"
- EXAMPLES:  
XXX = 125VDC  
XXX = 48VDC

#5-13

1.00  
3.00

XXX

- WHITE LETTERING ON BLACK BACKGROUND
- TEXT HEIGHT: .25 - CENTER TEXT ON LABEL
- DIMENSIONS: 1" X 3"
- EXAMPLES:  
XXX = AC PANEL-1  
XXX = DC PANEL-2A  
XXX = 125VDC PANEL  
XXX = 48DC PANEL  
XXX = 48DC PANEL-2  
XXX = 125VDC PANEL-1

LABEL FOR AC & DC PANELS

NO.	DATE	REVISION	BY	CHECKED	APPROVED
CITY OF TACOMA DEPARTMENT OF PUBLIC UTILITIES LIGHT DIVISION					
STANDARDS TYPICAL LABEL DETAILS SHEET 4					
SUBMITTED		DESIGNED	DRAWN	CHECKED	
AMY N. GRICE		ANG	RHC	XXX	
APPROVED		DATE		SCALE	
MICHAEL W. SIMPSON		3-29-06		NONE	
		DRAWING NO.		XX25-4	